**PORT OF HOOD RIVER COMMISSION**
**AGENDA**
**Tuesday, February 15, 2022**
**Via Remote Teleconference**
**1000 E. Port Marina Drive, Hood River**

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**5:00 P.M.**
**Regular Session**

1. Call to Order
   a. Modifications, Additions to Agenda
   b. Public Comment (5 minutes per person per subject; 30-minute limit)

2. Consent Agenda
   a. Approve Minutes from the February 1, 2022 Regular Session *(Patty Rosas, Page 3)*
   b. Approve Amendment No. 1 to Real Carbon Lease at the Big 7 Building *(Greg Hagbery, Page 7)*
   c. Approve Amendment No. 1 to Contract with Fred Kowell for Financial Services (*Michael McElwee, Page 11)*
   d. Approve Accounts Payable to Jaques Sharp in the Amount of $15,500 *(Jana Scoggins, Page 15)*

3. Informational Reports – *(Provided for information only, unless discussion requested by Commissioner)*
   a. Bridge Replacement Project Update *(Kevin Greenwood, Page 21)*
   b. Bridge Wire Ropes Replacement Project Plans, Specs, and Schedule *(John Mann, Page 29)*
   c. Auditor & General Counsel Draft Solicitations *(Michael McElwee, Page 31)*
   d. Executive Director Mid-Year Work Plan Update *(Michael McElwee, Page 49)*

4. Presentations & Discussion Items
   a. Bridge Load Limit Engineering Analysis Report – Mark Libby, HDR *(Michael McElwee/Mark Libby, P.E. Page 61)*
   b. Airport Work Session *(Greg Hagbery, Page 187)*

5. Executive Director Report *(Michael McElwee, Page 205)*

6. Commissioner, Committee Reports
   a. Marina Committee
   b. Waterfront Recreation Committee
   c. Bi-State Working Group
   d. Urban Renewal
   e. Hood River Energy Council

7. Action Items
   a. Approve Nez Perce Toll Waiver Policy *(Michael McElwee, Page 221)*

8. Confirmation of Commission Directives to Staff

9. Commission Call

10. Executive Session under ORS 192.660(2)(e) real estate negotiations and 192.660.(2)(f) to consider information or records that are exempt from disclosure by law, and 192.345(2) Trade Secrets.

11. Possible Action

12. Adjourn

If you have a disability that requires any special materials, services, or assistance, please contact us at 541,386,1645 so we may arrange for appropriate accommodations.

*The chair reserves the opportunity to change the order of the items if unforeseen circumstances arise. The Commission welcomes public comment on issues not on the agenda during the public comment period. With the exception of factual questions, the Commission does not immediately discuss issues raised during public comment. The Commission will either refer concerns raised during public comment to the Executive Director for a response or will request that the issue be placed on a future meeting agenda. People distributing copies of materials as part of their testimony should bring **10 copies**. Written comment on issues of concern may be submitted to the Port Office at any time.*

***Port of Hood River Commission***
***Meeting Minutes of February 1, 2022 Regular Session***
***Via Remote Video Conference***
***5:00 p.m.***

**THESE MINUTES ARE NOT OFFICIAL until approved by the Port Commission at the next regular meeting.**

**5:00 p.m.**
**Regular Session**

**Present:** Commissioners: Ben Sheppard, Kristi Chapman, Mike Fox, Hoby Streich, and Heather Gehring. Legal Counsel: Jerry Jaques, and Anna Cavaleri. From Staff: Michael McElwee, Kevin Greenwood, Daryl Stafford, Genevieve Scholl, Greg Hagbery, and Patty Rosas. Guests: None
**Absent:** None
**Media:** None

1. **Call to Order:** Commissioner Ben Sheppard called the meeting to order at 5:00 p.m.
   a. **Modifications or additions to the agenda:** Modification to 2(g) - change completion date of contract amendment from January 2023 to July 2022. Correction to 2(e) & Executive Directors Report – change date of Spring Planning from March to April 5. Correction to 2(a) – strike partial sentence on 7(b) and strike bold label on energy council.

2. **Public Comment:** None

3. **Consent Agenda:**
   a. Approve Minutes from the January 18, 2022 Regular Session with noted corrections.
   b. Approve Lease with Hood River County Veterans Affairs in the Marina Park #1 Building.
   c. Approve Commission Training Policy.
   d. Approve Employee Satisfaction Survey.
   e. Approve Grant Agreement with ODOT for Immediate Opportunity Fund for E Anchor Way Road and Utility Project.
   f. Approve Amendment No. 3 to Task Order 11 with HDR Engineering for Engineering Services Related to Bridge Load Rating.
   g. Approve Amendment No. 3 to Contract with Coffman Engineering for Engineering Services Related to Bridge Approach Ramp Overlay Project with noted contract end date change.
   h. Approve Contract with Soil Solutions for Tank Removal at the Airport.
   i. Approve Amendment No. 3 to Lease with Chief Consulting in the Timber Incubator Building.
   j. Approve Appointment of Brian Shortt to the Budget Committee to Fill Vacancy of Svea Truax.
   k. Approve Waterfront Recreation Lesson & Rental Seasonal Concession Permit for Doug's Hood River Water Adventures.
   l. Approve Dockage Agreement with Gorge Sailing Ventures, LLC at the Marina.
   m. Approve Accounts Payable to Jaques Sharp in the Amount of $12,475.

| | |
|---|---|
| **Motion:** | Approve consent agenda with the three noted changes above. |
| **Move:** | Kristi Chapman |
| **Second:** | Mike Fox |
| **Discussion:** | None |
| **Vote:** | Unanimous |

4. **Information Reports:** None

5. **Presentation & Discussion Items:** None

6. **Executive Director Report:**

a. **Administration –** Michael McElwee is pleased to report that he has an accepted offer from a C.F.O candidate. This individual will not be starting until Mid-March. McElwee noted that the budget preparation schedule is provided in the packet and requested that each Commissioner review it and make sure they are available on those dates. A 2022 SDAO Annual Conference link was provided, and Commissioners were encouraged to view the topics and participate if possible. Port of Cascade Locks (POCL) continues to express interest in having a joint Commission meeting or work session. McElwee is suggesting March 1 for this virtual meeting and is requesting that Commissioners check their availability. Commissioner Fox suggested that the topics they discuss should be common to both Ports and requested to see an agenda well in advance of the meeting. McElwee noted that a draft agenda will be ready at the next meeting on February 15.

b. **Bridge/Transportation –** McElwee commented that there will be a significant impact to traffic due to the two upcoming large projects on the bridge. John Mann reported that the project bid documents include incentives and motivation for faster completion of the projects. This work will require full bridge closures from 3-7 consecutive days, 24 hours per day.

**7. Commissioner, Committee Reports:**

a. **Airport Advisory Committee (AAC) –** Greg Hagbery reported that one of the items discussed at the previous meeting was a refined snowplow plan and added that it was a much more efficient way to deal with that challenge. Another topic that was discussed was the possibility of a quarterly newsletter that the Port would send out to stakeholders and tenants. The newsletter would provide updates on what has been accomplished and what to look forward to in the future. Members of the AAC meeting suggested having quarterly meetings rather than monthly meetings. A decision will be made at the next AAC meeting.

b. **Bi-State Working Group (BSWG) –** Commissioner Fox turned to Kevin Greenwood for an update. Greenwood reported that ODOT submitted extensive comments on the Replacement Bridge Management Contract (RBMC) RFP. Staff is currently working on making those adjustments. ODOT suggested adding criteria for the project approach and experience on similar projects. Greenwood hopes to have the document ready for Commission approval and release at the February 15 meeting. Commissioner Fox expressed the need for the BSWG/Commissioners to have a better understanding of the negotiation process. Greenwood replied that they have been speaking to a representative that works for TriMet who has experience in these processes and has been sharing some of his knowledge with the evaluation committee and BSWG. Greenwood added that he will focus on this matter once the RFP is complete. Commissioner Fox provided a brief update regarding legislation and advocacy activities underway in Oregon and Washington. They've had multiple meetings in the last three weeks with various representatives from Oregon legislature to discuss the proposed language for the Bi-State Bridge Authority as well as discussing bridge efforts that are underway, and the need for $20 million by summer of 2022. Overall, he felt that everyone was very supportive of the bridge project. Greenwood commented that there was recently a hearing in front of the Oregon Transportation Committee (OTC) and that there would be another one on February 17 and added that if anyone was interested in advocating, to please notify him. Greenwood reported that on the Washington side the BSWG members have been meeting with legislators. Also, the Washington Senate Bill 5558 passed the Senate Transportation Committee last Thursday.

**8. Action Items:**

a. **Approve Amendment No. 8 Contract with WSP for Engineering Services Related to Bridge Replacement**

**Motion:** Authorize amendment No. 8 with WSP for continued environmental work and other project assistance related to bridge replacement not to exceed $187,000.
**Move:** Mike Fox
**Second:** Hoby Streich
**Discussion:** None
**Vote:** Unanimous

b. **Approve Contract with Aset Advanced Security for Security Camera System at the Airport**

**Motion:** Approve Contract with Aset Advanced Security & Electrical Technology Inc., for security camera system at the Ken Jernstedt Airfield, not to exceed $15,000.
**Move:** Kristi Chapman
**Second:** Hoby Streich
**Discussion:** Commissioner Fox suggested a rotating camera to get a fuller view. Commissioner Streich noted that the lenses need to maintain clean and suggested adding this to the work schedule for the facilities crew. Commissioner Fox requested to have a third camera to cover the entrance and fuel station. There was unanimous consent to increase the budget to $15,000 to add a third camera at the fuel station.
**Vote:** Unanimous

c. **Approve 2022-25 Food Concession Agreement with The Downwinder at the Event Site Dock**

**Motion:** Approve Mobile Food Unit Vendor Concession Permit with Sandbar Café and Downwinder at the Event Site Cruise Ship Dock.
**Move:** Kristi Chapman
**Second:** Mike Fox
**Discussion:** None
**Vote:** Unanimous

d. **Approve 2022-25 Food Concession Agreement with The Sandbar Café at the Event Site Dock**

**Motion:** Approve Mobile Food Unit Vendor Concession Permit with Sandbar Café and Downwinder at the Event Site Cruise Ship Dock.
**Move:** Kristi Chapman
**Second:** Mike Fox
**Discussion:** None
**Vote:** Unanimous

**9. Confirmation of Commission Directives to Staff:**

a. Request for staff to provide a draft agenda on February 15 for the joint Commission meeting with POCL.
b. Request for staff to provide a better understanding of how the financial review will be conducted of the negotiated contract regarding the RFP for the RBMC. Commissioner Fox commented that he would like a better understanding of that evaluation and how they would determine if its fair and reasonable.

**10. Commission Call:** None

**11. Executive Session:** President Sheppard recessed Regular Session at 6:38 p.m. to call the Commission into Executive Session under ORS 192.660(2)(e) Real Estate Negotiations and 102.660(2)(f) to consider information or records that are exempt from disclosure by law.

**12. Possible Action:** None

**11. Adjourn:**

**Motion**: Adjourn the meeting
**Vote:** Unanimous
**MOTION CARRIED**

The meeting adjourned at 9:34 p.m.

Respectfully submitted,

_____
Patty Rosas

# Commission Memo

Prepared by: Greg Hagbery
Date: February 15, 2022
Re: Real Carbon Inc. - Lease Addendum No.1

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Real Carbon Inc. has been a tenant of the Port since 2011 and has been in the Big 7 Building since 2015. They lease R&D space for their work in the aviation technology industry. On January 1, 2021, Real Carbon entered into a new Lease agreement under the new lease structure. Real Carbon has informed the Port that they wish to exercise the option for a Lease extension but for only a six (6) month period, terminating June 30, 2022.

**RECOMMENDATION:** Approve Addendum No. 1 to Lease with Real Carbon, Inc. at Suite 101 of the Big 7 Building.

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# ADDENDUM NO.1 TO LEASE

**Whereas,** the Port of Hood River ("Lessor") and Real Carbon Inc, ("Lessee") entered into a Lease of Suite 101 in the Big 7 Building ("Building") located at 616 Industrial Street, Hood River, Oregon ("Leased Premises"), effective January 1, 2021 ("Lease"); and,

**Whereas,** pursuant to Section 2 of the Lease, Lessee has provided Lessor notice of Lessee's intent to exercise its option to renew the Lease, but requests a six-month extension only; and,

**Therefore,** Lessor and Lessee agree as follows:

1. The Lease term continues for an additional six (6) month, effective as of February 1, 2022 ("Effective Date") and terminating as of June 30, 2022, and;

Except as modified by this Addendum No.1, to Lease, all terms and conditions of the Lease shall remain in full force and effect.

DATED THIS _____ DAY OF _____ 2022.

By: _____
Michael S. McElwee, Port of Hood River, Executive Director

By: _____
Michael Graham, Real Carbon Inc.,

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# Commission Memo

Prepared by: Michael McElwee
Date: February 15, 2022
Re: Fred Kowell Consulting Contract – Amendment No. 1

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The attached Amendment No. 1 to the contract with retired CFO Fred Kowell extends the term of the contract based on the new CFO start date of March 14. The original contract amount was based upon a training and exit strategy occurring in February. This extension will allow transition training through the end of March with some availability thereafter. This will enable the Port to continue in an uninterrupted capacity in its Finance Department.

**RECOMMENDATION:** Approve Amendment No. 1 to contract with Fred Kowell for $11,000 for a total contract amount not to exceed $36,000, subject to legal counsel review.

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**AMENDMENT NO. 1**
**TO PERSONAL SERVICES CONTRACT**

This Amendment No. 1 to a Personal Services Contract ("Contract") is entered into by and between **Fred Kowell** ("Contractor") and the Port of Hood River ("Port").

**RECITALS:**

WHEREAS, Contractor and Port entered into Contract dated December 21, 2021 for consulting services for accounting, finance, budget, and tolling services; and

WHEREAS, the Port seeks additional services from the Contractor until his replacement is hired, trained and to have Contractor available for discussion on issues that arise that weren't covered during training.

NOW THEREFORE:

- Contractor and Port agree that the maximum consideration under this Contract shall be increased by $11,000 for a total Contract amount of $36,000.

- Contractor and Port agree that the Contract will be in effect until July 30, 2022.

Except as changed by this Amendment No. 1, all terms of the Contract shall remain unchanged and in effect.

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|---|---|
| **Fred Kowell** | **PORT OF HOOD RIVER** |
| _____ | _____ |
| Fred Kowell (Contractor) | Michael S. McElwee, Executive Director |
| Date:_____ | Date:_____ |
| 752 NE Royal Court<br>Portland, OR 97232<br>Phone: 503-308-2672<br>Email: fjkowell@hotmail.com | 1000 E. Port Marina Drive<br>Hood River OR 97031<br>(541) 386-1138<br>mmcelwee@portofhoodriver.com |

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# Commission Memo

Prepared by: Jana Scoggins
Date: February 15, 2022
Re: Accounts Payable Requiring Commission Approval

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**Jaques Sharp** **$15,500.00**

Attorney services per attached summary

**TOTAL ACCOUNTS PAYABLE TO APPROVE** **$15,500.00**

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JAQUES SHARP
ATTORNEYS AT LAW

205 3RD STREET / PO BOX 457
HOOD RIVER, OR 97031
(Phone) 541-386-1311 (Fax) 541-386-8771

CREDIT CARDS ACCEPTED



HOOD RIVER, PORT OF
1000 E. PORT MARINA DRIVE
HOOD RIVER OR 97031

February 10, 2022
Account No: PORTOHaM

| Previous Balance | Fees | Expenses | Advances | Payments | Balance |
|---|---|---|---|---|---|
| MCELWEE EMPLOYMENT CONTRACT | | | | | |
| 0.00 | 150.00 | 0.00 | 0.00 | 0.00 | $150.00 |
| MISCELLANEOUS MATTERS | | | | | |
| JJ | | | | | |
| 1,125.00 | 3,525.00 | 0.00 | 0.00 | -1,125.00 | $3,525.00 |
| FBO AIRPORT AGREEMENT (Gifford/Classic Wings) | | | | | |
| 0.00 | 775.00 | 0.00 | 0.00 | 0.00 | $775.00 |
| ORDINANCE #24 | | | | | |
| 3,175.00 | 0.00 | 0.00 | 0.00 | -3,175.00 | $0.00 |
| EASEMENT (CenturyLink) | | | | | |
| 225.00 | 0.00 | 0.00 | 0.00 | -225.00 | $0.00 |
| EXPO SITE DEVELOPMENT (Key Development;Pickhardt) | | | | | |
| 0.00 | 450.00 | 0.00 | 0.00 | 0.00 | $450.00 |
| TIMBER INCUBATOR BUILDING LEASE (Chief Consulting | | | | | |
| 325.00 | 975.00 | 0.00 | 0.00 | -325.00 | $975.00 |
| ODOT BRIDGE FUNDS IGA (State of OR; ODOT) | | | | | |
| 125.00 | 0.00 | 0.00 | 0.00 | -125.00 | $0.00 |
| BOATHOUSE LEASES | | | | | |
| 25.00 | 0.00 | 0.00 | 0.00 | -25.00 | $0.00 |

| Previous Balance | Fees | Expenses | Advances | Payments | Balance |
|---|---|---|---|---|---|
| SECURITY SERVICES CONTRACT (HRT) | | | | | |
| 0.00 | 475.00 | 0.00 | 0.00 | 0.00 | $475.00 |
| EMPLOYEE MATTERS | | | | | |
| 0.00 | 100.00 | 0.00 | 0.00 | 0.00 | $100.00 |
| CONCESSION PERMITS | | | | | |
| 0.00 | 2,000.00 | 0.00 | 0.00 | 0.00 | $2,000.00 |
| BRIDGE EASEMENT-CENRTYLINK (United Telephone Compa | | | | | |
| 75.00 | 0.00 | 0.00 | 0.00 | -75.00 | $0.00 |
| LEASE (United State Goverment (GSA)(FHWA)) | | | | | |
| 250.00 | 325.00 | 0.00 | 0.00 | -250.00 | $325.00 |
| NORTHWEST PIPELINE EASEMENT | | | | | |
| 325.00 | 50.00 | 0.00 | 0.00 | -325.00 | $50.00 |
| BRIDGE CABLE EASEMENT (Falcon) | | | | | |
| 350.00 | 75.00 | 0.00 | 0.00 | -350.00 | $75.00 |
| BISTATE WORKING GROUP | | | | | |
| 2,700.00 | 1,325.00 | 0.00 | 0.00 | -2,700.00 | $1,325.00 |
| BARMAN PROPERTY | | | | | |
| 450.00 | 50.00 | 0.00 | 0.00 | -450.00 | $50.00 |
| WAAAM HANGAR LEASE | | | | | |
| 1,125.00 | 2,175.00 | 0.00 | 0.00 | -1,125.00 | $2,175.00 |
| GOVERNANCE | | | | | |
| 0.00 | 725.00 | 0.00 | 0.00 | 0.00 | $725.00 |
| REPLACEMENT BRIDGE MANAGEMENT CONTRACT | | | | | |
| 0.00 | 550.00 | 0.00 | 0.00 | 0.00 | $550.00 |
| WASHINGTON BRIDGE FUNDS AGREEMENT (Washington State Department of Transportation/Klickitat County) | | | | | |
| 1,850.00 | 850.00 | 0.00 | 0.00 | -1,850.00 | $850.00 |
| FRED KOWELL SERVICES CONTRACT - OR (Fred Kowell) | | | | | |
| 350.00 | 0.00 | 0.00 | 0.00 | -350.00 | $0.00 |
| ODOT E. ANCHOR WAY IOF GRANT | | | | | |
| 0.00 | 475.00 | 0.00 | 0.00 | 0.00 | $475.00 |
| BREEZEBY TOLLING SYSTEM | | | | | |
| 0.00 | 425.00 | 0.00 | 0.00 | 0.00 | $425.00 |
| PROPERTY PURCHASE (Phil Jensen/Luhr Jensen) | | | | | |
| 0.00 | 25.00 | 0.00 | 0.00 | 0.00 | $25.00 |

| Previous Balance | Fees | Expenses | Advances | Payments | Balance |
|---|---|---|---|---|---|
| 12,475.00 | 15,500.00 | 0.00 | 0.00 | -12,475.00 | $15,500.00 |

**THIS STATEMENT REFLECTS SERVICES PROVIDED AND PAYMENTS RECEIVED THROUGH THE 31ST OF JANUARY UNLESS OTHERWISE STATED**

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Hood River – White Salmon BRIDGE REPLACEMENT PROJECT

Project Director Report
February 15, 2022

The following summarizes Bridge Replacement Project activities from Jan. 28-Feb. 10:

**PROJECT UPDATES**

- *The legislative process in both states have picked up steam. The Bi-State Working Group (BSWG), staff, Steve Siegel, Miles Pengilly and Brad Boswell have all helped in educating, advocating and effectively making the case for project funding and the bridge authority legislation. Numerous letters – from both private and public sector – have been submitted to the legislature and the Oregon Transportation Commission (OTC) and it appears that the effort is making a difference. A big thank you to Commissioner Fox and all of the local elected officials who have taken the lead on legislative advocacy.*
- *In Oregon, House Bill 4089-1 passed the Joint Transportation Committee last week. Rep. Anna Williams, Sen. Chuck Thomsen, Sen. Curtis King-Wash., and Commissioner Fox all testified. The vote was unanimous. Rep. Williams will be sponsoring the bill on the House floor; and Sen. Thomsen on the Senate floor. These votes will take place early this week and, if successful, will go to Governor's desk for signature.*
- *In Washington, SSB 5558 also passed the Senate Transportation Committee unanimously with Oregon Rep. Williams providing testimony. The bill co-sponsored by Sen. King, Sen. Liias, and Sen. Mullet passed the Senate unanimously as well on Feb. 8 and awaits introduction to the House.*
- *A transportation package being brought forth by Washington democrats includes $75-million for the Hood River Bridge. It's unclear whether the proposal will gain bi-partisan support. Funding for the package does not include a gas tax but significant fees are added.*
- *The Oregon Transportation Commission (OTC) will be holding a hearing on Feb. 17th on programming priorities for spending the nearly $800-million Infrastructure Investment & Jobs Act (IIJA). There continues to be letters submitted to the OTC in support of the $20-million request to complete bridge engineering. OneGorge letter of support attached.*
- *The RBMC RFP is in the review process currently with the Port's outside counsel, edits/changes will be made and final copy distributed to ODOT Procurement Office. As the final reviews are completed, the BSWG is reviewing the agenda for the Pre-Proposal Conference, staff is preparing training materials for the evaluation committee and for publishing the industry notices.*
- *First Treaty Agreement planning meeting with Yakama Nation took place last week. Agenda developed for larger meeting with FHWA and Yakama Directors.*
- *WSP and Port staff met with FHWA last week to review BUILD grant agreement materials. Agreement must be completed by September 2022.*
- *NOFO for Federal RAISE grant application has been issued. Deadline for application is April 15th. Limits are $1-$25M for rural planning grants. Will evaluate status of Port's BUILD award to analyze RAISE opportunity.*

- *Monthly NEPA Update included. Sec. 106 Consulting Parties meeting No. 5 scheduled for March 1st. The Meeting is an opportunity for those agencies and non-profits charged with monitoring historic and archaeological impacts to share their ideas for mitigation. The process will result in an agreement between FHWA and those parties. Agenda included in packet.*
- *BSWG heard legislative updates, P3 discussion with Jen Mayer (Concept Jeneration, LLC), discussion on Commission Formation Agreements with Steve Siegel. Agenda included in packet.*
- *HB2017 funds have been fully expended; Washington state funds start covering expenses as of first week of February. Efforts have started back up to complete grant agreements for BUILD and Oregon ARPA funds.*

**MEETING SCHEDULE**

- *FHWA BUILD, Feb. 11*
- *Yakama Treaty, Feb. 14*
- *WSP Weekly Check In, Feb. 14*
- *BSWG Meeting, Feb. 14*
- *Thorn Run Partners Check-in, Feb. 15*
- *Hood River Rotary Zoom, Feb. 17*
- *WSP Weekly Check In, Feb. 21*
- *NEPA Coordination, Feb. 24*
- *Cult. Resource Sec. 106, Jan. 25*
- *WSP Weekly Check In, Feb. 28*
- *Thorn Run Partners Check-in, Mar. 1*
- *Consulting Parties #5, Mar. 1*

Hood River – White Salmon

# EIS UPDATE
## BRIDGE REPLACEMENT PROJECT

**MARCH 2022 UPDATE**

In December 2003, a draft environmental impact statement (EIS) was published as part of a bi-state collaborative effort. This draft EIS was the first step in complying with the National Environmental Policy Act (NEPA). Currently, the Port of Hood River (Port) is advancing the project to complete the EIS effort and position the project for future funding and construction. A Bi-State Working Group (BSWG) consisting of Mayors and County Commissioners from both Hood River and Klickitat Counties monitors the project and advises the Port on bridge replacement activities.

## NEPA Activities:

**Work continues on tasks necessary to finalize the EIS and prepare a Record of Decision. This includes:**

- Tribal compensatory agreements for to impacts to treaty fishing activities during construction.
- Completion of the Endangered Species Act consultation.
- Finalizing Section 106 process including meeting with consulting parties and completion of the mitigation agreement for impacts to the historic bridge.

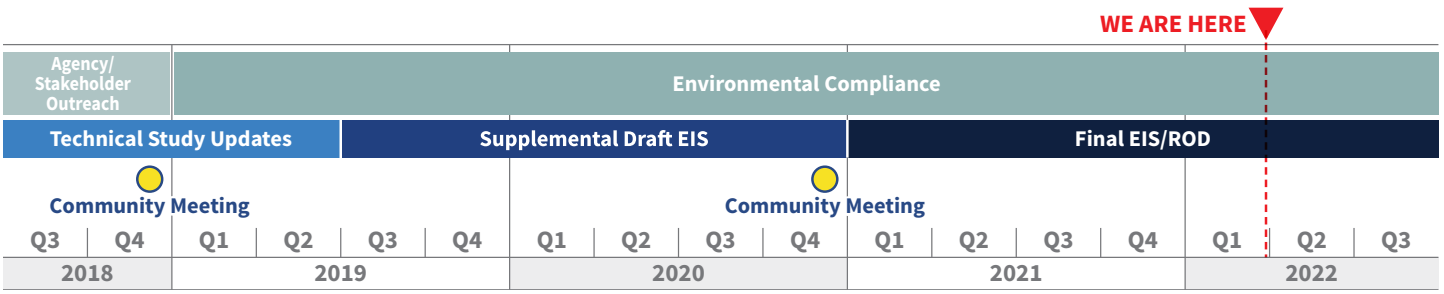
## Other Activities:

- Bridge Authority Legislation Update: Oregon House Bill 4089 passes full House and Washington Senate Bill 5558 passes full Senate.
- Project Management procurement for next phase of project continues to be reviewed by the state.
- Opportunity to advocate on behalf of project with Oregon Transportation Commission on Feb. 17th.
- Grant agreement with Washington state complete; allows project to continue.
- Bridge Weight Limit analysis to be reviewed by Port this month; options considered for possible plan to remove weight limits.
- Wire rope replacement and approach ramp repairs also being scheduled for contract this summer.

### *How would bridge replacement benefit the Columbia River Gorge communities?*

*The Hood River Bridge provides a critical connection for residents and visitors to the Columbia River Gorge National Scenic Area. One of only three bridges spanning the Columbia in this region, the bridge is a critical rural freight network facility for agriculture, forestry, heavy industry and high-tech companies with freight originating throughout the northwest. The existing bridge is nearing the end of its serviceable life and is obsolete for modern vehicles with height, width, and weight restrictions and is also a navigational hazard for marine freight vessels. The bridge has no sidewalks or bicycle lanes for non-motorized travel and would likely not withstand a large earthquake.*

*If project funding is secured, the new bridge would provide a safe and reliable way for everyone to cross or navigate the Columbia River—by car, truck, bus, bicycle, on foot, or on the water. A new bridge would support a thriving economy and livable communities.*




**To learn more about the project, please visit us at:**

**www.portofhoodriver.com/bridge**


## PROJECT CONTACT

Kevin Greenwood, Project Director
☏ 541-436-0797
@ kgreenwood@portofhoodriver.com

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**DRAFT AGENDA**

**Hood River – White Salmon Interstate Bridge Replacement Project**
**Section 106 Consulting Parties Meeting**
**March 1, 2022**

[redacted]

*Objective: The purpose of this meeting is to convene tribes and federal, state, and local agencies, as well as other consulting parties, to discuss the development of a Project Agreement to resolve the adverse effects from the Hood River-White Salmon Interstate Bridge Replacement Project consistent with Section 106 of the National Historic Preservation Act. The intent of this meeting will be to provide an update on the overall environmental (NEPA) process, review the status of Section 106 consultation performed for this project thus far, review draft agreement text, and refine ideas on which mitigation options to move forward with.*

1. Introductions
    a. Tribes (Cowlitz, Grand Ronde, Nez Perce, Siletz, Umatilla, Warm Springs, Yakama)
    b. Federal Agencies (Federal Highway Administration; U.S. Coast Guard; U.S. Army Corps of Engineers; U.S. Bureau of Indian Affairs; USDA-CRG National Scenic Area)
    c. State and Local Agencies (Oregon DOT; Washington State DOT; Oregon SHPO; Washington State DAHP; Port of Hood River; City of Hood River; City of White Salmon; Klickitat County; Hood River County)
    d. Consulting Parties
2. Project Updates
    a. NEPA process (Current Milestones & Schedule)
        i. Combined Final EIS & ROD – 2022
    b. Section 106 Consultation Updates – Oregon and Washington SHPOs -
        i. Archaeological Resources Survey Report & Archaeological Testing Report
            1. Comments received from consulting parties/Report Revisions
        ii. Inadvertent Discovery and Monitoring Plan (Attachment to MOA)
            1. Temporary Construction Easements
            2. No Work Zones
3. Review new additions and changes to the Project MOA since last meeting
4. Questions and Discussion concerning the latest changes to the MOA.
5. MOA Schedule for future reviews, agency/tribal counsel review, final signatures
6. Next Steps and next meeting date

**DRAFT AGENDA**
Bi-State Bridge Replacement Working Group Regular Meeting
February 14, 2022 / 2:00-4:00p (2 hour)
Via Zoom

Members: Chair, Mike Fox (Commissioner), Port of Hood River; Vice Chair, Jake Anderson (Commissioner), Klickitat County; Catherine Kiewit (Mayor), City of Bingen (absent); Marla Keethler (Mayor), City of White Salmon; Kate McBride (Mayor), City of Hood River; Bob Benton (Commissioner), Hood River County;

Alternates: Kristi Chapman (Commissioner), Port of Hood River; Arthur Babitz (Commissioner), Hood River County; Joe Sullivan, City of Bingen; Jason Hartmann (Councilor), City of White Salmon; David Sauter (Commissioner), Klickitat County; Jessica Metta (Councilor), City of Hood River.

Staff/Consultants: Kevin Greenwood (Project Director), Port of Hood River; Michael McElwee (Executive Director), Port of Hood River; Brad Boswell, Boswell Consulting; Miles Pengilly, Thorn Run Partners; Steve Siegel, Siegel Consulting.

| | | |
|---|---|---|
| 1. | Welcome | 2:00 |
| 2. | January 17 Regular Meeting Minutes | 2:01 |
| 3. | Washington Senate Leg. Process – Sen. Curtis King | 2:02 |
| 4. | Bridge Authority Legislation Update – Pengilly/Boswell | 2:12 |
| 5. | Jen Mayer, P3 Discussion | 2:22 |
| | A. When to consider a P3 | |
| 6. | Commission Formation Agreement Process – S. Siegel | 3:30 |
| 7. | Memo on BSWG Authority | 3:35 |
| 8. | RBMC RFP Update | 3:40 |
| | A. Industry Forum Draft Agenda | |
| 9. | Project Updates | 3:55 |
| | A. NEPA/Sec. 106/Treaty | |
| | B. Concept Schedule | |
| | C. Funding Opportunities | |
| | D. ODOT Professional Services Amendment | |
| 10. | Next Meeting, March 14, 2022 | 3:59 |
| 11. | Adjourn | 4:00 |

-###-

Oregon Transportation Commission
Attn: Commission Assistant
Oregon Department of Transportation
355 Capitol Street NE, MS11
Salem, OR 97301-3871

February 17, 2022

RE: PUBLIC COMMENT SUBMISSION FOR IIJA PROJECT PRIORITIZATION OF THE HOOD RIVER-WHITE SALMON INTERSTATE BRIDGE REPLACEMENT PROJECT

Dear Chair Van Brocklin and members of the Oregon Transportation Commission:

Thank you for the opportunity to provide comment on priorities for Oregon's apportionment of the Infrastructure Investment and Jobs Act (IIJA). OneGorge is an informally organized regional advocacy group comprised of private and public sector leaders collaborating to advocate for the investments and support that our communities need to build and sustain a thriving economy in the Columbia River Gorge. The undersigned participants of OneGorge wish to express their strong support for the prioritization of the Hood River-White Salmon Bridge Replacement Project in your consideration of priorities for IIJA Project Prioritization.

The Hood River-White Salmon Interstate Bridge Replacement project has been the #1 economic development priority in the Mid-Columbia region for many years. The bridge is nearly 100 years old, critical to the region's economy and culture, and nearing the end of its useful life. The project has received $15 million in funding to begin engineering, but that is not enough to complete the engineering work, with remaining costs expected to exceed $20 million.

We hope that the OTC and ODOT will keep in mind that a minimum of 15% of the $268 million in Bridge Formula Funds that will be distributed to Oregon over the life of the IIJA must be dedicated to off-system bridges. Flexible funding and resilience programs may be other excellent opportunities to complete funding for project engineering. Please consider the unique position of this project - it's magnitude and cost are out of reach for most local programming dollars.

Due to the rural location of the project, the OneGorge Advocacy Group participants listed below believe that funding this critical piece of infrastructure meets the priorities identified within the OTC/ODOT goals including equity, modernizing the state's transportation system, and identifying sufficient and reliable funding.

As you consider allocation of IIJA resources, please remember this region's critical need for local, state and federal funding for the Hood River-White Salmon Interstate Bridge replacement project. It is the Region's highest priority.

Respectfully,

DocuSigned by:
[signature]
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Representative Daniel Bonham
Oregon District 59

Marla Keethler
Mayor, City of White Salmon, WA

DocuSigned by:
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Catherine Kiewit
Mayor, City of Bingen, WA

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Scott Hege
Commissioner, Wasco County

DocuSigned by:
Michael McElwee
Michael McElwee
Executive Director, Port of Hood River

DocuSigned by:
Tracy Bech
Tracy Bech
Good Path Consulting, Inc.

DocuSigned by:
Brian Mullis
Brian Mullis,
Principal, Destination Sustainability

DocuSigned by:
Lisa Mullis
Lisa Mullis
Principal, Paraphrase Communications

DocuSigned by:
Gordon Zimmerman
Gordon Zimmerman
City Administrator, City of Cascade Locks

Jake Gundersen
Orange General Contracting

Kristin Dahl
Principal, Crosscurrent Collective

Paul Koch
Principle, PK Consulting

DocuSigned by:
Nancy White
Nancy White
CEO, Custom Interface, Inc.

DocuSigned by:
Jessica Metta
Jessica Metta
Executive Director, MidColumbia Economic Development District

Brian Shortt
Co-Owner, Shortt Supply

DocuSigned by:
Daniel Spatz
Daniel Spatz
Columbia Gorge Community College

DocuSigned by:
Bekah Rottenberg
Bekah Rottenberg
SASM Certified Personal Trainer
PMBI Certified Mountain Bike Coach

Cc: Rian Windsheimer, ODOT Reg. 1 Manager
Kris Strickler, ODOT Director

*The OneGorge Advocacy Group is a network of private businesses and public agencies in the bi-state Columbia River Gorge advocating for regional priorities.*

# Commission Memo

Prepared by: John Mann
Date: February 15, 2022
Re: Bridge Wire Rope Replacement Update

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**Project scope:**

Two years ago, during a rope inspection, it was determined there is one damaged wire rope on the north tower of the bridge. Contract bridge engineers Wiss Janey Elstner ("WJE") suggested a monitoring regime and encouraged work towards replacement of the wire ropes. The Port entered into an agreement with WJE for engineering related to replacement of the 16 wire ropes that carry the lift span. We have received the plans and specifications, attached.

**Project schedule and bridge closures:**

The project will be scheduled for mid-October or early November. There will be a need for a 2-3-day complete closure while the replacement is completed. This will take place over a weekend with a backup day being a Monday if it is needed. The rope replacement will take place from the bridge deck surface. The counterweights will be jacked up and the tension on the cables will be relieved while the contractor removes the old cables and replacement of the new cables take place. The engineers will then work with the contractor for proper load balancing of the lift span. The bridge will be inoperable during this procedure for marine traffic as well as vehicle traffic. We will coordinate with the U.S. Coast Guard for this closure.

There will be a 30 day follow up inspection and a 6 month follow up inspection to see if cable tension needs to be adjusted. If there is a cable stretch factor to correct, the contractor will return, jack the counterweight, and adjust the cable tension on the cables that require this. This process will involve a closure for a 1-2 days to make these adjustments and rebalancing of the lift span.

**RECOMMENDATION:** Informational.

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# Commission Memo

Prepared by: Michael McElwee
Date: February 15, 2022
Re: Draft Solicitations for Professional Services

The Executive Director's FY 20/21 Workplan includes two actions related to solicitation of professional service providers (excerpt below):

**Central Services**

> ***6.*** *Prepare and issue a Request for Qualifications (RFQ), complete evaluation process, and recommend a firm to serve as Port General Counsel. Completion Target: 6/20/22.*
>
> ***7.*** *Prepare and issue a Request for Qualifications (RFQ), complete evaluation process and recommend a firm to serve as Auditor. Completion Target: 3/20/22.*

Attached are drafts of these two solicitations. Commissioners are asked to review them and provide any comments or suggested changes to the Executive Director. The intent is to issue them in March.

**RECOMMENDATION:** Information & feedback.

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Request for Proposals

# Audit Services

for the

## Port of Hood River

Hood River, Oregon

Issued: **February 25, 2022**

Due Date: **April 15, 2022, 5:00 p.m.**

## Submit Responses to:

Attn: Michael S. McElwee, Executive Director
Port of Hood River
1000 E Port Marina Drive
Hood River, OR 97031

# 1. BACKGROUND & SCOPE OF WORK

## 1.1. Assignment.

The Port of Hood River ("Port") is committed to excellence in fiscal administration, striving for the highest standards of performance and accountability. As part of its continuing efforts to ensure financial management excellence, the Port invites competitive proposals from qualified and experienced audit firms to audit its financial statements. The Port is soliciting the services of qualified certified public accountants to audit its financial statements for the fiscal years ending **June 30, 2022 through June 30, 2025,** with options to audit the Port's financial statements for each of two (2) subsequent fiscal years. Audits are to be performed in accordance with the provisions contained in this Request for Proposal ("RFP").

## 1.2. About the Port of Hood River.

The Port was established in 1933 as a result of the Bonneville dam project because of the expressed desire of the Oregon State Legislature and the United State Government to develop industrial lands in the Columbia River Basin. As a special district, a port is a municipal corporation, a local unit of government, with the primary responsibility for stimulating economic development and facilitating maritime shipping, aviation and the commercial interests of the region within district boundaries. The powers and duties of the Port are circumscribed by state and federal law and are primarily detailed in ORS 777. The Port is governed by a five-member board of Commissioners, each Commissioner elected to serve for a four-year term. The board meets two times per month and may hold special meetings. The usual role of Commissioners is to set policy and approve the annual budget, contracts and expenditures. The board selects the Executive Director who is responsible for the day-to-day management of the Port.

## 1.3. Scope of Services.

The auditor is expected to express an opinion on the fair presentation of the Port's basic financial statements in conformity with generally accepted accounting principles. The auditor is required to audit the Port's combined and individual fund statements and supporting schedules. The auditor is not required to audit the introductory section of the report or the statistical section of the report. The auditor shall also be responsible for performing certain limited procedures involving required supplementary information required by the Governmental Accounting Standards Board as mandated by generally accepted auditing standards. The auditor is required to audit the Port's schedule of expenditures of federal awards.

### 1.3.1. Accounting Standards to be Followed.

Audits shall be performed in accordance with generally accepted auditing standards as set forth by the American Institute of Certified Public Accountants, the standards for financial audits set forth in the U.S. General Accounting Office's Government Auditing Standards (2007), the provisions of the Single Audit Act of 1984 (as amended in 1996) and the provisions of U.S. Office of Management and Budget {0MB) Circular A-133, Audits of State, Local Governments, and Non-Profit Organizations.

### 1.3.2. Reports to be Issued.

Following the completion of the audit of the fiscal year's financial statements, the auditor is expected to issue the following reports:

A. Report on the fair presentation of the Port's financial statements in conformity with generally accepted accounting principles, including an opinion on the fair presentation of the supplementary schedule of expenditures of federal awards "in relation to" the Port's audited financial statements.
B. Report on the Port's compliance and internal controls over financial reporting based on an audit of the Port's financial statements.
C. Report on the Port's compliance and internal controls over compliance applicable to each major federal award program.
D. Report of audit comments and disclosures as required by state regulations.

In the required reports on internal controls, the auditor shall communicate any reportable conditions found during the Port's audit. A reportable condition shall be defined as a significant deficiency in the design or operation of the Port's internal control structure, which could adversely affect the organization's ability to record, process, summarize and report financial data consistent with the assertions of management in the financial statements. Reportable conditions that are also material weaknesses shall be identified as such in the report. Non-reportable conditions discovered by the auditors shall be reported in a separate letter to Port management, which shall be referred to in the report on compliance and internal controls.

The report on compliance and internal controls shall include all instances of noncompliance. All non-material instances of noncompliance shall be reported in a separate management letter, which shall be referred to in the report on compliance and internal controls.

Auditors shall be required to make an immediate, written report of all irregularities and illegal acts or indications of illegal acts of which they become aware to the following parties:

- The Port's Executive Director
- The Port's Chief Financial Officer

**1.4. Working Papers Retention and Access to Working Papers.**

All working papers and reports must be retained, at the auditor's expense, for a minimum of three (3) years from the date of the Independent Auditor's Report, unless the audit firm is notified in writing by Port of the need to extend the retention period. The auditor will be required to make working papers available, upon request, to the following parties or their designees:

- Port of Hood River
- Grant Oversight Agencies
- Parties designated by the federal or state governments or by the Port of Hood River as part of an audit quality review process
- Auditors of entities of which the Port is a sub recipient of grant funds.

**1.5. Agency Description.**

**1.5.1. Overview.**

The Port of Hood River owns and operates the Hood River/White Salmon Bridge, the Ken Jernstedt Airport, the Hood River Marina, various recreation sites on the Waterfront and approximately 200,000 square feet of leased light industrial space. The Ports' fiscal year begins on July 1 and ends on June 30. The Port has 32 employees with an annual payroll of approximately $1.45 million dollars. The Port is organized into six asset centers, Hood River Interstate Bridge, Leased Properties, Marina, Waterfront Recreation, Airport, and General Government. The accounting and financial reporting functions of the Port of Hood River are centralized and are the responsibility of the Finance Department.

**1.5.2. Financial Structure.**

The Port categorizes all of its activities within three funds:

- **General Fund** - accounts for activities that are related to governmental activities. The revenues are from property tax receipts and the expenditures are those related to governmental activities. The property tax receipts are insufficient to pay all of the governmental related expenditures, so there is a transfer from the Revenue Fund to fund the difference.

- **Bridge Repair and Replacement Fund** - designated for capital projects to segregate the revenues and expenditures related to toll bridge capital improvements. The sources of revenues for this fund are grant monies, interest, and dedicated revenue from various toll increases. This dedicated revenue is a transfer from the Revenue Fund. The expenditures for the fund are those charges that are identified with capital improvement projects that extend the useful life of the toll bridge, related governmental activities, and debt service expenditures.

- **Revenue Fund** - most of the Port's activities are business-type activities and are accounted for in the Revenue Fund. The major revenues are from bridge tolls and leases and rents collected from the Port property tenants. The revenues and expenditures are identified and allocated to asset centers grouped by activity.

**1.5.3. Basis of Accounting.**

The Port prepares its budget on a basis consistent with generally accepted accounting principles (modified accrual) and Oregon Revised Statutes.

**1.5.4. Financial System.**

The Port’s accounting system is Great Plains. It consists of integrated modules for Accounts Receivable, Accounts Payable and Payroll. There is a separate software system for management of the electronic tolling on the Hood River Bridge.

**1.6. Time Requirement and Guidelines.**

The Port expects to have all financial records and audit schedules ready for audit and all management personnel available to meet with the audit firm's personnel no later than September 30 of each contract year. The auditor is expected to provide a detailed audit

plan and a list of all schedules to be prepared by the Port. At a minimum, the Port and the audit firm will participate in an initial conference with the Port's CFO prior to the audit firm's initiation of work to discuss any work to be performed and to review the prior year audit, establish the Port CFO as the audit firm's liaison for the audit and make arrangements for work space and any other needs of the auditor. An exit conference with the Port's CFO should occur before the completion of the audit firm's field work to summarize field work results and review significant findings and management letter comments. The final audit must be approved by the Port Commission and filed with the Oregon Secretary of State by December 31st of each year.

**1.7. Assistance to be Provided to the Auditor and Report Preparation.**

Port staff will be available during audits to assist the audit firm by providing information, documentation, and explanations as needed. Auditors may be asked to schedule specific audit work around Port staff availability. Port staff will prepare a final trial balance, lead schedules and supporting documentation, and other schedules required by the auditor. The Port will provide the auditor with reasonable work space, telephone, photocopier, FAX, and internet access. The Port will also provide requested electronic data files to the auditor when feasible. The auditor will be responsible for preparation of and editing the final audit.

## 2. PROPOSAL PROCESS

The Port follows Oregon Revised Statutes Chapters 279A, 279B, and 279C in the procurement of personal services.

2.1. This RFP has been advertised in the "Daily Journal of Commerce, "Columbia Gorge News", posted on the Port's web site (www.portofhoodriver.com) and direct mailed to known audit firms.

2.2. Potential Proposers should email the Port Executive Director, Michael McElwee at mmcelwee@portofhoodriver.com ("Port Contact") and provide contact information for an individual at their audit firm ("Proposer Contact"). Any addenda issued during the proposal process will be emailed to the Proposer Contact provided.

2.3. The Port Contact will accept questions submitted **via email** seeking clarification about the specifications, proposal submittal instructions, exceptions regarding contract terms, and questions or exceptions to the basis of award, until **April 1, 2022 at 5:00 p.m. PDT.** No questions about the RFP document or process will be accepted thereafter.

2.4. Written answers to submitted questions will be emailed as an Addendum to all potential Proposers by **April 8, 2022 at 5:00 p.m. PDT.**

2.5. To be eligible for consideration by the Port, Proposers must submit five (5) copies of Proposer's written proposal in a sealed envelope or box, delivered to the Port office, in person, by mail or courier service, at 1000 E. Port Marina Drive, Hood River, Oregon, 97031), no later than **5:00 p.m. PDT on April 15, 2022.** Proposals received after this date/time will be deemed ineligible and will remain sealed, will be marked on the outside with the date/time received and will be returned unopened to the Proposer.

2.6. The Port Executive Director, Chief Financial Officer and Port Treasurer ("Review Committee") will review the proposals for completeness and compliance with the proposal requirements, then evaluate them based on the criteria identified in Section 3, Evaluation Process & Basis of Award of Contract. The Port reserves the right to waive irregularities and minor informalities if such waiver is in the public interest.

2.7. The Chief Financial Officer will prepare a Notice of Intent to Award to the highest ranked audit firm and present it to the Port Commission with the basis for Evaluation Committee's recommendation. The Port Commission will then determine whether to accept or reject the recommendation or seek further information. The Port will email all Proposers stating the Port's Notice of Intent to Award a contract.

2.8. Proposers will have seven (7) calendar days to protest the Notice of Intent to Award (the "Protest Period"). Any protest filed after the Protest Period will not be considered. To file a protest, a Proposer must submit the protest in writing to the Port Contact and state the reasons for the protest. The Port's Executive Director will review any protest and make a decision as to the award of the proposal.

2.9. Following Port Commission approval of the Notice of Intent to Award and the expiration of the Protest Period, Port and selected Auditor will negotiate a contract for Auditor Services. If negotiations are not successful within four (4) weeks from the day after the expiration of the Protest Period, the Port reserves the right to terminate negotiations and initiate negotiations with the 2nd ranked Proposer.

2.10. The Port reserves the right to cancel this procurement and/or reject all proposals if it is in the best interest of the Port to do so in accordance with ORS 279B.100.

## Summary of RFP Timeline

| ACTION | DATE |
|---|---|
| Release Date | 2/18/2022 |
| Pre-Proposal Questions Due | 4/01/2022 @ 5:00 p.m. PDT |
| Final Date for Addenda Issued by Port | 4/08/2022 |
| Proposals Due | 4/15/2022 @ 5:00 p.m. PDT |
| Proposal Evaluation Period | 4/16/2022 - 5/03/2022 |
| Approximate Notice of Intent to Award Contract | 5/17/2022 @ 5:00 p.m. PDT |
| Approximate Protest Period Expires | 5/24/2022 @ 5:00 p.m. PDT |
| Anticipated Award of Contract | 6/07/2022 |
| Begin Contract (estimated) | 6/15/2022 |

## 3. EVALUATION PROCESS & BASIS OF AWARD OF CONTRACT

The Review Committee will use a 100-point formula to score proposals. Each Review Committee member will independently review the mandatory requirements then score each proposal based on the evaluation criteria and professional fees stated in Section 3.1 below. The Review Committee will then convene to review and discuss the evaluations and average each Proposer's individual scores to arrive at a ranking for all proposals submitted.

The Review Committee shall consist of:

- Michael McElwee, Port Executive Director
- _____, Chief Financial Officer
- Heather Gehring, Treasurer, Port Commission

The Review Committee may, at its discretion, request one or more audit firms to make an oral presentation. Such presentation would provide an opportunity for the Proposer to answer any questions the Review Committee may have and provide additional information for the Review Committee's consideration in scoring the proposals.

3.1. **Evaluation Criteria.** Proposals will be evaluated using the criteria stated below. Audit firms meeting the mandatory criteria will have their proposals evaluated and scored for both technical and professional fee qualifications. Audit firms not meeting the mandatory requirements will be eliminated from the RFP process.

**3.1.1 Mandatory Requirements**

A. Confirmation that the audit firm is independent and licensed to practice in the State of Oregon. Provide an affirmative statement that it is independent of the Port of Hood River as defined by the U.S. GAO Government Auditing Standards.

B. Confirmation that the audit firm has no conflict of interest with regard to any other work performed by the audit firm for the Port of Hood River. An affirmative statement should be included that the audit firm and all assigned key professional employees are licensed to practice in the State of Oregon as municipal auditors as defined by ORS 297.405 (1).

C. Adherence to the instructions in this RFP on preparing and submitting the proposal.

**3.1.2. Technical Qualifications.**

**A. Audit Approach.** (30 Points)

**1. Summary of the audit firm's approach to the services solicited in this RFP, addressing the audit requirements of the Port and recognition the Port's schedules and deadlines.** The proposal should set forth a work plan, including an explanation of the audit methodology to be followed to perform audit services. Reference may be made to the Port of Hood River's budget and related materials, organizational charts, manuals and programs, and financial and other management information systems.

Proposers may consider providing the following information on their audit approach:

- Proposed segmentation of the engagement
- Level of staff and number of hours to be assigned to each proposed segment of the engagement
- Sample size and the extent to which statistical sampling is to be used in the engagement
- Type and extent of analytical procedures to be used in the engagement
- Approach to be taken to gain and document an understanding of the Port's internal control structure
- Approach to be taken in determining laws and regulations that will be subject to audit test work
- Approach to be taken in drawing audit samples for purposes of tests of compliance
- Identification of any anticipated potential audit problems, the firm's approach to resolving these problems and any special assistance that will be requested from the Port of Hood River.

**B. Audit Firm and Staff Experience.** (40 Points)

**1. Experience and background of the audit firm on comparable government audit assignments.** The Proposer should state the size of the audit firm, the size of the firm's governmental audit staff, the location of the office from which the work on this engagement is to be performed, and the number and nature of the comparable government audit assignments. Provide information on the results of any federal or state desk reviews or field reviews of its audits during the past three (3) years and the circumstances and status of any disciplinary action taken or pending against the firm during the past three (3) years with state regulatory bodies or professional organizations.

**2. Identify a "Principal Auditor" and describe his/her background and experience.** Identify a "Principal Auditor" who will be the Proposer's primary contact for the Port and provide her or his background and experience, including confirmation that the Principal Auditor is registered or licensed to practice as a certified public accountant and municipal auditor in the State of Oregon, a brief summary of the Principal Auditor's government auditing experience, and memberships in professional organizations relevant to the performance of this audit.

**3. Identify and describe the background and experience of other professional staff who will be working in concert with the Principal Auditor to provide Audit Services to the Port.** Identify and describe the experience of supervisory and management staff, including engagement partners, managers, other supervisors, specialists, and/or professional staff who would be assigned to provide audit services to the Port. Indicate whether each person is registered or licensed to practice as a certified public accountant and municipal auditor in the State of Oregon. Provide a brief description of each person's experience, as well as the experience of the firm, in auditing Federal or State grants and other forms of financial assistance.

**3.1.3. Professional Fee.** (30 Points)

The fee proposal must contain the following:

A. **Total All-Inclusive Maximum Price** including all direct and indirect costs and out-of-pocket expenses for the 2021/2022 audit. Provide a schedule of professional fees and expenses, presented in a table format that supports the total all-inclusive maximum price.

B. **Maximum annual percentage increase** to provide audit services to the Port for the next three (3) fiscal years. If the annual price increase is tied to a price index, name the index and source.

C. **Rates by Partner, Specialist, Supervisory and Support Staff.** Hourly rates will be considered valid and firm for the FY 22/23 audit year unless otherwise stated.

D. **Rates for Additional Professional Services** should become necessary for the Port to request additional services to either supplement the audit services requested in this RFP or to perform additional work as a result of the specific recommendations included in any report issued. Indicate if any such additional work shall be performed at the same rates set forth in subsection 3.1.3.C hereinabove.

The evaluation of proposals and the determination of conformity and acceptability shall be the sole responsibility of the Port and will be based on information furnished by the Proposer, or identified in the proposal, as well as on other information available to the Port.

## 4. FORM OF PROPOSAL

There is no page limit for proposals. However, Proposers are encouraged to submit a proposal that is prepared simply, clearly and economically, providing a straightforward, concise description of the Proposer's capabilities to satisfy the requirements of this RFP.

**4.1. Transmittal Letter.** Proposer must include a signed letter of transmittal, which briefly states the Proposer's commitment to provide the Port with Audit Services, addresses the Mandatory Requirements stated in Section 3.1.1. above, and a statement that the proposal is an irrevocable offer for sixty (60) days from the date of the transmittal letter. Submission of a signed transmittal letter will be interpreted to mean that the audit firm has agreed to affirm all terms and conditions set forth in its proposal.

**4.2. Technical Qualifications.** Provide a written response to the Technical Qualifications stated in Section 3.1.2. above.

**4.3 Fee Proposal.** Provide a written and tabular response to the specific criteria stated in Section 3.1.3. above.

**4.4 References.** Proposers should provide the names and contact information of three (3) clients who represent prior or ongoing government audit assignments similar to the Audit Services sought by the Port of Hood River in this RFP.

**4.5 Other Information.** Proposers may provide any additional information that could support their capabilities in providing Audit Services to the Port.

## 5. INSTRUCTIONS FOR SUBMITTING THE PROPOSAL

Proposals must be submitted no later than **5:00 p.m. PDT, on April 15, 2022.** Proposals received after 5:00 p.m. will remain sealed, marked on the outside with the date and time received and returned to the Proposer.

Mail or deliver five (5) copies of the proposal document in a sealed envelope or box to:

**Port of Hood River**
**Attention: Michael McElwee, Executive Director**
**1000 E Port Marina Drive**
**Hood River, Oregon 97031**

Proposals should be submitted in a sealed envelope or box, plainly marked on the outside with the audit firms' name and the label **"RFP Response - Audit Services".**

Facsimile and email proposals will **not** be accepted.

The Port may alter the provisions of this RFP in any of its terms. No part of this solicitation is to be considered part of a contract, nor is any provision contained herein to be binding on the Port unless expressly included by reference or adoption in a subsequent written agreement executed by the Port.

If there are any changes in the RFP, additional information will be transmitted to every prospective Proposer who submitted a proposal under this RFP.

The Port adheres to the State of Oregon's public records laws. As such, response documents are generally considered confidential until after the Notice of Intent to Award a contract is issued. *ORS 279B.060(6)(a)* Thereafter, the Port may withhold from disclosure those parts of a proposal for goods or services that qualify as exempt under any provision of ORS 192.345 or 192.355.

**Request for Qualifications**

for

**General Counsel Services**

**D R A F T**

**Port of Hood River**
Hood River, Oregon

Issued: **February 25, 2022**

Due Date: **April 15, 2022, 5:00 p.m.**

**Submit Responses to:**
Michael S. McElwee, Executive Director
Port of Hood River
1000 E Port Marina Drive
Hood River, OR 97031

## 1. BACKGROUND & SCOPE OF WORK

The Port of Hood River ("Port") is committed to excellence in its general operations including overall administration and management of the financial and legal services it utilizes. In conformance with its Governance Policy, the Port is issuing this Request for Qualifications ("RFQ") seeking responses from qualified attorneys and/or law firms interested in providing ongoing legal services to the Port starting July 1, 2022, through June 30, 2027, with two (2) separate options to continue providing legal services for each of one (1) subsequent fiscal year. Legal services would be performed in accordance with the provisions contained in this RFQ.

**1.1. About the Port of Hood River.** The Port was established in 1933 as a result of the Bonneville dam project because of the expressed desire of the Oregon State Legislature and the United State Government to develop industrial lands in the Columbia River Basin. As a special district, a port is a municipal corporation, a local unit of government, with the primary responsibility for stimulating economic development and facilitating maritime shipping, aviation, and the commercial interests of the region within district boundaries. The powers and duties of the Port are circumscribed by state and federal law and are primarily detailed in ORS 777. The Port is governed by a five-member board of Commissioners, each Commissioner elected to serve for a four-year term. The board meets two times per month and may hold special meetings. The usual role of Commissioners is to set policy and approve the annual budget, contracts, and expenditures. The board selects the Executive Director who is responsible for the day-to-day management of the Port.

The Port of Hood River owns and operates the Hood River/White Salmon Interstate Bridge, the Ken Jernstedt Airfield, the Hood River Marina, various recreation sites on the Waterfront and approximately 200,000 square feet of leased light industrial space. The Port's fiscal year begins on July 1 and ends on June 30. The Port has 32 employees with an annual payroll of approximately $1.45 million dollars. The Port is organized into six asset centers: Hood River Interstate Bridge, Leased Properties, Marina, Waterfront Recreation, Airport, and General Government.

The Port retains a General Counsel ("GC") who attends Port meetings, reviews contracts, leases, and real estate transactions, and is responsible for providing ongoing legal advice to the Commission and Executive Director on a range of issues including, but not limited to, public contracting, meeting and records matters, real estate, land use, environmental, employment and governance topics.

**1.2. Scope of Services.** The Port has a broad and diverse portfolio and a significant, ongoing workload. The GC is expected to provide advice on a wide variety of legal matters, attend Port Commission meetings and be highly informed and knowledgeable about statutes related to public agencies including: contracting, ethics, meetings, records, environmental and tort liability and defense; real estate transactions, including easements, purchase agreements, disposition & development agreements, building leases, and ground leases; ORS 777, the enabling legislation for Port Authorities in Oregon; and the Governance policies and operations of the Port. The GC may identify and coordinate with outside counsel on matters that require specialized legal knowledge or expertise. The GC, or designee, will frequently provide an initial draft or review draft documents prepared by Port staff. The GC is often required to respond quickly to requests for advice or information from the Commission, Executive Director, or Port staff.

**1.3. Engagement Term.** The Port expects to enter into a contract for General Counsel Services for a five (5) year period commencing July 1, 2022, and extending through June 30, 2027, with two (2) options each for an additional one-year period.

## 2. RESPONSE PROCESS

An attorney or a representative of any interested law firm ("Respondent") may contact either Port Commission President, Ben Sheppard (telephone (503) 869-5619, email bens@portofhoodriver.com) or Port Executive Director, Michael McElwee (telephone (541) 386-6651, email mmcelwee@portofhoodriver.com) if they wish to ask questions or seek clarification about the specifications, submittal instructions or expectations associated with this RFQ.

To be eligible for consideration by the Port, Respondents must submit five (5) copies of a written response, delivered to the Port office, in person, by mail or courier service, at 1000 E. Port Marina Drive, Hood River, Oregon, 97031, no later than **5:00 p.m. PDT on Friday, April 15, 2022**. Responses received after this date/time shall be returned, unopened to the Respondent and deemed ineligible.

The Port Executive Director and Commission President ("Review Committee") will review the eligible responses for completeness and compliance with the RFQ requirements set forth herein, then evaluate each response based upon the criteria identified in Section 3 below.

The Review Committee will make a recommendation to the Port Commission, which may be one of the following:

- Recommend a single firm to prepare an engagement letter for General Counsel Services.
- Recommend two or more firms to interview with the full Port Commission.
- Cancel the qualifications solicitation response process.

## 3. EVALUATION PROCESS

The Review Committee will independently review each eligible response based upon the Evaluation Criteria stated in Section 3.1 below. The Review Committee will then convene to review and discuss their evaluations and prepare a recommendation for the Port Commission. The Review Committee may, at its discretion, seek further information from respondents during the course of its evaluation.

**3.1. Evaluation Criteria**. Responses will be evaluated using the criteria stated below. Respondents meeting the mandatory requirements will have their responses evaluated further. Respondents not meeting the mandatory requirements will be eliminated from the RFQ process.

### 3.1.1. Mandatory Requirements

A. Confirmation that the Respondent is licensed, insured, and is presently authorized to practice law in the State of Oregon.

B. Confirmation that the Respondent has no conflict of interest with regard to any other work performed by Respondent regarding the Port of Hood River, or a description how any such conflict(s) can be resolved.

C. Confirmation of Respondent's adherence to the submittal requirements set forth in this RFQ.

### 3.1.2. Approach & Qualifications.

#### A. Approach.

**1. Provide a summary of Respondent's approach to this RFQ.** Respondent should demonstrate its understanding of the Port's organization and background and describe Respondent's general approach to providing the required or anticipated legal services.

#### B. Respondent and Staff Qualifications.

**1. Describe the Respondent's general areas of legal practice and subject matter expertise and provide examples of experience providing legal services for municipal government clients.** Describe the size of Respondent's law firm, a brief overview of Respondent's background and experience, the types of clients Respondent has or does provide legal services to, general staff capabilities, and the location of the office from which the Port's work would be performed. Quantify and describe the nature of Respondent's local government experience comparable to the Port's needs as described in this RFQ..

**2. Identify a "Principal Attorney" and describe her/his background and experience.** Identify a "Principal Attorney" who will be the Respondent's primary attorney contact for the Port and provide his or her background and experience, including examples of prior work performed similar in nature to the General Counsel Services required by the Port as described in this RFQ.

**3. Identify and describe the background and experience of other attorneys and professional staff who will be working in concert with the Principal Attorney to provide General Counsel Services to the Port.** Identify any other attorneys and/or key support staff within Respondent's firm who would be assigned or available to assist the Principal Attorney in Port matters. Indicate whether each person is registered or licensed to practice in the State of Oregon. Provide a brief summary of each person's background and experience including a description of government-related legal work and membership in professional organizations.

**4. Identify and describe any outside counsel that Respondent would engage if specialized legal expertise is needed**. List any attorney and/or firm, their practice area of expertise, provide a brief description of their capabilities, and summarize under what circumstances they might be retained.

### 3.1.3. Professional Fees.

**A. List the hourly billing rates of the Principal Attorney, other in-house attorneys, and legal support staff that may be assigned to Port matters.** The hourly rates provided should be considered valid and firm until January 1, 2023, unless otherwise stated.

B. **Provide the hourly billing rate for the Principal Attorney when attending regular Port meetings.** The Port customarily meets the first and third Tuesday of each month. The Principal Attorney is expected to attend each of these meetings, each of which generally lasts 2-3 hours. Provide the Principal Attorney's billing rate, or the billing rate of an authorized designee (who must also be an attorney licensed in Oregon), to attend the Port's bi-monthly, regularly scheduled Commission meetings. If the billing rate for the Principal Attorney's attendance to regularly- cheduled Port Commission meetings is the same as his/her hourly billing rate, so indicate.

## 4. FORM OF RESPONSE

There is no page limit for responses. However, Respondents are encouraged to submit a response that is prepared simply, clearly, and economically, providing a straightforward, concise description of Respondent's capabilities to satisfy the requirements of this Request for Qualifications.

**4.1. Transmittal Letter.** Respondent must include a signed letter of transmittal, which briefly states Respondent's commitment to provide the Port with General Counsel Services, and addresses the Mandatory Requirements stated in Section 3.1.1 above.

**4.2. Approach & Qualifications Specifications**. Provide a written response to the Approach and Qualifications stated in Section 3.1.2 above.

**4.3. Hourly Billable Rates**. Provide a written and response to the specific criteria set forth in Section 3.1.3 above including an hourly billable rate schedule.

**4.4. References.** Respondent should provide the names and contact information of five (5) clients who previously or currently require legal services similar to the Port' s General Counsel Services as described in this RFQ. References of prior or current government clients are preferable.

**4.5. Other Information.** Respondent may provide any additional information that could support their capabilities in providing General Counsel Services to the Port.

## 5. INSTRUCTIONS FOR SUBMITTING THE RESPONSE

Responses must be submitted no later than **5:00 p.m. PDT on Friday, April 15, 2022.** Responses received after that date and time will remain sealed, marked on the outside with the date and time received and returned, unopened to the Respondent.

Mail or deliver five (5) copies of the response document in a sealed envelope or box to:

**Port of Hood River**
**Attention: Michael McElwee, Executive Director**
**1000 E Port Marina Drive**
**Hood River, Oregon 97031**

Responses should be submitted in a sealed envelope or box, plainly marked on the outside with Respondent's name and the label **"RFQ Response – General Counsel Services".**

Facsimile and email responses will not be accepted.

The Port may alter the provisions of this RFQ in any of its terms. No part of this solicitation is to be considered part of a contract, nor is any provision contained herein to be binding on the Port unless expressly included by reference or adoption in a subsequent written agreement executed by the Port.

If there are any changes in the RFQ, additional information will be transmitted to every prospective Respondent who submitted a response under this RFQ.

The Port adheres to the State of Oregon's public records laws. As such, response documents are generally considered confidential until after the notice of intent to award a contract is issued. *ORS 279B.060(6)(a)* Thereafter, the Port may withhold from disclosure those parts of a proposal for goods or services that qualify as exempt under any provision of ORS 192.345 or 192.355.

# Commission Memo

Prepared by: Michael McElwee
Date: February 15, 2022
Re: Executive Director 21/22 Workplan Mid-Year Update

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At the August 24, 2021 regular meeting, the Commission approved the Executive Director's FY 20/21 Workplan. The attached mid-year update provides notes and comments that indicate progress status for each work plan task for Commission understanding, review and comment. It also lists new tasks that have been added since the work plan was first approved.

Commissioners are requested to discuss, provide feedback, and ask questions about this mid-year update and consider consensus direction to any changes to work tasks. I will make changes to workplan goals and activities for the remainder of this review period.

**RECOMMENDATION:** Information & feedback.

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FISCAL YEAR 2021-22

## EXECUTIVE DIRECTOR WORK PLAN

**Mid—Year Update: For Commission Review February 15, 2022**

(Original Work Plan Approved by Commission on 8/24/21)

2021-26 STRATEGIC BUSINESS PLAN SERVICE AREA:

**CENTRAL SERVICES**

GOAL 1: ENSURE ALL OPERATIONS CONDUCTED BY PORT STAFF AND CONTRACTORS ARE DONE IN A SAFE MANNER.

GOAL 2: ENSURE THAT FINANCIAL AND STAFF RESOURCES ARE DEPLOYED EFFECTIVELY, WITH A HIGH DEGREE OF FORESIGHT AND IN ANTICIPATION OF FUTURE PORT NEEDS.

GOAL 3: EVALUATE PORT PUBLIC ENGAGEMENT POLICIES AND PROGRAMS AND PROVIDE RECOMMENDATIONS FOR ACTIONS TO ENHANCE AND EXPAND PUBLIC ENGAGEMENT GENERALLY, AND TO ADDRESS DIVERSITY, EQUITY, AND INCLUSION (DEI) CONSIDERATIONS IN ALL POLICY AND INVESTMENT DECISIONS.

GOAL 4: MAINTAIN AND IMPROVE ENGAGEMENT AND COLLABORATION WITH PORT PARTNERS TO LEVERAGE INVESTMENTS AND PURSUE SERVICE EFFICIENCIES.

GOAL 5: PREPARE SUCCESSION PLAN FOR SENIOR LEADERSHIP RETIREMENTS AND STRUCTURE THE ORGANIZATION CHART TO ANTICIPATE THESE TRANSITIONS

GOAL 6: ENSURE THE PORT WORK ENVIRONMENT IS ONE WHERE STAFF CAN GROW PROFESSIONALLY AND FEEL THAT THE PORT IS AN EXCELLENT PLACE TO WORK.

| ACTION | COMPLETION DATE TARGET | CURRENT STATUS |
|---|---|---|
| 1. Draft a policy that states any employee can stop work if unsafe conditions exist and brief employees, and highlight safety topics at weekly Port staff and monthly Safety Committee meetings to increase awareness of work safety issues and best practices for a safe work environment.<br>*Work safety topics are highlighted at each Safety Committee and staff meeting. Stop work directive written and conveyed to all staff on December 28, 2021.* | 5/1/22 | **COMPLETE** |
| 2. Prepare a "Fiscal Sustainability Model" that describes prior and potential future actions and timeframes to reduce reliance on bridge revenue over the next 5 years. Present to Commission for discussion and direction as part of FY 22/23 Budget.<br>*Issue paper prepared and initial discussion at 12/21/21 fall Planning. Departure of Fred Kowell means forward progress more* | *2/15/22* | |

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| *challenging--- engaged consultant for support on effort. Prepare for discussion at Spring Planning and consider approach to FY 22/23 Budget preparation.* | | |
| 4. Identify a staff/consultant structure to build redundancy in the Port's existing management capabilities and technical skills related to tolling over the next three years. | *4/15/22* | |
| 5. Purchase and install OpenMedia Foundation platform to enhance transparency and public participation in Port meetings.<br>*OpenMedia platform purchased and tested. Ready for use when in-person meetings resume.* | 10/30/21 | ***COMPLETE*** |
| 6. Prepare and issue a Request for Qualifications (RFQ), complete evaluation process, and recommend a firm to serve as Port General Counsel.<br>*Preparation of solicitation docs underway for distribution in March.* | *6/20/22* | |
| 7. Prepare and issue a Request for Qualifications (RFQ), complete evaluation process and recommend a firm to serve as Auditor.<br>*Preparation of solicitation docs underway for distribution in March.* | *3/20/22* | |
| 8. Prepare a draft update to the Communications Plan and present to the Commission for discussion and direction.<br>Presented at Fall Planning Mtg. on 12/7/22. | *3/15/22* | ***COMPLETE*** |
| 9. Complete formatting and printing of the 2021-26 Strategic Business Plan (SPB). Take steps to publicize and increase community awareness of the SBP.<br>Printed and distributed. Held up by Business Oregon as an excellent example. | *9/30/21* | ***COMPLETE*** |
| 10. Update the board ~~& staff~~ training policy for Commission consideration.<br>*Staff training is adequately described in Personnel Manual. Board training policy approved by Commission on Feb. 1,2022.* | *4/01/22* | ***COMPLETE*** |

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| 11. Prepare draft update to Ordinance 24 addressing enforcement issues including towing & trespass for Commission consideration.<br>*Initial discussion at 12/21/21 Fall Planning meeting. Counsel preparing summary of key issue and potential Ord. 24 changes.* | *4/15/22* | |
| 12. Engage in regular communication with Commissioners through individual briefings at least once every two months.<br>Weekly lunches with Commissioners held and scheduled through review period. | *6/30/22* | ***COMPLETE*** |
| 13.Prepare a revised evaluation form and process for annual performance review of the Executive Director for Commission consideration.<br>H.R. Answers retained on 11/9/21 to recommend form and content of E.D. evaluation form. Will be presented to Personnel Committee late January. | *5/1/22* | ***COMPLETE*** |
| 14. Implement modifications to the Port's organizational structure, staff job descriptions and wage scales consistent with plan approved by the Commission on June 1, 2021.<br>Two promotions & new Contracts Admin. position filled 1/15/22. | *12/15/21* | ***COMPLETE*** |
| 15. Develop and implement a plan to clarify human resource management functions.<br>*Postponed. Emphasis now on selection of new CFO who will be part of plan development.* | *12/15/21* | |
| 16. Develop an approach ~~scope and fee proposal~~ for an outside consultant for the Commission to obtain feedback from Port employees on workplace matters including safety, security, wellness, and general work environment.<br>H.R. Answers retained on 11/9/21 to review and make recommendations on form and content of staff survey. Presented to Commission on February 15, 2022. | *11/30/21* | ***COMPLETE*** |
| 17. Provide confirmation that ED has taken at least 120 hours of vacation.<br>*As of January 8, 72 vacation hours have been taken.* | *6/15/22* | |

2021-26 STRATEGIC BUSINESS PLAN SERVICE AREA:

**BRIDGE AND OTHER TRANSPORTATION**

GOAL 1: ENSURE ONGOING OPERATION AND MAINTENANCE OF THE EXISTING BRIDGE AND IMPLEMENT MEASURES AND TASKS AS LISTED IN THE CAPITAL MAINTENANCE PLAN.

GOAL 2: FACILITATE PORT ENGAGEMENT TO ASSIST IN ALL REASONABLE EFFORTS TO REPLACE THE BRIDGE FOLLOWING THE TASKS IDENTIFIED IN THE BI-STATE WORKING GROUP MEMO OF UNDERSTANDING (MOU) BY REMOVING BARRIERS TO SUCCESS IN ALL POTENTIAL PATHWAYS FORWARD FOR BRIDGE REPLACEMENT.

| ACTION | COMPLETION DATE TARGET | CURRENT STATUS |
|---|---|---|
| 1. Complete plans, specifications, cost estimate and construction schedule for replacement of wire ropes.<br>WJE has delivered completed materials and scheduled presented to the Commission at Feb. 15, 2022 meeting. Work scheduled for fall, 2022. | *1/10/22* | ***COMPLETE*** |
| 2. Complete annual update the Bridge Capital Maintenance Plan to ensure the bridge is safe by using engineering-based evaluations to plan and implement needed capital and capital maintenance projects.<br>*Presented at Fall Planning Work Session on 12/7/21. CMP being updated again for Spring Planning Work Session.* | *2/15/22* | ***COMPLETE*** |
| 3. Ensure completion of plans & specifications, manage bid process and complete re-paving of Bridge approach ramps.<br>*Plans complete. Bid process underway. Construction expected in April/May, 2022.* | *6/15/22* | |
| 4. Complete live load testing and ODOT review, identify reinforcement actions and cost estimates and prepare recommendations to the Commission for potential restoration of the 80 k Bridge weight limit.<br>Engineer's analysis of test results, potential actions and cost estimates underway. Recommendations expected to be presented at February 15, 2022 Commission Meeting. | *1/15/22* | ***COMPLETE*** |

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| 5. Prepare draft legislation to authorize creation of a Bi-State Bridge Authority and file for consideration in the Oregon & Washington legislatures during the 2022 short sessions.<br>*Draft legislation filed in both legislatures. Advocacy efforts ongoing through Feb./March.* | *2/1/22* | ***COMPLETE*** |
| 6. Complete agreement necessary to obtain $5 million in funding from State of Washington for bridge replacement tasks.<br>*Completed and presented to Commission for approval at January 18, 2022 regular meeting.* | *3/1/22* | ***COMPLETE*** |
| 7. Finalize a scope of work, complete solicitation, evaluation, and selection process to identify a Bridge Replacement Project Manager (BRPM) for Phase II bridge replacement efforts.<br>*Timeline extended due to extensive additional work reconciling initial drafts with statutory requirements and ODOT format, Draft will likely be submitted for ODOT review by 1/15/22. Final selection will now likely not occur until May/Juen timeframe.* | *5/1/22* | ***ADJUST TIMELINE*** |
| 8. Finalize a scope of work, complete solicitation, evaluation and selection process to identify a Design Engineer for Bridge replacement.<br>*Schedule dependent on selection and start up of RBMC. This selection process will not occur until the FY 23 Review Period.* | *5/1/22* | ***ADJUST TIMELINE*** |
| 9. Achieve 100% completion of the FEIS/NEPA process and secure Record of Decision.<br>*FHWA decision to require compensation agreements with four Treaty Tribes means securement of ROD is likely postponed until mid-year 2022 or later.* | *3/15/22* | ***ADJUST TIMELINE*** |
| 10. Prepare a market assessment to evaluate the potential for selling Breezeby electronic | *6/30/22* | ***REMOVE*** |

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| tolling system services to other public entities within Oregon and prepare draft marketing materials for Commission consideration.<br>*Retirement of CFO Fred Kowell means that this goal will be postponed.* | | |
| 10. Prepare an outreach and communication plan to inform trucking entities of the damage caused to the Bridge by excessive speed. **Information flyer distributed to trucking companies and major bridge users in October**. | *10/30/21* | ***COMPLETE*** |

## 2021-26 STRATEGIC BUSINESS PLAN SERVICE AREA:
## KEN JERNSTEDT AIRFIELD

GOAL 1: IMPLEMENT AND MAINTAIN PROGRAMS AND POLICIES THAT ACHIEVE THE PORT VISION FOR THE AIRFIELD AS ONE THAT OFFERS SAFE, EFFICIENT, AND ATTRACTIVE AVIATION FACILITIES AND SERVICES CONSISTENT WITH FAA B-2 DESIGNATION TO PILOTS, RESIDENTS, BUSINESSES, AND VISITORS.

GOAL 2: ENSURE THE AIRFIELD FULFILLS ITS MISSION TO SUPPORT GENERAL AVIATION, EMERGENCY RESPONSE, EDUCATION, AND ECONOMIC DEVELOPMENT GOALS BALANCED WITH THE NEEDS OF THE SURROUNDING COMMUNITY.

| ACTION | COMPLETION DATE TARGET | CURRENT STATUS |
|---|---|---|
| 1. Complete installation of AV Gas Tank and point-of-sale system on the N. ramp.<br>Tank shipment date was delayed by manufacturer. Installation now expected to occur by April, 2022. | *11/01/21* | |
| 3. Complete architectural plans, cost estimate, pro forma and marketing plan for a Commercial Hangar and make a recommendation to the Commission about proceeding to construction.<br>Schedule extended. 90% plans/specs received on December 29, 2022. Cost estimate is being prepared. Recommendation now likely in Feb., 2022. | *12/30/21* | |
| 4. Complete evaluation of aviation tracking technologies, discuss with the AAC and bring action alternatives to the Commission for direction. | *11/15/21* | ***COMPLETE*** |

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| Multiple options reviewed with AAC and presented to Commission at 9/21/21 meeting. Informal approach using "Game Camera" selected. Additional effort to facilitate surveillance cameras now being evaluated. | | |
| *5. Prepare summary assessment of ground lease issues for T-Hangar/Box Hangar development, discuss with the AAC and bring staff recommendations to the Commission for direction.*<br>Staff analysis & recommendations presented to Commission at Fall Planning Work Session on 12/7/21. | *11/15/21* | ***COMPLETE*** |
| *6. Draft and prepare a contract with the firm selected to provide general and on-call engineering services for Commission consideration.*<br>Selection process complete and contract with Precision Approach Engineering approved by Commission at 8/24/21 meeting. | *9/21/21* | ***COMPLETE*** |
| *7. Identify and implement a reporting, communication and oversight mechanism for activities of the Fixed Base Operator ("FBO") including monthly reports to the Commission.*<br>Report format prepared and monthly reports commenced in October 2021. Attached to ED Monthly report going forward. Additional FBO oversight will come from Property Manager and Facilities Director. | *9/30/21* | ***COMPLETE*** |

2021-26 STRATEGIC BUSINESS PLAN SERVICE AREA:

**REAL ESTATE DEVELOPMENT & MANAGEMENT**

GOAL 1: IMPLEMENT AND MAINTAIN 2018 REAL ESTATE INVESTMENT STRATEGY (REIS).

GOAL 2: ENSURE THAT THE PORT'S ROLE IN REGIONAL ECONOMIC DEVELOPMENT ACTIVITIES IS CLEARLY DEFINED. CONFIRM THAT THE OBJECTIVES ARE IDENTIFIED, AND ADEQUATE RESOURCES ARE IN PLACE TO BE SUCCESSFUL.

| ACTION | COMPLETION DATE TARGET | CURRENT STATUS |
|---|---|---|

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|---|---|---|
| 1. Update the Port of Hood River economic impact analysis Including a detailed focus on airport activities.<br>*Recommend removal of task. Near term benefits of analysis limited. Business Oregon expected to conduct comprehensive impact analysis of Oregon Ports in 2023.* | *6/30/22* | ***REMOVE*** |
| 3. Negotiate a Memorandum of Understanding (MOU) with a development entity describing the terms and conditions for future development of Lot #900 and present to the Commission for possible action.<br>MOU responses due Jan. 14. Presentation to Commission on Feb. 1 and final decision expected by March 1, 2022 Commission Meeting. | *1/15/22* | |
| 4. Prepare DDA Amendment #9 regarding Expo Phase II for Commission review.<br>*Recommended Amendment #9 nearly complete. Expected to be presented to Commission by March 15, 2022, meeting.* | *10/15/21* | |
| 5. Prepare plans/specifications, cost estimate and financing plan for construction of E. Anchor Way and seek Commission approval to initiate bidding and construction phases.<br>Expecting scope/fee proposal from KPFF Engineers by mid-January and Commission action by Feb. 1, 2022. | *6/30/21* | |
| 6. Prepare and submit application to the Economic Development Agency ("EDA") for grant funding for construction of N. 1st St.<br>*Draft grant application complete. Final app. Expected to be submitted my February 20. Commission approval has been obtained.* | *9/15/21* | |
| 7. Complete conceptual engineering plans and cost estimates, identify grant funding opportunities and make recommendation to the Commission about the feasibility of construction of N. 1st St.<br>*Concept plans and cost estimate complete. Presented to Commission and direction received on Sept. 21, 2021.* | *5/30/21* | ***COMPLETE*** |

2021-26 STRATEGIC BUSINESS PLAN SERVICE AREA:

**MARINA**

GOAL 1: ENSURE REALIZATION OF THE VISION OF THE MARINA AS A MULTI-USE RECREATIONAL MARINA THAT IS SAFE, FUNCTIONAL, WELCOMING, AND ATTRACTIVE THAT SERVES THE NEEDS OF MARINA TENANTS, GUEST BOATERS, AND LOCAL RESIDENTS AND GROUPS, PARTICULARLY YOUTH PROGRAMS.

| ACTION | COMPLETION DATE TARGET | CURRENT STATUS |
|---|---|---|
| 1. Complete plans, bid package and solicitation process and identify contractor for installation of new parallel boarding floats at the Public Boat Launch.<br>Plans/specs complete. Bidding expected to be completed by March 1, 2022. | 6/30/22 | |
| 2. Expand HRYC Boat Storage Area Fencing | 6/1/22 | |

2021-26 STRATEGIC BUSINESS PLAN SERVICE AREA:

**WATERFRONT RECREATION**

GOAL 1: ENSURE REALIZATION OF THE VISION OF PORT WATERFRONT RECREATIONAL TO MAINTAIN AND DEVELOP HIGH QUALITY RECREATIONAL SITES THAT PROMOTE RIVER ACCESS, ACTIVE RECREATION AND PASSIVE OPEN SPACE EXPERIENCES FOR COMMUNITY MEMBERS AND VISITORS WHILE SUPPORTING THE ECONOMIC DEVELOPMENT GOALS OF THE PORT DISTRICT.

GOAL 2: ENSURE BEST PRACTICE SAFETY PROTOCOLS AND SYSTEMS ARE IN PLACE AT ALL PORT WATERFRONT RECREATION FACILITIES AND CONTINUOUSLY EVALUATE SAFETY MEASURES ARE APPROPRIATELY MATCHED AND SIZED FOR THE CHANGING USES AND USER GROUPS AT EACH SITE.

| ACTION | COMPLETION DATE TARGET | CURRENT STATUS |
|---|---|---|
| 1. Reconvene the Waterfront Rec. Committee with a renewed focus on user/visitor safety. Recruit public safety officials, local expert user groups, and outside expert consultants to conduct a full evaluation of current conditions and develop recommended actions.<br>Committee membership approved and first meeting held on February 9, 2022. Outside expert under contract. Work Session to be scheduled in Spring '22. | 11/31/21 | **COMPLETE** |

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| 2. Develop and install an integrated signage plan for the Waterfront trail system.<br>*Plans complete. Bid process and installation planned for May/June 2022.* | 05/01/22 |
| 3. Complete plans/permits and ensure substantial completion of two rigging areas at the Hook.<br>*Plans complete, contractor selected, pre-con meeting done. Work is underway and expect substantial completion by April 2022.* | 12/15/21 |
| 4. Replace Pedestrian Bridge Deck.<br>*Work scheduled.* | 06/30/2022 |
| 5. Install Pedestrian Bridge Deck Lighting.<br>*Work effort being assessed. Lighting engineer may be required. May be postponed until FY 22/23.* | 06/30/2022 |

**UNPLANNED INITIATIVES OR COMMISSION DIRECTIVES**

THIS SECTION LISTS NEW, UNPLANNED EFFORTS AND APPROVED COMMISSION DIRECTIVES THAT OCCURRED THROUGHOUT THE REVIEW PERIOD.

| ACTION | COMPLETION/DATE TARGET |
|---|---|
| 1. Carry out candidate search and selection process and hire a new CFO to replace retiring Fred Kowell. | COMPLETE<br>01/31/22 |
| 2. Complete Pier Cap and Underwater Inspections and present findings to Commission.. | COMPLETE<br>12/21/21 |
| 3. Negotiate renewal of three Utility Easement Agreements on the Hood River Bridge. | 04/30/2022 |
| | |
| 4. Retain outside counsel, prepare materials and ensure Board training occurs to provide Commissioners with proper and adequate information on Governance, legal risks and exposures, and ED Employment Contract. | COMPLETE<br>09/30/2021 |
| | |
| 5. Negotiate Purchase Agreement, obtain appraisal, conduct Due Diligence, prepare pro forma and make recommendation regarding purchase of SDS Hangar. | COMPLETE<br>Feb. 15, 2022 |

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# Commission Memo

Prepared by: Michael McElwee
Date: February 15, 2022
Re: Bridge Weight Rating –
Test Results & Engineering Analysis

On August 24, 2021, the Commission approved Amendment No. 2 to Task Order No. 11 which authorized HDR Engineering, Inc. to coordinate live-load testing and subsequent engineering analysis related to the weight limit reduction on the Bridge.

