Georgian Bluffs

PEARSON ENGINEERING

SCHEDULE MUNCIPAL CLASS ENVIRONEMENTAL ASSESSMENT

STRUCTURE D-0007 SIDEROAD 3

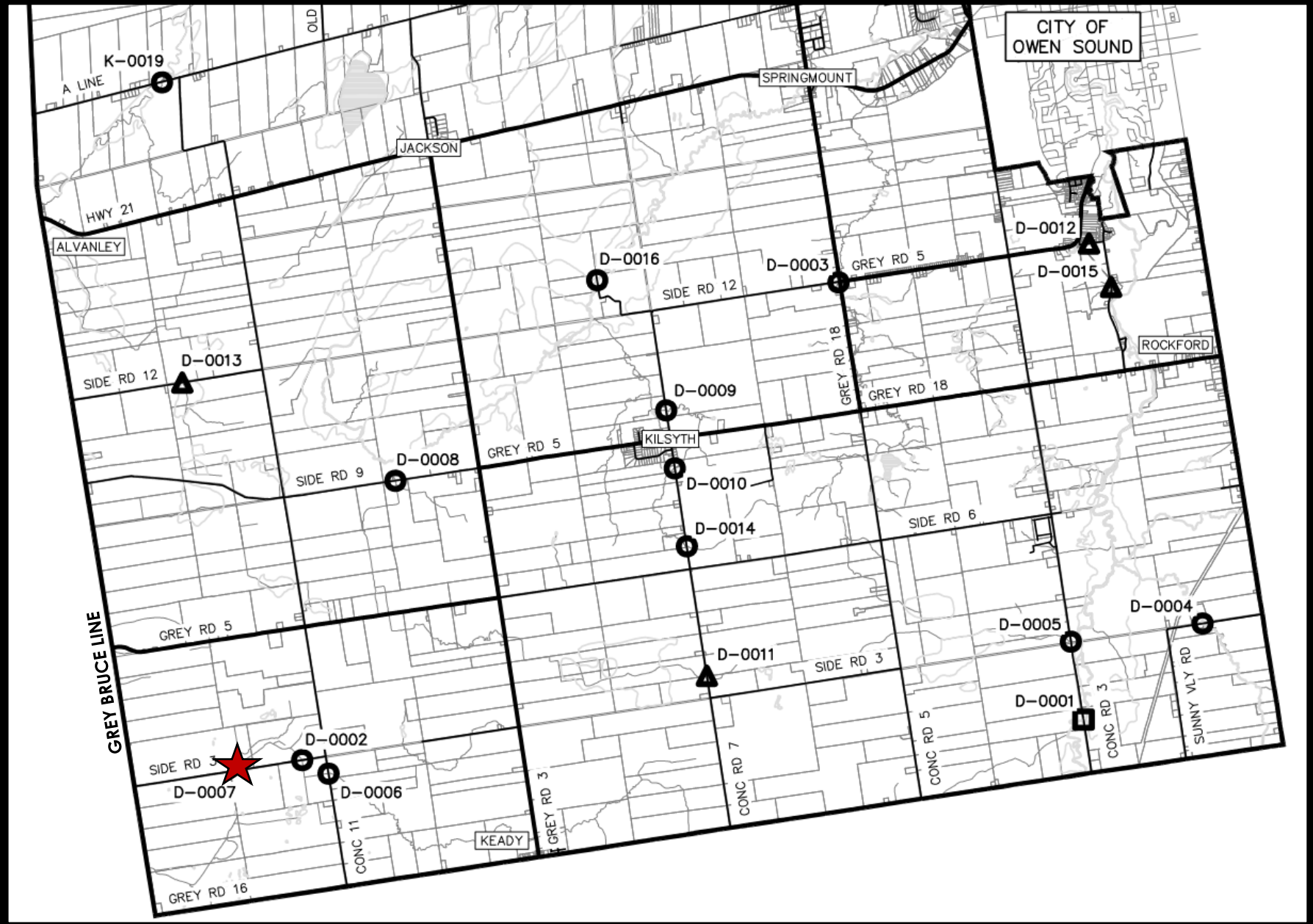
TOWNSHIP OF GEORGIAN BLUFFS

COUNTY OF GREY

Agenda

- Project Location
- Existing Conditions
- Study Purpose
- Stakeholder Considerations
- Background Studies
- Municipal Class EA Process
- Evaluation Criteria
- Alternative Solutions
- Alternative Solution Evaluation
- Preferred Design Alternative
- Question Contacts

PEARSON ENGINEERING



Project Location

Structure D-0007 is located in the former Township of Derby, now the Township of Georgian Bluffs, Ontario. The existing concrete structure conveys flows for the Keady Creek, a Sauble River Tributary, on Sideroad 3.

