

APPENDIX B - EXECUTIVE SUMMARY

Munn's Creek Flood Mitigation Opportunities Study

EXECUTIVE SUMMARY

Introduction

In 2008, the Town undertook a Town-wide flood study, which indicated 5 flood prone sites on Munn's Creek: Oakville Golf Course, Miller Road crossing, McCraney Street West crossing, Oakdale Park pedestrian bridge, and Culham Street crossing. The next step as identified in the 2008 Flood Prioritization Study was to undertake more detailed studies of channel reaches with flood-prone sites to further understand the flood risk and to determine the most viable and responsible mitigation options. Since the 2008 flood study, updates to the hydrologic and hydraulic models have been carried out for several watercourse systems within the Town resulting in an improved understanding of vulnerabilities related to riverine flooding. The purpose of the current study is to undertake an update to the hydrology and hydraulics for Munn's Creek between Upper Middle Road and the Morrison-Wedgewood diversion channel (Figure A-1).

PHASE I: IDENTIFICATION OF PROBLEMS AND OPPORTUNITIES

Modeling and studies on Munn's Creek have been completed in a piecemeal fashion. The study area has experienced historical flood damage; however, a comprehensive update to the hydrologic and hydraulic modeling has not been undertaken to confirm existing conditions within the watershed. As such, the current flood risks are not well defined and there is a need to update the modeling to provide a complete list of existing flood-prone sites and identify works required to mitigate flooding within the reaches of Munn's Creek between Upper Middle Road and the Morrison-Wedgewood diversion channel.

Identified opportunities within the Munn's Creek study area are to:

- Define existing flood risks and associated remediation measures;
- Model the Munn's Creek hydrology on a platform that is consistent with other recent modeling within the Town of Oakville (PCSWMM);
- Review the McCraney Street West and Miller Road culvert hydraulics prior to their upcoming replacements and provide appropriate sizing for the replacement structures; and,
- Update the hydrologic and hydraulic modeling to feed into the erosion study on Reaches 33 to 35 of Munn's Creek.

PHASE II: EVALUATION OF ALTERNATIVE SOLUTIONS

Under existing conditions, the Regional storm results in 4 areas of flooding: McCraney Street West, Culham Street and Osborne Crescent, the Oakville Golf Course, and rear yards from south of Miller Road and Upper Middle Road. The McCraney Street West crossing was determined to be the only flood-prone location with structures in the regulatory floodplain. Flood remediation alternatives were developed for this crossing as well as the Miller Road crossing and the recreational trail running from Oakdale Drive to Onslow Court. These 3 culverts are of approximately the same age and the McCraney Street West and Miller Road culverts are in the Town's forecast for replacement. Four (4) flood remediation alternatives were developed for the crossings:

- Alternative 1, Do Nothing
- Alternative 2, Pipe Arch CSP Culvert
- Alternative 3, Concrete Box Culvert

