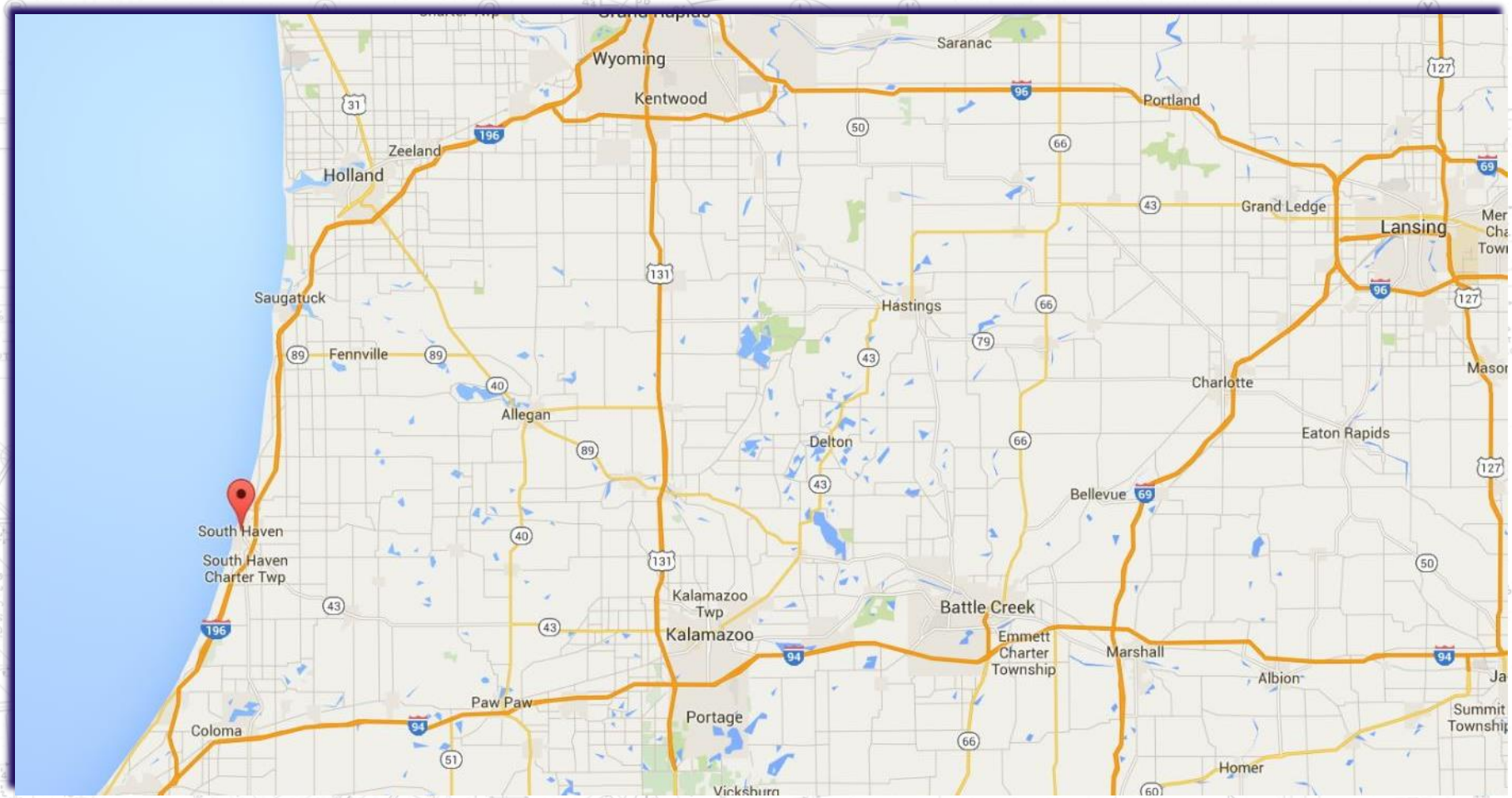
Dyckman Avenue over Black River: A Movable Bridge Rehabilitation

South Haven, Michigan

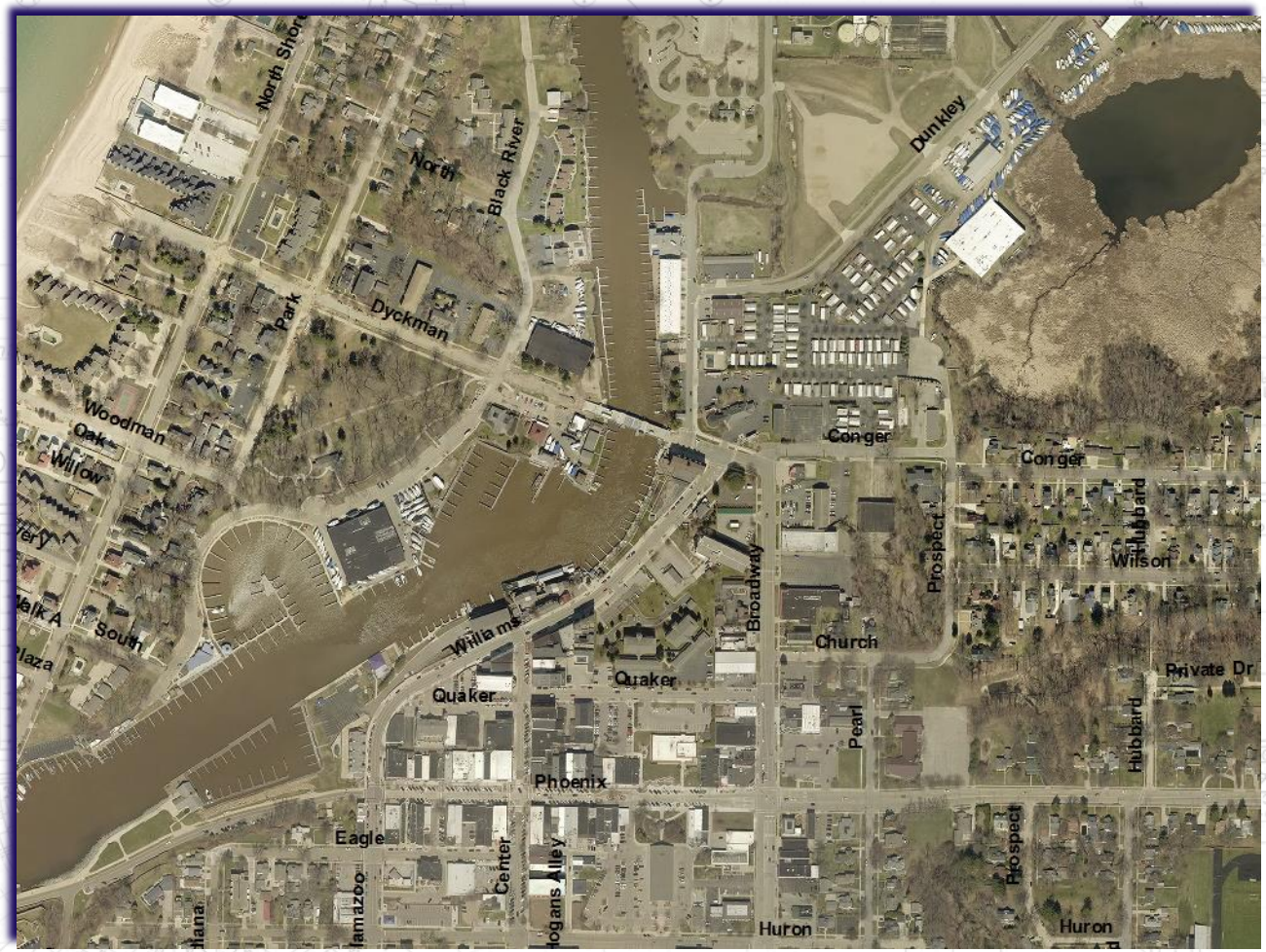
Summary of Presentation

- Project Location
- History
- Condition Assessment
- Funding
- Design
- Construction
- Acknowledgements
- Questions



