Agenda
Environmental and Ecological Planning Advisory Committee

The 7th Meeting of the Environmental and Ecological Planning Advisory Committee
June 20, 2019, 5:00 PM
Committee Rooms #1 and #2

The City of London is committed to making every effort to provide alternate formats and communication supports for Council, Standing or Advisory Committee meetings and information, upon request. To make a request for any City service, please contact accessibility@london.ca or 519-661-2489 ext. 2425.

Pages

1. Call to Order

1.1 Orientation

1.2 Disclosures of Pecuniary Interest

1.3 Election of Chair and Vice Chair for the term ending November 30, 2019

2. Scheduled Items

3. Consent

4. Sub-Committees and Working Groups

5. Items for Discussion

6. Adjournment

Environmental and Ecological Planning Advisory Committee Report

The 6th Meeting of the Environmental and Ecological Planning Advisory Committee
May 16, 2019
Committee Rooms #1 and #2

Attendance

PRESENT: S. Levin (Chair), R. Doyle, E. Duarte, C. Dyck, P. Ferguson, S. Hall, B. Krichker, K. Moser, S. Sivakumar and R. Trudeau

ABSENT: E. Arellano, A. Boyer, I. Mohamed and I. Whiteside

ALSO PRESENT: C. Creighton and J. MacKay

The meeting was called to order at 5:00 PM

1. Call to Order

1.1 Disclosures of Pecuniary Interest

That it BE NOTED that not pecuniary interests were disclosed.

2. Scheduled Items

None.

3. Consent

3.1 5th Report of the Environmental and Ecological Planning Advisory Committee

That it BE NOTED that the 5th Report of the Environmental and Ecological Planning Advisory Committee, from its meeting held on April 11, 2019, was received.

3.2 4th Report of the Trees and Forests Advisory Committee

That it BE NOTED that the 4th Report of the Trees and Forests Advisory Committee, from its meeting held on April 24, 2019, was received.

3.3 Municipal Council Resolution - 4th Report of the Environmental and Ecological Planning Advisory Committee

That it BE NOTED that the Municipal Council resolution adopted at its meeting held on April 23, 2019, with respect to the 4th Report of the Environmental and Ecological Planning Advisory Committee, was received.

3.4 Municipal Council Resolution - 5th Report of the Environmental and Ecological Planning Advisory Committee

That it BE NOTED that the Municipal Council resolution adopted at its meeting held on May 7, 2019, with respect to the 5th Report of the Environmental and Ecological Planning Advisory Committee, was received.

3.5 Notice of Study Completion - Bostwick Road Municipal Class Environmental Assessment Study

That it BE NOTED that the Notice of Study Completion for the Bostwick Road Municipal Class Environmental Assessment Study, from H. Huotari, Project Manager, Parsons Inc. and M. Elmadhoon, Project Manager, City of London, was received.

3.6 Notice of Study Completion - Southdale Road West Municipal Class Environmental Assessment Study

That it BE NOTED that the Notice of Study Completion for the Southdale Road West Class Environmental Assessment Study, from B. Huston, Project Manager, Dillon Consulting Limited and T. Koza, Transportation Design Engineer, The Corporation of the City of London, was received.

3.7 Notice of Study Completion - Southdale Road West - Pine Valley Boulevard to Colonel Talbot Road Municipal Class Environmental Assessment Study

That it BE NOTED that the Notice of Study Completion for the Southdale Road West Improvements, from Pine Valley Boulevard to Colonel Talbot Road, Municipal Class Environmental Assessment, from T. Koza, Transportation Design Engineer, The Corporation of the City of London and P. McAllister, Project Manager, AECOM Canada, was received.

4. Sub-Committees and Working Groups

4.1 Parks and Recreation Master Plan Comments

That the ~~attached~~ Working Group comments relating to the Parks and Recreation Master Plan BE FORWARDED to the Civic Administration for consideration; it being noted that the Environmental and Ecological Planning Advisory Committee has submitted the comments to the Civic Administration in order to meet their deadline.

4.2 Stantec Annual Post-Construction Monitoring Report (2018) for 905 Sarnia Road

That the following actions be taken with respect to the property located at 905 Sarnia Road:

a) the Civic Administration BE REQUESTED to consider continuing the monitoring of the relocated wetland;

b) the Civic Administration BE ASKED to develop a cost estimate for the above-noted proposed continued monitoring and provide it to the Chair of the Environmental and Ecological Planning Advisory Committee who will approach possible donors to pay the City the cost of the ongoing monitoring; it being noted that this would be similar to the arrangements to pay the consulting costs of the Environmental Management Guidelines; and,

c) the Chair and members of the Environmental and Ecological Planning Advisory Committee BE AUTHORIZED to seek donations to assist in funding an on-going monitoring.

4.3 You, Your Dog, and ESA's Brochure

That it BE NOTED that the Environmental and Ecological Planning Advisory Committee held a general discussion with respect to the "You, Your Dog and Environmentally Significant Areas" brochure drafted by P. Ferguson; it being noted that this matter will be discussed further at the next meeting.

4.4 Environmental Impact Study - 1176, 1200 and 1230 Hyde Park Road and a Portion of 1150 Gainsborough Road

That the ~~attached~~, revised, Working Group comments relating to the properties located at 1176, 1200 and 1230 Hyde Park Road and a portion of 1150 Gainsborough Road BE FORWARDED to the Civic Administration for consideration.

4.5 Victoria on the River, Phase 6 (1938 and 1964 Commissioners Road East and a Portion of 1645 Hamilton Road)

That the ~~attached~~ Working Group comments relating to the properties located at 1388 and 1964 Commissioners Road East and a portion of 1645 Hamilton Road (Victoria on the River subdivision Phase 6), BE FORWARDED to the Civic Administration for consideration.

5. Items for Discussion

5.1 Draft Lambeth Area Community Improvement Plan (CIP)

That the Civic Administration BE ADVISED that the draft Lambeth Community Improvement Plan (CIP) including funding a Conservation Master Plan for the East Lambeth Forest Environmentally Significant Area in order to create trails consistent with City guidelines; it being noted that one of the goals of the CIP is "Enhancing & Conserving Natural Heritage: Natural features and systems are a defining feature of Lambeth and are enhanced, conserved and celebrated."

5.2 Notice of Planning Application - Official Plan and Zoning By-law Amendments - 3334 and 3354 Wonderland Road South

That it BE NOTED that the Environmental and Ecological Planning Advisory Committee (EEPAC) reviewed and received a Notice of Planning Application dated April 17, 2019, relating to the properties located at 3334 and 3354 Wonderland Road South; it being further noted that the EEPAC may comment on future submissions.

5.3 Notice of Planning Application - Intent to Remove Holding Provision - 9345 Elviage Drive

That the following recommendations with respect to the Notice of Planning application dated May 6, 2019, relating to the property located at 9345 Elviage Drive, from L. Mottram, Senior Planner BE CONSIDERED:

a) invasive species, including phragmites, be removed from the property;

b) the buffer be restored with native species;

c) the owner be asked to ensure the buffer is demarcated and maintained in its natural state, post-restoration; and,

d) in addition to the requirements listed in the report from BioLogic, no refueling take place in the Tree Protection Zone.

5.4 Save Ontario Species

That the following actions be taken with respect to the communication from Ontario Nature, “Save Ontario Species”:

a) the Municipal Council BE ADVISED that Schedule 5 of Bill 108, the proposed More Homes, More Choices Act: Amendments to the Planning Act, is contrary to London's Strategic Plan and the recently declared London Climate Change Emergency; and,

b) the Municipal Council BE REQUESTED to express these concerns to the provincial government.

6. Deferred Matters/Additional Business

6.1 (ADDED) A Wetland Conservation Strategy for London - A Discussion Paper on Best Practices

That the following actions be taken with respect to the Working Group draft relating to "A Wetland Conservation Strategy for London – A Discussion Paper on Best Practices":

a) the above-noted draft document BE REFERRED to the Civic Administration for review as part of the forthcoming update to the Council approved Environmental Management Guidelines; and,

b) the Working Group BE COMMENDED and BE CONGRATULATED for their work on this project.

6.2 (ADDED) Huron Stormwater Management Facility Environmental Assessment - Notice of Completion

That it BE NOTED that the Notice of Completion for the Huron Stormwater Management Facility Environmental Assessment, was received.

6.3 (ADDED) One River Environmental Assessment - River Characterization Study and Hydraulic Modelling

That the following actions be taken with respect to the One River Environmental Assessment River Characterization Study and Hydraulic Modelling:

a) the Municipal Council BE ADVISED that the Environmental and Ecological Planning Advisory Committee supports the staff recommended preferred Option for the Springbank Dam; and,

b) the Municipal Council BE ADVISED that the Environmental and Ecological Planning Advisory Committee has concerns with the impacts to the natural features and functions caused by the proposed pathway between McKillop Park and Springbank Park included in the River Management section.

7. Adjournment

The meeting adjourned at 7:55 PM.

Trees and Forests Advisory Committee

Report

5th Meeting of the Trees and Forests Advisory Committee
May 22, 2019
Committee Room #4

Attendance	PRESENT: R. Mannella (Chair), A. Meilutis, M. Szabo, S. Teichert; and P. Shack (Secretary)
	ABSENT: C. Haindl, T. Khan, J. Kogelheide, C. Linton, G. Mitchell, A. Morrison and R. Walker
	ALSO PRESENT: A. Beaton, J. Spence and B. Williamson
	The meeting stood adjourned at 12:45 PM, due to lack of quorum

P.O. Box 5035
300 Dufferin Avenue
London, ON
N6A 4L9

June 12, 2019

P. Yeoman
Director, Development Services

S. Stafford
Managing Director, Parks and Recreation

I hereby certify that the Municipal Council, at its meeting held on June 11, 2019 resolved:

That, the following actions be taken with respect to the 6th Report of the Environmental and Ecological Planning Advisory Committee, from its meeting held on May 16, 2019:

a) the Working Group comments appended to the 6th Report of the Environmental and Ecological Planning Advisory Committee, relating to the Parks and Recreation Master Plan BE FORWARDED to the Civic Administration for consideration; it being noted that the Environmental and Ecological Planning Advisory Committee has submitted the comments to the Civic Administration in order to meet their deadline;

b) the following actions be taken with respect to the property located at 905 Sarnia Road:

i) the Civic Administration BE REQUESTED to consider continuing the monitoring of the relocated wetland;
ii) the Civic Administration BE ASKED to develop a cost estimate for the above-noted proposed continued monitoring and provide it to the Chair of the Environmental and Ecological Planning Advisory Committee who will approach possible donors to pay the City the cost of the ongoing monitoring; it being noted that this would be similar to the arrangements to pay the consulting costs of the Environmental Management Guidelines; and,
iii) the Chair and members of the Environmental and Ecological Planning Advisory Committee BE AUTHORIZED to seek donations to assist in funding an on-going monitoring;

c) the revised Working Group comments appended to the 6th Report of the Environmental and Ecological Planning Advisory Committee, relating to the properties located at 1176, 1200 and 1230 Hyde Park Road and a portion of 1150 Gainsborough Road BE FORWARDED to the Civic Administration for consideration;

d) the Working Group comments appended to the 6th Report of the Environmental and Ecological Planning Advisory Committee, relating to the properties located at 1938 and 1964 Commissioners Road East and a portion of 1645 Hamilton Road (Victoria on the River subdivision Phase 6), BE FORWARDED to the Civic Administration for consideration;

e) the Civic Administration BE REQUESTED to consider including funding for a Conservation Master Plan for the East Lambeth Forest Environmentally Significant

The Corporation of the City of London
Office 519.661.2500 x4856
Fax 519.661.4892
hlysynsk@london.ca
www.london.ca

Area, as part of the Lambeth Area Community Improvement Plan (CIP), in order to create trails consistent with City guidelines; it being noted that one of the goals of the CIP is "Enhancing & Conserving Natural Heritage: Natural features and systems are a defining feature of Lambeth and are enhanced, conserved and celebrated.";

f) the following recommendations with respect to the Notice of Planning application dated May 6, 2019, relating to the property located at 9345 Elviage Drive, from L. Mottram, Senior Planner BE CONSIDERED prior to the removal of the holding provision:

i) invasive species, including phragmites, be removed from the property;
ii) the buffer be restored with native species;
iii) the owner be asked to ensure the buffer is demarcated and maintained in its natural state, post-restoration; and,
iv) in addition to the requirements listed in the report from BioLogic, no refueling take place in the Tree Protection Zone;

g) the following actions be taken with respect to the communication from Ontario Nature, “Save Ontario Species”:

i) the Municipal Council BE ADVISED that Schedule 5 of Bill 108, the proposed More Homes, More Choices Act: Amendments to the Planning Act, is contrary to London's Strategic Plan and the recently declared London Climate Change Emergency; and,
ii) the Municipal Council BE REQUESTED to express these concerns to the provincial government;

h) the following actions be taken with respect to the Working Group draft relating to "A Wetland Conservation Strategy for London – A Discussion Paper on Best Practices":

i) the above-noted draft document BE REFERRED to the Civic Administration for review as part of the forthcoming update to the Council approved Environmental Management Guidelines; and,
ii) the Working Group BE COMMENDED and BE CONGRATULATED for their work on this project;

i) the following actions be taken with respect to the One River Environmental Assessment River Characterization Study and Hydraulic Modelling:

i) Municipal Council BE ADVISED that the Environmental and Ecological Planning Advisory Committee supports the staff recommended preferred Option for the Springbank Dam; and,
ii) the Municipal Council BE ADVISED that the Environmental and Ecological Planning Advisory Committee has concerns with the impacts to the natural features and functions caused by the proposed pathway between McKillop Park and Springbank Park included in the River Management section; and,

j) clauses 1.1, 3.1 to 3.7, inclusive, 4.3, 5.2 and 6.2 BE RECEIVED for information;

it being noted that the Planning and Environment Committee heard a verbal delegation from S. Levin, Chair, Environmental and Ecological Planning Advisory Committee (EEPAC), with respect to the 6th Report of the Environmental and Ecological Planning Advisory Committee. (3.1/11/PEC)

