AASHTOWare™ BRIDGE DESIGN AND RATING

# Accelerating Bridge Modeling with BrDR API: Case Studies from SC, IA, and OH

IOWA DOT | Ohio Department of Transportation | SCDOT South Carolina Department of Transportation | Michael Baker INTERNATIONAL 85 YEARS 1940 2025 HFF

2025 Rating and Design User Group Meeting
Boise, ID | August 12-13, 2025

# Agenda

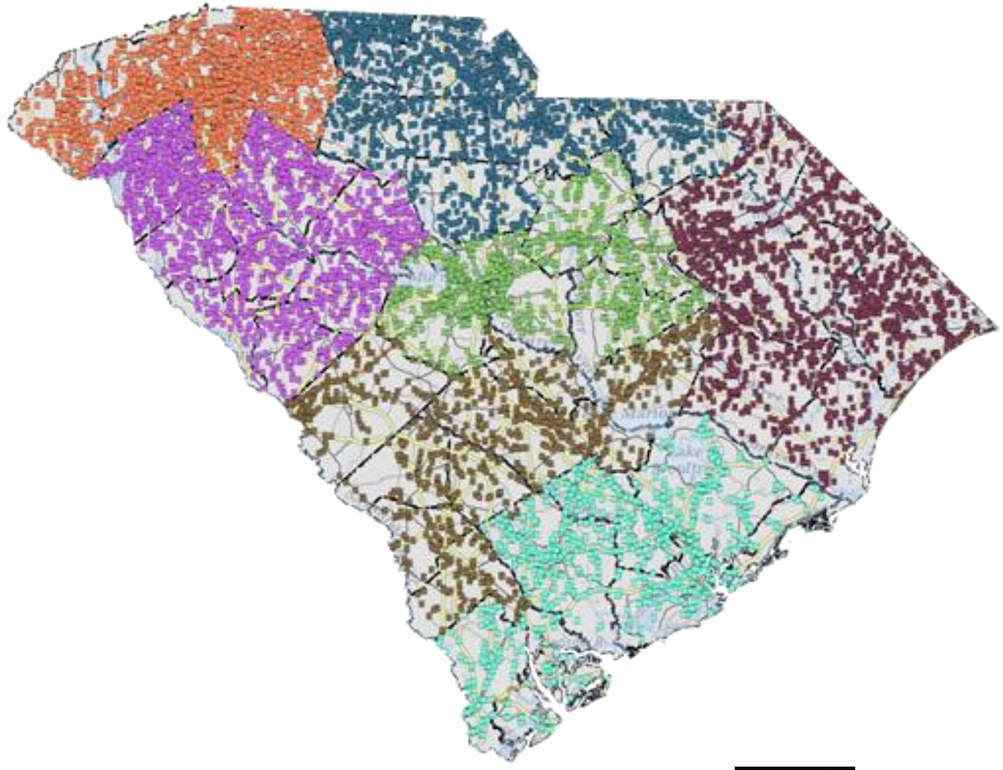
- Overview
- SCDOT Load Rating Project
- Iowa DOT Load Rating Project
- Ohio DOT Load Rating Project
- Conclusion

# SCDOT Load Rating Project

## SCDOT Implementation of Testing Results for Precast Slab Bridges

Background

- Around 25% of SCDOT Bridge inventory consists of precast panel slabs.
- Following initial load rating in BrR, a majority required posting.
  - Designed for older, lighter vehicles (H10 or H15 Truck)
- Ratings were not consistent with the condition and performance in the field.
- Field and Lab testing was completed to determine if capacity could be increased.
- Results confirmed theory that the capacity was higher than the results in BrR were showing.
- How to update so many models efficiently?





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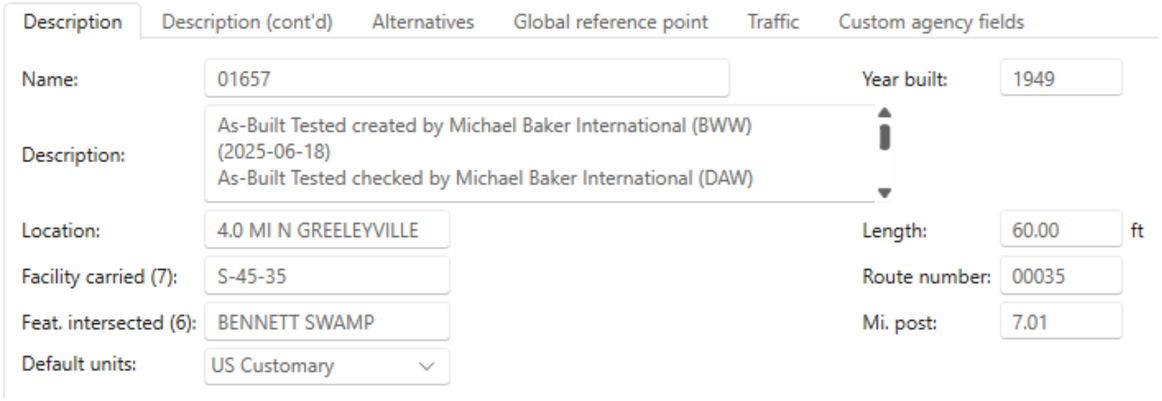
# Automating Bridge Data Entry – SCDOT Use Case

## Scaling BrR Modeling for 1250 Bridges in South Carolina

- **The Challenges:**
  - SCDOT needed to update about 1250 bridge models in BrR.
  - Each bridge had unique metadata (location, length, route number, etc.)
  - Manual entry would be time-intensive and error-prone.
  - Each bridge had an existing BrR model that the updates would need to be added to.
- **Why Automation Was Essential:**
  - Volume and complexity made manual modeling impractical.
  - Consistency and accuracy were critical across all bridge files.

| Facility Carried | Feature Intersected | Year Built | Total Length (Length) | Route Number | Mile Post |
|---|---|---|---|---|---|
| S-45-35 | BENNETT SWAMP | 1949 | 60 | 35 | 7.015 |
| S-28-148 | CAMP CREEK | 1950 | 30 | 148 | 0.429 |
| S-42-474 | CANE CREEK | 1950 | 90 | 474 | 1.300 |
| S-15-33 | INDIAN CREEK | 1951 | 42 | 33 | 3.133 |
| S-17-33 | BUCK SWAMP | 1951 | 120 | 33 | 2.873 |
| S-18-86/MT ZION RD | TRIB INDIAN FIELD SWP | 1951 | 28 | 86 | 3.418 |
| S-25-20 | MILL BAY CREEK | 1951 | 70 | 20 | 5.654 |
| S-43-41 | BLUFF SWAMP NO 4 | 1951 | 70 | 41 | 4.407 |
| S-18-16 | POLK SWAMP | 1952 | 42 | 16 | 5.559 |



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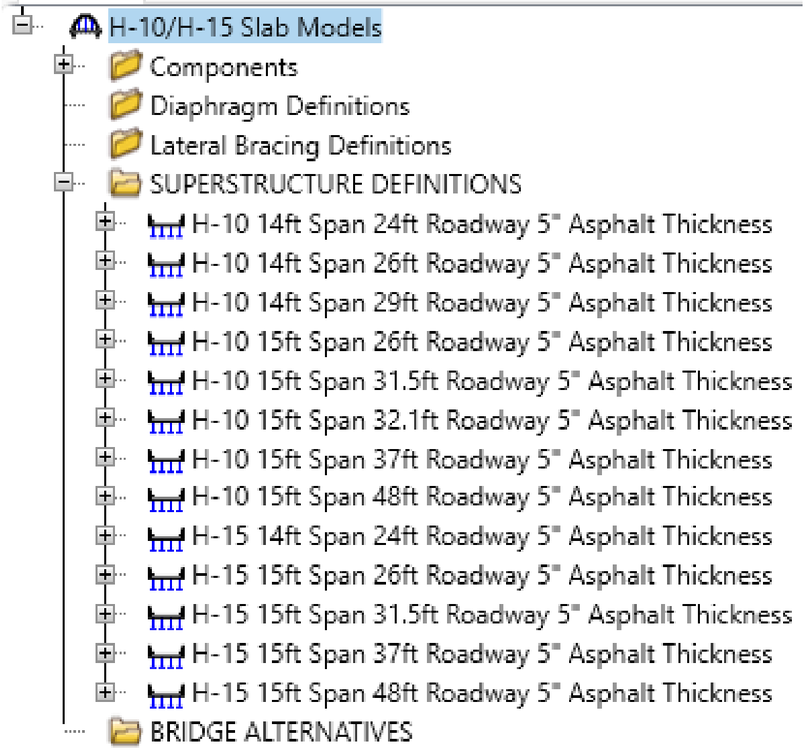
# Automating Bridge Data Entry – SCDOT Use Case

