



Design Workflow Integration

Mike Johnson, PE

Idaho Transportation Department



AASHTOWare Rating and Design Bridge User Group Meeting 2026

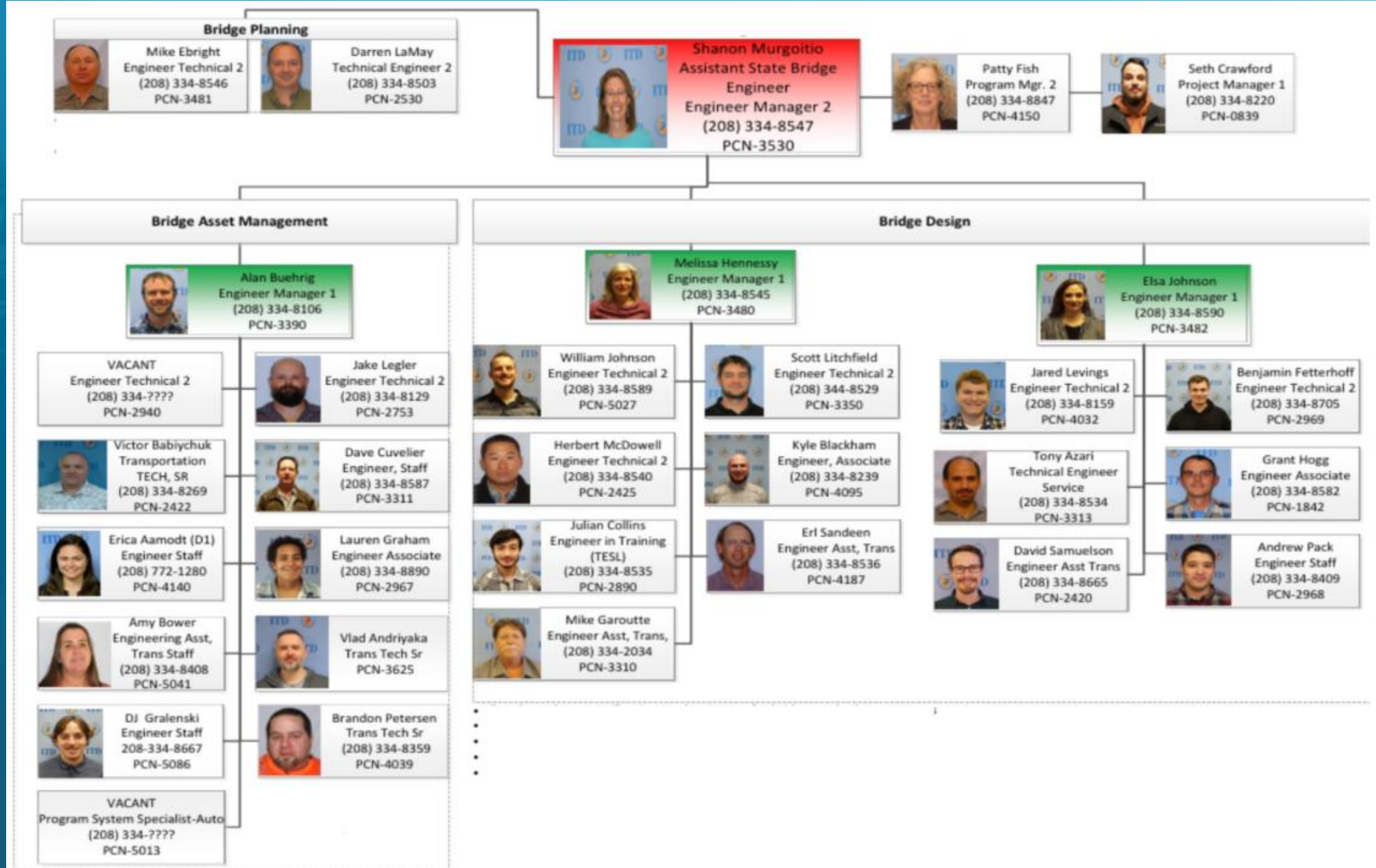
ITD Bridge Section

Bridge Inventory:

- 4403 – Total on State and Local System

Bridge Construction:

- \$100 Million Annual Bridge Program
- Average 24 Bridge Replacements per Year
 - 175,000 SF per Year
- \$1.05 Billion in FY25



ITD Common Bridge Types



An aerial photograph of a city, likely Pittsburgh, featuring a river with several bridges. A large mountain is visible in the background. The entire image is covered with a semi-transparent blue filter. The title 'Past Practice' is centered in white text.