The live-load testing was carried out in October. HDR has completed their engineering analysis. Attached are both HDR's analysis memo and the raw data test results report submitted to HDR by BDI, the subcontractor that carried out the tests.

Mark Libby, P.E. the Port's bridge engineer, will attend the meeting to review the testing results, discuss the engineering analysis and present the firm's recommendations.

**RECOMMENDATION:** Informational.

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# Memo

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|---|---|
| Date: | Thursday, February 10, 2022 |
| Project: | TO11 – Load Posting Restoration |
| To: | Michael McElwee, Executive Director Port of Hood River |
| From: | Mark Libby, PE<br>Carly Clark, PE, Santosh Timilsina, EI |
| Subject: | **Hood River Bridge – Load Testing and Rating Analysis** |

## 1.0 Introduction

In October 2021, BDI performed the field instrumentation and load testing program that HDR recommended and was accepted by the Port of Hood River. The instrumentation and load tests were performed on three sections of the bridge: the Oregon approach spans, the Washington approach spans, and truss spans 2 through 4. These sections were selected to address specific load rating deficiencies, which resulted in reduced load postings, identified by ODOT's 2020 Load Rating and discussed in the HDR June 25, 2021 *Load Posting Restoration Memo*.

The bridge spans were instrumented with strain transducers, rotational tiltmeters and cantilever deflection sensors to measure the strains, end rotations and deflections along the structural members respectively. The structural responses from the load-test truck slowly moving along the bridge were collected using a data acquisition system. Following the field data collection, BDI developed finite element models of the tested sections and used the load test data to generate field-verified models and refined load rating analysis. Controlling load rating factors were provided by BDI for the Oregon and Washington approach span members, Span 2 floorbeams, and the Span 3 and 4 truss members. The Span 3 and 4 truss member loads were then used by HDR to evaluate the gusset plates.

This Memo summarizes the results of the load testing program and recommendations for next steps for the Port. Tables 1 and 2, in Section 5.0, provide summaries of the pre- and post-load testing analysis for posted load restrictions and controlling load rating factors, respectively. Attachment 1 is a copy of the Deficiency Exhibit from the June 25 Memo referenced above for a visual reference to the locations of issues. Attachment 2 provides a summary of the original deficient load rating section details with the comparative results of the load testing analysis.

The full BDI report is included as Attachment 3 – *Live Load Testing & Field Verified Load Rating Report*.

## 2.0 Oregon Approach Spans

The Oregon approach spans consist of a two-span continuous steel stringer with concrete deck superstructure. The ODOT load rating showed deficiencies in these spans for positive moment flexure in interior stringers for the SU4-SU7 trucks and the EV2 and EV3 trucks.

The ODOT load rating assumed that the deck provided lateral support to the top flange of stringers, but the deck was not considered composite due to a lack of steel studs connecting the stringers and deck. Composite behavior adds significant positive moment capacity by engaging the concrete deck as the compression flange of the section. The load testing demonstrated that there was inconsistent partial composite action between the steel stringers and the concrete deck so BDI's rating analysis also assumed a non-composite section. The load rating analysis resulted in deficiencies in negative moment flexure at the Bent D support.

The previous deficiency of positive moment flexure appears to be mitigated by the actual load distribution on the spans resulting in lower demands than the theoretical load distributions. The negative moment flexure deficiency is new as this was not a control in the ODOT load rating. Bottom flange lateral buckling was the controlling factor in the BDI analysis as the negative moment capacity is significantly reduced due to the unbraced length (from Bent D to the mid-span diaphragm). A secondary analysis was performed with an additional lateral brace located midway between Bent D and the mid-span diaphragm and this resulted in all rating factors above 1.0.

## 3.0 Washington Approach Spans

The Washington approach spans consist of eight simply supported reinforced concrete deck girder (RCDG) spans. There are six shorter spans (5 @ 38.0', 1 @ 31.44') and two longer spans (43.8', 47.75'). The ODOT load rating showed deficiencies in shear and mid-span positive moment in all girders of these spans.

The Port was able to locate plans for the widening of the Washington approach spans from 1996. These plans were previously unavailable, and the details of the widening were unknown. The widening added a girder to each side for a total of 7 girders in the cross section. The ODOT load rating only considered 5 girders in the cross section since they did not have the widening plan information. The BDI analysis took into consideration the widened structure details.

For economic reasons, only Span 23 (38.0' span) was instrumented and analyzed to be representative of the Washington approach spans. Similar results are expected for the longer spans.

The load testing demonstrated that there is some partial continuity behavior due to the restraint of the abutting concrete diaphragms and the fixed end of spans. The load rating analysis resulted in a shear deficiency for EV3 truck in original interior girders and for positive moment flexure for the EV3 truck in original exterior girders. The newer exterior girders did not control over the original girders and all rating factors were above 1.0.

# 4.0 Truss Spans

## 4.1 Span 1 and 2 Floorbeams

The trusses in Spans 1 and 2 differ from the other deck trusses as the trusses are wider with the roadway passing between the trusses (partial through-truss). The floorbeams are framed into truss verticals in Spans 1 and 2 whereas they span over the top chords of trusses in the other spans. The ODOT load rating showed deficiencies in mid-span positive flexural moment of the Span 1 and 2 floorbeams.

During the instrumentation of Span 2 floorbeams, BDI noticed that stiffener plates had been added to the top and bottom of the web through the mid-span section. These plates were estimated to be 4" x 1" and applied to both sides of the web. The field crew did not measure these plates as they were unaware that they were not documented in plans. HDR could not find details in the available plans, or comments in the recent inspection reports, that include these plates and do not know when they were added or the extent of their application. This information should be determined during the next bridge inspection.

**Figure 1.** Span 2 floorbeam stiffener plates

The load testing demonstrated low responses at midspan, and the calibrated load rating analysis resulted in satisfactory rating factors for the legal and emergency vehicle trucks.

## 4.2 Span 3

Span 3 shows deficiencies in gusset plates at joints L4, L8, and L10. These joints are locations of splices in the bottom chord channel members where the splice of the channel is made with the joint gusset plates, which are exceeding the tension capacity. The interior floorbeams were also deficient for the EV3 truck. Span 3 varies from the typical deck truss in that it is slightly longer and varies in depth along its length.

Applying the truss member loads from the BDI field-verified model output to the gusset plate analysis tools used in the ODOT load rating resulted in a slight improvement at joints L8 and L10 and a reduction in rating factors at joint L4. Joints L8 and L10 remain deficient for the EV3 truck but have rating factors of 0.95 or above for the rest of the load posting vehicles. Joint L4 remains deficient for all but the Type 3 and SU4 trucks.

Span 3 floorbeams were not instrumented or analyzed since the load posting restriction would only be for the EV3 truck.

### 4.3 Span 4-10 and 12-18

These are the typical deck-truss spans and show deficiencies in the gusset plates at joints L7 and L4 (by symmetry). Similar to the Span 3 gusset plates, these joints are at locations of bottom chord splices using the gusset plates as part of the splice connection. The interior floorbeams are also deficient for the EV3 truck.

Applying the truss member loads from the BDI field-verified model output to the gusset plate analysis tools used in the ODOT load rating resulted in minimum rating factors of 0.95 and 0.99 for the EV3 truck. All other rating factors were above 1.0 for the legal and emergency vehicles.

Span 4 floorbeams were not instrumented or analyzed since the load posting restriction would only be for the EV3 truck.

### 4.4 Lift Span 11

The lift span truss had two diagonal members (L4-M5, M9-L10) with slight deficiencies in compression with rating factors of 0.93 for the EV3 truck and 0.95 for the SU7 truck.

The lift span was not instrumented or analyzed since the load posting would only be limited for the EV3 truck.

### 4.5 Span 19

Span 19 is a deck-truss span similar to the typical deck-truss spans; however, the roadway section was widened to match the widening of the Washington approach spans. The roadway width in Span 19 varies from 19'-7 ¼" at Pier 19 to 26'-9" at Pier 20. This span had originally been analyzed as typical of all deck-truss spans.

Span 19 showed deficiencies in top chord compression for the EV3 and SU7 trucks (members U3-U4 to U7-U8), bottom chord tension for the EV3 truck (member L5-L6), and gusset plate at joint L7 for several trucks.

ODOT did not have the widening plans that the Port found during this project, which revealed that high strength tensioning rods were added to the bottom chords to accommodate the widening. This span was not instrumented or analyzed due to the low added value relative to the additional cost. HDR anticipated that results from the typical deck truss spans and the additional widening design information would mitigate the deficiency issues in this span.

## 5.0 Load Rating Summary Comparisons

Table 1 provides a summary of the posted load restrictions issued by ODOT and the potential revised load posting based on the results of the load testing analysis and the controlling load rating factors listed in Table 2. These results represent the as-is condition of the bridge except for the Oregon approach spans. For the Oregon approach spans it is assumed that the added lateral bracing discussed in Section 2 is applied.

**Table 1. Load Posting Summary**

| Legal Vehicles | Unrestricted Weight | New Posted Weight Limit | Potential Revised Posted Limit | Controlled By |
|---|---|---|---|---|
| Type 3 | 25 tons | 24 tons | 25 tons | NA |
| Type 3S2 | 40 tons | 32 tons | 36 tons | Span 3 Gusset Plate L4 |
| Type 3-3 | 40 tons | 32 tons | 36 tons | Span 3 Gusset Plate L4 |
| SU4 | 27 tons | 22 tons | 27 tons | NA |
| SU5 | 31 tons | 24 tons | 31 tons | NA |
| SU6 | 34.75 tons | 25 tons | 30 tons | Span 3 Gusset Plate L4 |
| SU7 | 38.75 tons | 25 tons | 30.3 tons | Span 3 Gusset Plate L4 |
| EV2 | 28.75 tons | 26 tons | 28.75 tons | NA |
| EV3 | 43 tons | 25 tons | 31.5 tons | Span 3 Gusset Plate L4 |

**Table 2. Summary of Controlling Load Rating Factors**

| Original Load Rating Results | | | | | Load Test Results Controlling Rating Factors (Trucks) |
|---|---|---|---|---|---|
| Section / Span | Member / Location | Force Type | Controlling Rating Factor, Legal Trucks | Controlling Rating Factor, EV Trucks (All EV3) | |
| OR Approach / Spans SE, SD | Interior Stringers, 0.4L – 0.6L | +M | **0.72** (SU7) | **0.60** | **0.92** (+M, EV3)<br>**0.31** (-M, EV3)<br>1.16 (-M, EV3 braced) |
| Truss Span 1, 2 | Interior Floorbeam, 0.5L | +M | **0.68** (SU7) | **0.76** | 1.21 (SU7),<br>1.09 (+M, EV3) |
| Truss Span 3 | Gusset Plate L4, L4-L5<br>Gusset Plate L4, L4-L3 | Tension<br>Tens-yielding | **0.74** (SU7)<br>0.99 (SU7) | **0.69**<br>**0.92** | **0.78** (SU7), **0.73** (EV3)<br>**0.82** (SU7), **0.77** (EV3) |
| | Gusset Plate L8, L8-L9<br>Gusset Plate L8, L8-L7 | Tens-yielding<br>Tens-yielding | **0.88** (SU7)<br>**0.89** (SU7) | **0.82**<br>**0.83** | 0.96 (SU7), **0.89** (EV3)<br>0.95 (SU7), **0.90** (EV3) |
| | Gusset Plate L10, L10-L9 | Tens-yielding | **0.92** (SU7) | **0.85** | 0.99 (SU7), **0.92** (EV3) |
| | Interior Floorbeam, 0.5L | +M | 1.00 | **0.87** | --- |
| Truss Spans 4-10 and 12-18, + Span 19 Floorbeam | Gusset Plate L7, L7-L8<br>Gusset Plate L7, L7-L6 | Tens-yielding<br>Tens-yielding | **0.94** (SU7)<br>0.99 (SU7) | **0.88**<br>**0.93** | 1.02 (SU7), **0.95** (EV3)<br>1.06 (SU7), 0.99 (EV3) |
| | Interior Floorbeam, 0.5L | +M | 1.00 | **0.87** | --- |
| Lift Truss Span 11 | Truss Diagonal L4-M5 | Compression | 0.95 | **0.93** | --- |
| | Truss Diagonal M9-L10 | Compression | 0.95 | **0.93** | --- |

**Table 2. Summary of Controlling Load Rating Factors**

| Original Load Rating Results | | | | | Load Test Results Controlling Rating Factors (Trucks) |
|---|---|---|---|---|---|
| **Section / Span** | **Member / Location** | **Force Type** | **Controlling Rating Factor, Legal Trucks** | **Controlling Rating Factor, EV Trucks (All EV3)** | |
| Truss Span 19 | Top Chord, U3-U4<br>U4-U5<br>U5-U6<br>U6-U7<br>U7-U8 | Compression | 1.01<br>**0.89**<br>0.95<br>**0.89**<br>1.00 | **0.94**<br>**0.83**<br>**0.89**<br>**0.83**<br>**0.93** | --- |
| | Bottom Chord, L5-L6 | Tension | 1.01 | **0.94** | --- |
| | Gusset Plate L7, L7-L8<br>Gusset Plate L7, L7-L6 | Tension | **0.89**<br>**0.73** | **0.81**<br>**0.68** | --- |
| WA Approach, Spans 21, 22, 23, 24, 25, 27 | Exterior Girder*, 0.5L | +M | **0.93** (SU7) | **0.77** | 1.16 (+M, SU7)<br>**0.92** (+M, EV3) |
| | Exterior Girder*, 0.944L | V | 1.43 | **0.92** | |
| | Interior Girder, 0.923L<br>0.944L | V | 1.30 (SU7)<br>1.05 (SU7) | **0.94**<br>**0.73** | 0.98 (V, SU5),<br>**0.69** (V, EV3) |
| WA Approach Spans 20, 26 | Exterior Girder*, 0.5L | +M | 1.08 (SU7) | **0.92** | --- |
| | Interior Girder, 0.1L, 0.9L<br>0.938L<br>0.955L | V | 1.16 (SU7)<br>1.14 (SU7)<br>**0.93** (SU7) | **0.92**<br>**0.89**<br>**0.72** | --- |

*Exterior girders rated for the WA approach spans are the original exterior girders before the widening.

# 6.0 Conclusions and Recommendations

## 6.1 Conclusions

The load testing program has shown that most of the load restrictions should be able to be restored without repairs and that a couple of outstanding deficiencies can be repaired to restore previous load limits if desired. The two areas that warrant repair are the Oregon approach spans and the Span 3 Gusset Plate L4 connections, as shown in Table 1 above. The other areas are limited to a restriction in the EV3 truck load which is deemed preferrable to the cost of repairs to restore that truck to full capacity since it is an unlikely commercial customer need.

For these outcomes to be approved, ODOT will need to evaluate and accept the results. It is unclear at this point whether they will want to revise their official load rating utilizing results of the load testing analysis, accept the results for those members that were load rated, or some combination of these options. HDR expects that ODOT will need to review the load test information before making a decision.

The BDI load ratings were only for the legal and emergency vehicles for which load posted restrictions were applied so results for the design vehicle (HL-93) and the permit vehicles are

not currently available. The results for these additional vehicles could be generated from the field-verified models with additional effort. If ODOT chooses to utilize specific extracted results from the field verified models, then the specific results needed will need to be determined. The models and analysis provided by BDI are highly integrated but do not provide direct results to correlate to the same analysis sections as all of the ODOT load rating analysis. The focus of this effort was on the known deficiencies and not to reproduce all of the other section results.

## 6.2 Recommendations

Upon concurrence with the Port, HDR recommends sending this Memo and attached report to ODOT along with the 1996 widening plans for Washington approach spans and Span 19 truss modifications. HDR will need to coordinate with ODOT and BDI regarding the results and the manner in which they can incorporate this information into their official load rating of the bridge. It is important to understand what they will specifically need or require in order to extract the correct information out of the field-verified finite element models. To verify the potential revised posted limits shown in Table 1, ODOT will need to concur with these results.

Engineering design for additional lateral bracing in the Oregon approach spans should proceed as this repair is needed for all load conditions. The probable repair approach is to install steel channel or bent plate diaphragms between the steel stringers with bolted angle bracket connections. The expected probable cost to install this repair is approximately $50,000.

Strengthening design for the L4 gusset plates in Span 3 is recommended if further restoration of load limits, above that shown in Table 1, is desired. The retrofit strategy for this location is to add steel plates to the web of the bottom chord channels opposite of the gusset plates. Assuming that only these two joints (upstream and downstream trusses) require strengthening, the expected probable cost to implement this retrofit is approximately $60,000 to $80,000.

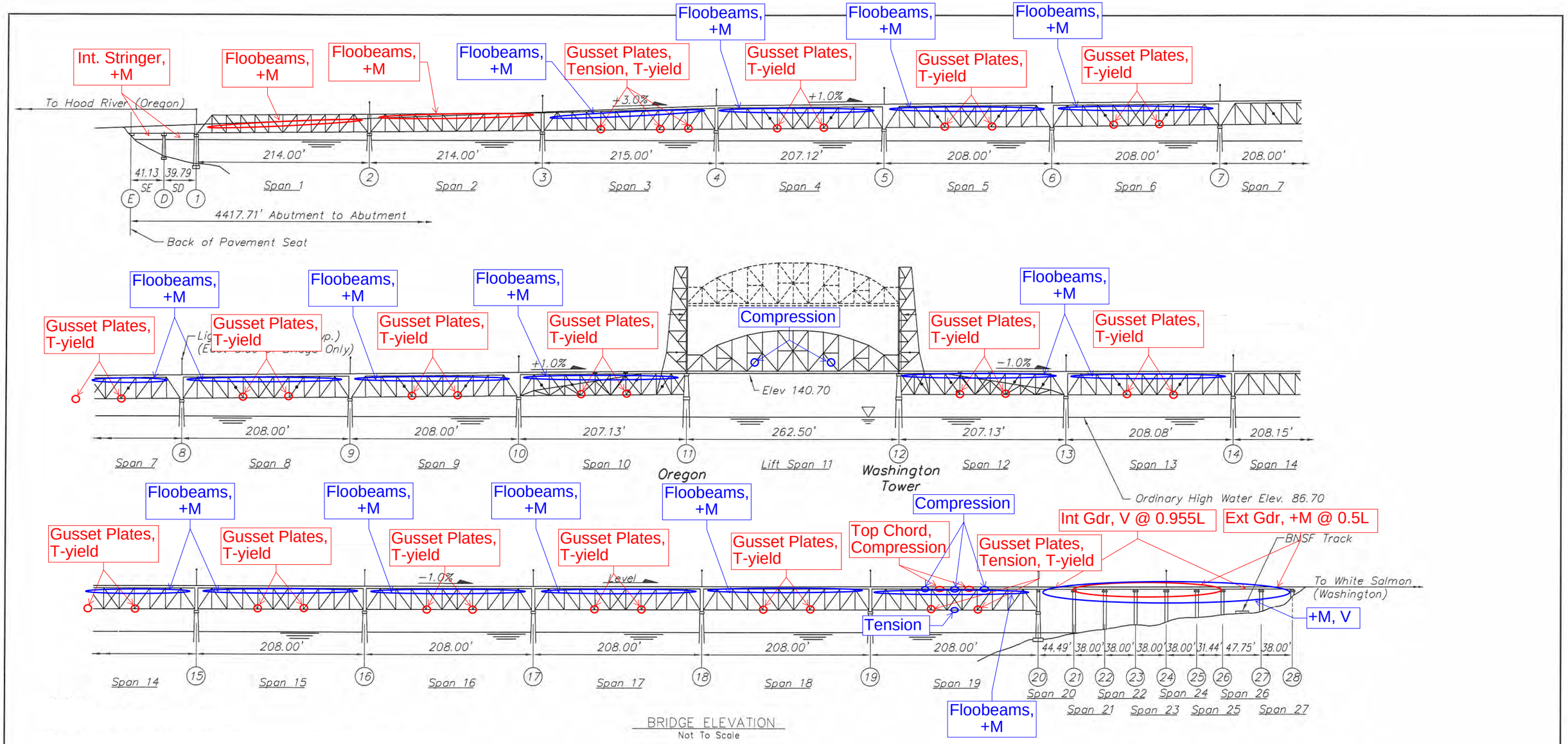
Attachments:

Attachment 1 –Deficiency Exhibit

Attachment 2 – Summary of Deficiencies w/ Load Testing Results

Attachment 3 – Live Load Testing & Field Verified Load Rating Report

# Attachment 1 – Deficiency Exhibit


Int. Stringer, +M
Floobeams, +M
Floobeams, +M
Floobeams, +M
Gusset Plates, Tension, T-yield
Floobeams, +M
Gusset Plates, T-yield
Floobeams, +M
Gusset Plates, T-yield
To Hood River (Oregon)
+3.0%
+1.0%
214.00'
214.00'
215.00'
207.12'
208.00'
208.00'
208.00'
41.13
39.79
SE
SD
E
D
1
2
3
4
5
6
7
Span 1
Span 2
Span 3
Span 4
Span 5
Span 6
Span 7
4417.71' Abutment to Abutment
Back of Pavement Seat
Floobeams, +M
Floobeams, +M
Floobeams, +M
Gusset Plates, T-yield
Gusset Plates, T-yield
Gusset Plates, T-yield
Gusset Plates, T-yield
Compression
Gusset Plates, T-yield
Floobeams, +M
Gusset Plates, T-yield
+1.0%
−1.0%
Elev 140.70
208.00'
208.00'
207.13'
262.50'
207.13'
208.08'
208.15'
8
9
10
11
12
13
14
Span 7
Span 8
Span 9
Span 10
Lift Span 11
Span 12
Span 13
Span 14
Oregon
Washington
Tower
Ordinary High Water Elev. 86.70
Floobeams, +M
Floobeams, +M
Floobeams, +M
Floobeams, +M
Compression
Int Gdr, V @ 0.955L
Ext Gdr, +M @ 0.5L
Gusset Plates, T-yield
Gusset Plates, T-yield
Gusset Plates, T-yield
Gusset Plates, T-yield
Gusset Plates, T-yield
Top Chord, Compression
Gusset Plates, Tension, T-yield
BNSF Track
−1.0%
Level
To White Salmon (Washington)
Tension
+M, V
208.00'
208.00'
208.00'
208.00'
208.00'
44.49'
38.00'
38.00'
38.00'
38.00'
31.44'
47.75'
38.00'
15
16
17
18
19
20
21
22
23
24
25
26
27
28
Span 14
Span 15
Span 16
Span 17
Span 18
Span 19
Span 20
Span 21
Span 22
Span 23
Span 24
Span 25
Span 26
Span 27
Floobeams, +M
BRIDGE ELEVATION
Not To Scale
2020 Load Rating - Locations with Rating Factors < 0.95
Additional Sections for EV Trucks with Rating Factors < 0.95
Legend
(1) – Denotes Pier Number

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# Attachment 2 – Summary of Deficiencies w/ Load Testing Results

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Att 1 - Summary of Deficiencies w/ Load Testing Results

| | Oregon Approach Spans | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **SECTION EVALUATED** | **594** | **Load Test Results** | **597** | **600** | **603** | **606** | **Load Test Results** | **Load Test Results** |
| LRFD Brass .OUT File Name: | INTSTR_OR_APP.OUT | Field verified model | INTSTR_OR_APP.OUT | INTSTR_OR_APP.OUT | INTSTR_OR_APP.OUT | INTSTR_OR_APP.OUT | Field verified model | Field verified model |
| FORCE TYPE (+/-M, V, T, C or B): | +M | +M | +M | +M | +M | +M | -M | **-M (w/bracing)** |
| PHI (Resistance Factor): | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | | |
| MEMBER (eg. Int. girder): | INT STR | INT STR | INT STR | INT STR | INT STR | INT STR | INT STR | INT STR |
| SPAN (eg. 1 of 4): | OR App 1 of 2 | OR App 1 of 2 | OR App 1 of 2 | OR App 1 of 2 | OR App 1 of 2 | OR App 1 of 2 | OR App 1 of 2 | OR App 1 of 2 |
| LOCATION (eg. 0.1L): | 0.4L | 0.45L | 0.45L | 0.5L | 0.55L | 0.6L | 0.96L | 0.96L |
| SINGLE LANE DF | 0.576 | | 0.576 | 0.576 | 0.576 | 0.576 | | |
| MULTI-LANE DF | 0.000 | | 0.000 | 0.000 | 0.000 | 0.000 | | |
| **DESIGN & LEGAL VEHICLES** | | | | | | | | |
| HL93 (INVENTORY) | 0.46 St1 | --- | 0.46 St1 | 0.48 St1 | 0.51 St1 | 0.56 St1 | --- | --- |
| TYPE 3 (50K) | 1.03 St1 | 1.56 St1 | 1.05 St1 | 1.09 St1 | 1.15 St1 | 1.25 St1 | **0.53 St1** | 1.99 St1 |
| TYPE 3S2 (80K) | 1.01 St1 | 1.49 St1 | 1.01 St1 | 1.06 St1 | 1.14 St1 | 1.28 St1 | **0.34 St1** | 1.22 St1 |
| TYPE 3-3 (80K) | 1.42 St1 | 2.00 St1 | 1.36 St1 | 1.36 St1 | 1.42 St1 | 1.54 St1 | **0.42 St1** | 1.52 St1 |
| TYPE 3-3 & LEGAL LANE | | | | | | | | |
| TYPE 3-3 TRAIN & LEGAL LANE | | | | | | | | |
| SU4 TRUCK (54K) | **0.89 St1** | 1.33 St1 | **0.90 St1** | **0.93 St1** | **0.99 St1** | 1.08 St1 | **0.47 St1** | 1.73 St1 |
| SU5 TRUCK (62K) | **0.83 St1** | 1.25 St1 | **0.85 St1** | **0.89 St1** | **0.93 St1** | 1.02 St1 | **0.43 St1** | 1.60 St1 |
| SU6 TRUCK (69.5K) | **0.76 St1** | 1.14 St1 | **0.77 St1** | **0.81 St1** | **0.86 St1** | **0.94 St1** | **0.39 St1** | 1.46 St1 |
| SU7 TRUCK (77.5K) | **0.73 St1** | 1.07 St1 | **0.73 St1** | **0.76 St1** | **0.82 St1** | **0.90 St1** | **0.36 St1** | 1.35 St1 |
| EV2 TRUCK (57.5K) | **0.91 St1** | 1.42 St1 | **0.94 St1** | **0.97 St1** | 1.01 St1 | 1.08 St1 | **0.47 St1** | 1.74 St1 |
| EV3 TRUCK (86K) | **0.60 St1** | **0.92 St1** | **0.61 St1** | **0.63 St1** | **0.67 St1** | **0.74 St1** | **0.31 St1** | 1.16 St1 |
| **CTP VEHICLE, MULTI-LANE** | | | | | | | | |
| OR-CTP-2A (105.5K) | 1.02 St2 | | 1.05 St2 | 1.13 St2 | 1.25 St2 | 1.44 St2 | | |
| OR-CTP-2B (105.5K) | **0.91 St2** | | **0.92 St2** | **0.95 St2** | 1.01 St2 | 1.12 St2 | | |
| OR-CTP-3 (98K) | **0.87 St2** | | **0.88 St2** | **0.91 St2** | **0.98 St2** | 1.10 St2 | | |
| **STP VEHICLE, MULTI-LANE** | | | | | | | | |
| OR-STP-3(120.5K) | **0.82 St2** | | **0.83 St2** | **0.87 St2** | **0.96 St2** | 1.09 St2 | | |
| OR-STP-4A (99K) | **0.87 St2** | | **0.87 St2** | **0.90 St2** | **0.98 St2** | 1.09 St2 | | |
| OR-STP-4B (185K) | **0.74 St2** | | **0.77 St2** | **0.82 St2** | **0.84 St2** | **0.90 St2** | | |
| OR-STP-4C (150.5K) | **0.68 St2** | | **0.69 St2** | **0.73 St2** | **0.79 St2** | **0.89 St2** | | |
| OR-STP-4D (162.5K) | **0.72 St2** | | **0.75 St2** | **0.79 St2** | **0.88 St2** | 1.04 St2 | | |
| OR-STP-4E (258K) | **0.72 St2** | | **0.74 St2** | **0.78 St2** | **0.83 St2** | **0.93 St2** | | |
| OR-STP-5BW (204K) | **0.76 St2** | | **0.79 St2** | **0.81 St2** | **0.84 St2** | **0.92 St2** | | |
| SPECIAL | | | | | | | | |
| **STP VEHICLE, SINGLE LANE W/ESCORT** | | | | | | | | |
| OR-STP-3(120.5K) | 0.98 St2 | | 0.99 St2 | 1.04 St2 | 1.14 St2 | 1.30 St2 | | |
| OR-STP-4A (99K) | 1.17 St2 | | 1.17 St2 | 1.21 St2 | 1.32 St2 | 1.47 St2 | | |
| OR-STP-4B (185K) | 0.77 St2 | | 0.80 St2 | 0.86 St2 | 0.88 St2 | 0.94 St2 | | |
| OR-STP-4C (150.5K) | 0.72 St2 | | 0.73 St2 | 0.78 St2 | 0.84 St2 | 0.95 St2 | | |
| OR-STP-4D (162.5K) | 0.77 St2 | | 0.80 St2 | 0.84 St2 | 0.94 St2 | 1.11 St2 | | |
| OR-STP-4E (258K) | 0.75 St2 | | 0.77 St2 | 0.81 St2 | 0.87 St2 | 0.97 St2 | | |
| OR-STP-5BW (204K) | 0.79 St2 | | 0.82 St2 | 0.85 St2 | 0.88 St2 | 0.96 St2 | | |
| SPECIAL | | | | | | | | |

| | Truss Span 1 | | Truss Span 3 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **SECTION EVALUATED** | **667** | **Load Test Results** | **437** | **Load Test Results** | **438** | **Load Test Results** | **451** | **Load Test Results** | **452** |
| LRFD Brass .OUT File Name: | XB_Span1_INT.xlsm | FLBm Span 2 | 645_Span 3_GussetPla | 645_Span 3_GussetPla | 06645_MBE_Gusset | 06645_MBE_Gusset | 645_Span 3_GussetPla | 645_Span 3_GussetPla | 645_Span 3_GussetPla |
| FORCE TYPE (+/-M, V, T, C or B): | +M | +M | T - Yldng | T - Yldng | Tension | Tension | T - Yldng | T - Yldng | T - Yldng |
| PHI (Resistance Factor): | 0.900 | 0.900 | 0.900 | 0.900 | 0.850 | 0.850 | 0.900 | 0.900 | 0.900 |
| MEMBER (eg. Int. girder): | Span 1 FB INT | Span 2 FB Int | Gusset Plate L4 | Gusset Plate L4 | Gusset Plate L4 | Gusset Plate L4 | Gusset Plate L8 | Gusset Plate L8 | Gusset Plate L8 |
| SPAN (eg. 1 of 4): | 1 of 19 | 2 of 19 | 3 of 19 | 3 of 19 | 3 of 19 | 3 of 19 | 3 of 19 | 3 of 19 | 3 of 19 |
| LOCATION (eg. 0.1L): | 0.5L | 0.5L | L4L3 | L4L3 | L4L5 | L4L5 | L8L9 | L8L9 | L8L7 |
| SINGLE LANE DF | 1.000 | | 0.992 | 0.992 | 0.992 | 0.992 | 0.992 | 0.992 | 0.992 |
| MULTI-LANE DF | 1.000 | | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| **DESIGN & LEGAL VEHICLES** | | | | | | | | | |
| HL93 (INVENTORY) | 0.40 St1 | --- | 0.42 St1 | 0.33 St1 | 0.32 St1 | 0.32 St1 | 0.38 St1 | 0.38 St1 | 0.38 St1 |
| TYPE 3 (50K) | **0.99 St1** | 1.80 St1 | 1.47 St1 | 1.22 St1 | 2.84 St1 | 3.03 St1 | 1.31 St1 | 1.43 St1 | 1.33 St1 |
| TYPE 3S2 (80K) | **0.96 St1** | 1.74 St1 | 1.06 St1 | **0.90 St1** | 2.04 St1 | 2.23 St1 | **0.95 St1** | 1.02 St1 | **0.97 St1** |
| TYPE 3-3 (80K) | 1.22 St1 | 2.31 St1 | 1.07 St1 | **0.89 St1** | 2.06 St1 | 2.21 St1 | **0.96 St1** | 1.04 St1 | **0.98 St1** |
| TYPE 3-3 & LEGAL LANE | 1.36 St1 | | 1.06 St1 | **0.87 St1** | 1.93 St1 | 2.03 St1 | **0.95 St1** | 1.01 St1 | **0.96 St1** |
| TYPE 3-3 TRAIN & LEGAL LANE | 1.53 St1 | | | | | | | | |
| SU4 TRUCK (54K) | **0.84 St1** | 1.52 St1 | 1.36 St1 | 1.18 St1 | 1.03 St1 | 1.17 St1 | 1.21 St1 | 1.67 St1 | 1.23 St1 |
| SU5 TRUCK (62K) | **0.79 St1** | 1.43 St1 | 1.21 St1 | **1.00 St1** | **0.91 St1** | **0.96 St1** | 1.08 St1 | 1.17 St1 | 1.09 St1 |
| SU6 TRUCK (69.5K) | **0.72 St1** | 1.29 St1 | 1.08 St1 | **0.90 St1** | **0.81 St1** | **0.86 St1** | **0.97 St1** | 1.05 St1 | **0.98 St1** |
| SU7 TRUCK (77.5K) | **0.68 St1** | 1.21 St1 | **0.99 St1** | **0.82 St1** | **0.74 St1** | **0.78 St1** | **0.88 St1** | **0.96 St1** | **0.89 St1** |
| EV2 TRUCK (57.5K) | 1.13 St1 | 1.63 St1 | 1.36 St1 | 1.13 St1 | 1.02 St1 | 1.09 St1 | 1.21 St1 | 1.32 St1 | 1.23 St1 |
| EV3 TRUCK (86K) | **0.76 St1** | 1.09 St1 | **0.92 St1** | **0.77 St1** | **0.69 St1** | **0.73 St1** | **0.82 St1** | **0.89 St1** | **0.83 St1** |
| **CTP VEHICLE, MULTI-LANE** | | | | | | | | | |
| OR-CTP-2A (105.5K) | **0.92 St2** | | **0.85 St2** | **0.66 St2** | **0.63 St2** | **0.63 St2** | **0.76 St2** | **0.76 St2** | **0.76 St2** |
| OR-CTP-2B (105.5K) | **0.79 St2** | | **0.85 St2** | **0.66 St2** | **0.59 St2** | **0.59 St2** | **0.76 St2** | **0.76 St2** | **0.78 St2** |
| OR-CTP-3 (98K) | **0.81 St2** | | **0.88 St2** | **0.68 St2** | 1.54 St2 | 1.54 St2 | **0.79 St2** | **0.79 St2** | **0.80 St2** |
| **STP VEHICLE, MULTI-LANE** | | | | | | | | | |
| OR-STP-3(120.5K) | **0.75 St2** | | **0.72 St2** | **0.56 St2** | **0.54 St2** | **0.54 St2** | **0.64 St2** | **0.64 St2** | **0.65 St2** |
| OR-STP-4A (99K) | **0.79 St2** | | **0.87 St2** | **0.67 St2** | **0.65 St2** | **0.65 St2** | **0.77 St2** | **0.77 St2** | **0.78 St2** |
| OR-STP-4B (185K) | **0.62 St2** | | **0.52 St2** | **0.40 St2** | **0.39 St2** | **0.39 St2** | **0.47 St2** | **0.47 St2** | **0.48 St2** |
| OR-STP-4C (150.5K) | **0.61 St2** | | **0.62 St2** | **0.48 St2** | **0.47 St2** | **0.47 St2** | **0.55 St2** | **0.55 St2** | **0.56 St2** |
| OR-STP-4D (162.5K) | **0.65 St2** | | **0.57 St2** | **0.44 St2** | **0.42 St2** | **0.42 St2** | **0.51 St2** | **0.51 St2** | **0.51 St2** |
| OR-STP-4E (258K) | **0.65 St2** | | **0.44 St2** | **0.34 St2** | **0.34 St2** | **0.34 St2** | **0.40 St2** | **0.40 St2** | **0.41 St2** |
| OR-STP-5BW (204K) | **0.60 St2** | | **0.50 St2** | **0.39 St2** | **0.38 St2** | **0.38 St2** | **0.45 St2** | **0.45 St2** | **0.46 St2** |
| SPECIAL | | | | | | | | | |
| **STP VEHICLE, SINGLE LANE W/ESCORT** | | | | | | | | | |
| OR-STP-3(120.5K) | 0.89 St2 | | 0.86 St2 | | 0.65 St2 | | 0.77 St2 | | 0.78 St2 |
| OR-STP-4A (99K) | 1.06 St2 | | 1.18 St2 | | 0.88 St2 | | 1.05 St2 | | 1.07 St2 |
| OR-STP-4B (185K) | 0.65 St2 | | 0.55 St2 | | 0.42 St2 | | 0.49 St2 | | 0.50 St2 |
| OR-STP-4C (150.5K) | 0.65 St2 | | 0.66 St2 | | 0.50 St2 | | 0.59 St2 | | 0.60 St2 |
| OR-STP-4D (162.5K) | 0.69 St2 | | 0.61 St2 | | 0.46 St2 | | 0.55 St2 | | 0.55 St2 |
| OR-STP-4E (258K) | 0.67 St2 | | 0.47 St2 | | 0.36 St2 | | 0.42 St2 | | 0.43 St2 |
| OR-STP-5BW (204K) | 0.63 St2 | | 0.53 St2 | | 0.40 St2 | | 0.47 St2 | | 0.48 St2 |
| SPECIAL | | | | | | | | | |

| | | | | | Truss Span 4-10 and 12-18 | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **SECTION EVALUATED** | **Load Test Results** | **457** | **Load Test Results** | **670** | **677** | **748** | **Load Test Results** | **749** | **Load Test Results** |
| LRFD Brass .OUT File Name: | 645_Span 3_GussetPla | 645_Span 3_GussetPla | 645_Span 3_GussetPla | XB_Span3.xlsm | XB_Span4.xlsm | 45_Span 18_GussetPl | 45_Span 18_GussetPl | 45_Span 18_GussetPl | 45_Span 18_GussetPl |
| FORCE TYPE (+/-M, V, T, C or B): | T - Yldng | T - Yldng | T - Yldng | +M | +M | T - Yldng | T - Yldng | T - Yldng | T - Yldng |
| PHI (Resistance Factor): | 0.900 | 0.900 | 0.900 | 0.900 | 0.900 | 0.900 | 0.900 | 0.900 | 0.900 |
| MEMBER (eg. Int. girder): | Gusset Plate L8 | Gusset Plate L10 | Gusset Plate L10 | Span 3 FB | Span 4 FB | Gusset Plate L7 | Gusset Plate L7 | Gusset Plate L7 | Gusset Plate L7 |
| SPAN (eg. 1 of 4): | 3 of 19 | 3 of 19 | 3 of 19 | 3 of 19 | 18 of 19 | 18 of 19 | 18 of 19 | 18 of 19 | 18 of 19 |
| LOCATION (eg. 0.1L): | L8L7 | L10L9 | L10L9 | 0.5L | 0.5L | L7L8 | L7L8 | L7L6 | L7L6 |
| SINGLE LANE DF | 0.992 | 0.992 | 0.992 | 1.000 | 1.000 | 0.992 | 0.992 | 0.992 | 0.992 |
| MULTI-LANE DF | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| **DESIGN & LEGAL VEHICLES** | | | | | | | | | |
| HL93 (INVENTORY) | 0.38 St1 | 0.39 St1 | 0.39 St1 | 0.59 St1 | 0.59 St1 | 0.41 St1 | 0.41 St1 | 0.43 St1 | 0.43 St1 |
| TYPE 3 (50K) | 1.43 St1 | 1.35 St1 | 1.48 St1 | 1.45 St1 | 1.45 St1 | 1.40 St1 | 1.53 St1 | 1.47 St1 | 1.60 St1 |
| TYPE 3S2 (80K) | 1.03 St1 | **0.99 St1** | 1.05 St1 | 1.41 St1 | 1.41 St1 | 1.02 St1 | 1.09 St1 | 1.08 St1 | 1.15 St1 |
| TYPE 3-3 (80K) | 1.04 St1 | **0.98 St1** | 1.09 St1 | 1.79 St1 | 1.79 St1 | 1.02 St1 | 1.11 St1 | 1.08 St1 | 1.16 St1 |
| TYPE 3-3 & LEGAL LANE | 1.01 St1 | **0.98 St1** | 1.05 St1 | 2.00 St1 | 2.00 St1 | 1.02 St1 | 1.09 St1 | 1.08 St1 | 1.13 St1 |
| TYPE 3-3 TRAIN & LEGAL LANE | | | | | | | | | |
| SU4 TRUCK (54K) | 1.57 St1 | 1.25 St1 | 1.91 St1 | 1.24 St1 | 1.24 St1 | 1.29 St1 | 1.77 St1 | 1.36 St1 | 1.71 St1 |
| SU5 TRUCK (62K) | 1.17 St1 | 1.11 St1 | 1.21 St1 | 1.16 St1 | 1.16 St1 | 1.15 St1 | 1.25 St1 | 1.21 St1 | 1.30 St1 |
| SU6 TRUCK (69.5K) | 1.05 St1 | 1.01 St1 | 1.09 St1 | 1.06 St1 | 1.06 St1 | 1.03 St1 | 1.12 St1 | 1.09 St1 | 1.17 St1 |
| SU7 TRUCK (77.5K) | **0.95 St1** | **0.92 St1** | **0.99 St1** | **1.00 St1** | **1.00 St1** | **0.94 St1** | 1.02 St1 | **0.99 St1** | 1.06 St1 |
| EV2 TRUCK (57.5K) | 1.33 St1 | 1.25 St1 | 1.36 St1 | 1.28 St1 | 1.28 St1 | 1.30 St1 | 1.41 St1 | 1.37 St1 | 1.48 St1 |
| EV3 TRUCK (86K) | **0.90 St1** | **0.85 St1** | **0.92 St1** | **0.87 St1** | **0.87 St1** | **0.88 St1** | **0.95 St1** | **0.93 St1** | **0.99 St1** |
| **CTP VEHICLE, MULTI-LANE** | | | | | | | | | |
| OR-CTP-2A (105.5K) | **0.76 St2** | **0.79 St2** | **0.79 St2** | 1.42 St2 | 1.42 St2 | **0.81 St2** | **0.81 St2** | **0.85 St2** | **0.85 St2** |
| OR-CTP-2B (105.5K) | **0.78 St2** | **0.77 St2** | **0.77 St2** | 1.22 St2 | 1.22 St2 | **0.81 St2** | **0.81 St2** | **0.87 St2** | **0.87 St2** |
| OR-CTP-3 (98K) | **0.80 St2** | **0.82 St2** | **0.82 St2** | 1.24 St2 | 1.24 St2 | **0.84 St2** | **0.84 St2** | **0.89 St2** | **0.89 St2** |
| **STP VEHICLE, MULTI-LANE** | | | | | | | | | |
| OR-STP-3(120.5K) | **0.65 St2** | **0.67 St2** | **0.67 St2** | 1.15 St2 | 1.15 St2 | **0.69 St2** | **0.69 St2** | **0.73 St2** | **0.73 St2** |
| OR-STP-4A (99K) | **0.78 St2** | **0.80 St2** | **0.80 St2** | 1.21 St2 | 1.21 St2 | **0.83 St2** | **0.83 St2** | **0.87 St2** | **0.87 St2** |
| OR-STP-4B (185K) | **0.48 St2** | **0.48 St2** | **0.48 St2** | **0.96 St2** | **0.96 St2** | **0.50 St2** | **0.50 St2** | **0.53 St2** | **0.53 St2** |
| OR-STP-4C (150.5K) | **0.56 St2** | **0.57 St2** | **0.57 St2** | **0.94 St2** | **0.94 St2** | **0.59 St2** | **0.59 St2** | **0.63 St2** | **0.63 St2** |
| OR-STP-4D (162.5K) | **0.51 St2** | **0.52 St2** | **0.52 St2** | **1.00 St2** | **1.00 St2** | **0.55 St2** | **0.55 St2** | **0.57 St2** | **0.57 St2** |
| OR-STP-4E (258K) | **0.41 St2** | **0.40 St2** | **0.40 St2** | **0.99 St2** | **0.99 St2** | **0.43 St2** | **0.43 St2** | **0.46 St2** | **0.46 St2** |
| OR-STP-5BW (204K) | **0.46 St2** | **0.46 St2** | **0.46 St2** | **0.93 St2** | **0.93 St2** | **0.48 St2** | **0.48 St2** | **0.51 St2** | **0.51 St2** |
| SPECIAL | | | | | | | | | |
| **STP VEHICLE, SINGLE LANE W/ESCORT** | | | | | | | | | |
| OR-STP-3(120.5K) | | 0.81 St2 | | 1.37 St2 | 1.37 St2 | 0.83 St2 | | 0.87 St2 | |
| OR-STP-4A (99K) | | 1.08 St2 | | 1.63 St2 | 1.63 St2 | 1.12 St2 | | 1.18 St2 | |
| OR-STP-4B (185K) | | 0.50 St2 | | 1.00 St2 | 1.00 St2 | 0.53 St2 | | 0.56 St2 | |
| OR-STP-4C (150.5K) | | 0.61 St2 | | 1.00 St2 | 1.00 St2 | 0.64 St2 | | 0.68 St2 | |
| OR-STP-4D (162.5K) | | 0.56 St2 | | 1.06 St2 | 1.06 St2 | 0.59 St2 | | 0.61 St2 | |
| OR-STP-4E (258K) | | 0.43 St2 | | 1.04 St2 | 1.04 St2 | 0.46 St2 | | 0.49 St2 | |
| OR-STP-5BW (204K) | | 0.48 St2 | | 0.97 St2 | 0.97 St2 | 0.51 St2 | | 0.54 St2 | |
| SPECIAL | | | | | | | | | |

| | Lift Truss Span 11 | | | Truss Span 19 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **SECTION EVALUATED** | **292** | **307** | **674** | **320** | **328** | **329** | **330** | **331** | **332** |
| LRFD Brass .OUT File Name: | 645_Span 11_Truss_LF | 645_Span 11_Truss_LF | XB_Span11.xlsm | 645_Span 19_Truss_LF | 645_Span 19_Truss_LF | 645_Span 19_Truss_LF | 645_Span 19_Truss_LF | 645_Span 19_Truss_LF | 645_Span 19_Truss_LF |
| FORCE TYPE (+/-M, V, T, C or B): | C | C | +M | T | C | C | C | C | C |
| PHI (Resistance Factor): | 0.855 | 0.855 | 0.900 | 0.855 | 0.855 | 0.855 | 0.855 | 0.855 | 0.855 |
| MEMBER (eg. Int. girder): | Builtup Box Section | Builtup Box Section | Span 11 FB INT | Builtup Box Section | Builtup Box Section | Builtup Box Section | Builtup Box Section | Builtup Box Section | Builtup Box Section |
| SPAN (eg. 1 of 4): | 11 of 19 | 11 of 19 | 11 of 19 | 19 of 19 | 19 of 19 | 19 of 19 | 19 of 19 | 19 of 19 | 19 of 19 |
| LOCATION (eg. 0.1L): | L4-M5 | M9-L10 | 0.5L | L5-L6 | U3-U4 | U4-U5 | U5-U6 | U6-U7 | U7-U8 |
| SINGLE LANE DF | 0.858 | 0.858 | 1.000 | 1.206 | 1.206 | 1.206 | 1.206 | 1.206 | 1.206 |
| MULTI-LANE DF | 1.000 | 1.000 | 1.000 | 1.210 | 1.210 | 1.210 | 1.210 | 1.210 | 1.210 |
| **DESIGN & LEGAL VEHICLES** | | | | | | | | | |
| HL93 (INVENTORY) | 0.60 St1 | 0.60 St1 | 0.58 St1 | 0.43 St1 | 0.44 St1 | 0.39 St1 | 0.40 St1 | 0.39 St1 | 0.44 St1 |
| TYPE 3 (50K) | 1.38 St1 | 1.38 St1 | 1.41 St1 | 1.51 St1 | 1.52 St1 | 1.35 St1 | 1.44 St1 | 1.34 St1 | 1.51 St1 |
| TYPE 3S2 (80K) | 1.31 St1 | 1.31 St1 | 1.33 St1 | 1.12 St1 | 1.10 St1 | **0.98 St1** | 1.02 St1 | **0.98 St1** | 1.09 St1 |
| TYPE 3-3 (80K) | 1.72 St1 | 1.72 St1 | 1.75 St1 | 1.09 St1 | 1.11 St1 | **0.98 St1** | 1.01 St1 | **0.97 St1** | 1.10 St1 |
| TYPE 3-3 & LEGAL LANE | 1.99 St1 | 1.99 St1 | 2.21 St1 | 1.09 St1 | 1.10 St1 | **0.97 St1** | **1.00 St1** | **0.97 St1** | 1.09 St1 |
| TYPE 3-3 TRAIN & LEGAL LANE | | | | | | | | | |
| SU4 TRUCK (54K) | 1.17 St1 | 1.17 St1 | 1.19 St1 | 1.40 St1 | 1.40 St1 | 1.24 St1 | 1.33 St1 | 1.23 St1 | 1.39 St1 |
| SU5 TRUCK (62K) | 1.12 St1 | 1.12 St1 | 1.14 St1 | 1.24 St1 | 1.24 St1 | 1.09 St1 | 1.17 St1 | 1.09 St1 | 1.23 St1 |
| SU6 TRUCK (69.5K) | 1.01 St1 | 1.01 St1 | 1.03 St1 | 1.11 St1 | 1.11 St1 | **0.98 St1** | 1.05 St1 | **0.98 St1** | 1.10 St1 |
| SU7 TRUCK (77.5K) | **0.95 St1** | **0.95 St1** | **0.97 St1** | 1.01 St1 | 1.01 St1 | **0.89 St1** | **0.95 St1** | **0.89 St1** | **1.00 St1** |
| EV2 TRUCK (57.5K) | 1.46 St1 | 1.46 St1 | 1.55 St1 | 1.40 St1 | 1.40 St1 | 1.24 St1 | 1.33 St1 | 1.24 St1 | 1.39 St1 |
| EV3 TRUCK (86K) | **0.93 St1** | **0.93 St1** | **0.99 St1** | **0.94 St1** | **0.94 St1** | **0.83 St1** | **0.89 St1** | **0.83 St1** | **0.93 St1** |
| **CTP VEHICLE, MULTI-LANE** | | | | | | | | | |
| OR-CTP-2A (105.5K) | 1.30 St2 | 1.30 St2 | 1.61 St2 | **0.88 St2** | **0.87 St2** | **0.77 St2** | **0.80 St2** | **0.77 St2** | **0.86 St2** |
| OR-CTP-2B (105.5K) | 1.18 St2 | 1.18 St2 | 1.46 St2 | **0.91 St2** | **0.89 St2** | **0.80 St2** | **0.82 St2** | **0.80 St2** | **0.88 St2** |
| OR-CTP-3 (98K) | 1.13 St2 | 1.13 St2 | 1.41 St2 | **0.90 St2** | **0.91 St2** | **0.81 St2** | **0.84 St2** | **0.81 St2** | **0.90 St2** |
| **STP VEHICLE, MULTI-LANE** | | | | | | | | | |
| OR-STP-3(120.5K) | 1.09 St2 | 1.09 St2 | 1.35 St2 | **0.75 St2** | **0.74 St2** | **0.66 St2** | **0.68 St2** | **0.66 St2** | **0.74 St2** |
| OR-STP-4A (99K) | 1.12 St2 | 1.12 St2 | 1.39 St2 | **0.88 St2** | **0.89 St2** | **0.79 St2** | **0.82 St2** | **0.79 St2** | **0.88 St2** |
| OR-STP-4B (185K) | 1.05 St2 | 1.05 St2 | 1.30 St2 | **0.56 St2** | **0.55 St2** | **0.49 St2** | **0.50 St2** | **0.49 St2** | **0.54 St2** |
| OR-STP-4C (150.5K) | **0.90 St2** | **0.90 St2** | 1.12 St2 | **0.65 St2** | **0.64 St2** | **0.57 St2** | **0.59 St2** | **0.57 St2** | **0.64 St2** |
| OR-STP-4D (162.5K) | **0.93 St2** | **0.93 St2** | 1.15 St2 | **0.58 St2** | **0.58 St2** | **0.51 St2** | **0.53 St2** | **0.51 St2** | **0.58 St2** |
| OR-STP-4E (258K) | **0.97 St2** | **0.97 St2** | 1.20 St2 | **0.49 St2** | **0.47 St2** | **0.43 St2** | **0.44 St2** | **0.42 St2** | **0.47 St2** |
| OR-STP-5BW (204K) | 1.02 St2 | 1.02 St2 | 1.26 St2 | **0.53 St2** | **0.52 St2** | **0.46 St2** | **0.48 St2** | **0.46 St2** | **0.52 St2** |
| SPECIAL | | | | | | | | | |
| **STP VEHICLE, SINGLE LANE W/ESCORT** | | | | | | | | | |
| OR-STP-3(120.5K) | 1.51 St2 | 1.51 St2 | 1.61 St2 | 0.89 St2 | 0.89 St2 | 0.79 St2 | 0.82 St2 | 0.79 St2 | 0.88 St2 |
| OR-STP-4A (99K) | 1.76 St2 | 1.76 St2 | 1.87 St2 | 1.19 St2 | 1.20 St2 | 1.06 St2 | 1.11 St2 | 1.06 St2 | 1.19 St2 |
| OR-STP-4B (185K) | 1.28 St2 | 1.28 St2 | 1.35 St2 | 0.58 St2 | 0.57 St2 | 0.51 St2 | 0.53 St2 | 0.51 St2 | 0.57 St2 |
| OR-STP-4C (150.5K) | 1.12 St2 | 1.12 St2 | 1.19 St2 | 0.69 St2 | 0.69 St2 | 0.61 St2 | 0.63 St2 | 0.61 St2 | 0.68 St2 |
| OR-STP-4D (162.5K) | 1.15 St2 | 1.15 St2 | 1.22 St2 | 0.62 St2 | 0.62 St2 | 0.55 St2 | 0.57 St2 | 0.54 St2 | 0.62 St2 |
| OR-STP-4E (258K) | 1.18 St2 | 1.18 St2 | 1.26 St2 | 0.51 St2 | 0.49 St2 | 0.45 St2 | 0.46 St2 | 0.45 St2 | 0.49 St2 |
| OR-STP-5BW (204K) | 1.24 St2 | 1.24 St2 | 1.32 St2 | 0.55 St2 | 0.55 St2 | 0.49 St2 | 0.50 St2 | 0.49 St2 | 0.54 St2 |
| SPECIAL | | | | | | | | | |

Att 1 - Summary of Deficiencies w/ Load Testing Results

| | | | WA Span 22 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **SECTION EVALUATED** | 524 | 526 | **613** | 617 | **Load Test Results** | **623** | **625** | **Load Test Results** | **637** |
| LRFD Brass .OUT File Name: | 06645_MBE_Gusset | 06645_MBE_Gusset | EXTGIR_SPAN22.OUT | EXTGIR_SPAN22.OUT | Orig-Ext-Gdr_Span23 | EXTGIR_SPAN22.OUT | EXTGIR_SPAN22.OUT | Orig-Ext-Gdr_Span23 | INTGIR_SPAN22.OUT |
| FORCE TYPE (+/-M, V, T, C or B): | Tension | Tension | V | +M | +M | V | V | V | V |
| PHI (Resistance Factor): | 0.850 | 0.850 | 0.900 | 0.900 | 0.900 | 0.900 | 0.900 | 0.900 | 0.900 |
| MEMBER (eg. Int. girder): | Gusset Plate L7 | Gusset Plate L7 | EXT RCDG | EXT RCDG | Orig-Ext RCDG | EXT RCDG | EXT RCDG | Orig-Ext RCDG | INT RCDG |
| SPAN (eg. 1 of 4): | 19 of 19 | 19 of 19 | WA Span 22 | WA Span 22 | WA Span 23 | WA Span 22 | WA Span 22 | WA Span 23 | WA Span 22 |
| LOCATION (eg. 0.1L): | L7L8 | L7L6 | 0.1L | 0.5L | 0.25L | 0.923L | 0.944L | | 0.923L |
| SINGLE LANE DF | 1.206 | 1.206 | 0.477 | 0.477 | | 0.477 | 0.477 | | 0.566 |
| MULTI-LANE DF | 1.210 | 1.210 | 0.352 | 0.416 | | 0.352 | 0.352 | | 0.607 |
| **DESIGN & LEGAL VEHICLES** | | | | | | | | | |
| HL93 (INVENTORY) | 0.39 St1 | 0.32 St1 | 0.66 St1 | 0.57 St1 | --- | 0.65 St1 | 0.62 St1 | --- | 0.55 St1 |
| TYPE 3 (50K) | 1.32 St1 | 1.11 St1 | 1.99 St1 | 1.36 St1 | 1.62 St1 | 1.95 St1 | 1.87 St1 | 1.85 St1 | 1.69 St1 |
| TYPE 3S2 (80K) | **0.98 St1** | **0.80 St1** | 2.05 St1 | 1.28 St1 | 1.98 St1 | 1.99 St1 | 1.91 St1 | 2.23 St1 | 1.73 St1 |
| TYPE 3-3 (80K) | **0.98 St1** | **0.81 St1** | 2.54 St1 | 1.68 St1 | 1.57 St1 | 2.46 St1 | 2.34 St1 | 1.84 St1 | 2.14 St1 |
| TYPE 3-3 & LEGAL LANE | **0.96 St1** | **0.89 St1** | | | | | | | |
| TYPE 3-3 TRAIN & LEGAL LANE | | | | | | | | | |
| SU4 TRUCK (54K) | 1.22 St1 | 1.02 St1 | 1.73 St1 | 1.15 St1 | 1.43 St1 | 1.69 St1 | 1.62 St1 | 1.62 St1 | 1.46 St1 |
| SU5 TRUCK (62K) | 1.08 St1 | **0.90 St1** | 1.57 St1 | 1.10 St1 | 1.37 St1 | 1.52 St1 | 1.46 St1 | 1.52 St1 | 1.31 St1 |
| SU6 TRUCK (69.5K) | **0.97 St1** | **0.81 St1** | 1.56 St1 | **0.99 St1** | 1.18 St1 | 1.51 St1 | 1.44 St1 | 1.30 St1 | 1.30 St1 |
| SU7 TRUCK (77.5K) | **0.89 St1** | **0.73 St1** | 1.56 St1 | **0.93 St1** | 1.16 St1 | 1.51 St1 | 1.43 St1 | 1.29 St1 | 1.30 St1 |
| EV2 TRUCK (57.5K) | 1.21 St1 | 1.02 St1 | 1.63 St1 | 1.20 St1 | 1.39 St1 | 1.59 St1 | 1.52 St1 | 1.59 St1 | 1.53 St1 |
| EV3 TRUCK (86K) | **0.81 St1** | **0.68 St1** | **0.97 St1** | **0.77 St1** | **0.92 St1** | **0.96 St1** | **0.92 St1** | 1.09 St1 | **0.94 St1** |
| **CTP VEHICLE, MULTI-LANE** | | | | | | | | | |
| OR-CTP-2A (105.5K) | **0.79 St2** | **0.63 St2** | 2.13 St2 | 1.36 St2 | | 2.05 St2 | 1.95 St2 | | 1.77 St2 |
| OR-CTP-2B (105.5K) | **0.79 St2** | **0.65 St2** | 2.03 St2 | 1.23 St2 | | 1.97 St2 | 1.89 St2 | | 1.71 St2 |
| OR-CTP-3 (98K) | **0.80 St2** | **0.66 St2** | 1.62 St2 | 1.06 St2 | | 1.58 St2 | 1.51 St2 | | 1.36 St2 |
| **STP VEHICLE, MULTI-LANE** | | | | | | | | | |
| OR-STP-3(120.5K) | **0.67 St2** | **0.54 St2** | 1.88 St2 | 1.29 St2 | | 1.83 St2 | 1.75 St2 | | 1.58 St2 |
| OR-STP-4A (99K) | **0.79 St2** | **0.65 St2** | 1.60 St2 | 1.09 St2 | | 1.54 St2 | 1.46 St2 | | 1.33 St2 |
| OR-STP-4B (185K) | **0.49 St2** | **0.40 St2** | 1.77 St2 | 1.36 St2 | | 1.71 St2 | 1.63 St2 | | 1.47 St2 |
| OR-STP-4C (150.5K) | **0.58 St2** | **0.47 St2** | 1.66 St2 | 1.10 St2 | | 1.61 St2 | 1.54 St2 | | 1.39 St2 |
| OR-STP-4D (162.5K) | **0.53 St2** | **0.42 St2** | 1.56 St2 | 1.13 St2 | | 1.50 St2 | 1.42 St2 | | 1.29 St2 |
| OR-STP-4E (258K) | **0.42 St2** | **0.34 St2** | 1.68 St2 | 1.18 St2 | | 1.61 St2 | 1.51 St2 | | 1.39 St2 |
| OR-STP-5BW (204K) | **0.47 St2** | **0.38 St2** | 1.55 St2 | 1.23 St2 | | 1.50 St2 | 1.43 St2 | | 1.29 St2 |
| SPECIAL | | | | | | | | | |
| **STP VEHICLE, SINGLE LANE W/ESCORT** | | | | | | | | | |
| OR-STP-3(120.5K) | 0.80 St2 | 0.65 St2 | 2.24 St2 | 1.54 St2 | | 2.18 St2 | 2.08 St2 | | 2.02 St2 |
| OR-STP-4A (99K) | 1.06 St2 | 0.88 St2 | 2.15 St2 | 1.47 St2 | | 2.07 St2 | 1.97 St2 | | 1.92 St2 |
| OR-STP-4B (185K) | 0.52 St2 | 0.42 St2 | 1.85 St2 | 1.42 St2 | | 1.78 St2 | 1.70 St2 | | 1.65 St2 |
| OR-STP-4C (150.5K) | 0.62 St2 | 0.50 St2 | 1.77 St2 | 1.17 St2 | | 1.71 St2 | 1.64 St2 | | 1.59 St2 |
| OR-STP-4D (162.5K) | 0.57 St2 | 0.45 St2 | 1.66 St2 | 1.20 St2 | | 1.60 St2 | 1.51 St2 | | 1.47 St2 |
| OR-STP-4E (258K) | 0.44 St2 | 0.36 St2 | 1.75 St2 | 1.23 St2 | | 1.68 St2 | 1.58 St2 | | 1.56 St2 |
| OR-STP-5BW (204K) | 0.50 St2 | 0.40 St2 | 1.62 St2 | 1.28 St2 | | 1.57 St2 | 1.49 St2 | | 1.44 St2 |
| SPECIAL | | | | | | | | | |

| | | | WA Span 26 | | | | |
|---|---|---|---|---|---|---|---|
| **SECTION EVALUATED** | **639** | **Load Test Results** | **643** | **650** | **658** | **660** | 662 |
| LRFD Brass .OUT File Name: | INTGIR_SPAN22.OUT | Orig-Int-Gdr_Span23 | EXTGIR_SPAN26.OUT | INTGIR_SPAN26.OUT | INTGIR_SPAN26.OUT | INTGIR_SPAN26.OUT | INTGIR_SPAN26.OUT |
| FORCE TYPE (+/-M, V, T, C or B): | V | V | +M | V | V | V | V |
| PHI (Resistance Factor): | 0.900 | | 0.900 | 0.900 | 0.900 | 0.900 | 0.900 |
| MEMBER (eg. Int. girder): | INT RCDG | Orig-Ext RCDG | EXT RCDG | INT RCDG | INT RCDG | INT RCDG | INT RCDG |
| SPAN (eg. 1 of 4): | WA Span 22 | WA Span 23 | WA Span 26 | WA Span 26 | WA Span 26 | WA Span 26 | WA Span 26 |
| LOCATION (eg. 0.1L): | 0.944L | | 0.5L | 0.1L | 0.9L | 0.938L | 0.955L |
| SINGLE LANE DF | 0.566 | | 0.474 | 0.596 | 0.596 | 0.596 | 0.596 |
| MULTI-LANE DF | 0.607 | | 0.400 | 0.644 | 0.644 | 0.644 | 0.644 |
| **DESIGN & LEGAL VEHICLES** | | | | | | | |
| HL93 (INVENTORY) | 0.42 St1 | --- | 0.67 St1 | 0.51 St1 | 0.51 St1 | 0.51 St1 | 0.40 St1 |
| TYPE 3 (50K) | 1.40 St1 | 1.18 St1 | 1.60 St1 | 1.60 St1 | 1.61 St1 | 1.57 St1 | 1.32 St1 |
| TYPE 3S2 (80K) | 1.43 St1 | 1.43 St1 | 1.58 St1 | 1.70 St1 | 1.71 St1 | 1.67 St1 | 1.41 St1 |
| TYPE 3-3 (80K) | 1.77 St1 | 1.18 St1 | 1.95 St1 | 1.81 St1 | 1.81 St1 | 1.73 St1 | 1.44 St1 |
| TYPE 3-3 & LEGAL LANE | | | | | | | |
| TYPE 3-3 TRAIN & LEGAL LANE | | | | | | | |
| SU4 TRUCK (54K) | 1.20 St1 | 1.04 St1 | 1.38 St1 | 1.41 St1 | 1.41 St1 | 1.39 St1 | 1.16 St1 |
| SU5 TRUCK (62K) | 1.07 St1 | **0.98 St1** | 1.29 St1 | 1.27 St1 | 1.27 St1 | 1.25 St1 | 1.04 St1 |
| SU6 TRUCK (69.5K) | 1.06 St1 | 1.05 St1 | 1.16 St1 | 1.21 St1 | 1.21 St1 | 1.18 St1 | **0.98 St1** |
| SU7 TRUCK (77.5K) | 1.05 St1 | 1.04 St1 | 1.08 St1 | 1.16 St1 | 1.16 St1 | 1.14 St1 | **0.93 St1** |
| EV2 TRUCK (57.5K) | 1.23 St1 | 1.01 St1 | 1.42 St1 | 1.51 St1 | 1.51 St1 | 1.47 St1 | 1.21 St1 |
| EV3 TRUCK (86K) | **0.73 St1** | **0.69 St1** | **0.92 St1** | **0.92 St1** | **0.92 St1** | **0.89 St1** | **0.72 St1** |
| **CTP VEHICLE, MULTI-LANE** | | | | | | | |
| OR-CTP-2A (105.5K) | 1.46 St2 | | 1.68 St2 | 1.61 St2 | 1.61 St2 | 1.56 St2 | 1.31 St2 |
| OR-CTP-2B (105.5K) | 1.41 St2 | | 1.51 St2 | 1.66 St2 | 1.66 St2 | 1.62 St2 | 1.37 St2 |
| OR-CTP-3 (98K) | 1.11 St2 | | 1.31 St2 | 1.19 St2 | 1.19 St2 | 1.14 St2 | **0.93 St2** |
| **STP VEHICLE, MULTI-LANE** | | | | | | | |
| OR-STP-3(120.5K) | 1.30 St2 | | 1.52 St2 | 1.52 St2 | 1.52 St2 | 1.49 St2 | 1.24 St2 |
| OR-STP-4A (99K) | 1.07 St2 | | 1.32 St2 | 1.14 St2 | 1.14 St2 | 1.10 St2 | **0.90 St2** |
| OR-STP-4B (185K) | 1.20 St2 | | 1.45 St2 | 1.34 St2 | 1.34 St2 | 1.30 St2 | 1.07 St2 |
| OR-STP-4C (150.5K) | 1.13 St2 | | 1.31 St2 | 1.33 St2 | 1.33 St2 | 1.30 St2 | 1.08 St2 |
| OR-STP-4D (162.5K) | 1.04 St2 | | 1.29 St2 | 1.13 St2 | 1.13 St2 | 1.11 St2 | **0.90 St2** |
| OR-STP-4E (258K) | 1.11 St2 | | 1.30 St2 | 1.16 St2 | 1.16 St2 | 1.12 St2 | **0.91 St2** |
| OR-STP-5BW (204K) | 1.05 St2 | | 1.33 St2 | 1.20 St2 | 1.20 St2 | 1.16 St2 | **0.95 St2** |
| SPECIAL | | | | | | | |
| **STP VEHICLE, SINGLE LANE W/ESCORT** | | | | | | | |
| OR-STP-3(120.5K) | 1.66 St2 | | 1.81 St2 | 1.95 St2 | 1.95 St2 | 1.92 St2 | 1.59 St2 |
| OR-STP-4A (99K) | 1.55 St2 | | 1.78 St2 | 1.66 St2 | 1.66 St2 | 1.60 St2 | 1.31 St2 |
| OR-STP-4B (185K) | 1.34 St2 | | 1.51 St2 | 1.51 St2 | 1.51 St2 | 1.47 St2 | 1.21 St2 |
| OR-STP-4C (150.5K) | 1.29 St2 | | 1.39 St2 | 1.53 St2 | 1.53 St2 | 1.50 St2 | 1.24 St2 |
| OR-STP-4D (162.5K) | 1.19 St2 | | 1.37 St2 | 1.30 St2 | 1.30 St2 | 1.28 St2 | 1.04 St2 |
| OR-STP-4E (258K) | 1.24 St2 | | 1.36 St2 | 1.31 St2 | 1.31 St2 | 1.26 St2 | 1.03 St2 |
| OR-STP-5BW (204K) | 1.18 St2 | | 1.39 St2 | 1.35 St2 | 1.35 St2 | 1.31 St2 | 1.07 St2 |
| SPECIAL | | | | | | | |

# Attachment 3 – Live Load Testing & Field Verified Load Rating Report

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# HDR
# LIVE LOAD TESTING & FIELD VERIFIED LOAD RATING REPORT

## I-84 OVER HOOD RIVER – ODOT BRG-06645
## PORT OF HOOD RIVER BRIDGE

SUBMITTED TO:
HDR ENGINEERING, INC.
1050 SW 6TH AVE, SUITE 1800
PORTLAND, OR 97204

SUBMITTED BY:
BDI - PA
740 S PIERCE AVE
#15, LOUISVILLE, CO 80027

BDI Project No.: 210311-OR
Report Version: V3
Original Submitted: December 17th, 2021
Version Submitted: January 24th, 2022

RAW DATA. REFINED RESULTS.

# TABLE OF CONTENTS

## EXECUTIVE SUMMARY

BDI was contracted by HDR to perform diagnostic load tests and subsequent field-verified load ratings on the Port of Hood River Bridge that crosses the Columbia River near Hood River, Oregon. Testing and evaluation of this structure was part of the Task Order 11 Load Posting Restoration Project. As part of this task order, BDI instrumented and tested selected portions of the structure to aid in evaluating the structure in its current condition based on HDR's current posting evaluation. The overall goal of these tests was to better understand the structure's behavior and in turn provide field-verified load ratings for member types of interest. To obtain this goal, the collected responses from selected spans/members were used to generate field-verified finite-element models (FEMs) of the tested portions of the structure. These field verified FEMs were then used to compute refined load ratings according to the AASHTO LRFR and ODOT specifications. BDI's refined load ratings will inform HDR's final posting evaluation of the structure.

Instrumentation and load tests were performed October 8th – 22nd, 2021. Based on HDR's rating results, the following spans/members were tested: Oregon approach Span SE for interior beam evaluation; Truss Span 2 floor system for floorbeam/stringer evaluation; Truss Span 3 & 4 for selected truss members for truss member evaluation and HDR's gusset plate evaluation; and Washington Approach Span 23 for interior beam evaluation. During the load tests, a dump truck crossed the structure while response measurements were collected. Load test response data was first evaluated for quality and subsequently used to verify and calibrate an FEM of each tested structure type. The following summary describes findings from the data review and model calibration:

### GENERAL OBSERVATIONS

- NO SIGNS OF DISTRESS: Responses induced by the test truck indicated the bridge was behaving in a linear-elastic manner and no signs of distress were observed.
- GENERAL STRUCTURAL BEHAVIOR: Overall, the selected spans were found to generally perform as expected, with the following observed behaviors noted:
  - Oregon Approach Span SE: The steel stringers in this approach span were found to exhibit inconsistent partial composite action with the deck due to friction between these components and member interaction at the diaphragm connections. This behavior was found to vary significantly between beam lines and along the length of each beam. Therefore, the composite behavior was determined to not be reliable enough for consideration during load rating.

    Span flexural continuity across the interior pier was observed and was found to be consistent throughout the instrumented span and tests performed along different truck paths. This behavior was caused by the stiff splice detail over the interior pier between Span SE & SD. Given that this continuity behavior was consistent and due to an engineered detail, it was considered during the load rating of this span.

    Lastly, the concrete deck was found to behave in a flexible manner, with the calibrated effective deck stiffness being equal to approximately one third of the theoretical design value. This flexible deck behavior likely indicates a significant level of deterioration was present (i.e., the deck was behaving in a cracked state).
  - Washington Approach Span 23: This span's beams were found to generally behave as expected; with expected T-beam behavior, effective material stiffness, and load distribution between beam lines. Additionally, a significant amount of support fixity and span continuity with adjacent spans was observed. This behavior was caused by the monolithic connection between the pier diaphragms and beam ends and minor movement of the piers during loading. A portion of the support behavior was considered for rating given its consistency and it was caused by an engineered detail, while allowing consideration for seasonal changes.
  - Span 2 Floor System: The instrumented stringers were found to have consistent continuity behavior between bays due to the stiff splice detail over the floorbeams. This behavior was verified during model calibration and was considered for load rating. The instrumented floorbeams were observed to have relatively low response magnitudes near their midspans. Upon review of photos taken by the field crew, it was found that these lower responses were caused by stiffener plates that have been added to both sides of the floorbeam webs near both top and bottom of these members' webs. These

stiffener plates could not be found in any of the available structural plans. The effect of these stiffener plates was verified during model calibration and considered for load rating of these members.

- Span 3 & 4 Trusses: These truss spans were generally found to behave as expected. Minor support restraint and continuity between spans was observed. This support behavior is common, especially in larger structure types, and was likely caused by resistance within the truss bearings and movement of the piers under load, which transferred load between truss spans. This support behavior was found to vary between support locations, even at the fixed supports, and therefore was not considered for load rating. Another notable finding from the model calibration of these spans was that modeling of all bracing elements (top, bottom, diagonal and vertical) was required to best match distribution of load between upstream and downstream trusses. This finding shows that the bracing elements provide a notable level of load distribution, which effected the load induced in the primary members. These secondary elements are often not considered during a more typical two-dimensional evaluation approach.

## Load Rating Results

Once the field-verified FEM matched the collected responses to an acceptable level, the model was adjusted and used to compute accurate and reliable load ratings. Load and Resistance Factor Rating (LRFR) ratings were computed for ODOT legal and AASHTO emergency vehicles based on details provided in the structure's design plans. BDI's results showed that some of the tested and evaluated structural components have deficient load ratings in their current condition. A summary of BDI's load rating results for examined components has been provided below:

- OREGON APPROACH SPAN SE: The load rating of this approach structure was significantly controlled by negative flexure near the interior pier. This result was due a structural beam splice over the pier combined with a very long unbraced length (21') of the beams' bottom (compression) flange. Due to this detail, the negative moment capacity was greatly reduced such that resulting load ratings were at approximately 50% of the vehicle weights. However, these load ratings could be increased to above satisfactory for all ODOT legal and AASHTO EVs if the unbraced length of these members are reduced at both sides of the interior pier.
- WASHINGTON SPAN 23: Similar to the HDR rating results, the load rating of this span was controlled by shear along the interior beam lines. One notable difference between BDI's and HDR's rating analysis, other than the use of a field-calibrated model, was that BDI utilized a dynamic allowance factor of 25% based on ODOT's LRFR manual. This factor reduction, and use of the calibrated model, resulted in most of the rated vehicles having satisfactory ratings for this span. Additionally, due to the observed load distribution and support behavior, BDI's flexural rating results were found to be satisfactory, with the exception of EV3.
- SPAN 2 FLOOR SYSTEM: The load rating of Span 2's floor system was controlled by positive flexure in the floorbeams. Due to the additional stiffness and capacity provided by the stiffener plates found along the instrumented floorbeams, all legal and emergency vehicle rating were found to be satisfactory. BDI approximated the size of these stiffener plates based on photos taken during instrumentation and verified their effect during the model calibration process. The floorbeam stiffener plate size, configuration, and locations along the truss spans was not present in the available plans and not fully captured during BDI's field visit. Therefore, it is recommended that this information be verified through a document investigation and/or during the next bridge inspection.
- SPAN 3 & 4 TRUSSES: As expected, the primary truss members along these spans were all found to have satisfactory legal and emergency vehicle load ratings. Additionally, force envelopes created from BDI's rating model for each primary truss member in these spans and should assist in HDR's evaluation of the gusset plates for this structure's truss spans.

All results and recommendations provided in this report were based on the structure in its current condition; therefore, any significant changes in condition must be considered since they may invalidate BDI's results. This report provides details regarding the instrumentation and test procedures, review of collected responses, findings from model calibration, and results from the FEM based evaluation. Questions regarding this report and/or data should be directed to Brice Carpenter (bricec@bditest.com) at BDI. For further information on BDI's equipment, services, and analysis methods please visit www.bditest.com.

## SUBMITTAL & REFERENCE NOTES

This submittal includes the following files:

1. BDI_HDR_POH_Bridge_LLT_Rating_Report_V3.pdf
   This is the BDI report in "pdf" format. It contains details regarding the testing procedures, qualitative data review, model calibration procedures and results, FEM based load rating procedures and results, and appendices of instrumentation and testing drawings.
2. BDI_HDR_POH_Bridge_LLT_Rating_Data_V3.zip
   This is a set of model files and outputs from BDIRATE software used to compute load ratings.

The following list of referenced materials were utilized for this evaluation:

- AASHTO LRFD Bridge Design Specifications, 8th Edition, 2017
- ODOT LRFR Manual – June 2018
- AASHTO Manual for Bridge Evaluation, 3rd edition with 2019 interim revisions

## LIVE LOAD TESTING PROCEDURES

The Port of Hood River Bridge crosses the Columbia River and connects Hood River, OR with White Salmon, WA. Based on available structural details, the structure has an overall length of 4,418 ft and a roadway width of approximately 20 ft for steel spans and 28 ft for concrete spans. The superstructure is comprised of multiple span types; including steel stringers with concrete deck along the Oregon approach; steel truss main spans with orthotropic steel decking; and concrete T-beam spans along the Washington approach. Based on previously calculated load ratings, various spans were selected for load testing to determine if load ratings could be increased and eliminate posting for ODOT legal and AASHTO emergency vehicles. This section focuses on the live load tests performed in October 2021.

The selected spans and structural components were instrumented with reusable, surface-mounted strain transducers (Figure 1, Figure 2, Figure 3, and Figure 6), surface-mounted tiltmeter rotation sensors (Figure 4 and Figure 7), and cantilever displacement sensors (Figure 5 and Figure 8). The final instrumentation plans, including sensor locations and IDs, have been provided in the attached drawings in Appendix A.

Once the instrumentation was installed, a series of controlled load tests were completed with the test truck traveling across the structure at crawl speed (3 to 5 mph) in the northeast direction. During each test, data was recorded on all channels at a sample rate of 50 Hz as the test vehicle (dump truck) crossed the structure. Three different lateral positions were defined, referred to as Paths Y1 through Y3 (further described in the attached test documents).

Throughout the test procedures, the only live load applied to the structure was the test truck. Therefore, traffic was periodically stopped so that the only live loads being applied to the structure while data was being recorded were the wheel loads of the test truck.

A primary goal of the test procedures was to obtain structural response measurements for known load conditions. Therefore, the truck's longitudinal position was tracked so that the response data could later be viewed as a function of vehicle position rather than just an arbitrary point in time. Load position tracking was achieved by attaching BDI's load position sensor to the test truck (Figure 9).

General information about the load tests can be found in Table 1. The test vehicle dimensions, and gross and axle weights are provided in Table 2.

