



THE MUNICIPAL HOW-TO GUIDE FOR

CSA Community Water Standards

July 2022



The Municipal How-to Guide for CSA Community Water Standards

CSA Group (the Canadian Standards Association) is a leader in standards development, research, education, and advocacy. Standards development promotes safety, environmental stewardship, and economic efficiency through an open, transparent, and consensus-based development process. CSA standards are developed leveraging technical rigor and expertise of our more than 10,000 volunteer members organized in committees with balanced representation to help ensure perspectives of various stakeholders are reflected.

CSA Group's Standards Development organization delivers fully accredited solutions as well as guidance documents and workshop agreements to meet the changing needs of industries and society. Other CSA Group activities include research that explores existing and emerging technologies landscape and provides evidence-based recommendations for future standards development, promotes stakeholder education and usability of standards, and drives advocacy and public awareness for standards across various sectors.

Acknowledgments

CSA Group would like to thank the Councils in the following municipalities for leadership and support of this project. We are especially grateful to their Chief Administrative Officers, Directors of Planning and Engineering, and all the members of municipal staff who participated in the creation of this Guide. Their experiences and materials they shared provided key input for the development of this document.

The City of
**Colwood,
British Columbia**

POPULATION
18,971*

Town of
**High River,
Alberta**

POPULATION
14,324*

Municipality of
**Lakeshore,
Ontario**

POPULATION
40,410*

City of
**Cambridge,
Ontario**

POPULATION
138,479*

We would also like to thank the engineering consulting team at WSP for their contribution:

Meagan Boles, Project Manager

Chen Peng, Planner

Kari Schulz, Planner

Robert Rappolt, Planner

Reid Shepherd, Planner

Mathieu Langlois, Planner

Brittany Shewchuk, Planner

*Statistics Canada, 2021 (<https://census.gc.ca/census-recensement/index-eng.cfm>)

The Guide in a Nutshell

The number of weather-related natural catastrophes in Canada has increased in the last few decades. Damages caused by floods and rainstorms comprise a significant portion of the financial costs associated with these events. There are several factors contributing to this trend, including a high number of properties located in flood-prone areas, loss of permeable surfaces due to urbanization, aging infrastructure, and changes in the intensity, frequency, or duration of precipitations due to climate change.

Municipalities shoulder the burden of responding to these events and their aftermath. They are looking for ways to protect their communities before the next catastrophe hits. The suite of Community Water Standards developed by CSA Group can help support efforts toward building flood-resilient cities, towns, and hamlets – regardless of their size.

Incorporating these standards by reference into municipal plans and bylaws can help consistently apply best practices in the design, construction, and management of water infrastructure and give the building community clarity on expectations. Using

the trusted, credible CSA Group-developed resources can help municipalities save time and cost and gain public confidence in measures taken to protect communities.

This Guide can help urban planners, managers, and elected municipal officials understand the standards they can leverage and use to support their municipal objectives. The Guide also includes sample language municipalities can use when referencing standards in their policies, bylaws, and municipal documents.

To develop this Guide, CSA Group collaborated with four Canadian municipalities: Colwood, British Columbia; High River, Alberta; Lakeshore, Ontario; and Cambridge, Ontario. Together with engineering consultant, WSP, they shared documents and experiences that helped develop this *Municipal How-to Guide*. Validated by other municipalities from different parts of the country, this Guide provides a three-step process for incorporating CSA Group Community Water Standards into municipal planning and approval processes.

Table of Contents

- How can this Guide Help your Municipality? 6**
- What will you find in this guide? 7**
 - Three Steps to Integrating CSA Standards into municipal planning and approval processes 7
- Step 1 - Assemble your toolbox 8**
 - Add new tools: CSA Group community water standards 12
- Step 2 - Identify the Gaps 16**
- Step 3 - Develop Policies and Guidelines - Sample Language 20**
 - Regional Plan 21
 - Official Community Plan or Development Plan 22
 - Zoning Bylaw 24
 - Development Permit Areas (British Columbia) 25
 - Stormwater Management Plan 26
 - Subdivision Bylaw Or Development Manual 28
 - Subdivision Agreement or Development Agreement 29
 - Erosion and Sediment Control Plans 30
 - Subdivision Application / Development Permit Application 30
- Other Opportunities to Use CSA Community 32**
- Appendix A: Standard Terms 34**
- Appendix B: CSA Group Community Water Standards 36**
- Appendix C: How Municipalities Integrated CSA Community Water Standards Into
Their Planning Processes 40**

How Can This Guide Help your Municipality?

In response to the urgent need for municipalities to build flood resilience into their communities, CSA Group has facilitated the development of a suite of Community Water Standards to manage stormwater and the entire stormwater system as well as protect water quality.

The implementation of CSA Standards and Codes is commonplace in the building and electrical sectors but is an emerging approach to water management. Municipalities have called for more detailed guidance on how to apply these standards and integrate them into their strategic documents. To answer this call, CSA Group developed this *Municipal How-to Guide*.

The Guide provides a detailed framework that shows how CSA Standards can be integrated into their planning and approval

processes and incorporated by reference into their governance documents such as bylaws, policy and planning documents, development plans, requests for proposals, contracts, etc. The Guide also includes examples of policy language and suggestions for where standards can be referenced. This can supplement existing resources or provide new ones, saving municipalities valuable time and money.

The Guide can be used by municipalities of any size but may be particularly helpful to those with limited staff, expertise, or financial resources to develop similar guidance on their own. It can help managers, urban planners, development staff, and municipal officials understand how CSA Standards can be leveraged to save time and money. By not "re-inventing the wheel", in-house resources can be focused on other areas.

What will you find in this guide?

Descriptions

of the CSA Standards for flood resiliency, stormwater, bioretention systems, and erosion and sediment control

Easy steps

municipalities can follow to integrate the standards into their planning and approval processes.

Examples

of bylaw and policy wording to “cut and paste” into your documents.

Three Steps to Integrating CSA Standards into municipal planning and approval processes



