



Broadway Viaduct Bridge Replacement

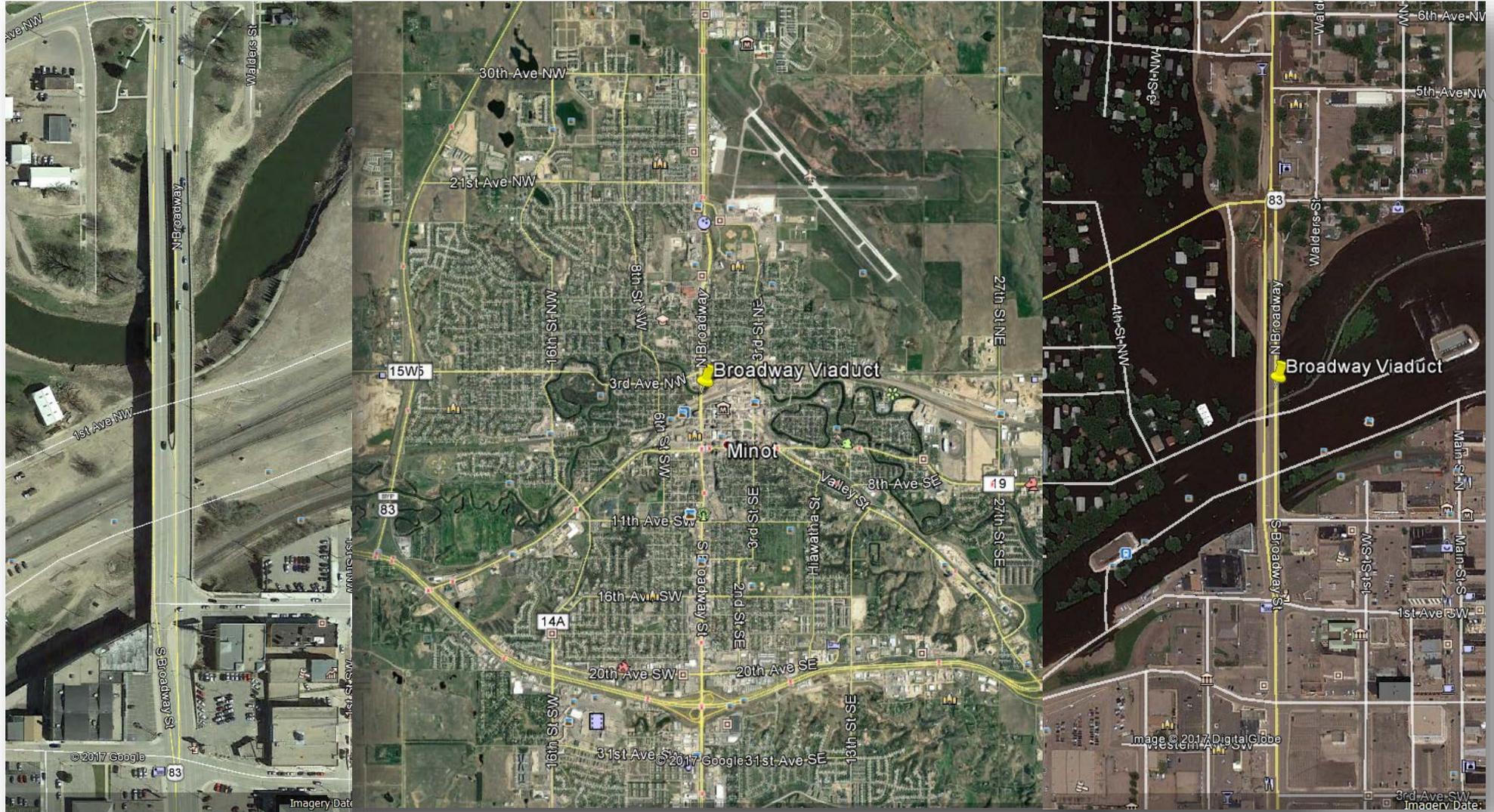
February 28, 2018



Project Team



Project Location



Background

- NB built in 1971
- SB built in 1962
- About at its 50-year design life
- Would need major maintenance in the next few years
- 30,000 Vehicles/day
- Major N/S route



Bid

- **Project bid in November 2016**
- **Engineer's estimate - \$22 M**
- **Project awarded - \$20.7 M**
- **Next bidder - \$22.8 M**
- **15 existing piers to 6 piers**
- **Contractor assigned a PM in February**
- **RFIs began in January from suppliers**
- **Precondition survey and preconstruction meeting held on February 28, 2017**



