

# Design and Construction of the BNSF Br 58.8 over Wind River

IBC 20-31



Alan Bloomquist  
BNSF Railway

Kyle Izatt  
Advanced American Construction

Joe Knapp  
Genesis Structures



# Presenters



Alan Bloomquist  
BNSF Railway

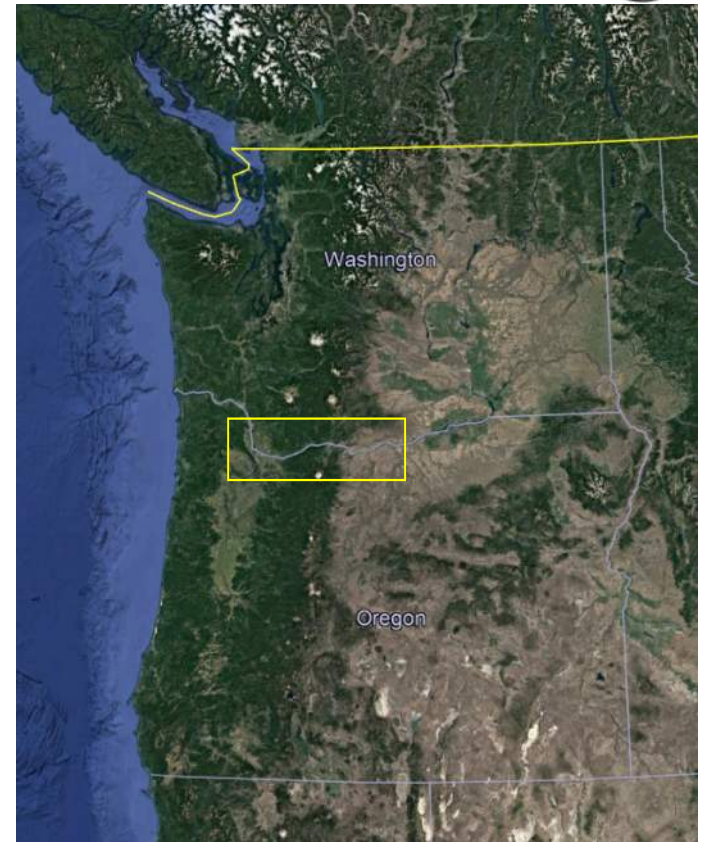
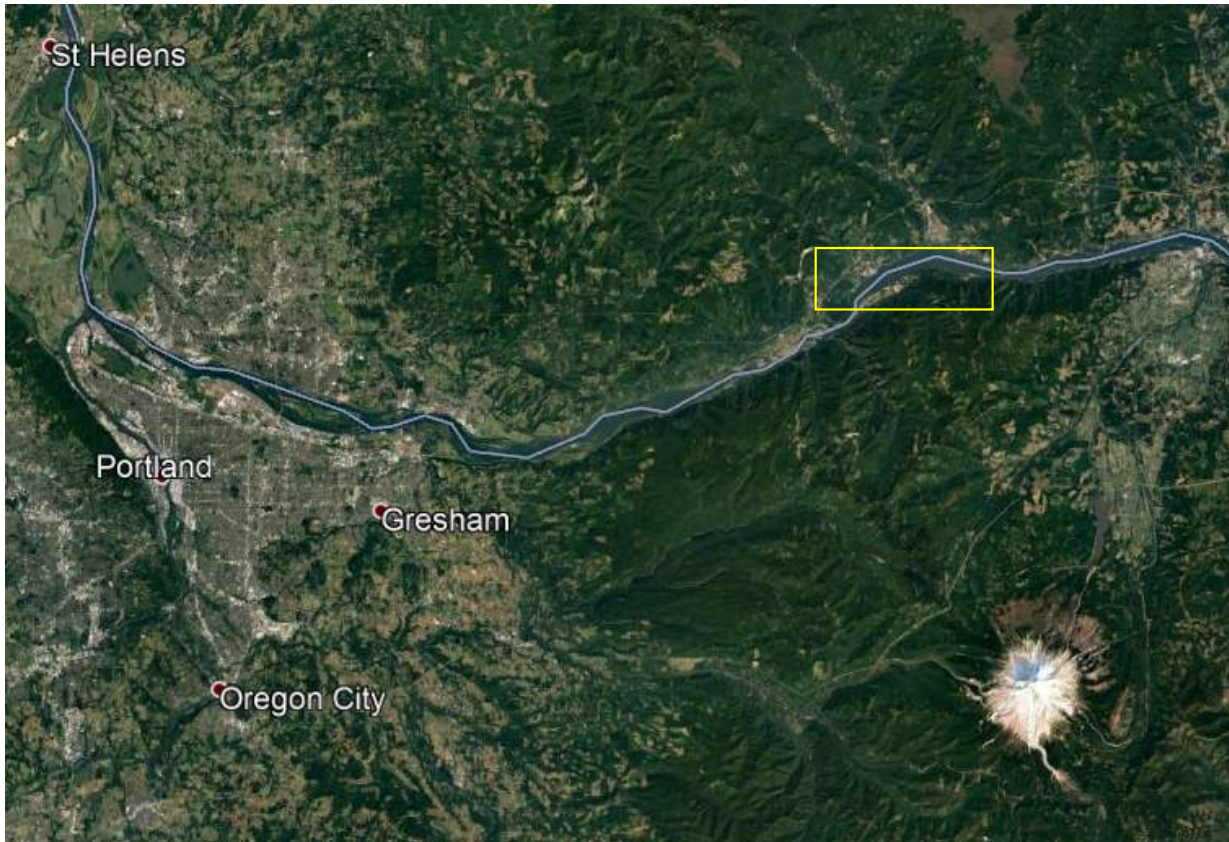


