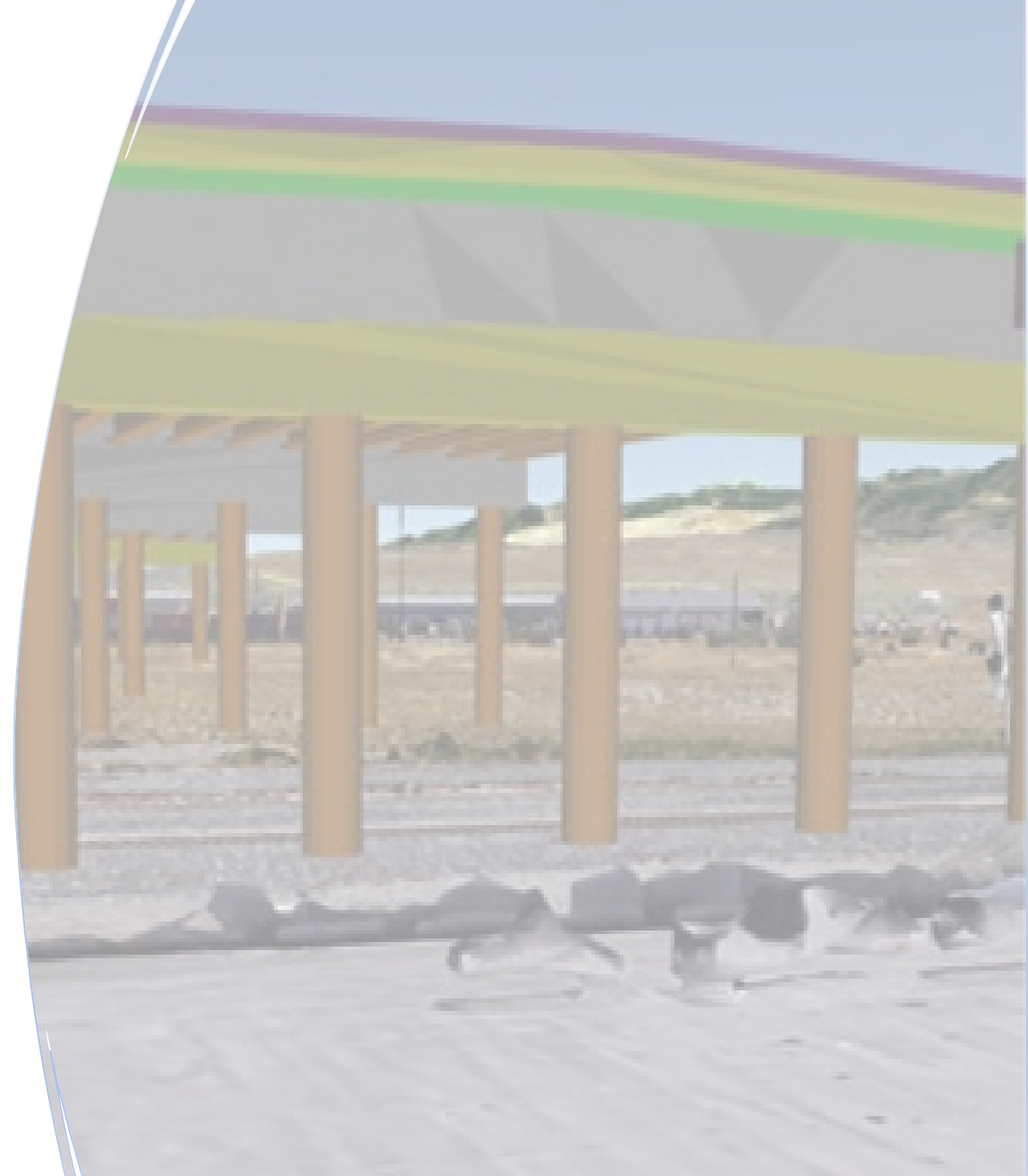


# Design Review of BIMs

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Utah Department of Transportation  
Structures Digital Delivery