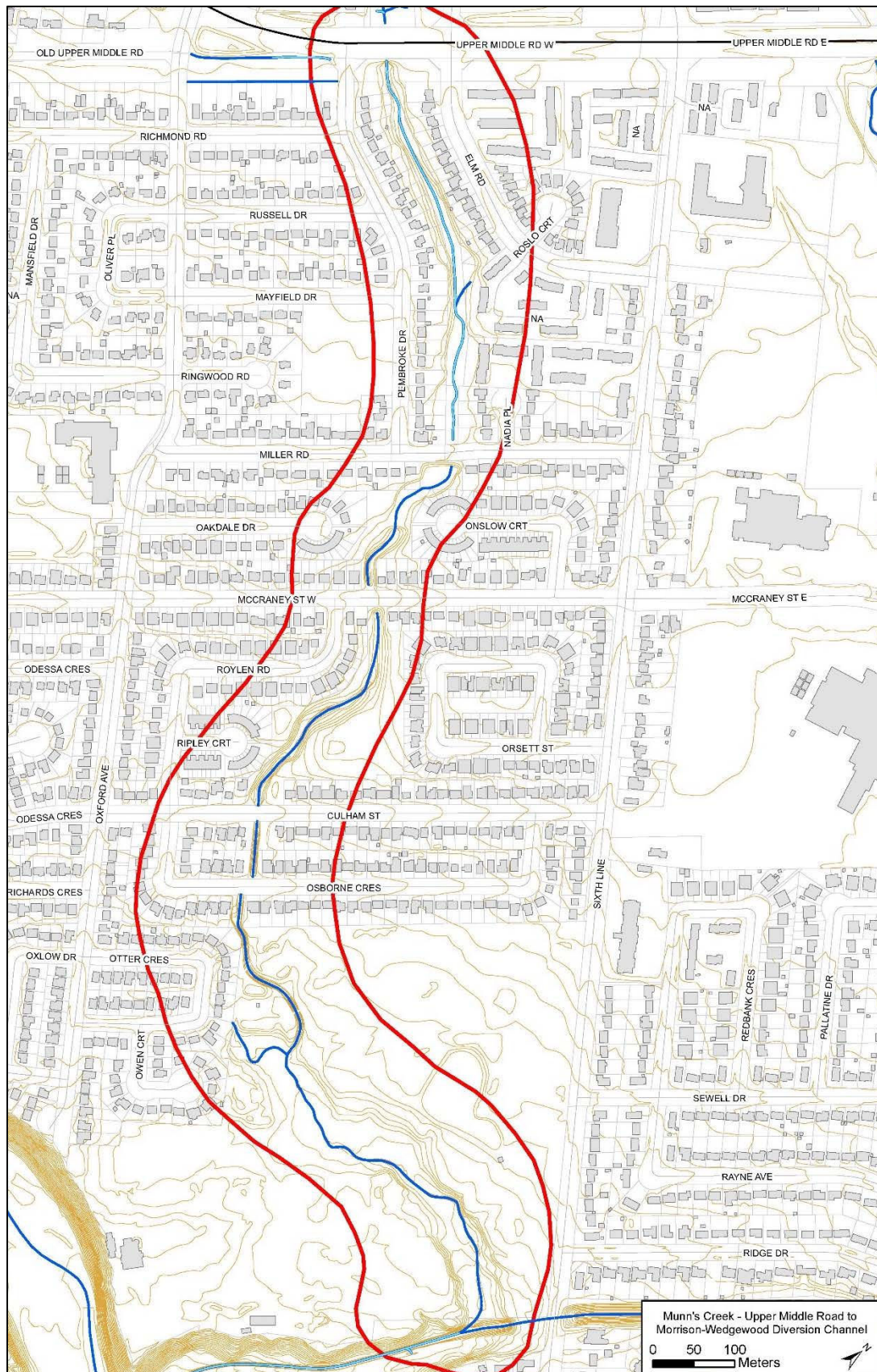


Figure A-1: Munn's Creek Flood Mitigation Study Area

- Alternative 4, Fish Passage Accommodation
 - Alternative 4a, Closed Bottom Box Culvert with Baffles
 - Alternative 4b, Open Bottom Box Culvert
 - Alternative 4c, Span Bridge

Alternatives 2 – 4 involve replacement of the crossings at McCraney Street West, Miller Road, and the recreational trail crossing running from Oakdale Drive to Onslow Court, with each replacement culvert sized to prevent overtopping of McCraney Street West during the Regional Event and to remove the 6 identified houses from the Regional floodplain. Conceptual hydraulic modeling was completed to identify the changes to the floodlines for each of the alternatives.

Evaluation of Alternatives

Each of the alternatives was evaluated based on a set of criteria including:

Environmental/Physical

- Impacts to significant woodlands
- Impacts to fish habitat
- Impacts to significant wildlife habitat
- Impacts to linkage(s)
- Impacts to watercourse
- Impacts to floodlines/flood elevations

Social

- Community disruption
- Impacts to private property use
- Impacts to creek corridor aesthetics

Economic

- Construction costs
- Maintenance costs

The results of the evaluation identified Alternative 4 (replacement of the 3 crossings with structures that accommodate fish passage) as the preliminary preferred alternative.