## Scaling BrR Modeling for 1250 Bridges in South Carolina

- **Simplifying the Process**
  - Bridge data could be pulled from BrM Database into Excel.
    - Each bridge was categorized by span length and width to match standard drawings.
    - Allowed us to filter out bridges that did not meet the criteria for automated updates.
      - Certain criteria needed to be met for K-factor updates.
  - Created BrR models for all standard bridge plans in one .xml file.
    - Included K-factor update from testing. Assumed 5” wearing surface, Fair condition factor, and ADT <5000.
      - Any bridges with wearing surface >5” or ADT >5000 would need manual update.
      - Initial discussion on having models in 1” increments but was determined to be unnecessary.
  - This allowed for the fewest models encompassing a majority of the bridges that needed updates.



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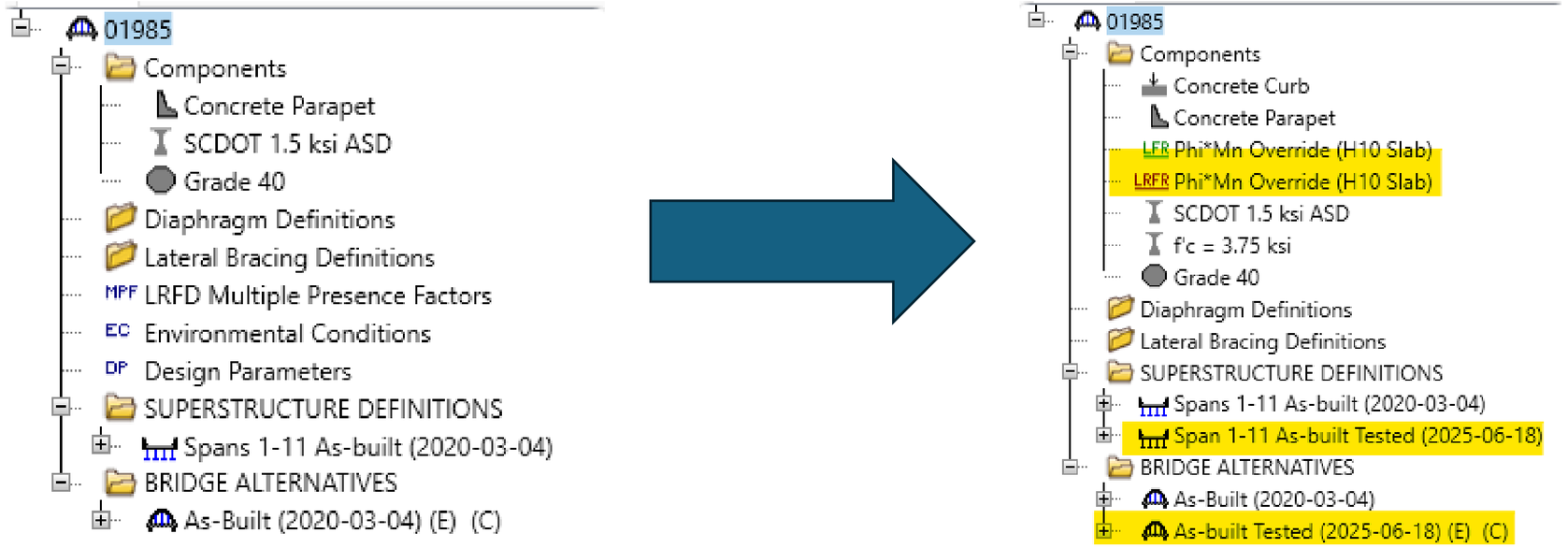
# Automating Bridge Data Entry – SCDOT Use Case

## Scaling BrR Modeling for 1250 Bridges in South Carolina

- Automation allowed for minimal BrR entry.
  - Limited checking and QC time
- Updated all metadata, added in superstructure template, and updated bridge alternatives.
- BrR model was fully complete and ready to be uploaded to server.



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# Automating Bridge Data Entry – SCDOT Use Case

## Scaling BrR Modeling for 1250 Bridges in South Carolina

- **Creating Load Rating Summary Form (LRSF)**
  - Along with a BrR model, each bridge would need an LRSF with bridge metadata and rating results that is signed and sealed electronically.
    - This is needed in Excel and PDF form.
  - Excel LRSF was created for each BrR superstructure model and blank metadata.
  - Macro was developed to populate correct LRSF template with bridge data and along with the addition of PE stamp and data.
    - These were then converted into PDF format as needed.

SCDOT **LRFR BRIDGE LOAD RATING SUMMARY** Version 3

Page 1 of 3

**SECTION 1 - GENERAL BRIDGE DATA**

| (8) Asset ID | Route Type | (27) Year Built | (90) Date of Inspection | (411) Date Rated |
|---|---|---|---|---|
| 00000 | 0 | 0 | | |

| (9) Bridge Location | (7) Facility Carried | (6) Feature Intersected/Route Crossing |
|---|---|---|
| 0 | 0 | 0 |

| (49) Length | (11) Milepost | (2) District | (3) County | (22) Owner | (418) Conditions During Rating (NBI Item 58, NBI Item 59, NBI Item 60) |
|---|---|---|---|---|---|
| ft. | 0.000 | 0 | 0 | 0 | |

| (43, 44, 45, & 46) Bridge Description | (31) Design Load | (108) Existing Wearing Surface Type | (891) LR Wearing Surface Depth (in) |
|---|---|---|---|
| Span RCS Bridge | 0 | 0 | |

| Rating Program & Version | Rating Program & Version | Rating Method | AASHTO Reference |
|---|---|---|---|
| BrR 7.5 - AASHTO Engine | N/A | LRFR | MBE 3rd Edition, w/ 2023 Interims |

| (58) Deck | (59) Superstructure | (60) Substructure | (62) Culvert | (113) Scour Critical |
|---|---|---|---|---|
| | | | | |

**SECTION 2 - INVENTORY AND OPERATING LOAD RATINGS**

| Rating Vehicle | Rating Level | Controlling Member | Controlling Location | Controlling Limit State | Rating Factor |
|---|---|---|---|---|---|
| HL-93 Truck + Lane | Inventory | S2-S5 | 1.5 | STRENGTH-I Concrete Flexure | 0.857 |
| HL-93 Truck Train + Lane (90%) | Inventory | - | - | - | - |
| HL-93 Tandem + Lane | Inventory | S2-S5 | 1.6 | STRENGTH-I Concrete Flexure | 0.779 |
| HL-93 Truck + Lane | Operating | S2-S5 | 1.5 | STRENGTH-I Concrete Flexure | 1.111 |



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# Automating Bridge Data Entry – SCDOT Use Case

## Creating LRSF for 1250 Bridges in South Carolina

- **LRSF Creation**

| Instructions | | | Inputs | |
|---|---|---|---|---|
| 0. Make sure the tab, "H10-H15" is up to date. | | *Last updated: 6/18/25* | | |
| 1. Enter the following information: | | | | |
| | Date of signing | | Signing Date: | 6/24/2025 |
| | Path of the folder where LRSF template Excel sheet are located | | Template Folder: | C:\Temp\SCDOT\LRSF\Template |
| | Path of the folder where the templates are copied to | | Destination Folder: | C:\Temp\SCDOT\LRSF\Output |
| | Path of the PE stamp image | | Stamp Image file: | C:\Temp\SCDOT\LRSF\PeStamp.jpg |
| 2. Click on "Copy Bridge" to copy the templates for each bridge. | | | | |
| 3. Click on "Add Date and Stamp" to add the signing date and PE stamp. | | | | |
| *Alternatively, you can click on "Add Date" or "Add Stamp" separately.* | | | | |

