Engineering Comments:

I have reviewed their functional servicing and offer the following:

1. The sanitary flows run to the City of Cambridge and they have identified that they have no capacity and therefore they do not support an increase in the sanitary flows. Further questions on this should be directed to Sarah Austin at The City of Cambridge AustinS@Cambridge.ca
2. KU has reviewed the water distribution. They note that they cannot have a 250mm service. They will need to show it as 300mm within the ROW and reduce it once on private property. They will also need to prepare a P&P for King Street to submit for a Form 1.
3. Region will ask for a backflow preventer on the storm service on private property,
4. Developer must be aware of neighbouring property's wells and their impact to them.

Thanks,

Christine Goulet, C.E.T.

Project Manager | Development Engineering
519-741-2200 Ext. 7820

From:	Katrina Fluit
To:	"cdahmer@mte85.com"; Melanie Weisenberg
Cc:	Kiel Moreau; William Towns; Eric Schneider; "Brandon Flewwelling"
Subject:	4611 King Street East - Regional Comments on Servicing Grading and SWM report
Date:	Tuesday, October 29, 2024 3:31:20 PM
Attachments:	DOCS_ADMIN-#4786332-v1-Removals_Plan_KM_Redline01_20241003.pdf DOCS_ADMIN-#4786325-v1-Functional_Site_Grading_and_Servicing_Plan_KM_Redline01_20241003.pdf

Hello All,

Staff have reviewed the Servicing and Grading drawings and SWM report submitted in support of the OPA/ZBA at 4611 King Street East. Please see regional comments written out below and in the redline drawings attached to this email.

The storm sewer on King Street East is not sized to accommodate predevelopment or post development storm drainage from this site. When the storm sewer was designed and installed as part of the King Street reconstruction project, drainage from the site was not accounted for since the existing property is lower than the road and had no status as a potential development. The existing drainage pattern is towards the south and should be maintained. Alternatively, to continue with the development as proposed, the developer will have to install a new sewer to drain the site or replace the existing sewer on King Street with a sewer of sufficient capacity.

Please provide an updated SWM Report outlining how the development will address the drainage issues on the site.

Drawing C1.1 (Removals Plan):

1. Show existing sidewalk removals

Drawing C2.1 (Functional Site Grading & Servicing Plan):

1. Extend existing CB lead and keep this as a DSICBMH and realign it with the new entrance curb. The Region does not want any CB grates within the paved access.
2. Confirm there is no conflict between proposed hydrant and existing buried hydro conduit.
3. Confirm if this sanitary service can be directionally drilled under King Street East (RR08). Alternatively if trenching is required, show limits of reinstatements to asphalt, curbs, boulevard, sidewalk including 1.0m step joints, as per RMW 207 and 208.
4. Staff strongly suggest that the proposed service connections for this development be installed using trenchless technology given the newly reconstructed status of King Street and the significant disruption to traffic that an open-cut trench across the road would create.
5. Existing 100mm gas main runs along King Street East (RR08) behind existing curb. Existing gas service is present, servicing this property. Confirm with Kitchener Utilities and add to drawing.
6. Move proposed water valve to property line.
7. Confirm the City of Kitchener has reviewed and approved the proposed watermain connection.
8. Confirm the City of Kitchener has reviewed and approved the proposed sanitary sewer

connection.

General Comments:

1. Please note that in addition to a complete Site Plan Application, the applicant must obtain Municipal Consent and Work Permit approval(s) from the Region of Waterloo prior to proceeding. Municipal Consent and Work Permit applications are to be applied for through the Region's website at the following link: https://rmow.permitcentral.ca/
2. As part of the Drawings to be submitted for the Municipal Consent Application, the applicant shall submit a Composite Utility Plan that show how the proposed development will be serviced by Enova (hydro), Bell/Rogers, Kitchener Utilities (gas), etc.
3. As part of the Drawings to be submitted for the Municipal Consent Application, the applicant shall submit Landscaping Drawings and show any proposed features along the Regional Right-of-Way (i.e. trees, sod, furniture, etc.). Please note that no enhanced landscape features (shrubs, planter boxes, etc.) or similar site furniture (benches, tables, etc.) are permitted to be installed within the Regional Road allowance, unless the City of Kitchener agrees to be fully responsible including ownership and maintenance. Otherwise enhanced landscaping features and site furniture are to be installed entirely within private property.
4. Please note that if shoring and tie-backs are proposed, which encroach the Regional Right-of-Way along King Street East (RR08), a separate Municipal Consent Application will be required. As part of this application, detailed shoring and tie-back drawings will need to be provided and reviewed by Region staff. The applicant will also need to enter an Encroachment Agreement with the Region.

Please let me know if you have any questions or concerns about these comments.

Thank you,

Katrina Fluit
Transportation Planner
Planning, Development and Legislative Services
Region of Waterloo
150 Frederick Street, 8th Floor, Kitchener ON N2G 4J3
KFluit@regionofwaterloo.ca

Region of Waterloo

PLANNING, DEVELOPMENT
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Will Towns: 519-616-1868
File: D17/2/24012
C14/2/24024
January 8, 2025

Eric Schneider
Senior Planner
City of Kitchener
200 King Street West, 6th Floor
P.O. Box 1118, Kitchener, ON
N2G 4G7

Dear Mr. Schneider,

Re: Official Plan Amendment OPA24/012 and Zoning By-law Amendment ZBA24/024
4611 King Street East
LJM Developments (c/o Brandon Flewwelling, GSP Group) on behalf of Imperial Old Ltd.
City of Kitchener

Regional staff have received site-specific Official Plan amendment (OPA) and zoning by-law amendment (ZBA) applications for a development proposal at 4611 King Street East in the City of Kitchener. The applicant is proposing a mixed-use development with 726 dwelling units, 1,242 square metres of office space, and 650 square metres of retail space (office/retail proposed at grade and on the second level). The building would also consist of two towers (25 and 30 storeys) situated atop a seven-storey shared podium. A range and mix of unit types are proposed, including one-bedroom, one-bedroom plus den, two-bedroom, and three-bedroom. 501 parking spaces (surface and underground) and 404 bicycle parking spaces are proposed as well. Note that the Region provided pre-consultation comments on a previous proposal for these lands in fall 2023.

The lands are designated Urban Area and Built Up Area in the Regional Official Plan (ROP), and located along a Regional Intensification Corridor (King Street East) as per Map 2 of the ROP. Note that the site is located adjacent to the boundary of the Sportsworld Station Major Transit Station Area (MTSA).

The site is also designated Commercial in the City's Official Plan and zoned Arterial Commercial (COM-3). The OPA is required to change the land use designation to High Rise Residential, while the ZBA seeks to change the zone category to Mixed Use Three

(MIX-3) and relief from site-specific requirements for maximum building height, maximum floor space ratio, and maximum number of storeys.

Further to Regional comments dated October 22, 2024, Regional staff have the following to provide in relation to a Transportation Impact Study provided by the applicant as an update to the previously-submitted Transportation Impact Brief:

Transportation Impact Brief Update

Regional staff received and reviewed the Transportation Impact Brief (TIB) entitled 4611 King Street East, Kitchener, Transportation Impact Brief dated July 3, 2024 and prepared by Paradigm Transportation Solutions Ltd., as submitted with the application. In previous comments, Regional staff indicated concerns with the findings of the TIB, including the proposed full-movement access to King Street East. The applicant was advised to consider acquiring additional lands south of the property to facilitate access to Limerick Drive, thereby providing a connection to the signalized intersection at Sportsworld Drive and King Street East and facilitating a more feasible access arrangement to and from the site. A Transportation Demand Management (TDM) plan was also requested as part of the TIB. These items were discussed at a meeting with the applicant on October 31, 2024.

Staff have now received a Transportation Impact Study (TIS) prepared as an update to the TIB provided with the application, along with a comment response letter addressing key issues identified by the Region and Ontario Ministry of Transportation (MTO). Regional staff have the following comments to provide on the updated documents:

- The applicant's consultant should have evaluated whether a right-turn lane into the site is warranted; however, Transportation Planning would be unlikely to approve this measure on King Street East and therefore this is not critical.
- Impacts to the Regional road associated with the proposed development are not anticipated to be significant, and no upgrades to Regional infrastructure are required. The TIS identifies a right-in/right-out access as requested by the Region.
- A TDM plan has been submitted with the TIS that is satisfactory (see below for additional comments).
- Overall, Regional staff consider the TIS acceptable in that impacts to Regional infrastructure are not anticipated to be significant.

On an advisory basis, and notwithstanding Regional acceptance of the TIS as identified above, Regional staff wish to provide the following with respect to the viability and functioning of the site over the long term. The following are provided to the City and MTO for their consideration:

- Comment #11 (addressed to MTO staff) in the response letter indicates that the existing median break adjacent to the subject lands can be used to support U-turn movements and therefore provide bi-directional access to King Street East. The City should be advised that this option is applicable only in the short term. The existing median break will be closed in the future with the construction of

Stage 2 ION Light Rail Transit, and therefore does not constitute a viable U-turn opportunity long term. U-turn activity may shift to nearby intersections once the median break is closed.

- Table 5.2 in the TIS projects that delays leaving the site in both the AM and PM peak hours will be long, leading to significant queuing on-site.
- Regional staff are of the view that these concerns and associated impacts to residents could be addressed by:
    - The construction of the access ramp from Highway 8 southbound to Highway 401 westbound (i.e. "Highway 8 Interchange Improvements" as identified in Table 5.3 in the TIS), which would redistribute traffic away from King Street East and mitigate delays at the proposed site access location; and/or
    - The provision of additional or alternate site access via Limerick Drive, which would permit site traffic to access the signalized intersection at King Street East and Sportsworld Drive.

To make future residents aware of the long-term access arrangement, please note that the following warning clause should be included in all agreements of Offers of Purchase and Sale, lease/rental agreements and condominium declaration associated with the development:

> *Purchasers/tenants are advised that the approved alignment for Stage 2 ION Light Rail Transit is adjacent to the development within the King Street East right-of-way. The site's access to King Street East is designed for right-in and right-out movements only, and the median gap along the site's frontage will be closed once Stage 2 ION is constructed.*

Finally, Grand River Transit staff have reviewed the TDM plan provided in Section 7 of the TIS and have the following comments to provide on an advisory basis:

- The applicant should clarify how many residential and commercial bicycle parking spaces will be provided. 369 residential (363 Type A and 6 Type B) and 8 commercial/retail spaces (4 Type A and 4 Type B) are required as per the zoning bylaw. However, a total of 167 spaces are identified Section 7.1.2 and 404 bicycle parking spaces were included in Section 7.3.
- 7.2 Potential Policies, Programs, and Strategies:
    - Regional staff supports the provision of an unbundled parking plan as an impactful TDM/transit-supportive measure for this site.
    - In relation to the proposed car-share program – the applicant is advised that the most established car-sharing program in Waterloo Region is Communauto. The applicant should contact Janet MacLeod jmacleod@communauto.ca to learn more about opportunities available locally.
    - Providing subsidized transit passes as proposed incurs significant financial and administrative costs. This initiative requires a commitment

from the owner/applicant to manage, administer, and fund the full cost of monthly transit passes for residents. If this is to be considered by the applicant, further consultation and confirmation of expectations between all three parties (Applicant, City, Region – GRT) is required as soon as possible.

Environmental & Stationary Noise

Peer review comments associated with the environmental and stationary noise study have not yet been received by Regional staff but will be provided to the City as soon as possible (along with interpretation and acceptance of comments pertaining to the Regional road noise source). In line with the implementation of Bill 23 and associated changes to areas of authority within the Regional planning framework effective January 1, 2025, acceptance of the stationary noise and non-Regional road transportation components of the study will be the City's responsibility.

Fees

The Region is in receipt of OPA ($7,000) and ZBA ($3,000) review fees, as well as peer review fees for the noise study ($5,085). All fees were received on October 9 and 10, 2024.

Conclusions & Next Steps

As described above, Regional staff are satisfied overall that the findings and recommendations of the Transportation Impact Study are satisfactory – impacts to the Regional road resulting from the proposed development are not anticipated to be significant from traffic volume or functional perspectives, and the TIS proposes a right-in/right-out access to King Street East as requested by the Region.

In addition to the above and as outlined in previous comments, the Region would have no concerns with the application, provided the amending zoning by-law includes a site-specific geothermal prohibition. The Region requests a copy of the decision pertaining to this application.

Please be advised that any future development on the lands subject to the above-noted application will be subject to the provisions of Regional Development Charge By-law 19-037 or any successor thereof.

Should you have any questions, please do not hesitate to contact the undersigned.

Yours truly,

Will Towns, RPP
Senior Planner

Hi Eric,

No heritage planning comments or concerns for this application.

Thanks!

Kind Regards,

Deeksha Choudhry, MSc., BES
Heritage Planner| Development and Housing Approvals Division| City of Kitchener
200 King Street West, 6th Floor | P.O. Box 1118 | Kitchener ON N2G 4G7
519-741-2200 ext. 7602
deeksha.choudhry@kitchener.ca

City of Kitchener

Zone Change / Official Plan Amendment Comment Form

Address: **4611 King St E**
Owner: **Imperial Oil Limited**
Application: **OPA24/012/K/ES and ZBA24/024/K/ES**

Comments Of: Park Planning
Commenter's Name: Lenore Ross
Email: Lenore.ross@kitchener.ca
Phone: 519-741-2200 ext 7427

Date of Comments: Oct 16 2024

☐ I plan to attend the meeting (questions/concerns/comments for discussion)
☒ No meeting to be held
☐ I do NOT plan to attend the meeting (no concerns)

Documents Reviewed:
I have reviewed the documentation noted below submitted in support of Official Plan Amendment is requested to change the land use designation from 'Commercial" to "High Rise Residential" and Zoning By-law Amendment to change the Zoning from 'Arterial Commercial' (COM-3) to 'Mixed Use Three' (MIX-3) and add a site-specific provision for development standards.

- Official Plan Amendment Application Form
- Zoning By-law Amendment Application Form
- Planning Justification Report
- Architectural Package (elevations, renderings, floor plans, shadow study)
- Functional Site Grading and Servicing Plan
- Urban Design Brief
- Wind Study
- Noise Impact Study
- Site Statistics
- Tree Protection Plan

Site Specific Comments & Issues:
Park Planning has no significant concerns with the proposed Official Plan and Zoning Bylaw amendments and can provide conditional support subject to the minor updates to submitted studies are noted below.

Comments on Submitted Documents

Pedestrian Wind Assessment – Rowan Williams Davies & Irwin Inc. (RWDI) dated May 6 2024
The report outlines the desktop estimation of pedestrian wind conditions without wind-tunnel testing and provides a screening-level estimation of potential wind conditions and offers conceptual wind control measures for improved wind comfort, where necessary. The report further states that in order to quantify and confirm the predicted conditions or refine any of the suggested conceptual wind control measures,

physical scale model tests in a boundary-layer wind tunnel would be required; this full wind tunnel test will be a requirement of Final Site Plan approval.

The report identifies several areas of potential concern for pedestrian wind safety and pedestrian wind comfort at entrances, drop off areas, sidewalks walkways, parking lots and amenity spaces. and provides recommendations for wind control solutions. Wind-tunnel testing is recommended to quantify the level and frequency of high wind activity, confirm the need for wind control features and to optimize mitigation efforts and these mitigations measures should be incorporated into Building and Landscape design to achieve the required wind attenuation.

Tree Protection Plan, Tree Tables and Preliminary Landscape Plan L1-L3 - Adesso Design dated 2024.06.10.
L2- Endangered Species Notes. Reference is incorrect, please remove.
L3 – Large Canopy Deciduous Street Trees are noted to be planted by the City of Kitchener – please remove reference to the City of Kitchener. King St E is a Regional road and any required street trees will be reviewed through the Site Plan application and approved by the Region of Waterloo in conjunction with the City of Kitchener (Urban Design and Park Planning) and planted by the developer. With the existing and planned overhead hydro and the proposed ION Stage 2 catenary lines, large statured tree planting may be limited.

Urban Design Brief – GSP Group dated June 2024
Section 5.10 Amenity Areas indicates that the "outdoor rooftop amenity located between the towers, measuring 880 square meters. This outdoor plaza is designed for various social and amenity functions for residents, complementing the indoor spaces".

As noted in Park Planning's Presubmission comments, "Robust on-site outdoor amenity spaces with good solar access and protection from wind and noise will be required as part of the site plan and should include seating and play equipment for residents of all ages and abilities. **The UDB should provide conceptual details for on-site amenity spaces including commentary and precedent images to guide detailed site design through the site plan application."** Further details, including commentary and precedent images illustrating seating and play equipment for residents of all ages and abilities is required in a revised Urban Design Brief.

Policies, Standards and Resources:

- Kitchener Official Plan
- City of Kitchener Park Dedication Bylaw 2022-101 and Park Dedication Policy MUN-PLA-1074
- City of Kitchener Development Manual
- Cycling and Trails Master Plan (2020)
- Chapter 690 of the current Property Maintenance By-law
- Places & Spaces: An Open Space Strategy for Kitchener
- Multi-Use Pathways & Trails Masterplan
- Urban Design Manual

Anticipated Fees:
Parkland Dedication

The parkland dedication requirement for the OPA and ZBA application is **deferred** and will be assessed at a future Site Plan Application. Parkland dedication will be assessed based on the land use class(es) and density approved through the OPA and ZBA and required as a condition of Final Site Plan Approval **as cash-in-lieu of land.**

Dedication requirements are subject to the Planning Act, Parkland Dedication Bylaw, Park Dedication Policy and rates in effect.

The site is located within the Pioneer Tower West Planning Community and while this neighbourhood has been identified in Places and Spaces: An Open Space Strategy for Kitchener as being well served overall with active neighbourhood park space, the distribution, access and connectivity of active neighbourhood park space is not ideal and this site is located 1.2km from Pioneer Grove Parkette (no play equipment) and 1.8km from Settlers Grove Park on a route with discontinuous sidewalk infrastructure.

Given the distance to active public park space, the provision of robust on-site outdoor amenity spaces with good solar access, protection from wind, noise and incorporating seating and play equipment for residents of all ages and abilities will be critical to this proposal. The developer should provide a clear commitment to providing robust on-site amenities including children's play facilities.