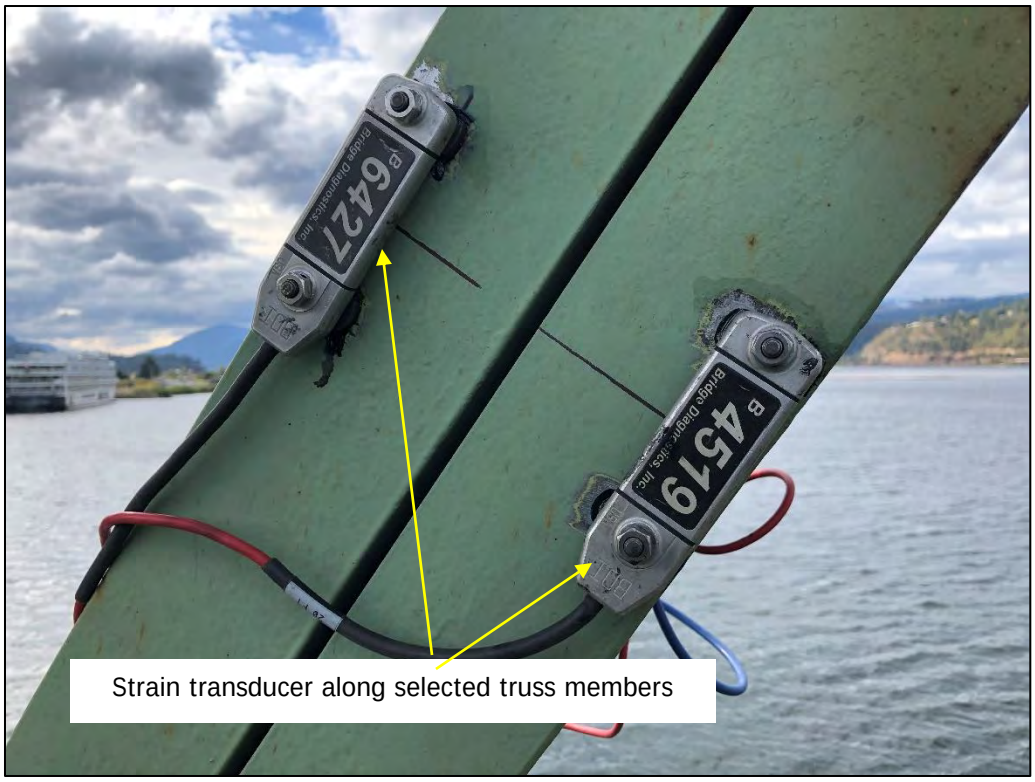


Figure 1 – Strain transducers along selected Span 3 & 4 truss members (typical)

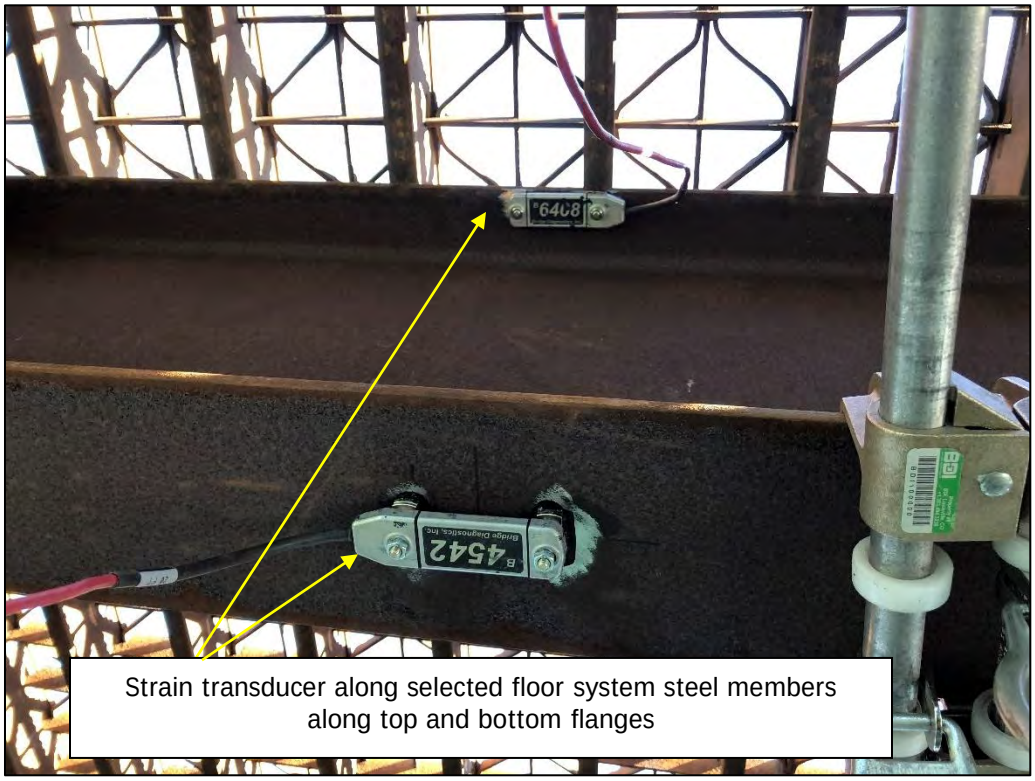


Figure 2 – Strain transducers along selected Span 2 floor system members (typical)

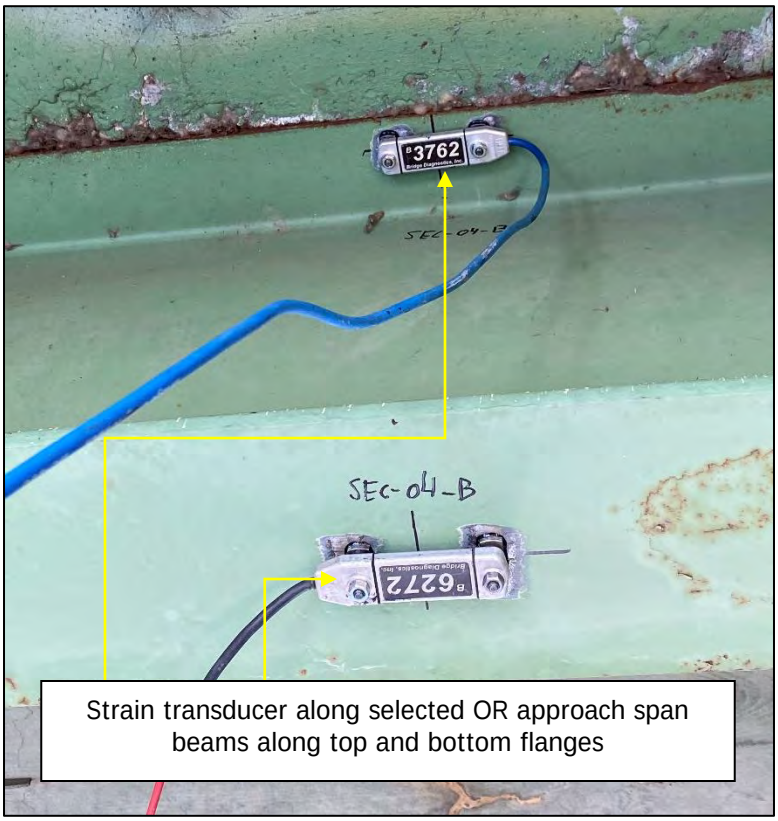


Figure 3 – Strain transducer along OR approach span stringers (typical)

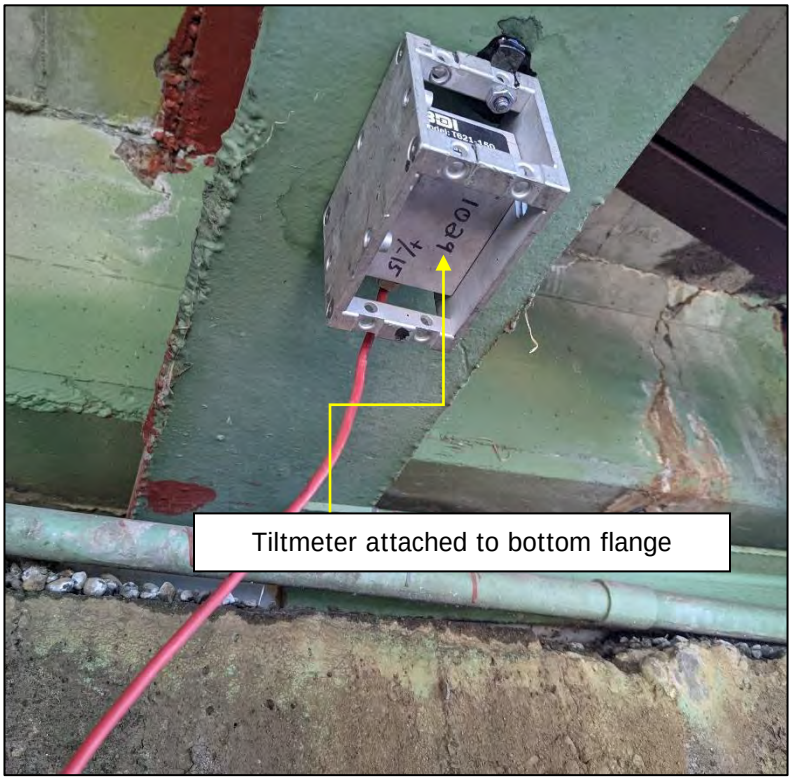


Figure 4 – Tiltmeters attached to OR approach span stringers (typical)

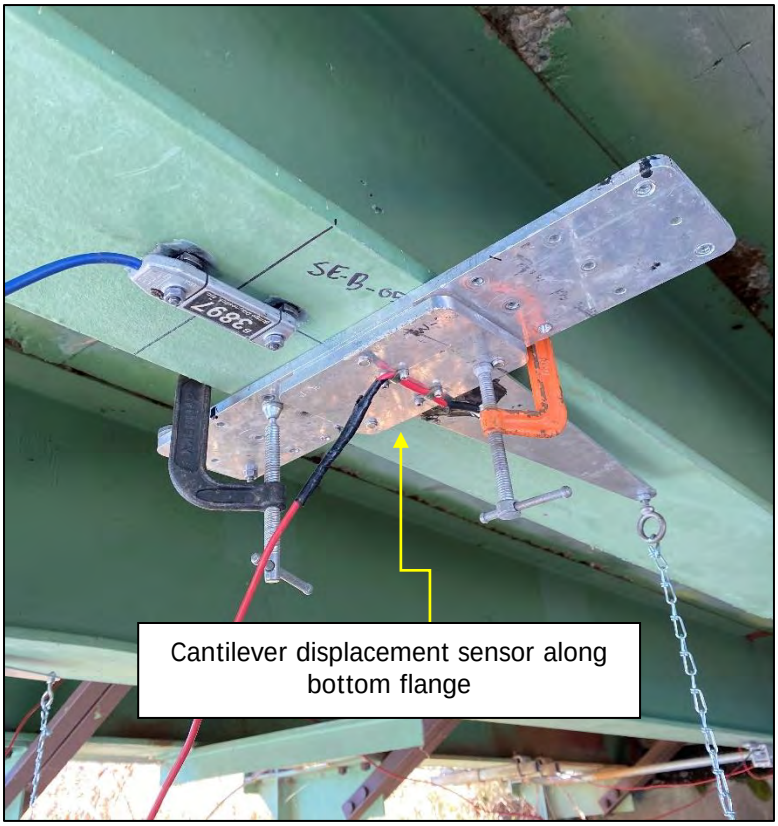


Figure 5 – Displacement sensor along OR approach span stringer midspan (typical)

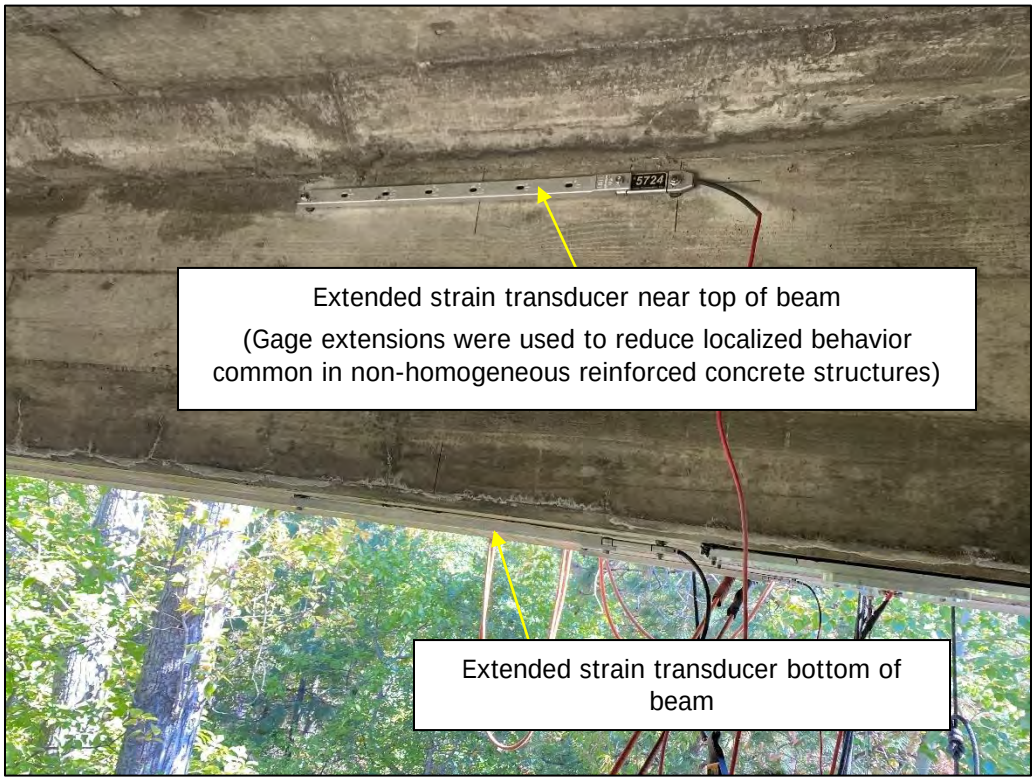


Figure 6 – Strain transducers along WA approach span concrete beams (typical)

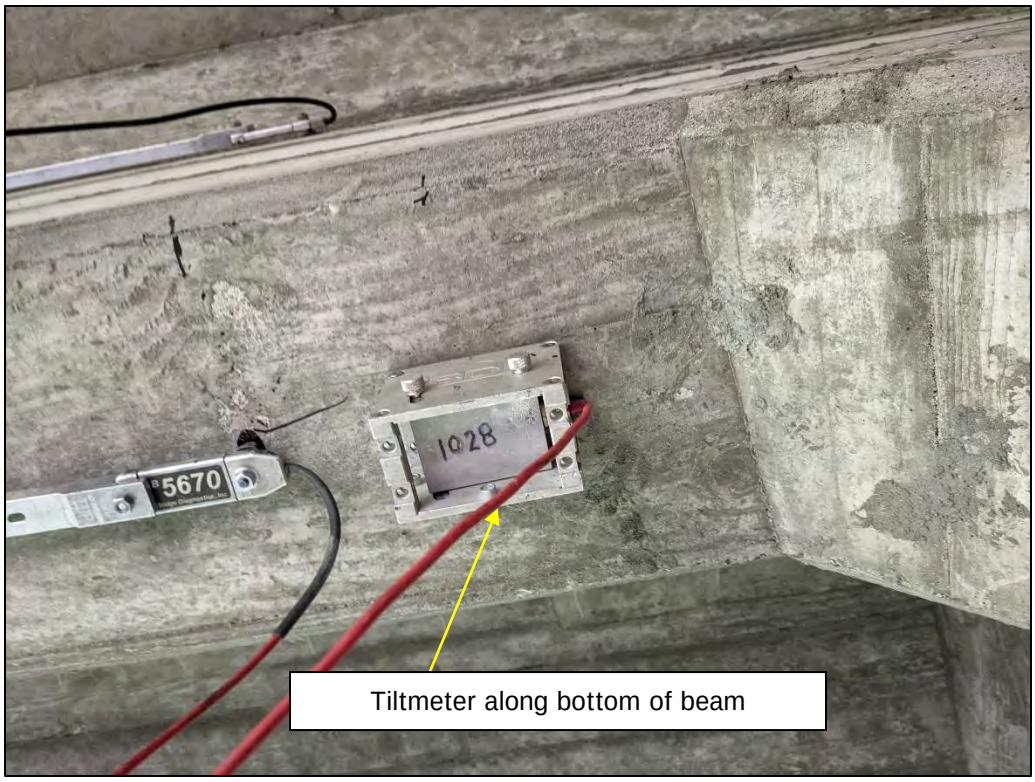


Figure 7 – Tiltmeters along WA approach span concrete beams (typical)

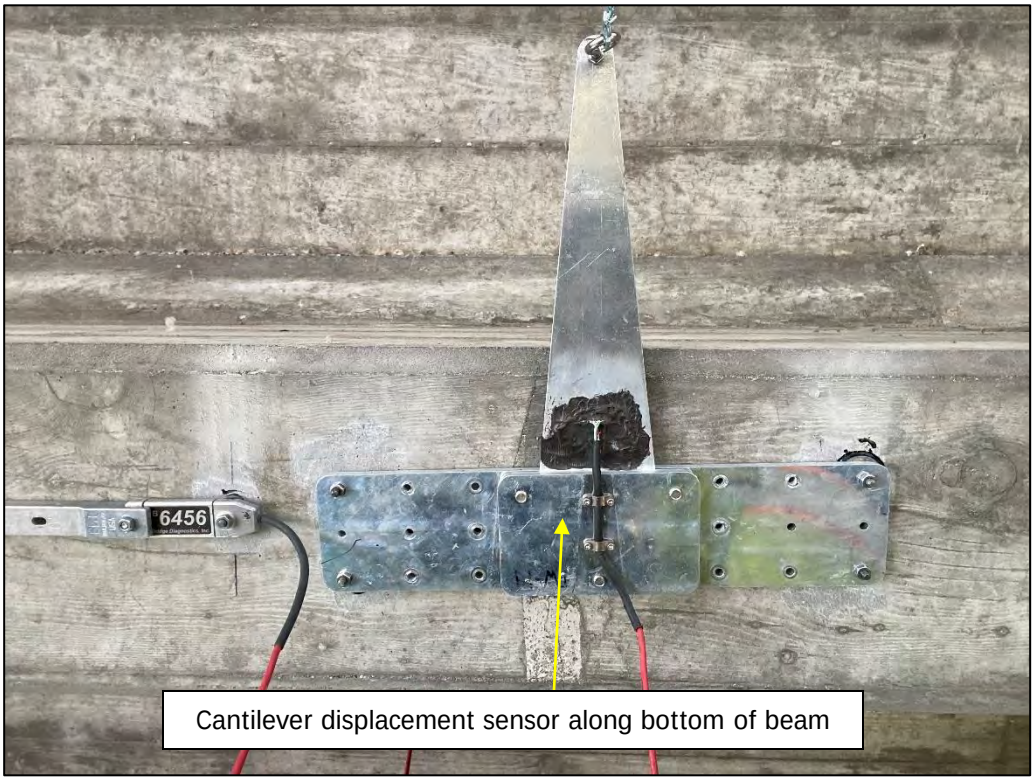


Figure 8 – Displacement sensor along WA approach concrete span beams near midspan (typical)

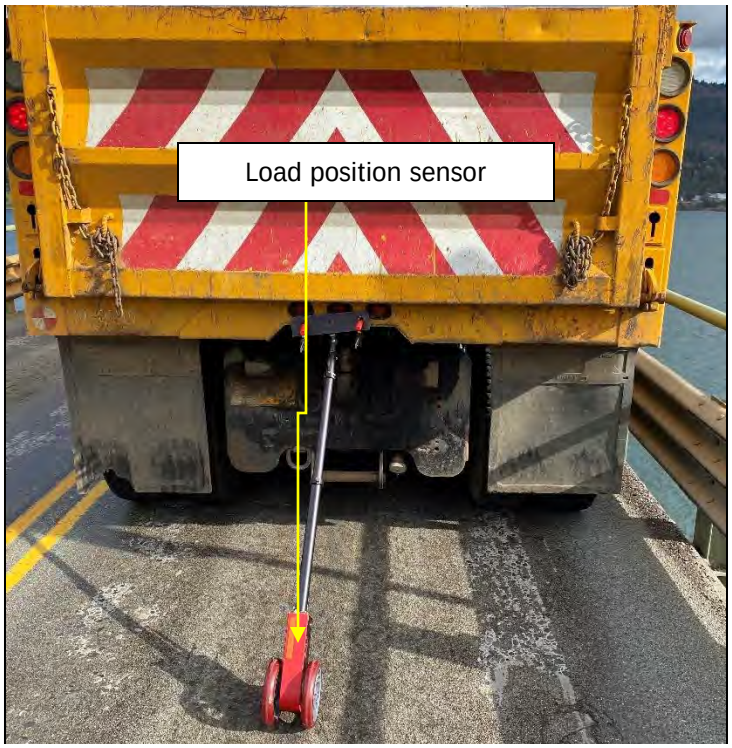


Figure 9 – Load position sensor attached to test truck (typical)

Table 1 – Structure description & testing notes

| ITEM | DESCRIPTION |
|---|---|
| STRUCTURE NAME | Port of Hood River Bridge |
| BDI JOB NUMBER | 210311-OR |
| TESTING DATES | Spans 2 ,3, & 4 - October 13, 2021; Approach spans – October 18, 2021 |
| LOCATION/ROUTE | I-84 White Salmon over Columbia River |
| STRUCTURE TYPE | Approach spans: Steel stringers with RC deck / Concrete T-beams<br>Main Spans: Steel truss with steel orthotopic deck |
| NUMBER/TYPE OF SENSORS | <u>WA Approach Spans 23</u><br>Strain Transducers – 28<br>Tiltmeters – 6<br>Displacement Sensors – 5<br><u>OR Approach Spans SE</u><br>Strain Transducers – 34<br>Tiltmeters – 6<br>Displacement Sensors – 5<br><u>Spans 2, 3, & 4</u><br>Strain Transducers – 144 |
| SAMPLE RATE | 50 Hz |
| TOTAL FIELD TIME | 11 Days |
| ACCESS TYPE | BDI Ropes Crew |

Table 2 – Testing truck details

| VEHICLE TYPE | Dump truck 10-500 | |
|---|---|---|
| GROSS VEHICLE WEIGHT (GVW) | 47,800 lbs | |
| WEIGHT/WIDTH - AXLE 1 | 15,400 lbs | 6′-11″ |
| WEIGHT/WIDTH – AXLE 2 | 32,450 lbs | 7′-2″ |
| SPACING: AXLE 1 TO AXLE 2 | 14'-8" | |
| SPACING: AXLE 2 TO AXLE 3 | 4′-6″ | |
| | | |
| VEHICLE PROVIDED BY | ODOT Maintenance in Cascade Locks | |
| WEIGHTS PROVIDED BY | ODOT Maintenance in Cascade Locks | |

## INVESTIGATION OF LIVE LOAD TEST RESULTS

Field data was examined graphically to provide a qualitative assessment of the structure's live-load response. Some indicators of data quality include reproducibility between tests along identical truck paths, elastic behavior (responses returning to zero after truck crossing), and any unusual-shaped responses that might indicate nonlinear behavior, or possible gage malfunctions. In addition, the visualization process can provide a significant insight into how a structure responds to live-load and is often extremely helpful in performing an efficient and accurate structural analysis. Note that for this data review, all strain responses were left in the as-measured units of microstrain ($10^{-6}$ in/in). For model calibration, all strain responses collected along steel members were converted to units of stress assuming a steel modulus of 29,000 ksi.

Once test data was initially processed and assessed for quality, one set of test data for each truck path was selected for having the best apparent quality. This selected data was then used to verify and calibrate the FEM of the structure, which was in turn used to produce the field verified load ratings.

### GENERAL DATA NOTES

- RESPONSES AS A FUNCTION OF LOAD POSITION: The truck's longitudinal position was tracked by a specialized load position sensor. This position tracking was completed so that the response data could later be viewed as a function of vehicle position rather than just an arbitrary point in time. This data processing allowed the collected responses to be directly compared to the model responses.
- REPRODUCIBILITY AND LINEARITY OF RESPONSES: The structural responses from tests along identical paths were very reproducible as shown in Figure 10 through Figure 12. In addition, all responses appeared to be linear with respect to magnitude and truck position and all responses returned to essentially zero, barring minor thermal drift in strain measurements (typical sensor behavior), indicating that the structure was acting in a linear-elastic manner. All response histories had a similar degree of reproducibility and linearity, indicating that the data was of good quality.
- RESPONSE FILTERING: All data was filtered using a low-pass Butterworth digital filter to reduce the apparent noise level, primarily due to ambient vibration in the structure under the test truck. The purpose of this filtering was to reduce the dynamic component of the response so that the semi-static response could be isolated. This was especially important for rotation sensors that are sensitive to vibration. Responses were typically filtered using a 1.0 Hz frequency cutoff, which removed the dynamic component without significantly altering the overall response magnitudes (i.e., without over-filtering).

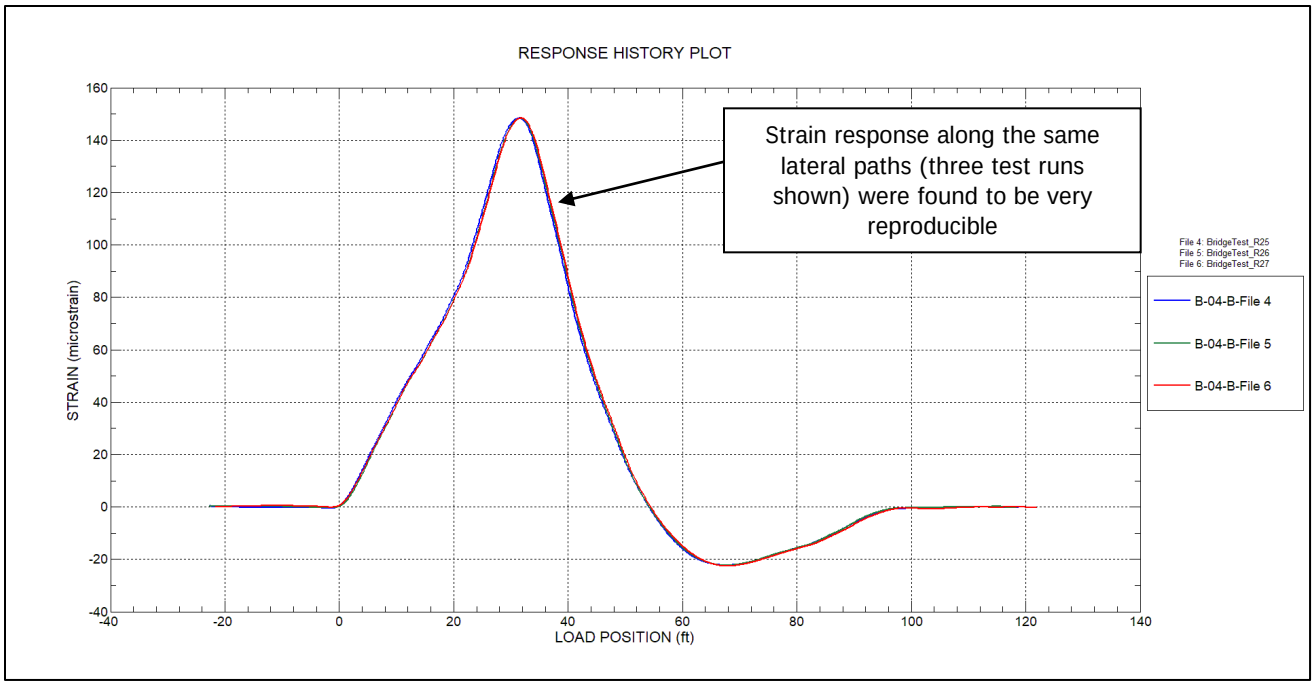


Figure 10 – Example filtered strain reproducibility – OR Approach Span SE – Section B near midspan – Center girder 4 – Along bottom of girder – Truck path Y2

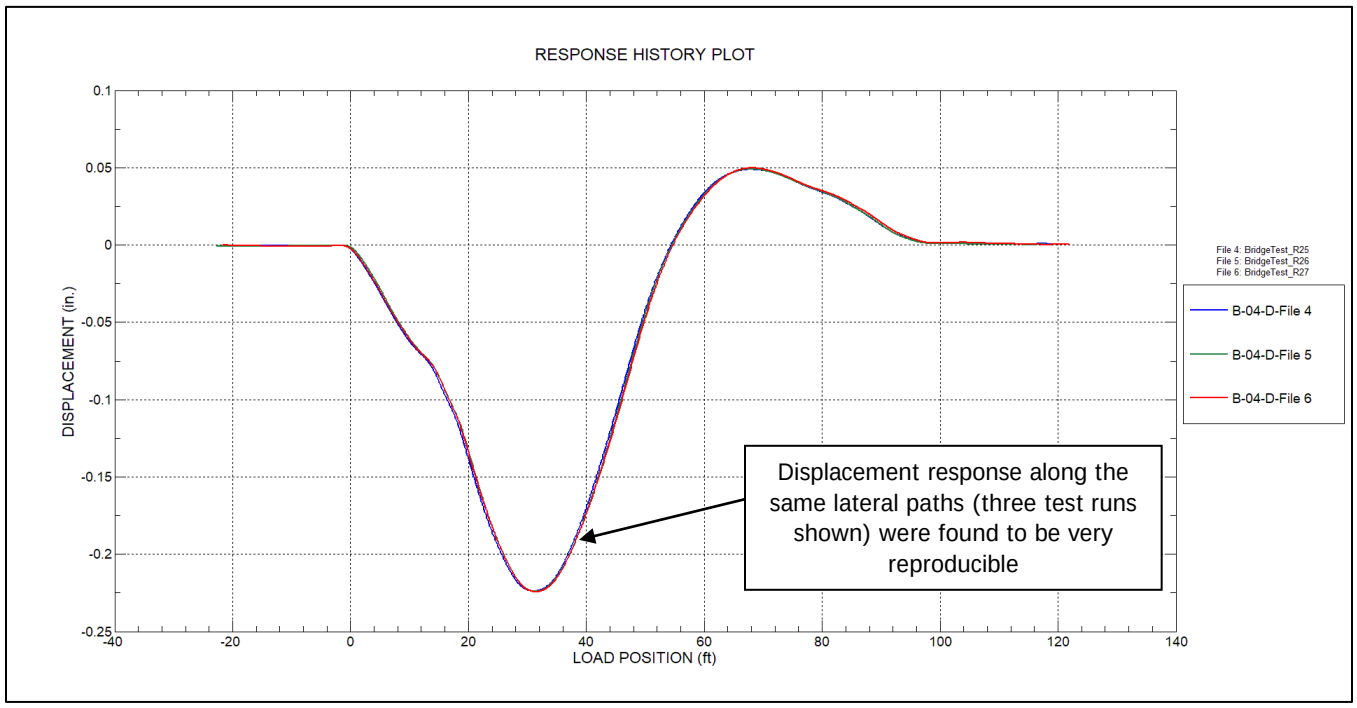


Figure 11 – Example filtered displacement reproducibility – OR Approach Span SE – Section B near midspan – Center girder 4 – Along bottom of girder – Truck path Y2

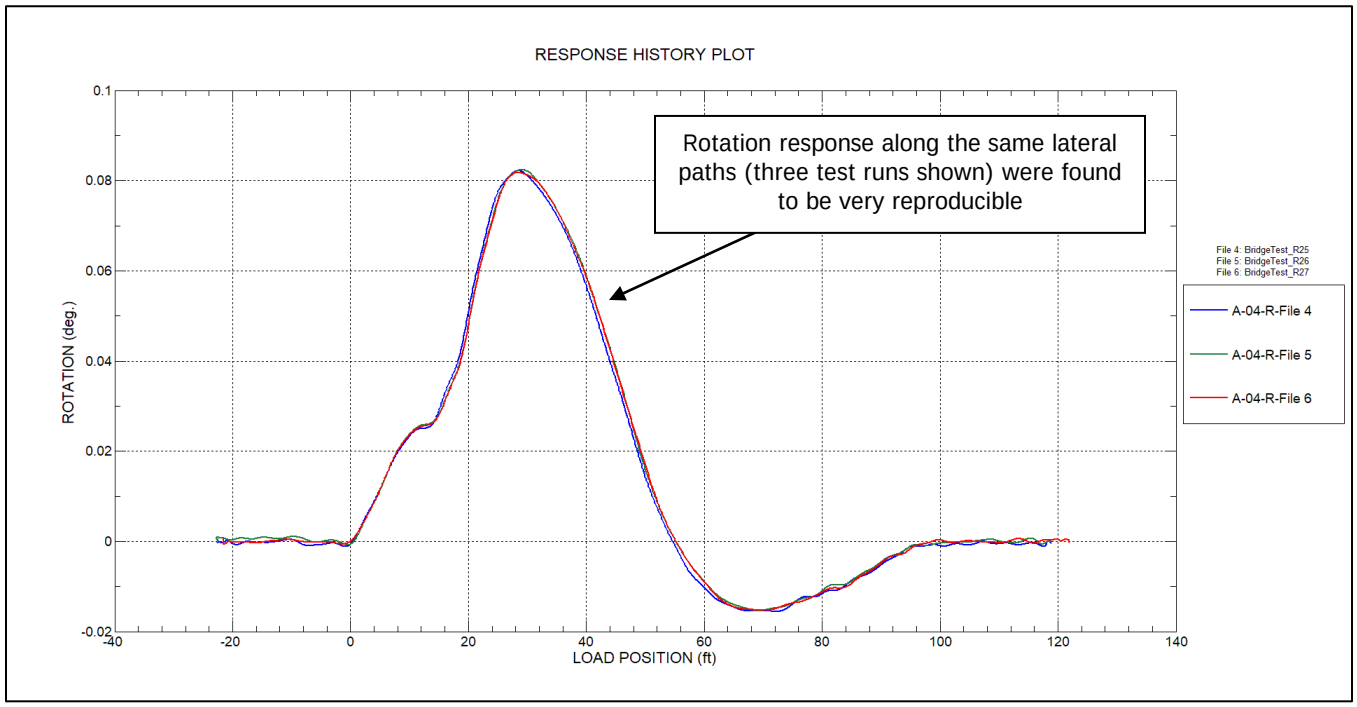


Figure 12 – Example filtered rotation reproducibility – OR Approach Span SE – Section A near abutment – Center girder 4 – Along bottom of girder – Truck path Y2

## OREGON APPROACH SPAN SE BEHAVIOR

The following is a summary of the behavior observed while reviewing the Span SE response data:

- COMPOSITE BEHAVIOR: When reviewing the beam response data, it was observed that inconsistent composite action between the beams and the deck was present throughout the structure. The composite behavior varied significantly between instrumented locations, especially near the supports. Figure 13 through Figure 14 show beam responses near both midspan and the abutment that highlight this variation in behavior. The observed ratio of bottom and top flange strain near midspan did not match fully composite condition and indicated that the beams acted partially composite with the concrete deck. Figure 15 shows a response near the abutment where an unexpected top flange response was observed. Along a few beam lines, large tensile response was observed along the top flange, which was likely caused by unintended restraint of the top flange by the connection between the abutment diaphragms and the beam top flanges. Note that this top flange behavior was a local response and only observed near the span supports. The composite behavior was further investigated during the model calibration process.
- SPAN CONTINUITY OVER INTERIOR PIER: Beam responses showed consistent span continuity behavior between the two Oregon approach spans, which has been highlighted in Figure 16 and Figure 17. This behavior matched the approach spans' detailing, which consist of flange splice plates and a web splice over the interior pier and was further investigated during the model calibration process.
- LATERAL LOAD DISTRIBUTION: A bridge's ability to laterally distribute load is an essential characteristic to quantify for accurate load ratings. Lateral distribution can be observed by plotting the responses along an entire lateral cross-section, as done in Figure 18 and Figure 19. These plots display peak midspan strains or displacements from all three truck paths (Y1-Y3). The response values shown in this figure correspond to the longitudinal load positions producing the maximum midspan responses for each truck path. The distribution plots show that it is apparent that the load distribution was generally symmetric and consistent.

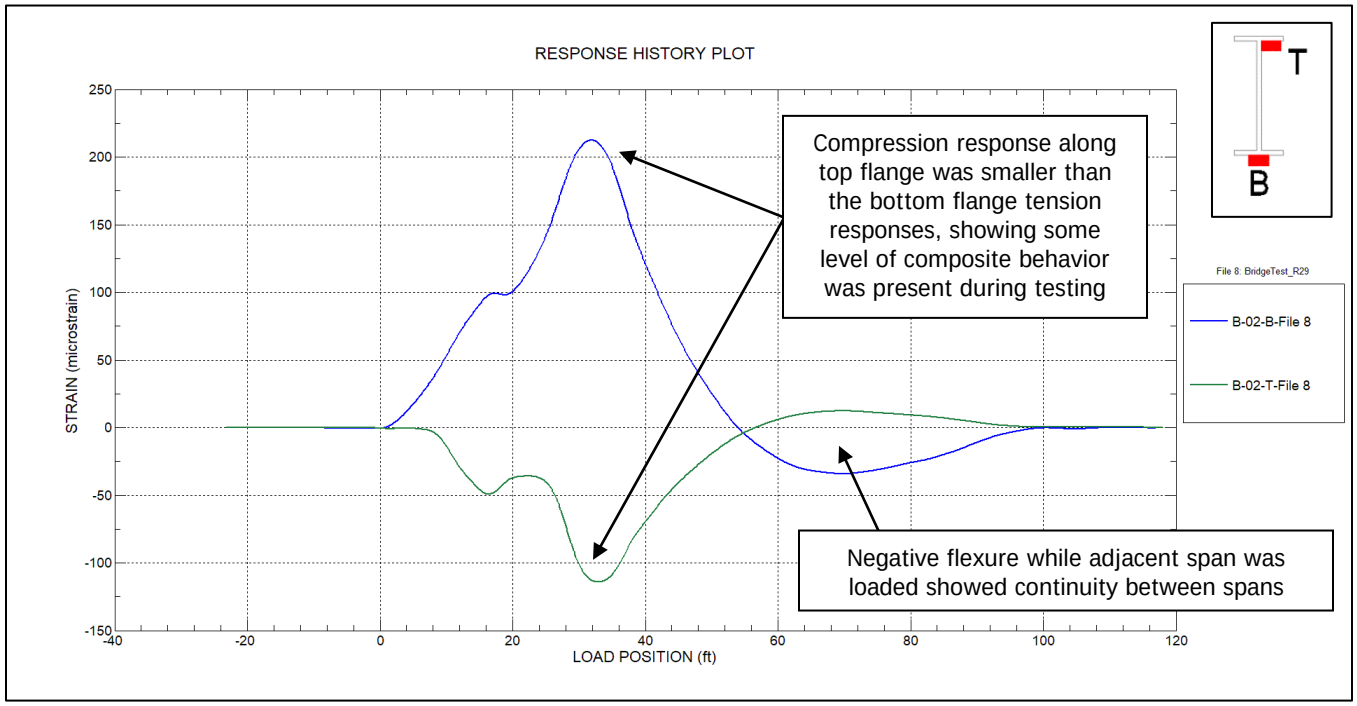


Figure 13 – Strain response plot showing partial stringer composite action – OR Approach Span SE – Section B near midspan – Interior girder 2 – Along top and bottom of girder – Truck path Y1

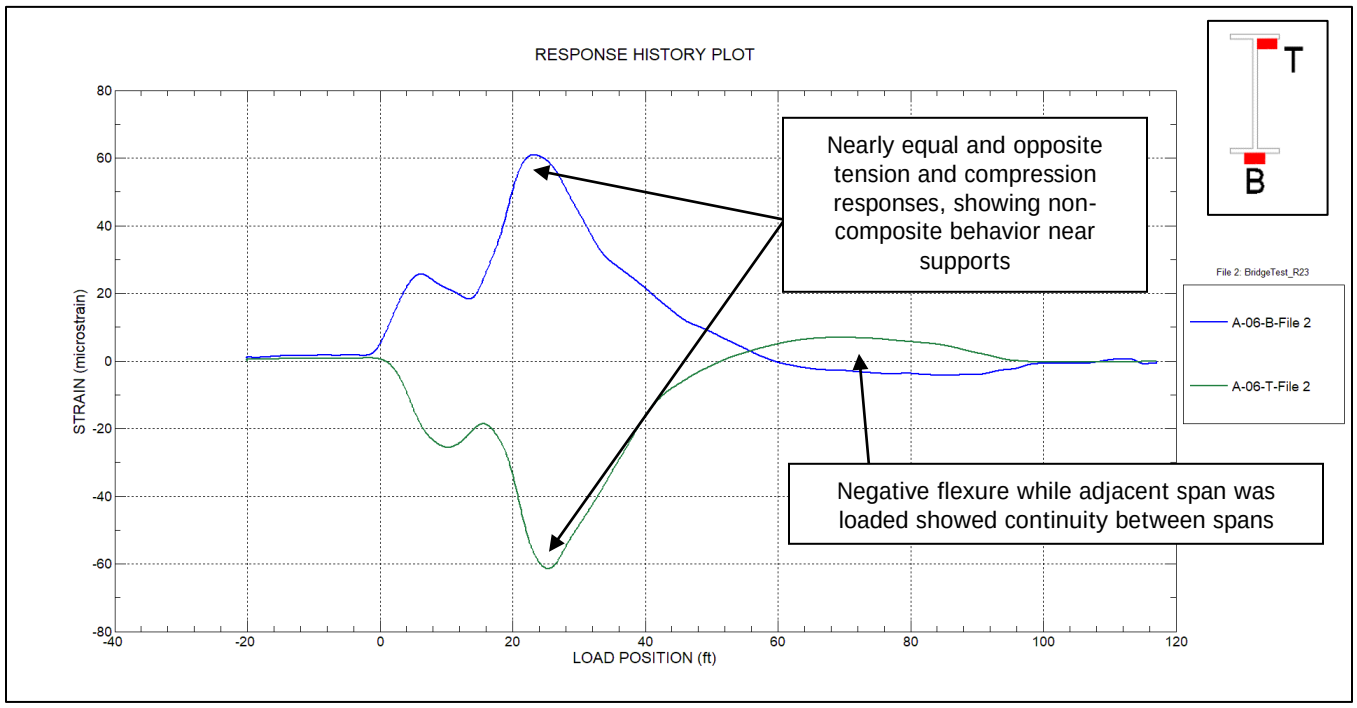


Figure 14 – Strain response plot showing stringer non-composite action – OR Approach Span SE – Section A near abutment – Interior girder 6 – Along top and bottom of girder – Truck path Y3

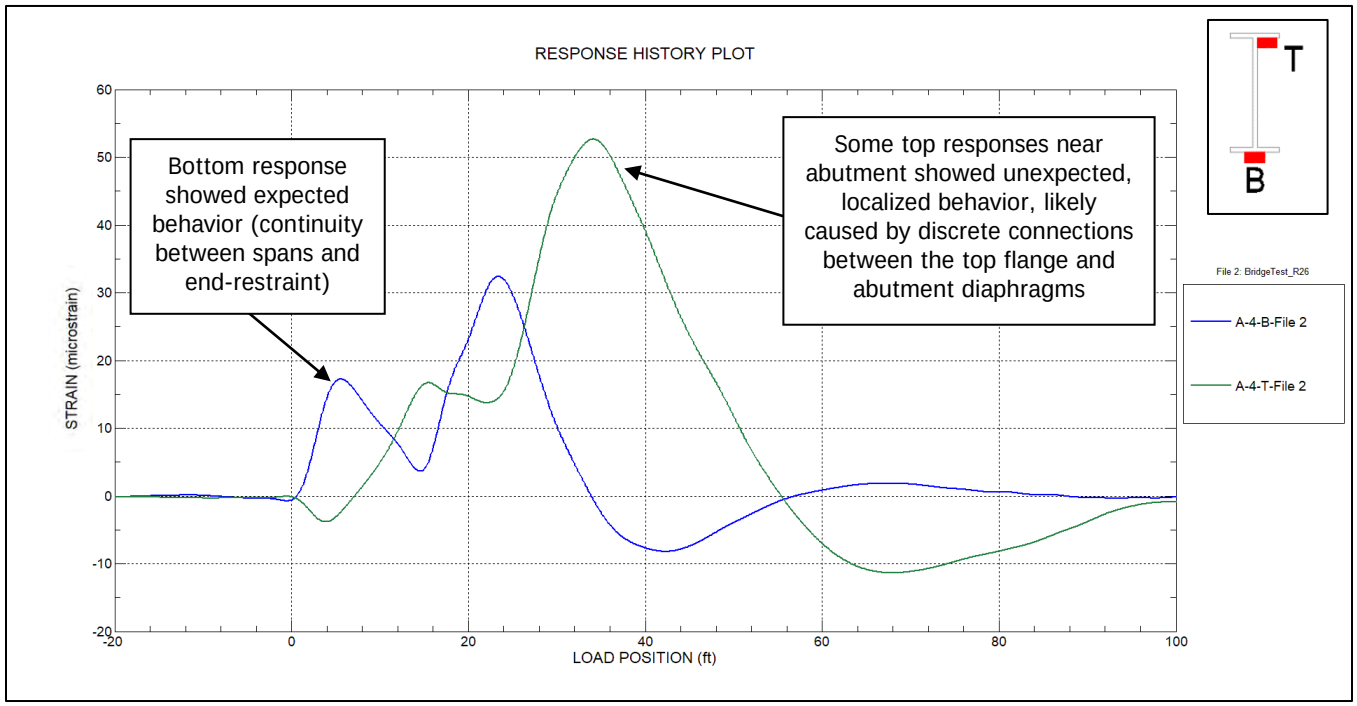


Figure 15 – Strain response plot showing unexpected top flange behavior near abutment – OR Approach Span SE – Section A near abutment – Interior girder 4 – Along top and bottom of girder – Truck path Y2

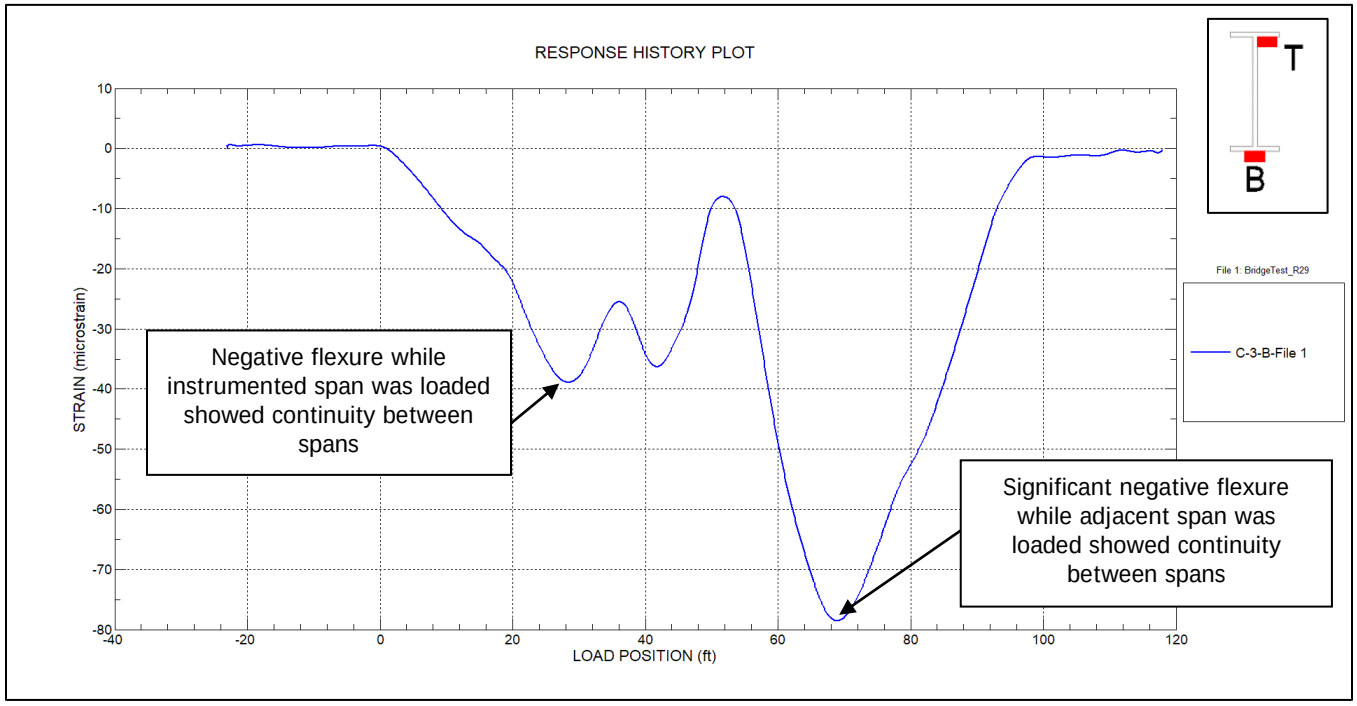


Figure 16 – Strain response plot showing span continuity – OR Approach Span SE – Section C near interior pier – Interior girder 3 – Along top and bottom of girder – Truck path Y1

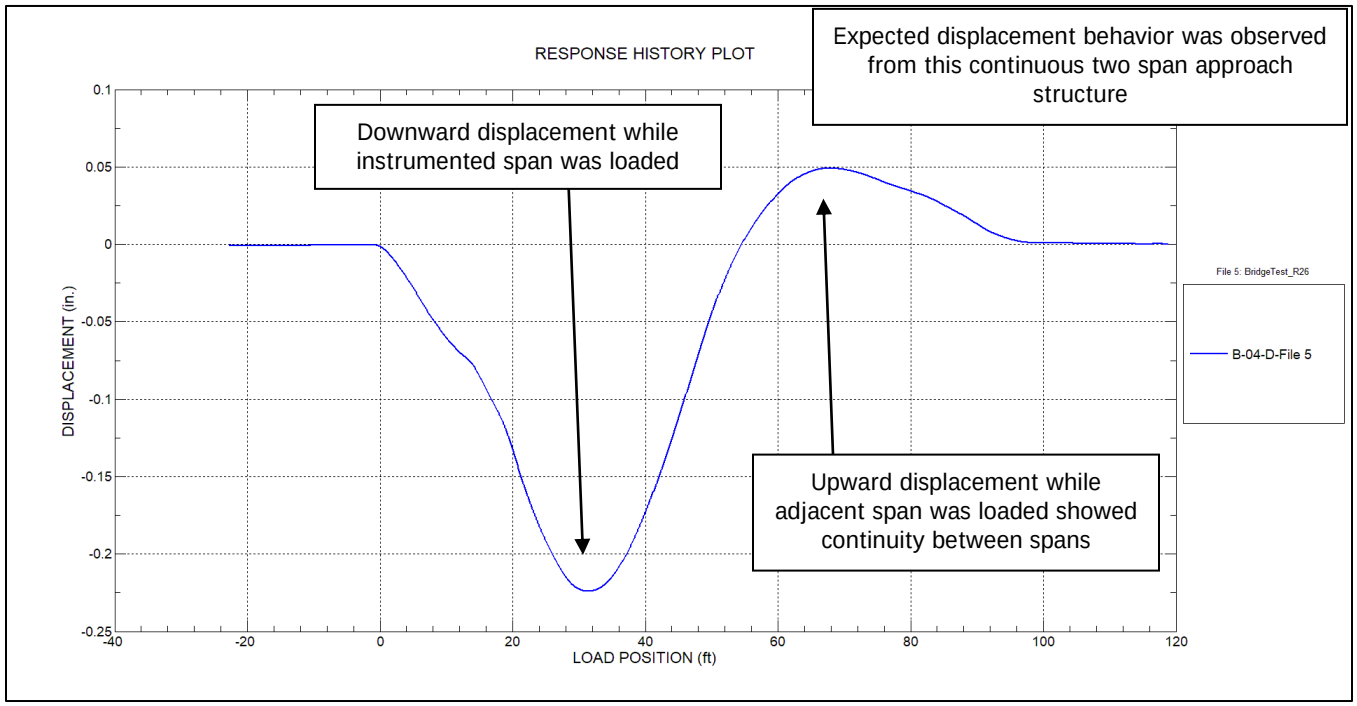


Figure 17 – Displacement response plot – OR Approach Span SE – Section B near midspan – Center girder 4 – Along bottom of girder – Truck path Y2

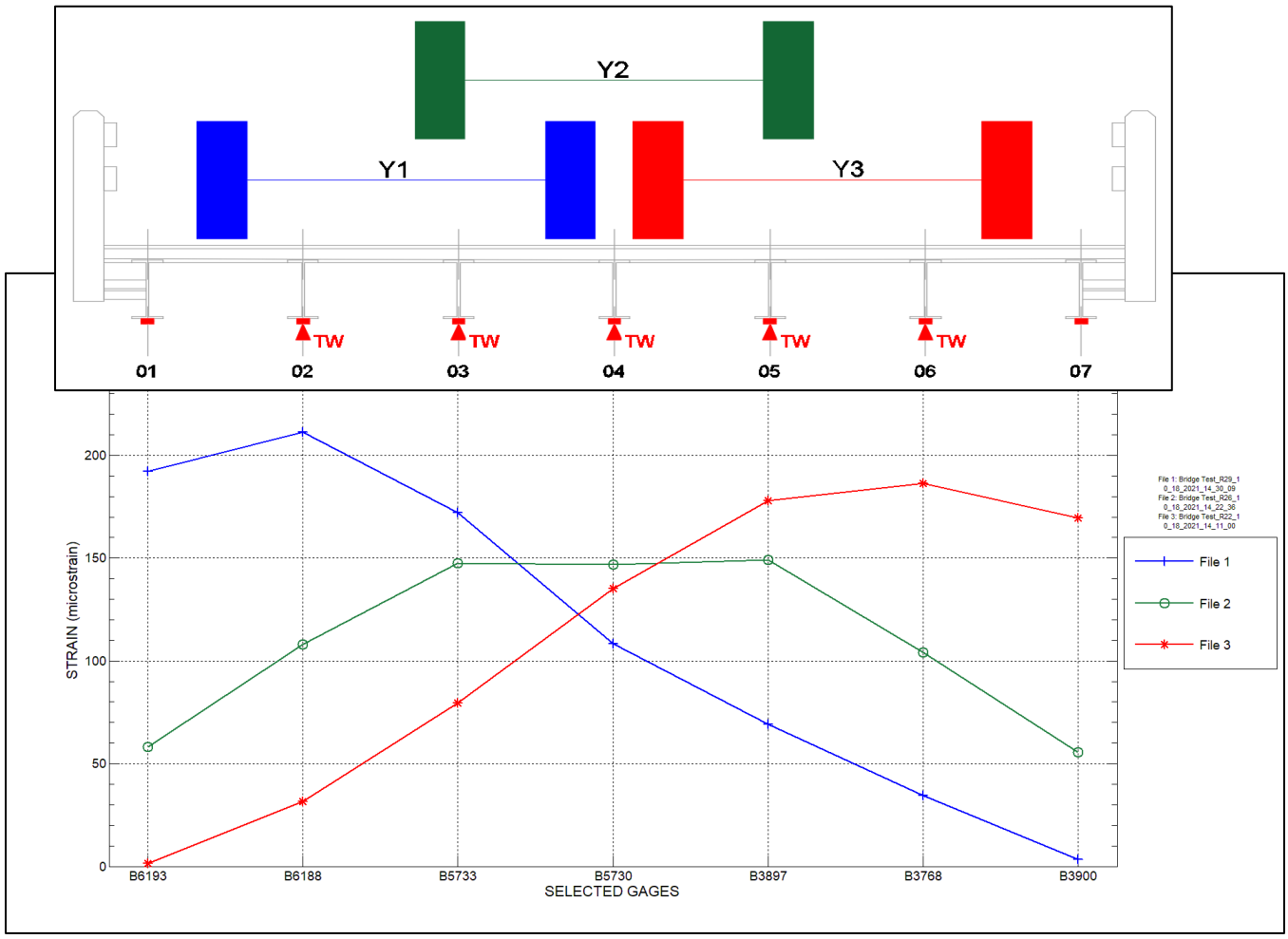


Figure 18 – Lateral distribution plot – OR Approach Span SE - Section B – Peak stringer strain responses – Truck paths Y1-Y3

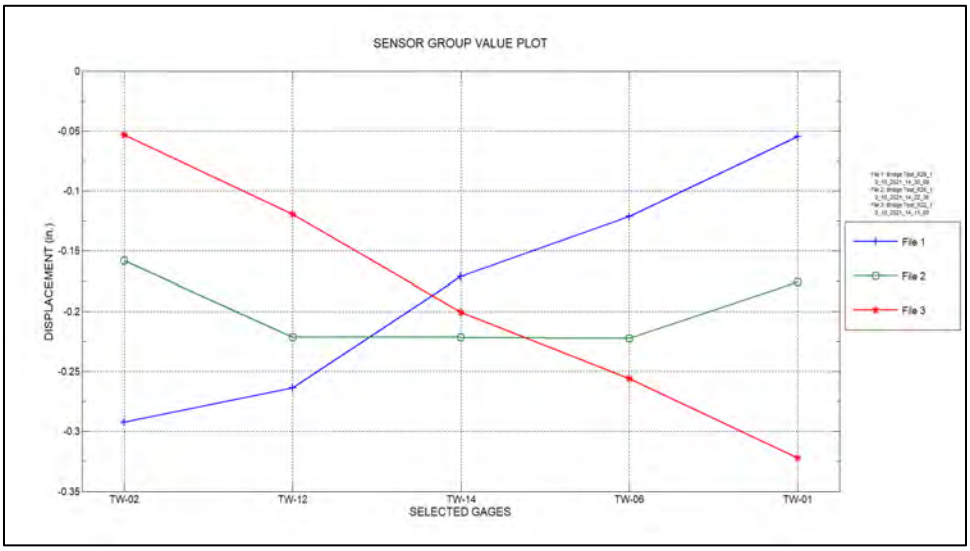


Figure 19 – Lateral distribution plot – OR Approach Span SE - Section B – Peak stringer displacement responses – Truck paths Y1-Y3

## WASHINGTON APPROACH SPAN 23 BEHAVIOR

The following is a summary of the behavior observed while reviewing the Span 23 response data:

- T-BEAM BEHAVIOR: The concrete beams were observed to behave with the expected T-beam behavior, as highlighted in Figure 20. This plot shows a top and bottom gage pair near midspan, where the neutral axis was observed to be above the top gage (top gage in minimal tension).
- SUPPORT BEHAVIOR: Concrete beam responses showed consistent span continuity/support fixity behavior, highlighted in Figure 20 through Figure 22. This behavior was not unexpected given that the concrete beams terminate into the pier diaphragms, and this behavior was further investigated during the model calibration process.
- LATERAL LOAD DISTRIBUTION: A bridge's ability to laterally distribute load is an essential characteristic to quantify for accurate load ratings. Lateral distribution can be observed by plotting the responses along an entire lateral cross-section, as done in Figure 23 and Figure 24. These plots display peak midspan strains or displacements from all three truck paths (Y1-Y3). The response values shown in this figure correspond to the longitudinal load positions producing the maximum midspan responses for each truck path. The distribution plots show that it is apparent that the load distribution was generally symmetric and consistent.

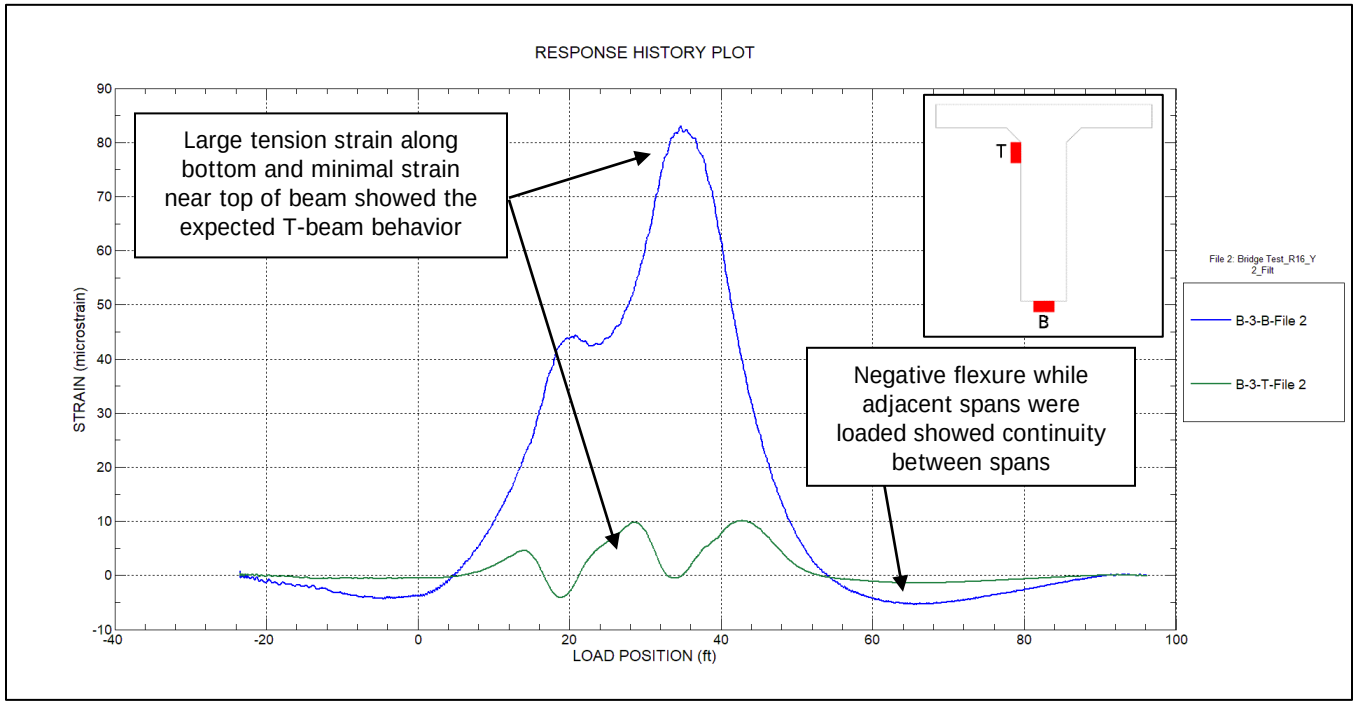


Figure 20 – Strain response plot showing beam composite action – WA Approach Span 23 – Section B near midspan – Interior girder 3 – Along top and bottom of girder – Truck path Y2

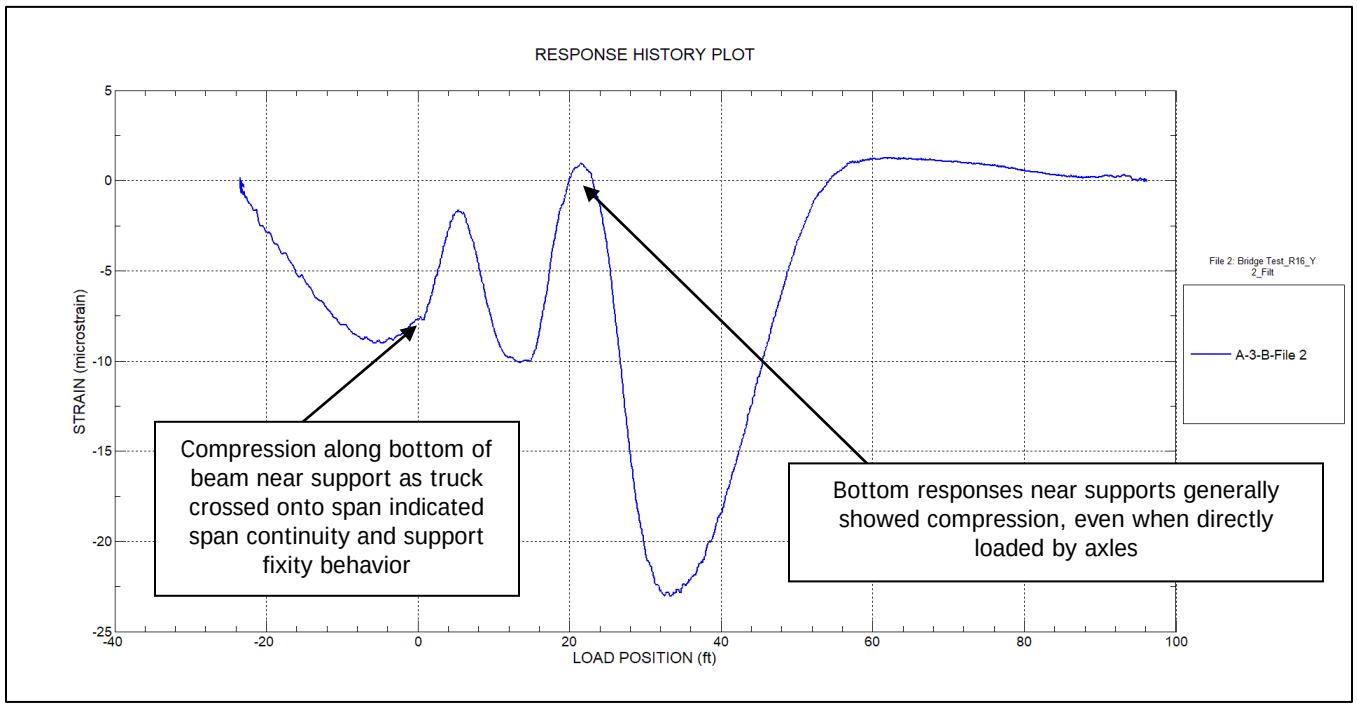


Figure 21 – Strain response plot showing support behavior – WA Approach Span 23 – Section A near pier – Interior girder 3 – Along bottom of girder – Truck path Y2

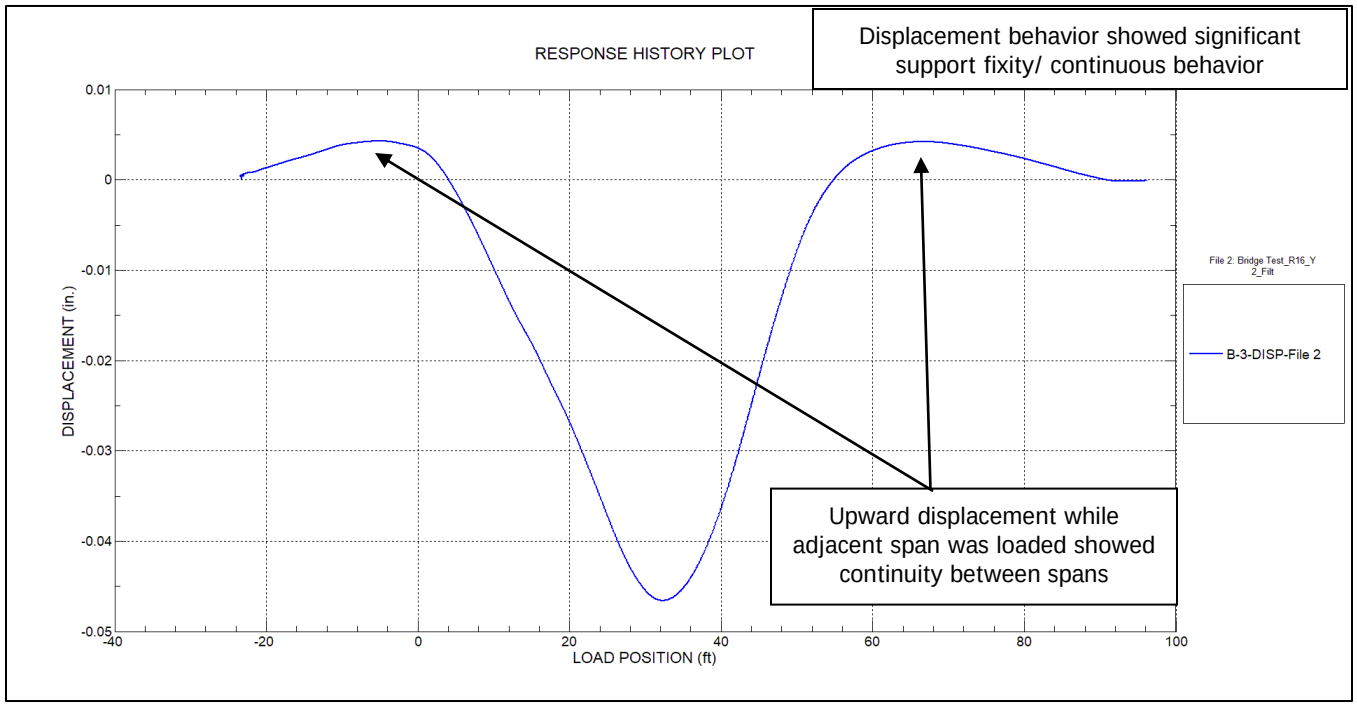


Figure 22 – Displacement response plot – WA Approach Span 23 – Section B near midspan – Center girder 3 – Along bottom of girder – Truck path Y2

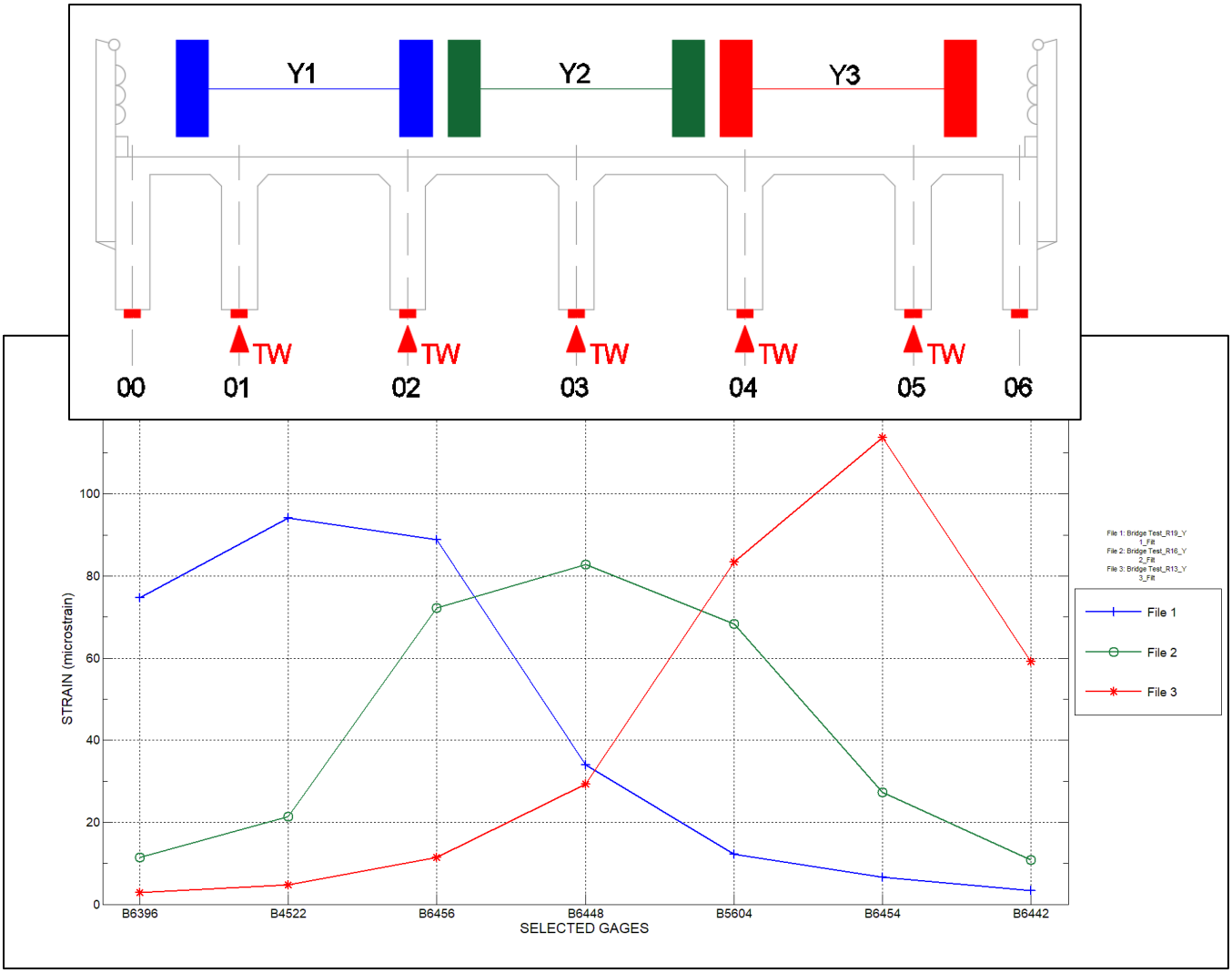


Figure 23 – Lateral distribution plot – WA Approach Span 23 - Section B – Peak stringer strain responses – Truck paths Y1-Y3

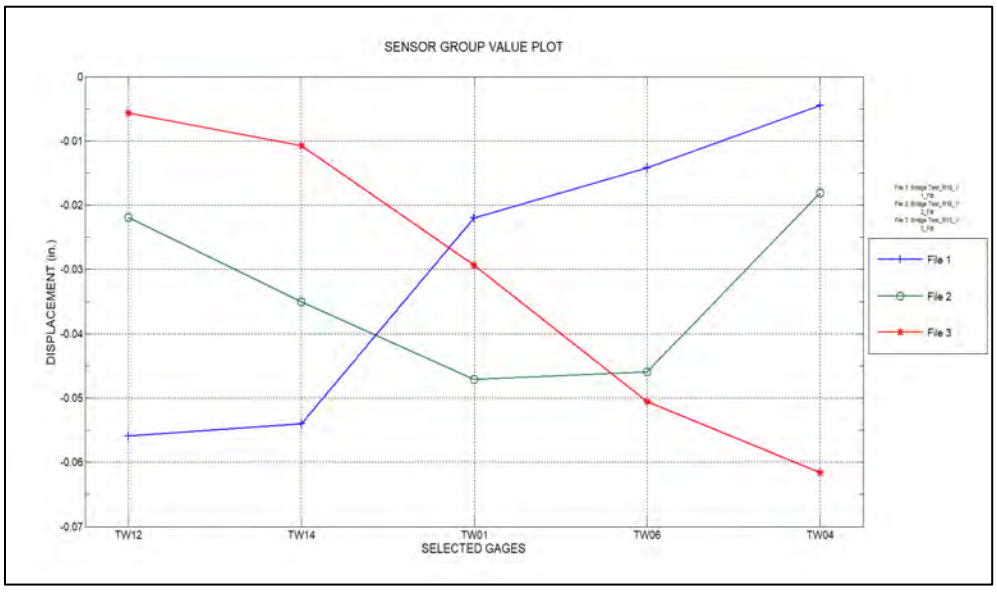


Figure 24 – Lateral distribution plot – WA Approach Span 23 - Section B – Peak stringer displacement responses – Truck paths Y1-Y3

## SPAN 2 FLOOR SYSTEM RESPONSES

The following is a summary of the behavior observed while reviewing the Span 2 floor system response data:

- STRINGER BEHAVIOR: Stringer responses showed consistent continuous behavior between bays, highlighted in Figure 25. This behavior was likely due the connection plates above each floorbeam (shown in Figure 26) and was further investigated during the model calibration process.
- FLOORBEAM BEHAVIOR: Floorbeam responses generally showed expected positive flexure under truck load as highlighted Figure 27 and Figure 28. One notable observation was the relatively low response magnitude measured near the instrumented floorbeam midspans. Upon review of photos taken by the field crew, it was found that these lower responses were likely caused by stiffener plates that have been added to both sides of the floorbeam webs near both top and bottom of these members' webs (Figure 29). These stiffener plates could not be found in any of the available structural plans. This behavior was further investigated during the model calibration process.
- LATERAL LOAD DISTRIBUTION: A bridge's ability to laterally distribute load is an essential characteristic to quantify for accurate load ratings. Lateral distribution can be observed by plotting the responses along an entire lateral cross-section, as done in Figure 30. These plots display peak midspan strains from all three truck paths (Y1-Y3). The response values shown in this figure correspond to the longitudinal load positions producing the maximum midspan responses for each truck path. The distribution plots show that it is apparent that the load distribution was generally symmetric and consistent.

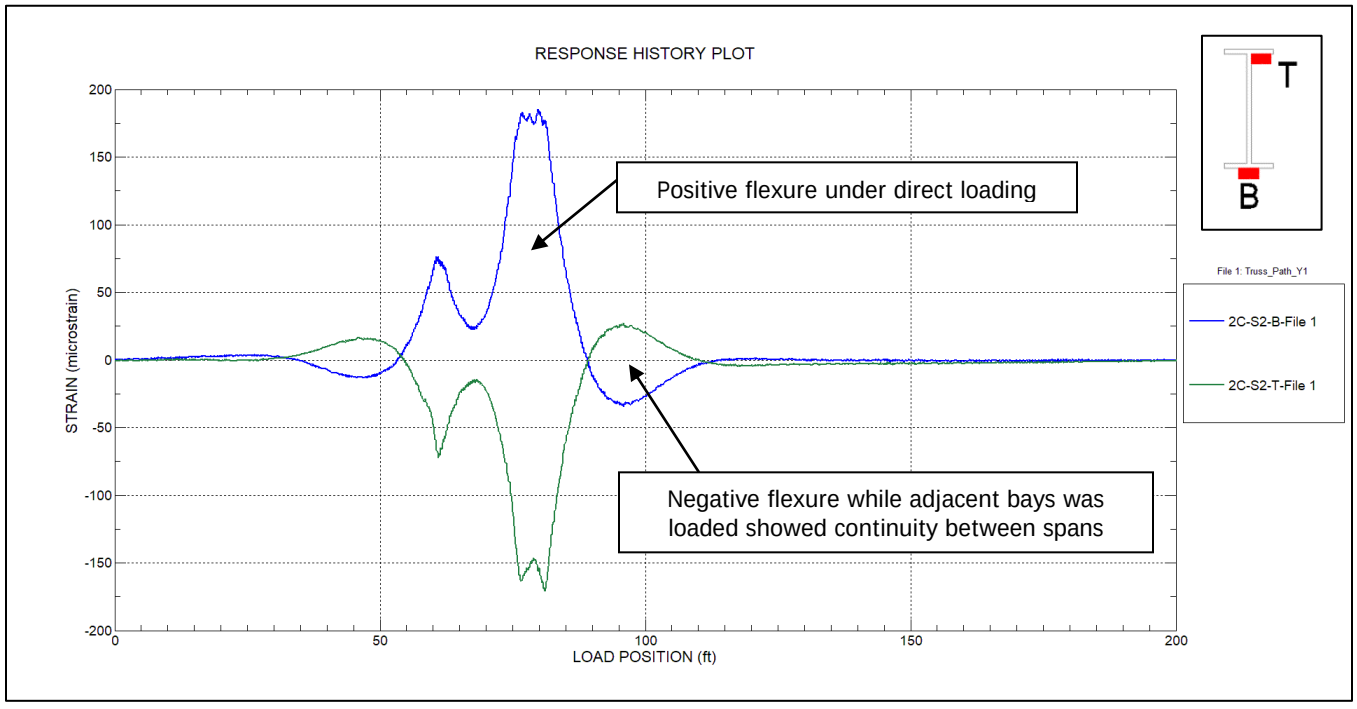


Figure 25 – Strain response plot showing typical stringer behavior – Span 2 Bay 5 – Section 2C near bay midspan – Interior stringer 2 – Along top and bottom of stringer – Truck path Y1

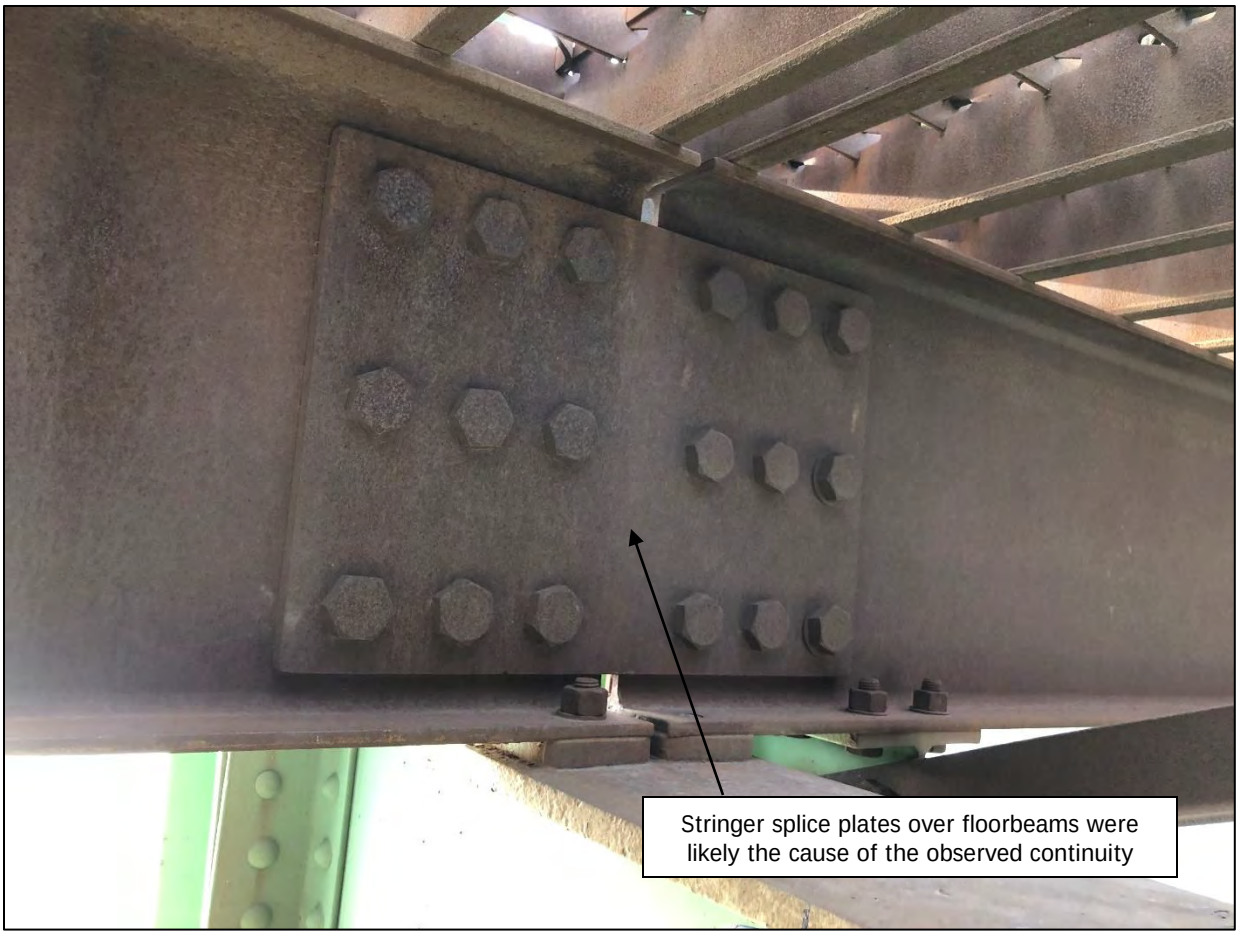


Figure 26 – Photo of stringer splice plate causing continuity between bays

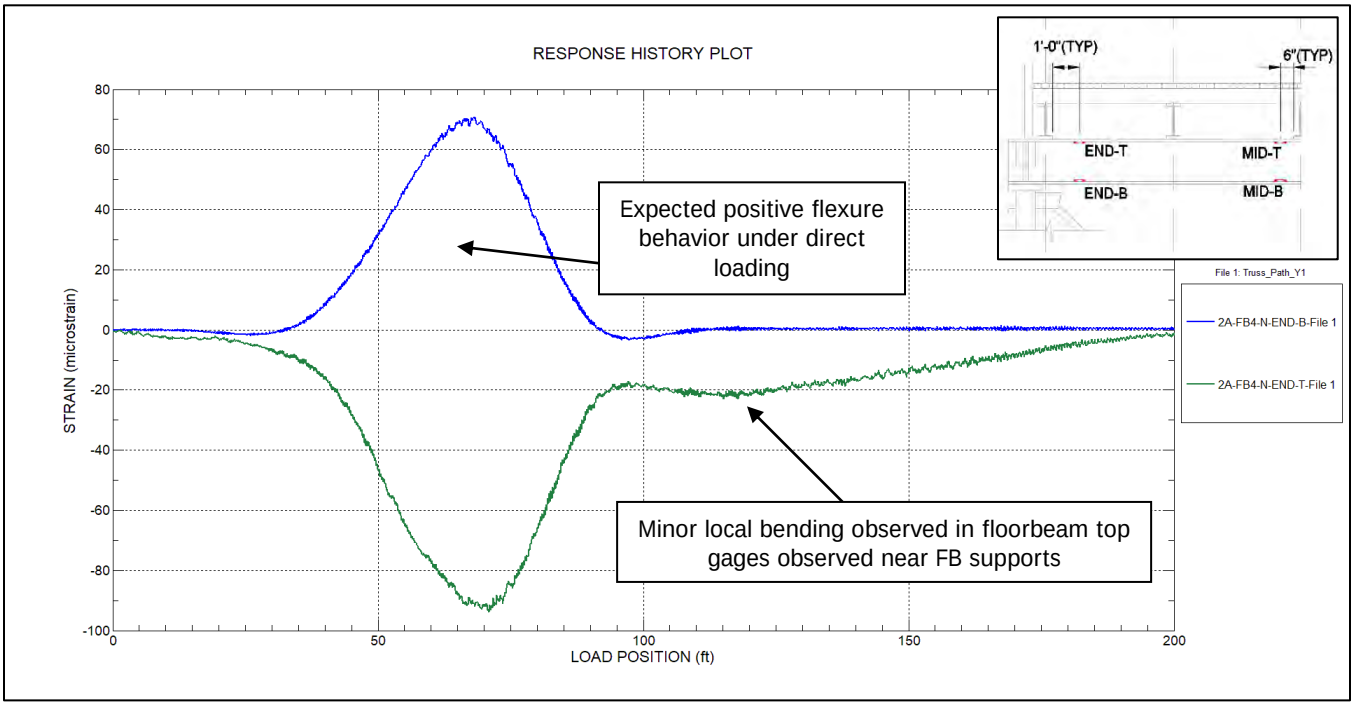


Figure 27 – Strain response plot showing floorbeam end behavior – Span 2 Floorbeam 4 – Section 2A near west beam end – Along top and bottom of floorbeam – Truck path Y1

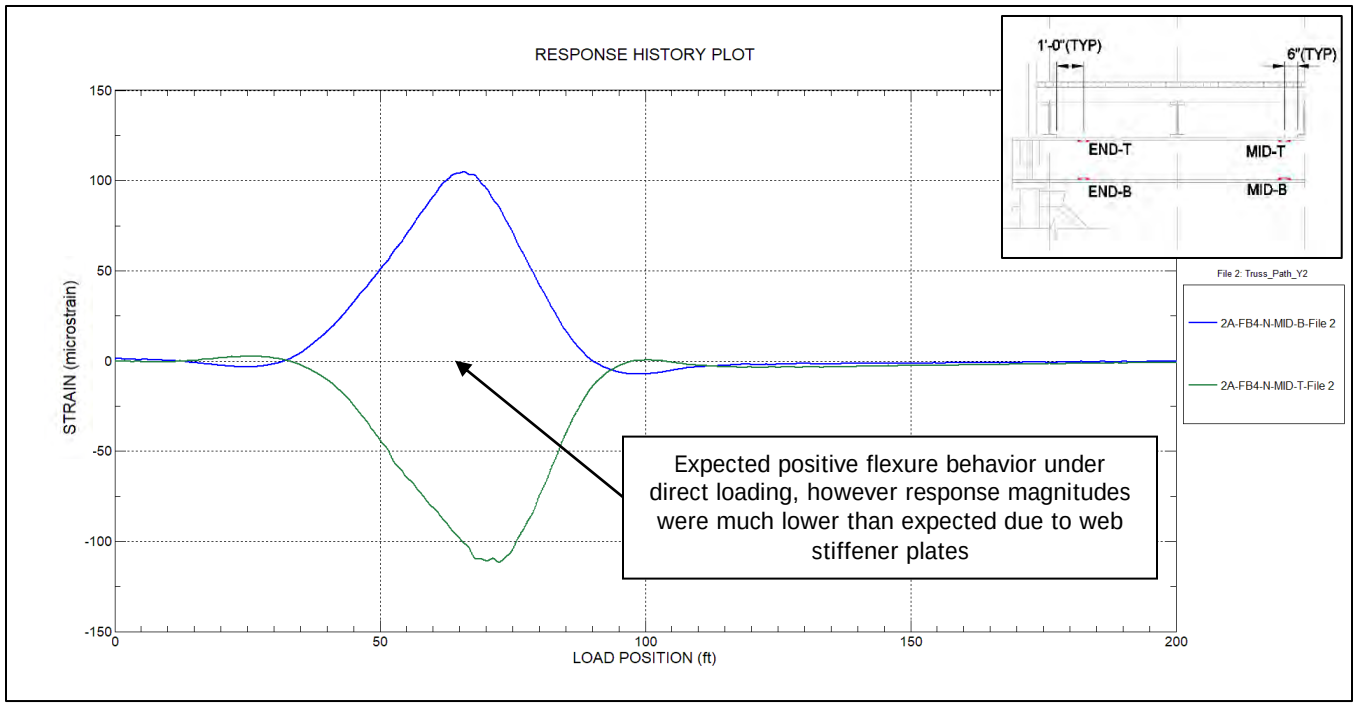


Figure 28 – Strain response plot showing floorbeam midspan behavior – Section 2A – Span 2 Floorbeam 4 near midspan – Along top and bottom of floorbeam – Truck path Y2

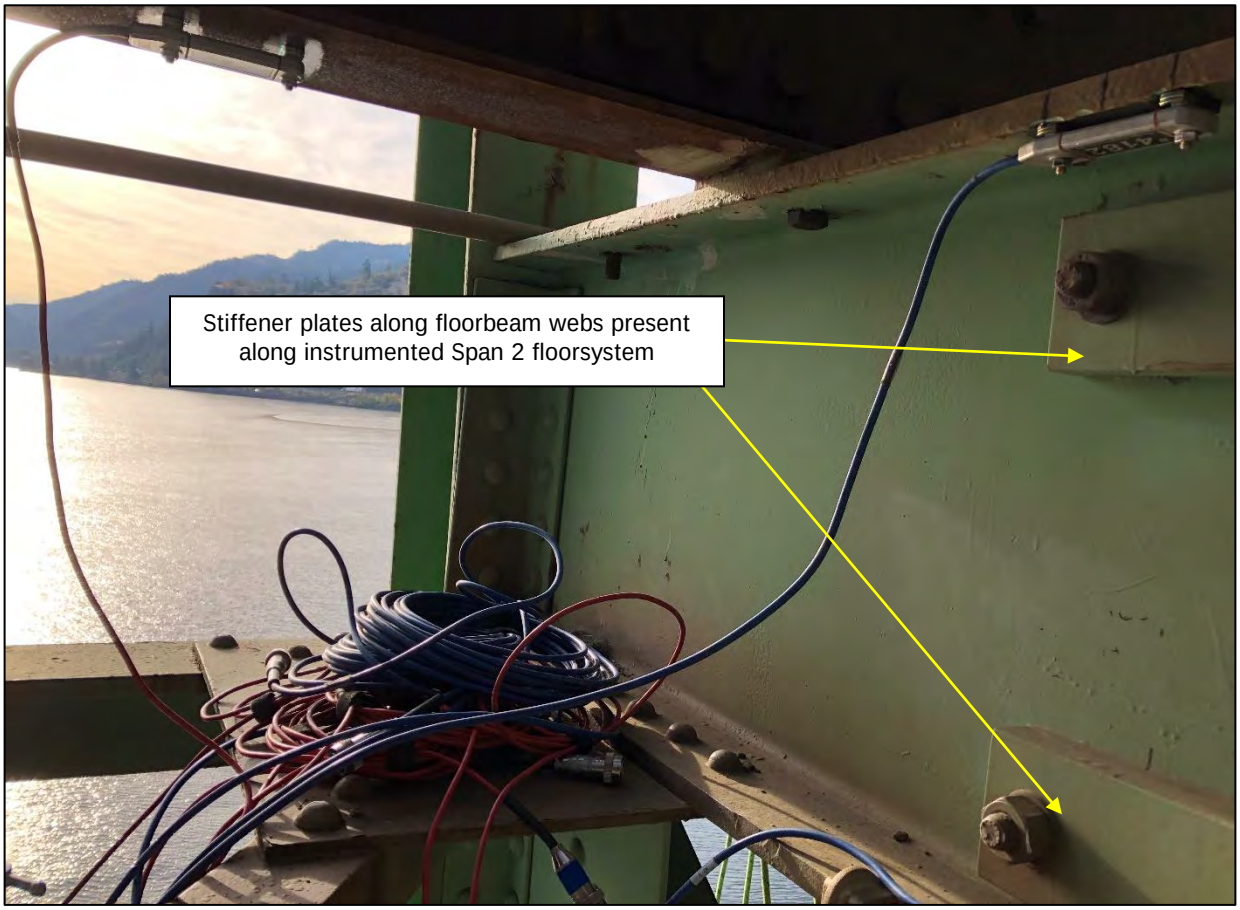


Figure 29 – Photo of web stiffener plates along instrumented floorbeams

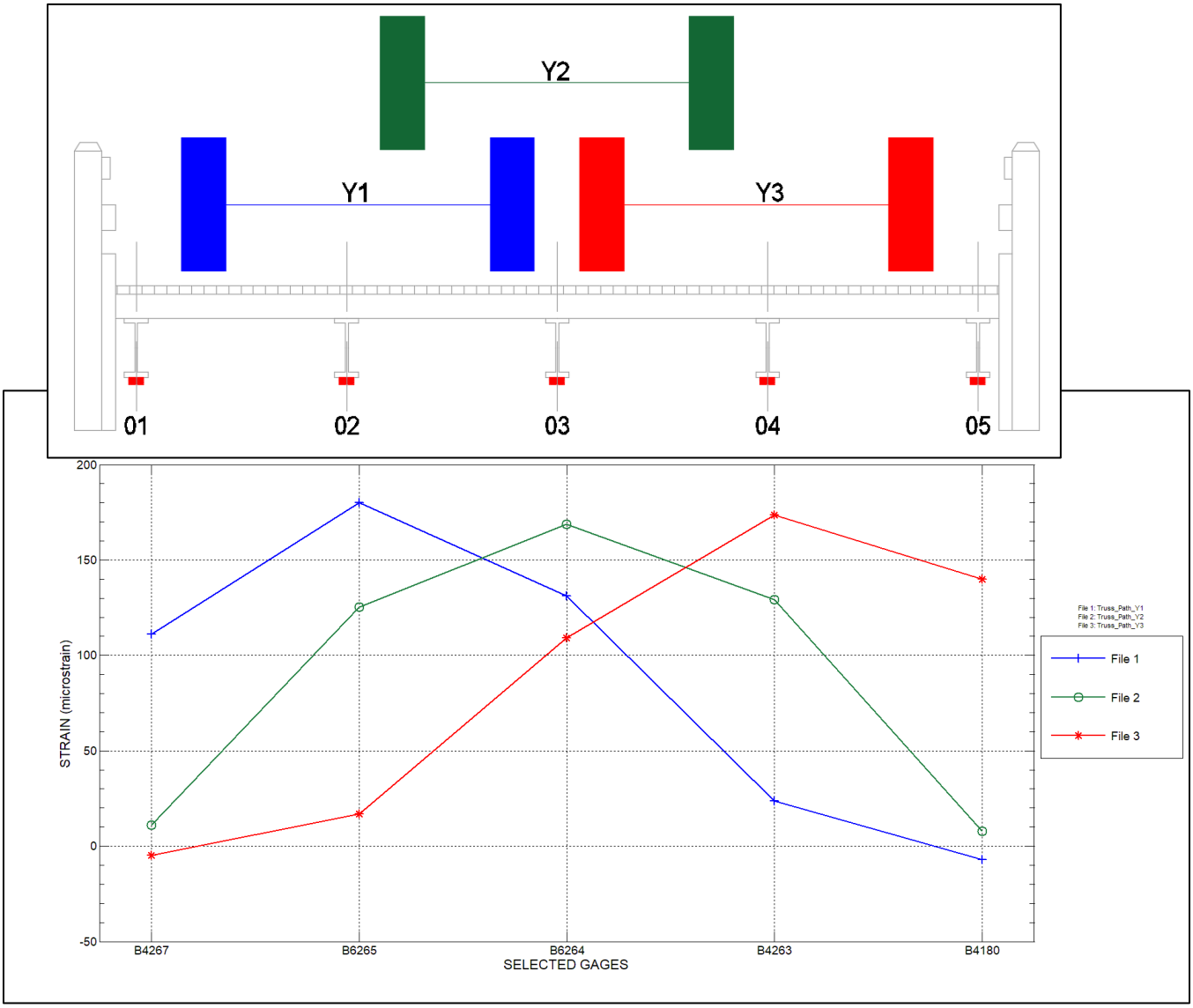


Figure 30 – Lateral distribution plot – Span 2 Bay 6 - Section 2G – Peak stringer strain responses – Truck paths Y1-Y3

## SPAN 3 & 4 TRUSS BEHAVIOR

The following is a summary of the behavior observed while reviewing the Spans 3 & 4 truss response data:

- SUPPORT BEHAVIOR: Responses collected along bottom chord members near the truss supports showed that minor support fixity/span continuity behavior was present during testing. This support behavior is common in larger structures and was likely caused by minor restraint at the truss bearings and movement of the piers under load, which transferred load between truss spans. Figure 31 provides responses from instrumented bottom chords near the truss supports (in end bays) that highlight the observed truss support behavior. This behavior was further investigated during the model calibration process.
- INTERIOR BOTTOM CHORD BEHAVIOR: Responses collected along interior bottom chord members generally indicated these truss elements were behaving as expected, with tension observed under load with minor and varying degrees of induced flexure. Figure 32 provides an example bottom chord response of Span 3 downstream L3-L4 member. Minor variations between each sections gage responses indicated flexure and /or possible independent bending of member components. This behavior was further investigated during the model calibration process.
- INTERIOR DIAGONAL BEHAVIOR: Responses collected along interior diagonal members generally indicated these truss elements were behaving as expected, with both tension and compression observed under load with a minimal level of induced flexure. Figure 33 provides an example diagonal response of Span 3 downstream U3-L4 member. Minimal variations between each sections gage responses indicated minor flexure and /or possible independent bending of member components. This behavior was further investigated during the model calibration process.
- INTERIOR VERTICAL BEHAVIOR: Responses collected along interior vertical members generally indicated these truss elements were behaving as expected, with both tension and compression observed under load with a notable level of induced longitudinal (weak-axis) flexure. Figure 34 provides an example vertical response of Span 3 downstream U4-L4 member. Notable variations between the north and south gages (Gages 1 & 3 vs 2 & 4 shown in plot) indicated weak-axis flexure and/or possible independent bending of member components. This behavior was further investigated during the model calibration process.