Assemble
your toolbox



Identify
the gaps



Develop
policies
and guidelines



Step 1

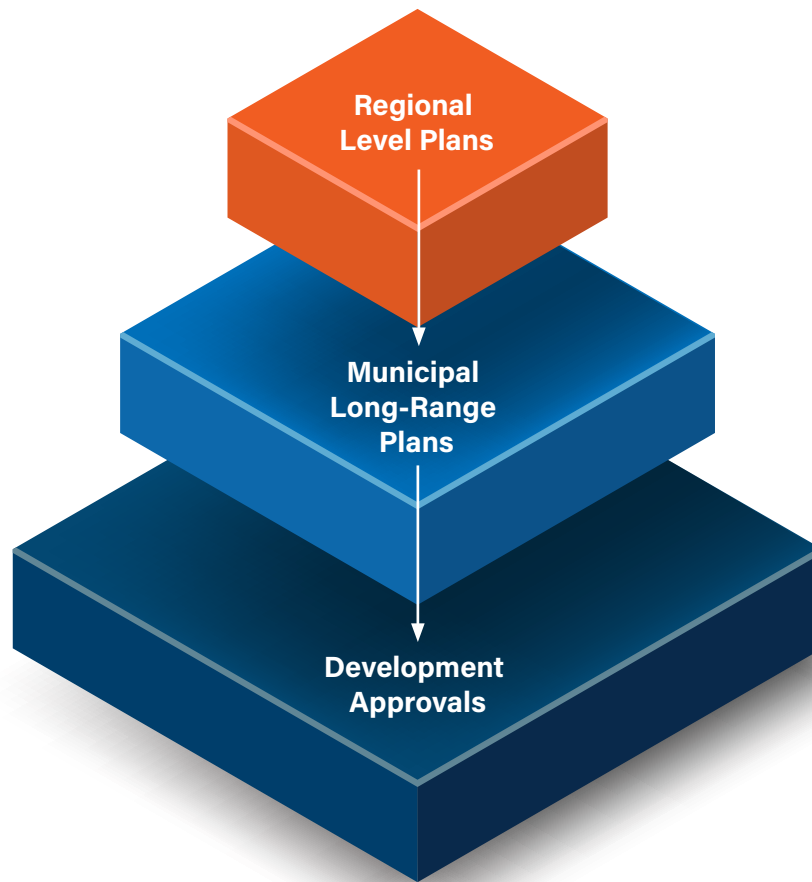
Assemble your Toolbox

Collect the tools you already have

Before you can fully understand how CSA Group Community Water Standards can help support your municipality, the first step is to understand what “tools” you already have in place. By identifying existing municipal bylaws and other strategic documents, and creating their inventory, you will have a good starting point.



This image illustrates the hierarchy of strategic municipal documents and how they relate to various levels of planning:



Regional-Level Plans - policy documents

- Regional Plan
- Conservation Authority Requirements (Ontario only)

Municipal Long-Range Plans - policy documents

- Official Community Plan / Municipal Development Plan
- Zoning Bylaw / Land Use Bylaw
- Stormwater Management Plan
- Flood Mitigation Plan
- Development Permit Area (British Columbia only)
- Sustainability Strategies



Development Approvals - technical/engineering documents

- Subdivision and Development Bylaw / Development Manual
- Subdivision Agreement / Development Agreement
- Erosion and Sediment Control Guidelines / Bylaw

Definitions of document types are included in [Appendix A](#). Note that there may be variations by region. Your municipality or jurisdiction may also have additional bylaws or documents not listed here.

This table lists some common document titles used for bylaws, policies, plans, and manuals in different provinces.

Regional Plan	Master Community Development Plan	Zoning Bylaw	Stormwater Management Plan	Flood Mitigation Plan	Subdivision Bylaw	Subdivision Agreement
British Columbia						
<ul style="list-style-type: none"> Regional Growth Strategy 	<ul style="list-style-type: none"> Official Community Plan 	<ul style="list-style-type: none"> Land Use Bylaw Zoning Bylaw 	<ul style="list-style-type: none"> Integrated Stormwater Management Plan 	<ul style="list-style-type: none"> Flood Plain By-law 	<ul style="list-style-type: none"> Subdivision Servicing Bylaw 	<ul style="list-style-type: none"> Phased Development Agreement
Alberta						
<ul style="list-style-type: none"> Regional Plan Intermunicipal Development Plan 	<ul style="list-style-type: none"> Municipal Development Plan 	<ul style="list-style-type: none"> Land Use Bylaw Zoning Bylaw 	<ul style="list-style-type: none"> Stormwater Management Plan 	<ul style="list-style-type: none"> Flood Resilience Plan Flood Mitigation Strategy (no standard term) 	<ul style="list-style-type: none"> Design and Construction Standards Design Guidelines for Subdivision Servicing (no standard term) 	<ul style="list-style-type: none"> Servicing Agreement Development Agreement (dependent on municipality)
Saskatchewan						
<ul style="list-style-type: none"> Regional Plan 	<ul style="list-style-type: none"> Official Community Plan 	<ul style="list-style-type: none"> Zoning Bylaw 	<ul style="list-style-type: none"> Stormwater Management Plan 	<ul style="list-style-type: none"> Flood Mitigation Plan Flood Control Strategy 	<ul style="list-style-type: none"> Standard Servicing Conditions 	<ul style="list-style-type: none"> Servicing Agreement
Manitoba						
<ul style="list-style-type: none"> Regional Plan 	<ul style="list-style-type: none"> Development Plan 	<ul style="list-style-type: none"> Zoning Bylaw 	<ul style="list-style-type: none"> Stormwater Management Plan 	<ul style="list-style-type: none"> Flood Mitigation Plan 	<ul style="list-style-type: none"> Standard Construction Specifications 	<ul style="list-style-type: none"> Development Agreement
Ontario						
<ul style="list-style-type: none"> Regional Official Plan 	<ul style="list-style-type: none"> Official Plan 	<ul style="list-style-type: none"> Zoning By-law 	<ul style="list-style-type: none"> Stormwater Management Master Plan 	<ul style="list-style-type: none"> No standard term 	<ul style="list-style-type: none"> No standard term 	<ul style="list-style-type: none"> Registered Plan of Subdivision

Regional Plan	Master Community Development Plan	Zoning Bylaw	Stormwater Management Plan	Flood Mitigation Plan	Subdivision Bylaw	Subdivision Agreement
Quebec						
▪ Schéma d'aménagement et de développement	▪ Plan d'urbanisme	▪ Règlement de zonage	▪ Plan de gestion des eaux pluviales	▪ Plan de protection du territoire face aux inondations	▪ Règlement de lotissement	▪ Règlement sur les ententes relatives à des travaux municipaux
New Brunswick						
▪ No standard term	▪ Municipal Plan	▪ Zoning By-law	▪ Stormwater Management Plan	▪ No standard term	▪ Subdivision By-law	▪ Subdivision Agreement
Nova Scotia						
▪ Regional Planning Strategy	▪ Municipal Planning Strategy	▪ Land Use By-law	▪ Stormwater Management Plan	▪ No standard term	▪ Subdivision By-law	▪ Development Agreement
PEI						
▪ No standard term	▪ Official Plan	▪ Land Use By-law	▪ Stormwater Management Plan	▪ No standard term	▪ Subdivision By-law	▪ No standard term
Newfoundland						
▪ No standard term	▪ Municipal Plan	▪ Development Regulations	▪ Stormwater Management Plan	▪ No standard term	▪ No standard term	▪ No standard term