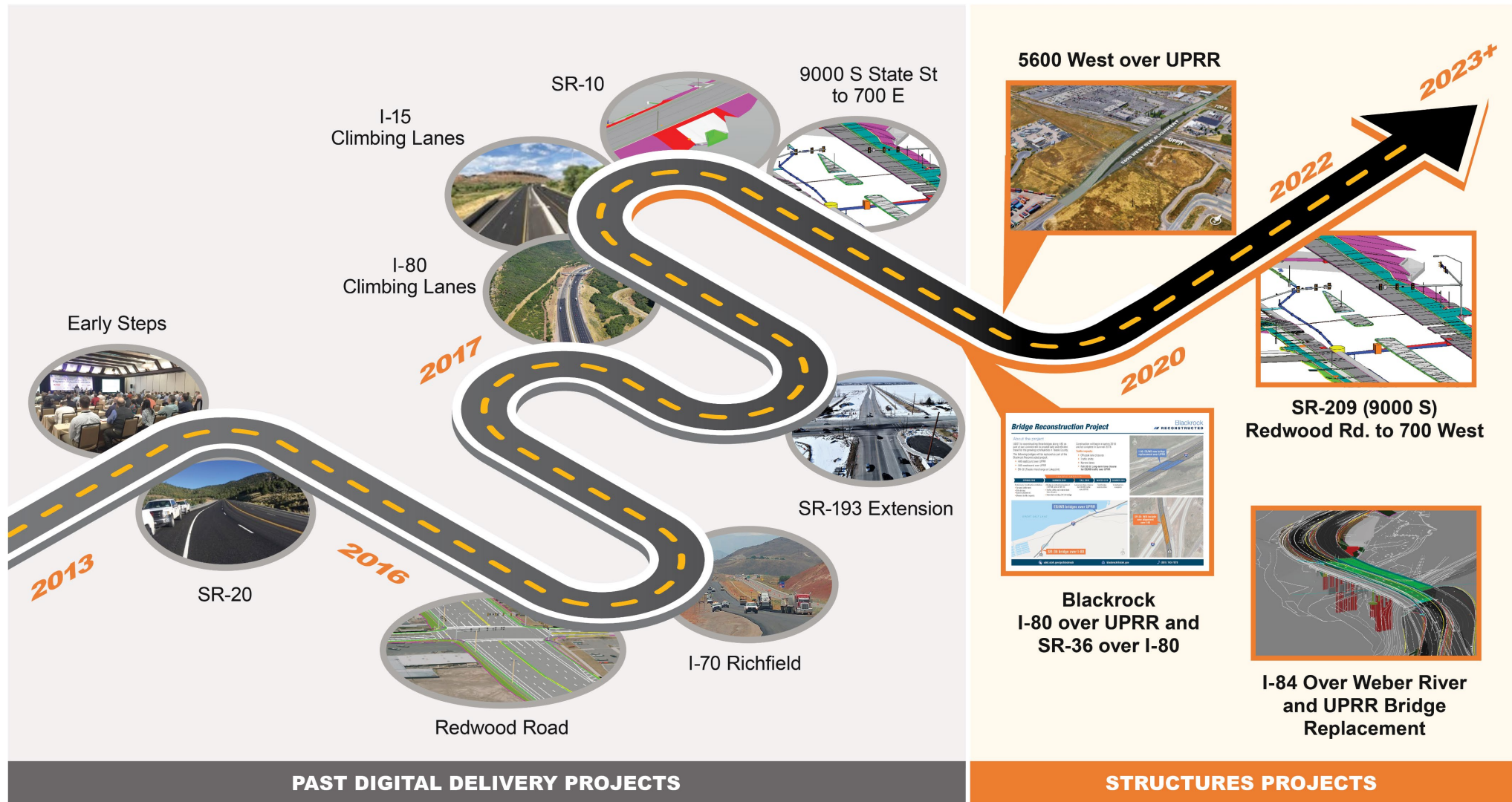


# Presentation Outline

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- Project Overviews
- Types of Reviews
  - Discipline/Design Review
  - Interdisciplinary Reviews
  - Third Party Reviews
- Design Changes
- Sign and Seal