Kyle Izatt  
Advanced American Construction

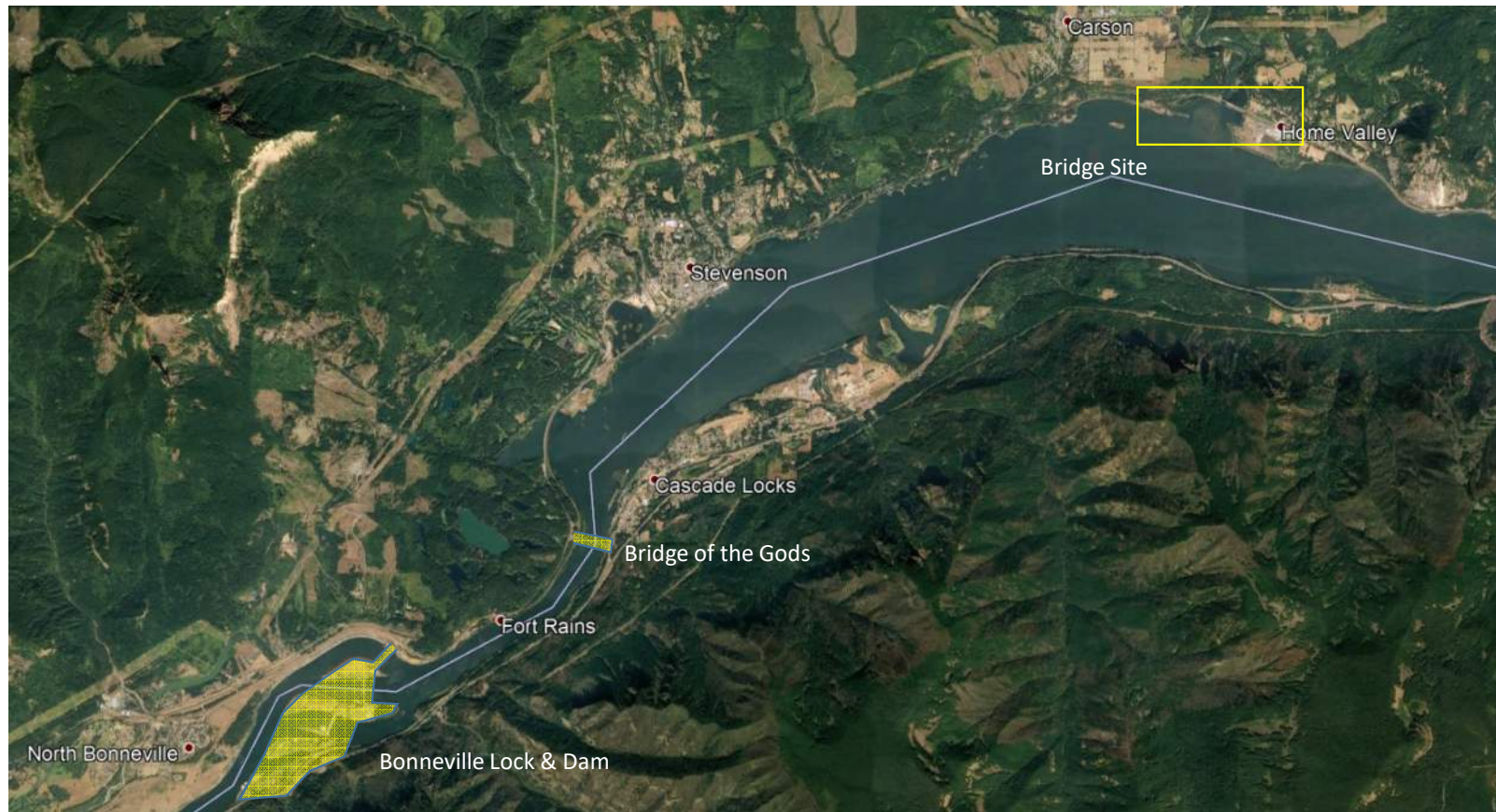


Joe Knapp  
Genesis Structures

# Project Location



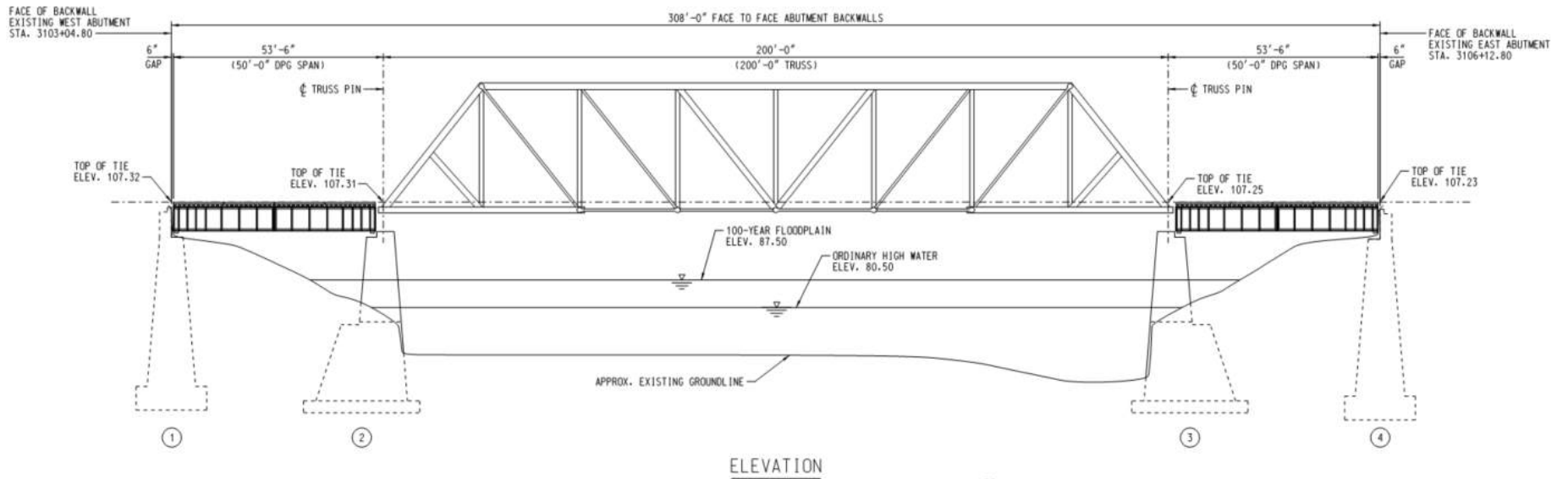
# Project Location



# Project Location



# Existing BNSF Br. 58.8





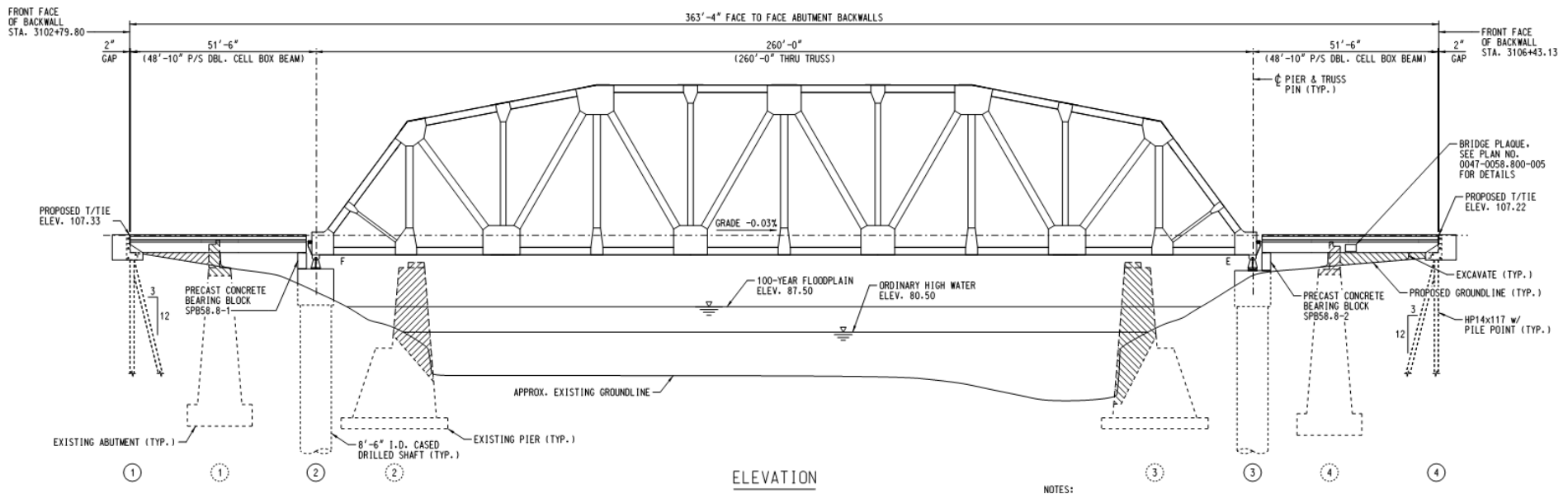
# Replacement of Existing Bridge

- Increase capacity of the bridge
- Increase in vertical clearance for freight
- Eliminate any FCM concerns with the pin-connected truss
- Utilize ABC techniques in design and construction in order to limit track closure
- Online replacement