An estimate of required parkland dedication was provided at the presubmission application, and this estimate has been revised to reflect the updated development proposal with increased FSR and additional residential units. If further changes are made to the development proposal, a revised estimate will be required.

An estimate is provided using the approved land valuation of $19,768,000/ha and a dedication rate of 1ha/1000 units; a maximum dedication of either land or CIL of 10% and a capped rate of $11,862/unit. The estimated cash-in-lieu park dedication for the proposed 0.7360ha site with 726 proposed units, 1892.6m^2 commercial and an FSR of 7.83 is **$1,454,925.00**

Calculation: 726 units/1000 units/ha x $19,768,000/ha = $14,351,568 (alt. rate Bylaw 2022-101)
0.7360 ha x $19,768,000/ha x 0.05 = $727,462 (5% rate Bylaw 2022-101)
726 units x $11,862 = $8,611,812 (City of Kitchener capped rate)
0.7360ha x $19,768,000/ha x 0.1 = $1,454,925 (More Homes Built Faster Act)

Eric Schneider

To: Stefan Hajgato
Subject: RE: 4611 King Street East- Updated TIS

From: Stefan Hajgato <Stefan.Hajgato@kitchener.ca>
Sent: Friday, December 27, 2024 2:15 PM
To: 'Johnston, Jeremiah (MTO)' <Jeremiah.Johnston@ontario.ca>; William Towns <wtowns@regionofwaterloo.ca>; Eric Schneider <Eric.Schneider@kitchener.ca>
Cc: Vallvé, Nina (MTO) <nina.vallve@ontario.ca>; Malik, Rafiq (MTO) <Rafiq.Malik@ontario.ca>; Katrina Fluit <KFluit@regionofwaterloo.ca>
Subject: RE: 4611 King Street East- Updated TIS

Hi All,

City Transportation staff have no comments on the updated material received from the Applicant.

However, City Transportation staff request to be included on any discussions regarding King St or the Highway ramps in this area to be aware of any potential impacts.

Thanks,

Stefan Hajgato, P.Eng. (he/him)

Transportation Planning Analyst | City of Kitchener
519-783-8957 | TTY 1-866-969-9994

City of Kitchener

PRE-SUBMISSION CONSULTATION COMMENT FORM

Comments Of:	Transportation
Commenter's Name:	Stefan Hajgato
Email:	Stefan.Hajgato@kitchener.ca
Phone:	(519) 741-2200 e 7410
Date of Comments:	October 18, 2024
Address:	4611 King Street East

1. Site Specific Comments and Issues:

- Accessible parking will need to be located closer to the principal pedestrian entrance.
- City staff request that the active transportation connections from the north side of the building to King Street East are more clearly identified.
- A longer throat length will be required to the first parking space on the west side of the drive aisle.
- A Transportation Demand Management (TDM) Plan will need to be provided to support the reduced parking rate as the subject site is located outside of the PMTSA area. However, City staff are generally supportive of a reduced parking rate for this site and have no concerns with the Parking Assessment included in the 4611 King Street East Transportation Impact Brief (TIB) dated 2024-07.
- City staff request that the applicant considers implementing one-way counterclockwise circulation around the internal traffic island, east of the internal parking garage access.
- City staff would like clarification of where waste collection will occur.
- Pending the layout of the internal parking structure, which was not provided to City staff at this time, a Swept Vehicle Path Analysis may be required. However, City staff have no concerns with the surface level vehicle circulation at this time for any TAC HSU or smaller design vehicle.
- City staff will need to confirm with Regional and MTO staff regarding how vehicles will exit the subject site to go westbound, and if future eastbound vehicles will be permitted to perform a U-turn at the Hwy 401 WB Off-Ramp as identified in the TIB dated 2024-07.

2. Plans, Studies and Reports to submit as part of a complete Planning Act Application:

- Vehicle Swept Path Analysis using AutoTURN or equivalent software (TBD)

3. Anticipated Requirements of full Site Plan Approval:

- Pavement Marking and Signage Plan (PMSP)

4. Policies, Standards and Resources:

- Urban Design Manual
- Zoning bylaw - City of Kitchener

5. Anticipated Fees:

- N/A.

City of Kitchener

Zone Change Comment Form

Address: 4611 King St E
Owner:
Application #: ZBA24/024/K/ES - OPA24/012/K/ES

Commenter's Name: Pegah Fahimian
Email: Pegah.fahimian@kitchener.ca
Phone: 519-741-2200 Ext. 7342
Date of Comments: Oct 18, 2024

☐ I plan to attend the meeting (questions/concerns/comments for discussion)
☒ No meeting to be held
☐ I do NOT plan to attend the meeting (no concerns)

1. Documents Reviewed:

- Urban Design Brief- GSP, June 2024
- Architecture Plans – Krikor Architects
- Shadow Study- GSP, June 2024
- Wind Study - Pedestrian Wind Assessment – RWDI, May 2024

2. Site-Specific Comments & Issues:

I have reviewed the documentation (as listed above) to support an OPA / ZBA to change the land use designation from 'Commercial" to "High Rise Residential" and Zoning By-law Amendment to change the Zoning from 'Arterial Commercial' (COM-3) to 'Mixed Use Three' (MIX-3) and add a site-specific provision for development standards.

3. Comments on Submitted Documents

Design Brief- GSP, June 2024

Tall Building Design Analysis: Physical separation**:** The proposal needs to fully meet the tall building guidelines, specifically with regard to separation as the guidelines are an excellent compatibility test for proposals exceeding their zoning permissions. The tower separation distance for tower A is estimated to be 18m, and for tower B is estimated to be 16.5m. The proposed tower separation from the adjacent property to the south and east is deficient as per Tall Building Design Guidelines (TBDG). The proposal will need to be modified until the resulting built form meets its corresponding separation target.

Scale and Transition: The proposed towers do not show an appropriate transition to the existing low-rise directly adjacent to the south of this project. Further setback or physical separation is to be considered for this location. Urban Design Staff is not supportive of placing a 25-storey tower in close proximity to the adjacent low-rise neighborhood. Due to its scale, height, mass and proximity to the adjacent low-rise neighbourhoods, the proposed tower will create an enclosed structure that hinders sky view and creates an overwhelming scale. You may consider lowering the tower's height while increasing the setback to achieve good separation and compatibility while mitigating unwanted impacts. This will help transition to the adjacent neighborhood and benefit sky views, sun/shadow and microclimate.

- A compatibility study should be provided to address potential impacts on the adjacent low-rise residential. This report should identify existing and potential compatibility issues and identify and evaluate options to achieve appropriate design, buffering, transitions, and separation distances. Recommended measures intended to eliminate or mitigate negative impacts and adverse effects should be provided.

On-site Amenity area:

- Required amenity space calculations are contained in the Urban Design Manual and include two parts – one for a general amenity area and one for children's play facilities in multiple residential developments. (2m2 x #units) + (2.5m2 x #bedrooms - #units) = outdoor amenity space.
- The Urban Design Brief should be updated to include text and conceptual images that demonstrate the commitment to providing sufficient and appropriate amenity space for all potential residents on-site. Ensuring a robust on-site amenity for this development block is crucial as this community lacks active parkland. The amenities must cater to a range of ages and abilities, not just passive lounge spaces. Preliminary landscape plan should be provided to show the location of playground area and outdoor amenity space.

Shadow Studies, GSP, June 2024

Written confirmation should be provided that the proposal will maintain access to at least 5 hours of cumulative direct sunlight to nearby sidewalks and open spaces.

Architecture Package- KIRKOR Architects

As detailed below, key design considerations must be addressed through a redesign of the site plan to create a more functional site for residents and ensure the project fits in the context of the neighborhood.

- The City's Tall Building Guidelines should be consulted to inform the revised design of the site with respect to:
    - Tower dimensions, configuration, separation and overlook
    - Location of amenity space(s)
    - Podium characteristics

- The proposed visitor parking is highly visible from King Street. You may consider reducing the number of visitor parking spaces and relocating them to underground/structural parking.

- Active uses should be along King Street, including retails with outdoor patios or residential amenity areas.

- The proposed long podium A should be broken down using enhanced detailing and articulation.
- The building facades fronting King Street should contain the primary residential and commercial entrances and the appropriate amount of glazing and articulation, particularly along the lower 5m where the building addresses the sidewalk.
- Consider stepbacks for the upper storeys in the tower, both to increase articulation/visual interest in the building and create room for shared outdoor amenity space. This will also facilitate the transition to low-rise neighbourhoods.
- All at-grade parking should be wrapped with active uses.
- The area between the building's face and the property line should be well integrated with the street and public realm to deliver high-quality and seamless private, semi-private and public spaces.
- The tower should step back from its base a minimum of 3m along any street-facing elevations.
- The underground parking structure should have a sufficient setback from the property lines to accommodate the necessary soil volume to support required large-statured, high canopied trees. Perimeter trees should not be located on the garage slab roof. Within the site, required tree plantings can be accommodated on the garage slab but will still require standard minimum soil volumes.
- Provide natural surveillance by employing high percentages of glazing, and active uses at ground level and incorporate more units with patios and windows/balconies on the main facade with views onto King Street.

- The proposed towers should have unique top features that are architecturally excellent, highly visible and makes a positive contribution to the image of Kitchener developing skyline.

- Provide materiality and texture shifts at the podium and across the towers and incorporate variations in tower setbacks from the base to distinguish the tower form from the podium.
- Wind assessment and shadow study required for outdoor amenity and the pedestrian realm.
- Residential and commercial entrances should be clearly identified and offer access from both the public realm and the private parking side of the building. The proposed main entrance is to be further enhanced to create visual interest at the street edge. (for example cantilevered entrance canopy, corrugated-metal panels and fritted glass.
- Balconies may be staggered in a creative pattern to lighten the structure and provide private outdoor space for the units.
- Towers are highly visible elements of the urban environment and must meet Kitchener's highest standards for design excellence. The building should be designed and clad with different materials and colours so that they read as distinct from one another.
- All utilities should be coordinated with the landscape design and with building elevations to provide a high-quality pedestrian experience with the site and from the public realm. Infrastructure should be located within the building in mechanical/electrical rooms and exterior connections located discretely and incorporate physical screens or landscape plating as required. Surface transformers or service connections visible from the public realm are not supported.

Wind Study - Pedestrian Level Wind – Preliminary Impact Assessment.
The submitted preliminary Wind Study indicates that the proposed development is significantly taller than the existing surroundings and includes two towers that will interact with the prevailing winds. As a result, areas of increased wind speed are predicted where comfort conditions will not be suitable.

A full Wind tunnel study should be provided for review at the site plan application stage. A revised design proposal that addresses the wind impacts outlined in the submitted wind study should be developed.

Region of Waterloo

PLANNING, DEVELOPMENT
AND LEGISLATIVE SERVICES
Community Planning

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www.regionofwaterloo.ca

Will Towns: 1-519-616-1868
File: D17/2/24012
C14/2/24024
October 22, 2024

Eric Schneider
Senior Planner
City of Kitchener
200 King Street West, 6th Floor
P.O. Box 1118, Kitchener, ON
N2G 4G7

Dear Mr. Schneider,

Re: Official Plan Amendment OPA24/012 and Zoning By-law Amendment ZBA24/024
4611 King Street East
LJM Developments (c/o Brandon Flewwelling, GSP Group) on behalf of Imperial Old Ltd.
City of Kitchener

Regional staff have received site-specific Official Plan amendment (OPA) and zoning by-law amendment (ZBA) applications for a development proposal at 4611 King Street East in the City of Kitchener. The applicant is proposing a mixed-use development with 726 dwelling units, 1,242 square metres of office space, and 650 square metres of retail space (office/retail proposed at grade and on the second level). The building would also consist of two towers (25 and 30 storeys) situated atop a 7-storey shared podium connecting the towers. A range and mix of unit types are proposed, including 1-bedroom, 1-bedroom plus den, 2-bedroom, and 3-bedroom. 501 parking spaces (surface and underground) and 404 bicycle parking spaces are proposed as well. Note that the Region provided pre-consultation comments on a previous proposal for these lands in fall 2023.

The lands are designated Urban Area and Built Up Area in the Regional Official Plan (ROP), and located along a Regional Intensification Corridor (King Street East) as per Map 2 of the ROP. Note that the site is located adjacent to the boundary of the Sportsworld Station Major Transit Station Area (MTSA).

The site is also designated Commercial in the City's Official Plan and zoned Arterial Commercial (COM-3). The OPA is required to change the land use designation to High

Rise Residential, while the ZBA seeks to change the zone category to Mixed Use Three (MIX-3) and seek relief from site-specific requirements for maximum building height, maximum floor space ratio, and maximum number of storeys.

The Region has had the opportunity to review the proposal and offers the following:

Community Planning

Provincial Planning Statement (PPS) 2024

The PPS encourages the development of livable communities. It also provides a framework for planning authorities to ensure the wise use of resources while protecting Ontario's long-term prosperity and environmental and social well-being. It directs growth to built-up areas and promotes a mix of land uses that efficiently use resources, minimize negative environmental impacts, function compatibly with surrounding land uses, and support active transportation and transit use.

The Planning Justification Report (PJR) prepared by GSP Group (dated August 2024) reviews applicable PPS policies in section 4.2. (While the PJR reviews PPS 2020, a decision on this application will be made after October 20, 2024, at which point the updated PPS 2024 will take effect – for the purposes of this proposal, the application of PPS policies does not differ significantly between the two versions.) Regional staff note that the application proposes an intensified use of land within a designated built-up area and corridor identified as appropriate for intensification. While services must be extended to the subject lands (and a storm service connection remains to demonstrated), services are in the vicinity and connections are feasible.

The proposal would also enhance the mix of available housing in the area (which includes an established low-rise neighbourhood to the south and east, as well as a number of proposed multi-residential buildings along King Street East along the future ION light rail alignment). Though not located within the MTSA, the development is within comfortable walking distance of both existing and planned transit services and proposes pedestrian connections to existing sidewalks. Overall, Regional staff are satisfied that the application is consistent with the PPS.

Regional Official Plan

ROP policies are reviewed in Section 4.4 of the PJR. Section 1.6 of the ROP establishes the Regional Planning Framework and Section 2.B.1 and 2.C establish policies for the Urban System, including for Regional Intensification Corridors. Section 2.F establishes policies and intensification targets within the Delineated Built-Up Area, which is set at 60 percent annually for the City of Kitchener. Development in the Built Up Area is intended to support the achievement of 15-minute neighbourhoods. The proposed application provides for residential density that will contribute to the achievement of Kitchener's intensification target for the Delineated Built Up Area, while providing commercial and employment components beneficial to both existing and future residents of the development and surrounding neighbourhood. The development also proposes units with a range of bedroom counts and unit sizes, which serve to enhance the mix of unit types in the area, and is appropriately located along a corridor well-served by transit.

Section 2.D.6 of ROPA 6 establishes policies for ensuring that development within strategic growth areas – which include Regional Intensification Corridors – is transit-supportive. This section requires that applicants in these areas provide compact built form, a mix of uses, and integration of and connectivity to active transportation options. The site's proximity to existing and planned transit stops, connection to sidewalks on King Street East, and on-site bicycle parking provides support for the application in these areas, while the built form proposes high density within 200 metres of an iXpress bus stop.

In addition, Chapter 3 of ROPA 6 establishes policies for housing in the Region – the provision of a range of unit types in the development meets the policy intent of section 3.A. Overall, Regional staff are satisfied that this application conforms to the ROP.

Environmental Threats & Record of Site Condition

In accordance with the Region's Implementation Guideline for the Review of Development Applications on or Adjacent to Known and Potentially Contaminated Sites and as identified in Regional pre-submission comments (dated October 3, 2023), a Record of Site Condition (RSC) is required in association with the ZBA application due to the presence of known sources of contamination on the subject lands as per the Region's Threats Inventory Database.

As the RSC and associated acknowledgement letter from the MECP have not been submitted as part of a complete application, Regional staff require a holding provision implemented through the ZBA requiring the submission of the RSC and MECP Acknowledgement Letter to the Region's satisfaction. Alternately, the City's Chief Building Official may provide the Region with written confirmation that an RSC is required under O. Reg 153/04. Required wording for the holding provision is as follows:

> *That a holding provision shall apply to the entirety of the subject lands until a satisfactory Record of Site Condition has been submitted to the Ministry of Conservation and Parks, and that the Record of Site Condition and Ministry Acknowledgment Letter are provided to the Regional Municipality of Waterloo.*

Corridor Planning

Conditions of OPA & ZBA Approval

Approval of the noise study and Transportation Impact Brief Study would be required prior to final approval of the OPA and ZBA applications.

Environmental Noise (Transportation and Stationary Sources) Study

Regional staff have received the noise study entitled Road Traffic and Stationary Noise Impact Study, 4611 King Street East, Kitchener, Ontario dated March 21, 2024 and prepared by JJ Acoustic Engineering Ltd. submitted with the application. This has been circulated to the Region's third-party peer review consultant; comments will be provided under separate cover once received.

Should the application proceed to Council for approval prior to the receipt of peer review comments, the Region will require a holding provision until the preliminary study is completed and a detailed noise study addressing final design of the site and its impact on surrounding sensitive land uses and itself is prepared and accepted by the Region. Required wording for the holding provision is as follows:

*That a holding provision shall apply to the entirety of the subject lands until satisfactory detailed **environmental** and stationary noise studies have been completed and implementation measures addressed to the satisfaction of the Regional Municipality of Waterloo. The detailed **environmental** and stationary noise study shall review the potential impacts of noise (e.g. **transportation noise,** HVAC systems) on the sensitive points of reception and the impacts of the development on adjacent noise sensitive uses.*

Transportation Impact Brief

Regional staff have received the Transportation Impact Brief (TIB) entitled 4611 King Street East, Kitchener Transportation Impact Brief dated July 3, 2024 and prepared by Paradigm Transportation Solutions Ltd.

Regional staff have concerns with the findings of the TIB, including the function of the proposed full-movement access to King Street East (whereas right-in/right-out only was identified as the Region's preferred design in pre-submission comments dated October 3, 2023). The applicant could consider acquiring additional lands south of the property to facilitate access to Limerick Drive, thereby providing a connection to the signalized intersection at Limerick Drive and King Street East and facilitating a more feasible full-movement access arrangement to and from the site. The Regional Transportation Planner will follow up directly with Paradigm staff and the applicant to arrange a meeting to address TIB concerns as soon as possible.

