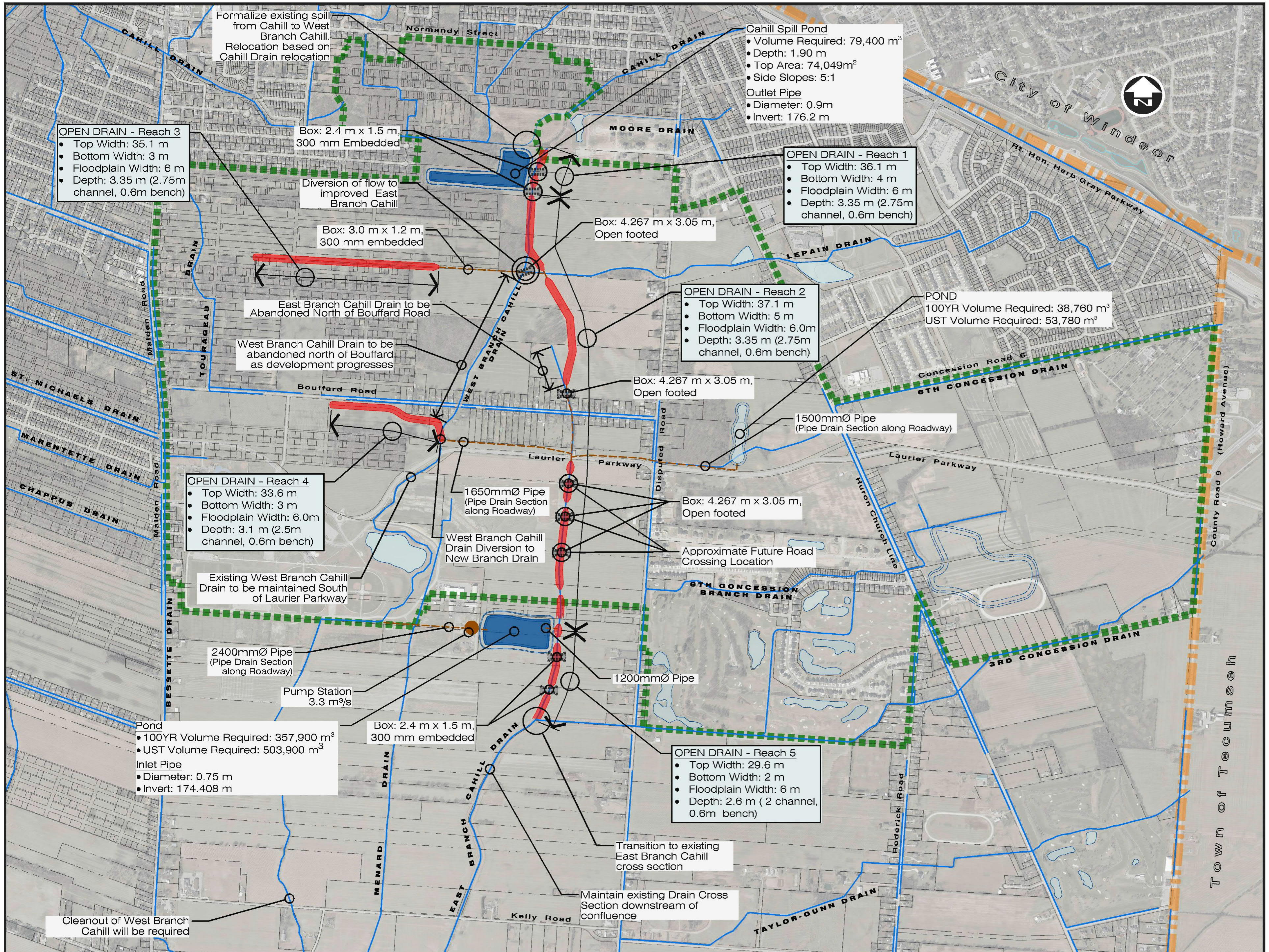
Alternative Solutions

	Alternative Solution	Description
Alternative 1*	Do Nothing	Maintain status quo – no drainage solution to address spillover
Alternative 2	Consolidate Stormwater to Regional Facility	Update of previous preferred solution (as presented at PIC #2)
Alternative 3	Local Stormwater Management Ponds	Builds on the solution as presented in the 2017 EA Addendum

Evaluation of Alternative Solutions: A comparative evaluation for three alternative solutions was completed to identify the level of preference for each alternative solution in comparison to the others. The following categories were used for the evaluation: natural environment, socio-economic, cultural heritage, engineering, cost and timing of implementation.

***Alternative 1: Do Nothing** does not address the identified problem statement requiring a solution to address overland flooding and support future development in the Study Area. **This Alternative is not considered further in the evaluation of alternatives.**

Alternative 2 – Regional Facility



HOWARD/BOUFFARD PLANNING AREA

Master Drainage Study

LEGEND

- MUNICIPAL BOUNDARY
- HOWARD/BOUFFARD STUDY AREA
- Pipe Drain Section
- Proposed Channel Alignment
- Potential Future Road/Bridge Location
- Pond Locations Identified in 2017 E.A. Addendum
- Proposed Pond Locations Newly Identified
- Existing Municipal Drains

NOTE:
Property is required along corridors to facilitate solution.

Drain Crossing Locations Identifier

CHANNEL DESCRIPTION IDENTIFIER

NOTE:
1. Drain alignments and extents to be refined through Detailed Design Process.
2. Number and locations of box culverts to be confirmed through Detailed Design.
3. Proportion of open and closed sections of each branch drain may be refined through Detailed Design.

DRAINS

3:1 Side Slopes (SS) Preferred.