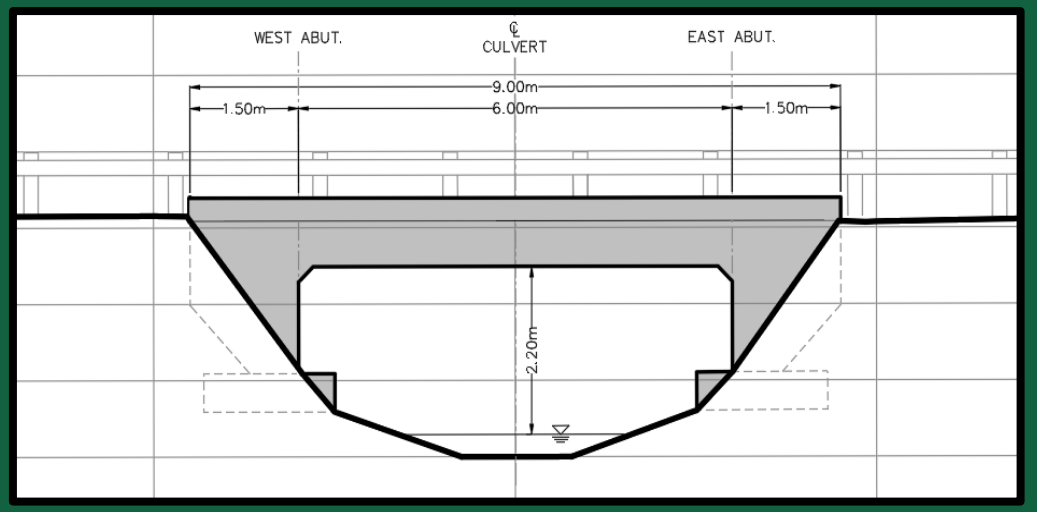
The structure is located approximately 1.5 km east of the Grey Bruce Line between Lots 3 & 4 of Concession 11.

PEARSON ENGINEERING

EXISTING CONDITIONS

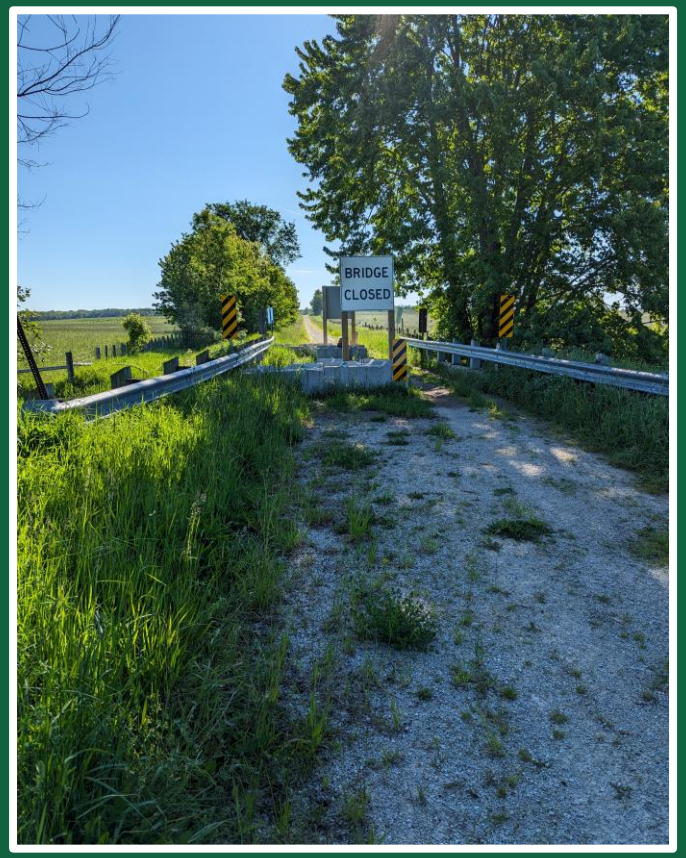
The existing structure consists of a cast-in-place, open bottom, concrete rigid frame complete with a steel beam guiderail barrier system on either side of the roadway. The structure has an overall span of 6.0m and a rise of 2.2m measured from centerline of creek. Based on previous OSIM inspection reports and information provided by the Town, the structure was constructed in approximately 1925.