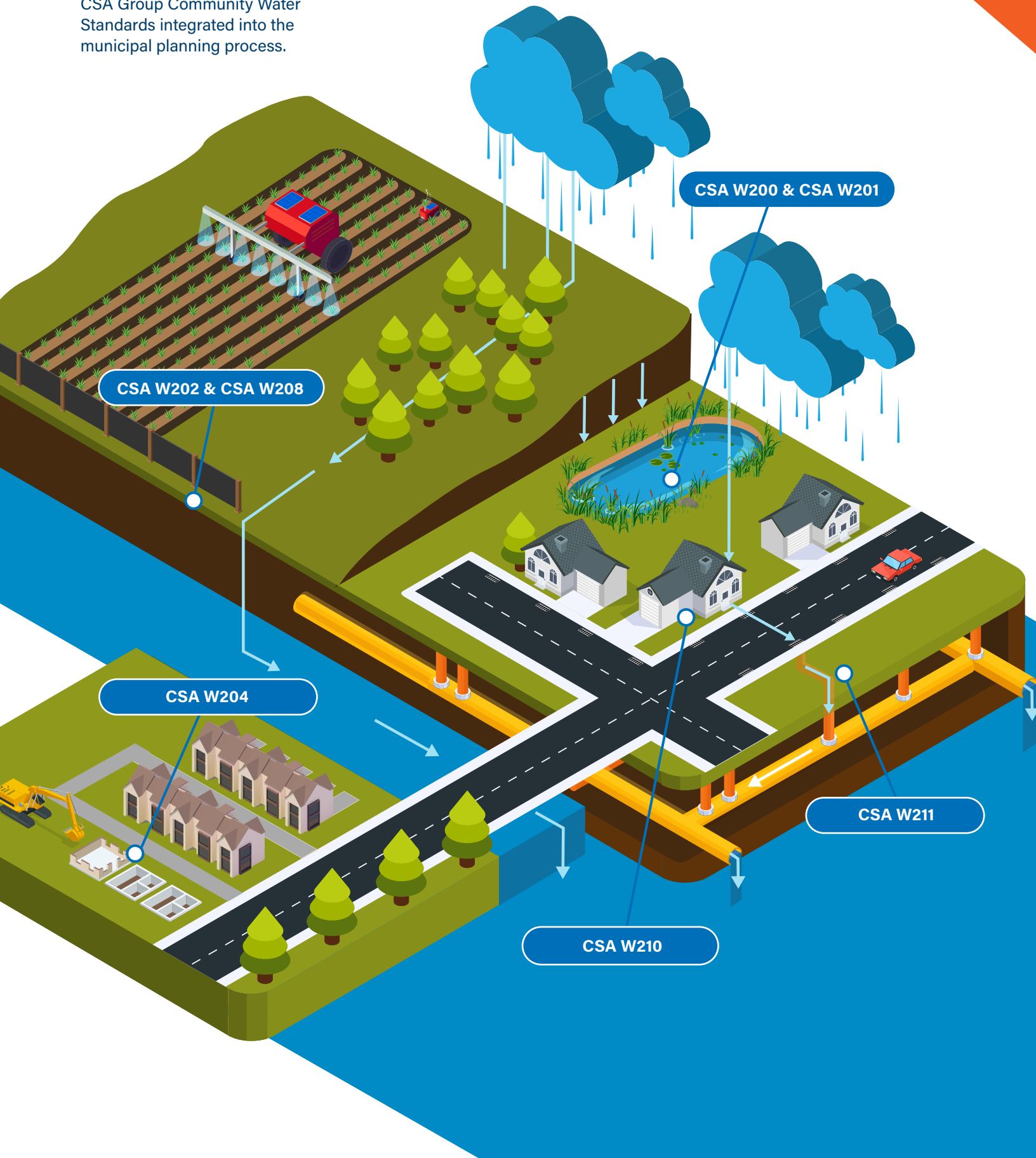
Definitions of document types are included in Appendix A. Note that there may be variations by region. Your municipality or jurisdiction may also have additional bylaws or documents not listed here.

Add new tools: CSA Group community water standards

Get familiar with the CSA Group Community Water Standards and how they can fit into various provincial and municipal plans, policies, and guidelines.

Stormwater Systems Management and Flood Resiliency	Low Impact Development	Erosion and Sediment Control
<p>CSA W211:21 <i>Management standard for stormwater systems</i></p> <p>PURPOSE: Provide requirements and recommendations for the management of stormwater systems.</p> <p>FUNCTION: Applies to organizations that own, manage, or operate stormwater systems</p>	<p>CSA W200-18 <i>Design of bioretention systems</i></p> <p>PURPOSE: Provide guidance for the development of three types of bioretention systems.</p> <p>FUNCTION: Applies to those who design or evaluate bioretention systems, such as landscape architects, engineers, geotechnical professionals, arborists, etc.</p>	<p>CAN/CSA-W202-18 <i>Erosion and sediment control inspection and monitoring</i></p> <p>PURPOSE: Provide minimum requirements for the inspection of erosion and sediment control measures during construction and water quality criteria.</p> <p>FUNCTION: Applies to municipal governments (erosion and sediment control inspectors), regulatory agencies, contractors, consultants, etc.</p>
<p>CSA W204:19 <i>Flood resilient design of new residential communities</i></p> <p>PURPOSE: Provide requirements and guidance for the flood-resilient design of new residential communities.</p> <p>FUNCTION: Applies to a variety of roles, including building inspectors, community design consultants, developers, home builders, etc.</p>	<p>CSA W201-18 <i>Construction of bioretention systems</i></p> <p>PURPOSE: Provide construction considerations for the development of bioretention systems.</p> <p>FUNCTION: Applies to those who design or evaluate bioretention systems, such as landscape architects, engineers, geotechnical professionals, arborists, etc.</p>	<p>CSA W208:20 <i>Erosion and sediment control installation and maintenance</i></p> <p>PURPOSE: Provide a framework for the installation and maintenance of erosion and sediment control measures as required by an erosion and sediment control plan.</p> <p>FUNCTION: Applies to municipal governments (erosion and sediment control inspectors), regulatory agencies, contractors, consultants, etc.</p>
<p>CSA W210:21 <i>Prioritization of flood risk in existing communities</i></p> <p>PURPOSE: Provide guidance to help prioritize where flood risk-reduction work should occur within existing communities.</p> <p>FUNCTION: Applies to a variety of municipalities and regional governments, Indigenous communities, and authorities in charge of managing and developing community infrastructure.</p>	<p>More detailed descriptions of these standards are included in Appendix B.</p>	

CSA Group Community Water Standards integrated into the municipal planning process.



CSA W202 & CSA W208

CSA W200 & CSA W201

CSA W204

CSA W210

CSA W211

This table illustrates how the specific CSA Group Community Water Standards can be integrated into the municipal planning process. Additional examples of how the City of Colwood, British Columbia; Town of High River, Alberta; Municipality of Lakeshore, Ontario; and City of Cambridge, Ontario, integrated CSA Standards into their processes are available in Appendix C.

Figure 2: Integrating CSA Group Community Water Standards into the municipal planning process

	Overarching Standards		
	Stormwater Management and Flood Resiliency		
Applicable Provincial and Municipal Plans, Policies and Guidelines	CSA W211:21 <i>Management standard for stormwater systems</i>	CSA W204:19 <i>Flood resilient design of new residential communities</i>	CSA W210:21 <i>Prioritization of flood risk in existing communities</i>
Regional Plans and Documents			
Regional Plan			
Conservation Authority Requirements (Ontario)			
Municipal Long Range Planning Documents			
Official Community Plan			
Zoning Bylaw			
Stormwater Master Plan			
Flood Mitigation Plan			
Development Approval Documents			
Subdivision Bylaw			
Subdivision Agreement			
Erosion and Sediment Control Guidelines			
Internal Operations Documents			
Operations / Maintenance Manual*			

*If available

	Applicable
	Probable
	Not Applicable

Design and Construction Standards			
Low Impact Development		Erosion and Sediment Control	
CSA W200-18 <i>Design of bioretention systems</i>	CSA W201-18 <i>Construction of bioretention systems</i>	CAN/CSA-W202-18 <i>Erosion and sediment control inspection and monitoring</i>	CSA W208-20 <i>Erosion and sediment control installation and maintenance</i>
Regional Plans and Documents			
Municipal Long Range Planning Documents			
Development Approval Documents			
Internal Operations Documents			



Step 2

Identify the Gaps

In Step 1, you assembled your toolbox using your existing municipal documents and the suite of CSA Group Community Water Standards. The next step is to understand the gaps in your processes and see where these Standards can be integrated.