4:1 Side Slopes (SS) may be required based on Geotechnical recommendations.

SCALE 0 0.2 0.5 1.0km

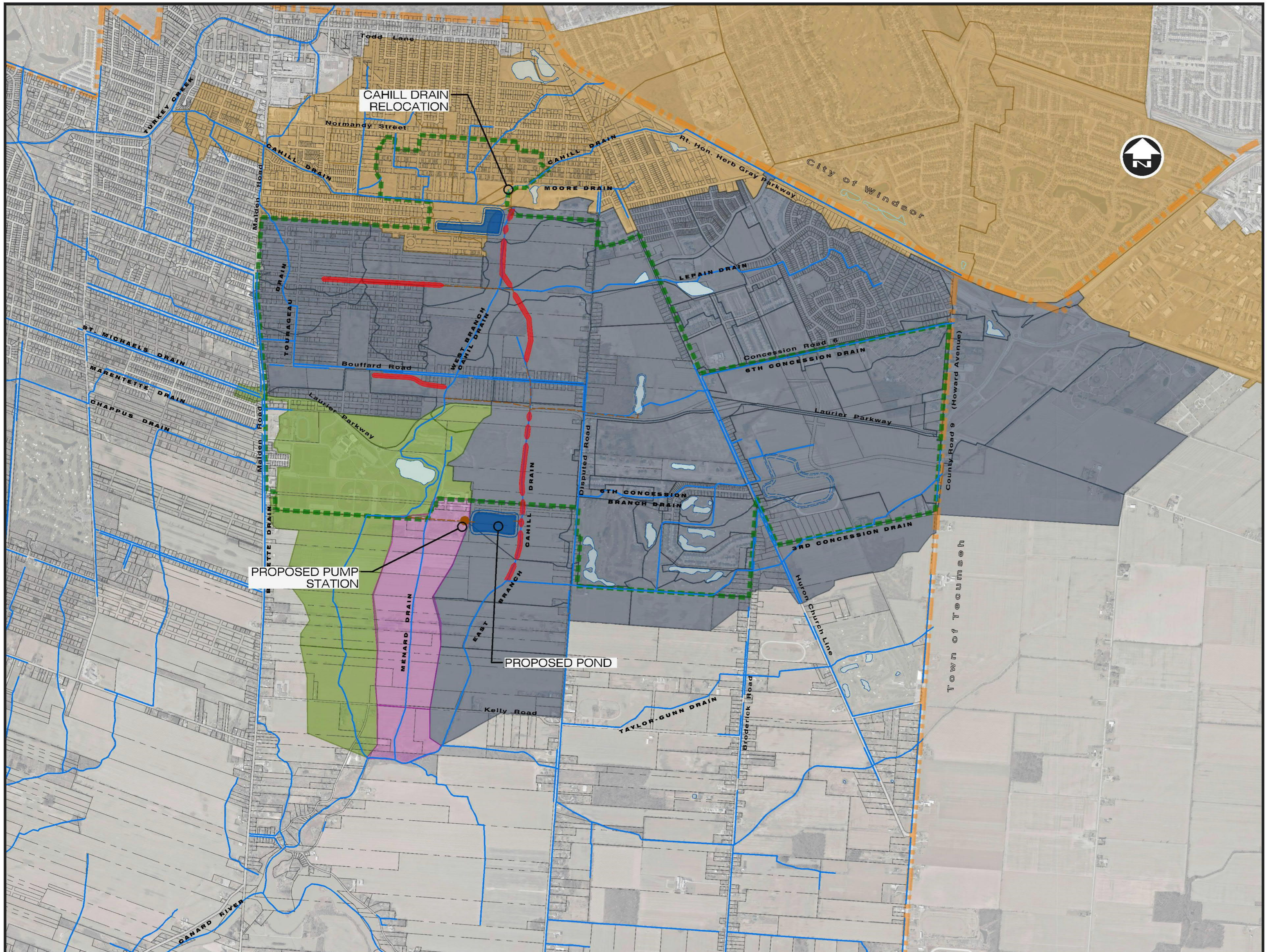
ALTERNATIVE 2

UPDATED REGIONAL SOLUTION

DATE: MARCH 2023
Dillon Proj.No. 18-8169-3000

DILLON CONSULTING

Alternative 2 – Proposed Drainage Conditions



HOWARD/BOUFFARD PLANNING AREA
Master Drainage Study

LEGEND

- MUNICIPAL BOUNDARY
- HOWARD/BOUFFARD STUDY AREA
- Pipe Drain Section
- Proposed Channel Alignment
- Pond Locations Identified in 2017 E.A. Addendum
- Proposed Pond Locations Newly Identified
- Existing Municipal Drains
- Drainage Area Discharging to Cahill Drain
- Drainage Area Discharging to East Branch Cahill Drain
- Drainage Area Discharging to West Branch Cahill Drain
- Drainage Area Discharging to Menard Drain