Structure D-0007 underwent a load evaluation in 2010 and was permanently closed to traffic in 2018 due to continued deterioration. The wingwalls are experiencing wide shear cracking and outward rotation. The foundations are exposed due to scouring and exhibiting severe. The abutment walls are in poor condition with wide cracks in multiple locations.



PEARSON ENGINEERING

EXISTING CONDITIONS



View of Structure Facing East

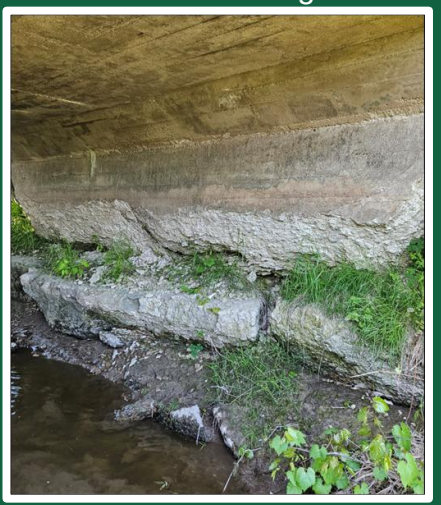
View of Spalling on East Abutment

View of Interior Soffit

View of Wide Crack & Rotation at Wingwall

View of Wide Cracking at Abutment/Wingwall

View of Wide Cracking at West Footing



View of West Footing and Abutment Wall

STUDY PURPOSE

As per the biennial visual inspection completed by Pearson Engineering Ltd. in accordance with the Ontario Structure Inspection Manual (OSIM) in 2024, the existing structure is considered to be in overall poor condition with advanced deterioration.

The existing structure is currently closed to all traffic loads due to load carrying capacity concerns. Structure D-0007 serves as a connection for traffic on Sideroad 3, between Concession 11 and the Grey Bruce Line.

The Township of Georgian Bluffs initiated a Municipal Class Environmental Assessment (MCEA) in September 2024 to consider multiple design alternatives prior to selecting a preferred solution. Multiple background studies and investigations have been completed to support this process.

PEARSON ENGINEERING

STEAKHOLDER CONSIDERATIONS

GREY SAUBLE CONSERVATION AUTORITY (GSCA)

Since the structure is located within the Grey Sauble Conservation Authority (GSCA) regulated limits, permit approval will be required. Conservation authorities regulate activities to manage natural hazards and protect ecosystems. The permitting process ensures that the project will not negatively impact the environment, particularly adjacent watercourse and wetlands.

2025 Grey County Maps – Public GIS Site

ONTARIO FEDERATION OF SNOWMOBILE CLUBS (OFSC)

Structure D-0007 has been historically utilized in the past as a part of the OFSC trail system. Snowmobile trails often attract tourists, contributing to the local economy through spending on fuel, food, and other services. The removal of a bridge can disrupt the continuity of a snowmobile trail network, making certain routes inaccessible and/or potentially isolating parts of the trail system. The assessment of the structure should consider the potential of a reduced number of trail users (visitors), negatively impacting local businesses.

