



# How many Engineers in the room?





# St. Mary's River Little Rapids Habitat Restoration Project



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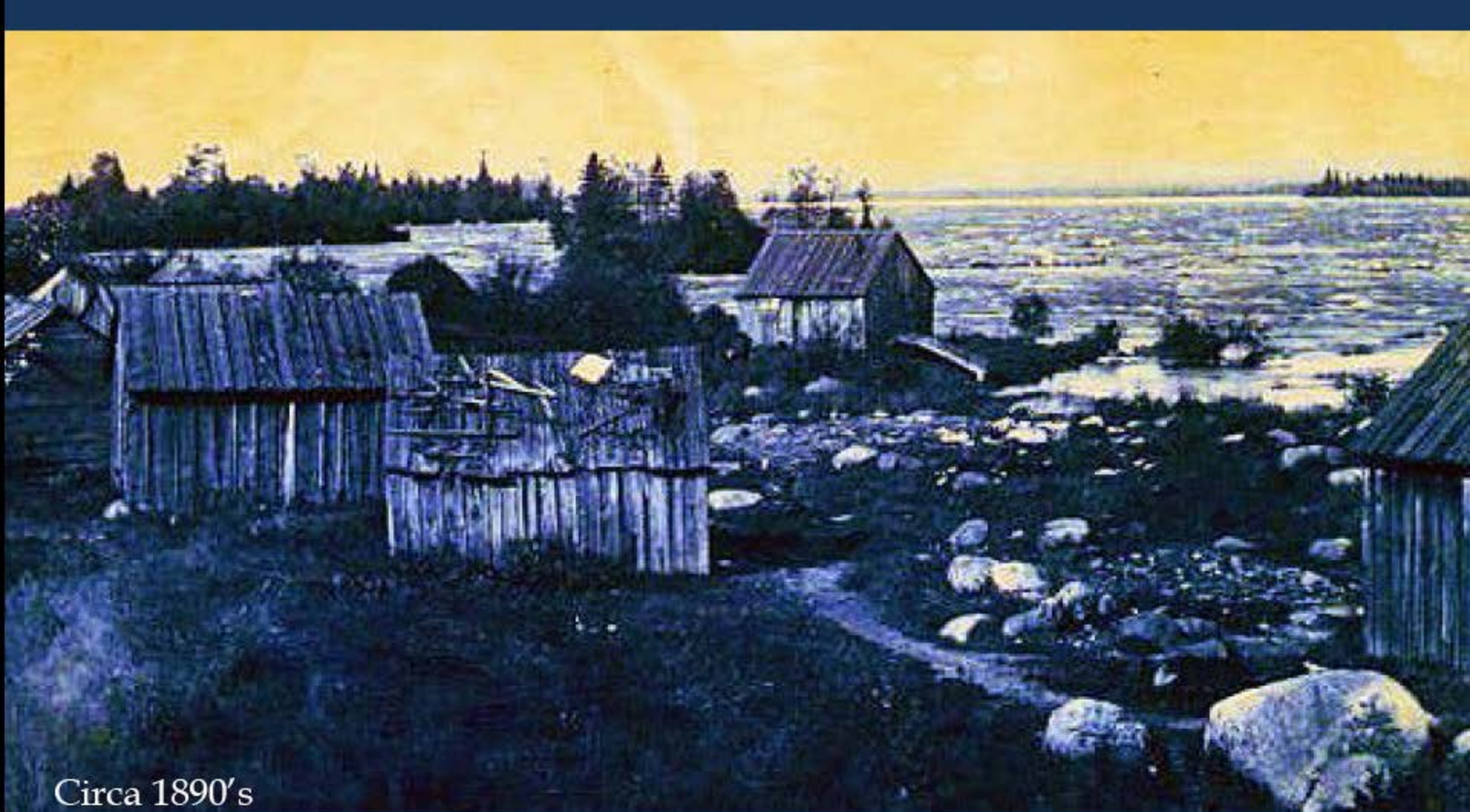




# St. Mary's River Little Rapids Habitat Restoration Project







Circa 1890's

**The Sault Area Rapids have been highly modified including: 1) total island removal, 2) development of hydroelectric plants, 3) locks and dredged channels for support of ship navigation, and 4) construction of the island causeway at Sugar Island and the Neebish Island cut.**



Native Americans netting whitefish in the famous Sault Rapids no longer exists as much of the rapids habitat was destroyed for shipping and commercial interests.