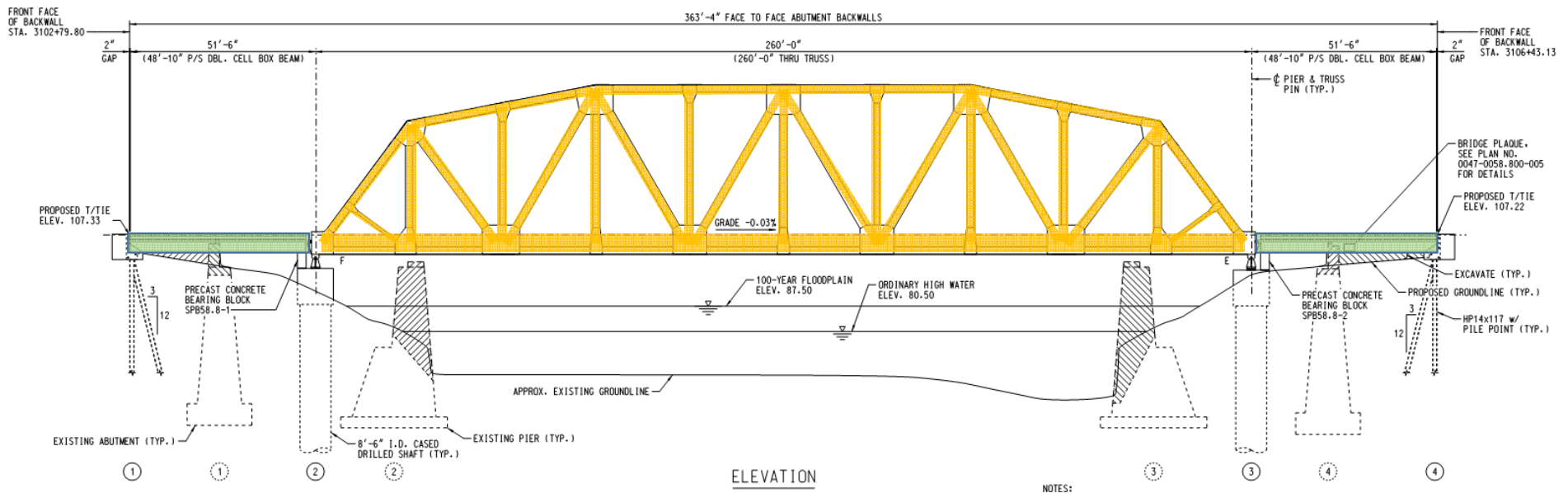
# Proposed Structure



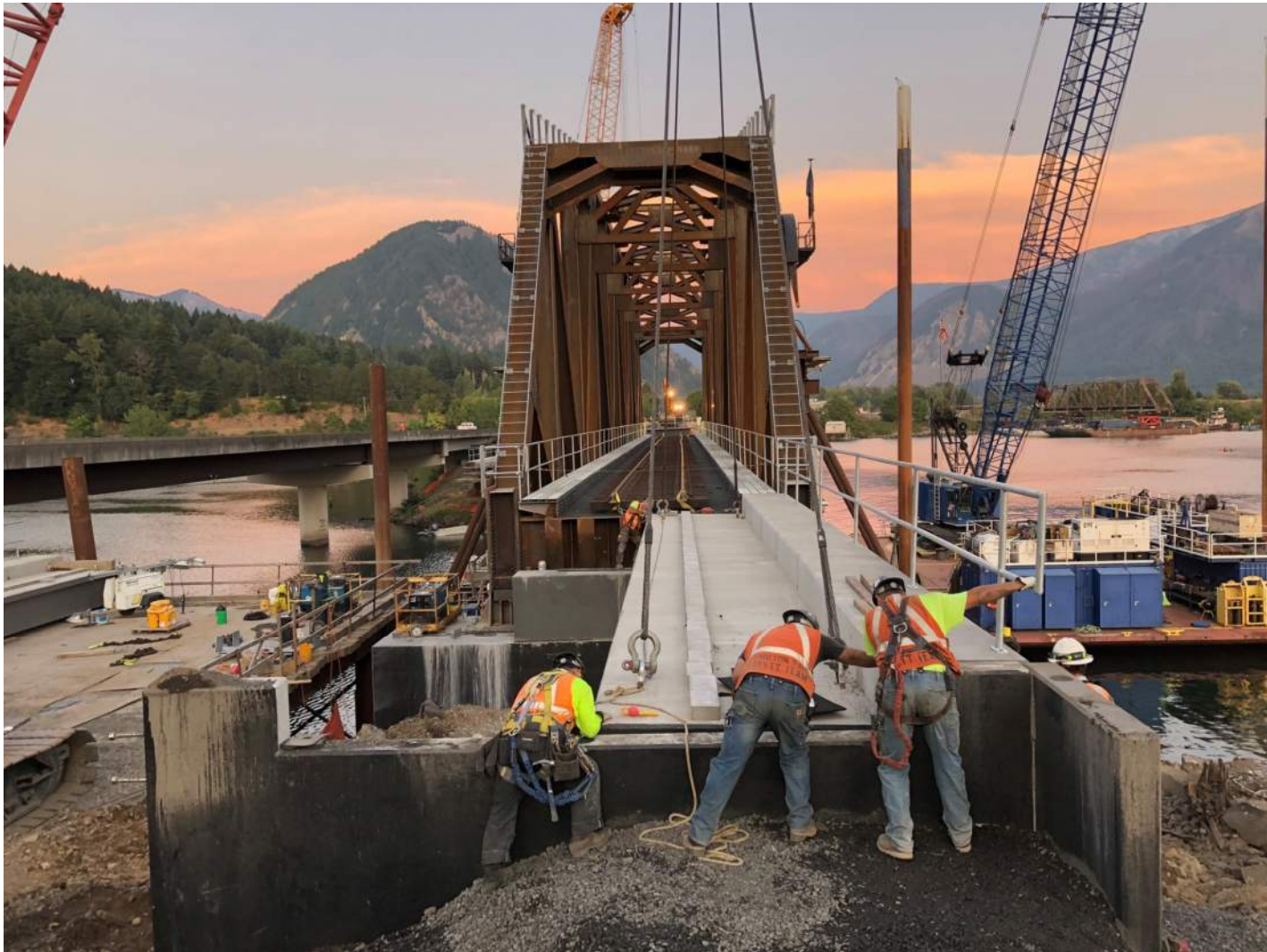
- 260' thru-truss with weathering steel
- BSNF standard precast concrete box beam approaches and standard abutments
- Cast-in-place concrete caps supported on 8'-6" diameter drilled shafts