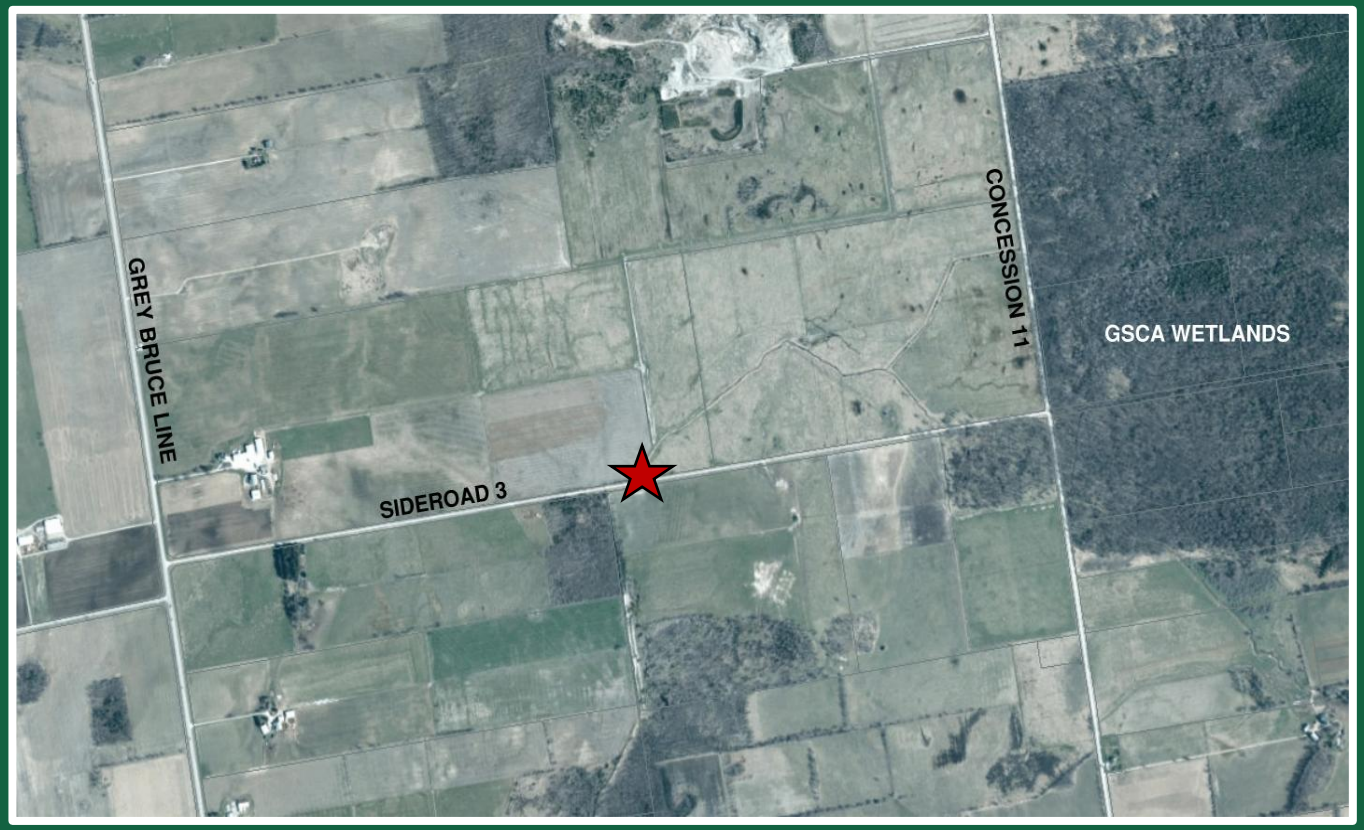
Historical OFSC Mapping

PEARSON ENGINEERING

STEAKHOLDER CONSIDERATIONS

LOCAL RESIDENTS/BUISINESSES

- Sideroad 3 is currently home to one private residential dwelling (west of structure), as well as several agricultural field entrances.
- Properties located east and west of the existing structure are owned by the same private landowner.
- Concession 11 between Grey Road 5 and Grey Road 16 has a total of five private residential dwellings, as well as a functional gravel pit owned by E.C. King Contracting.
- The gravel road spans one concession terminating at the Grey Bruce Line and Concession 11, where a Grey Sauble Conservation Authority wetlands is located.
- The Sideroad 3 traffic count is classified as “low” to “very Low” (ADT ≤ 12). It should be noted that due to the closure of the structure, current traffic loading data may be skewed.