The Corporation of the City of London
Office 519.661.2500 x4856
Fax 519.661.4892
hlysynsk@london.ca
www.london.ca

C. Saunders
City Clerk
/lm

cc. D. Baxter, Manager, Policy and Planning
L. Mottram, Senior Planner
L. Pompilii, Manager, Development Planning
A. Rammeloo, Manager lll
L. Snyder, Planner ll
C. Smith, Senior Planner
J. MacKay, Ecologist Planner
J. A. Reid, Administrative and Technical Support Representative
Chair and Members, Environmental and Ecological Planning Advisory Committee

The Corporation of the City of London
Office 519.661.2500 x4856
Fax 519.661.4892
hlysynsk@london.ca
www.london.ca

NOTICE OF PUBLIC INFORMATION CENTRE #1

The Study

The City of London is completing a Municipal Class Environmental Assessment (EA) study to determine road improvements for Dingman Drive, East of Wellington Road to Highway 401. This study will also address traffic capacity and road operational improvements to the associated Exeter Road/Wellington Road and Dingman Drive/White Oak Road intersections (Figure 1). This project was identified as a priority in response to the proposed London Gateway development (formerly PenEquity) near Wellington Road and Highway 401 and the corresponding increased traffic and pedestrian volumes. The proposed improvements will assess opportunities to improve existing cycling and pedestrian facilities connections to encourage active transportation.

The Process

The Municipal Class EA study will be completed in accordance with the Ontario Environmental Assessment Act and will fulfill the requirements of the *Municipal Class EA process (October 2000, as amended in 2007, 2011 and 2015)* for Schedule C projects. The project team will examine a full range of alternatives and identify a preferred strategy for addressing the project needs. The project will include public and agency consultation and require the completion of an Environmental Study Report (ESR).

Public Information Centre (PIC) #1

PIC No. 1 will be presented in an **online format** with material available **Monday June 17th 2019** on the City of London website at:

http://www.london.ca/residents/Environment/EAs/Pages/Dingman-Road-Environmental-Assesment.aspx.

PIC No. 1 will introduce the project, outline the rationale behind it, identify existing conditions, and provide a brief overview of the Class EA process. The website will also include a comment sheet and an email address to submit comments. A second PIC **(drop-in format)** will be scheduled in the early fall of 2019 and advance notification will be provided.

Public input is encouraged throughout this process and will be given consideration during the planning and design of this project. The deadline for the submission of comments following PIC No. 1 will be **July 5th, 2019.** If you wish to discuss the project in-person with the Project Team, a meeting could be arranged. A hardcopy of the display materials will also be available to view at the City of London Transportation Division (300 Dufferin Ave, 8th Floor). Information collected for the study will be used in accordance with the *Municipal Freedom of Information and Protection of Privacy Act*. Except for personal information, including your name, address and property location, all comments received

NOTICE OF PUBLIC INFORMATION CENTRE #1

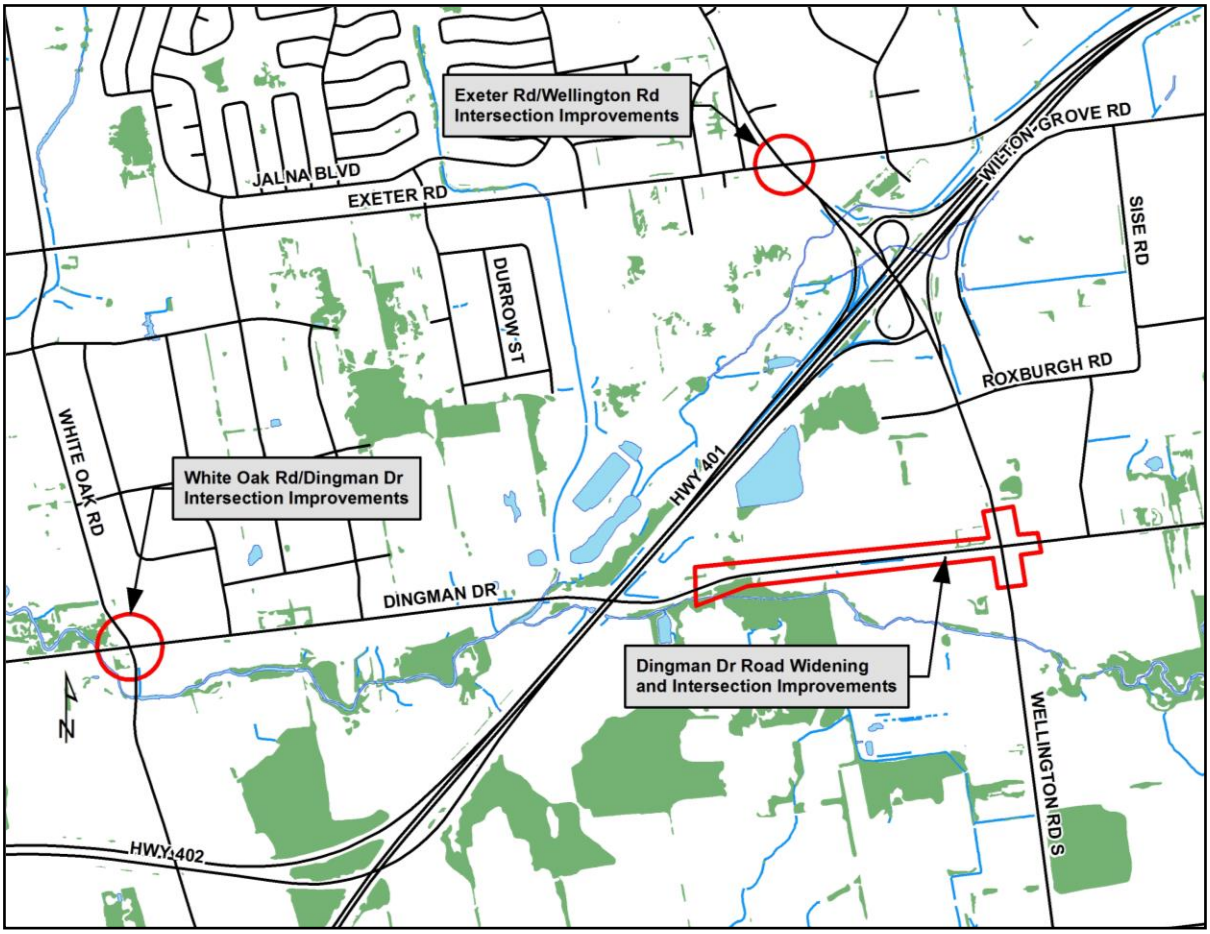
throughout the study will become part of the public record and included in project documentation.

To obtain additional information, provide comments, or to be placed on a mailing list for this project, please visit the project website at www.london.ca or contact either of the following members of the Project Team as follows:

Maged Elmadhoon M.Eng., P.Eng.,
Project Manager,
Corporation of the City of London
300 Dufferin Avenue
London ON, N6A 4L9
Tel: 519-661-CITY (2489) x. 4934
Email: melmadho@london.ca

Peter McAllister, P.Eng., PMP,
Project Manager,
AECOM Canada Ltd.
250 York Street, Suite 410
London ON, N6A 6K2
Tel: 519-963-5865
Email: peter.mcallister@aecom.com

Figure 1: Study Area



Issued on June 6th, 2019.

Review of the ONE RIVER Master Plan Municipal Class Environmental Assessment (EA) by JACOBS, dated May 2019

The City of London identified that the overall goal of the One River Master Plan Class EA study is to develop a comprehensive plan that encompasses the implementation plan and strategies for various projects within the One River study area.

This Master Plan identifies:

- the infrastructure projects major principals that have been assessed based on the Municipal Class EA Master Plan stage requirements under the Environmental Assessment Act (EAA); and
- the community's visions and needs regarding social, recreational, cultural, environmental and economical issues associated with the One River Master Plan Class EA study area.

The **One River Master Plan Strategy** incorporates the selected preferred alternatives for the:

- ***Springbank Dam;***

- ***Forks of the Thames; and***

- ***River Management Plan to reflect the City's current and future vision of the Thames River as an important environmental, ecological and cultural heritage resources.***

Furthermore, this Master Plan recommends various projects become the basis for future planning and project infrastructure implementation and in some permanent infrastructure cases, further Municipal Class EA studies will be required to be undertaken prior to constructing these works.

Springbank Dam Partial Removal - One River Master Plan Class EA the selected preferred alternatives

EEPAC has no concerns and supports the **One River Master Plan selected preferred alternatives for the Springbank Dam Partial Removal that was completed as Class EA, Schedule B** and provided adequate details. EEPAC agrees with the Master Plan Class EA conclusions and this Plan's recommended solution that is intended to improve River environmental/ecological conditions and the system health, water quality and sediment transportation conditions, as well the southern shoreline should be restored and the existing dam structure should be stabilized.

EEPAC has the concern that the post-construction water quality monitoring was not included in the recommendations for the **Springbank Dam Partial Removal** work. EEPAC is of the opinion that the post-construction water quality monitoring is a critical component of the post construction monitoring requirements and is intended to measure the expected water quality improvements as the results of the recommended solution for the Springbank Dam of the One River Master Plan. This water quality monitoring program was also suggested and identified in previous comments from EEPAC to the City staff and the Consultant in January 2019.

Recommendations:

1. EEPAC recommends that the post-construction water quality monitoring program be undertaken by the City in addition to the Master Plan identified proposed post-construction monitoring programs. EEPAC recommends that the post-construction water quality monitoring program be consisted with the water quality basic chemistry monitoring/analysis together with BioMAP biological monitoring of the Thames River water quality and be implemented to measure and evaluate the water quality improvements associated with the **Springbank Dam Partial Removal** proposed work.

2. EEPAC recommends that the Restoration Mitigation Naturalization Plan, which will be required to be developed during the detailed design stage for this proposed work, be reviewed by EEPAC to reaffirm and ensure that improved River environmental/ecological conditions and health associated with the proposed works are maintaining, protecting and meeting the public's expectations.

The Forks of the Thames Suspended Walkway and Softscaped Terraces- One River Master Plan Class EA the selected preferred alternatives

This solution includes the Thames Suspended Walkway and Softscaped Terraces that are intended to provide:

- public exposure;
- spaces for events;
- access to the shoreline;
- pathways to provide pedestrian integration with exiting City's Parks, all works need to be done in accordance with City standards;
- existing sewer outfalls protection and access to linear infrastructure; and
- design of the space that will be provided by the First Nation Community for their cultural requirements.

EEPAC has concerns related to the Thames Suspended Walkway and Softscaped Terraces proposed work solution. EEPAC concerns are mostly based on the facts that this construction would require construction equipment and usages of this equipment would cause significant intrusions into the existing natural areas of this study areas and potentially create adverse impacts on the existing ecological/environmental system and the system conditions. Therefore, EEPAC is of the opinion that potential adverse impacts of the proposed works are not well addressed by the required specific details and/or mitigated in River Master Plan. Also, the mitigation and compensation plan are not identified.

Furthermore, the proposed work represents new **permanent** structural work that may create significant adverse impacts on and/or substantially alter the existing slope stability conditions and the erosion hazard limits within the proposed work areas that may case adverse impacts on ecological/environmental conditions. Also, appropriate remediation slope stability measures/works may be required to be implemented to minimize the long-term adverse impacts on the study area.

Recommendations:

1. As identified in the One River Master Plan Class EA, Schedule 'B', EEPAC recommends that additional detail studies related to assessments and evaluations of the existing and future Geotechnical, Hydrogeological and Slope Stability conditions, as well as the evaluation of the existing infrastructure outlets conditions, locations, relation to the existing slope stability and the proposed work needs to be undertaken, prior to completing the detailed design.

2. Taking into consideration that the Thames Suspended Walkway and Softscaped Terraces proposed work represents a new permanent structural work, which also includes the existing sewer outfalls protection and access to linear infrastructure, and completed only as the Master Plan Class EA, Schedule'B' (some parts of Class EA process are not completed because they are not required under the status of the Master Plan of Class EA process), EEPAC suggests that a full scale Municipal Class EA, Schedule 'B' study for the proposed work may required, subject to accepting the One River Master Plan of Class EA by MOECP and their conditions of acceptance of this Class EA.

3. EEPAC recommends that all additional detailed studies, which will be developed for this proposed work, be reviewed by EEPAC to reaffirm and to ensure that improved River environmental/ecological conditions and the system health associated with the proposed works will be maintained, protected and meet the public's expectation.

One River Management Plan: Stage 2 - Strategic River Corridor Active Use and strategic access to the Thames River

One River Management Plan - Stage 2 - Strategic River Corridor Active Use and strategic access to the Thames River represents an overall plan that encompasses River accesses, social (fishing and boating) and environmental management.