# ABC Techniques

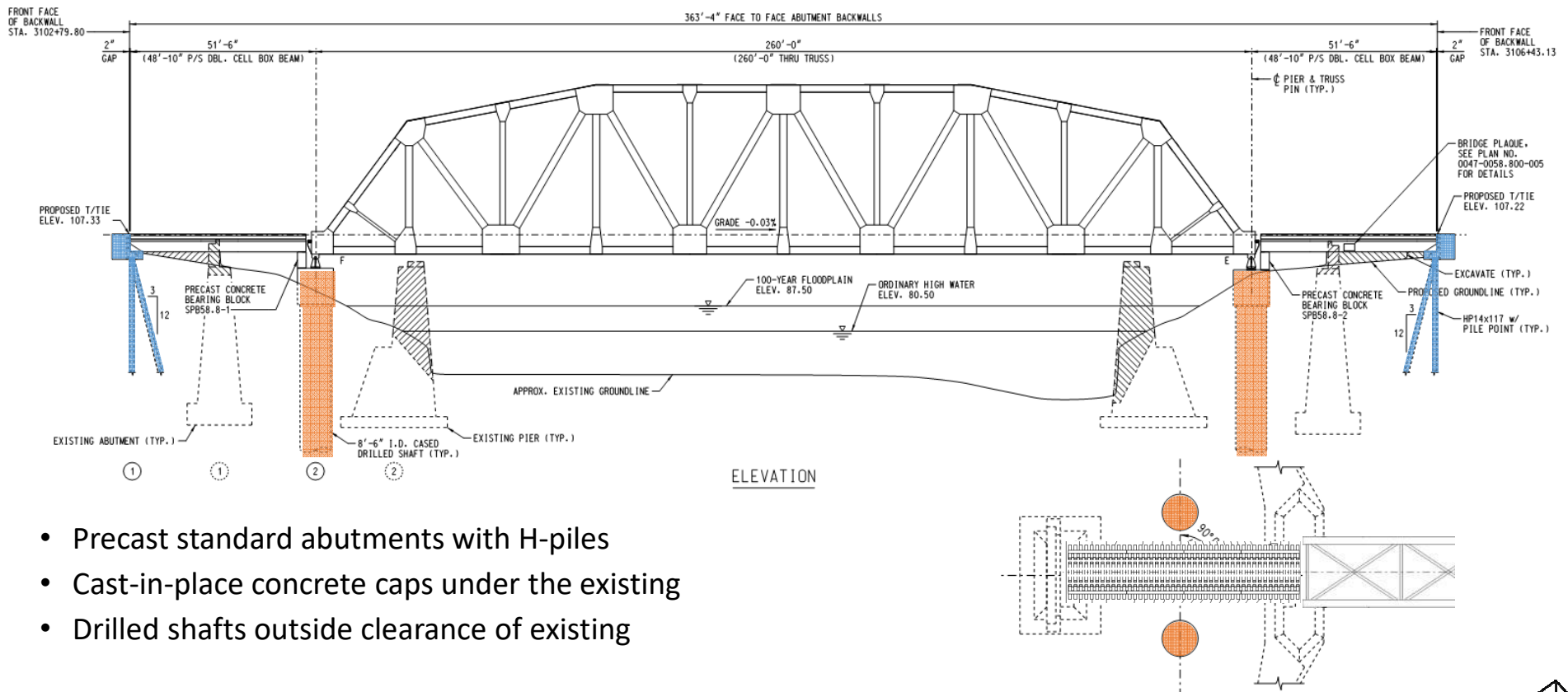


- Precast concrete approach spans
- Off-site assembly and float in of truss

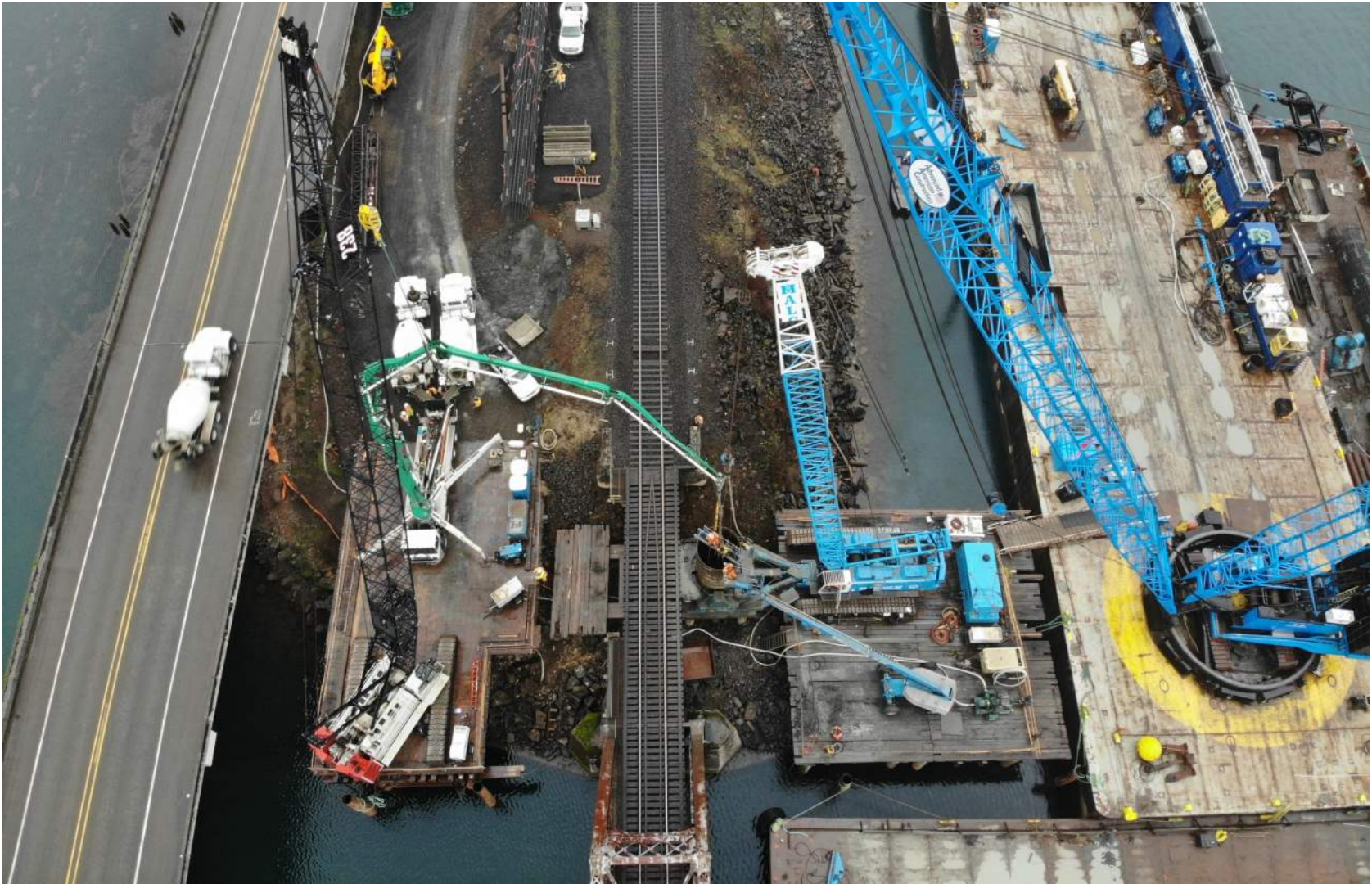




# ABC Techniques



- Precast standard abutments with H-piles
- Cast-in-place concrete caps under the existing
- Drilled shafts outside clearance of existing





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Malcom/Hamilton - standing  
rebar cage for Pier 2NW  
Inspector: Mark Bush

BNSF Bridge 58.8  
18 Jan 2019, 09:08:49





# Construction Timeline

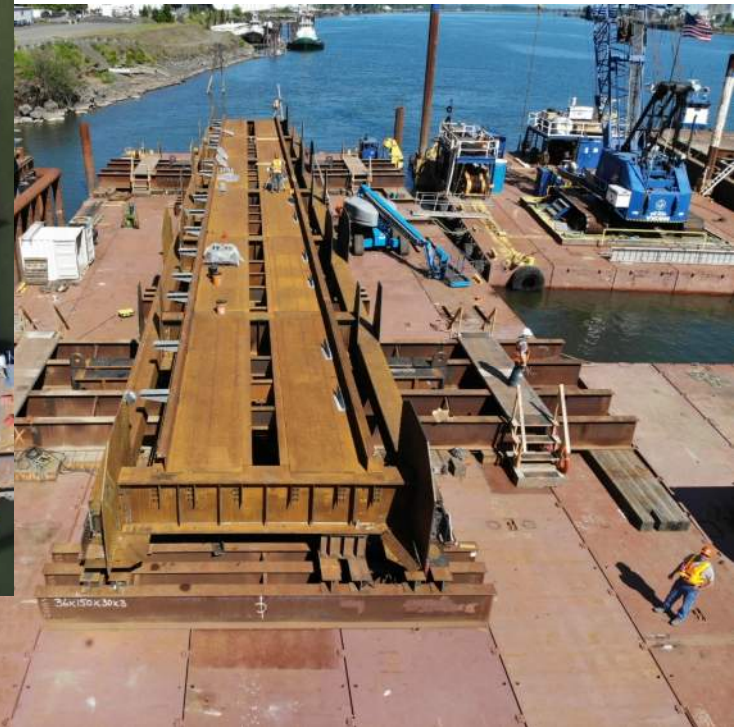
- On-site in October of 2018
- Piles for abutments driven: November to December 2018
- Drilled shaft construction: January to March 2019
- Piers complete: May 2019
- Assembly of truss began: April 2019
- Final change-out: August 4-5, 2019 with 36 hour track closure
- Construction complete: February 12<sup>th</sup>, 2020



# Assembly of New Truss



# Assembly of New Truss



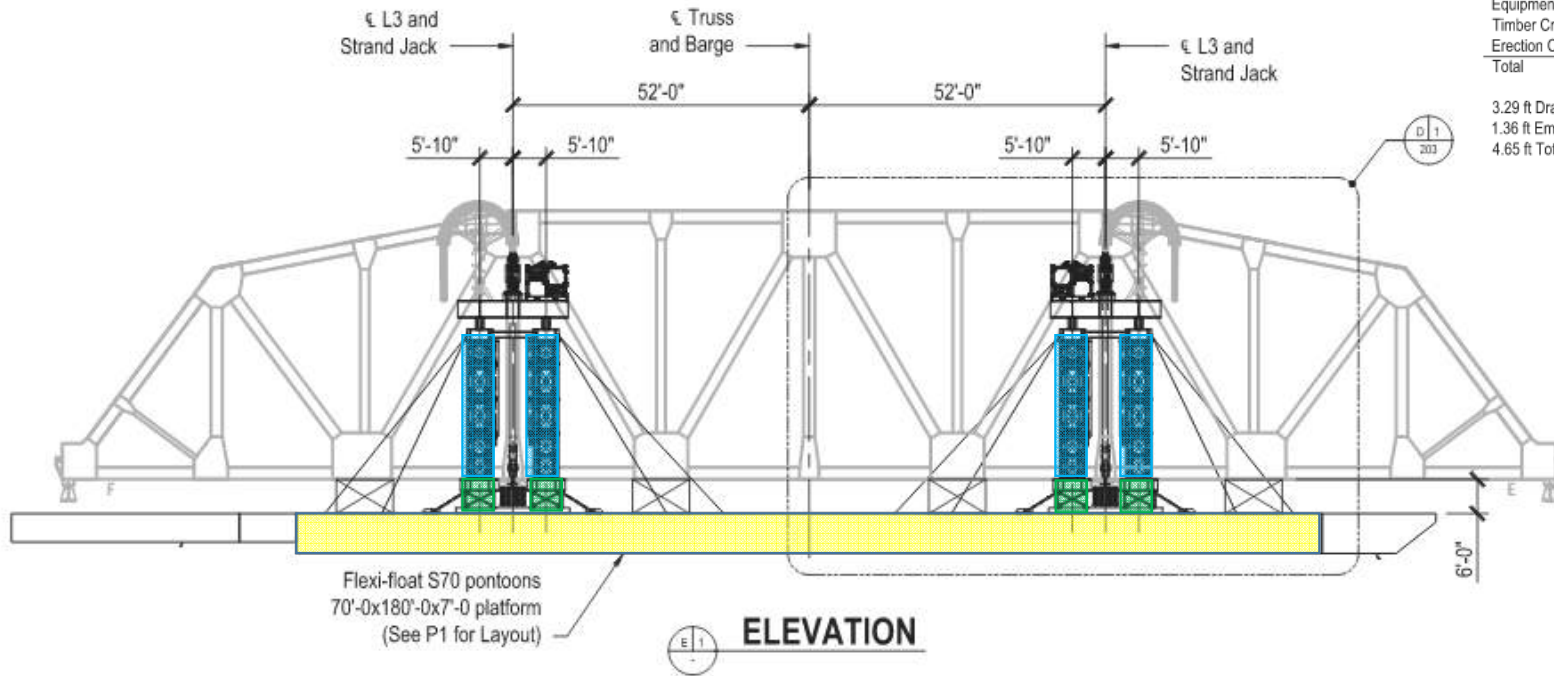
# Assembly of New Truss



# Truss Lifting System



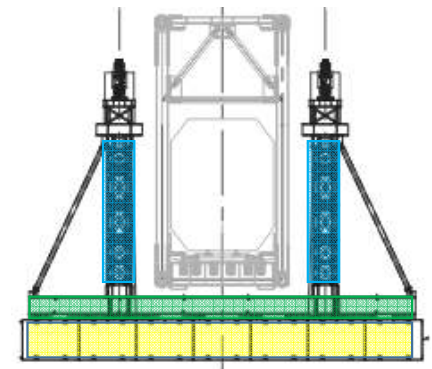
# Truss Lifting System



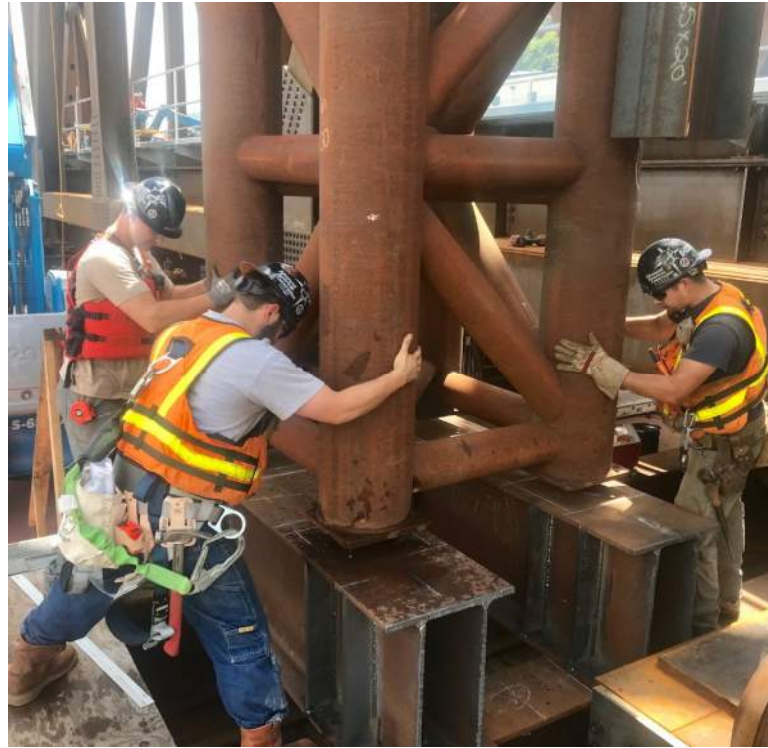
Estimated Weights:

