# County of Bruce
## Class EA for Replacement of the Teeswater River Bridge

Virtual Public Meeting

May 18, 2021

# Agenda

- Project Background
- Schedule ‘C’ Class EA Process
- Hydrological Assessment
- Preliminary Preferred Detour Route
- Bridge Design Alternatives
- Proposed Timelines
- Next Steps

45.0°N 81.3°W
BRUCE county

BMROSS
engineering better communities

# Teeswater River Bridge

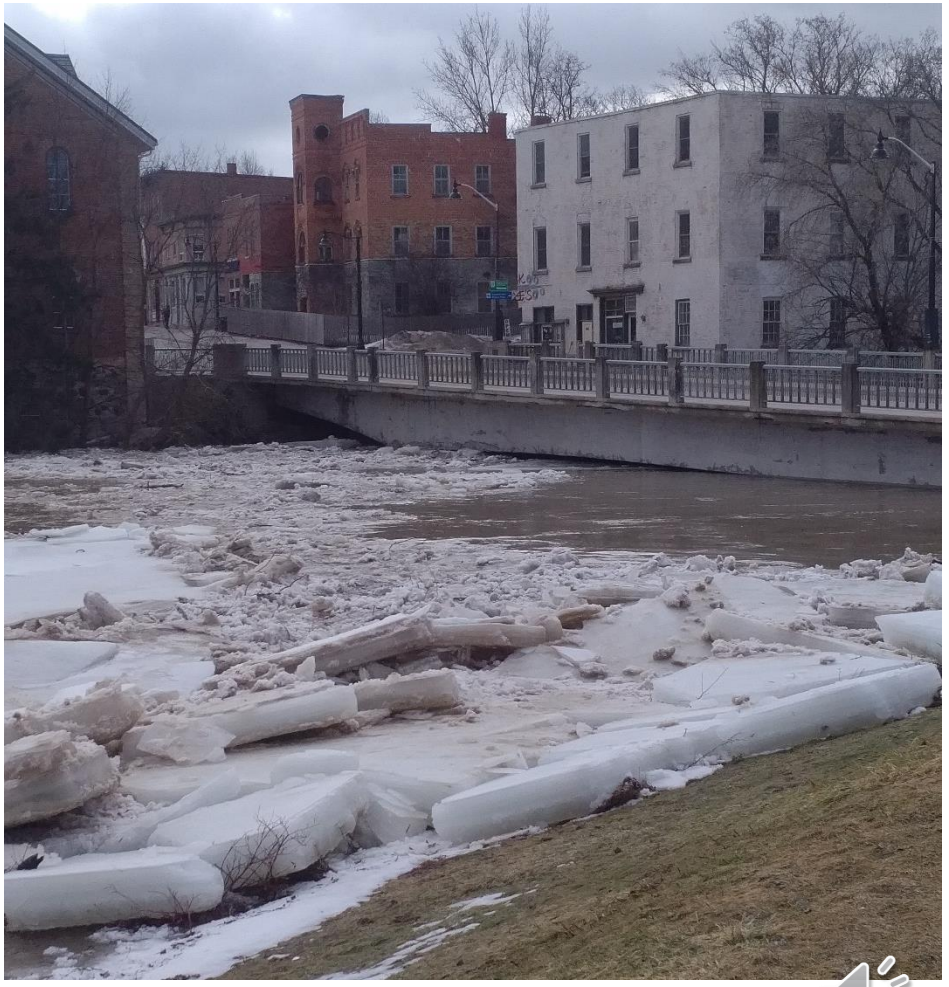
- Three span T-Beam Girder Bridge
- Constructed Circa 1935


- **Deficiencies**
  - Concrete Deterioration
  - Flood Capacity
  - Deck Deterioration

BMROSS
engineering better communities

# Teeswater River Bridge - Deficiencies

Concrete deterioration



Flood Capacity

# Municipal Class Environmental Assessment (Class EA)

- Planning and Design Process for Municipal Water, Wastewater and Road Projects
- Conducted to Evaluate the Potential Impacts of Municipal Projects and Impact Mitigation
- Involves Consultation with the Public, Regulatory Agencies, Adjacent Property Owners
- Requires Consideration of Natural, Social, Cultural, Economic and Built Environments