PEARSON ENGINEERING

STEAKHOLDER CONSIDERATIONS

TOWNSHIP OF GEORGIAN BLUFFS

- The Township of Georgian Bluffs currently boasts an inventory of 16 bridges and 30 culverts.
- Based on the asset management information prepared by Pearson Engineering during the 2024 Biennial OSIM Inspection Program, the average replacement cost of the Township's bridge and culvert inventory is approximately $1,250,000 per structure (2024 $).
- As per the '10-Year Capital Works Plan' prepared by Pearson Engineering in 2024, 13% of all bridges and 16% of all culverts in the Township's inventory are considered in poor condition.
- A total of 35 rehabilitation / replacement projects are recommended between 2026 to 2034.
- The total project cost estimate for the '10-Year Capital Needs Plan' is ± $19,000,000 assuming 3% inflation per year.
- Therefore, the Township needs to be allocating approximately $1,900,000 / year into their annual budget for upcoming bridge and culvert work.

PEARSON ENGINEERING

BACKGROUND STUDIES

Cultural heritage evaluation REPORT

- Fieldwork completed by TMHC October 17th, 2024.
- Investigated a total of nine (9) areas of potential heritage value in accordance with the Ontario Heritage Act (O.REG. 9/06).
- The report determined that the rigid frame design of the culvert exhibits an early example of its style.
- TMHC concluded in their evaluation report that the structure only meets 1 of the 9 criteria (Design/Physical Value) for determining heritage value. Therefore, no further heritage evaluation is required.

Archaeological Assessment - STAGE 1

- Fieldwork completed by TMHC October 22nd, 2024.
- Investigated multiple information sources to verify past settlement history and previous archeological studies close to the project site.
- TMHC concluded in their Archaeological Assessment Report that areas within the Municipal right-of-way have been previously disturbed and have no archeological value. Areas beyond the right-of-way limits may have low potential archeological value.
- Given that any construction activities completed in the future at the bridge site can be restricted to the limits of the Municipal right-of-way, no further Archaeological Assessment is required.

PEARSON ENGINEERING

BACKGROUND STUDIES

NATURAL ENVIRONMENT STUDY

- Fieldwork completed by Cambium Inc. October 17th, 2024.
- The report outlines potential habitats for bird, reptile, amphibian and invertebrate species designated as Species at Risk (no fish species).
- Cambium concluded that protection measures can be implemented during construction to mitigate harmful impacts to the surrounding environment.
- Necessary permits should be obtained from DFO and GSCA prior to construction.