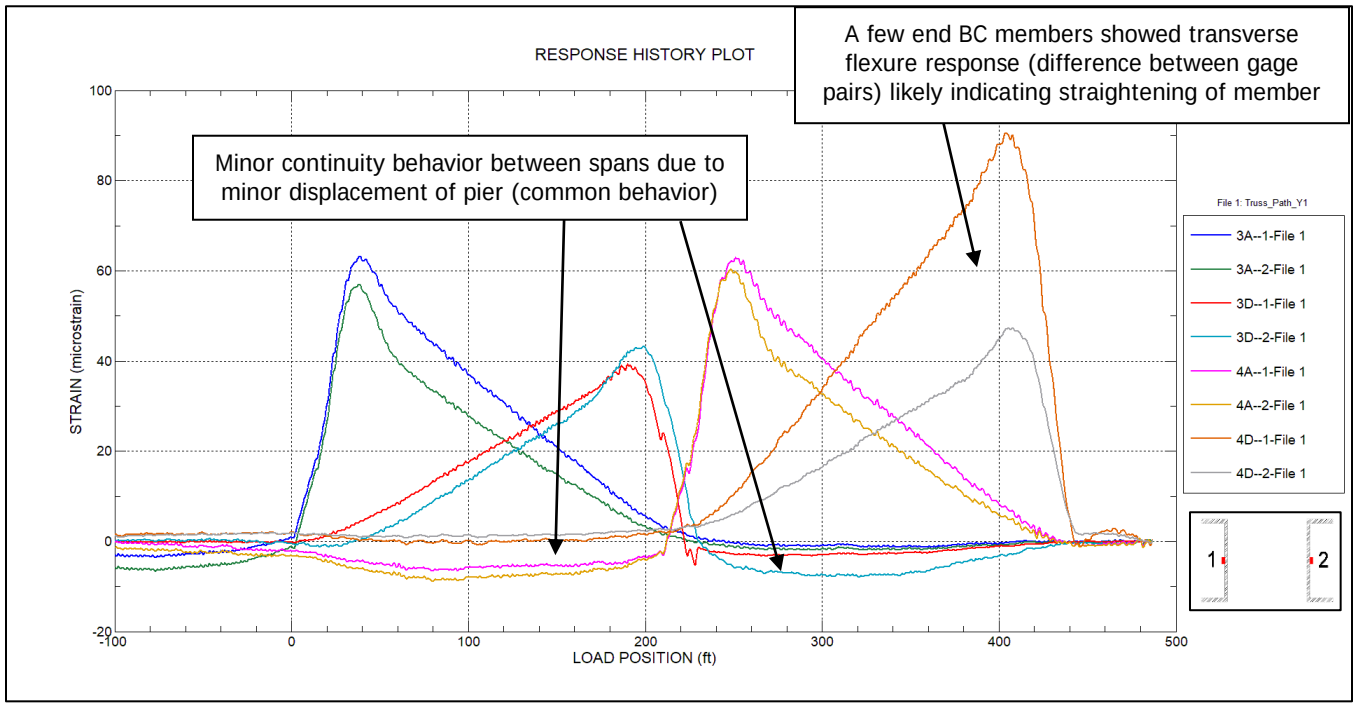


Figure 31 – Strain response plot showing truss support behavior– End Bottom Chord Sections – Spans 3 & 4 – Along channel centroids– Truck path Y1

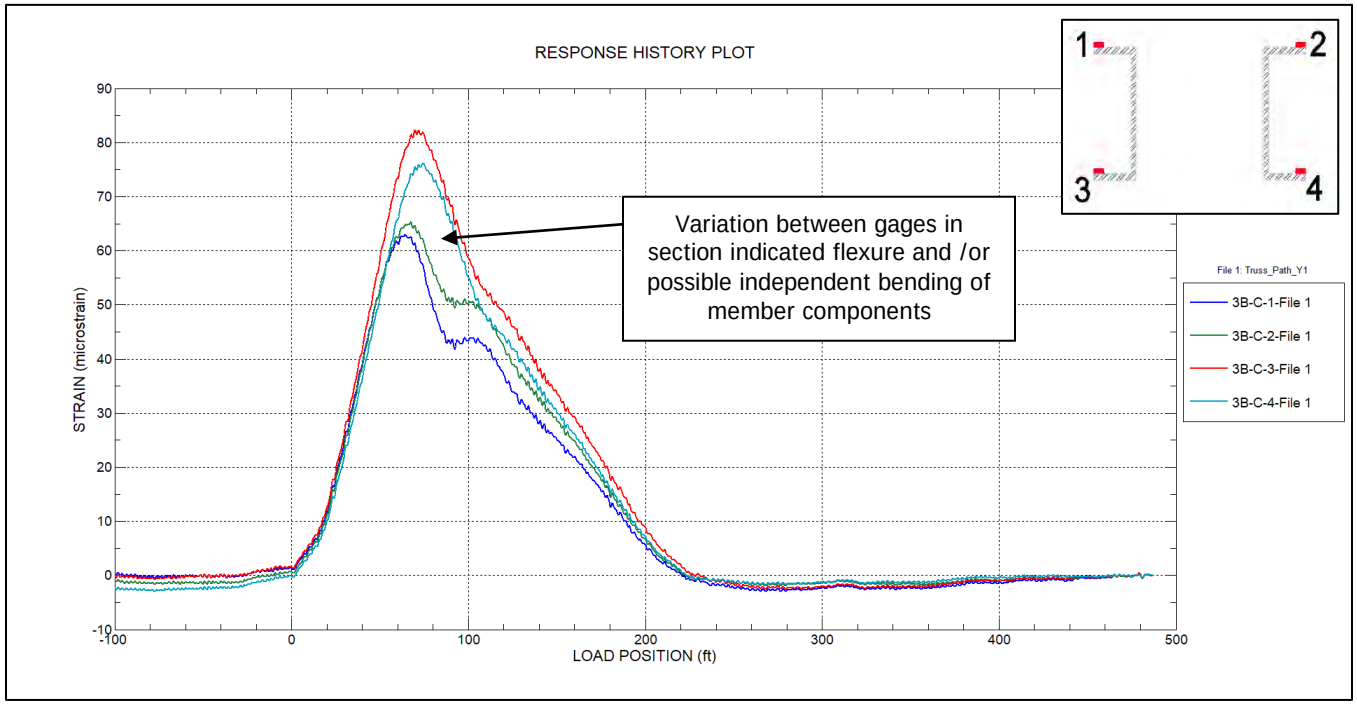


Figure 32 – Strain response plot showing interior bottom chord behavior – Section 3B-C – Span 3 L3-L4 (Downstream) – Along outer channel flange edges– Truck path Y1

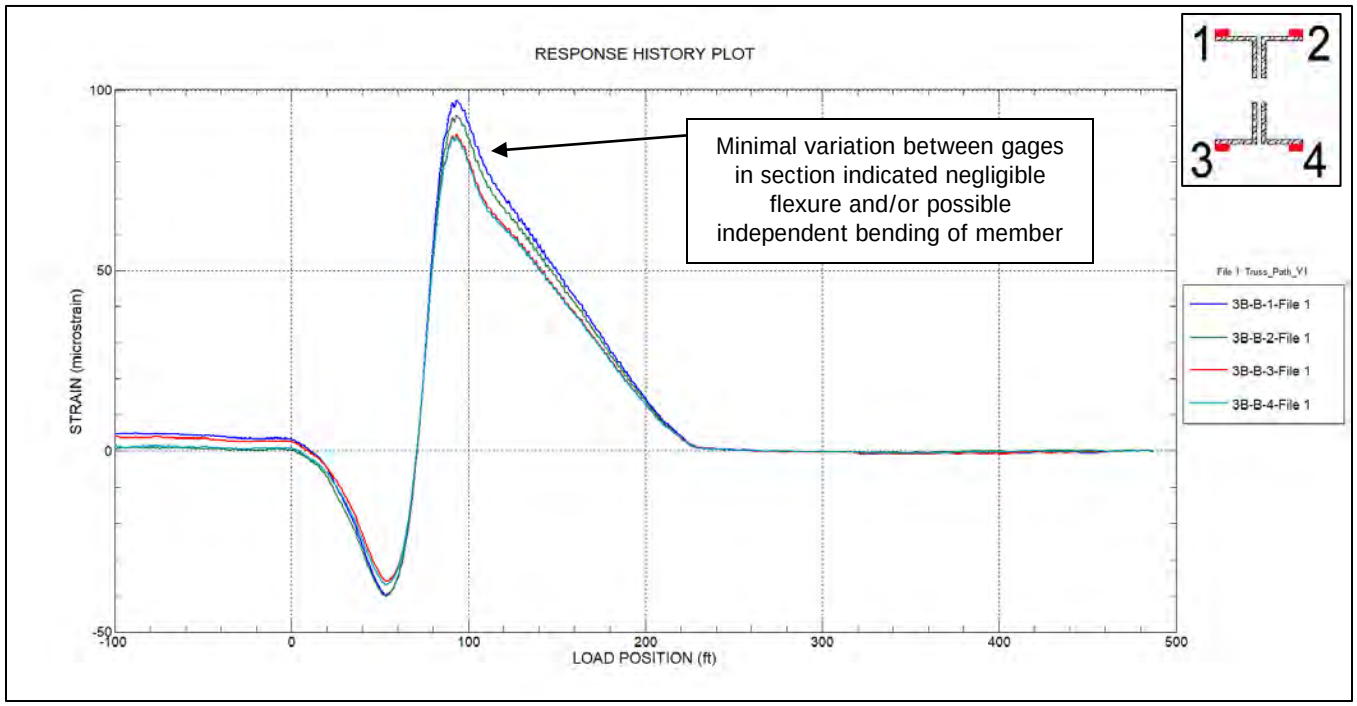


Figure 33 – Strain response plot showing interior diagonal behavior – Section 3B-B – Span 3 U3-L4 (Downstream) – Along outer channel flange edges– Truck path Y1

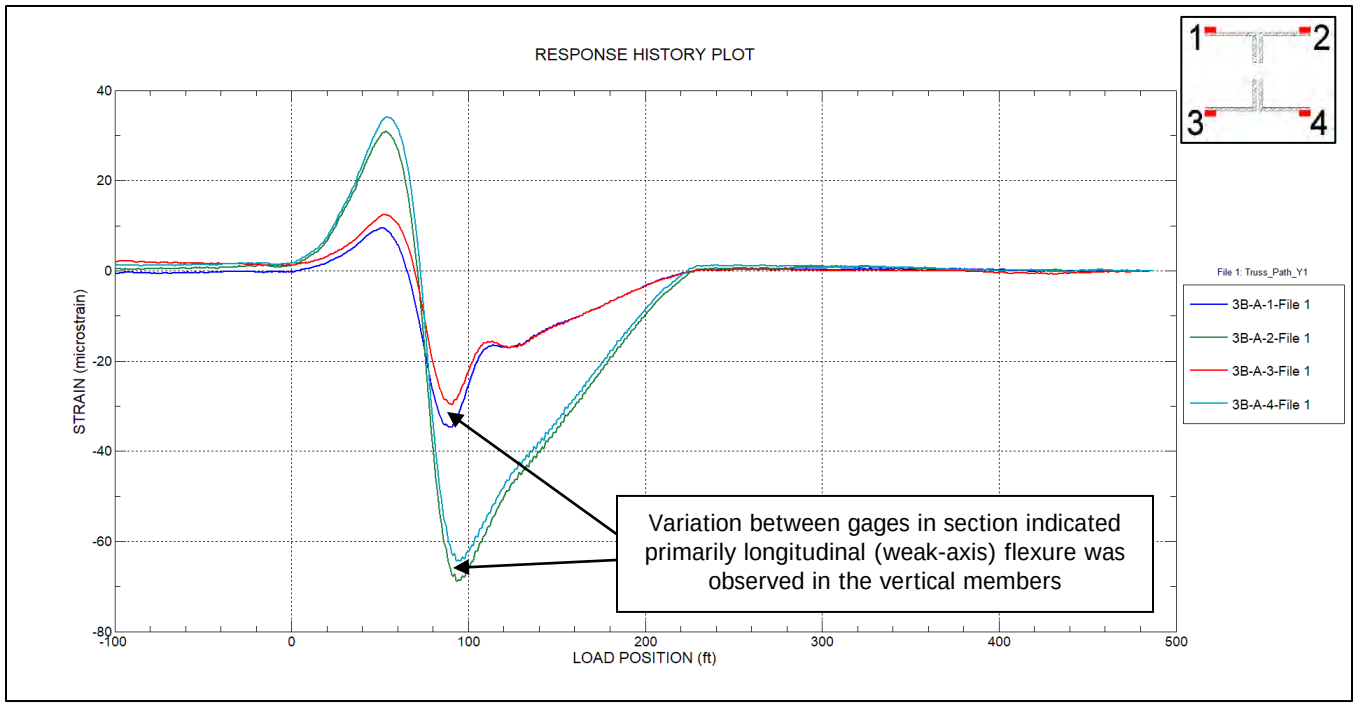


Figure 34 – Strain response plot showing interior vertical behavior – Section 3B-A – Span 3 U4-L4 (Downstream) – Along outer channel flange edges– Truck path Y1

## MODELING, ANALYSIS, AND DATA CORRELATION

The key objectives of calibrating a finite-element model of a bridge are to accurately simulate the structural responses observed during the load test and in turn utilize this model to accurately predict the structure's response under standard and site-specific rating loads. This section briefly describes the methods and findings of the modeling procedures. A list of modeling and analysis parameters specific to this bridge is provided in Table 3.

Table 3 – Analysis and model details

| | |
|---|---|
| ANALYSIS TYPE | - Linear-elastic finite element - stiffness method |
| MODEL GEOMETRY | Oregon Approach Spans SE & SD Model<br>- 2D model composed of frame, shell, and rigid link/support elements<br>Washington Approach Span 23 Model<br>- Quasi 3D model (2D with beam offsets) composed of frame, shell, and rigid link/support elements<br>Span 2 Floor System Model<br>- 2D model composed of frame, shell, and rigid link/support elements<br>Span 3 & 4 Truss Model<br>- 3D model composed of frame, shell, and rigid link/support elements |
| NODAL LOCATIONS | - Nodes placed at the ends of each frame and shell element<br>- Nodes placed at all spring locations where end-restraint was investigated |
| MODEL COMPONENTS | - Frame elements representing the primary and secondary members such as truss members, stringers, floorbeams, diaphragms / bracing members, and curbs<br>- Shell elements representing the deck (both concrete and steel orthotropic deck)<br>- Rigid links representing connection between members' centroid and their bearings<br>- Nodal restraints representing support conditions at bearings<br>- Nodal springs representing end-restraint/support fixity at bearings |
| TEST LIVE-LOAD APPLICATION | - 2-D footprint of test truck consisting vertical point loads applied to deck elements. Truck paths simulated by series of load cases with truck footprint moving at approximately 2′-4′ increments along a straight path. Each wheel load was simulated with a point load. |

### MODEL CALIBRATION PROCEDURES:

First, geometric data from provided plans and insight gained from the qualitative data investigation were used to create initial, finite-element models using Strand7, illustrated in Figure 35 through Figure 39. Once the initial models were created, the load test procedures were reproduced using BDI's MORPH structural analysis and correlation software. This was done by moving a two-dimensional "footprint" of the test truck(s) across the model in consecutive load cases simulating the truck crossings along the bridge (Paths Y1-Y3). Analytical responses of this simulation were then compared to the field responses to validate the model's basic structure and to identify differences between the measurements and simulated responses.

The model was then calibrated until an acceptable match between the measured and analytical responses was achieved. Note that each model calibration focused on instrumented members and overall general behavior, and therefore were not used for evaluation of un-instrumented member types. This calibration involved an iterative process of optimizing material properties, load distribution, and boundary conditions until they were effectively quantified and provided a best-fit match between the measured and calculated responses.

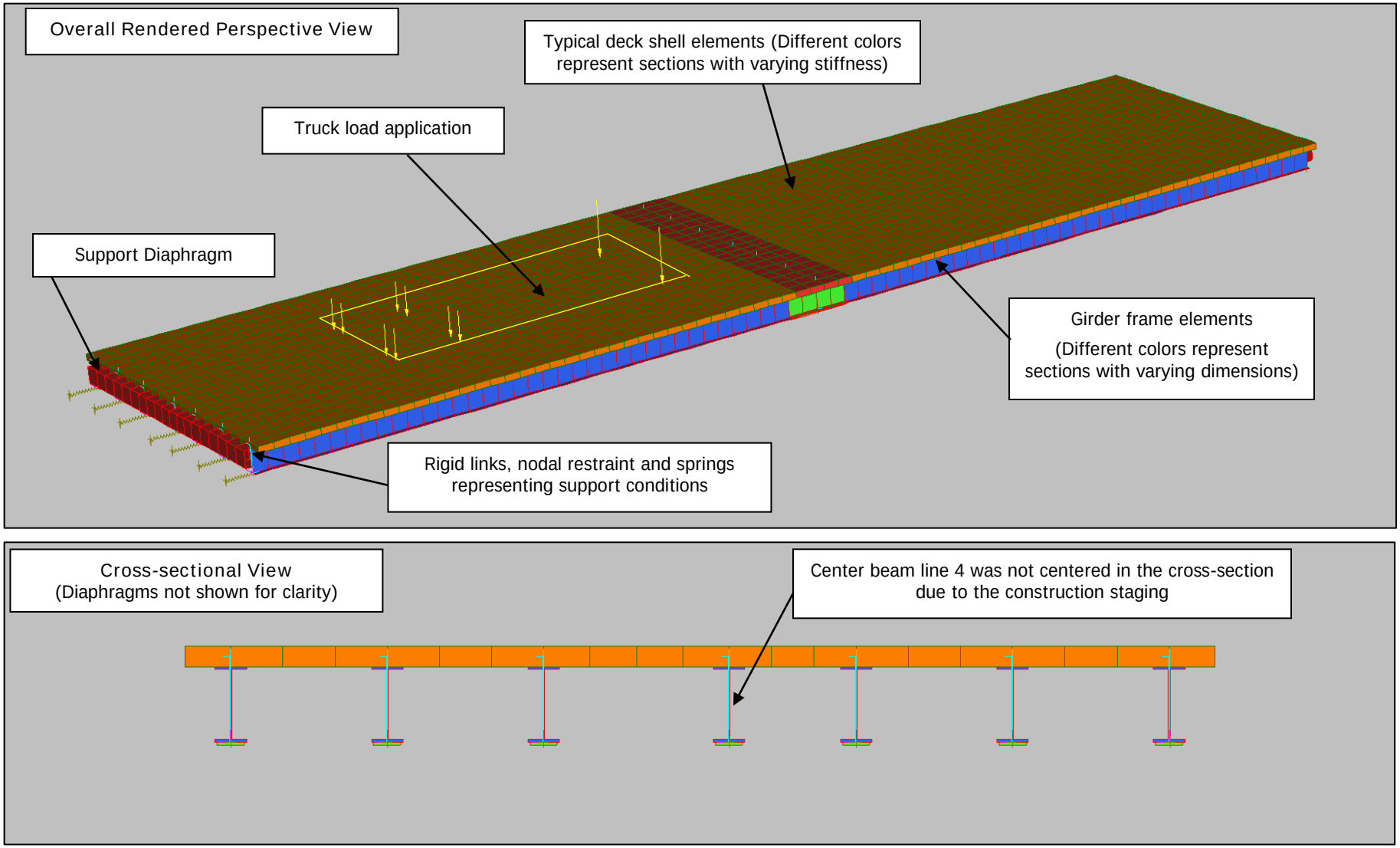


Figure 35 – Model Overview of Oregon Approach Spans (SE & SD) FEM illustrating test truck on the bridge

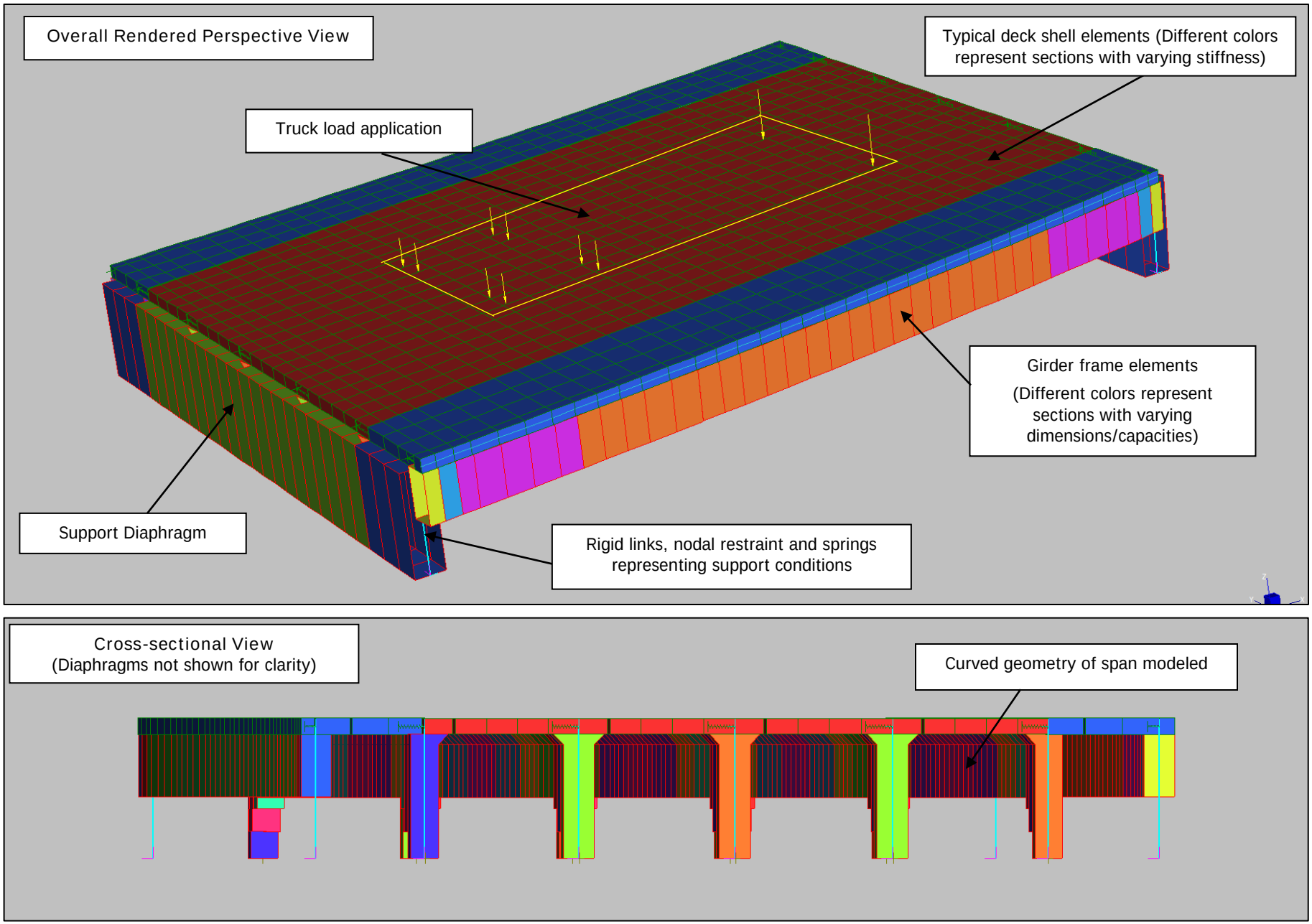


Figure 36 – Model Overview of Washington Approach Span 23 FEM illustrating test truck on the bridge

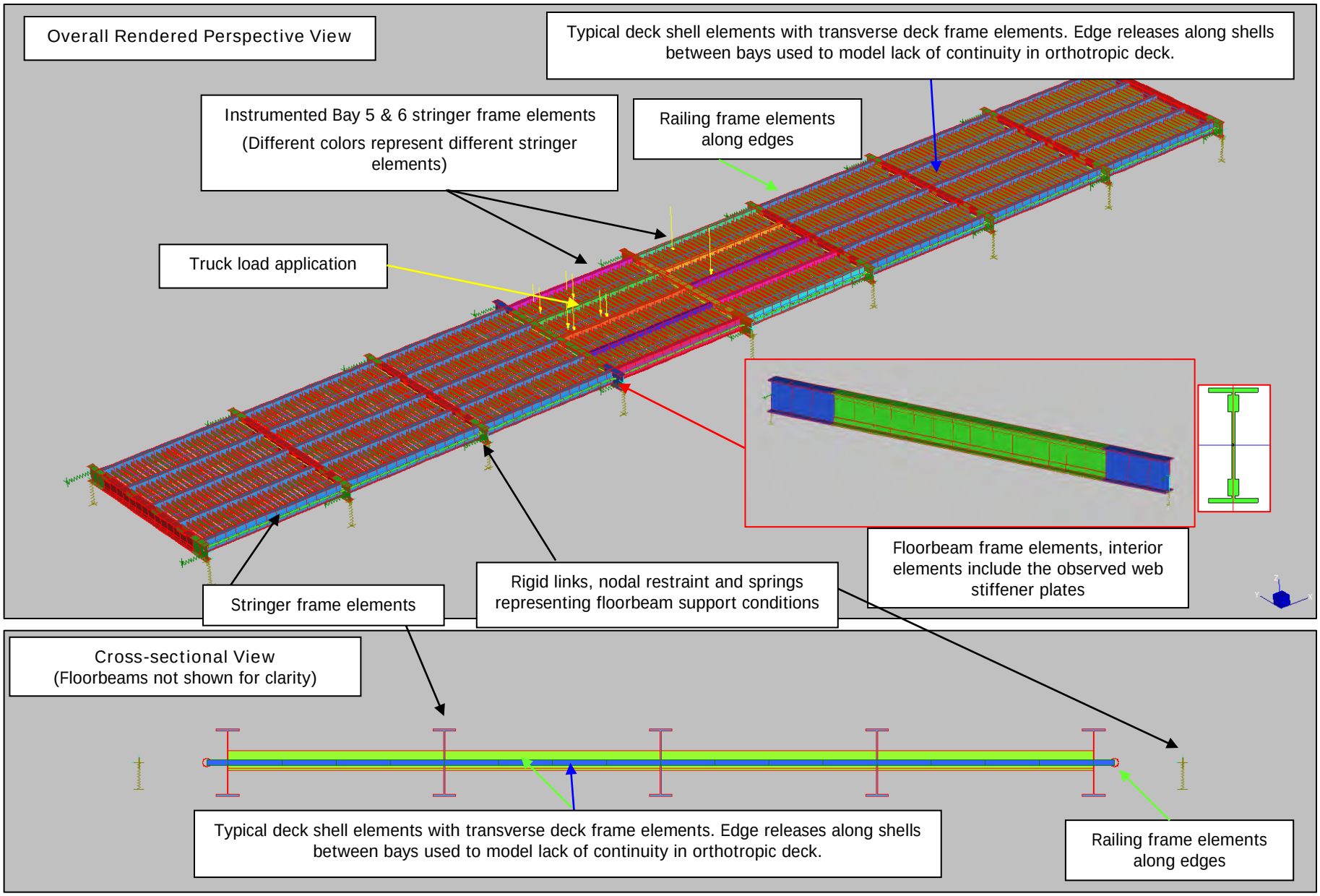


Figure 37 – Model Overview of Span 2 floor system FEM illustrating test truck on the bridge

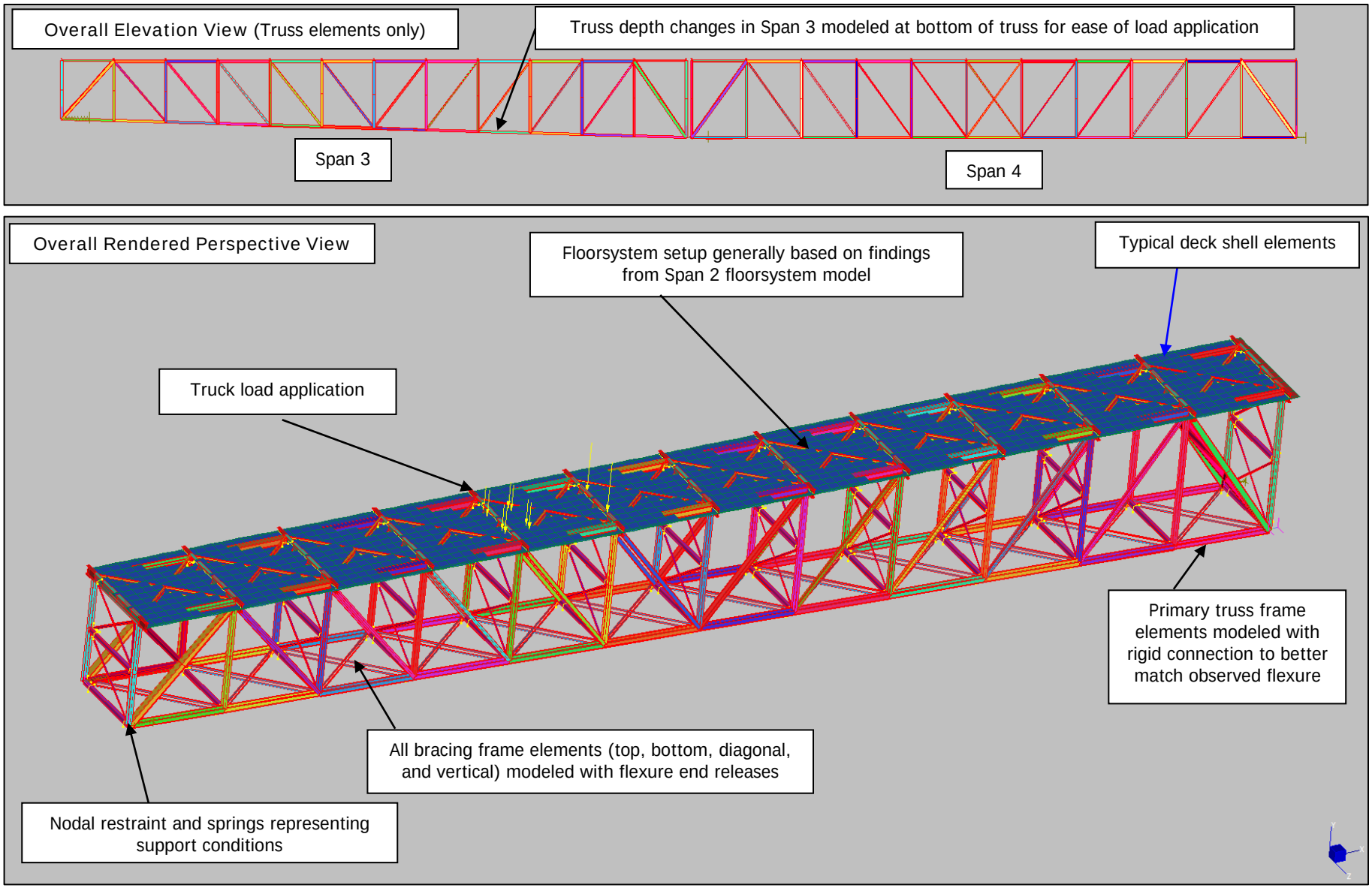


Figure 38 – Model Overview of Span 3 Truss FEM illustrating test truck on the bridge

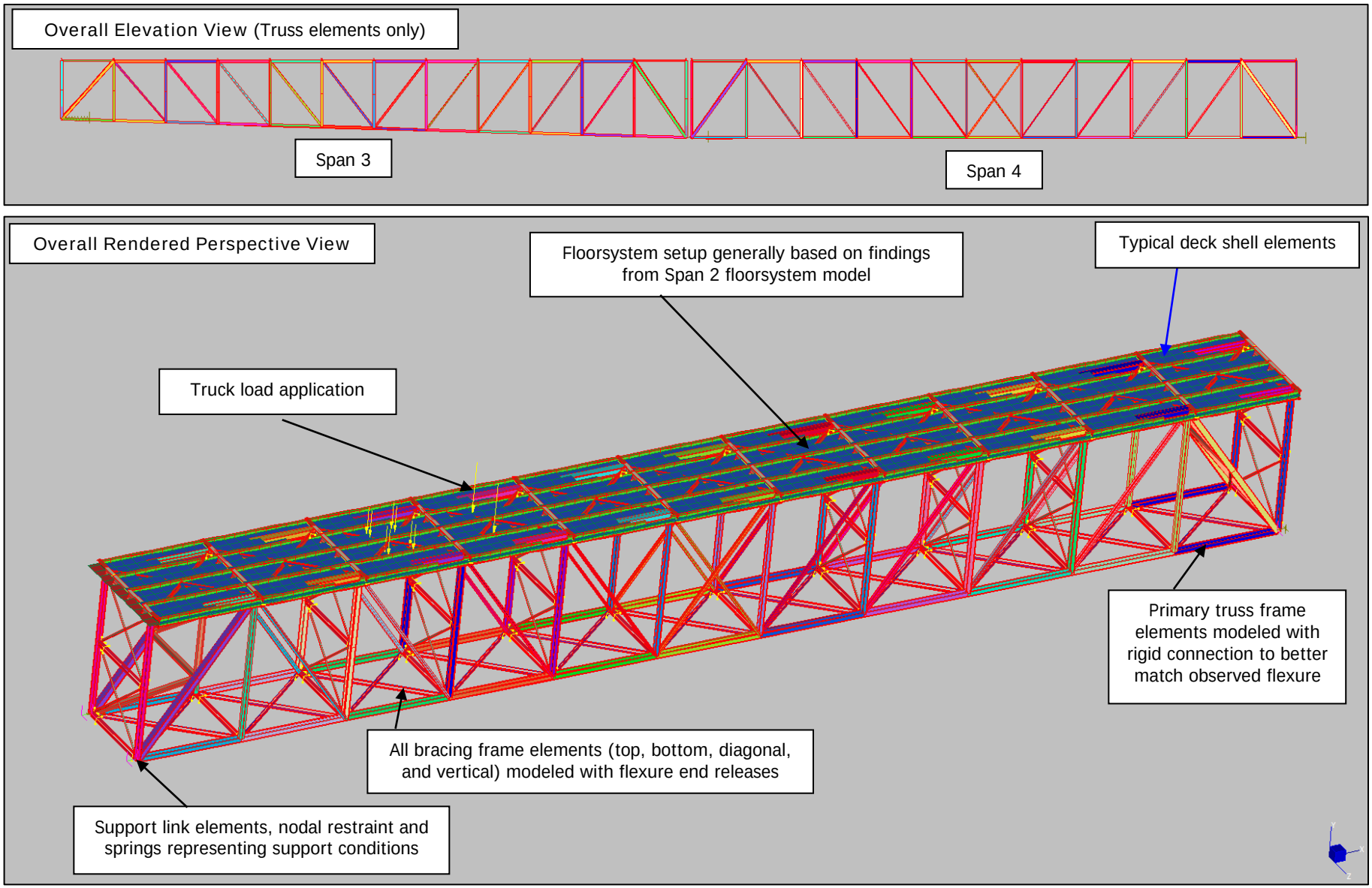


Figure 39 – Model Overview of Span 4 Truss FEM illustrating test truck on the bridge

## MODEL CALIBRATION RESULTS:

Overall, conclusions made from the data review were verified during the model calibration. The following list outlines the findings:

### Oregon Approach Span SE Findings

- EFFECTIVE DECK STIFFNESS: The effective concrete deck stiffness was approximated using an averaged or "smeared" approach; in which the elastic moduli were adjusted to better match the average behavior. A lower effective stiffness typically accounts for an increased flexibility due to flexural cracking (often at the micro-cracking stage) while a higher effective stiffness typically accounts for stiff concrete along with secondary effects such as variations in concrete thickness and wearing surface participation.

  The deck was found to behave in a flexible manner. The best fit deck properties were modeled with an approximate elastic modulus of 1000 ksi and a thickness of 5″. Additionally, the deck over the interior pier was acting very flexible and was best modeled with a modulus of 10 ksi and a thickness of 5″. This low stiffness value indicated a significant level of deterioration/cracking in the deck, when compared to the expected modulus value of ~2850 ksi (based on f`c = 2.5 ksi). This condition is common for this structure type and age and is typically due to heavy loadings over time. Note that the steel girder modulus was assumed to be 29,000 ksi. The flexible concrete stiffness verified during the model calibration were utilized for load rating.

- SUPPORT FIXITY BEHAVIOR: Support fixity was investigated based on the review of the responses data, which was likely caused by friction-based restraint at the beam supports. This behavior was important to investigate the effects of this common support behavior so that other parameters were not overestimated to simulate the structural responses.

  Eccentric translational springs at the girder supports were utilized to simulate the support resistance. During model calibration, it was found that the support fixity behavior was very non-linear and inconsistent, with variation between beam lines and as the test truck crossed the structure. In order to match the global behavior, stiff support springs in the range of 500-1000 kip/in were required. However, to better match the measured beam stress behavior, more flexible support spring in the range of 0-250 kip/in were used. In general, the restraint behavior varied enough for most of this behavior to not to be considered for load rating. However, restraint at the interior pier was considered for rating to ensure that the negative flexure while the adjacent span was loaded was not significantly overpredicted when compared to the test data.

- CONTINUITY BEHAVIOR: For live-load and deck loading, the beams were modeled as fully continuous between spans in order to match the observed behavior. Additionally, the stiffener plates over the interior pier were accounted for in beam stiffness in these regions for a total of four longitudinal feet (two feet on either side of the interior support). The beams were assumed to be simply supported for self-weight, as it was assumed the beam splice was created during onsite construction.

- COMPOSITE BEHAVIOR: Overall, the composite action between the steel beams and concrete deck was inconsistent/unreliable. Even near midspan, the level partial composite behavior was observed vary between beam lines during model calibration. Given that this behavior was observed to be unreliable and inconsistent, all levels of composite action were eliminated for load rating. The final and rating model comparison plots shown in this report section therefore did not contain model attributes simulating this behavior.

Example response comparison plots for both the final and rating models have been provided in Figure 40 through Figure 51 so that a comparison of calibrated and rating models could be made. In these response comparison plots; modeled responses were provided as discrete markers showing the computed response for each load case used to simulate the test. Given that the composite and support behavior varied significantly, two different calibrated models were highlighted. One calibrated model with significant support restraint was found to best match the global behavior (rotation and displacement) as well as the stress behavior near the supports. The second calibrated model used for these plots considered minor support restraint which better matched the beam stress behavior near midspan. Finally, the rating model only considered support restraint at the interior pier to reduce the overestimation of negative flexure while the adjacent spans were loaded.

Figure 52 and Figure 53 compare the measured and computed lateral beam stress and displacement distribution near midspan for both the calibrated and rating models, where the modelled responses are shown as dotted lines.

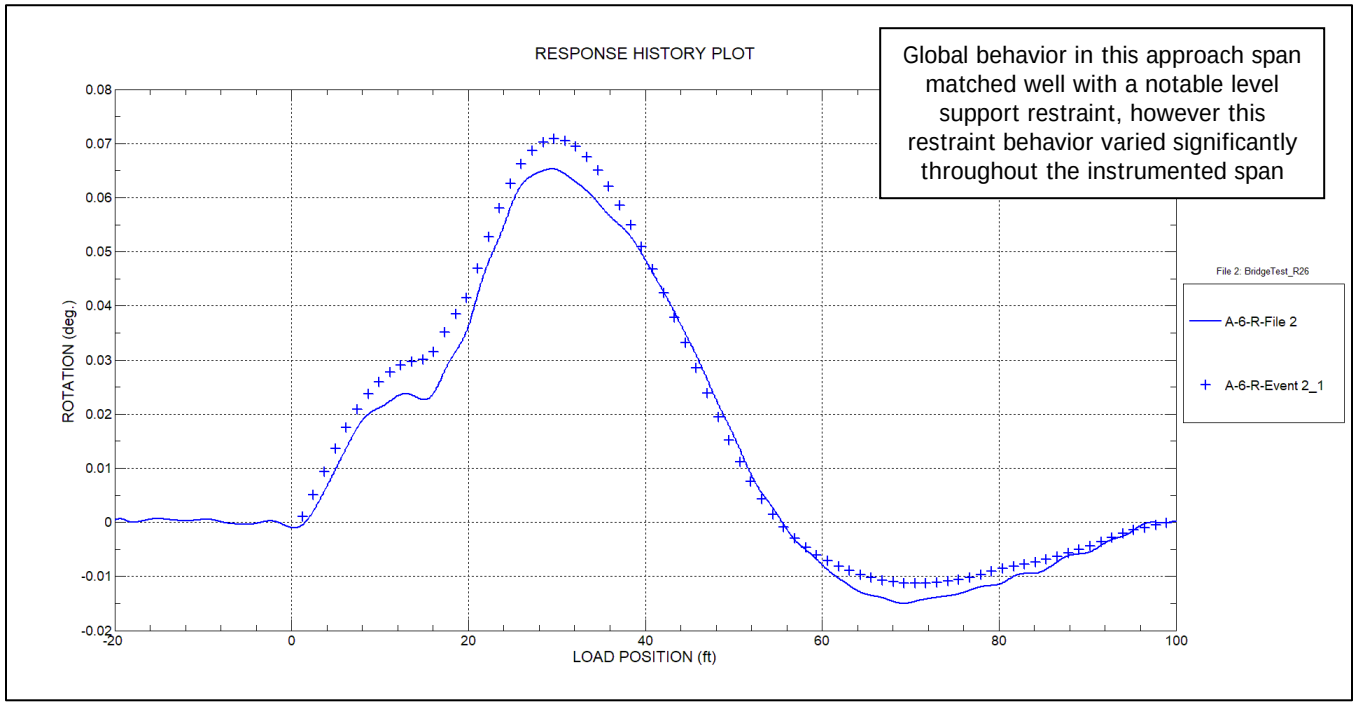


Figure 40 – Response comparison plot – Final Model with significant support restraint – OR Approach Span SE – Section A near abutment – Interior stringer 4 – Stringer rotation – Truck path Y2

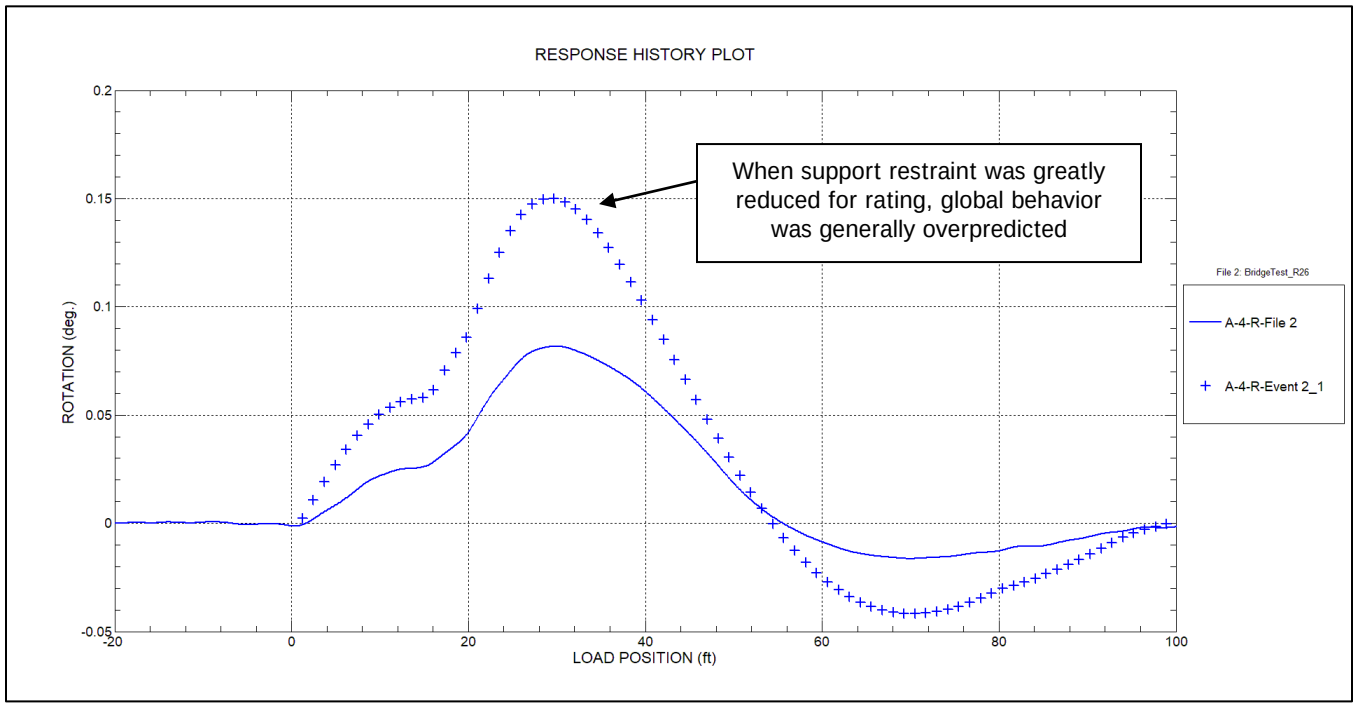


Figure 41 – Response comparison plot – Rating Model – OR Approach Span SE – Section A near abutment – Interior stringer 4 – Stringer rotation – Truck path Y2

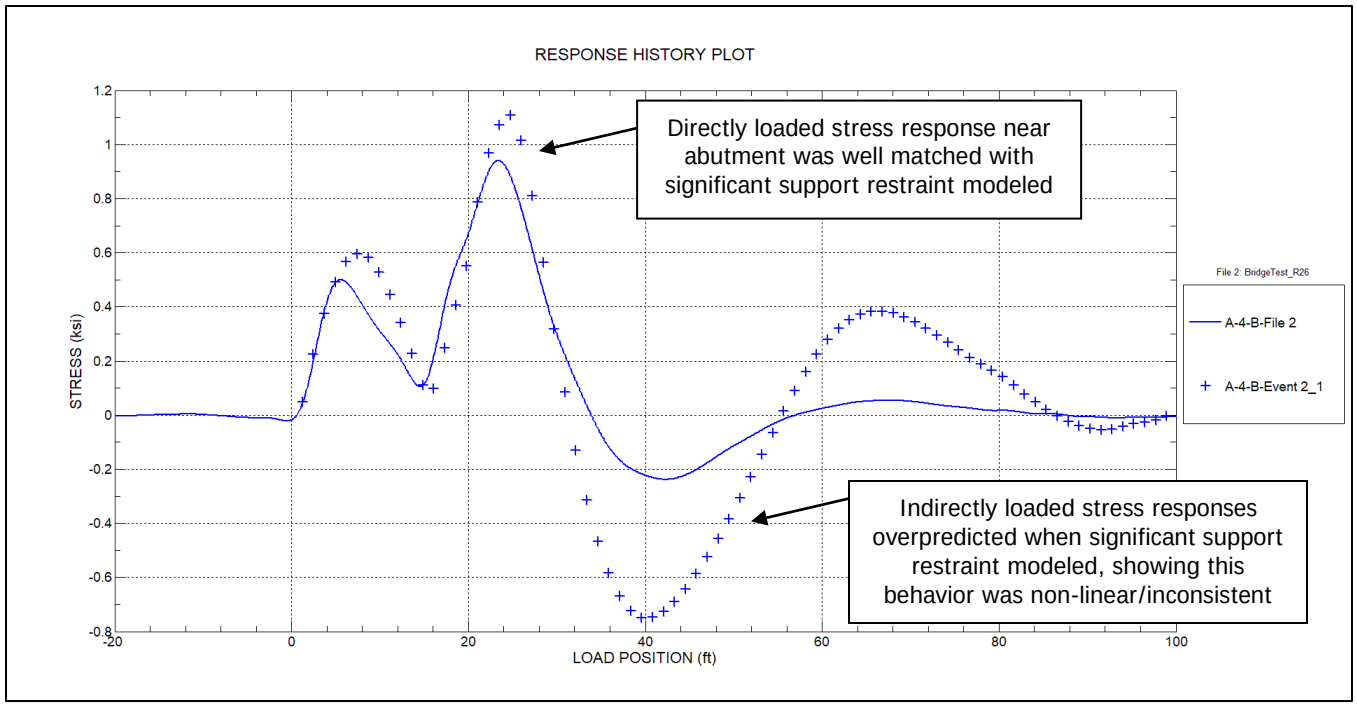


Figure 42 – Response comparison plot – Final Model with significant support restraint – OR Approach Span SE – Section A near abutment – Interior stringer 4 – Stress along bottom of stringer – Truck path Y2

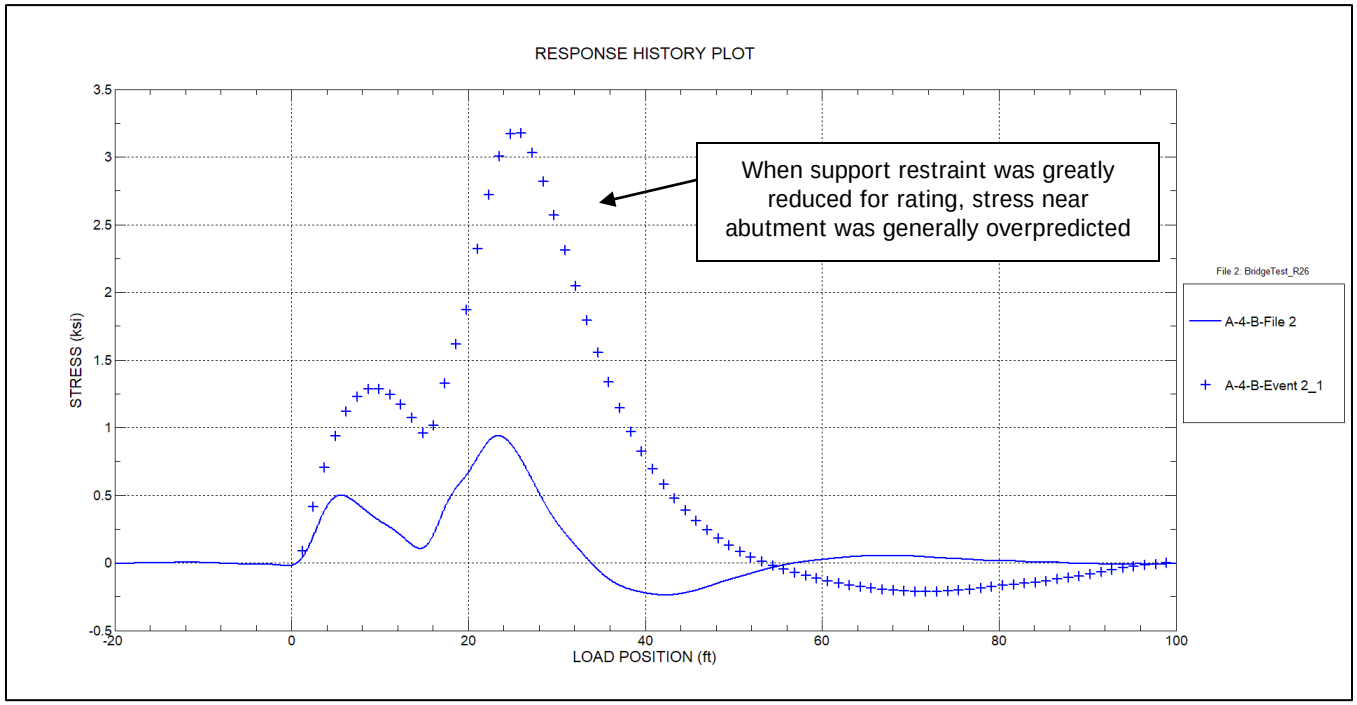


Figure 43 – Response comparison plot – Rating Model – OR Approach Span SE – Section A near abutment – Interior stringer 4 – Stress along bottom of stringer – Truck path Y2

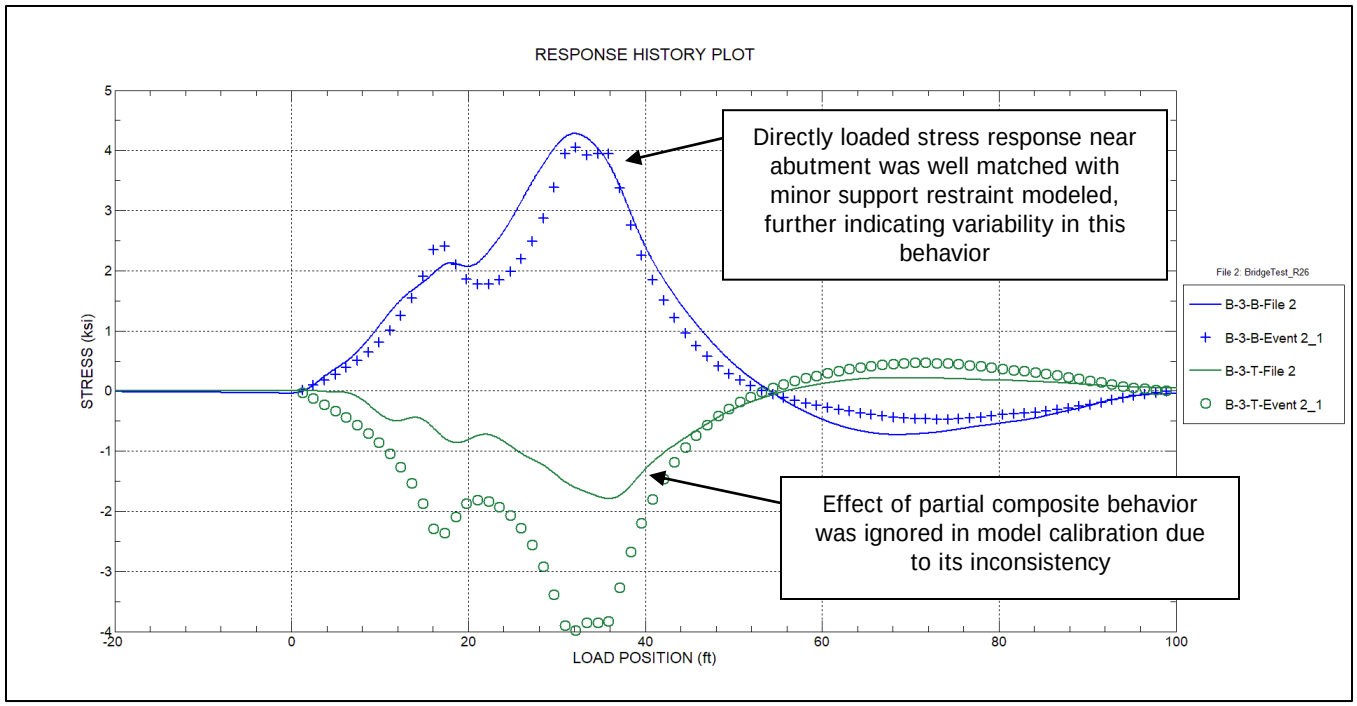


Figure 44 – Response comparison plot – Final Model with minor support restraint – OR Approach Span SE – Section B near midspan – Interior stringer 3 – Stress along bottom and top of stringer – Truck path Y2

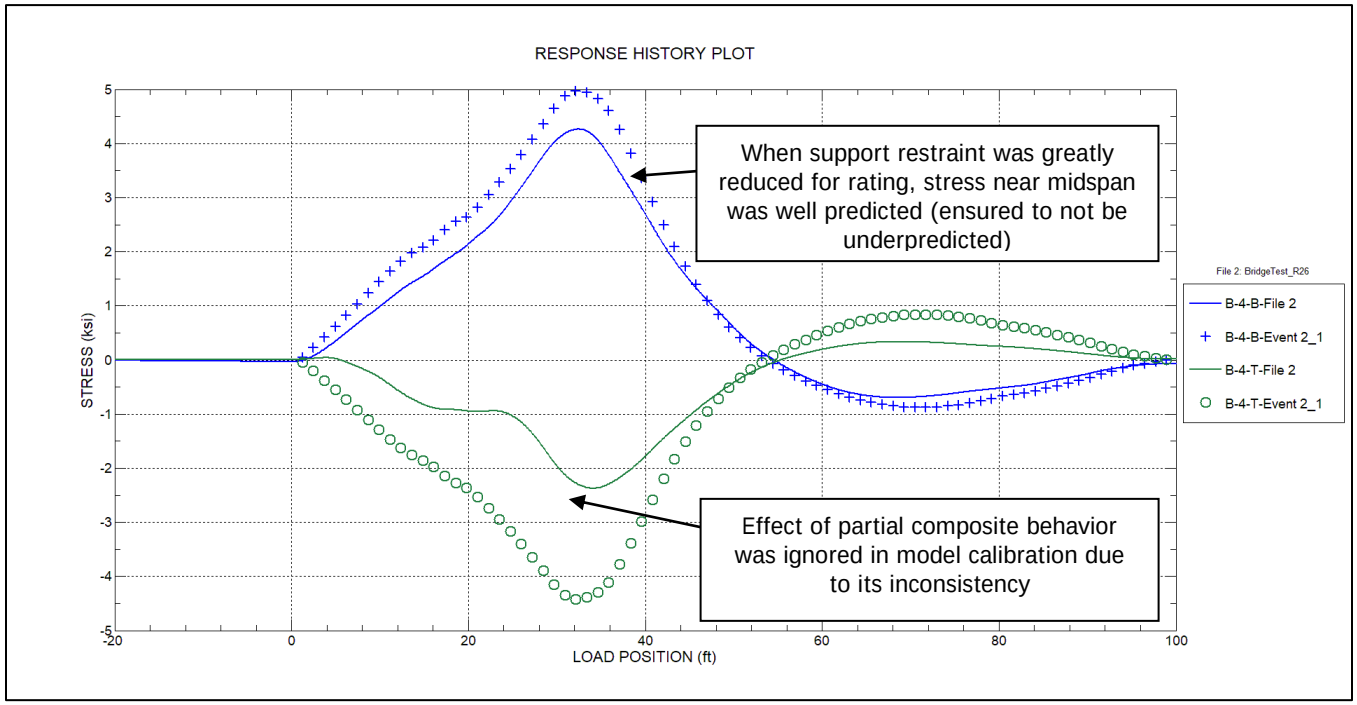


Figure 45 – Response comparison plot – Rating Model – OR Approach Span SE – Section B near midspan – Interior stringer 4 – Stress along bottom and top of stringer – Truck path Y2

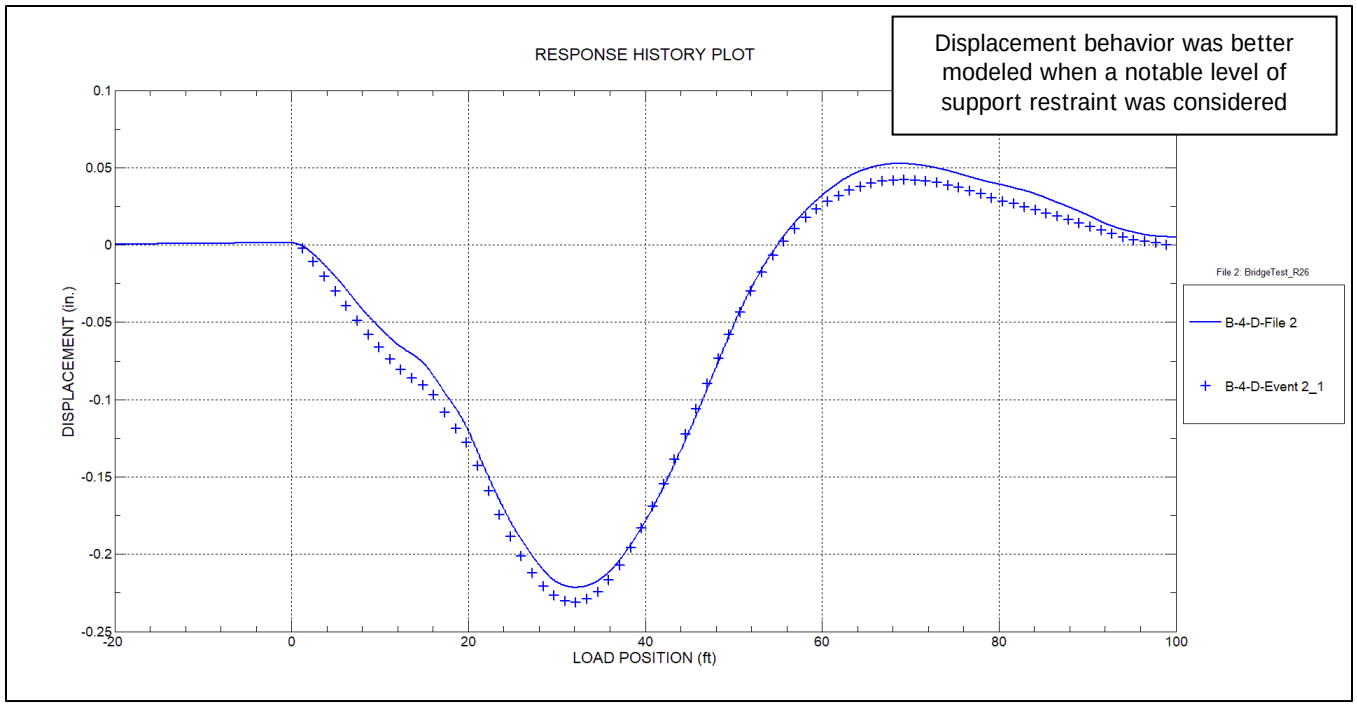


Figure 46 – Response comparison plot – Final Model with significant support restraint – OR Approach Span SE – Section B near midspan – Interior stringer 4 – Stringer displacement – Truck path Y2

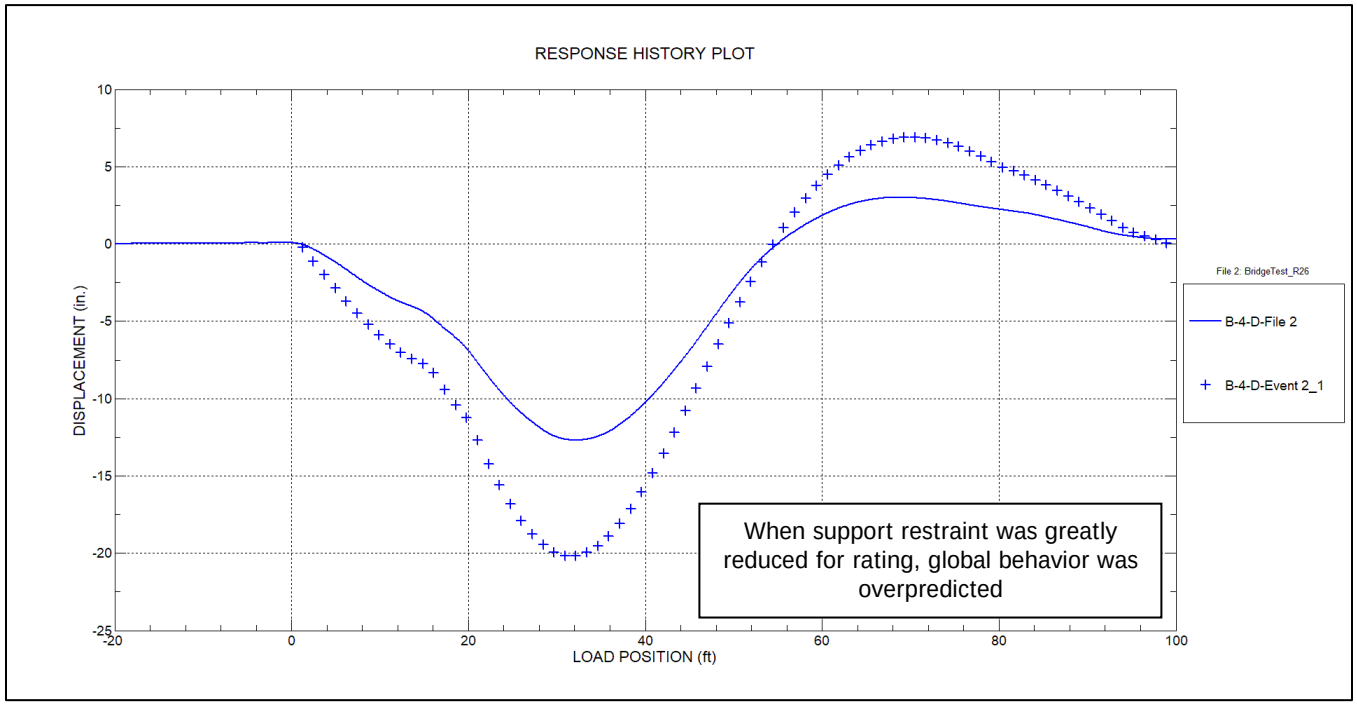


Figure 47 – Response comparison plot – Rating Model – OR Approach Span SE – Section B near midspan – Interior Girder 4 – Stringer displacement – Truck path Y2

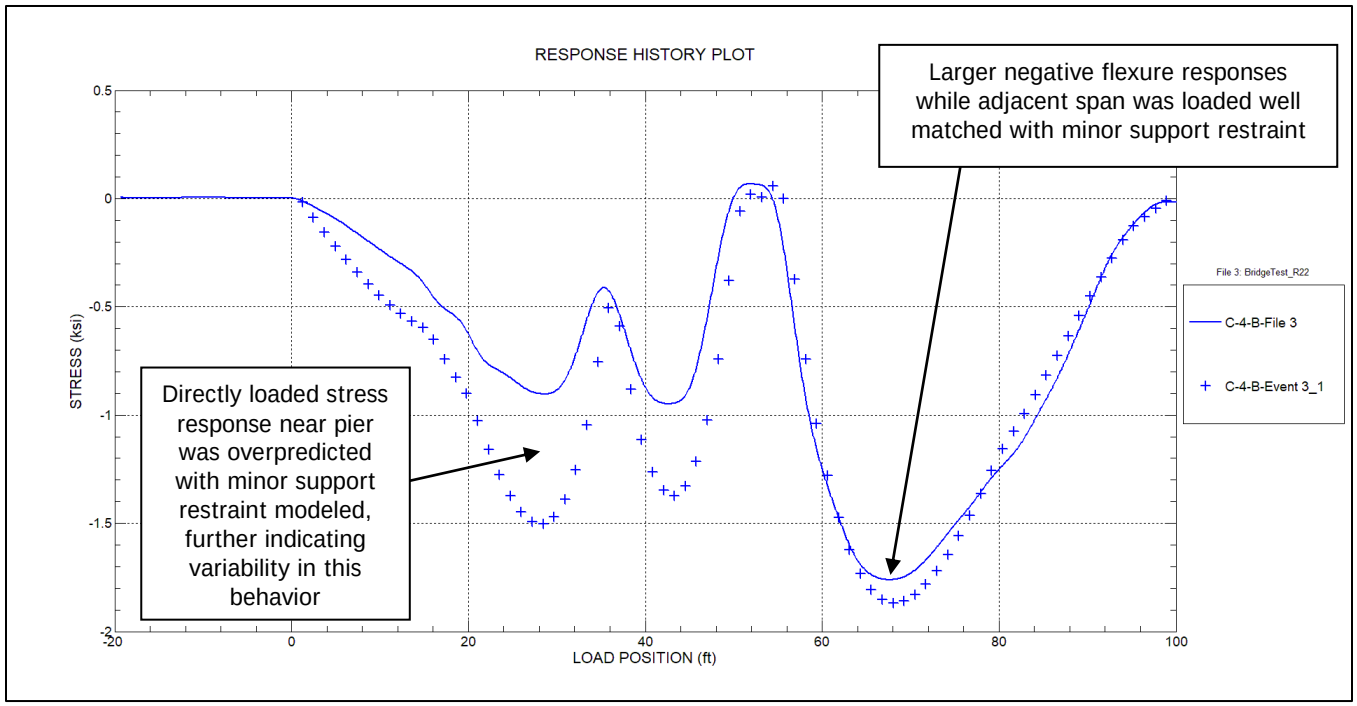


Figure 48 – Response comparison plot – Final Model with minor support restraint – OR Approach Span SE – Section C near interior pier – Interior stringer 4 – Stress along bottom of stringer – Truck path Y3

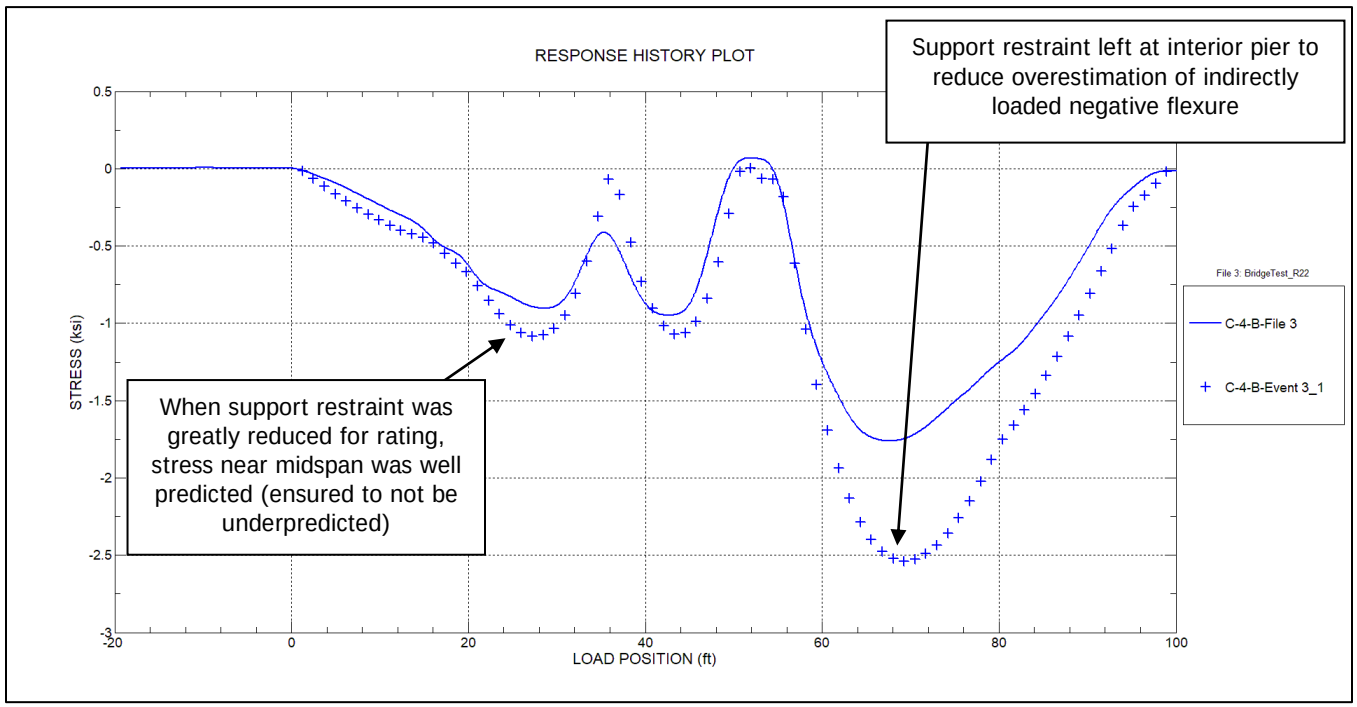


Figure 49 – Response comparison plot – Rating Model – OR Approach Span SE – Section C near interior pier – Interior stringer 4 – Stress along bottom of stringer – Truck path Y3

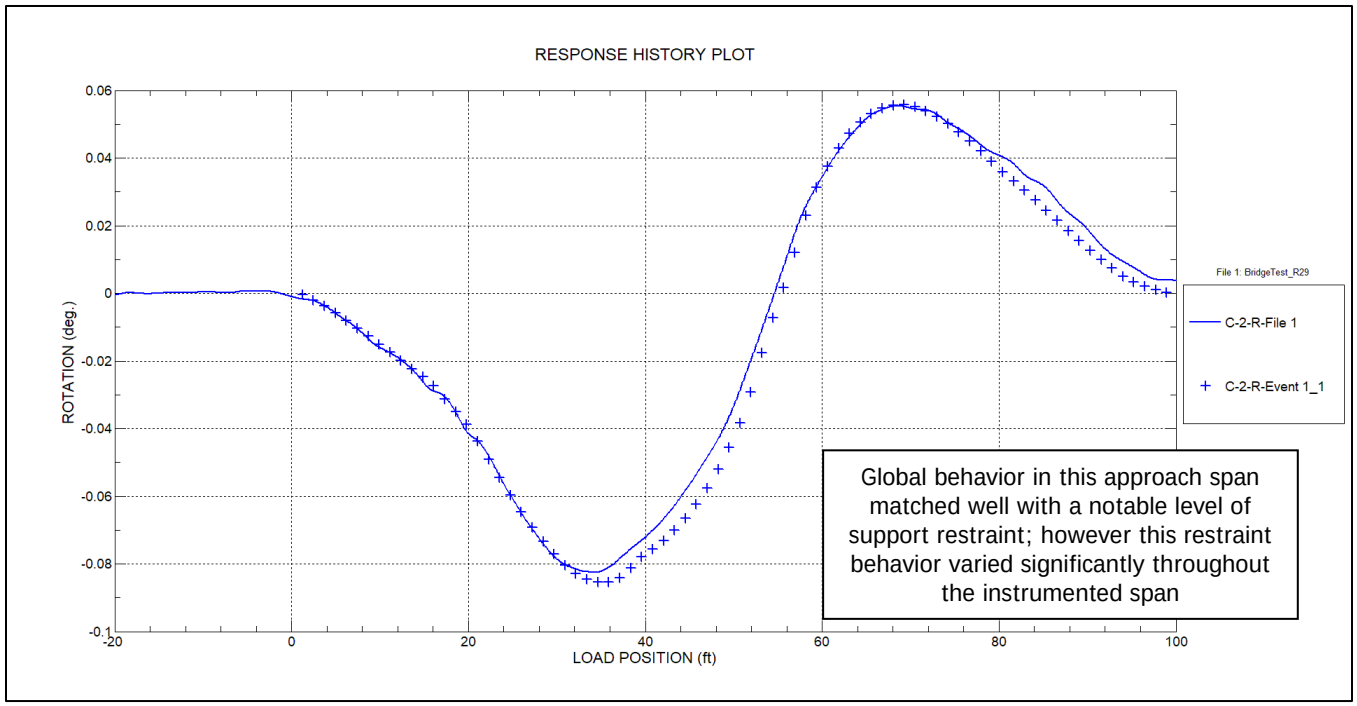


Figure 50 – Response comparison plot – Final Model with significant support restraint – OR Approach Span SE – Section C near interior pier – Interior stringer 2 – Stringer rotation – Truck path Y1

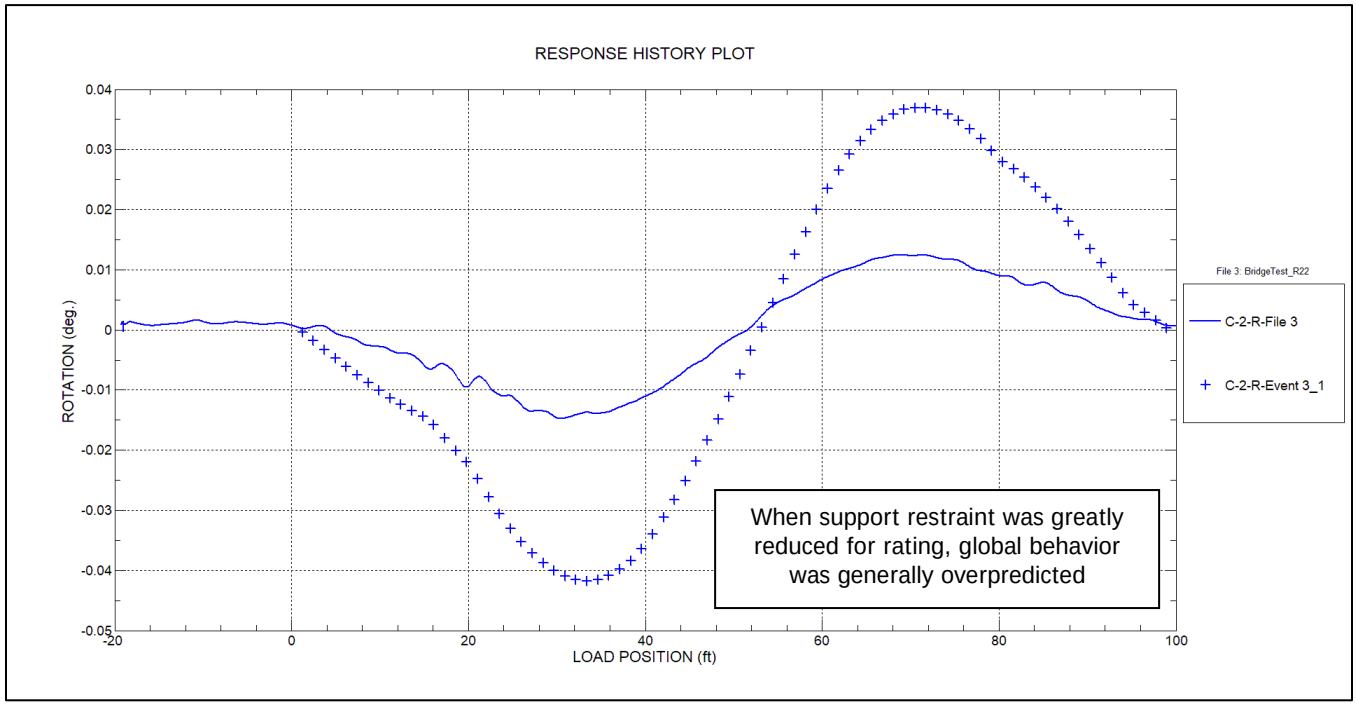


Figure 51 – Response comparison plot – Rating Model – OR Approach Span SE – Section C near interior pier – Interior stringer 2 – Stringer rotation – Truck path Y3

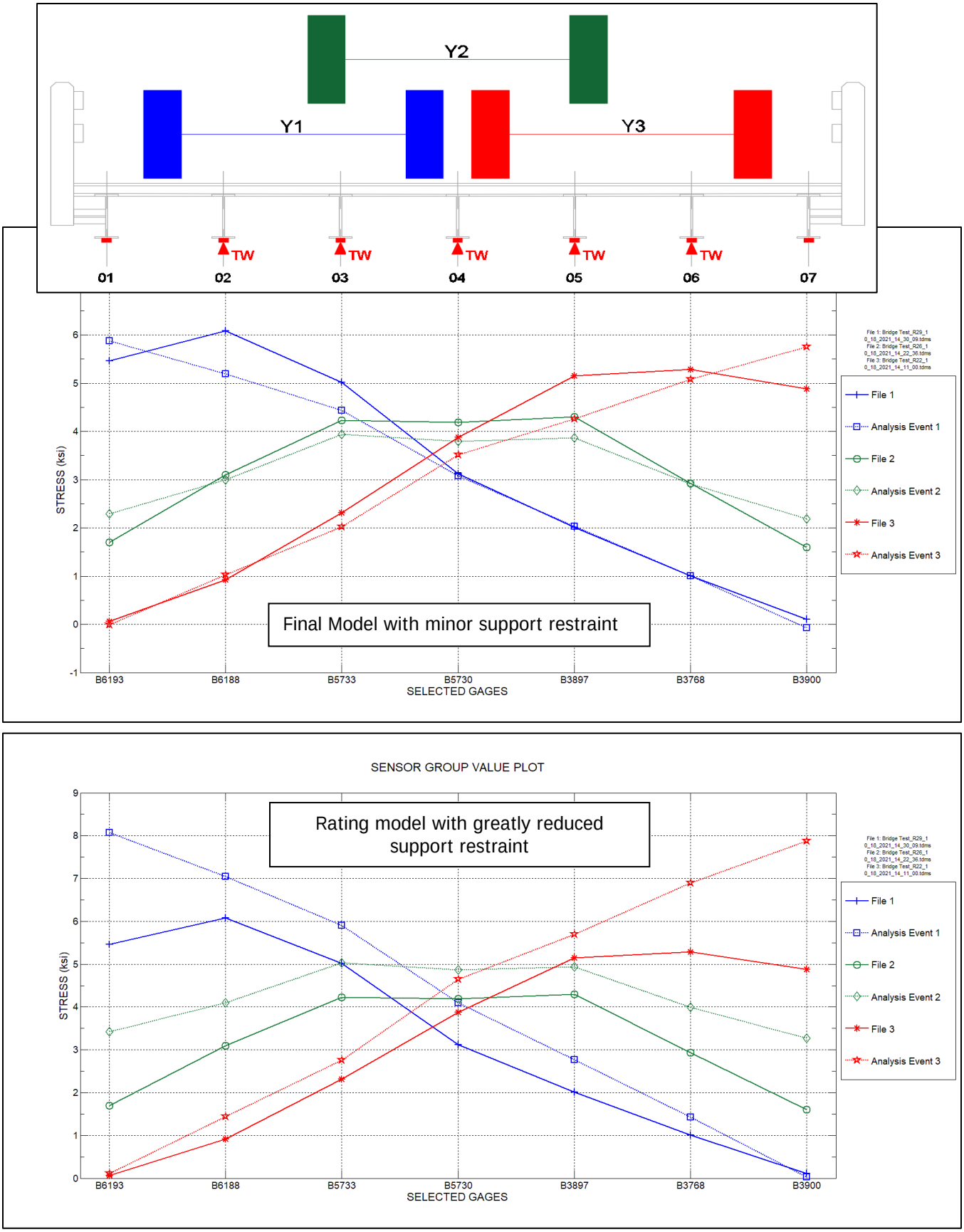


Figure 52 – Lateral distribution plot – OR Approach Span SE - Section B – Peak stringer stress responses – Final and Rating Models – Truck paths Y1-Y3

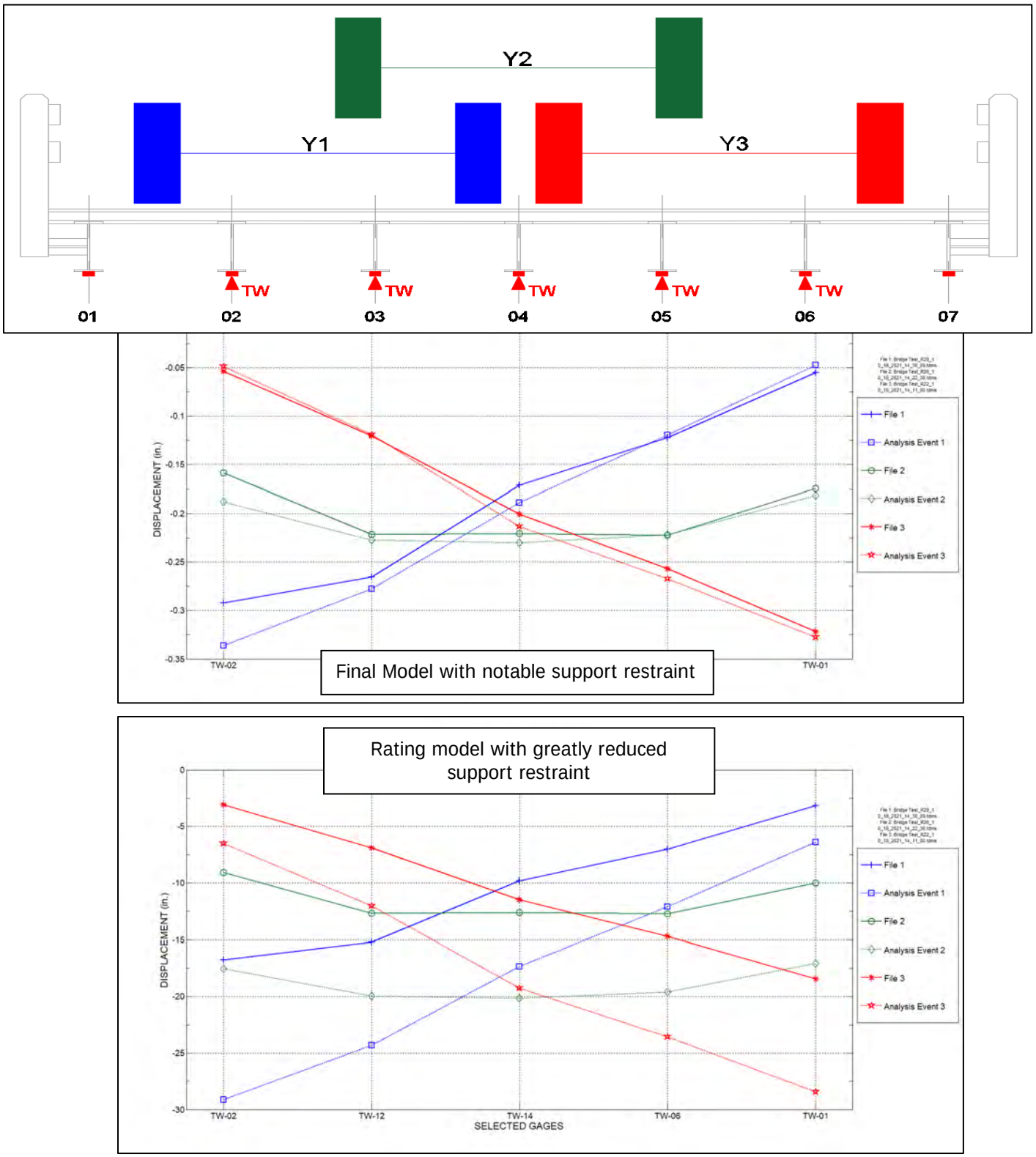


Figure 53 – Lateral distribution plot – OR Approach Span SE - Section B – Peak stringer displacement responses – Final and Rating Models – Truck paths Y1-Y3

## Washington Approach Span 23 Findings

- EFFECTIVE DECK STIFFNESS: The effective deck/beam stiffness was approximated using an averaged or "smeared" approach; in which the elastic moduli were adjusted to better match the average behavior. A lower effective stiffness typically accounts for an increased flexibility due to flexural cracking (often at the micro-cracking stage) while a higher effective stiffness accounts for stiff concrete along with secondary effects such as variations in concrete thickness.