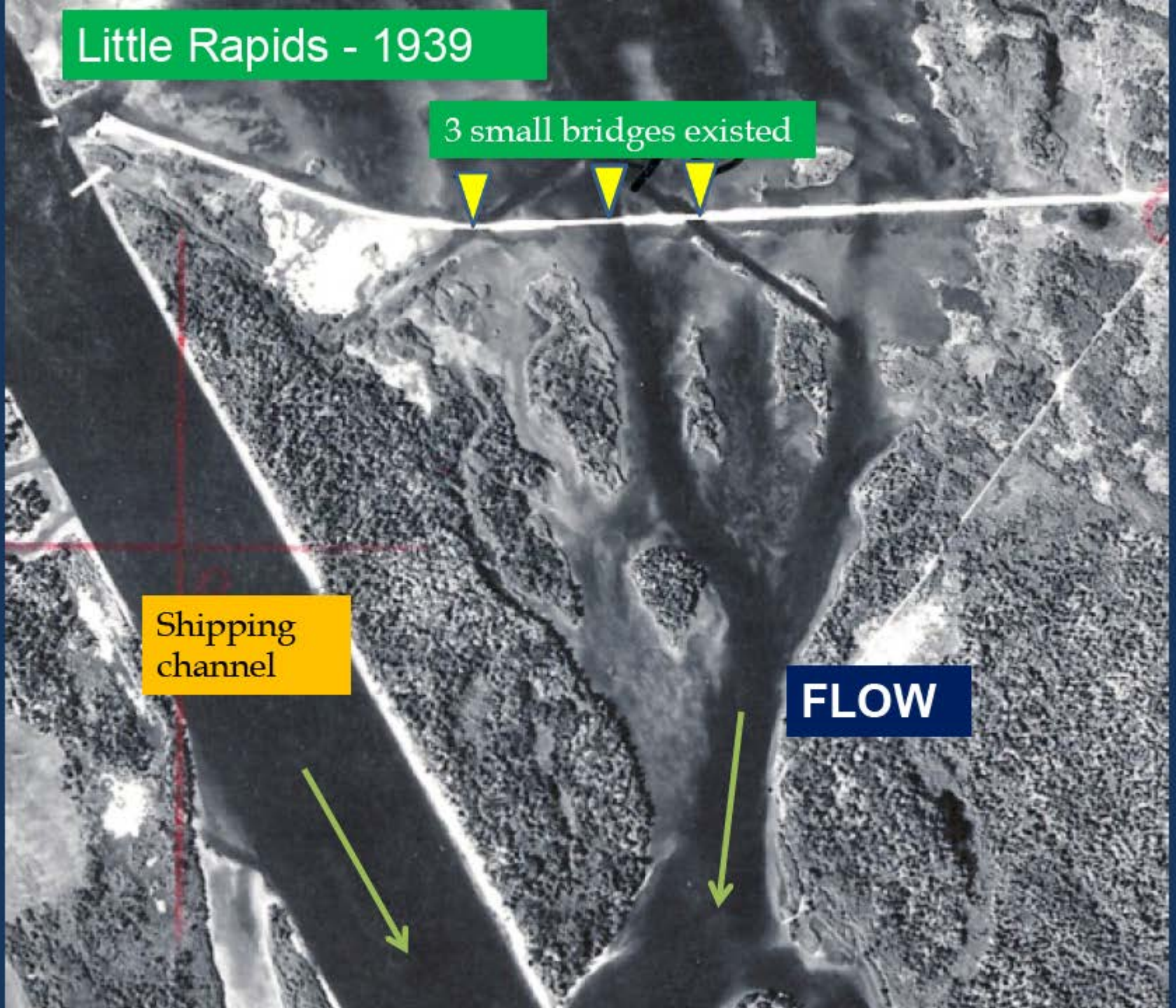


# Little Rapids - 1939

3 small bridges existed

Shipping  
channel

**FLOW**







Looking ***south*** east from the Sugar Island Causeway





Looking *north* east from the Sugar Island Causeway



# Primary project goal –Rehabilitation of St. Marys River Little Rapids



Lentic (still) water



Lotic (moving) water

# Expected Changes

- Stream velocity
- Flow
- Bottom Substrate changes in specific areas
- Fish community composition shift
- Increased seasonal use by new fish species
- Benthic organism composition shift and expansion







Current state – Silt may cover some of the better substrate south of the causeway





After restoration – Clean gravel for spawning and juvenile rearing expected



# Seasonal fisheries surveys proposed

- Determine species composition and fish abundance pre and post implementation





Numerous other studies have been proposed including :

- Aquatic insect surveys
- Sturgeon/walleye spawning and use
- Sea Lamprey use
- Recreational use using cameras
- Freshwater mussel





What about Great Lakes Shipping? A 2012/2013 flow study funded by NOAA indicates that restoring flows to the Little Rapids will not have any meaningful impact on Great Lakes Shipping under all flows conditions (Per Troy R. Naperalala /Senior Engineer/ URS 2013)



# Great Idea, How do we fund it?

- Project was first proposed by Soo area sportsmen's club in 1992.
- Co-operative feasibility study performed by the club, MDNR and funded by Edison Sault Electric Co.
- Found to be feasible but no viable funding sources were identified.
- Feasibility study lacks hydraulic modeling.



# Great Idea, How do we fund it?

- 2010 – Great Lakes Restoration Initiative is introduced
- 2011 – Soo area sportsmen, MDNR, MDEQ, LSSU, U.S. Fish and Wildlife, EUP Regional Planning Great Lakes Commission and others approach road commission and ask to apply for funds to complete hydraulic analysis, complete engineering design, and construct.
- Road Commission agrees, LSSU is first applicant

# Great Idea, How do we fund it?

- LSSU application is not selected, NOAA is interested, recommends re-application for only hydraulic modeling and engineering
- 2012 – EUP Regional Planning re-applies and grant for engineering work is awarded to URS Corp.
- 2013 – Great Lakes Commission applies for and is awarded construction grant - 6.1 mill
- 2013 – EUP Reg. Planning, LSSU, and Road Commission sign sub-recipient agreements with Great Lakes Commission

# Great Idea, How do we fund it?

- After agreements with sub-recipients 4.6 million left for construction
- Design-Build, Fixed Price-Variable Scope contracting method chosen. URS Corp.(now AECOM) prepares project documents and RFP for Road Commission
- 2014 – No completed proposals received, all contractors state project goals can not be met with available funds. Also state a need for additional geotechnical information.