GRT staff note that the transportation demand management (TDM) plan requested at pre-submission has not been provided in the TIB. Please provide a TDM plan to Regional staff for review and information.

Conditions of Future Site Plan Application

Approval of the lot grading plan/stormwater management report and Access Permit would be required prior to final approval of a future site plan application.

Access Permit/Access Regulation

A Regional Access Permit will be required for the proposed access to King Street East. Due to the center median, proximity to MTO ramps, and future ION Stage 2 alignment all access from King Street East to the site will be right-in/right-out only. The applicant will be responsible for all costs associated with the proposed access. The fee for the issuance of the permit is $230.

The proposed access must comply with the Regional Access Policy, being between 7.6m and 9.0m wide at the property line. The application for an Access Permit can be found on the Region's website at https://forms.regionofwaterloo.ca/ePay/PDLS-Online-Payment-Forms/Commercial-Access-Permit-Application

Stormwater Management & Site Grading

Staff have received the report entitled 4611 King Street West Functional Servicing and Stormwater Management Report dated May 22, 2024, as well as the drawings entitled Functional Site Grading and Servicing Plan and Removals Plan, both dated June 6, 2024, all prepared by MTE Consultants Inc. Detailed comments on these plans will be provided under separate cover, though staff note that the proposed connection to Regional stormwater services on King Street East is not supportable.

The applicant must submit a Landscape Plan for approval. This plan should include proposed plantings and landscaping, including those within the Regional Right of way, all to the satisfaction of the Regional Municipality of Waterloo. Please note that any new trees within the Regional Right-of-way will be assessed for feasibility and may not be permitted.

The site must be graded in accordance with the approved plan and the Regional Road allowance must be restored to the satisfaction of the Regional Municipality of Waterloo. Please be advised that the any new servicing connections or update to the existing servicing would require Regional approval through a separate process of Municipal Consent.

Grand River Transit (GRT)

Staff note that the site is in close proximity to the proposed Sportsworld (ION) Station, as well as Route 206 iXpress stops (bi-directional) within 200-400 metres of the subject lands. No stop infrastructure upgrades are required, though the applicant is encouraged to consider additional measures to make the development more transit-supportive: as identified above in relation to the TIB, please provide a TDM report for the Region's review.

Other

A Site Plan pre-consultation fee of $300 and a Site Plan review fee of $805 will be required for the review and approval of a future Site Plan application.

Region of Waterloo International Airport

Region of Waterloo International Airport staff have reviewed the application on the basis of its proposed height and location within the obstacle protection area of Runway 26 departures. This area has a minimum estimated allowable elevation of 481 metres above sea level (ASL). Architectural drawings submitted in support of the application propose a maximum building elevation of 402.5 metres ASL. This leaves 78.5 metres available above the building for any cranes, which is expected to be sufficient.

The developer will need to submit a Land Use application to Nav Canada, and obtain a letter of no objection to the satisfaction of the Region.
https://www.navcanada.ca/en/aeronautical-information/land-use-program.aspx

Since the building is proposed to exceed 90 metres in height, the developer will also need to submit an Aeronautical Assessment Form to Transport Canada and comply with all requirements. More information can be fond here:
https://tc.canada.ca/en/aviation/general-operating-flight-rules/marking-lighting-obstacles-air-navigation

Source Water Protection & Risk Management

This site is not located in a wellhead protection sensitivity area (WPSA) as identified in the ROP, nor within an area regulated by the Clean Water Act. Please note that there is a large plume of contaminated groundwater directly beneath the property. The construction dewatering for the proposed three levels of underground parking will draw this plume further toward the property and the footprint of the building, and the applicant will therefore be dealing with contaminated dewatering discharge. This plume has been appropriately identified in the Phase I and II Environmental Site Assessment reports submitted in support of the application. However, Regional staff will require a prohibition on geothermal energy systems open, closed loop and horizontal systems) to be written into the site-specific zoning by-law amendment for this property. The required wording for the prohibition is:

> *Geothermal energy systems are prohibited on-site. A geothermal energy system is defined as a vertical well, borehole or pipe installation used for geothermal systems, ground-source heat pump systems, geo-exchange systems or earth energy systems for heating or cooling; including open-loop and closed-loop vertical borehole systems or a horizontal system.*

In addition, in keeping with ROP policy, Regional staff advise that the developer will be required to complete a Salt Management Plan (SMP) to the Region's satisfaction as part of a future site plan application. As part of the SMP, HWP would encourage the proponent to incorporate design considerations with respect to salt management, including:

- Ensure that cold weather stormwater flows are considered in the site design. Consideration should be given to minimize the transport of meltwater across the parking lots or driveway. This also has the potential to decrease the formation of ice and thereby the need for de-icing.
- Directing downspouts towards pervious (i.e. grassy) surfaces to prevent runoff from freezing on parking lots and walkways.
- Locating snow storage areas on impervious (i.e. paved) surfaces.
- Locating snow storage areas in close proximity to catchbasins.
- Using winter maintenance contractors that are Smart About Salt™ certified.
- Using alternative de-icers (i.e. pickled sand) in favour of road salt.

The proponent is eligible for certification under the Smart About SaltTM program for this property. Completion of the SMP is one part of the program. To learn more about the program and to find accredited contractors please refer to http://www.smartaboutsalt.com. Benefits of designation under the program include cost savings through more efficient use of salt, safe winter conditions by preventing the formation of ice, and potential reductions in insurance premiums.

Water Services

Regional staff have reviewed the FSR prepared by MTE Consultants Inc. dated May 22, 2024 submitted in support of the application and have no concerns in relation to the proposed water and wastewater connections.

Housing Services

The following Regional policies and initiatives support the development and maintenance of affordable housing:

- Regional Strategic Plan
  - Strategic Priority 1 is “Homes for All” in the 2023-2027 Strategic Plan.
- 10-Year Housing and Homelessness Plan
  - Contains an affordable housing target, which aims for 30 percent of all new residential development between 2019 and 2041 in the Region to be affordable to low and moderate income households.
- Building Better Futures Framework
  - Demonstrates Regional plans to create 2,500 units of housing affordable to people with low to moderate incomes by 2025.
- Region of Waterloo Official Plan
  - Section 3.A (Range and Mix of Housing) contains land use policies that ensure the provision of a full and diverse range and mix of permanent housing that is safe, affordable, of adequate size, and meets the accessibility requirements of all residents.
  - Section 2.D.2.7 (MTSA Policies) contains policies that support the use of inclusionary zoning by the area municipalities as a means of requiring affordable housing in Major Transit Station Areas.

The Region supports the provision of a full range of housing options, including affordable housing. Should these amendments be approved, staff recommend that, in addition to any inclusionary zoning requirements, the applicant consider providing a number of affordable housing units on the site, as defined in the ROP. Rent levels and house prices that are considered affordable according to the Regional Official Plan are provided in the following section.

For affordable housing to fulfill its purpose of being affordable to those who require rents or purchase prices lower than the regular market provides, a mechanism should be in place to ensure the units remain affordable and establish income levels of the households who can rent or own the homes.

Staff further recommend meeting with Housing Services to discuss the proposal in more detail and to explore opportunities for partnerships or programs and mechanisms to support a defined level of affordability.

Affordability

For the purposes of evaluating the affordability of an ownership unit, based on the definition in the Regional Official Plan, the purchase price is compared to the least expensive of:

Housing for which the purchase price results in annual accommodation costs which do not exceed 30 percent of gross annual household income for low and moderate income households	$395,200
Housing for which the purchase price is at least 10 percent below the average purchase price of a resale unit in the regional market area	$740,000

*Based on the most recent information available from the PPS Housing Tables (2023).

For an owned unit to be deemed affordable, the maximum affordable house price is $395,200.

For the purposes of evaluating the affordability of a rental unit, based on the definition of affordable housing in the Regional Official Plan, the average rent is compared to *the least expensive of*:

A unit for which the rent does not exceed 30 per cent of the gross annual household income for low and moderate income renter households	$2,040
A unit for which the rent is at or below the average market rent (AMR) in the regional market area	Bachelor: $1,164 1-Bedroom: $1,346 2-Bedroom: $1,658 3-Bedroom: $2,039 4+ Bedroom: n/a

*Based on the most recent information available from the PPS Housing Tables (2023)

For a rental unit to be deemed affordable, the average rent for the proposed units must be at or below the average market rent in the regional market area as shown above.

Please do not hesitate to contact Housing Services staff directly at JMaanMiedema@regionofwaterloo.ca or 226-753-9593 should you have any questions or wish to discuss in more detail.

Fees
The Region is in receipt of OPA ($7,000) and ZBA ($3,000) review fees, as well as peer review fees for the noise study ($5,085). All fees were received on October 9 and 10, 2024.

Conclusions & Next Steps
Regional staff request that the applicant address concerns with the findings of the Transportation Impact Brief (i.e. access issues) and finalize the study prior to City Council's consideration of this application. Regional staff will contact the applicant to discuss as soon as possible.

Once the Transportation Impact Brief is finalized and access concerns addressed, the Region would have no concerns with the application, provided:

- A holding provision is applied to the property requiring acceptance of the preliminary noise study by the Region and the completion of a detailed noise study prior to site plan approval.
- A holding provision is applied to the entirety of the property requiring submission of an RSC and MECP acknowledgement letter to the Region.
- The amending zoning by-law includes a site-specific geothermal prohibition as outlined above.

Please be advised that any future development on the lands subject to the above-noted application will be subject to the provisions of Regional Development Charge By-law 19-037 or any successor thereof.

Further, please accept this letter as our request for a copy of the decision pertaining to this application. Should you have any questions, please do not hesitate to contact the undersigned.

Yours truly,

Will Towns, RPP
Senior Planner

C. Brandon Flewwelling, GSP Group (Applicant)

City of Kitchener - Comment Form

Project Address: 4607-4611 King St E
Application Type: OPA/ZBA

Comments of: Environmental Planning (Sustainability) – City of Kitchener
Commenter's name: Mike Balch
Email: mike.balch@kitchener.ca
Phone: 519-741-2200 x 7110

Written Comments Due: October 21, 2024
Date of comments: November 5, 2024

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1. **Plans, Studies and/or Reports submitted and reviewed as part of a complete application:**
    - Sustainability Statement 4607-4611 King St E as prepared by Clifford Korman, dated June 28, 2024

2. **Comments & Issues:**

I have reviewed the supporting documentation (as listed above) to support a site plan application proposing two mixed use office/residential towers, regarding sustainability and energy conservation, and provide the following comments:

- Although the Ontario Building Code (OBC) is progressive, going forward all developments will need to include energy conservation measures that go beyond the OBC as the City (and Region of Waterloo) strive to achieve our greenhouse gas reduction target.
- A Sustainability Statement (as per the City's Terms of Reference) will be required as part of a complete Site Plan Application which can further explore and/or confirm additional sustainability measures that are best suited to the development as the design evolves.
- **Upon review of the supporting documentation, the Official Plan and Zoning Bylaw Amendments can be supported as several sustainable measures have been proposed or are being considered for the development.**
- The development proposes several sustainable measures including:
    - The compact and efficient design of an underutilized lands
    - Control measures to improve stormwater runoff quantity and quality
    - The consideration to encourage greater public transit use
    - Pedestrian supportive design
    - On-site secure bike parking promoting active transportation
    - Building orientation for southern exposure reducing heating requirements
    - Cool/light coloured roofing material
    - Consideration for the reuse and recycling of construction and building materials

- On-site garbage, recycling, and compost

- Potential items for consideration are:
  - If the development will utilize low flow plumbing fixtures to reduce water demand
  - Consideration of alternative or renewable energy systems to meet new energy demand created by the development (i.e. ground source or air source heat pumps, roof-top solar photovoltaic panels, solar thermal hot water system, capture of waste heat from industrial processes to use for thermal energy needs, etc), or design of the site and building for "readiness" to add these systems in the future.

3. Conditions of Site Plan Approval:

- To submit a revised Sustainability Statement to the satisfaction of the City's Director of Planning. Further, the approved sustainability measures recommended in the Sustainability Statement will be implemented in the landscape, stormwater management, and building design, to the satisfaction of the City's Manager of Development Review.

4. **Policies, Standards and Resources:**

- Kitchener Official Plan Policy 7.C.4.5. The City will encourage and support, where feasible and appropriate, alternative energy systems, renewable energy systems and district energy in accordance with Section 7.C.6 to accommodate current and projected needs of energy consumption.
- Kitchener Official Plan Policy 7.C.6.4. In areas of new development, the City will encourage orientation of streets and/or lot design/building design with optimum southerly exposures. Such orientation will optimize opportunities for active or passive solar space heating and water heating.
- Kitchener Official Plan Policy 7.C.6.8. Development applications will be required to demonstrate, to the satisfaction of the City, energy is being conserved or low energy generated.
- Kitchener Official Plan Policy 7.C.6.27. The City will encourage developments to incorporate the necessary infrastructure for district energy in the detailed engineering designs where the potential for implementing district energy exists.

5. Advice:

- As part of the Kitchener Great Places Award program every several years there is a Sustainable Development category. Also, there are community-based programs to help with and celebrate and recognize businesses and sustainable development stewards (Regional Sustainability Initiative - http://www.sustainablewaterlooregion.ca/our-programs/regional-sustainability-initiative and TravelWise - http://www.sustainablewaterlooregion.ca/our-programs/travelwise).

- The 'Sustainability Statement Terms of Reference' can be found on the City's website under 'Planning Resources' at … https://www.kitchener.ca/SustainabilityStatement

The Ministry of Transportation (MTO) has completed a review of the OPA/ZBA submission documents provided for the site located at 4611 King Street East, Kitchener. The documents circulated have been considered in accordance with the *Public Transportation and Highway Improvement Act* (PTHIA), MTO's Highway Corridor Access Management Manual, and all other related MTO policies.

The site has frontage along Highway 401, which is designated as a **Controlled Access Highway (CAH)**. As such, all requirements, guidelines and best practices in accordance with this classification and designation shall apply;

The owner should be aware that the property falls within MTO's Permit Control Area (PCA), and as such, MTO Permits are required before any demolition, grading, construction or alteration to the site commences. In accordance with the Ontario Building Code, municipal permits may not be issued until such time as all other applicable requirements (i.e.: MTO permits/approvals) are satisfied. As a condition of MTO permit(s) MTO will require the following for review and acceptance;

The following comments are based on information received to date, and are subject to change upon new or updated documents being provided.

Access

MTO's desirable access connection offset spacing criteria at this location is 150 m measured westerly from the beginning of the westbound on-ramp taper to Highway 401. The site does not have adequate frontage to meet desirable MTO's spacing requirements. As such, alternative access should be considered by the applicant.

Should alternative access not be available, MTO may consider accepting a right in-right out access to the site, at the westerly limit of the site, if supported by MTO's review and acceptance of a Traffic Impact Study.

Additionally, the Region as the road authority of this section of King Street should also review and approve the location of the proposed right in-right out access, given the proximity to the dropped curb/ U-turn opening in the raised median.

Traffic Impact Assessment

Typically, MTO would require the owner to submit a Traffic Impact Study (TIS) to MTO for review and acceptance, indicating the anticipated volumes of traffic and its impact upon the provincial highway network with the following requirements:

- The TIS will be prepared by a Registry, Appraisal and Qualification System (RAQS) qualified transportation consultant in accordance with MTO TIS Guidelines attached.

- The MTO list of Prequalified Engineering Service Providers (ESPs), completing Traffic Impact Analysis is publicly available on MTO Technical Documents website, under Qualifications.
- MTO will be available to review the TIS scope of work (Terms of Reference (TOR)) once prepared, to ensure MTO concerns and requirements are addressed.
- Should improvements be identified as warranted and as a condition of MTO permits, the improvements will be designed and constructed to the standards and approval of MTO at the cost of the applicant.
- MTO suggests the owner engage in pre-consultation with MTO to discuss the existing and proposed trip distribution in tabular and a diagram with the volumes distributed in the network..
- MTO staff would be avaible to attend a pre-study meeting.
- The TIS should include an operational review/analysis of any proposed access location, and identify any potential impacts to the provincial highway system, and surrounding road network.

MTO comments on TIB submitted

A Traffic Impact Brief was prepared and submitted to MTO without prior consultation. As a result, clarification of the following comments is required:

Assumptions:

- The TIB relies on 2031 traffic forecasts referenced in the TIA Report for Stage2 ION. – Please provide a copy of the report referenced.
- The report should consider and analyze both existing and future conditions.
- What are the expected timelines of the Stage2 ION project and what is the expected timeline of the proposed development, should this application be approved?

Trip Generation:

- Why is equation used even with a R^2 <0.75 ?
- In a mixed-use development, it is likely that there would be trips internal to the site. Can Paradigm please provide comment on this, if / how it was factored into the trip generation.
- How was the pass-by trip percentage determined? There is no pass-by trip table for subject LUC's.

Trip Distribution:

- Please provide justification for Sportsworld Dr trips as this appears to be less attractive being parallel to Highway 401.
- Figure 4.3 Confusion: Hwy 401 WB Off-Ramp AM Peak Hour – 59 trips are shown making a U-Turn but the same are assigned to Hwy 401 On-

Ramp. Same for all remaining figures. Provide a sketch/layout of the intersections for clarity.
- No existing traffic counts were provided. – Please provide counts for MTO facilities.

Development Impacts:

- How is this justifiable to assume that the development will have no impacts at the intersection of Hwy 401 EB off ramp LT lanes which would have a LOS F with the development traffic? No existing performance measures were provided to compare with.
- No separation distance is provided between the site entrance and King St SB to Hwy 401WB on-ramp. This will help to assess weaving conflicts between exiting ~140 trips destined SB and Hwy 401 on-ramp traffic.
- Under existing conditions (i.e. without Signalized ramp terminals) where is it anticipated that site traffic would complete U-turns on King Street?

Building and Land Use Permit

Subject to the above access and Traffic Impact Assessment requirements being met, MTO Building and Land Use (BLU) Permit(s) would be required. As a condition of permits MTO would require the following for review:

- The applicant would be required to submit; Site Plans, Grading Plans, Drainage Plans, Erosion Control Plans and Site Servicing Plans for MTO review and acceptance. These plans shall clearly identify all structures/works (existing and proposed). MTO would require all buildings, structures and features integral to the site to be located a minimum of 3 metres from all existing MTO property limits, inclusive of integral parking, fire lanes and stormwater management facilities.