Truss (with rail and waterproof)	- 1,900 kips
Underslung Lifting Beams	- 85 kips
Spine Beams	- 100 kips
Tower Assemblies	- 120 kips
Upper and Lower Grillage	- 100 kips
4 (500 Ton) Strand Jacks	- 36 kips
Equipment Allowance	- 40 kips
Timber Crane Mats	- 115 kips
Erection Cribbing	- 90 kips
<b>Total</b>	<b>2,585 kips</b>

3.29 ft Draft on 70x180  
 1.36 ft Empty Flexifloat draft  
 4.65 ft Total average draft



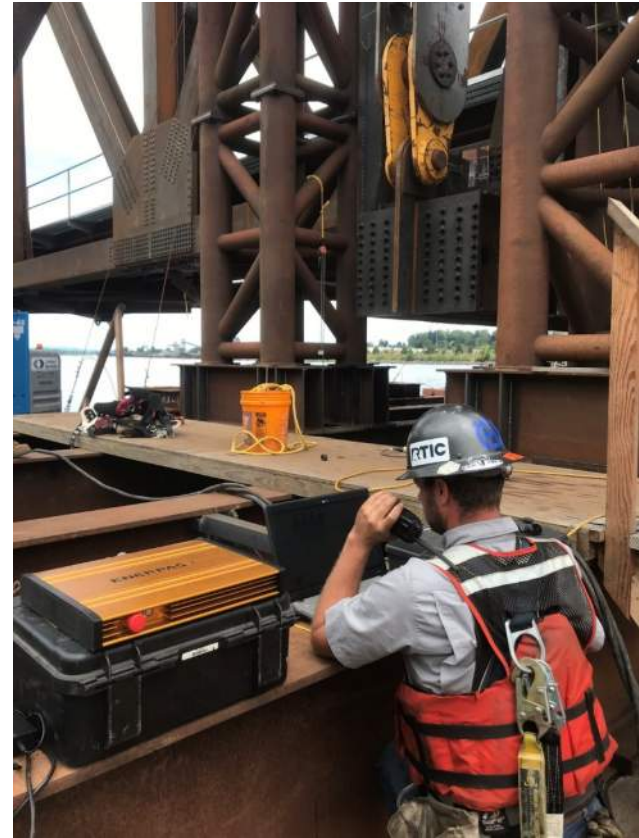
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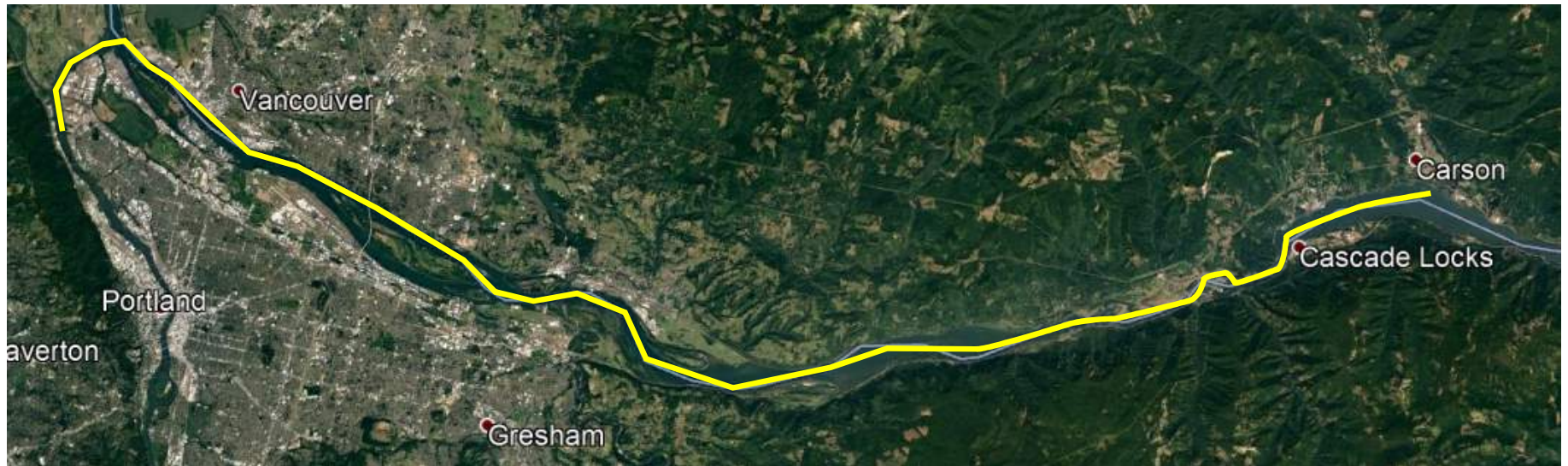
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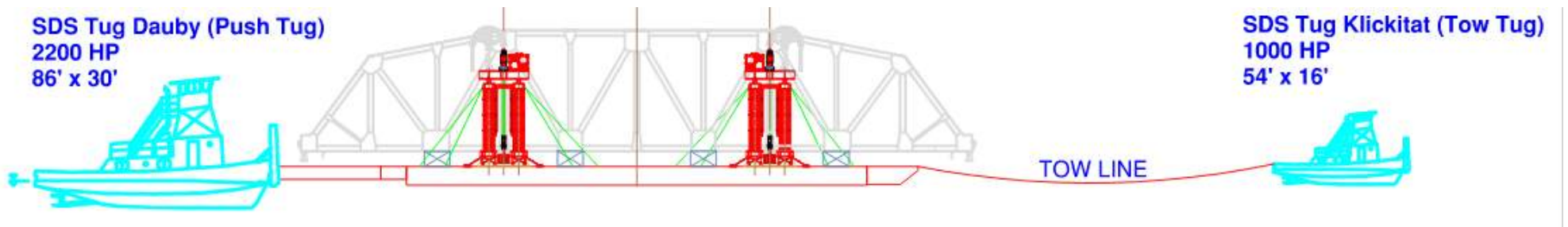
# Truss Lifting System