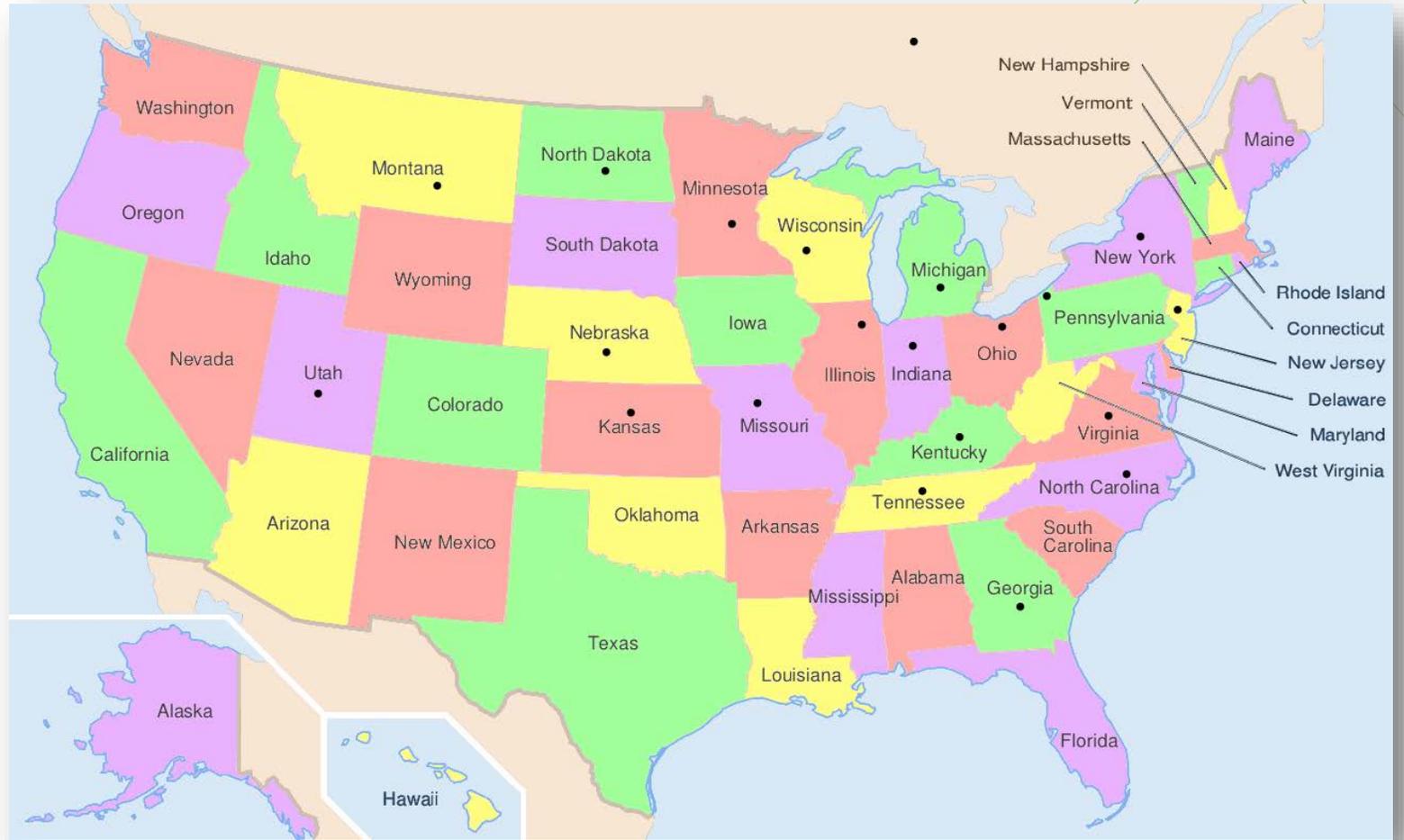
Proposed Bridge

- **Welded steel girders**
- **Overall length is just over 822 feet**
- **Constructed in two phases:**
 - NB – 2017 (Slab width about 46 feet)**
 - SB – 2018 (Slab width about 40 feet)**
 - Closure pour between the NB and SB is 3 feet**
 - Total width is just over 86 feet**
- **100 foot pile supported approach slab**