# UDOT Digital Delivery Overview

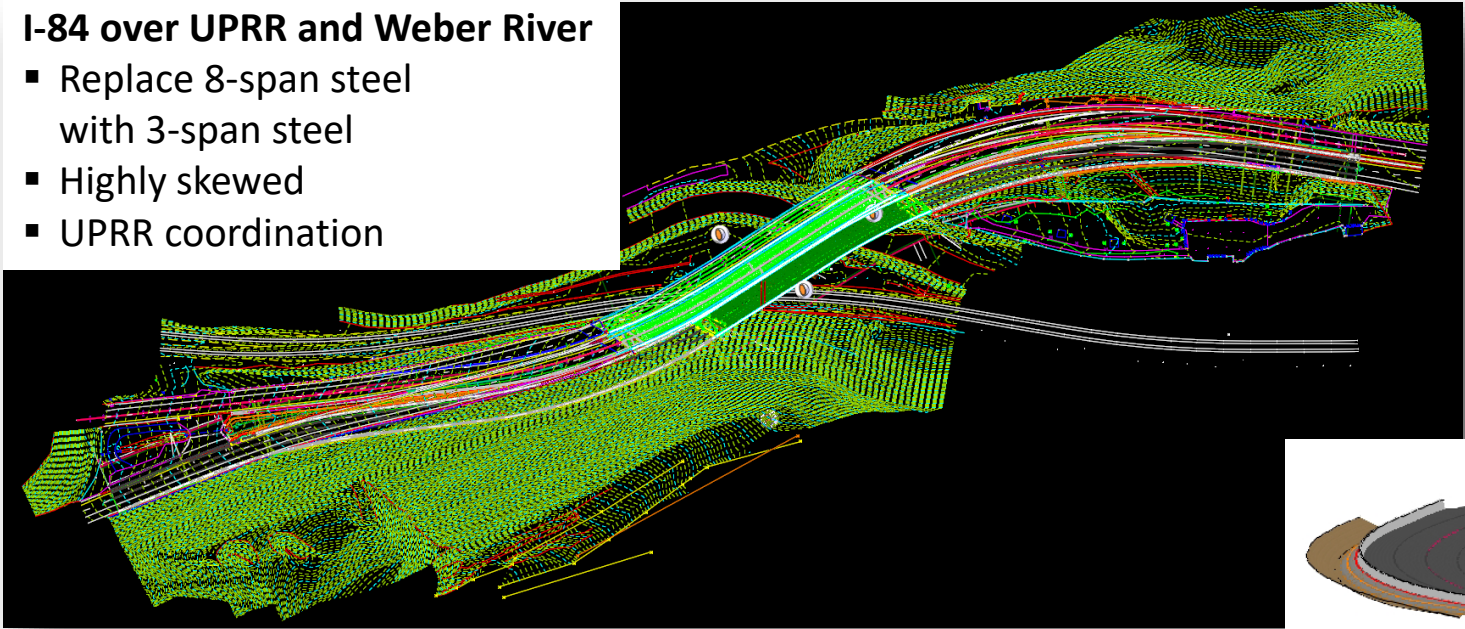


# UDOT Pilot Project

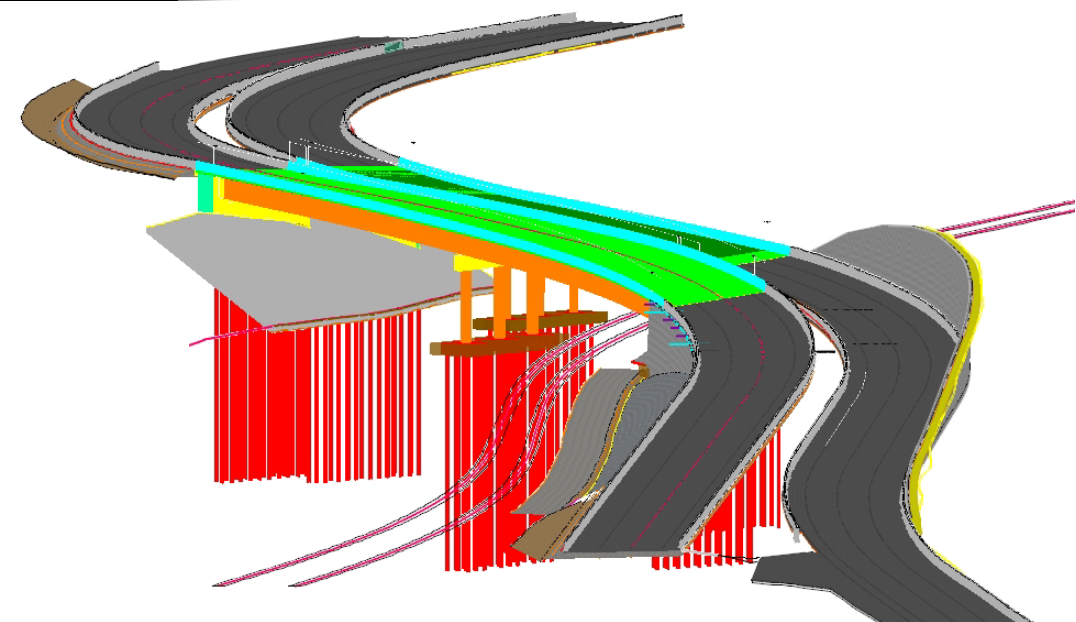
## I-84; Over Weber River and UPRR Bridge Repl, C-476

### I-84 over UPRR and Weber River

- Replace 8-span steel with 3-span steel
- Highly skewed
- UPRR coordination

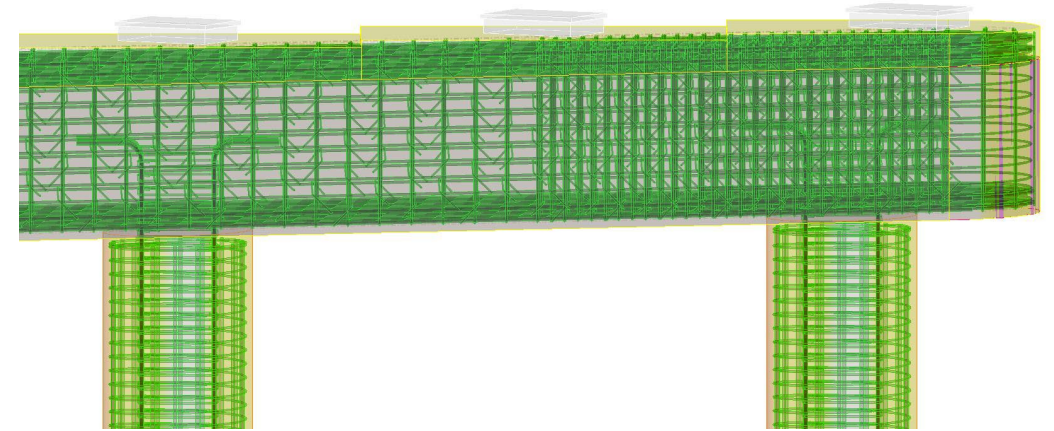
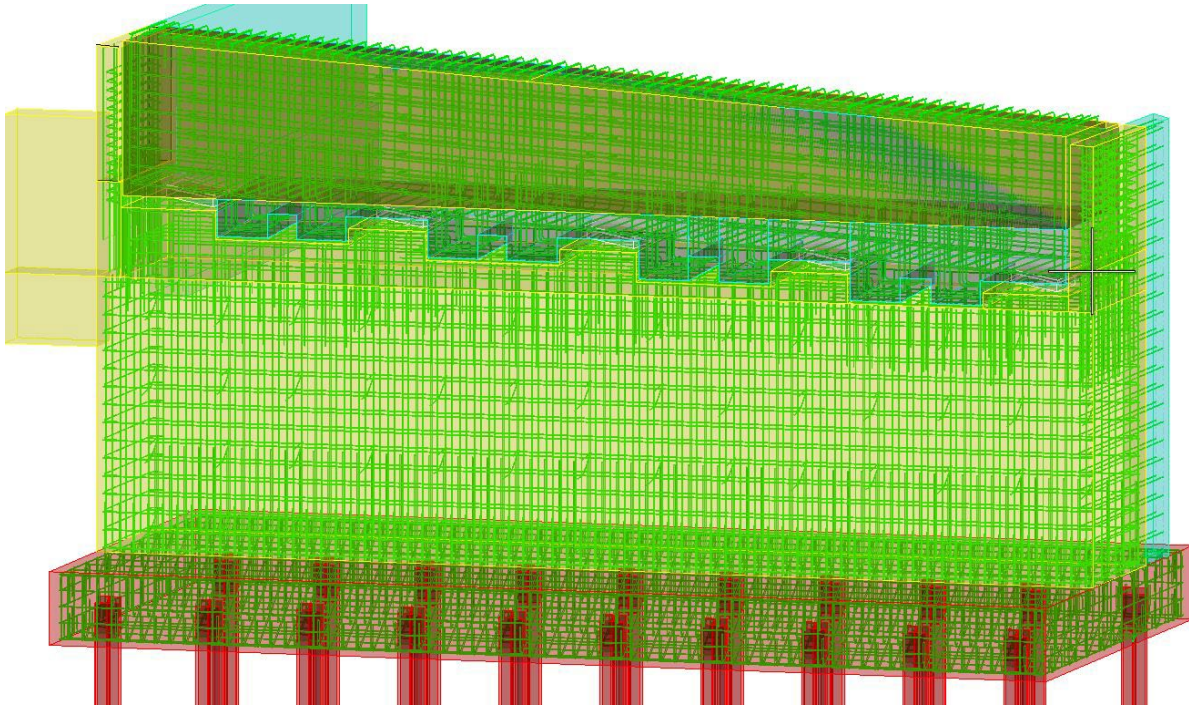