Location of South Haven, Michigan

Project Location



Location of Dyckman Ave Bridge

Project Location

History

- Four Movable Bridges at Dyckman Avenue crossing of the Black River

- First Bridge constructed in 1856
- Construction cost was $1,120
- Timber drawbridge

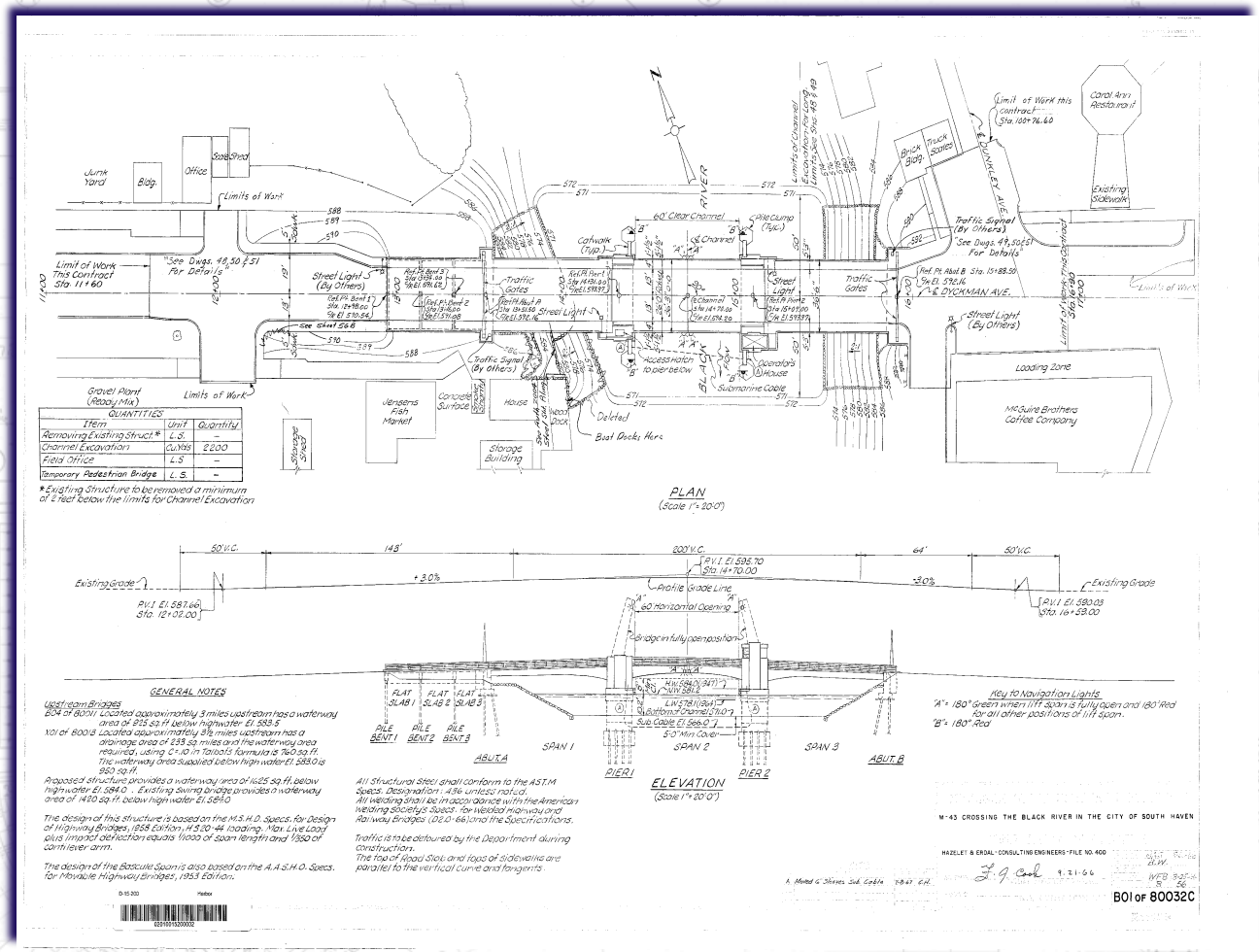
- Second Bridge constructed in 1877
- Timber drawbridge

History

- Third Bridge constructed in 1890
- Steel through Truss Swing Bridge
- In service for 78 years

History

- Current Bridge constructed in 1967-68
- Designed by State Highway Department
- Cost of Construction was $782,157
- Double Bascule Span
- Hydraulic Cylinders as Prime Mover



General Plan of Structure

History

Approach Span Construction

History

Bascule Span Installation

History

Condition Assessment

- Identify Scope of Rehabilitation Needs
- Review 1993 Repairs
- Work Started in 2007
- Efforts Continued through 2010