  The majority of the concrete was found to behave within the expected design stiffness range. The best fit deck/beam properties were modeled with accurate structural dimensions and approximate elastic moduli of 2850 & 3600 ksi for the original and newer exterior beams, respectively. The expected concrete stiffness verified during model calibration was utilized for load rating.

- SUPPORT FIXITY /SPAN CONTINUITY BEHAVIOR: Support fixity and span continuity was expected due to the support details and was likely caused by the connection between the beams and pier diaphragms. To match the observed behavior, multiple types of support behavior were investigated.

  Eccentric translational and rotational nodal springs at the girder supports were investigated to simulate the rotational resistance caused by the support details. Through multiple iterations of model calibration, it was found that a combination of longitudinal translational springs, eccentric from the superstructure, and rotational springs best modeled this behavior. Given this behavior was consistent and caused by the engineered support details, a portion of this behavior was considered for load rating. To account for possible seasonal variations in the support behavior, the support spring values were reduced by 50% for load rating.

Example comparison plots for the final optimized Strand7 models have been provided below in Figure 54 through Figure 58. In these response comparison plots; modeled responses were provided as discrete markers showing the computed response for each load case used to simulate the test. Figure 59 and Figure 60 compare the measured and computed lateral beam stress and displacement distribution near midspan, where the modelled responses are shown as dotted lines.

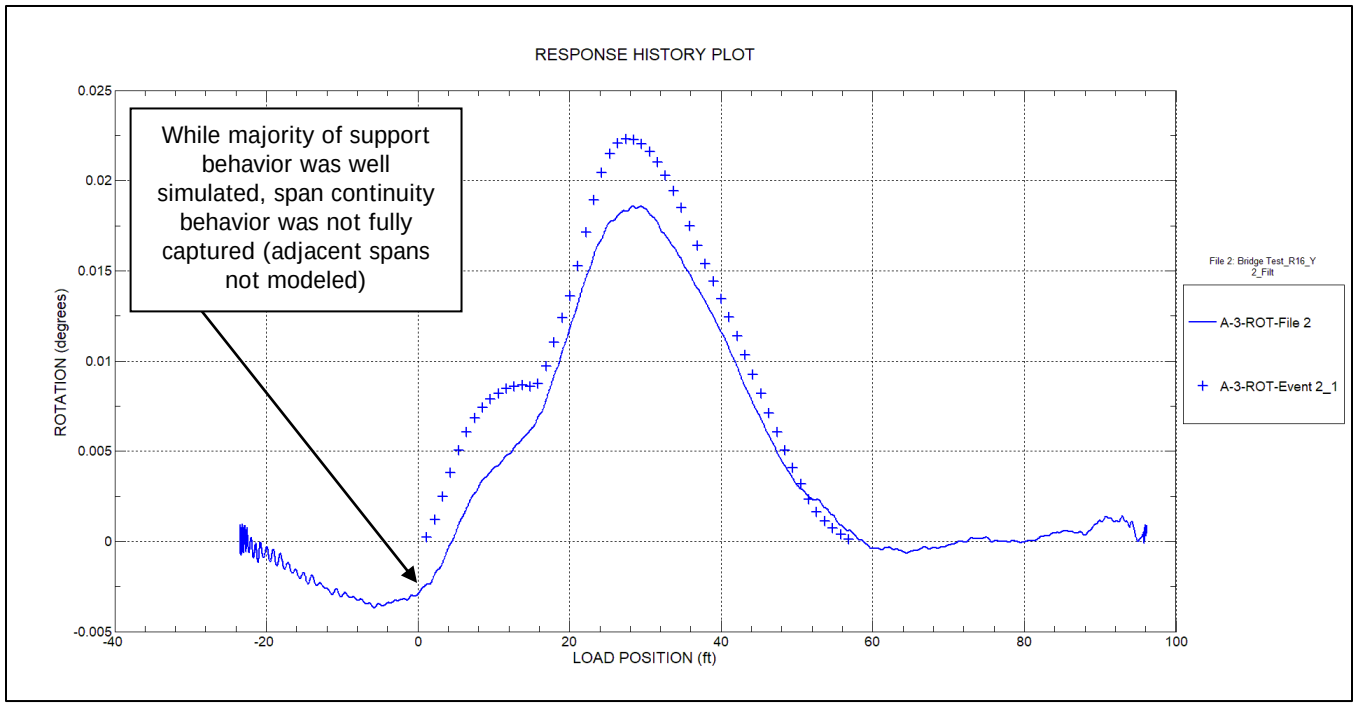


Figure 54 – Response comparison plot – WA Approach Span 23 – Final model – Section A near support – Beam Rotation – Truck path Y2

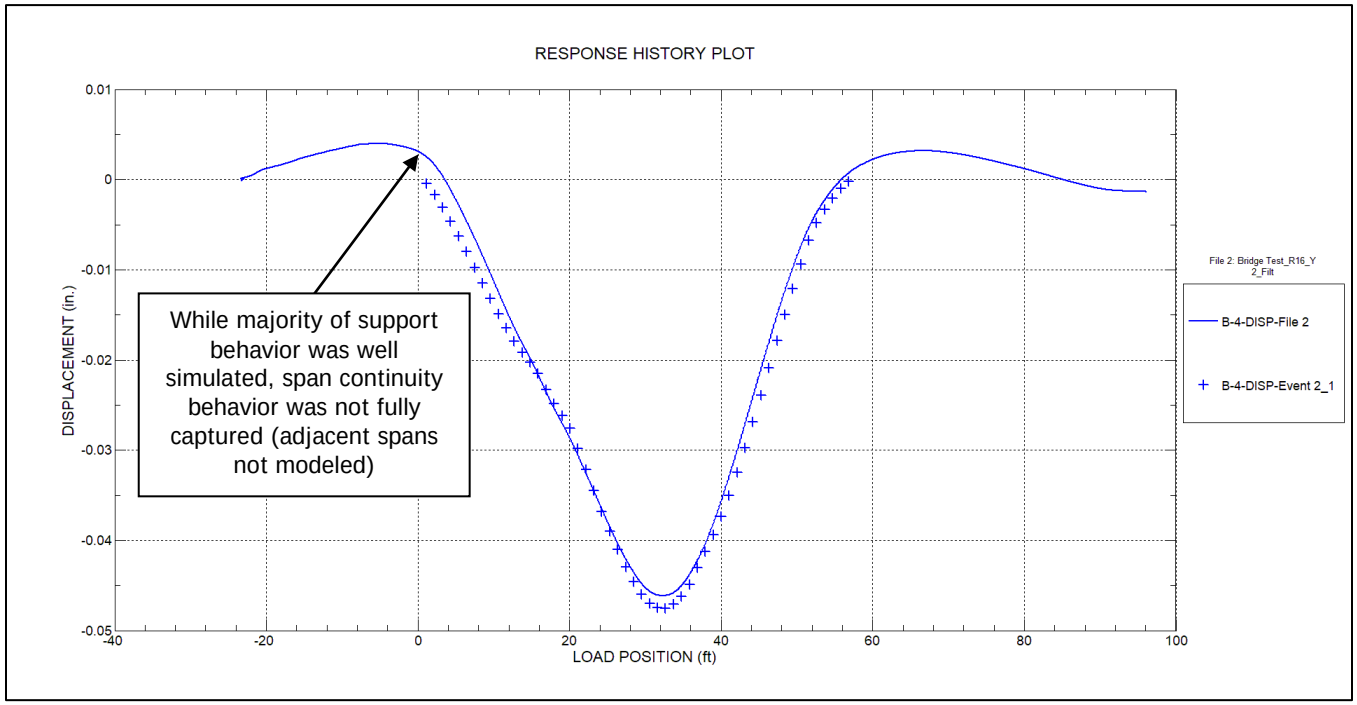


Figure 55 – Response comparison plot – WA Approach Span 23 – Final model – Section B near midspan – Beam Displacement – Truck path Y2

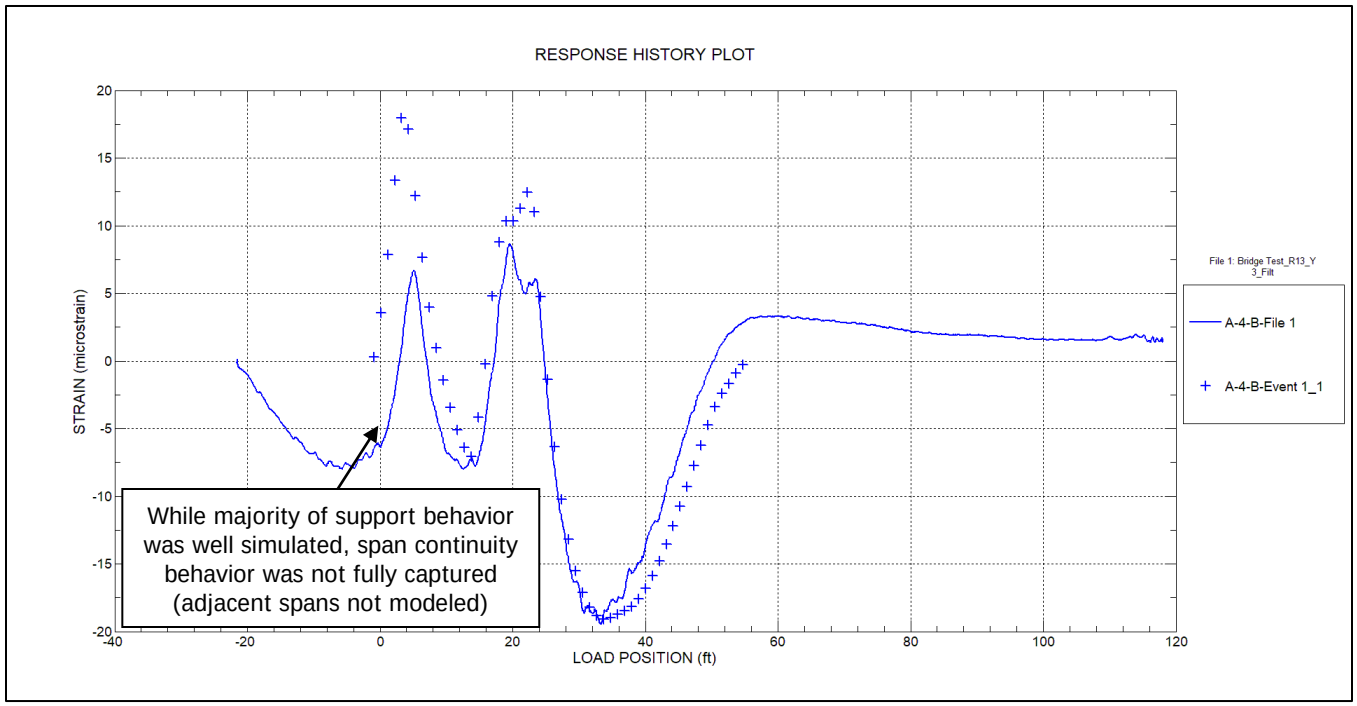


Figure 56 – Response comparison plot – WA Approach Span 23 – Final model – Section A near support – Strain along bottom of beam – Truck path Y3

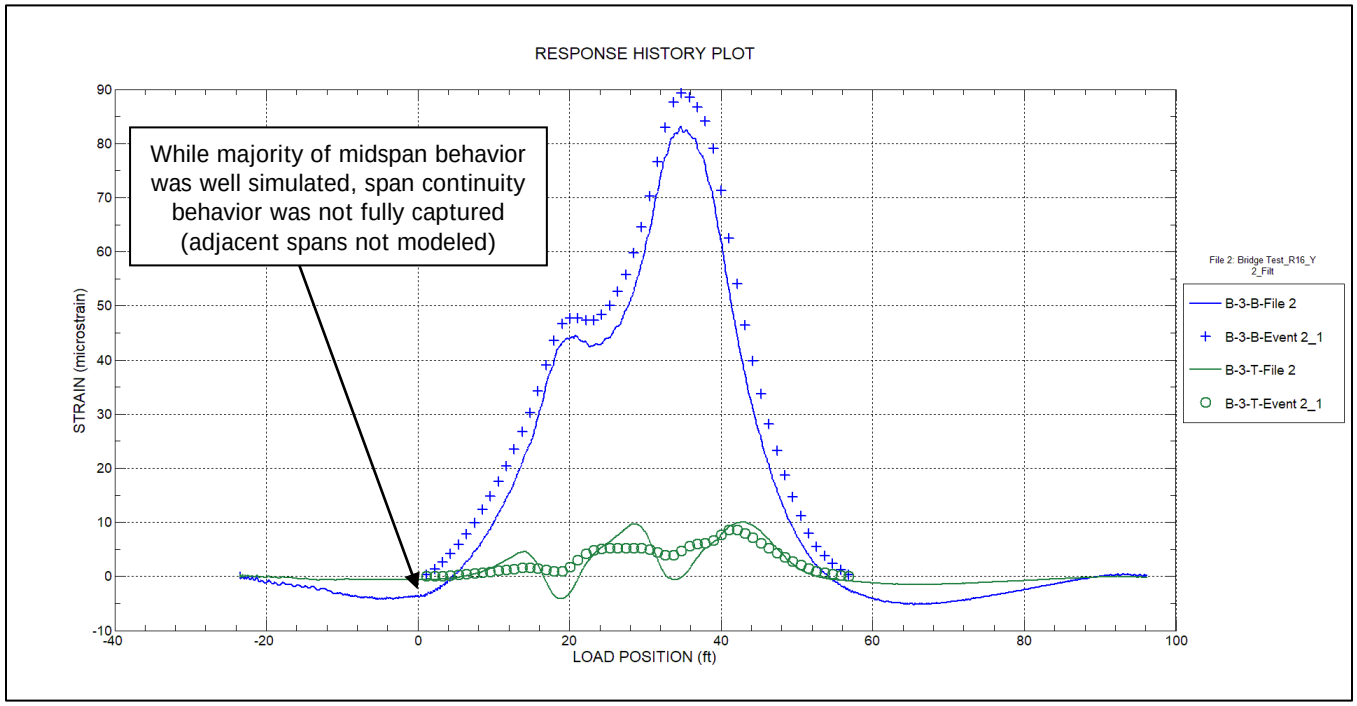


Figure 57 – Response comparison plot – WA Approach Span 23 – Final model – Section B near midspan – Strain along bottom and top of beam – Truck path Y2

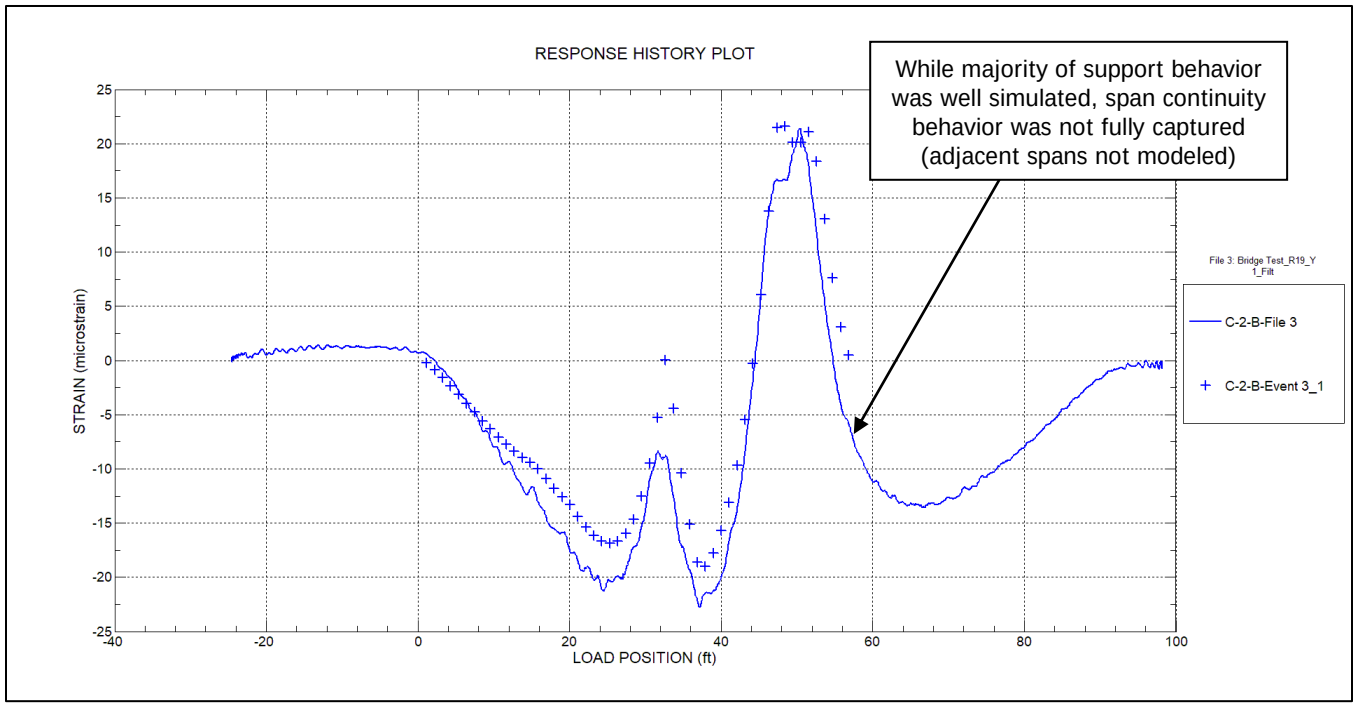


Figure 58 – Response comparison plot – WA Approach Span 23 – Final model – Section C near support – Strain along bottom of beam – Truck path Y1

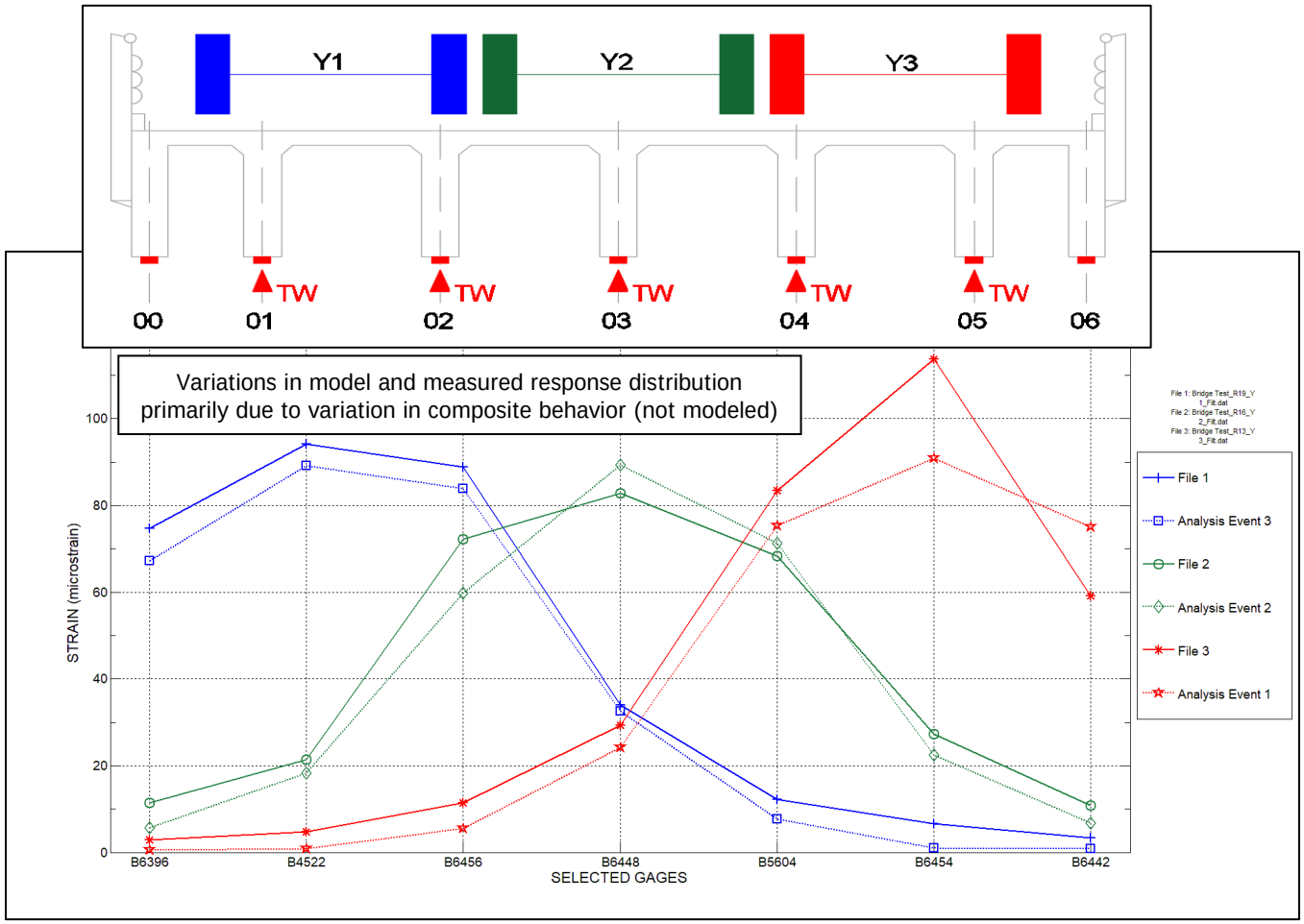


Figure 59 – Lateral distribution plot – WA Approach Span 23 – Final model – Section B – Peak beam strain responses – Final model – Truck paths Y1-Y3

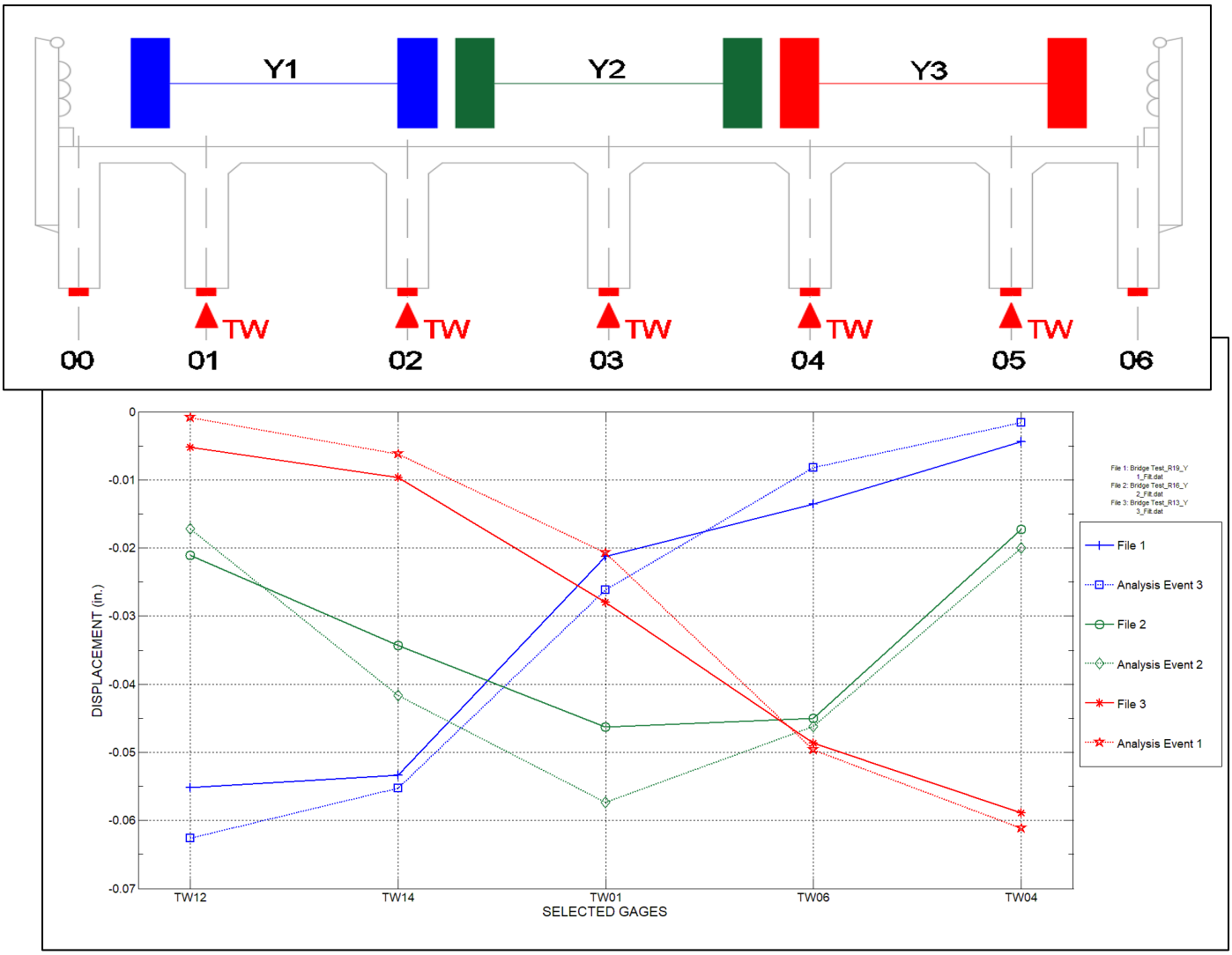


Figure 60 – Lateral distribution plot – WA Approach Span 23 - Final model – Section B – Peak beam displacement responses – Final model – Truck paths Y1-Y3

Span 2 Floor System Findings

- EFFECTIVE DECK STIFFNESS: The effective orthotropic steel deck stiffness was approximated using shell elements, with an elastic modulus of 29000 ksi and a thickness of 1.5 inches, and frame elements representing the deck channel elements. This modeling approach helped match the load distribution between stringers. This calibrated modeling of the deck was utilized for load rating.
- CONTINUITY BEHAVIOR: The stringers were consistently acting continuous between bays due to the splice plates over each floorbeam. To match the observed continuity behavior, varying levels of end-releases between bays were investigated. End release springs with stiffness of 750,000 kip-in/radian helped match the stringer behavior. Given this behavior was consistent and caused by engineered support details, this behavior was considered for load rating.
- FLOORBEAM SUPPORT FIXITY BEHAVIOR: Support behavior between the truss and floorbeams was modeled using a combination of eccentric translational and rotational nodal springs at the floorbeam supports (rotational spring values of 450,000 kip-in/radian and vertical springs of 500 kips/in). Given this behavior was consistent between the two instrumented floorbeams and a function of engineered support details, a portion of this behavior was considered for load rating. For rating the vertical springs were increased to match a rigid support and the rotational springs were reduced by 50% to account for seasonal changes in this behavior.
- FLOORBEAM STIFFENER PLATE BEHAVIOR: Midspan floorbeam responses were much lower than expected. During review of photos taken during testing it was observed that significant stiffener plates were present along the top and bottom of the floorbeam webs (both sides). The presence or dimensions of these stiffener plates could not be found in the provided plans. The field crew did not realize the stiffener plates were an unknown feature and did not obtain measurements while on site. Therefore, stiffener plate dimensions were estimated from photos. BDI used multiple floorbeam sections with varying stiffener plate sizes until an acceptable match was achieved. It was found that adding four 4″x1″ stiffener plates to the floorbeams helped match the collected responses. The floorbeam strengthening measures appeared to be an engineered solution and were therefore utilized for midspan load rating. Note: It is recommended that this information be verified through a document investigation and/or during the next bridge inspection.
- RAIL PARTICIPATION: It was observed that the measured exterior stringers responses were initially lower than model responses. This behavior is common and is typically due to a stiffening effect of the railing. During the model calibration, modeling the railing as composite with the floorsystem using beam offsets better matched the load distribution behavior. However, this behavior varied between instrumented locations and could be affected by impact from traffic. Therefore, the beam offsets of the railing elements were removed for load rating to ensure reliable rating values.

Example comparison plots for the final optimized Strand7 models have been provided below in Figure 61 through Figure 65. In these response comparison plots; modeled responses were provided as discrete markers showing the computed response for each load case used to simulate the test. Figure 66 compares the measured and computed lateral beam stress distribution near midspan of one of the instrumented stringer bays, where the modelled responses are shown as dotted lines.

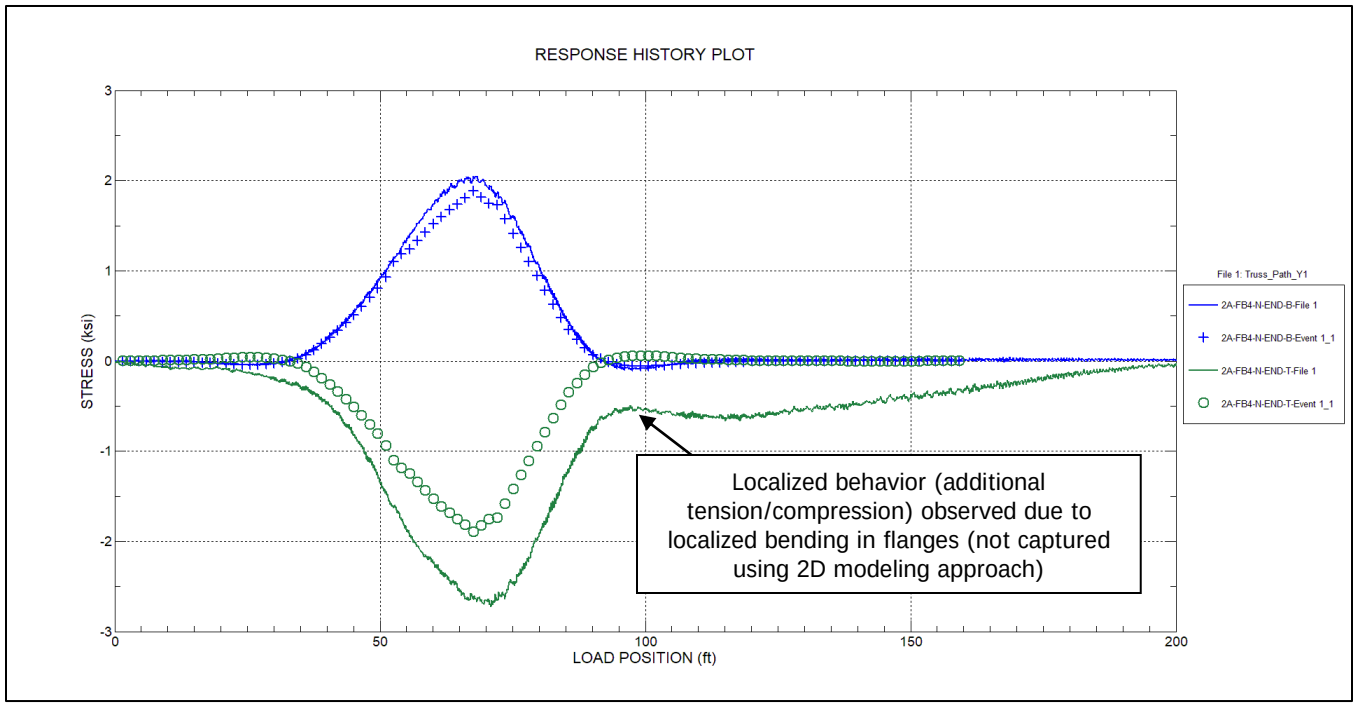


Figure 61 – Response comparison plot – Final Model – Span 2 Floorbeam 4 – Section 2A near floorbeam end – Stress along bottom and top of beam – Truck path Y1

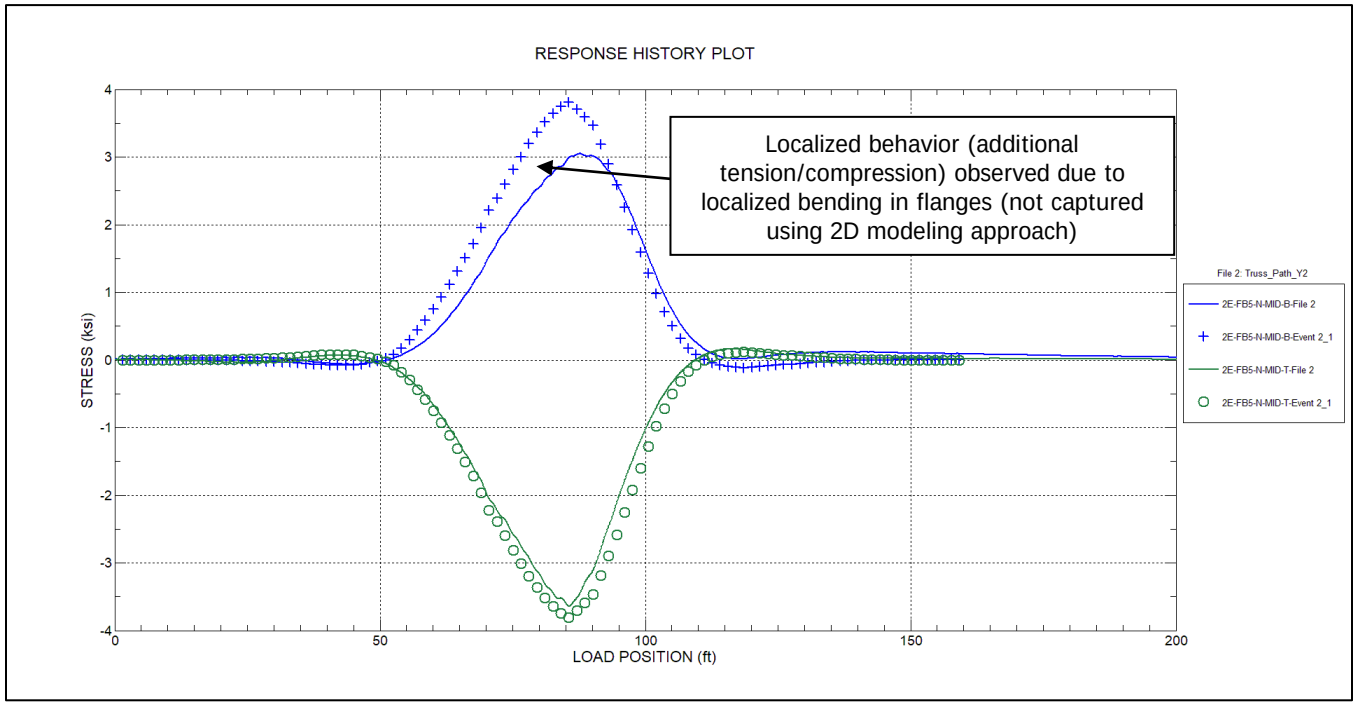


Figure 62 – Response comparison plot – Final model – Span 2 Floorbeam 5 – Section 2E near floorbeam midspan – Stress along bottom and top of beam – Truck path Y2

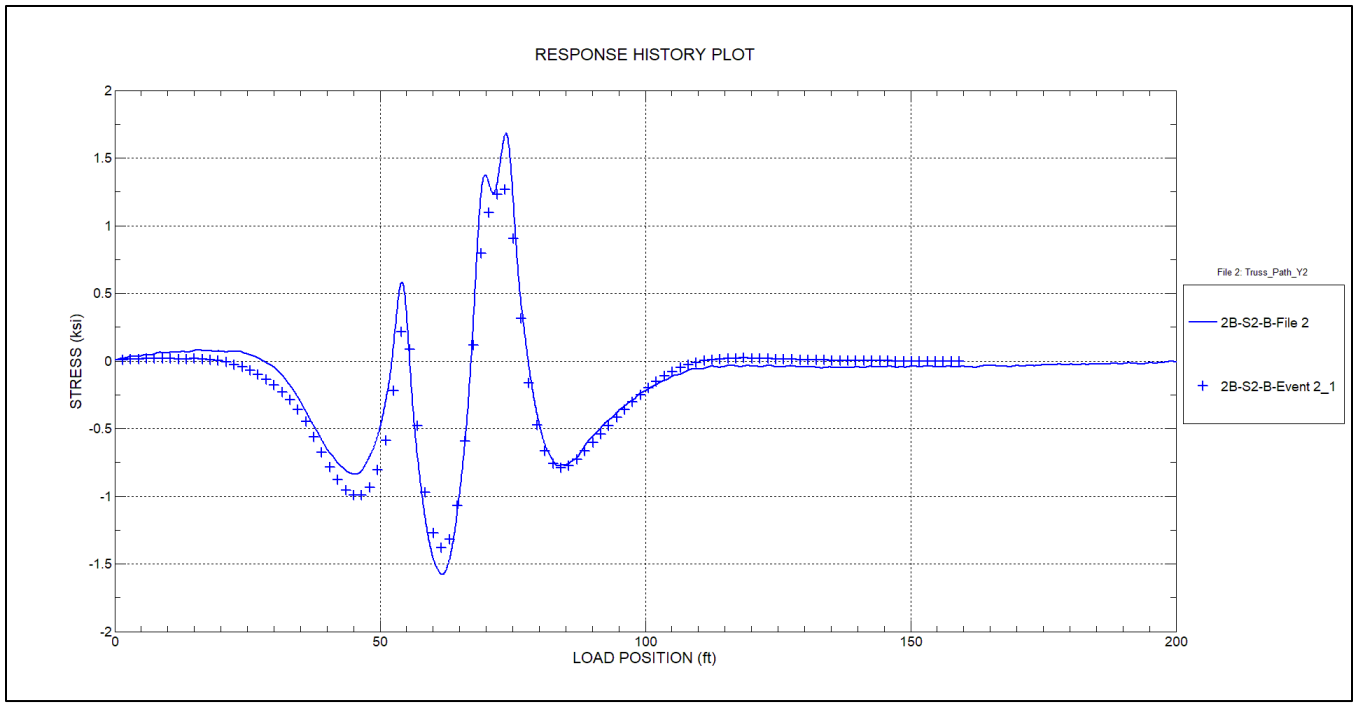


Figure 63 – Response comparison plot – Final model – Span 2 Bay 4 – Section 2B along stringer near floorbeam 4 – Interior stringer 2 – Stress along bottom of beam – Truck path Y2

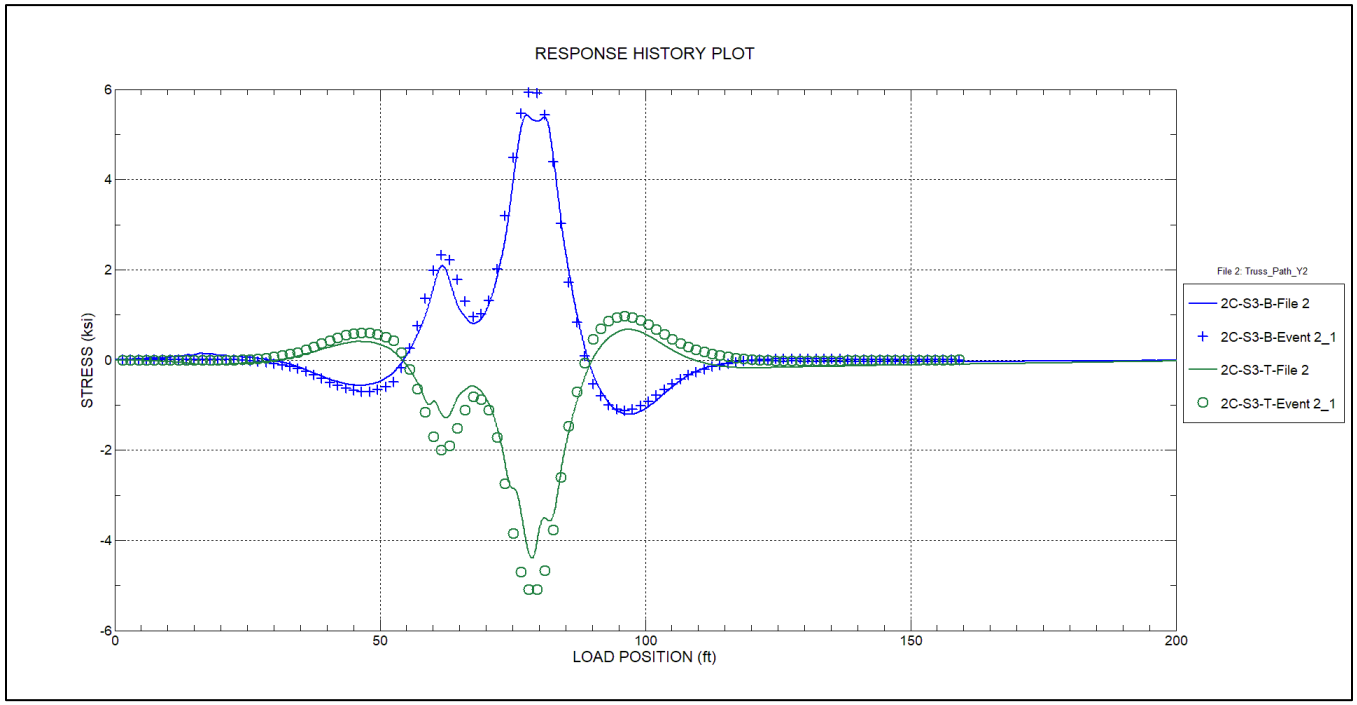


Figure 64 – Response comparison plot – Final model – Span 2 Bay 4 – Section 2C along stringer near midspan – Interior stringer 3 – Stress along bottom and top of beam – Truck path Y2

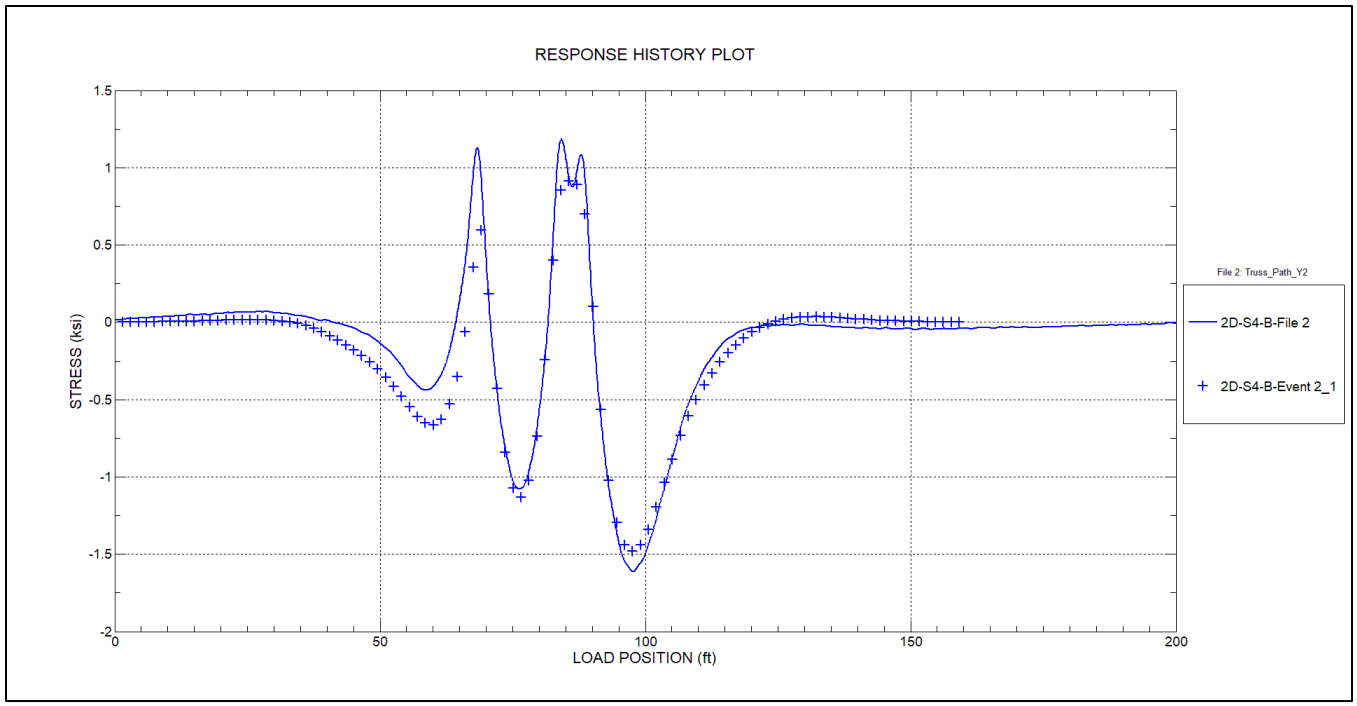


Figure 65 – Response comparison plot – Final model – Span 2 Bay 4 – Section 2D along stringer near floorbeam 5 – Interior stringer 4 – Stress along bottom of beam – Truck path Y2

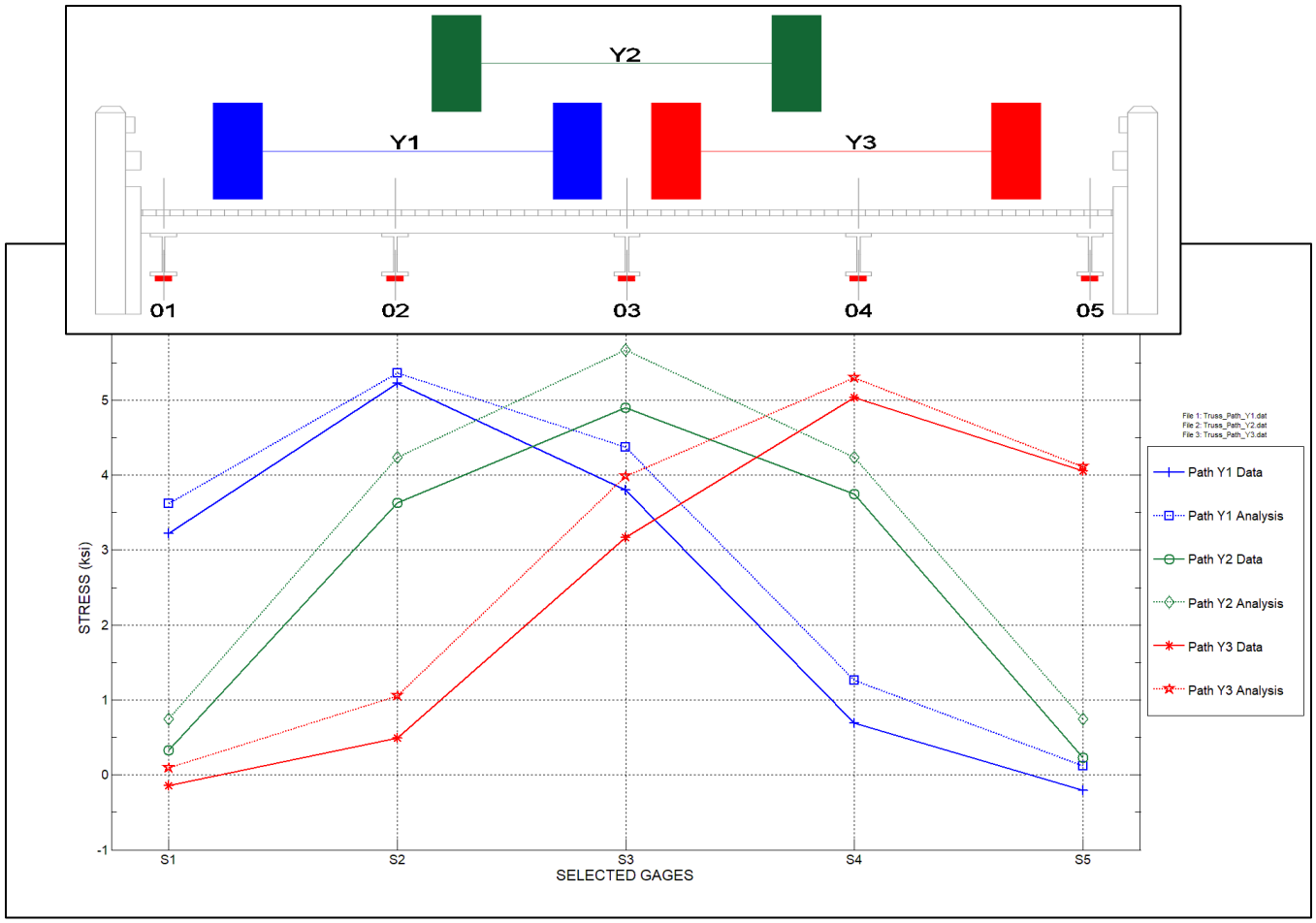


Figure 66 – Lateral distribution plot – Final model – Span 2 Bay 5 - Section G – Peak stringer stress responses – Final models – Truck paths Y1-Y3

### Span 3 & 4 Truss Findings

- EFFECTIVE FLOOR SYSTEM PROPERTIES: The findings from the model calibration of the Span 2 floor system were utilized for the Span 3 & 4 truss model calibration. However, it was found that the refined modeling of the deck elements had little to no effect on truss element responses. Therefore, the deck was modeled solely using 2″ steel shell elements to simplify the model and reduce run time.
- TRUSS SUPPORT/CONTINUITY BEHAVIOR: Minor truss support restraint and continuity between truss spans were observed in the collected responses. This support behavior was modeled using a combination of translational springs at the truss supports and axial links between the Span 3 & 4 trusses. While this support behavior could be reasonably simulated using this modeling approach, this behavior was varied support to support and was likely caused by friction-based restraint at the truss supports and minor movement of the piers that induced load into the adjacent truss spans. Given this behavior was found to vary between support locations, even at the supports designed to be fixed, this behavior was not considered for rating. For load rating, it was found that modeling the support conditions with vertical and lateral nodal restraints and minor longitudinal springs (5 kip/in) allowed for a stable model while enveloping the measured axial responses.
- TRUSS CONNECTIONS: Connections between primary truss elements were typically modeled as rigid frame connections (i.e., no flexural releases). This modeling approach helped better match the minor flexure observed during testing. However, bracing elements were modelled with end-releases of in-plane and out-of-plane moment given the flexibility of these members and their connections to the primary truss members.
- PARTICIPATION OF BRACING: It was found that modeling of all bracing elements (top, bottom, diagonal and vertical) was required to best match distribution of load between upstream and downstream trusses. This finding shows that the bracing elements provide a notable level of load distribution. Therefore, these elements were considered for rating.

Example comparison plots for the final optimized Strand7 model have been provided below. In these response comparison plots; modeled responses were provided as discrete markers showing the computed response for each load case used to simulate the test. Sensor location comparison plots for the final calibrated model have been provided in Figure 67 through Figure 69. These plots help highlight the model's ability to simulate the truss member flexure. Average truss member comparison plots, which correspond to the axial response of the truss members, have been provided in Figure 70 through Figure 76.

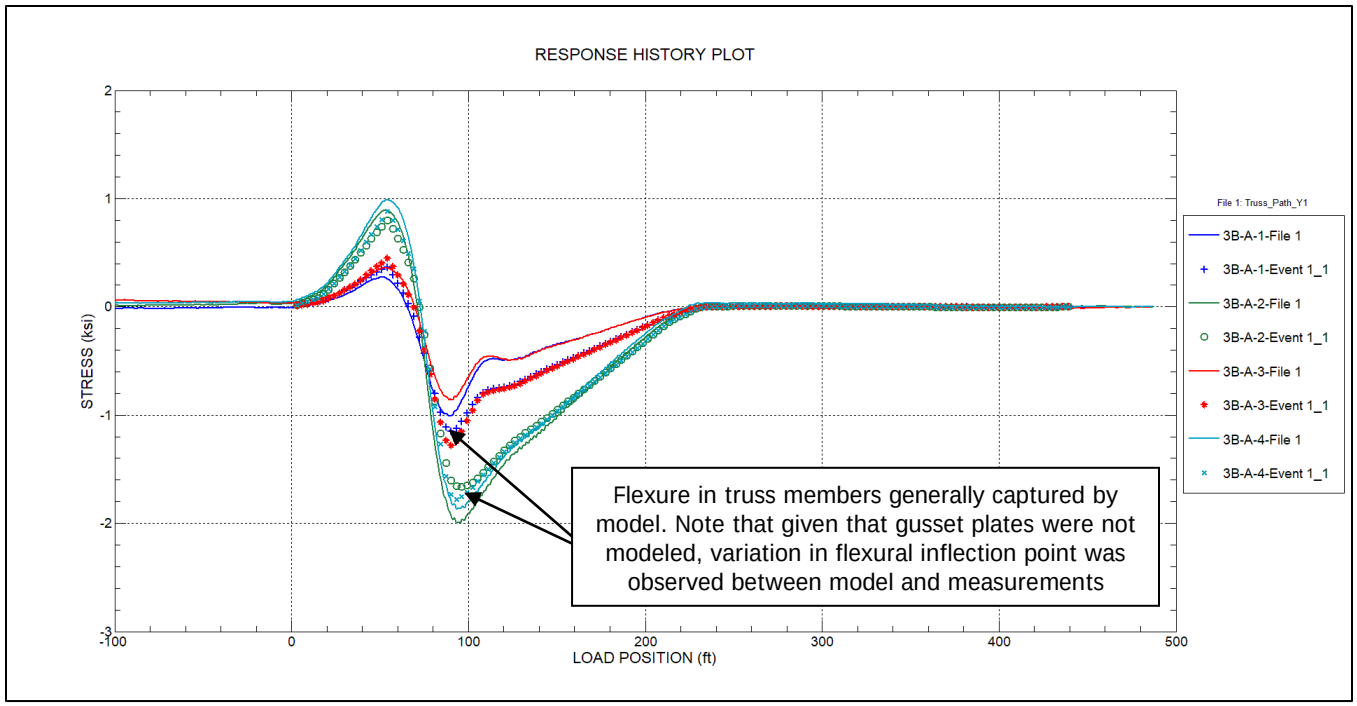


Figure 67 – Response comparison plot – Final model – Span 3 downstream U4-L4 – Section 3B-A along vertical near panel point 4 – Stresses along section edges – Truck path Y1

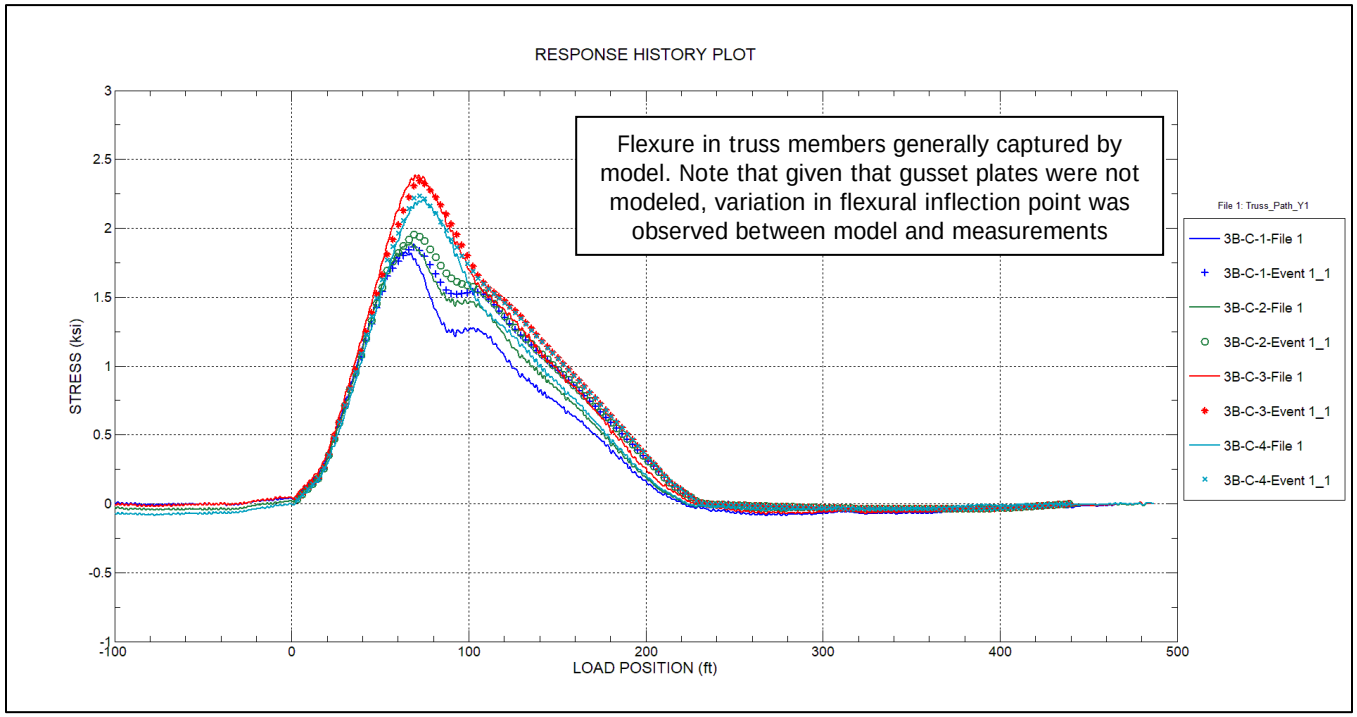


Figure 68 – Response comparison plot – Final model – Span 3 downstream L3-L4 – Section 3B-C along bottom chord near panel point 4 – Stresses along section edges – Truck path Y1

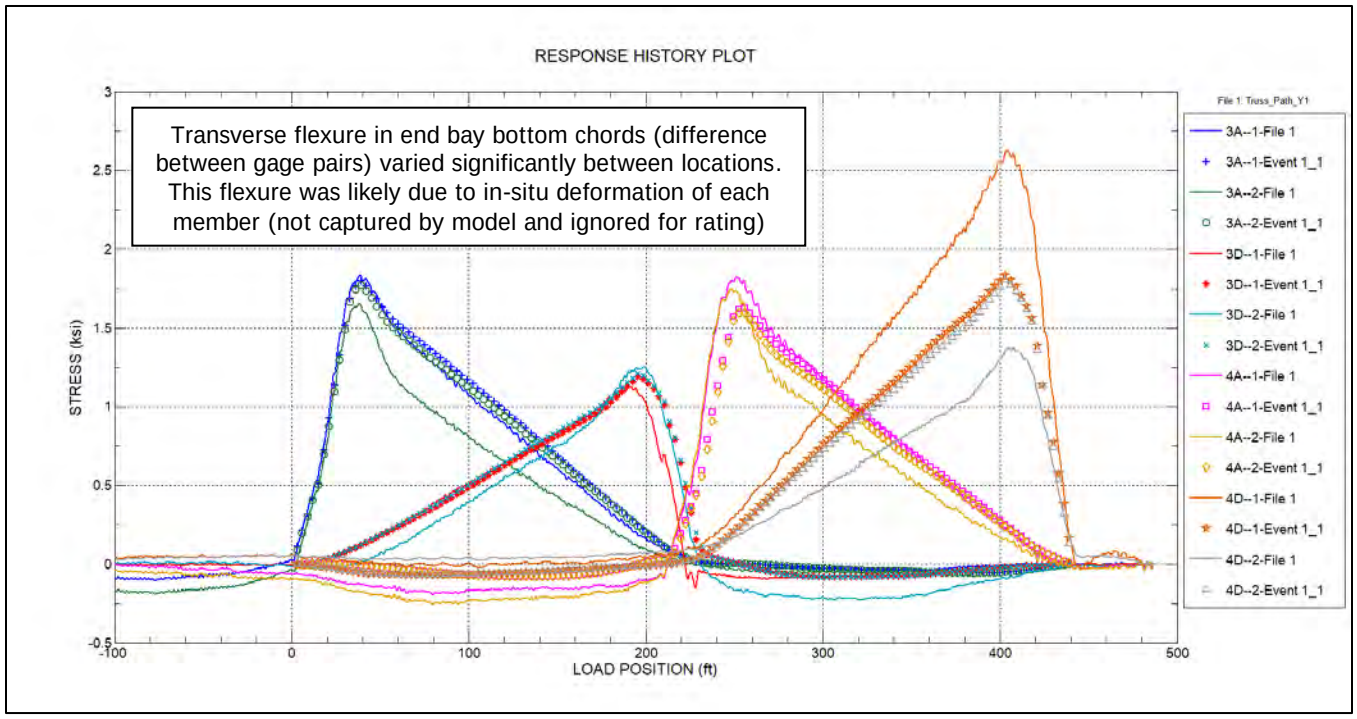


Figure 69 – Response comparison plot – Final model – Span 3 & 4 downstream end bottom chords –– Stresses along section's channel centroids – Truck path Y1

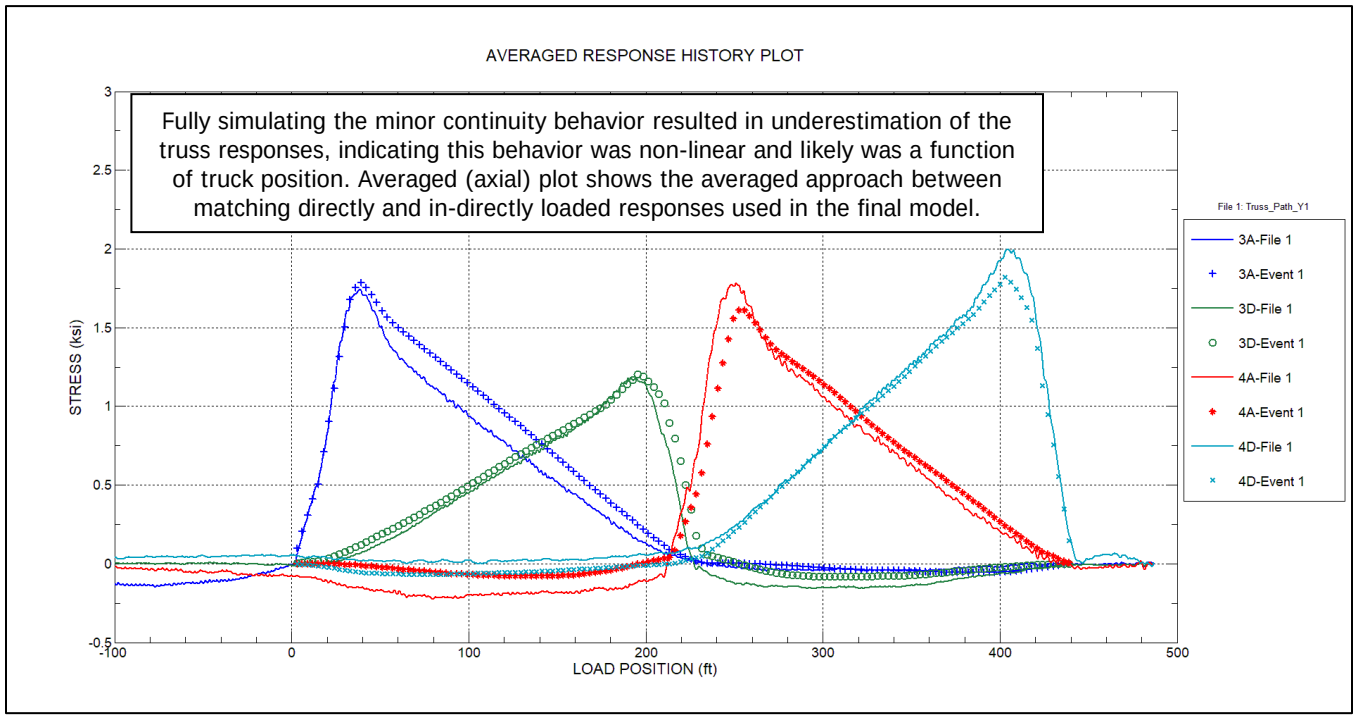


Figure 70 – Response comparison plot – Final model – Span 3 & 4 downstream end bottom chords –– Average (axial) stresses along members – Truck path Y1

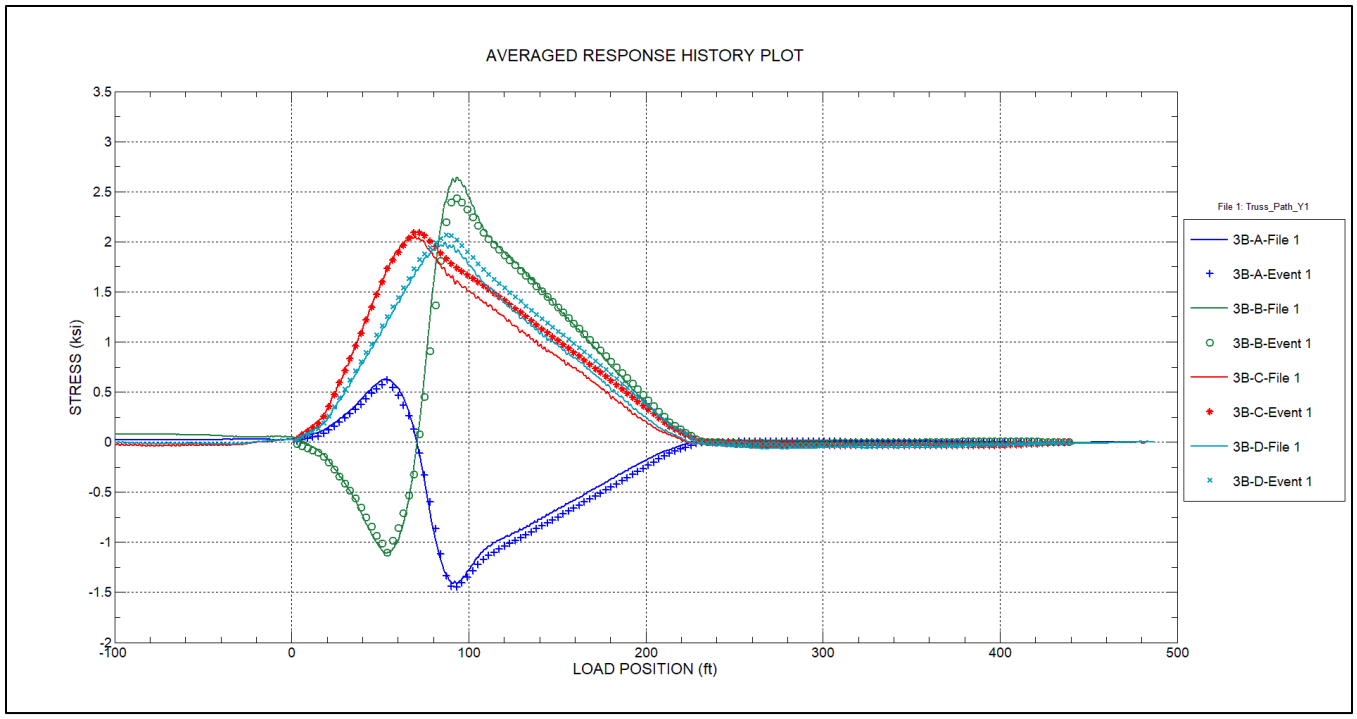


Figure 71 – Response comparison plot – Final model – Span 3 downstream panel point 4 – Average (axial) stresses along panel point members – Truck path Y1

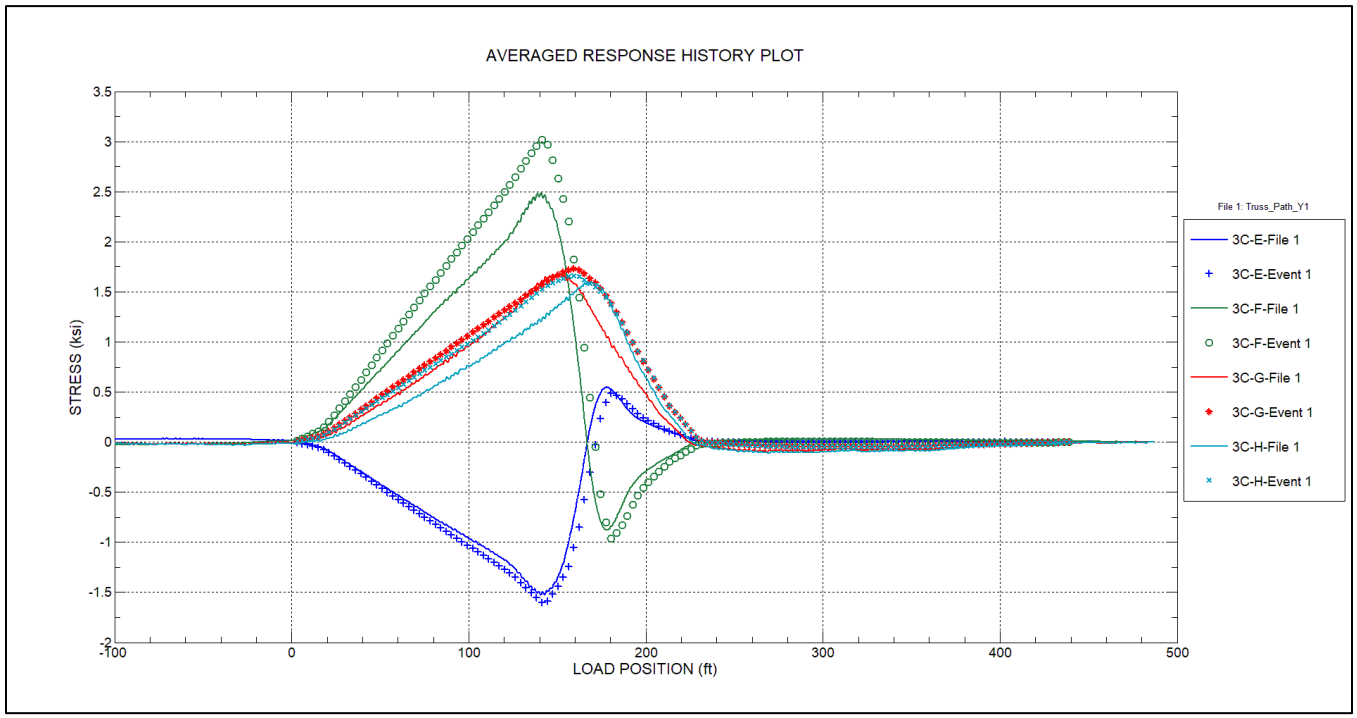


Figure 72 – Response comparison plot – Final model – Span 3 downstream panel point 8 – Average (axial) stresses along panel point members – Truck path Y1

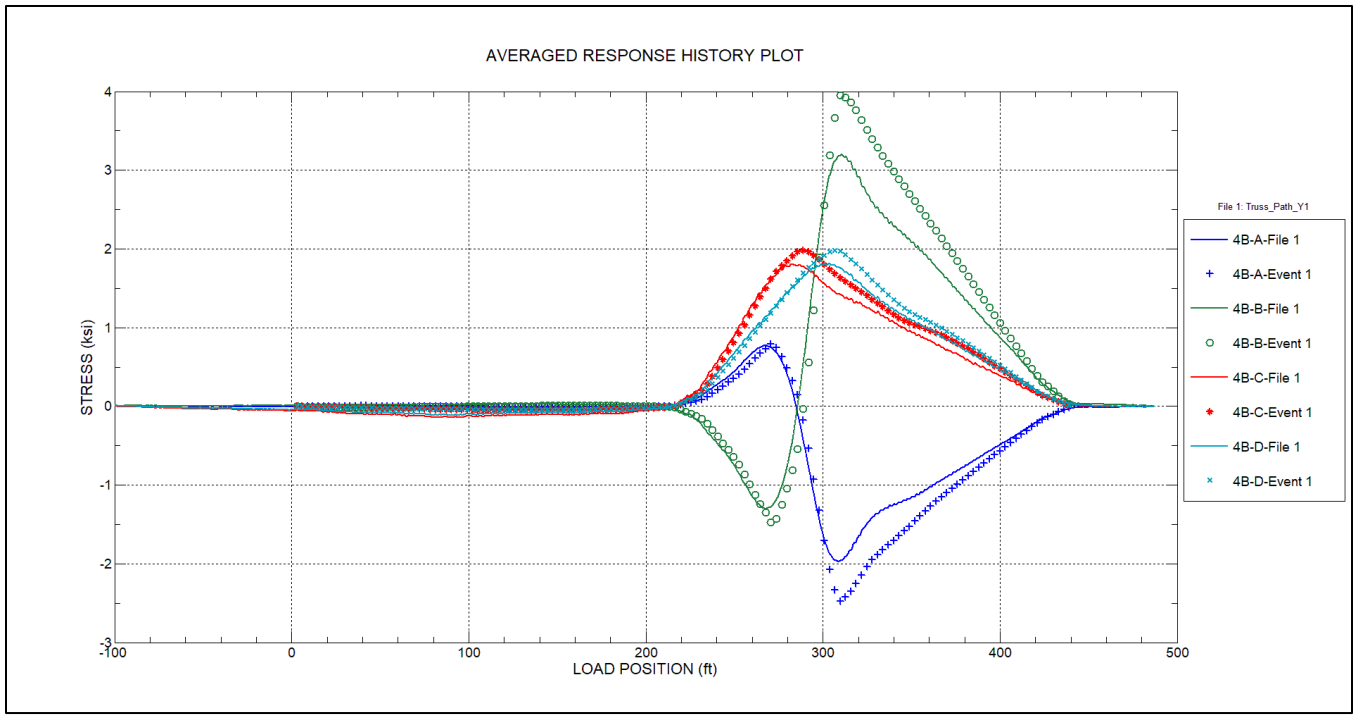


Figure 73 – Response comparison plot – Final model – Span 4 downstream panel point 4 – Average (axial) stresses along panel point members – Truck path Y1

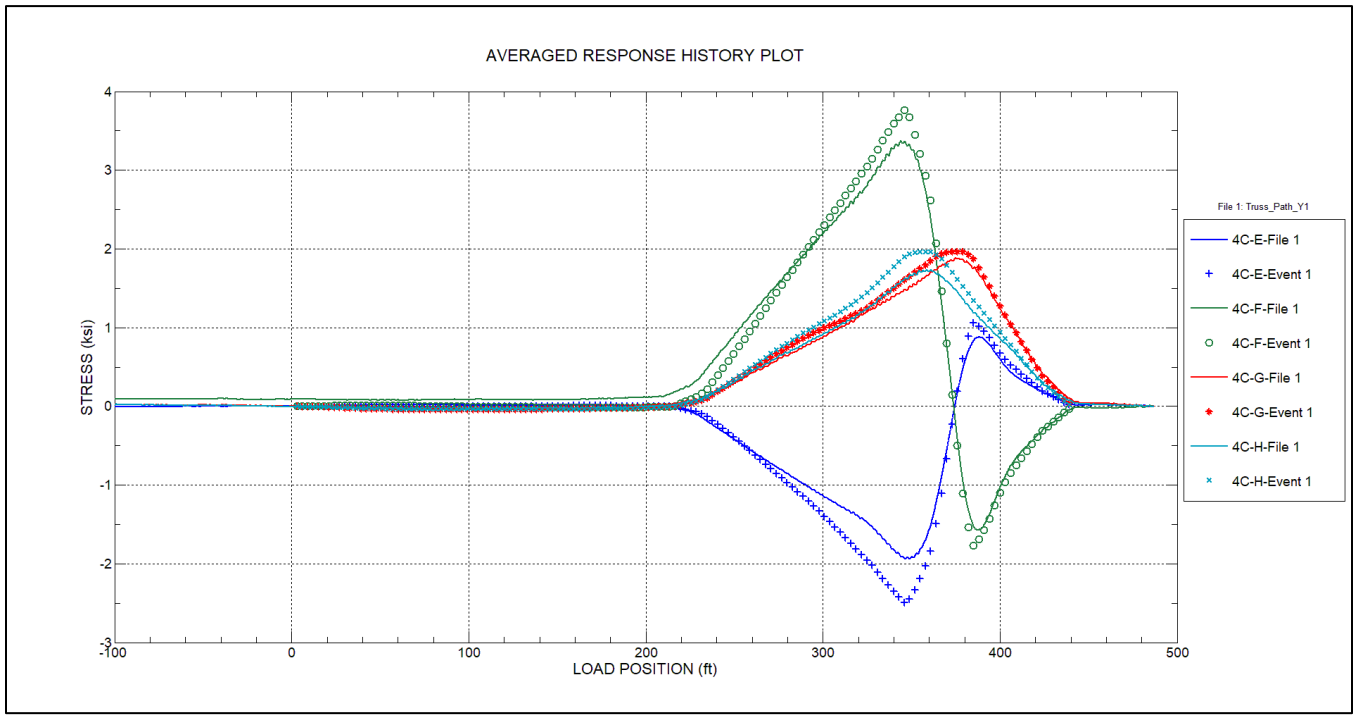


Figure 74 – Response comparison plot – Final model – Span 4 downstream panel point 7 – Average (axial) stresses along panel point members – Truck path Y1

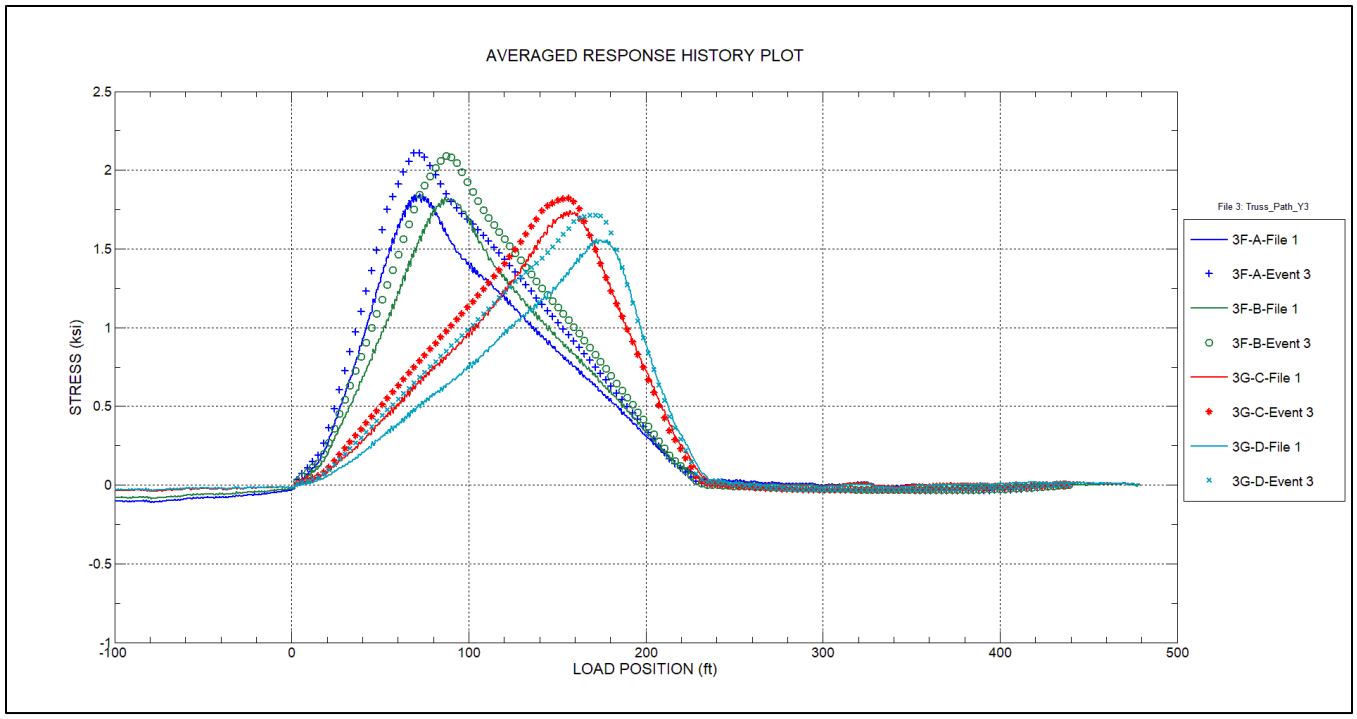


Figure 75 – Response comparison plot – Final model – Span 3 upstream panel point 4 & 8 bottom chords – Average (axial) stresses along bottom chord members – Truck path Y3

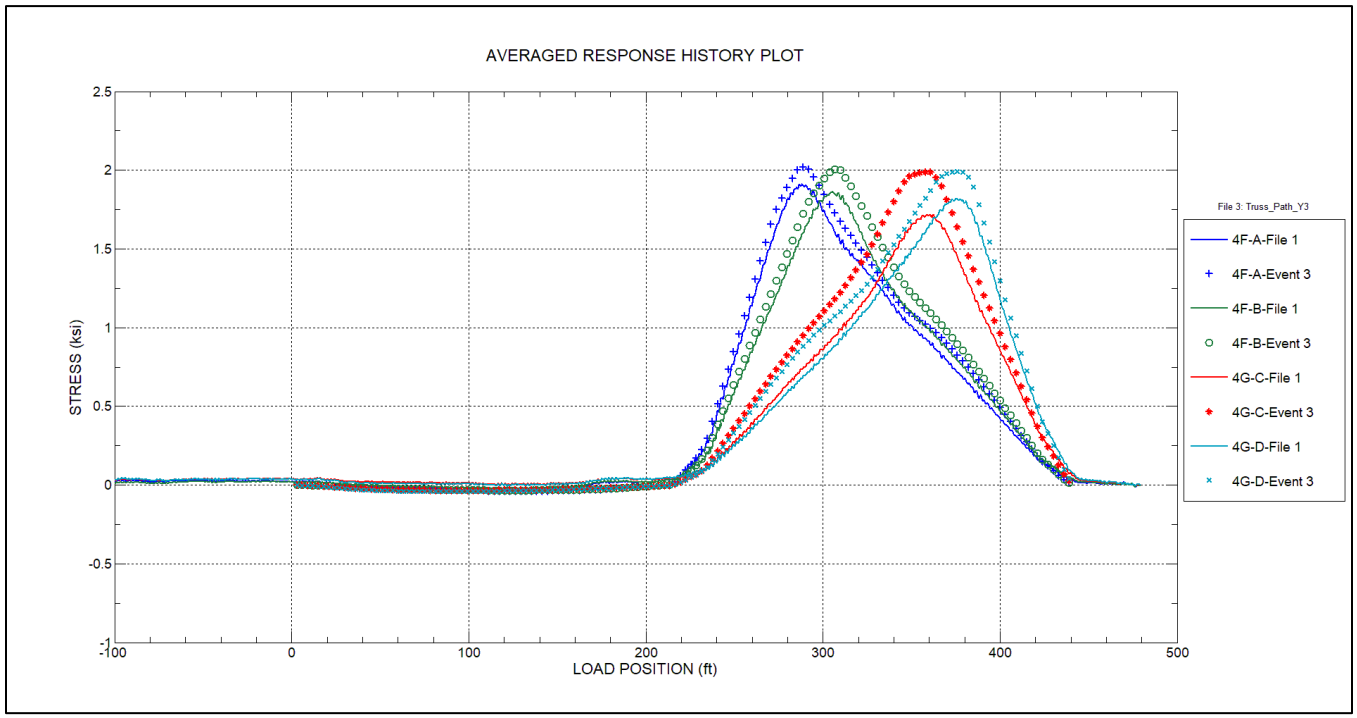


Figure 76 – Response comparison plot – Final model – Span 4 upstream panel point 4 & 7 bottom chords – Average (axial) stresses along bottom chord members – Truck path Y3

# FIELD-VERIFIED LOAD RATING

## LOAD RATING PROCEDURES

Load rating was performed on structural elements in accordance with the AASHTO and ODOT guidelines. Structural responses were obtained from adjusted versions of the final calibrated models, and the member capacities were calculated based on the AASHTO MBE and LRFD Standard Specifications. The rating methods used in BDI's approach closely match typical rating procedures, with the exception that a field-verified FEM analysis was used rather than a typical AASHTO beam line type analysis. This section briefly discusses the methods and findings of the load rating procedures.