Past Practice

AASHTOWare Rating and Design Bridge User Group Meeting 2026

Design

Bridge Design & Rating
Version 6.8.4.3002
Build date May 12 2020

Project <u>Chicoutimi Road over I-84</u>		Computed <u>MTI</u>		Date <u>8/14/2020</u>
Subject <u>Chicoutimi Rd. GS</u>		Checked _____		
Task <u>Interior - Rider Design</u>		Sheet _____		of _____



Bridge with curb to curb

t deck out

t deck face

b sidewalk

b diaph

b channel

Overhang

Spacings

Leading Information				
S _{max} =	94.91667 ft			
S _{clear} =	0.000 deg			
Bridge width (curb to curb)	77.000 ft			
Bridge width with curb to curb?	43.000 ft	Number Lanes =	4	
Circle type	☒ Interior ☐ Exterior			
Interior or Exterior?	☒ Interior ☐ Exterior			
Number of Girders =	7	Rail Type=	Concrete rail w/ f. ▼	
Spacing =	7.575 ft			
Clearance Overhang =	3.625 ft	Rail width =	1.00 ft	
t deck =	0.0 in	Rail weight =	0.353 klp/ft	
t deck out =	0.0 in	w sidewalk =	13.50 ft	
t deck face =	0.0 in	t sidewalk =	6.75 in	
r come =	0.153 klf	n =	1.0000 (val 0.0, 0.0)	
r come =	0.153 klf (girders only)	E deck =	5220.6 kip	
g deck =	8.0 k/ft	E girder =	5220.6 kip	
g girder =	8.0 k/ft	E release =	4925.3 kip	
r release =	7.0 in			
Metal Deck Forms?	☒ Yes ☐ No		weight FWS =	0.037 klf
	7.0 in		curb strip =	0.00 in
	0.0 kip		Actual area, curb=	0.28 m
Lane Load =	10.13 klp/ft	30% curb strip is to account for the extra thickness of the slab at 13.50'. Assume a parabolic transition from 1.37' to 0'. = 1.00' + 0.00' kip/ft		
MD truck =	1.31			
MD lane =	1.31			

Sheet 1 of 2

#

Design calculations for a precast prestressed concrete beam in Class B as per IS 456:2000
 Design of Prestressed Concrete Beam (IS 456:2000)
 Prestress Design (IS 456:2000)
 Prestress Design (IS 456:2000)
 Prestress Design (IS 456:2000)

