



## The Corporation of the Town of Tecumseh

Public Works & Environmental Services

**To:** Mayor and Members of Council

**From:** John Henderson, Manager Engineering Services

**Date to Council:** May 28, 2019

**Report Number:** PWES-2019-27

**Subject:** Windsor/Essex Region Stormwater Management Standards Manual

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### Recommendations

It is recommended:

**That** Report PWES-2019-27 titled Windsor/Essex Region Stormwater Management Standards Manual **be received**;

**And that**, based on feedback received during the May 28, 2019 Regular Meeting of Council, Administration **bring forward** a future report to Council on June 25, 2019 recommending the adoption of this manual for the design and review of stormwater infrastructure within the Town of Tecumseh.

### Background

The purpose of this report is to inform Council of the recently completed Windsor/Essex Region Stormwater Management Standards Manual (Manual). The Town of Tecumseh was a participating partner in the development of this Manual. The Manual provides technical stormwater standards to ensure stormwater infrastructure is designed using the best available science, with consideration for local conditions, to satisfy municipal stormwater obligations within the Windsor Essex Region.

In 2015, the Essex Region Conservation Authority (ERCA) approached the City of Windsor, the County of Essex, and the Towns of Tecumseh (Town), Amherstburg, Essex, Kingsville, Lakeshore, LaSalle and the Municipality of Leamington regarding the need for regional stormwater management standards. The lack of regional standards was resulting in inconsistent requirements between local municipalities, varying levels of service for stormwater facilities, lack of clear guidance for developers and engineering consultants, significant review

times and the high potential for numerous review submissions. At that time, the Town was in the process of engaging a consultant to develop stormwater management standards to be included in a Town of Tecumseh Development Standards Manual. The Town was pleased to be involved in this regional undertaking and encouraged other municipalities to participate.

Based on ERCA's request, the County of Essex and all local municipalities agreed to partner with ERCA to develop regional stormwater management standards with the cost of the study to be split equally between partners. ERCA engaged the services of Stantec Consulting Ltd. (Stantec) as the principal consultant for the project. A Technical Committee was also created to provide technical input into the study, which consisted of three local engineers experienced in stormwater management and with knowledge of local/regional conditions. All partners agreed that public consultation was not required for the development of local engineering standards which build on existing Provincial guidelines to meet municipal stormwater obligations. From a development perspective, storage options remain flexible (subject to site-specific conditions) and continue to include wet ponds, dry ponds, underground storage, road storage, wetlands, etc.

Engineering representatives from the Town, and engineering representatives from all partners, have worked collaboratively with ERCA, Stantec and the Technical Committee through an iterative process to develop the final stormwater management standards manual. This process included several meetings and draft reports leading to the attached final version of the Manual. Milestones throughout the duration of the study include the following:

**May 2016** – The Town participated in an individual partner meeting with ERCA/Stantec to confirm the Town's issues and needs.

**October 2016 – January 2017** – Stantec provided an initial draft report for review by the Technical Committee. The initial draft report was revised based on comments received from the Technical Committee and an updated draft report was distributed to municipal partners for review in January 2017.

**January - November 2017** – Based on comments received from municipal partners, the January 2017 draft report was revised and distributed to the Technical Committee for review.

**December 2017 – February 2018** – A draft final report was prepared based on comments received from the Technical Committee. The draft final report was circulated to the Technical Committee and municipal partners.

**March 2018** – A meeting was held with the Technical Committee and municipal partners to discuss the draft final report.

**August - October 2018** – Stantec revised the draft final report based on the March 2018 meeting and a second draft final report was circulated to the Technical Committee and all municipal partners for final review and comment.

**November - December 2018** – Stantec finalized the Manual based on feedback from the Technical Committee and municipal partners.

**December 2018** – ERCA Administration presented the Manual to the ERCA Board of Directors and the Manual was unanimously adopted into ERCA policies for use as a regional stormwater management standard. The ERCA Board of Directors also approved the recommendation that the Manual be distributed to all partners for incorporation into municipal development standards.