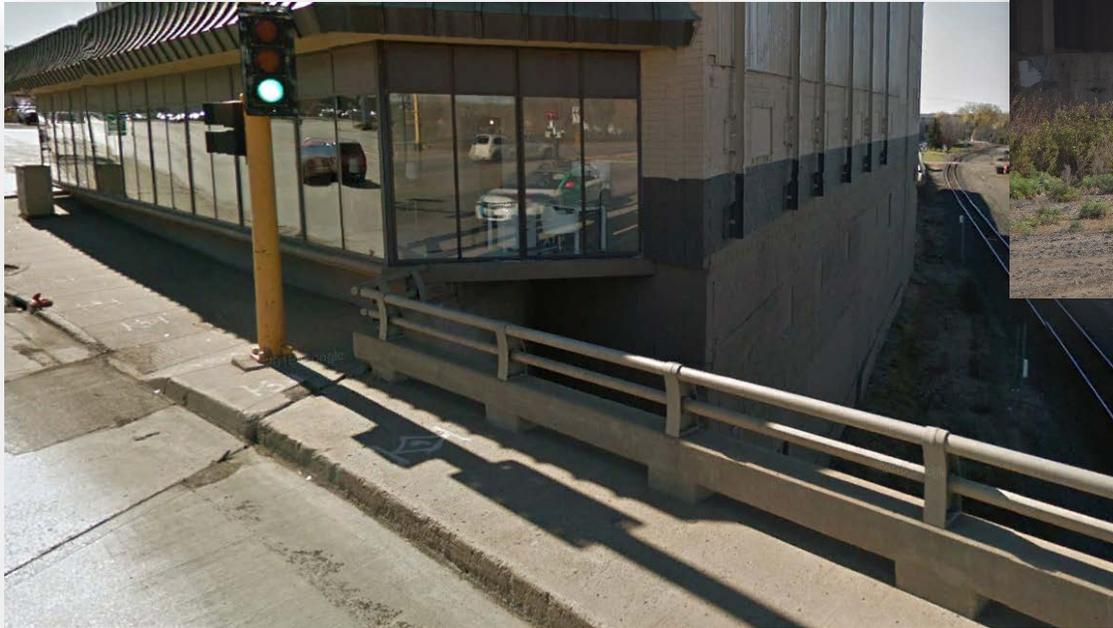
Parts from Across the US

- More than 20 states
- 1 piece from Canada



Precondition Survey Monitoring

- I-Keating Furniture
- Historic Building built in the early 1900s
- Bootlegging tunnels for Al Capone



On-site Work Started

- Onsite work began March 20, about two weeks ahead of schedule
- Last time we were ahead of schedule



Demo Plan

- **Original demo plan submitted on February 21, 2017**
- **Revised on March 10**
 - **Permit indicated the use of tarps, plywood and a 4-sided coffer dam**
 - **Contractor submitted a plan to use a barge to collect the debris from hitting the water and a three-sided coffer dam**
 - **USACE, State Engineers Office-Sovereign Lands and the City of Minot**
- **Approved demo of everything north of the river on March 31**
- **Final Approval from BNSF on April 26 – Kind of!**
 - **Couldn't start over the BNSF road until May 1**
 - **Needed the non-existent track windows to perform the work**
 - **Laydown area May 2**
 - **Temporary track crossing – BNSF would not allow**