Location: 100 m from Prestress Road

Compared to: 1.2, 2.2

Beam Design: 1000 mm

Max: 100/400

Min: 100/400

OK

Load List (Designation) Position: OK

Fixed Load: OK

Number of Span: 1 OK

Span Length: 10.0 m OK

Span Length: 10.0 m OK

Development Length: 1.0 m OK

Concrete Strength: 25 MPa OK

Concrete Strength: 25 MPa OK

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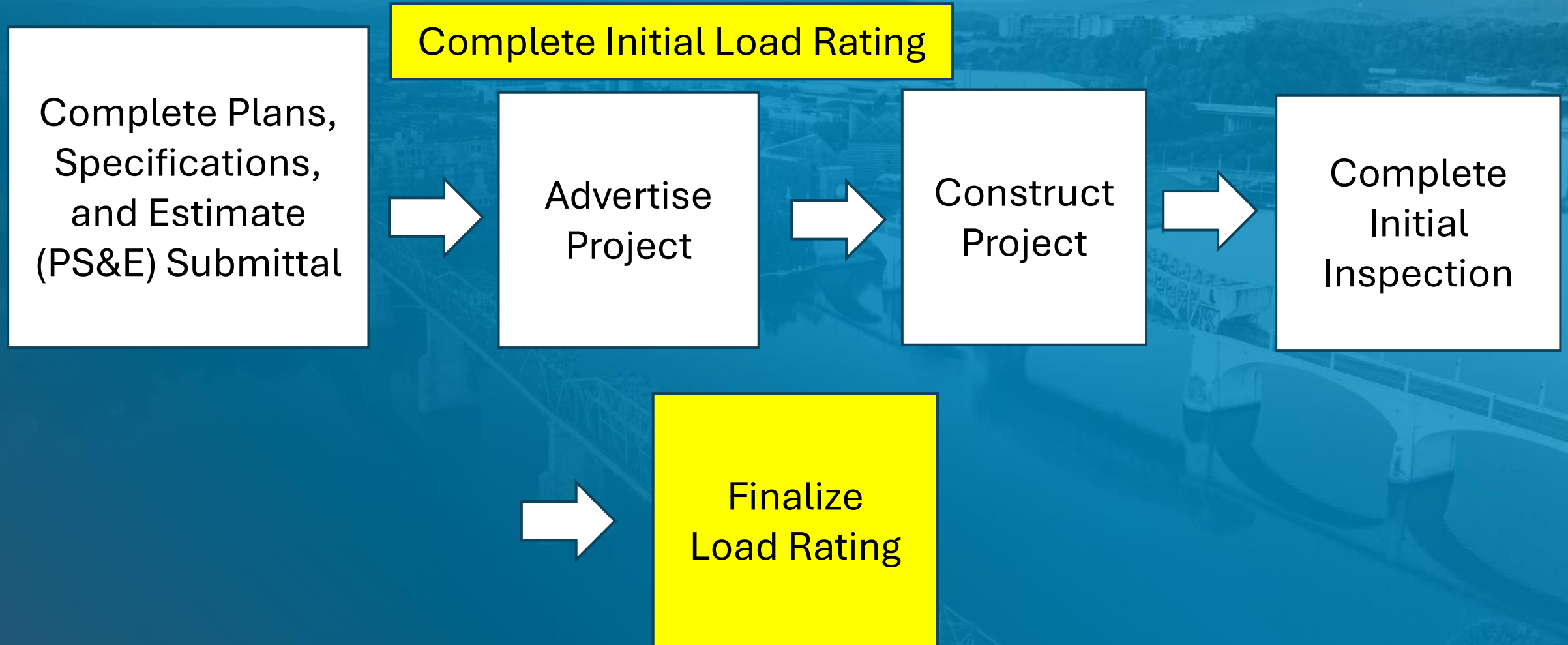
Concrete Strength: 25 MPa OK

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Concrete Strength: 25 MPa OK

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ITD Past Practice



ITD Past Practice Design

Designer Completes Design Using Program / Spreadsheet of Choice

Checker Completes
Design Check Using
Program / Spreadsheet
of Choice

Senior Independent Reviewer Checks Design / Plans for Accuracy and Constructability

[illegible]

Isho Transportation Department

Project: **Chandrasekhar road near I-40**

Computer: **MTH**

Date: **5/14/2016**

Subjob: **Chandrasekhar Rd. app**

Checked: _____

Printed: _____

Diagram showing a cross-section of a bridge deck. The total width is 16' (10' sidewalk + 1' curb + 1' shoulder). The diagram is labeled "1' deck out" and "1' sidewalk".

Isho Transportation Department Bridge Section

Name: _____

Notes:
 1. This drawing is for informational purposes only.
 2. The bridge section is shown for informational purposes only.
 3. The bridge section is shown for informational purposes only.
 4. The bridge section is shown for informational purposes only.

