

City of London

Planning & Environment Committee

Monday September 19, 2016

1234-1246 Richmond Street,
 Application by: Textbook (Ross Park) Inc.
 File No. OZ-8552

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 Manager Environmental Planning & Regulations
 Upper Thames River Conservation Authority

Overview

1) Conservation Authority's Roles

- Delegated Responsibility for Natural Hazards
- Conservation Authorities Act

2) Natural Hazard Policies

- Provincial Policy Statement (2014)
- MNRF Technical Guide to assist with implementation of Natural Hazard Policies (2002)
 - Dykes & Floodwalls
 - Floodway / Flood Fringe
- City of London Official Plan

3) Analysis of Floodproofing

- Flood Fringe Access Requirements

Delegated Responsibility

- Delegated 'Provincial Interest' in Plan Review- As outlined in the Conservation Ontario/Ministry of Natural Resources (MNRF) /Ministry of Municipal Affairs and Housing (MMAH) Memorandum of Understanding (MOU) on Conservation Authority (CA) Delegated Responsibilities (original signed 2001)
- Conservation Authorities have been delegated responsibilities from the Minister of Natural Resources to represent the provincial interests regarding natural hazards encompassed by Section 3.1 of the *Provincial Policy Statement*. These delegated responsibilities require CAs to review and provide comments on municipal policy documents (Official Plans and Comprehensive Zoning By-laws) and applications submitted pursuant to the *Planning Act* as part of the Provincial One-Window Plan Review Service

Role in Land Use Planning

- Provide municipalities with access to technical advice and planning advice to assist them in fulfilling their responsibilities under the Planning Act
- Assist the municipality with interpretation of policies, technical and scientific information
- Assist with "shall be consistent with" requirement of the Planning Act
- Rely heavily on scientific defensibility/justification

Mission Statement - to protect life and property from flood and erosion



Natural Hazards

- Within the Flooding Hazard / Regulatory Flood Plain as shown on SCHEDULE B-2 TO THE CITY OF LONDON OFFICIAL PLAN - NATURAL RESOURCES AND NATURAL HAZARDS MAP NO. 2



Source: CityMap <http://maps.london.ca/CityMap/Index.html?viewer=Zoning>

- The UTRCA applies the Historical observed 1937 flood as the regulatory flood standard across the watershed (1:250 Year Flood)

Provincial Policy Statement

Part IV Vision for Ontario's Land Use Planning System:

- Land use must be carefully managed to accommodate appropriate development to meet the full range of current and future needs, while achieving efficient development patterns and avoiding significant or sensitive resources and areas which may pose a risk to public health and safety.
- It is equally important to protect the overall health and safety of the population. The Provincial Policy Statement (PPS) directs development away from areas of natural and human made hazards. This preventative approach supports provincial and municipal financial well-being over the long term, protects public health and safety, and minimizes cost, risk and social disruption



Provincial Policy Statement

3.0 Protecting Public Health and Safety

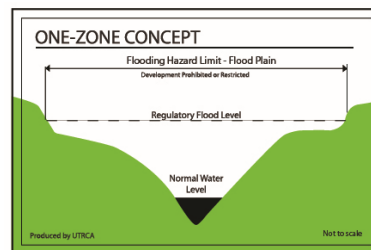
- Ontario's long-term prosperity, environmental health and social well-being depend on reducing the potential for public cost or risk to Ontario's residents from natural or human-made hazards.
- Development shall be directed away from areas of natural or human-made hazards where there is an unacceptable risk to public health or safety or of property damage, and not create new or aggravate existing hazards.
- The UTRCA Board of Directors approved the Authority's Environmental Planning Policy Manual in 2006. This Manual consolidates the Authority's policies, which guide development and site alteration while protecting, preserving and enhancing the natural environment in the watershed.



Flooding Hazards

One Zone Flood Hazard

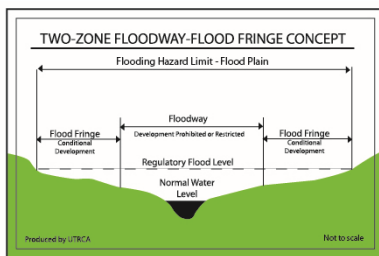
- 3.1.2 Development and site alteration shall not be permitted within:
- c) areas that would be rendered inaccessible to people and vehicles during times of flooding hazards
 - d) a floodway regardless of whether the area of inundation contains high points of land not subject to flooding



Flooding Hazards

Two Zone Flood Fringe

3.1.6 Where the *two zone concept for flood plains* is applied, development and site alteration may be permitted in the *flood fringe*, subject to appropriate floodproofing to the flooding hazard elevation or another flooding hazard standard approved by the Minister of Natural Resources.