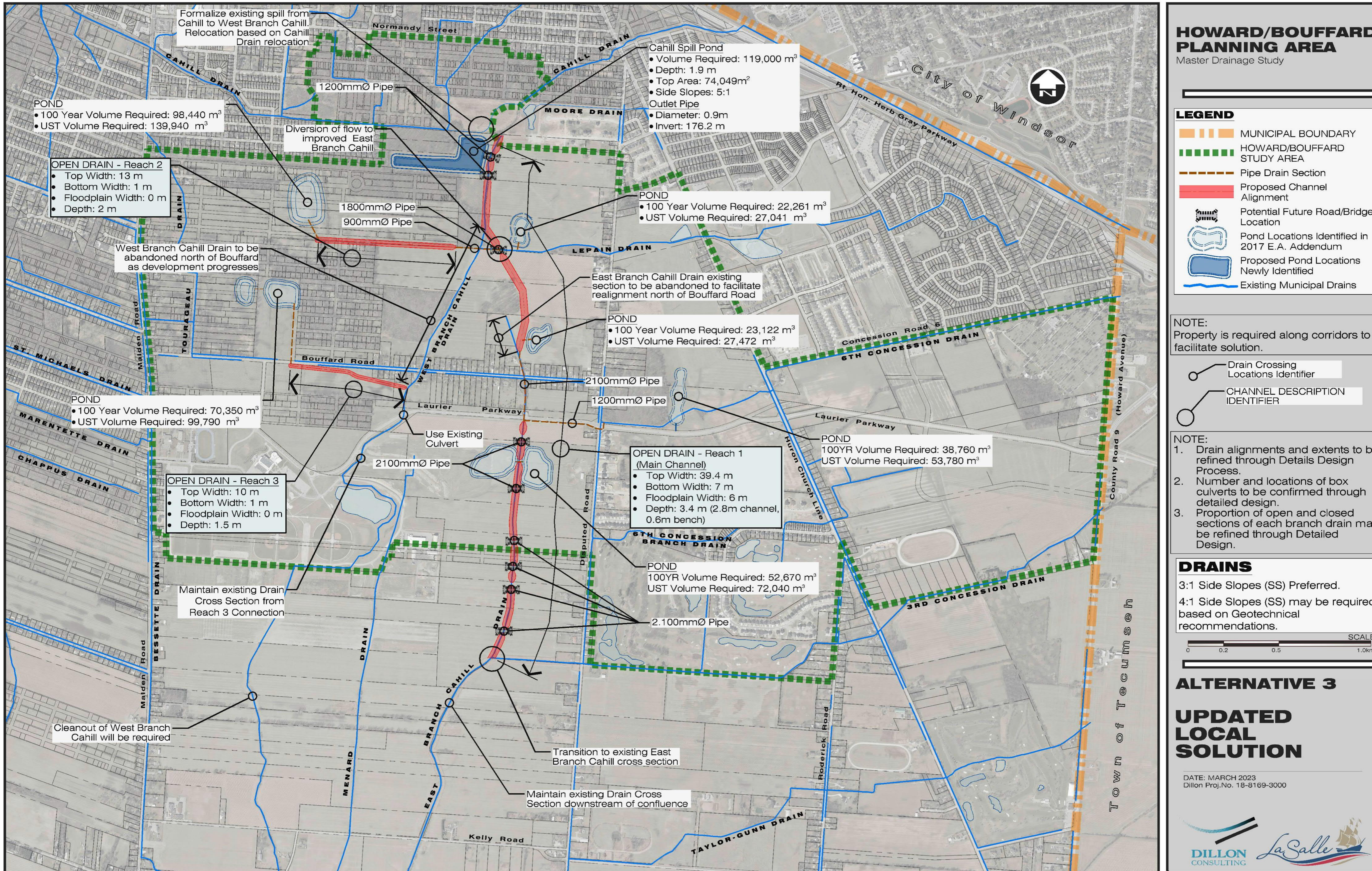
SCALE: N.T.S.

ALTERNATIVE 2

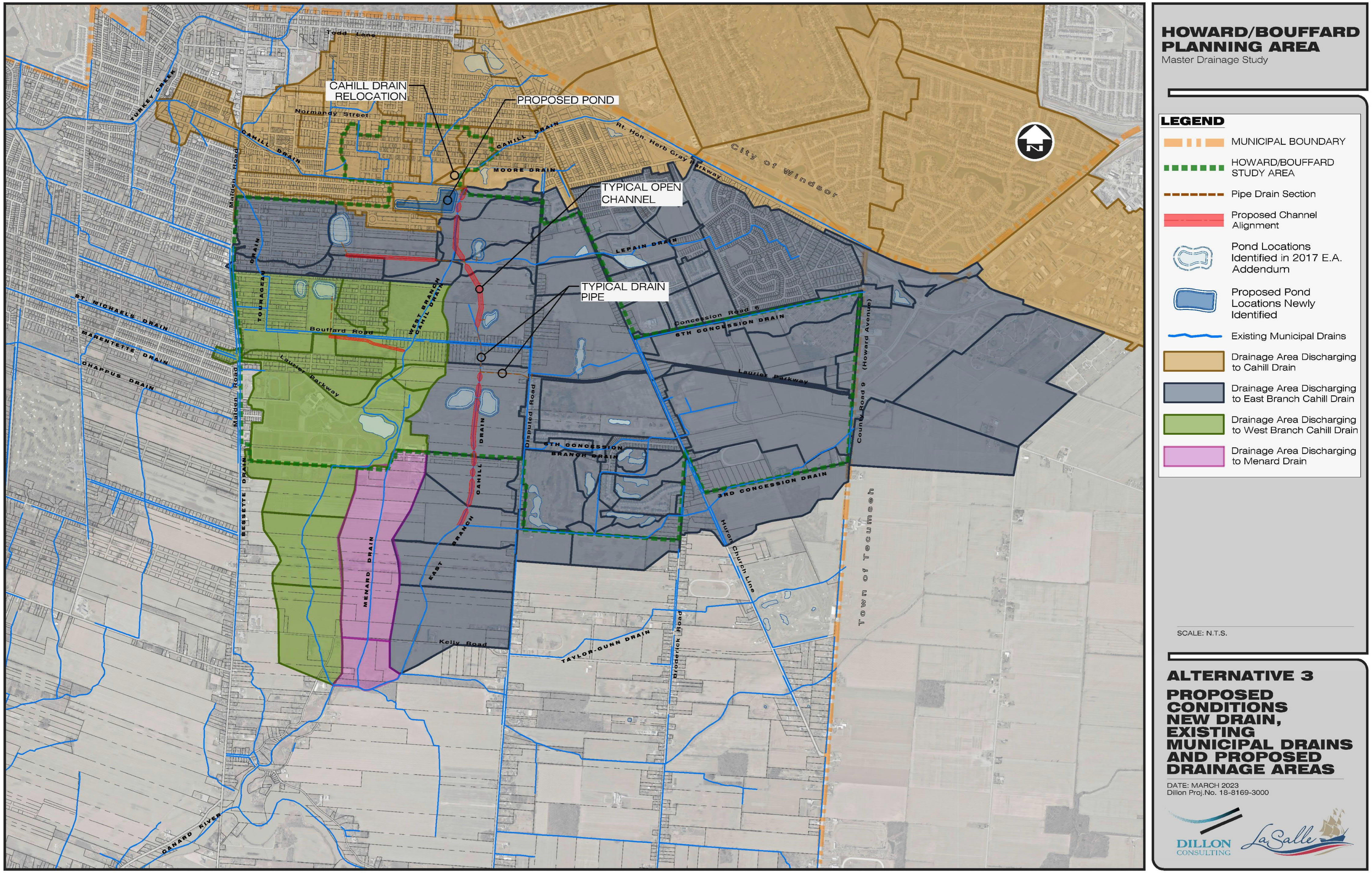
PROPOSED CONDITIONS NEW DRAIN, EXISTING MUNICIPAL DRAINS AND PROPOSED DRAINAGE AREAS