Copy Bridge

Update LRSF

| Asset ID | Template File Name | Final File Name |
|---|---|---|
| 1985 | H-15 15ft Span 31.5ft Roadway 5in Asphalt Thickness | 1985_LRSF.xlsm |

SCDOT **LRFR BRIDGE LOAD RATING SUMMARY** Version 3

Page 1 of 3

**SECTION 1 - GENERAL BRIDGE DATA**

| (8) Asset ID | Route Type | (27) Year Built | (90) Date of Inspection | (411) Date Rated |
|---|---|---|---|---|
| 01985 | Secondary Road | 1954 | 9/7/2023 | 6/24/2025 |

| (9) Bridge Location | (7) Facility Carried | (6) Feature Intersected/Route Crossing |
|---|---|---|
| 8.5MI SW ABBEVILLE | S-1-40 | CALHOUN CREEK |

| (49) Length | (11) Milepost | (2) District | (3) County | (22) Owner | (418) Conditions During Rating (NBI Item 58, NBI Item 59, NBI Item 60) |
|---|---|---|---|---|---|
| 154 ft. | 3.403 | 2 | ABBEVILLE | SCDOT | 5,5,5 |

| (43, 44, 45, & 46) Bridge Description | (31) Design Load | (108) Existing Wearing Surface Type | (891) LR Wearing Surface Depth (in) |
|---|---|---|---|
| 11 Span RCS Bridge | H-10 | Bituminous | 5 |

| Rating Program & Version | Rating Program & Version | Rating Method | AASHTO Reference |
|---|---|---|---|
| BrR 7.5 - AASHTO Engine | N/A | LRFR | MBE 3rd Edition, w/ 2023 Interims |

| (58) Deck | (59) Superstructure | (60) Substructure | (62) Culvert | (113) Scour Critical |
|---|---|---|---|---|
| 5 Fair | 5 Fair | 5 Fair | N N/A (NBI) | 3 - Scour Critical |

**SECTION 2 - INVENTORY AND OPERATING LOAD RATINGS**

| Rating Vehicle | Rating Level | Controlling Member | Controlling Location | Controlling Limit State | Rating Factor |
|---|---|---|---|---|---|
| HL-93 Truck + Lane | Inventory | S2-S5 | 1.5 | STRENGTH-I Concrete Flexure | 0.857 |
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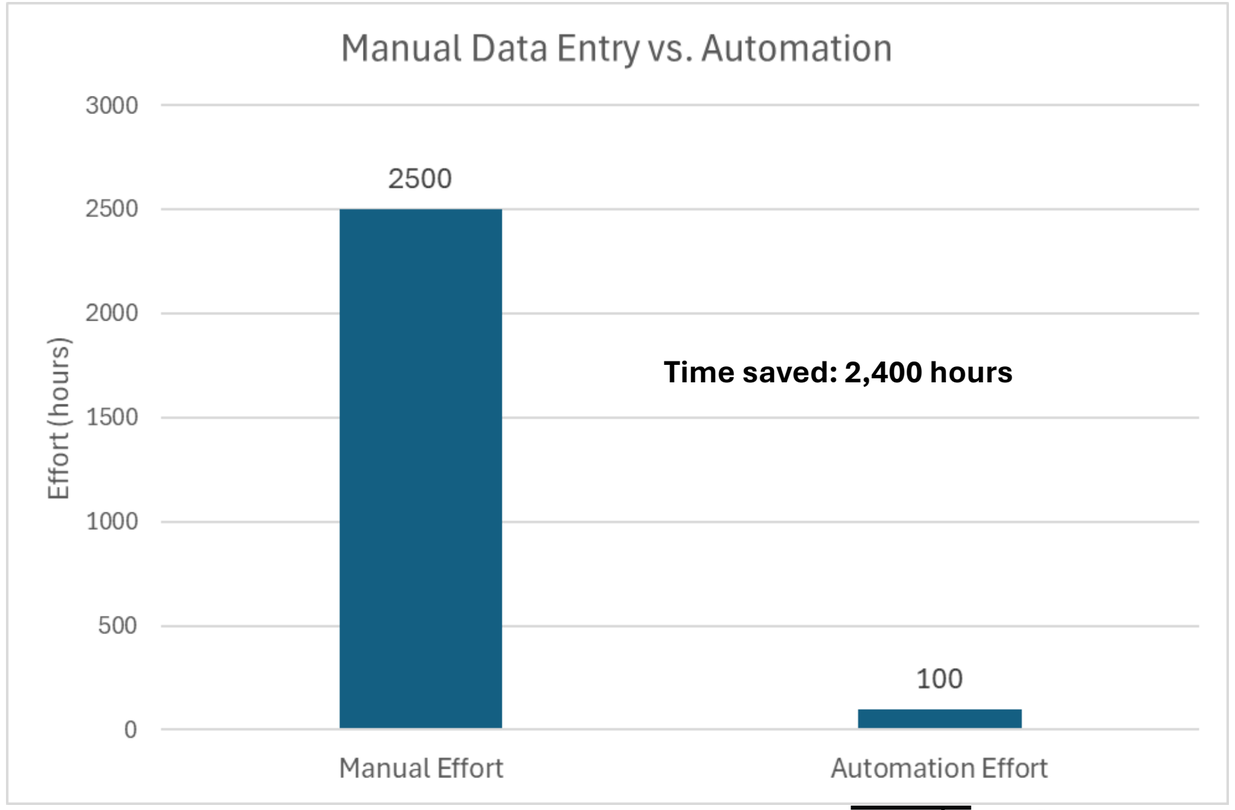
| HL-93 Truck + Lane | Operating | S2-S5 | 1.5 | STRENGTH-I Concrete Flexure | 1.111 |

# The Automation Solution for SCDOT's Load Rating Project

## Automating Metadata and Superstructure Modeling in BrR

- **What the automation does:**
  - Reads metadata from Excel and populates it into BrR via API.
  - Copies superstructure definitions from a template BrR file based on bridge configuration.
  - Create corresponding structure alternatives.
- **Key Benefits:**
  - Enables rapid population of hundreds of BrR models.
  - Ensures consistency in structure definitions.
  - Reduces manual workload and potential for input errors.
- **ROI:**
  - Manual data entry: 2,500 hours
  - Automated entry: around 100 hours
  - Time saved: 2,400 hours (96% time saving)



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AASHTOWare™ BRIDGE DESIGN AND RATING

# Iowa DOT Implementing BrR for Locals

## API Tool For Modeling Iowa Trusses in BrR

- **Background**
  - Iowa is setting up BrR for locals.
  - To help, three consultants were hired to create templates for Iowa's standard bridges.
  - Michael Baker Is modeling the standard trusses including gusset plates.

- **Iowa Truss Standards**
  - About 100 from 1914-1945
  - Modeling ~70 in BrR
  - Templates will be baseline for users

# Iowa DOT Implementing BrR for Locals

## API Tool For Modeling Iowa Trusses in BrR

- **Gusset Plate Problem**
  - Rating gusset plates is complex.
  - Users are new to BrR.
  - Even within standard trusses, gusset plates are not consistent (Plans say “See Shop Drawings”).

- **Solution**
  - Develop an API tool to assist load raters in modeling the gusset plates.
  - Make it easier for new users.
  - Create uniformity amongst the different Iowa agencies.