- As a condition of MTO permits, to ensure that stormwater runoff from this property does not adversely affect the Highway drainage system or the highway corridor, MTO would require the owner to submit a Storm Water Management Report along with the above-noted grading/drainage plans for the proposed development for our review and approval.

  For a comprehensive set of MTO drainage related documentation requirements, please refer to the following link:
  http://www.mto.gov.on.ca/english/publications/drainage-management.shtml

MTO provides the following comments on the SWMR provided.

- For the purpose of MTO permits, the report must be prepared in accordance with MTO Stormwater Management Requirements for Land Development Proposals, attached.
- Please confirm diameters of existing storm pipes referenced in the report.
- Please use MTO IDF Curves for pre/post-development to calculate peak flows.

Sign Permit

MTO Sign Permit(s) would be required for any exiting or proposed signage visible from the Highway property limit. A MTO sign permit will be required prior to installation of signs. This is inclusive of any temporary signage.

General Comments

MTO permits for development will not be available to the applicant until such a time that MTO comments are addressed to the satisfaction of MTO.

If there are any questions, please direct them to me by email.

Thank you,

Jeremiah Johnston
Corridor Management Planner | Highway Operations Branch
Ministry of Transportation | Ontario Public Service
(226)-980-6407 | jeremiah.johnston@ontario.ca

Ontario

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MINISTRY OF TRANSPORTATION

MTO Stormwater Management Requirements for Land Development Proposals

2009
(References Updated April 2022)

Standards & Contracts Branch

Highway Design Office

Contents

1.0 About this Document

This document is a guidance tool developed to specify the requirements and mandate of the Ministry of Transportation of Ontario (MTO) related to stormwater management (SWM) for municipal development. It outlines specifically what information should be included in Stormwater Management Reports required in support of applications for Encroachment and/or Development and Land Use Permits. The information is for use by consultants, developers, municipalities, other government agencies and MTO staff.

Land development proposals are routinely submitted to the MTO to obtain appropriate approvals. SWM Reports may accompany these proposals to present the drainage works associated with the proposed land development and to identify any potential impacts to the highway drainage works. This guidance report, *MTO Stormwater Management Requirements for Land Development Proposals (2022)*, was developed to provide the proponent with a comprehensive set of MTO documentation requirements that might have to be satisfied before obtaining an MTO approval. The approach used in this document is consistent with the approach applied in the planning and design of provincial highways (*Highway Drainage Design Standards, 2008*), the planning and design of stormwater management controls (*Stormwater Management Planning and Design Manual, 2003*), and the watershed management approach.

1.1 Purpose of this Document

This document was developed to enable the drainage practitioner to identify all drainage related impacts to the highway, caused by the proposed land development, at the earliest possible design stage. As issues are identified, MTO requirements can then be considered and incorporated into the design. Finally, the drainage practitioner can consider MTO documentation requirements when completing the SWM Report, to ensure that each issue has been resolved. If MTO requirements are appropriately considered when completing these tasks, the number of iterations involved with identifying and resolving drainage issues should be reduced; helping to minimize review and approval time frames.

The purpose of this document is to strengthen the management of highway drainage works by implementing the modern drainage management approach to the management and control of highway corridors. Its objective is to consider the use of alternative drainage management techniques while maintaining the integrity of the highway infrastructure. This document ensures consistency in the application of drainage management practices across all MTO regions of the province, while also ensuring that regulatory concerns are addressed in a consistent and comprehensive

manner. Additionally, it helps to minimize potential liabilities incurred by the MTO in the approval of drainage works associated with a proposed land development.

It is important to note the following:

- Those who investigate, develop and/or submit land development proposals to use the highway drainage system or right-of-way, do so at their own risk. The MTO cannot be held responsible for any expenditure incurred, both monetary and non-monetary losses, if the review of the proposed land development is delayed or not approved.
- It is the responsibility of the proponent to familiarise themselves with MTO requirements, to provide all information required by the MTO for the evaluation of the proposed land development, and to satisfy all MTO requirements.
- Any MTO approval is for conveyance of stormwater runoff from the proposed land development only. The MTO is primarily concerned with impacts to the highway drainage system. Wherever stormwater runoff discharging from the proposed land development may impact the highway drainage system, impacts to the highway right-of-way should be assessed, and the capacity of the highway drainage system must be checked.
- Responsibility for regulating stormwater runoff to ensure that the proposed land development will not impact the riparian rights of upstream or downstream property owners resides with the municipality and other regulatory agencies. However, the MTO recognises that the property of riparian landowners located upstream or downstream of the highway right-of-way cannot be damaged by stormwater runoff discharging from the proposed land development. Even though this responsibility is within the mandate of the regulatory agencies, MTO may become liable if the stormwater runoff from the proposed land development is conveyed through a highway drainage system and damages any riparian property located upstream or downstream of the highway right-of-way. Consequently, the MTO reserves the right to request that the proponent complete drainage impact analysis of the proposed land development to determine if any drainage impacts will occur to the receiving drainage system, including the highway drainage system, because of the proposed land development.
- The MTO may alter requirements presented in this document, since an extensive SWM Report is not always required. The MTO may make provisions to accept a drainage impact analysis that has a lower level of detail associated with it, provided that the proponent submits a plan showing how stormwater runoff from the proposed land development will be conveyed to the receiving drainage system. The proponent must be able to demonstrate that drainage impacts to the highway right-of-way or upstream/downstream riparian landowners will not occur,

and that the capacity of the highway drainage system will not be exceeded because of stormwater runoff discharging from the proposed land development.

1.2 The Role of MTO Drainage Directives in this Document

MTO Drainage Directives are MTO policies and standards that are to be applied whenever highway drainage works are being designed or may be impacted by works external to the MTO right-of-way. There are three relevant directives:

- PHY Directive B-012: Petition drains under the Drainage Act for both private and MTO petitions.
- PHY Directive B-013: Agricultural piped drains discharging into the highway right-of-way.
- PHY Directive B-014: Drainage management policy for highway corridors.

The requirements set out in this document conform to these directives. Some portions of the directives have been directly incorporated into the appropriate sections (complete with references) for discussion purposes only. It is the responsibility of the designer to refer to the original directive for instruction.

1.3 Summary of Tasks

A brief explanation of the document structure is provided by *Figure 1*. This “Task Summary Chart” provides an illustration using coloured layers of the tasks associated with SWM Reports.

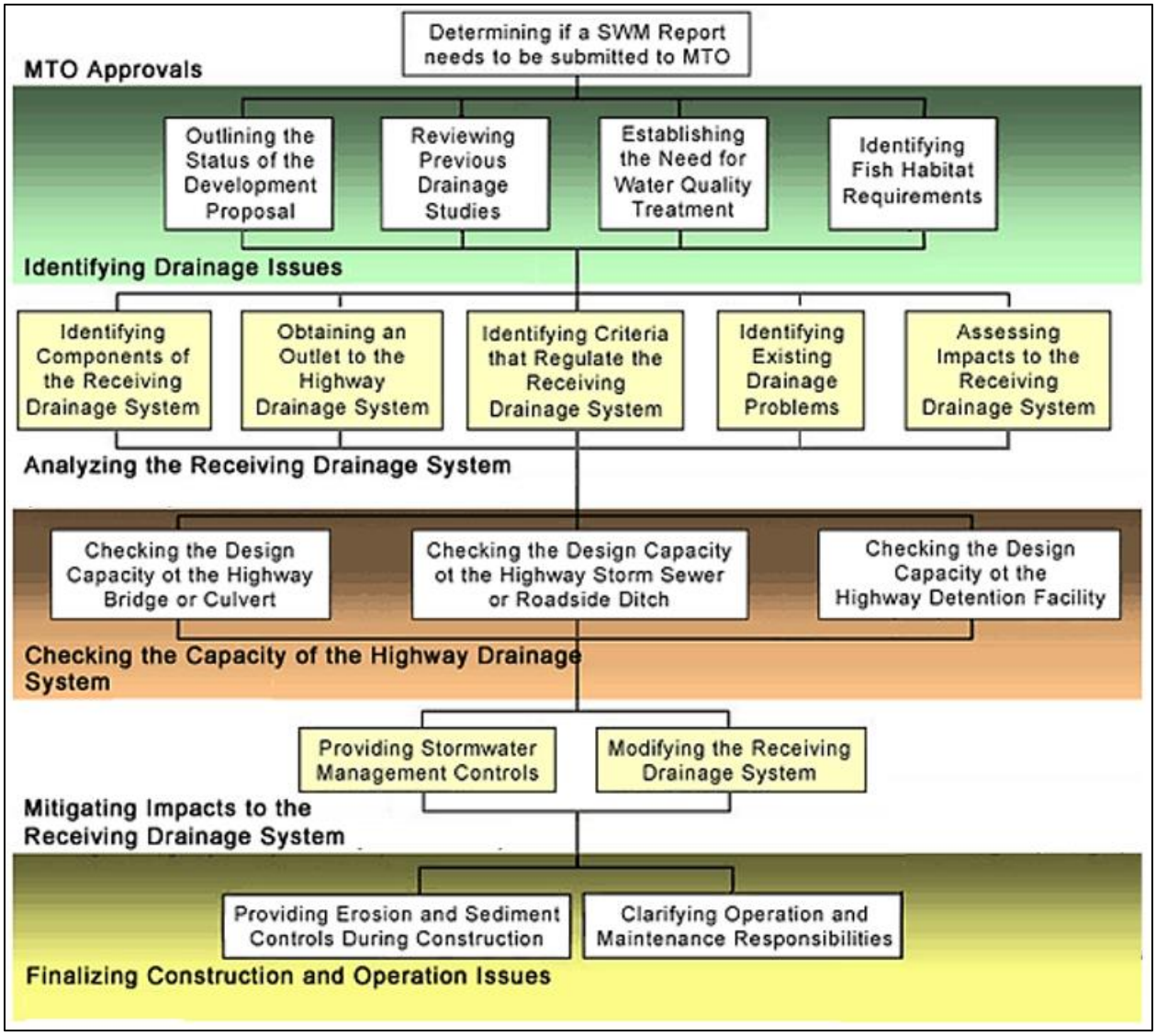


Figure 1: Task Summary Chart

1.4 Requirements Checklists

The checklists presented in ***Appendix A*** provide a comprehensive list of documentation requirements to be included in a SWM Report submitted to the MTO. It is the responsibility of the drainage practitioner to determine the applicability of the potential documentation requirements. The selection should be based on the suitability to each land development proposal and will depend on the scale and nature of the proposed land development. The checklists include:

- Checklist 1: Background Information Required to Identify Drainage Issues.
- Checklist 2: Receiving Drainage System Information.

- Checklist 3: Assessing Impacts to the Receiving Drainage System
- Checklist 4: Construction Operation and Maintenance Issues.
- Checklist 5: Supplemental Drainage Information.

These checklists should be used to ensure that the various tasks presented in this document have been considered, addressed, and documented in the SWM Report, and that all drainage issues and impacts have been identified and mitigated to the satisfaction of the MTO.

2.0 MTO Approvals

Before proceeding with the SWM Report, the proponent should first determine if a SWM Report needs to be submitted to the MTO. A SWM Report is generally required by MTO with a Land Development Proposal to support the following MTO approvals

- **A Public Transportation and Highway Improvement Act (PTHIA) Permit**: which may be a Building and Land Use Permit or an Encroachment Permit.
    - **A Building and Land Use Permit** is required when a structure is to be constructed within the highway corridor control area. The control area varies depending on the type of structure (e.g. the control area for a shopping centre is 800m). To determine if a Building and Land Use Permit is required, contact the local MTO District Office.
    - **An Encroachment Permit** is generally required when any work is to be completed within the highway right-of-way. To determine if an Encroachment Permit is required, contact the local MTO District Office.
- **Conditions of Approval:** apply to Site Plan or Draft Plan of Subdivision proposals. During the circulation process, the MTO may request Conditions of Approval. Each condition must be cleared by the MTO before the proposal is approved. For clarification, contact the MTO Regional Highway Planning and Design Office or the local MTO District Office.

Refer to *Table 1* to determine when a SWM Report is required to support either of the above noted approvals.

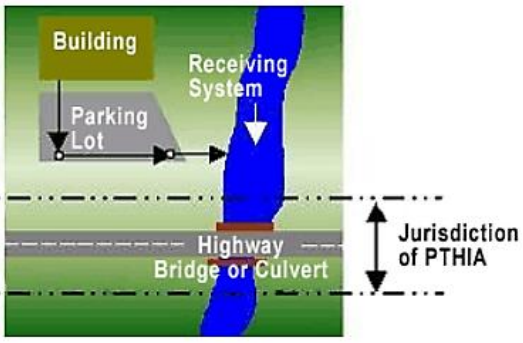
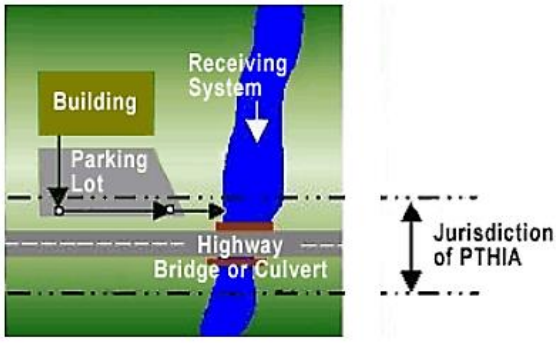
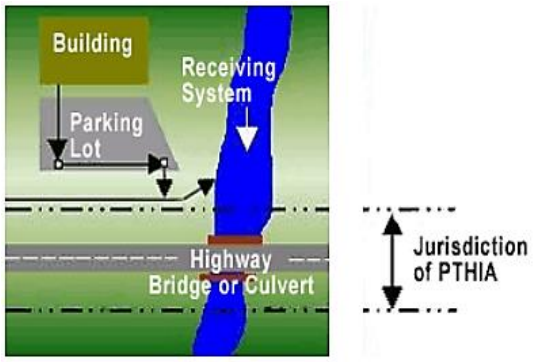
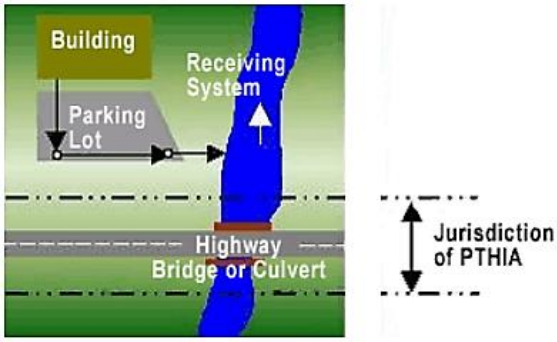
	A SWM Report is required when:	
Development Proposals Outside the Jurisdiction of the PTHIA		• drainage related Conditions of Approval have been requested by MTO
Development Proposals Within the Jurisdiction of the PTHIA		• a Building and Land Use Permit is required; and/or • drainage related Conditions of Approval have been requested by MTO.
		• a Building and Land Use Permit is required; and/or • an Encroachment Permit is required; and/or • drainage related Conditions of Approval have been requested by MTO
		• a Building and Land Use Permit is required; and/or • drainage related Conditions of Approval have been requested by MTO.

Table 1: Determining when a SWM Report is Required

3.0 Identifying Drainage Issues

Having determined that a SWM Report is required by the MTO, the proponent should review all the following drainage issues related to the proposed land development.

- Outlining the Status of the Land Development Proposal:
  - Preliminary or Detail Stormwater Management Report.
  - Land Use Designations.
  - Conditions of Approval (Draft Plan of Subdivision or Site Plan).
  - Regulatory Approval Process.
  - MTO Permits - Establishing the Need
- Reviewing Previous Drainage Studies:
  - Previous Drainage Studies.
  - Previous Environmental Study Reports, Preliminary Design Reports and Detail Design Reports for Provincial Highways.
- Establishing the Need for Water Quality Treatment:
  - Documentation Required in SWM Report.
  - Relevance to MTO.
- Identifying Fish Habitat Requirements:
  - Documentation Required in SWM Report.
  - Relevance to MTO.

3.1 Outlining the Status of the Land Development Proposal

A proposed land development requires approvals from the municipality and regulatory agencies. The SWM report should outline the status of the land development proposal by providing documentation on the following areas.

3.1.1 Preliminary or Detail SWM Report

At the preliminary stage, the SWM report will typically outline all potential impacts that are caused by the proposed land development, recommend mitigative works, and demonstrate the feasibility of the mitigative works.

At the detailed stage, the SWM report will typically provide the detailed design and demonstrate adherence with all requirements that have been set.

Documentation Required in SWM Report

Clarify whether the report is preliminary or detailed in nature.

Relevance to MTO

- The types of comments provided by the MTO will depend on whether the report is preliminary or detailed.
- MTO review of the SWM report at the preliminary stage is to set requirements for approval.
- MTO review of the SWM report at the detailed stage is to issue final approval.

3.1.2 Land Use Designations

The local municipality typically plans and regulates the development of private land by approving areas for development and designating the type of land development (e.g., residential, commercial, industrial) that is permitted. Land use planning designations are documented in municipal planning documents such as:

- Official Plans.
- Official Plan Amendments.
- Secondary Plans.
- Secondary Plan Amendments; and
- Zoning By-laws.

Land development proposals must be in conformance with municipal planning documents.

Documentation Required in SWM Report

The SWM report should clearly indicate all land use designations, particularly those associated with land drainage (i.e., hazard land or flood plain designations). Conformance with the hazard land or flood plain designations must be clearly documented in the report. If changes to these designations are required to accommodate the proposed land development, the report should provide information regarding the required zoning changes. Any unresolved issues associated with the proposed changes should be highlighted complete with the steps that are being taken to resolve them.

Relevance to MTO

It may be too soon in the municipal approval process for the MTO to conduct a review of the SWM report, if the land use designation has not been approved (i.e. by the

municipality). Contact the local MTO District Office or MTO Regional Highway Planning and Design Office for clarification.

As an agent of the crown, MTO will not approve a SWM report that will contravene the mandate or authority of another regulatory agency.

3.1.3 Conditions of Approval (Draft Plan of Subdivision or Site Plan)

During the circulation process, regulatory agencies, including the MTO, may request Conditions of Approval. These conditions could include the requirements for submitting a SWM report.