I-84 over UPRR and Weber River	
Construction Year	2023 – 2024
Project Value	\$38 Million
Delivery Method	Design Bid Build





# UDOT I-84; Over Weber River and UPRR Bridge Repl, C-476



# Design Review

- I-84
  - Traditional design calculation checks
  - Model
    - Geometry
    - Final geometry
    - Reinforcing
    - Element data attribution
  - Reports
  - Custom comparison spreadsheet
    - Design values vs Model values
    - Comment/response

## Bar Bending Schedule

Order Name:		Building Owner:		Project Name:		Project:		Schedule Name:		Index:		First Page Only: Design Package No. or Description	
		UDOT										11/24/2021	
												11/24/2021	
Approach Slab Geometry													
Approach Slab 1													
	Design	Model				Design	Model						
Length (ft)	25	25.000				25	25.000						
Thickness (ft):													
Center	1.0833	1.083				1.0833	1.083						
Edge	0.7083	0.708				0.7083	0.708						
Thickened Edge (ft):													
Height	0.5	0.500		0.5	0.500	0.5	0.500		0.5	0.500		0.5	0.500
Width Top	1.5	1.50		1.5	1.50	1.5	1.50		1.5	1.50		1.5	1.50
Width Bottom	1	1.00		1	1.00	1	1.00		1	1.00		1	1.00
Corbel:													
Abutment	0.0833	0.083		0.0833	0.083	0.0833	0.083		0.0833	0.083		0.0833	0.083
Sleeper	0.2500	0.250		0.2500	0.250	0.2500	0.250		0.2500	0.250		0.2500	0.250
Drain	0.2500	0.250		0.2500	0.250	0.2500	0.250		0.2500	0.250		0.2500	0.250
Sleeper Slab Geometry													
Sleeper Slab 1													
	Design	Model				Design	Model						
Length (ft)	5	5.000				5	5.000						
Thickness (ft)	1.2500	1.250				1.2500	1.250						
Sleeper Slab 2													
	Design	Model				Design	Model						
Length (ft)	5	5.000				5	5.000						
Thickness (ft)	1.2500	1.250				1.2500	1.250						
Project: I-84; over Weber River and UPRR Bridge Repl, C-476													
Subject: C-1080 Bridge Design													
Task: Model Detailed Check													
Job #: 14264													
Comments:		Checker: DMW				Backcheck/Updater: RID				Verification: DMW			
		1 Update location of diaphragms? Thickened end of deck is offset from girder at				Decided to leave as is since Framing Plan sheet overrides				Completed			
		2 abutment 3 for girder 3 and girder 4				Modeling constraint.				Completed			