# Iowa DOT Implementing BrR for Locals

## API Tool For Modeling Iowa Trusses in BrR

- **Create Iowa DOT Standard BrR Library and System Files**
- **Create Iowa DOT Br Standard Analysis Setting**
- **Create Iowa DOT Standard BrR Preferences, Including Control Options**
- **Create BrR Models for Standards and Generate Baseline Load Ratings**



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# Iowa DOT Implementing BrR for Locals

## API Tool For Modeling Iowa Trusses in BrR

- **Create BrR Models for Trusses including Gusset Plates and Generate Baseline Load Ratings**
  - Seven series, oldest 1914 and newest 1945
  - Three types of trusses

Pony Truss

Straight High Truss

Arched High Truss



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# Iowa DOT Implementing BrR for Locals

## API Tool For Modeling Iowa Trusses in BrR

- **Develop BrR Models for Trusses including Gusset Plates**
  - Leverage similarities in truss standards to streamline modeling and analysis
  - Create templates for efficiency and consistency
  - Reduce errors and enhance quality



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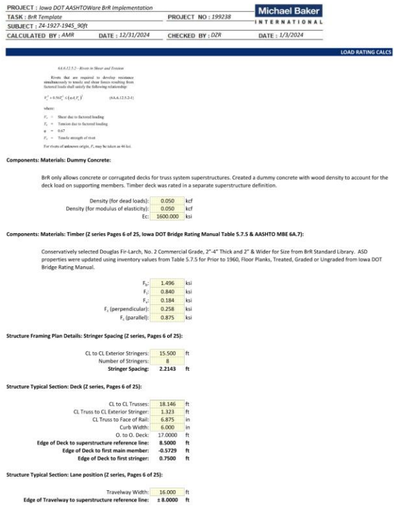
AASHTOWare™ BRIDGE DESIGN AND RATING

# Iowa DOT Implementing BrR for Locals

## API Tool For Modeling Iowa Trusses in BrR

- **Create BrR Models for Trusses including Gusset Plates**
  - Create one pony and one high truss load rating
  - Submit for Iowa DOT review
  - Address DOT comments
  - Obtain final approval from Iowa DOT



PROJECT : Iowa DOT AASHTOWare BrR Implementation
TASK : BrR Template — PROJECT NO : 199238 — Michael Baker INTERNATIONAL
SUBJECT : 24-1927-1945_9QY
CALCULATED BY : AMR — DATE : 12/31/2024 — CHECKED BY : DZR — DATE : 1/3/2024

LOAD RATING CALCS

Components: Materials: Dummy Concrete:

BrR only allows concrete or corrugated decks for truss system superstructures. Created a dummy concrete with wood density to account for the deck load on supporting members. Timber deck was rated in a separate superstructure definition.

| | | |
|---|---|---|
| Density (for dead loads): | 0.050 | kcf |
| Density (for modulus of elasticity): | 0.050 | kcf |
| Ec: | 1600.000 | ksi |

Components: Materials: Timber (Z series Pages 6 of 25, Iowa DOT Bridge Rating Manual Table 5.7.5 & AASHTO MBE 6A.7):

Conservatively selected Douglas Fir-Larch, No. 2 Commercial Grade, 3"-4" Thick and 2" & Wider for Size from BrR Standard Library. ASD properties were updated using inventory values from Table 5.7.5 for Prior to 1960, Floor Planks, Treated, Graded or Ungraded from Iowa DOT Bridge Rating Manual.

| | | |
|---|---|---|
| $F_{bc}$: | 1.496 | ksi |
| $F_{v}$: | 0.840 | ksi |
| $F_{c}$: | 0.184 | ksi |
| $F_{c}$ (perpendicular): | 0.258 | ksi |
| $F_{c}$ (parallel): | 0.875 | ksi |

Structure Framing Plan Details: Stringer Spacing (Z series, Pages 6 of 25):

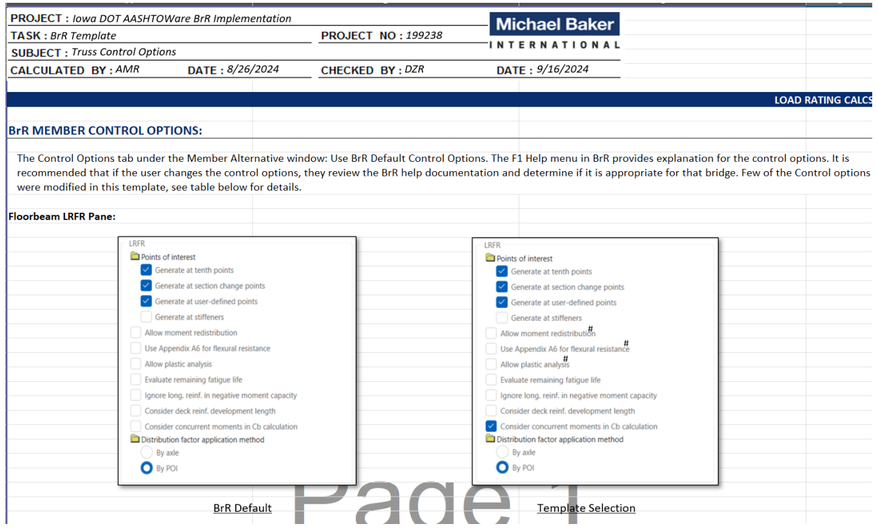
| | | |
|---|---|---|
| CL to CL Exterior Stringers: | 15.500 | ft |
| Number of Stringers: | 8 | |
| **Stringer Spacing:** | **2.2143** | **ft** |

Structure Typical Section: Deck (Z series, Pages 6 of 25):

| | | |
|---|---|---|
| CL to CL Trusses: | 18.146 | ft |
| CL Truss to CL Exterior Stringer: | 1.323 | ft |
| CL Truss to Face of Rail: | 6.875 | in |
| Curb Width: | 6.000 | in |
| O. to O. Deck: | 17.0000 | ft |
| **Edge of Deck to superstructure reference line:** | **8.5000** | **ft** |
| **Edge of Deck to first main member:** | **-0.5729** | **ft** |
| **Edge of Deck to first stringer:** | **0.7500** | **ft** |

Structure Typical Section: Lane position (Z series, Pages 6 of 25):

| | | |
|---|---|---|
| Travelway Width: | 16.000 | ft |
| **Edge of Travelway to superstructure reference line:** | **± 8.0000** | **ft** |



PROJECT : Iowa DOT AASHTOWare BrR Implementation
TASK : BrR Template — PROJECT NO : 199238 — Michael Baker INTERNATIONAL
SUBJECT : Truss Control Options
CALCULATED BY : AMR — DATE : 8/26/2024 — CHECKED BY : DZR — DATE : 9/16/2024

LOAD RATING CALCS

BrR MEMBER CONTROL OPTIONS:

The Control Options tab under the Member Alternative window: Use BrR Default Control Options. The F1 Help menu in BrR provides explanation for the control options. It is recommended that if the user changes the control options, they review the BrR help documentation and determine if it is appropriate for that bridge. Few of the Control options were modified in this template, see table below for details.

Floorbeam LRFR Pane:




BrR Default

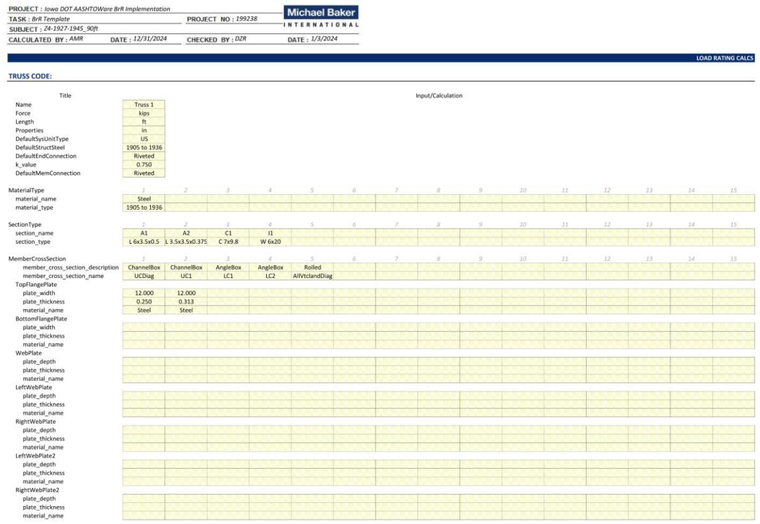



Template Selection

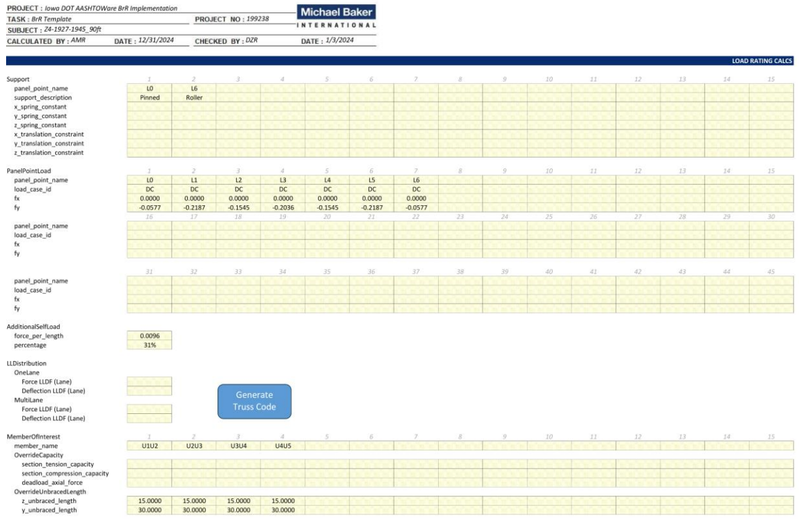
# Iowa DOT Implementing BrR for Locals

## API Tool For Modeling Iowa Trusses in BrR

- **Create BrR Models for Trusses including Gusset Plates**
  - Use Excel Macro to create BrR truss code.