# Great Idea, How do we fund it?

- 2014 – Great Lakes Commission approaches NOAA and requests additional funds for construction. 3.5 mill additional is approved.
- Winter 2014/2015 - Additional geotechnical drilling is accomplished and amended RFP is prepared
- Summer/ Fall 2015 – Payne and Dolan / Zenith Tech are chosen as design – builders
- Winter 2015/2016 – Design Phase, RFC plans by May

# Why is the Road Commission involved?



# Why is the Road Commission involved?

- Through Long-term use, Road Commission is owner of roadway
- U.S. Corps of Engineers is owner of adjacent bottomland
- U.S. Corps of Engineers, NOAA very interested in project
- Road Commission remains involved to maintain local input and control since we are ultimate owner and responsible for maintenance.
- Existing culverts (two 6' Dia.) are a safety hazard and should be replaced anyway

# Human Benefits





# Construction Difficulties

- Its ON an island, not TO an island!!! Delivery of all materials must pass across the deck of this boat. Max Length 114', Max weight is two Redi-mix trucks.





# Construction Difficulties

- There is no good source of aggregate on the island, all aggregates must be trucked to the site.
- License was received to haul waste stone from a Corps of Engineers property approx 20 miles south of site.



# Borrow site



# Aerial view of eventual bridge location

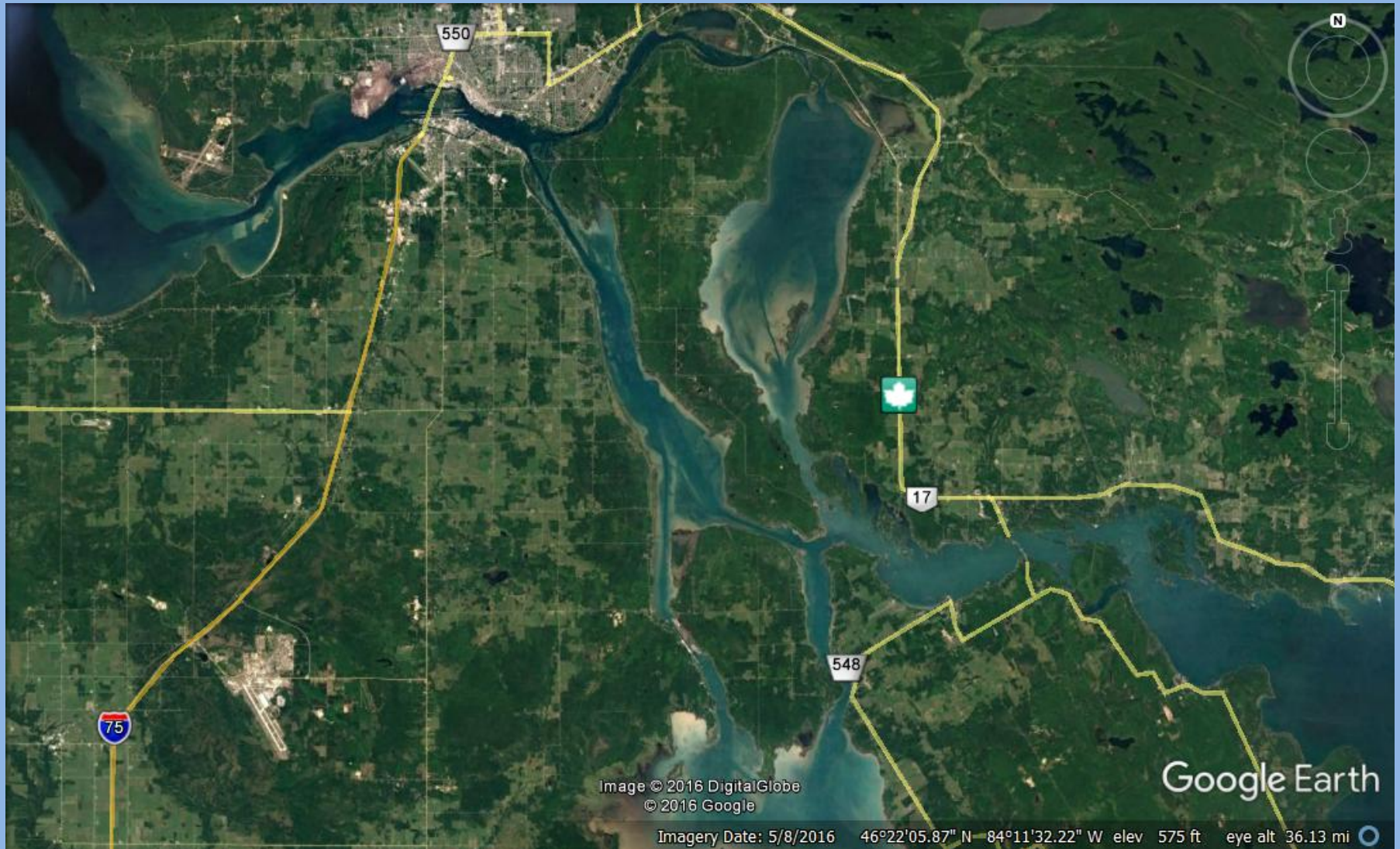


- Very little room for staging
- Must allow for two-way traffic
- O/H power needs relocate

