Date         March 19, 2019            Report No. 2019-157

To          Chair and Members
            Committee of the Whole – Operations and Administration

From        E. (Beth) Goodger, General Manager
            Public Works Commission

1.0  Type of Report

Consent Item [ ]
Item For Consideration [X]

2.0  Topic

3.0  Recommendation


B. THAT the “Design and Construction Manual for Vertical Municipal Infrastructure” BE APPROVED effective March 26, 2019; and

C. THAT the General Manager of Public Works BE DELEGATED AUTHORITY to approve revisions to the “Design and Construction Manual for Vertical Municipal Infrastructure” upon recommendation by the Technical Review Committees as set out in the Manual and THAT the Execution of Routine Documents By-law BE AMENDED to reflect that authority.

4.0  Purpose and Overview

The purpose of this report is to present the “Design and Construction Manual for Vertical Municipal Infrastructure” (Manual) to City Council for approval and implementation effective March 2019. The Manual has been collaboratively
developed over the last 14 months and provides a comprehensive set of standards for vertical municipal infrastructure in the City of Brantford for new development and reconstruction of existing infrastructure.

Vertical municipal infrastructure includes the following:

- Water: Water treatment facility, pumping stations, reservoirs, elevated tanks, and bulk water fill stations;
- Wastewater: Wastewater pumping stations, septage receiving stations, wastewater treatment, and biosolids management; and,
- Stormwater: Stormwater pumping stations

The intended use of the Manual is to:

- Provide a comprehensive set of guidelines to aid in the consistent design and construction of new assets and retrofits of vertical municipal infrastructure;
- Integrate industry standards and best practices;
- Encourage consistent approaches for design in the City;
- Prioritize the health and safety of the public; and,
- Reduce impacts to the natural environment and protect natural resources.

5.0 Background

In May 2015, City Council approved report PW2015-049, titled “Additional Funding to Develop Design, CADD and Project Delivery Specifications for Municipal Infrastructure”, which outlined the development and implementation of a comprehensive set of Design Criteria, Standards, Specifications and Drawings for municipal infrastructure.

In March 2016, City Council was presented with report PW2016-026, titled “Development of Design Criteria, and Standards and Specifications for Municipal Infrastructure”, providing an introduction to the steps that would be taken in the development and implementation of the Design Criteria, Standards and Specifications for municipal infrastructure.
In December 13, 2016, City Council was presented with report PW2016-082 titled “Design Criteria, Standards and Specifications for Municipal Infrastructure Update”, providing an update to the development and implementation of the linear municipal infrastructure manuals.


On December 14, 2017 the kickoff meeting for the “Design and Construction Manual for Vertical Municipal Infrastructure” was held. Technical workshops were facilitated by GM BluePlan Engineering and well attended by staff from a variety of City departments from January 2018 to September 2018. The Manual developed represents a collaborative effort and consensus through discussion with staff and stakeholders. This dialogue was essential to achieve an accurate representation of the expectations and vision for the City of Brantford moving forward with respect to vertical municipal infrastructure.

The following collection of City documents were discussed and cross referenced throughout the process:

- Master Servicing Plan
- Official Plan
- City of Brantford By-laws (including but not limited to Sewer Use Regulation and Water Use – Regulation)
- Site Plan Manual
- Facility Accessibility Design Standards
- Design and Construction Manual Linear Municipal Infrastructure Standards
- Supervisory Control and Data Acquisition (SCADA) Standards
- Corporate Energy Management Plan
6.0 Corporate Policy Context

A City-wide Design and Construction Municipal Vertical Infrastructure Manual falls in line with Goals 3 and 4 of the City’s adopted Strategic Plan, “Managed Growth and Environmental Leadership” and “Excellence in Governance and Municipal Management”. This includes the Long Term desired Outcome outlining that the City of Brantford will be recognized as a fiscally responsible and well managed City that provides efficient and effective government services.

7.0 Input From Other Sources

Stakeholders from various divisions and departments throughout the City were an integral part of the development of the Manual, which included:

- Public Works Commission, Environmental Services
- Public Works Commission, Engineering Services
- Community Development, Planning Division
- Corporate Services, Purchasing Division

The final Manual was also distributed to developers and consultants within the community that have previously worked with City Staff for review. No comments were received.

8.0 Analysis

To develop the Manual, City staff reviewed the design criteria of existing infrastructure, the provincial design guidelines developed by the Ministry of Environment, Conservation and Parks as well as the standards of neighbouring municipalities to gauge the level of detail and design parameters currently used in Southern Ontario. The standards reviewed included but were not limited to the Region of Halton, Region of Peel, City of Hamilton and Region of Niagara. From these examples, the team worked collaboratively to create a backbone structure that would be best for existing and future projects: a standard for format and a structure of deliverables and design parameters that would work in line with the City’s values to commitment to innovation and learning.