PROJECT : Iowa DOT AASHTOWare BrR Implementation
TASK : BrR Template — PROJECT NO : 199238
SUBJECT : 24-1927-1945_90ft
CALCULATED BY : AMR — DATE : 12/31/2024 — CHECKED BY : DZR — DATE : 1/3/2024
Michael Baker INTERNATIONAL
LOAD RATING CALCS
TRUSS CODE:

| Title | Input/Calculation |
|---|---|
| Name | Truss 1 |
| Force | kips |
| Length | ft |
| Properties | in |
| DefaultSysUnitType | US |
| DefaultStructSteel | 1905 to 1936 |
| DefaultEndConnection | Riveted |
| k_value | 0.750 |
| DefaultMemConnection | Riveted |
| MaterialType | |
| material_name | Steel |
| material_type | 1905 to 1936 |
| SectionType | |
| section_name | A1: L 6x3.5x0.5 — A2: L 3.5x3.5x0.375 — C: C 7x9.8 — I: W 6x20 |
| MemberCrossSection | |
| member_cross_section_description | ChannelBox — AngleBox — AngleBox — Rolled |
| member_cross_section_name | UCDiag — UC1 — LC1 — LC2 — AllVtclandDiag |
| TopFlangePlate | |
| plate_width | 12.000 — 12.000 |
| plate_thickness | 0.250 — 0.313 |
| material_name | Steel — Steel |
| BottomFlangePlate | |
| plate_width | |
| plate_thickness | |
| material_name | |
| WebPlate | |
| plate_depth | |
| plate_thickness | |
| material_name | |
| LeftWebPlate | |
| plate_depth | |
| plate_thickness | |
| material_name | |
| RightWebPlate | |
| plate_depth | |
| plate_thickness | |
| material_name | |
| LeftWebPlate2 | |
| plate_depth | |
| plate_thickness | |
| material_name | |
| RightWebPlate2 | |
| plate_depth | |
| plate_thickness | |
| material_name | |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TASK : BrR Template — PROJECT NO : 199238
SUBJECT : 24-1927-1945_90ft
CALCULATED BY : AMR — DATE : 12/31/2024 — CHECKED BY : DZR — DATE : 1/3/2024
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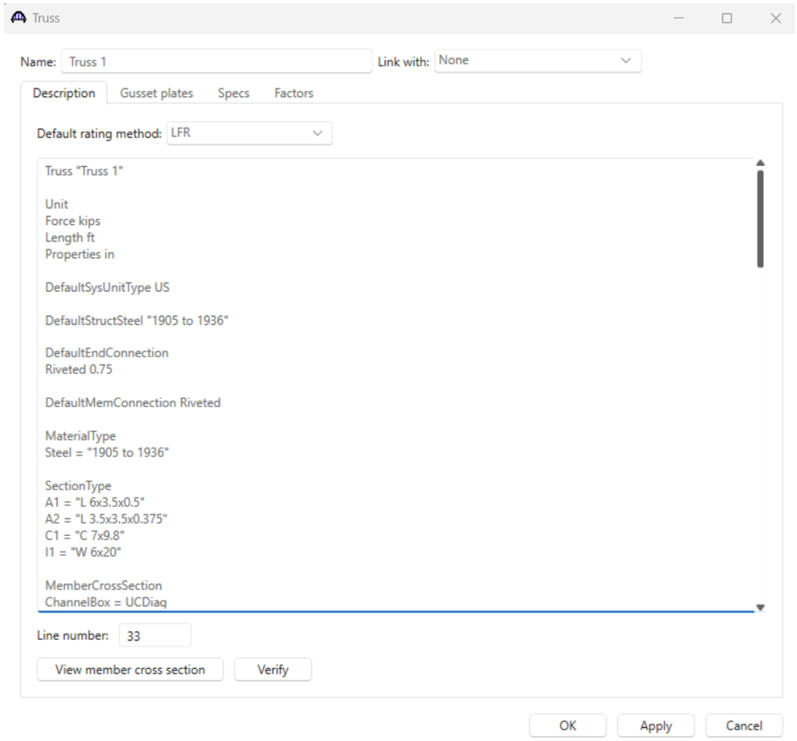
LOAD RATING CALCS

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Support | | | | | | | |
| panel_point_name | L0 | L6 | | | | | |
| support_description | Pinned | Roller | | | | | |
| x_spring_constant | | | | | | | |
| y_spring_constant | | | | | | | |
| z_spring_constant | | | | | | | |
| x_translation_constraint | | | | | | | |
| y_translation_constraint | | | | | | | |
| z_translation_constraint | | | | | | | |
| PanelPointLoad | | | | | | | |
| panel_point_name | L0 | L1 | L2 | L3 | L4 | L5 | L6 |
| load_case_id | DC | DC | DC | DC | DC | DC | DC |
| fx | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| fy | -0.0577 | -0.2187 | -0.1545 | -0.2036 | -0.1545 | -0.2187 | -0.0577 |
| panel_point_name | | | | | | | |
| load_case_id | | | | | | | |
| fx | | | | | | | |
| fy | | | | | | | |
| panel_point_name | | | | | | | |
| load_case_id | | | | | | | |
| fx | | | | | | | |
| fy | | | | | | | |
| AdditionalSelfLoad | | | | | | | |
| force_per_length | 0.0096 | | | | | | |
| percentage | 31% | | | | | | |
| LLDistribution | | | | | | | |
| OneLane | | | | | | | |
| Force LLDF (Lane) | | | | | | | |
| Deflection LLDF (Lane) | | | | | | | |
| MultiLane | | | | | | | |
| Force LLDF (Lane) | | | | | | | |
| Deflection LLDF (Lane) | | | | | | | |
| MemberOfInterest | | | | | | | |
| member_name | U1U2 | U2U3 | U3U4 | U4U5 | | | |
| OverrideCapacity | | | | | | | |
| section_tension_capacity | | | | | | | |
| section_compression_capacity | | | | | | | |
| deadload_axial_force | | | | | | | |
| OverrideUnbracedLength | | | | | | | |
| z_unbraced_length | 15.0000 | 15.0000 | 15.0000 | 15.0000 | | | |
| y_unbraced_length | 30.0000 | 30.0000 | 30.0000 | 30.0000 | | | |

Generate Truss Code





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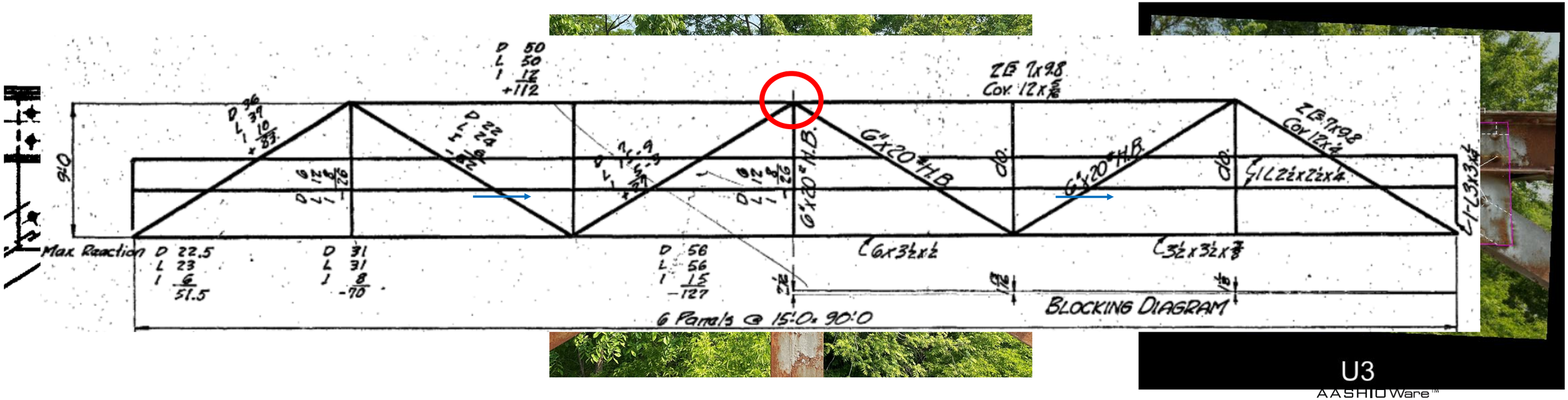
## API Tool For Modeling Iowa Trusses in BrR