# Transport to Jobsite



# Transport to Jobsite



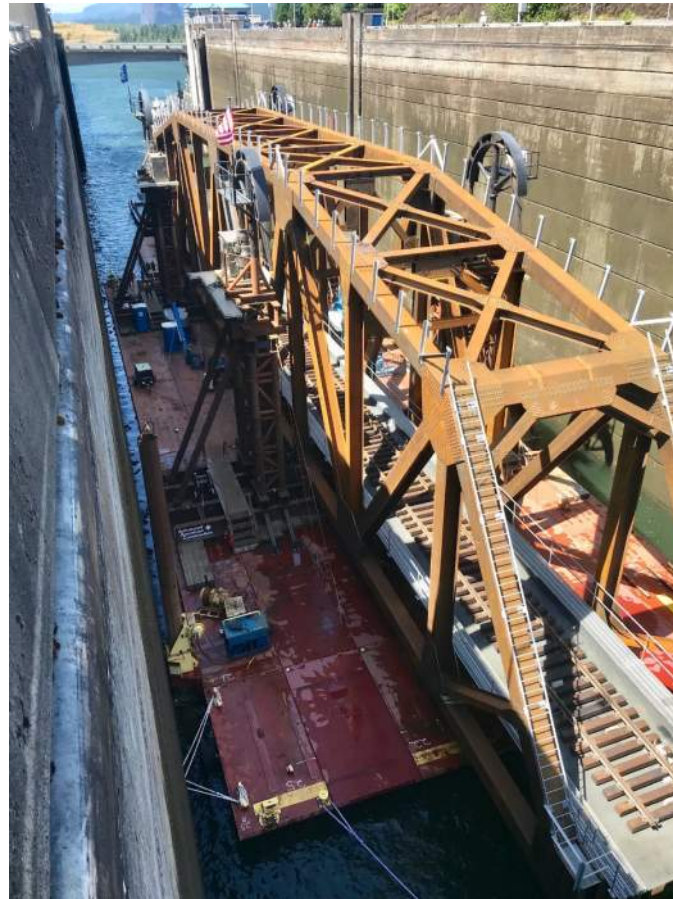
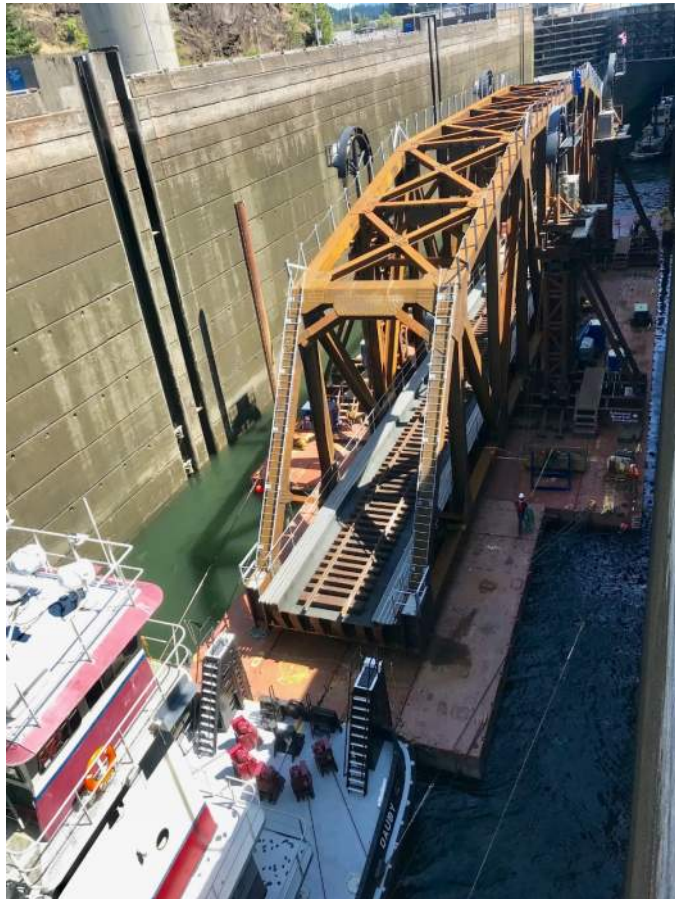
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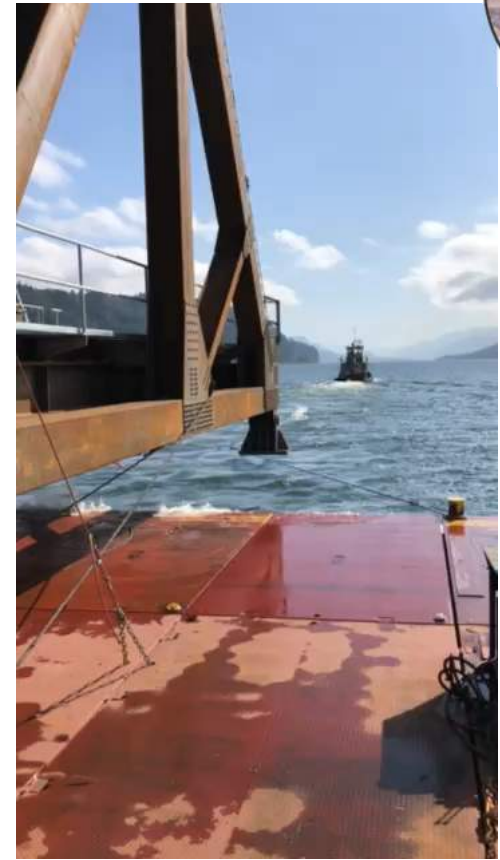
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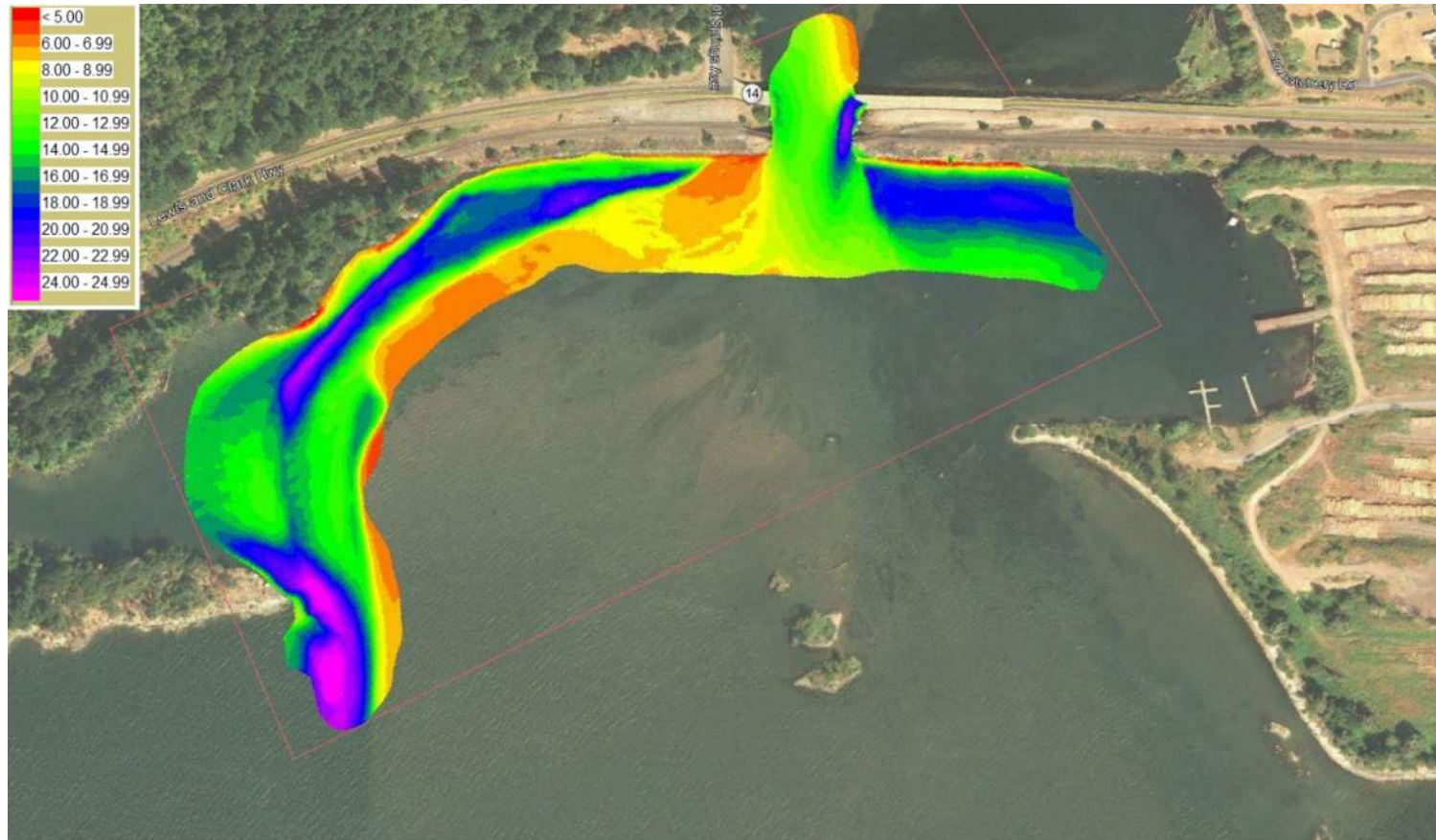
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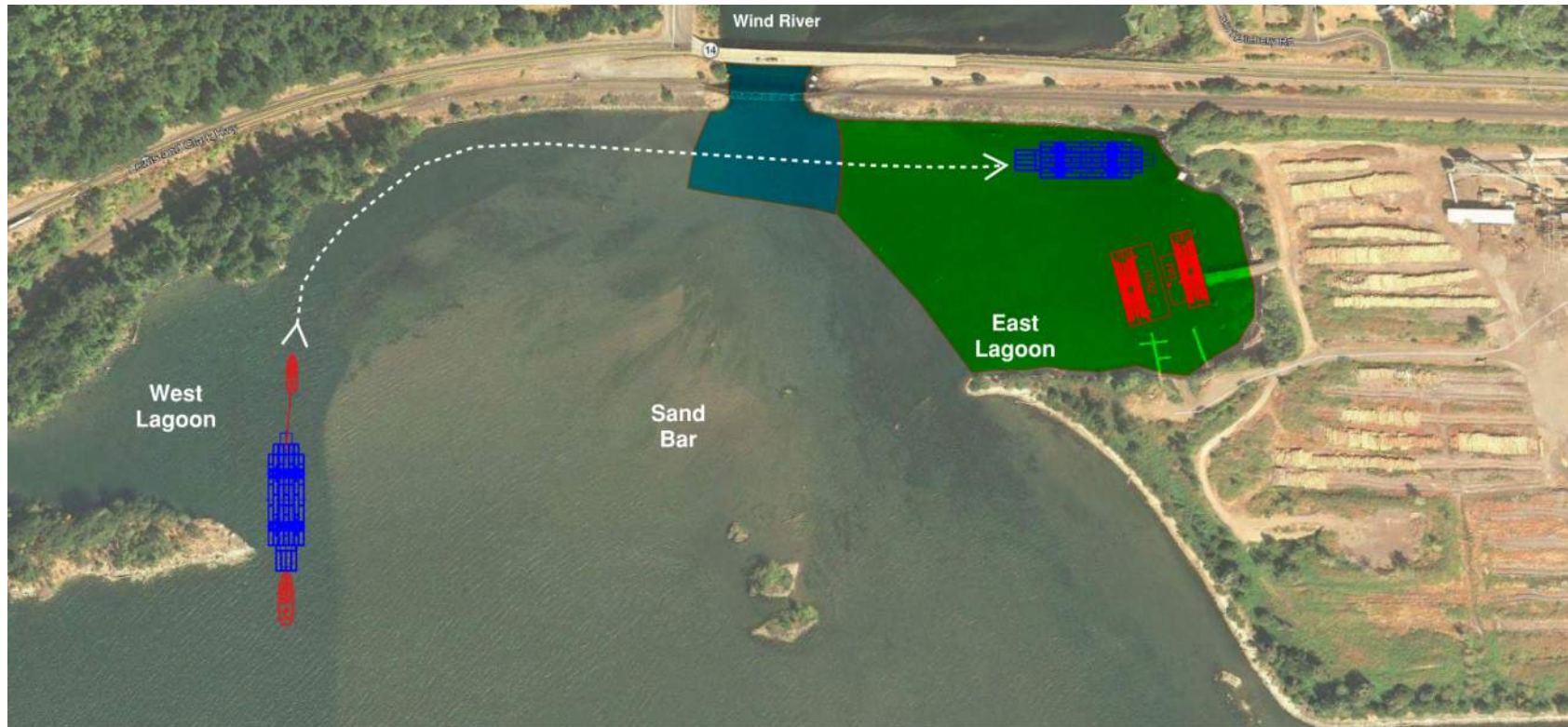
# Project Site Challenges