As the preliminary and detail designs are submitted to the various regulatory agencies, the conditions will have to be cleared. Any drainage conditions set by the MTO would be reviewed and clearance will be contingent on satisfying the requirements of the MTO, as outlined in this guide.

The MTO may place a requirement for a SWM Report on a Site Plan or Draft Plan of a Subdivision to address issues related to:

- On site stormwater management detention facilities.
- Temporary sediment and erosion control during construction.
- Provisions for a suitable outlet.
- Limits related to design flow capacity associated with a highway water crossing or the highway surface drainage system.
- Ownership of SWM facilities.

Documentation Required in SWM Report

The report must clearly indicate the drainage related requirements imposed by the MTO and document how they are satisfied by the proposed submission.

The report should also provide all other Conditions of Approval that pertain to land drainage, which regulatory agency is responsible for clearing the condition, and the status of the clearance with that agency.

Relevance to MTO

- To provide clearance of a Condition of Approval, the MTO must ensure that all Conditions of Approval imposed by the MTO are addressed satisfactorily.

- In some cases, the MTO may circulate a land development proposal that is beyond the jurisdictional control of the Public Transportation and Highway Improvement Act, and will not require a permit from the MTO (e.g., Encroachment Permit, Building and Land Use Permit) to be issued for the proposed land development. In such cases the MTO will address any highway drainage concerns by requesting suitable Conditions of Approval during the circulation process.
- As an agent of the crown, the MTO will not clear any Condition of Approval until those of all regulatory agencies have been cleared; or an approval in principle is provided. Confirmation of final approval should be forwarded to the MTO.
- The MTO can issue an approval in principle for the SWM Report if it is required by the proponent to secure clearances from other regulatory agencies.
- Conditions imposed by other regulatory agencies should not compromise the highway drainage system.
- Should a Condition of Approval of another regulatory agency conflict with those of the MTO, or vice versa, a meeting between the parties may be warranted to resolve the conflict.

3.1.4 Regulatory Approval Process

In addition to the local municipality, the Ministry of Northern Development, Mines, Natural Resources and Forestry (MNDMNRF), MECP, and the local conservation authority (where applicable) may also review the SWM Report. In some cases, the Department of Fisheries and Oceans may also be involved. Refer to Statutory Mandate of the Regulatory Agencies for a summary of regulatory agency mandates.

Documentation Required in SWM Report

The report should indicate all the regulatory agencies involved in the review of the land development proposal and provide an update on the status of approvals with each of the agencies. Copies of documentation (i.e. letters of approval, permits, etc.) from the various regulatory agencies involved should be appended to the proposal as they become available.

Relevance to MTO

- As an agent of the crown, MTO will not provide an approval that will contravene the mandate or authority of another regulatory agency. As a result, the MTO requires the SWM Report to be approved by all regulatory agencies; or an approval in principle is provided by the regulatory agency. Confirmation of final approval should be forwarded to the MTO.

- The MTO will review the requirements set by the regulatory agencies to ensure that the MTO requirements will not conflict with those of another agency, and vice versa.
- Should the requirements of other regulatory agencies conflict with the MTO requirements, or vice versa, a meeting may be warranted to resolve the controversial aspects of the SWM Report.
- The MTO can issue an approval in principle for the SWM Report if it is required by the proponent to secure clearances from other regulatory agencies.

3.1.5 MTO Permits

As part of the MTO's mandate under the Public Transportation and Highway Improvement, certain land development proposals will require that an Encroachment Permit, Building and Land Use Permit, Entrance Permit, or Signage Permit be obtained from the MTO.

Issuance of these permits will depend on the jurisdictional requirements (i.e., setback distance between the proposed land development and the highway right-of-way) for each type of permit. Contact the local MTO District Office for further clarification.

Documentation Required in SWM Report

The report should indicate which permits are required from MTO.

A background check on the site, with the assistance of the local MTO District Office, would turn up any previous permits that may have been issued in the past for the proposed land development. Clarification on the validity of the previous permit, and any changes to the MTO drainage practice that might affect the required permit can also be obtained. All relevant issues should then be summarised in the SWM report (e.g., partial construction of the proposed land development, validity of permit, expiry dates, conditions of approval of the permit, applicability of the previous conditions on current land development proposals, and ownership of the property, etc.).

Relevance to MTO

- Where the MTO has issued a permit, the status and applicability of that permit for the proponent or the proposed land development must be determined.
- Should approvals of other regulatory agencies conflict with the MTO requirements, or vice versa, a meeting may be warranted to resolve the controversial aspects of the SWM Report.

- The MTO can issue an approval in principle if it is required by the proponent to secure clearances from other regulatory agencies.

3.2 Reviewing Previous Drainage Studies

The SWM Report should document any previously completed drainage studies that are to be used for the proposed land development by providing documentation on the following areas.

3.2.1 Previous Drainage Studies

Previous drainage studies include the following:

- Watershed, sub-watershed, and master drainage plans provide the goals, objectives, and criteria for the management of resources in a watershed, sub-watershed, or area of specific interest.
- Preliminary SWM Reports are typically submitted at the earlier stage of design to outline all potential impacts that are caused by the proposed land development, recommend mitigative works, and demonstrate the feasibility of the mitigative works.
- Detailed SWM Reports are typically submitted at the detailed design stage to provide the detailed design and demonstrate adherence with all requirements that have been set.
- Other types of drainage studies could include (sources include conservation authorities, MNDMNRF, MECP, and municipalities):
    - Flood Damage Reduction Program Studies (FDRP studies).
    - erosion control studies.
    - flood control studies.
    - combinations of the above.

Documentation required in SWM Report

Where a previous drainage study is in existence and any objectives, goals, design criteria and other elements from that study are intended to be used in the proposed SWM report, the report must clearly indicate if MTO formally endorsed the previous drainage study.

- **If MTO endorsed the previous drainage study** documentation of relevant objectives, goals, design criteria and other elements of the referenced study must be included (with clear references to its source). This may include:
    - Limits on regulatory flood flows and water levels.

- Water quality objectives.
- Fish habitat restoration or protection objectives.
- Identification of flood or erosion prone areas.
- The type of drainage system that is required.
- Requirements for stormwater management controls.

Adherence of the SWM Report to the referenced drainage study must also be clearly documented. When making submissions based on previously completed drainage studies, changes that have occurred to MTO drainage practice must be considered (i.e., the MTO continually updates its drainage practice). Other agencies also undertake these types of updates. Contact the MTO Regional Highway Planning and Design Office to determine if changes have occurred to the MTO drainage practice since the previous drainage study was completed. If there has been changes, the proponent must demonstrate how the previously completed drainage study is in conformance with current MTO drainage practice.

- **If MTO did not endorse the previous drainage study**, there may be two reasons. The SWM Report should document which of the following reasons apply.
    - The MTO may not have endorsed the previous drainage study since the MTO was not on the circulation list and had not reviewed it. In this case, the previous drainage study should be reviewed by the MTO for conformity to the MTO drainage practice. Should the study be acceptable to the MTO, an endorsement can be issued. Once complete, the proposed SWM Report can be reviewed based on conformity to the previous drainage study.
    - The MTO may not have endorsed the previous drainage study because of a disagreement with certain objectives, goals, design criteria or other elements of the previous drainage study. Determine the aspects of the previously completed drainage study that were not acceptable to the MTO. Once this has been established there are two options available.
        - If the proposed SWM Report does not encompass any area of disagreement, the MTO can review the SWM Report in isolation of the previously completed drainage study. The review would be based on conformity with current MTO drainage practice.
        - If the proposed SWM Report encompasses an area of disagreement, a meeting between all supporting regulatory agencies is warranted to sort out those controversial aspects of the previously completed drainage study. During this activity, the MTO is not able to review the proposed SWM Report and would be

unable to approve the SWM Report, issue any permits for the proposed land development, or clear any Conditions of Approval.

Relevance to MTO

- Any previous drainage study that was endorsed by the MTO must be referenced in the SWM Report
- The SWM Report must show conformance with the previous drainage study if it was endorsed by the MTO.
- The review of the SWM Report may be accelerated if the MTO endorsed a previous drainage study.
- The review of the SWM Report can be delayed if a previous drainage study, not endorsed by the MTO, will be referenced. Any disputes should be identified before first submission.

3.2.2 Previous Environmental Study Reports, Preliminary Design Reports and Detail Design Reports for Provincial Highways

When proposing to discharge stormwater runoff from a proposed land development into the highway right of way, either in the highway surface drainage system or into a highway water crossing, it may be necessary to obtain design information regarding the highway drainage works. To obtain this information or data, it is prudent to consult with the MTO Regional Highway Planning and Design Office. Information may be available from environmental study reports, preliminary design reports and detail design reports. This information should be used to check the capacity of the existing highway drainage system.

Documentation Required in SWM Report

The SWM Report should provide documentation on the relevant objectives, goals, design criteria and other elements of the previous highway design report (with clear references to its source), such as:

- Limits on regulatory flood flows and water levels.
- Water quality objectives.
- Fish habitat restoration or protection objectives.
- Identification of flood or erosion prone areas.
- Drainage system requirements.

- Requirements for stormwater management controls.

Relevance to MTO

- Existing or future highway needs should not be compromised by the proposed land development.

3.3 Establishing the Need for Water Quality Treatment

Generally, in land development proposals, the MECP will determine the need for stormwater management quality control. The document titled *Stormwater Management Planning and Design Manual* (MOE 2003), provides general guidance on the planning and design of stormwater quality control facilities.

The need for stormwater management quality control is based on the sensitivity of the receiving drainage system, and may be a requirement placed on the proposed land development by the regulatory agencies before any impact assessment has been completed.

Documentation Required in SWM Report

Document the requirements, if any, for water quality that has been placed on the proposed land development by the regulatory agencies.

Relevance to MTO

- As an agent of the crown, MTO will not provide an approval that will contravene the mandate or authority of another regulatory agency.
- The MTO reserves the right to input into water quality requirements imposed upon the land development proposal, when drainage from a land development will be entering the highway surface drainage system and will be conveyed to a receiving drainage system. Requirements set by the regulatory agencies should not conflict with the requirements of MTO, and vice versa.
- The primary concern for the MTO is with regards to the riparian rights of upstream or downstream landowners. If the MTO could become unduly exposed to legal action, MTO reserves the right to impose or increase, whichever is applicable, the requirements imposed upon the land development proposal. An MTO drainage representative should be contacted for clarification.
- Should the requirements of other regulatory agencies conflict with MTO requirements, or vice versa, a meeting may be warranted to resolve the controversial aspects of the SWM Report. For stormwater management quality control requirements refer to, Providing Stormwater Management Controls.

3.4 Identifying Fish Habitat Requirements

Generally, in land development proposals, the MNDMNRF, DFO, or the local conservation authority will determine fish habitat requirements. Since fish habitat requirements are based on the sensitivity of the receiving drainage system, requirements may be set before any impact assessment has been completed.

Documentation Required in SWM Report

Document the requirements, if any, for fish habitat mitigation that have been placed on the proposed land development by the regulatory agencies. Clarify that the proposed method of mitigation will not impact the highway drainage system. Refer to the appropriate section listed below for more detail.

- Checking the Design Capacity of the Highway Bridge or Culvert.
- Checking the Design Capacity of the Highway Storm Sewer or Roadside Ditch.
- Checking the Design Capacity of the Highway Stormwater Management Detention Facility.

Relevance to MTO

- As an agent of the crown MTO will not provide an approval that will contravene the mandate or authority of another regulatory agency.
- MTO reserves the right to input into fish habitat mitigation requirements imposed upon the land development proposal when the proposed method of mitigation may cause an impact to the highway water crossing. Requirements set by the regulatory agencies should not conflict with the requirements of the MTO, and vice versa. Contact the MTO Regional Environmental Section for further guidance.
- Where any proposed method of fish habitat mitigation is to be placed within the highway right-of way, refer to the following sections. Contact the MTO Regional Environmental Section for further guidance.
    - Fundamental Purpose of Highway Right-of-way and Drainage System.
    - Drainage Works by Outside Parties Constructed within the Highway Right-of-way.
    - Consider a Planned Shared Use of the Drainage System.
    - Legal Agreements.
- Should the requirements of other regulatory agencies conflict with MTO requirements, or vice versa, a meeting may be warranted to resolve the controversial aspects of the SWM Report.

4.0 Identifying Drainage Impacts

4.1 Analyzing the Receiving Drainage System

Before proceeding with the tasks in this grouping, the following tasks should have been completed:

- Determining if a SWM Report needs to be submitted to MTO; and
- Identifying Drainage Issues.

The MTO is primarily concerned with impacts to the highway drainage system. Wherever stormwater runoff discharging from the proposed land development may impact the highway drainage system, impacts to the highway right-of-way should be assessed, and the capacity of the highway drainage system must be checked.

However, the MTO recognises that the property of riparian landowners located upstream or downstream of the highway right-of-way cannot be damaged by stormwater runoff discharging from the proposed land development. Even though this responsibility is within the mandate of the regulatory agencies, the MTO may become liable if the stormwater runoff from the proposed land development is conveyed through a highway drainage system and damages any riparian property located upstream or downstream of the highway right-of-way.

For these reasons, the MTO reserves the right to request that the proponent complete a hydrologic analysis and/or a hydraulic analysis of the proposed land development to determine if any drainage impacts will occur to the receiving drainage system, including the highway drainage system, as a result of the proposed land development. This task is completed in:

- Identifying Components of the Receiving Drainage System.
- Obtaining an Outlet to the Highway Drainage System.
- Identifying Criteria that Regulates the Receiving Drainage System.
- Identifying Existing Drainage Problems.
- Assessing Impacts to the Receiving Drainage System.

4.2 Identifying Components of the Receiving Drainage System

The SWM Report should document all the components of the receiving drainage system that will convey stormwater runoff from the proposed land development. Documentation

of the receiving drainage system should proceed to a location upstream and/or downstream of the proposed land development, where it can be shown that a drainage impact will not exist.

The SWM Report should also include the specific information presented in *Table 2 - Components of the Receiving Drainage System*, for all the identified components of the receiving drainage system.

The SWM Report should also present the organisation or person responsible for the operation and maintenance, or stewardship of the identified components of the receiving drainage system. The following organisations or persons could have these responsibilities.

- MTO (provincial highways): the SWM Report should clearly identify which components of the receiving drainage system are part of the highway drainage system (contact the MTO Regional Highway Planning and Design Office for details). The existing highway drainage system could include:
    - highway bridges or culverts
    - highway storm sewers or roadside ditches
    - the highway major system
    - highway stormwater management detention facilities
    - highway erosion protection works.
- MNDMNRF (i.e., for crown land).
- Local conservation authority (where they exist).
- Local municipality or roads authority.
- Federal Department of Transportation.
- Riparian landowners.
- Petition awards or municipal drains should also be identified, where they exist.

Component	Relevant Information to be Provided in SWM Report
Stream Channel Systems (natural or manmade)	cross-section configuration, slope, lining material, alignment/meander pattern
Trunk Storm Sewers	tributary area and applicable information presented for storm sewers (see below)
Storm Sewers	material (e.g. CSP, concrete, etc.), diameters, lengths, slopes, inverts, junctions, catch basin and/or maintenance hole spacing and layout, and inlet/outlet configuration (e.g. head walls, wing walls, flared entrances, flow splitter, etc.)

Roadside Ditches	cross-section configuration, slopes, inverts, ancillary structure (check dams, drop structure, etc.) and lining material
Major System	roadway surface, median drains, boulevards and storage areas within the right-of-way, swales, and channels or roadside ditches conveying the major storm runoff away from roadway to the receiving streams, channels, ravines trunk storm sewers or ponds
Bridges	soffit elevation, span arrangement, pier details, abutments, and superstructure
Culverts	culvert type (e.g. elliptical, box, open footing, etc.), culvert configuration (e.g. single barrel, double barrel, etc.), diameter or span/rise, length, slope, material (e.g. CSP, concrete, etc.), and inlet/outlet configuration (e.g. head walls, wing walls, flared entrances, etc.)
Stormwater Management Facilities	type of facility (wet, dry, extended wet, etc.), location and layout, size, length to width ratio, detention time, inlet and outlet configuration, emergency spillway, flow splitter/bypass location, type and capacity, maintenance access, special safety requirements, grading and planting strategy, maintenance procedures/responsibilities, setbacks from highway, and ownership
Erosion Protection Works	lining material/cover work, bank drainage, buffers strips, runoff diversions, drop structures, energy dissipators, stilling basins, chutes, retaining walls and check dams
Dams	size of reservoir, dam height, type, operational rule curve, spillway location, maintenance procedures/responsibilities, and ownership
Waterbodies	name, location
Natural Recharges or Depression Areas	volume and location
Tile Drains	location, property ownership

Table 2: Components of the Receiving Drainage System

Where a suitable drainage outlet does not exist, and stormwater runoff is conveyed downstream as sheet flow, the sheet flow component should be presented in the SWM Report as being part of the receiving drainage system and assessed accordingly.

4.3 Obtaining an Outlet to the Highway Drainage System

The SWM Report should provide the location of the drainage system outlet for the proposed land development, and indicate the legal rights associated with that outlet. Conflicts with existing or future highway drainage works must also be noted.

Documenting Future Highway Drainage Works

Contact the MTO Regional Highway Planning and Design Office for information regarding future highway works. The SWM report should identify future highway drainage works that may be associated with any of the following:

- New highways
- Lane widenings
- Addition of travelling, passing or truck climbing lanes
- Addition of right or left turning lanes
- Interchange or intersection improvements
- Structure replacement and widenings
- Roadside ancillary facilities
- Improvements to the existing highway drainage system

Documenting if the Proponent Has the Right to Outlet to the Highway Drainage System

This section contains excerpts from PHY Directive B014 (Policy Area 2: Drainage of Lands Owned by Others) which have been modified to suit the purposes of this document. This section does not replace PHY Directive B014. Refer to PHY Directive B014 when evaluating MTO drainage policy matters.