DATE: MARCH 2023
Dillon Proj.No. 18-8169-3000

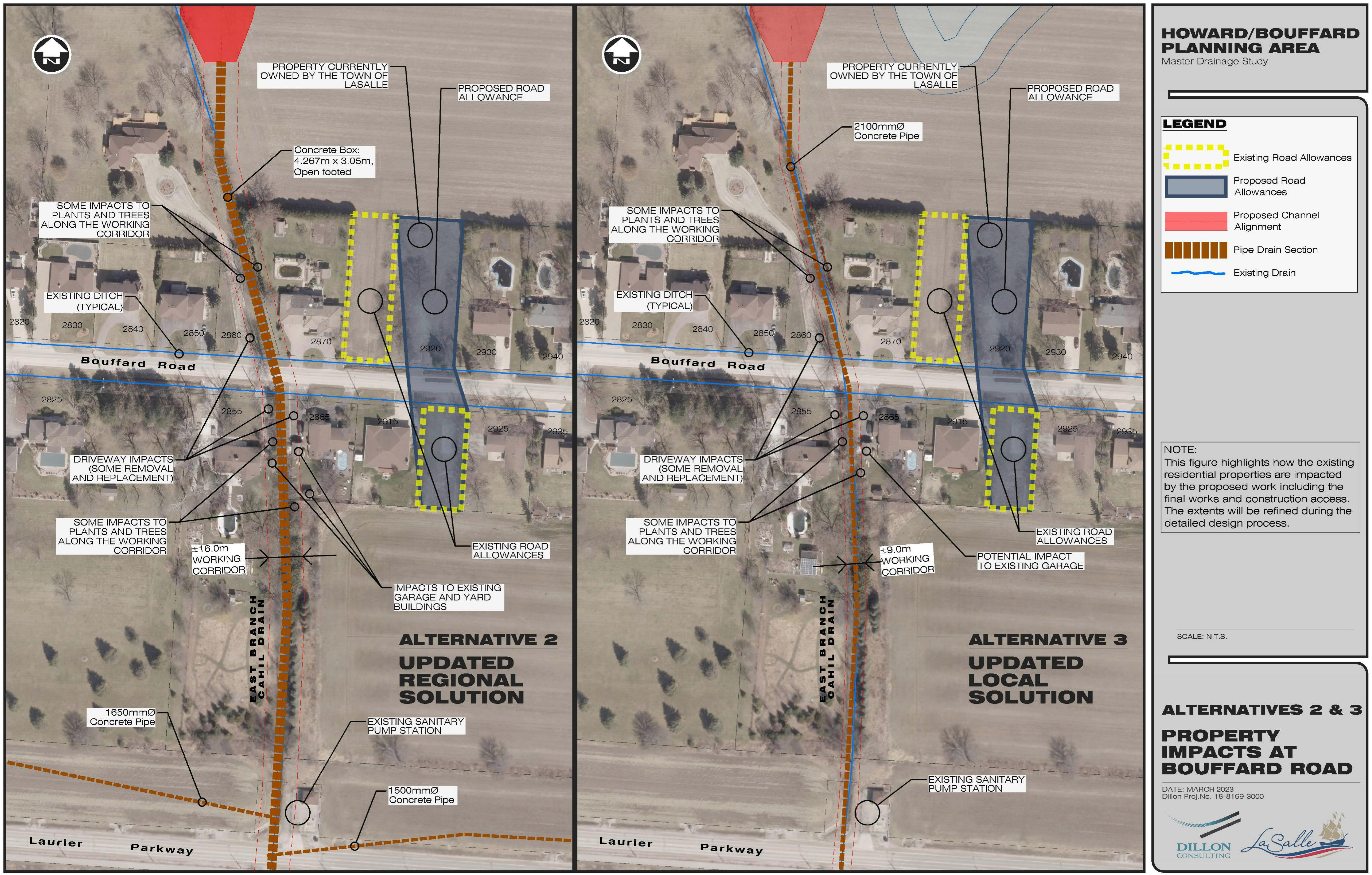
Alternative 3 – Local SWM Ponds



Alternative 3 – Proposed Drainage Conditions



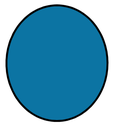
Alternatives 2 and 3 – Property Impacts



Evaluation of Alternatives – Natural Environment

Natural Environment Criteria	Metrics	Alternative 2 Regional Facility	Alternative 3 Local SWM Ponds
Terrestrial Ecosystems	• Anticipated area of impact to natural environment communities		
Terrestrial Ecosystems	• Anticipated area of impact to Species at Risk / Species at Risk habitat and/or Significant Wildlife Habitat	Potential impact is considered equal	Potential impact is considered equal
Terrestrial Ecosystems	• Potential benefit for terrestrial ecosystems/connectivity	Potential benefit is considered equal	Potential benefit is considered equal
Aquatic Ecosystems	• Anticipated length of fish habitat and aquatic ecosystems to be impacted		
Aquatic Ecosystems	• Potential benefit to fish habitat and aquatic ecosystems		
Source Water Protection	• Potential impact on water sources for municipal drinking water systems	Stormwater management is not considered a threat to drinking water within the study area	Stormwater management is not considered a threat to drinking water within the study area

Natural Environment Evaluation Summary	Alternative 3 is more preferred in terms of natural environment impacts. Compared to Alternative 2, it is anticipated to have a lesser impact on both terrestrial and aquatic ecosystems, and has a greater potential for positive impacts to aquatic ecosystems. Specifically, Alternative 3: • Impacts approximately 0.92 hectares less natural environment communities, and avoids restoration areas • Impacts to Significant Wildlife Habitat and Species at Risk habitat are considered equal (0.1 hectare difference between alternatives) • Alters approximately 1,745 metres less of the Cahill Drain

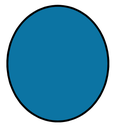
EVALUATION LEGEND  Most Preferred  Least Preferred

***Alternative 1: Do Nothing** does not address the identified problem statement requiring a solution to address overland flooding and support future development in the Study Area. **This Alternative was not considered further in the evaluation of alternatives.**

Evaluation of Alternatives – Socio-Economic

Socio-Economic Criteria	Metrics	Alternative 2 Regional Facility	Alternative 3 Local SWM Ponds
Land Use	• Effectiveness in supporting existing and planned land uses for the area	Support for existing and planned land use is considered equal	Support for existing and planned land use is considered equal
Policies	• Alignment with policies in the local Official Plans and the Provincial Policy Statement, 2020	Alignment with policies is considered equal	Alignment with policies is considered equal
Community Impacts	• Anticipated impact to the local community during construction (noise, dust, traffic restrictions, duration of impacts) • Potential impact/benefit to public safety	Community impacts during construction and benefit to public safety is considered equal	Community impacts during construction and benefit to public safety is considered equal
Aesthetics	• Potential impact/benefit to the public realm (aesthetics, trails, recreational amenities)	Benefit to area aesthetics and recreational amenities is considered equal	Benefit to area aesthetics and recreational amenities is considered equal