The completed Manual is divided into sections as follows:
• General Preface – Introduction to the purpose of the Manual: to provide consistent application of design practices of vertical municipal infrastructure within the City

• Common Elements – Requirements related to common elements in the design of water, wastewater and stormwater vertical infrastructure

• Water – Requirements related to the design of treatment, storage, and distribution of drinking water vertical infrastructure

• Wastewater – Requirements related to the design of pumping and septage receiving stations, treatment and biosolids management of wastewater vertical infrastructure

• Stormwater – Requirements related to the design of pumping stations for stormwater vertical infrastructure

• Appendices – Standard and Project Deviation Forms, Process Standard Schematics and the Approved Products Lists

Similar to the Design and Construction Manual for Linear Municipal Infrastructure, some of the key design features identified in this Manual are as follows:

1. Design Deviation Form, to provide justification as to why a proposed design will not meet the standard design criteria

2. Request for Design Change Form, to establish a proactive approach to change a design standard within the manual

3. Design Review Advisory Panel (DRAP), establishing a panel of staff represented by various departments to revise the Manual on a yearly basis, to keep current with new innovations, industry standards and best practices

4. Product Review Advisory Panel (PRAP), establishing a panel of staff represented by various departments to review the “Approved Products List” on a quarterly basis, keeping current with new technologies and products

Implementation of the Manual will formally begin effective April 1, 2019. Moving forward, designs of vertical municipal infrastructure, be it capital projects, development of subdivisions or operational and maintenance improvements will comply with the Manual and the processes outlined. Where it is technically
infeasible to meet the specified standards the Project Deviation Forms can be utilized. A change from a standard will be evaluated by the City that such a variance will provide a comparable result. Sound evidence, consistent with good engineering practices, which supports the alternate design to the City standard, must be provided for consideration.

The Manual is intended to be a living document and will be updated annually to stay current with industry standards and best practices. Change requests based on the submitted Project Deviation Forms and Approved Products Review forms will be reviewed by the appropriate Committee (DRAP or PRAP) to determine whether or not updates are warranted. The Committees will then recommend the accepted changes and updates for approval by the General Manager of Public Works. The updated Manual will be released at a set time period on a year to year basis to reflect the approved revisions.

Completion of the Vertical Manual marks the conclusion of Phase 2 of the Infrastructure Design Criteria, Standards and Specifications Project. Phase 1 was the creation and publication of the Design and Construction Manual for Linear Municipal Infrastructure, which was approved by Council in August 2017 and implemented in October 2017. Moving forward, to ensure both Manuals stay current with design guidelines, industry best practices and to remain in compliance with regulatory requirements, they will be reviewed and updated on an annual basis.

An electronic version can be accessed for review through the following links.

- **Vertical Infrastructure – Manual Preface**¹
- **Vertical Infrastructure – Common Elements**²

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Vertical Infrastructure – Water
Vertical Infrastructure – Wastewater
Vertical Infrastructure – Stormwater
Vertical Infrastructure – Appendices

Hard copies of the document can be supplied upon request.

9.0 Financial Implications

There are a number of indirect and direct financial benefits resulting from the approval of the Manual. Over time as the guidelines are implemented, efficiencies will result in the design, construction and operation of municipal infrastructure. The efficiencies that may be recognized are related to consistency, clarity and communication. Consistency, ultimately, decreases the time required to plan, design, construct, operate and maintain the City’s infrastructure; Clarity will improve accuracy and reduce the re-occurrence of errors and; Communication provides opportunities to consider innovated designs, new technologies and best practices that can improve the performance as well as extend the life of the infrastructure.

10.0 Conclusion

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The Engineering Services Department has completed the Design and Construction Manual for Municipal Vertical Infrastructure. The report seeks approval from City Council to implement the Manual commencing April 2019. It is intended for the manual to be made available on the City’s web page in a user friendly format.

The Design and Construction Manual, once approved, will become the municipal infrastructure guideline for vertical infrastructure in the City of Brantford. Moving forward, the Manual will not only ensure clarity, efficiency, consistency and fiscal accountability, but also allow for opportunities in innovation and new technologies.

Russ Loukes, P.Eng., PTOE
Director, Engineering Services

E. (Beth) Goodger
General Manager, Public Works Commission

Wendy Teufel, CMMIII, CET
Manager, Design and Construction

Attachments

Appendix “A” – General Preface to the Design and Construction Manual for Vertical Infrastructure

In adopting this report, is a by-law or agreement required? If so, it should be referenced in the recommendation section.

By-law required

[ ] yes  [x] no

Agreement(s) or other documents to be signed by Mayor and/or City Clerk

[ ] yes  [x] no

Is the necessary by-law or agreement being sent concurrently to Council?

[ ] yes  [x] no