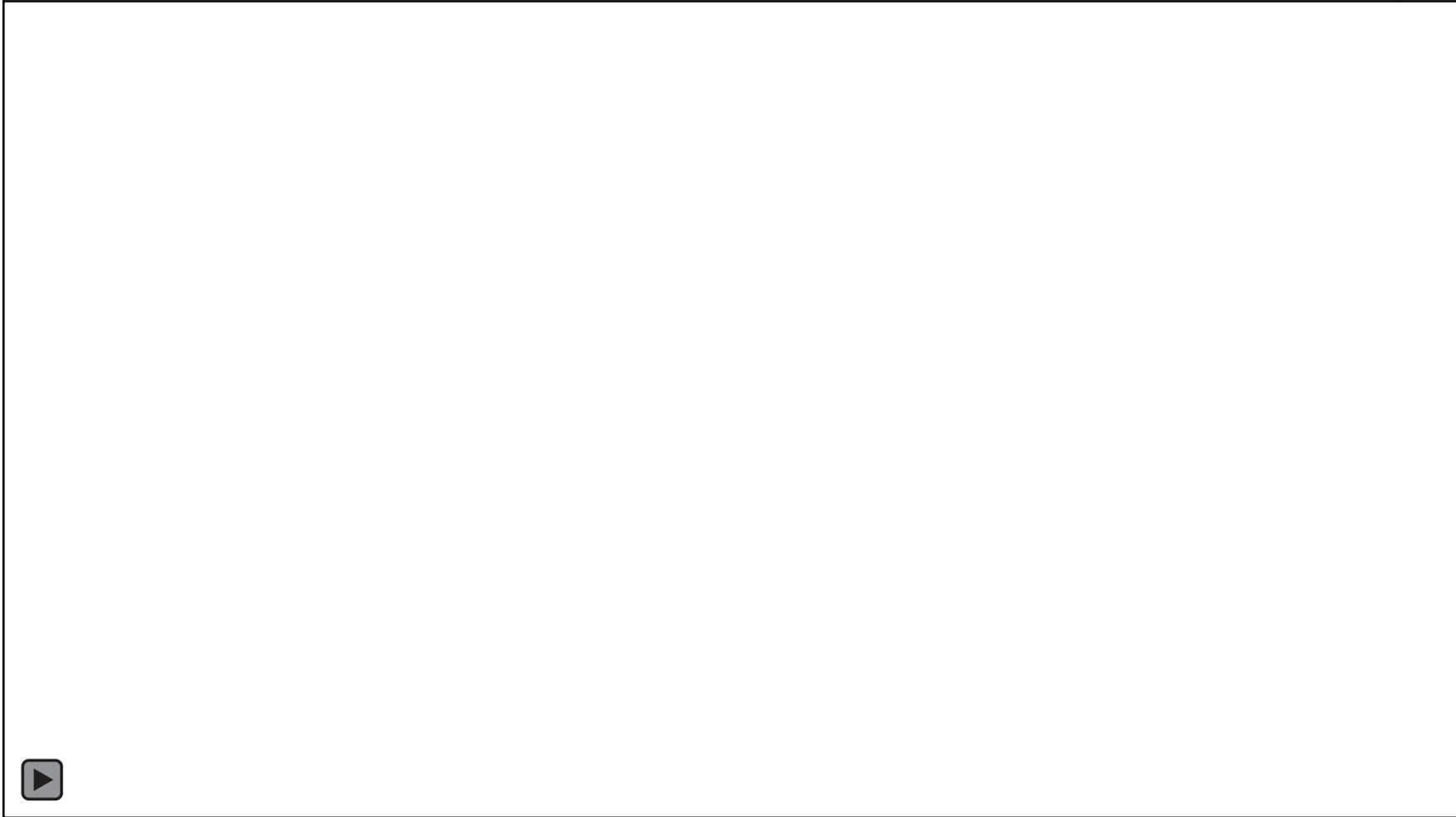


Bridge Demo

- Started on the north and worked to the south



Demo - Video



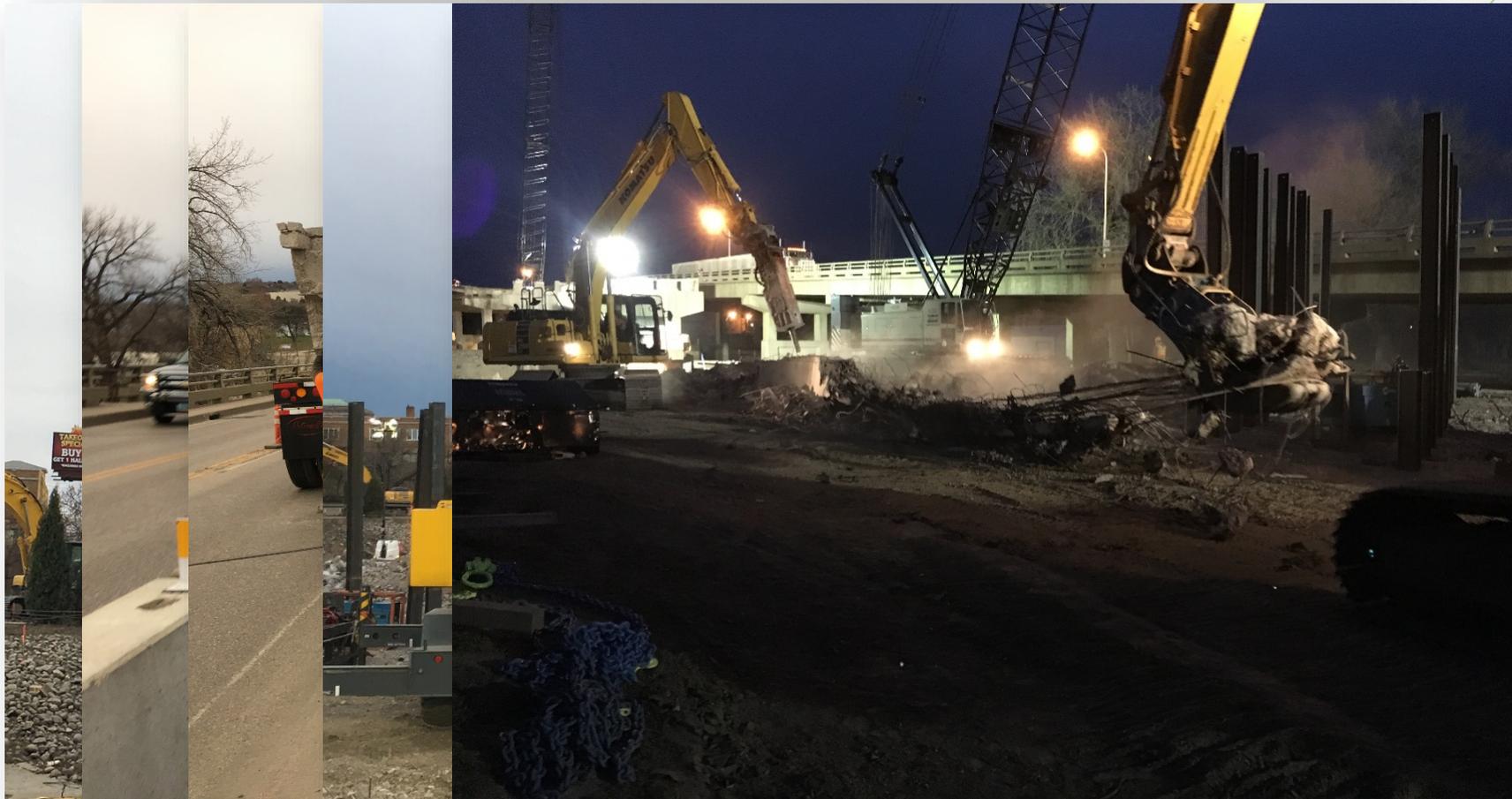
Demo



Demo Sawing



Demo – Night Work



River Pier Demo



Demo Over RR



Demo Over RR



Demo of Pier Next to RR



Pier 7 – 48” Sundre Waterline



Pier 7 – Sundre Waterline



Pier 7 – Sundre Waterline



Underground Obstructions



Underground Obstructions



Found a Basement



Debris from 2011 Flood

- Potential April news article



Pile Driving

- **Started pile driving April 12**
- **Finished driving July 31**
- **Four different pile types –**
 - **HP 10x42**
 - **HP 12x53**
 - **HP 14x73**
 - **HP 14x102**
- **Plan total was 24,842 LF (combined LF for all 4 sizes of HP pile)**
- **To date about 88% (21,972 LF) of the plan quantity has been driven, with about 40% of the pile locations remaining to be driven for the SB structure**
- **Social media “What is the constant ringing throughout the town?”**