Concrete Deck

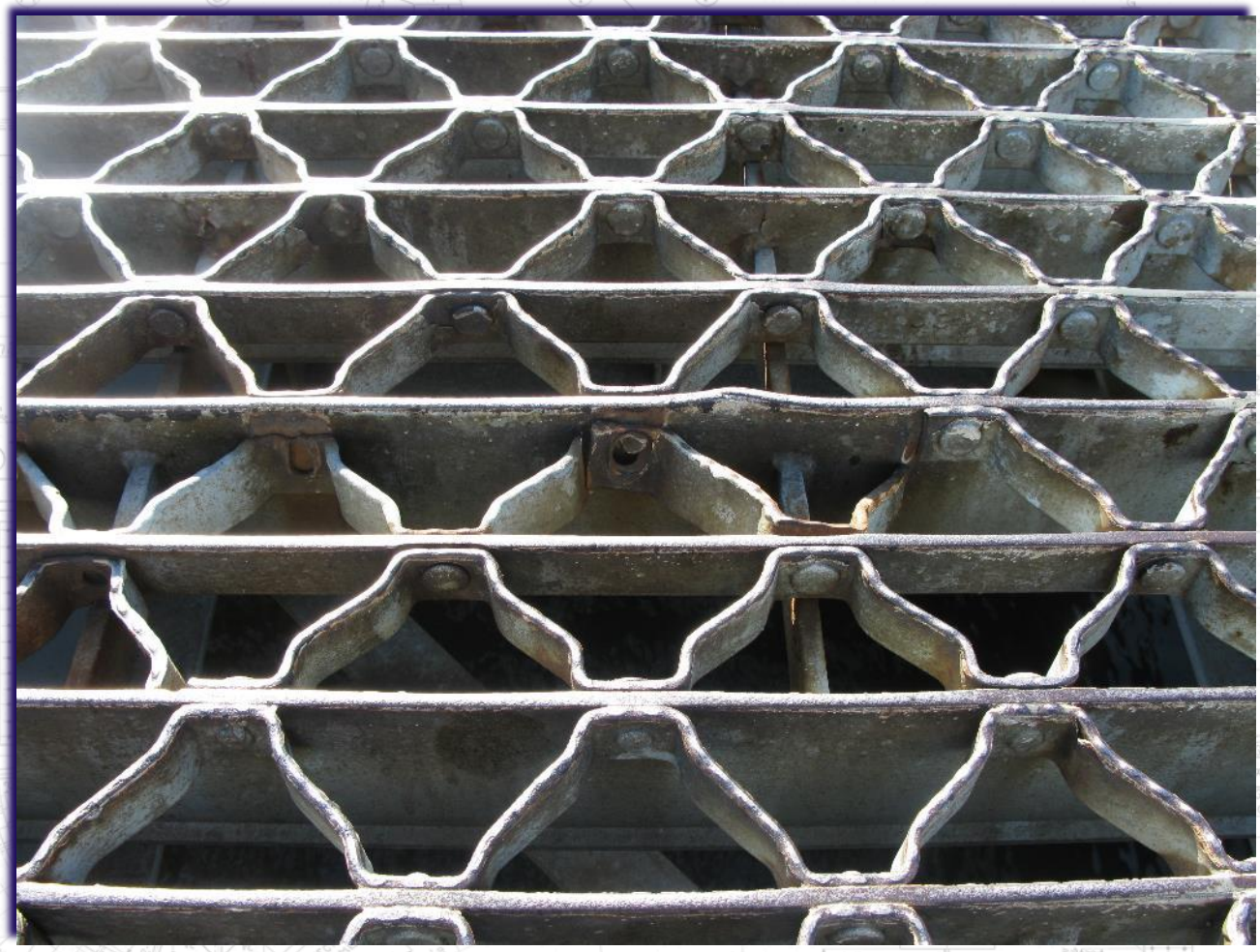
Condition Assessment

Traffic Gate Operator

Condition Assessment

Bascule Span Sidewalk

Condition Assessment



Bascule Span Deck Grating

Condition Assessment

Floor Beams

Condition Assessment

Main Cylinder

Condition Assessment

Brake Cylinder

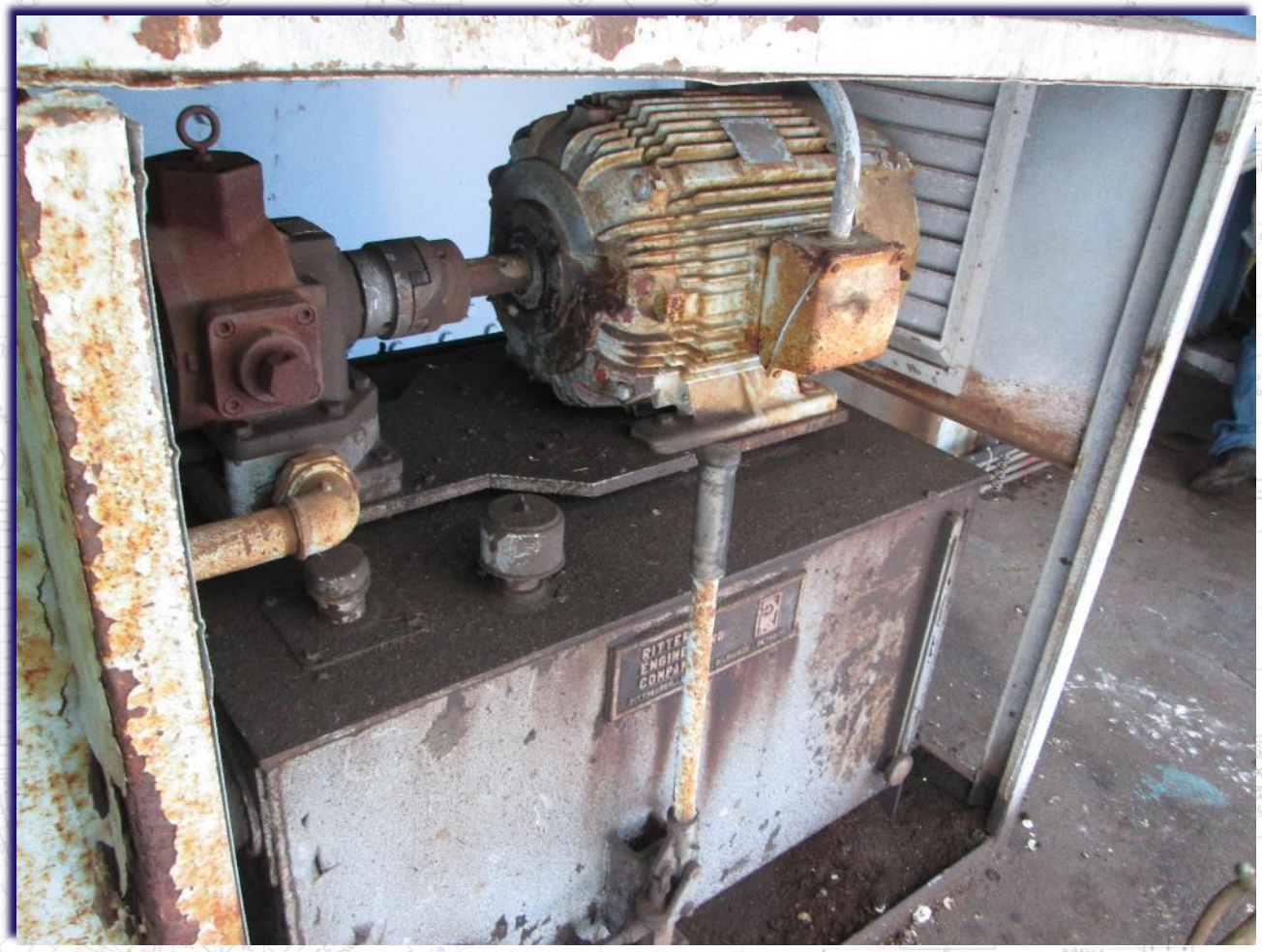
Condition Assessment

Position Sensor

Condition Assessment

Tail Bearing

Condition Assessment



Hydraulic Power Unit

Condition Assessment

Hydraulic Controls

Condition Assessment

Hydraulic Control Tubing

Condition Assessment

Submarine Cables

Condition Assessment

Condition Assessment

- Concrete Deck Overlay
- Riveted Steel Grid Deck and Floor Beams
- Non-skid Steel Plate Sidewalks
- Submarine Cables
- Hydraulic Cylinders, Power Units, and Controls
- Scour Countermeasures
- Shimming and Balancing