Once the analytical models were calibrated to produce an acceptable match to the measured responses, they were reviewed to ensure the reliability of all optimized model parameters. This adjustment involved the identification of any calibrated parameters that could change over time or could become unreliable under heavy loads. Parameter adjustments for load rating are highlighted in the previous *MODELING, ANALYSIS, AND DATA CORRELATION* section.

The following is a list of assumptions made during the load rating process:

- RATED MEMBERS: Load rating was performed on the primary structural members of the instrumented bridge sections. Note that only members which behavior could be reasonably simulated based on the collected response data were evaluated, per BDI's scope for this project.
  - Oregon Approach Model – All steel beams along Spans SE & SD were evaluated using this adjusted calibrated model. Note that while Span SD was not instrumented, this span's detailing matches the instrumented Span SE (symmetric two span design) and therefore was assumed to be in the same condition.
  - Washington Approach Span 23 Model – All reinforced concrete beams in Span 23 were evaluated using this adjusted calibrated model.
  - Span 2 Floor System Model – Only the instrumented steel stringers and floorbeams were evaluated using this adjusted calibrated model. This member list includes Floorbeams 4 & 5 and all stringers in Bay 5 & 6. While the behavior of similar floor system members should match the instrumented bays, the responses from the adjacent modeled bays could not be verified using measured responses and were included in the model primarily to evaluate and match bay continuity observed in the stringer test data.
  - Span 3 & 4 Truss Model – All primary truss elements were evaluated using this adjusted calibrated model. Only a selected few truss members were instrumented due to practical testing limitations (i.e. number of sensors required). However, because trusses are essentially non-redundant and have well defined load-paths, the model was assumed to have the same level of accuracy on the non-instrumented members as the instrumented members. Additionally, force envelopes for each primary truss members and rating vehicle considered were created so that HDR could use this information to evaluate the gusset plates.
- DEAD LOAD APPLICATION: The structural dead load was applied to a load rating model based on the following assumptions:
  - Material weights – A concrete unit weight of 150 lb/ft$^3$ and steel unit weight of 490 lb/ft$^3$ were utilized for structure self-weight.
  - OR Approach Span SE: Beam weight was applied to simply supported model which assumed that the beam splice between spans was constructed on-site. Deck weight was applied to a continuous model given the beams would likely have been spliced prior to the application of the deck.
  - WA Approach Span 23: Support restraint present during testing was removed for dead load application. Additionally, any discontinuity of dead load between the original structure and the newer exterior beams was ignored.
  - Span 2 Floor System and Span 3 & 4 Trusses: Self-weight of primary steel members was increased by 5% to account for the components not modeled (connection plates, bracing elements, etc.). For the Span 2 floor system model, the continuity between bays present at the time of testing

was ignored/removed for dead load. Lastly, a deck weight of 30lb/ft$^2$ was considered based on the provided 2004 deck replacement plans.

- DW loading – For superimposed dead load considerations, a bridge rail weight– 0.05 kip/ft based on available information. Information on the existing utilities lines was not available at the time of BDI's analysis; therefore, it was not considered for load rating.

- MEMBER CAPACITIES: Capacities were calculated for the reinforced concrete elements using the AASHTO LRFD Standard Specifications. The following capacity assumptions were made:
  - Plan based material strengths – The material strengths were based on the provided design plans. Yield strength of the A7 structural steel of 33 ksi was utilized for Span 2 floorbeams, OR approach span beams, and Span 3 & 4 truss members. A yield strength of 50 ksi was utilized for the Span 2 stringer members given these members were replaced with Grade 50 steel in 2000. For WA approach Span 23, mild reinforcement of 40 and 60 ksi for the original and newer RC approach span beams, respectively, and concrete strength of 2.5 & 4 ksi for the original and newer RC approach span, respectively.
  - Member configuration/reinforcement details – General member configuration/reinforcement details in the provided design plans were used for capacity calculations.
  - Consideration of structural condition – While minor deterioration was observed in the provided inspection report, no condition factors were applied during this evaluation.
  - Additional OR approach beam capacities/ratings considered – Given the poor negative flexure ratings computed for these spans due to the long-unbraced length of the bottom flange, additional negative flexure capacities were considered if braces were added between the interior pier and the interior concrete diaphragms.
  - WA approach beam reinforcement development lengths – LRFD development lengths were considered for load rating capacity groups. Note that flexural reinforcement was ignored until full developed. This assumption resulted in conservative load ratings and flexural ratings that were subsequently controlled near the span's quarterpoint.
  - Span 2 floor system stringer capacities – While the stringer's bottom flanges are not braced between floorbeams, utilizing the unbraced length for negative flexure as the bay length results in a very small capacity. Based on the rating model results, the stringer response under total load (dead and live) showed that the stringer midspan never experiences negative flexure. Therefore, the unbraced length considered for the stringers negative flexure capacity was half the bay length.
  - Summary tables – Table 4 through Table 13 provides a summary of the member capacities considered in each span.
- LIVE LOAD CONFIGURATIONS CONSIDERED: One and two lane loading conditions were considered in the 18-28 ft wide roadways using ODOT legal and emergency rating vehicles shown in Figure 77 through Figure 79. Load conditions considered for each rating vehicle are shown in Figure 80 through Figure 81.
- CONTROLLING LOAD CONDITIONS: Controlling loading conditions were computed using BDI's rating program that utilizes Strand7's enveloping feature. This program creates envelopes for each set of vehicle/load configuration considered, superimposes envelopes for multi-lane loaded conditions, and applies applicable multiple presence factors to all conditions considered.
- RATING FACTORS: Ratings were calculated using the AASHTO and ODOT specified rating factors. Table 14 provides the utilized factors. In addition, an element-specific live-load factor of 1.30, based on the observed level of flexure in the vertical truss members, was applied in conjunction with the typical live-load factor for these member types. This factor was based on the notable weak-axis bending measured in these members during testing. During model calibration, this bending was found to be primarily induced by the transverse bracing between these members. The bending component in the other primary truss members were generally found to be minimal and therefore were not considered for rating.
- RATING PROCEDURES: Figure 82 shows the load rating equations used for the computed load ratings. Ratings were computed using BDI-RATE, BDI's rating post-processing software. BDI-RATE allows different response envelope files, member capacities, and load and resistance factors to compute tiered ratings for

each vehicle and corresponding rating levels. Resulting output and summary "html" files are created for review. These output files have been provided along with this report.

- LIMIT STATES EVALUATED: Ratings efforts were focused on the Strength II limit state based on the posting focus of the project. Service I (For Span 23), Service II (for steel spans), and Fatigue (for steel spans) limit states were not evaluated. This decision was based on BDI's ratings of selected member will be supplementary to HDR's evaluation of the entire structure.

Table 4 – OR Approach Span nominal capacities – Shear

| Member ID | Section Description | Panel Type | Stiffener Spacing, in | $V_P$, Plastic Shear Capacity, kip | C, Shear coefficient | Shear Capacity, kip |
|---|---|---|---|---|---|---|
| Beam | W18x55 | End | N/A (Compact Section) | 125.70 | 1.00 | 125.70 |
| Beam_Pier | W18x55 w/ splice plates | End | N/A (Compact Section) | 125.70 | 1.00 | 125.70 |

Table 5 – OR Approach Span nominal capacities – Flexure

| Member ID | Section Description | Section Modulus, $in^3$ | Flexure Orientation | Unbraced Length, in | Controlling Flexural Stress, ksi | Flexural Capacity, kip-in |
|---|---|---|---|---|---|---|
| Beam | W18x55 | 97.46 | Positive | 24.0 | 33.0 | 3,216.3 |
| | | | Negative | 252.0 | 11.08 | -1,079.5 |
| | | | Negative (Braced) | 126.0 | 25.09 | -2,445.3 |
| Beam_Pier | W18x55 w/ splice plates | 201.72 | Positive | 24.0 | 33.0 | 6,656.9 |
| | | | Negative | 252.0 | 10.92 | -2,201.9 |
| | | | Negative (Braced) | 126.0 | 25.00 | -5,042.5 |

Table 6 – WA Approach Span 23 nominal capacities – Shear

| Member ID | Section ID | Starting Distance from Support, in | Ending Distance from Support, in | Stirrup Spacing, in | $V_s$ Stirrup Shear Strength, kips | $V_c$ Concrete Shear Strength, kips | Nominal Shear Capacity, kip |
|---|---|---|---|---|---|---|---|
| Widened Exterior Beams (Beam lines 0 & 6) | A | 0 | 8.5 | - | - | - | - |
| | B | 8.5 | 17.5 | 12 | 52.98 | 40.93 | 93.9 |
| | C | 17.5 | 80.5 | 12 | 52.98 | 40.93 | 93.9 |
| | D | 80.5 | midspan | 12 | 47.55 | 36.73 | 84.3 |
| Original Exterior Beams (Beam lines 1 & 5) | A | 0 | 7.5 | - | - | - | - |
| | B | 7.5 | 16.5 | - | - | - | - |
| | C | 16.5 | 25.5 | - | - | - | - |
| | D | 25.5 | 53.5 | 18 | 21.43 | 29.99 | 51.4 |
| | E | 53.5 | 103.5 | 18 | 21.43 | 29.99 | 51.4 |
| | F | 103.5 | 169.5 | 18 | 20.3 | 28.41 | 48.7 |
| | G | 169.5 | midspan | 18 | 19.93 | 27.89 | 47.8 |
| Original Interior Beams (Beam lines 2, 3, &4) | A | 0 | 7.5 | - | - | - | - |
| | B | 7.5 | 16.5 | - | - | - | - |
| | C | 16.5 | 25.5 | - | - | - | - |
| | D | 25.5 | 67.5 | 18 | 21.17 | 33.68 | 54.9 |
| | E | 67.5 | 115.5 | 18 | 21.17 | 33.68 | 54.9 |
| | F | 115.5 | 181.5 | 18 | 19.94 | 31.72 | 51.7 |
| | G | 181.5 | midspan | 18 | 19.52 | 31.05 | 50.6 |

Table 7 – WA Approach Span 23 nominal capacities – Positive flexure

| Member ID | Section ID | Starting Distance from Support, in | Ending Distance from Support, in | Steel Area ($A_s$), $in^2$ | Moment Arm (D), in | Effective Compression Block (a), in | Nominal Flexural Capacity, kip-in |
|---|---|---|---|---|---|---|---|
| Widened Exterior Beams (Beam lines 0 & 6) | A | 0 | 8.5 | - | - | - | - |
| | B | 8.5 | 17.5 | - | - | - | - |
| | C | 17.5 | 80.5 | 3.14 | 28.5 | 2.6 | 5129.1 |
| | D | 80.5 | midspan | 6.28 | 28.5 | 5.2 | 9300.9 |
| Original Exterior Beams (Beam lines 1 & 5) | A | 0 | 7.5 | - | - | - | - |
| | B | 7.5 | 16.5 | - | - | - | - |
| | C | 16.5 | 25.5 | - | - | - | - |
| | D | 25.5 | 53.5 | - | - | - | - |
| | E | 53.5 | 103.5 | 2.98 | 27.94 | 1.1 | 2939.3 |
| | F | 103.5 | 169.5 | 4.97 | 27.94 | 1.9 | 4653.3 |
| | G | 169.5 | midspan | 5.96 | 26.69 | 2.2 | 5490.3 |
| Original Interior Beams (Beam lines 2, 3, &4) | A | 0 | 7.5 | - | - | - | - |
| | B | 7.5 | 16.5 | - | - | - | - |
| | C | 16.5 | 25.5 | - | - | - | - |
| | D | 25.5 | 67.5 | - | - | - | - |
| | E | 67.5 | 115.5 | 4.68 | 27.81 | 1.4 | 4563.9 |
| | F | 115.5 | 181.5 | 7.80 | 26.81 | 2.4 | 7190.1 |
| | G | 181.5 | midspan | 9.36 | 26.56 | 2.9 | 8462.5 |

Table 8 – Span 2 floor system nominal capacities – Shear

| Member ID | Section Description | Yield Stress Fy, ksi | Stiffener Spacing, in | VP, Plastic Shear Capacity, kip | C, Shear coefficient | Shear Capacity, kip |
|---|---|---|---|---|---|---|
| Stringer | W18x35 | 50 | N/A (Compact Section) | 146.60 | 1.00 | 146.60 |
| Floorbeam_End | W21x82 at the ends of these members | 33 | N/A (Compact Section) | 184.05 | 1.00 | 184.05 |
| Floorbeam | W21x82 w/ 4-4″x1″ stiffener plates | 33 | N/A (Compact Section) | 184.05 | 1.00 | 184.05 |

Table 9 – Span 2 floor system nominal capacities – Flexure

| Member ID | Section Description | Section Modulus, $in^3$ | Flexure Orientation | Unbraced Length, in | Controlling Flexural Stress, ksi | Flexural Capacity, kip-in |
|---|---|---|---|---|---|---|
| Stringer | W18x35 | 56.62 | Positive | 24.0 | 50.0 | 2,831.0 |
| | | | Negative | 110.88* | 29.83 | -1,689.1 |
| Floorbeam_End | W21x82 | 166.69 | Positive | 24.0 | 33.0 | 5,500.9 |
| | | | Negative | 264.0 | 14.48 | -2,413.8 |
| Floorbeam | W21x82 w/ 4-4″x1″ stiffener plates | 246.31 | Positive | 24.0 | 33.0 | 8128.2 |
| | | | Negative | 264.0 | 14.48 | -3,566.7 |

* - Stringer negative flexure capacity assumed an unbraced length of bottom flange equal to half the bay length

Table 10 – Span 3 nominal capacities – Truss tension

| Member ID | Gross Area, $in^2$ | Net Area, $in^2$ | Shear Lag Factor, U | Gross Tensile Capacity, kip | Net Tensile Capacity, kip | Nominal Tensile Capacity, kip |
|---|---|---|---|---|---|---|
| Span3_L0L1 | 11.70 | 9.99 | 0.97 | 385.96 | 532.61 | 385.96 |
| Span3_L1L2 | 11.70 | 9.99 | 0.95 | 385.96 | 523.34 | 385.96 |
| Span3_L2L3 | 17.58 | 14.55 | 0.97 | 580.00 | 734.73 | 580.00 |
| Span3_L3L4 | 17.58 | 14.55 | 0.95 | 580.00 | 724.17 | 580.00 |
| Span3_L4L5 | 20.52 | 16.83 | 0.97 | 677.02 | 849.16 | 677.02 |
| Span3_L5L6 | 25.52 | 20.42 | 0.96 | 842.02 | 1024.22 | 842.02 |
| Span3_L6L7 | 25.52 | 20.42 | 0.96 | 842.02 | 1024.22 | 842.02 |
| Span3_L7L8 | 20.52 | 16.83 | 0.96 | 677.02 | 846.25 | 677.02 |
| Span3_L8L9 | 17.58 | 14.55 | 0.97 | 580.00 | 734.73 | 580.00 |
| Span3_L9L10 | 17.58 | 14.55 | 0.96 | 580.00 | 731.99 | 580.00 |
| Span3_L10L11 | 11.70 | 9.99 | 0.97 | 385.96 | 503.94 | 385.96 |
| Span3_L11L12 | 11.70 | 9.99 | 0.97 | 385.96 | 532.61 | 385.96 |
| Span3_U0L0 | 11.95 | 10.55 | 0.95 | 394.45 | 544.89 | 394.45 |
| Span3_U1L1 | 11.95 | 11.02 | 0.95 | 394.45 | 498.52 | 394.45 |
| Span3_U2L2 | 11.95 | 11.02 | 0.97 | 394.45 | 559.95 | 394.45 |
| Span3_U3L3 | 11.95 | 11.02 | 0.97 | 394.45 | 555.44 | 394.45 |
| Span3_U4L4 | 11.95 | 11.02 | 0.97 | 394.45 | 555.44 | 394.45 |
| Span3_U5L5 | 11.95 | 11.02 | 0.97 | 394.45 | 555.44 | 394.45 |
| Span3_U6L6 | 11.95 | 11.02 | 0.97 | 394.45 | 555.44 | 394.45 |
| Span3_U7L7 | 11.95 | 11.02 | 0.97 | 394.45 | 555.44 | 394.45 |
| Span3_U8L8 | 11.95 | 11.02 | 0.97 | 394.45 | 555.44 | 394.45 |
| Span3_U9L9 | 11.95 | 11.02 | 0.97 | 394.45 | 558.70 | 394.45 |
| Span3_U10L10 | 11.95 | 11.02 | 0.97 | 394.45 | 559.95 | 394.45 |
| Span3_U11L11 | 11.95 | 11.02 | 0.95 | 394.45 | 498.52 | 394.45 |
| Span3_U12L12 | 11.95 | 10.55 | 0.95 | 394.45 | 544.89 | 394.45 |
| Span3_U1L0 | 19.31 | 18.15 | 0.97 | 637.10 | 920.81 | 637.10 |
| Span3_U1L2 | 12.00 | 10.50 | 0.95 | 396.00 | 484.21 | 396.00 |
| Span3_U2L3 | 9.19 | 8.06 | 0.94 | 303.19 | 369.84 | 303.19 |
| Span3_U3L4 | 7.73 | 6.80 | 0.92 | 255.23 | 303.64 | 255.23 |
| Span3_U4L5 | 8.03 | 7.12 | 0.92 | 265.00 | 320.52 | 265.00 |
| Span3_U5L6 | 8.03 | 7.12 | 0.92 | 265.00 | 320.52 | 265.00 |
| Span3_U7L6 | 8.03 | 7.12 | 0.92 | 265.00 | 320.52 | 265.00 |
| Span3_U8L7 | 6.48 | 5.55 | 0.90 | 213.98 | 239.21 | 213.98 |
| Span3_U9L8 | 7.73 | 6.80 | 0.92 | 255.23 | 303.64 | 255.23 |
| Span3_U10L9 | 10.61 | 9.30 | 0.94 | 350.11 | 425.39 | 350.11 |
| Span3_U11L10 | 12.00 | 10.50 | 0.95 | 396.00 | 484.21 | 396.00 |
| Span3_U11L12 | 19.31 | 18.15 | 0.97 | 637.10 | 920.81 | 637.10 |

Table 11 – Span 4 nominal capacities – Truss tension

| Member ID | Gross Area, $in^2$ | Net Area, $in^2$ | Shear Lag Factor, U | Gross Tensile Capacity, kip | Net Tensile Capacity, kip | Nominal Tensile Capacity, kip |
|---|---|---|---|---|---|---|
| Span4_L0L1 | 8.92 | 7.84 | 0.97 | 294.22 | 396.06 | 294.22 |
| Span4_L1L2 | 8.92 | 7.84 | 0.95 | 294.22 | 387.42 | 294.22 |
| Span4_L2L3 | 11.70 | 9.99 | 0.95 | 385.96 | 495.16 | 385.96 |
| Span4_L3L4 | 14.64 | 12.28 | 0.95 | 483.21 | 607.85 | 483.21 |
| Span4_L4L5 | 17.58 | 14.55 | 0.91 | 580.00 | 736.77 | 580.00 |
| Span4_L5L6 | 17.58 | 14.55 | 0.97 | 580.00 | 790.11 | 580.00 |
| Span4_L6L7 | 17.58 | 14.55 | 0.97 | 580.00 | 790.11 | 580.00 |
| Span4_L7L8 | 14.64 | 12.28 | 0.91 | 483.21 | 584.32 | 483.21 |
| Span4_L8L9 | 11.70 | 9.99 | 0.95 | 385.96 | 495.16 | 385.96 |
| Span4_L9L10 | 8.92 | 7.84 | 0.95 | 294.22 | 387.42 | 294.22 |
| Span4_L10L11 | 8.92 | 7.84 | 0.97 | 294.22 | 396.06 | 294.22 |
| Span4_U0L0 | 6.70 | 5.71 | 0.95 | 221.18 | 300.40 | 221.18 |
| Span4_U1L1 | 9.61 | 8.20 | 0.97 | 317.11 | 437.26 | 317.11 |
| Span4_U2L2 | 11.70 | 9.99 | 0.96 | 385.96 | 528.90 | 385.96 |
| Span4_U3L3 | 8.92 | 7.84 | 0.96 | 294.22 | 409.74 | 294.22 |
| Span4_U4L4 | 6.70 | 5.71 | 0.97 | 221.18 | 304.82 | 221.18 |
| Span4_U5L5 | 5.69 | 4.75 | 0.97 | 187.85 | 255.86 | 187.85 |
| Span4_U6L6 | 5.69 | 4.75 | 0.97 | 187.85 | 255.86 | 187.85 |
| Span4_U7L7 | 6.70 | 5.71 | 0.97 | 221.18 | 304.82 | 221.18 |
| Span4_U8L8 | 8.92 | 7.84 | 0.96 | 294.22 | 409.74 | 294.22 |
| Span4_U9L9 | 11.70 | 9.99 | 0.96 | 385.96 | 528.90 | 385.96 |
| Span4_U10L10 | 9.61 | 8.20 | 0.97 | 317.11 | 437.26 | 317.11 |
| Span4_U11L11 | 6.70 | 5.71 | 0.95 | 221.18 | 300.40 | 221.18 |
| Span4_U1L0 | 15.85 | 15.00 | 0.97 | 523.00 | 734.49 | 523.00 |
| Span4_U1L2 | 9.73 | 8.42 | 0.95 | 321.23 | 418.79 | 321.23 |
| Span4_U2L3 | 7.11 | 6.17 | 0.95 | 234.61 | 304.82 | 234.61 |
| Span4_U3L4 | 5.25 | 4.50 | 0.94 | 173.25 | 221.96 | 173.25 |
| Span4_U4L5 | 4.75 | 4.00 | 0.93 | 156.75 | 193.83 | 156.75 |
| Span4_U5L6 | 4.75 | 4.00 | 0.90 | 156.75 | 187.41 | 156.75 |
| Span4_U6L5 | 4.75 | 4.00 | 0.90 | 156.75 | 187.41 | 156.75 |
| Span4_U7L6 | 4.75 | 4.00 | 0.93 | 156.75 | 193.83 | 156.75 |
| Span4_U8L7 | 5.25 | 4.50 | 0.94 | 173.25 | 221.96 | 173.25 |
| Span4_U9L8 | 7.11 | 6.17 | 0.95 | 234.61 | 304.82 | 234.61 |
| Span4_U10L9 | 9.73 | 8.42 | 0.95 | 321.23 | 418.79 | 321.23 |
| Span4_U10L11 | 15.85 | 15.00 | 0.97 | 523.00 | 734.49 | 523.00 |

Table 12 – Span 3 nominal capacities – Truss compression

| Member ID | Gross Area, $in^2$ | Elastic Critical Buckling Resistance (Pe_FB), Kip | Elastic Critical Buckling Resistance (Pe_FTB), Kip | Nominal Yield Resistance (Po), Kip | Nominal Compressive Capacity, kip |
|---|---|---|---|---|---|
| Span3_U0U1 | 7.15 | 1,902.17 | 784.08 | 235.89 | 207.98 |
| Span3_U1U2 | 19.31 | 5,207.73 | 4,160.50 | 637.10 | 597.55 |
| Span3_U2U3 | 19.31 | 5,207.73 | 4,160.50 | 637.10 | 597.55 |
| Span3_U3U4 | 22.26 | 6,027.32 | 5,009.04 | 734.52 | 690.79 |
| Span3_U4U5 | 22.26 | 6,027.32 | 5,009.04 | 734.52 | 690.79 |
| Span3_U5U6 | 22.26 | 6,027.32 | 5,009.04 | 734.52 | 690.79 |
| Span3_U6U7 | 22.26 | 6,027.32 | 5,009.04 | 734.52 | 690.79 |
| Span3_U7U8 | 22.26 | 6,027.32 | 5,009.04 | 734.52 | 690.79 |
| Span3_U8U9 | 22.26 | 6,027.32 | 5,009.04 | 734.52 | 690.79 |
| Span3_U9U10 | 19.31 | 5,207.73 | 4,160.50 | 637.10 | 597.55 |
| Span3_U10U11 | 19.31 | 5,207.73 | 4,160.50 | 637.10 | 597.55 |
| Span3_U11U12 | 7.15 | 1,902.17 | 784.08 | 235.89 | 207.98 |
| Span3_U0L0 | 11.95 | 1,056.67 | 1,056.67 | 394.45 | 337.39 |
| Span3_U1L1 | 11.95 | 1,002.50 | 1,002.50 | 394.45 | 334.56 |
| Span3_U2L2 | 11.95 | 952.39 | 952.39 | 394.45 | 331.67 |
| Span3_U3L3 | 11.95 | 905.95 | 905.95 | 394.45 | 328.74 |
| Span3_U4L4 | 11.95 | 862.83 | 862.83 | 394.45 | 325.76 |
| Span3_U5L5 | 11.95 | 822.71 | 822.71 | 394.45 | 322.73 |
| Span3_U6L6 | 11.95 | 785.32 | 785.32 | 394.45 | 319.66 |
| Span3_U7L7 | 11.95 | 750.42 | 750.42 | 394.45 | 316.55 |
| Span3_U8L8 | 11.95 | 717.81 | 717.81 | 394.45 | 313.40 |
| Span3_U9L9 | 11.95 | 687.27 | 687.27 | 394.45 | 310.22 |
| Span3_U10L10 | 11.95 | 658.64 | 658.64 | 394.45 | 307.00 |
| Span3_U11L11 | 11.95 | 631.77 | 631.77 | 394.45 | 303.74 |
| Span3_U12L12 | 11.95 | 606.50 | 606.50 | 394.45 | 300.45 |
| Span3_U1L0 | 19.31 | 3,544.40 | 2,963.29 | 637.10 | 582.27 |
| Span3_U1L2 | 12.00 | 833.22 | 833.22 | 396.00 | 324.57 |
| Span3_U2L3 | 9.19 | 634.33 | 634.33 | 303.19 | 248.22 |
| Span3_U3L4 | 7.73 | 523.27 | 523.27 | 255.23 | 208.10 |
| Span3_U4L5 | 8.03 | 1,238.53 | 621.08 | 265.00 | 221.66 |
| Span3_U5L6 | 8.03 | 1,196.16 | 603.38 | 265.00 | 220.50 |
| Span3_U7L6 | 8.03 | 1,196.16 | 603.38 | 265.00 | 220.50 |
| Span3_U8L7 | 6.48 | 415.06 | 415.06 | 213.98 | 172.45 |
| Span3_U9L8 | 7.73 | 455.54 | 455.54 | 255.23 | 201.88 |
| Span3_U10L9 | 10.61 | 586.14 | 586.14 | 350.11 | 272.66 |
| Span3_U11L10 | 12.00 | 631.57 | 631.57 | 396.00 | 304.59 |
| Span3_U11L12 | 19.31 | 2,339.76 | 2,096.24 | 637.10 | 561.00 |

Table 13 – Span 4 nominal capacities – Truss compression

| Member ID | Gross Area, $in^2$ | Elastic Critical Buckling Resistance (Pe_FB), Kip | Elastic Critical Buckling Resistance (Pe_FTB), Kip | Nominal Yield Resistance (Po), Kip | Nominal Compressive Capacity, kip |
|---|---|---|---|---|---|
| Span4_U0U1 | 5.69 | 1,697.99 | 651.30 | 187.85 | 166.49 |
| Span4_U1U2 | 15.84 | 4,801.70 | 3,614.75 | 522.87 | 492.15 |
| Span4_U2U3 | 15.84 | 4,801.70 | 3,614.75 | 522.87 | 492.15 |
| Span4_U3U4 | 18.37 | 5,543.67 | 4,330.11 | 606.16 | 571.67 |
| Span4_U4U5 | 21.32 | 6,450.46 | 5,257.87 | 703.58 | 665.26 |
| Span4_U5U6 | 21.32 | 6,450.46 | 5,257.87 | 703.58 | 665.26 |
| Span4_U6U7 | 21.32 | 6,450.46 | 5,257.87 | 703.58 | 665.26 |
| Span4_U7U8 | 18.37 | 5,543.67 | 4,330.11 | 606.16 | 571.67 |
| Span4_U8U9 | 15.84 | 4,801.70 | 3,614.75 | 522.87 | 492.15 |
| Span4_U9U10 | 15.84 | 4,801.70 | 3,614.75 | 522.87 | 492.15 |
| Span4_U10U11 | 5.69 | 1,697.99 | 651.30 | 187.85 | 166.49 |
| Span4_U0L0 | 6.70 | 1,313.66 | 1,313.66 | 221.18 | 206.13 |
| Span4_U1L1 | 9.61 | 841.66 | 841.66 | 317.11 | 270.85 |
| Span4_U2L2 | 11.70 | 2,325.93 | 2,325.93 | 385.96 | 360.06 |
| Span4_U3L3 | 8.92 | 1,810.19 | 1,810.19 | 294.22 | 274.87 |
| Span4_U4L4 | 6.70 | 1,313.66 | 1,313.66 | 221.18 | 206.13 |
| Span4_U5L5 | 5.69 | 1,096.44 | 920.13 | 187.85 | 172.46 |
| Span4_U6L6 | 5.69 | 1,096.44 | 920.13 | 187.85 | 172.46 |
| Span4_U7L7 | 6.70 | 1,313.66 | 1,313.66 | 221.18 | 206.13 |
| Span4_U8L8 | 8.92 | 1,810.19 | 1,810.19 | 294.22 | 274.87 |
| Span4_U9L9 | 11.70 | 2,325.93 | 2,325.93 | 385.96 | 360.06 |
| Span4_U10L10 | 9.61 | 841.66 | 841.66 | 317.11 | 270.85 |
| Span4_U11L11 | 6.70 | 1,313.66 | 1,313.66 | 221.18 | 206.13 |
| Span4_U1L0 | 15.85 | 1,801.75 | 1,801.75 | 523.00 | 463.17 |
| Span4_U1L2 | 9.73 | 484.71 | 484.71 | 321.23 | 243.42 |
| Span4_U2L3 | 7.11 | 364.35 | 364.35 | 234.61 | 179.18 |
| Span4_U3L4 | 5.25 | 266.26 | 266.26 | 523.00 | 463.17 |
| Span4_U8L7 | 5.25 | 266.26 | 266.26 | 321.23 | 243.42 |
| Span4_U9L8 | 7.11 | 364.35 | 364.35 | 234.61 | 179.18 |
| Span4_U10L9 | 9.73 | 484.71 | 484.71 | 173.25 | 131.95 |
| Span4_U10L11 | 15.85 | 1,801.75 | 1,801.75 | 173.25 | 131.95 |

Table 14 – Applied LRFR rating factors

| FACTOR TYPE | DESCRIPTION | FACTOR VALUE |
|---|---|---|
| AASHTO Load Factors | DC Dead Load – Strength I – Component | 1.25 |
| | DW Dead Load – Strength I – Superimposed (Verified) | 1.25 |
| | Live Load – Strength I – Legal (ODOT LRFR 1.4.1.10 - Interpolated based on ADTT) | 1.33 |
| | Live Load – Strength II – Emergency | 1.30 |
| | Impact Factor (ODOT LRFR 1.4.1.14 for legal/permit vehicles) | 25% |
| AASHTO Strength Reduction Factor | RC Component in Shear and Flexure | 0.90 |
| | Steel Component in Shear and Flexure | 1.00 |
| | Steel Component in Compression | 0.95 |
| | Steel Component in Fracture on the Net Section of Tension Members | 0.80 |
| | Steel Component in Yielding on the Gross Section of Tension Members | 0.95 |
| AASHTO Multiple Presence Factors | One lane loaded | 1.20 |
| | Two lanes loaded | 1.00 |
| AASHTO Condition Factor | Good Condition | 1.00 |
| AASHTO System Factor | Redundant members | 1.00 |
| | Riveted Members in Truss Bridges | 0.90 |
| | Floorbeams with Spacing > 12ft and Noncontinuous Stringers | 0.85 |
| Site Specific Truss Vertical Flexure Factor | Based on observed bending in vertical members, this factor was applied to live load of vertical truss members in conjunction to the live-load factor listed above to account for the increased stress level observed during testing. | 1.30 |

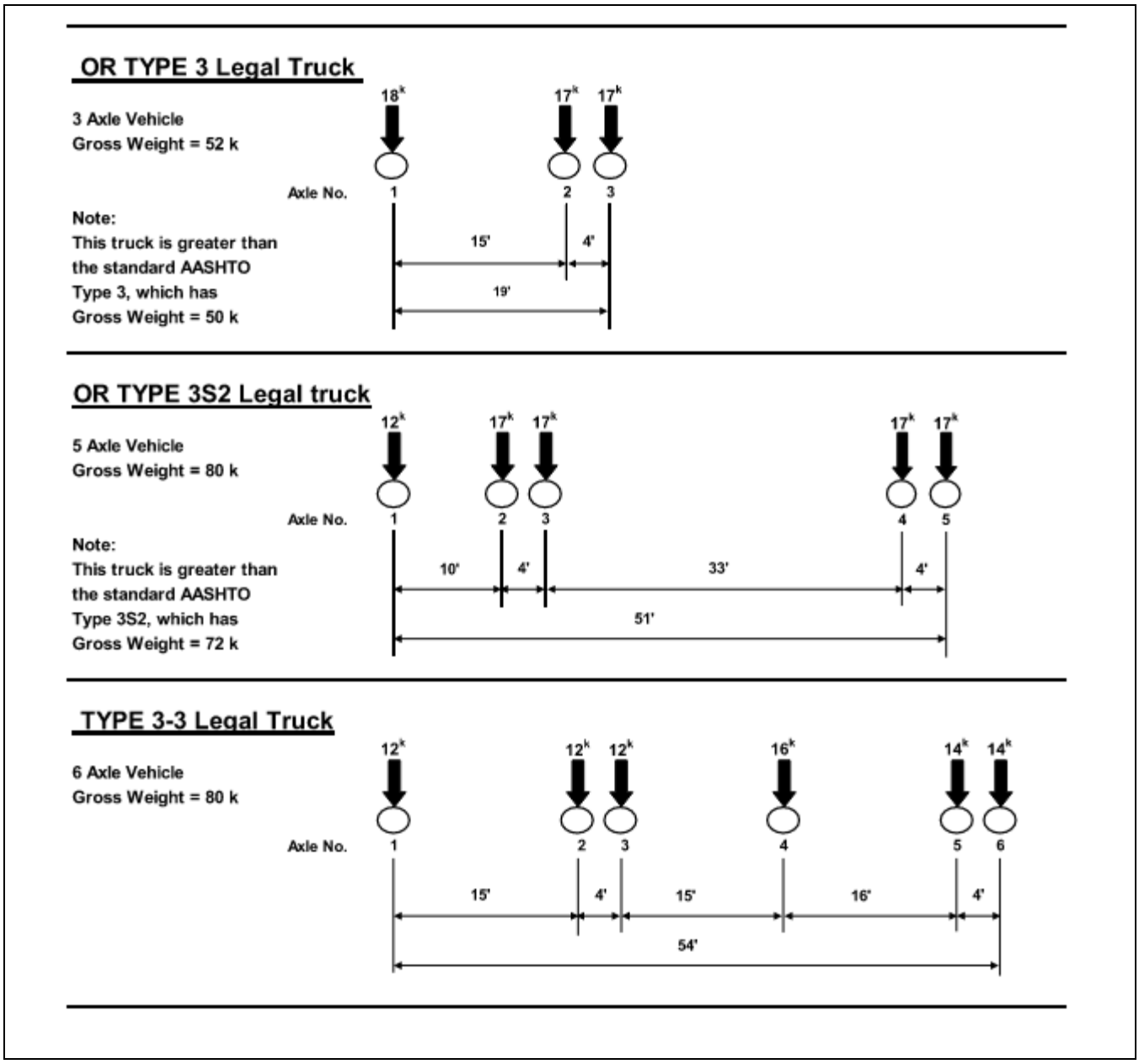


Figure 77 – Diagram of ODOT legal loads

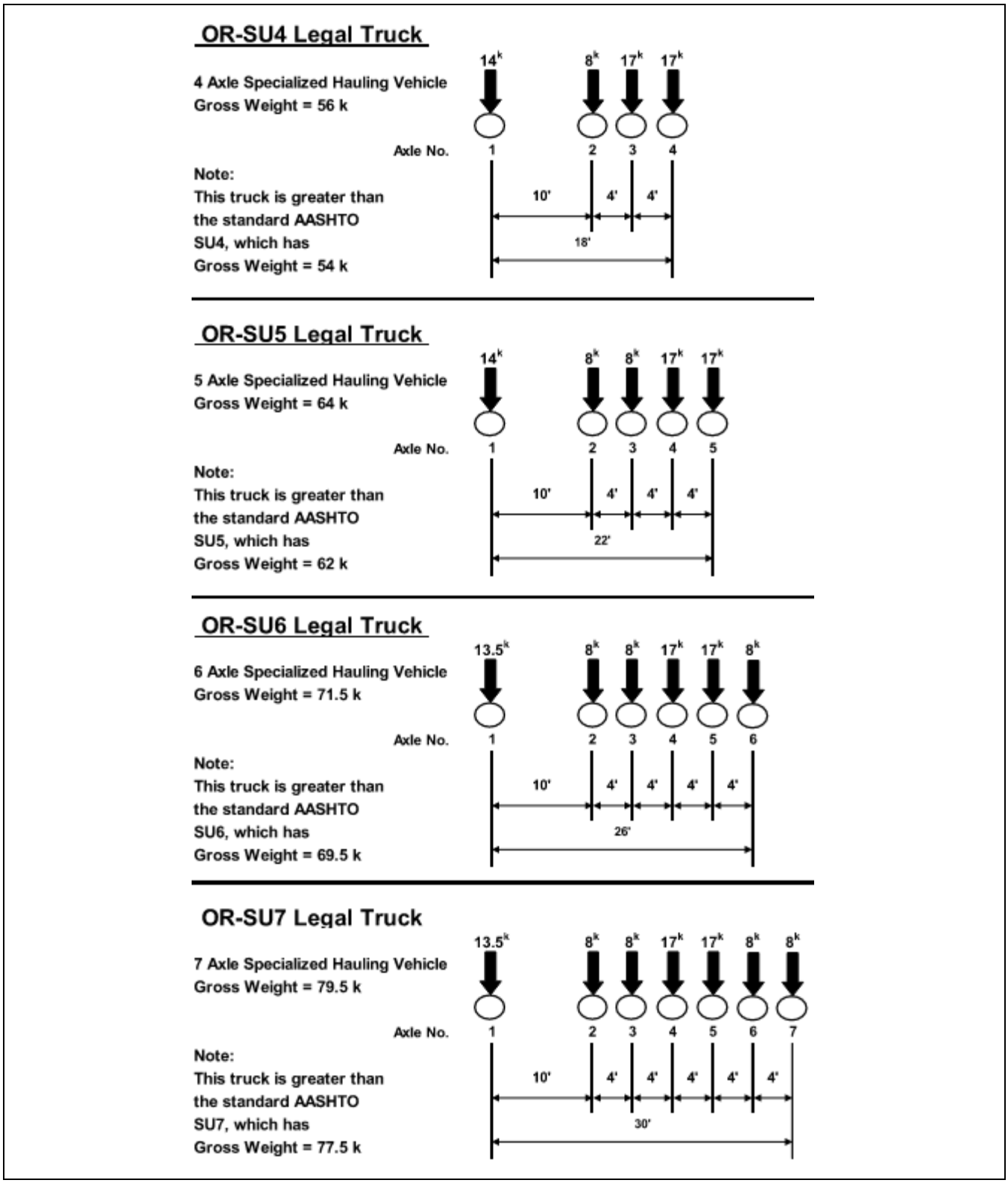


Figure 78 – Diagram of ODOT special hauling loads

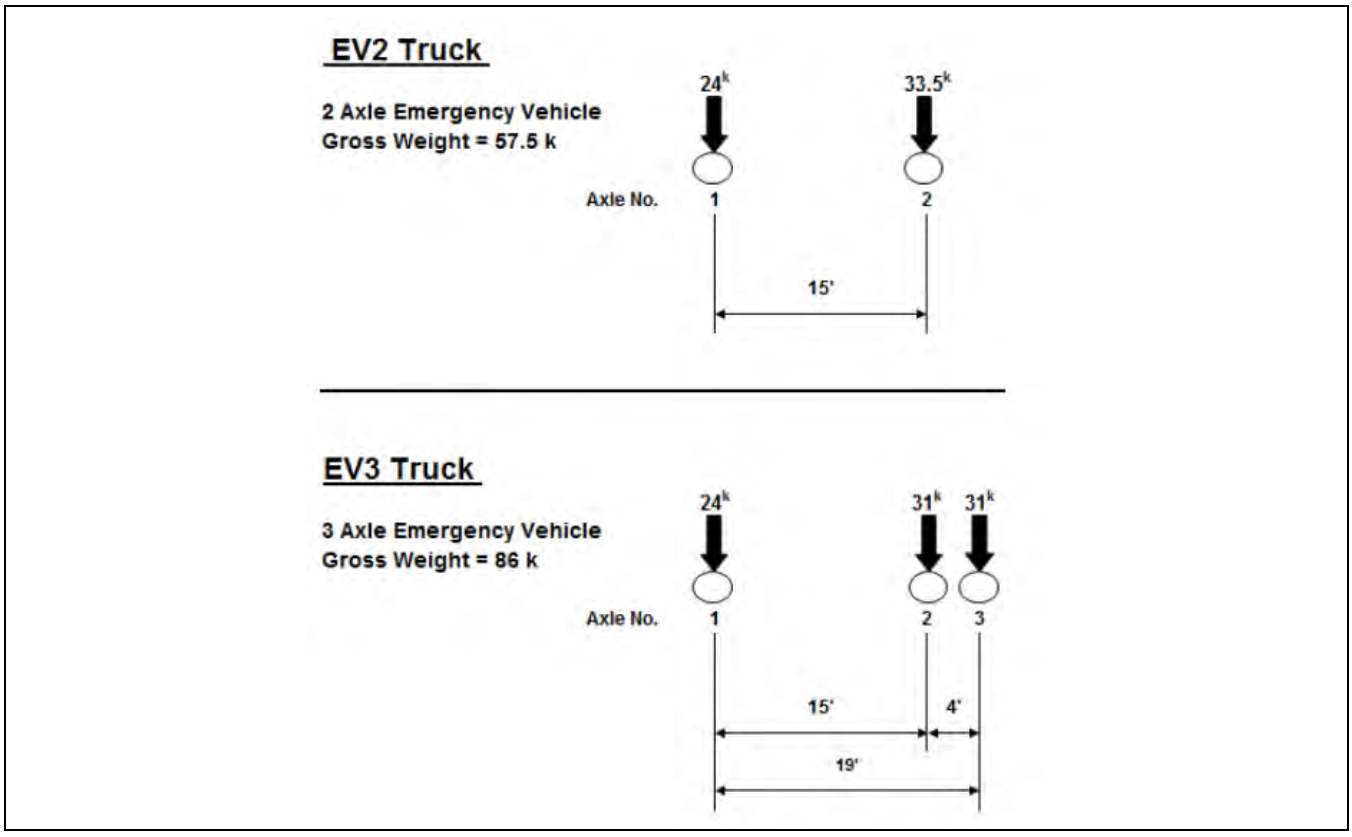


Figure 79 – Diagram of FAST Act Emergency Vehicles

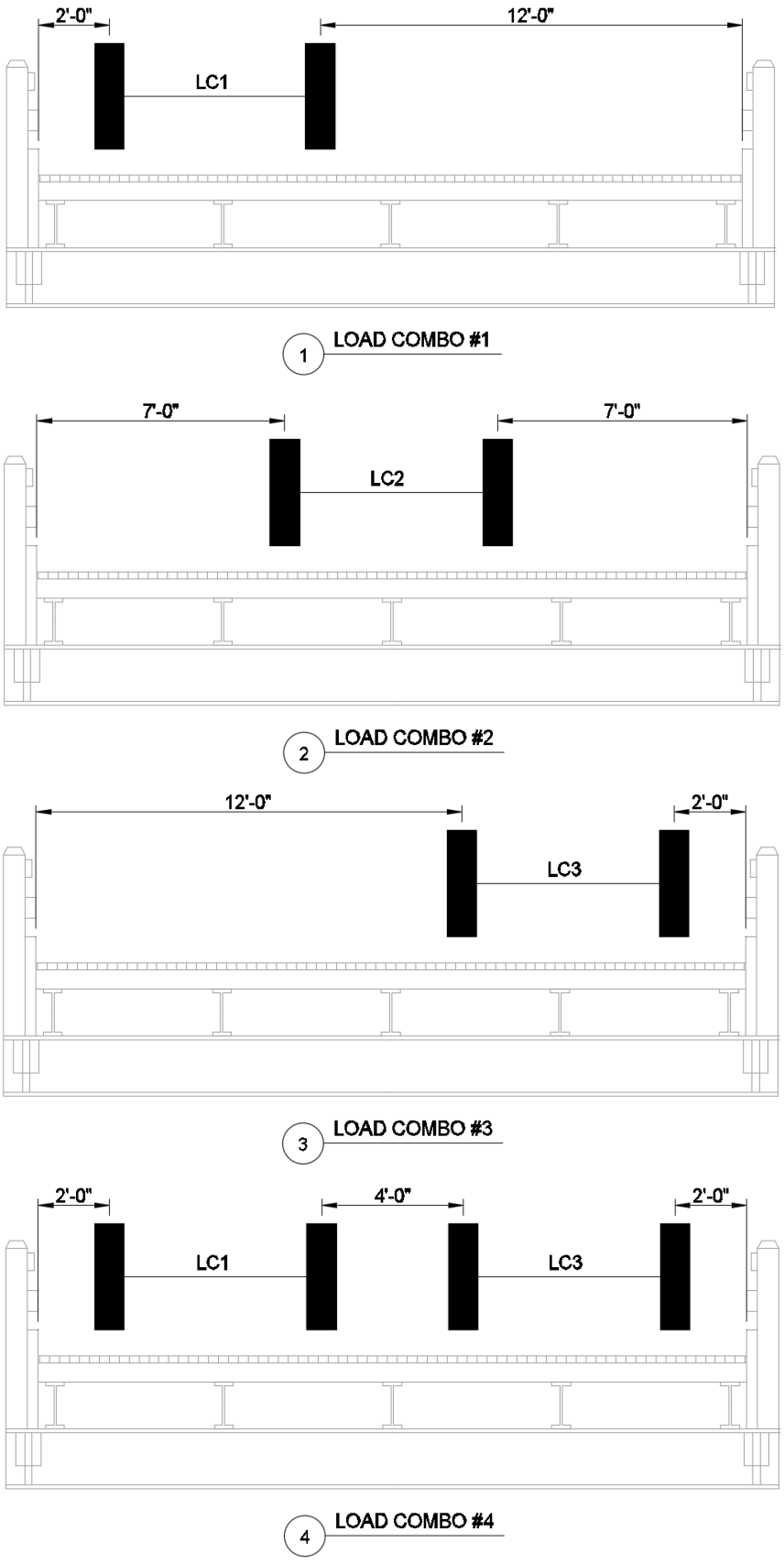


Figure 80 – Load conditions considered for load rating – Steel Spans

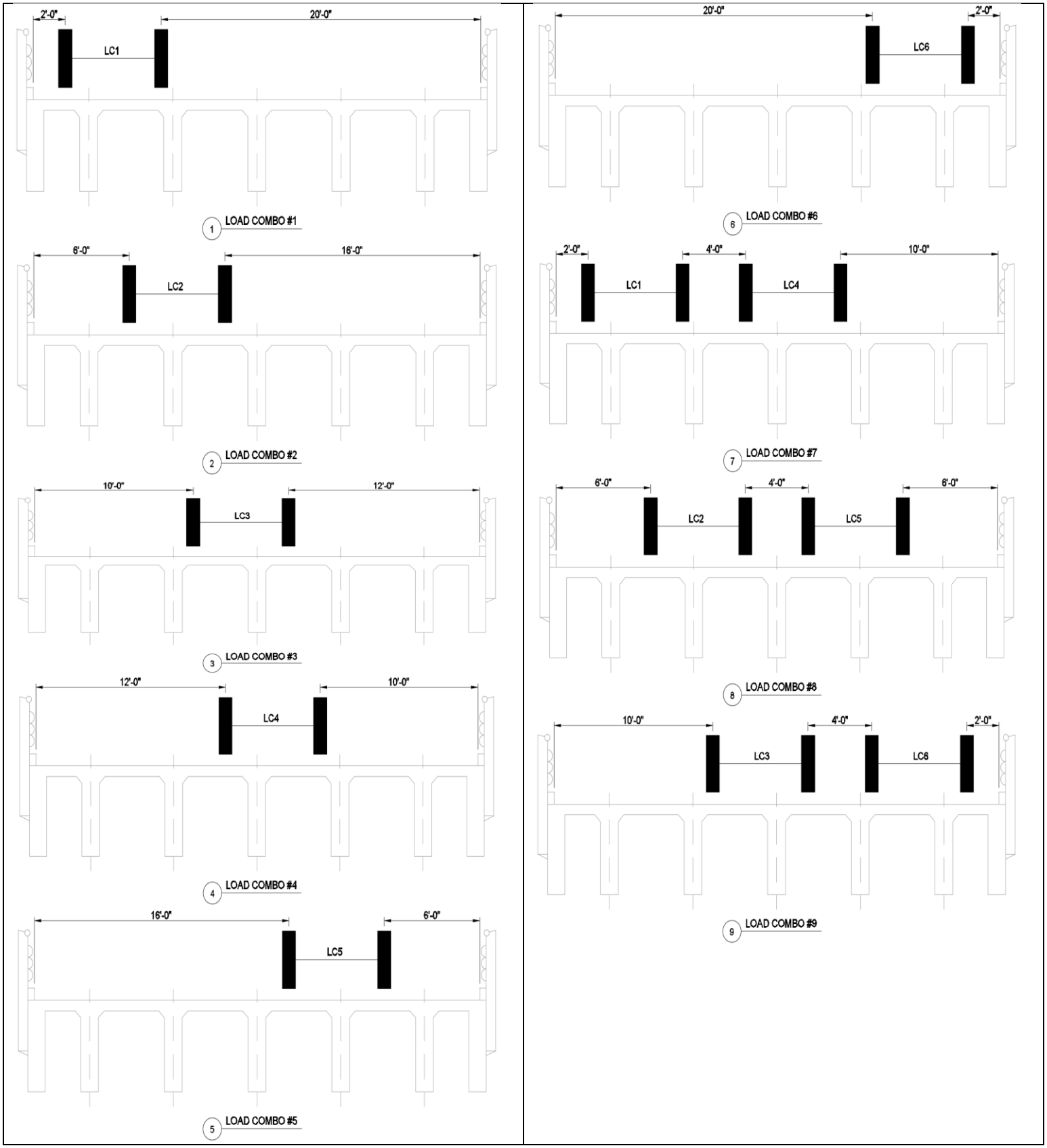


Figure 81 – Load conditions considered for load rating – Concrete Approach Span

**6A.4.2—General Load-Rating Equation**

**6A.4.2.1—General**

The following general expression shall be used in determining the load rating of each component and connection subjected to a single force effect (i.e., axial force, flexure, or shear):

$$RF = \frac{C - (\gamma_{DC})(DC) - (\gamma_{DW})(DW) \pm (\gamma_P)(P)}{(\gamma_{LL})(LL + IM)} \quad (6A.4.2.1\text{-}1)$$

Figure 82 – AASHTO rating equation (AASHTO MBE)

## LOAD RATING RESULTS

Following is a summary of the load rating factors for the standard ODOT legal and emergency rating vehicles. Results indicate that isolated regions have deficient load ratings while most of the structural components examined have acceptable ratings for all legal loads and most EVs. Rating summary tables have been provided in Table 15 through Table 25. Note that Table 18 provides theoretical negative flexure ratings for the Oregon approach span stringers if the bottom flange unbraced lengths were halved. A load rating summary for examined components has been provided below:

- OREGON APPROACH SPAN SE: The load rating of this approach structure was significantly controlled by negative flexure near the interior pier. This result was due a structural beam splice over the pier combined with a very long unbraced length (21') of the beams' bottom (compression) flange. Due to this detail, the negative moment capacity was greatly reduced such that resulting load ratings were at approximately 50% of the vehicle weights. However, these load ratings could be increased to above satisfactory for all ODOT legal and AASHTO EVs if the unbraced length of these members are reduced at both sides of the interior pier.
- WASHINGTON SPAN 23: Similar to the HDR rating results, the load rating of this span was controlled by shear along the interior beam lines. One notable difference between BDI's and HDR's rating analysis, other than the use of a field-calibrated model, was that BDI utilized a dynamic allowance factor of 25% based on ODOT's LRFR manual. This factor reduction, and use of the calibrated model, resulted in most of the rated vehicles having satisfactory ratings for this span. Additionally, due to the observed load distribution and support behavior, BDI's flexural rating results were found to be satisfactory, with the exception of EV3.
- SPAN 2 FLOOR SYSTEM: The load rating of Span 2's floor system was controlled by positive flexure in the floorbeams. Due to the additional stiffness and capacity provided by the stiffener plates found along the instrumented floorbeams, all legal and emergency vehicle rating were found to be satisfactory. BDI approximated the size of these stiffener plates based on photos taken during instrumentation and verified their effect during the model calibration process. The floorbeam stiffener plate size, configuration, and locations along the truss spans was not present in the available plans and not fully captured during BDI's field visit. Therefore, it is recommended that this information be verified through a document investigation and/or during the next bridge inspection.
- SPAN 3 & 4 TRUSSES: As expected, the primary truss members along these spans were all found to have satisfactory legal and emergency vehicle load ratings. Additionally, force envelopes created from BDI's rating model for each primary truss member in these spans and should assist in HDR's evaluation of the gusset plates for this structure's truss spans.

Table 15 – Oregon Approach Spans – Controlling girder shear load rating factors and unfactored inputs

| Rating Load | Controlling Capacity Section/ Location Description | Design Shear Capacity (kip) | DC Dead Load Shear (kip) | DW Dead Load Shear (kip) | Live Load Shear (kip) | Rating Factor |
|---|---|---|---|---|---|---|
| ODOT Type 3 | Beam_Pier / Directly over the pier | 125.7 | 6.21 | 0.11 | 17.02 | 4.16 |
| ODOT Type 3S2 | Beam_Pier / Directly over the pier | 125.7 | 6.21 | 0.11 | 16.97 | 4.17 |
| ODOT Type 3-3 | Beam_Pier / Directly over the pier | 125.7 | 6.21 | 0.11 | 13.98 | 5.07 |
| ODOT SU4 | Beam_Pier / Directly over the pier | 125.7 | 6.21 | 0.11 | 18.43 | 3.85 |
| ODOT SU5 | Beam_Pier / Directly over the pier | 125.7 | 6.21 | 0.11 | 19.65 | 3.61 |
| ODOT SU6 | Beam_Pier / Directly over the pier | 125.7 | 6.21 | 0.11 | 19.83 | 3.57 |
| ODOT SU7 | Beam_Pier / Directly over the pier | 125.7 | 6.21 | 0.11 | 20.72 | 3.42 |
| AASHTO EV2 | Beam_Pier / Directly over the pier | 125.7 | 6.72 | 0.12 | 18.51 | 3.89 |
| AASHTO EV3 | Beam_Pier / Directly over the pier | 125.7 | 6.72 | 0.12 | 27.79 | 2.59 |

Table 16 – Oregon Approach Spans – Controlling girder positive flexure load rating factors and unfactored inputs

| Rating Load | Controlling Capacity Section/ Location Description | Design Moment Capacity (kip-in) | DC Dead Load Moment (kip-in) | DW Dead Load Moment (kip-in) | Live Load Moment (kip-in) | Rating Factor |
|---|---|---|---|---|---|---|
| ODOT Type 3 | Beam/ ~0.45L from end supports | 3,216.3 | 323.8 | 15.1 | 1,078.3 | 1.56 |
| ODOT Type 3S2 | Beam/ ~0.45L from end supports | 3,216.3 | 323.8 | 15.1 | 1,128.4 | 1.49 |
| ODOT Type 3-3 | Beam/ ~0.45L from end supports | 3,216.3 | 311.6 | 13.5 | 845.6 | 2.00 |
| ODOT SU4 | Beam/ ~0.45L from end supports | 3,216.3 | 323.8 | 15.1 | 1,266.6 | 1.33 |
| ODOT SU5 | Beam/ ~0.45L from end supports | 3,216.3 | 323.8 | 15.1 | 1,339.3 | 1.25 |
| ODOT SU6 | Beam/ ~0.45L from end supports | 3,216.3 | 323.8 | 15.1 | 1,478.2 | 1.14 |
| ODOT SU7 | Beam/ ~0.45L from end supports | 3,216.3 | 323.8 | 15.1 | 1,574.3 | 1.07 |
| AASHTO EV2 | Beam/ ~0.45L from end supports | 3,216.3 | 323.8 | 15.1 | 1,212.6 | 1.42 |
| AASHTO EV3 | Beam/ ~0.45L from end supports | 3,216.3 | 323.8 | 15.1 | 1,862.9 | 0.92 |

Table 17 – Oregon Approach Spans – Controlling girder negative flexure load rating factors and unfactored inputs

| Rating Load | Controlling Capacity Section/ Location Description | Design Moment Capacity (kip-in) | DC Dead Load Moment (kip-in) | DW Dead Load Moment (kip-in) | Live Load Moment (kip-in) | Rating Factor |
|---|---|---|---|---|---|---|
| ODOT Type 3 | Beam / Beam near the interior pier at the start of splice | -1,079.5 | -448.8 | -15.4 | -564.8 | 0.53 |
| ODOT Type 3S2 | Beam / Beam near the interior pier at the start of splice | -1,079.5 | -448.8 | -15.4 | -885.6 | 0.34 |
| ODOT Type 3-3 | Beam / Beam near the interior pier at the start of splice | -1,079.5 | -448.8 | -15.4 | -719.7 | 0.42 |
| ODOT SU4 | Beam / Beam near the interior pier at the start of splice | -1,079.5 | -448.8 | -15.4 | -648.1 | 0.47 |
| ODOT SU5 | Beam / Beam near the interior pier at the start of splice | -1,079.5 | -448.8 | -15.4 | -703.4 | 0.43 |
| ODOT SU6 | Beam / Beam near the interior pier at the start of splice | -1,079.5 | -448.8 | -15.4 | -769.8 | 0.39 |
| ODOT SU7 | Beam / Beam near the interior pier at the start of splice | -1,079.5 | -449.0 | -15.4 | -834.3 | 0.36 |
| AASHTO EV2 | Beam / Beam near the interior pier at the start of splice | -1,079.5 | -448.8 | -15.4 | -660.5 | 0.47 |
| AASHTO EV3 | Beam / Beam near the interior pier at the start of splice | -1,079.5 | -449.0 | -15.4 | -986.9 | 0.31 |

Table 18 – Oregon Approach Spans – Controlling girder negative flexure load rating factors and unfactored inputs – Theoretical braced condition

| Rating Load | Controlling Capacity Section/ Location Description | Design Moment Capacity (kip-in) | DC Dead Load Moment (kip-in) | DW Dead Load Moment (kip-in) | Live Load Moment (kip-in) | Theoretical Rating Factor |
|---|---|---|---|---|---|---|
| ODOT Type 3 | Beam / Beam near the interior pier at the start of splice | -2,445.3 | -447.1 | -15.4 | -564.8 | 1.99 |
| ODOT Type 3S2 | Beam / Beam near the interior pier at the start of splice | -2,445.3 | -298.0 | -48.8 | -993.4 | 1.22 |
| ODOT Type 3-3 | Beam / Beam near the interior pier at the start of splice | -2,445.3 | -405.6 | -13.7 | -759.2 | 1.52 |
| ODOT SU4 | Beam / Beam near the interior pier at the start of splice | -2,445.3 | -447.1 | -15.4 | -648.1 | 1.73 |
| ODOT SU5 | Beam / Beam near the interior pier at the start of splice | -2,445.3 | -447.1 | -15.4 | -703.4 | 1.60 |
| ODOT SU6 | Beam / Beam near the interior pier at the start of splice | -2,445.3 | -447.1 | -15.4 | -769.8 | 1.46 |
| ODOT SU7 | Beam / Beam near the interior pier at the start of splice | -2,445.3 | -447.3 | -15.4 | -834.3 | 1.35 |
| AASHTO EV2 | Beam / Beam near the interior pier at the start of splice | -2,445.3 | -447.1 | -15.4 | -660.5 | 1.74 |
| AASHTO EV3 | Beam / Beam near the interior pier at the start of splice | -2,445.3 | -447.3 | -15.4 | -986.9 | 1.16 |

Note: Potential load ratings if lateral brace spacing was reduced from 21’ to 10’-6” from the interior pier

Table 19 – Washington Approach Span 23 – Controlling girder shear load rating factors and unfactored inputs

| Rating Load | Controlling Capacity Section/ Location Description | Design Shear Capacity (kip) | DC Dead Load Shear (kip) | DW Dead Load Shear (kip) | Live Load Shear (kip) | Rating Factor |
|---|---|---|---|---|---|---|
| ODOT Type 3 | Beam02_D / Outer original interior beam at end of taper | 49.44 | 10.25 | 0.45 | 18.37 | 1.18 |
| ODOT Type 3S2 | Beam02_D / Outer original interior beam at end of taper | 49.44 | 10.25 | 0.45 | 15.14 | 1.43 |
| ODOT Type 3-3 | Beam02_D / Outer original interior beam at end of taper | 49.44 | 10.25 | 0.45 | 18.41 | 1.18 |
| ODOT SU4 | Beam02_D / Outer original interior beam at end of taper | 49.44 | 10.25 | 0.45 | 20.74 | 1.04 |
| ODOT SU5 | Beam02_D / Outer original interior beam at end of taper | 49.44 | 10.25 | 0.45 | 22.14 | 0.98 |
| ODOT SU6 | Beam02_D / Outer original interior beam at end of taper | 49.44 | 10.25 | 0.45 | 20.67 | 1.05 |
| ODOT SU7 | Beam02_D / Outer original interior beam at end of taper | 49.44 | 10.25 | 0.45 | 20.74 | 1.04 |
| AASHTO EV2 | Beam02_D / Outer original interior beam at end of taper | 49.44 | 10.25 | 0.45 | 21.86 | 1.01 |
| AASHTO EV3 | Beam02_D / Outer original interior beam at end of taper | 49.44 | 10.25 | 0.45 | 32.17 | 0.69 |

Table 20 – Washington Approach Span 23 – Controlling girder positive flexure load rating factors and unfactored inputs

| Rating Load | Controlling Capacity Section/ Location Description | Design Moment Capacity (kip-in) | DC Dead Load Moment (kip-in) | DW Dead Load Moment (kip-in) | Live Load Moment (kip-in) | Rating Factor |
|---|---|---|---|---|---|---|
| ODOT Type 3 | Beam05_E / Original exterior beam near 0.25L | 2646.4 | 829.0 | 28.26 | 583.6 | 1.62 |
| ODOT Type 3S2 | Beam05_E / Original exterior beam near 0.25L | 2646.4 | 829.0 | 28.26 | 478.1 | 1.98 |
| ODOT Type 3-3 | Beam05_E / Original exterior beam near 0.25L | 2646.4 | 829.0 | 28.26 | 602.5 | 1.57 |
| ODOT SU4 | Beam05_E / Original exterior beam near 0.25L | 2646.4 | 829.0 | 28.26 | 659.7 | 1.43 |
| ODOT SU5 | Beam05_E / Original exterior beam near 0.25L | 2646.4 | 829.0 | 28.26 | 690.8 | 1.37 |
| ODOT SU6 | Beam05_E / Original exterior beam near 0.25L | 2646.4 | 829.0 | 28.26 | 801.9 | 1.18 |
| ODOT SU7 | Beam05_E / Original exterior beam near 0.25L | 2646.4 | 837.1 | 27.46 | 809.7 | 1.16 |
| AASHTO EV2 | Beam05_E / Original exterior beam near 0.25L | 2646.4 | 829.0 | 28.26 | 696.5 | 1.39 |
| AASHTO EV3 | Beam05_E / Original exterior beam near 0.25L | 2646.4 | 829.0 | 28.26 | 1,048.5 | 0.92 |

Table 21 – Span 2 floor system – Controlling girder shear load rating factors and unfactored inputs

| Rating Load | Controlling Capacity Section/ Location Description | Design Shear Capacity (kip) | DC Dead Load Shear (kip) | DW Dead Load Shear (kip) | Live Load Shear (kip) | Rating Factor |
|---|---|---|---|---|---|---|
| ODOT Type 3 | FB5_End/Floorbeam 5 at its support location | 156.44 | 8.30 | 0.89 | 31.78 | 2.74 |
| ODOT Type 3S2 | FB5_End/Floorbeam 5 at its support location | 156.44 | 8.30 | 0.89 | 32.98 | 2.64 |
| ODOT Type 3-3 | FB5_End/Floorbeam 5 at its support location | 156.44 | 8.30 | 0.89 | 24.78 | 3.52 |
| ODOT SU4 | FB5_End/Floorbeam 5 at its support location | 156.44 | 8.30 | 0.89 | 37.71 | 2.31 |
| ODOT SU5 | FB5_End/Floorbeam 5 at its support location | 156.44 | 8.30 | 0.89 | 40.17 | 2.17 |
| ODOT SU6 | FB5_End/Floorbeam 5 at its support location | 156.44 | 8.36 | 0.89 | 44.41 | 1.96 |
| ODOT SU7 | FB5_End/Floorbeam 5 at its support location | 156.44 | 8.30 | 0.89 | 47.57 | 1.83 |
| AASHTO EV2 | FB5_End/Floorbeam 5 at its support location | 156.44 | 8.30 | 0.89 | 35.90 | 2.48 |
| AASHTO EV3 | FB5_End/Floorbeam 5 at its support location | 156.44 | 8.36 | 0.89 | 53.36 | 1.67 |

Table 22 – Span 2 floor system – Controlling girder positive flexure load rating factors and unfactored inputs

| Rating Load | Controlling Capacity Section/ Location Description | Design Moment Capacity (kip-in) | DC Dead Load Moment (kip-in) | DW Dead Load Moment (kip-in) | Live Load Moment (kip-in) | Rating Factor |
|---|---|---|---|---|---|---|
| ODOT Type 3 | FB5 / Floorbeam 5 near its midspan | 6,909.0 | 594.6 | 14.4 | 2049.5 | 1.80 |
| ODOT Type 3S2 | FB5 / Floorbeam 5 near its midspan | 6,909.0 | 594.6 | 14.4 | 2123.1 | 1.74 |
| ODOT Type 3-3 | FB5 / Floorbeam 5 near its midspan | 6,909.0 | 594.6 | 14.4 | 1601.6 | 2.31 |
| ODOT SU4 | FB5 / Floorbeam 5 near its midspan | 6,909.0 | 594.6 | 14.4 | 2425.7 | 1.52 |
| ODOT SU5 | FB5 / Floorbeam 5 near its midspan | 6,909.0 | 594.6 | 14.4 | 2580.4 | 1.43 |
| ODOT SU6 | FB5 / Floorbeam 5 near its midspan | 6,909.0 | 594.6 | 14.4 | 2859.3 | 1.29 |
| ODOT SU7 | FB5 / Floorbeam 5 near its midspan | 6,909.0 | 594.6 | 14.4 | 3055.8 | 1.21 |
| AASHTO EV2 | FB5 / Floorbeam 5 near its midspan | 6,909.0 | 594.6 | 14.4 | 2315.1 | 1.63 |
| AASHTO EV3 | FB5 / Floorbeam 5 near its midspan | 6,909.0 | 594.6 | 14.4 | 3483.7 | 1.09 |

Table 23 – Span 2 floor system – Controlling girder negative flexure load rating factors and unfactored inputs

| Rating Load | Controlling Capacity Section/ Location Description | Design Moment Capacity (kip-in) | DC Dead Load Moment (kip-in) | DW Dead Load Moment (kip-in) | Live Load Moment (kip-in) | Rating Factor |
|---|---|---|---|---|---|---|
| ODOT Type 3 | FB4_End/ Floorbeam 4 at its support location | -2,051.8 | 0.0 | -7.1 | -528.2 | 2.33 |
| ODOT Type 3S2 | FB4_End/ Floorbeam 4 at its support location | -2,051.8 | 0.0 | -7.1 | -546.1 | 2.25 |
| ODOT Type 3-3 | FB4_End/ Floorbeam 4 at its support location | -2,051.8 | 0.0 | -7.1 | -413.9 | 2.97 |
| ODOT SU4 | FB4_End/ Floorbeam 4 at its support location | -2,051.8 | 0.0 | -7.1 | -628.8 | 1.95 |
| ODOT SU5 | FB4_End/ Floorbeam 4 at its support location | -2,051.8 | 0.0 | -7.1 | -667.2 | 1.84 |
| ODOT SU6 | FB4_End/ Floorbeam 4 at its support location | -2,051.8 | 0.0 | -7.1 | -740.3 | 1.66 |
| ODOT SU7 | FB4_End/ Floorbeam 4 at its support location | -2,051.8 | 0.0 | -7.1 | -791.2 | 1.55 |
| AASHTO EV2 | FB4_End/ Floorbeam 4 at its support location | -2,051.8 | 0.0 | -7.1 | -604.6 | 2.08 |
| AASHTO EV3 | FB4_End/ Floorbeam 4 at its support location | -2,051.8 | 0.0 | -7.1 | -913.6 | 1.38 |

Table 24 – Spans 3 & 4 truss – Controlling tensile load rating factors and unfactored inputs

| Rating Load | Controlling Capacity Section/ Location Description | Design Tensile Capacity (kip) | DC Dead Load Tension (kip) | DW Dead Load Tension (kip) | Live Load Tension (kip) | Rating Factor |
|---|---|---|---|---|---|---|
| ODOT Type 3 | Span4_U3L4 / Span 4 Diagonal U3-L4 | 148.13 | 31.95 | 2.27 | 37.37 | 1.69 |
| ODOT Type 3S2 | Span4_U8L7 / Span 4 Diagonal U8-L7 | 148.13 | 31.88 | 2.27 | 49.72 | 1.28 |
| ODOT Type 3-3 | Span4_U3L4 / Span 4 Diagonal U3-L4 | 148.13 | 31.95 | 2.27 | 50.16 | 1.26 |
| ODOT SU4 | Span4_U8L7 / Span 4 Diagonal U8-L7 | 148.13 | 31.88 | 2.27 | 42.58 | 1.49 |
| ODOT SU5 | Span4_U3L4 / Span 4 Diagonal U3-L4 | 148.13 | 31.95 | 2.27 | 45.96 | 1.38 |
| ODOT SU6 | Span4_U3L4 / Span 4 Diagonal U3-L4 | 148.13 | 31.95 | 2.27 | 50.94 | 1.24 |
| ODOT SU7 | Span4_U3L4 / Span 4 Diagonal U3-L4 | 148.13 | 31.95 | 2.27 | 55.54 | 1.14 |
| AASHTO EV2 | Span4_U3L4 / Span 4 Diagonal U3-L4 | 148.13 | 31.95 | 2.27 | 41.54 | 1.56 |
| AASHTO EV3 | Span4_U3L4 / Span 4 Diagonal U3-L4 | 148.13 | 31.95 | 2.27 | 61.90 | 1.05 |

Table 25 – Spans 3 & 4 truss – Controlling compressive load rating factors and unfactored inputs

| Rating Load | Controlling Capacity Section/ Location Description | Design Compressive Capacity (kip) | DC Dead Load Compression (kip) | DW Dead Load Compression (kip) | Live Load Compression (kip) | Rating Factor |
|---|---|---|---|---|---|---|
| ODOT Type 3 | Span3_U10L10 / Span 3 Vertical U10-L10 | -262.49 | -58.82 | -3.95 | -40.96 | 2.08 |
| ODOT Type 3S2 | Span3_U10L10 / Span 3 Vertical U10-L10 | -262.49 | -58.82 | -3.95 | -57.43 | 1.48 |
| ODOT Type 3-3 | Span3_U10L10 / Span 3 Vertical U10-L10 | -262.49 | -58.82 | -3.95 | -54.73 | 1.55 |
| ODOT SU4 | Span3_U10L10 / Span 3 Vertical U10-L10 | -262.49 | -58.82 | -3.95 | -46.71 | 1.82 |
| ODOT SU5 | Span3_U10L10 / Span 3 Vertical U10-L10 | -262.49 | -58.82 | -3.95 | -49.59 | 1.72 |
| ODOT SU6 | Span3_U10L10 / Span 3 Vertical U10-L10 | -262.49 | -58.82 | -3.95 | -54.63 | 1.56 |
| ODOT SU7 | Span3_U10L10 / Span 3 Vertical U10-L10 | -262.49 | -58.82 | -3.95 | -60.13 | 1.42 |
| AASHTO EV2 | Span3_U10L10 / Span 3 Vertical U10-L10 | -262.49 | -58.82 | -3.95 | -47.06 | 1.85 |
| AASHTO EV3 | Span3_U10L10 / Span 3 Vertical U10-L10 | -262.49 | -58.82 | -3.95 | -66.30 | 1.31 |

# A. Appendix A - Instrumentation & Testing Drawings

RAW DATA. REFINED RESULTS.

# HDR
# PORT OF HOOD RIVER BRIDGE
# LIVE LOAD TESTING

RAW DATA. REFINED RESULTS.
740 S PIERCE AVE, SUITE 15
LOUISVILLE, CO 80027
303.494.3230
WWW.BDITEST.COM

ISSUE

CLIENT

HDR
1050 SW 6TH AVE SUITE 1800
PORTLAND, OR 97204

PROJECT NAME

HDR
PORT OF HOOD RIVER BRIDGE
LIVE LOAD TESTING

| | |
|---|---|
| Drawn By: | EDC |
| Checked By: | KNR |
| Date: | 09/28/2021 |
| Client No.: | - |
| BDI No.: | 210311-OR |
| SCALE: | NTS |

COVER

LLT-00

PLOT TIME: 12/16/2021 3:40 PM
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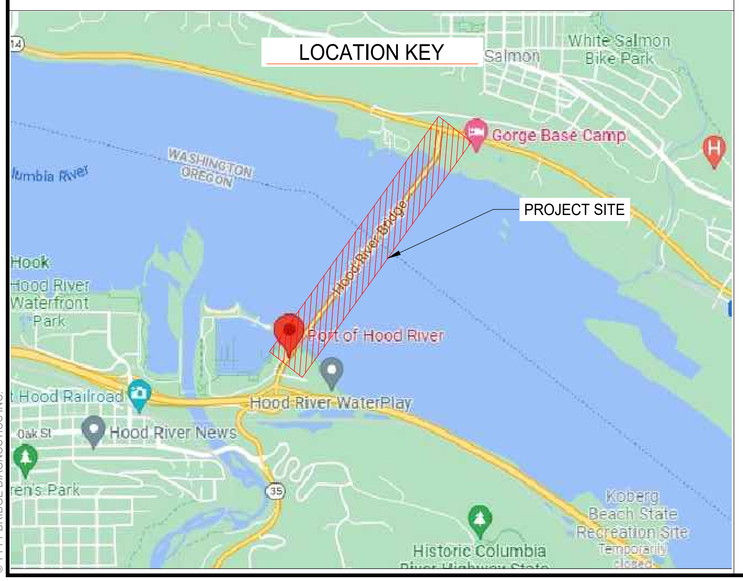
## GAGE LEGEND & SPECIFICATION

| SYMBOL | TYPE | BRAND | MODEL | NOTES |
|---|---|---|---|---|
| | STRAIN TRANSDUCER | BDI | ST350 | |
| | TILTMETER (UNI-AXIAL) | BDI | T500-030 | |
| TW | DISPLACEMENT SENSOR (TWANGER) | BDI | TWANGER | |

## GENERAL NOTES

PROJECT LOGISTICS / TIMELINE:

1. BDI RESERVES THE RIGHT TO MODIFY SENSOR LOCATIONS AND QUANTITIES IN THE FIELD BASED ON SITE CONDITIONS.
2. LIVE LOAD INSTRUMENTATION AND TESTING WILL BE CONDUCTED 10/08 THRU 10/24, 2021.
3. TESTING SHALL BE CONDUCTED FOLLOWING THE COMPLETION OF INSTRUMENTATION.
4. INSTRUMENTATION AND TESTING SHALL BE CONDUCTED TOGETHER FOR SPANS 2, 3 ,AND 4.
5. INSTRUMENTATION AND TESTING FOR BOTH APPROACH SPANS SHALL BE CONDUCTED ONE AT A TIME FOLLOWING COMPLETION OF TRUSS SPAN WORK.
6. SYSTEM REMOVAL SHALL BE CONDUCTED FOLLOWING TESTING.
7. TESTING THE BRIDGE REQUIRES INTERMITTENT FULL BRIDGE CLOSURES FOR EACH TRUCK CROSSING.
8. FOR TESTING PLAN SEE LLT-13.
9. FOR SENSOR INSTALLATION DETAILS SEE LLT-14.