Property Impacts	• Anticipated impacts to private property (including driveways, trees, aesthetics)		

Socio-Economic Evaluation Summary	Alternative 3 is most preferred due to anticipating a lesser impact to private property Alternatives 2 and 3 are equally preferred for the following socio-economic criterion: • Support the existing and planned land uses and policies for the area. • Temporary impacts to the local community during construction • Increase public safety due to decrease of overland flooding during storm events • Increase recreational amenities in the study area (through public ROW recreational areas adjacent to drains)

EVALUATION LEGEND  Most Preferred  Least Preferred

***Alternative 1: Do Nothing** does not address the identified problem statement requiring a solution to address overland flooding and support future development in the Study Area. **This Alternative was not considered further in the evaluation of alternatives.**

Evaluation of Alternatives – Cultural Environment

Cultural Environment Criteria	Metrics	Alternative 2 Regional Facility	Alternative 3 Local SWM Ponds
Archaeology	• Anticipated impacts to areas with archaeological potential	Potential impact is considered equal	Potential impact is considered equal
Cultural Heritage	• Potential impact to built heritage resources and cultural heritage landscapes	Potential impact is considered equal	Potential impact is considered equal
Cultural Environment Evaluation Summary	Areas requiring Stage 2 investigations are present for both Alternative 2 and 3 and the potential impact is considered equal. Alternative 2 will require less effort to complete a Stage 2 archaeological assessment compared to Alternative 3 based on shovel testing required.		

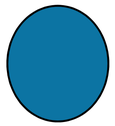
EVALUATION LEGEND — Most Preferred — Least Preferred

***Alternative 1: Do Nothing** does not address the identified problem statement requiring a solution to address overland flooding and support future development in the Study Area. **This Alternative was not considered further in the evaluation of alternatives.**

Evaluation of Alternatives - Engineering

Engineering Criteria	Metrics	Alternative 2 Regional Facility	Alternative 3 Local SWM Ponds
Drainage	• Ability to provide quantity control and flood protection	Ability to provide quantity control and flood protection is considered equal	Ability to provide quantity control and flood protection is considered equal
Permitting/ Approvals	• Potential challenges in obtaining permits and approvals	Alternatives require similar approvals (Conservation Authority, Provincial and Federal)	Alternatives require similar approvals (Conservation Authority, Provincial and Federal)
Utilities	• Anticipated impacts to existing municipal services and utilities	Alternatives require the relocation of various utilities to facility construction	Alternatives require the relocation of various utilities to facility construction
Construction Complexity	• Anticipated requirements for utility relocation or complex construction staging		

Engineering Evaluation Summary	Alternative 3 is most preferred as it requires less, smaller enclosures, smaller and more shallow channels and does not require a regional pond and pump station. Alternatives 2 and 3 are considered as having equal requirements for drainage, permitting/approvals and utility relocation.