11/24/2021
11/24/2021
11/24/2021
11/24/2021
11/24/2021
11/24/2021
10
9
47

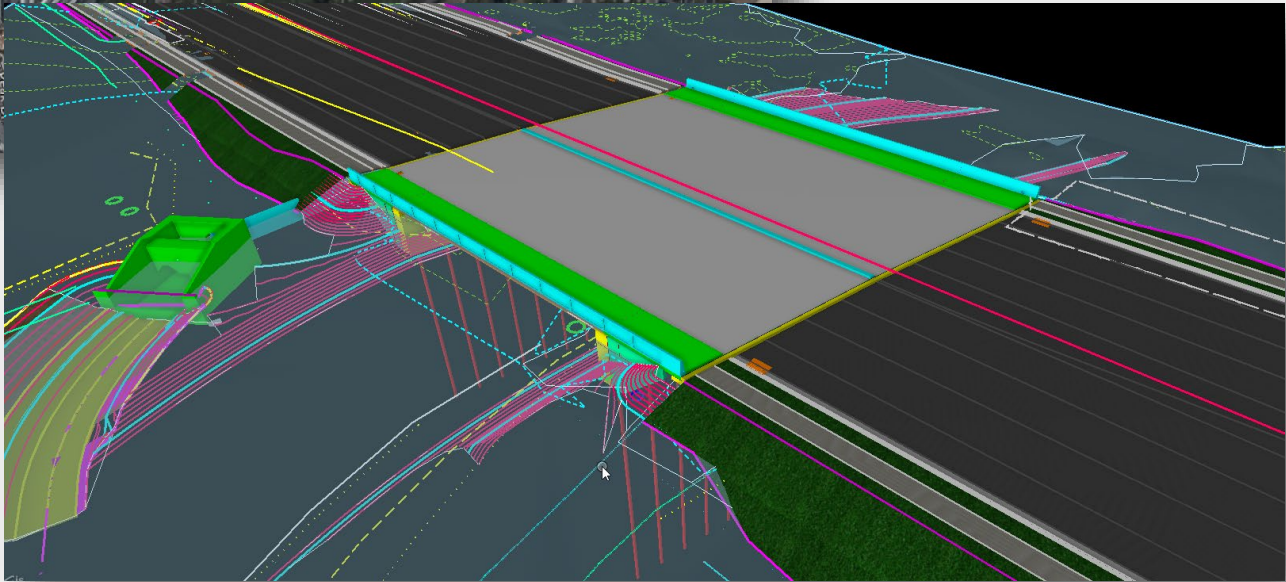
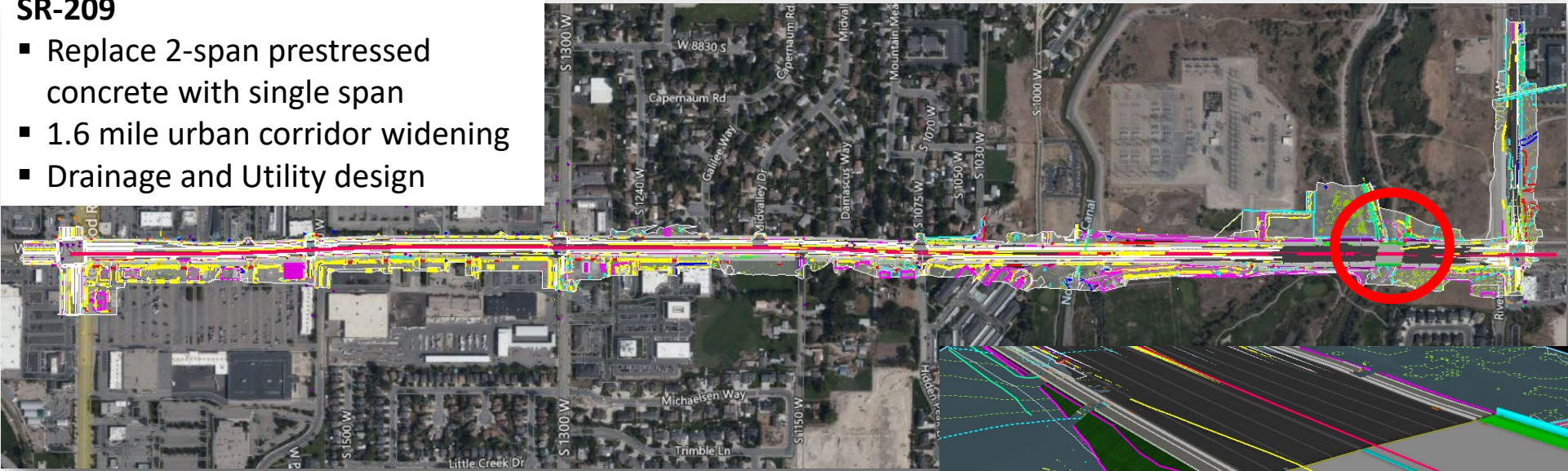


# UDOT Pilot Project

## SR-209; Redwood Rd to I-15

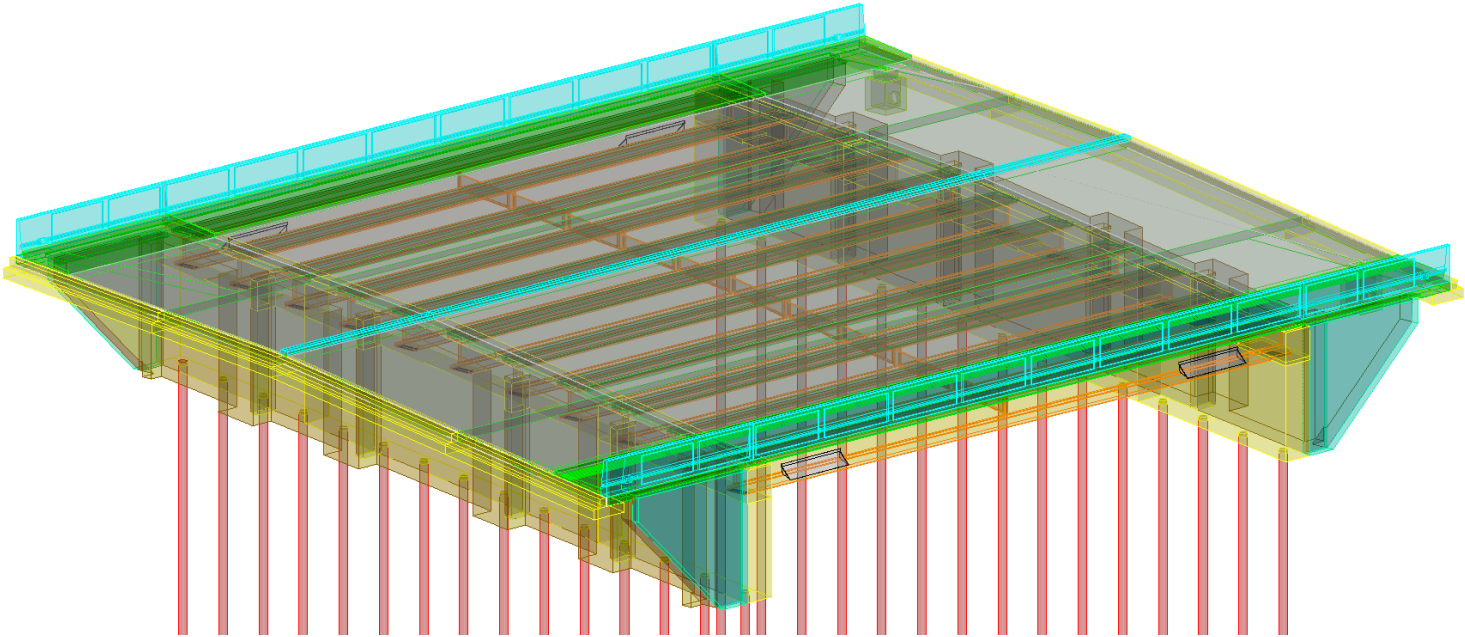
### SR-209

- Replace 2-span prestressed concrete with single span
- 1.6 mile urban corridor widening
- Drainage and Utility design