Stage 2 identified and evaluated River Management Plan Alternatives and recommended and selected the preferred alternatives for River Management Class EA Schedule B and C projects studies that will be required to be undertaken as an additional Class EA work, which were identified within the One River Master Plan Class EA as part of the Stage 2 River Management Plan (not including the Springbank Dam and Forks of the Thames projects).

The Schedule A works for the River Management Plan are recommended to proceed on the basis of this Master Plan and MEA Master Planning Process, subject to reaffirming that the proposed Schedule A projects will have minimum adverse impacts on environmental/ecological conditions within the One River Master Plan study area.

EEPAC has no concerns and supports in principal the One River Management Plan - Stage 2 - Strategic River Corridor Active Use and strategic access to the Thames River.

Recommendations:

1. EEPAC recommends that all detailed studies and additional Class EA studies for the various projects for the Stage 2, River Management Plan proposed work be reviewed by EEPAC to reaffirm and to ensure the improved River environmental/ecological conditions and the system health associated with the proposed works be maintained, protected and meet the public's expectation.

You, Your Dog, and Environmentally Significant Areas (ESAs)

A guide to help you and your dog enjoy—and protect—nature in London

Environmentally Significant Areas (ESAs) are designed to preserve and protect nature by minimizing human and pet disturbance to rare and endangered plants and animals and significant natural features

Dog walking is allowed in ESAs, but for the safety of visitors and your pet:

- Keep your dog on a leash and under control at all times.
- Stay on marked trails to minimize the impacts to our environment.
- please remember to dispose of all pet waste in garbage bins. Help to keep it safe and clean for everyone!
- There are natural risks to your pet from steep drops, encounters with wildlife and being in unfamiliar surroundings with new smells.
- Be aware that there are diseases which naturally affect our native wildlife and can pose a risk to dogs.
- Your dog may be friendly, but not all visitors like dogs and some may be afraid of them. Please be respectful of fellow visitors.

An ESA is not a Dog Park

London has dog parks specially designated for your dog to roam and play off leash. See **More Information** section for locations and by-laws.

Picture of an ESA entrance (with sign)

Wild animals

Some animals can seriously harm or kill your dog, especially when he's off-leash:

- **Coyote**—an off-leash dog is more likely to encounter a coyote. Coyotes are more afraid of people than dogs.
- **Raccoon**—well-armed with teeth and claws and not afraid to use them when cornered by any dog —no matter how large
- **Skunk** —need we mention the smell – and the difficulty of its removal?)

Any animal - no matter its size - can scratch or bite your dog in self-defense. Even minor bites or scratches can transmit serious infections to your dog and lead to a large veterinary bill.

Even if your dog "wins" in an encounter with a wild animal, your dog may injure or kill a bird or animal that the ESA was designed to protect.

The mere presence of your dog can affect the feeding, mating, or nesting of birds and animals.

Coyote (note long bushy tail)

Poisonous Plants

Many wild plants can also harm or kill your dog.

~~**Milkweed** is found in some natural areas in London, such as ESAs. Milkweed is prized for its role in providing food for the endangered monarch butterfly. Milkweed contains several **poisons** that can seriously harm or kill your dog.~~

(Picture to be removed)

Many other plants in ESAs can seriously sicken or kill your dog. These include:

Poison oak	Poison ivy
Poison sumac	Foxglove
Dogbane	Castor bean
Giant hogweed	Bloodroot
Thorn apple (jimsonweed)	Yew

Many mushrooms

Even if your dog does not get sick or injured by running, rolling, or digging through plants, rare or endangered plant species may be damaged.

Need More Information?

City of London, City Planning
519-661-4980
www.london.ca

Upper Thames River Conservation Authority (UTRCA)
519-451-2800 ext. 281
www.thamesriver.on.ca

London Animal Care Centre
519-685-1330
www.accpets.ca

There are 11 ESAs in London, please see:
www.london.ca/ESA

The City of London also operates 5 Off leash dog parks
www.london.ca/residents/Parks/Explore-Parks/Pages/Off-Leash-Dog-Parks.aspx

City logo to go here

Prepared by Environmental and Ecological Planning Advisory Committee (EEPAC) of the City of London

Trails Advisory Group for Environmentally Significant Areas

Terms of Reference

1.0 Background

The Trails Advisory Group (TAG) will assist with the implementation of the Guidelines for Management Zones and Trails in Environmentally Significant Areas (ESAs) as approved by City Council on June 23, 2016. ESAs are identified in the City's Official Plan as areas that contain natural features and perform ecological functions that warrant their protection in a natural state. Publicly-owned ESAs have a purpose and function distinct from all other publicly owned open space parks. Permitted uses, access, and the provision of recreational activities within ESAs are governed by the Environmental Policies of the Official Plan for significant components of the natural heritage system.

2.0 Purpose

The purpose of the TAG is to provide comment on trail related issues in London's ESAs that were not addressed or contemplated in the most current Conservation Master Plan (CMP) for each ESA. It serves as an information conduit with respective organization members and leverages resources within the community. The TAG serves as the communication link for local trails volunteers and stakeholders. The expected benefits of such a strategy include sharing expertise and perspectives leading to greater understanding and cooperation among stakeholders.

Policies for trail planning and design are implemented through the CMP process which typically includes consultation with Environmental and Ecological Planning Advisory Committee (EEPAC), public participation meetings, and a public meeting before Planning Environment Committee. As most CMPs include recommendations for implementation over a 10 year period, situations may arise where alternative trail alignments or solutions may be required due to the dynamic nature of ecosystems. The TAG will provide part of the public engagement process for comments on trails not originally addressed or contemplated in the most current CMPs. The TAG is an advisory body and is not an approval authority.

3.0 Responsibilities and Functions

The TAG will provide timely, consistent and effective trail planning and design comments by:

(a) Reviewing and suggesting creative trail design responses to the identified problems in the establishment of trails and trail structures;

(b) Ensuring proposed trails and trail structures are consistent with the Council adopted Guidelines for Management Zones and Trails in Environmentally Significant Areas (ESAs).

(c) Fostering an effective working relationship with all trail user groups and organizations; and

(d) Broadening public discussion about trails and ESAs in London and strengthening public input.

4.0 Membership

The TAG shall be comprised of:

- 1 representative and 1 alternate representative from TVTA
- 1 representative and 1 alternate representative from EEPAC
- 1 representative and 1 alternate representative from Nature London
- 1 representative and 1 alternate representative from UTRCA
- 1 representative and 1 alternate representative from Accessibility Advisory Committee
- A representative from the neighbourhood community association and a representative from the directly associated "Friends of" ESA group will be included based on which ESA the TAG is reviewing
- City staff who will facilitate meetings and site visits

5.0 Terms of Office

Service on the TAG is a 2 year appointment confirmed by October 1st. TAG representatives shall serve without compensation. Appointment to the TAG will be by nomination from within each of the user groups and organizations. Representatives (or their alternate representative) must be available and provide their own transportation to attend all meetings of the TAG.

6.0 Processes / Meetings

The TAG will meet as required, usually onsite, to address specific trail projects and identified problem trail sites in ESAs that were not originally contemplated or addressed in the current ESA Master Plans.

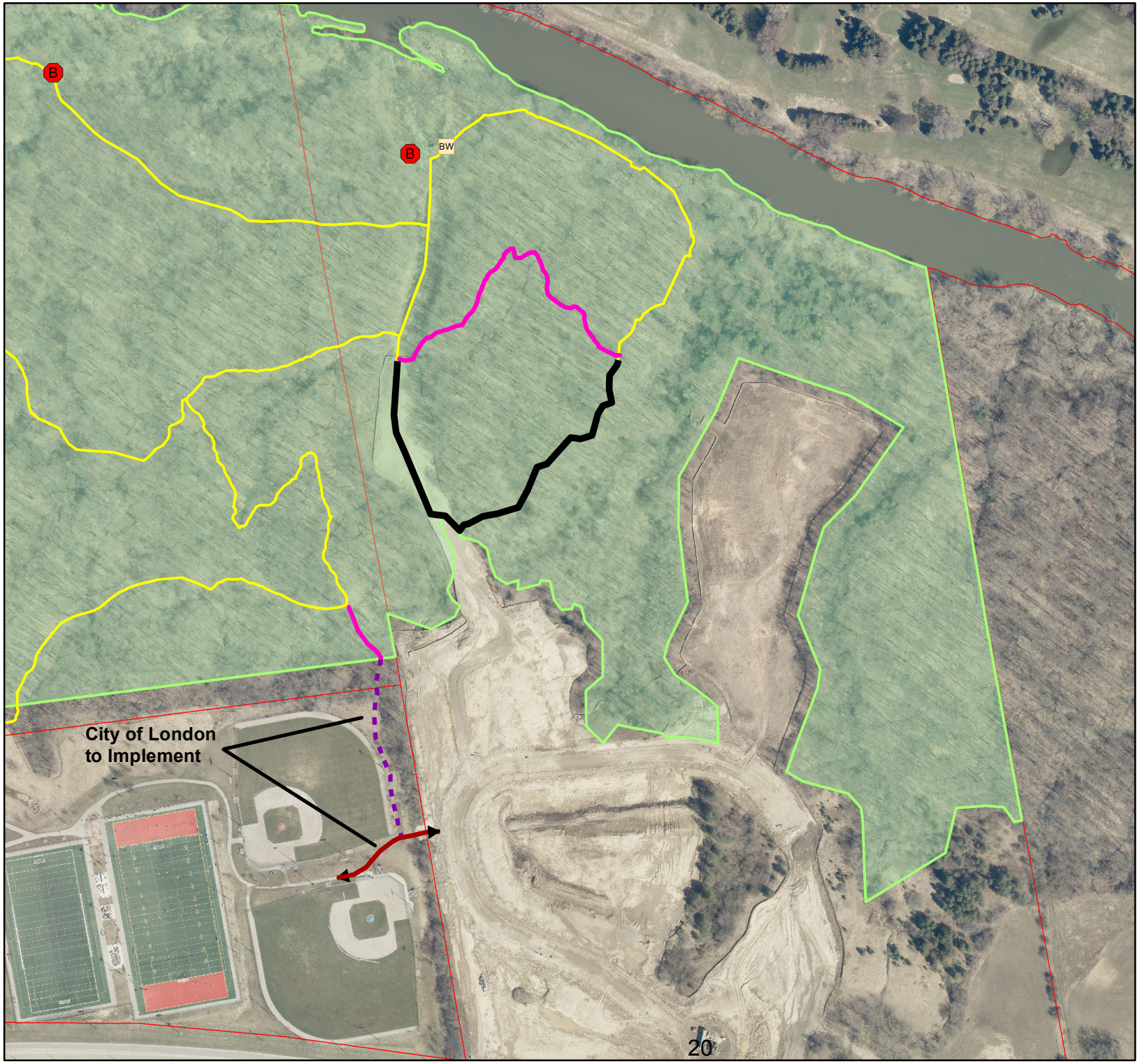
City staff will set the meeting agenda, location and provide background information, maps and photos to facilitate meetings.

The TAG will strive for consensus in making decisions. However, if consensus is not reached after significant effort, a majority of the TAG members present will be required to make a decision.

City staff will take TAG meeting minutes and summarize the results and distribute the minutes to TAG members within two weeks after TAG meetings.

The TAG representatives will liaise with members of the public as well as their respective stakeholder groups in order to share information both to and from the TAG.

Communication between EEPAC and TAG and back will be through the City Ecologist.