Provincial Policy Statement

- 3.1.7 Further to policy 3.1.6, and except as prohibited in policies 3.1.2 and 3.1.5, development and site alteration may be permitted in those portions of hazardous lands and hazardous sites where the effects and risk to public safety are minor, could be mitigated in accordance with provincial standards, and where all of the following are demonstrated and achieved:

- development and site alteration is carried out in accordance with floodproofing standards, protection works standards, and access standards;
- vehicles and people have a way of safely entering and exiting the area during times of flooding, erosion and other emergencies;
- new hazards are not created and existing hazards are not aggravated; and
- no adverse environmental impacts will result.



London, 1937

Definitions

Floodproofing standard: means the combination of measures incorporated into the basic design and/or construction of buildings, structures, or properties to reduce or eliminate flooding hazards, wave uprush and other water-related hazards along the shorelines of the Great Lakes - St. Lawrence River System and large inland lakes, and flooding hazards along river, stream and small inland lake systems.

Ingress/Egress:

Major accessways to development potentially located in the flood fringe must be examined. It is not acceptable to have development isolated during the flood conditions because roads and escape routes are not passable (MNR, 2002).



Adelaide and Windermere, 1963

Technical Guide

River & Stream Systems Flooding Hazard Limit

- One of the implementation documents used to support natural hazard policies contained in the PPS
- Provides direction when considering:
 - Dykes & Floodwalls (4.1.2)
 - Floodway / Flood Fringe (Two Zone Concept - Appendix 4)

Both include requirements for floodproofing measures that confirm emergency and private vehicles and persons have a way to safely enter & exit during times of flooding



Dykes & Flood Walls

- Dykes and flood walls are not regarded as permanent flood control structures and the land behind the dykes and flood walls should continue to require protection to the revised (increased) flood standard. **As such, new development would still be required to be floodproofed to the flood standard.**
- The establishment of no development or limited development zones behind a dyke will be dependent on local conditions (i.e., flood depth and velocity) and local approaches to flood plain management. **Dykes and flood walls protect existing areas located behind, but do not provide additional flood benefits.**

Dykes & Flood Walls

- Area behind a dyke can be considered flood fringe if dykes are high enough to provide protection against the flood standard for the area and **development in this area is subject to flood proofing requirements to flood standard**, unless designated as a Special Policy Area. Where dykes have been constructed in the flood plain for protective purposes, if **the dykes are too low and would be overtopped by the flood standard selected for flood plain definition, the land behind the dykes would be in the flood plain and, therefore, within the flood risk area.** If the dykes are of sufficient height to contain the flood standard, the dykes would normally delineate the extent of inundation. **This does not apply in cases where the dykes are structurally inadequate and would fail under large floods.**

Special Policy Areas (SPA's) must be approved by both the Minister of Natural Resources and Forestry and Minister of Municipal Affairs and Housing because SPA's represent a relaxation of natural hazard policy standards for flood related events, where this is deemed appropriate.

Source: Technical Guide River & Stream Systems Flooding Hazard Limit (MNR, 2002)

London Earth Dykes Stability Review (June, 2013)

Technical assessment of geotechnical stability and provides conceptual recommendations for long-term planning and maintenance

- Broughdale Dyke was identified as being in poor condition with numerous geotechnical stability issues
- Recommends the dyke be at a height of the Regulatory Elevation plus 0.6 metres to prevent overtopping (existing dyke would be overtopped)



For these reasons, the area behind Broughdale Dyke can not be considered flood fringe due to the presence of the dyke.

Planning Application OZ-8552 – Technical Submissions

The UTRCA consistently provided comments which cautioned that:

- It was uncertain if the area could be considered Flood Fringe;
- The area behind the dyke is complex, and 2D modelling may be required, and
- Safe access for vehicles and people was required during times of flooding

The UTRCA expressed significant concerns about the intensity of the proposed development.