- **Create BrR Models for Trusses including Gusset Plates**
  - Use iPad/GoPro/Drone to obtain gusset plate information in the field.
  - Use field photos, field measurements, and MicroStation to generate gusset Inputs.



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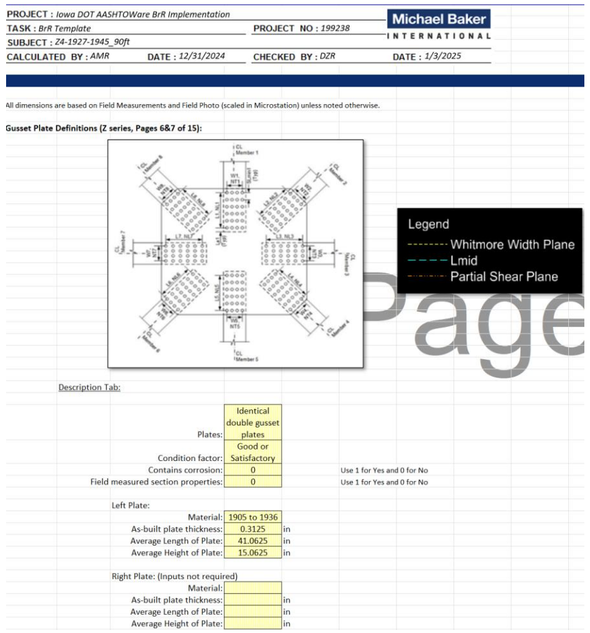
# Iowa DOT Implementing BrR for Locals

## API Tool For Modeling Iowa Trusses in BrR

- **Create BrR Models for Trusses including Gusset Plates**
  - Use BrR Open API tool "BAMS" to auto transfer gusset plate inputs into BrR gusset plate windows.



PROJECT : *Iowa DOT AASHTOWare BrR Implementation*
TASK : *BrR Template*
SUBJECT : *24-1927-1945_90ft*
CALCULATED BY : *AMR* DATE : *12/31/2024*
PROJECT NO : *199238*
CHECKED BY : *DZR* DATE : *1/3/2025*

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All dimensions are based on Field Measurements and Field Photo (scaled in Microstation) unless noted otherwise.

**Gusset Plate Definitions (Z series, Pages 6&7 of 15):**

Legend
Whitmore Width Plane
Lmid
Partial Shear Plane

Description Tab:

| | |
|---|---|
| Plates: | Identical double gusset plates |
| Condition factor: | Good or Satisfactory |
| Contains corrosion: | 0 (Use 1 for Yes and 0 for No) |
| Field measured section properties: | 0 (Use 1 for Yes and 0 for No) |

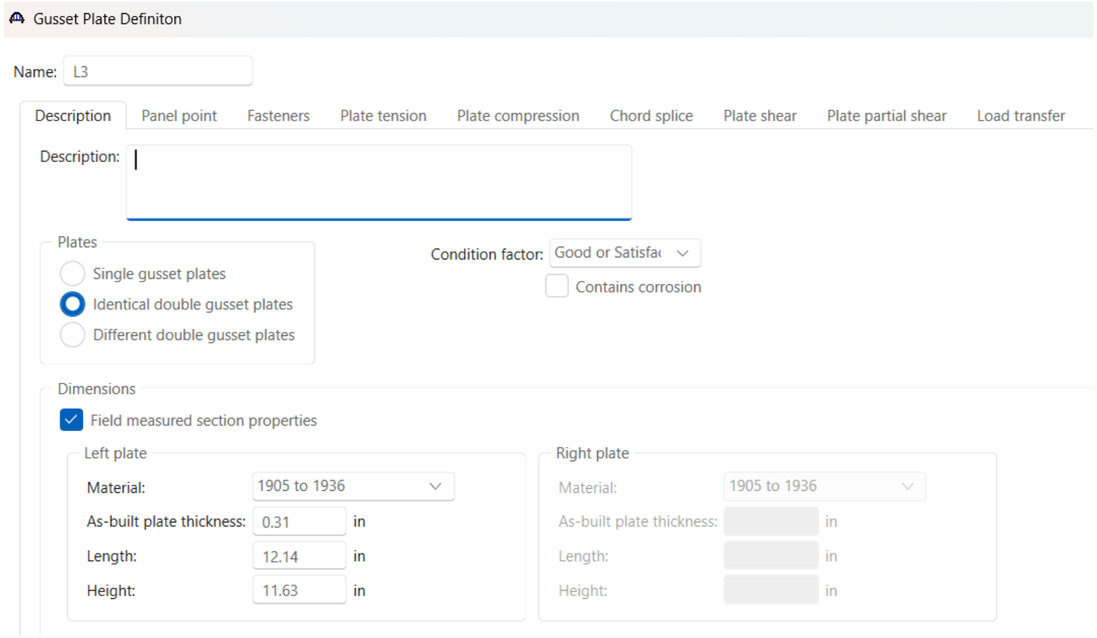
Left Plate:

| | | |
|---|---|---|
| Material: | 1905 to 1936 | |
| As-built plate thickness: | 0.3125 | in |
| Average Length of Plate: | 41.0625 | in |
| Average Height of Plate: | 15.0625 | in |

Right Plate: (Inputs not required)

| | | |
|---|---|---|
| Material: | | |
| As-built plate thickness: | | in |
| Average Length of Plate: | | in |
| Average Height of Plate: | | in |

"BAMS"



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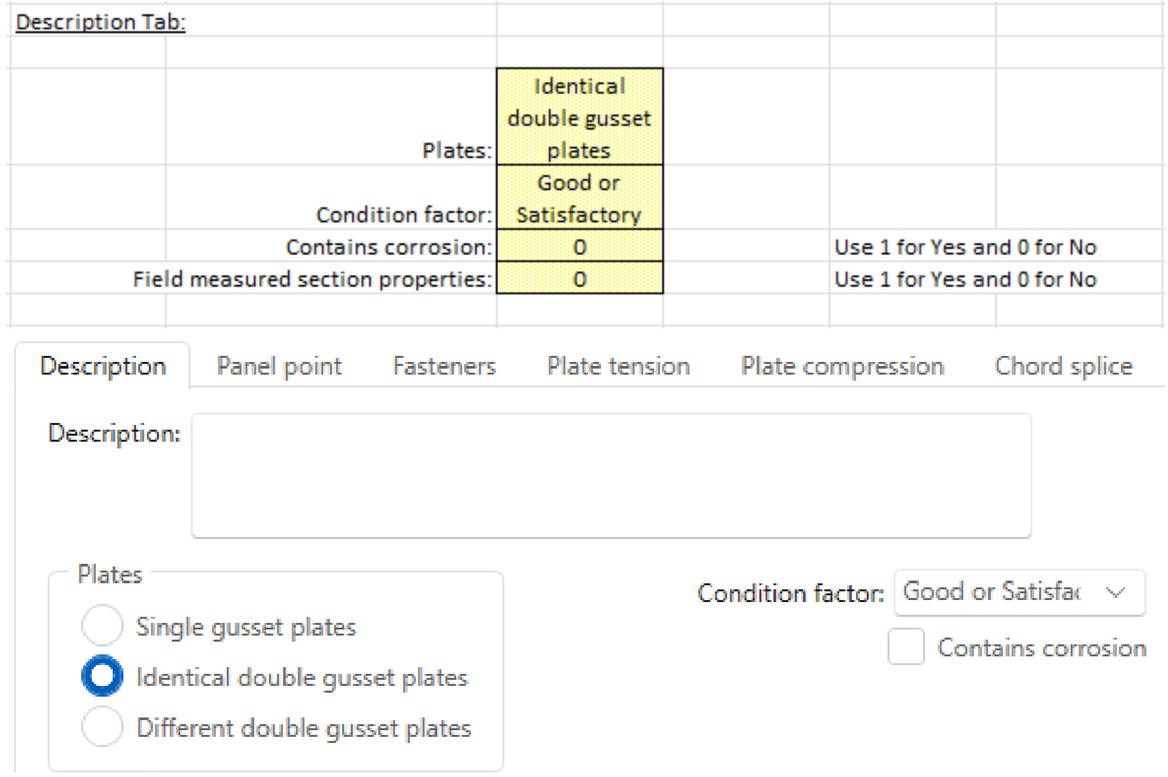
# Automating Gusset Plate Data Entry – Iowa DOT Use Case