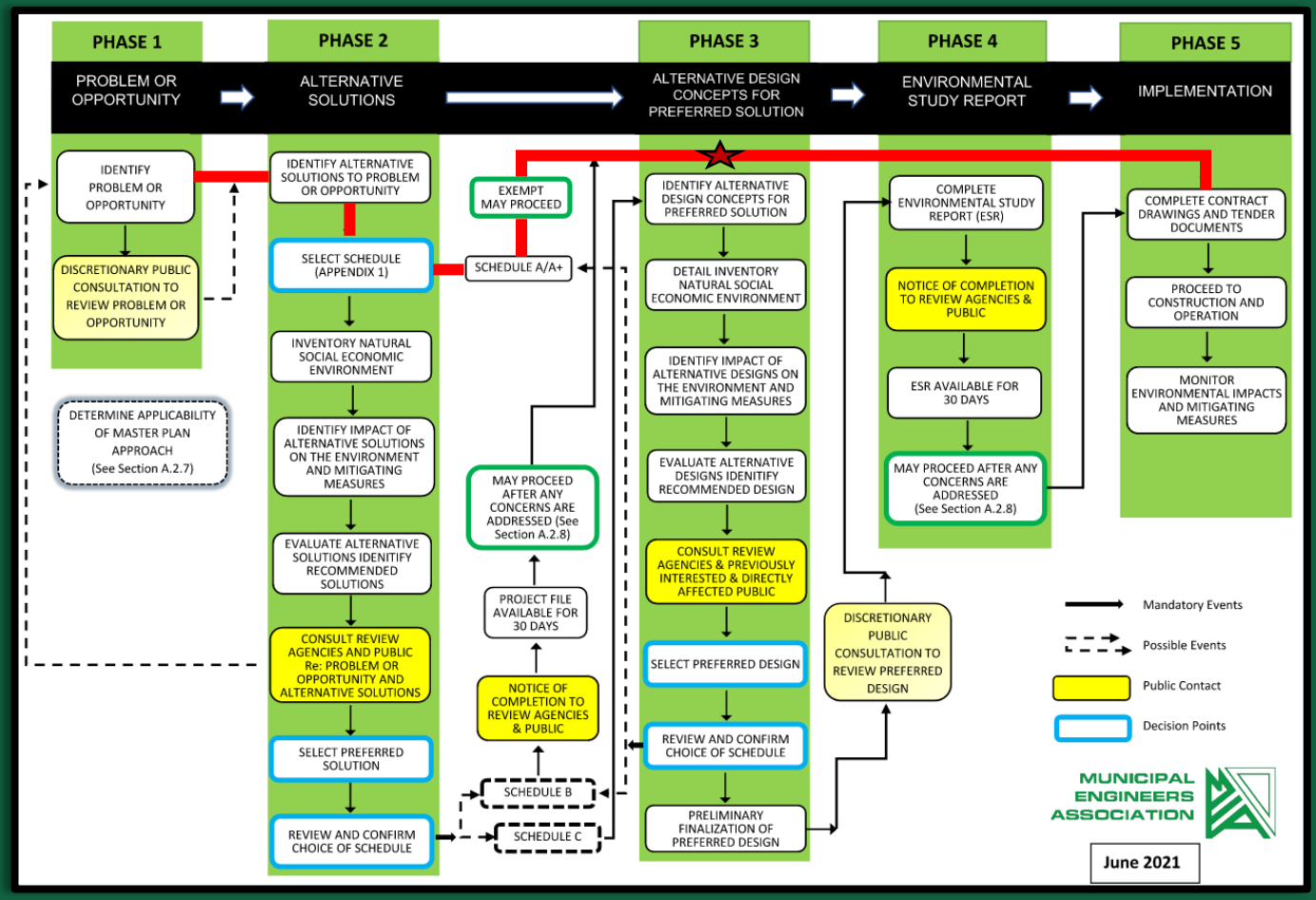
HYDROLOGY & HYDRAULIC ASSESSMENT REPORT

- Survey by Pearson Engineering Ltd. October 16th, 2024
- Investigated multiple information sources to verify past settlement history and previous archeological studies close to the project site.
- The existing structure was found to have a headwater elevation of 240.59 meters above sea level at a peak flow of 20.5m3/s meeting the local 100-year storm event.
- The hydrological modelling information was utilized to verify hydraulic sizing requirements for multiple design alternatives.

PEARSON ENGINEERING

MUNICIPAL CLASS EA PROCESS

- Based on the completed background studies, it has been determined that the MCEA is classified as an “Exempt” project (previously known as Schedule ‘A/A+’) in accordance with Section 31a of the MCEA User Guide developed by the MEA.
- Table A - Section 31a – Reconstruction of, or alteration to a structure or the grading adjacent to it, when the structure is over 40 years old and has been found not to have cultural heritage value or interest.
- Currently, the project is between Phase 2 and 5 of the MCEA flow chart shown.
- As directed by the Township, the project is evaluating the feasibility, cost and overall impact of multiple design alternatives.
- The design alternatives are evaluated based on a set of criteria described on the following slide.



PEARSON ENGINEERING

EVALUATION CRITERIA

General	• Ability to address the Problem Statement.
Natural	• Protection of the natural and physical environment. • Includes considerations for water, wildlife, air and vegetation, as well as species at risk environmentally sensitive habitats.
Social	• Road usage, traffic movements and availability of alternative routes. • Access to emergency services. • Active transportation networks include connection to trail systems.
Cultural	• Protection of archaeological and/or cultural heritage resources. • Cultural landscapes, fixed archaeological structures on land and water, and built environments.
Economic	• Construction costs, long term operating costs and maintenance costs. • Overall municipal transportation system and potential capital commitments. • Potential risks associated with Townships liability.
Technical	• Type and complexity of construction. • Future maintenance requirements (short and long term). • CHBDC and road design standards.