SPAN SE INSTRUMENTATION

| SENSOR LEGEND | SENSOR COUNT | CHANNEL COUNT |
|---|---|---|
| STRAIN TRANSDUCER | (34) | (34) |
| TILTMETER (UNI-AXIAL) | (6) | (6) |
| TW DISPLACEMENT SENSOR (TWANGER) | (5) | (5) |
| TOTAL | (45) | (45) |

SPAN 2 INSTRUMENTATION

| SENSOR LEGEND | SENSOR COUNT | CHANNEL COUNT |
|---|---|---|
| STRAIN TRANSDUCER | (48) | (50) |
| TOTAL | (48) | (50) |

SPAN 3 INSTRUMENTATION

| SENSOR LEGEND | SENSOR COUNT | CHANNEL COUNT |
|---|---|---|
| STRAIN TRANSDUCER | (48) | (48) |
| TOTAL | (48) | (48) |

SPAN 4 INSTRUMENTATION

| SENSOR LEGEND | SENSOR COUNT | CHANNEL COUNT |
|---|---|---|
| STRAIN TRANSDUCER | (48) | (48) |
| TOTAL | (48) | (48) |

WA APPROACH SPAN 23 INSTRUMENTATION

| SENSOR LEGEND | SENSOR COUNT | CHANNEL COUNT |
|---|---|---|
| STRAIN TRANSDUCER | (28) | (28) |
| TILTMETER (UNI-AXIAL) | (6) | (6) |
| TW DISPLACEMENT SENSOR (TWANGER) | (5) | (5) |
| TOTAL | (39) | (39) |

## SHEET LIST TABLE



## INDEX OF ISSUE

| NO. | DATE | REVISION DESCRIPTION |
|---|---|---|
| - | 9/28/2021 | LIVE LOAD TESTING (LLT) INSTRUMENTATION PLAN (FOR APPROVAL) |
| | | |
| | | |
| | | |
| BDI REFERENCE NUMBER: 210311-OR | | |

BDI
RAW DATA. REFINED RESULTS.
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LOUISVILLE, CO 80027
303.494.3230
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ISSUE

CLIENT

HDR
1050 SW 6TH AVE SUITE 1800
PORTLAND, OR 97204

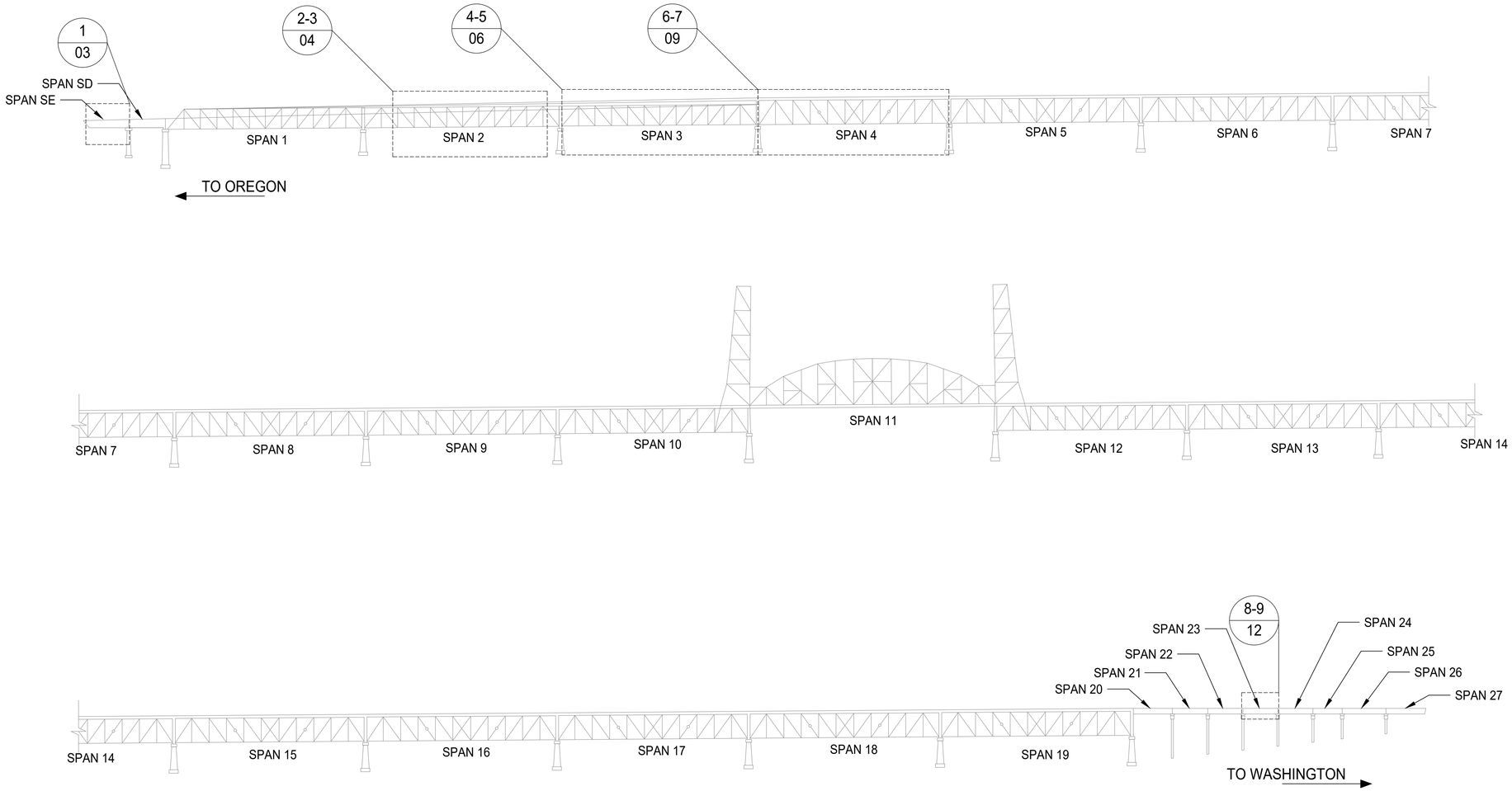
PROJECT NAME

HDR
PORT OF HOOD RIVER BRIDGE
LIVE LOAD TESTING

| | |
|---|---|
| Drawn By: | EDC |
| Checked By: | KNR |
| Date: | 09/28/2021 |
| Client No.: | - |
| BDI No.: | 210311-OR |
| SCALE: | NTS |

OVERALL LEGEND

LLT-01

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| BDI No.: | 210311-OR |
| SCALE: | NTS |

OVERALL LEGEND

LLT-02

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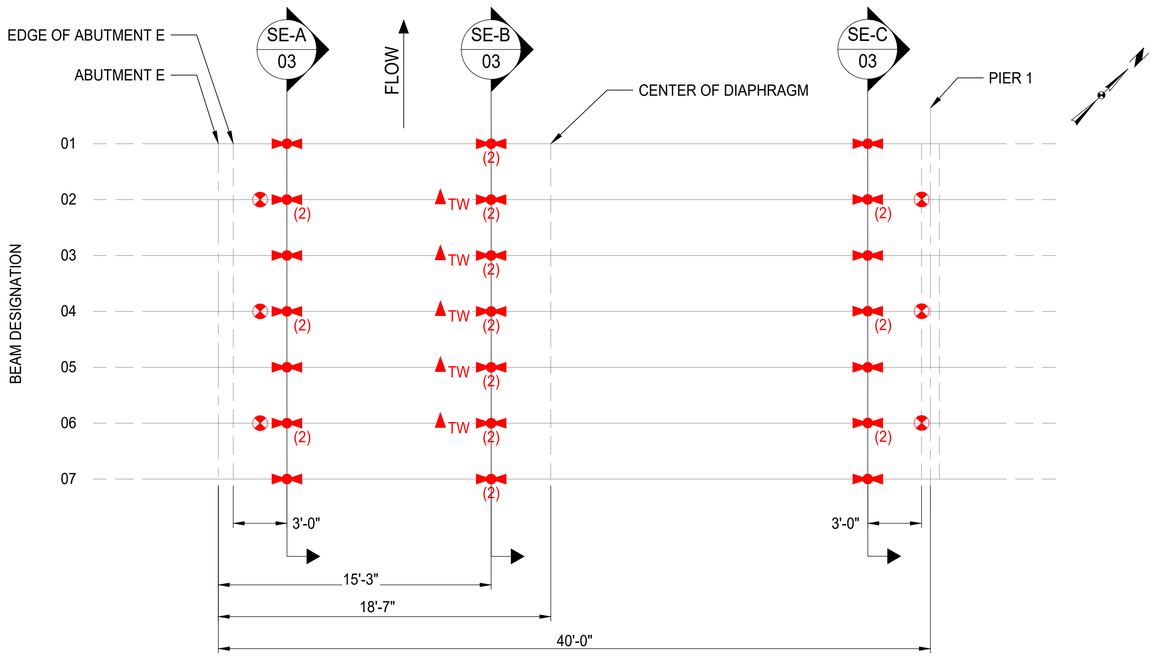
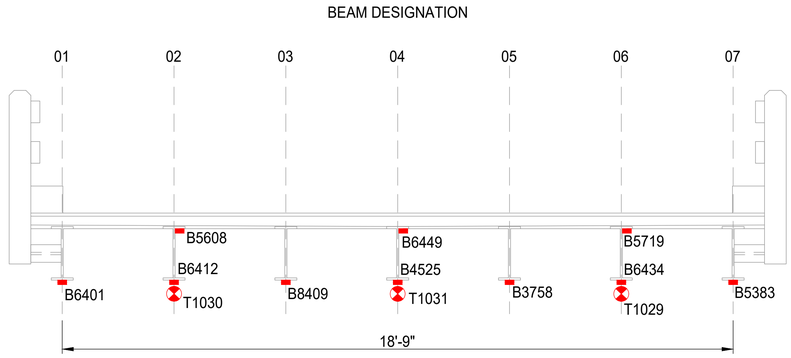
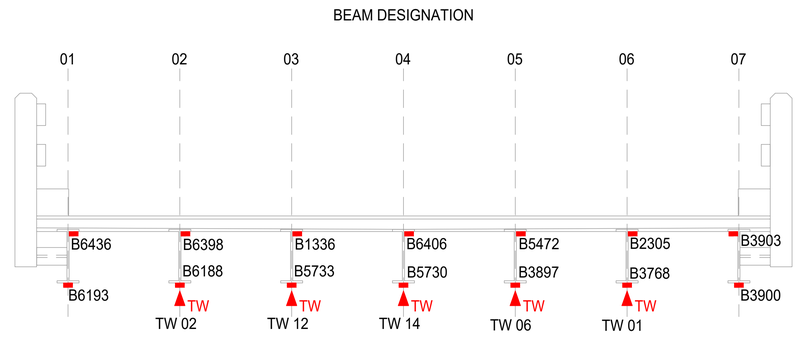


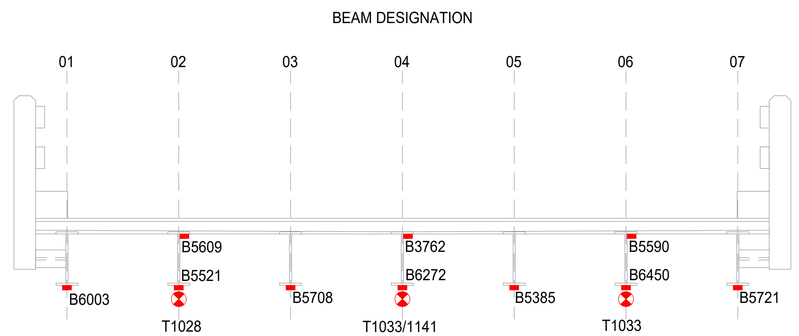

1 PLAN VIEW
SPAN SE




SE-A SECTION SE-A
LOOKING NORTH




SE-B SECTION SE-B
LOOKING NORTH




SE-C SECTION SE-C
LOOKING NORTH

SENSOR LEGEND
- STRAIN TRANSDUCER
- TILTMETER (UNI-AXIAL)
- TW DISPLACEMENT SENSOR (TWANGER)

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LIVE LOAD TESTING

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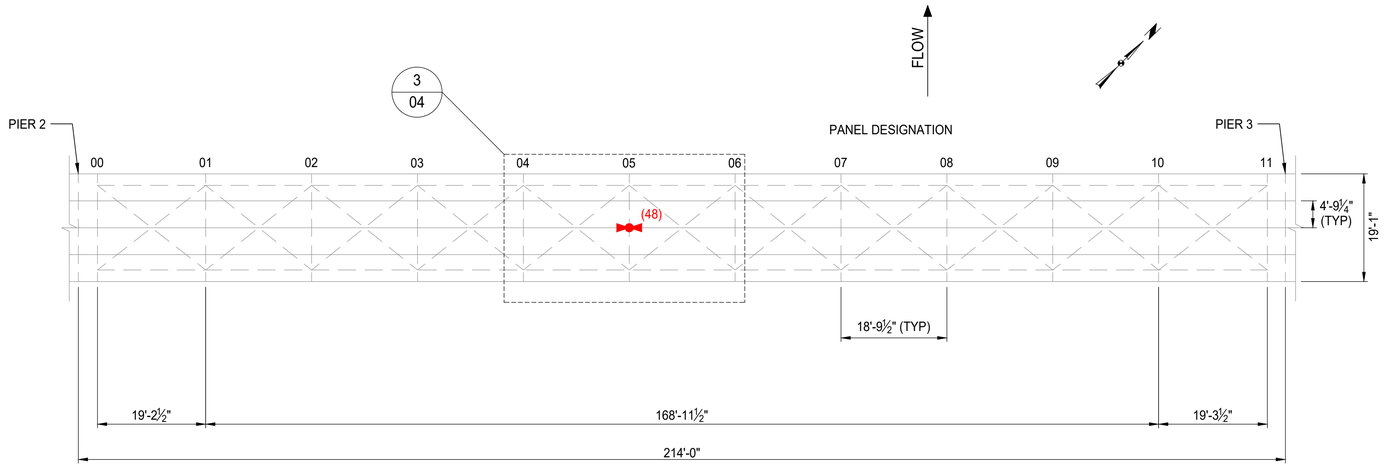
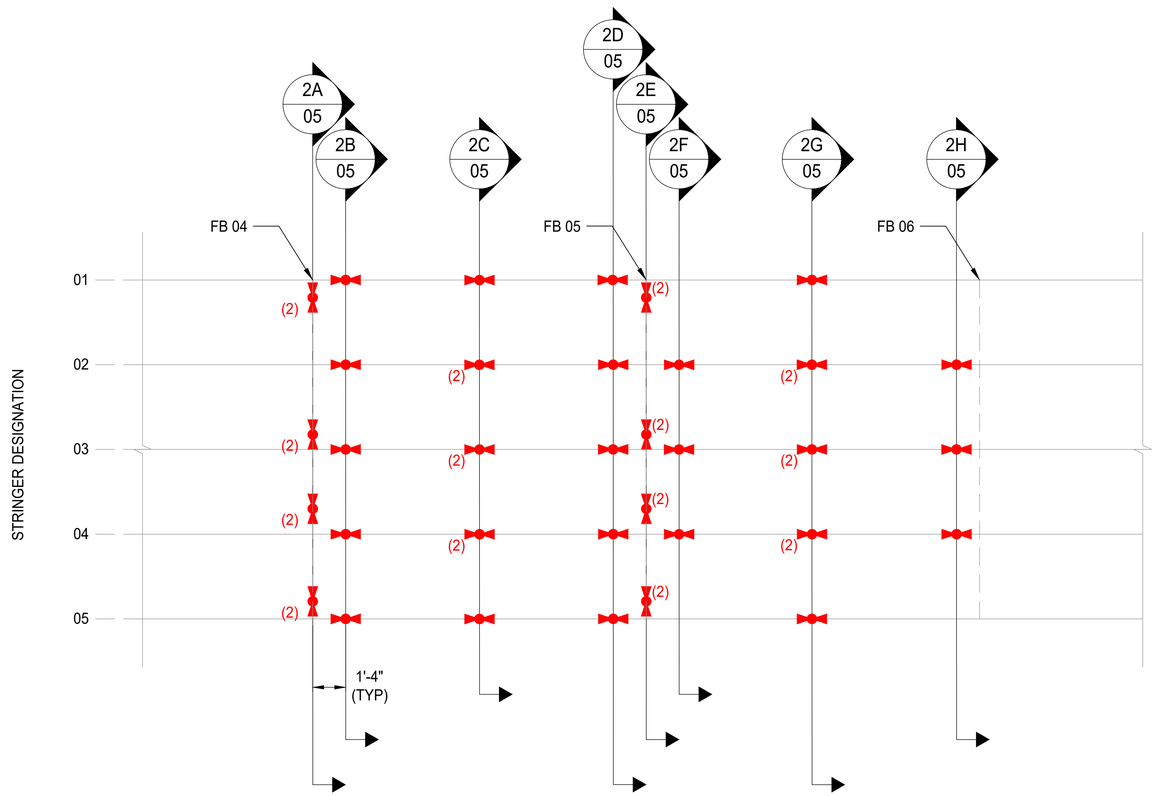
| SCALE: | NTS |

SPAN SD

LLT-03




2 PLAN VIEW
SPAN 2




3 INSTRUMENTATION PLAN
SPAN 2

SENSOR LEGEND
STRAIN TRANSDUCER

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LIVE LOAD TESTING

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| Drawn By: | EDC |
| Checked By: | KNR |
| Date: | 09/28/2021 |
| Client No.: | - |
| BDI No.: | 210311-OR |
| SCALE: | NTS |

SPAN 2 OVERALL PLAN
LLT-04

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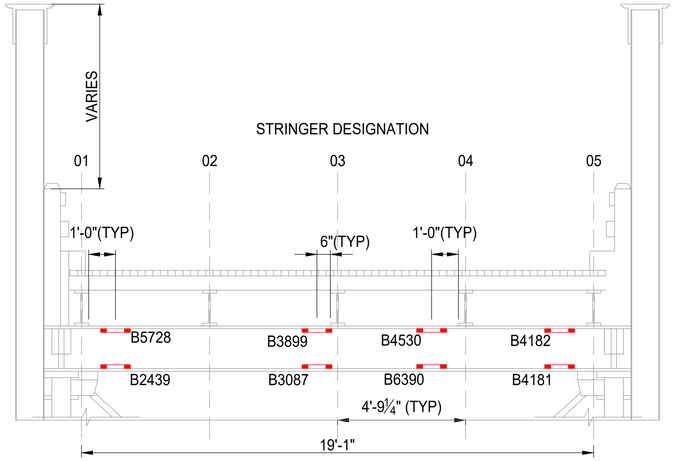
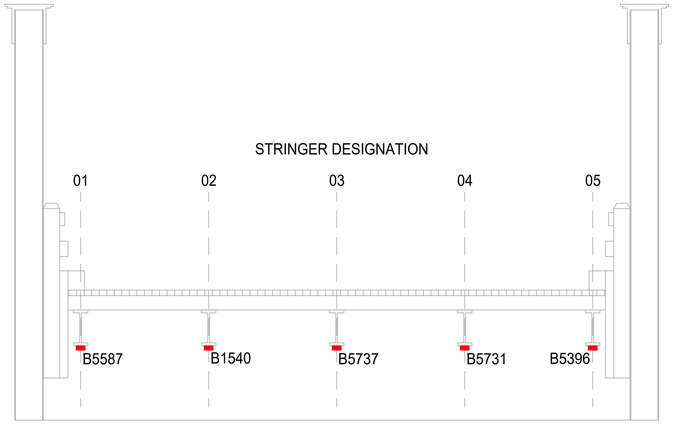
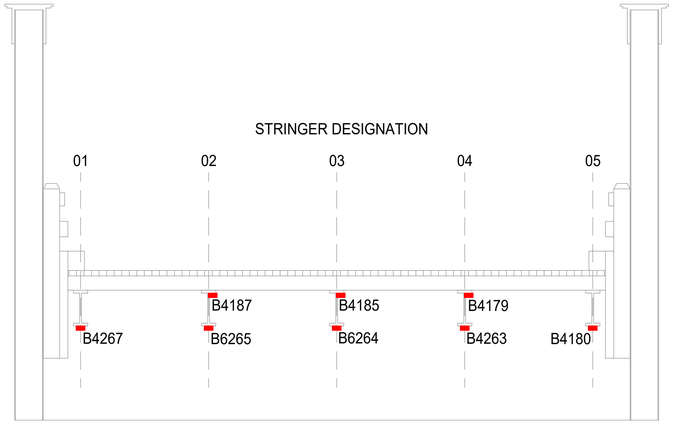


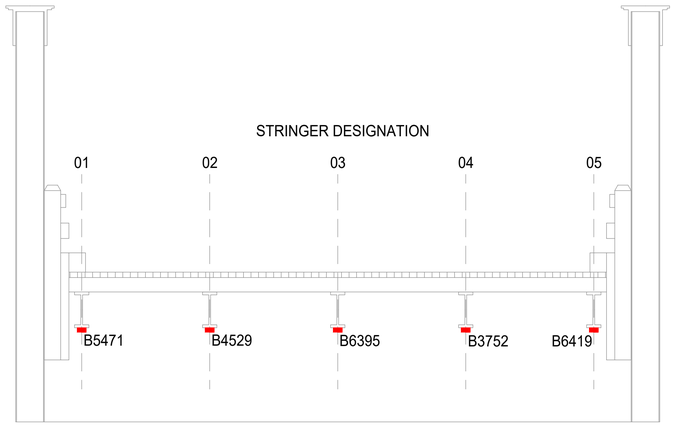

2A SECTION 2A
SPAN 2 FB4




2D SECTION 2D
SPAN 2 BAY 5 NEAR FB5




2G SECTION 2G
SPAN 2 BAY 6 MIDSPAN

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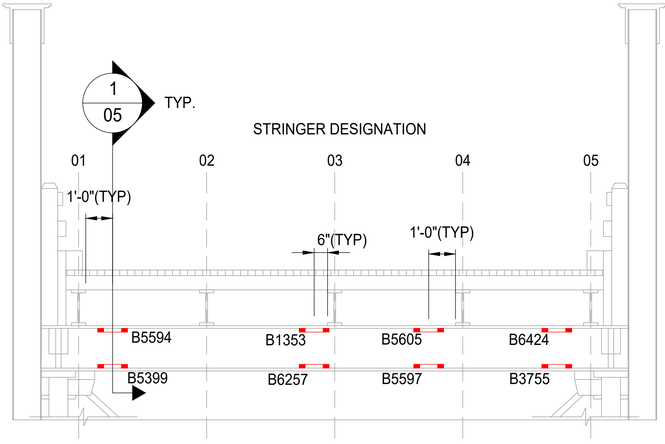
SPAN 2 BAY 4 NEAR FB4

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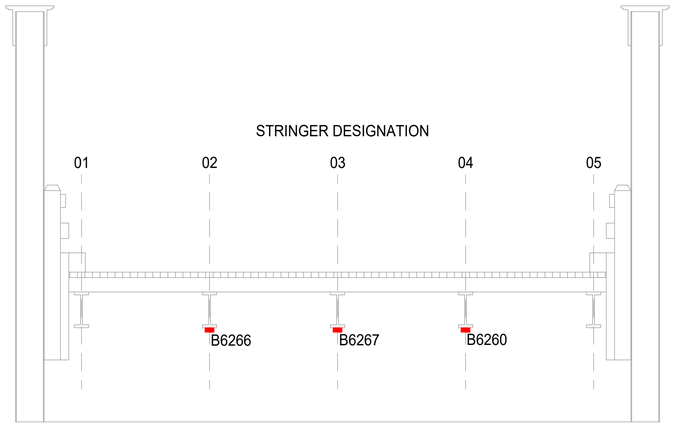
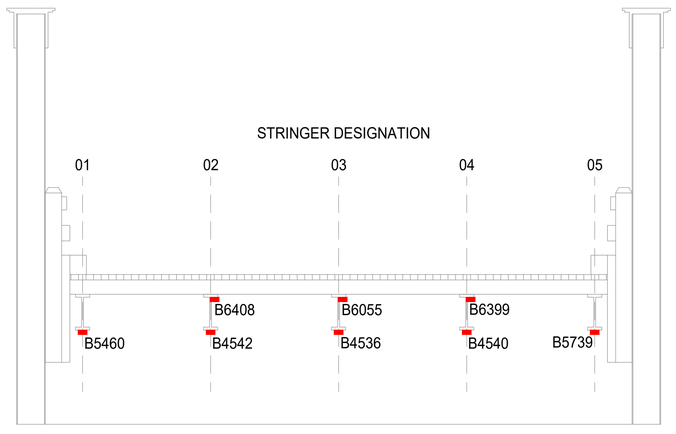
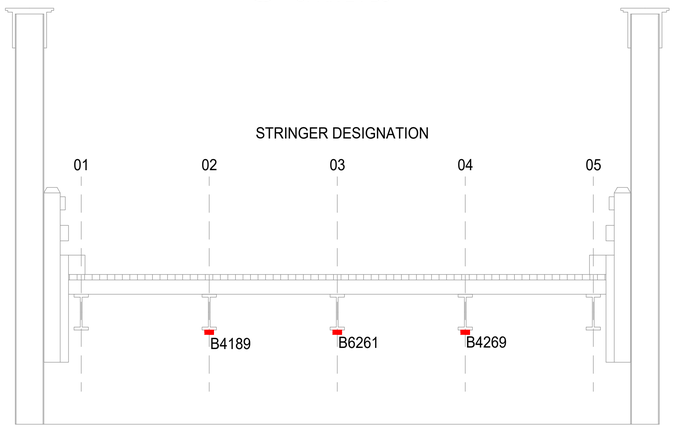
SPAN 2 FB5



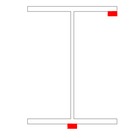

2H SECTION 2H BAY 6 NEAR FB6
SPAN 2




2C SECTION 2C
SPAN 2 BAY 5 MIDSPAN




2F SECTION 2F
SPAN 2 BAY 6 NEAR FB5



1 TYPICAL FLOOR BEAM SECTION
LOOKING NORTH

NOTES:
1. STRAIN GAGES SHALL BE INSTALLED ON EDGE OF FLANGE.

SENSOR LEGEND
STRAIN TRANSDUCER

BDI
RAW DATA. REFINED RESULTS.
740 S PIERCE AVE, SUITE 15
LOUISVILLE, CO 80027
303.494.3230
WWW.BDITEST.COM

ISSUE

CLIENT

HDR
1050 SW 6TH AVE SUITE 1800
PORTLAND, OR 97204

PROJECT NAME

HDR
PORT OF HOOD RIVER BRIDGE
LIVE LOAD TESTING

| | |
|---|---|
| Drawn By: | EDC |
| Checked By: | KNR |
| Date: | 09/28/2021 |
| Client No.: | - |
| BDI No.: | 210311-OR |
| SCALE: | NTS |

SPAN 2 CROSS SECTIONS
LLT-05

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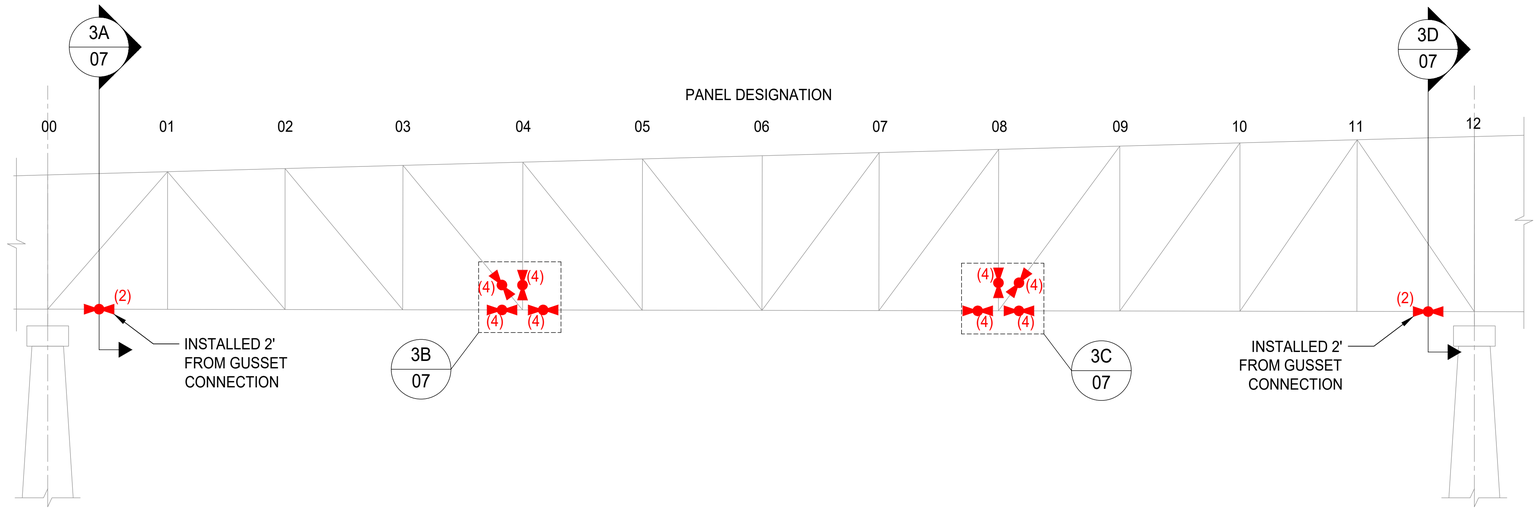
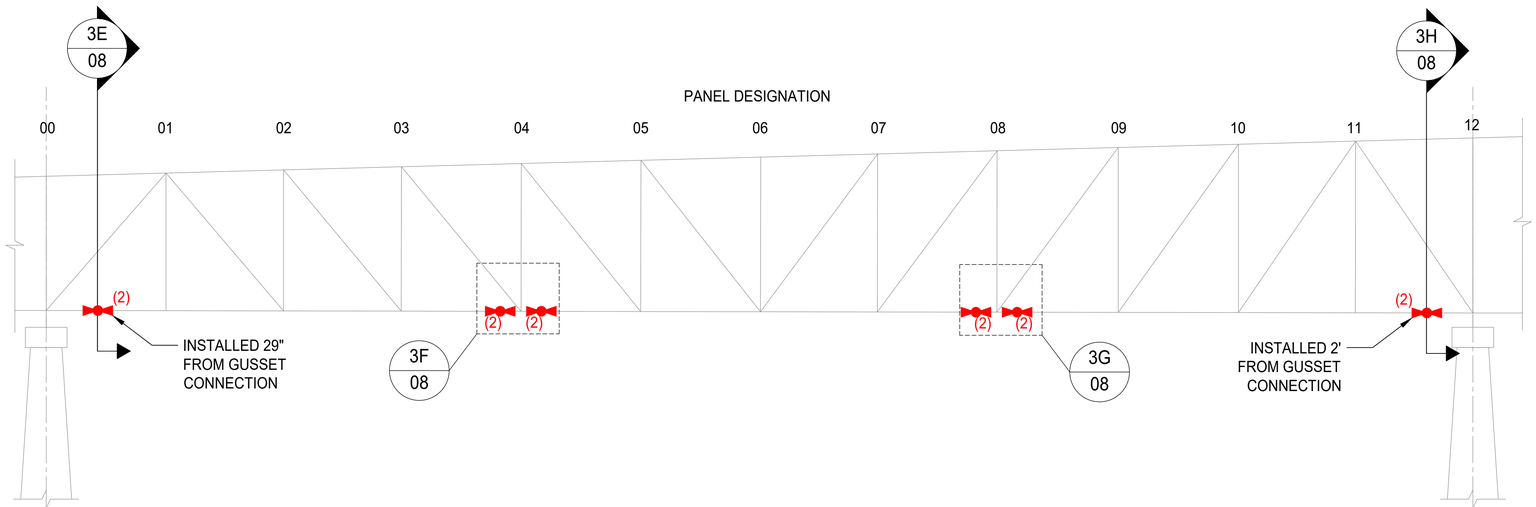
© YYYY BRIDGE DIAGNOSTICS INC.




4 SPAN 3 DOWNSTREAM (WEST) TRUSS
ELEVATION VIEW FACING WEST




5 SPAN 3 UPSTREAM (EAST) TRUSS
ELEVATION VIEW FACING EAST

SENSOR LEGEND
STRAIN TRANSDUCER

BDI
RAW DATA. REFINED RESULTS.
740 S PIERCE AVE, SUITE 15
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CLIENT

HDR
1050 SW 6TH AVE SUITE 1800
PORTLAND, OR 97204

PROJECT NAME

HDR
PORT OF HOOD RIVER BRIDGE
LIVE LOAD TESTING

| | |
|---|---|
| Drawn By: | EDC |
| Checked By: | KNR |
| Date: | 09/28/2021 |
| Client No.: | - |
| BDI No.: | 210311-OR |
| SCALE: | NTS |

SPAN 3 OVERALL ELEVATION
LLT-06

PLOT TIME: 12/16/2021 3:20 PM
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B5730 B5383

3A SECTION 3A
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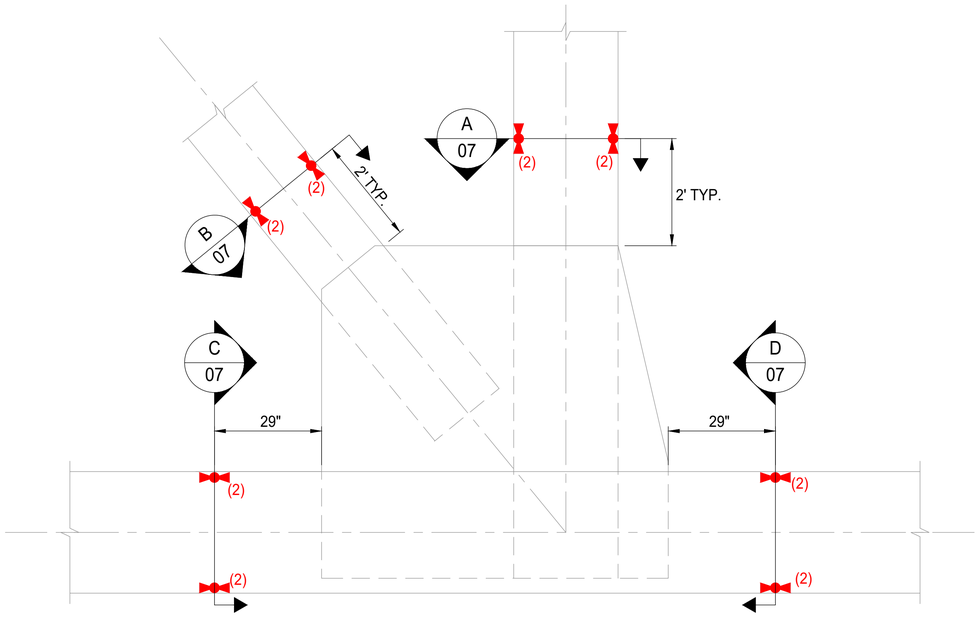
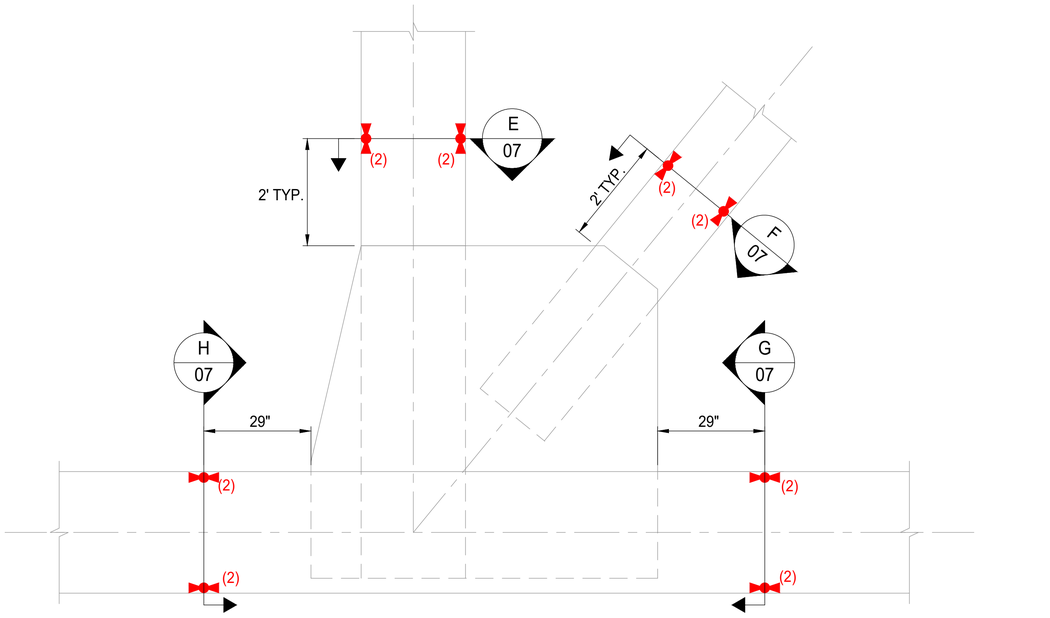


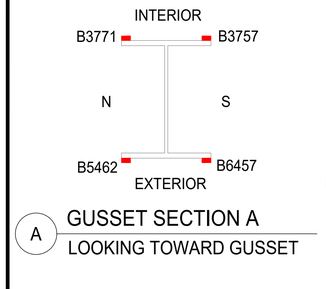

3B SECTION 3B ELEVATION
LOOKING WEST

B6418 B3901

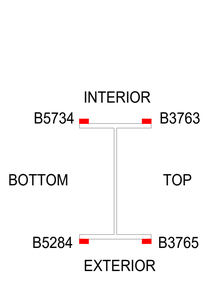
3D SECTION 3D
LOOKING NORTH




3C SECTION 3C ELEVATION
LOOKING WEST




A GUSSET SECTION A
LOOKING TOWARD GUSSET

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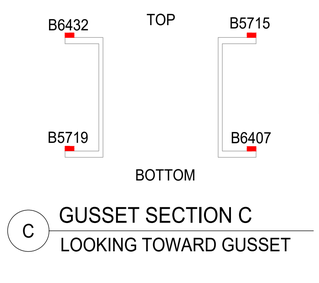
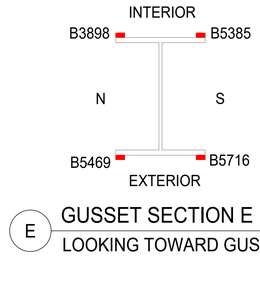
LOOKING TOWARD GUSSET




C GUSSET SECTION C
LOOKING TOWARD GUSSET

D GUSSET SECTION D
LOOKING TOWARD GUSSET

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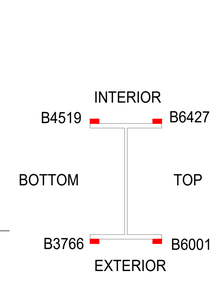
LOOKING TOWARD GUSSET

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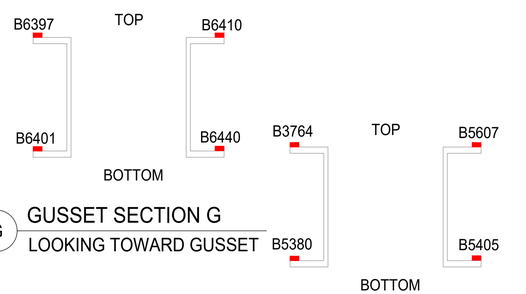
LOOKING TOWARD GUSSET




G GUSSET SECTION G
LOOKING TOWARD GUSSET

H GUSSET SECTION H
LOOKING TOWARD GUSSET

NOTES:
1. STRAIN GAGES SHALL BE INSTALLED ON EDGE OF FLANGE.

SENSOR LEGEND
STRAIN TRANSDUCER

BDI
RAW DATA. REFINED RESULTS.
740 S PIERCE AVE, SUITE 15
LOUISVILLE, CO 80027
303.494.3230
WWW.BDITEST.COM

ISSUE

CLIENT

HDR
1050 SW 6TH AVE SUITE 1800
PORTLAND, OR 97204

PROJECT NAME

HDR
PORT OF HOOD RIVER BRIDGE
LIVE LOAD TESTING

| | |
|---|---|
| Drawn By: | EDC |
| Checked By: | KNR |
| Date: | 09/28/2021 |
| Client No.: | - |
| BDI No.: | 210311-OR |
| SCALE: | NTS |

SPAN 3 CROSS SECTIONS
LLT-07

PLOT TIME: 12/16/2021 3:22 PM
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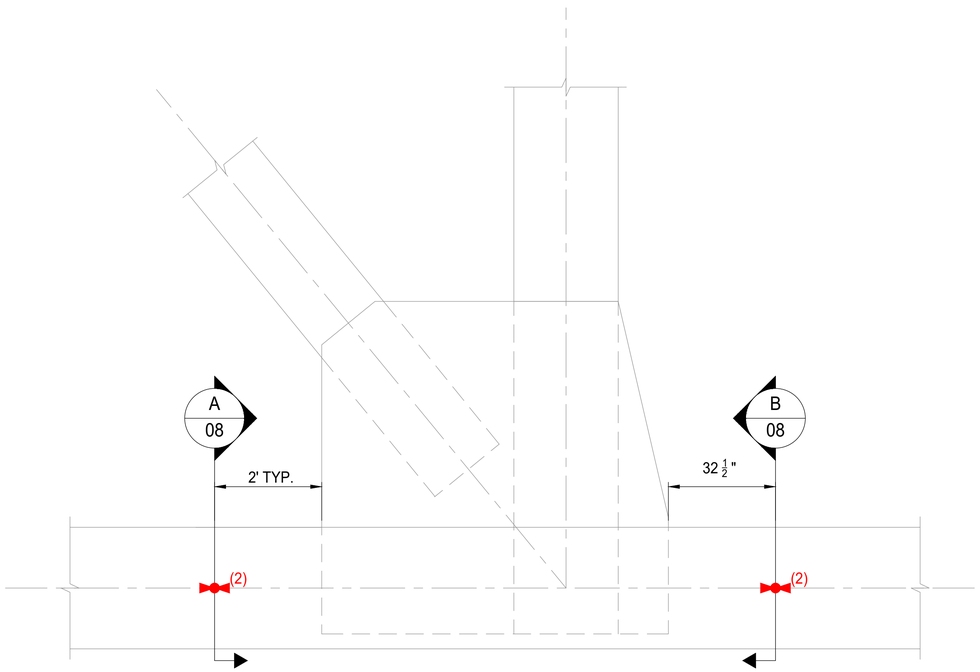
© YYYY BRIDGE DIAGNOSTICS INC.

B6436 B6398

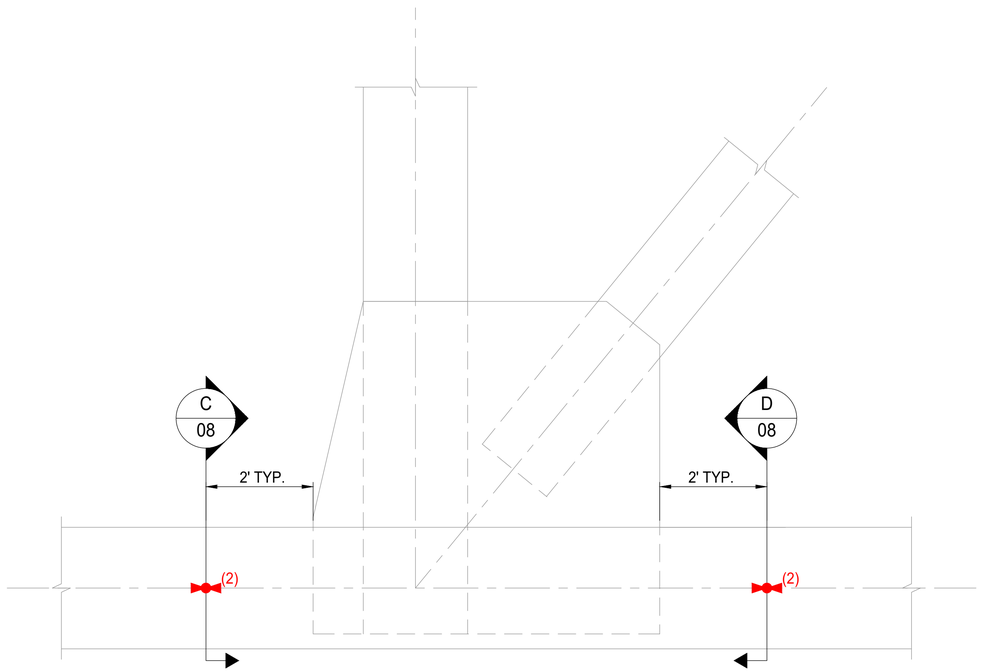
3E SECTION 3E
LOOKING NORTH

B6406 B5733

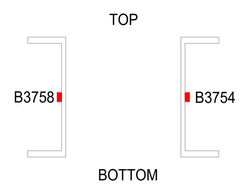
3H SECTION 3H
LOOKING NORTH



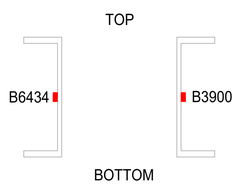

3F SECTION 3F ELEVATION
LOOKING EAST



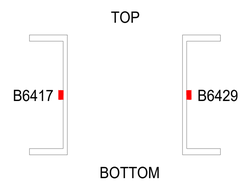

3G SECTION 3G ELEVATION
LOOKING EAST



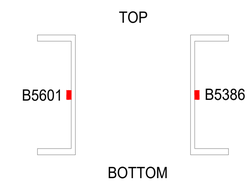

A GUSSET SECTION A
LOOKING TOWARD GUSSET




B GUSSET SECTION B
LOOKING TOWARD GUSSET




C GUSSET SECTION 3
LOOKING TOWARD GUSSET




D GUSSET SECTION D
LOOKING TOWARD GUSSET

NOTES:
1. STRAIN GAGES SHALL BE INSTALLED ON EDGE OF FLANGE.

SENSOR LEGEND
STRAIN TRANSDUCER

BDI
RAW DATA. REFINED RESULTS.
740 S PIERCE AVE, SUITE 15
LOUISVILLE, CO 80027
303.494.3230
WWW.BDITEST.COM

ISSUE

CLIENT

HDR
1050 SW 6TH AVE SUITE 1800
PORTLAND, OR 97204

PROJECT NAME

HDR
PORT OF HOOD RIVER BRIDGE
LIVE LOAD TESTING

| | |
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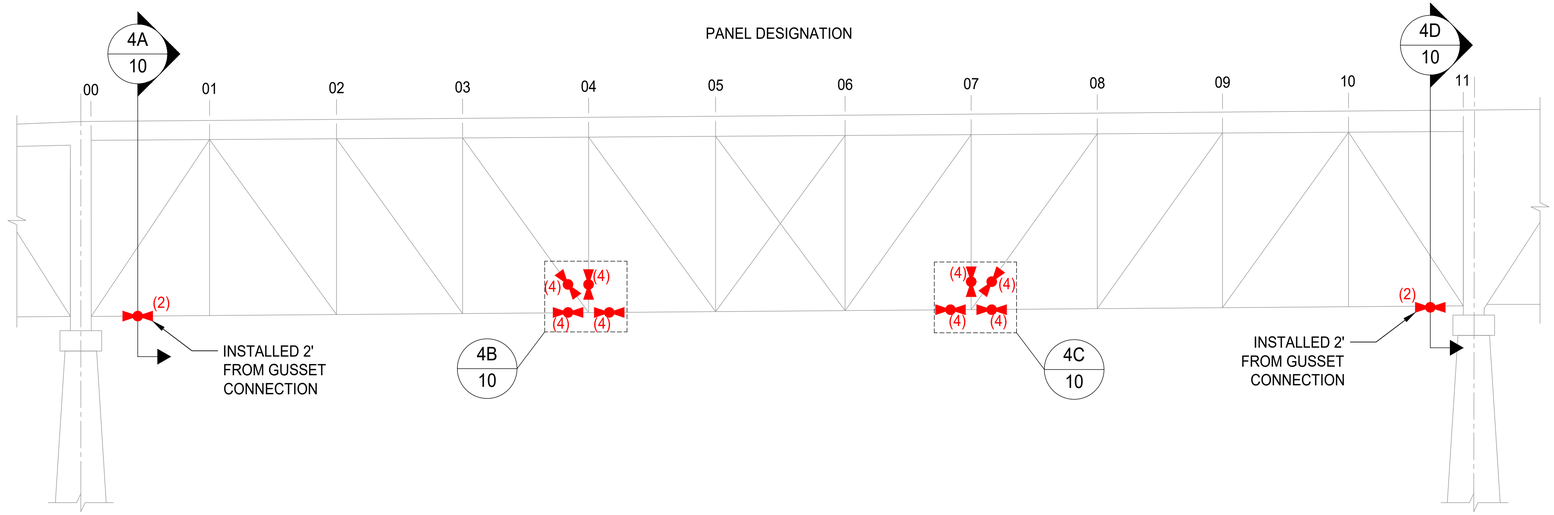
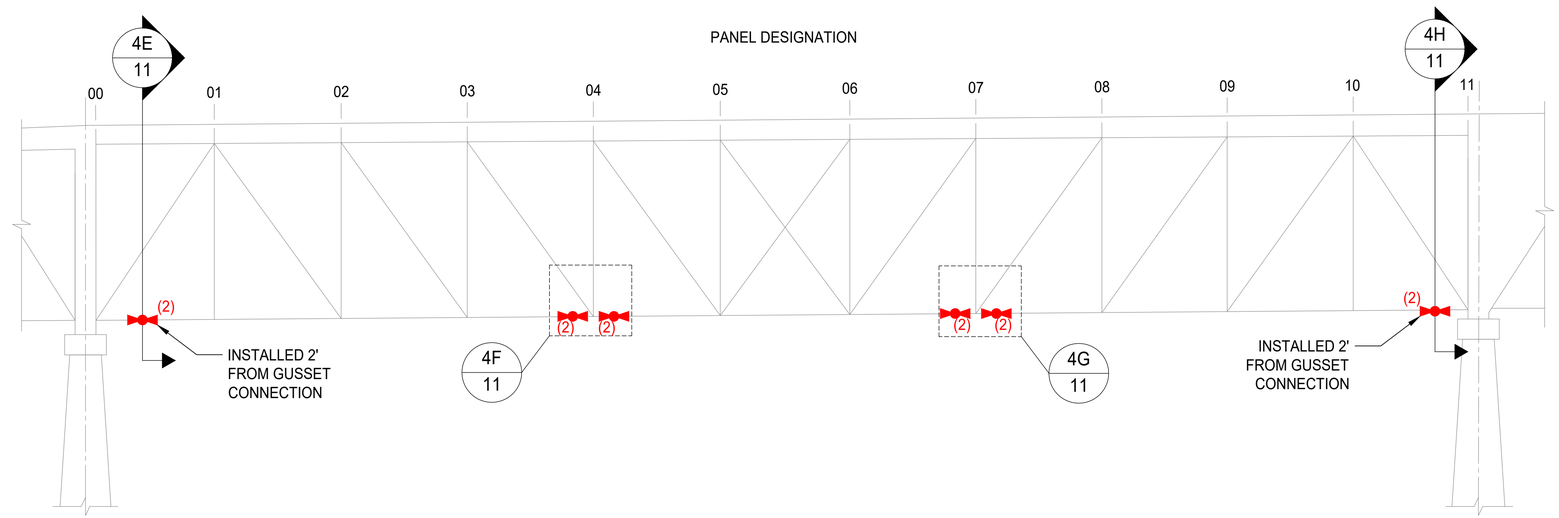
| Checked By: | KNR |
| Date: | 09/28/2021 |
| Client No.: | - |
| BDI No.: | 210311-OR |
| SCALE: | NTS |

SPAN 3 CROSS SECTIONS (2)
LLT-08




6 SPAN 4 DOWNSTREAM (WEST) TRUSS
ELEVATION VIEW FACING WEST




7 SPAN 4 UPSTREAM (EAST) TRUSS
ELEVATION VIEW FACING EAST

SENSOR LEGEND
STRAIN TRANSDUCER

RAW DATA. REFINED RESULTS.
740 S PIERCE AVE, SUITE 15
LOUISVILLE, CO 80027
303.494.3230
WWW.BDITEST.COM

ISSUE

CLIENT

HDR
1050 SW 6TH AVE SUITE 1800
PORTLAND, OR 97204

PROJECT NAME

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PORT OF HOOD RIVER BRIDGE
LIVE LOAD TESTING

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|---|---|
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| Checked By: | KNR |
| Date: | 09/28/2021 |
| Client No.: | - |
| BDI No.: | 210311-OR |
| SCALE: | NTS |

SPAN 4 OVERALL ELEVATION
LLT-09

PLOT TIME: 12/16/2021 3:24 PM
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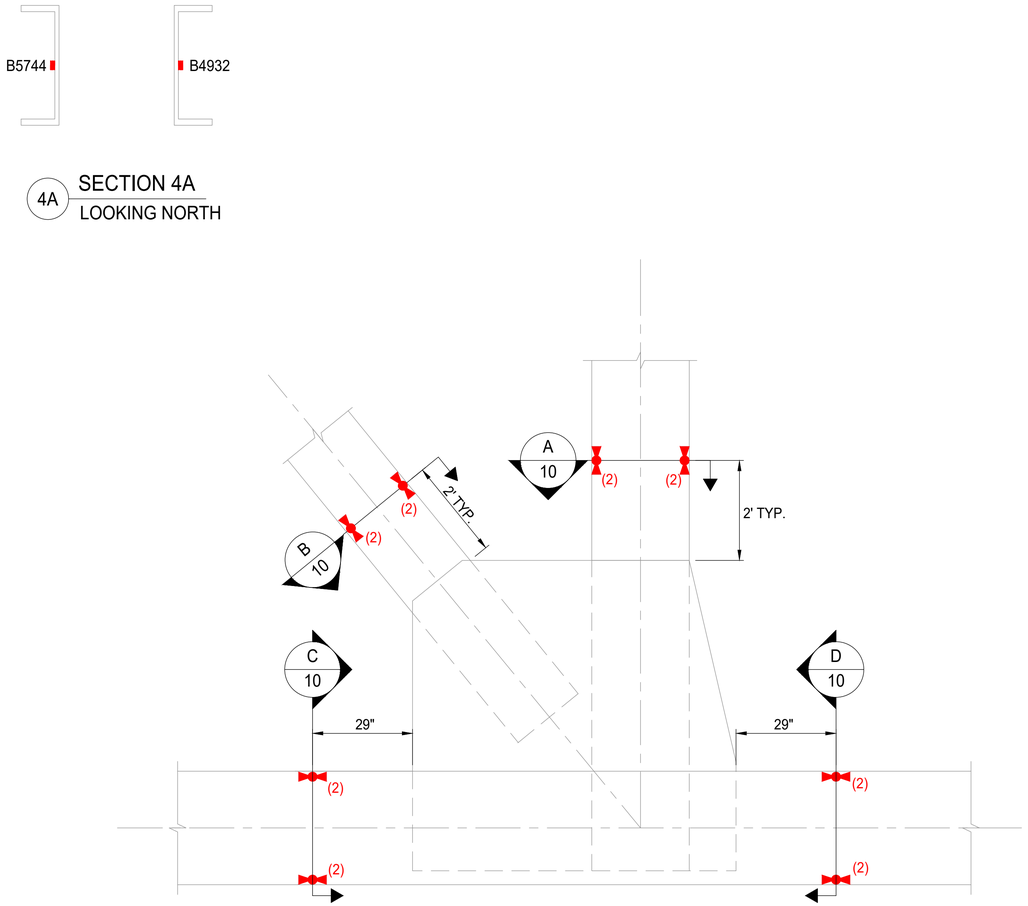
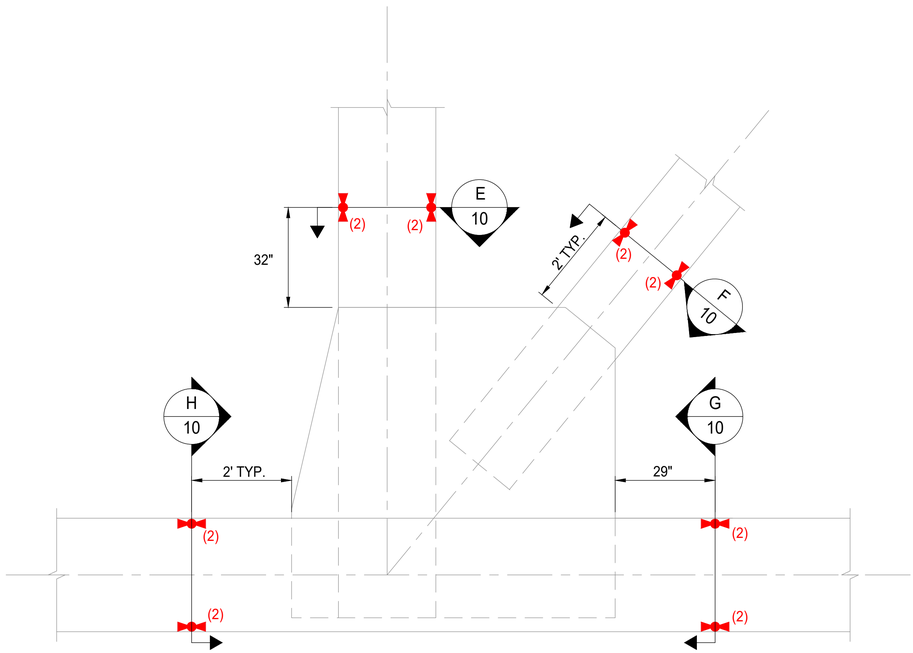


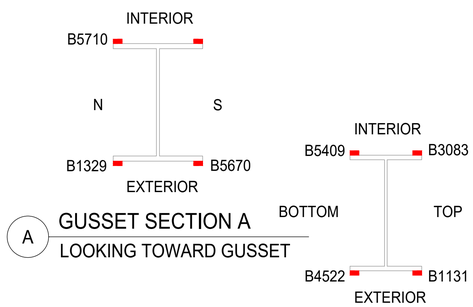

4A SECTION 4A
LOOKING NORTH

4B SECTION 4B ELEVATION
LOOKING WEST


4D SECTION 4D
LOOKING NORTH



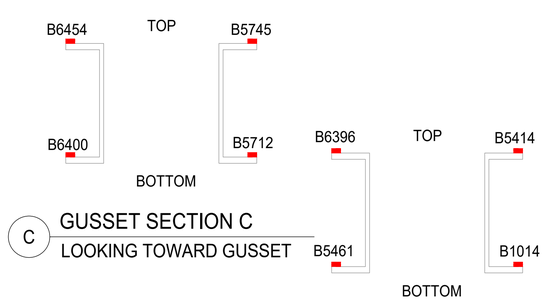

4C SECTION 4C ELEVATION
LOOKING WEST




A GUSSET SECTION A
LOOKING TOWARD GUSSET

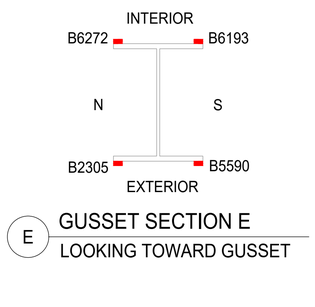



B GUSSET SECTION B
LOOKING TOWARD GUSSET

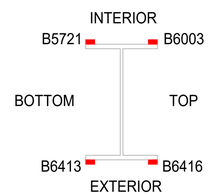



C GUSSET SECTION C
LOOKING TOWARD GUSSET

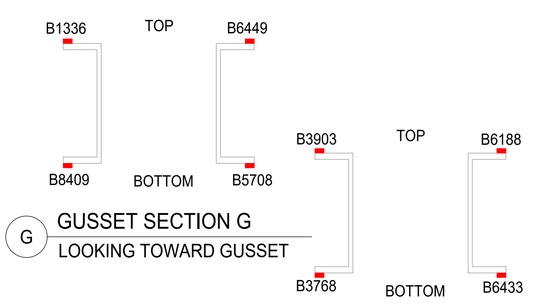
D GUSSET SECTION D
LOOKING TOWARD GUSSET




E GUSSET SECTION E
LOOKING TOWARD GUSSET




F GUSSET SECTION F
LOOKING TOWARD GUSSET




H GUSSET SECTION H
LOOKING TOWARD GUSSET

NOTES:
1. STRAIN GAGES SHALL BE INSTALLED ON EDGE OF FLANGE.

SENSOR LEGEND
STRAIN TRANSDUCER

BDI
RAW DATA. REFINED RESULTS.
740 S PIERCE AVE, SUITE 15
LOUISVILLE, CO 80027
303.494.3230
WWW.BDITEST.COM

ISSUE

CLIENT

HDR
1050 SW 6TH AVE SUITE 1800
PORTLAND, OR 97204

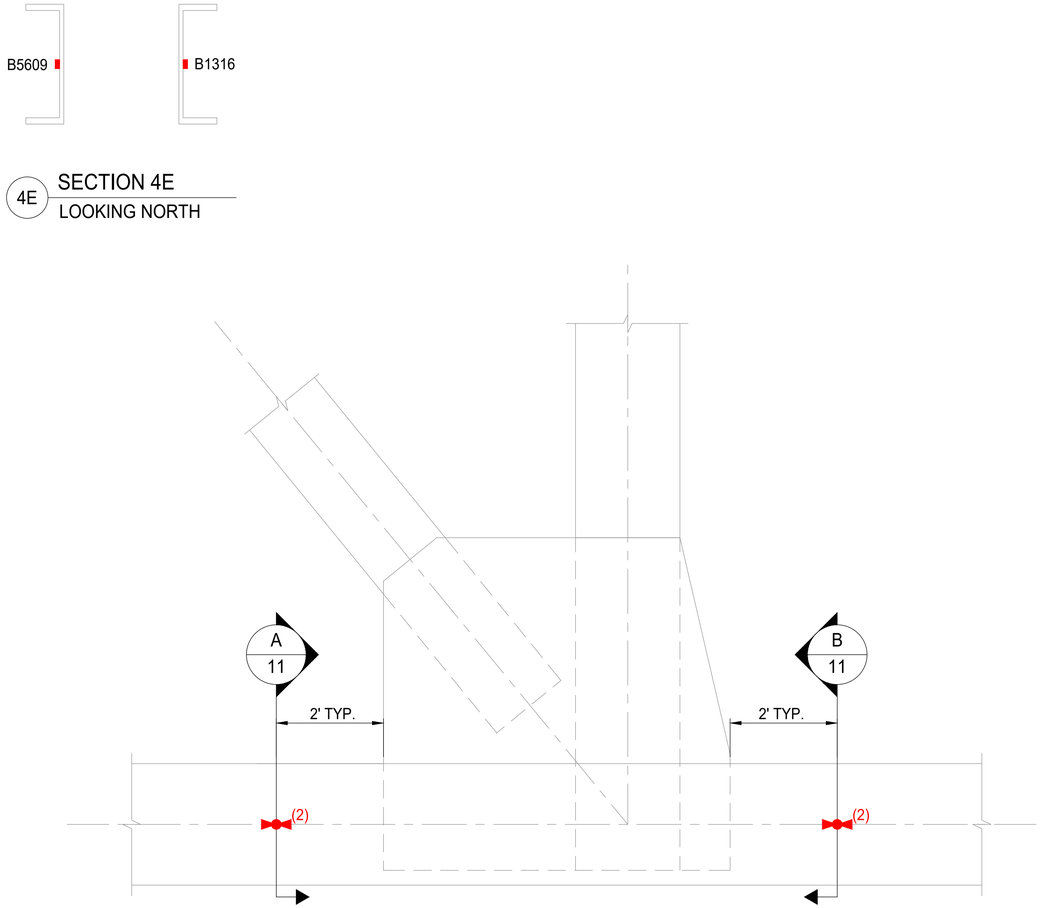
PROJECT NAME

HDR
PORT OF HOOD RIVER BRIDGE
LIVE LOAD TESTING

| | |
|---|---|
| Drawn By: | EDC |
| Checked By: | KNR |
| Date: | 09/28/2021 |
| Client No.: | - |
| BDI No.: | 210311-OR |
| SCALE: | NTS |

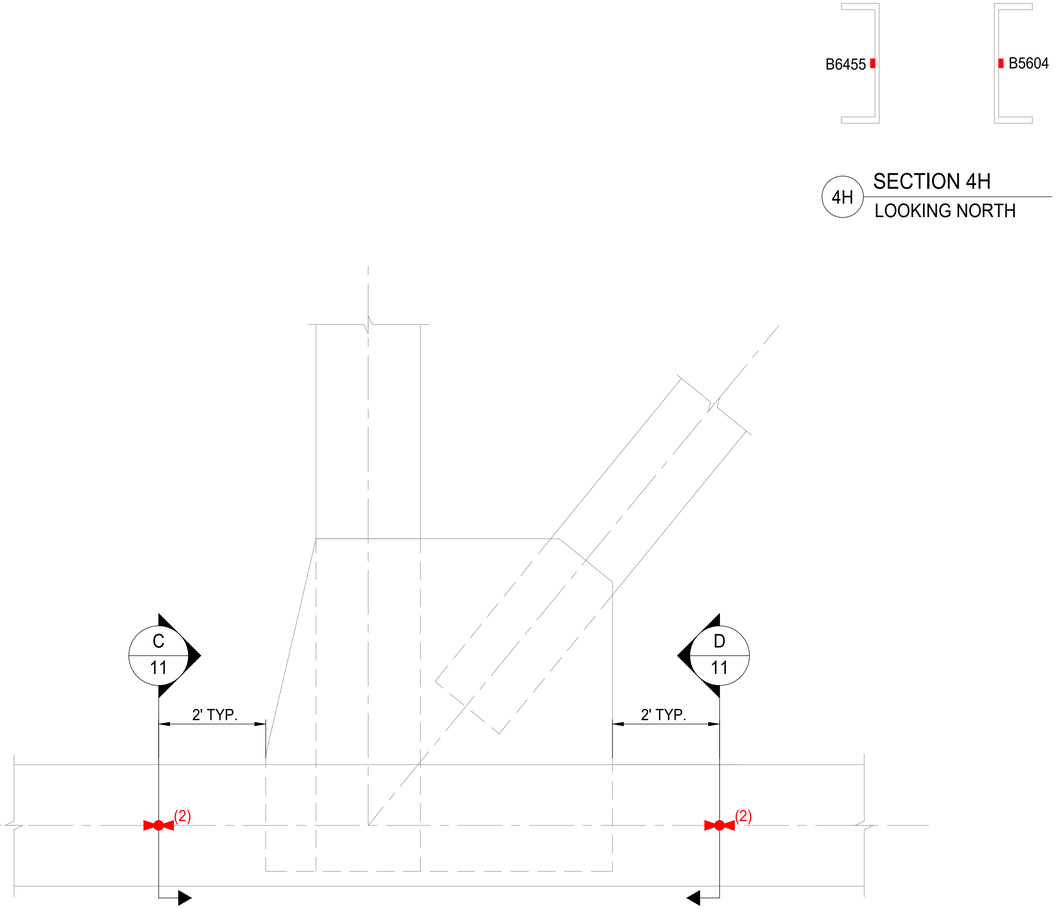
SPAN 4 CROSS SECTIONS
LLT-10

PLOT TIME: 12/16/2021 3:27 PM
FILEPATH: B:\6_Service\2_US\OR-Oregon\1_Active\210311-OR_HDR_POHR_LLT\7. Instrumentation Plans\BDI_OR_HDR_POHR_LLT_210922_V1.dwg



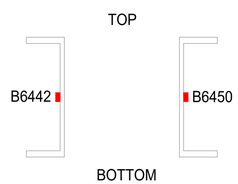

4E SECTION 4E
LOOKING NORTH

4F SECTION 4F ELEVATION
LOOKING EAST

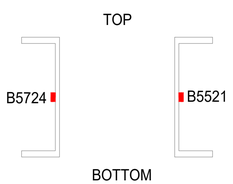



4H SECTION 4H
LOOKING NORTH

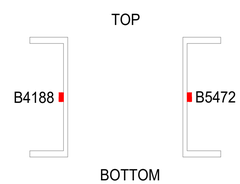
4G SECTION 4G ELEVATION
LOOKING EAST



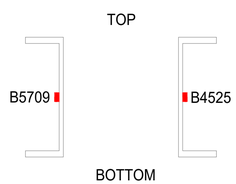

A GUSSET SECTION A
LOOKING TOWARD GUSSET




B GUSSET SECTION B
LOOKING TOWARD GUSSET




C GUSSET SECTION 3
LOOKING TOWARD GUSSET




D GUSSET SECTION D
LOOKING TOWARD GUSSET

NOTES:
1. STRAIN GAGES SHALL BE INSTALLED ON EDGE OF FLANGE.

SENSOR LEGEND
STRAIN TRANSDUCER

BDI
RAW DATA. REFINED RESULTS.
740 S PIERCE AVE, SUITE 15
LOUISVILLE, CO 80027
303.494.3230
WWW.BDITEST.COM

ISSUE

CLIENT

HDR
1050 SW 6TH AVE SUITE 1800
PORTLAND, OR 97204

PROJECT NAME

HDR
PORT OF HOOD RIVER BRIDGE
LIVE LOAD TESTING

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|---|---|
| Drawn By: | EDC |
| Checked By: | KNR |
| Date: | 09/28/2021 |
| Client No.: | - |
| BDI No.: | 210311-OR |
| SCALE: | NTS |

SPAN 4 CROSS SECTIONS (2)
LLT-11

PLOT TIME: 12/16/2021 3:28 PM
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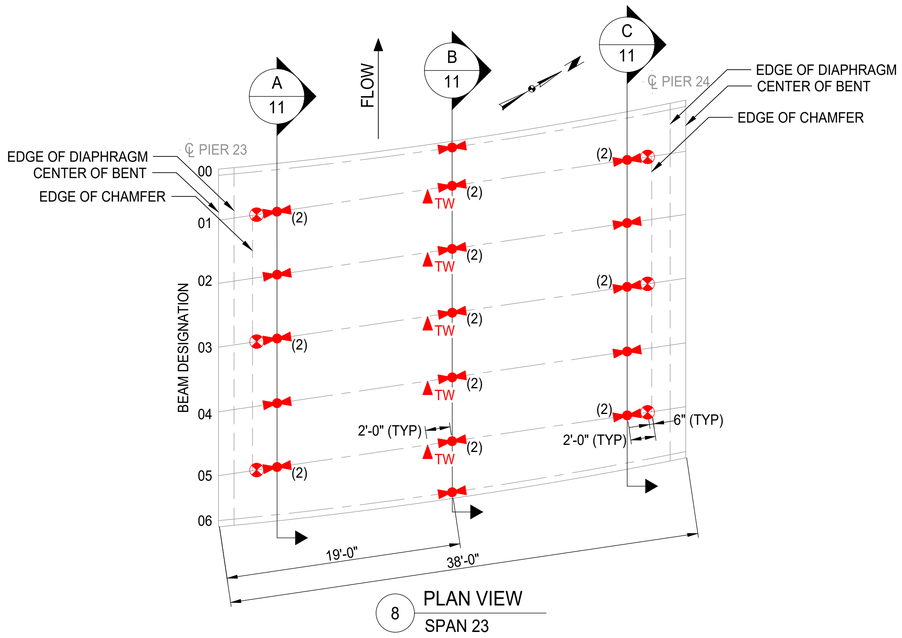
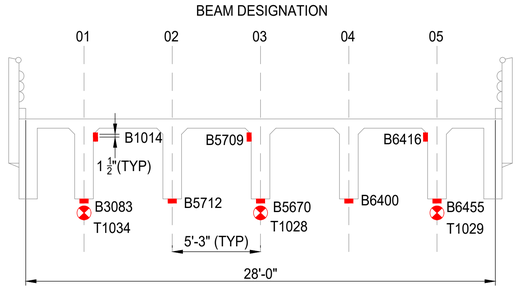
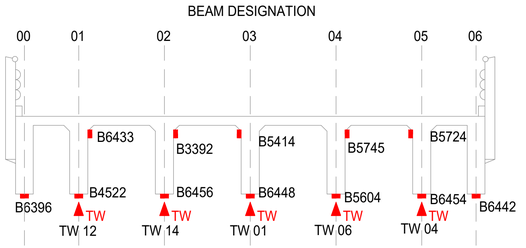


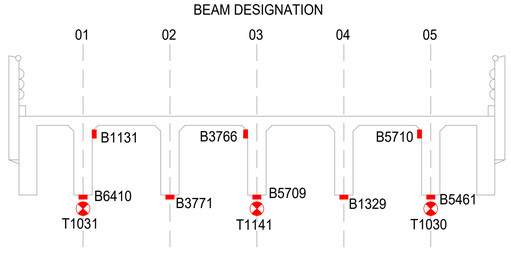

8 PLAN VIEW
SPAN 23




23-A SECTION 24-A
LOOKING NORTH




23-B SECTION 24-B
LOOKING NORTH




23-C SECTION 24-C
LOOKING NORTH

NOTES:
1. TILTMETERS SHALL BE INSTALLED 1' FROM EDGE OF PIER.
2. SECTION A AND C STRAIN GAGES SHALL BE INSTALLED 2' FROM EDGE OF PIER.
3. SECTION B STRAIN GAGES SHALL BE INSTALLED CENTER OF SPAN.

SENSOR LEGEND
- STRAIN TRANSDUCER
- TILTMETER (UNI-AXIAL)
- TW DISPLACEMENT SENSOR (TWANGER)

RAW DATA. REFINED RESULTS.
740 S PIERCE AVE, SUITE 15
LOUISVILLE, CO 80027
303.494.3230
WWW.BDITEST.COM

ISSUE

CLIENT

HDR
1050 SW 6TH AVE SUITE 1800
PORTLAND, OR 97204

PROJECT NAME

# HDR
# PORT OF HOOD RIVER BRIDGE
# LIVE LOAD TESTING

| | |
|---|---|
| Drawn By: | EDC |
| Checked By: | KNR |
| Date: | 09/28/2021 |
| Client No.: | - |
| BDI No.: | 210311-OR |
| SCALE: | NTS |

SPAN 24

LLT-12

PLOT TIME: 12/16/2021 3:29 PM
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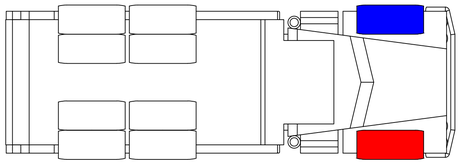

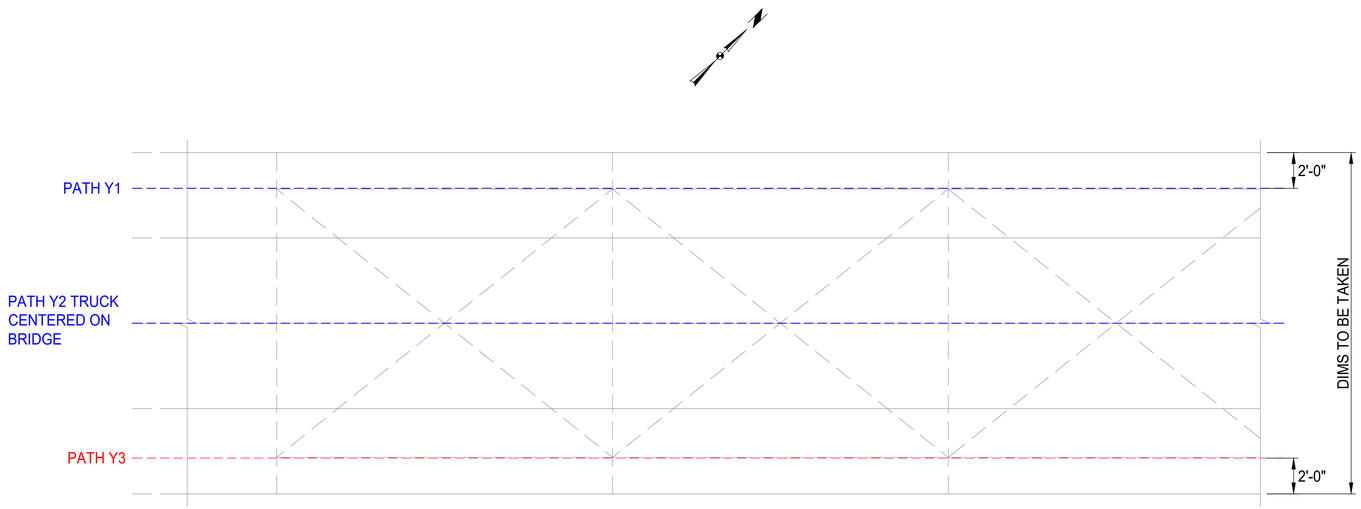


8 TESTING PLAN
ALL SPANS

NOTES:

1. ALL TESTS SHALL BE RUN IN THE NORTHBOUND DIRECTION.
2. LOAD PATH Y1 SHALL BE RUN WITH THE DRIVER SIDE WHEEL 2' FROM THE EDGE OF ROADWAY.
3. LOAD PATH Y2 SHALL BE RUN WITH THE TRUCK CENTERED ON THE ROADWAY.
4. LOAD PATH Y3 SHALL BE RUN WITH THE PASSENGER SIDE WHEEL 2' FROM EDGE OF ROADWAY.
5. TWO CRAWL TESTS (3-5 MPH) OF HIGH QUALITY SHALL BE COMPLETED ALONG ALL TRUCK PATHS.
6. TRUSS SPANS 2, 3, AND 4 SHALL BE TESTED SIMULTANEOUSLY.
7. FOR TRUSS SPAN TESTS VEHICLE SHALL START AND END 50' FROM INSTRUMENTED SPANS.
8. FOR APPROACH SPAN TESTS VEHICLE SHALL START AND END 20' FROM INSTRUMENTED SPAN.
9. THE QUALITY OF EACH CRAWL TEST SHALL BE BRIEFLY ASSESSED AFTER ITS COMPLETION. QUALITY PARAMETERS INCLUDE REPEATABILITY OF RESPONSE, MAGNITUDES AND SHAPES, OBSERVED THERMAL EFFECTS, GAGE MALFUNCTIONS, ETC.
10. THE QUALITY OF ALL COLLECTED TEST DATA SHALL BE EXAMINED AND DOCUMENTED ON SITE BY A TRAINED PROFESSIONAL.
11. THE TEST TRUCK SHALL BE WEIGHED BY ODOT PRIOR TO TESTING WITH GROSS WEIGHT, FRONT AXLE WEIGHT, AND REAR TANDEM AXLE WEIGHT PROVIDED.
12. ROADWAY WIDTH DIMENSIONS TO SHALL BE TAKEN BY BDI FOR EACH INDIVIDUAL SPAN.

RAW DATA. REFINED RESULTS.
740 S PIERCE AVE, SUITE 15
LOUISVILLE, CO 80027
303.494.3230
WWW.BDITEST.COM

ISSUE

CLIENT

HDR
1050 SW 6TH AVE SUITE 1800
PORTLAND, OR 97204

PROJECT NAME

HDR
PORT OF HOOD RIVER BRIDGE
LIVE LOAD TESTING

| | |
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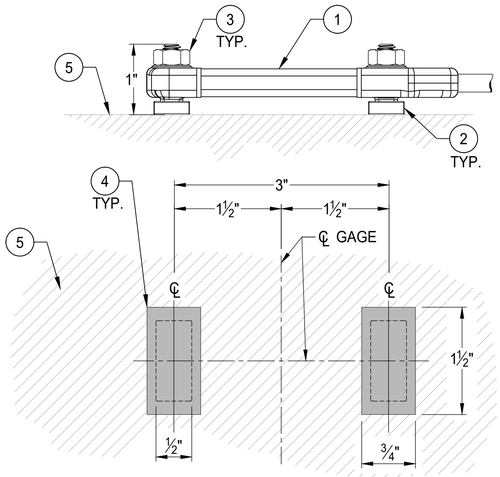
| Drawn By: | EDC |
| Checked By: | KNR |
| Date: | 09/28/2021 |
| Client No.: | - |
| BDI No.: | 210311-OR |
| SCALE: | NTS |

TESTING PLAN

LLT-13

PLOT TIME: 12/16/2021 3:30 PM
FILEPATH: B:\6_Service\2_US\OR-Oregon\1_Active\210311-OR_HDR_POHR_LLT\7. Instrumentation Plans\BDI_OR_HDR_POHR_LLT_210922_V1.dwg

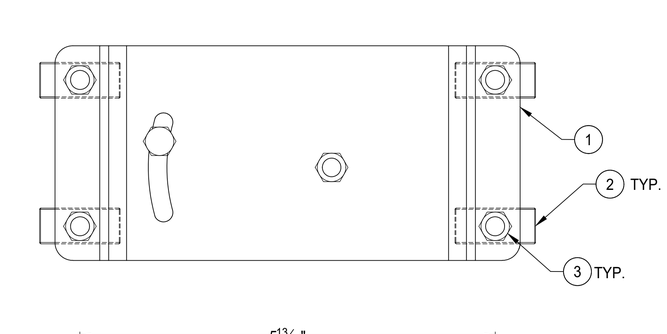



COMPONENT DESCRIPTION

1. ST350 STRAIN GAGE
2. 1/4"-20 THREADED MOUNTING TAB
3. 1/4"-20 STAINLESS STEEL NUT
4. TYPICAL SURFACE PREP REQUIRED TO MOUNT STRAIN GAGES
5. TYPICAL MOUNTING SURFACE

| FOOTNOTES - INSTANT ADHESIVE |
|---|
| 1. STRAIN GAGES TO BE MOUNTED BY EPOXY MOUNTING TABS TO SURFACE OF STRUCTURE. MANUFACTURER'S SUGGESTED EPOXY SPECIFICATION IS LOCTITE H4500. |
| 2. DURING SURFACE PREP ALL PAINT AND SURFACE DEFORMATIONS MUST BE REMOVED WITH A SANDING DISC. |
| 3. SURFACE PREP IS REQUIRED JUST PRIOR TO TAB INSTALLATION AS TO NOT ALLOW SURFACE CONTAMINANTS TO ACCUMULATE OR OXIDATION TO OCCUR. |

1 TYPICAL ST350 STRAIN GAGE INSTALLATION

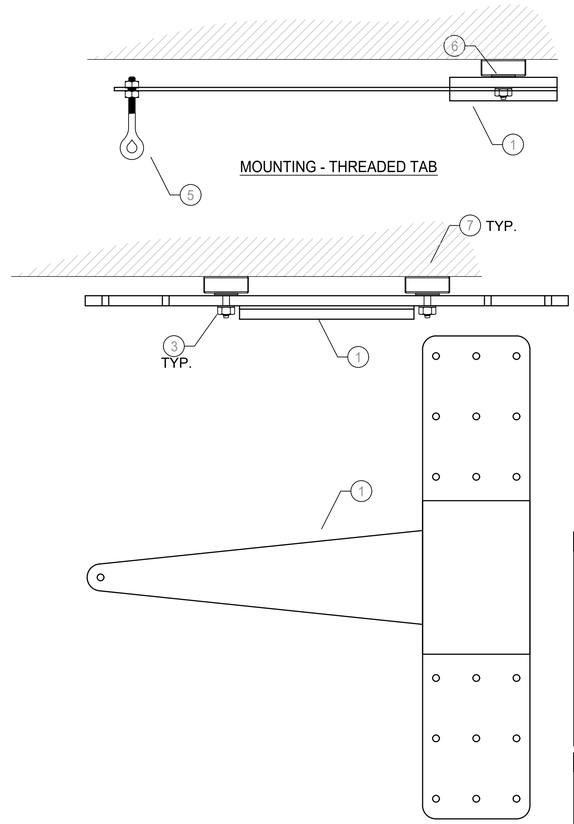



COMPONENT DESCRIPTION

1. BDI +/- 15 DEGREE TILTMETER WITH COVER AND ADJUSTMENT BOLTS
2. 1/4"-20 THREADED MOUNTING TAB
3. 1/4"-20 STAINLESS STEEL NUT
4. TYPICAL SURFACE PREP REQUIRED TO MOUNT TILTMETERS
5. TYPICAL MOUNTING SURFACE

| FOOTNOTES - INSTANT ADHESIVE |
|---|
| 1. TILTMETERS TO BE MOUNTED BY EPOXY MOUNTING TABS TO SURFACE OF STRUCTURE. MANUFACTURER'S SUGGESTED EPOXY SPECIFICATION IS LOCTITE H4500. |
| 2. DURING SURFACE PREP ALL PAINT AND SURFACE DEFORMATIONS MUST BE REMOVED WITH A SANDING DISC. |
| 3. SURFACE PREP IS REQUIRED JUST PRIOR TO TAB INSTALLATION AS TO NOT ALLOW SURFACE CONTAMINANTS TO ACCUMULATE OR OXIDATION TO OCCUR. |

2 TYPICAL BDI TILTMETER INSTALLATION




1. BDI TWANGER
2. 1/4"-20 THREADED MOUNTING TAB
3. 1/4"-20 STAINLESS STEEL NUT
4. TYPICAL MOUNTING SURFACE
5. 1/4"-20 STAINLESS STEEL EYE BOLT
6. 1/4"-20 STAINLESS STEEL WASHER
7. 1/4"-20 MOUNTING TAB
8. 1/4"-20 STAINLESS STEEL FENDER WASHER
9. TYPICAL SURFACE PREP REQUIRED TO MOUNT STRAIN GAGES

| FOOTNOTES - INSTANT AHDESIVE |
|---|
| 1. TWANGERS TO BE MOUNTED WITH LOCTITE 410 INSTANT ADHESIVE AND LOCTITE 7452 ACCELERANT |
| 2. DURING SURFACE PREP ALL PAINT AND SURFACE DEFORMATIONS MUST BE REMOVED. |
| 3. SURFACE PREP IS REQUIRED JUST PRIOR TO GAGE INSTALLATION AS TO NOT ALLOW SURFACE CONTAMINANTS TO ACCUMULATE. |

| FOOTNOTES - INSTANT ADHESIVE |
|---|
| 1. WHEN INSTANT ADHESIVE IS NOT APPLICABLE CLAMPS CAN BE SUBSTITUTED. |

3 TYPICAL BDI TWANGER SENSOR INSTALLATION

BDI
RAW DATA. REFINED RESULTS.
740 S PIERCE AVE, SUITE 15
LOUISVILLE, CO 80027
303.494.3230
WWW.BDITEST.COM

ISSUE

CLIENT

HDR
1050 SW 6TH AVE SUITE 1800
PORTLAND, OR 97204

PROJECT NAME

HDR
PORT OF HOOD RIVER BRIDGE
LIVE LOAD TESTING

| | |
|---|---|
| Drawn By: | EDC |
| Checked By: | KNR |
| Date: | 09/28/2021 |
| Client No.: | - |
| BDI No.: | 210311-OR |
| SCALE: | NTS |

SENSOR DETAILS

LLT-14

PLOT TIME: 12/16/2021 3:30 PM
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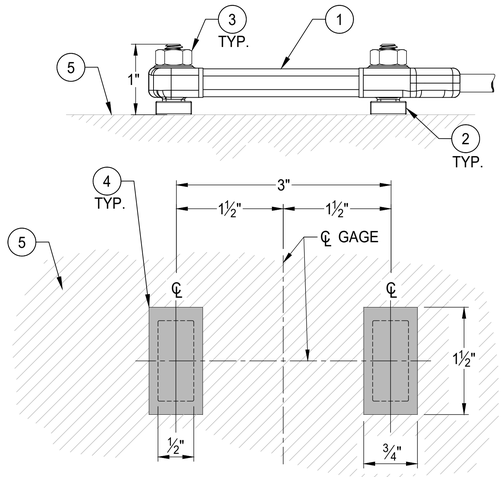


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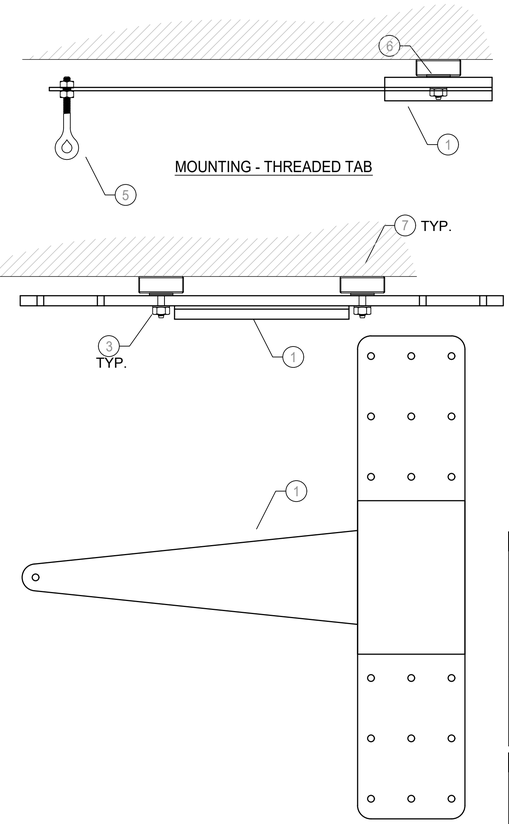


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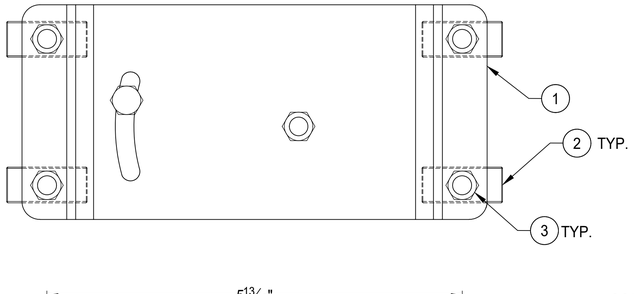


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ISSUE

CLIENT

HDR
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PROJECT NAME

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SENSOR DETAILS

LLT-14

PLOT TIME: 12/16/2021 3:30 PM
FILEPATH: B:\6_Service\2_US\OR-Oregon\1_Active\210311-OR_HDR_POHR_LLT\7. Instrumentation Plans\BDI_OR_HDR_POHR_LLT_210922_V1.dwg
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# Commission Memo

Prepared by: Greg Hagbery
Date: February 15, 2022
Re: Ken Jernstedt Airport – Work Session

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At the December 7, 2021, Fall Planning work session, staff provided brief descriptions of past and current development efforts at the Ken Jernstedt Airfield. Several key issues were also presented. A list of Action Items was drafted after the discussion and provided to the Commission in a December 21, 2021, Fall Planning Actions Items report.

This Airport Work Session is intended to address the seventh Action Item on the list, "Schedule Commission work session" with the intent of covering the following sub-tasks:

1. **Prepare a summary of key terms of a ground lease to address Commission concerns -** *Staff has compiled a list of key subjects in a common airport ground lease and brief descriptions of their purpose in the attached supplemental report.*

2. **Forward the SBP community survey to Commission –** *attached. In 2020, the Port conducted a public input survey as part of the 2021-2026 Strategic Business Plan development process. A copy of that survey is attached for Commission review, and the survey results report can be provided upon request.*

3. **Develop and distribute a survey to assess community interest & issues –** *discussion. Staff seeks guidance if the survey offers the desired community feedback or if a new survey should be developed and distributed.*

4. **Consider a community meeting to hear community ideas and perspective –** *discussion.*

5. **Evaluate potential for private partnership opportunities to develop a new FBO. -** *Staff continually seeks out opportunities to establish partnerships that can assist with financing future development at the airport. Staff is currently focused on two subjects that may provide private partnership possibilities (see also item #6 below).*

6. **Assess market for businesses interested in locating to Airport**

***Commercial Hangar:*** The Port recently completed a project to expand the North apron in support of future hangar development. Staff recently received Bid-Set plans (Sheets 7, 20, 21, 25, 26 and 27 of 30 are attached), Project Specifications, and rough order of magnitude (ROM) costs for a flex hangar from Aron Faegre Architect. The Bid-Set includes an alternative development option that incorporates mezzanine space, office finishes/HVAC and an epoxy floor. Staff analyzed both alternative construction scenarios using the Architect-provided ROM costs and determined a Base Construction Cost for each alternative as $4.8M and $3.7M, respectively. Multiple financial-modeled scenarios were explored to determine if a rate of return of 4% or better, as set by Port Policy, can be achieved. Staff looked at twenty-year and thirty-year loan scenarios, a construction loan interest rates of 4%, differentiating

percentages of Port initial out-of-pocket investment, aggressive lease rates and included up to $500,000 in grant money towards initial investment in the analyses.

In one financial scenario, that is heavily dependent on Port out-of-pocket initial investment, using the non-alternative option (no mezzanine, no office finishes/HVAC and no epoxy floor), a 30 year loan, 4% interest, with 40% Port out of pocket investment ($1.3M), utilizing $500,000 in grant money and a slightly above current market tenant lease rate of $1/sf ($5,680-$5,720 per month), staff was able to achieve a 4% minimum return rate, as depicted in the image below. This financial scenario would require $5.6M (Base cost + Additional Funding + Interest) in overall Port investment over the course of the 30-year loan.

| Hangar NO Alts 30yr | | |
|---|---|---|
| Base Construction Cost (Hard + Soft) | | $ 3,718,597 |
| Interest | 4.00% | |
| Percent Down | 40.00% | $ 1,287,439 |
| Additonal Funding (Grant) | $ 500,000 | |
| Interest Accrued | | $ 1,419,214 |
| Port Total Investment | | $ 5,637,811 |
| Hangar rental p/sf | $ 1.00 | |
| IRR % | 4% | |

Given that ROM construction costs were used in all financial models, it may be prudent to utilize a professional estimating firm to provide more reliable cost estimates and then rerun the financial models. Please advise if staff should pursue quotes for construction costs estimates.

***T-Hangar Development:*** A Federal Aviation Administration (FAA) approved Airport Layout Plan (ALP) depicting locations for proposed airport development is a prerequisite for issuance of a grant through the Airport Improvement Program (AIP). The Port ALP (attached) currently depicts three general locations for T-Hangar construction. One of the three locations is considered the least challenging to develop. Alternative locations have topography or land use (zoning) considerations.

The Port is seeking FAA AIP grant funding to construct new taxi lane access in support of future hangar development. The current FAA, AIP, Capital Improvements Program (CIP) has Phase 1 (Environmental & Design) of taxi lane construction in 2024 and Phase 2 (Construction) in 2025. Future T-Hangar construction is not likely to take place until after this project is complete. Alternatively, staff continues to seek private partnerships that may realize hangar construction sooner by assuming the private entity would finance the pavement access construction as well as future T-Hangar structures.

**RECOMMENDATION:** Discussion.

# Airport Ground Lease – Key Subjects

The following are key subjects a ground lease should address and manage through terms and conditions embedded in the lease to ensure the Airport Sponsor is able to maintain a level of management authority over the life of the lease.

**Lease Term:** The typical airport land lease term will range from a 20 to 30-year term. This timeframe is generally seen as appropriate for the developer to fully amortize their investment.

**Lease Rate:** The rental amount is usually determined by fair market value.

**Escalation Clause:** Provide for the continued rate adjustment to compensate for inflation. The most common form of rent escalation is a standard increase every 3 to 5 years that is tied to one or more of the consumer price indices set by the U.S. Department of Labor.