## Why we need to automate gusset plate modeling in BrDR?

- **Manual Process Overview**
  - Engineers manually enter gusset plate data into BrDR.
  - Up to about 650 data entries per gusset plate
  - Data is typically sourced from Excel spreadsheets.

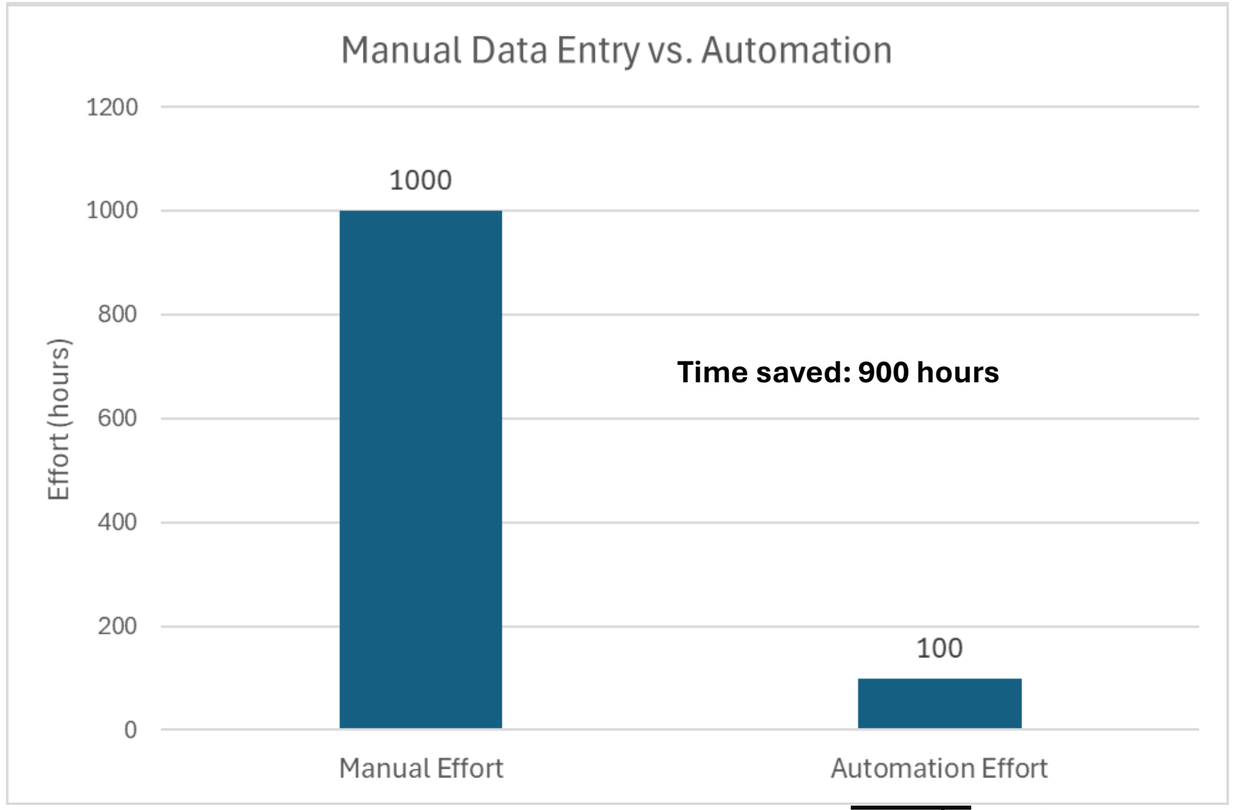
- **Challenges with Manual Entry**
  - Time-consuming and repetitive for each gusset plate
  - High risk of human error (e.g., typos, misalignment of data)
  - Inefficient for large or complex truss structures
  - Difficult to scale or standardize across projects



# The Automation Solution for Iowa DOT's Load Rating Project

## How we automated gusset plate modeling

- **What the automation does:**
  - A custom-built tool developed for gusset plate definition
  - Includes a UI for selecting Excel files and displaying warnings or errors
  - Automates the transfer of gusset plate data from Excel into BrDR
- **How It Works:**
  - Reads gusset plate data from Excel
  - Uses BrDR's API to populate the gusset plate automatically
- **ROI:**
  - Manual data entry: 1,000 hours
  - Automated entry: around 100 hours
  - Time saved: 900 hours



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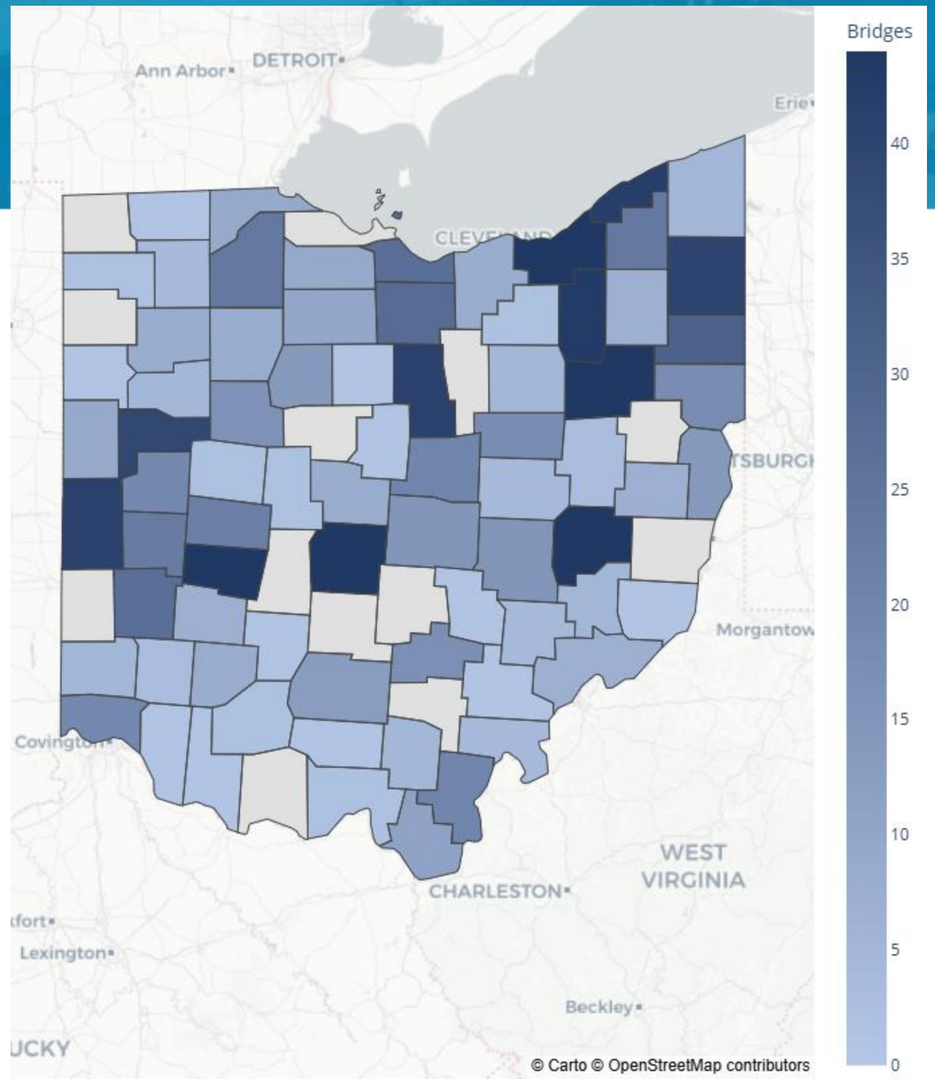
# ODOT Load Rating Project