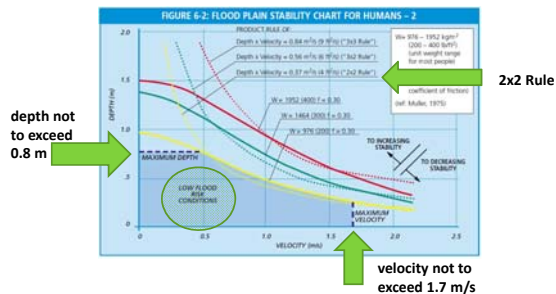
The technical submissions provided by the applicant have not confirmed that the site is in the flood fringe:

- *This memo is focused on the analysis of local flood conditions (i.e. flood depth and velocity) of the subject land during a Regulatory flood without the flood protection of the Broughdale Dyke being considered. The identification of the site located in flood plain or flood fringe limit is not the subject of this memo.*

Technical Memo, Assessment of Flood Path of 1234-1246 Richmond Street, City of London, prepared by Maggie Ding MMM Group for Textbooksites Property Inc., dated June 2016

Depth & Velocity of Flooding

- Hazard to life is linked to the frequency of flooding, and to depth of flood waters and the velocity of flow in the floodplain. Depth increases buoyancy and velocity increases instability
- The 2 x 2 line excludes most of the unstable conditions for most individuals



Flood Proofing – Flooding as a Threat to Life

- A product depth and velocity less than or equal to 0.4 m²/s defines the low risk area providing that depth does not exceed 0.8 m and that the velocity does not exceed 1.7 m/s
- Areas highlighted in blue on the table below, do not meet this criteria

Table 2 Future Hydraulic Conditions – Product of Flood Depth x Velocity

River Sta	At River Street (Route 1)			At Raymond Ave Side (Route 2)			At House Lots (Route 3)		
	Hydraulic Depth (m)	Velocity (m/s)	Product of Depth x Vel (m ² /s)	Hydraulic Depth (m)	Velocity (m/s)	Product of Depth x Vel (m ² /s)	Hydraulic Depth (m)	Velocity (m/s)	Product of Depth x Vel (m ² /s)
48.5	0.44	1.53	0.673	0.03	0.4	0.012	0.25	1.67	0.418
24.5	0.84	0.86	0.722	0.86	0.86	0.731	0.86	0.89	0.757
7.5	0.86	0.62	0.533	0.56	0.95	0.289	0.7	0.57	0.399
0	0.49	1.42	0.696	0.23	0.86	0.198	0.34	1.13	0.384

Table 2 of the Technical Memo, Assessment of Flood Path of 1234-1246 Richmond Street, City of London, prepared by Maggie Ding MMM Group for Textbooksuites Property Inc., dated June 2016

Flood Proofing – Vehicles

- For most private vehicles a range of about 0.3 m - 0.4 m (1 - 1.5 ft.) would be the maximum depth of flooding before potential egress problems would result.
- River Sta.0 is the cross section at the centre line of Richmond Street.
- River Sta.24.5 is cross section in close proximity to proposed entrance from Raymond Avenue

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Comments on Submissions

- Submissions described the project as a 'redevelopment' and suggested mitigation techniques rather than following Policy requirements for 'new development'.
- Analysis of flood conditions did not extend beyond the limits of the site to understand how safe access could be achieved.
- The proper depth and velocity criteria were not considered. New development must apply the 2x2 rule, not the 3x3 rule.
- The Technical Guide explains that the 3x3 rule applies to trained professionals (Water Survey of Canada) whose regular work accustoms them to the dynamic forces of river flows, buoyant forces a recognition of potential hazards. These professionals also enter the water with proper equipment to assist them in maintaining stability.
- Submissions only considered access for emergency vehicles.
- Depth of flooding for private vehicles is 0.3m and would be exceeded along the escape routes.
- MNR Technical Guide states: Major accessways must be examined, it is not acceptable to have development isolated during times of flooding because roads and escape routes are not passable.

Flood Depth

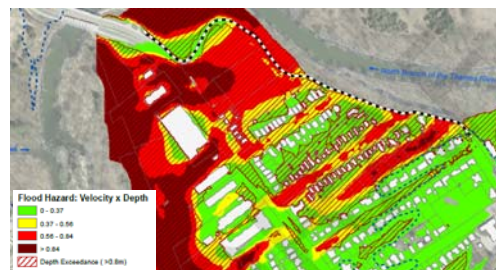
Source; UTRCA December 2015 1D HEC RAS model.

