

Volume 1: Introduction

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1 Purpose

The City of Waterloo Comprehensive Engineering and Landscape Manual (CELM) has been prepared as a guidance document to assist Developers, Consultants, and the general public through the City of Waterloo's infrastructure and development processes. This current document was developed to reflect current Site Plan, Subdivision and Capital Project applications and development processes.

This document includes design criteria specific to the City of Waterloo. The intention of this manual is to provide general guidance for the efficient approval and completion of the servicing, grading, transportation, and/or landscaping of lands within the City of Waterloo.

Every engineering project is unique and will be reviewed on its own merits. The City reserves the right to apply discretion in the interpretation of these guidelines and requires the use of other applicable guidelines and good engineering judgment when reviewing each project. The standards in this manual are considered to be minimum requirements by the City and do not relieve the designer from providing adequate and safe design. Current legislation shall be followed at all times.

This document is an official Integrated Planning and Public Works Policy document and has been approved by City Council. The CELM is to be read in conjunction with the City of Waterloo Urban Design Manual and applicable City by-laws and policies.

For most projects, the City of Waterloo has adopted the "Ontario Provincial Standard Drawings and Specifications (OPSS, OPSD)" and "Region of Waterloo and Area Municipalities Design Guidelines (DGSSMS)" except where amended as indicated in this Manual. For specialty projects (e.g., Landscape) the City may choose to utilize the Canadian Construction Documents Committee (CCDC) contracts.

2 Volume Structure

This manual has been split into multiple volumes as follows:

- Volume 1: Introduction
- Volume 2: Process
- Volume 3: Drawing and Report Requirements
- Volume 4: Transportation
- Volume 5: Underground Servicing, Grading, and Utilities
- Volume 6: Stormwater Management
- Volume 7: Landscape Architecture
- Standard Drawings
- Specifications

3 Acknowledgements

This manual builds on the original *Development Engineering Manual*, first developed by Phil Quickfall, and was last published in 2013. It incorporates the *Landscape Design Process and*

Requirements Manual for New Subdivision Development, first developed by Barb Magee Turner, last published in 2008.

Engineering Services staff wishes to thank all City Staff who participated in the writing, reviewing and finalizing of this major refresh and update. We would also like to thank the members of the Waterloo Region Home Builders Association, Conestoga Heavy Construction Association, the local Association of Consulting Engineering Companies Ontario chapter, as well as the local engineering and landscape architectural consultants and contractors for their comment and input into the preparation and update of this document.

4 Disclaimer

The content of this manual is being supplied by the City of Waterloo for informational purposes only and is not intended as a substitute for independent professional advice. While every effort is made to ensure the accuracy of the information in this manual, the City of Waterloo does not warrant same. The City of Waterloo does not assume any liability for the reader's application, misapplication, or misinterpretation of any information contained in this manual, nor does it assume any liability whatsoever to any person, corporation or organization for damages, injuries or costs resulting from the use of the information supplied.

The City of Waterloo reserves the right to amend, alter or accept revisions to this manual at any time, without notice.

5 Updates

Changes and revisions will be made to these standards from time to time and it is the responsibility of the designer to obtain and make use of the latest version available at the time of engineering design. It is the user's responsibility to check the City of Waterloo's website for the current revision of this manual. Manual holders should immediately discard superseded and obsolete standards.

Each Volume may be updated independent of one another. Records of updates will be tracked within this section (Table V1-1).

First Anticipated Update: January 2024

TABLE V1-1: UPDATE CHANGE LOG

Volume	Section	Description

6 General

It is the responsibility of the designer to obtain and make use of the latest version of documents available at the time of design.

Should any referenced by-law, regulation, design standard, etc., be updated or amended prior to the project reaching building permit or issued for tender stage, the design shall be updated accordingly to meet the requirements of the new, updated or amended document.

A glossary of key terms used in this manual may be found in Appendix V1-A.

7 Climate Adaptation Equity

Climate change is a global phenomenon that affects all communities, but its impacts are not felt equally. There is growing evidence that low-income neighborhoods, which often have limited resources and face systemic inequalities, are disproportionately affected by the impacts of climate change such as flooding, heatwaves, and extreme weather events. The City of Waterloo recognizes this reality and is committed to promoting climate adaptation equity through its development guidelines and requirements.