Before MTO permission is given to use the highway drainage system for a drainage outlet, the SWM Report should document how the following requirements have been satisfied.

i. The proponent is a riparian landowner.
ii. The drainage area that corresponds to the proposed drainage outlet is within the natural drainage tributary area (i.e., stormwater runoff is not being diverted).
iii. The proposed land development does not interfere with the rights of upstream or downstream riparian owners (including the MTO) to drain their land.
iv. Any stormwater runoff that is proposed to be discharged into a highway drainage system shall not be allowed if the runoff may potentially contravene the mandate of another regulatory agency. If any regulatory agency advises that contravention has occurred subsequent to approval, the source may be disconnected by the MTO on written request of that agency.
v. The proponent has demonstrated satisfactorily that there is no feasible alternative solution.

Where any of the above noted conditions are not satisfied, the MTO reserves the right to reject any land development proposal that may be harmful to its interests (refer to PHY Directive B014, Policy Area 2: Drainage of Lands Owned by Others). In such cases, an MTO drainage representative should be contacted for clarification.

Documenting if the Proposed Outlet Conflicts with the Highway Drainage System

The SWM Report should clearly indicate whether the proposed outlet will conflict with the existing highway drainage system, or with any future highway drainage works. Where a conflict with future highway works has been identified, the SWM report must document how the conflict was resolved.

The MTO does not generally allow drainage works associated with land development proposals to be located within the highway right-of-way, as they should be confined within the land development property boundaries; however, where a mutual benefit is recognized, PHY Directive B014 provides guidance. The MTO Regional Highway Planning and Design Office must be contacted before making such a recommendation. The following sections should be reviewed.

- Fundamental Purpose of Highway Right-of-way and Drainage System.
- Drainage Works by Outside Parties Constructed within the Highway Right-of-way.
- Consider a Planned Shared Use of the Highway Drainage System
- Legal Agreements

4.4 Identifying Criteria that Regulate the Receiving Drainage System

Criteria used to regulate impacts to the receiving drainage system should be documented in the SWM Report. Regulating criteria are presented below.

Highway Drainage Design Criteria

The SWM Report must identify the design criteria for the components of the highway drainage system (i.e. that form part of the receiving drainage system) whose capacity may be impacted by stormwater runoff discharging from the proposed land development. For details on MTO drainage design criteria refer to *Highway Drainage Design Standards 2008* or refer to *Design Criteria for Highway Drainage Works*. Other highway design criteria may also be applied. Contact the MTO Regional Highway Planning and Design Office for further details.

Where a previous drainage study has been referenced for highway drainage design criteria, refer to *Reviewing Previous Drainage Studies*.

Other Drainage Design Criteria

The local conservation authority and/or municipality should be contacted for design criteria applicable to the component of the receiving drainage system for which they have operational and maintenance responsibilities.

Where a previous drainage study has been referenced for drainage design criteria related to other components of the receiving drainage system (i.e. other than the highway drainage system), refer to Reviewing Previous Drainage Studies.

Drainage Management Policy of Regulatory Agencies

Provincial regulatory policies for drainage management include:

- Provincial Policy Statement: Natural Heritage, Water Quality and Quantity, Natural Hazards and Human Made Hazards (Planning Act)
- Provincial Water Quality Objectives (Ontario Water Resources Act)
- Official Plans, Secondary Plans, and Zoning By-laws (Planning Act, Municipal Act)
- Fill, Construction and Alteration of Waterway (Conservation Authorities Act)

The above noted policies are recognised by the MTO. Where required by the regulatory agencies, the SWM Report should document compliance with these policies.

Drainage Management Policy of MTO

Drainage management policies are issued by the MTO under the authority of the Public Transportation and Highway Improvement Act through the following directives.

PHY Directive B014 presents MTO drainage policy conforming to common law precedents. The fundamental basis of this directive is to ensure that stormwater runoff discharging from any highway drainage works will not infringe upon the riparian rights of landowners located upstream or downstream of the highway right-of-way. The proponent must recognise that the MTO will not approve a land development proposal if the riparian rights of any landowner may be infringed upon by the proposed land development.

MTO drainage policy for private piped drains on the highway right-of-way is detailed in PHY Directive B217 and B213 and should be reviewed when matters related to municipal drains or tile drainage apply to the proposed land development. In such

cases, the SWM Report must document how the procedure in either directive was followed.

Standards of Practice Identified through Manuals and Guidelines

Manuals and guidelines are prepared to implement the design criteria and regulatory policy of a provincial agency, local municipality, or local conservation authority. Manuals and guidelines present acceptable design applications and/or computation methodologies that conform to design criteria and regulatory policy, and they should be reviewed accordingly. Standard manuals and guidelines that are issued by provincial agencies and are applicable to land development proposals include:

- *Highway Drainage Design Standards* (MTO 2008);
- *Stormwater Management Planning and Design Manual* (MOE 2003); and
- *River and Stream Systems: Flooding Hazard Limit Technical Guide* (MNR 2002).

This document does not present examples on the application of the various computational methodologies or design applications presented within the manuals listed above; however, references are provided where appropriate.

The local conservation authority and municipality should be contacted for manuals or guidelines that are applicable in their local jurisdiction.

Where Conflicts Exist between MTO and the Regulatory Agencies

As an agent of the crown, the MTO will not approve a land development proposal that will contravene the design criteria, drainage management policy, or the guidelines and manuals of the regulatory agencies, provided that the integrity of the highway drainage system is not compromised. Should any design criteria, drainage management policy, guideline or manual of a regulatory agency conflict with a design criterion, drainage management policy, guideline or manual of MTO, or vice versa, a meeting between the parties may be warranted to resolve the conflict.

4.5 Identifying Existing Drainage Problems

Before proceeding with an impact assessment, any existing drainage problems that may be aggravated by stormwater runoff from the proposed land development must be identified.

Upstream or Downstream Riparian Property

The SWM Report should identify any existing drainage problems and associate each problem with the appropriate riparian property owner. Existing drainage problems could include:

- Flooding of property
- Erosion of the stream bed and/or sediment accumulation
- Bank slumping
- Degraded water quality
- Lack of a sufficient drainage outlet

Visit the site, if possible, to assess drainage conditions in the area. Contact the local conservation authority, municipality, MECP, MNDMNRF, or MTO office for information.

Highway Right-of-way

The SWM Report should identify any existing drainage problems associated with the highway right-of-way, including:

- Flooding on the highway surface or highway overtopping at the bridge or culvert
- Erosion on the highway right-of-way surface (e.g., roadside ditches)
- Erosion/sedimentation build-up at a highway bridge or culvert crossing
- Exceeding the capacity of the highway bridge or culvert
- Exceeding the capacity of the highway storm sewer system or roadside ditch
- Exceeding the capacity of the highway stormwater management detention facility

Contact the local MTO District Office for information. Visit the site, if possible (permission from the local MTO District Office may be required).

Documenting Existing Drainage Problems

Having identified existing drainage problems, the cause of the problem should be assessed to determine the potential for further aggravation (refer to Assessing Impacts to the Receiving Drainage System). If existing drainage problems were not identified, the SWM Report should document the steps taken to reach such a conclusion.

4.6 Assessing Impacts to the Receiving Drainage System

The MTO reserves the right to request that the proponent determine if any potential drainage impacts will occur to the property of upstream or downstream riparian

landowners, including the highway right-of-way, as a result of the proposed land development. The SWM Report should provide documentation on the following areas.

Hydrologic and Hydraulic Analysis of the Receiving Drainage System

Complete a hydrologic analysis and a hydraulic analysis of the receiving drainage system, for the pre-development scenario and the post-development scenario(s). The level of detail required in the analysis should be considered before proceeding. The goal of the analysis is to identify potential impacts to the property of upstream or downstream riparian landowners (including the highway right-of-way) which may result from the construction of the proposed land development. The analysis should calculate peak flows, water surface elevations and flow velocities, at different reference points and for the frequencies presented in Table 3.

Reference points in the receiving drainage system:	Parameters to be Calculated[1]	Range of Frequencies[2]
i. Immediately upstream of the proposed land development; or immediately upstream of the proposed outlet to the receiving drainage system.[1] -And- **ii.** Immediately downstream of the proposed land development; or immediately downstream of the proposed outlet to the receiving drainage system.[1] -And- **iii.** Immediately upstream of the highway drainage system. -Or- **iv.** Along the highway drainage system.[3] -And- **v.** Immediately downstream of the highway drainage system. -And- **vi.** Control point located downstream of the highway right-of-way. -And- **i.** Where a known drainage problem(s) have been identified either in the highway right-of-way; and/or upstream or downstream of the highway right-of-way.	• Peak flows • Water surface elevations • Flow Velocities • Run-off Volumes[5]	• Low flows[4] • 2 yr • 5 yr • 10 yr • 25 yr • 50 yr • 100 yr • Regulatory Storm

Table 3: Analysis of Receiving Drainage System

Notes:

1. Where the peak flows discharging from the proposed land development will be controlled on-site via stormwater management controls at pre-development levels for range of frequencies specified, reference points i), ii) and/or iv) need only be analyzed.
2. Where the specified range of frequencies or number of reference points in the receiving drainage system is reduced, the SWM report should clearly document the rational used to reduce the level of detail.
3. May be required when stormwater runoff from the proposed land development discharges directly into the highway surface drainage system.
4. May be used for water quality controls, fish habitat requirements or for erosion protection works.
5. Optional: may be required where a sufficient outlet does not exist.

The SWM Report must present peak flows, water surface elevations, and flow velocities, calculated for the range of frequencies and reference points presented in *Analysis of Receiving Drainage System - Table 3*. A table should be presented that compares the results for the pre-development scenario to the results for the post-development scenario(s). Any differences must be clearly presented.

Check the Capacity of the Highway Drainage System

The SWM Report should include documentation regarding the capacity of the highway drainage system. Refer to *Design Criteria for Highway Drainage Works* for more information on appropriate criteria or contact the MTO Regional Highway Planning and Design Office for details. By completing the following tasks, the capacity of the highway drainage system can be checked.

- *Checking the Design Capacity of the Highway Bridge or Culvert.*
- *Checking the Design Capacity of the Highway Storm Sewer or Roadside Ditch.*
- *Checking the Design Capacity of the Highway Stormwater Management Detention Facility.*

Documenting Computational Methodology

The SWM Report should document the computational methodology used to analyze the components of the receiving drainage system, including the highway drainage system. The SWM Report should also document which method was selected, why it was applicable and include any assumptions that were part of the computation. In addition, include the information presented in *Table 4*.

Computational Method	Documentation in SWM Report
• Flow Rate Calculation • Assessing Channel Erosion • Assessing Roadway Surface Flooding • Assessing the Potential for Scour	method used, applicability and assumptions
Identifying Catchment Inputs	method used, applicability and assumptions, the selection of input parameters used in the flow rate calculation
Selecting Precipitation Data	the type (synthetic, historic, IDF, continuous, etc.), meteorologic station, storm duration (where applicable) and the discretization time step (where applicable).
• Performing Culvert Analysis • Performing Bridge Analysis	method used, applicability and assumptions, performance curves, and input parameters (expansion/contraction coefficients, roughness coefficients, etc.)
• Assessing Flow in Open Channels • Assessing Flow in Storm Sewers	method used, applicability and assumptions, input parameters (expansion/contraction coefficients, roughness coefficients, etc.), and starting water surface elevations
• Assessing Flow in Stormwater Management Detention Facilities	method used, applicability and assumptions, and stage- storage-discharge relationship

Table 4: Documenting the Computational Methodology

Identifying Impacts to the Receiving Drainage System

Impacts to the receiving drainage system will not occur if the analysis of the receiving drainage system determined that the proposed land development would not:

- increase peak flows, water surface elevations, or flow velocities at the reference points and range of frequencies specified in Analysis of Receiving Drainage System - Table 3; or
- cause the capacity of the highway drainage system to be exceeded.

In such a case, MTO will not require mitigation. The SWM Report should clearly document the results of the analysis and rationalise that impacts to the receiving drainage system will not occur. It should be recognised that mitigation may still be required by other regulatory agencies.

Impacts to the receiving drainage system will occur and mitigation may be required by the MTO if the analysis of the receiving drainage system determined that the proposed land development does not satisfy either of the conditions noted above.

Recommending Mitigative Works

The SWM Report should clearly present an assessment of the identified impacts with regards to risk. Each impact should be compared against the risk criteria listed below.

Risk Criteria: where each of the identified impacts do not satisfy all of the following risk criteria, the MTO will require that mitigation be provided for that impact (the required level of mitigation must then be established):

- Damage will not occur to the property of riparian landowners located upstream or downstream of the highway right-of-way.
- The structural integrity of the highway right-of-way will not be threatened.
- The safety of the travelling public will not be threatened.

The Level of Mitigation: the SWM Report must clearly present the following;

- The level to which peak flows are reduced using stormwater management controls to restore water surface elevations and/or flow velocities, at the reference points and range of frequencies specified in *Analysis of Receiving Drainage System - Table 3*, to a level(s) that will satisfy the risk criteria; and/or
- the level to which peak flows are reduced using stormwater management controls to restore the capacity of the highway drainage system to a level(s) that will satisfy the risk criteria; and/or
- modifications that are proposed to the receiving drainage system, including erosion protection works, to restore water surface elevations and/or flow velocities, at the reference points and range of frequencies specified in *Analysis of Receiving Drainage System - Table 3*, to a level (s) that will satisfy the risk criteria.

Where a conflict with future highway works has been identified, the SWM Report must document how the conflict was resolved, which may only be achieved by applying one of the methods presented above.

5.0 Checking the Capacity of the Highway Drainage System

The capacity of the highway drainage system should be checked as part of the receiving drainage system analysis. Complete the following tasks, depending on the highway drainage works that form part of the receiving drainage system.

- *Checking the Design Capacity of the Highway Bridge or Culvert.*
- *Checking the Design Capacity of the Highway Storm Sewer or Roadside Ditch.*
- *Checking the Design Capacity of the Highway Stormwater Management Detention Facility.*

5.1 Checking the Design Capacity of the Highway Bridge or Culvert

Where the proposed land development will be discharging to a receiving drainage system that leads to a highway bridge or culvert, the design capacity of the existing highway bridge or culvert must be examined. The SWM Report must present the following parameters calculated at the upstream face of highway bridge or culvert using the total catchment area which must include the proposed land development area:

a. Peak flow rate, headwater level and flow velocity (at the highway bridge or culvert outlet) at the design flow frequency with the proposed land development area at pre-development conditions;

b. Peak flow rate, headwater level and flow velocity (at the highway bridge or culvert outlet) at the design flow frequency with the proposed land development area at post-development conditions;

c. Peak flow rate and the corresponding headwater level calculated using the regulatory storm with the proposed land development area at pre- development conditions; and

d. Peak flow rate and the corresponding headwater level calculated using the regulatory storm with the proposed land development area at post- development conditions.

The SWM Report must document if the capacity of the highway bridge or culvert will be exceeded because of stormwater runoff discharging from the proposed land development. Review the following conditions and report the results in the SWM Report. If the capacity is exceeded, an impact should be identified in the SWM Report.

Where the pre-development peak flow (calculated in a) is less than or equal to the design flow capacity; or the pre-development headwater level (calculated in a) is less than or equal to the allowable headwater level, the capacity of the highway bridge or culvert is not exceeded if:

- The post-development peak flow rate (calculated in b) is less than the design flow capacity; and
- The post-development headwater level (calculated in b) is less than the allowable headwater level; and
- Any relief flow over the highway bridge or culvert (calculated in d) is less than the allowable depth of flow on the highway surface; and
- The post-development flow velocity (calculated in b) does not cause erosion or scour; and
- Fish passage (for highway culverts only), river ice, and debris flow are not affected

If a highway bridge or culvert has excess capacity that is to be used to accommodate stormwater runoff from the proposed land development, the portion of the excess flow capacity allocated to the proposed land development must be presented in the SWM Report.

An allocation of excess flow capacity will not be approved by the MTO if the excess flow capacity is required for future highway works; or if the excess flow capacity causes a drainage impact to the property of riparian landowners located upstream or downstream of the highway right-of-way.

Where the pre-development peak flow (calculated in a) **is greater than** the design flow capacity; or the pre-development headwater level (calculated in a) **is greater than** the allowable headwater level, the capacity of the highway bridge or culvert is not exceeded if:

- The post-development peak flow rates (calculated in b and d) are less than or equal to the pre-development peak flow rates (calculated in a and c); and
- The post-development headwater levels (calculated in b and d) are less than or equal to the pre-development headwater levels (calculated in a and c); and
- The post-development flow velocity (calculated in b) is less than or equal to the pre-development flow velocity (calculated in a); and
- Fish passage (for highway culverts only), river ice, and debris flow are not affected

5.2 Checking the Design Capacity of the Highway Storm Sewer or Roadside Ditch

Where the proposed land development will be discharging to a receiving drainage system that leads to a highway storm sewer or roadside ditch, the design capacity of the existing highway storm sewer or roadside ditch must be examined. The SWM Report must present the following parameters calculated at the location where external stormwater runoff enters the highway storm sewer or roadside ditch, using the total catchment area which must include the proposed land development area:

- Peak flow rate and the corresponding depth of flow and flow velocity calculated using the design flow frequency with the proposed land development area at pre-development conditions;
- Peak flow rate and the corresponding depth of flow and flow velocity calculated using the design flow frequency with the proposed land development area at post-development conditions;
- Peak flow rate and the corresponding depth of flow calculated using the regulatory storm and the proposed land development area at pre- development conditions; and
- Peak flow rate and the corresponding depth of flow calculated using the regulatory storm and the proposed land development area at post- development conditions.

The SWM report must document if the capacity of the highway storm sewer or roadside ditch will be exceeded because of stormwater runoff discharging from the proposed land development. Review the following conditions and report the results in the SWM Report. If the capacity is exceeded, the impacts should be identified in the SWM Report.

Where the pre-development peak flow (calculated in a) **is less than or equal** to the design flow capacity, the capacity of the highway storm sewer or roadside ditch is not exceeded if:

- The post-development peak flow rate (calculated in b) is less than the design flow capacity; and
- Freeboard requirements (for the highway roadside ditch only) are satisfied; and
- The post-development depth of flow (calculated in b and d) is less than the allowable depth of flow; and
- The post-development flow velocity (calculated in b) does not cause erosion or scour.

If a highway storm sewer or roadside ditch has excess capacity that is to be used to accommodate stormwater runoff from the proposed land development, the portion of the excess flow capacity allocated to the proposed land development must be presented in the SWM Report.

An allocation of excess flow capacity will not be approved by the MTO if the excess flow capacity is required for future highway works.