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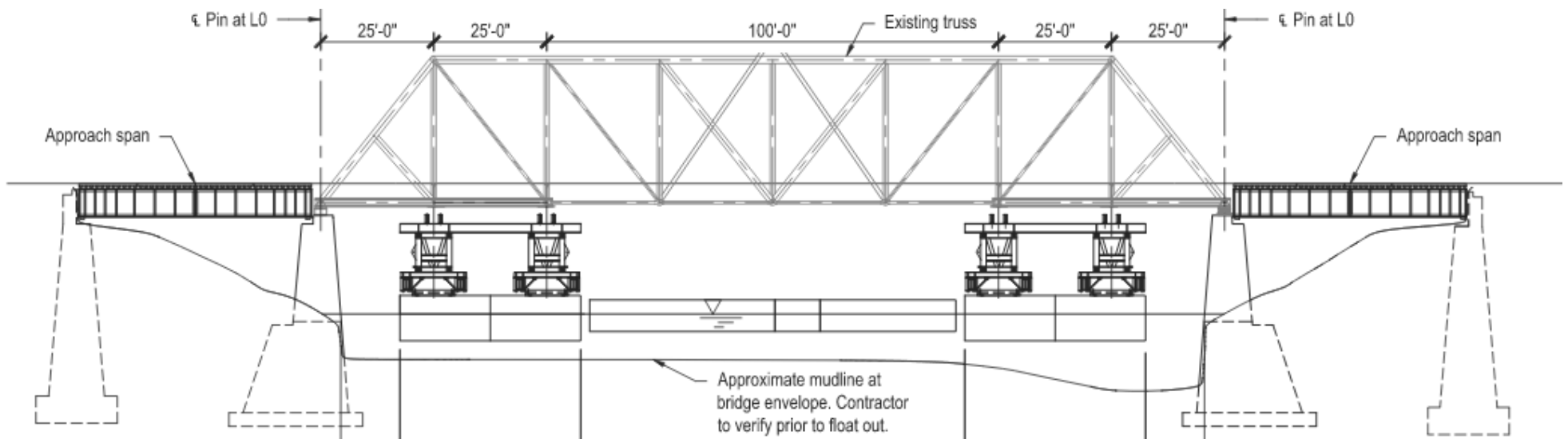
# Project Site Challenges



# Float Out Existing Truss



# Float Out Existing Truss



# Float Out Existing Truss



Weight/Barge (kip)	River Travel	Position under Truss	Take Truss	Empty Ballast
Barge	532	532	532	532
Grillage	200	200	200	200
Empty Baker Tanks	153	153	153	153
Ballast Water	0	900	550	0
Truss	0	0	350	350
<b>Total</b>	<b>885</b>	<b>1785</b>	<b>1785</b>	<b>1235</b>
Freeboard (ft)	7.1	4.1	4.1	5.9
Draft (ft)	2.9	5.9	5.9	4.1

# Float Out Existing Truss



# Float Out Existing Truss



# Float Out Existing Truss



# Float Out Existing Truss



# Float In New Truss



# Float In New Truss



# Float In New Truss



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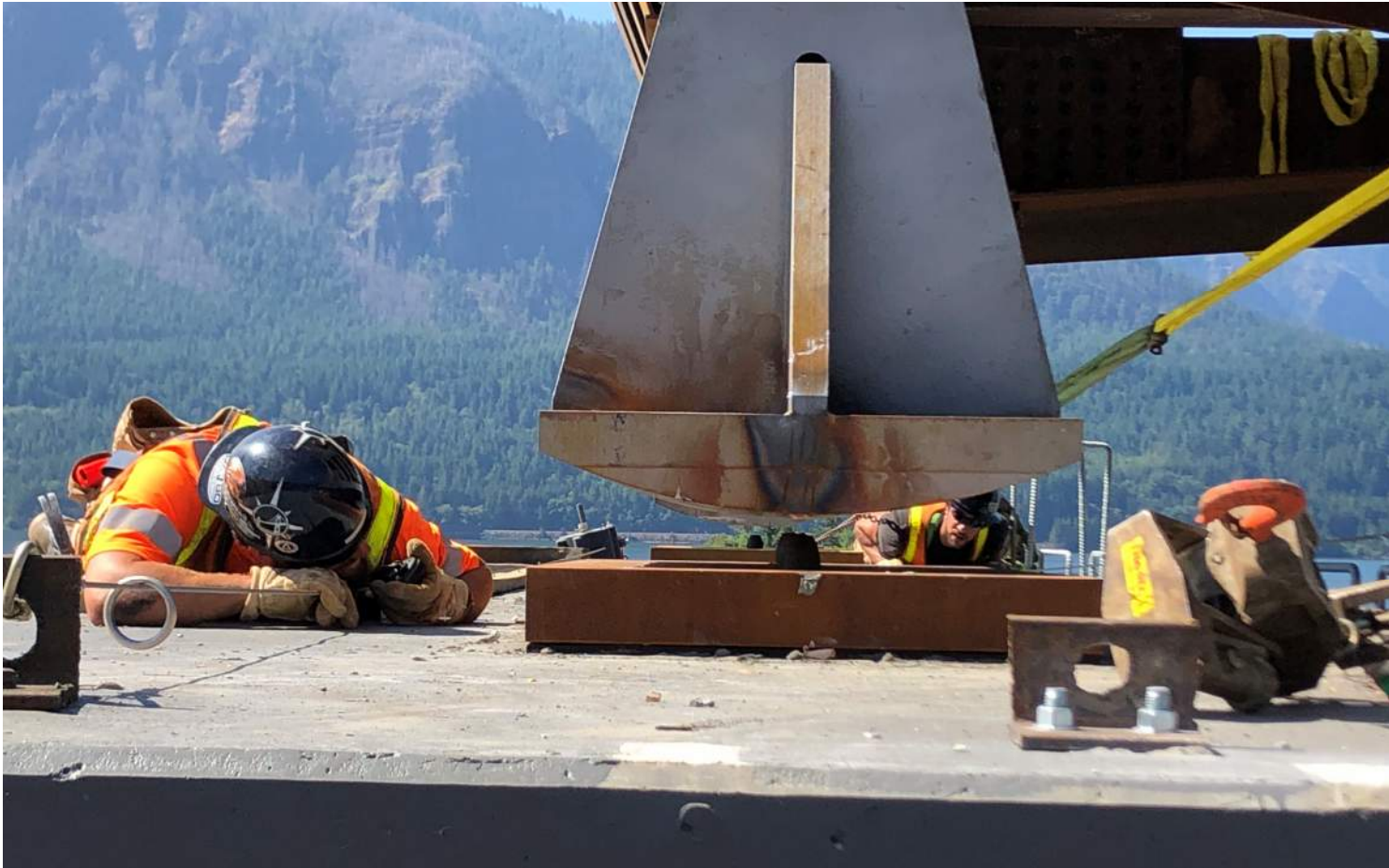
# Float In New Truss