Meadowlilly ESA

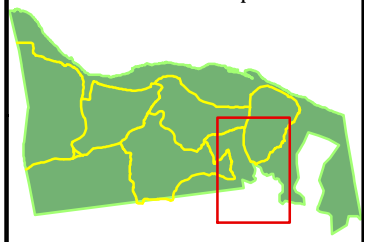
Planned & Proposed Trail Options

UPPER THAMES RIVER
CONSERVATION AUTHORITY

Legend

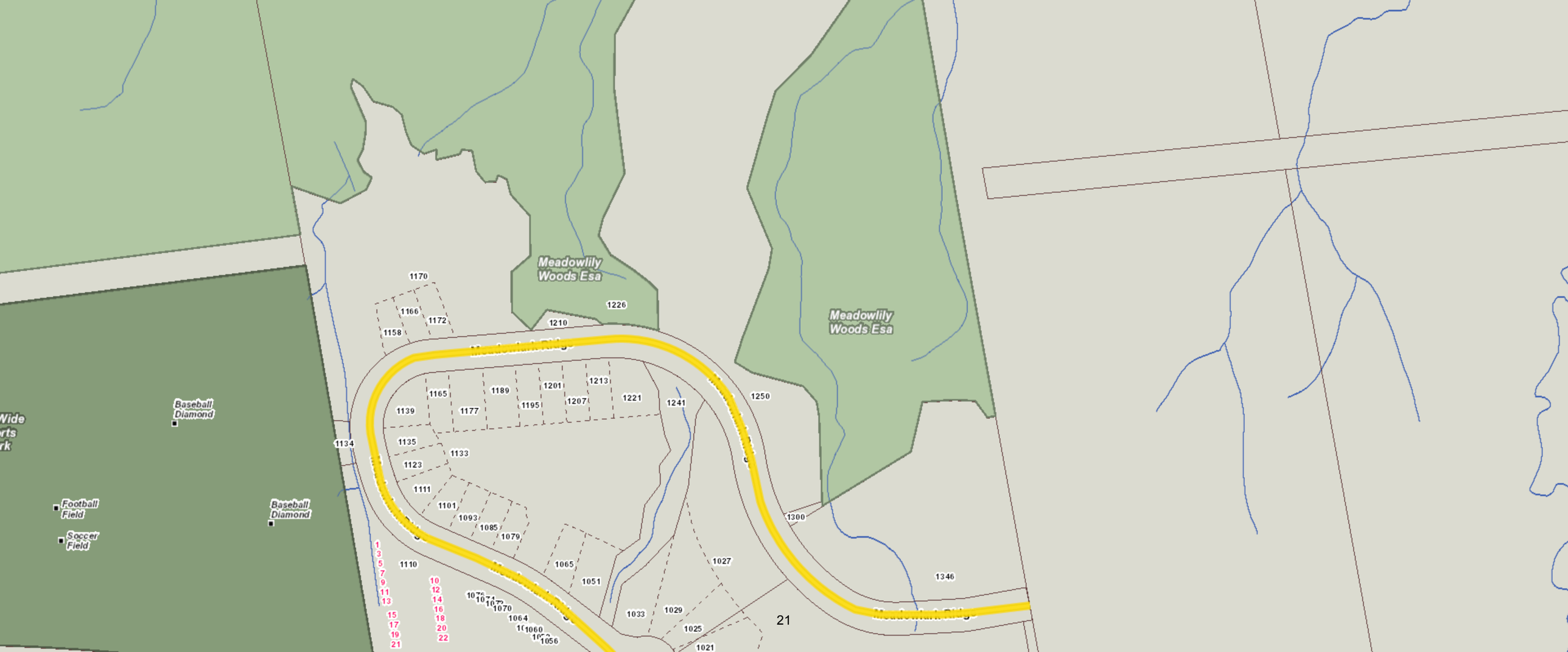
- Barricade (Closed)
- Boardwalk
- Proposed Trail
- Planned Connection Trail
- Planned TVP Trail
- Removed Trail
- Managed Trail
- ESA Management Area

Location Map



0 30 60 90 120

Metres


Meadowlily Woods Esa
Meadowlily Woods Esa
Baseball Diamond
Football Field
Soccer Field
Baseball Diamond
1170
1166
1172
1158
1226
1210
1165
1189
1201
1213
1139
1177
1195
1207
1221
1241
1250
1134
1135
1133
1123
1111
1101
1093
1085
1079
1300
1110
1065
1051
1027
1346
1033
1029
1025
1021
1064
1060
1056
21

- **Sifton Properties Limited**

Old Victoria – Grenier Lands &
1645 Hamilton Road
London, Ontario

Geotechnical Investigation - Slope Assessment

Project Name
Old Victoria – Grenier Lands Slope, London, ON

Project Number
KCH-00238640-GE

Prepared By:
exp **Services Inc.**
15701 Robin's Hill Road
London, ON, N5V 0A5

Date
July 2017
Reissued March 2019

Sifton Properties Limited

Old Victoria – Grenier Lands & 1645 Hamilton Road, London, Ontario

Type of Document:
Slope Stability Assessment

Project Name:
Old Victoria – Grenier Lands, London, Ontario

Project Number:
KCH-00238640-GE

Prepared By:
EXP Services Inc.
15701 Robin's Hill Road
London, ON, N5V 0A5
Canada
T: +519.963.3000
F: +519.963.1152
www.exp.com

Craig Swinson, P.Eng.
Geotechnical Services

Botel Chiu, M. Eng., P.Eng
Senior Discipline Manager

Date:
July 2017, Reissued March 2019

Legal Notification

This report was prepared by EXP Services Inc. for the account of **Sifton Properties Limited.**

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. EXP Services Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this project.

Table of Contents

1.0 Introduction

1.1 Introduction

This report presents the findings of a Slope Stability Assessment carried out in association with the Old Victoria Area Plan, along the Grenier Property and 1645 Hamilton Road in London, Ontario.

The proposed development is within an area regulated by the Upper Thames River Conservation Authority. As a result, consent from the Conservation Authority is required prior to construction of the proposed addition at the site.

1.2 Terms of Reference

Authorization to proceed with this investigation was received from Phil Masschelein of Sifton Properties Limited by email on May 26, 2017.

The purpose of this investigation was to assess the physical conditions of the slope located along the Grenier property and 1645 Hamilton Road, and based on the results of the investigation provide comments on slope stability and recommendations on development setback limits.

Based on an interpretation of the factual borehole data, a review of the topographic survey by Trueline Services Inc., EXP Services Inc. has provided engineering guidelines for the geotechnical design and construction of the proposed development.

This report is provided on the basis of the terms of reference presented above, and on the assumption that the design will be in accordance with applicable codes and standards. More specifically, EXP has referenced the Natural Hazards Manual and Technical Guides prepared by the Ontario Ministry of Natural Resources for geotechnical and slope assessment purposes.

If there are any changes in the design features relevant to the geotechnical analyses, or if any questions arise concerning geotechnical aspects of the codes and standards, this office should be contacted to review the design.

The information in this report in no way reflects on the environmental aspects of the soil. Should specific information in this regard be needed, additional testing may be required.

2.0 Methodology

2.1 Review of Previous Investigations

In September 2006, EXP Serivices Inc. (formerly Trow Associates Inc.) prepared a Geotechnical and Hydrogeological Investigation (Trow Reference LNGE00008290A) as part of the Old Victoria Area Planning Study, and included a slope inventory. The work area for the Geotechnical Investigation and slope inventory encompasses the current study area.

In July 2015, EXP Services Inc. prepared a Preliminary Slope Stability Assessment for the current subject site. No boreholes were completed as part of that investigation.

The relevant information from the aforementioned reports has been reviewed and incorporated into the current investigation.

2.2 Site Reconnaissance

A reconnaissance survey of the slope was undertaken by a member of EXP's field engineering staff on July 6, 2017. The MNR Rating Chart was utilized for four slope sections to summarize the site observations and empirically score various elements which contribute to slope stability, to provide an assessment of the potential for slope instabilities at the site. The slopes located within the northern land parcel at 1645 Hamilton Road possessed similar conditions based on past observations and topographic information. Soil and groundwater information from EXP's field program was incorporated into the rating charts.

No evidence of previous sliding or slope failures was observed during EXP's site reconnaissance. No seepage zones were noted in the slope faces along the watercourse. In general, based on the values recorded on the Slope Stability Rating Charts, the site slopes are considered to have a `slight potential' to 'moderate potential' for instability, see Appendix C.

2.3 Review of Topographic Data

The work program for the slope assessment included a review of the topographic survey (actual survey spot elevations) provided by Trueline Services Inc. The topographic survey information was utilized to create cross sections for use in estimating the location of the Erosion Hazard Limit, which defines the development setback limit. Using sound engineering judgement and technical experience, six cross sections (which are considered to be representative of typical site conditions) have been reviewed. Consideration has also been given to incorporate potential slope sections which have a higher potential for slope instability which may be indicated by the presence of more steeply inclined slopes or the localized presence of seepage zones.

Examination of factors of safety using Bishop's Simplified methods were carried out and analyzed by computer methods utilizing the Slope/W computer program. Soil strength parameters used in the analyses were obtained from typical values in literature sources.

Once the stable slope profile is determined, an additional setback for erosion allowance is applied, as required for site specific conditions. This analysis is carried out where there are

changes in the soil and groundwater conditions and where there are significant changes in the slope inclination and surface topography.

3.0 Site and Subsurface Conditions

3.1 Site Description

The site for the proposed development (see Drawing 1) is currently undeveloped located on the north side of Commissioners Road East within the Grenier property of Old Victoria Area and the subsequently acquired property at 1645 Hamilton Road in London, Ontario. A drainage creek traverses the property from south to north, draining northward towards the Thames River. The watercourse was previously identified as 'Watercourse 3' in the Old Victoria Area Planning Study. Photographs are included below as reference.

Photo 1 – Tableland and slope crest at Borehole BH1.

Photo 2 – Drainage Creek Base

The slopes along the watercourse are well vegetated, with a mixture of young and mature trees, and heavy brush. No overturning or bending of the existing trees was observed. This is a sign that significant movement of the soils in the slope has not occurred.

The topography of the tableland was described as inclined slightly towards the watercourse. Relief along the tableland is considered low; the total local relief across the site, from south to north, is estimated at about 20 metres.

3.2 Soil Stratigraphy

In addition to the site reconnaissance, two (2) boreholes were advanced by EXP on July 6, 2017 to provide information on the soil stratigraphy. The stability of each representative slope section was analyzed by computer methods utilizing the Slope/W computer program for the slope profiles. Soil strength parameters used in the analyses were obtained from typical values in literature sources and from the borehole investigation carried out by EXP.

The boreholes were advanced using a subcontracted specialist drilling company using continuous flight, soil sampling and soil testing equipment. The boreholes were terminated at a depth of about 9.6 m below existing grades.

Within the boreholes, Standard Penetration Tests (SPTs) were performed to assess the compactness or consistency of the underlying soils and to obtain representative samples. During the drilling, the stratigraphy in the borehole was examined and logged in the field by EXP geotechnical personnel.

Short-term groundwater level observations within the open boreholes and the natural moisture contents of recovered soil samples are recorded on the borehole logs. Following the drilling, the boreholes were backfilled with the excavated material and bentonite hole plug in order to satisfy the requirements of O. Reg. 903.

Representative samples of the various soil strata encountered at the borehole locations were taken to our laboratory in London for further examination by a geotechnical engineer and laboratory classification testing. Laboratory testing for this investigation comprised of routine moisture content determinations with results presented on the borehole logs found in Appendix B.

It must be noted that the boundaries of the soil indicated on the borehole logs are inferred from non-continuous sampling and observations during drilling. These boundaries are intended to reflect transition zones for the purpose of geotechnical design and should not be interpreted as exact planes of geological change. A brief description of the stratigraphy encountered at the borehole locations follows.

TOPSOIL/FILL

Topsoil/Fill was contacted at ground surface in each of the boreholes. The topsoil/fill extended to a depth ranging between about 0.9 and 1.4 m below ground surface. Based on the cultivated and agricultural land use throughout the site, areas with blended topsoil and shallow subgrade soils are anticipated. The topsoil/fill were generally described as a dark brown sand silt with trace to some clay and gravel, and in a very loose to compact state, based on drilling resistance.

SANDY SILT

Below the topsoil/fill in borehole BH2 was a layer of sandy silt extending to a depth of about 1.8 m below ground surface. The sandy silt is described as brown and weathered. The

sandy silt is in a compact state, based on a Standard Penetration Test (SPT) N-value of 17 blows per 300 mm penetration of the split-spoon sampler. Based on laboratory testing, the *in situ* moisture content of the sandy silt was in the range of 15 percent, indicative of very moist conditions.

CLAYEY SILT

Beneath the topsoil/fill at borehole BH1 and the sandy silt at BH2, a native clayey silt glacial was encountered. The clayey silt was generally described as light brown to grey (at depth) with trace to some sand, and occasional dilatant silt seams in the upper 5.6 m. The consistency of the clayey silt was described as firm to very stiff (based on tactical observations, observed drill resistance and SPT N-values ranging between about 6 and 17 blows). Based on laboratory testing, the *in situ* water content of the clayey silt ranges between about 17 and 26 percent, generally indicative of moist to very moist soil conditions.

It should be noted that the predominant natural soil contacted throughout the southern part of the OVAPS area is glacial till. The texture of the till is described as silt with some clay and trace sand and fine gravel. Intermittent wet silt seams, and clay seams were observed within the till, which generally becomes cohesive with depth. The silt till deposits have a compact to dense relative density based on SPT N-values which range from 25 to 46 blows per 300 mm penetration of the spilt-spoon sampler. Moisture contents in the silt till range from 14 to 26 indicative of moist conditions.

SILTY SAND

Beneath the clayey silt, a silty sand layer was encountered. In general, the silty sand was noted to be grey and fine-grained. The silty sand is in a compact to dense state, based on a SPT N-values in the range of about 23 to 31 blows per 300 mm penetration of the split-spoon sampler. The *in situ* moisture content of the silty sand is about 19 percent, generally indicative of wet soil conditions.

3.3 Groundwater Conditions

Details of the groundwater conditions observed within the boreholes are provided on the attached Borehole Logs. Measurement of the water level and moisture contents of selected samples are also recorded on the attached Borehole Logs.

Upon completion of drilling, the open borehole excavations were examined for the presence of groundwater and groundwater seepage.

Short-term groundwater levels and seepage were observed at various depths in the boreholes. Based on these observations and the moisture content of the recovered soil samples, the groundwater observed in the boreholes is contained within the wet silt or sand seams within the clayey silt deposits.

It should be noted that, insufficient time was available for the measurement of the depth to the stabilized groundwater table prior to backfilling the borehole. The depth to the groundwater table may vary in response to climatic or seasonal conditions, and, as such, may differ with high levels occurring in wet seasons. Capillary rise effects should also be anticipated in fine-grained soil deposits.

During our site reconnaissance, the slope condition was examined by exp staff and did not reveal any noticeable seepage zone at the slope face.