## **Comments**

### **Purpose of Stormwater Management**

Land development increases both the amount (volume) of stormwater runoff, and the rate at which runoff occurs. A principal purpose of stormwater management is to mitigate the potential for flooding to downstream landowners due to the hydrologic effects of development. Without stormwater management measures, the impacts of development can lead to increased flooding, degradation of water quality and aquatic ecosystems, stream erosion and property damage. Left unmanaged, stormwater often leads to major public expenditures in infrastructure to solve flooding or erosion problems.

### **Stormwater Issues in the Windsor Essex Region**

Prior to the development of the Manual, stormwater management measures were being implemented by municipalities in the Windsor Essex Region, however the approach was generally isolated to individual developments and at the site planning level. This approach has the potential to lead to both inefficient and inconsistent implementation of stormwater management within a watershed. From a Regional perspective, stormwater management needs within the Windsor Essex Region were not clearly defined and available Provincial guideline documents did not capture the unique design challenges in this area. The majority of the Windsor Essex Region has relatively flat topography and poorly drained soils, which creates many challenges for effective management of stormwater. Many drainage systems are also affected by lake levels which can have a notable backwater effect. Moreover, the construction of stormwater management ponds in flat areas can artificially create a backwater condition that can surcharge storm sewer systems.

The lack of clearly defined stormwater standards has resulted in significant variation in engineering design submissions for development proposals. The lack of a regional approach has also resulted in significant variation in the design requirements between municipalities, some of which are in the same watershed. Currently, stormwater submissions for similar developments proposal can range from 100 page (plus) reports to 5 page design briefs. The level of detail is dramatically different between these submissions, which creates the following challenges:

- In many cases, the short design briefs do not satisfy the needs of the municipality and result in numerous re-submissions and significant review time for municipal staff.
- Numerous re-submissions result in additional cost to developers and result in project delays.

- The lack of clearly defined regional stormwater standards creates unfair circumstances for engineers providing quotes for design work.
- The lack of clearly defined regional stormwater standards creates unfair advantages for municipalities with competing development needs.

In addition, development trends have changed in the last 20 years, however, in many cases the corresponding local design parameters for stormwater infrastructure have not been adjusted accordingly. Historically, a typical single-family residential development was assumed to include approximately 35% to 40% impervious surface. Based on this assumption, stormwater facilities for multi-phased developments were designed, approved and constructed. Current development trends, however, typically include smaller lots, large houses, large patios and outbuildings resulting in a significant increase in the site impervious level. Many new single-family residential developments have as-built impervious levels in the range of 55%. This increased impervious level results in increased runoff volume and the need for larger stormwater facilities. This issue has been identified at a number of existing stormwater facilities within the Windsor Essex Region where re-assessments of existing stormwater facilities determined there was no storage capacity available for the final phases of multi-phase developments. This creates challenging situations for developers and municipalities when additional storage must be provided in order for approved developments to fully mature.

## **The Manual**

The Manual provides a concise set of design methodologies and parameters to address stormwater management issues based on local conditions, current development trends and up to date stormwater management practices. To be successful, stormwater management requires appropriate project consideration starting at the planning level and continuing through to long-term operation and maintenance.

To address these needs, the Manual is separated into the following six sections:

- Section 1 - Introduction
  - Includes the objective of the Manual, explains why stormwater management is needed and provides information on risk.
- Section 2 - Planning
  - Includes discussion on the importance of watershed planning.
- Section 3 - Design
  - Outlines standards for design criteria, input parameters and submission requirements to provide clear and concise guidance to stormwater management practitioners to ensure a consistent regional approach to stormwater design.
- Section 4 - Private Drainage Systems
  - Outlines potential flooding issues with private drainage systems and identifies improvements that can be implemented by private property owners.

- Section 5 - Implementation/Construction
  - Outlines the importance of coordination between the stormwater management design, the preparation of construction drawings, construction and appropriate construction site environmental controls.
- Section 6 - Operations and Maintenance
  - Provides minimum requirements for operation and maintenance manuals/procedures for stormwater management facilities.