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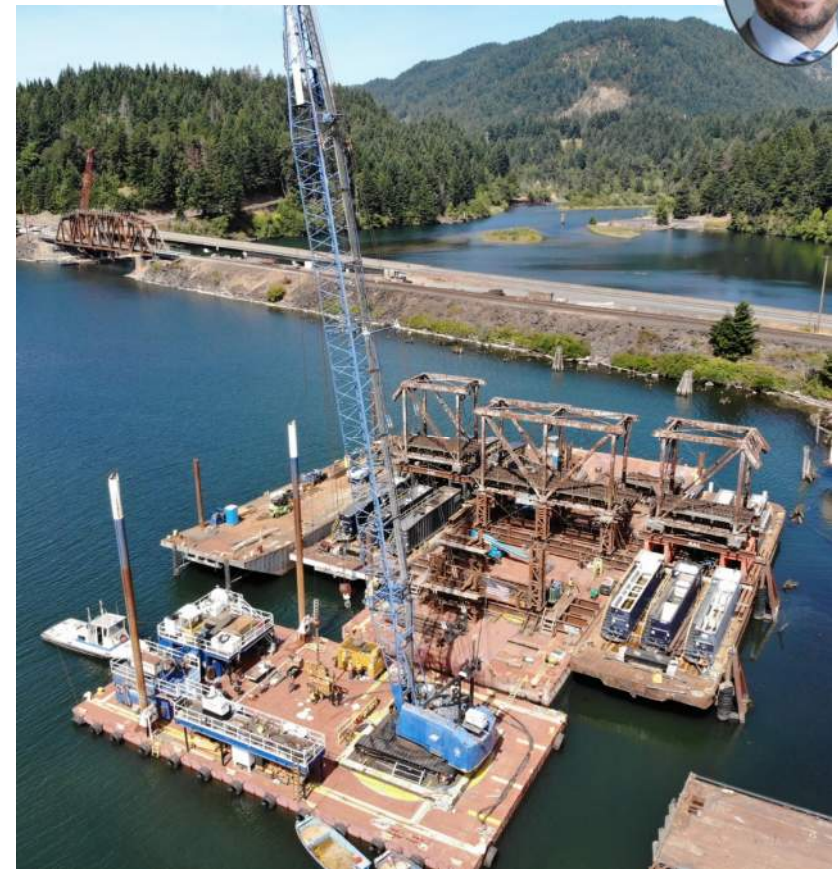
# Float In New Truss



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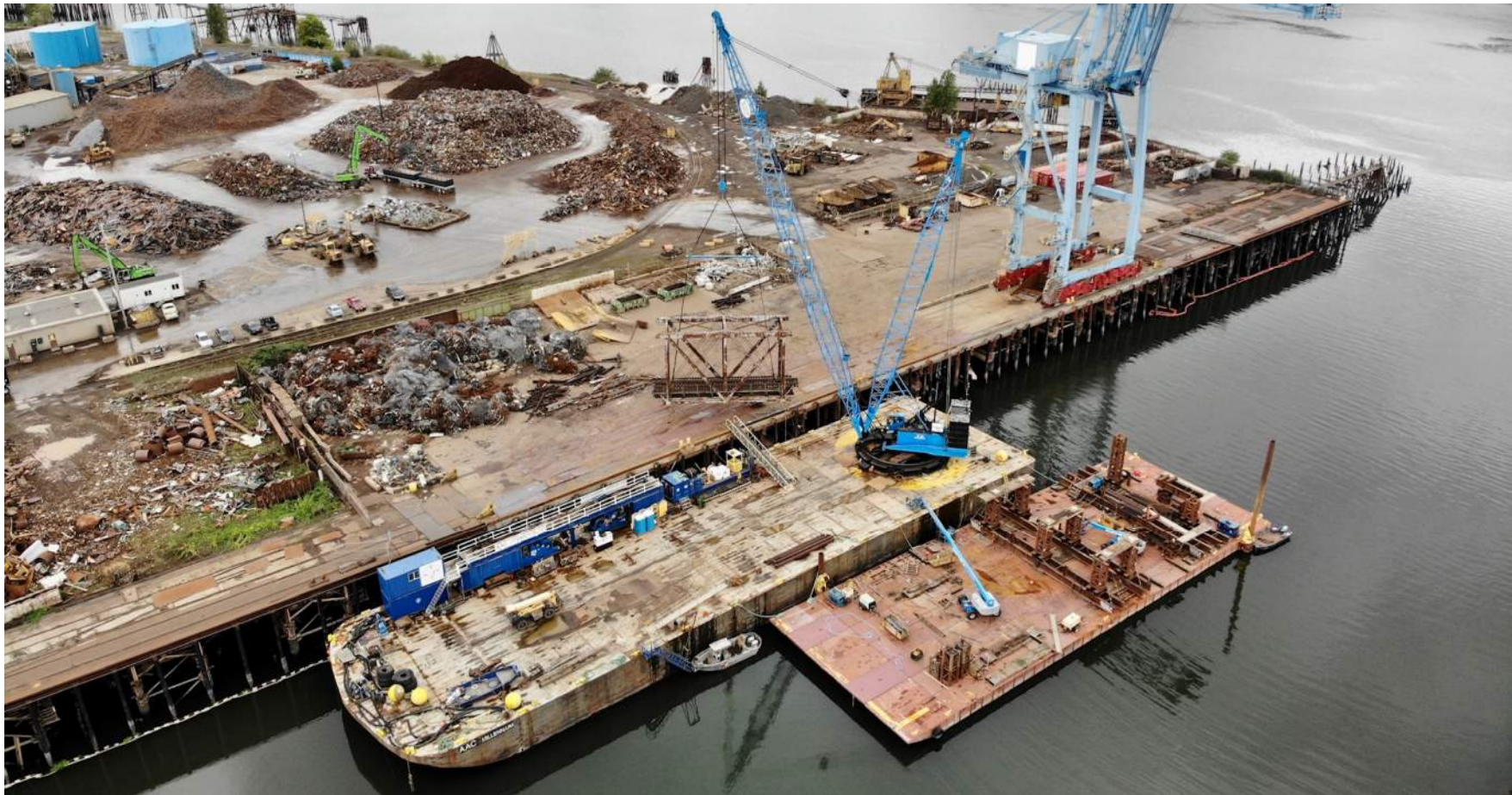
# Demolition of Existing Truss



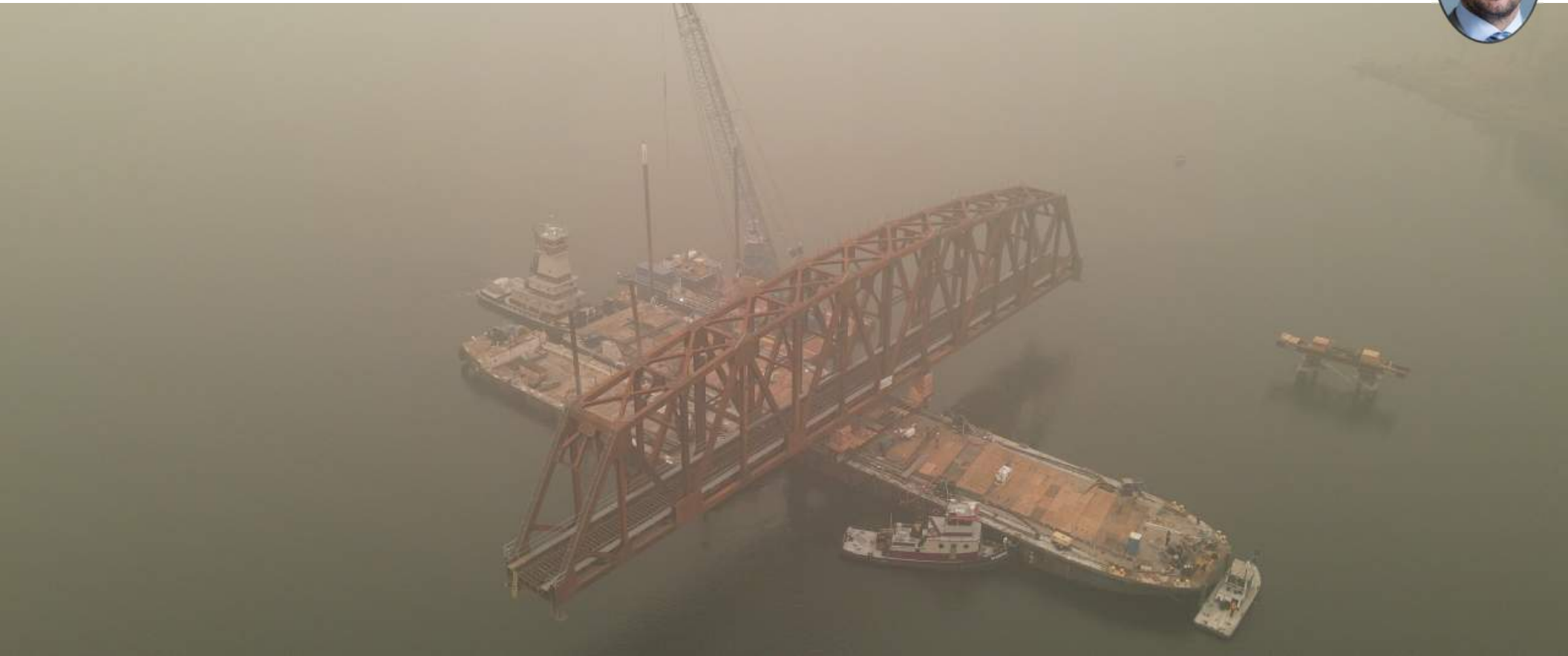
# Demolition of Existing Truss



# Demolition of Existing Truss



# Stay Tuned For Bridge 66.4





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