SR-209; Redwood Rd to I-15	
Construction Year	2023 – 2024
Project Value	\$30 Million
Delivery Method	Design Bid Build

# UDOT SR-209; Redwood Rd to I-15





# Design Review

- SR-209
  - Traditional design calculation checks
  - Model
    - Geometry
    - Final geometry
    - Reinforcing
    - Element data attribution
  - Input geometry reports
  - Reinforcing schedule reports
  - Elevation reports

Bridge Name: F-924

Bridge Unit: F-924 Phase 1 Left :: Beam Slab Concrete-Girders Bridge

## Deck Elevation Report

Parallel to start support

DeckEdgeLeft with offset = 0.0000 (Deck)

P\_1

Span 4

Point Of Interest	Station - Bridge Alg(ft)	Offset - Bridge Alg(ft)	Elevation(ft)
0 / 10 L	90+59.7884	-64.4167	4309.4995
1 / 10 L	90+68.9888	-64.4167	4309.4535
2 / 10 L	90+78.1892	-64.4167	4309.4075
3 / 10 L	90+87.3896	-64.4167	4309.3615
4 / 10 L	90+96.5900	-64.4167	4309.3155
5 / 10 L	91+05.7904	-64.4167	4309.2694
6 / 10 L	91+14.9908	-64.4167	4309.2234
7 / 10 L	91+24.1912	-64.4167	4309.1774
8 / 10 L	91+33.3916	-64.4167	4309.1314
9 / 10 L	91+42.5920	-64.4167	4309.0854
10 / 10 L	91+51.7924	-64.4167	4309.0394

BeamPath with offset = 0.0000 (Deck)

Girder 1

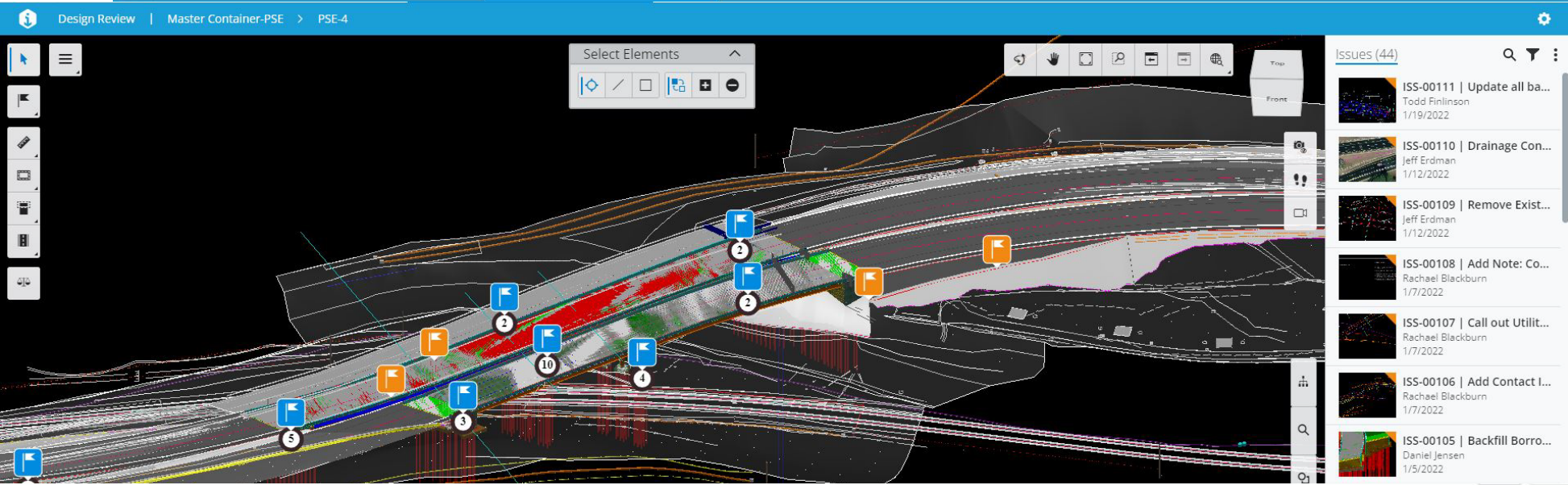
Span 4

Point Of Interest	Station - Bridge Alg(ft)	Offset - Bridge Alg(ft)	Elevation(ft)
0 / 10 L	90+58.7280	-60.0000	4309.6556
1 / 10 L	90+67.9284	-60.0000	4309.6096
2 / 10 L	90+77.1288	-60.0000	4309.5636
3 / 10 L	90+86.3292	-60.0000	4309.5176
4 / 10 L	90+95.5296	-60.0000	4309.4716
5 / 10 L	91+04.7301	-60.0000	4309.4256

First Page Only: % / Discipline / Location	
<b>PS&amp;E</b>	
No. <u>1</u>	Date <u>5/23/2022</u>
<b>CHECK PRINT</b>	
Dwg. checked against calcs. and calc. check confirmed	
By <u>CDC</u>	Date <u>8/08/2022</u>
Originator <u>RID</u>	Date <u>5/23/2022</u>
Checker <u>CDC</u>	Date <u>8/08/2022</u>
Backchecker <u>--</u>	Date <u>--</u>
Updater <u>--</u>	Date <u>--</u>
Rechecker <u>--</u>	Date <u>--</u>