In addition, and subsequent to the commencement of this project in 2015, the Town of Tecumseh and other local municipalities were impacted by significant flood events in both 2016 and 2017. These flood events resulted in millions of dollars in insurance claims. As a result, the scope of the regional stormwater management standards project was expanded to include consideration for climate change. Using the current understanding of rainfall in our region, the Manual prescribes a “stress test” which is intended to assess the resiliency and vulnerability of stormwater facilities. The “stress test” involves assessing stormwater management facilities by adding approximately 40% to the 1:100 year Windsor Airport 24 hour rainfall amount of 108 mm. This translates to assessing stormwater systems for a 150 mm rainfall event over a 24 hour period.

While the Manual provides practical guidance, and at times fairly prescriptive design criteria, it does not replace sound engineering judgment or entirely replace current Provincial design standards such as the Ministry of Environment, Conservation and Parks’ (formerly the Ministry of Environment and Climate Change) 2003 Stormwater Management Planning and Design Manual or the Ministry of Natural Resources and Forestry’s (MNRF) Natural Hazard Technical Guide. By incorporating design criteria related to local challenges in the Windsor-Essex Region, it allows the Manual to be used in conjunction with, and to supplement other planning and design manuals provided by the Province of Ontario.

The Manual provides sufficient information for engineers to complete detailed science based stormwater modeling assessments to optimize the storage requirements for a development proposal. It is recognized that not all proposals warrant an excessively detailed analysis. For smaller development proposals, the Manual includes simplified conservative stormwater design approaches. These approaches will result in additional storage requirements compared to a detailed modeling assessment but can be completed quickly and potentially reduce engineering costs. This gives a proponent the option of optimizing storage with a detailed modeling design or, if additional storage is available, to reduce design and review time.

## **Implementation**

Implementation of the stormwater management standards contained in the Manual will result in the following:

- Properly sized stormwater infrastructure based on up to date science and local conditions.
- Minimize the potential for future stormwater management storage issues at multi-phased developments by accounting for current development trends, local constraints and

reviewing resiliency by stress testing the stormwater system for potential climate change impacts.

- Provide clear direction to developers and engineers on stormwater management requirements for new development within the Windsor Essex Region.
- Create an even playing field for engineers providing proposals for stormwater management design.
- Provide a consistent watershed approach to stormwater management for all municipalities within the Windsor Essex Region.
- Reduce the number of reviews and re-submissions. This should create efficiencies for municipal/agency reviews, expedite the approval process and reduce the proponent's design costs.

As noted above, ERCA has approved this Manual as their regional standard for stormwater management design and is currently using it in their development reviews. Accordingly, developments that require ERCA approval (within the Town of Tecumseh and all other local municipalities) are already subject to these standards. Based on discussions with the project partners, the following is provided regarding the regional implementation of the Manual:

**City of Windsor** – Council has approved the Manual. Administration is using the Manual for development design requirements and staff review. A memorandum was released to Windsor/Essex Consulting Engineers on February 19, 2019 advising that all development applications are required to comply with the Manual. The Manual is available on the City of Windsor website.

**County of Essex** – The Manual is being used in the design of new County of Essex road infrastructure. A report to Council is planned in the future.

**Municipality of Leamington** – Administration is using the Manual for development design requirements and staff review. A report to Council is planned in the future.

**Town of Amherstburg** – Administration is using the Manual for development design requirements and staff review. A report to Council is planned in the near future to update their Development Standards Manual, which will include reference to the Manual.

**Town of Essex** – Administration is using the Manual for development design requirements and staff review. A report to Council is planned in the future.

**Town of Kingsville** – Administration is using the Manual for development design requirements and staff review. A report to Council is planned in the future to update their Development Standards Manual, which will include reference to the Manual.

**Town of Lakeshore** – Administration is using the Manual for development design requirements and staff review. A report to Council is planned in the future to update their Development Standards Manual, which will include reference to the Manual.

**Town of LaSalle** – Administration is using the Manual for development design requirements and staff review. A report to Council is planned in the future.