4.0 Slope Stability

4.1 General

The purpose of this investigation was to determine a safe setback distance from the existing slope profiles and stream system which traverse the site using the information which is currently available. It is important to mention that specific details regarding the proposed development, layout and site grading have not been examined as part of the current scope of work.

The slope was evaluated using the method prescribed by Ministry of Natural Resources in the Technical Guide for Assessing the Erosion Hazard Limit for River and Stream Systems. The overall Erosion Hazard Limit (Development Setback) for the site slope is determined by evaluating the slope stability, considering surficial seepage and shallow failures, allowance for potential flooding hazards, and an erosion allowance.

Slope Stability Rating Charts have been completed for the referenced cross sections and are attached, see Appendix C. Based on the values recorded on the Slope Stability Rating Charts, the ratings suggests that a slight to moderate potential of slope instability exists.

4.2 Erosion Hazard Limit

As defined by the MNR Technical Guide, based on the type of river and stream system landform (confined or unconfined) the following figure provides guidance on which factors (hazard allowances) should be used in defining the erosion hazard limits.

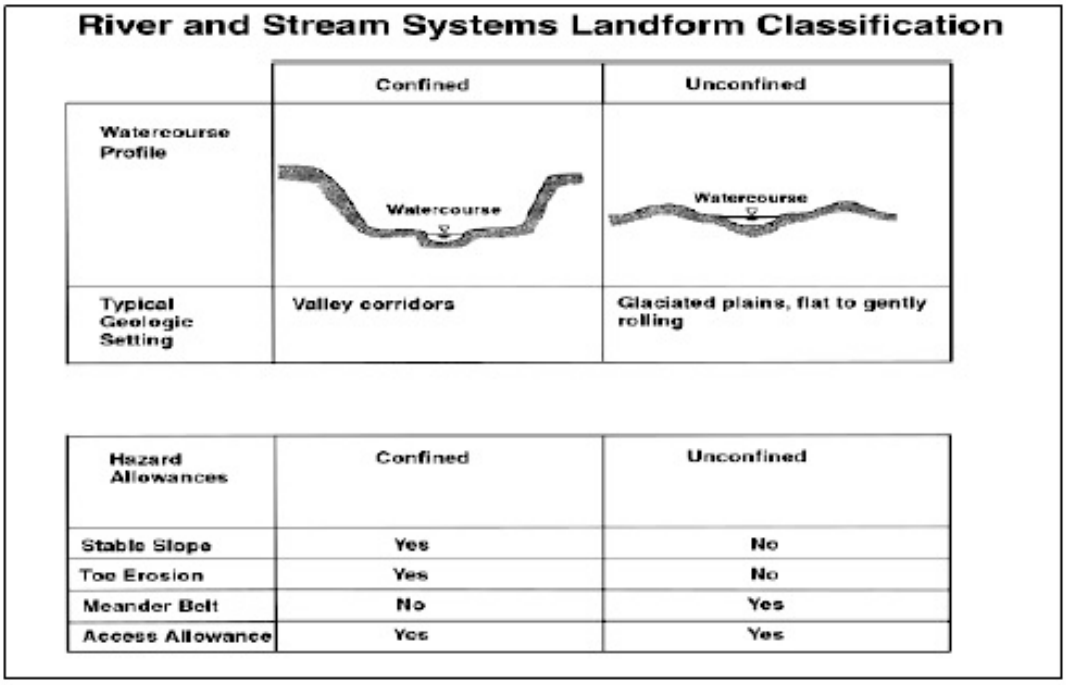


Figure obtained from page 35 of MNR Technical Guide – River and Stream Systems: Erosion Hazard Limit

As defined by the MNR Technical Guide, confined river and stream systems are ones in which the physical presence of a valley corridor containing a river or stream channel, which may or may not contain flowing water, is visibly discernable form the surrounding landscape by either field investigations, aerial photography and or map interpretation. The Erosion Hazard Limit for a confined system consists of the following hazard allowances:

- Toe Erosion Allowance
- Stable Slope Allowance
- Access Allowance

Additional setbacks may also be required based on local Municipal and Conservation Authority requirements.

The setback distance from the slope crest varies slightly along the slope, based on the overall slope height and inclination, and the type and amount of toe erosion at the base of the slopes. As mentioned in section 2.2, six cross sections (cross sections A, B, C, D, E and F) have been shown on Drawing 1 along the existing slope profile and were used for establishing the location of the Erosion Hazard Limit. Additionally, the inferred location of the top of slope line and top of stable slope line are also provided on Drawing 1 and on cross sectional Drawings 2, 3, 4, 5, 6 and 7.

4.2.1 Toe Erosion Allowance

The extent of potential erosion damage is a function of the competence of the natural subgrade soils, the type and quality of vegetative cover, and the frequency with which the slope is subject to erosive forces. Active erosion of the soil on the face of the riverbank slope is most likely caused by normal or increased flow volumes and velocities moving through the drainage creek. The figure below provides guidance on how to determine a minimum toe erosion allowance for a confined system.

MINIMUM TOE EROSION ALLOWANCE - River Within 15 m of Slope Toe*

Type of Material Native Soil Structure	**Evidence** of Active Erosion** OR Bankfull Flow Velocity > Competent Flow Velocity*** RANGE OF SUGGESTED TOE **EROSION ALLOWANCES**	**No evidence** of Active Erosion** OR Bankfull Flow Velocity <Competent Flow Velocity*** Bankfull Width		
		< 5m	5-30m	> 30m
1.Hard Rock (granite) *	0 - 2 m	0 m	0 m	1 m
2.Soft Rock (shale, limestone) Cobbles, Boulders *	2 - 5 m	0 m	1 m	2 m
3.Stiff/Hard Cohesive Soil (clays, clay silt), Coarse Granular (gravels) Tills *	5 - 8 m	1 m	2 m	4 m
4.Soft/Firm Cohesive Soil, loose granular, (sand, silt) Fill *	8 - 15 m	1-2 m	5 m	7 m

*Where a combination of different native soil structures occurs, the greater or largest range of applicable toe erosion allowances for the materials found at the site should be applied

****Active Erosion*** is defined as: bank material is exposed directly to stream flow under normal or flood flow conditions where undercutting, oversteepening, slumping of a bank or down stream sediment loading is occurring. An area may have erosion but there may not be evidence of 'active erosion' either as a result of well rooted vegetation or as a result of a condition of net sediment deposition. The area may still suffer erosion at some point in the future as a result of shifting of the channel. The toe erosion allowances presented in the right half of Table 3 are suggested for sites with this condition. See Step 3.

*****Competent Flow Velocity*** is the flow velocity that the bed material in the stream can support without resulting in erosion or scour. For *bankfull width* and *bankfull flow velocity*, see Section 3.1.2.

Figure obtained from page 38 of MNR Technical Guide – River and Stream Systems: Erosion Hazard Limit

Where detailed slope stability analyses have not been carried out, the Natural Hazards Manual by Ministry of Natural Resources indicates that a minimum toe erosion allowance of 1 m is recommended where the bankfull width is less than 5 metres and no evidence of active erosion is present.

At present, there is very little water in the tributary. When water is present, the watercourse is marshy in nature, with very low velocity water rather than a stream condition with higher water flow velocities. Signs of active erosion along the watercourse are not present. The predominant soils near the base of the slope are expected to comprise of clayey silt deposits. Since this watercourse contains intermittent and typically low-velocity flows, an

erosion allowance of 2 m is generally considered to be appropriate along the base of this slope.

4.2.1.1 Consideration of Surface Erosion and Piping

The surficial soils on the face of the slope also experience minor long-term erosion due to weathering (wetting/drying and freezing/thawing cycles). The extent of potential erosion damage is a function of the competence of the natural subgrade soils, the type and quality of vegetative cover, and the frequency with which the slope is subject to erosive forces. Serious erosion of the soil on the face of the slope could be caused by run-off water washing over the face of the slope (such as tile drains or redirected surface water which is directed onto existing slopes), as well as human disturbance, both of should be minimized where possible.

Water seepage and shallow groundwater levels can also impact slope stability, by reducing the soil strength. Piping on a slope face can occur where groundwater seepage daylights on the face of the slope. Based on the available information, and the observations during the site reconnaissance work, no seepage zones were observed, which would impact the existing slope stability.

4.2.2 Stable Slope Geometry

The stability of the slope profiles were investigated for a number of conditions. The examinations involve an assessment of the natural slope with and without the influence of perched groundwater the effects of possible construction in proximity to the site slopes. The various types of failures analyzed include shallow slumping failures, medium depth rotational failures near the crest of the slope, and deep rotational failures through the entire height of the slope.

The analyses were undertaken by computer methods utilizing the Slope/W computer program for select slope profiles.

The soil parameters used were conservative to build in an added safety factor for the analyses. The table on the following page summarizes the parameters for the predominant soils which were used in **exp's** evaluation of the stable slope configuration:

Table 1 – Soil Properties

Soil Type	Unit Weight	Cohesion	Angle of Internal Friction
Sandy Silt	19.0 kN/m^3	0 kPa	28^o
Clayey Silt	18.0 kN/m^3	10 kPa	25^o
Silty Sand	20.5 kN/m^3	0 kPa	30^o

In order to determine an appropriate Erosion Hazard Limit setback from the crest of the slope, a minimum factor of safety of 1.4 was used during the computerized stable slope analysis. The following table from the MNR Technical Guide provides guidance on how to select a minimum factor of safety based on the intended land use above or below the slope.

Table 2 – Design Minimum Factor of Safety

	LAND-USES	FACTOR OF SAFETY
A	**PASSIVE**; no buildings near slope; farm field, bush, forest, timberland, woods, wasteland, badlands, tundra	1.10
B	**LIGHT**; no habitable structures near slope; recreational parks, golf courses, buried small utilities, tile beds, barns, garages, swimming pools, sheds, satellite dishes, dog houses	1.20 to 1.30
C	**ACTIVE**; habitable or occupied structures near slope; residential, commercial, and industrial buildings, retaining walls, storage/warehousing of non-hazardous substances	1.30 to 1.50
D	**INFRASTRUCTURE and PUBLIC USE**; public use structures or buildings (i.e., hospitals, schools, stadiums), cemeteries, bridges, high voltage power transmission lines, towers, storage/warehousing of hazardous materials, waste management areas	1.40 to 1.50

Table obtained from page 60 of MNR Technical Guide – River and Stream Systems: Erosion Hazard Limit

After completing the computerized stable slope analysis on each cross section, the minimum calculated factor of safety under the existing conditions was 1.52 for cross sections B and C. The minimum calculated FOS value for cross sections A and D were 1.70 and 1.97 respectively, and for cross sections E and F were 1.90 and 1.57 respectively, all of which are above the 1.4 recommended minimum FOS value. Summarized results are provided in the following table.

Table 3 - Summary of Pertinent Slope Stability Analyses

Cross-Section Condition	Computed Factor of Safety
Slope Section, A-A:	1.70
Slope Section, B-B:	1.52
Slope Section, C-C:	1.52
Slope Section, D-D:	1.97
Slope Section, E-E:	1.90
Slope Section, F-F:	1.57

The findings were in general agreement with observations of the local slope (vegetated and treed slope which is beneficial for protection against shallow slides). The soil conditions encountered in the boreholes were generally found to comprise of firm to very stiff clayey deposits. In determining suitable input soil and groundwater parameters, consideration has been given to incorporating the presence of groundwater within the subsurface soil strata. Local changes and variations in the groundwater level were also considered when carrying out the analyses, to examine possible post-development effects. Changes in the groundwater level may result from a number of causes, included (but not limited to) possible site grading activities, changes to site drainage, use of at-source infiltration, or types of surface cover.

The average inclinations along the existing slope profiles at the investigated cross sections range between about 1H:1V to 3.8H:1V. Based on the soil conditions encountered during the field investigation and based on the results of the computerized slope stability analysis a stable slope line of 2.5H:1V has been applied and should be considered suitable based on the results of the current geotechnical study.

It should be noted that the theoretical calculations for FOS are conservative. Based on the site reconnaissance conducted by EXP, it was observed that the slope face along the riverbank is covered by vegetation (manure trees and heavy shrubs). The trees were generally in an upright state. The deep roots of mature trees assist to reinforce and enhance the stabilization of slopes.

In addition to the stable slope geometry, an emergency access allowance should also be applied. This is described in the following section.

4.2.3 Erosion Access Allowance

The Ontario Government provides planning guidelines for development adjacent to slopes. The 2005 Provincial Policy Statement (PPS Section 3.1.3) requires that an access allowance be included as part of the Erosion Hazard Limit. In accordance with PPS, 6 to 15 m setback is required in addition to the erosion and stability setbacks, which are discussed in the following sections. It is understood that this access allowance is required to ensure that there is a large enough safety zone for people and vehicles to enter and exit an area during an emergency, such as slope failure and flooding.

Since the subsurface conditions within the study area are generally considered to be geologically stable, we recommend that at a minimum, a planning setback of 6 m be applied to existing slopes.

4.2.4 Erosion Hazard Limit (Development Setback Limit)

As defined by the MNR Technical Guide, the Erosion Hazard Limit for confined systems includes the following 3 elements in determining the setback limits from a geotechnical standpoint:

- Emergency Access Allowance
- Stable Slope Setback
- Toe Erosion Allowance

Ultimately, the Erosion Hazard Limit also defines the development limit for the site. Additional setbacks may also be required based on EIS or studies prepared by others.