- Working with Cindy Wang and Amjad Waheed
- Statewide Load Rating Includes all ODOT Owned Bridges
- Michael Baker has Rated > 1200 over 2 contracts
- Complex Steel Bridges Include
  - Curved
  - Flared
  - Kinked/Chorded/Dog-legged



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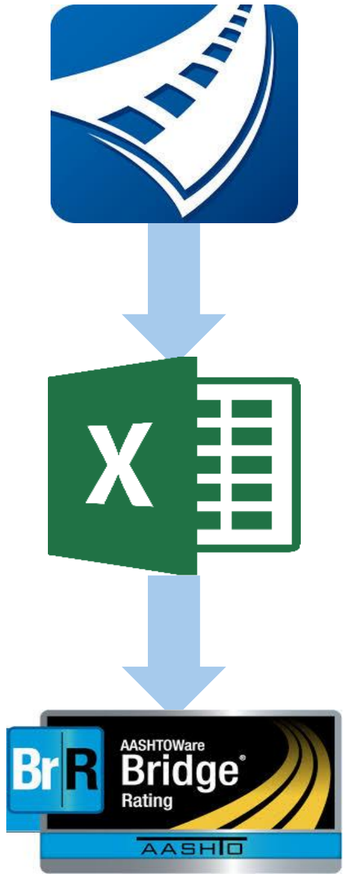
# ODOT Steel Bridge Automation

- Without Automation
  - Use BrR Wizards & table inputs
  - Might use Excel to speed up
- With Automation
  - Uses VBA within Microstation
  - Engineer draws framing plan forcing complete geometry definition
  - Tool provides de-bugging feedback
  - Tool exports to Excel in BrR friendly table



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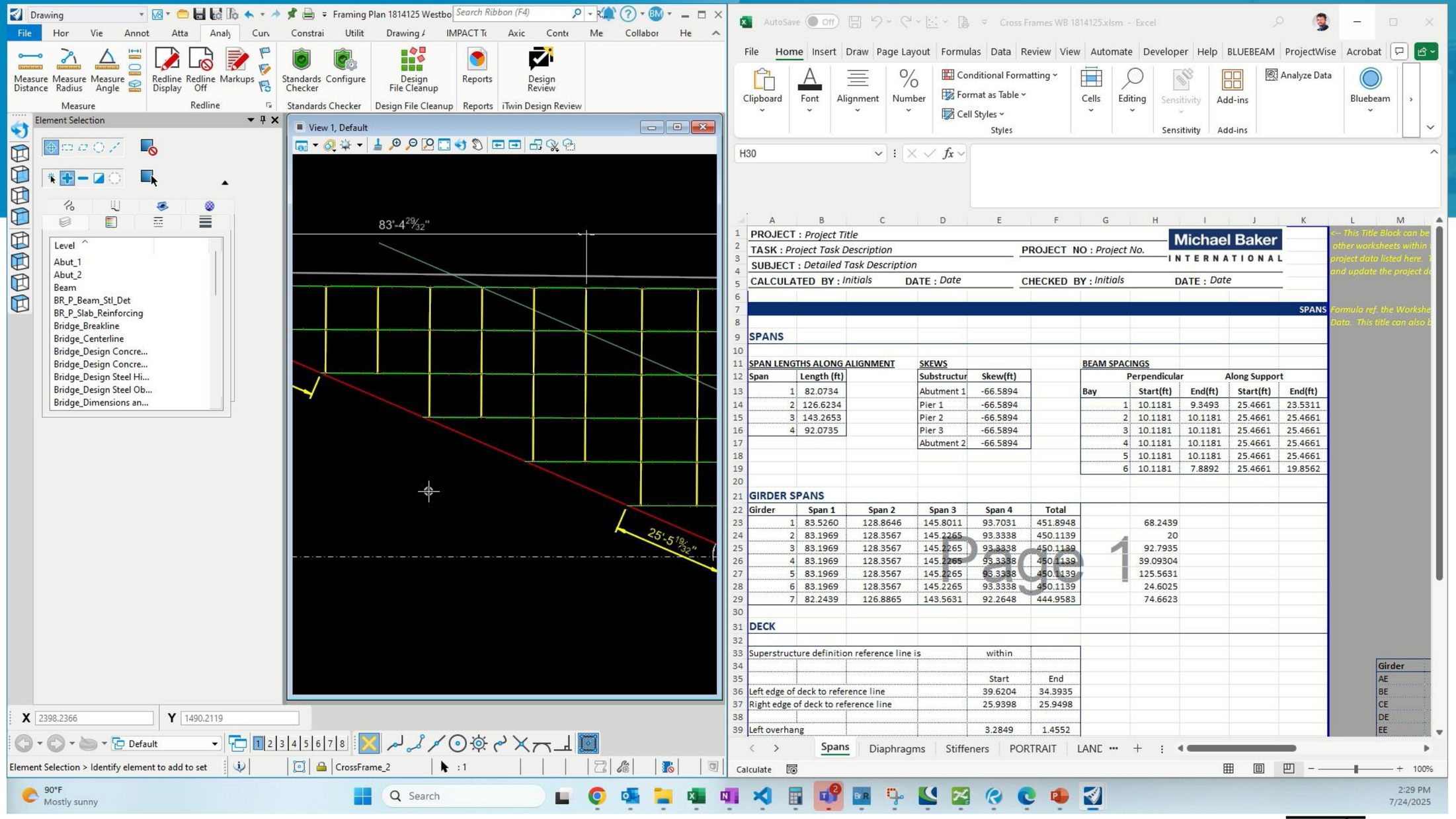
Framing Plan 1814125 Westbo
Search Ribbon (F4)
Element Selection
Level
Abut_1
Abut_2
Beam
BR_P_Beam_Stl_Det
BR_P_Slab_Reinforcing
Bridge_Breakline
Bridge_Centerline
Bridge_Design Concre...
Bridge_Design Concre...
Bridge_Design Steel Hi...
Bridge_Design Steel Ob...
Bridge_Dimensions an...
View 1, Default
83'-4 29/32"
25'-5 19/32"
X 2398.2366
Y 1490.2119
Element Selection > Identify element to add to set
CrossFrame_2
Cross Frames WB 1814125.xlsm - Excel
H30
PROJECT : Project Title
TASK : Project Task Description
SUBJECT : Detailed Task Description
CALCULATED BY : Initials
DATE : Date
PROJECT NO : Project No.
CHECKED BY : Initials
DATE : Date
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SPANS
SPAN LENGTHS ALONG ALIGNMENT
SKEWS
BEAM SPACINGS
GIRDER SPANS
DECK
Superstructure definition reference line is within
Left edge of deck to reference line
Right edge of deck to reference line
Left overhang
Spans
Diaphragms
Stiffeners
PORTRAIT
Page 1
90°F Mostly sunny
2:29 PM 7/24/2025

# ODOT Steel Bridge Automation

- Gains:
  - 2,000 man hours expected savings
  - Allow junior staff to input rate more complex bridges
  - Improved quality

| Bridge Type | Labor (Hours) | Labor (% Reduction) | Inputting Staff | Quality |
|---|---|---|---|---|
| Flared Steel | 20 → 10 | 50% | PE only -> EITs | Improved Xframe & Stiffener Inputs |
| Curved Steel | 32 → 12 | 63% | PE only -> EITs | Improved Geometry Input |
| Irregular Stiffeners/ Crossframes | 20 → 12 | 40% | | Improved Xframe & Stiffener Inputs |

# Acknowledgement

- SCDOT Load Rating Project
- Iowa DOT Load Rating Project
- Ohio DOT Load Rating Project

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