Funding

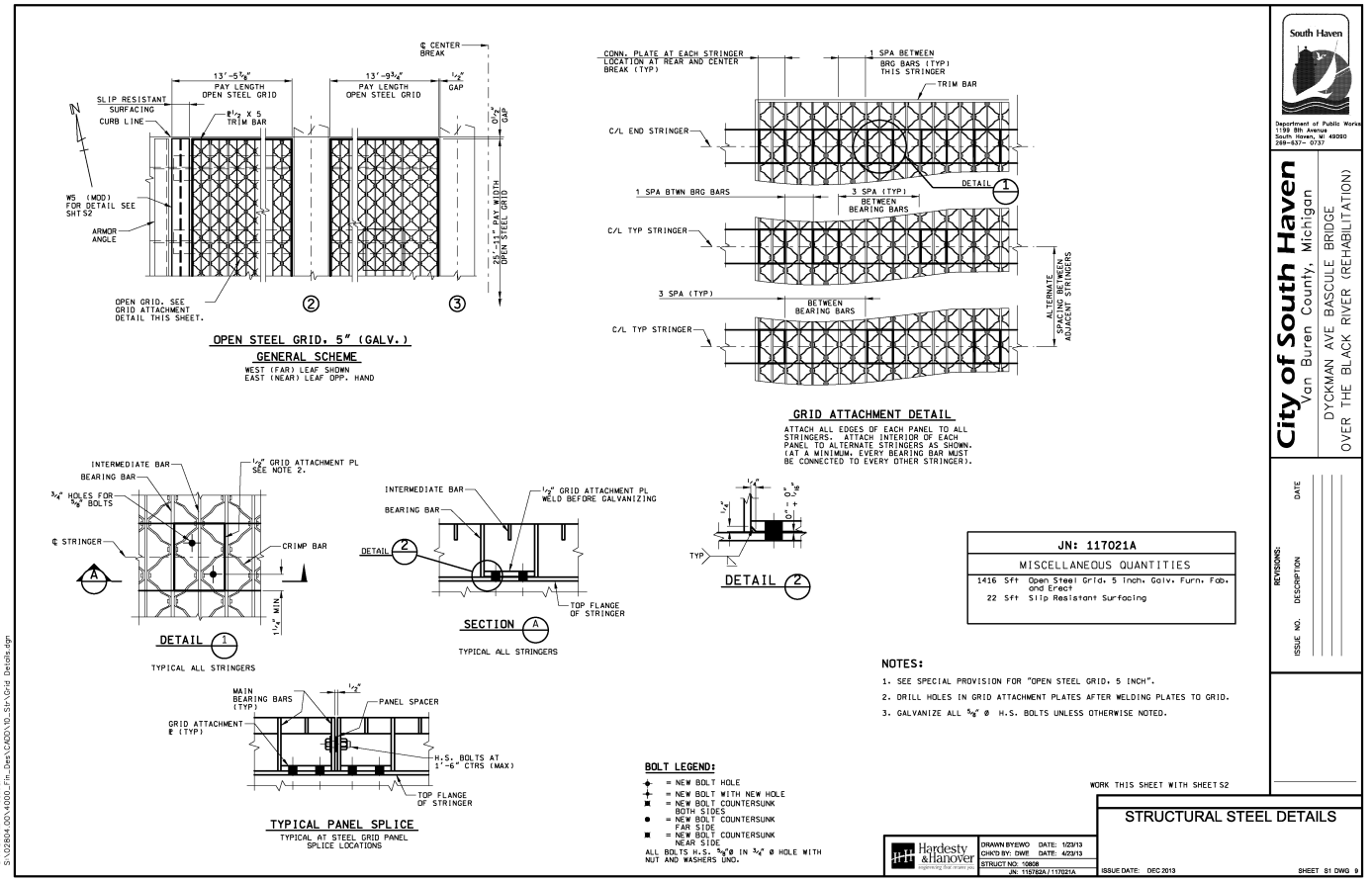
- Local Bridge Program Application Submitted in 2009, 2010, and 2011
- Regional Bridge Council Commitment
- Movable Bridges considered Major Structures
- Selected for Funding in 2014 FY

Funding

- Total Construction Cost - $2,498,500
- Local Bridge Program - $1,573,200
- Small Urban Program - $375,000
- Local Funding - $550,300
- Engineering Fees - $607,500

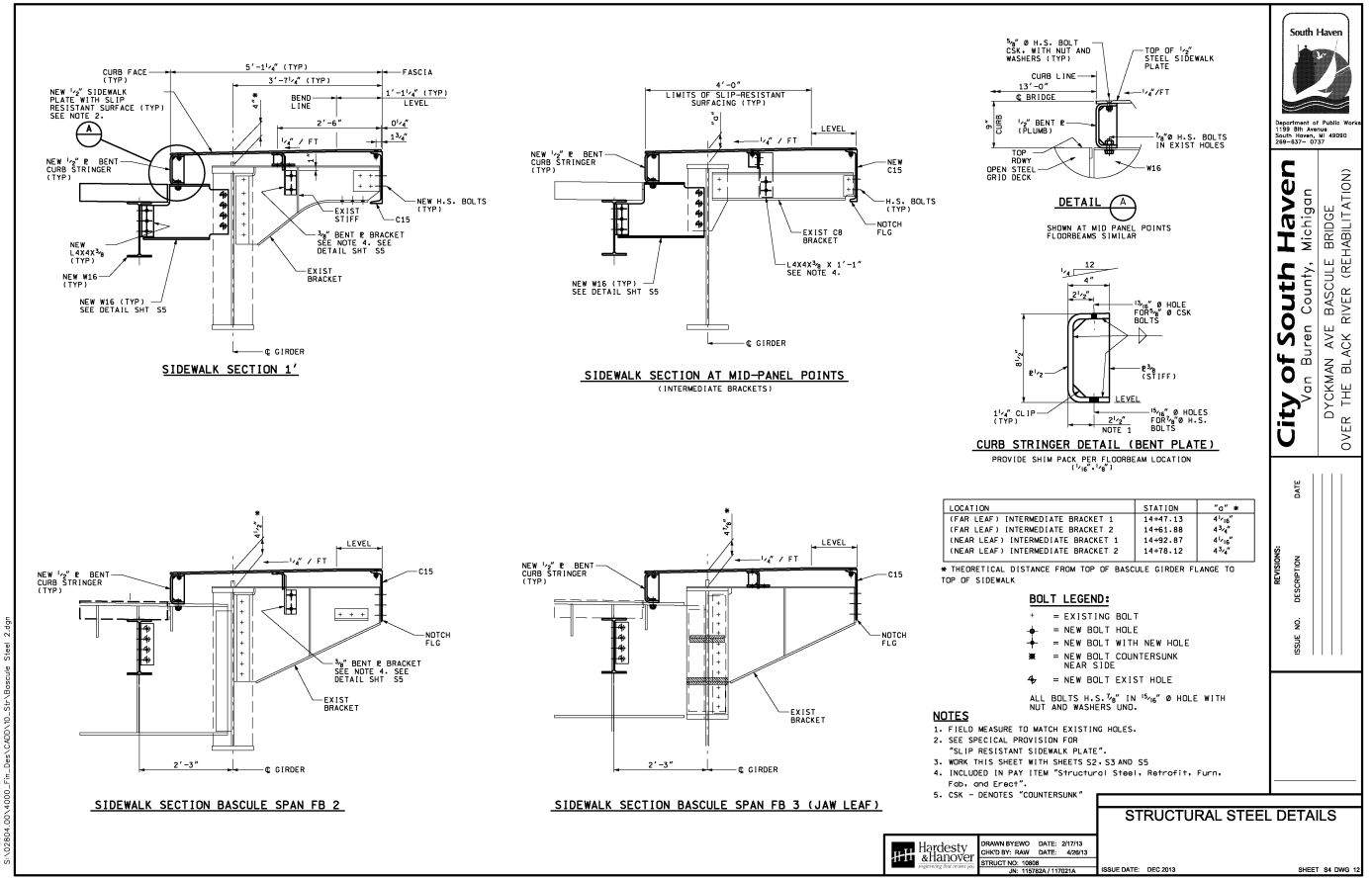
Design Phase

- Great Lakes Engineering Group, LLC – Underwater Inspection/Scour Mitigation
- Hardesty & Hanover – Structural, Mechanical & Electrical Engineering
- City Staff – Traffic Control Plan
- Spicer Group – Construction Observation & Administration