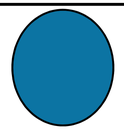
EVALUATION LEGEND  Most Preferred  Least Preferred

***Alternative 1: Do Nothing** does not address the identified problem statement requiring a solution to address overland flooding and support future development in the Study Area. **This Alternative was not considered further in the evaluation of alternatives.**

Evaluation of Alternatives - Cost

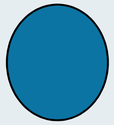
Cost Criteria	Metrics	Alternative 2 Regional Facility	Alternative 3 Local SWM Ponds
Capital Cost	• Estimated cost of implementation, including property acquisition costs		
Operational Costs	• Estimated operations and maintenance costs		
Future Flood Costs	• Estimated reduction in future flood damage costs	Estimated reduction in future flood damage costs are considered equal	Estimated reduction in future flood damage costs are considered equal

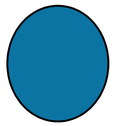
Cost Evaluation Summary	Alternative 3 is most preferred as the costs for construction, property acquisition and Operation and Maintenance are much lower than Alternative 2. The estimate for Construction and Engineering for Alternative 2 is $54M. For Alternative 3 it is $18M. Property Acquisition is an additional cost. In the case of both Alternatives, the excess material is assumed to be trucked away. There may be an opportunity to reduce the cost if some or all of the material can remain onsite. This will have to be reviewed further during detailed design. The cost evaluation considers only the estimated cost of each alternative as presented. The local ponds and pump stations identified in Alternative 3 would be the responsibility of the developer and are <u>not</u> considered in the Evaluation of Alternatives.

EVALUATION LEGEND  Most Preferred  Least Preferred

***Alternative 1: Do Nothing** does not address the identified problem statement requiring a solution to address overland flooding and support future development in the Study Area. **This Alternative was not considered further in the evaluation of alternatives.**

Evaluation of Alternatives – Timing of Implementation

Timing Of Implementation Criteria	Metrics	Alternative 2 Regional Facility	Alternative 3 Local SWM Ponds
Timing of Implementation	• Estimated time required for project implementation		
Timing of Implementation Evaluation Summary	Alternative 3 is most preferred as it will take less time to implement and more control over stormwater management for development lands is left with the developers.		

EVALUATION LEGEND  Most Preferred  Least Preferred

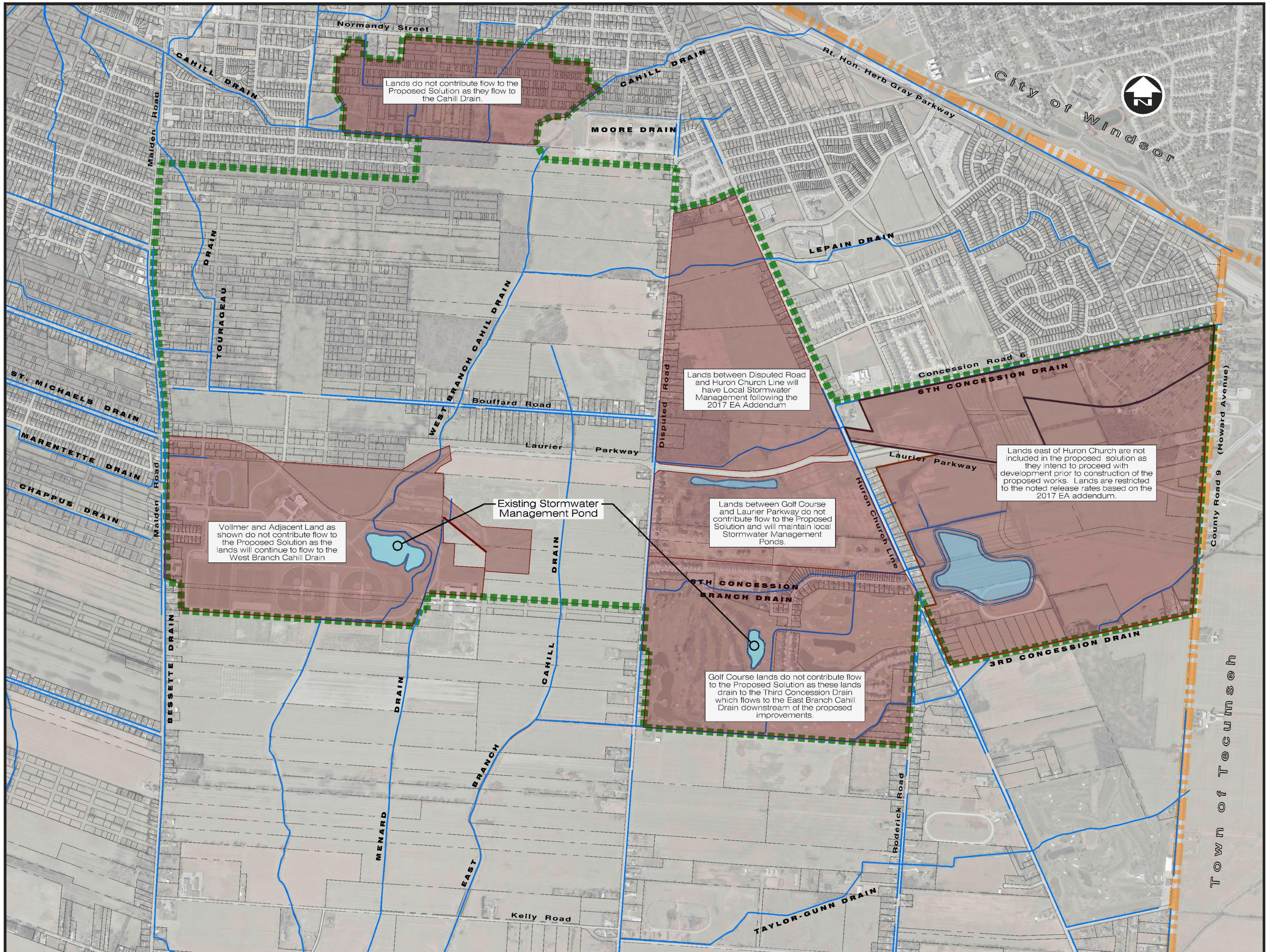
***Alternative 1: Do Nothing** does not address the identified problem statement requiring a solution to address overland flooding and support future development in the Study Area. **This Alternative was not considered further in the evaluation of alternatives.**