BMROSS
engineering better communities

# CLASS EA STUDY PHASES

**PROBLEM DEFINITION**

↓

**EVALUATION OF ALTERNATIVES**

↓

**EVALUATION OF DESIGN CONCEPTS**

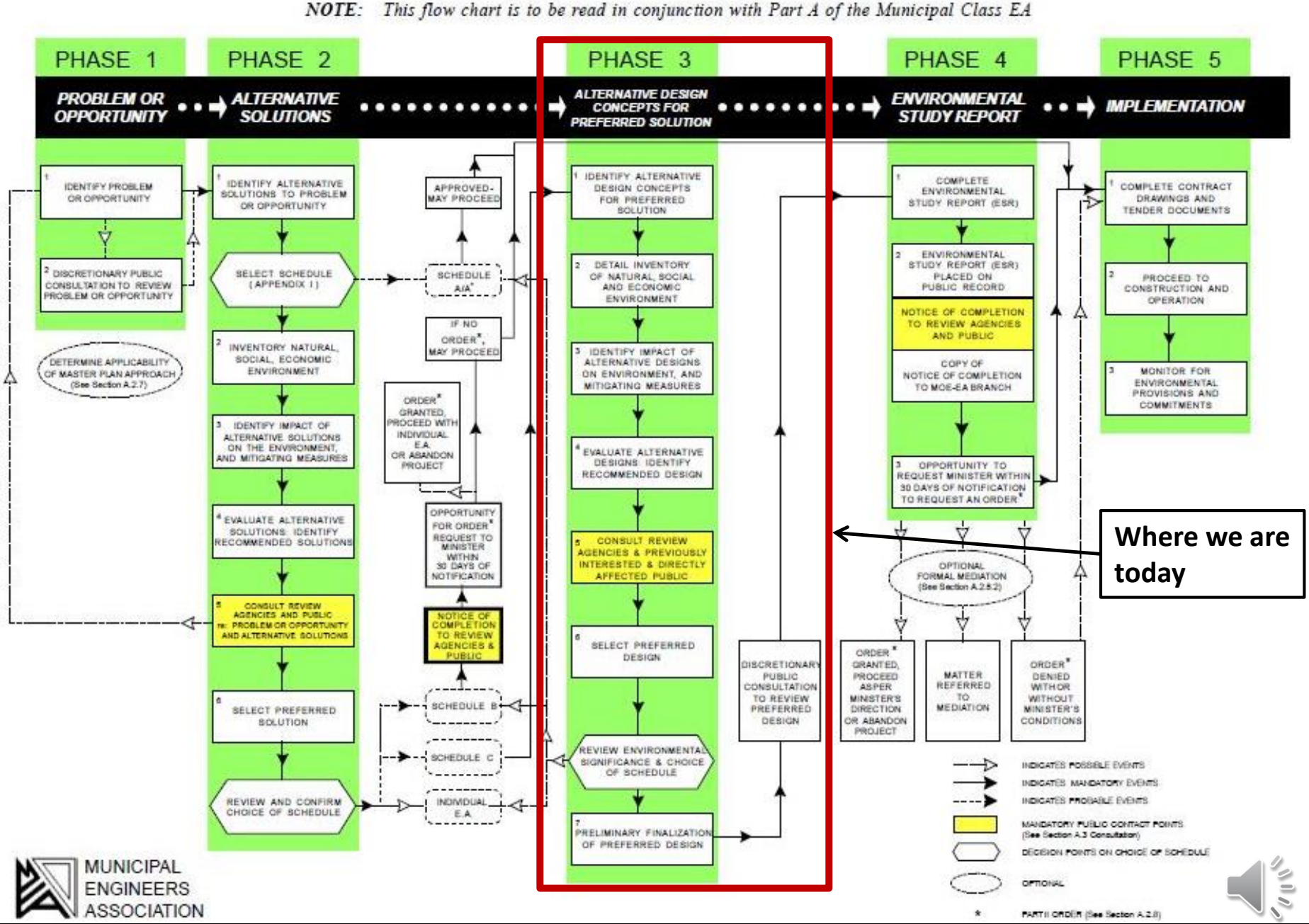
↓

**PREPARE ENVIRONMENTAL STUDY REPORT**

↓

**PROJECT IMPLEMENTATION**

BMROSS
engineering better communities


NOTE: This flow chart is to be read in conjunction with Part A of the Municipal Class EA
PHASE 1
PROBLEM OR OPPORTUNITY
PHASE 2
ALTERNATIVE SOLUTIONS
PHASE 3
ALTERNATIVE DESIGN CONCEPTS FOR PREFERRED SOLUTION
PHASE 4
ENVIRONMENTAL STUDY REPORT
PHASE 5
IMPLEMENTATION
1 IDENTIFY PROBLEM OR OPPORTUNITY
2 DISCRETIONARY PUBLIC CONSULTATION TO REVIEW PROBLEM OR OPPORTUNITY
DETERMINE APPLICABILITY OF MASTER PLAN APPROACH (See Section A.2.7)
1 IDENTIFY ALTERNATIVE SOLUTIONS TO PROBLEM OR OPPORTUNITY
SELECT SCHEDULE (APPENDIX I)
2 INVENTORY NATURAL, SOCIAL, ECONOMIC ENVIRONMENT
3 IDENTIFY IMPACT OF ALTERNATIVE SOLUTIONS ON THE ENVIRONMENT, AND MITIGATING MEASURES
4 EVALUATE ALTERNATIVE SOLUTIONS. IDENTIFY RECOMMENDED SOLUTIONS
5 CONSULT REVIEW AGENCIES AND PUBLIC re: PROBLEM OR OPPORTUNITY AND ALTERNATIVE SOLUTIONS
6 SELECT PREFERRED SOLUTION
REVIEW AND CONFIRM CHOICE OF SCHEDULE
APPROVED - MAY PROCEED
SCHEDULE A/A*
IF NO ORDER*, MAY PROCEED
ORDER* GRANTED, PROCEED WITH INDIVIDUAL E.A. OR ABANDON PROJECT
OPPORTUNITY FOR ORDER* REQUEST TO MINISTER WITHIN 30 DAYS OF NOTIFICATION
NOTICE OF COMPLETION TO REVIEW AGENCIES & PUBLIC
SCHEDULE B
SCHEDULE C
INDIVIDUAL E.A.
1 IDENTIFY ALTERNATIVE DESIGN CONCEPTS FOR PREFERRED SOLUTION
2 DETAIL INVENTORY OF NATURAL, SOCIAL AND ECONOMIC ENVIRONMENT
3 IDENTIFY IMPACT OF ALTERNATIVE DESIGNS ON ENVIRONMENT, AND MITIGATING MEASURES
4 EVALUATE ALTERNATIVE DESIGNS. IDENTIFY RECOMMENDED DESIGN
5 CONSULT REVIEW AGENCIES & PREVIOUSLY INTERESTED & DIRECTLY AFFECTED PUBLIC
6 SELECT PREFERRED DESIGN
REVIEW ENVIRONMENTAL SIGNIFICANCE & CHOICE OF SCHEDULE
7 PRELIMINARY FINALIZATION OF PREFERRED DESIGN
DISCRETIONARY PUBLIC CONSULTATION TO REVIEW PREFERRED DESIGN
1 COMPLETE ENVIRONMENTAL STUDY REPORT (ESR)
2 ENVIRONMENTAL STUDY REPORT (ESR) PLACED ON PUBLIC RECORD
NOTICE OF COMPLETION TO REVIEW AGENCIES AND PUBLIC
COPY OF NOTICE OF COMPLETION TO MOE-EA BRANCH
3 OPPORTUNITY TO REQUEST MINISTER WITHIN 30 DAYS OF NOTIFICATION TO REQUEST AN ORDER*
OPTIONAL FORMAL MEDIATION (See Section A.2.8.2)
ORDER* GRANTED, PROCEED AS PER MINISTER'S DIRECTION OR ABANDON PROJECT
MATTER REFERRED TO MEDIATION
ORDER* DENIED WITH OR WITHOUT MINISTER'S CONDITIONS
1 COMPLETE CONTRACT DRAWINGS AND TENDER DOCUMENTS
2 PROCEED TO CONSTRUCTION AND OPERATION
3 MONITOR FOR ENVIRONMENTAL PROVISIONS AND COMMITMENTS
Where we are today
INDICATES POSSIBLE EVENTS
INDICATES MANDATORY EVENTS
INDICATES PROBABLE EVENTS
MANDATORY PUBLIC CONTACT POINTS (See Section A.3 Consultation)
DECISION POINTS ON CHOICE OF SCHEDULE
OPTIONAL
* PART II ORDER (See Section A.2.8)
MUNICIPAL ENGINEERS ASSOCIATION

# Class EA Timelines

- October 2019 – Project Initiation
  - Notice Published in Sun Times, Paisley Advocate
  - Letters sent to Review Agencies, Adjacent Property Owners and Aboriginal Communities
- May 2020 – Dedicated website launched with signs at bridge
- June 2020 – Heritage Evaluation of bridge completed
- June 2020 – Species at Risk Assessment completed
- September 2020 – First Public Information Meeting
- Winter 2021 – Preliminary Bridge Design/Hydrology
- May 2021 – 2nd Public Information Meeting

BMROSS
engineering better communities

# Input from Residents

- Comments Related to the New Bridge Design
  - Wider sidewalk would be preferred
  - Possible viewing platform to view river and dam
  - Appearance of bridge should reflect Paisley, not the standard
- Comments Related to Proposed Detour Route
  - Concerned with impacts to downtown businesses – loss of tourist traffic, already impacted by Covid19
  - Concerned with emergency response time
  - General social impacts to residents who work and live in town or have children in school
  - Local detour poses potential risk to Mennonite community
  - Temporary bridge would be preferred

BMROSS engineering better communities

# Input from Agencies

- **Ministry of Environment, Conservation and Parks**
  - Consultation Program Required
  - Climate Change and Source Water Protection be considered
- **Saugeen Valley Conservation Authority (SVCA)**
  - Concerned with flooding impacts within river
  - SVCA owns and maintains flood control dyke
- **Ministry of Heritage, Sport, Tourism, and Culture Industries**
  - Concerns related to Archaeology, Built & Cultural heritage

# Input from Agencies

- **Mennonite Community**
  - Prefer in-town detour route
- **Grey Bruce Health Unit**
  - Concerned with injury prevention, interactions between vehicles & cyclists/pedestrians
  - Potential impact to Mennonite Community from detour
  - Social impacts of longer detour routes
- **Bruce County Planning Dept.**
  - Recommendations on bridge design that reflect community

BMROSS
engineering better communities

# Hydrologic Investigation

BMROSS
engineering better communities

- **Historic Flooding**
  - Due to Paisley's location at the junction of the Teeswater and Saugeen Rivers, the community is prone to flooding
  - There have been a number of historic flooding events in Paisley – 1977 Flood instigated the Flood Control Study (1979)