# Interdisciplinary/UDOT Reviews

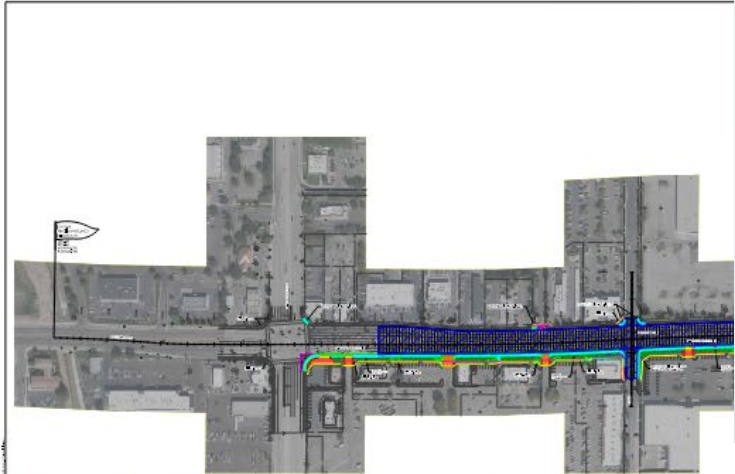
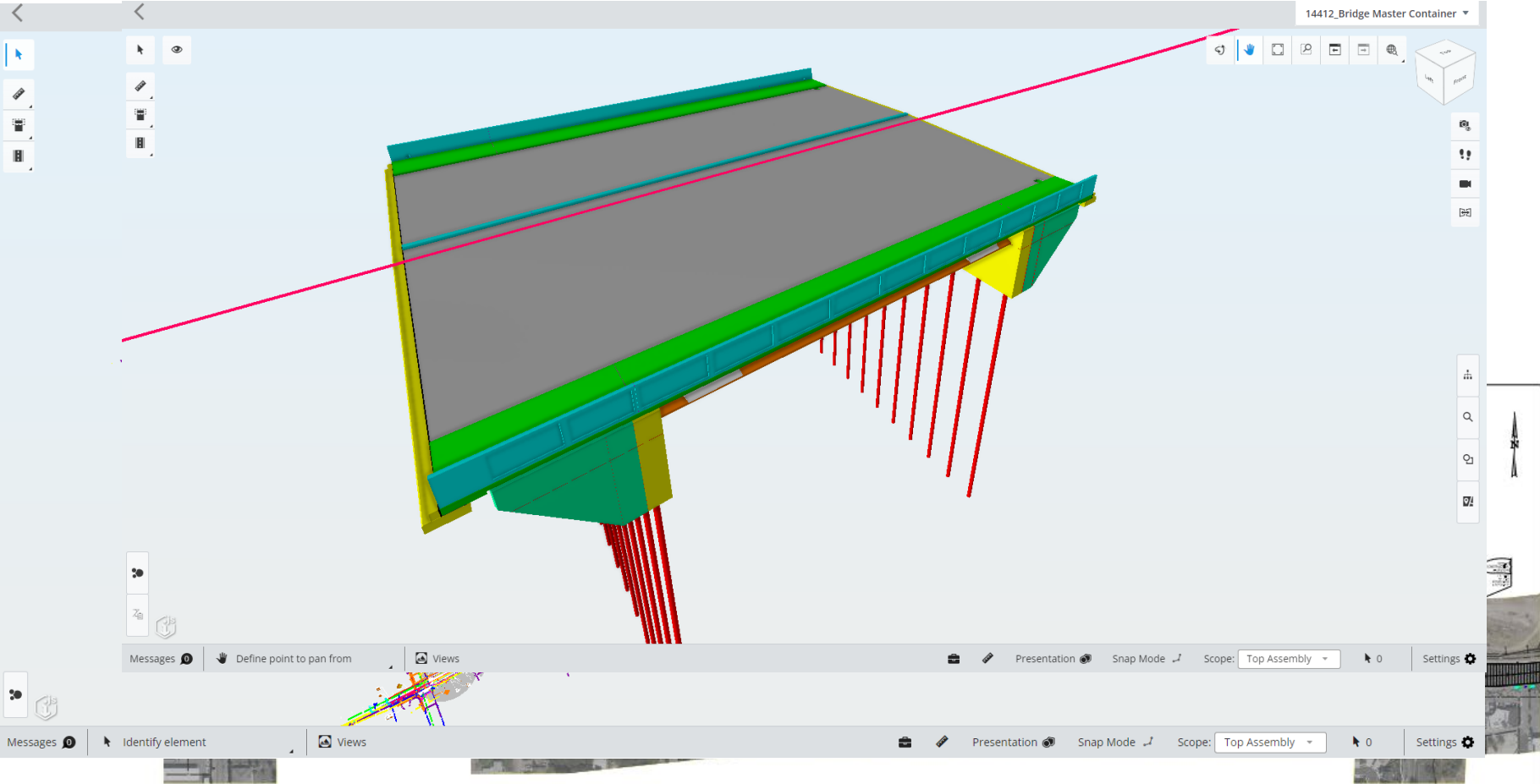
■ I-84



<input type="checkbox"/> Display Name	Subject	State	Assigned To	Status	Created By	Created Date	Modified Date	Modified By	Linked Items
<input type="checkbox"/> Update all barrier and include linear delineation	Update all barrier and include linear delineation to meet Region preference ...	Open	Todd Finlinson	Draft	Todd Finlinson	01/19/2022 8:...	01/19/2022 8:...	Todd Finlinson	<a href="#">Link</a>
<input type="checkbox"/> Drainage Connection	Drainage Connection	Open	Jeff Erdman	Draft	Jeff Erdman	01/12/2022 1...	03/16/2022 9:...	Daniel Jensen	<a href="#">Link</a>
<input type="checkbox"/> Remove Existing RCP	Remove Existing RCP	Open	Jeff Erdman	Draft	Jeff Erdman	01/12/2022 1...	01/12/2022 1...	Ryan O'Mahony	<a href="#">Link</a>
<input type="checkbox"/> Add Note: Contractor Right of Entry	Add Note: Contractor Right of Entry	Open	Rachael Black...	Draft	Rachael Black...	01/07/2022 7:...	01/07/2022 7:...	Rachael Black...	<a href="#">Link</a>
<input type="checkbox"/> Call out Utility Ownership	Call out Utility Ownership	Open	Rachael Black...	Draft	Rachael Black...	01/07/2022 7:...	01/07/2022 7:...	Rachael Black...	<a href="#">Link</a>
<input type="checkbox"/> Add Contact Information All Utilities	Add Contact Information All Utilities	Open	Rachael Black...	Draft	Rachael Black...	01/07/2022 7:...	01/07/2022 7:...	Rachael Black...	<a href="#">Link</a>