Evaluation Summary and Preferred Solution

Category	Preferred Solution Determined by Evaluation
Natural Environment	Alternative 3 – Local SWM Ponds
Socio-Economic Environment	Alternative 3 – Local SWM Ponds
Cultural Environment	Alternatives are considered equal
Engineering	Alternative 3 – Local SWM Ponds
Cost	Alternative 3 – Local SWM Ponds
Timing of Implementation	Alternative 3 – Local SWM Ponds

Based on the Evaluation of Alternatives, it was determined that Alternative 3 – Local SWM Ponds is the Preferred Solution

Area Specific Considerations



HOWARD/BOUFFARD PLANNING AREA
Master Drainage Study

LEGEND

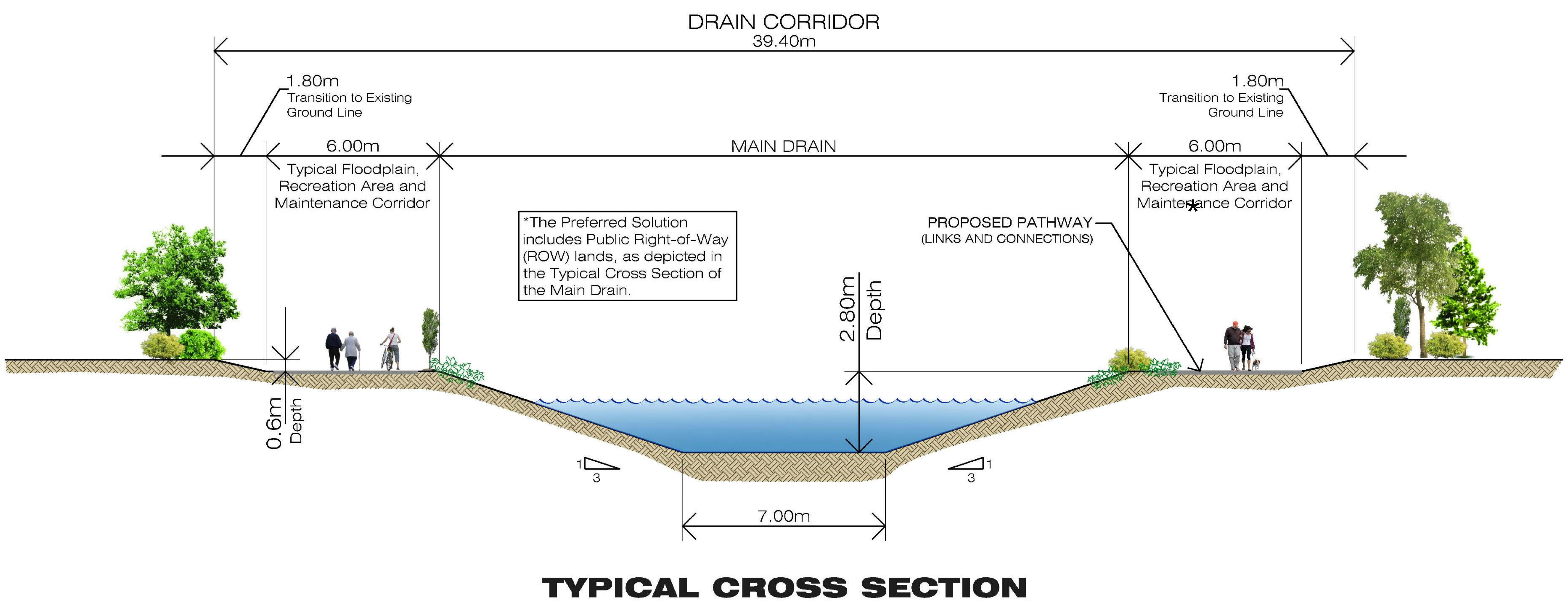
- MUNICIPAL BOUNDARY
- HOWARD/BOUFFARD STUDY AREA
- Existing Municipal Drains
- Area Specific Notes

SCALE 0 0.2 0.5 1.0km

AREA SPECIFIC CONSIDERATIONS

DATE: MARCH 2023
Dillon Proj.No. 18-8169-3000

Preferred Solution – Typical Cross Section



HOWARD/BOUFFARD PLANNING AREA
Master Drainage Study

Maximum Ponding Depths in Floodplain is 0.3m for 100yr, 24hr. Chicago Storm.