Pile Driving

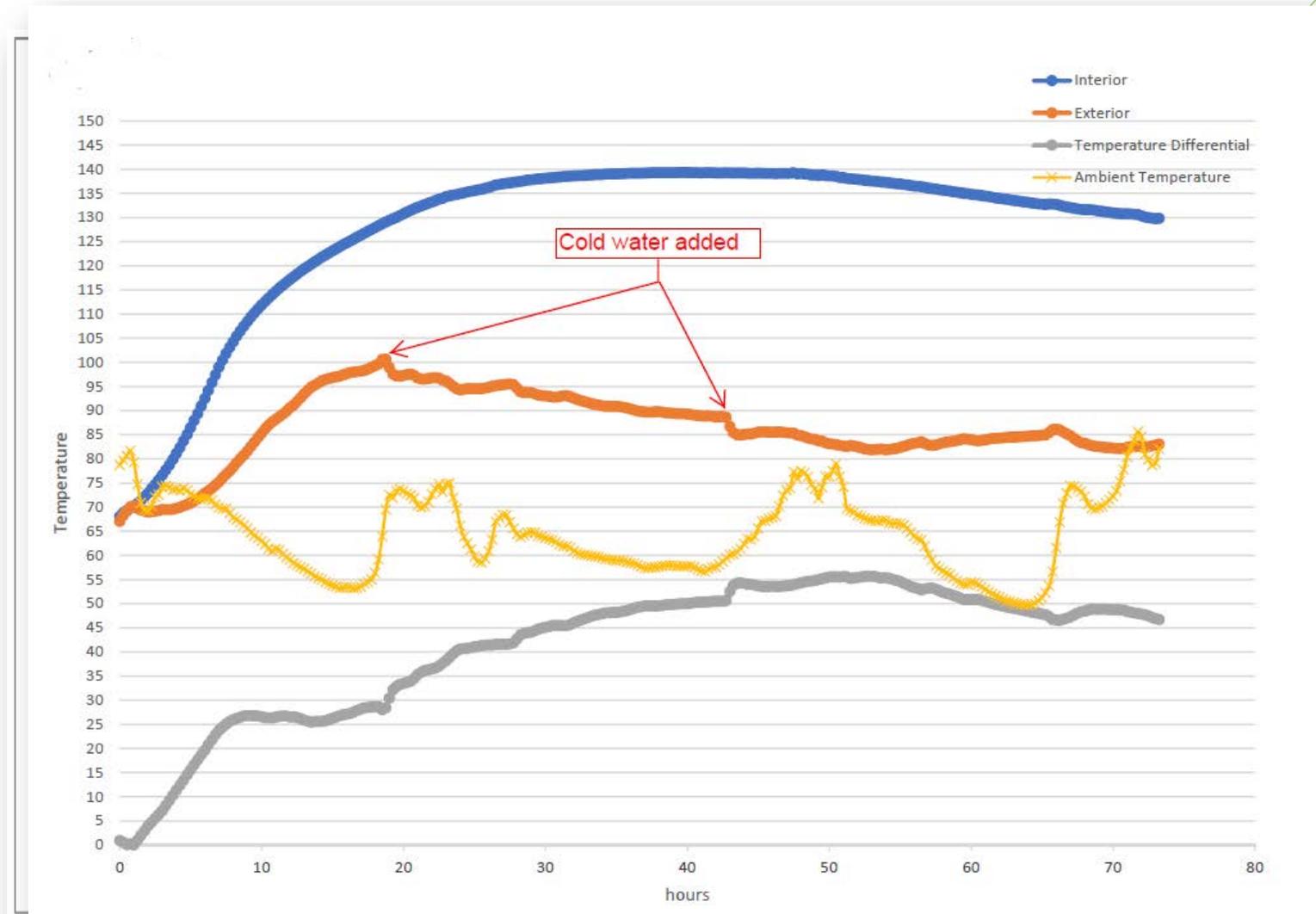


Geogrid



Mass Concrete - Substructure

- Maximum temperature 150° F
- Max differential temperature 35° F



Piers



Finger Joint and Bearing Delays

- **Early July weekly meeting – “Everything is going to be pushed back 1 to 1 ½ months – Hard to finish the bridge this year.”**
 - **Bearings are going to arrive 3 weeks late (mid August)**
 - **Finger Joint is 20 weeks out (December)**
- **We indicated that they should work with their suppliers to accelerate their schedules**
- **Mid July weekly meeting –**
 - **Bearings arrive mid-August**
 - **Fingers arrive in September**
- **Special September 6 meeting to discuss schedule and how the contractor is going to finish the bridge this year**
- **Add extra crews, work 7 days a week, night shift, paint girders onsite, cold weather plan, open to traffic on November 17**
- **Bearings arrived on September 4 (Labor Day)**
- **Finger Joints arrived on August 30 and September 20**



Finger Joint



Bearings



Steel Girders – Short – Situation 1

NB girders started manufacturing on April 10.

July 11 – during the review of the SB shop drawings the EOR discovered that the cord lengths were not properly detailed in the shop drawings for the NB structure. The detailer used horizontal lengths and not chord lengths to determine the actual length of the girder.

Big deal? For the southern half of the structure it didn't matter due to the almost 0% profile grade. The northern half was a big deal. It was estimated that the beams would be about 4 to 7 inches short depending on temperature and dimensioning. But no one could be exactly sure without fitting up the beams.

- Options:
- 1) Re-manufacture correct length beams.
 - 2) Get the beam stretcher and extend the beams.
 - 3) Extend the beam seat on the abutment.