Where the pre-development peak flow (calculated in a) is greater than the design flow capacity, the capacity of the highway storm sewer is not exceeded if:

- The post-development peak flow rate (calculated in b and d) is less than or equal to the pre-development peak flow rate (calculated in a and c); and
- The post-development depth of flow along the highway surface (calculated in b and d) is less than or equal to the pre-development depth of flow along the highway surface (calculated in a and c); and
- The post-development flow velocity (calculated in b) is less than or equal to the pre-development flow velocity (calculated in a).

5.3 Checking the Design Capacity of the Highway Stormwater Management Detention Facility

Where the proposed land development will be discharging to **a receiving drainage system** that leads to a highway stormwater detention facility, the design capacity of the existing highway stormwater management detention facility must be examined. The SWM Report must present the following parameters calculated using the tributary area, which must include the proposed land development area:

- Peak flow rates calculated at the location where external stormwater runoff enters the highway stormwater detention facility using the design flow frequencies with the proposed land development area at pre-development conditions;
- Peak flow rates calculated at the location where external stormwater runoff enters the highway stormwater detention facility using the design flow frequencies with the proposed land development area at post-development conditions;
- Maximum storage volume used, headwater level, and peak flow rates and velocities (at the outlet of the highway stormwater detention facility) determined by routing the peak flows calculated in (a) through the design stage-storage-discharge relationship;

- Maximum storage volume, headwater level, and peak flow rates and velocities (at the outlet of the highway stormwater detention facility) determined by routing the peak flows calculated in (b) through the design stage-storage-discharge relationship;
- Peak flow rate and the corresponding depth of flow in the emergency spillway calculated using the regulatory storm with the proposed land development area at pre-development conditions; and
- Peak flow rate and the corresponding depth of flow in the emergency spillway calculated using the regulatory storm with the proposed land development area at post-development conditions.

The SWM Report must document if the capacity of the highway stormwater management detention facility will be exceeded because of stormwater runoff discharging from the proposed land development. Review the following conditions and report the results in the SWM Report. If the capacity is exceeded, an impact should be identified in the SWM Report.

Where the pre-development maximum storage volume used (calculated in c) is less than or equal to the allowable storage volume; or the maximum pre-development headwater level (calculated in c) is less than or equal to the allowable headwater level; or the maximum pre-development peak flow rate (calculated in c) is less than or equal to the design flow capacity, the capacity of the highway stormwater management detention facility is not exceeded if:

- The post-development peak flow rates (calculated in d) are all less than the design flow capacity; and
- The post-development headwater levels (calculated in d) are all less than the allowable headwater level; and
- The post-development storage volumes (calculated in d) are all less than the maximum storage volume; and
- The post-development depth in the emergency spillway (calculated in f) is contained within the emergency spillway; and
- The post-development flow velocities (calculated in d) do not cause erosion or scour.

If a highway stormwater management detention facility has excess storage volume capacity that is to be used to accommodate stormwater runoff from the proposed land development, the portion of the excess storage volume capacity allocated to the proposed land development must be presented in the SWM Report.

An allocation of excess storage volume capacity will not be approved by the MTO if the excess storage volume capacity is required for future highway works.

Where the maximum pre-development storage volume used (calculated in c) **is greater than** the allowable storage volume; or the maximum pre-development headwater level (calculated in c**) is greater than** the allowable headwater level; or the maximum pre-development peak flow rate (calculated in c) **is greater than** the design flow capacity, the capacity of the highway stormwater management detention facility is not exceeded if:

- The post-development peak flow rates (calculated in d and f) are less than or equal to the pre-development peak flow rates (calculated in c and e); and
- The post-development headwater levels (calculated in d) are less than or equal to the pre-development headwater levels (calculated in c); and
- The post-development storage volumes (calculated in d) are less than or equal to the pre-development storage volumes (calculated in c); and
- The post-development depth in the emergency spillway (calculated in f) is less than or equal to pre-development depth in the emergency spillway (calculated in e); and
- The post-development flow velocities (calculated in d) are less than or equal to the pre-development flow velocities (calculated in c).

6.0 Mitigating Impacts to the Receiving Drainage System

Before proceeding with the tasks in this grouping, the following tasks should have been completed:

- Determining if a SWM Report needs to be submitted to the MTO;
- Identifying Drainage Issues;
- Analyzing the Receiving Drainage System; and
- Checking the Capacity of the Highway Drainage System.

The MTO is primarily concerned with impacts to the highway drainage system. Wherever stormwater runoff discharging from the proposed land development may impact the highway drainage system, impacts to the highway right-of-way should be assessed, and the capacity of the highway drainage systems must be checked.

However, the MTO recognises that the property of riparian landowners located upstream or downstream of the highway right-of-way cannot be damaged by stormwater runoff discharging from the proposed land development. Even though this responsibility is within the mandate of the regulatory agencies, the MTO may become liable if the stormwater runoff from the proposed land development is conveyed through a highway drainage system and damages any riparian property located upstream or downstream of the highway right-of-way.

During the analysis of the receiving drainage system, impacts were identified, and it was determined that a method of mitigation is required by the MTO to mitigate the impact. Impacts may be mitigated by:

- Providing Stormwater Management Controls; or
- Modifying the Receiving Drainage System, which includes erosion protection.

6.1 Providing Stormwater Management Controls

If impacts have been identified such that stormwater management controls may be required to mitigate these impacts, the SWM Report must provide documentation on the following areas.

Documenting the Need for Stormwater Management Quantity Control

The need for stormwater management controls originates from the need to mitigate impacts that the proposed development may cause to the receiving drainage system. The local municipality, conservation authority, MNDMNRF, MECP, and the DFO may also require stormwater management quantity control. These organisations should be consulted in conjunction with the MTO.

When the need for stormwater management quantity control originates from a previous drainage study, refer to Reviewing Previous Drainage Studies.

Documenting MOE Requirements for Stormwater Management Quantity Control

Stormwater management quantity control requirements for land development proposals are stated in the document *Stormwater Management Planning and Design Manual* (MOE 2003).

Where MOE requirements are set in a previous drainage study, refer to *Reviewing Previous Drainage Studies.*

Documenting MTO Requirements for Stormwater Management Quantity Control

Where a stormwater management quantity control facility is to be located within the highway right-of-way, refer to the *Highway Drainage Design Standards* (MTO 2008) for information on developing a stormwater management design.

Where a stormwater management quantity control detention facility is to be located within the property proposed for development, methods documented in the *Stormwater Management Planning and Design Manual* (MOE 2003), are generally suitable, except for the following techniques.

- **Parking lot or roof top storage:** the MTO does not recognise any benefit from the attenuation of stormwater runoff using parking lot or roof top storage, where the control is achieved through an orifice device or a roof top control device. MTO's concern is that as the continued functioning of such a control device cannot be guaranteed. The MTO will consider an alternative form of control devices (e.g. a short segment of storm sewer, equal to the diameter of the required orifice that leads from a manhole to and is directly connected to the storm sewer system). In general, it should be demonstrated that the failure of a storage facility will not result in unsusceptible impacts to the Highway Drainage System.
- **Grassed ditches and swales:** The runoff hydrograph is attenuated due to the resistance offered by the grassed surface and some degree of quantity control can thereby be achieved. The long-term viability, operation and maintenance of grassed swales and ditches will be a concern to MTO. MTO reserves the right to

reject the benefits achieved from conveyance controls, where the long-term viability, operation and maintenance cannot be reasonably guaranteed.

- **Infiltration facilities:** the MTO does not accept the location of an infiltration facility, within a proposed land development area, where it may impact the structural integrity of the highway sub-grade. If the use of infiltration facilities was a requirement of a regulatory agency, and no other stormwater management control option could be utilised, the infiltration facility should be located where it can be demonstrated that there will be no impact to the highway sub-grade.
- **Roof leader disconnection and cisterns:** in general, MTO does not accept the benefits from roof leader disconnection and cisterns if the continuing functioning and long-term reliability cannot be guaranteed.

Where MTO requirements are set in a previous drainage study, refer to *Reviewing Previous Drainage Studies.*

Selecting the Level of Water Quantity Control

The level to which peak flows will be reduced depends upon the level of mitigation that is required, and the degree to which MTO is exposed to risk. MTO reserves the right to impose a higher level of control upon the land development proposal (i.e. as compared to the requirements of other regulatory agencies). In such cases an MTO drainage representative should be contacted for clarification. Peak flows must be reduced to a level that will restore:

- water surface elevations and/or flow velocities, at the reference points and range of frequencies specified in Table 3, to a level(s) that will satisfy the risk criteria; and/or
- the capacity of the highway drainage system to a level(s) that will satisfy the risk criteria.

Documenting the Need for Stormwater Management Quality Control

The need for stormwater management quality control is based on the sensitivity of the receiving drainage system and may be a requirement placed on the land development proposal by the regulatory agencies before any impact assessment has been completed for the proposed land development.

Documenting MOE Requirements for Stormwater Management Quality Control

Generally, in land development proposals, the MOE will determine the need for stormwater quality control. The *Stormwater Management Planning and Design Manual* (MOE 2003) provides general guidance on the planning and design of stormwater management quality control facilities.

Documenting MTO Requirements for Stormwater Management Quality Control

Where a stormwater management quality control facility is to be located within the highway right-of-way, refer to the *Highway Drainage Design Standards* (MTO 2008

Where a stormwater management quality control detention facility is to be located within the property proposed for development, methods documented in the *Stormwater Management Planning and Design Manual* (MOE 2003), are generally suitable except for infiltration facilities.

Selecting the Level of Water Quality Control

The level of control will depend on the sensitivity of the receiving drainage system.

The MTO reserves the right to input into the level of control for water quality treatment imposed upon the land development proposal, when drainage from the proposed land development will be entering the highway surface drainage system and will be conveyed to the receiving drainage system. In such a case, the primary concern for MTO is with regards to the riparian rights of upstream or downstream landowners. If the MTO could become unduly exposed to legal action, MTO reserves the right to impose or increase, whichever is applicable, the level of control imposed upon the land development proposal. An MTO drainage representative should be contacted for clarification.

Identifying Design Criteria for Stormwater Management Controls

Where a previous drainage study has been referenced for design criteria, refer to *Reviewing Previous Drainage Studies*.

Parking Lot or Roof Top Storage

- The device used to achieve the parking lot or roof top storage.
- The location and layout of the proposed parking lot or roof top storage locations.
- The volume controlled and the corresponding water surface elevation.
- Maintenance procedures/responsibilities: refer to Clarifying Operation and Maintenance Responsibilities.

Stormwater Management Detention Facilities

- The location and layout of the detention facility should be confined within the land development property boundaries. The MTO does not generally allow detention facilities to be located within the highway right-of-way; however, where a mutual benefit is recognized, PHY Directive B014 provides guidance. The MTO Regional

Highway Planning and Design Office must be contacted before making such a recommendation. The following sections should be reviewed.

- Fundamental Purpose of Highway Right-of-way and Drainage System.
- Drainage Works by Outside Parties Constructed within the Highway Right-of-way.
- Consider a Planned Shared Use of the Highway Drainage System.
- Legal Agreements.

Issues to consider when selecting the location and configuration are as follows.

- Maintenance access should be sufficient to allow for the passage of equipment required for the dredging and removal of sediment.
- Multiple storage facilities located in the same drainage basin will affect the timing of the hydrograph as it travels downstream. This could increase or decrease peak flows in downstream locations. Coordination of stormwater management detention facilities with other drainage structures, on a watershed or sub watershed basis, is a primary consideration.
- The size of a detention facility is typically measured in terms of surface area and depth.
- **Inlet and outlet configuration:** the design of the outflow control will determine the outlet flow rate and hence the detention time for the facility. The outlet may include devices such as weirs, orifice plates, perforated risers, or a combination of them.
- **A flow splitter** may be needed to direct the stormwater runoff into the quality control facility. When the required storage volume has been captured, the flow splitter will divert the stormwater runoff to a quantity control facility or back to the receiving drainage system.
- **Emergency spillway location, type and capacity:** an emergency spillway should be designed to pass the regulatory flood, without failure, under blocked outlet conditions. Reference should be made to *the River and Stream Systems: Flooding Hazard Limit Technical Guide* (MNR 2002) for design criteria related to potential loss of life from dam failure.
- **Maintenance access** provisions should be included to ensure access to trash racks, and for removal of sediment. Access ramps should be designed to support maintenance equipment.

- **Special safety requirements:** roadside safety for errant vehicles should be considered where detention facilities are located near a highway (consult the MTO Regional Highway Planning and Design Office for further details).
- **A minimum freeboard depth:** as a guide use 0.3m.
- **Maintenance procedures/responsibilities:** refer to *Clarifying Operation and Maintenance Responsibilities*.
- **Setbacks from highway:** the Public Transportation and Highway Improvement Act mandates the MTO to enforce setback requirements, for structures constructed within certain distances from the highway right-of-way. The stormwater management detention facility is considered to begin at the berm toe of slope, which should generally be setback 14m from the highway property line. Contact the local MTO District Office or the MTO Regional Highway Planning and Design Office for more details.
- **Ownership**: refer to *Clarifying Operation and Maintenance Responsibilities.*

Analyzing and Documenting Results of the Design

Where stormwater management quantity controls are provided, the approach used in the analysis of the receiving drainage system should be repeated with one change: the proposed stormwater control is added to the receiving drainage system. Re- calculate peak flows, water surface elevations, or flow velocities at the reference points and range of frequencies specified in Table 3. The SWM Report should present results in a table that compares the results for the pre-development scenario to the results for the post-development scenario(s). The computational methodology used in the design of the stormwater management controls must be documented in the SWM Report.

The SWM Report must also document that the identified impact has been mitigated by the proposed stormwater management controls by showing that peak flows have been reduced to a level to that will restore:

- water surface elevations and/or flow velocities, at the reference points and range of frequencies specified in Table 3, to a level(s) that will satisfy the risk criteria; and/or
- the capacity of the highway drainage system to a level(s) that will satisfy the risk criteria.

Where stormwater management quality controls are provided, the SWM Report must document how MECP and/or MTO requirements were satisfied by the proposed design. The documentation as noted in the above section may also be required if there is a concern that the proposed controls will impact the receiving drainage system.

Where stormwater management quality and quality controls are provided, the SWM Report must provide the documentation as noted in both sections noted above.

6.2 Modifying the Receiving Drainage System

If modifications to the receiving drainage system, including the highway drainage system, may be required to mitigate the identified impacts, the SWM Report must provide documentation on the following areas. Modifications to the receiving drainage system include erosion protection works.

Documenting the Need to Modify the Receiving Drainage System

Before the proposed modification can be approved, the SWM Report must provide documentation on the areas listed below. This step should be completed at the earliest possible stage of design and should include the tasks presented below.

Documenting the Requirements of the Organizations Identified as responsible for Operation and Maintenance

Whenever modifications to the receiving drainage system are proposed, the organization responsible for the operation and maintenance for the component that is to be modified, must be contacted to ensure that they approve the proposed modification.

For modifications to highway drainage works, the MTO Regional Highway Planning and Design Office must be contacted before making any recommendation to modify a highway drainage works. The MTO does not generally allow highway drainage works to be modified unless it can be demonstrated that alterations will be of benefit to the highway; however, where a mutual benefit is recognised, Directive B014 provides guidance. The following sections should be reviewed.

- Fundamental Purpose of Highway Right-of-way and Drainage System.
- Drainage Works by Outside Parties Constructed within the Highway Right-of-way.
- Consider a Planned Shared Use of the Highway Drainage System.
- Legal Agreements.

Where the MTO Regional Highway Planning and Design Office has accepted the proposal to modify the highway drainage works, the SWM report must document the basis of the approval.

For modifications to other components of the receiving drainage system (i.e. other than the highway drainage system), contact the local municipality, and/or the local conservation authority. Where the responsible organisation has accepted the proposal

to modify the receiving drainage system, the SWM Report must document the basis of the approval.

Documenting Requirements of the Regulatory Agencies

Whenever a modification is proposed to any component of the receiving drainage system (including the highway drainage system), the regulatory agencies must be contacted to ensure that the proposed modification will comply with their respective mandates. Contact the local municipality, local conservation authority, the MNDMNRF, MECP, DFO, and in some cases the DTO.

In the case where the proposed modifications do not involve the highway drainage system, the MTO Regional Highway Planning and Design Office should be contacted to ensure that MTO drainage policy are not compromised by the proposed modifications.

The SWM Report must document all the regulatory agencies that were contacted, and the basis of the approval of the proposed modification.

Identifying the Receiving Drainage System Modification

The SWM report should present the component of the receiving drainage system that is to be modified along with a description of the proposed modification(s). Refer to Table 2 for relevant information about the modification that should be provided in the SWM Report.

Identifying Design Criteria used in the Receiving Drainage System Modification

Where modifications to the highway drainage system have been accepted by the MTO Regional Highway Planning and Design Office, design criteria for highway drainage works along with the design procedures and considerations presented in the *Highway Drainage Design Standards* (MTO 2008), must be followed to the satisfaction of the MTO Regional Highway Planning and Design Office. The SWM Report must document how the highway drainage works design criteria were satisfied.

Where modifications to other components of the receiving drainage system (i.e. other than the highway drainage system) have been accepted by the organisation responsible for its operation and maintenance, the design criteria of that organisation must be followed to their satisfaction. The SWM Report must provide appropriate documentation.

Design criteria, drainage management policy, or the guidelines and manuals of other regulatory organisations should also be considered. The SWM Report should document the process followed to contact other regulatory organizations and the criteria that were proposed as a result.

Should any design criteria, drainage management policy, guideline, or manual of a regulatory agency conflict with a design criterion, drainage management policy, guideline or manual of MTO, or vice versa, a meeting between the parties may be warranted to resolve the conflict.

Analyzing and Documenting the Results of the Modification

The approach used in the analysis of the receiving drainage system should be repeated with one change: the proposed modifications to the receiving drainage system must be included. Re-calculate peak flows, water surface elevations, or flow velocities at the reference points and range of frequencies specified in Table 4. The SWM report must present the results in a table that compares the results for the pre-development scenario to the results for the post-development scenario(s). The SWM report must also document that the identified impact has been mitigated by the proposed modifications by showing that:

- Water surface elevations and/or flow velocities, at the reference points and range of frequencies specified in Table 7, are restored to a level(s) that will satisfy the risk criteria; and/or
- The capacity of the highway drainage system is restored to a level(s) that will satisfy the risk criteria.