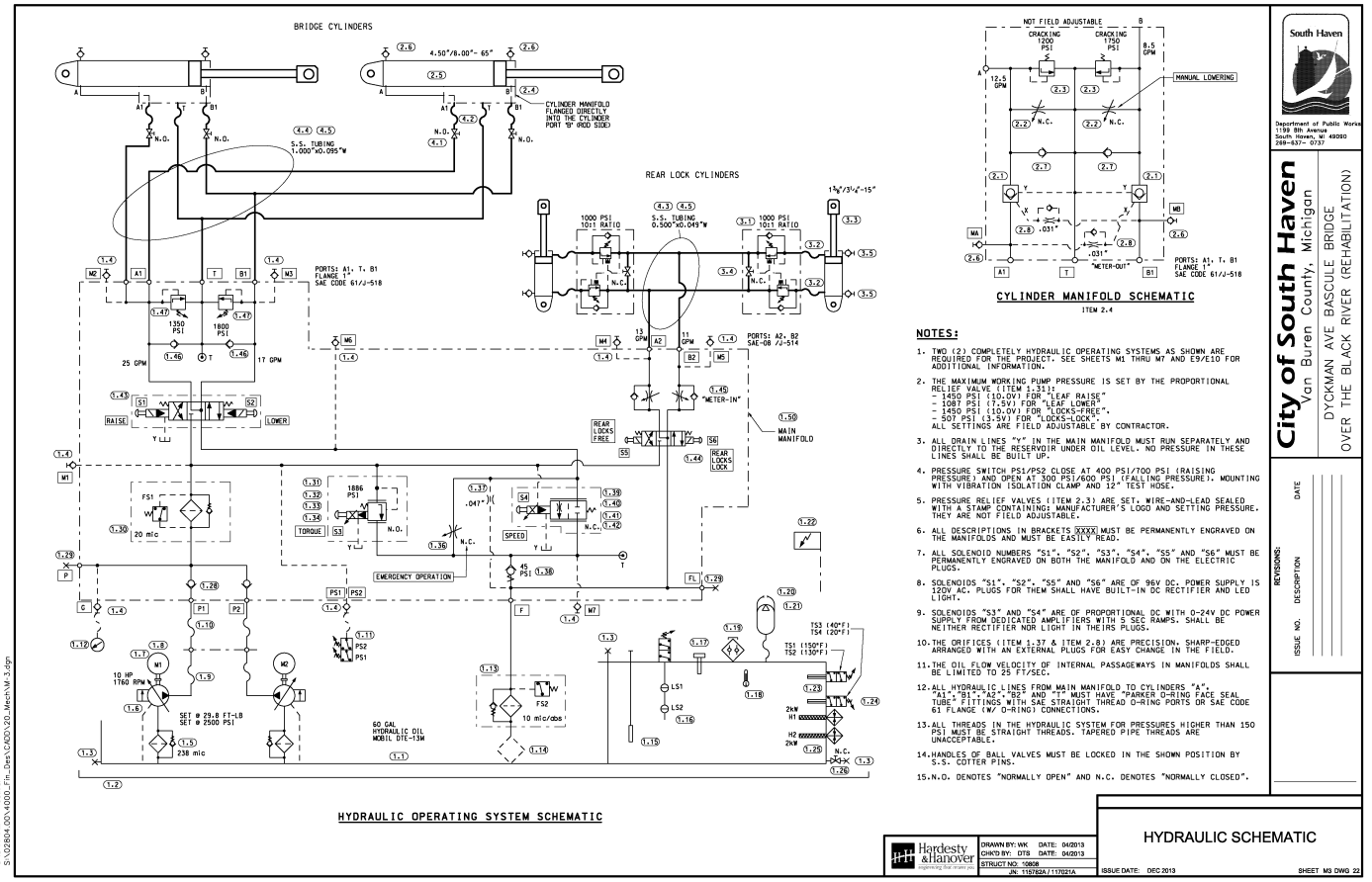
Open Steel Grid Decking

Design Phase



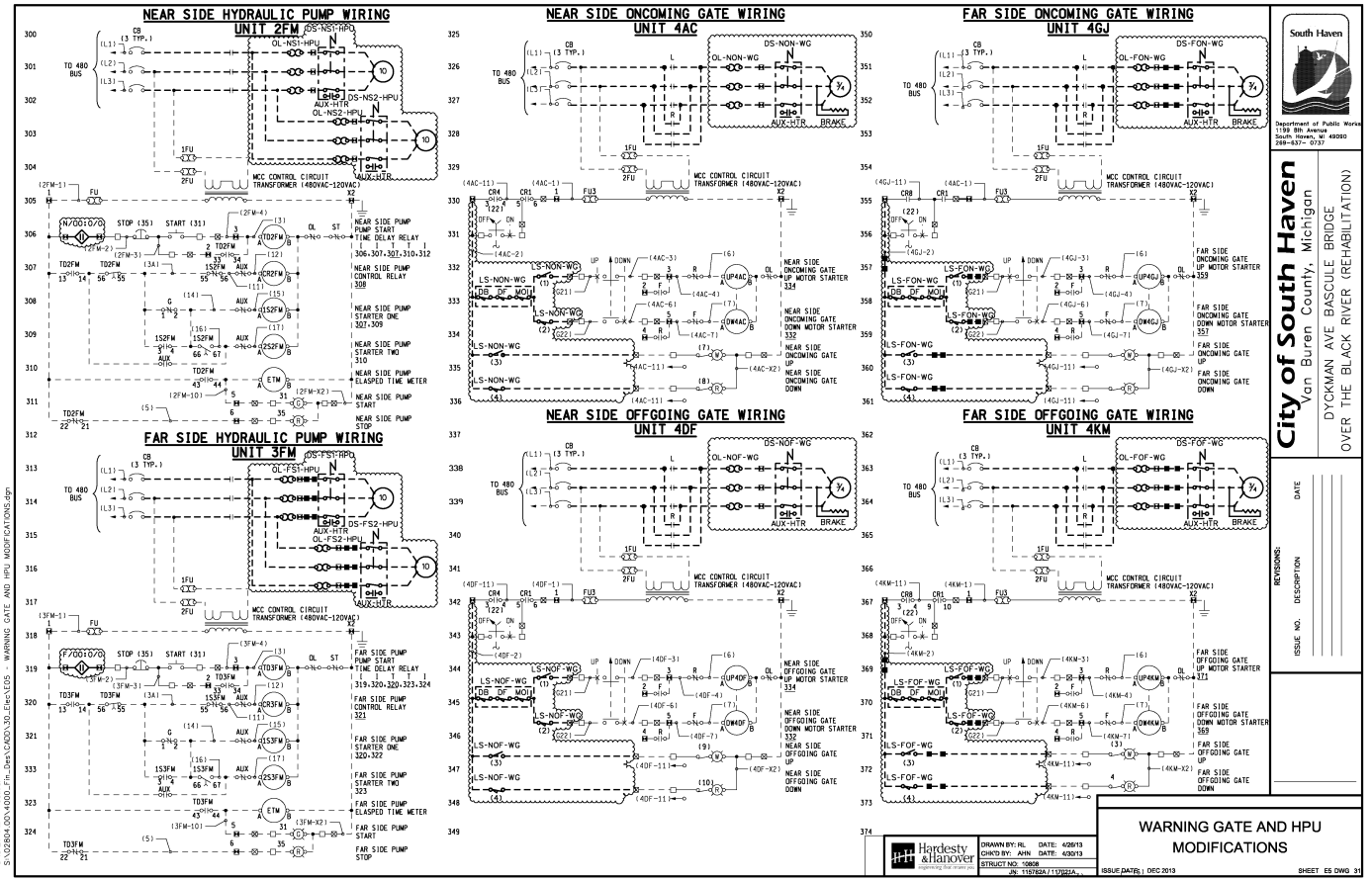
Non-skid Steel Plate Sidewalks

Design Phase



Hydraulic Schematic

Design Phase



Electric Schematic