**Town of Tecumseh** – Requirements identified in the Manual are being considered in the Town of Tecumseh Storm Drainage Master Plan and the Oldcastle Storm Drainage Master Plan. Based on ERCA and Windsor approvals of the Manual, and local consultant knowledge of same, the Town is receiving design submissions based on the criteria identified within the Manual. As such, these submissions are being reviewed in accordance with the requirements of the Manual.

## Conclusions

Prior to the completion of this Manual, a consistent approach for stormwater management did not exist for the Windsor Essex Region. The Manual provides up to date stormwater management standards based on the best available science with consideration of local conditions. The Manual provides consistent stormwater requirements for all local municipalities, enables consistent development submissions, and in the long-term, should result in shorter agency review times with fewer re-submissions. As noted above, the Manual also includes a “stress test” to assess the resiliency and vulnerability of new and existing stormwater systems in relation to climate change. While there remains a lack of clear and consistent guidance on how to address climate change, the recent extreme events, the Provincial Policy Statement 2014 as well as expectations from the Province warrant the need to consider climate change in the design of stormwater infrastructure.

In addition, stormwater management and climate change practices are continuing to evolve. In order to stay current with increasing knowledge and new practices, it is recommended that the Manual be reviewed and updated on a five (5) year cycle.

The goal of this project was to develop consistent stormwater management standards for development within the Windsor Essex Region. All local municipalities participated in the development of these standards with the intention that the Manual would form part of each partner’s development standards. To ensure a consistent approach to stormwater management within the Windsor Essex Region, and to satisfy the expectation of all municipal partners that collaborated on this project, it is important for all municipalities to adopt this Manual as a design standard. Following Council adoption of the Manual, Administration intends to notify local consultants and developers of the new stormwater infrastructure standards for Tecumseh. Memos will be sent to the local Chapter of Professional Engineers Ontario and to developers who regularly undertake projects within the Town. The Manual will also be available on the Town website.

In accordance with the foregoing, Administration recommends:

**That** Report PWES-2019-27 titled Windsor/Essex Region Stormwater Management Standards Manual **be received**;

**And that**, based on feedback received during the May 28, 2019 Regular Meeting of Council, Administration **bring forward** a future report to Council on June 25, 2019 recommending the adoption of this manual for the design and review of stormwater infrastructure within the Town of Tecumseh.

## Consultations

Planning & Building Services  
Essex Region Conservation Authority (ERCA)

## Financial Implications

There are no financial implications associated with this report.

## Link to Strategic Priorities

Applicable	2017-18 Strategic Priorities
<input type="checkbox"/>	Make the Town of Tecumseh an even better place to live, work and invest through a shared vision for our residents and newcomers.
<input checked="" type="checkbox"/>	Ensure that the Town of Tecumseh's current and future growth is built upon the principles of sustainability and strategic decision-making.
<input type="checkbox"/>	Integrate the principles of health and wellness into all of the Town of Tecumseh's plans and priorities.
<input checked="" type="checkbox"/>	Steward the Town's "continuous improvement" approach to municipal service delivery to residents and businesses.
<input checked="" type="checkbox"/>	Demonstrate the Town's leadership role in the community by promoting good governance and community engagement, by bringing together organizations serving the Town and the region to pursue common goals.

## Communications

Not applicable ☒

Website ☐ Social Media ☐ News Release ☐ Local Newspaper ☐



This report has been reviewed by Senior Administration as indicated below and recommended for submission by the Chief Administrative Officer.

Prepared by:

John Henderson, P.Eng.  
Manager Engineering Services

Reviewed by:

Phil Bartnik, P.Eng.  
Director Public Works & Environmental Services

Reviewed by:

Brian Hillman, MA, MCIP, RPP  
Director Planning & Building Services

Recommended by:

Margaret Misek-Evans, MCIP, RPP  
Chief Administrative Officer

<b>Attachment Number</b>	<b>Attachment Name</b>
1	Windsor/Essex Region Stormwater Management Standards Manual (December 6, 2018)