The following questions will help you identify gaps and the applicable CSA Group Community Water Standards.

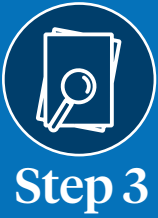
	YES	NO	Relevant Standards
Does the Regional Plan have a hazard-related policy or flood planning section?	See "Basic Regional Plan Policy"	See "Comprehensive Regional Plan Policy"	<ul style="list-style-type: none"> ▪ W204:19 ▪ W210:21
Does your Official Community Plan or Development Plan have a hazard-related policy or flood planning section?	See "Basic Official Community Plan or Development Plan Policy"	See "Comprehensive Official Community Plan Policy"	<ul style="list-style-type: none"> ▪ W204:19 ▪ W210:21
Does your Official Community Plan or Development Plan require or encourage low-impact development and/or green infrastructure?	See "Basic Official Community Plan or Development Plan Policy"	See "Comprehensive Official Community Plan Policy"	<ul style="list-style-type: none"> ▪ W200-18 ▪ W201-18
Does your municipal Zoning Bylaw or Land Use Bylaw limit development in areas subject to flooding?	See "Basic Zoning Bylaw Regulation"	See "Comprehensive Zoning Bylaw Regulation"	<ul style="list-style-type: none"> ▪ W204:19 ▪ W210:21
Does your municipal Zoning Bylaw or Land Use Bylaw promote safer building and rebuilding through required elevations above base flood elevation?	See "Basic Zoning Bylaw Regulation"	See "Comprehensive Zoning Bylaw Regulation"	<ul style="list-style-type: none"> ▪ W204:19 ▪ W210:21
Has your municipality established Development Permit Areas to regulate development within and abutting flood-prone areas? (applies to British Columbia only)	See "Basic Development Permit Area Regulation"	See "Comprehensive Development Permit Area Regulation"	<ul style="list-style-type: none"> ▪ W204:19 ▪ W210:21
Does your municipality's Stormwater Management Plan encourage low-impact development and/or green infrastructure for stormwater management?	See "Basic Stormwater Management Plan Provision"	See "Comprehensive Stormwater Management Plan Provision"	<ul style="list-style-type: none"> ▪ W200-18 ▪ W201-18
Does your municipality have a long-term management plan for your stormwater system? This plan would go beyond management of stormwater and would include all the key aspects of managing the stormwater system, such as a description of existing stormwater system assets, roles and responsibilities, and identification of supporting information and plans that impact the stormwater systems.	See "Comprehensive Stormwater Management Plan Provision"	See "Comprehensive Stormwater Management Plan Provision"	<ul style="list-style-type: none"> ▪ W211:21

	YES	NO	Relevant Standards
Does your municipality's Subdivision Bylaw or Development Manual for development approvals address stormwater management and erosion and sediment control?	See "Basic Subdivision Bylaw or Development Manual Provision"	See "Comprehensive Subdivision Bylaw or Development Manual Provision"	<ul style="list-style-type: none"> ▪ W200-18 ▪ W201-18 ▪ W202-18 ▪ W208:20
Does your municipality require developers to enter into a subdivision or development agreement?	See "Basic Subdivision Agreement or Development Agreement Provision"	N/A	<ul style="list-style-type: none"> ▪ W200-18 ▪ W201-18 ▪ W202-18 ▪ W208:20
Does your municipality's subdivision or development agreement take into account the prioritization of flood risk areas, flood-resilient design and/or require or encourage low impact development strategies?	N/A	See "Specific Subdivision Agreement or Development Agreement Provision"	<ul style="list-style-type: none"> ▪ W200-18 ▪ W201-18 ▪ W204:19 ▪ W210:21
Does your municipality (or Conservation Authority) require developers to prepare and submit an Erosion and Sediment Control Plan?	See "Basic Erosion and Sediment Control Provision"	N/A	<ul style="list-style-type: none"> ▪ W202-18 ▪ W208:20
Does your municipality's subdivision and/or development permit applications list the requirements for submission?	See "Basic Subdivision Application or Development Permit Application Provision"	N/A	<ul style="list-style-type: none"> ▪ W200-18 ▪ W201-18 ▪ W202-18 ▪ W208:20 ▪ W211:21



Understand the gaps in your processes and see where these Standards can be integrated to fill those gaps.





Develop Policies and Guidelines

Sample language

In step 2, you identified your municipality's gaps and saw which specific CSA Group Community Water Standards can help fill these gaps. The next step is to integrate these standards by reference, where applicable, into your existing policies and guidelines or develop new ones.

Whether or not you are ready to make changes to your key policies and guidelines, being aware of and understanding how you can leverage CSA Group Standards prepares you for such changes when an opportunity arises.

The examples in this section illustrate the most common areas where CSA Group Community Water Standards can support municipal planning and development processes. While it is not strictly necessary to implement a CSA Standard in its entirety, it is strongly recommended. Incorporating the whole standard by reference keeps all the benefits and consistency it provides and helps ensure policy references stay current with regular CSA Standards updates and revisions.

The examples of policy language in this section can be considered a starting point, and can be modified to meet specific needs of your municipality.

Definitions of document types are included in Appendix A. Note there may be variations by region. Your municipality or jurisdiction may also have additional bylaws or documents not listed in this section.

Regional Plan

A regional plan provides a framework for the larger region and, therefore, is not under the jurisdiction of the municipality to amend. However, it is recommended that proposed amendments are brought forward to the region for consideration.

Regional plan policies are intended to provide direction and context for official community plans or development plans. Below are two sample policies – a basic policy referencing the relevant CSA Standards and a more comprehensive policy if the regional plan lacks policies related to development in flood-prone or hazardous areas. Note that the CSA Standards may be referenced generally in the policy or specified in the policy.

Basic Regional Plan Policy

“Drainage and surface water shall be managed throughout the region using internationally recognized Canadian Standards Association (CSA) tools.”

OR

“Drainage and surface water shall be managed throughout the region in compliance with CSA W211:21 Management standard for stormwater systems; CSA W204:19, Flood resilient design of new residential communities; and CSA W210:21, Prioritization of flood risk in existing communities.”