The computational methodology used in the modification of the receiving drainage system must also be documented in the SWM report.

The SWM report must document how MTO requirements, and requirements of the other regulatory agencies were satisfied by the proposed modification.

For simple erosion protection works: if the proposed modification only involves simple erosion protection works such as lining material or rip-rap placement, the SWM report need only document how the proposed method will provide the necessary erosion protection for the flow velocities at the reference points and range of frequencies specified in Table 7. Where the erosion protection works are major, such as drop structures, the procedures noted above must be followed.

7.0 Finalizing Construction and Operation Issues

Before proceeding with the tasks in this grouping, the following tasks should have been completed:

- Determining if a SWM Report needs to be submitted to MTO;
- Identifying Drainage Issues;
- Analyzing the Receiving Drainage System;
- Checking the Capacity of the Highway Drainage System; and
- Mitigating Impacts to the Receiving Drainage System.

Before the MTO can issue an approval for a land development proposal, the following tasks must be completed:

- Providing Temporary Sediment and Erosion Control During Construction; and
- Clarifying Ownership, Operation and Maintenance Responsibilities.

7.1 Providing Temporary Sediment and Erosion Control During Construction

Where applicable, the MTO will require that a sediment and erosion control plan stamped by a Professional Engineer be submitted prior to final approval. Issues to be addressed are listed below. For further details on sediment and erosion control during construction, refer to the *Highway Drainage Design Standards* (MTO 2008).

- **Construction timing** and the proposed construction timeframe and timing constraints for construction (spring, fall constraints) should be noted.
- **Construction phasing** and timeframes for the different phases should be included. Indicate whether the entire site is to be developed all at once or whether the proposed land development is to be phased. Sediment control techniques must address both pre-serviced and serviced phases of construction.
- **Stabilization requirements** and the allowable timeframe for land to remain exposed before it is stabilized with sod, mulch, or hydroseeding, should be noted. Indicate provisions for the stockpiling of soil.
- **Siltation fencing locations** should be located at the site boundary at all side slope and down gradient locations. Siltation fence should also be used to protect

significant features (i.e., provides a limit for grading activities) and to control dust, nuisance problems to homeowners in existing surrounding land developments.

- **Access/mud mat locations** should be located at each entrance/exit location to the construction site. The mat can be removed once the access locations are paved. The number of access locations to a construction site should be minimized (1 or 2).
- **Catch-basin controls**, where used, prevent the migration of sediment into the storm sewers.
- **Rock check dam locations** should be in overland swale systems which outlet to the receiving waters.
- **Siltation basins** can be used to service larger drainage areas (stormwater detention facilities can be used as temporary sediment basins during construction, wherever possible).
- **Topsoil stockpile storage locations** for soil storage piles and their distance from roads and drainage channels should be clearly shown. Timeframes and proposed works for the stabilization and remediation of topsoil stockpiles should be provided.
- **Inspection and maintenance requirements** of the sediment and erosion control works should be noted. Maintenance should be performed as required to ensure the proper operation of sediment and erosion controls, and the works should be inspected after each storm to ensure proper operation.

7.2 Clarifying Ownership, Operation and Maintenance Responsibilities

The MTO cannot issue final approval until responsibility for operation, maintenance and ownership of any drainage works has been clarified.

Documentation Required in SWM Report

The SWM Report should document who will be assuming ownership and long-term maintenance responsibilities associated with the drainage work, to ensure that the drainage works will remain in good working order and function properly according to its original design. Long-term operation and maintenance responsibilities include costs.

Where required, the SWM Report should also propose an appropriate legal mechanism, such as:

- Legal agreements with the municipality;
- Legal agreement with the owner;

- Conditions issued through a Building and Land Use or Encroachment Permit; or
- Conditions registered on title (site plan agreement or a subdivision agreement).

The MTO Regional Highway Planning and Design Office should be contacted for clarification. Refer to PHY Directive B014 for additional guidance. The following sections should also be reviewed.

- Fundamental Purpose of Highway Right-of-way and Drainage System.
- Drainage Works by Outside Parties Constructed within the Highway Right-of-way.
- Consider a Planned Shared Use of the Highway Drainage System

Relevance to MTO

- MTO will not assume the costs for any maintenance and operation associated with a drainage works that is not part of the highway drainage system.
- MTO must clarify who should be contacted, legal or otherwise, if repairs, or maintenance is required to a drainage works.
- MTO must ensure that appropriate legal mechanisms are in place to ensure future enforcement regarding operation and maintenance costs associated with the drainage works.

Appendix A – Requirements Checklists

Checklist 1: Background Information Required to Identify Drainage Issues

	Items or Elements Discussed in SWM Report	Applicable	Is it Documented?	Comments
Status of Land Development Proposal	Preliminary Stormwater Management Report?			
	Detail Stormwater Management Report?			
	Zoning Status of Land Development Proposal: - Current Designation - Amendments			
	Existence of MTO Conditions of Approval on: - Draft Plan of Subdivision - Site Plan			
	Status of Regulatory Agencies Approvals/Permits: - MNR - MOE - Conservation Authority Municipality - Others: _____			
Referenced Drainage Studies	Watershed, sub-watershed or master drainage studies			
	Approved SWM reports for same site			
	Approved detailed SWM reports for same site			
	MTO Environmental Study Reports			
	MTO Preliminary Design Reports			
	MTO Detail Design Reports			
	Other drainage studies: - Flood Damage Reduction Program Study - Erosion Control Study - Flood Control Study - Others: _____			

Checklist 1: Background Information Required to Identify Drainage Issues

	Items or Elements Discussed in SWM Report	Applicable	Is it Documented?	Comments
Water Quality Treatment	<u>Requirements:</u> MOE MNR MTO Others: _____			
Fish Habitat	<u>Requirements:</u> MOE MNR MTO Others: _____			

Checklist 2: Receiving Drainage System Information

	Items or Elements Discussed in SWM Report	Applicable	Is it Documented?	Comments
Receiving Drainage System Information	Components (other than highway drainage system): - Stream channel - Storm sewers - Roadside ditches - Bridges, culverts - Stormwater management facilities - Other: _____			
	Operation and Maintenance Responsibilities for Components (other than highway drainage system): - Agency - Organization - Person - Other: _____			
	Highway Drainage System: - Bridge - Culvert - Storm sewer - Roadside ditch - Major system - Stormwater management facility - Other: _____			
	Right to Outlet: - Alternative outlets - Into highway drainage system - Into receiving drainage system upstream of highway - Into receiving drainage system downstream of highway			
	Future Highway Works: - New highway, expansions, rehabilitation - Maintenance works - Drainage works - Identified conflicts with outlet from the proposed development			

Checklist 2: Receiving Drainage System Information

	Items or Elements Discussed in SWM Report	Applicable	Is it Documented?	Comments
	Criteria Regulating Receiving Drainage System: - Highway design criteria - Policy of regulatory agencies - MTO policy - Manuals and guidelines - Conflicts between MTO and Regulatory Agencies			
	Known Drainage Problem: - Upstream or downstream riparian property - Lack of sufficient drainage outlet			
	Highway Right-of-way: - Flooding or overtopping of highway bridge or culvert - Erosion on highway right-of-way - Erosion at highway bridge or culvert - Silt in culvert - Flooding of riparian property - Erosion on riparian property - Water quality			

Checklist 3: Assessing Impacts to the Receiving Drainage System

	Items or Elements Discussed in SWM Report	Applicable	Is it Documented?	Comments
Reference Points	- Upstream of proposed land development - Downstream of proposed land development - Upstream of highway drainage system - Downstream of highway drainage system Along highway drainage system - Control point - Known drainage problems			
Parameters to be Calculated	- Peak Flows - Water surface elevations - Flow Velocities - Runoff Volume			
Calculations	<u>Range of Frequencies to be Analyzed:</u> - low flow events (water quality or fisheries) - 2 year - 5 year - 10 year - 25 year - 50 year - 100 year regulatory storm			
	<u>Design Storm Events:</u> - Type and duration - Rainfall records and station - Rainfall discretization - Input parameters			
Watershed/ Catchment area Data	- Discretization and areas - Land use, soil types, vegetation cover slope and infiltration parameters (CN) - Pervious and impervious areas, directly connected areas, travel length, slope and time to peak or time of concentration - Recession constants - Computational time step - Rational method runoff coefficient			

Checklist 3: Assessing Impacts to the Receiving Drainage System

	Items or Elements Discussed in SWM Report	Applicable	Is it Documented?	Comments
Capacity of Highway Drainage System	Bridges and culverts: - Allowable headwater level - Design flow capacity - Regulatory storm			
	Storm sewer, roadside ditches and major system: - Design flow frequency - Freeboard requirements - Allowable depth of flow on highway surface - Regulatory storm			
	Stormwater Management Detention Facilities: - Design flow capacity, design flow frequencies - Allowable storage volume and headwater level - Design stage-storage discharge relationship - Freeboard requirements - Regulatory storm			
Computational Methods	- Culvert analysis - Bridge analysis - Flow in open channels - Assessing channel erosion (including roadside ditches) - Flow in storm sewers - Roadway surface flooding - Flow in stormwater management detention facilities - Scour potential - Computer models			
Documentation of Impacts	Post-development to Pre-Development Scenario Comparison: - Suitability of reference points - Peak flow rates - Water surface elevations - Flow velocities - Runoff volumes			

Checklist 3: Assessing Impacts to the Receiving Drainage System

	Items or Elements Discussed in SWM Report	Applicable	Is it Documented?	Comments
	Impacts: - Increased peak flows at references points - Increased water surface elevations at reference points - Increased flow velocities at reference points - Capacity of highway drainage system			
	Recommendation for Mitigative Works: - Level of mitigation required at references points - Level of peak flow reduction - Level of water surface elevation reduction - Level of erosion protection required (due to flow velocities)			
Mitigative Works Proposed	Stormwater Management Controls: - Water quality and/or water quantity facilities - Type - Size - Location (setback from highway) - Roof top or parking lot controls - Device used - Location and layout - Volume controlled - Operation and maintenance responsibilities			
	Modifications to the Receiving Drainage System: - Modifications to highway drainage works - Modification to other components of receiving drainage system - Erosion protection			
	Results of Modifications: - Peak flows at references points restored - Water surface elevations at reference points restored - Level of erosion protection/ flow velocities at reference points - Capacity of highway drainage system			

Checklist 4: Construction Operation and Maintenance Issues

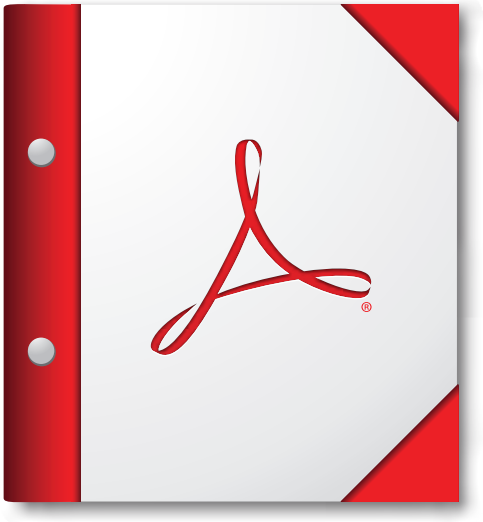
	Items or Elements Discussed in SWM Report	Applicable	Is it Documented?	Comments
Interim and Final Drainage Systems	<u>Drainage Plan:</u> - Interim drainage system layout, components and timeframe of use - Final drainage system layout and components			
Erosion and Sediment Control Plan	<u>During Construction:</u> - Temporary erosion control works, layout, location and timeframe of use - Maintenance scheduling of temporary erosion control works - Maintenance schedule of permanent erosion works - Maintenance on highway drainage system during construction			
Ownership, Operational and Maintenance Responsibilities	<u>Party Responsibilities for:</u> - owner of site drainage system - maintenance of site drainage system - maintenance of permanent erosion control works - maintenance on highway drainage system after construction - Legal Agreements - MTO maintenance responsibilities			

Checklist 5: Supplemental Drainage Information

	Items or Elements Discussed in SWM Report	Applicable	Is it Documented?	Comments
Rationale and Justification	<u>Documentation to Support Selection of:</u> - Level of detail used in analysis - Hydrologic and hydraulic computer models - Selection of computational methods			
Figures, Maps and Plans	<u>Documentation:</u> - Location/site map - Land use map - Soils map - Natural resources map - Proposed land development and grading plan - Drainage plans - Catchment discretization schematic - Drainage system connectivity flowchart - Stormwater management plan - In-stream works plan - Temporary sediment and erosion control - Location of stream cross-sections			
Tables and Graphs	<u>Input and Output Parameters:</u> - Soil types and CN numbers - Stormwater management works - Design storm events - Hydrologic computational parameters - Stage-storage-discharge curves - Hydrologic analysis results - Hydraulic computation - Water surface elevations - Flow velocities			

Checklist 5: Supplemental Drainage Information

	Items or Elements Discussed in SWM Report	Applicable	Is it Documented?	Comments
Letters, Permits and Supporting Computer Files	SWM report prepared and signed by a Professional Engineer			
	<u>Copies of correspondence:</u> - Letters of approval - Copies of permits - Municipality acceptance of ownership of site drainage system - Other: _____			
	<u>Hydrologic modelling input and output:</u> - Disk copy; or - Computer printout			
	<u>Hydraulic modelling input and output:</u> - Disk copy; or - Computer printout			



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Re: Circulation for Comment - 4611 King Street East (OPA/ZBA)

File No.: ZBA24-024-K-ES
Municipality: Kitchener
Location: 4611 King Street East
Owner/Applicant: Imperial Oil Limited

Eric,
The Waterloo Region District School Board (WRDSB) has reviewed the above-noted application that proposes the development of 726 dwelling units along with office space and retail uses in two towers. The WRDSB appreciates the note that a range of bedroom counts are to be provided including 3 bedroom units, this helps us assess the attractiveness to families of school age children. We offer the following additional comments.
Student Accommodation
At this time, the subject lands are within the boundaries of the following WRDSB schools:

- Grand View Public School (Junior Kindergarten to Grade 6)
- William G. Davis Public School (Grade 7-8)
- Preston High School (Grade 9 to Grade 12)

While no accommodation pressure is currently modelled for this area in the WRDSB's 2020-2030 Long-Term Accommodation Plan, there is potential for pressure to be realized as additional lands are contemplated for residential conversion. Interim student accommodation measures, including portable classrooms, may be required until an alternative accommodation solution is in place. Alternatively, the WRDSB may conduct a boundary study or designate this property as a "Development Area" and assign it to Holding Schools before occupancy or sales.
Student Transportation

The WRDSB supports active transportation and appreciates the detailed pedestrian routing planning offered in the Urban Design Brief and PJR. We ask that pedestrians continue to be considered in the review of this application to ensure the enhancement of safety and connectivity. STSWR may have additional comments on the location of future school bus pick-up and drop-off points.
Student Transportation Services of Waterloo Region (STSWR)'s school buses will not travel privately owned or maintained rights-of-way to pick-up/drop-off students. Transported students will be required to meet the bus at a congregated bus pick-up point. STSWR may have additional comments about student pick-up point(s) placement on municipal rights-of-way.
WRDSB Draft Conditions

Concerning any future declaration or agreement, the WRDSB requests the following inclusions in the conditions of Draft Approval:

1. That the Owner/Developer shall include the following wording in the condominium declaration to advise all purchasers of residential units and/or renters of same:

    a. *"Despite the best efforts of the Waterloo Region District School Board (WRDSB), accommodation in nearby facilities may not be available for all anticipated students. You are hereby notified that students may be accommodated in temporary facilities and/or bussed to a school outside the area, and further, that students may, in future, be transferred to another school."*

    b. *"For information on which schools are currently serving this area, contact the WRDSB Planning Department at 519-570-0003 ext. 4419, or email planning@wrdsb.ca. Information provided by any other source cannot be guaranteed to reflect current school assignment information."*

c. *"In order to limit risks, public school buses contracted by Student Transportation Services of Waterloo Region (STSWR), or its assigns or successors, will not travel on privately owned or maintained right-of-ways to pick up and drop off students, and so bussed students will be required to meet the bus at a congregated bus pick-up point"*

2. That the Owner/Developer enters into an agreement with the City of Kitchener to be registered on the title to the Property that provides:

    a. *"All agreements of purchase and sale or leases for the sale or lease of a completed home or a home to be completed on the Property must contain the wording set out below to advise all purchasers of residential units and/or renters of same."*

        i. *"Despite the best efforts of the Waterloo Region District School Board (WRDSB), accommodation in nearby facilities may not be available for all anticipated students. You are hereby notified that students may be accommodated in temporary facilities and/or bussed to a school outside the area, and further, that students may, in future, be transferred to another school."*

        ii. *"For information on which schools are currently serving this area, contact the WRDSB Planning Department at 519-570-0003 ext. 4419, or email planning@wrdsb.ca. Information provided by any other source cannot be guaranteed to reflect current school assignment information"*

        iii. *"In order to limit risks, public school buses contracted by Student Transportation Services of Waterloo Region (STSWR), or its assigns or successors, will not travel on privately owned or maintained right-of-ways to pick up and drop off students, and so bussed students will be required to meet the bus at a congregated bus pick-up point"*

3. That in cases where Agreements of Purchase and Sale have already been executed, the Owner/Developer sends a letter to all purchasers which include the above statements (conditions 2 a. i., ii., and iii.).

4. That the Owner/Developer supply, erect and maintain a sign (at the Owner/Developer's expense and according to the WRDSB's specifications), near or affixed to the development sign, advising prospective residents about schools in the area and that prior to final approval, the Owner/Developer shall submit a photo of the sign for review and approval of the WRDSB.

5. Prior to final approval, the WRDSB advises in writing to the Approval Authority how the above condition(s) has/have been satisfied.

Please be advised that any development on the subject lands is subject to the provisions of the WRDSB's Education Development Charges By-law, 2021 or any successor thereof and may require the payment of Education Development Charges for these developments prior to issuance of a building permit.
The WRDSB requests to be circulated on any subsequent submissions on the subject lands and reserves the right to comment further on this application.

If you have any questions about the comments provided, don't hesitate to contact the undersigned.

Sincerely,

Sarah West

Senior Planner

Waterloo Region District School Board
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