- U/G phone needs relocate
- Very poor underlying soils



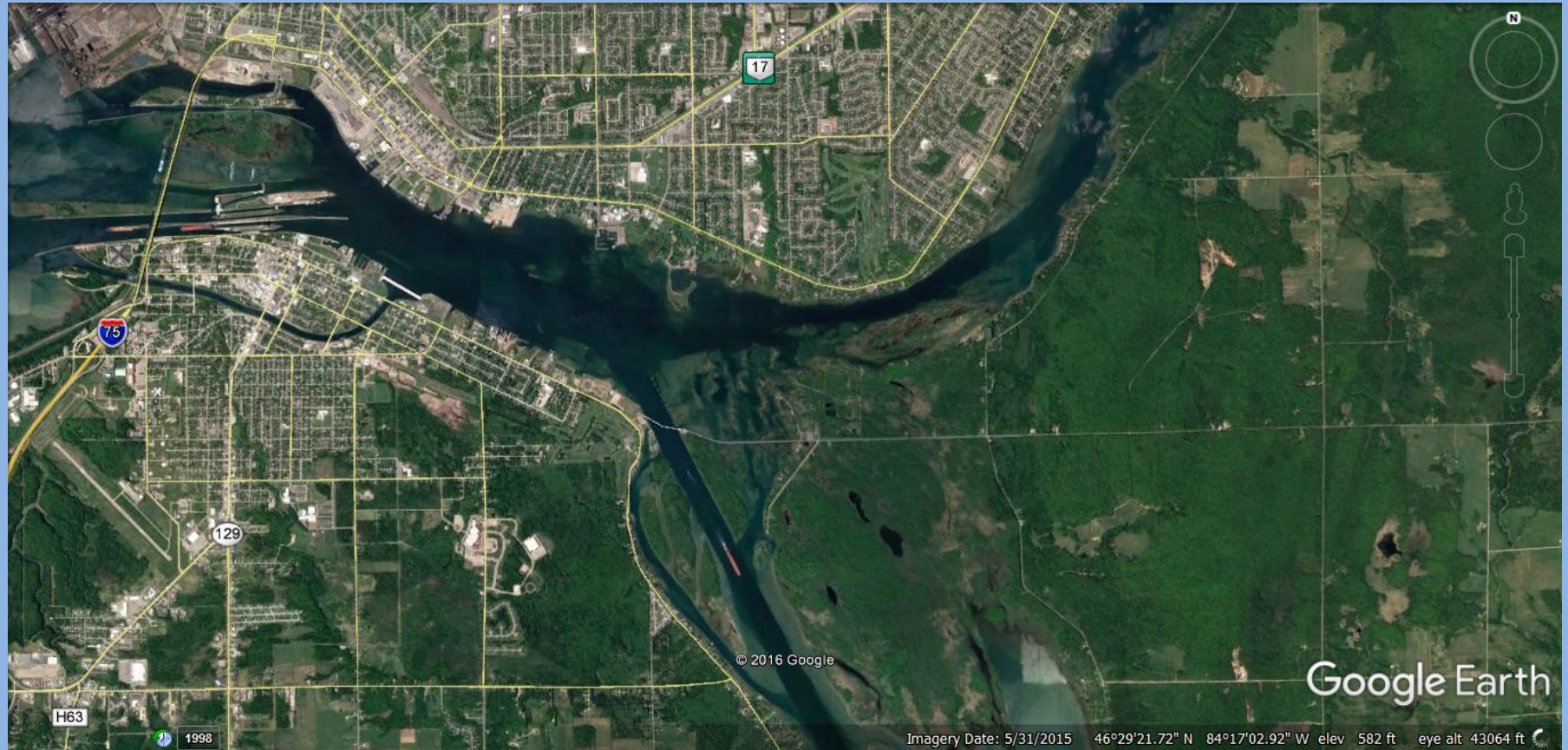
# Overview of the region



Approx 20 mile haul route on County owned roads



# Construction Difficulties





# Construction Difficulties



SHEET 1	COVER SHEET
SHEET 2	NOTES
SHEET 3-6	TYPICAL SECTIONS
SHEET 7-9	STATION DETAILS
SHEET 10	TEMPORARY EROSION CONTROL
SHEET 11	PERMANENT EROSION CONTROL
SHEET 12	ALIGNMENT DATA
SHEET 13	STAGE 1 REMOVALS
SHEET 14-15	TEMPORARY TRAFFIC ROAD PLAN AND PROFILE
SHEET 16-24	TEMPORARY TRAFFIC ROAD CROSS SECTIONS
SHEET 25	STAGE 2 REMOVALS
SHEET 26-27	CONSTRUCTION ROAD PLAN & PROFILE
SHEET 28-33	CONSTRUCTION ROAD CROSS SECTIONS
SHEET 34	CAUSEWAY REMOVAL BENEATH BRIDGE PLAN
SHEET 35-38	CAUSEWAY REMOVAL BENEATH BRIDGE CROSS SECTIONS
SHEET 39-40	FINISHED ROAD PLAN AND PROFILE
SHEET 41-49	FINISHED ROAD CROSS SECTIONS
SHEET 50	STAGE 3 REMOVALS
SHEET 51-60	TEMPORARY TRAFFIC ROAD REMOVAL CROSS SECTIONS
SHEET 61-62	CONSTRUCTING DETAILS
SHEET 63	FINISHED ROAD PAVEMENT MARKING AND SIGNAGE
SHEET 64-79	TRAFFIC CONTROL
SHEET 8-1	GENERAL PLAN OF STRUCTURE & PROFILE
SHEET 8-2	SECTIONS & DETAILS
SHEET 8-3	RURRAP DETAILS
SHEET 8-4	ABUTMENT A PLAN
SHEET 8-5-6	ABUTMENT A DETAILS
SHEET 8-7	ABUTMENT B PLAN
SHEET 8-8	ABUTMENT B DETAILS
SHEET 8-9	PIER 1 PLAN
SHEET 8-10	PIER 2 PLAN
SHEET 8-11	PIER 3 PLAN
SHEET 8-12	PIER 4 PLAN
SHEET 8-13	PIER DETAILS
SHEET 8-14	DIAPHRAGM DETAILS
SHEET 8-15	SLEEPER SLAB DETAILS
SHEET 8-16	BEARING PAD DETAILS
SHEET 8-17	BEAM DETAILS
SHEET 8-18	PRECAST BEAM DETAILS
SHEET 8-19	DECK PLAN
SHEET 8-20	DECK DETAILS
SHEET 8-21	PEDESTRIAN RAILING DETAILS
SHEET 8-22	BARRIER RAILING DETAILS
SHEET 8-23	DRAIN CASTINGS
SHEET 8-24	EXPANSION JOINT DETAILS
SHEET 8-25	GENERAL STEEL REINFORCING
SHEET 8-26	SCREED DETAILS