Comprehensive Regional Plan Policy

“To protect communities from the risk of flooding, development shall be restricted in areas identified as a flood risk. Within these flood risk areas:

- a.** *Infill of existing communities may be permitted;*
- b.** *Growth shall be directed away from (low lying) wetland areas; and*
- c.** *Drainage and surface water shall be managed throughout the region using internationally recognized Canadian Standards Association (CSA) tools; or
Drainage and surface water shall be managed throughout the region in compliance with CSA Group Standards CSA W211:21, Management standard for stormwater systems; CSA W204:19, Flood resilient design of new residential communities; and CSA W210:21, Prioritization of flood risk in existing communities.”*



Effective Integration

Integrating hazard and/or flood mitigation policies into the official community plan or development plan can elevate the importance of flood mitigation throughout the planning framework.

Official Community Plan or Development Plan

Official community plans or development plans describe the long-term vision of communities and guide decisions on municipal land use. Official community plan policies impact a community's sustainability and resilience. The following are several sample policies – basic policies for greenfield and existing residential development and more comprehensive policies for greenfield and existing residential development. The Official Community Plan should also contain maps of the hazardous areas to ensure development is limited.



Basic Official Community Plan or Development Plan Policy

POLICY FOR GREENFIELD RESIDENTIAL DEVELOPMENT:

“New residential development shall be designed in compliance with the CSA Group Standard CSA W204:19 Flood resilient design of new residential communities.”

POLICY FOR EXISTING RESIDENTIAL DEVELOPMENT:

“Existing residential development shall be prioritized for flood protection in compliance with CSA W210:21, Prioritization of flood risk in existing communities.”

POLICY FOR LOW-IMPACT DEVELOPMENT:

“The municipality shall encourage the use of innovative low-impact development design, as per CSA W200-18, Design of bioretention systems and CSA W201-18, Construction of bioretention systems, in new development and redevelopment in addition to, or as an alternative to, the required stormwater management quantity facilities.”

Comprehensive Official Community Plan Policy

POLICY FOR GREENFIELD RESIDENTIAL DEVELOPMENT:

“Development in the flood-prone area may be permitted provided that existing or potential hazards can be mitigated through accepted engineering techniques and resource management practices which meet the approval of the Municipality, [the relevant Conservation Authority], and the other appropriate agencies as necessary, and where the risk to public safety and other effects can be mitigated in accordance with the following policies and standards:

- a.** *The flooding and erosion hazards can be safely addressed, and the development and site alteration is carried out in accordance with standards (e.g., CSA W202-18, CSA W208:20)*
- b.** *Existing hazards are not aggravated, or new hazards are not created;*
- c.** *No adverse environmental impacts and no negative impact on natural heritage features will result. An Environmental Impact Assessment may be required to demonstrate that no adverse environmental impacts will result;*
- d.** *Vehicles and people have a way of safe ingress and egress during times of flooding, erosion, or other emergencies; and*
- e.** *The development is carried out in accordance with CSA W204:19, Flood resilient design of new residential communities.”*



POLICY FOR EXISTING RESIDENTIAL DEVELOPMENT:

“Development in the flood-prone area may be permitted provided that existing or potential hazards can be mitigated through accepted engineering techniques and resource management practices which meet the approval of the Municipality, [the relevant Conservation Authority], and the other appropriate agencies as necessary, and where the risk to public safety and other effects can be mitigated in accordance with the following policies and standards:

- a.** *Existing developments that are prone to flooding shall be encouraged to implement additional flood mitigation measures.*
- b.** *Existing residential development shall be prioritized for flood protection in compliance with the CSA W210:21, Prioritization of flood risk in existing communities.”*

POLICY FOR LOW-IMPACT DEVELOPMENT:

“Low-Impact Development is an innovative approach to land development that mimics the natural movement of water in order to manage stormwater (rainwater and urban runoff) close to where the rain falls. Bioretention is a form of low-impact development and is an innovative stormwater management approach. It is a surface and sub-surface water filtration, infiltration, and evapotranspiration system, which uses designs for water retention above and below ground along with plant materials and underlying soils (bioretention media and native subgrade soils) to remove contaminants and reduce stormwater runoff rates and volumes.

The following policies are designed to promote low-impact development and the use of bioretention systems:

- a.** *In order to reduce surface runoff, the percentage of impervious paving and building areas on a parcel shall be limited as to what is detailed in the zoning bylaw.*
- b.** *Planting of trees or other shrubbery within road allowance boulevards is encouraged and is detailed in the subdivision servicing bylaw.*
- c.** *Native trees and vegetation should be maintained to reduce the effect of rainfall on stormwater flows, where possible, at the time of approval of rezoning and other discretionary development applications.*
- d.** *Where retention of native vegetation is not possible, re-vegetation should be completed to reduce the effect of rainfall on stormwater flows, where possible, at the time of approval of rezoning and other discretionary development applications.*
- e.** *The use of bioretention systems for stormwater management is encouraged, as per CSA W200-18, Design of bioretention systems, and CSA W201-18, Construction of bioretention systems, in new development and redevelopment in addition to, or as an alternative to, the required stormwater management quantity facilities.”*

Zoning Bylaw

Zoning bylaws implement the policies of the Official Community Plan or Development Plan with more detailed regulations and are one of the most common tools available to community planners. Flood-prone areas are typically zoned accordingly, and development is already limited within those zones. However, it is recommended that a section related to flooding be included in the general provisions section of the zoning bylaw to ensure the applicability of the regulation to all zones

Basic Zoning Bylaw Regulation

"No new structures or buildings shall be constructed within the flood plain.

New greenfield (or brownfield) development shall comply with CSA W204:19, Flood resilient design of new residential communities."



Comprehensive Zoning Bylaw Regulation

"The intent of the flood regulations is to limit development in flood-prone areas and to ensure other areas are flood resilient. The following regulations apply to all zones:

- a.** *Individual lots, buildings, and streets should be designed and located to minimize the impact on the protected lands;*
- b.** *The design should protect floodplains, wetlands, steep slopes, and shoreline and bluff impact zones from clearing, grading, filling, and construction impacts;*
- c.** *The design should avoid siting new construction on prominent hilltops or ridges;*
- d.** *Permanent structures shall be protected from flooding by raising the building site to the flood protection level, which is 60 cm above the flood level;*
- e.** *The design should protect the character of the site by retaining existing trees or native vegetation between housing and roads, setting back development from roads, or designating new landscaping as a buffer;*
- f.** *New greenfield (or brownfield) development shall comply with CSA W204:19, Flood resilient design of new residential communities."*

Development Permit Areas (British Columbia)

Development Permit Areas (DPA) and Guidelines support the goals, objectives, and policies of the Official Community Plan. The DPAs regulate development within abutting flood risk areas and require a development application. There are a number of plans and studies that may be required, and integrating standards into DPA requirements can support the policy objectives of a Basic Development Permit Area Regulation.

Basic Development Permit Area Regulation

"Development within the Development Permit Area shall comply with CSA W204:19, Flood resilient design of new residential communities"

"Developments shall be prioritized for flood protection measures as per CSA W210:21, Prioritization of flood risk in existing communities."



Comprehensive Development Permit Area Regulation

"This Development Permit Area is established for the protection of development from hazardous conditions.

The Development Permit Area guidelines apply to lands designated as Primary Floodways, Secondary Floodways, and Debris Hazard Areas. The Development Permit Area guidelines also apply to parcels abutting areas designated as Secondary Floodways.