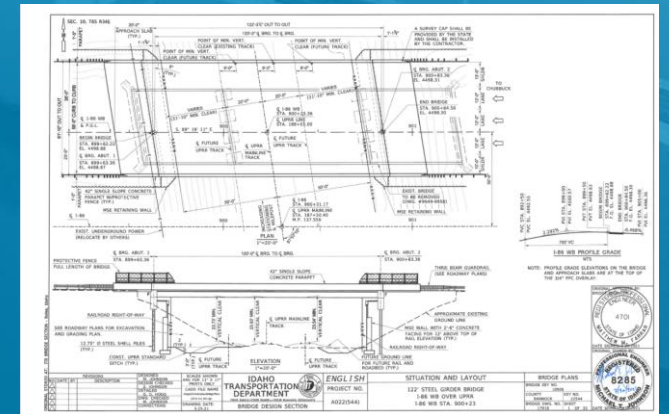
Project: **Chandrasekhar Rd. app**
 Date: **5/14/2016**
 Checked: _____
 Printed: _____

Notes:
 1. This drawing is for informational purposes only.
 2. The bridge section is shown for informational purposes only.
 3. The bridge section is shown for informational purposes only.
 4. The bridge section is shown for informational purposes only.

Project: **Chandrasekhar Rd. app**
 Date: **5/14/2016**
 Checked: _____
 Printed: _____

Bridge Information

Bridge name: **Chandrasekhar Rd. app**
 Bridge width: **16.00**
 Bridge width (ft): **16.00**
 Bridge width (m): **4.88**
 Bridge width (in): **160.00**
 Bridge width (mm): **1600.00**
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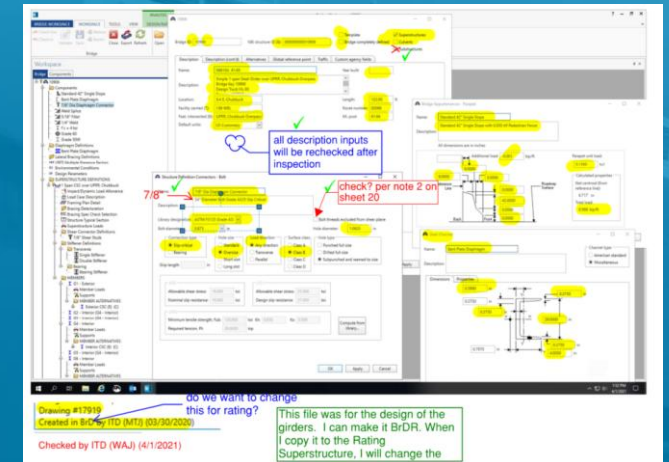
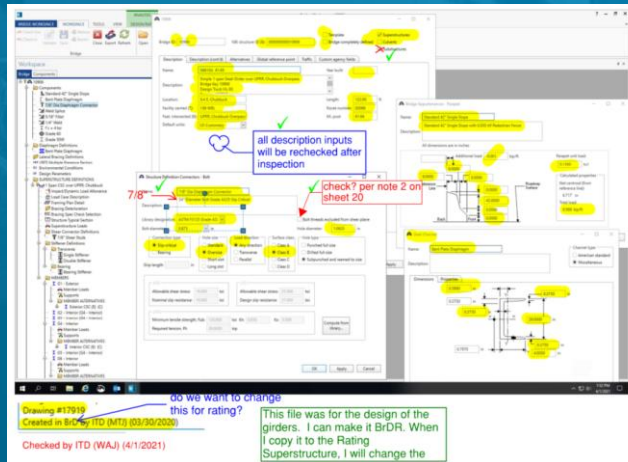
ITD Past Practice

Load Rating

Rater Completes
Load Rating Using
BrDR

Checker Completes Line
By Line Check of BrDR
Documented on
Screen Shots

S.I.R. Completes Line
By Line Review of Key
Items of Load Rating
Documented on
Screen Shots