The setback distance from the slope crest varies slightly along the slope, based on the overall slope height and inclination, and the type and amount of toe erosion at the base of the slopes. Further, the inferred location of the Erosion Hazard Limit setback line is provided on Drawing 1 for review and consideration.

4.3 UTRCA Generic Regulation

In May 2006, Ontario Regulation 157/06 came into effect in the Upper Thames River Conservation Authority (UTRCA) watershed, which locally implements the Generic Regulation (Development, Interference with Wetlands and Alterations to Shoreline and Watercourses). This regulation replaces the former Fill, Construction and Alteration to Waterways regulations, and is intended to ensure public safety, prevent property damage and social disruption, due to natural hazards such as flooding and erosion. Ontario Regulation 157/06 is implemented by the local Conservation Authority, by means of permit issuance for works in or near watercourses, valleys, wetlands, or shorelines, when required.

Property owners must obtain permission from the UTRCA before beginning any development, site alteration, construction, or placement of fill within the regulated area. Permits are also required for any wetland interference, or for altering, straightening, diverting or interfering in any way with the existing channel of a creek, stream or river.

Proposed development within the study area will be subject to the above referenced Regulation. Consultation with the local Conservation Authority for review of site-specific development plans is recommended in this regard.

4.4 General Comments for Site Works

It is imperative that future development generally not occur within the Erosion Hazard Limit identified at the site. To this end, the following comments are provided and measures are recommended.

1. The surficial soils on the face of the slope experience minor long-term erosion due to weathering (wetting/drying and freezing/thawing cycles). The extent of potential erosion damage is a function of the competence of the natural subgrade soils, the type and quality of vegetative cover, and the frequency with which the slope is subject to erosive forces. Surficial erosion of the soil on the face of the slope could be caused by run-off water washing over the face of the slope, such as tile drains or redirected surface water which is directed onto existing slopes. Where possible, uncontrolled surface water flows over the face of the slope should be minimized, to reduce the risk of surface erosion. Erosion control measures may be required during construction, to reduce the risk of surface water flows from washing out non-vegetated surfaces.

2. Indiscriminate stockpiling of fill or construction materials should be avoided. In the event that stockpiling of material is proposed in the vicinity of the slope crest, a review by the Geotechnical consultant is required.

3. Any buildings and permanent structures associated with the proposed site development must be located outside of the Erosion Hazard Limit, which is identified on the Site Plan. The Cross Section drawings helps identify the location of this line.

4. Water from downspouts and perimeter weeping tile etc. must also be collected in a controlled manner and re-directed away from the slope.

5. Existing vegetation on the slope should be maintained.

6. Building foundations should be founded on the competent soil, set below a line drawn from the erosion setback at the toe of the slope at 2.5H:1V. Review by the Geotechnical consultant is recommended to confirm that the geotechnical requirements for foundation design are satisfied.

Final design drawings including building locations, services etc. should be reviewed by a geotechnical consultant to ensure that the Erosion Hazard Limit is properly interpreted. Geotechnical inspection and testing is recommended during construction to confirm that all recommendations set out will be followed.

5.0 General Limitations

The comments given in this report are intended only for the guidance of design engineers. The number of test holes required to determine the localized underground conditions between test holes affecting construction costs, techniques, sequencing, equipment, scheduling, etc. would be much greater than has been carried out for design purposes. Contractors bidding on or undertaking the works should in this light, decide on their own investigations, as well as their own interpretations of the factual borehole results, so that they may draw their own conclusions as to how the subsurface conditions may affect them.

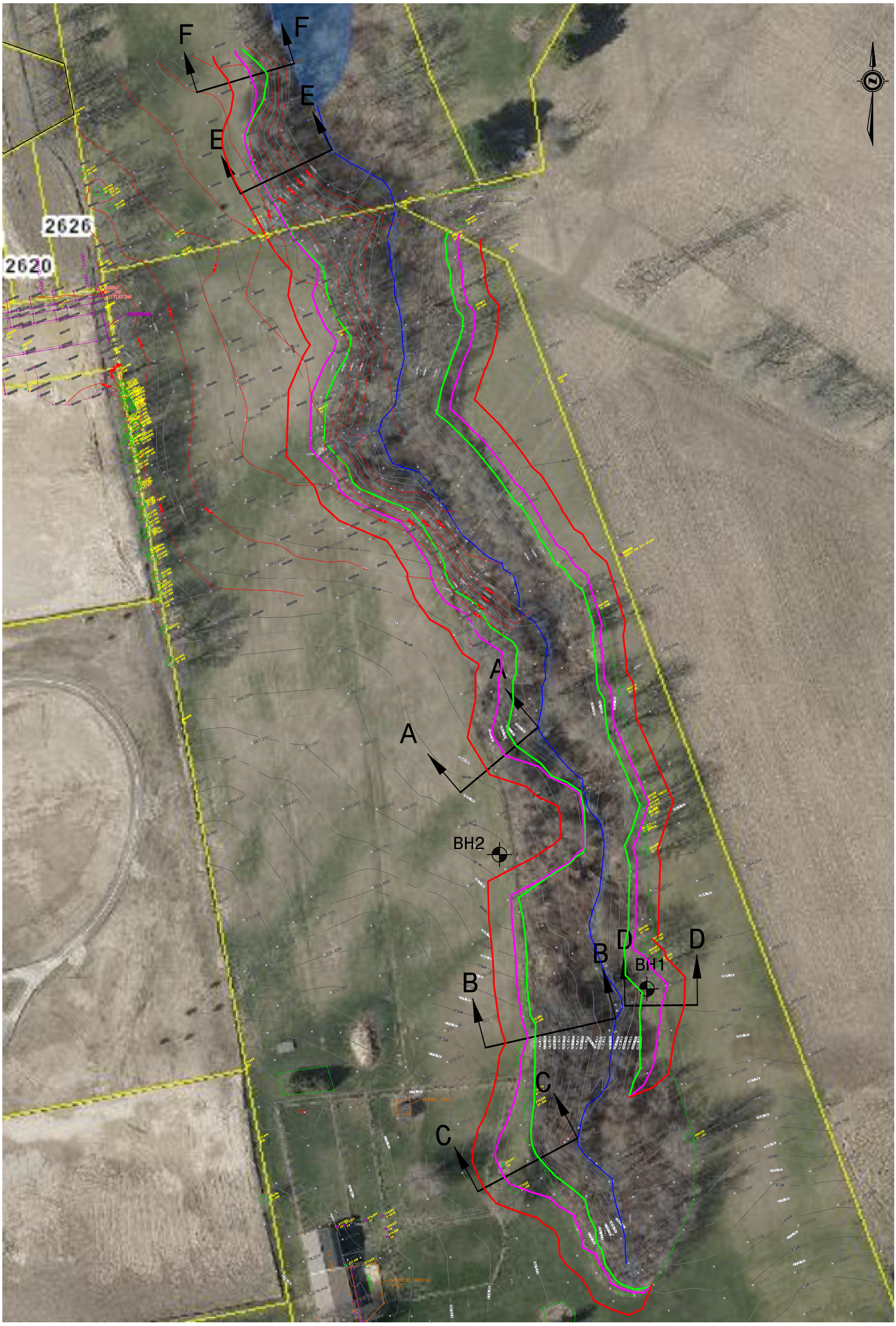
EXP Services Inc. should be retained for a general review of the final design and specifications to verify that this report has been properly interpreted and implemented. If not afforded the privilege of making this review, EXP Services Inc. will assume no responsibility for interpretation of the recommendations in this report.

We trust that this report is satisfactory to your present requirements and we look forward to assisting you in the completion of this project. Should you have any questions, please contact our office.

All the foregoing and attachments respectfully submitted,

EXP Services Inc.

Appendix A
Drawings



LEGEND

BH1 — Approximate Borehole Location

Top of Slope

Top of Stable Slope

Erosion Hazard Limit

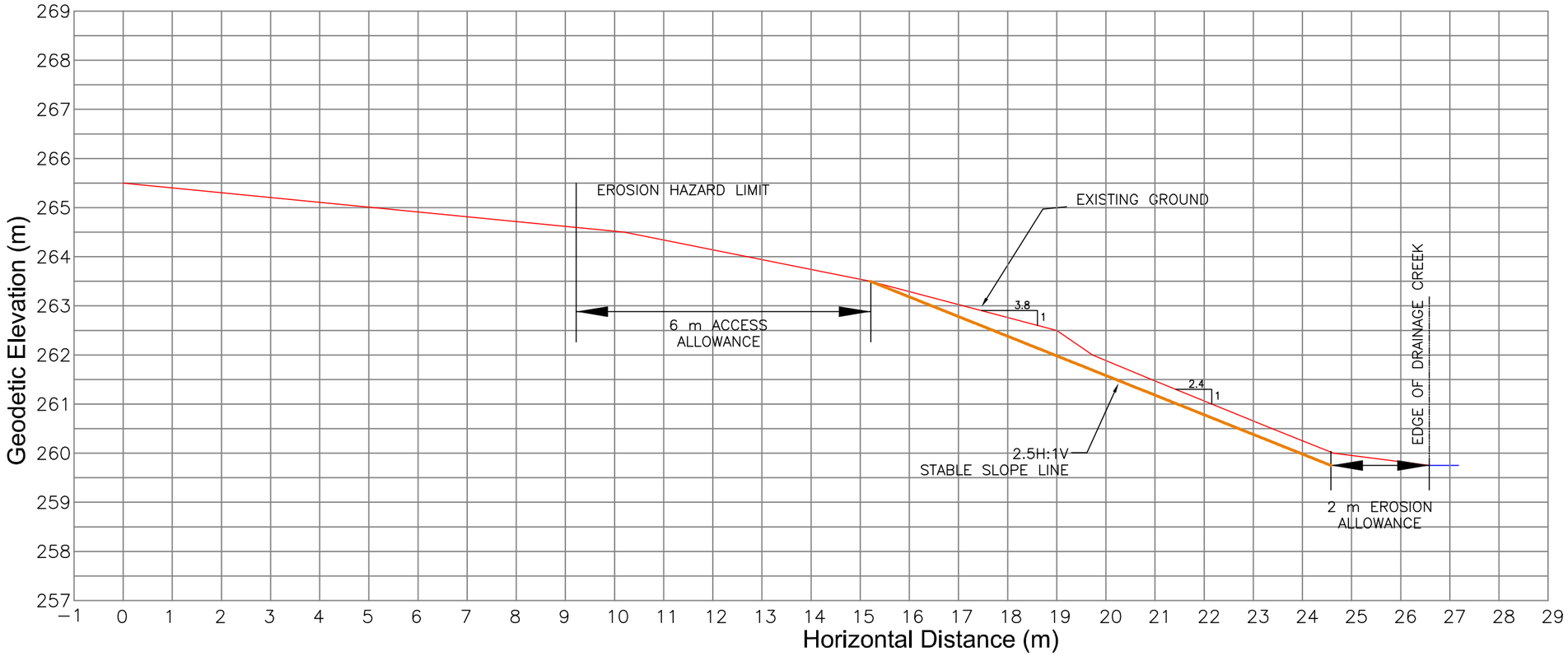
A — A — Slope Cross Section Location

Site plan should be read in conjunction with exp report KCH-00238640-GE

-NOTES-

1. The boundaries and soil types have been established only at test hole locations. Between test holes they are assumed and may be subject to considerable error.
2. Map referenced from City of London Mapping.

CLIENT	SIFTON PROPERTIES LIMITED
PROJECT	GRENIER LANDS SLOPE ASSESSMENT
TITLE	SITE PLAN
	exp Services Inc. 15701 Robin's Hill Road, London, Ontario N5V 0A5
DATE	FEBRUARY 2019
SCALE	1:900
PROJECT NO.	KCH00238640-GE
DWG.	1