Public Consultation

A Public Information Centre (PIC) was held on April 11, 2018 at Town Hall (1225 Trafalgar Road). A series of posters were presented which outlined existing conditions and study objectives, draft 100-year and Regional floodlines, the long list of alternatives, and next steps. The PIC was attended by 19 people. In general, attendees were most concerned about erosion within the study area rather than flooding.

A second PIC was held on April 30, 2019 at Town Hall (1225 Trafalgar Road) and was combined with the first PIC for the Munn's Creek Erosion Mitigation EA Study. The PIC was attended by 16 people. In general, attendees were most concerned about the erosion study, rather than the flood study. Some attendees had interest in how the presented floodlines related to regulation of development of their properties.

Selection of Preferred Alternatives

Based on the results of the alternatives evaluation and the consultation with the Town, Conservation Halton, and the public, Alternative 4 (replacement of the crossings at McCraney Street West, Miller Road, and the recreational trail crossing running from Oakdale Drive to Onslow Court with crossings that accommodate fish passage) was selected as the preferred alternative. The crossings that accommodate fish passage that were determined to be feasible for each crossing include a closed bottom concrete box culvert with baffles at McCraney Street West, an open bottom concrete box culvert at Miller Road, and a span bridge at the recreational trail crossing running from Oakdale Drive to Onslow Court. This alternative will address flooding concerns by reducing water surface elevations under flood flows from upstream of Miller Road to McCraney Street West, preventing the overtopping of McCraney Street West during the Regional event, removing the six (6) identified houses from the Regional floodplain, and reducing nuisance flooding. Additionally, the selected crossing replacements will improve fish and terrestrial connectivity, most notably at the recreational trail where a berm is being removed, and at Miller Road where existing culvert perching is being eliminated.

Estimated Costs and Implementation

Costs for replacing the existing CSP culverts with fish passage accommodating alternatives were estimated and are summarized in the table below. Drawings illustrating conceptual designs of the preferred alternatives have been included at the end of the summary. It is recommended that each crossing be replaced at the end of the culvert design life.

Component	Estimated Construction Costs	Estimated Engineering and Geotechnical Costs
McCraney Street West Crossing Replacement	\$948,000	\$150,000
Miller Road Crossing Replacement	\$1,380,000	\$150,000
Onslow – Oakdale Pedestrian Crossing Replacement	\$570,000	\$100,000

Conclusions and Recommendations

Under existing conditions, the Regional storm results in 4 areas of flooding: McCraney Street West, Culham Street and Osborne Crescent, the Oakville Golf Course, and rear yards from south of Miller Road and Upper Middle Road. Replacement of the McCraney Street West culvert with a larger culvert will remove the 6 identified structures from the Regional Floodplain. As Miller Road and the Oakdale-Onslow berm culvert are of the same age as the McCraney Street West culvert, replacement of these structures was also investigated. Implementation of the preferred alternative, replacement of these 3 structures with structures that accommodate fish passage, will remove all buildings from the floodplain and reduce nuisance flooding. It is recommended that the McCraney Street West culvert be replaced with a closed-bottom box culvert with baffles for fish passage and a rise of 2.0 m and span of 3.5 m, the Miller Road culvert with an open-bottom box culvert with a rise of 3.0 m and a span of 3.0 m, and the Oakdale Drive – Onslow Court pedestrian crossing with a 22 m span bridge. Expected impacts to the Regional Natural Heritage System should be limited by mitigation measures, and it is anticipated that the environment would return to the pre-project level or better over the duration of the successional period of 10 years or greater.