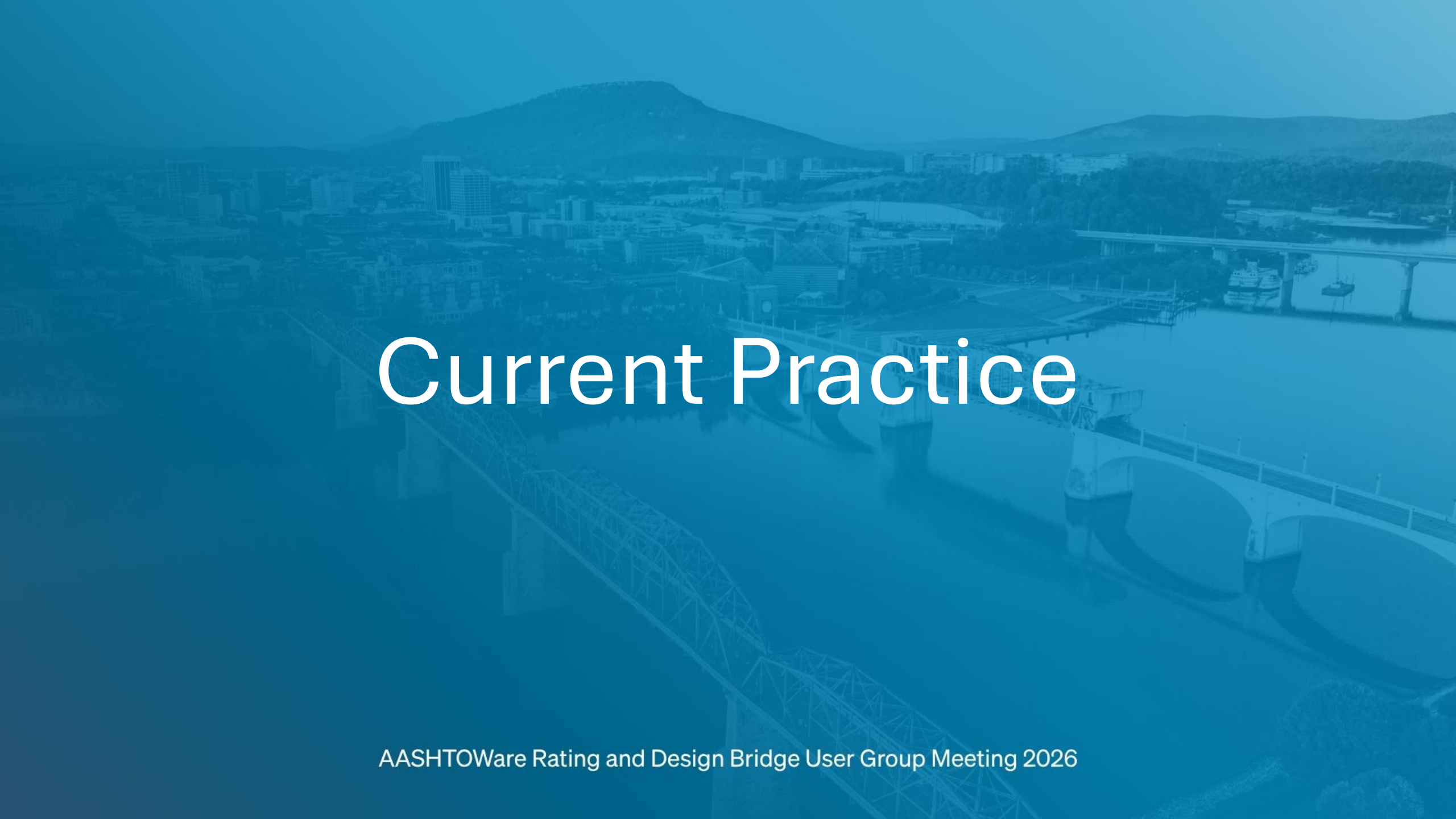
ITD Past Practice

Advantages

- Load Rating Gave A Second Check

Disadvantages

- Extra Effort
- Rating Finds Issues After Design Documents Are Completed
- Inconsistent Design Programs / Spreadsheets
- Maintaining Multiple Spreadsheets
- Difficult To Check

An aerial photograph of a city and a river, overlaid with a blue filter. The city is in the background, with a large hill or mountain behind it. The river flows through the foreground, with several bridges crossing it. The text "Current Practice" is centered over the image in a large, white, sans-serif font.

Current Practice

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ITD Current Practice

The design checker's primary responsibilities include:

- Verifying the design theory and correct interpretation of the design code to the level of accepting responsibility for stamping the record design calculations if needed.
- Accuracy and completeness of the design calculations to confirm the structural adequacy of the components
- Design check using the BrDR software
- Independent check of all geometry and elevations
- Verifying the accuracy and completeness of the load rating
- Stamping the contract plan sheets if the designer is not a licensed professional engineer or if the design engineer is not available.