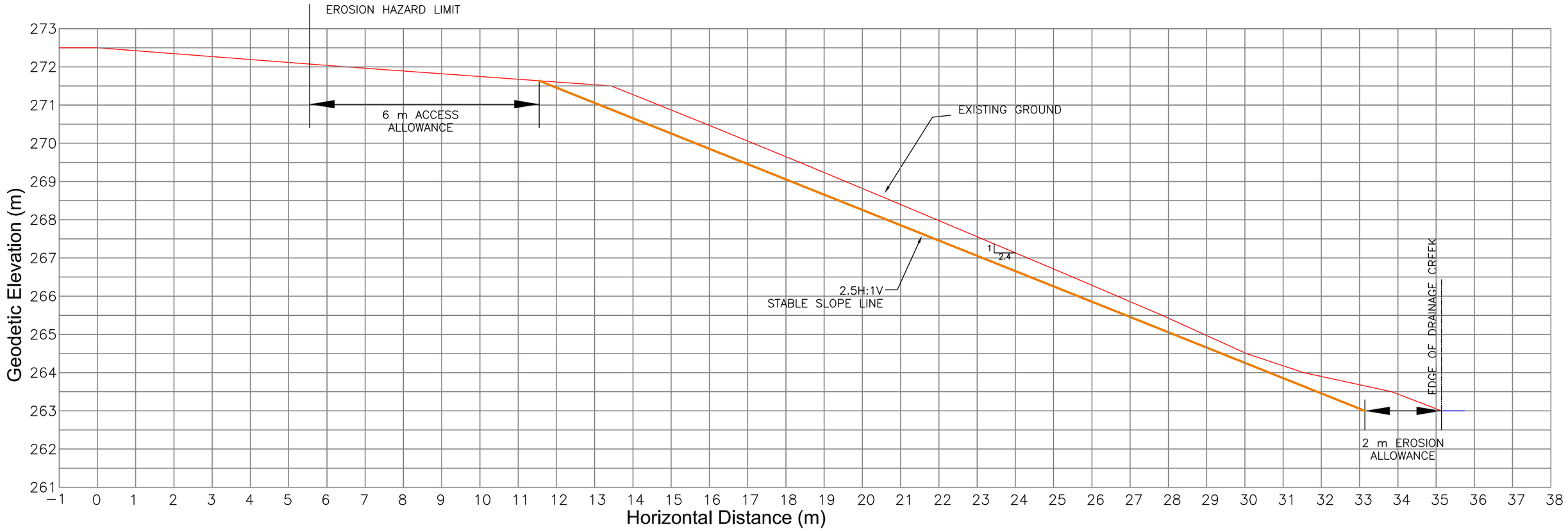
–NOTES–

1. Drawing should be read in conjunction with exp report KCH00238640–GE.

CLIENT	SIFTON PROPERTIES LIMITED
PROJECT	GRENIER LANDS SLOPE ASSESSMENT
TITLE	CROSS SECTION A – A

exp Services Inc.
15701 Robin's Hill Road, London, Ontario N5V 0A5

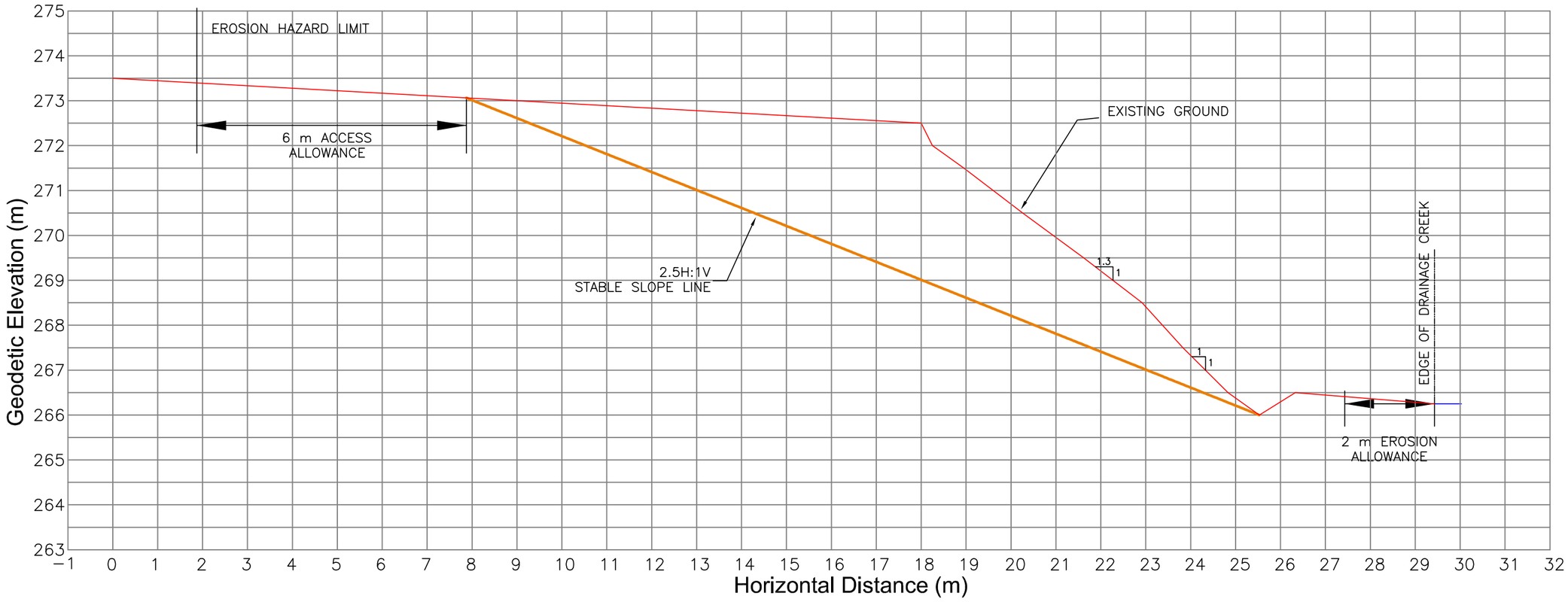
DATE	SCALE	PROJECT NO.	DWG.
JULY 2017	1:100	KCH00238640–GE	2



−NOTES−

1. Drawing should be read in conjunction with exp report KCH00238640−GE.

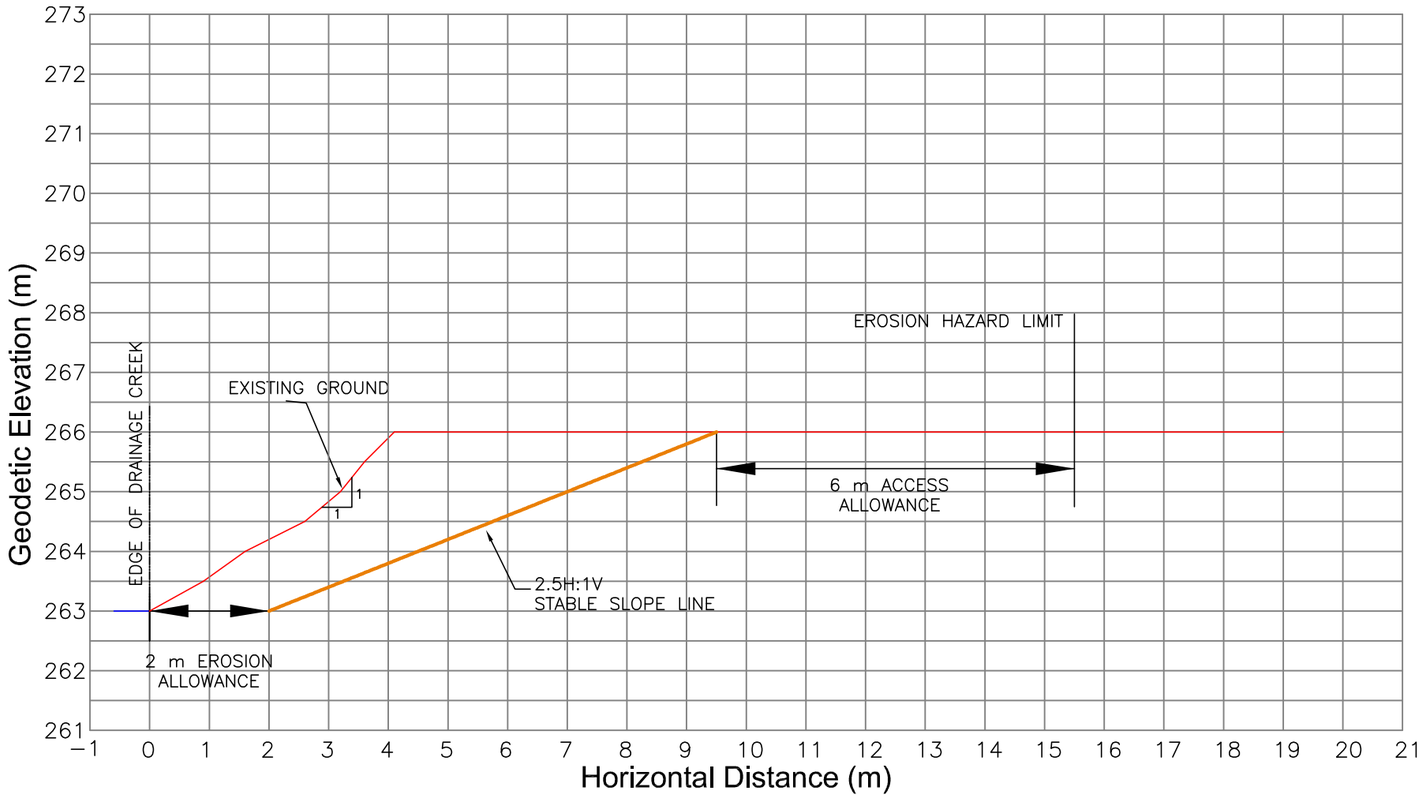
CLIENT	SIFTON PROPERTIES LIMITED
PROJECT	GRENIER LANDS SLOPE ASSESSMENT
TITLE	CROSS SECTION B − B
	exp Services Inc. 15701 Robin's Hill Road, London, Ontario N5V 0A5
DATE: JULY 2017	SCALE: 1:100
PROJECT NO.: KCH00238640−GE	DWG.: 3



−NOTES−

1. Drawing should be read in conjunction with exp report KCH00238640−GE.

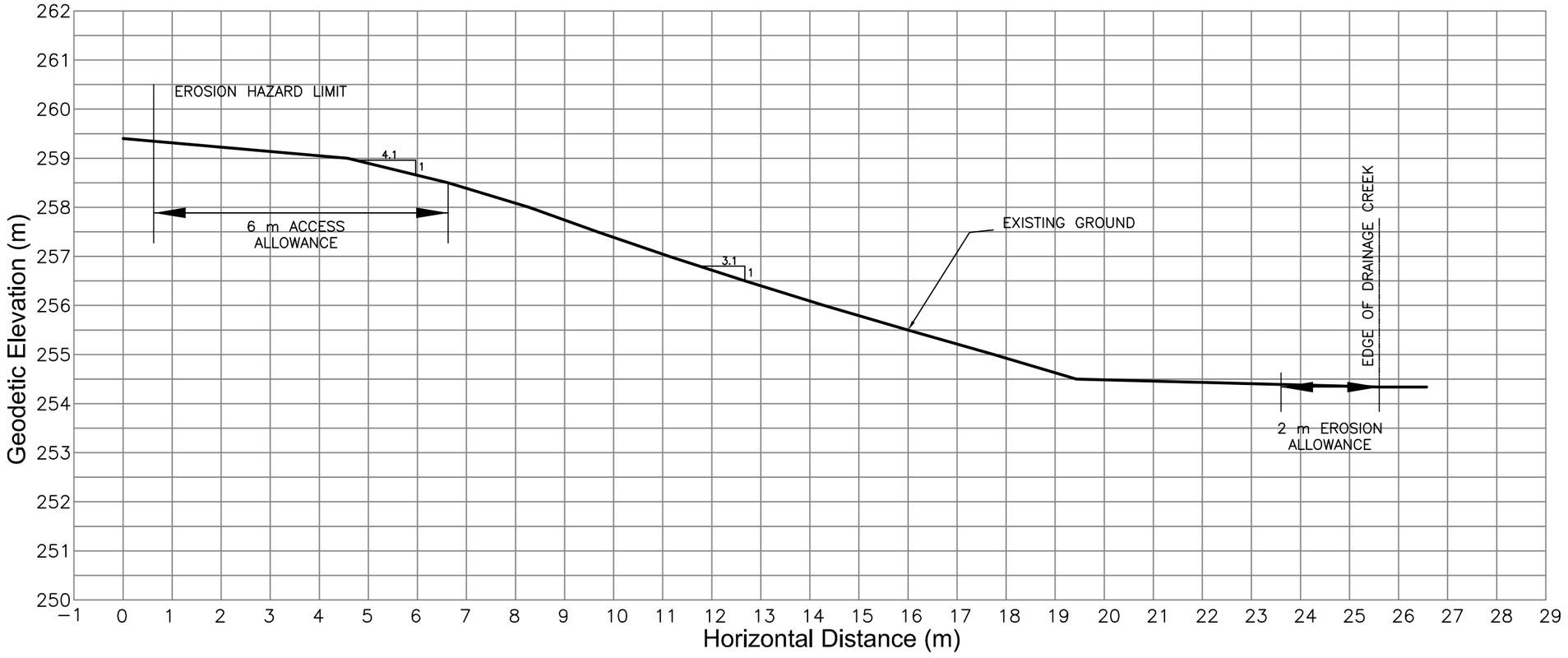
CLIENT	SIFTON PROPERTIES LIMITED
PROJECT	GRENIER LANDS SLOPE ASSESSMENT
TITLE	CROSS SECTION C − C
	exp Services Inc.
	15701 Robin's Hill Road, London, Ontario N5V 0A5
DATE	JULY 2017
SCALE	1:100
PROJECT NO.	KCH00238640−GE
DWG.	2