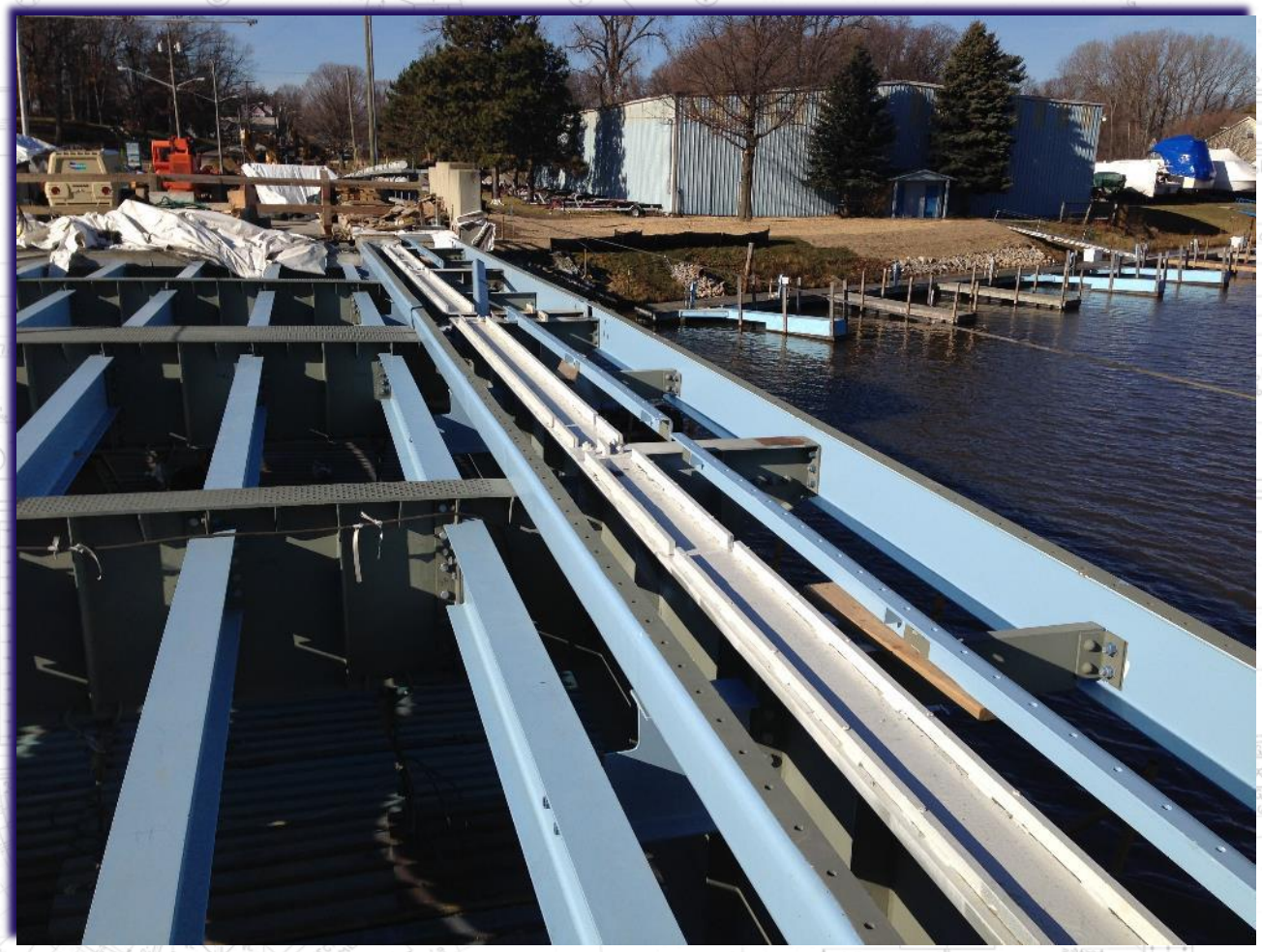
Design Phase

Construction Phase

- 2014-15 Winter Construction
- Construction started October 13, 2014
- Completion date of April 30, 2015
- Long Lead Time Items: Hydraulic Cylinders and Open Steel Grid Decking