**Operation and Maintenance:** (O&M) elements of a lease agreement specify the division of responsibility between the lessee and the lessor for the cost and effort required to maintain the leasehold to airport standards, and allocate the expenses associated with daily operation of the facility (utility costs). It should be the goal of the airport sponsor to assign to the lessee the general maintenance and repair responsibility and expense along with grounds upkeep obligations. The O&M section of the lease should list the specific responsibilities of the lessee for the leasehold maintenance and upkeep, as well as detail the minimum standards that must be met. It is in the best interest of the airport sponsor to be as detailed as possible when assigning these obligations within the lease.

**Construction of Improvements:** The lease agreement should detail the required approval process from the lessor regarding any repairs, renovations, improvements, and alterations. This ensures that design standards, quality, and conformance to standards are met and follow the long-term vision for the airport. The lease should also contain a provision within the construction of improvement clause that provides a clear timeline as to when the construction of improvements and beginning of facility operation must occur.

**Reversion/Reversionary Clause:** The reversion of leasehold improvements refers to the transition of ownership of all improvements to the airport sponsor as the termination of the lease agreement. The reversion upon termination at the end of a lease term, or upon early termination, properly protects the airport and its interest in the property, yet often leads to issues with improvement maintenance and upkeep as the lease nears the end of its term. Most tenants will typically enter into long-term lease agreements with the understanding that any investment in leasehold improvements will be fully depreciated over the length of the lease and have no expectation of asset recovery at the termination of the lease. Since leasehold improvements will revert to airport ownership, tenants may have little motivation to put additional resources into the current facility unless enforceable specifications for upkeep and maintenance are appropriately detailed in the lease document or referenced in the Airport Minimum Standards document. Specifically, a schedule for routine and

preventive maintenance and set system inspections with reports to airport management is prudent language to include.

**Rights, Reservations, and Obligations of the Lessor:** Many contemporary leases provide the lessor with the right of ingress and egress to leased premises. Leases should also reference the rights of the lessor for the purpose of enforcing compliance with the Airport Rules and Regulations and for ensuring that maintenance standards detailed in the lease agreement are being met. Airport management may also want to reserve the right to close the airport facility, including, but not limited to, the runway, taxiway, apron, terminal building, and automobile parking facilities when reasonably necessary. This should be at the airport's sole discretion for the purpose of maintenance, repair, further development, or construction, or for the safety of the general public.

**Rights, Reservations, and Obligations of the Lessee:** Clearly state the rights that the tenant is entitled to as the lessee, and the obligations the lessee must fulfill under the lease agreement. Based aircraft reporting requirements, disposal of trash and waste and regulation of hazardous waste, fluids or oils are typically included in this section.

**Security Requirements:** Leases should reference the Airport Rules and Regulations (ORD 23).

**Damage to Facilities:** Circumstances and responsibility for repairing damages to facilities during the lease term should be described and outlined in this section of the airport lease. Even if the developer pays the entire cost of agreed-upon improvements to airport land, all parties should understand and agree to the manner in which damages will be repaired should damages occur. Specifically, requirements for premises insurance should be considered, with clarity as to how insurance proceeds shall be used. The timeframe for which repairs shall be made should also be described fully. The airport sponsor's interest should be well protected in this language, precluding a tenant that is late in the lease term from opting out of its responsibility to repair damaged facilities.

**Insurance Obligations:** To protect the lessee and the airport sponsor from financial liability arising from the operations of a tenant, insurance requirements should be detailed in all lease agreements. Insurance requirements, at a minimum, should outline coverage types and amounts so that the airport is protected from financial liability.

**Taxes and Fees:** When private development in support of a commercial venture takes place on public property, interpretation as to how the tenant of the leased property is taxed varies widely and can easily change with the political winds and economic climate. Airport sponsors, therefore, should strive to protect themselves from incremental development costs and associated tax exposure by appropriately passing any tax liability through to the tenant that occupies the airport property. These provisions and protection of the airport sponsor should be fully described within the language of the lease.

**Liens:** Improvements on leased airport property are often financed, and the bank or lending institution is likely to require some type of security against the money to be loaned. Liens are

the common instrument in this regard, as the lender has a recorded interest in the improvements and a right to claim ownership of those improvements should the borrower default on the loan. Liens are typically recorded at the appropriate courthouse as a legal claim against real property. In the event of default of the loan, the lender will have first claim to the property if it has a first lien position or stand behind the first lien holder in the case of a second lien position. Lien position establishes priority for satisfying claims against the real property that secures collateral interest.

The caveat to this basic real estate principle is that the airport sponsor is restricted from disposal of property without FAA concurrence. In this case, a lien on the property itself must be precluded in the lease agreement. Lenders cannot be allowed to dispose of public airport property in the interest of satisfying a defaulted loan. The improvements can serve as security against debt— though the airport sponsor would typically restrict the placement of liens to new development it has approved—with strict conditions for cure (e.g., payment of outstanding rents owed). Specifically, lease language should include airport sponsor approval of any new tenant the lender wishes to place in facilities encumbered by a lien, in the event of loan default, to preserve compatibility of the airport sponsor's vision for airport development. Ultimately, a lien on tenant improvements will generally provide less security than a traditional lien placed on fee simple property owned by the borrower.

**Defaults:** The defaults section of a lease should stipulate the scenario(s) in which the terms of the lease have been violated. This section should include methods for curing the default, as well as periods of time that must pass without curing before the lease can be terminated. For example, typical default provisions will include termination language that speaks to what happens in the event the tenant does not pay the agreed-upon rents. But the defaults section should also include language that allows the tenant to cure, the timeframe in which this must occur, and how penalties or late fees are to be applied. Additionally, default language in this example should address how the airport sponsor will apply or pursue security deposits, bonds, or letters of credit. Essentially, the defaults section will describe which (if not all) violations of the lease provisions will trigger lease default, the actions the airport sponsor intends to take in the event of default, and the recourses that the lessee is entitled to if provisions and/or terms of the lease are not met.

Default language that speaks to a failure to pay rent is perhaps the most common but should not be the only parameter for lease default language. Failure to comply with airport rules and/or regulations, environmental damage to airport property, inappropriate use of airport land and/or facilities, and illegal activities are other examples that the airport sponsor should consider addressing within the context of a defaults section of a lease. Language that requires the tenant to comply with local, state, and federal laws, rules, and regulations, which may change during the course of the lease term, should be considered to protect the airport sponsor if the regulatory environment changes.

**Assignments and Subletting:** The assignment of a lease is the process of transferring all rights and provisions of a lease from one tenant to another. A request for assignment may

occur because one company is being acquired or sold by another, so the legal obligations need to transfer to the new legal entity. Another request may occur simply because the developer wants to divest of the liability and/or sell any equity interest in the facility. Subletting is the process of leasing part or all of the facility to another party without transferring any of the lessee's responsibilities to the airport sponsor.

Assignment and subletting language is important in an airport lease, especially in circumstances where permanent improvements need to be amortized over long periods of time to meet market pricing. The developer and/or the financier of the project will typically want some assurance from the airport sponsor that, if circumstances dictate, another tenant can replace the initial tenant and/or subletting is allowed if the financial and/or business circumstances of the tenant change over time. The initial tenant may sign a lease that is sufficient in length to amortize investment in improvements, but many things can happen over the course of a 20- or 30-year lease.

For the reasons just described, many airport leases include language that allows assignment, subletting, or both, within specific parameters. If improvements were made on airside property for the storage of aircraft, the allowable uses of the lease, including any assignment or subletting, should preclude nonaeronautical activity. Restrictions on use affect the market price of a facility, so the developer and lender often look for flexibility in the lease that will allow assignment and/or subleasing to build confidence in the commercial viability of a project. At the minimum, the airport sponsor should consider assignment and subletting language that passes all obligations of the initial lease to any assignee or subtenant.

**Regulatory Compliance:** The regulatory compliance section of a lease is a vitally important component of an airport lease agreement in that it assists the airport sponsor in keeping pace with a changing regulatory environment. The airport sponsor can and should require regulatory compliance with known applicable local, state, and federal regulations. In addition, the regulatory compliance section should pass along responsibility for complying with the inevitable additions and/or modifications to existing regulations that will certainly occur over the course of decades.

**Hold Harmless Provision:** The lease between the airport sponsor and the tenant should include a hold harmless or indemnity clause that protects the airport sponsor from any legal action, suits, proceedings, claims, damage, loss, liability, cost, or expense that may be filed against the lessee for any reason arising from the operation and/or negligence of the lessee.

**Nondiscrimination:** Part 21 of 49 CFR (Code of Federal Regulations) outlines the mandate for nondiscrimination in federally assisted programs of the Department of Transportation. Airport sponsors that receive federal grant funding through the Airport Improvement Program (AIP) are bound by grant assurances that prohibit discrimination on the grounds of race, color, or national origin. Tenants leasing property that is part of an airport's lands fall within the parameters of a federally assisted transportation program, so the airport sponsor should include nondiscrimination language in its lease agreements, which is typically found under a "nondiscrimination" heading of the lease document.

**Living Clauses:** Living clauses play an important role in the lease document. These clauses allow existing agreements to evolve as associated regulations and laws change during the lease term (e.g., wildlife, security, and environmental). Rules and Regulations, Minimum Standards, Rates and Charges, and Schedules of Insurances are other examples of documents that will likely change over time and that can be addressed through living clauses to maintain consistency.

Airport sponsors should always be aware of ongoing regulation amendments and changes. It is the airport sponsor's responsibility to ensure the airport and all-encompassing aspects conform to state and federal laws. Airport tenants should remain current on these laws, as the changes may require substantial financial obligations or a complete change of operating standards.

**Force Majeure:** The *force majeure* provision of an airport development and/or airport lease should consider unavoidable causes for delay due to acts of God and natural disaster, which may set the stage for failures to perform the provisions of the agreement. Force majeure clauses are often provided to address delays in construction due to weather and should consider both the developer/tenant and the airport sponsor perspectives. Specifically, agreements should include force majeure language when the airport sponsor has agreed to do certain things or make certain improvements. For example, the airport sponsor may agree to construct a taxiway extension to meet the needs of a new development, but the agreement should include force majeure language that protects it if there are construction delays and places the sponsor in the position of being unable to meet obligations of the lease/development agreement due to circumstances beyond its control.

**Holdover:** Holdover provisions of an airport lease simply allow the airport sponsor to extend the terms of an existing airport lease, in the event both the airport sponsor and the tenant desire to continue the relationship as it exists, without execution of a new lease. Holdover provisions are useful in bridging gaps and meeting short-term needs of the parties involved but should be used sparingly. Renegotiation of a lease or transition of lessees are typical uses of holdover provisions, where it is mutually beneficial for all parties to preserve the terms of the existing agreement without rushing negotiation for the sake of meeting a deadline, or for bridging the operational gaps that might occur between tenants. At the end of a long-term lease, the revenue associated with a lease may be below market value, so holdover provisions of that lease may result in a reduced revenue stream to the airport sponsor. Holdover provisions should be used sparingly.

**Term Extension Options:** Flexibility in the length of the lease term can be achieved through extension provisions written into the lease. These can be 5- to 10-year extension clauses that effectively extend the lease term to a length that is mutually beneficial for both the airport sponsor and the tenant.

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# Strategic Business Plan Public Input Survey

**Please submit by March 6th**

Welcome! Over the past five years, our region has seen significant changes to its economy, with both new and enduring challenges facing businesses and families. The Port of Hood River wants to better serve the community by understanding your needs and thoughts on the Port's role in the region. The Port will use the input you provide as it completes a planning process to develop its 2020-2026 Strategic Business Plan.

*This survey will take about 8 minutes to complete.*
*An online version is available at*
*bitl.ly/porthoodriver*

**What is the biggest issue facing our community?**

_____

_____

_____

_____

_____

## KEN JERNSTEDT AIRFIELD

The Ken Jernstedt Airfield is a General Aviation airport with a 3,040' runway and an alternate grass landing area. The airport offers self-serve fueling, private pilot training, glider rides and club, sight-seeing flights, and mechanic services. The airport serves the WAAAM museum, hosts of the annual Hood River Fly-In. The airport also provides hangar space for aviation technology companies, private aircraft, and serves as a base of operations for wildfire response and emergency search and rescue operations.

**How would you describe the importance of the airport and its role in our community?**

- O Critically Important
- O Very Important
- O Somewhat Important
- O Not Important
- O Don't Know/No Opinion

**Please indicate how well you feel the airfield is currently maintained and operated?**

- O Very Well
- O Well
- O Somewhat Poorly
- O Very Poorly
- O Don't Know/No Opinion

**For the following questions, please indicate whether you agree or disagree with the following statements:**

The Port should develop hangar spaces at the airport to support growth of local aviation technology industry.

O Agree O Disagree O Neutral O Don't know

The Port should invest in improvements to the airport that would attract or expand its current use.

O Agree O Disagree O Neutral O Don't know

Noise from activities at the airfield are a significant issue in my home or neighborhood.

O Agree O Disagree O Neutral O Don't know

## WATERFRONT PARKS AND OPEN SPACES

The Port of Hood River has developed and maintained most of the beaches, parks, and recreational open spaces along the Hood River waterfront area for many years, including the Event Site beach, Frog Beach, the small boat dock at Nichols Basin, the Hook launch, Marina Green, the Marina swim beach, the access road to the Spit, and the Waterfront Trail. Unlike most parks that are funded by property-tax based revenue, the ongoing operation and maintenance of Port-owned parks are, to a certain extent, funded by paid parking that was first implemented in 2018.

**How would you describe the importance of the waterfront parks, beaches, and open spaces to our community?**

- O Critically Important
- O Very Important
- O Somewhat Important
- O Not Important
- O Don't Know/No Opinion

**Please indicate how well you feel the Port-owned sites listed above are currently maintained and operated?**

- O Very Well
- O Well
- O Somewhat Poorly
- O Very Poorly
- O Don't Know/No Opinion

**For the following questions, please indicate whether you agree or disagree with the following statements:**

The Port should seek to expand and increase the use of current waterfront recreational facilities.

O Agree O Disagree O Neutral O Don't know

The Port should work to restore natural habitat areas and improve natural functions at the mouth of the Hood River and other areas of the waterfront.

O Agree O Disagree O Neutral O Don't know

The Port should collaborate with the County and the Hood River Valley Parks and Recreation District to identify efficiencies and cost savings in parks maintenance and operations.

O Agree O Disagree O Neutral O Don't know

The Port should actively work to improve water access opportunities and invest in further development of waterfront recreational facilities.

O Agree O Disagree O Neutral O Don't know

## HOOD RIVER MARINA

The Hood River Marina provides a free-to-use guest boat launch for fishing and other recreational uses as well as Sheriff and Columbia River Inter-Tribal Fish Commission (CRITFC) enforcement patrols on the Columbia. The Marina also provides long-term moorage for privately owned boats in over 160 boat slips and several boat houses, as well as short-term cruise ship and large vessel docking.

**How would you describe the importance of the Marina and its role in our community?**

- O Critically Important
- O Very Important
- O Somewhat Important
- O Not Important
- O Don't Know/No Opinion

**Please indicate how well you feel the Marina is currently maintained and operated?**

- O Very Well
- O Well
- O Somewhat Poorly
- O Very Poorly
- O Don't Know/No Opinion

**For the following questions, please indicate whether you agree or disagree with the following statements:**

It is important to have free, public boat launch access for fishing and other recreational uses.

O Agree O Disagree O Neutral O Don't know

It is important for Hood River to have a marina for long-term moorage of private sailboats and vessels.

O Agree O Disagree O Neutral O Don't know

It is important to provide Youth Sailing educational programs at the Hood River Marina.

O Agree O Disagree O Neutral O Don't know

## ECONOMIC DEVELOPMENT

The Port owns and manages industrial and commercial properties, as well as several parcels of undeveloped industrial zone land. Even though the public may not often visit or recreate near these properties, they provide direct and indirect economic benefit to the region in terms of job creation, wages and revenue.

**How would you describe the importance of economic development activities to support the retention and expansion of locally-owned businesses?**

- O Critically Important
- O Very Important
- O Somewhat Important
- O Not Important
- O Don't Know/No Opinion

**How would you describe the importance of economic development activities to attract new businesses and industries to our area?**

- O Critically Important
- O Very Important
- O Somewhat Important
- O Not Important
- O Don't Know/No Opinion

**For the following questions, please indicate whether you agree or disagree with the following statements:**

It is important that the Port of Hood River maintain its real estate portfolio to enable local businesses to operate and grow.

O Agree O Disagree O Neutral O Don't know

It is important to have developable properties ready to support the growth and retention of locally owned light industrial businesses.

O Agree O Disagree O Neutral O Don't know

# Strategic Business Plan Public Input Survey

## HOOD RIVER-WHITE SALMON INTERSTATE BRIDGE

With narrow lanes, lack of safety shoulders, difficult barge navigation, and no bike or pedestrian path, the Hood River-White Salmon Bridge does not meet current needs of travelers. The Port is engaged in efforts to replace the nearly 100-year old bridge but expects that effort to take several years and the new bridge will require significant changes to traffic patterns, tolling, local control, and operations.

**How would you describe the importance of the bridge connecting Hood River to Bingen and White Salmon for our community?**

- O Critically Important
- O Very Important
- O Somewhat Important
- O Not Important
- O Don't Know/No Opinion

**Please indicate how well you feel the current bridge is maintained and operated?**

- O Very Well
- O Well
- O Somewhat Poorly
- O Very Poorly
- O Don't Know/No Opinion

**For the following questions, please indicate whether you agree or disagree with the following statements:**

Tolls should be set as low as possible, even if that means delaying replacement of the current bridge.

O Agree O Disagree O Neutral O Don't know

The replacement of the bridge with a new, modern structure is so important that the Port should ask residents to consider a higher toll to make it happen.

O Agree O Disagree O Neutral O Don't know

The new bridge must have bicycle and pedestrian access and amenities.

O Agree O Disagree O Neutral O Don't know

The new bridge should be owned and operated by a state agency (either ODOT or WSDOT or a combination of both).

O Agree O Disagree O Neutral O Don't know

The new bridge should be owned and operated by a local agency or authority.

O Agree O Disagree O Neutral O Don't know

The new bridge should be owned and operated by a private party or a public-private partnership.

O Agree O Disagree O Neutral O Don't know

## PORT PUBLIC SERVICES AND FACILITIES

The Port is focused on optimizing operations while continuing to provide needed public facilities and services. There are 23 Port Districts in Oregon, each supporting long-term economic development in their communities. Their role in attracting jobs and private investment can be especially beneficial in rural areas where industrial infrastructure might not otherwise be developed. Some ports, like the Port of Hood River, also maintain transportation infrastructure and public recreational facilities such as parks and boat launches.

**How would you describe the importance of the Port for our community?**

- O Critically Important
- O Very Important
- O Somewhat Important
- O Not Important
- O Don't Know/No Opinion

**Please indicate how well you feel the Port is currently is managed and operated?**

- O Very Well
- O Well
- O Somewhat Poorly
- O Very Poorly
- O Don't Know/No Opinion

**For the following questions, please indicate whether you agree or disagree with the following statements:**

The Port should work to identify efficiencies to reduce the cost and scope of its operations.

O Agree O Disagree O Neutral O Don't know

The Port should increase its investments to improve the quality of its level of service and maintenance of its facilities.

O Agree O Disagree O Neutral O Don't know

The Port should seek to develop collaborative partnerships with other agencies (like the City, County, Parks & Rec, etc.) to deliver existing services.

O Agree O Disagree O Neutral O Don't know

**What should be the Port's highest priority for the next six years?**

_____

_____

_____

_____

## TELL US MORE ABOUT YOURSELF

**How do you identify?**

- O Female
- O Male
- O Non-Binary
- O Prefer to self-describe

**The median household income in the Hood River area is about $50,000 per year. Was your household income in 2019?**

- O Below the median
- O Above the median
- O Right at or near the median

**How do you identify yourself culturally?**

- O Asian or Pacific Islander
- O Latin(x)/Hispanic
- O Caucasian or White
- O African American
- O Native American or Native Alaskan
- O Other

Thank you for taking time to provide your thoughts.

**Please return your survey to the Port of Hood River by March 6th.**
**You may drop it off or mail it to:**

**Port of Hood River**
1000 E. Port Marina Drive
Hood River, OR 97031

**Send your survey via email to:**
porthr@gorge.net

**The Port's survey is also available online at:**
http://bit.ly/porthoodriver

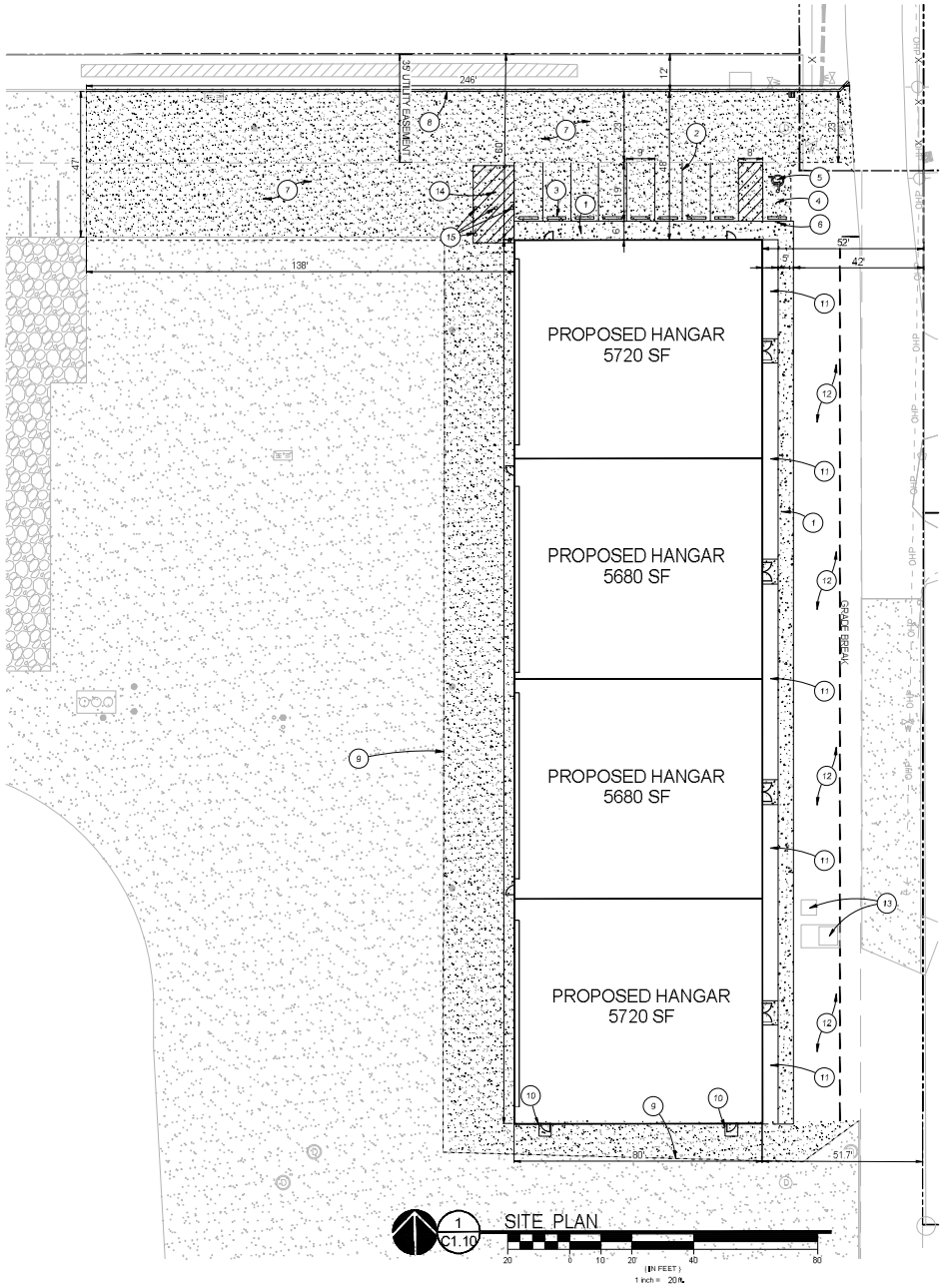
**The Port is planning to hold public meetings to receive comment on the 2020-2026 Strategic Business Plan. The first meeting is:**

### STRATEGIC BUSINESS PLAN OPEN HOUSE

Thursday, February 20, 6-8pm
Port of Hood River Conference Room
1000 E. Port Marina Drive, Hood River

All meetings will be announced in the Hood River News and the Port's website at portofhoodriver.com. Follow us on Facebook (Facebook.com/PortofHoodRiver) and Twitter (Twitter.com/PortofHoodRiver) for updates.

If you would like to provide more information, comments, suggestions, or thoughts for the Port to consider in developing its strategic plan, or on any Port-related issue, please write to us at porthr@gorge.net.




## KEYNOTES

1. 5' CONCRETE SIDEWALK, SEE DETAIL 1/C5.10
2. 4" WHITE STRIPING, SEE DETAIL 2/C5.10
3. WHEEL STOP, SEE DETAIL 3/C5.10
4. ADA STALL, SEE DETAIL 4/C5.10
5. ADA SYMBOL, SEE DETAIL 4/C5.10
6. ADA SIGN, SEE DETAIL 4/C5.10
7. ASPHALT PAVEMENT, SEE DETAIL 5/C5.10
8. 6" CURB, SEE DETAIL 6/C5.10
9. ASPHALT SAWCUT, SEE DETAIL 8/C5.10
10. 4'X4' CONCRETE PAD (0.25' ELEVATION GAIN)
11. PROPOSED 5' PLANTER - GRAVEL TO BE FULLY REMOVED AND TO BE BACKFILLED WITH APPROPRIATE SOIL PER THE PLANTING PLAN
12. PROPOSED LANDSCAPE AREA - GRAVEL TO BE FULLY REMOVED AND TO BE BACKFILLED WITH APPROPRIATE SOIL PER THE PLANTING PLAN
13. PROTECT EXISTING VAULT AND TRANSFORMER
14. 4" WHITE STRIPING FOR NO PARKING AREA
15. BOLLARD - SEE DETAIL 7/C5.11

M.
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360.695.7879
Seattle, WA
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DESIGN DRIVEN | CLIENT FOCUSED

Client
**ARON FAEGRE & ASSOCIATES**

Project
**PORT OF HOOD RIVER - AIRPORT HANGAR**



REVISION SCHEDULE

| Delta | Issued As | Issue Date |
|---|---|---|
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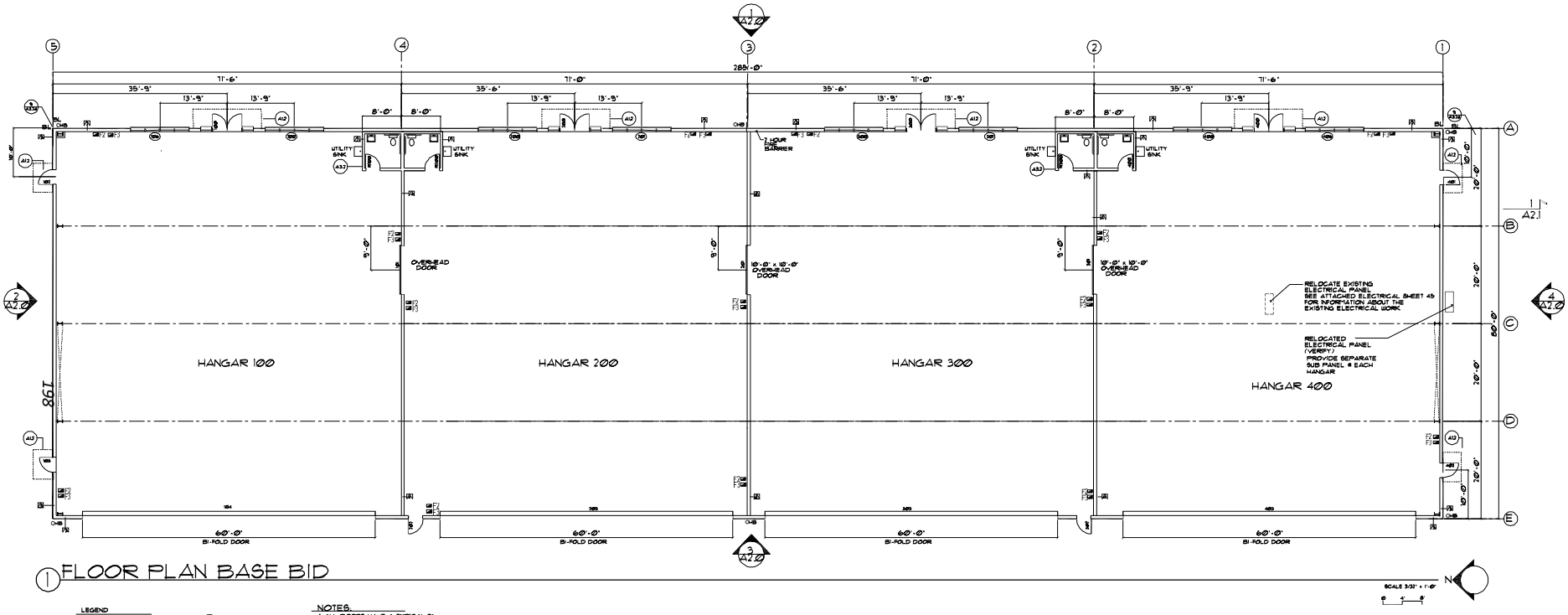
SHEET TITLE:
**SITE PLAN**

DRAWN BY: VSN
CHECKED BY: CTL
SHEET:
**C1.10**
JOB NO. **2210414.00**

**DRAFT**




# 1 FLOOR PLAN BASE BID

SCALE 3/32" = 1'-0"

LEGEND

- CMB — HOSE BIB
- NON RATED WALL
- (P1) WALL TYPES SEE A3.2
- PROVIDE PORTABLE FIRE EXTINGUISHERS PER NFPA 10 REQUIREMENTS
  - P1 — 2A:10B:C (RECESSED CABINET)
  - P2 — 6A:10B:C
  - P3 — 2.5 GALLON APFF
- WINDOW NUMBER SEE A8.3
- 100 — DOOR NUMBER SEE A8.3
- BL — BUILDING LINE (BL) IS THE SAME AS OUTSIDE FACE OF GIRT AND EDGE OF CONCRETE SLAB

NOTES.

1. ALL DOORS HAVE A TYPICAL 9" SPACING FROM 1 OF ADJACENT WALL TO JAMB ON HINGE SIDE UNLESS OTHERWISE INDICATED.
2. DIMENSIONS ARE TO FACE OF STUD OR GIRT, UNLESS OTHERWISE NOTED.
3. METAL STUDS SHALL BE C-STUDS WITH A MINIMUM YIELD STRENGTH OF 33,000 PSI FOR 18 AND 20GA. AND 50,000 PSI FOR 12, 14, AND 16 GA. STUDS.
4. DO NOT USE DEFLECTION TRACKS AT LOAD BEARING WALLS

ARON FAEGRE
ARCHITECT
13200 FELDING ROAD
LAKE OSWEGO
OREGON 97304
503-680-1469
faegre@earthlink.net

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PORT OF HOOD RIVER
KEN JERNSTEDT AIRFIELD
NORTH APRON
COMMERCIAL HANGAR
HOOD RIVER OREGON

FLOOR PLAN
BASE BID

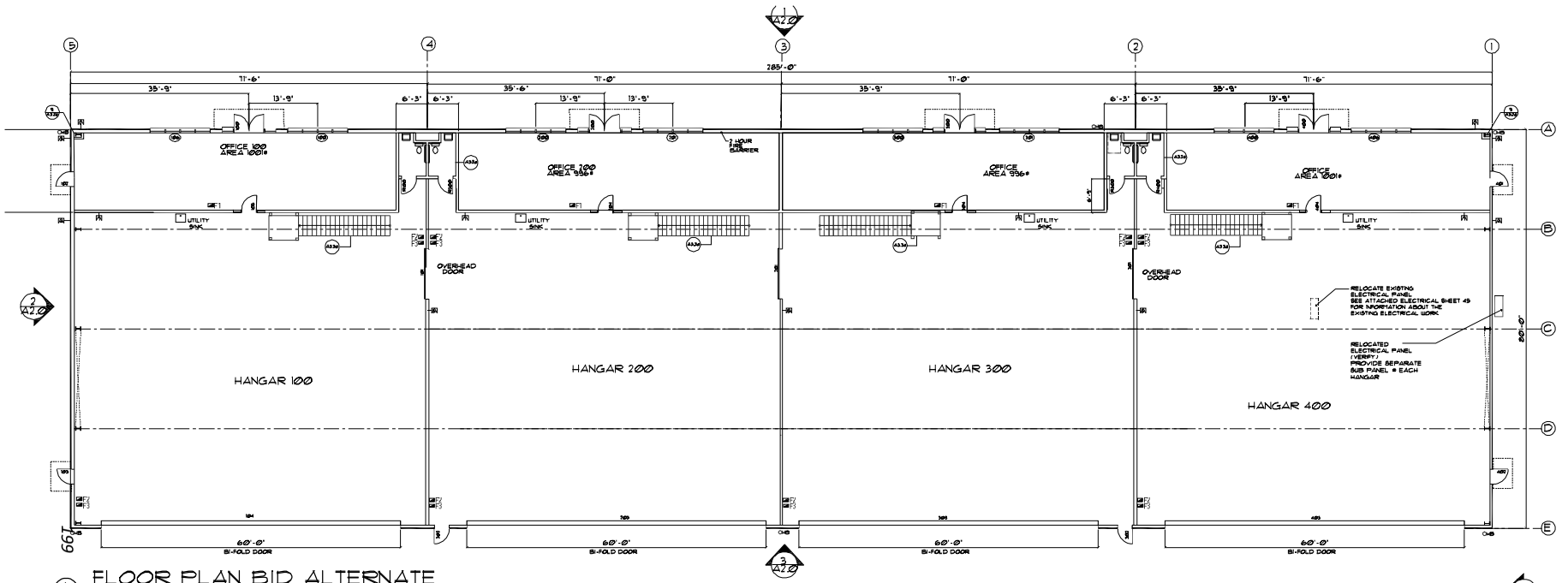
DATE: 12-23-21

DRAFT

REVISIONS

| NO.: | DATE: | DESCRIPTION: |
|---|---|---|

SHEET
A1.0




## 1 FLOOR PLAN BID ALTERNATE

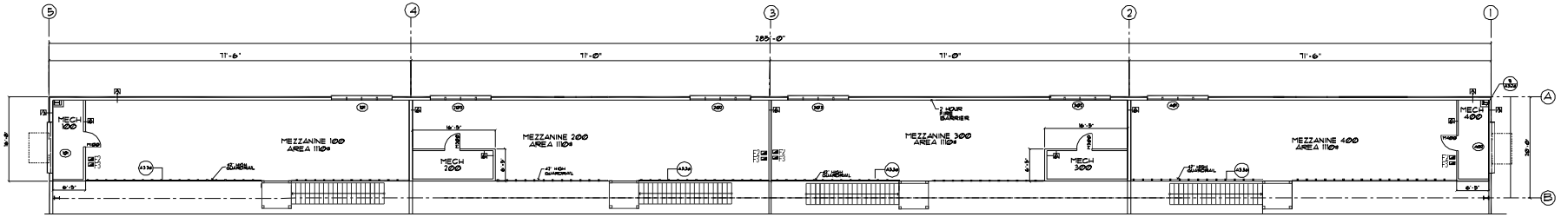
SCALE 3/32" = 1'-0"

LEGEND

- CMB HOSE BIB
- NON RATED WALL
- PA WALL TYPES SEE A33
- WINDOW NUMBER SEE 283
- DOOR NUMBER SEE 403
- PE PROVIDE PORTABLE FIRE EXTINGUISHERS PER NFPA 10 REQUIREMENTS
  - P1 2A: 10B: C (RECESSED CABINET)
  - P2 4A: 40B: C
  - P3 2-1/2 GALLON AFFF
- BL BUILDING LINE (BL) IS THE SAME AS OUTSIDE FACE OF GIRT AND EDGE OF CONCRETE SLAB

NOTES:

1. ALL DOORS HAVE A TYPICAL 5" SPACING FROM 1 OF ADJACENT WALL TO JAMB ON HINGE SIDE UNLESS OTHERWISE INDICATED.
2. DIMENSIONS ARE TO FACE OF STUD OR GIRT, UNLESS OTHERWISE NOTED.
3. METAL STUDS SHALL BE C-STUDS WITH A MINIMUM YIELD STRENGTH OF 33,000 PSI FOR 18 AND 20GA AND 50,000 PSI FOR 12, 14, AND 16 GA STUDS.
4. DO NOT USE DEFLECTION TRACKS AT LOAD BEARING WALLS




## 2 MEZZANINE PLAN BID ALTERNATE

SCALE 3/32" = 1'-0"

ARON
FAEGRE
ARCHITECT
13200 FELDING ROAD
LAKE OSWEGO
OREGON 97304
503-880-1469
faegre@earthlink.net

REGISTERED ARCHITECT
ARON FAEGRE
PORTLAND, OREGON
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KEN JERNSTEDT AIRFIELD
NORTH APRON
COMMERCIAL HANGAR
HOOD RIVER OREGON

FLOOR PLAN
BID ALTERNATE

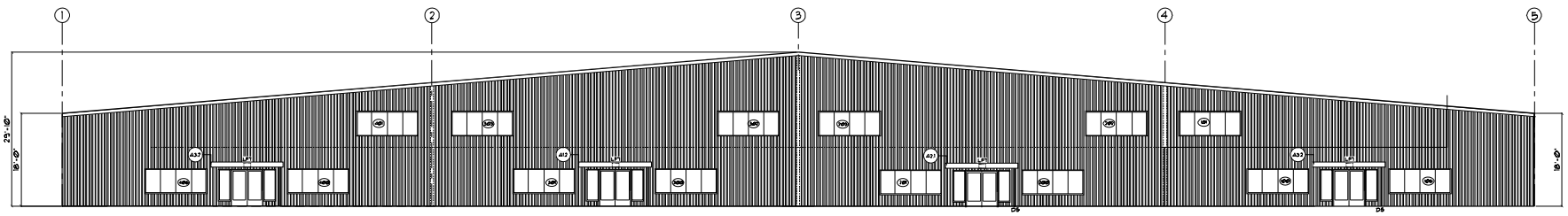
DATE: 12-23-21

DRAFT

REVISIONS

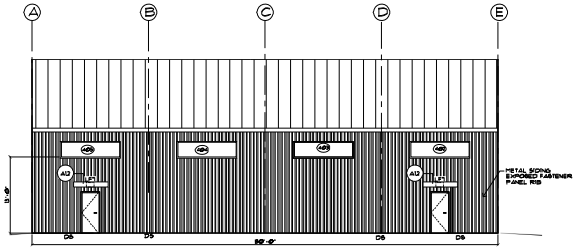
| NO.: | DATE: | DESCRIPTION: |
|---|---|---|

SHEET
A1.0a



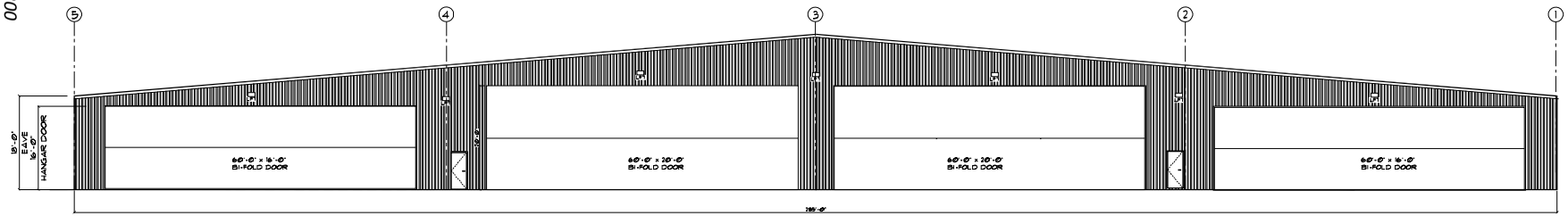
1 EAST ELEVATIONS

SCALE 3/32" = 1'-0"



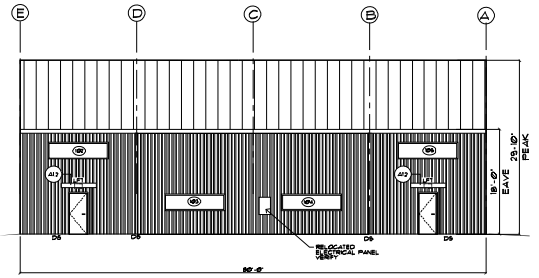

2 NORTH ELEVATIONS

SCALE 3/32" = 1'-0"




3 WEST ELEVATIONS

SCALE 3/32" = 1'-0"




4 SOUTH ELEVATIONS

SCALE 3/32" = 1'-0"

200

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FAEGRE
ARCHITECT
13200 FEILDING ROAD
LAKE OSWEGO
OREGON 97304
503-880-1469
faegre@earthlink.net

REGISTERED ARCHITECT
ARON FAEGRE
PORTLAND, OREGON
STATE OF OREGON

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ELEVATION

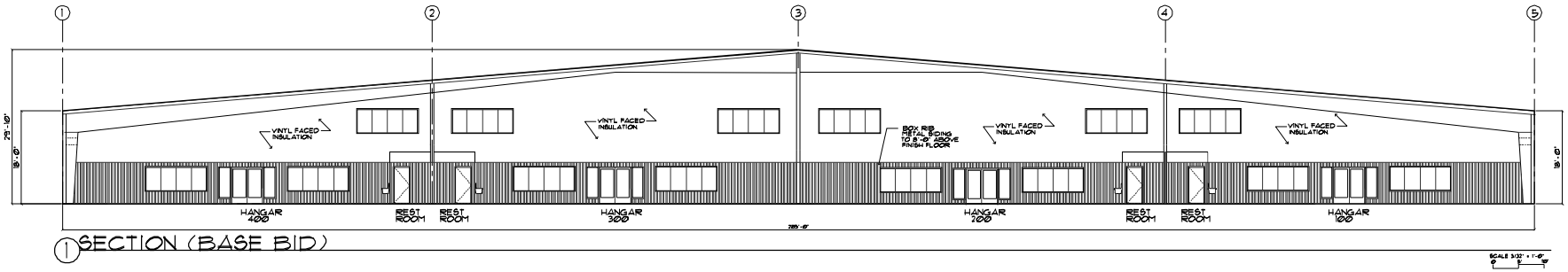
DATE: 12-23-21

DRAFT

REVISIONS

| NO.: | DATE: | DESCRIPTION: |
|---|---|---|

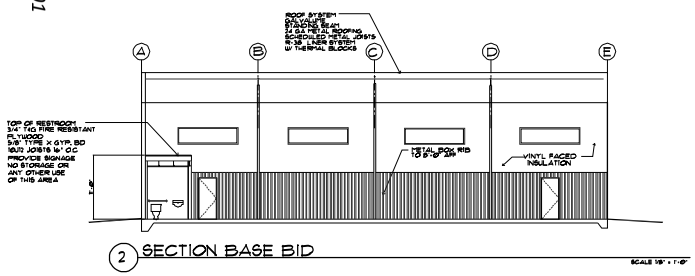
SHEET
A2.0




1 SECTION (BASE BID)

SCALE 3/32" = 1'-0"

201




2 SECTION BASE BID

SCALE 1/8" = 1'-0"

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13200 FEILDING ROAD
LAKE OSWEGO
OREGON 97304
503-590-1459
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COMMERCIAL HANGAR
HOOD RIVER OREGON

SECTIONS
BASE BID

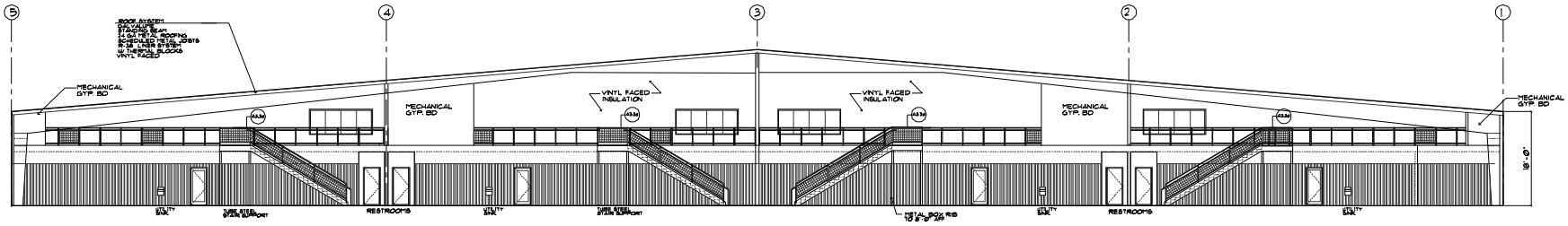
DATE 12-23-21

DRAFT

REVISIONS

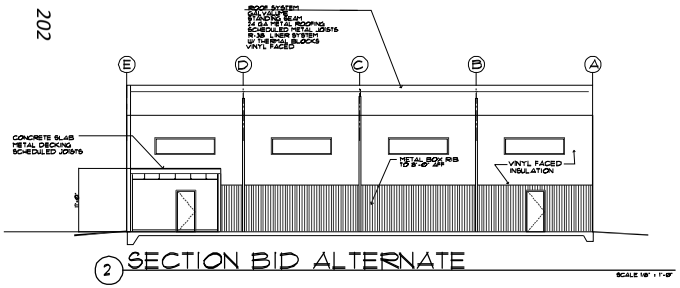
| NO.: | DATE: | DESCRIPTION: |
|---|---|---|

SHEET
A2.1




1 SECTION BID ALTERNATE

SCALE 3/32" = 1'-0"




2 SECTION BID ALTERNATE

SCALE 1/8" = 1'-0"

202

ARON
FAEGRE
ARCHITECT
13200 FEILDING ROAD
LAKE OSWEGO
OREGON 97304
503-880-1489
faegre@earthlink.net

REGISTERED ARCHITECT
ARON FAEGRE
PORTLAND, OREGON
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PORT OF HOOD RIVER
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COMMERCIAL HANGAR

HOOD RIVER OREGON

SECTIONS
BID ALTERNATE

DATE 12-23-21

DRAFT

REVISIONS

| NO.: | DATE: | DESCRIPTION: |
|---|---|---|

SHEET
A2.1a

## BUILDING / FACILITY KEY

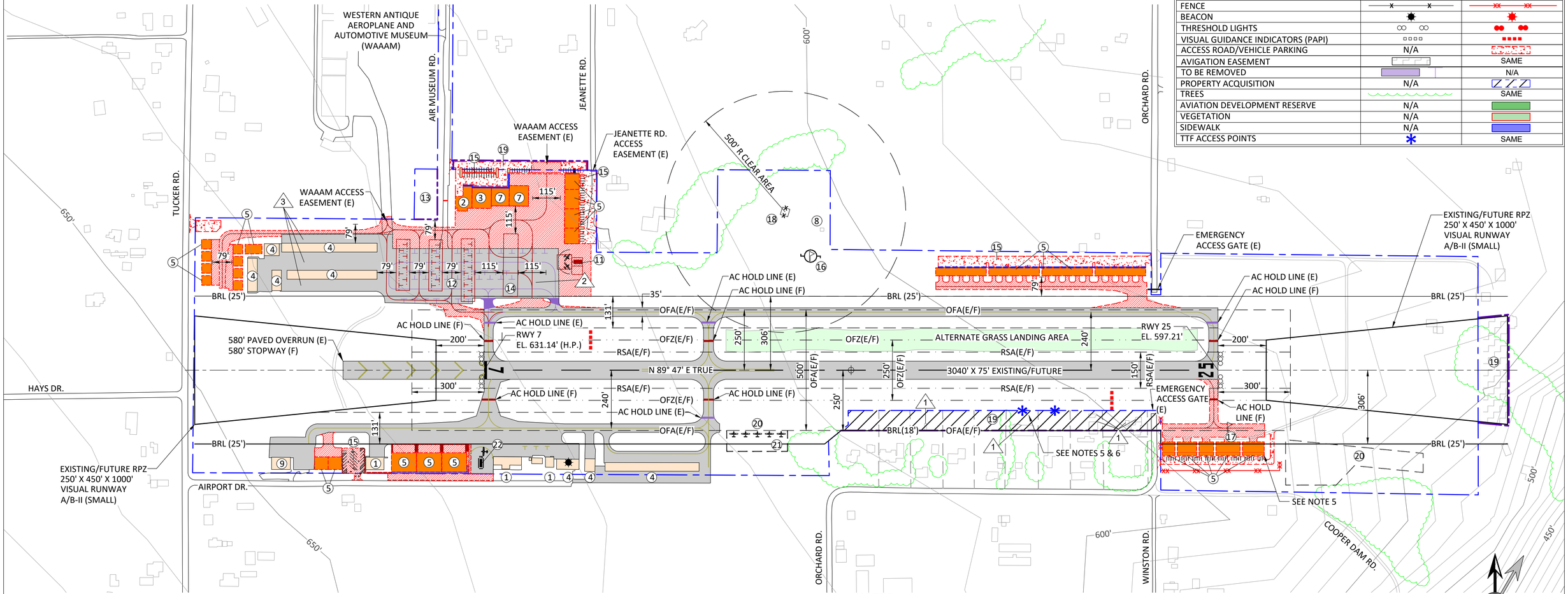
| | DESCRIPTION | | DESCRIPTION |
|---|---|---|---|
| 1 | FBO / MAINTENANCE HANGAR (E) | 12 | TIEDOWN APRON |
| 2 | FBO BUILDING (F) | 13 | WAAAM OVERFLOW AIRCRAFT PARKING (F) |
| 3 | MAINTENANCE HANGAR (F) | 14 | TRANSIENT HELICOPTER PARKING |
| 4 | HANGARS (E) | 15 | AUTO PARKING (F) |
| 5 | BOX HANGARS (F) | 16 | WIND TEE (E) |
| 6 | MULTI-UNIT HANGARS (F) | 17 | SUPPLEMENTAL WIND TEE (E) |
| 7 | COMMERCIAL HANGAR (F) | 18 | AWOS (E) |
| 8 | REGULATOR BUILDING | 19 | PROPERTY TO BE ACQUIRED |
| 9 | AGRICULTURAL OPS AREAS | 20 | GLIDER STORAGE / PARKING AREA (E/F) |
| 10 | FUEL LOCATION (E) | 21 | OVERFLOW PARKING AREA (F) |
| 11 | FUEL LOCATION (F) | 22 | TEMPORARY FUEL LOCATION |

## NON STANDARD CONDITIONS

| NO. | ITEM | DESCRIPTION | DISPOSITION |
|---|---|---|---|
| 1 | ROFA | SOUTHEAST SIDE RESIDENCES | FUTURE PROPERTY ACQUISITION |
| 2 | TAXILANE OFA APRON | TAXILANE CLEARANCES TO PARKED AIRCRAFT (ADG I & ADG II) | RECONFIGURE APRON |
| 3 | TAXILANE OFA (HANGARS) | LESS THAN STD. ADG I CLEARANCES | MODIFY WHERE FEASIBLE |

## LEGEND

| | EXISTING | FUTURE |
|---|---|---|
| BUILDINGS | | |
| AIRFIELD PAVEMENT | | |
| BUILDING RESTRICTION LINE (BRL) | BRL (E) | BRL (F) |
| AIRPORT PROPERTY LINE | | |
| RUNWAY SAFETY AREA (RSA) | | |
| OBJECT FREE AREA (OFA) | | |
| OBSTACLE FREE ZONE (OFZ) | | |
| TAXIWAY OBJECT FREE AREA (TOFA) | | |
| RUNWAY PROTECTION ZONE (RPZ) | | |
| GROUND CONTOURS | 10' | SAME |
| AIRPORT REFERENCE POINT (ARP) | | SAME |
| RUNWAY END IDENTIFIER LIGHTS (REIL) | | |
| WIND INDICATOR | | |
| SEGMENTED CIRCLE WIND INDICATOR | | |
| FENCE | | |
| BEACON | | |
| THRESHOLD LIGHTS | | |
| VISUAL GUIDANCE INDICATORS (PAPI) | | |
| ACCESS ROAD/VEHICLE PARKING | N/A | |
| AVIGATION EASEMENT | | SAME |
| TO BE REMOVED | | N/A |
| PROPERTY ACQUISITION | N/A | |
| TREES | | SAME |
| AVIATION DEVELOPMENT RESERVE | N/A | |
| VEGETATION | N/A | |
| SIDEWALK | N/A | |
| TTF ACCESS POINTS | | SAME |




## NOTES:

1. STOPWAY (F) AT WEST END OF RUNWAY WILL INCREASE FUTURE ACCELERATE - STOP DISTANCE AVAILABLE (ASDA) FOR RUNWAY 25 TO 3,620 FEET.
2. HIGH POINT (SURVEYED) ON RUNWAY IS 631.14' MSL. PUBLISHED AIRPORT ELEVATION (FAA A/FD) TO BE UPDATED FOR CONSISTENCY.
3. AIRPORT IS NOT SUBJECT TO 100-YEAR FLOODING.
4. FUTURE STOPWAY AT RUNWAY 7 END REQUIRES DECLARED DISTANCES AND STOPWAY DESIGNATION PUBLISHED IN FAA CHART SUPPLEMENT.
5. AIRPORT USES DEPICTED ON PARCELS ZONED EFU OR RR ARE SUBJECT TO FUTURE COMPREHENSIVE PLAN MAP AMENDMENT AND REZONE APPLICATION(S) AND DETERMINATION(S) BY HOOD RIVER COUNTY.
6. PROPERTY TO BE ACQUIRED TO ALLOW AIRPORT CONTROL OF RUNWAY OBJECT FREE AREA. CONFIGURATION OF PROPERTY TO BE ACQUIRED AND ACCOMMODATION OF EXISTING THROUGH THE FENCE AGREEMENTS WILL BE COORDINATED WITH THE PROPERTY OWNER.

*"THE PREPARATION OF THIS DOCUMENT MAY HAVE BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION (PROJECT NUMBER 3-41-0001-012-01) AS PROVIDED UNDER TITLE 49, UNITED STATES CODE, SECTION 47104. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS REPORT BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."*

| NO. | DATE | BY | APPR | REVISIONS |
|---|---|---|---|---|
| | | | | |

VERIFY SCALES

BAR IS ONE INCH ON ORIGINAL DRAWING. 0" 1" IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

FEDERAL AVIATION ADMINISTRATION APPROVAL

APPROVAL DATE: _____

SIGNATURE

PORT OF HOOD RIVER APPROVAL

APPROVAL DATE: _____

SIGNATURE

CENTURY WEST ENGINEERING
BEND OFFICE
1020 SW EMKAY DRIVE., #100
BEND, OR 97702
541.322.8962 OFFICE
541.382.2423 FAX

| DESIGNED BY: | DRAWN BY: | CHECKED BY: | SCALE: |
|---|---|---|---|
| DM | JLS | WMR | AS SHOWN |
| DATE: MARCH 2018 | | PROJECT NO: 12399009.01 | |

# KEN JERNSTEDT AIRFIELD

## AIRPORT LAYOUT PLAN

FIGURE NO. -

SHEET NO. 3 OF 11

## BUILDING / FACILITY KEY

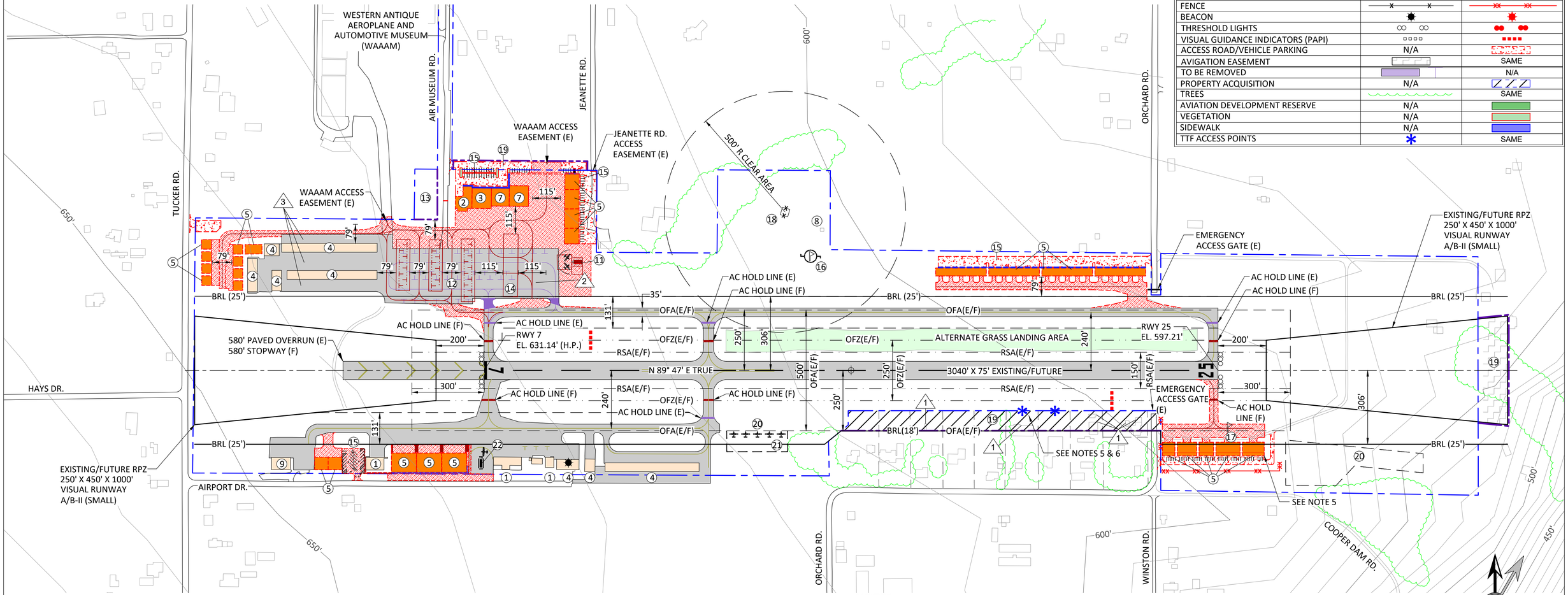
| | DESCRIPTION | | DESCRIPTION |
|---|---|---|---|
| 1 | FBO / MAINTENANCE HANGAR (E) | 12 | TIEDOWN APRON |
| 2 | FBO BUILDING (F) | 13 | WAAAM OVERFLOW AIRCRAFT PARKING (F) |
| 3 | MAINTENANCE HANGAR (F) | 14 | TRANSIENT HELICOPTER PARKING |
| 4 | HANGARS (E) | 15 | AUTO PARKING (F) |
| 5 | BOX HANGARS (F) | 16 | WIND TEE (E) |
| 6 | MULTI-UNIT HANGARS (F) | 17 | SUPPLEMENTAL WIND TEE (E) |
| 7 | COMMERCIAL HANGAR (F) | 18 | AWOS (E) |
| 8 | REGULATOR BUILDING | 19 | PROPERTY TO BE ACQUIRED |
| 9 | AGRICULTURAL OPS AREAS | 20 | GLIDER STORAGE / PARKING AREA (E/F) |
| 10 | FUEL LOCATION (E) | 21 | OVERFLOW PARKING AREA (F) |
| 11 | FUEL LOCATION (F) | 22 | TEMPORARY FUEL LOCATION |

## NON STANDARD CONDITIONS

| NO. | ITEM | DESCRIPTION | DISPOSITION |
|---|---|---|---|
| 1 | ROFA | SOUTHEAST SIDE RESIDENCES | FUTURE PROPERTY ACQUISITION |
| 2 | TAXILANE OFA APRON | TAXILANE CLEARANCES TO PARKED AIRCRAFT (ADG I & ADG II) | RECONFIGURE APRON |
| 3 | TAXILANE OFA (HANGARS) | LESS THAN STD. ADG I CLEARANCES | MODIFY WHERE FEASIBLE |

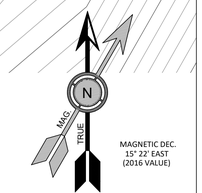
## LEGEND

| | EXISTING | FUTURE |
|---|---|---|
| BUILDINGS | | |
| AIRFIELD PAVEMENT | | |
| BUILDING RESTRICTION LINE (BRL) | BRL (E) | BRL (F) |
| AIRPORT PROPERTY LINE | | |
| RUNWAY SAFETY AREA (RSA) | | |
| OBJECT FREE AREA (OFA) | | |
| OBSTACLE FREE ZONE (OFZ) | | |
| TAXIWAY OBJECT FREE AREA (TOFA) | | |
| RUNWAY PROTECTION ZONE (RPZ) | | |
| GROUND CONTOURS | 10' | SAME |
| AIRPORT REFERENCE POINT (ARP) | | SAME |
| RUNWAY END IDENTIFIER LIGHTS (REIL) | | |
| WIND INDICATOR | | |
| SEGMENTED CIRCLE WIND INDICATOR | | |
| FENCE | | |
| BEACON | | |
| THRESHOLD LIGHTS | | |
| VISUAL GUIDANCE INDICATORS (PAPI) | | |
| ACCESS ROAD/VEHICLE PARKING | N/A | |
| AVIGATION EASEMENT | | SAME |
| TO BE REMOVED | | N/A |
| PROPERTY ACQUISITION | N/A | |
| TREES | | SAME |
| AVIATION DEVELOPMENT RESERVE | N/A | |
| VEGETATION | N/A | |
| SIDEWALK | N/A | |
| TTF ACCESS POINTS | | SAME |




## NOTES:

1. STOPWAY (F) AT WEST END OF RUNWAY WILL INCREASE FUTURE ACCELERATE - STOP DISTANCE AVAILABLE (ASDA) FOR RUNWAY 25 TO 3,620 FEET.
2. HIGH POINT (SURVEYED) ON RUNWAY IS 631.14' MSL. PUBLISHED AIRPORT ELEVATION (FAA A/FD) TO BE UPDATED FOR CONSISTENCY.
3. AIRPORT IS NOT SUBJECT TO 100-YEAR FLOODING.
4. FUTURE STOPWAY AT RUNWAY 7 END REQUIRES DECLARED DISTANCES AND STOPWAY DESIGNATION PUBLISHED IN FAA CHART SUPPLEMENT.
5. AIRPORT USES DEPICTED ON PARCELS ZONED EFU OR RR ARE SUBJECT TO FUTURE COMPREHENSIVE PLAN MAP AMENDMENT AND REZONE APPLICATION(S) AND DETERMINATION(S) BY HOOD RIVER COUNTY.
6. PROPERTY TO BE ACQUIRED TO ALLOW AIRPORT CONTROL OF RUNWAY OBJECT FREE AREA. CONFIGURATION OF PROPERTY TO BE ACQUIRED AND ACCOMMODATION OF EXISTING THROUGH THE FENCE AGREEMENTS WILL BE COORDINATED WITH THE PROPERTY OWNER.




Scale: 1"=200'

*"THE PREPARATION OF THIS DOCUMENT MAY HAVE BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION (PROJECT NUMBER 3-41-0001-012-01) AS PROVIDED UNDER TITLE 49, UNITED STATES CODE, SECTION 47104. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS REPORT BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."*

| NO. | DATE | BY | APPR | REVISIONS |
|---|---|---|---|---|
| | | | | |

VERIFY SCALES

BAR IS ONE INCH ON ORIGINAL DRAWING. 0" 1"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

FEDERAL AVIATION ADMINISTRATION APPROVAL

APPROVAL DATE: _____

SIGNATURE

PORT OF HOOD RIVER APPROVAL

APPROVAL DATE: _____

SIGNATURE

CENTURY WEST ENGINEERING

BEND OFFICE
1020 SW EMKAY DRIVE., #100
BEND, OR 97702
541.322.8962 OFFICE
541.382.2423 FAX

| DESIGNED BY: | DRAWN BY: | CHECKED BY: | SCALE: |
|---|---|---|---|
| DM | JLS | WMR | AS SHOWN |

DATE: MARCH 2018

PROJECT NO: 12399009.01

# KEN JERNSTEDT AIRFIELD

## AIRPORT LAYOUT PLAN

FIGURE NO. -

SHEET NO. 3 OF 11

**Executive Director's Report**
February 15, 2022

## Administration

- The new CFO will be starting work on March 14, 2022. We will be able to announce his name and background on March 1.

- The Employee Survey was released on Monday, February 7 via email and hard copy format to all employees in both English and Spanish. Responses are due February 25.

- I will be on vacation February 21-March 4. This will fulfill my Work Plan goal of taking at least 120 hours of vacation this fiscal year. Genevieve Scholl will serve as Acting Executive Director in my absence.

- Thanks to all that participated in the SDAO Annual Conference February 10-13. Multiple staff members attended and received valuable training relevant to each of their positions including public records law, risk mitigation, new heat and smoke exposure rules from OSHA, cybersecurity issues, and leadership skills.

- The Joint Work session with the Port of Cascade Locks is scheduled for March 1. The meeting will be via Zoom. Attached is a draft agenda for any Commissioner questions or suggestions.

- The Oregon Employment Department has issued its January 22 edition of their Columbia Gorge Economic Indicators via MCEDD. Attached for information.

## Recreation/Marina

- The Marina Committee met on February 10. Key issues discussed included rate increases, Marina security, boat house replacements, repairs and maintenance, Hood River Yacht Club Yard Expansion, youth sailing program, and the boat ramp float replacement project. Thank you to Commissioner Sheppard for attending this meeting.

- The newly revitalized Recreation Committee met on February 9. Key issues discussed included parking and crowd management, river access, restrooms, dogs off leash, trash, water safety and signage at Nichols Basin, improvements to the inlet to Nichols Basin, providing more areas for families where they would be safe from watersport participants, and the overall experience for people utilizing the waterfront. Thank you to Commissioner Gehring for attending this meeting.

- One of the failing boat houses is scheduled for removal the week of February 14th. Oregon Marine Construction is the contractor and they are working closely with staff. There will be a large dumpster in the Boat Ramp parking lot for a week or so.

## Development/Property

- Facilities staff removed a large amount of trash, primarily left by persons without housing, from an area near the southwest corner of the Nichols Basin. This is an area that is particularly challenging to determine ownership. The removal request came from the City but it is likely within ODOT right-of-way. See photo to right.

- Conversations with the City of Hood River Planning Department on additional Transient Vending Cart (Food Cart) locations at the Waterfront has revealed zoning restrictions on property zoned Light Industrial (LI). Aside from Lot 900, all Port owned property at the Waterfront falls under this zone. The Waterfront Overlay Zone provides an allowance for Transient Vending Carts in Subarea 1 of the overlay map. Subarea 1 is an area just West of Nichols Basin to include First Street. A large project to realign N. First Street and extend Anchor Way is being pursued. Staff will continue to work with the City to determine best options for Port consideration if and when the major construction project in Subarea 1 is complete.

## Airport

- Removal of the underground storage tank adjacent to the SDS Hangar and associated soil excavation is scheduled for Friday, February 11. A DEQ registration form and DEQ approval was required before work could begin.

- Attached is the monthly activity report from the Airport's FBO Tac-Aero. This report covers activities from January 2022.

- Airport Advisory Committee meeting minutes from their January 20 meeting are attached.

## Bridge/Transportation

- The Facilities Department staff has scheduled the lift span shim project from midnight on February 25th to 5:00 a.m., or earlier if the work is complete. This will require a full bridge closure. It is expected that the full five hours will not be needed. A press release has been issued, attached.

- John Mann met with Lumen on February 8 to discuss their plans to repair the damaged telecom line over the lift span. Lumen is preparing a work plan and will prepare a schedule in coordination with Charter for review by the Port. Repairs are expected to take place in

approximately 3 weeks. The bridge will be closed entirely for the duration of the work, which is likely to take about an hour. Per our agreement, Lumen will pay revenue loss, crew time for closures and administrative coordination.

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# JOINT WORK SESSION OF THE BOARD OF COMMISSIONERS OF THE PORTS OF HOOD RIVER AND CASCADE LOCKS

Tuesday, March 1, 2022
Via Remote Teleconference
5:00 p.m.

**1. Call to Order/Welcome (5 minutes)**

a. Port of Cascade Locks — President Jess Groves
b. Port of Hood River — President Ben Sheppard

**2. Introductions/Comments (15 minutes)**

a. POCL Commissioners & Staff
b. POHR Commissioners & Staff

**3. Overview of Current Port Activities (10 minutes)**

a. POCL — Olga Kaganova
b. POHR — Genevieve Scholl

**4. Discussion Topics (25 minutes)**

a. Bridges
b. Breeze-BY
c. Real Estate
d. Lobbying efforts / OneGorge
e. Airports
f. Other Topics

**5. Wrap Up Comments** — Sheppard, Groves

**6. Adjourn**

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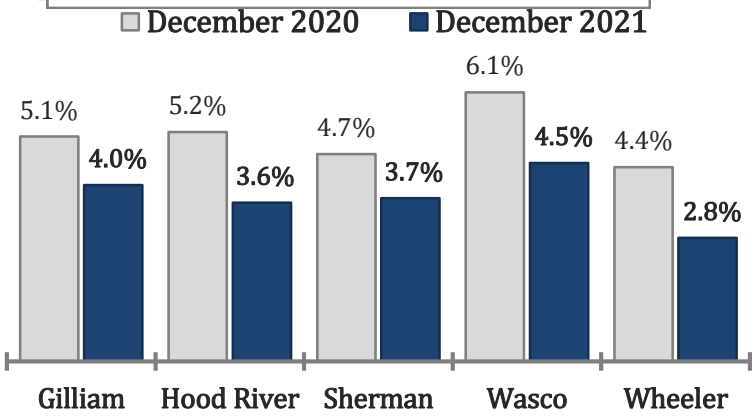
# Columbia Gorge Economic Indicators

State of Oregon Employment Department
www.QualityInfo.org

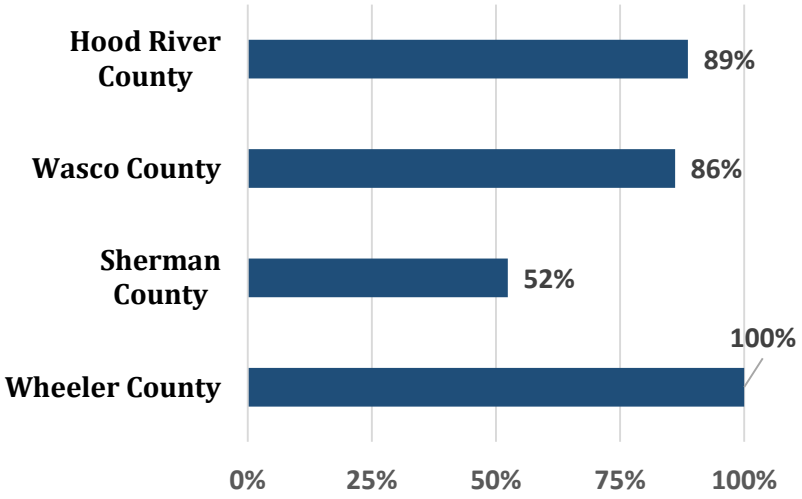
## January 2022 Edition

*(December 2021 data)*

### Local Area Unemployment Rates
**(Seasonally adjusted)**




### Graph of the Month
**Share of Initial Job Losses Gained Back**
*Source: Oregon Employment Department*

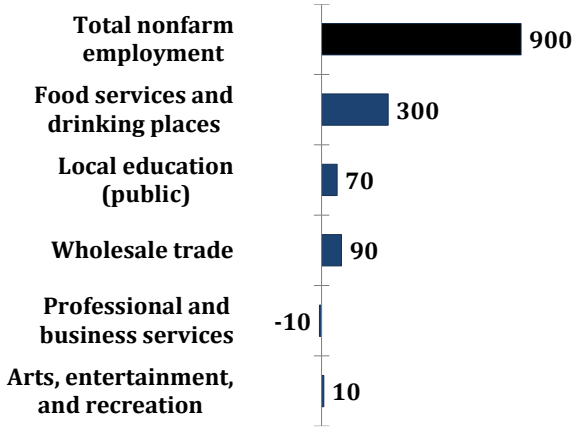



As the labor market supply has tightened to levels similar to pre-pandemic levels, job gains have slowed. Over the 12 months ending in December, employment in Hood River County grew by an impressive 7.8%. However, Wasco County grew by 3.4% while Wheeler and Sherman counties grew at a similar rate. For comparison, Oregon grew by 5.6%.

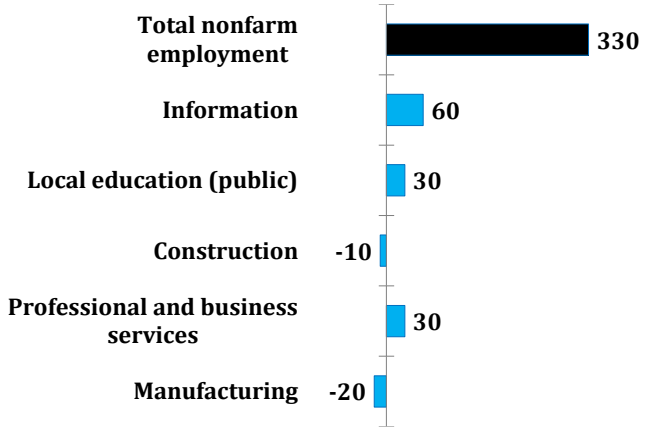
Each county has reached a different milestone in its respective economic recovery. Hood River County has gained back 89% of the jobs lost at the onset of the pandemic, while Wasco has regained 86%, Sherman has regained 52%, and Wheeler has regained 100%.

### Select Industry Gains and Losses
**(Over-the-year net employment change)**

#### Hood River County




#### Wasco County




### Largest Over-the-Year Changes

**Gilliam**
**Total nonfarm employment (+5)**
Local Government (+5)

**Sherman**
**Total nonfarm employment (-30)**
Leisure and hospitality (5)
Retail trade (-20)

**Wheeler**
**Total nonfarm employment (+10)**
Leisure and hospitality (+5)



*Want to join the distribution list?*
***Christian Kaylor*** ***christian.r.kaylor@oregon.gov***

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**Airport Activity:**
Airport activity was slow to start in January. This was due mostly to a storm that dropped a large amount of snow over a short amount of time. Activity picked up to above average as the month progressed. This was due to clear skies and cold conditions.

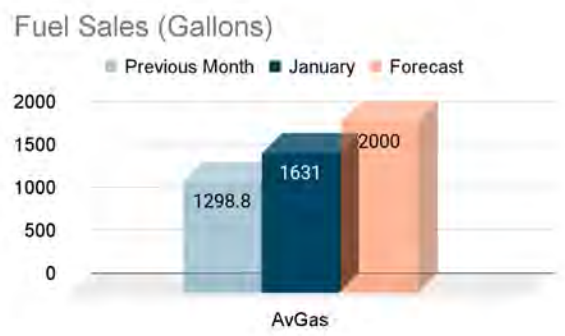

**Night Flights:**
No exercises or large events were scheduled in January. Fewer than expected R&D flights were flown. Suspecting an upswing of night flights next month as the weather continues to improve.



**Flight Training:** No external or internal training events were conducted or scheduled at 4S2.

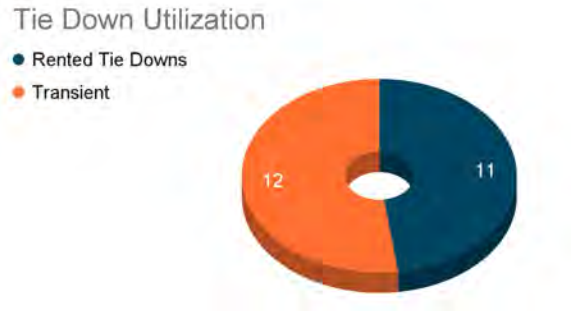

**Maintenance Activity:**
2 fleet aircraft inspections conducted along with 3 general aviation maintenance procedures. No large maintenance projects scheduled during January.

**Fuel Sales:**
Fuel sales were off to a slow start in January due to a large snow storm. Sales have gradually picked up throughout the month and ended above projected. Anticipate an increase in sales next month as weather gets better.




**Fuel Flowage Fees:**
New fuel tank has been delayed at the factory. Anticipate delivery in March 2022. Fuel flowage fee schedule will go into effect at that time. This section will be dedicated to the communication of flowage fees when they are established. The following graphic contains fictitious data but is representative of the information that will be provided.


**Tie Down Activity:**
- 23 total spots.
- 50% utilization for December.
- $385 collected in January.




**Noise Feedback:**
No noise complaints taken by the FBO in November.

**Pilot Feedback:**
No pilot feedback supplied to the FBO in November.

**Airport Surfaces:**

| | Condition | Notes. |
|---|---|---|
| Rwy 7/25 | | |
| Grass Strip | | |
| N. Ramp | | |
| S. Ramp | | |
| S. Gravel | | |
| Taxiways | | |

**Facilities:**

| | Condition | Notes. |
|---|---|---|
| N. Hangars | | Minor damage to doors. |
| S. Hangars | | |
| FBO | | Would like to add TacAero FBO signage on the |

| | | |
|---|---|---|
| | | ramp side of the FBO building. |
| MX Hangar | | Minor insulation damage. |
| Ops Hangar | | |
| Collins Hangar | | |

**Lighting:**

- No issues noted with airport lighting. Pilot Controlled Lighting is in operation with no complaints noted.

**Other:**

- AWOS transmitter needed to be replaced and is in the mail. Should be installed and functioning within the first few weeks of February.

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4S2 Airport Advisory Committee
20 January 2022
4:00 PM-5:30 PM
Port Conference Room

**MINUTES**

**PRESENT:** Greg Hagbery, Tor Bieker, Chris Robuck, Adam Young

**CALL TO ORDER/OPENING REMARKS**

- The meeting was called to order at 4:02 PM by Tor Bieker. No decisions were on the agenda for this meeting so a quorum was not needed and attendance was acceptable to hold the meeting.

**APPROVAL OF THE MINUTES FROM LAST MONTH**

- Motion was made by Tor to approve the meeting minutes from last month. Minutes were approved with no additions or corrections.

**ADDITIONS TO THE AGENDA**

- No additions or modifications were requested to the agenda.

**APPROVAL OF THE AGENDA**

- Agenda was approved with no additions or modifications.

**BUSINESS ARISING OUT OF THE PREVIOUS MEETING**

- No previous business was discussed.

**ITEMS DISCUSSED**

- New Fuel Tank: Current estimate on fuel tank delivery has been pushed to the first week in March. Currently waiting on the tank meter to arrive and be installed. The existing fuel hose on the current fuel tank is showing signs of wear and may need to be replaced prior to the arrival of the new tank. The FBO is aware and monitoring the condition closely. Turn around time for a replacement hose is not a concern.

- ORD 23: Suggested verbiage for Ordinance 23 edits were sent to PAE for review and comment. Has since been passed to the Port legal team for review. Once that is complete, a public notice will be sent out for input/comment.

- Hood River Soaring Club: The location of the suggested staging area that was brought up at the last AAC meeting by Cory is still within the obstacle free zone which would not comply with FAA requirements. Tor questioned what the driver for this staging area was as the airport is generally not busy enough to have glider staging be a large impact. There were no members of the soaring club present to answer.

- Plow Plan: Dave K put together a graphic that was a snow removal priority proposal that he had Greg hand out. The plan triages the airport into 3 priorities. First priority is building access, second priority is runway and taxiway, and the third priority is the T-Hangars.

- Quarterly Newsletter: Dave K requested that the agenda make time to discuss the idea of an AAC Quarterly Newsletter. The idea would be to provide a newsletter on a quarterly basis to tenants and stakeholders. Tor suggested that aviation related events could be included in the newsletter. (WAAAM events, EAA events, etc.) Chris brought up concern that this could be seen as the Port using its "voice" to the public to promote private events. Greg suggested the idea of having the Port legal team review this idea to make sure that no bounds are overstepped.
- FBO: No significant news to report. Awaiting arrival of the fuel tank. Fuel sales are where they normally are at this time of the season.

- WAAAM: No WAAAM representative present.

- Glider Club: No glider club representative present.

- New Business: None
- Public Comment: None

**ACTION ITEMS**

- None specified

**ADJOURNMENT**

- Meeting adjourned at 4:23 PM.

**NEXT MEETING DATE**

- Next meeting is set for February 17th, location TBD.  Agenda will be sent out prior to the next meeting and will detail the date, time, and location.

On

INDUSTRIAL/COMMERCIAL FACILITIES • AIRPORT • INTERSTATE BRIDGE • MARINA

1000 E. Port Marina Drive • Hood River, OR 97031 • (541) 386-1645 • Fax: (541) 386-1395 • www.portofhoodriver.com • Email: porthr@gorge.net

For Immediate Release
Date: February 11, 2022

Contact:
Genevieve Scholl, Deputy Executive Director, Port of Hood River
(541) 386-6145 / gscholl@portofhoodriver.com

**NIGHTTIME CLOSURE OF HOOD RIVER-WHITE SALMON INTERSTATE BRIDGE**
**SCHEDULED FOR MIDNIGHT – 5:00AM FRIDAY, FEBRUARY 25**
***For required repairs to the lift span rocker bearing***

HOOD RIVER, ORE. – The Hood River-White Salmon Interstate Bridge will be closed to all vehicle traffic beginning at midnight on Friday, February 25, 2022 as Port of Hood River crews make required repairs to the bridge's lift span rocker bearing. The rocker bearing is a structural support of the bridge's lift span when it is in the down position. The maximum duration of the closure will be five hours, but the bridge will reopen to vehicle traffic immediately upon the completion of the work.

During the closure, access to the bridge will be closed at the signaled intersection of OR Hwy 30 and E. Port Marina Drive in Oregon and at the Washington SR14 bridge onramp just west of Bingen, WA. Access will be provided only for emergency vehicles conducting emergency response or transport.

For more information, contact the Port of Hood River via email to porthr@gorge.net.

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# Commission Memo

Prepared by: Michael McElwee
Date: February 15, 2022
Re: Nez Perce Toll Waiver Policy

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On March 17, 2020, the Commission approved a toll waiver policy for Yakama Nation Members and employees. The policy has been successfully implemented since June 1, 2020.

On August 6, 2020, staff received a similar toll waiver request from the Nez Perce Tribe, also a federally recognized Sovereign Native Nation pursuant to the Treaty with the Nez Perces, 12 Stat. 957, secured on June 11, 1855. ("Treaty"). The Treaty secured to the Nez Perce the right to travel upon public highways, free from restriction, encumbrance, and precondition.

A toll waiver for Nez Perce tribal members has been informally implemented since October 2020. The attached toll waiver policy would more formally recognize the perpetual rights of the Nez Perce to cross the Hood River Bridge without paying a toll. The one major difference with the Yakama Nation policy is that the Nez Perce have no tribal license plate. Therefore, all members and employees would need to show their ID card to staff at the toll booth.

**RECOMMENDATION:** Approve Acknowledgement of Nez Perce Treaty Rights and Statement of Policy Regarding Non-Revenue Passage for Nez Perce Tribal Members and Employees crossing the Hood River – White Salmon Interstate Bridge.

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**Port of Hood River**
**Hood River-White Salmon Interstate Bridge**

**Acknowledgment of Nez Perce Treaty Rights and Statement of Policy Implementing Non-Revenue Passage For Nez Perce Tribal Members and Employees**

The Nez Perce Tribe ("Nez Perce") is a federally recognized Sovereign Native Nation pursuant to the United States' Treaty with the Nez Perce of June 11, 1855, 12 Stat. 957. ("Treaty"). The Treaty reserved to the Nez Perce the right to travel upon public highways, free from restriction, encumbrance and precondition. This treaty right to travel has been recognized and affirmed by the United States Supreme Court in *Wash. State Dep't of Licensing v. Cougar Den, Inc.*, 139 S. Ct. 1000, 203 L.Ed.2d 301 (2019)

Therefore, Port of Hood River ("Port") recognizes the perpetual treaty right of Nez Perce Enrolled Members ("Members") and Nez Perce tribal employees ("Employees") to cross the Hood River-White Salmon Toll Bridge ("Bridge") without paying a vehicle toll.

This right shall be implemented through the following policy to be implemented on and after February, 16, 2020, as follows:

- Nez Perce Tribal Members or Employees traveling across the Bridge who display their Enrollment Card (Members) or Identification Card (Employees) to the toll booth attendant, or if there is no toll booth attendant if they present their Enrollment Card or Identification Card to the Port, shall not be subject to a toll. shall not be subject to a toll.

**DATED: February 16, 2022**

PORT OF HOOD RIVER

By:

_____
Michael S. McElwee
Executive Director

*Approved by the Port of Hood River Board of Commissioners: February 15, 2022.*

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Nez Perce

TRIBAL EXECUTIVE COMMITTEE
P.O. BOX 305 • LAPWAI, IDAHO 83540 • (208) 843-2253

February 1, 2022

***Sent via email only: mmcelwee@portofhoodriver.com***

Mr. Michael McElwee
Executive Director
Port of Hood River
1000 E. Port Marina Dr.
Hood River, OR 97031

**Re: Appreciation for the Port of Hood River's Acknowledgment and Implementation of the Nez Perce Tribe's Treaty-Reserved Right to Travel on the Hood River-White Salmon Interstate Bridge**

Dear Mr. McElwee:

I am writing on behalf of the Nez Perce Tribe ("Tribe") to express the Tribe's appreciation for the Port of Hood River's ("Port") acknowledgment, in fall 2020, of the Tribe's Treaty-reserved right to travel upon all public highways free from restriction, encumbrance, and precondition[1] and for ensuring that the Tribe's members and employees do not incur a toll as they travel across the Hood River-White Salmon Interstate Bridge.

The Tribe is pleased that implementation of the toll waiver for the Hood River-White Salmon Interstate Bridge has been proceeding smoothly for its tribal members and employees as well as for Port staff. Several months ago, the Tribe understood that the Port was interested in formally adopting an "Acknowledgment of the Nez Perce Treaty and Statement of Policy Implementing Non-Revenue Passage for Nez Perce Tribal Members and Employees." The Tribe has reviewed the draft statement (attached) and is comfortable with the Port formally adopting this statement.

Please reach out to David J. Cummings, Senior Staff Attorney, at (208) 843-7355 or djc@nezperce.org, with any questions.

[1] Treaty with the Nez Perces, June 11, 1855, 12 Stat. 957, art. 3; *see Washington State Dep't of Licensing v. Cougar Den, Inc.*, 139 S. Ct. 1000, 203 L.Ed.2d 301 (2019).

*Qe'ciyéw'yew'* (thank you).

Sincerely,

Samuel N. Penney

Samuel N. Penney
Chairman

Enclosure