—NOTES—

1. Drawing should be read in conjunction with exp report KCH00238640-GE.

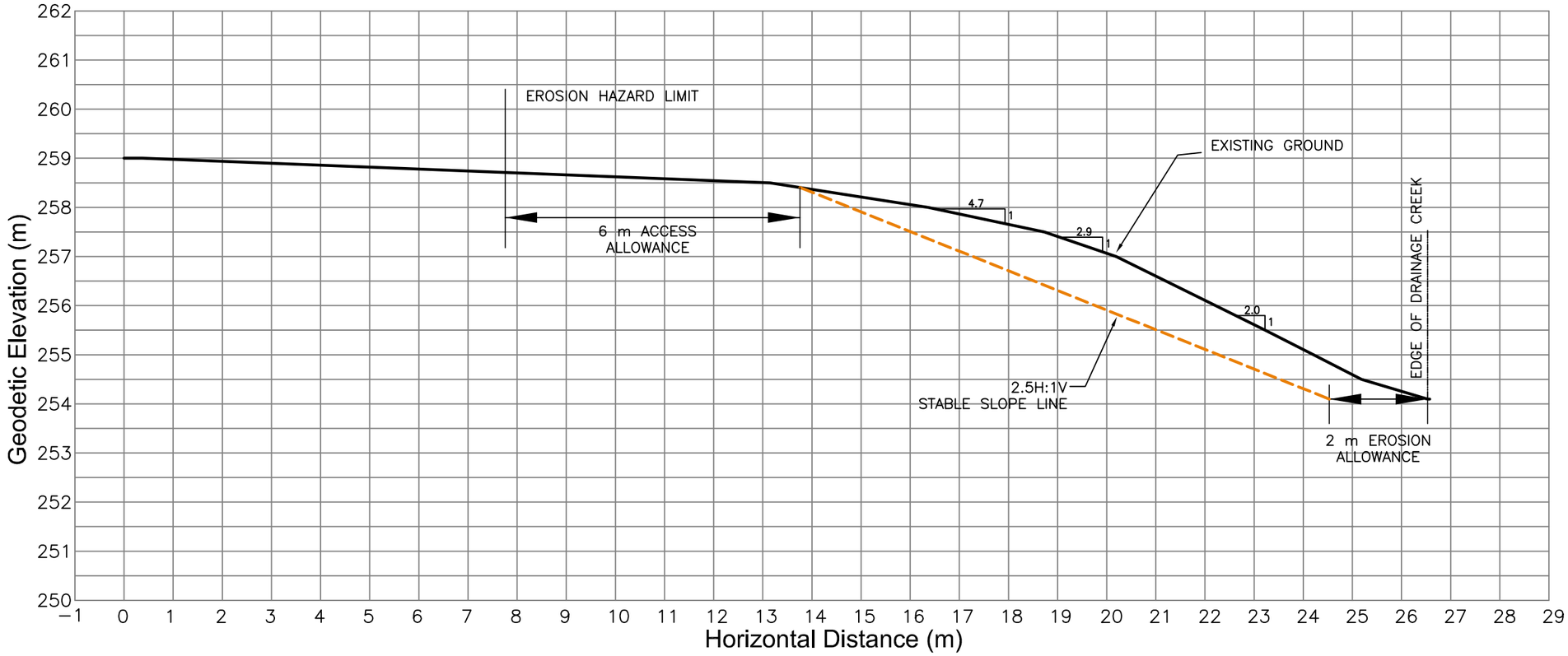
CLIENT	SIFTON PROPERTIES LIMITED
PROJECT	GRENIER LANDS SLOPE ASSESSMENT
TITLE	CROSS SECTION D – D
	exp Services Inc. 15701 Robin's Hill Road, London, Ontario N5V 0A5
DATE: JULY 2017	SCALE: 1:100
PROJECT NO.: KCH00238640-GE	DWG.: 5



—NOTES—

1. Drawing should be read in conjunction with exp report KCH00238640-GE.

CLIENT	SIFTON PROPERTIES LIMITED
PROJECT	GRENIER LANDS SLOPE ASSESSMENT
TITLE	CROSS SECTION E – E
	exp Services Inc. 15701 Robin's Hill Road, London, Ontario N5V 0A5
DATE	FEBRUARY 2019
SCALE	1:100
PROJECT NO.	KCH00238640-GE
DWG.	6



—NOTES—

1. Drawing should be read in conjunction with exp report KCH00238640-GE.

CLIENT	SIFTON PROPERTIES LIMITED
PROJECT	GRENIER LANDS SLOPE ASSESSMENT
TITLE	CROSS SECTION F – F
	exp Services Inc. 15701 Robin's Hill Road, London, Ontario N5V 0A5
DATE	FEBRUARY 2019
SCALE	1:100
PROJECT NO.	KCH00238640-GE
DWG.	7

Appendix B
Borehole Logs

BOREHOLE LOG

BH1
Sheet 1 of 1

CLIENT **Sifton Properties Limited** PROJECT NO. **KCH-00238640-GE**
PROJECT **Grenier Lands Slope Stability** DATUM
LOCATION **1964 Commissioners Rd E, London, ON** DATES: Boring **July 6, 2017** Water Level

DEPTH (m bgs)	ELEVATION (~m)	STRATA DESCRIPTION	STRATA PLOT	WELL LOG	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm)	SAMPLES N VALUE (blows)	MOISTURE CONTENT (%)
0	0.2	**TOPSOIL** - 240 mm							
		FILL - sandy silt, dark brown, some clay, trace to some gravel, trace to some topsoil inclusions, loose to compact, moist			SS	S1	425	5	19
1					SS	S2	250	15	16
	1.4								
		CLAYEY SILT - light brown, trace to some sand, firm to stiff, moist to very moist - occasional dilatant silt seams to 5.6 m bgs			SS	S3	400	6	20
2					SS	S4	350	8	20
		- becoming grey near 2.6 m bgs							
3					SS	S5	450	6	19
4					SS	S6	450	9	21
					SS	S7	450	9	21
5									
6					SS	S8	450	8	25
7									
8					SS	S9	450	12	27
	8.6								
		SILTY SAND - grey, fine grained, compact, wet		▽					
9					SS	S10	450	23	19
	9.6								
10		**End of Borehole at 9.6 m bgs.**							

SHEAR STRENGTH
✤ S Field Vane Test (#=Sensitivity)
▲ Penetrometer ■ Torvane
100 200 kPa

Atterberg Limits and Moisture
W_P W W_L
● SPT N Value × Dynamic Cone
10 20 30 40

NOTES

1) Borehole Log interpretation requires assistance by exp before use by others. Borehole Log must be read in conjunction with exp Report KCH-00238640-GE.
2) Borehole open to 9.1 m bgs and groundwater encountered near 9.1 m bgs upon completion of drilling.
3) bgs denotes below ground surface.
4) No significant methane gas concentration was detected upon completion of drilling.

SAMPLE LEGEND
☒ AS Auger Sample ▨ SS Split Spoon ■ ST Shelby Tube
▯ Rock Core (eg. BQ, NQ, etc.) ▯ VN Vane Sample

OTHER TESTS

G Specific Gravity	C Consolidation
H Hydrometer	CD Consolidated Drained Triaxial
S Sieve Analysis	CU Consolidated Undrained Triaxial
γ Unit Weight	UU Unconsolidated Undrained Triaxial
P Field Permeability	UC Unconfined Compression
K Lab Permeability	DS Direct Shear

WATER LEVELS
▽ Apparent ▼ Measured ▲ Artesian (see Notes)

BOREHOLE LOG

BH2
Sheet 1 of 1

CLIENT **Sifton Properties Limited** PROJECT NO. **KCH-00238640-GE**
PROJECT **Grenier Lands Slope Stability** DATUM
LOCATION **1964 Commissioners Rd E, London, ON** DATES: Boring **July 6, 2017** Water Level

DEPTH (m bgs)	ELEVATION (~m)	STRATA DESCRIPTION	STRATA PLOT	WELL LOG	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm)	SAMPLES N VALUE (blows)	MOISTURE CONTENT (%)
0	0.2	**TOPSOIL** - 180 mm							
		FILL - sandy silt, dark brown, trace clay, trace to some gravel, trace topsoil inclusions, very loose, moist			SS	S1	400	3	20
1	0.9	**SANDY SILT** - brown, weathered, compact, very moist			SS	S2	175	17	15
	1.8				SS	S3	300	13	18
2		**CLAYEY SILT** - light brown, trace to some sand, stiff to very stiff, moist to very moist - occasional dilatant silt seams to 5.6 m bgs			SS	S4	125	17	17
3		- becoming grey near 2.9 m bgs			SS	S5	350	11	17
4									
5					SS	S6	450	8	23
6									
					SS	S7	450	10	22
7									
8					SS	S8	450	9	26
	8.6								
9		**SILTY SAND** - grey, fine grained, dense, wet							
	9.6				SS	S9	450	31	19
10		**End of Borehole at 9.6 m bgs.**							

SHEAR STRENGTH
S Field Vane Test (#=Sensitivity)
Penetrometer Torvane
100 200 kPa
Atterberg Limits and Moisture
W_P W W_L
SPT N Value Dynamic Cone
10 20 30 40

NOTES

1) Borehole Log interpretation requires assistance by exp before use by others. Borehole Log must be read in conjunction with exp Report KCH-00238640-GE.
2) Borehole open to 8.8 m bgs and dry upon completion of drilling.
3) bgs denotes below ground surface.
4) No significant methane gas concentration was detected upon completion of drilling.

SAMPLE LEGEND
AS Auger Sample SS Split Spoon ST Shelby Tube
Rock Core (eg. BQ, NQ, etc.) VN Vane Sample

OTHER TESTS

G Specific Gravity	C Consolidation
H Hydrometer	CD Consolidated Drained Triaxial
S Sieve Analysis	CU Consolidated Undrained Triaxial
γ Unit Weight	UU Unconsolidated Undrained Triaxial
P Field Permeability	UC Unconfined Compression
K Lab Permeability	DS Direct Shear

WATER LEVELS
Apparent Measured Artesian (see Notes)

Appendix C
Slope Stability Rating Charts

Appendix D
Limitations and Use of Report

LIMITATIONS AND USE OF REPORT

BASIS OF REPORT

This report ("Report") is based on site conditions known or inferred by the slope investigation undertaken as of the date of the Report. Should changes occur which potentially impact the geotechnical condition of the site, or if construction is implemented more than one year following the date of the Report, the recommendations of exp may require re-evaluation.

The Report is provided solely for the guidance of design engineers and on the assumption that the design will be in accordance with applicable codes and standards. Any changes in the design features which potentially impact the geotechnical analyses or issues concerning the geotechnical aspects of applicable codes and standards will necessitate a review of the design by exp. Additional field work and reporting may also be required.

Where applicable, recommended field services are the minimum necessary to ascertain that construction is being carried out in general conformity with building code guidelines, generally accepted practices and exp's recommendations. Any reduction in the level of services recommended will result in exp providing qualified opinions regarding the adequacy of the work. Exp can assist design professionals or contractors retained by the Client to review applicable plans, drawings, and specifications as they relate to the Report or to conduct field reviews during construction.

Contractors contemplating work on the site are responsible for conducting an independent investigation and interpretation of the borehole results contained in the Report. The number of boreholes necessary to determine the localized underground conditions as they impact construction costs, techniques, sequencing, equipment and scheduling may be greater than those carried out for the purpose of the Report.

Classification and identification of soils, rocks, geological units, contaminant materials, building envelopment assessments, and engineering estimates are based on investigations performed in accordance with the standard of care set out below and require the exercise of judgment. As a result, even comprehensive sampling and testing programs implemented with the appropriate equipment by experienced personnel may fail to locate some conditions. All investigations or building envelope descriptions involve an inherent risk that some conditions will not be detected. All documents or records summarizing investigations are based on assumptions of what exists between the actual points sampled. Actual conditions may vary significantly between the points investigated. Some conditions are subject to change over time. The Report presents the conditions at the sampled points at the time of sampling. Where special concerns exist, or the Client has special considerations or requirements, these should be disclosed to exp to allow for additional or special investigations to be undertaken not otherwise within the scope of investigation conducted for the purpose of the Report.

RELIANCE ON INFORMATION PROVIDED

The evaluation and conclusions contained in the Report are based on conditions in evidence at the time of site inspections and information provided to exp by the Client and others. The Report has been prepared for the specific site, development, building, design or building assessment objectives and purpose as communicated by the Client. Exp has relied in good faith upon such representations, information and instructions and accepts no responsibility for any deficiency, misstatement or inaccuracy contained in the Report as a result of any misstatements, omissions, misrepresentation or fraudulent acts of persons providing information. Unless specifically stated otherwise, the applicability and reliability of the findings, recommendations, suggestions or opinions expressed in the Report are only valid to the extent that there has been no material alteration to or variation from any of the information provided to exp.

STANDARD OF CARE

The Report has been prepared in a manner consistent with the degree of care and skill exercised by engineering consultants currently practicing under similar circumstances and locale. No other warranty, expressed or implied, is made. Unless specifically stated otherwise, the Report does not contain environmental consulting advice.

COMPLETE REPORT

All documents, records, data and files, whether electronic or otherwise, generated as part of this assignment form part of the Report. This material includes, but is not limited to, the terms of reference given to exp by its client ("Client"), communications between exp and the Client, other reports, proposals or documents prepared by exp for the Client in connection with the site described in the Report. In order to properly understand the suggestions, recommendations and opinions expressed in the Report, reference must be made to the Report in its entirety. Exp is not responsible for use by any party of portions of the Report.

USE OF REPORT

The information and opinions expressed in the Report, or any document forming part of the Report, are for the sole benefit of the Client. No other party may use or rely upon the Report in whole or in part without the written consent of exp. Any use of the Report, or any portion of the Report, by a third party are the sole responsibility of such third party. Exp is not responsible for damages suffered by any third party resulting from unauthorised use of the Report.

REPORT FORMAT

Where exp has submitted both electronic file and a hard copy of the Report, or any document forming part of the Report, only the signed and sealed hard copy shall be the original documents for record and working purposes. In the event of a dispute or discrepancy, the hard copy shall govern. Electronic files transmitted by exp have utilized specific software and hardware systems. Exp makes no representation about the compatibility of these files with the Client's current or future software and hardware systems. Regardless of format, the documents described herein are exp's instruments of professional service and shall not be altered without the written consent of exp.