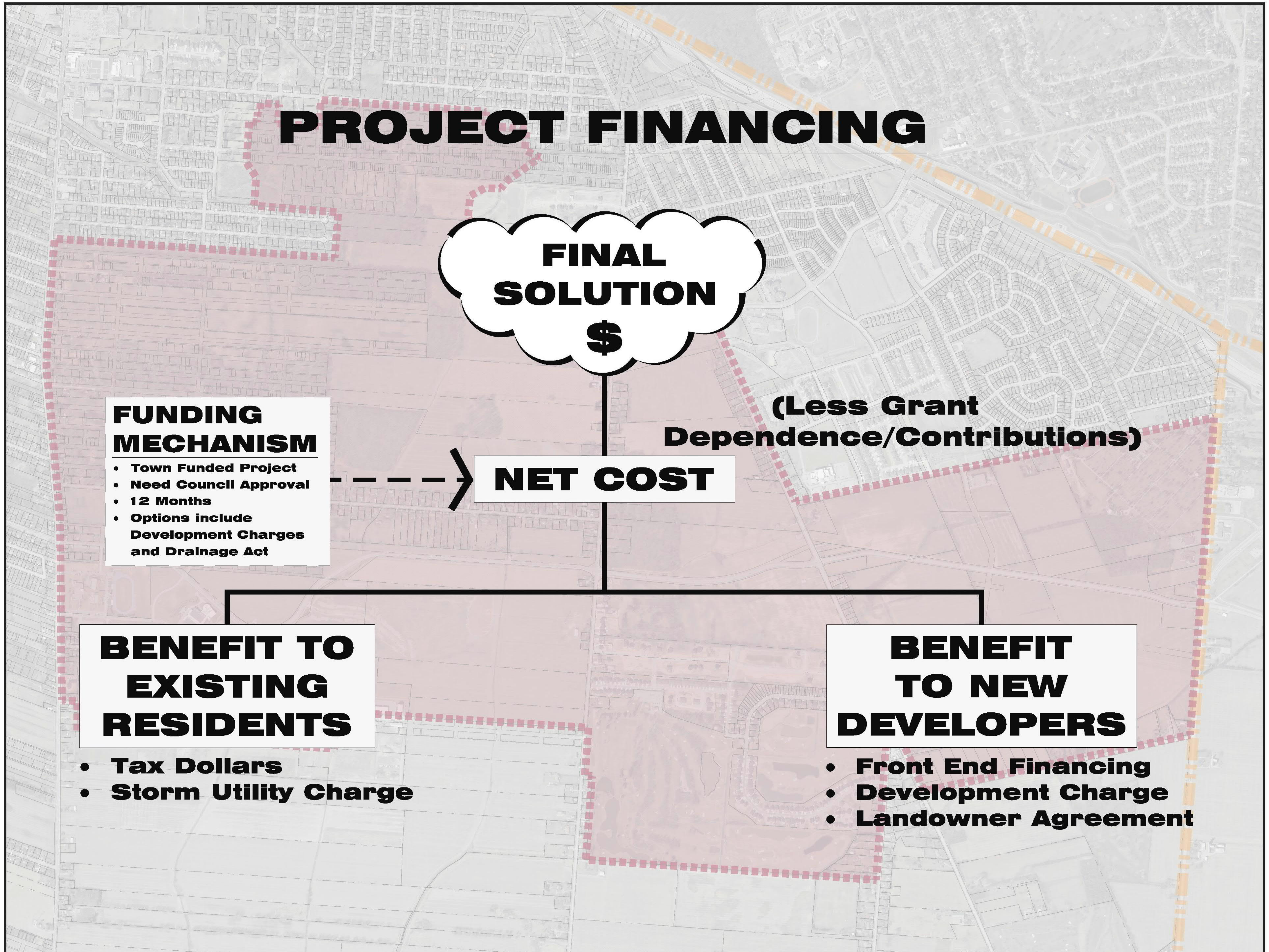
SCALE: N.T.S.

ALTERNATIVE 3

TYPICAL DRAIN CROSS SECTION

DATE: MARCH 2023
Dillon Proj.No. 18-8169-3000

Project Financing



HOWARD/BOUFFARD PLANNING AREA
Master Drainage Study

* The Drainage Act is currently the preferred mechanism to formalize the implementation of the project including refining the design, project costs and confirming the assessments to the contributing lands. The Drainage Act provides a mechanism to ensure that upstream lands contribute to the project cost.

PROJECT FINANCING

DATE: MARCH 2023
Dillon Proj.No. 18-8169-3000

Anticipated Project Timeline

	Q1 2023	Q2 2023	Q3 2023	Q4 2023	Q1 2024	Q2 2024	Q3 2024	Q4 2024	Q1 2025	Q2 2025	Q3 2025	Q4 2025
1. Final Master Drainage Study (Public Process)		X	X									
2. Financing Solutions • Drainage Act • Agreements • Development Charges (Public Process)				X	X	X	X					
3. Preliminary Development Plans						X	X	X	X			
4. Agency Approvals								X	X			
5. Tender and Construction										X	X	X
6. Development Design and Construction									X	X	X	X

Notes:

- All works beyond Final Master Drainage Study require Council Approval
- Preliminary Schedule shown is based on no objections throughout the various public process'
- Development Approval to begin in 2025
- Tender and Construction extends beyond Q4 2025

We Need Your Participation

Feedback from the public and the development community is vital as this project sets the basis for future development of a key part of LaSalle.

- These display slides and an opportunity to comment will be available on PlaceSpeak
- Comment forms are also available today and can be submitted at or following this PIC
- You can contact the project leads below via email, mail, or phone.

Please provide your comments by:

March 31, 2023

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