View looking South along Queen Street

# Hydrologic Investigation

- Previous Flood Control Study recommended that a series of dykes be installed adjacent to the river banks to control flooding within the community
- The existing bridge railing was modified so that the railings would form part of the flood control barrier

# Hydrologic Investigation

- A model of the river was developed during the 1979 study, and last updated in 1990, to simulate conditions in the river during various storm events
- The model has been updated to reflect existing site conditions, with additional topographic information and updated stream gauge records.
- Software used is HEC-RAS
- Information related to the proposed bridge designs, and the temporary detour bridge, has been modeled using the updated HEC-RAS model to ensure that the new bridge will meet floodplain criteria set by the SVCA

BMROSS
engineering better communities

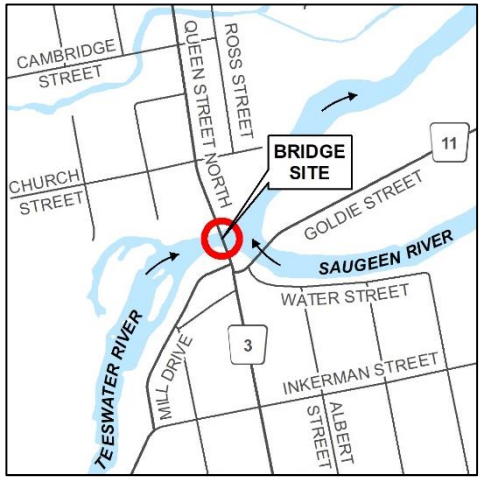
# Model of the Saugeen & Teeswater River


N

River

Model Cross-section

Existing Dyke




BMROSS engineering better communities

# Hydrologic Investigation

- **Additional Considerations**
  - Mill Race under Mill Structure
  - Ice Jamming Potential


# Hydrologic Findings – Proposed Bridge

- High flood levels are driven by backwater conditions from the larger Saugeen River Flows.
- Proposed structure will improve flood flow and reduce the potential for ice jams. No increase in flooding with proposed bridge structure.
- Historical mill race to be maintained with a culvert within the bridge abutment.
- Rock protection is recommended to eliminate scour at piers.
- Bridge railings are recommended to include heightened barriers for flood protection, to be tied into existing and future dyke upgrades.

BMROSS
engineering better communities

# Hydrologic Findings – Detour Bridge

- Temporary bridge has been designed for 1:50 year flow, for projected 1 year construction period.
- Low steel elevation has been set to reduce flood impacts. No significant increase in flood levels up to 1:50 year event
- No reduction on existing dyke elevation. Bridge approaches are proposed above existing dyke level.
- Proposed fill within floodplain for approaches is considered insignificant for the river flood storage.
- Rock protection is recommended to eliminate scour at piers

BMROSS
engineering better communities

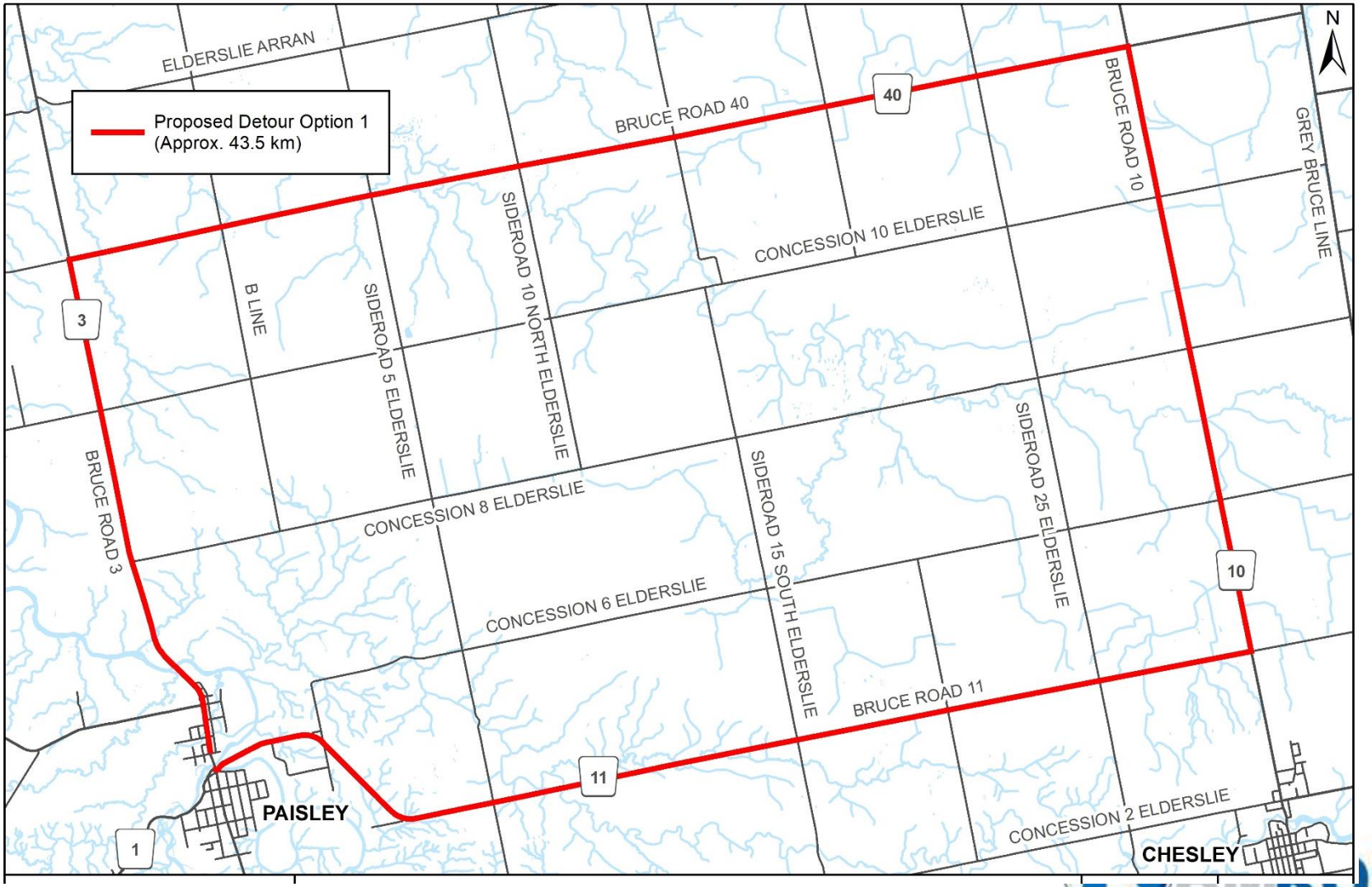
# Class EA Detour Alternatives

- **Alternative 1** – Detour using County Roads
  - Formal detour route would follow County Road network
- **Alternative 2A & B** – Detour using local roads
  - There is an east and a west option. East is in Arran-Elderslie and west is in Brockton and Kincardine
- **Alternative 3** – Detour in-town using temporary bridge.
  - New steel panel bridge would be constructed adjacent to the fire hall and exit past the arena with two lanes for traffic and a pedestrian walkway.