Deck Removals

Construction Phase

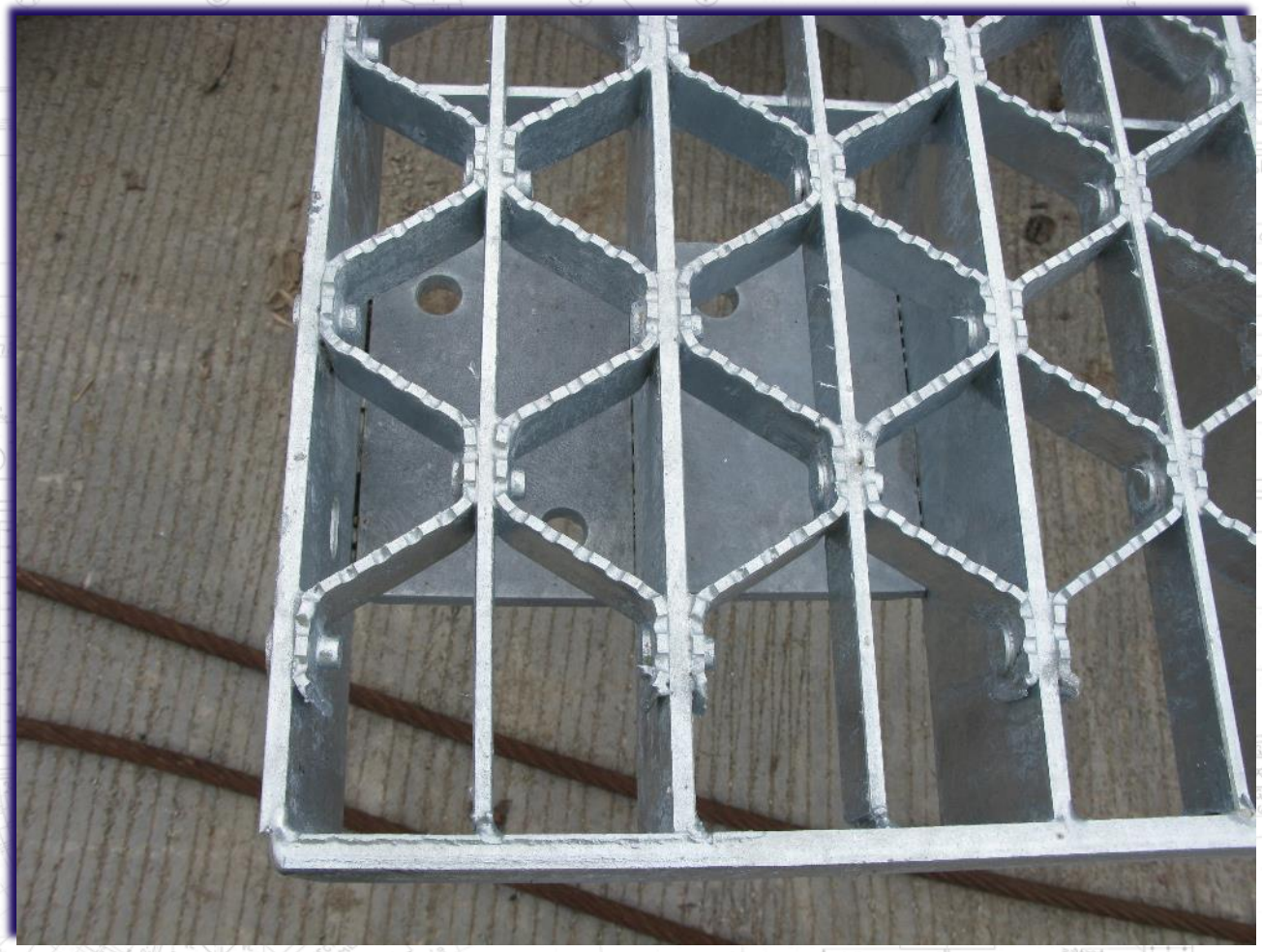


New Floor Beams

Construction Phase

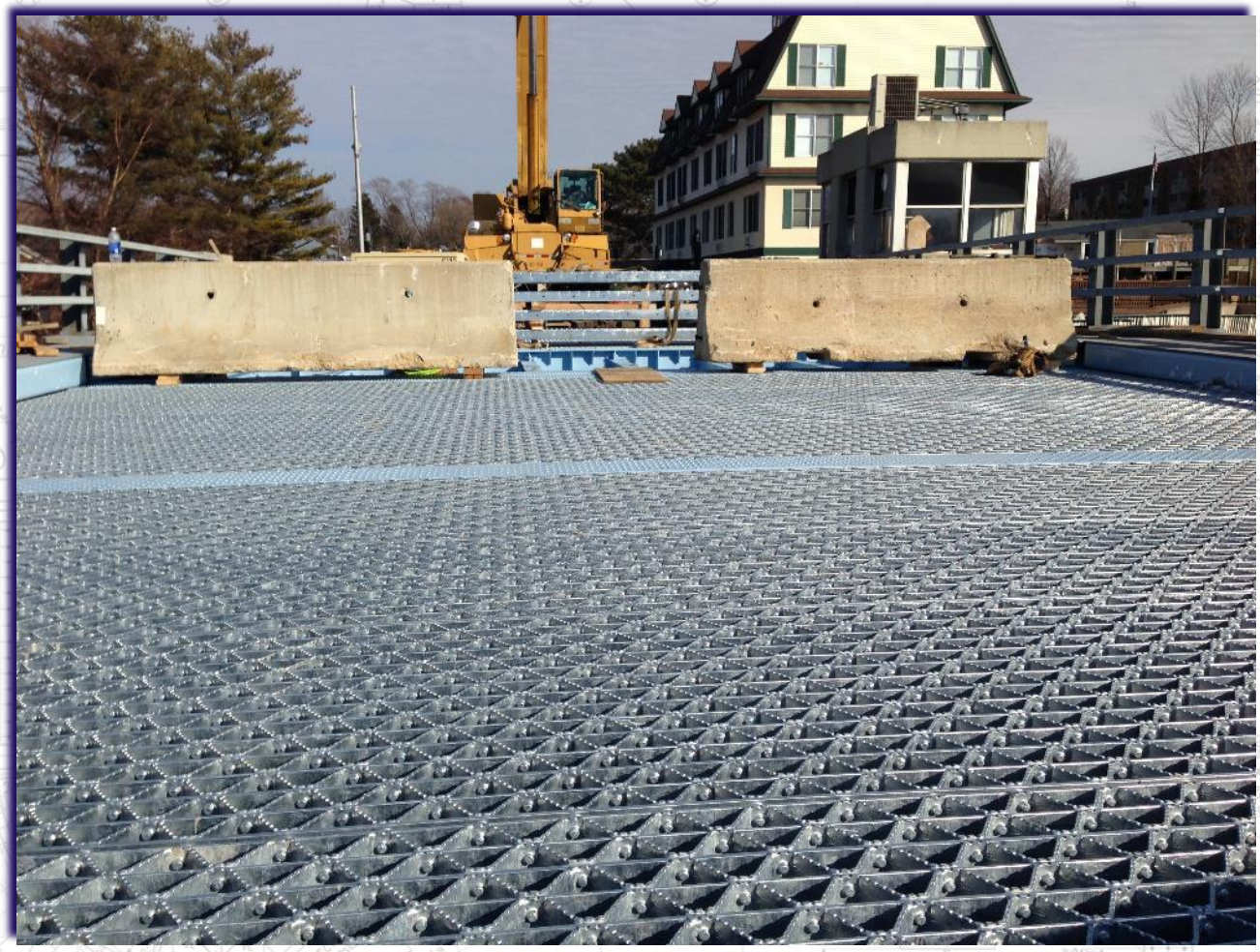
Steel Curb Beam

Construction Phase



Open Steel Deck Grid

Construction Phase



Open Steel Grid Deck

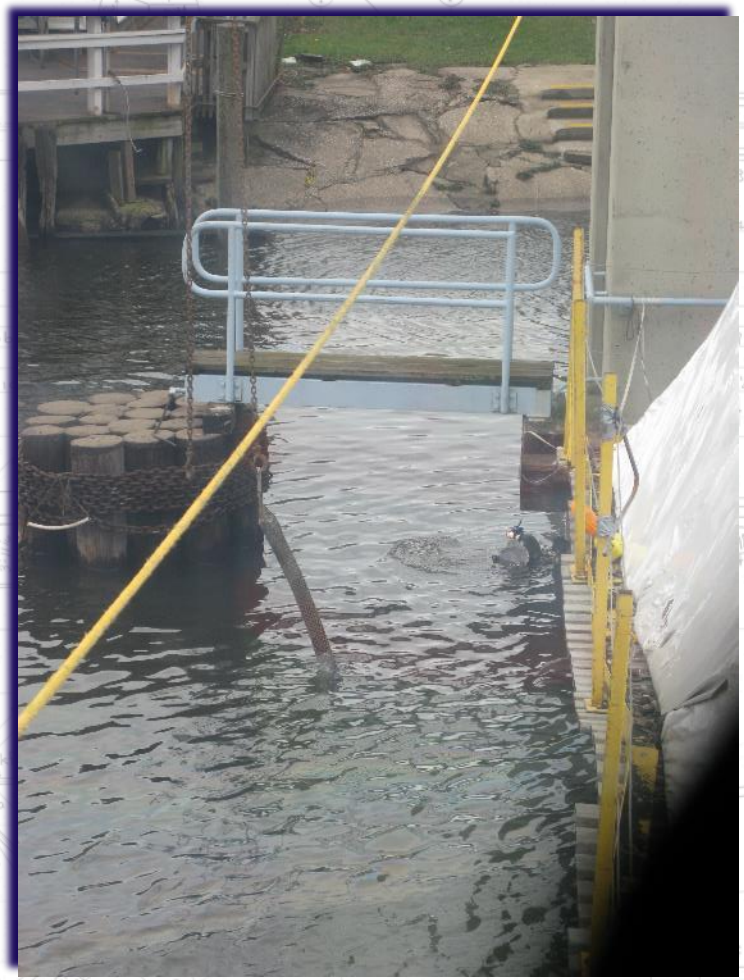
Construction Phase

Non-skid Steel Plate Sidewalks

Construction Phase

Submarine Cable

Construction Phase



Submarine Cable

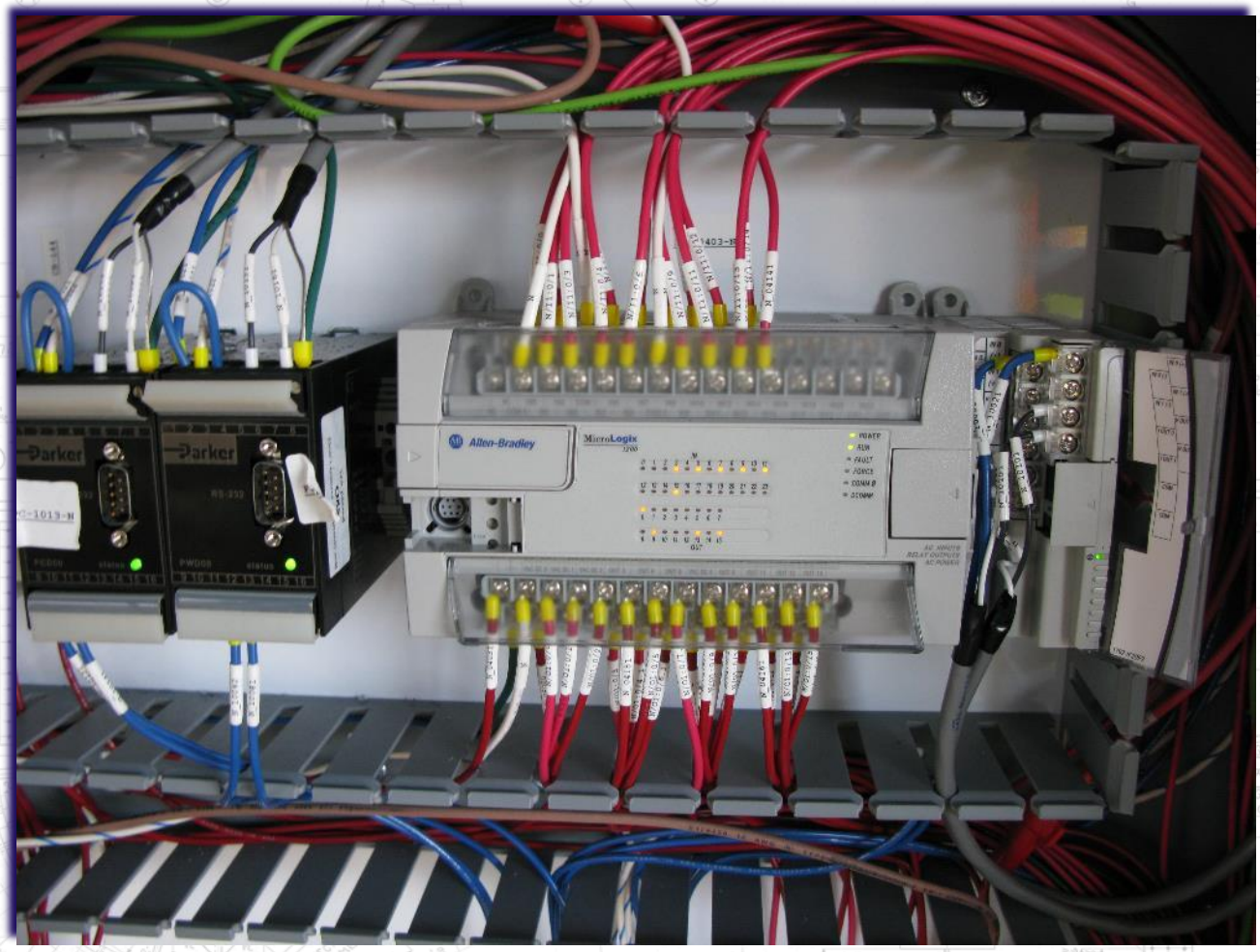