To ensure that all neighborhoods, including those with low socioeconomic status, are resilient to the impacts of climate change, the City of Waterloo's development guidelines prioritize the following:

- **Access to green spaces and urban forests:** Green spaces and urban forests play a crucial role in mitigating the impacts of climate change by reducing the urban heat island effect, improving air quality, and reducing stormwater runoff. The City of Waterloo requires that all new developments provide access to green spaces and urban forests, particularly in neighborhoods with low-income households.
- **Designing for climate resilience:** The City of Waterloo's guidelines require that all new developments are designed to withstand the impacts of climate change, such as flooding and extreme heat. This includes requiring developers to use sustainable design strategies, such as low impact developments where applicable and strategic tree planting locations to reduce stormwater runoff and mitigate the urban heat island effect.
- **Ensuring equitable access to infrastructure:** The City of Waterloo's guidelines require that all new developments provide equitable access to infrastructure, such as stormwater management systems and flood protection measures, access to trails. This is particularly important in neighborhoods with low-income households, which are often more vulnerable to the impacts of climate change.
- **Community engagement:** The City of Waterloo recognizes that engaging communities in the planning process is essential for promoting climate adaptation equity. The City encourages developers to engage with local communities, particularly those with low socioeconomic status, to ensure that their needs and concerns are addressed in the development process.

The City of Waterloo is committed to promoting climate adaptation equity in all neighborhoods, including those with low socioeconomic status. The City's development guidelines prioritize access to green spaces, designing for climate resilience, ensuring equitable access to infrastructure, and engaging local communities in the planning process. These measures will help ensure that all neighborhoods are resilient to the impacts of climate change, and that no community is left behind.

8 Integrated Planning and Public Works Department

Municipal approvals and permits for development in Waterloo are managed by the City's Integrated Planning and Public Works (IPPW) Department. This department is structured into specific administrative divisions, five of which manage applicable requirements for land development.

Table V1-1 (below) lists each division and its corresponding function with respect to land development.

TABLE V1-1 CITY OF WATERLOO IPPW DEPARTMENT

Division	Key Roles & Service Deliverables
Building Standards	<ul style="list-style-type: none"> • Inspections • Plans examination • Building Permits • Demolition Permits
Engineering Services	<ul style="list-style-type: none"> • Site Plan Engineering and Landscape Review • Subdivision Engineering and Landscape Review • Site Alteration Permits (Grading, Filling, Drainage) • Field Inspection Services • Capital Projects • Special Servicing Agreements
Transportation Services	<ul style="list-style-type: none"> • Transportation Operations • Active & Autonomous Transportation • Transportation Engineering
City Utilities	<ul style="list-style-type: none"> • Municipal System Alteration Approvals • Water Operations & Maintenance • Wastewater Operations & Maintenance • Stormwater Operations & Construction • City Utilities Program Management
Planning Approvals	<ul style="list-style-type: none"> • Official Plan Policy • Heritage Planning • Station Area Planning • Environmental Planning • Growth Management • Urban Design • Land Use Zoning • Demolition Control • Site Plan • Consent applications • Plan of Subdivision • Plan of Condominium • Severances, part lot control • Minor Variance (Committee of Adjustment)

9 Applicable Legislation

The Divisions in the IPPW Department conduct work under the authority or direction of various pieces of legislation, namely:

- Planning Act
- Environmental Protection Act
- Fisheries Act
- Professional Engineers Act
- Municipal Drainage Act
- Safe Drinking Water Act
- Ontario Water Resources Act
- Ontario Clean Water Act
- Accessibility for Ontarians with Disabilities Act, 2005, S.O. 2005, c. 11
- Municipal Act
- Building Code Act
- Applicable By-laws of the City of Waterloo and the Regional Municipality of Waterloo

10 Approval from Outside Agencies

Depending on the location and nature of the project, a variety of other agencies may place conditions on the approval of an application. The following list is intended to identify external agencies that may be interested or affected parties for the project, and is not intended to be a full and comprehensive list of all such agencies:

- Area Municipalities
- Canada Post
- Electrical Safety Authority
- Technical Standards & Safety Authority
- First Nations
- Grand River Conservation Authority
- Grand River Transit
- Grand River Accessibility Advisory Committee (GRAAC)
- Hydro One
- ION Light Rail Grand River Transit
- Ministry of Environment, Conservation and Parks (MECP)
- Ministry of Transportation
- Ministry of Natural Resources and Forestry (MNR)
- Municipal Heritage Committee
- Region of Waterloo
- Telecommunications providers
- Utility providers
- Reconciliation, Equity, Diversity, and Inclusion City Staff
- Enova Power Corp. (Enova, formerly: Waterloo North Hydro)
- Waterloo Advisory Committee on Active Transportation (WACAT)

11 Applicable By-laws

In addition to applicable provincial statutes related to development, various by-laws govern the development process in Waterloo. The following list is intended to identify potential affecting by-laws and is not intended to be a full and comprehensive list of all possible applicable by-laws:

- By-law 2003-039 Water Feature By-law and amendment (2004-055)
- By-law 2010-066 Site Alteration
- By-law 2010-073 Noise
- By-law 2013-014 Demolition Control
- By-law 2013-017 Municipal Fence
- By-law 2013-115 Water Supply
- By-law 2013-124 Site Plan Control
- By-law 2014-054 Highways and boulevards bylaw
- By-law 2014-077 Regulation for Municipal Parks and Process for Authorizing Particular Uses within Parks
- By-law 2014-078 Protection of Trees on City Property
- By-law 2015-044 Parkland Dedication
- By-law 2016-050 Signs
- By-laws 2018-037 and 2018-038 Traffic and Parking
- By-law 2018-050 Zoning
- By-law 2020-058 Sanitary and Stormwater Service
- By-law 2022-042 Fees and Charges
- Region of Waterloo By-law 07-029 Work Permit, if applicable
- Region of Waterloo By-law 08-026 Woodland Conservation
- Region of Waterloo By-law 21-036 Sewer Use
- Region of Waterloo By-law 17-007 Waste Management

Relevant by-laws are available online at the City of Waterloo website. It is the applicant's (often the developer representative's) responsibility to ensure that the most recent version of the by-law is used.

12 Additional Background Information & Guidelines

The following list references documents that may be relevant to the design process. Each subsequent Volume may include more detailed lists of reference documents.

National

- Accessible Playgrounds in Canada (CAN/CSA-Z614 Annex H)
- Transportation Association of Canada (TAC) Standards

Provincial

- Low Impact Development Stormwater Management Planning and Design Guide (Credit Valley Conservation Authority and Toronto and Region Conservation Authority, 2010)
- MECP Design Guidelines for Drinking Water Systems
- MECP Design Guidelines for Sewage Works
- MECP Stormwater Management Planning and Design Manual
- MECP Design Criteria for Drinking Water Systems (PIBS 6881e)
- MECP Design Criteria for Sanitary Sewers, Storm Sewers and Force mains for Alterations Authorized Under Environmental Compliance Approval
- MNRF documents
- Ontario Building Code
- Ontario Provincial Standards Specifications
- Ontario Traffic Manual (OTM), including Book 15 and Book 18

- Ontario Regulation 191-11: Integrated Accessibility Standards

Regional

- Region of Waterloo By-laws
- Region of Waterloo Design Guidelines and Supplemental Specifications for Municipal Services (DGSSMS)
- Region of Waterloo Transportation Corridor Design Guidelines for Regional roads
- Regional Road Access Policy
- Transportation Impact Study Guidelines
- Noise Implementation Guideline
- Regional Official Plan with all Appendices
- Regional Road Widening Policies and Procedures

City of Waterloo

- Official Plan
- Sanitary Sewer Master Plan
- Stormwater Master Plan
- Transportation Master Plan
- Sidewalk Policy (PW-002)
- [Accessibility Standards Guide](#)
- Parkland Strategy
- Guidelines for Privately Owned Publically Accessible Spaces (POPS)
- Urban Design Manual
- Urban Forest Policy
- Water Distribution Master Plan
- [FUTURE, UPCOMING] City Storm Sewer Use By-law

Localized

- Laurel Creek Watershed Study
- Northdale Land Use and Community Improvement Plan Study – Urban Design and Built Form Guidelines
- Site Zoning restrictions concerning landscape elements
- Stormwater Management in Uptown Waterloo Report P&PW/EG 4201
- Laurel Greenway Master Plan
- West Side Employment Lands Urban Design Guidelines

Other applicable Design Guidelines for specific areas (e.g., the North Node, the South Node, David Johnston Research and Technology Park, University of Waterloo Northwest Campus Design Guidelines, etc.) It is the Developer Representative's responsibility to ensure that the most recent version of the above background information and guidelines are used.

13 Requirements for Design Professionals

All drawings and reports must be signed and sealed by the professional responsible for the work. The professional must be working under a Certificate of Authorization allowing them to provide services to the public. The professional must be qualified and competent to design the proposed work. Table V1-2 identifies the license requirements for professionals.

TABLE V1-2: REQUIREMENTS FOR PROFESSIONALS

Professional	License
Engineer	Professional Engineers Ontario (PEO)
Landscape Architect	Ontario Association of Landscape Architects (OALA)
Arborist	International Society of Arboriculture (ISA)
Forester	Ontario Professional Foresters Association (OPFA)
Architect	Ontario Association of Architects (OAA)
Geoscientist	Association of Professional Geoscientists (APGO)
Legal Surveyor	Association of Ontario Land Surveyors (AOLS)