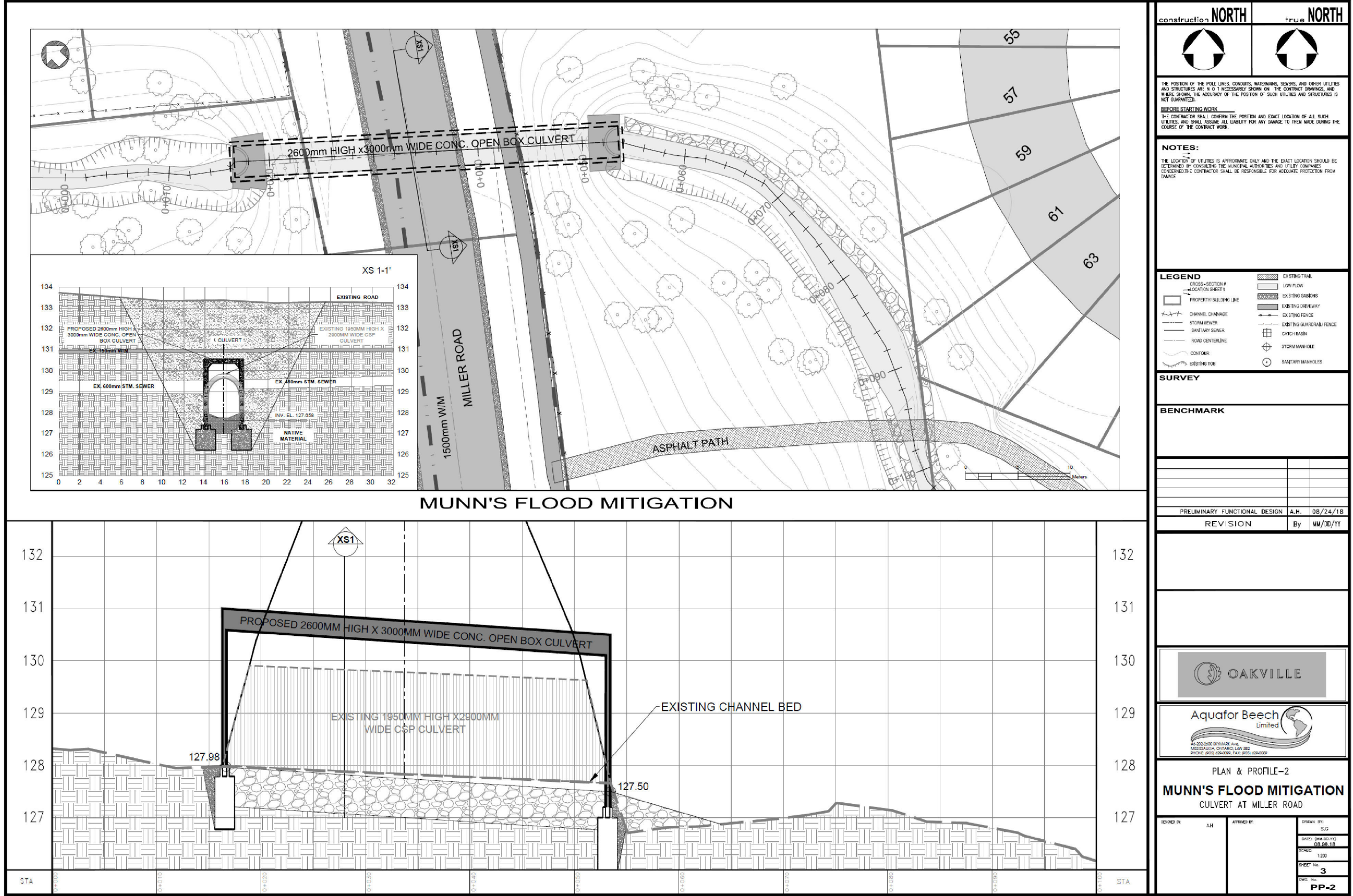


Figure A-3: Conceptual Design of Preferred Alternative for Miller Road Crossing