- Richmond Street 0.7m to 0.9m (subject property frontage)
- Raymond Avenue 0.4m to 0.8m (subject property frontage)



Flood Depth & Velocity

- DRAFT 1D/2D HEC RAS results:
- Upper Thames River Conservation Authority, *Broughdale Dyke Flood Characterization (DRAFT)*, AECOM May, 2016



22

Climate Change

- Section 3.1.3 of the 2014 PPS states that: Planning authorities shall consider the potential impacts of climate change that may increase the risks associated with natural hazards.
- *Rising temperatures and changing precipitation patterns in Ontario have already reduced river flows, warmed surface waters and impacted wetlands. These impacts will likely continue, and other threats to environmental and public health are expected to materialize including increased flooding and reduced quantity and quality of drinking water.* (2011) Conservation Ontario's Response to 'Climate Ready: Ontario's Adaptation Strategy & Action Plan'

City of London Official Plan

Development within the Flood Plain

- Unless otherwise provided for under the Special Policy Area provisions in Section 15.6.4., development within the flood plain will be restricted in accordance with the following conditions:
- (a) The floodway - the development of lands in the floodway will be consistent with the One-Zone flood plain policies in Section 15.6.2 iv) and v)
- (b) **The flood fringe** - conditional development may occur subject to meeting **flood proofing and access requirements** and obtaining the approval of the Upper Thames River Conservation Authority.
- (c) All new development or structures within the flood plain will require the approval of the Upper Thames River Conservation Authority.

City of London Official Plan

Natural Hazard Objectives Section 15.1.2

- i) Minimize the possibility of property damage, social disruption and danger to life from flooding, by restricting the uses and activities permitted on lands susceptible to flooding and/or erosion processes (Clause i) amended by OPA 438 Dec. 17/09).
- ii) Provide for limited and controlled development on flood plain lands in accordance with provincial policies, where such development would be safe and appropriate, and would not reduce flood storage capacity.
- iii) Through acquisition and agreement, provide for the use of flood plain lands as public open space.
- iv) Identify flood plain, slope and erosion hazard areas, and prohibit or regulate land use activity in areas where public safety may be affected by natural hazards, in accordance with Provincial natural hazard management policies, and regulations under the Conservation Authorities Act. (Clause iv) deleted and replaced by Ministry Mod. #41 Dec. 17/09)

City of London Official Plan

Natural Hazard Policies Section 15.6

- The extent of the floodway will be generally defined by the one hundred year flood standard. On individual watercourse reaches the floodway may vary from the one hundred year flood standard according to critical flood depth and velocity, existing and proposed development in the immediate area, and the potential for adverse impact on upstream or downstream development or lands. The precise delineation of the floodway is the responsibility of the Upper Thames River Conservation Authority.

Planning Application OZ-8552

- Official Plan to change the designation of the subject lands FROM a Low Density Residential designation TO a Multi-Family, High Density Residential designation is not consistent with the PPS
- Zoning By-Law No. Z-1 to change the zoning of the subject lands FROM a Residential R1 Special Provision (R1-5(3)) Zone TO a Residential R9 Bonus (R9-7•B(_)) Zone
- Revised Application to change the zoning of the subject lands FROM a Residential R1 Special Provision (R1-5(3)) Zone TO a Residential R9 Bonus (R9-7•H50•B_) Zone to permit: Apartment buildings; lodging house class 2; Senior citizens apartment buildings; Handicapped persons apartment buildings; and Continuum of care facilities...

Institutional Uses

- 3.1.5 Development shall not be permitted to locate in **hazardous lands** and hazardous sites where the use is:
 - a) an **institutional use** including hospitals, long-term care homes, retirement homes, pre-schools, school nurseries, day cares and schools;

Institutional Use: for the purposes of policy 3.1.5, means land uses where there is a threat to the safe evacuation of vulnerable populations such as older persons, persons with disabilities, and those who are sick or young, during an emergency as a result of flooding, failure of floodproofing measures or protection works, or erosion.

The Revised Zoning Application includes the following Institutional Uses:
Senior citizen apartment buildings; Handicapped persons apartment buildings; and continuing care facilities.

This location is clearly within hazardous lands, in this case the flooding hazard. The Revised Application is not consistent with Provincial Policy.

Summary

- Regardless if a dyke is in place, any development, to intensify the residential uses within the Flood Plain (as proposed) ALL the requirements of the PPS Section 3.1.7 must be demonstrated and achieved to apply Flood Fringe policies.
- The information submitted by the applicant **does not** demonstrate:
 - That the area of the subject property can be considered Flood Fringe; and
 - That safe access for vehicles and pedestrians can be achieved.
- UTRCA analysis indicates that the area of the subject property is Floodway.
- The recommendation to **refuse** the applications is appropriate.