- a.** *Development is restricted within any Primary Floodway. Buildings and fill may only be placed within the Primary Floodway in accordance with specific conditions laid out in the DPA.*
- b.** *Development within or abutting Secondary Floodways is subject to regulations, including a requirement for a Qualified Professional (QP) to certify the development, regulations on placement of fill, and maintaining watercourse setbacks.*
- c.** *Development within Debris Flow Hazard Areas is subject to regulations including avoidance of hazard where possible, the requirement for a QP to certify the development, and policy regarding off-site protective works."*



Development Permit Areas

Municipal governments in British Columbia have the authority to designate Development Permit Areas. These areas identify locations that need special treatment for certain purposes including the protection of development on flood-prone lands.

Stormwater Management Plan

A stormwater management plan is a set of drawings and other documents that comprise all the information and specifications for the programs, drainage systems, structures, concepts, and techniques intended to maintain or restore the quality and quantity of stormwater runoff to pre-development levels. Stormwater management plans may be adopted by bylaw.

Reference to water standards in stormwater management plans, which are in turn referenced in municipal planning and development documents, is another way to integrate standards into policy. Stormwater management plans can be referenced in official community plans, zoning bylaws, subdivision bylaws, subdivision agreement/development agreements, etc.



Basic Stormwater Management Plan Provision

POLICY FOR LOW-IMPACT DEVELOPMENT:

“New development projects shall be designed and constructed using low-impact development techniques in accordance with CSA W200-18, Design of bioretention systems, and CSA W201-18, Construction of bioretention systems”

POLICY FOR MANAGEMENT STANDARD FOR STORMWATER SYSTEMS:

“The planning for management of stormwater systems shall be done in accordance with CSA W211:21, Management standard for stormwater systems.”

Comprehensive Stormwater Management Plan Provision

POLICY FOR LOW-IMPACT DEVELOPMENT:

“New development projects shall be designed using low-impact development techniques, which are applied early in the design process to preserve natural areas, reduce impervious cover, distribute runoff, and use pervious areas to more effectively treat stormwater runoff. Site design shall address and consider open space protection, impervious cover minimization, runoff distribution and minimization, and runoff utilization, as outlined below:

1. Open space protection and restoration

- a. *Conserve and protect existing natural areas (upland and wetland);*
- b. *Implement reforestation efforts;*
- c. *Re-establish dominant forest type;*
- d. *Restore wetlands;*
- e. *Establish or protect stream, shoreline, and wetland buffers; and*
- f. *Re-establish native vegetation into the landscape.*



2. Reduction of impervious cover

- a. *Reduce new impervious cover through redevelopment of existing sites and use of existing roadways, trails, etc.;*
- b. *Minimize street width, parking space size, driveway length, and sidewalk width; and*
- c. *Reduce impervious surface footprint (e.g., two-story buildings, parking structures).*

3. Distribution and minimization of runoff

- a. *Utilize vegetated areas for stormwater treatment (e.g., parking lot islands, vegetated areas along property boundaries, front and rear yards, building landscaping);*
- b. *Direct impervious surface runoff to vegetated areas or to designed treatment areas (roofs, parking, and driveways drain to pervious areas, not directly to storm sewer or other conveyances); and*
- c. *Encourage infiltration and soil storage of runoff through grass channels, soil compost amendment, vegetated swales, rain gardens, etc.*

4. Low-Impact Development treatment train tool

- a. *Utilize a connected network of pre-treatment practices and proprietary devices.*

5. Runoff utilization

- a. *Capture and store runoff for use for irrigation in areas where irrigation is necessary.*

6. Utilization of green infrastructure

- a. *Design and construction of bioretention systems in accordance with CSA W200-18, Design of bioretention systems, and CSA W201-18, Construction of bioretention systems."*

POLICY FOR MANAGEMENT STANDARD FOR STORMWATER SYSTEMS:

"Maintenance comprises the inspection of the system, record keeping, regular maintenance, and the analysis of the data related to problems. Routine inspection, record keeping, and regular maintenance are essential for the effective maintenance of the stormwater drainage system. The maintenance of stormwater management facilities shall be done in accordance with CSA W211:21, Management standard for stormwater systems."

Subdivision Bylaw Or Development Manual

To aid developers during the development process, municipalities may adopt a subdivision bylaw or create a development manual outlining the engineering standards and requirements for stormwater management and erosion and sediment control.



Basic Subdivision Bylaw or Development Manual Provision

POLICY FOR LOW-IMPACT DEVELOPMENT:

“The design and construction of bioretention systems shall be in accordance with CSA W200-18, Design of bioretention systems, and CSA W201-18, Construction of bioretention systems.”

POLICY FOR EROSION AND SEDIMENT CONTROL:

“The erosion and sediment control inspection and monitoring protocol as specified by CAN/CSA-W202-18, Erosion and sediment control inspection and monitoring, shall be followed.”

“The erosion and sediment control installation and maintenance protocol as specified by CSA W208:20, Erosion and sediment control installation and maintenance, shall be followed.”

Comprehensive Subdivision Bylaw or Development Manual Provision

POLICY FOR LOW-IMPACT DEVELOPMENT:

“Bioretention systems are designed to store and infiltrate stormwater runoff. Water quality is improved through the use of bioretention, as particles are filtered out as water passes through the filter bed. If the underlying soil has a low infiltration rate, an under drain may be required to prevent standing water. The design and construction of these systems shall be in accordance with the guidance in CSA W200-18, Design of bioretention systems, and CSA W201-18, Construction of bioretention systems.”

POLICY FOR EROSION AND SEDIMENT CONTROL:

“Erosion prevention is the preferred mitigation measure for eliminating and/or reducing the potential for sedimentation. The developer shall take the necessary precautions to prevent erosion and sedimentation of sewers, ditches, watercourses, culverts, slopes, and other related features both within the plan and down gradient from the plan during and after the completion of construction. The developer is responsible for the implementation of the standard on-site controls during construction and the performance of any constructed control features. The Erosion and Sediment Controls shall be installed and maintained as per CSA W208:20, Erosion and sediment control installation and maintenance.”

“The intention of monitoring is to provide environmental protection and compliance with all applicable legislation while contributing to the overall success of a project. An effective inspection and monitoring program should include the following:

- a.** *identification of personnel;*
- b.** *details and locations of the environmental constraints for an undertaking, including maps, reports, approvals, and permits;*
- c.** *construction drawings detailing the erosion and sediment controls installed;*
- d.** *identification of high-risk areas; and inspection schedule.*

The erosion and sediment control monitoring protocol as specified by CAN/CSA-W202-18, Erosion and sediment control inspection and monitoring, shall be followed.”

Subdivision Agreement or Development Agreement

The subdivision or development agreement details the obligations of both parties and lays out the various standards and conditions that will control the development of the subject property. The agreement ensures that the development proceeds in a manner acceptable to both the municipality and developer.



Basic Subdivision Agreement or Development Agreement Provision

PROVISION FOR EROSION AND SEDIMENT CONTROL:

"The Owner agrees to implement CAN/CSA-W202-18, Erosion and sediment control inspection and monitoring, and CSA W208:20, Erosion and sediment control installation and maintenance, as part of the Erosion and Sediment Control Plan."