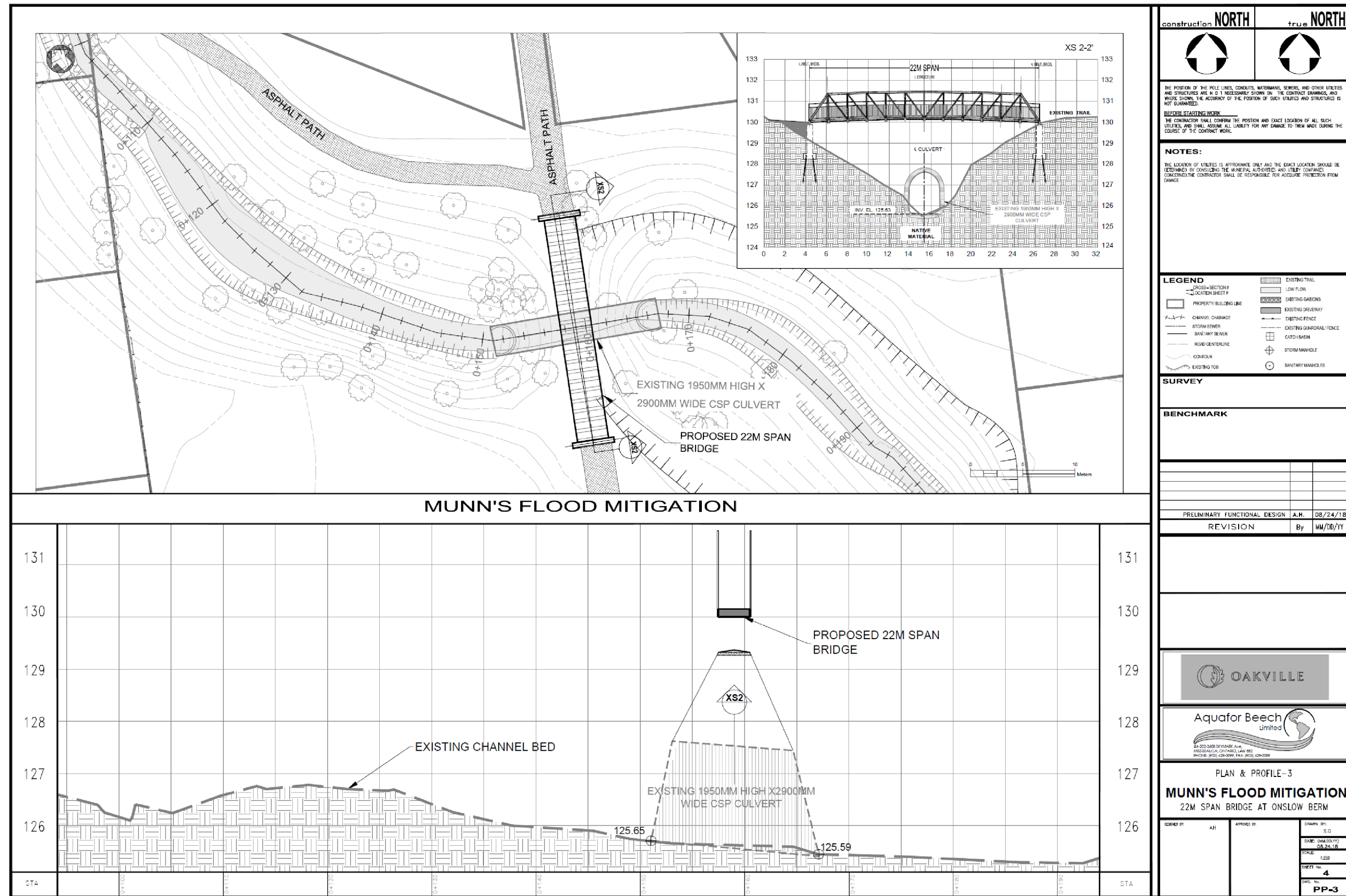


Figure A-4: Conceptual Design of Preferred Alternative for Oakdale Drive to Onslow Court Recreational Trail Crossing