PEARSON ENGINEERING

ALTERNATIVE SOLUTIONS

The following alternatives were identified to address the structural deficiencies, continued deterioration and safety risks associated with Structure D-0007.

#	Alternative	Estimated Useful Service Life	Description
1	Do Nothing (Maintain Existing Structure)	N/A	Maintain bridge closure and consider restricting all traffic types. Reassess in 3-5 years.
2	Rehabilitation	N/A	Rehabilitation of Structure D-0007 is not feasible due to severely deteriorated condition of the structure.
3A	Precast Concrete Box Culvert	75-90 Years	Replacement of Structure D-0007 with a precast concrete box culvert complete with new guiderail barriers, roadway widening and segmental block retaining walls on each end of the culvert.
3B	Twin SPCSP Culverts	40-60 Years	Replacement of Structure D-0007 with a twin structural plate corrugated steel pipe (SPCSP) culverts complete with new guiderail barriers, roadway widening and segmental block retaining walls on each end of the culvert. Creek realignment may be necessary.
4	Permanent Removal	N/A	Excavation and removal of Structure D-0007 structure, as well as reinstatement of creek embankments. Installation of roadway turnarounds, barricades and signage.

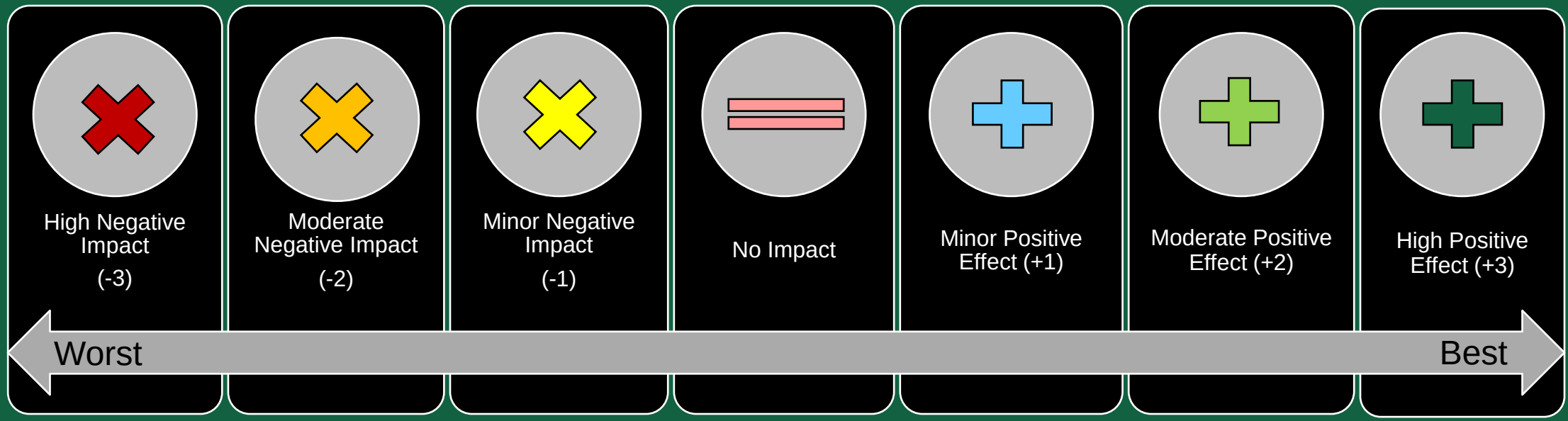
PEARSON ENGINEERING

ALTERNATIVE SOLUTION EVALUATION

Evaluation Criteria	Alternative 1 Do Nothing	Alternative 3A Precast Concrete Box Culvert	Alternative 3B Twin SPCSP Culverts	Alternative 4 Permanent Removal
Natural Environment	No immediate impact to fish and wildlife. Continuing erosion issues. No hydraulic flow improvements.	Temporary impact to fish habitat. Stabilize erosion on embankments. No hydraulic flow improvements.	Temporary impact to fish habitat. Stabilize erosion on embankments. Creek Re-alignment. No hydraulic flow improvements.	Temporary impact to fish habitat. Stabilize erosion on embankments. No future construction disturbance. Improved Hydraulic flow capacity.
Social Environment	Does not reinstate traffic flow on roadway. No safety improvements.	Reinstates traffic flow on roadway. Improved roadway safety with two lane structure.		Does not reinstate traffic flow on roadway.
Cultural Environment	No cultural or archaeological impact.	Minimal cultural or archaeological impact.		
Transportation	No through traffic permitted on Side Road 3. Future impacts to OFSC trail system.	Widening and reopening of road for agricultural, construction and recreational vehicle use.		No through traffic permitted on Side Road 3. Revised OFSC trail system.
Economic Environment	No initial capital cost. Future budgetary costs. Reduction in Municipal Infrastructure assets.	Highest initial capital cost. 75 to 90 years of useful Service Life. Regular future maintenance needs.	High initial capital cost. 40 to 60 years of useful Service Life. Regular future maintenance needs.	Low initial capital cost. No long-term maintenance costs.