Delayed the girders about 1 week



Abutment 8 Build Up



Steel Girders – Delay – Situation 2

- September 5 – Girders first started to arrive, about 3 months behind the original schedule and about 2 weeks behind their revised July schedule
- September 11 – We were notified that the supplier was not going to make their schedule of all girders installed by September 21 due to paint drying conditions
- September 22 – We were provided a plan with 8 girders to be placed onsite with primer only and will be field painted in the 2018 construction season
- Of course the beams are over the river! At least they are not over the RR
- Last beam was erected on September 27



Steel Girders



Decking – Sept 27-Oct 10

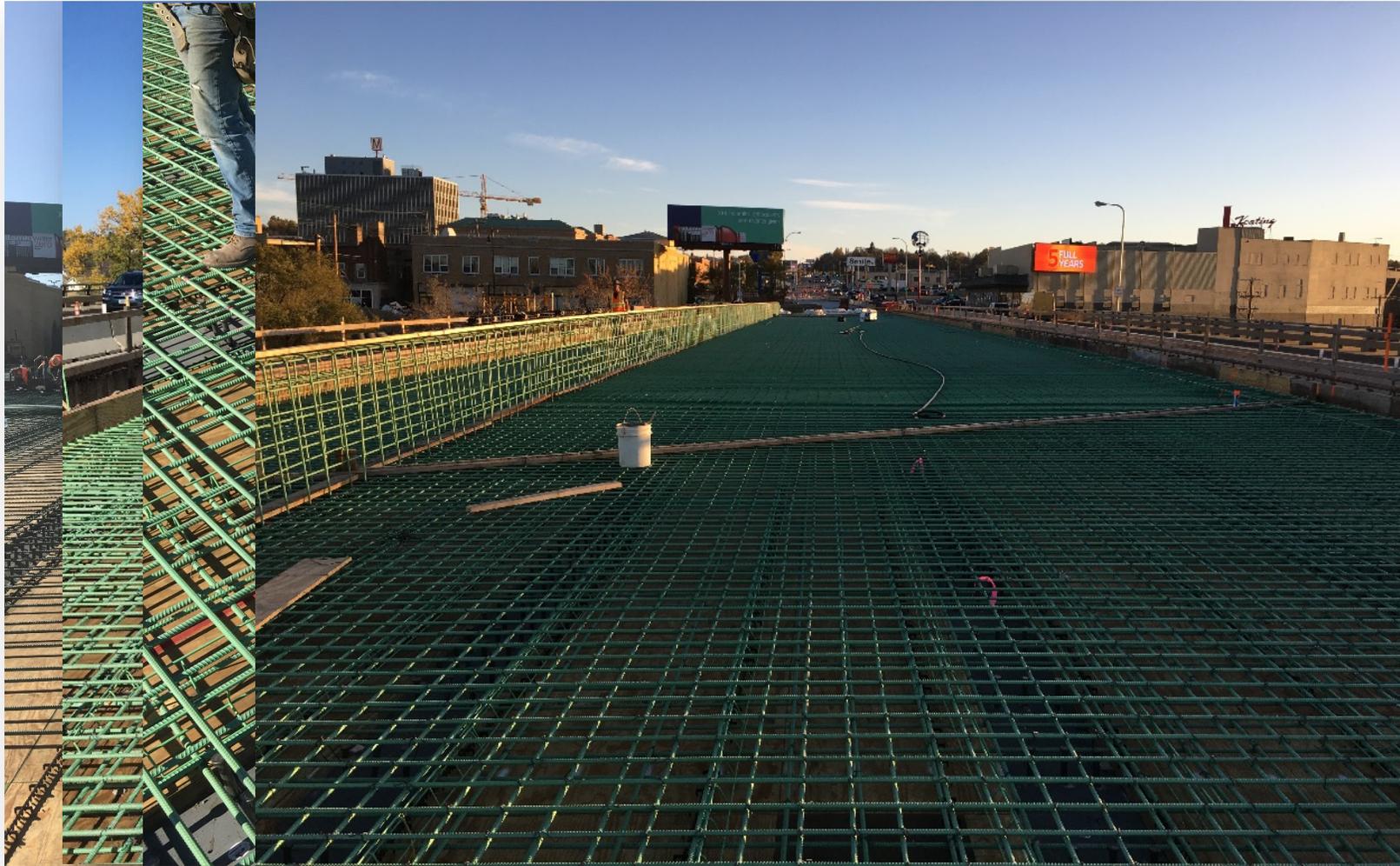


Girder Studs

- John N. installed 15,848 studs in 6 days. Ouch my back!!!