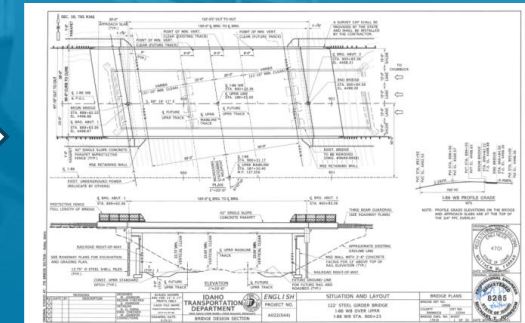
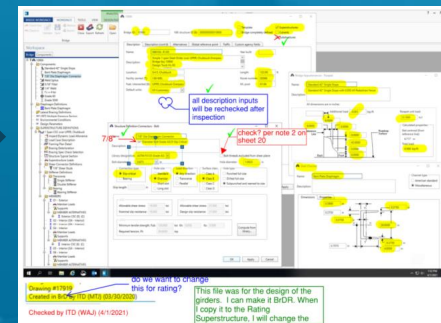
ITD Current Practice

Designer
Completes
Design Using
Program /
Spreadsheet of
Choice

Checker Completes Independent Check Using BrDR

Checker
Completes Line
By Line Check
of BrDR
Documented on
Screen Shots

Senior
Independent
Reviewer Checks
Design / Plans
for Accuracy and
Constructability

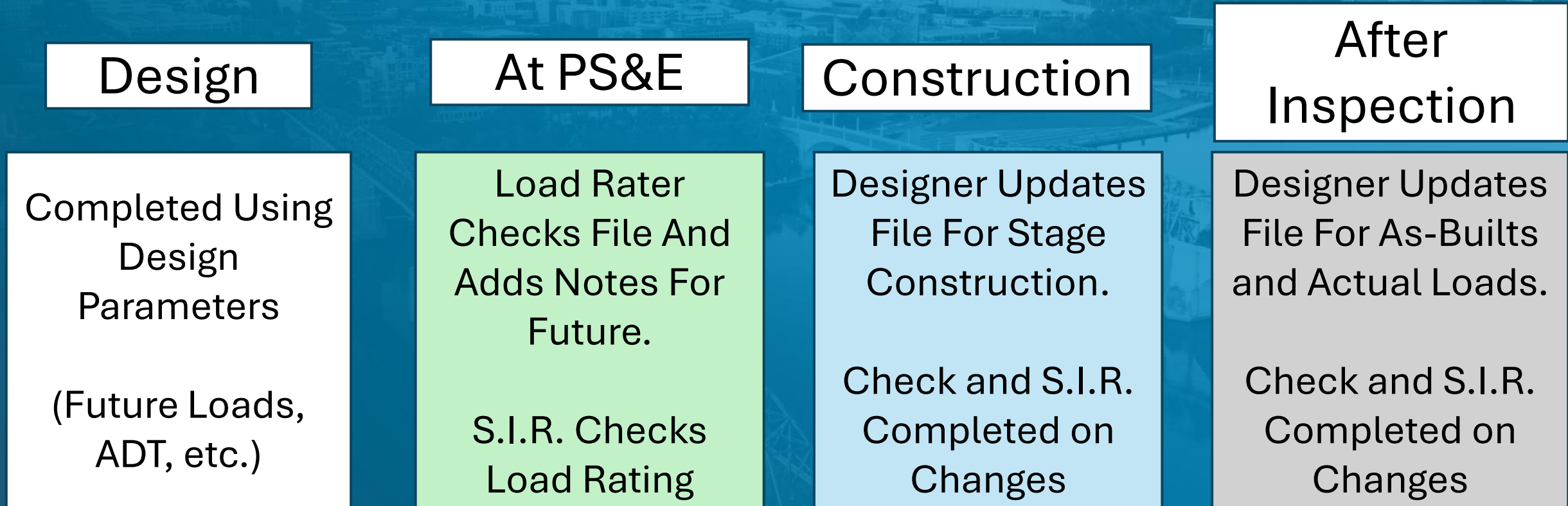
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BrDR Design File Is Initial Load Rating File