Construction Phase

Hydraulic Power Unit

Construction Phase

Hydraulic Control Valves

Construction Phase



Programmable Logic Controller

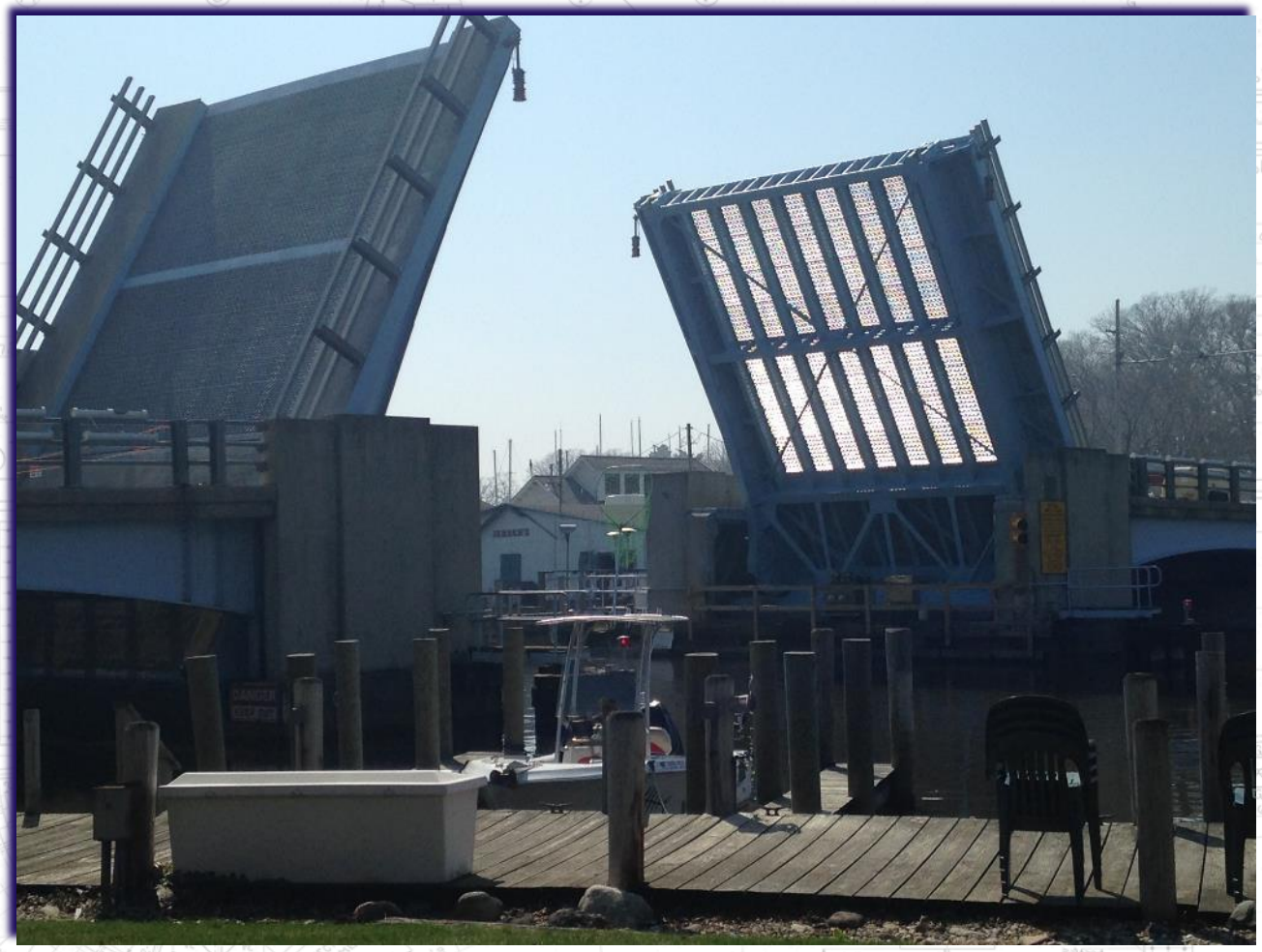
Construction Phase

Main Hydraulic Cylinder

Construction Phase

Tail Lock Cylinder

Construction Phase



Construction Phase

Video of Opening

Construction Phase

Acknowledgements

- MDOT Staff
- RBC and LBAB Volunteers
- Consultants
- Contractor (Anlaan Corporation)
- Citizens of South Haven

Questions