Reinforcement



Deck Pours

- Plan indicated 4 deck pours
- Contactor did it in 3 pours to save time
- 1st pour 10/6 – 70 yd
- 2nd pour 10/19 – 540 yd
- 3rd pour 10/24 – 365 yd



Barrier

- First pour Nov 7
- Last pour Dec 1



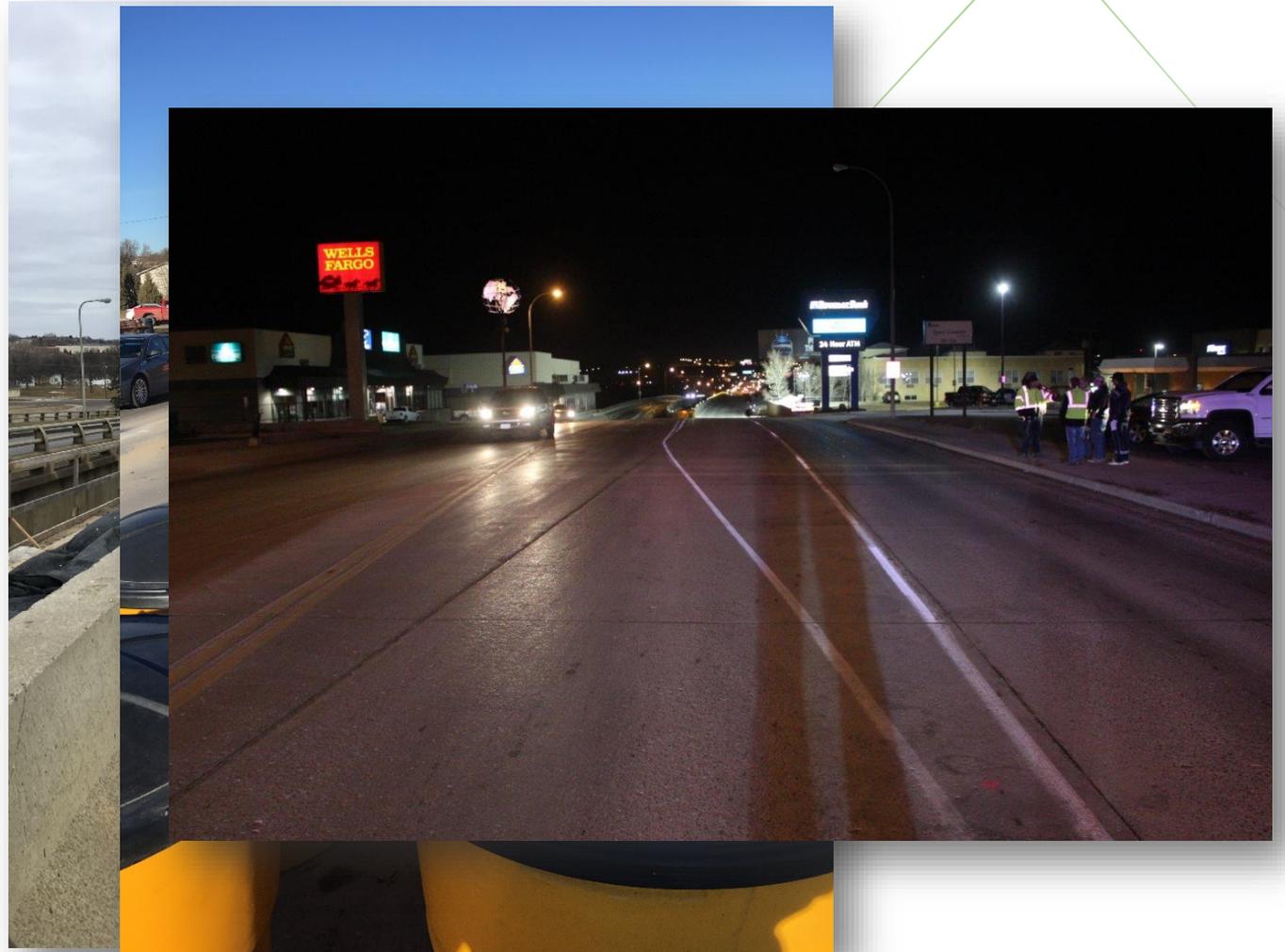
Trough Drain



Open to Traffic

November 22, 2017 - 3:30 PM

First accident November 22, 2017 - 9:00







Questions?