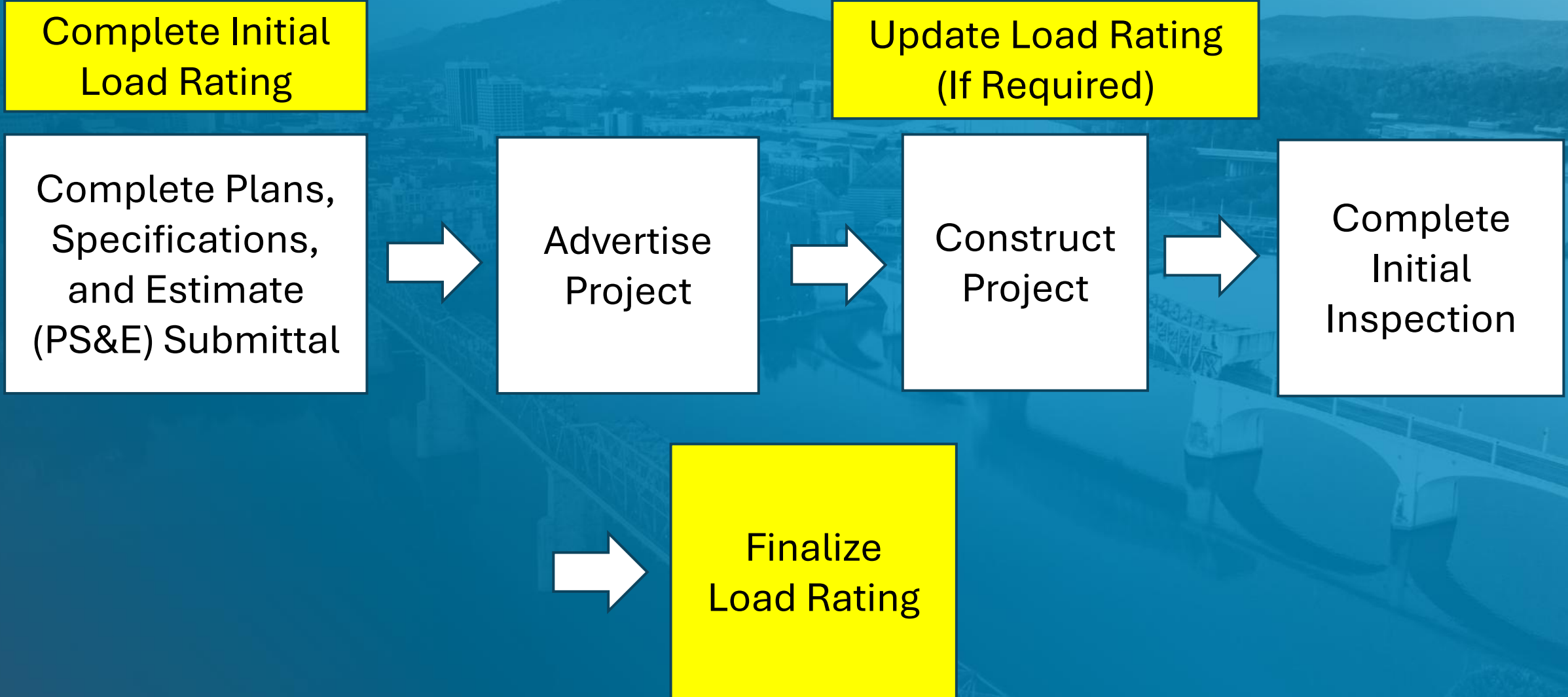
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ITD Current Practice

Progression of the Load Rating File



ITD Current Practice



ITD Current Practice

Advantages

- Saves Time and Effort
- Load Rating File Ready Prior To Final Plans
 - Load Rating For All Vehicles Completed at Final Plans
 - Reduced Risk of Design Vehicle < 1.0 For Load Rating
- Minimal Effort for Load Rating Staff For New Designs
- Minimal Effort for Completing Load Rating After Initial Inspection

Disadvantages

- Repeat Revisions of BrDR File