45.0°N 81.3°W BRUCE county

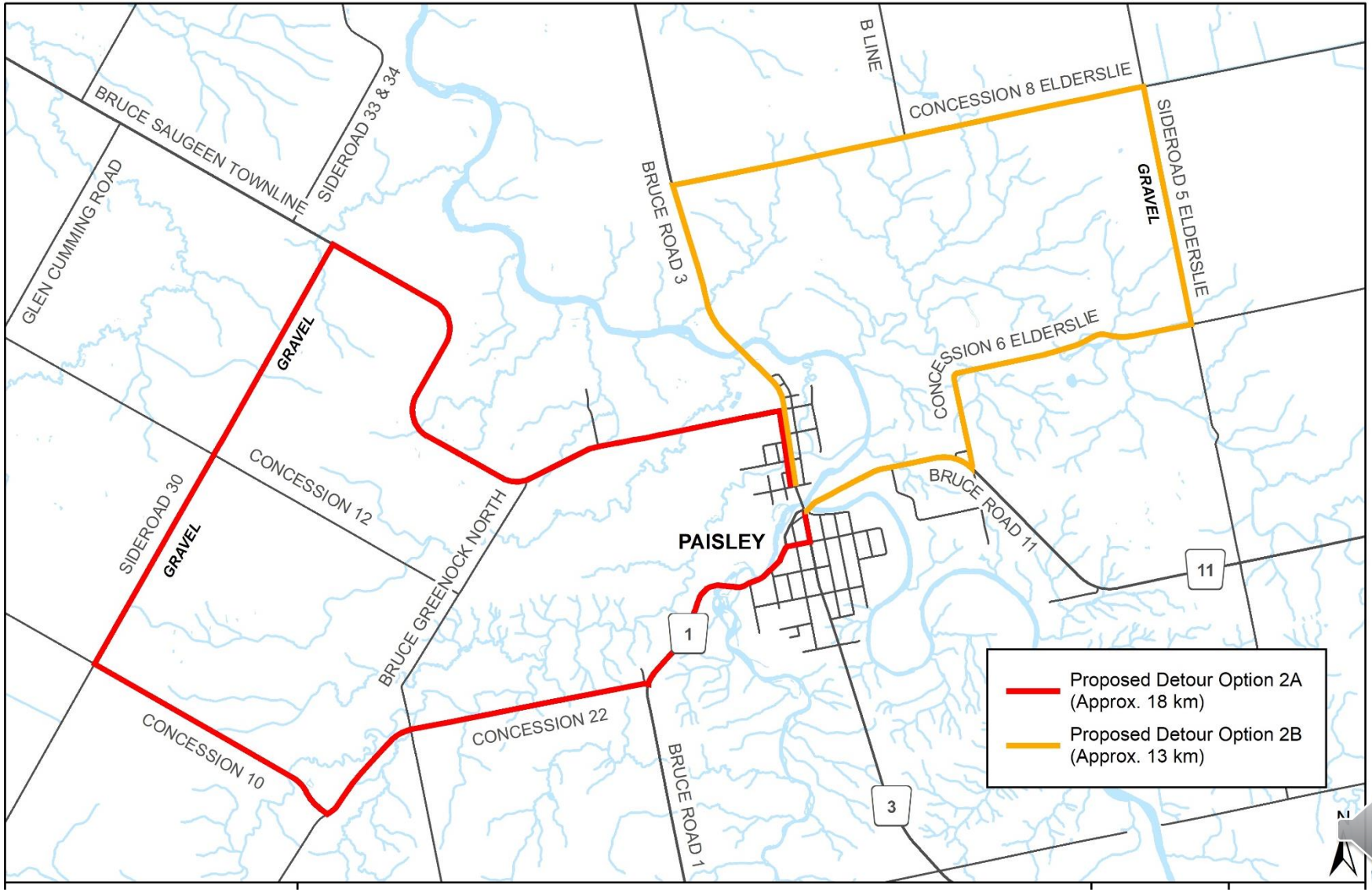
BMROSS engineering better communities

# Detour Option 1 – County Roads

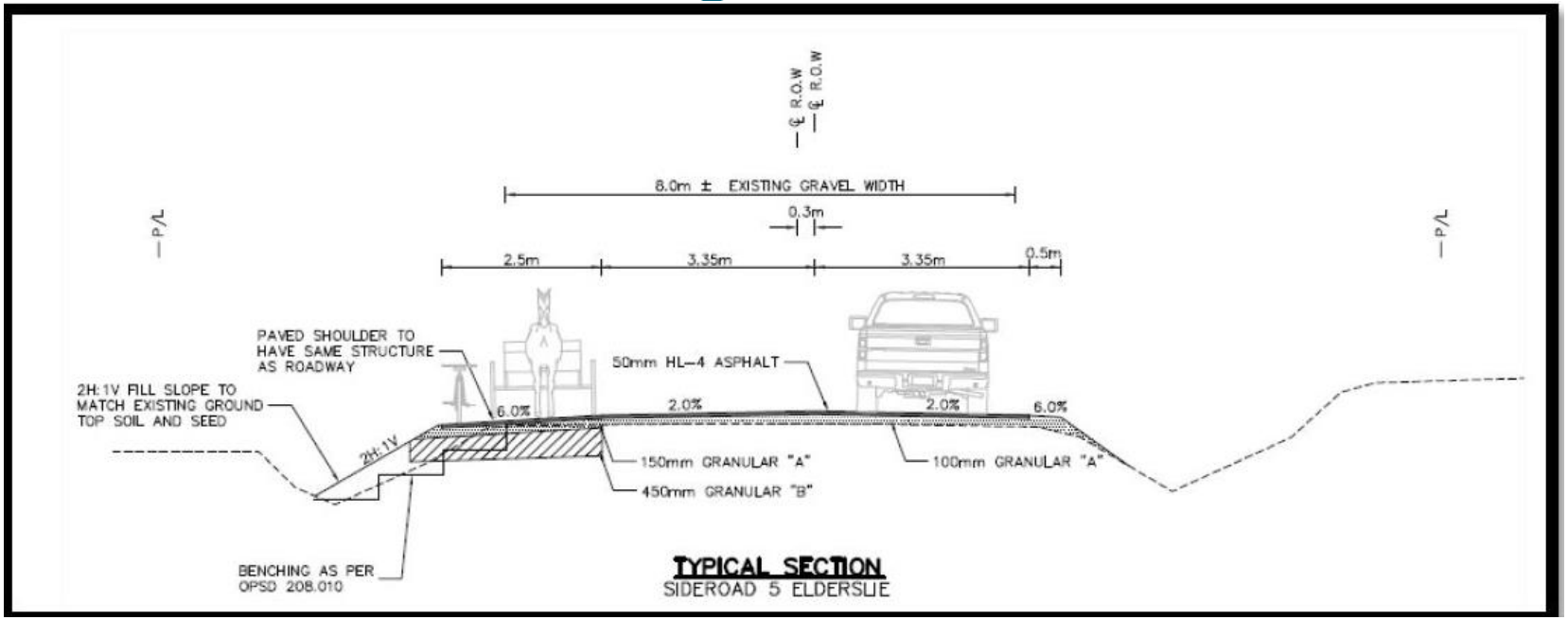



engineering better communities

# Detour Option 2A & 2B – Local Roads

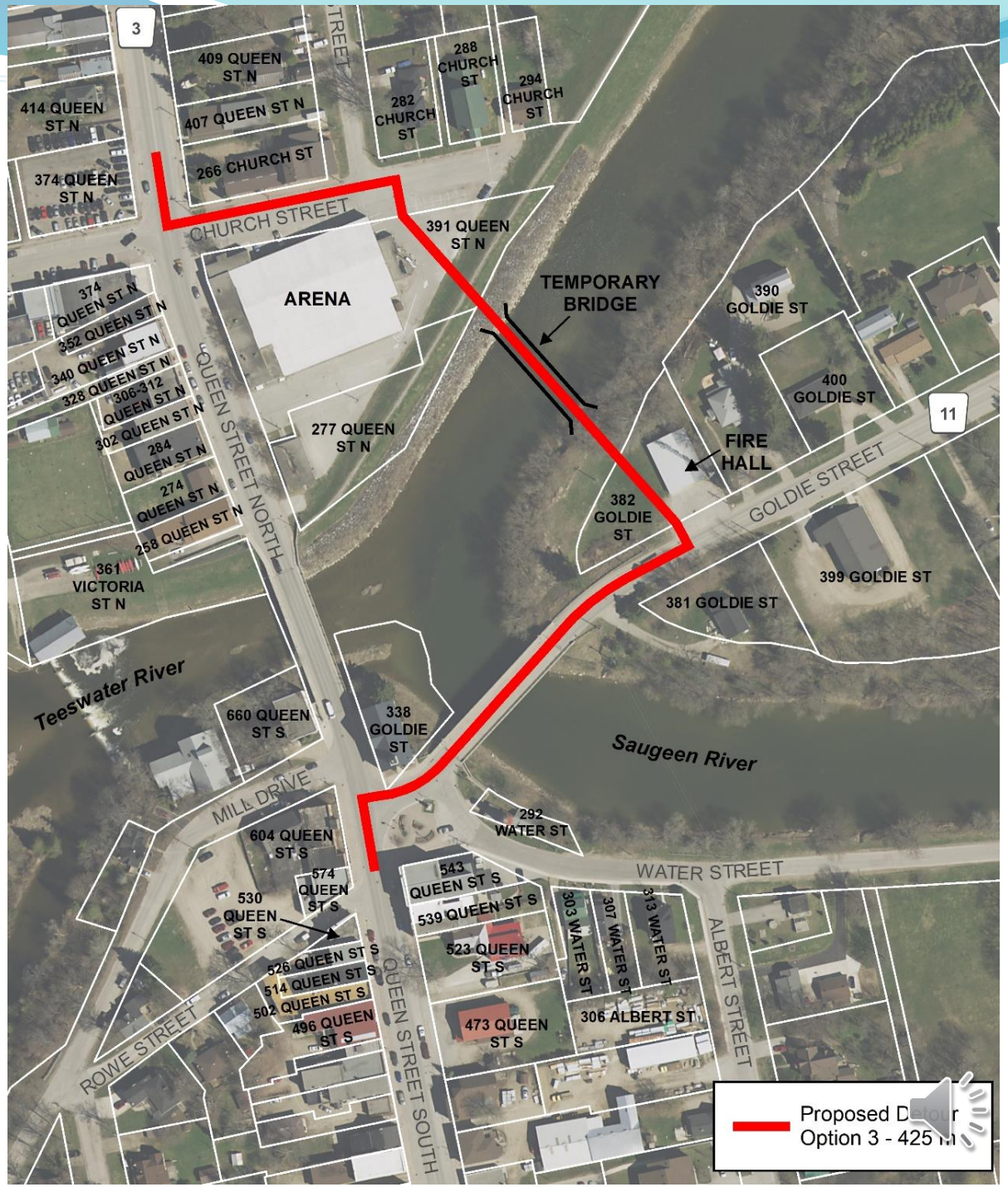


# Detour Investigation



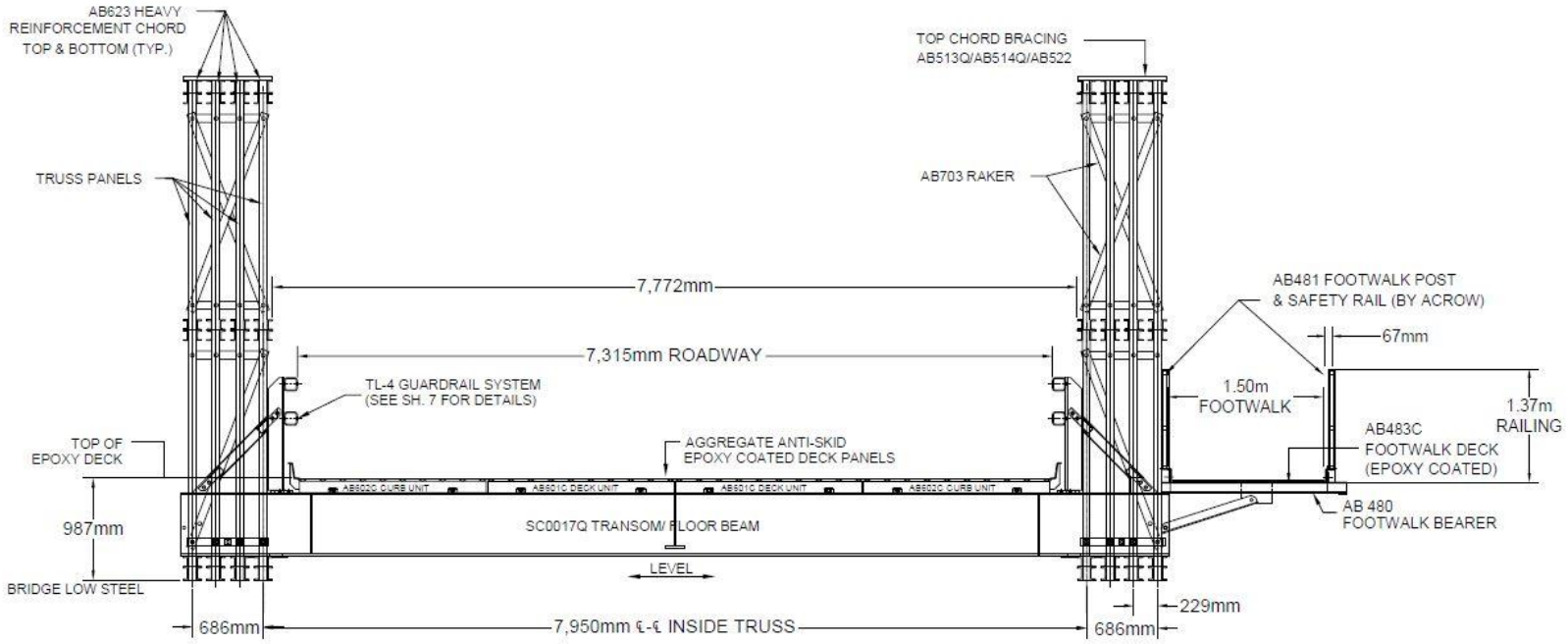


# Detour Option 3 – Temporary Bridge



# Preliminary Preferred Detour Alternative:

- **Alternative 3** – Temporary Bridge for Local Traffic
- **Alternative 1** – County Road detour - could be designated for through-truck traffic
- Still needs to be confirmed by County Council




**Proposed Temporary Bridge - Cross Section**

# Detailed Design Alternatives

- **Railing Options**– A number of railing options are being presented which provide a sympathetic replication of the existing railing details present on the structure
- **Sidewalk Options** – A standard sidewalk width is 1.5m (5 feet) for a bridge crossing like this. A width of 1.8m (6 feet) is proposed with wider viewing areas at the center stanchion on both sides of the bridge.
- **Bridge Design Details** – Two or Three Spans