# Interdisciplinary/UDOT Reviews

- SR-209
  - Hybrid approach
  - Digital scroll plot



Legend	Legend	Legend	Legend	Legend
SR-209	SR-209	SR-209	SR-209	SR-209
SR-209	SR-209	SR-209	SR-209	SR-209
SR-209	SR-209	SR-209	SR-209	SR-209
SR-209	SR-209	SR-209	SR-209	SR-209

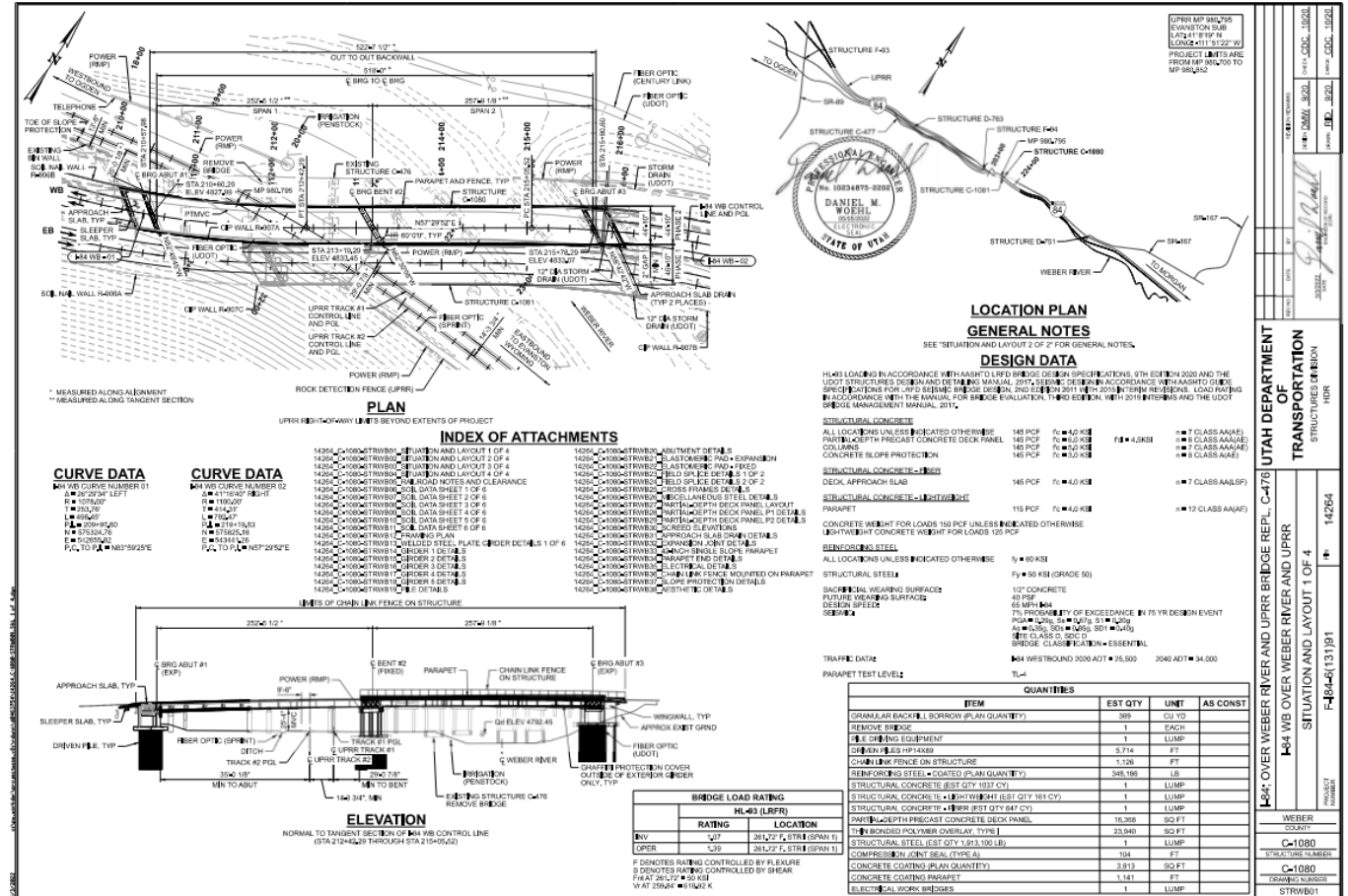
REMOVAL

RMV-01



# Third Party Reviews

- UPRR
- Salt Lake County
- Local Municipalities
- Local Irrigation Company



UTAH DEPARTMENT OF TRANSPORTATION  
SITUATION AND LAYOUT 1 OF 4  
F-484-64(13)191  
14264



# Design Changes

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- Changes during detail checking
  - Updated reports
- Changes after interdisciplinary/UDOT/3<sup>rd</sup> party reviews
  - Issues resolution and comment resolution forms

# Lessons Learned/Next Steps

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- New tools in newer versions
- Provide more training to reviewers
- Identify staff interested in working with Digital Delivery
- Continue development of QC/QA processes
- Integrating ifc 4x3 to support MALD deliverables