**POB**  
**BEGIN PROJECT**  
STA: 51+32  
N: 631,762.76  
E: 26,928.422.75

CHIPPEWA COUNTY, MICHIGAN  
SUGAR ISLAND TOWNSHIP  
T 47N, R 01E

A map of Michigan divided into counties. A line points from the text 'PROJECT LOCATION' to a shaded area in the central-eastern part of the state, specifically covering parts of Leelanau, Benzie, and Charlevoix counties.



PROJECT LOCATION MAP  
SCALE: NONE

POE  
END PROJECT  
STA: 76+75  
N: 631,808.23  
E: 26,930,957.94

### TITLE SHEET LEGEND

## PROJECT LOCATION

THE IMPROVEMENTS COVERED BY THESE PLANS SHALL BE DONE IN ACCORDANCE WITH THE MICHIGAN DEPARTMENT OF TRANSPORTATION 2012 STANDARD SPECIFICATIONS FOR CONSTRUCTION AND THE 2011 MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.

DESIGN SPEED 60 MPH  
AADT 2000-5000

Robert  
Laitinen,  
PS

Robert Laitinen, PS  
cn=Robert Laitinen, PS,  
o=Chippewa County Road  
Commission,  
ou=Superintendent /  
Manager,  
email=surveyor@sault.com,  
c=US  
2016.08.18 10:12:22 -0400

THE CLIENT AND/OR OTHER RECIPIENTS AGREE TO THE FULLEST EXTENT PERMITTED BY LAW TO INDEMNIFY AND HOLD PAYNE AND DOLAN HARMLESS FOR ANY REUSE OF OR FROM CHANGES MADE TO THE ORIGINAL DRAWING OR DATA WITHOUT PRIOR WRITTEN CONSENT BY PAYNE AND DOLAN.



PAYNE & DOLAN  
INCORPORATED



LITTLE RAPIDS  
HABITAT  
RESTORATION  
1 1/2 MILE ROAD

SUGAR ISLAND  
CHIPPEWA COUNTY  
MICHIGAN

RFC ROADWAY  
PLANS

ADMINISTRATION	
DATE:	05/02/2016
ENGINEER:	BT
DRAWN BY:	SP
CHECKED BY:	BT
SCALE:	NT

[illegible]



Project

Document Search

🔍

📁 Contract Documents

RFP w/ Addendums

Technical Proposal

Addendums

Document Control

NTP

📁 Design

👤 Design Submittal Tracking

👤 Design RFI Tracking

✉ Design Submittal Discussi

✉ Design RFI Discussion

📁 RFC Documents

📁 Meeting Minutes

📁 Construction

👤 **Construction Submittal**

👤 Construction RFI Tracking

✉ Construction Submittal Di

✉ Construction RFI Discussi

📁 Change Orders

📁 Work Orders

📁 Meeting Minutes

📁 Reference Information Docu

📅 Calendar

👤 Directory

🏷 Tag Cloud

Construction > Construction Submittal Tracking

➕ New

🖨

🔔 Subscribe

Filter:

🔍

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Originator	Assigned To	In Court	Subject	Related RFP Section Number	Submittal Type	Submitted On	Due Date	Status	Closed on
Brucker, Jake	Helmstetter, Dave	Brucker, Jake	Substantial Completion	02 - Project Management	General	11/11/2016	11/18/2016	Answered (23)	
TenHaken, Amy	Helmstetter, Dave		Progress Report #9 + certified	02 - Project Management	General	11/08/2016	11/15/2016	Closed	12/07/2016
TenHaken, Amy	Helmstetter, Dave		Pay Application #9	02 - Project Management	Invoice	11/08/2016	11/15/2016	Closed	12/07/2016
VanDorn, Tom	Helmstetter, Dave		Punch List as of 11/7/16	02 - Project Management	General	11/08/2016	11/15/2016	Closed	12/08/2016
VanDorn, Tom	Helmstetter, Dave		Punch List as of 10/20/16	02 - Project Management	General	10/20/2016	10/27/2016	Closed	12/08/2016
Solwold, John	Helmstetter, Dave	Solwold, John	Deck 7 Day Break Results	13 - Structures	General	10/20/2016	10/27/2016	Answered (13)	
TenHaken, Amy	Helmstetter, Dave		Progress Report #8 + certified	02 - Project Management	General	10/10/2016	10/17/2016	Closed	11/08/2016
TenHaken, Amy	Helmstetter, Dave		Pay Application #8	02 - Project Management	Invoice	10/10/2016	10/17/2016	Closed	11/08/2016
Solwold, John	Helmstetter, Dave	Solwold, John	Upcoming Strength Requirements	13 - Structures	General	10/06/2016	10/13/2016	Answered	
Brucker, Jake	Helmstetter, Dave	Brucker, Jake	Temporary Road Removal Plan	04 - Environmental Compliance	General	10/05/2016	10/12/2016	Answered	