PROVISION FOR STORMWATER MANAGEMENT:

"The Owner shall provide a stormwater management report for internal drainage of the subject land to the satisfaction of the municipality and shall include a description of the stormwater system as per CSA 211:21, Management standard for stormwater systems."

"In an effort to improve the quality of stormwater runoff, the Owner shall utilize bioretention systems in accordance with CSA W200-18, Design of bioretention systems and CSA W201-18, Construction of bioretention systems."

Specific Subdivision Agreement or Development Agreement Provision

PROVISION FOR STORMWATER MANAGEMENT, FLOOD RESILIENCY, AND LOW-IMPACT DEVELOPMENT:

"In an effort to promote flood-resilient design in new residential communities, especially into prioritized flood risk sectors, the owner agrees to implement CSA W204:19, Flood resilient design of new residential communities, and, when the municipality deems it advisable, to implement CSA W200-18, Design of bioretention systems, and CSA W201-18, Construction of bioretention systems."

"In an effort to address flood risk in existing communities, especially into prioritized flood risk sectors and areas prone to redevelopment, the owner agrees to implement CSA W210:21, Prioritization of flood risk in existing communities, and, when the municipality deems it advisable, to implement CSA W200-18, Design of bioretention systems, and CSA W201-18, Construction of bioretention systems."

Erosion and Sediment Control Plans

Erosion and Sediment Control Plans are the key to managing erosion and sediment on construction and subdivision sites. These plans are submitted to the municipality at the development application stage.



Basic Erosion and Sediment Control Provision

"Installation and maintenance of the site shall be in accordance with CSA W208:20, Erosion and sediment control installation and maintenance."

"Inspection of the site shall be in accordance with CAN/CSA-W202-18, Erosion and sediment control inspection and monitoring."

Subdivision Application / Development Permit Application

As a requirement of an application for a subdivision or development permit, the municipality may require the developer to submit various documents or studies. For example, the municipality may require that the developer submit a stormwater management plan and an erosion and sediment control plan.



Basic Subdivision Application or Development Permit Application Provision

"The Owner shall provide a stormwater management report for internal drainage of the subject land to the satisfaction of the municipality and shall include a description of the stormwater system as per CSA 211:21, Management standard for stormwater systems."

"In an effort to improve the quality of stormwater runoff, the Owner shall utilize bioretention systems in accordance with CSA W200-18, Design of bioretention systems, and CSA W201-18, Construction of bioretention systems."

"An erosion and sediment control plan that references CAN/CSA-W202-18, Erosion and sediment control inspection and monitoring, and CSA W208:20, Erosion and sediment control installation and maintenance, as part of the Erosion and Sediment Control Plan is required."

Notes:

Other Opportunities to Use CSA Community Water Standards

To increase uptake of CSA Group Community Water Standards and gain benefits associated with their use, your municipality may consider other options besides incorporating by reference the standards and its requirements in bylaws. Provincial legislation gives local governments legal options for providing landowners and developers with incentives to meet community goals, such as utilizing a minimum standard. Finding the right incentives and drivers for integrated planning can help give your municipality the necessary momentum to get things started.

Here are a few examples of how you can encourage the use of CSA Group Community Water Standards:

FAST-TRACK APPLICATIONS

Give priority to review or "fast track" review of approvals that utilize CSA Group Community Water Standards.

FEE REDUCTION

Offer a fee reduction on subdivision or development permit applications if the proposed developments use and comply with CSA Group Community Water Standards.



PERFORMANCE MEASURES

The implementation of CSA Group Community Water Standards could be a way to measure how well flood resilience objectives are met. Implementation of these standards can demonstrate your municipality's commitment to proactive flood mitigation approaches.

INCLUSION IN CONTRACTS AND REQUESTS FOR PROPOSALS

Including the requirement for the use of bioretention standards (CSA W200-18 and/or CSA W201-18) or erosion and sediment control standards (CAN/CSA-W202-18 and CSA W208:20) in all municipally funded projects could be a way to introduce and encourage the use of these standards in advance of their inclusion into bylaws or other municipal requirements.



Get more ideas and connect with other municipalities and regulators on our CSA Communities. Email our team at environment@csagroup.org for more information on how to join.



Help us improve this Guide! Share your comments, insights, and experiences with us. Email our team at environment@csagroup.org

Appendix A: Standard Terms

TERMS AND DEFINITIONS

Regional Plans and Documents

1 Regional Plan

A regional plan is a framework that aligns growth, servicing, and infrastructure investment to support a growing region and economic development. A regional plan will deal with the efficient placement of land-use activities across a broader area than an individual city or town. Many regional plans contain policies related to flooding and do not permit, or limit, development within areas identified as flood-prone.

2 Conservation Authority Requirements (applies to Ontario only)

In Ontario, Conservation Authorities, under the *Conservation Authorities Act*, regulate development in and near rivers, streams, floodplains, wetlands, steep slopes, and shorelines. A development project in a regulated area may need a permit from the conservation authority to proceed in order to ensure it complies with provincial regulations.

Municipal Long-Range Planning Documents

3 Official Community Plan / Development Plan

An Official Community Plan (OCP) or Development Plan sets a general policy direction for development and conservation in a municipality. The OCPs articulate the community's objectives and policies regarding land use, community development, and operations. OCPs may contain policies related to stormwater management, flood protection, erosion control, or climate resiliency.

The policies within an OCP assist a municipality in deciding whether a proposed development fits with a community's goals and desired pattern of land use. The OCP provides information that can guide the development sector and landowners toward the most appropriate form of development. They also help councils assess the merits of a development proposal in relation to a community's goals and objectives.

Many OCPs contain policies to restrict development in hazard land areas and to limit development within the flood fringe.

4 Municipal Zoning Bylaw / Land Use Bylaw

Zoning allows local governments to regulate land uses, buildings, and structures on a property, including how much of that use (density) is allowed on a specific part of the property. On a neighbourhood or site-specific level, use and density are the primary means local governments have to shape development. On a municipal, regional district, or watershed level, zoning is the primary means of preventing development in locations where it can harm sensitive ecosystems and ecosystem connectivity, directing development towards more appropriate locations. The ability to regulate use also includes the ability to prohibit use within a zone.

Zoning bylaws can include regulations for controlling surface and rainwater runoff from paved and roof areas. For example, they can establish the maximum percentage of the land that may be covered with impermeable surfaces. This will ensure that rainwater filters into the soil at its source rather than causing concentrated impacts downstream by being piped into watercourses

5 Development Permit Area (applies to British Columbia only)

Local governments may designate Environmental Development Permit Areas (EDPAs) to protect the natural environment, its ecosystems and biological diversity, regulate the form and character of development, and influence the siting of development on a parcel. They are a more detailed tool than standard zoning for shaping how development occurs on a site. Applying to private land, EDPAs reflect the shared responsibility that landowners and a local government have for protecting the environment.