Technical	Structural condition not improved. Load carrying capacity issues and continued deterioration.	Long term solution. New code complaint structure. Improved roadway geometry at structure.		Simple construction efforts. Addresses current structure safety concerns. No long-term maintenance costs.
Construction Cost	**$0 + Roadway Maintenance**	**$900,000 – $1,100,000 (Two-lane structure)**	**$850,000 - $950,000 (Two-lane structure)**	**$250,000 - $300,000 + Roadway Maintenance**

PEARSON ENGINEERING

ALTERNATIVE SOLUTION EVALUATION

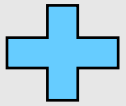


Each design alternative is assigned a score based on the significance of their impact for each criteria (previous slide). The symbols above are used to identify their effect on a scale from (-3) to (+3).

±3 – High Importance
±2 – Moderate Importance
±1 – Minor Importance

PEARSON ENGINEERING

DESIGN ALTERNATIVE EVALUATION

Evaluation Criteria	Alternative 1 Do Nothing	Alternative 3A Precast Concrete Box Culvert	Alternative 3B Twin SPCSP Culverts	Alternative 4 Permanent Removal
Natural Environment				
Social Environment				
Cultural Environment				
Transportation				
Economic Environment				
Technical				
Overall Scoring	**-5**	**+0**	**+0**	**+4**

PEARSON ENGINEERING

PREFERRED DESIGN ALTERNATIVE

ALTERNATIVE 4: PERMANENT REMOVAL

Based on the results of the Design Alternative Evaluation, the preliminary preferred design solution is 'Alternative 4', which recommends the permanent removal of the existing culvert structure. Key parameters to consider as part of this evaluation are as follows:

- Side Road 3 is surrounded by various County roads (CR16, Grey Bruce Line and CR5), which are more heavily used roadway systems. Sideroad 3 extends one concession with a current ADT of 12 vehicles.
- The roadway currently provides access to one private dwelling and five agricultural fields which can all be accessed via the Grey Bruce Line or Concession 11.
- The maximum detour distance created by the structure removal is approximately 9.1km. Although this detour route will have a very minor impact to the Township's traffic network, significant impacts to local property owners may occur.
- The Ontario Federation of Snowmobile Clubs (OFSC) will be required to develop an alternative route for the connecting link from Concession 11, west to the Municipality of Arran-Elderslie.
- The Township has an increased bridge and culvert inventory that requires a significant economic commitment for the next 10 years.

The Township is advised to review the results of the design alternative evaluation completed as part of the MCEA process and confirm the preferred design alternative.

PEARSON ENGINEERING

QUESTION CONTACTS

Township of Georgian Bluffs

Kevin Verkindt

Manager, Engineering and Infrastructure

117964 Grey Road 18,

Owen Sound, ON, N4K 5N5

Pearson Engineering Ltd.

Jesse Borges, P. Eng., PMP

Structural Project Manager

345 8th Street East

Owen Sound, ON, N4K 1L3

jborges@pearsoneng.com

PEARSON ENGINEERING