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# Construction Begins

- May 09 2016 – Construction commences



# Turbidity Curtains





# Temporary Roadway



# Temporary Roadway





# Construction Access Roadway



# Construction Access Roadway





# Buried Treasure



# Equipment and Materials Arriving





# Pile Driving begins



# Pile Driving continues





# Pile Driving continues





# Work Force Changes





# Friday Jobsite Visitor



# Foundation work continues





# Stripping Forms



# Foundation Complete 08/31/2016





# Loading Girders



# Safety Meeting before Girder set

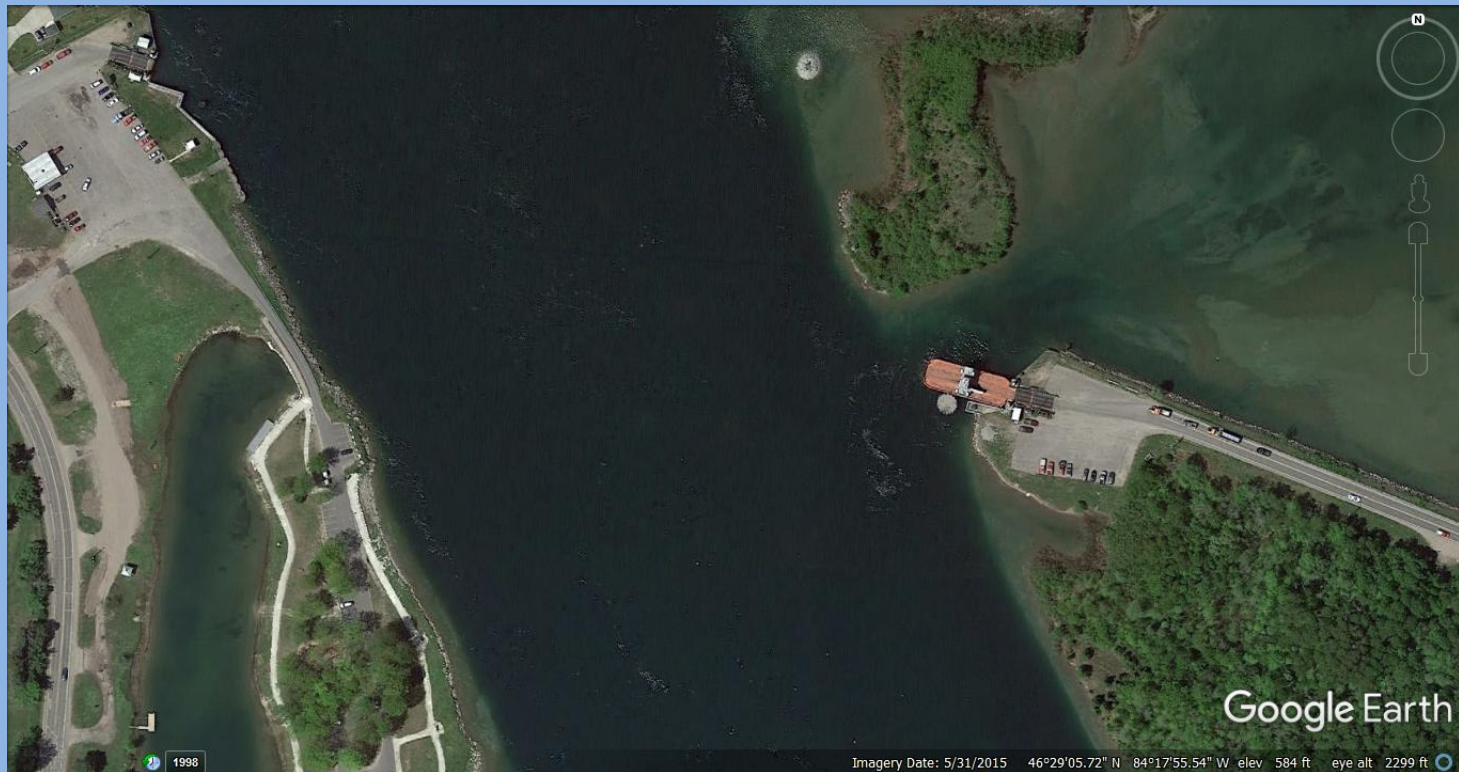