# Railing Details – Existing Bridge

# Railing Details – Standard Design

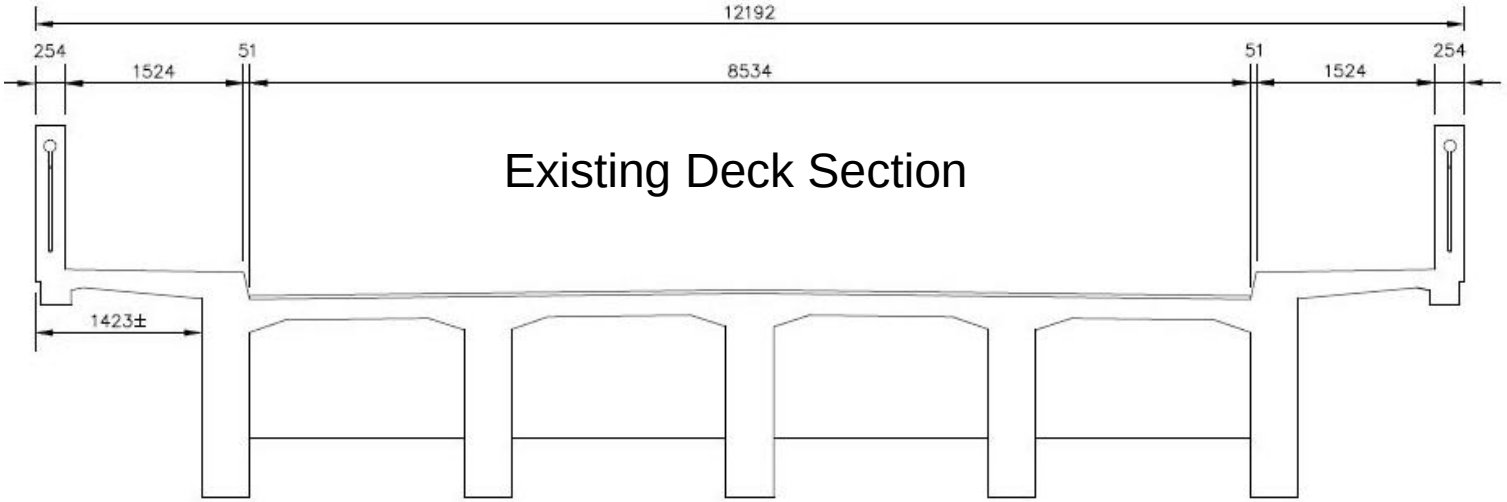
# Railing Design Options

# Railing Design Options

# Railing Design Options

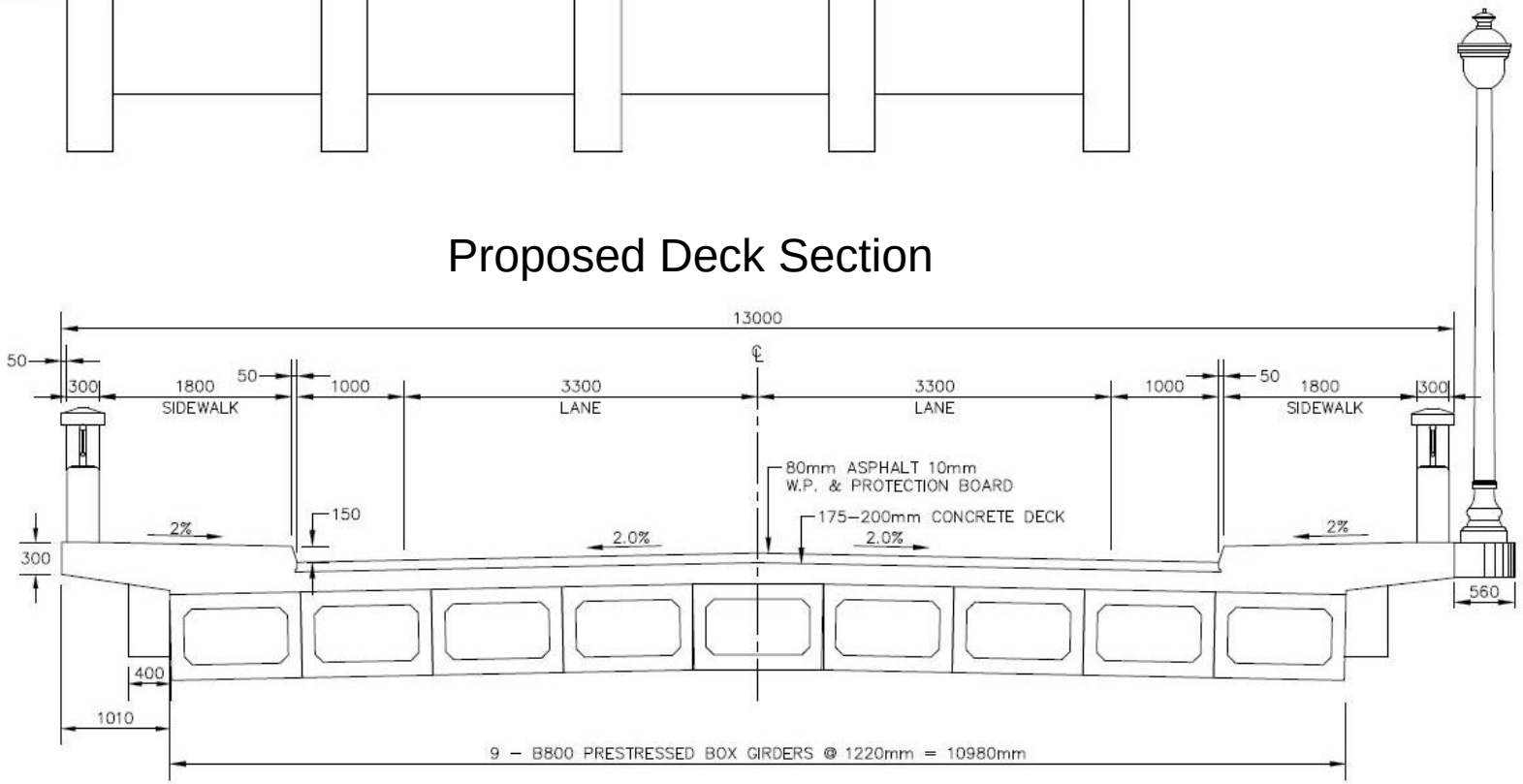
# Railing Design Options

# Proposed Bridge Design

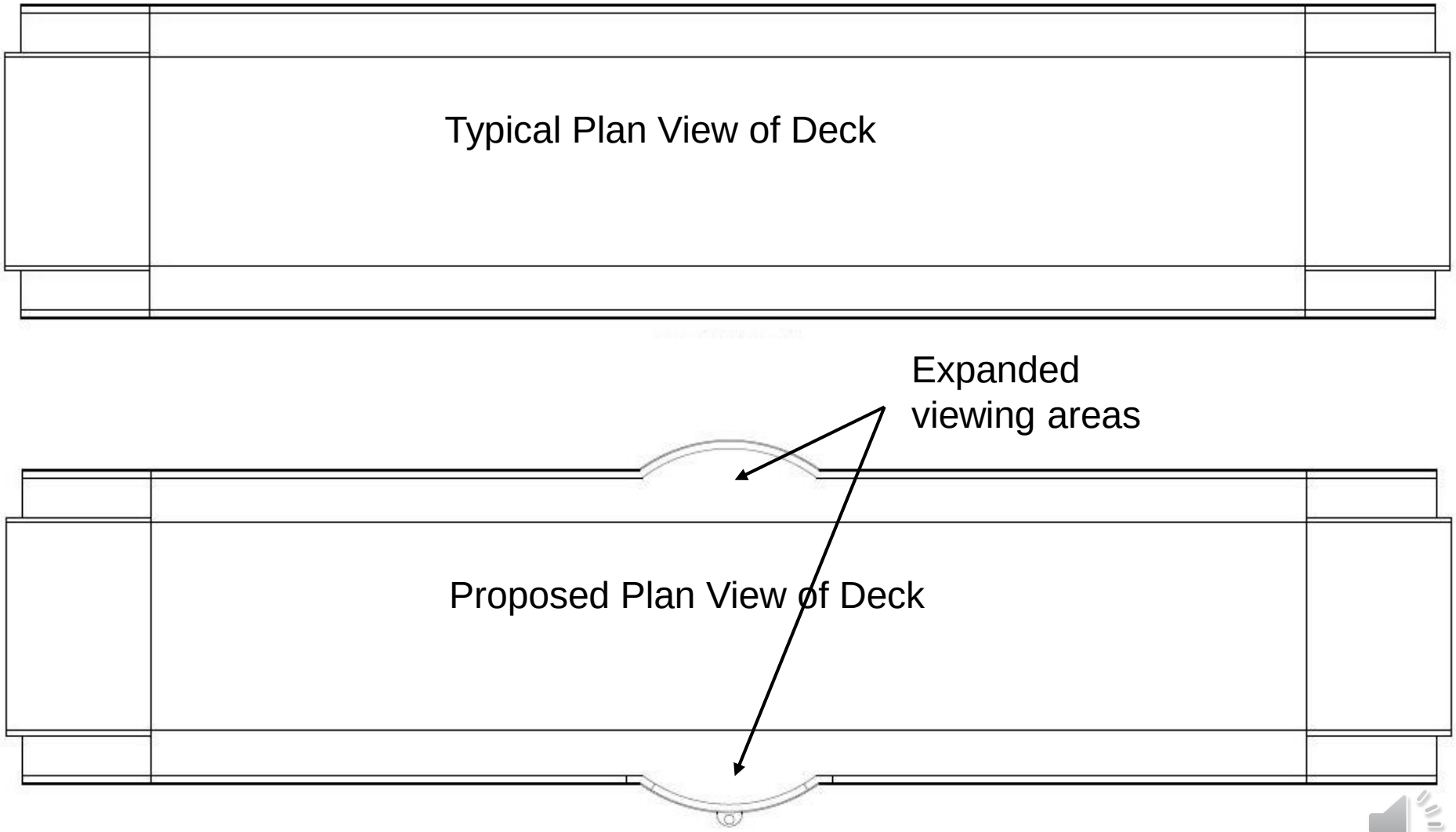



Existing Deck Section

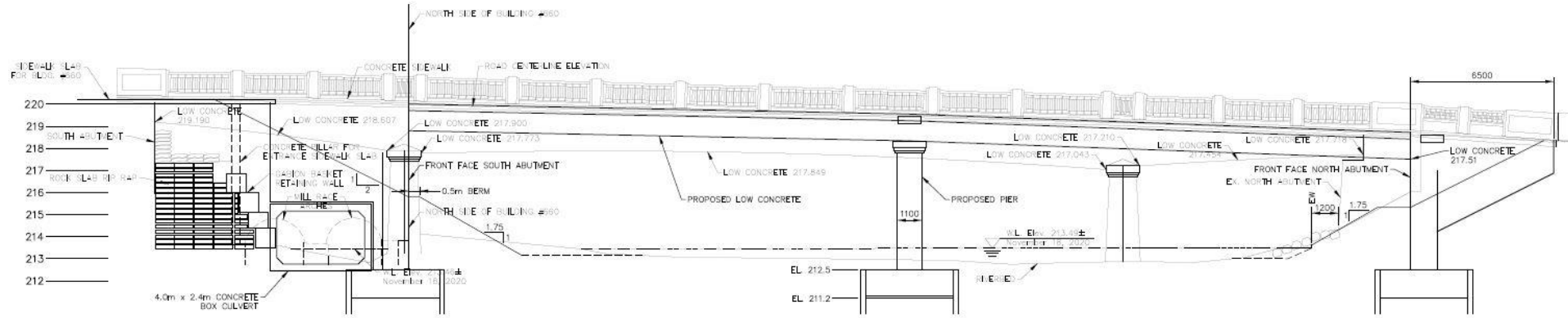
Proposed Deck Section



# Proposed Bridge Design

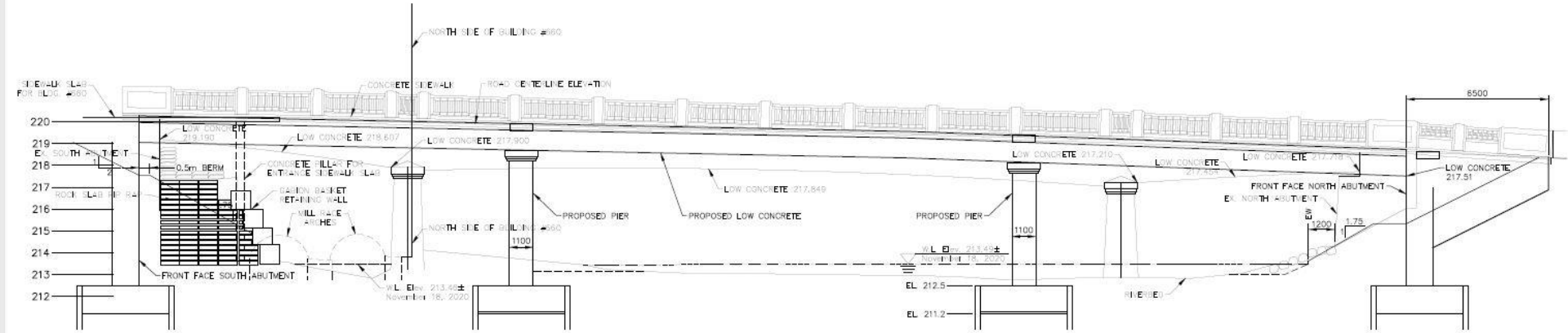


# Proposed 2 Span Bridge



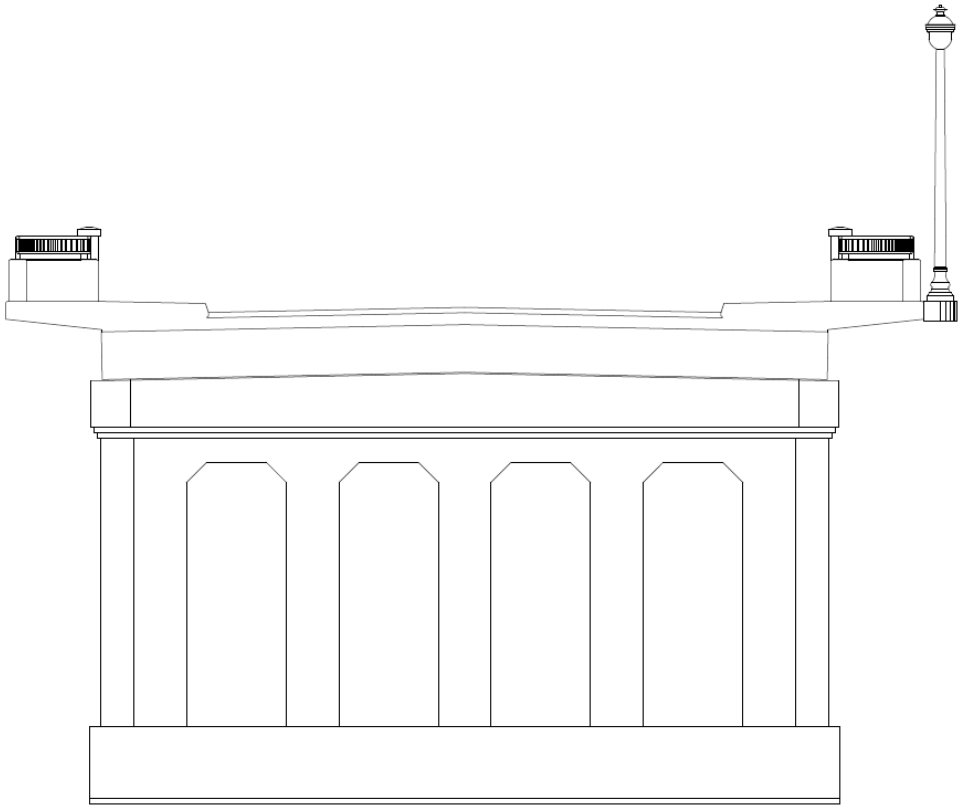

TEESWATER RIVER BRIDGE TWO SPAN – EAST ELEVATION
SCALE 1:125

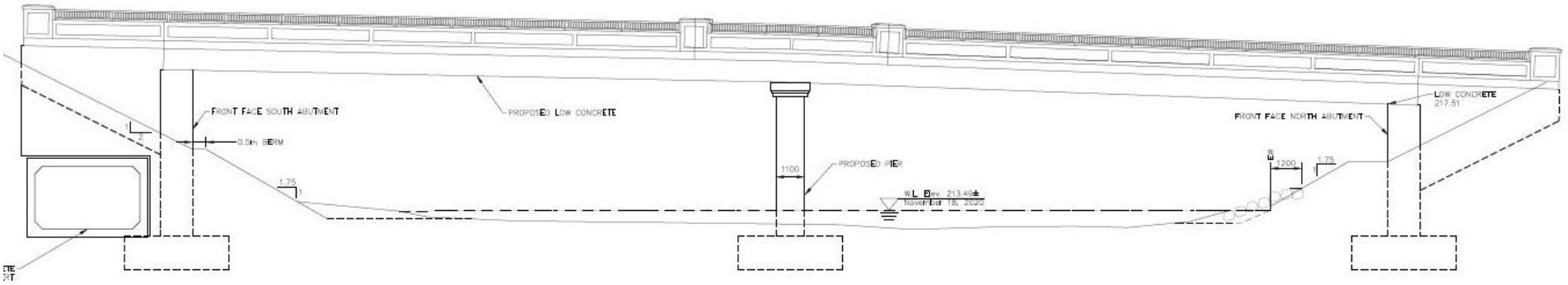
# Proposed 3 Span Bridge




TEESWATER RIVER BRIDGE THREE SPAN – EAST ELEVATION
SCALE 1:125

# Typical Pier Section

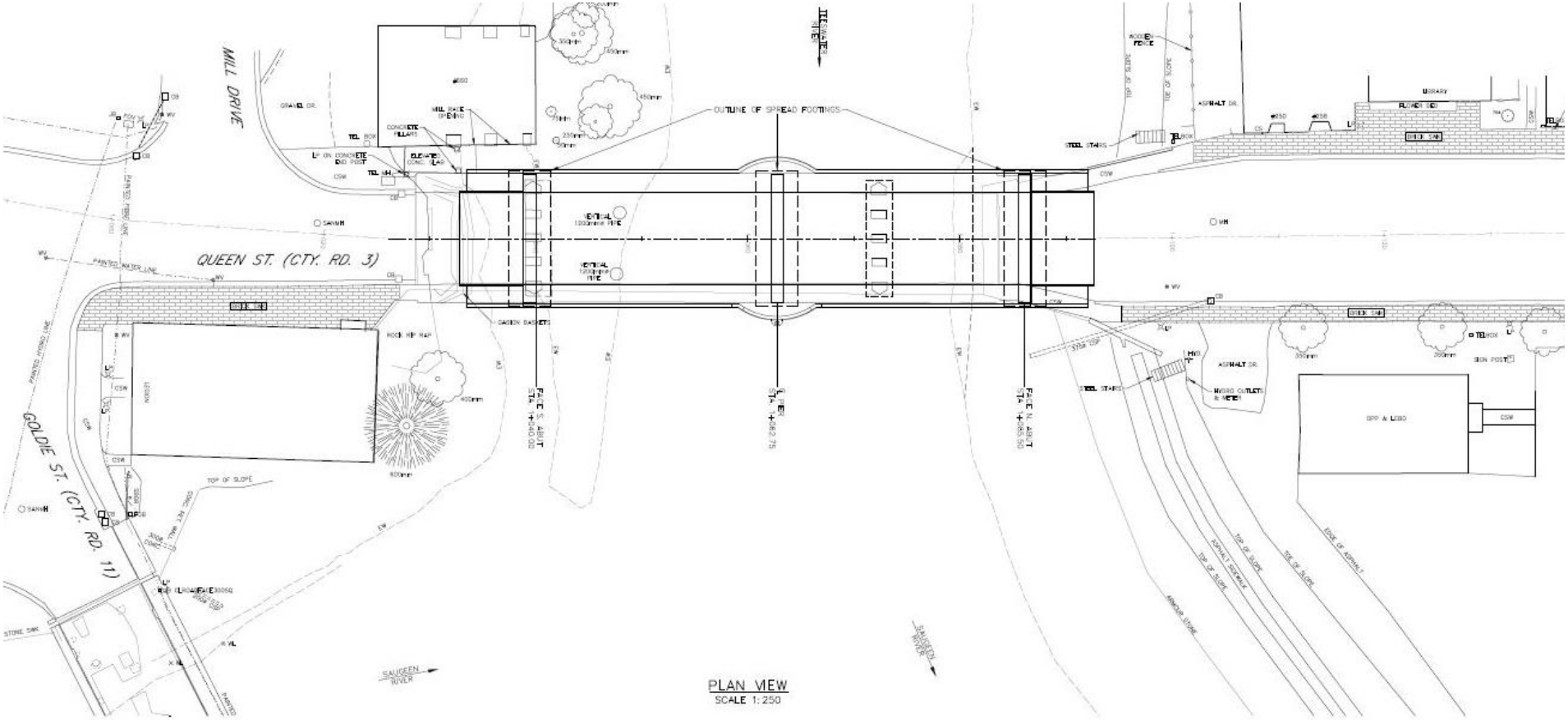





# Proposed Elevation View

BMROSS
engineering better communities

# Proposed Plan View




BMROSS