# Girders Arrive



# Girders Arrive





# Girders Arrive



# Girders Arrive

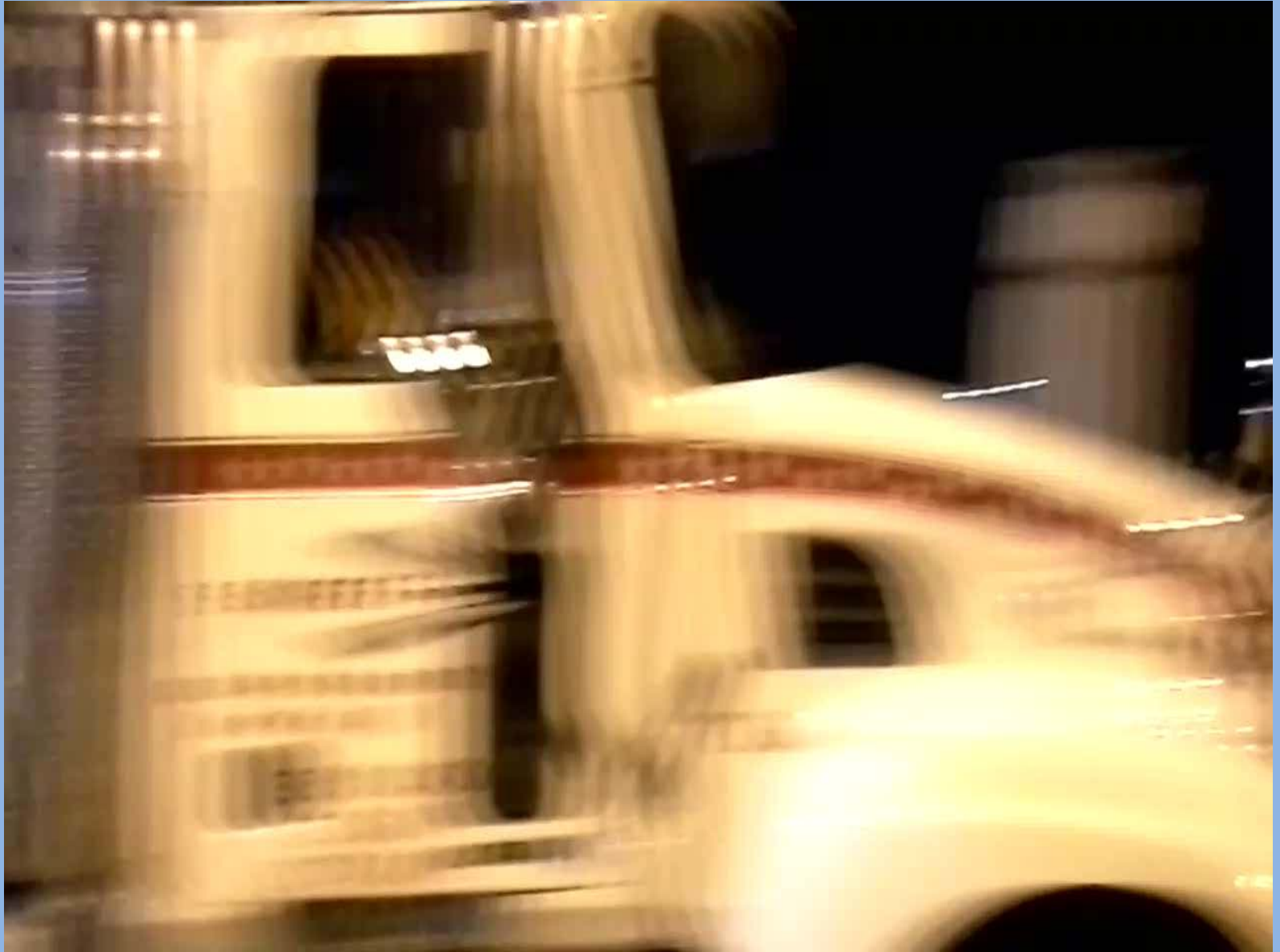




# Girders Arrive



First to unload





# First to unload



# First Set





# More Girders



# More Girders





# More Girders



# Girder Set Complete





# Girder Set Complete 09/02/2016

## 7:25 AM





# Begin Formwork 09/03/2016





# Continue Formwork



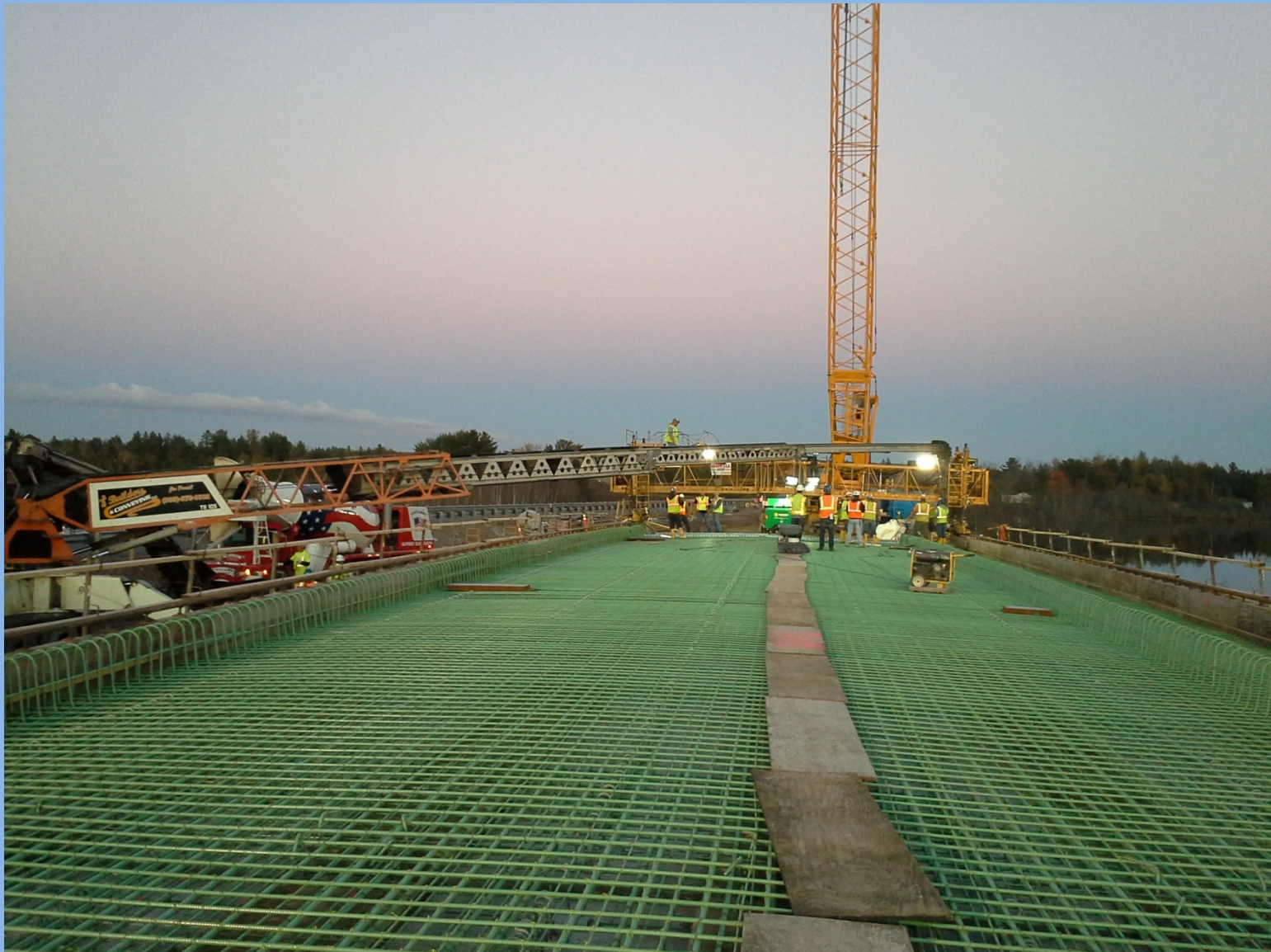


# Ready to pour





# Ready to Pour



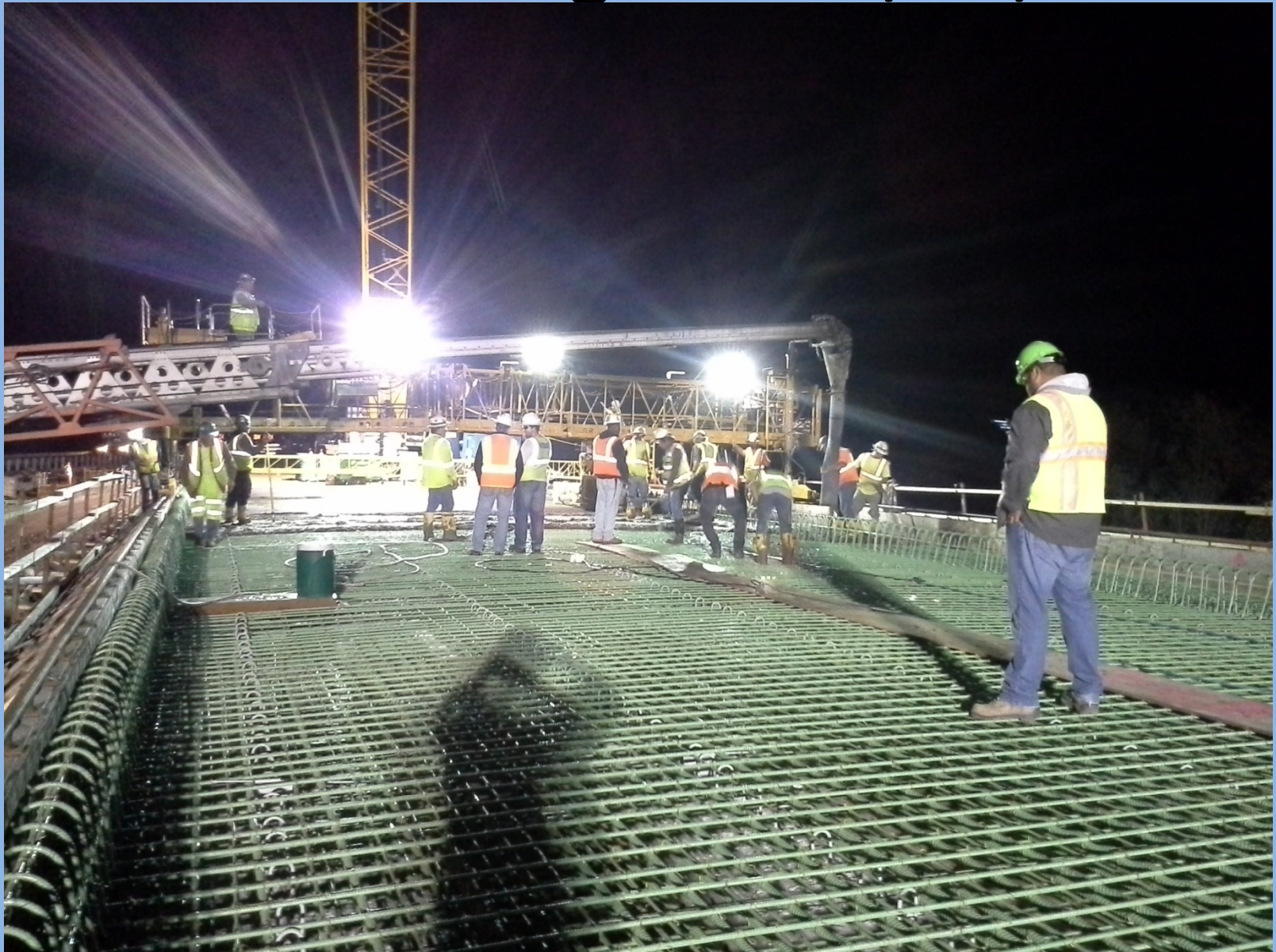


# Another All Nighter 10/03/2016





# Another All Nighter 10/03/2016





# Another All Nighter 10/03/2016





# Deck Pour Complete 10/04/2016

## 6:55 AM



# Curing deck and Forming Parapets





# Bridge Nearing Completion



# Bridge Nearing Completion





# Bridge Nearing Completion



# Bridge is complete





Open to Traffic 10/21/2016 11:30 AM



# Remove Temp Road





# Remove Temp Road



# Remove Temp Road





# Remove Temp Road Complete

## 11/02/2016



Build it and they will come.....





# Timelapse of construction