engineering better communities

# Bridge Design Recommendations

- **Proposed Bridge Deck** – Two lanes with viewing platforms on either side.
- **Bridge Spans** – Two span bridge proposed with culvert at south end to accommodate flow from Mill Race
- **Sidewalk** – 1.8m (6 foot) sidewalk on both sides with wider viewing platforms in the middle
- **Railing** – Lower height solid railing with design imprint to replicate existing + metal railing above, similar to example from Stratford

BMROSS
engineering better communities

# Proposed Bridge Renderings

# Proposed Schedule

- **Summer/Fall 2021:**
  - Finalize Hydrologic Investigation/Consultations with SVCA
  - Complete Bridge Design
  - Prepare Environmental Study Report (ESR)
- **Fall 2021** – Finalize EA Process & Publish Report
- **Fall 2021** – Complete Engineering Design & Apply for Approvals (DFO/SVCA/MECP)
- **Spring 2022** - Construction

BMROSS
engineering better communities

# Next Steps

- Collect and Review Additional Public Input
- Confirm Project Details at County Council
- Finalize Discussions with SVCA related to Hydrology and Temporary Bridge
- Finalize Design of New Bridge
- Finalize Design of Temporary Bridge
- Finalize Class EA Environmental Study Report (ESR)
- Publish Notice of Study Completion

BMROSS
engineering better communities

# Questions?

- Comments or questions on the presentation material can be directed to Kelly Vader at kvader@bmross.net or through the project website at www.paisleybridgestudy.ca
- You can also participate in the Virtual Public Meeting scheduled for May 18, 2021 at 6 pm. Please contact Lisa Courtney at lcourtney@bmross.net to register for the meeting.
- Staff from the County of Bruce and BMROSS will be present at the meeting to answer questions.

BMROSS
engineering better communities