6 Stormwater Management Plan

A stormwater management plan is the set of drawings and other documents that comprise all the information and specifications for the programs, drainage systems, structures, concepts, and techniques intended to maintain or restore the quality and quantity of stormwater runoff to pre-development levels. It may evaluate existing infrastructure and policies, identify drainage system deficiencies, and develop an implementation plan such as the inclusion of potential funding mechanisms for a long-term sustainable program. Stormwater management plans may be adopted by bylaw.

7 Flood Mitigation Plan

A flood mitigation plan identifies areas within a municipality that are prone to flooding and develops long-term strategies for protecting people and property from flood events. The long-term strategies are intended to significantly reduce or eliminate the risk of flooding before it occurs.

Development Approval Documents

8 Subdivision and Development Bylaw / Development Manual

A subdivision and development bylaw or development manual provides the technical framework for engineering standards and requirements with respect to infrastructure servicing and transportation planning. This bylaw addresses the required level of infrastructure servicing standards, detailed engineering design, and construction standards. Typical topics covered include subdivision, site plans, roads, water mains, sanitary and storm sewers, stormwater management, street lighting, lot grading, erosion and sediment control, and parks and community trails.

9 Subdivision Agreement / Development Agreement

A subdivision or development agreement is an agreement between a municipality and a developer or landowner setting out the terms under which the builder is allowed to subdivide the land. The agreement details the obligations of both parties and lays out the various policies, practices, standards, and conditions that will control the development of the subject property. The policies, practices, standards, and conditions may be related to drainage, landscaping, and erosion and sediment control.

10 Erosion and Sediment Control Guidelines or Plans

Municipalities have the authority to regulate and prohibit activities with regard to the soil. Local governments may, by bylaw, require a permit for removing or depositing soil and may impose fees for permits or for activities carried out under the permits. Soil removal and deposit provisions often require a sediment and erosion control plan for developments of a certain type or size, or in areas in close proximity to watercourses. Municipalities may require developers to follow an erosion and sediment control plan to ensure that sediment from the construction site is not transported beyond the limits of the active work area.

Appendix B: CSA Group Community Water Standards

Stormwater management & flood resiliency standards

CSA W204:19, *Flood resilient design of new residential communities*

With the growing number of weather-related natural catastrophes in Canada, it is important that new communities in Canada are designed for resiliency. Incorporating flood-resilient design measures into the planning and development of new residential communities can help improve public safety, reduce potential flood damages, and avoid costly future infrastructure replacement and potential liability related to inadequate design standards.

CSA W204:19 outlines overarching community-level and stormwater system-specific elements that should be considered in the design of new residential communities. The Standard lays out:

- roles and responsibilities in the design of flood-resilient new residential communities;
- characteristics of a flood-resilient community and general design, planning, and siting principles;
- types of rainfall events and management of runoff;
- considerations for natural infrastructure and low-impact development measures;
- major and minor stormwater systems, and their components, design objectives, and principles;
- sanitary sewer and wastewater pumping station design; and
- requirements and guidelines for operation and maintenance of public infrastructure, and more.

CSA W210:21, *Prioritization of flood risk in existing communities*

Prioritizing flood mitigation measures and investments is difficult, particularly in existing communities. The National Standard of Canada, CSA W210:21, presents a unique framework for identifying high flood risk areas within a community. The Standard offers a flexible approach that can be implemented by communities of any size and technical readiness and:

- describes the common types of flood mechanisms and challenges they present in existing communities;
- outlines a flood risk prioritization framework with foundational, intermediate, and advanced levels of flood risk assessment;
- summarizes inputs needed for the different levels of assessment and guidance on how practitioners can move from one assessment level to the next;
- identifies of core hazards, proxy risk factors, and impact categories that should be considered in the vulnerability assessment;
- provides a scoring methodology to determine where flooding can have the greatest, most damaging impact in a community; and
- includes annexes with additional information on core and proxy risk factors, best practices for community-based flood resiliency in existing residential communities, and other resources.

CSA W211:21, *Management standard for stormwater systems*

Aging and inadequate infrastructure, climate change impacts, and complex oversight structure complicate stormwater systems management. CSA W211:21 provides guidance on the effective management of stormwater systems and helps increase their resiliency. The Standard outlines:

- key policies and procedures needed for effective management of a stormwater system;
- a framework for increasing public safety by identifying and mitigating environmental, social, legal, and economic risks to the system;
- requirements for a documented stormwater system management plan endorsed by top management and the owner;
- requirements for a documented organizational structure of the operator's organization, including roles, responsibilities, and authorities; and
- resources to assist in watershed planning, risk assessment, life cycle cost analysis, and more.

Low-impact development standards

CSA W200-18, *Design of bioretention systems*

The importance of proper stormwater management has become increasingly apparent in recent years, as Canada is experiencing increases in precipitation due to climate change. Bioretention is an innovative stormwater management approach that can provide many positive outcomes in the treatment of runoff, reducing its volume and controlling its rate, and recharging groundwater. CSA W200-18 provides requirements and recommendations for the design of bioretention systems intended for the management of urban stormwater runoff. The Standard covers:

- roles and responsibilities in the design of bioretention systems;
- typical performance and design criteria of a bioretention system;
- criteria and constraints for bioretention site planning
- assessing bioretention system suitability for a specific site and for cold climate;
- design criteria for various bioretention systems;
- design considerations for operation and maintenance; and
- documents and reports that might be required by local authorities.

CSA W201-18, *Construction of bioretention systems*

Complimenting the CSA W200-18 Standard for design of bioretention systems, CSA W201-18 focuses solely on construction aspect of bioretention systems. This Standard covers:

- roles and responsibilities of the various construction team members;
- contract documentation and its elements;
- construction considerations, including timing and supervision;
- sequencing of construction activities;
- erosion and sediment control measures, approaches, and requirements for erosion and sediment control plan;
- project documentation responsibilities;
- requirements and recommendations for material supply and handling;
- considerations for bioretention system installation and landscaping; and
- requirements for bioretention systems maintenance, and more.

Erosion and Sediment Control

CAN/CSA-W202-18, Erosion and sediment control inspection and monitoring

Construction activities can result in soil erosion. Stormwater runoff can carry sediment from the construction area to rivers, streams, or wetlands, leading to degradation of ecosystems, loss of structural integrity and functionality of watercourses, flooding, and costly infrastructure maintenance. The National Standard of Canada, CAN/CSA-W202-18, helps prevent such adverse impacts by providing requirements and recommendations for the inspection and monitoring of erosion sediment control (ESC) measures implemented at the construction site.

Specifically, the Standard provides requirements and recommendations for:

- qualification of inspection and monitoring personnel;
- ESC measures inspections before, during, and post-construction;
- effluent discharge and watercourse monitoring to determine ESC measure performance;
- documenting compliance with an ESC plan and communication protocols; and more.

The Standard also provides additional information on monitoring equipment and includes data on significant rainfall events in various regions of Canada and a sample ESC inspection report.

CSA W208:20, Erosion and sediment control installation and maintenance

Complementing the CAN/CSA-W202-18 Standard for erosion sediment control (ESC) inspection and monitoring, the National Standard of Canada, CSA W208:20 helps provide consistency in how ESC measures are installed and maintained at construction projects across the country.

This Standard provides a framework that describes the key success factors for the installation and maintenance of ESC measures, including:

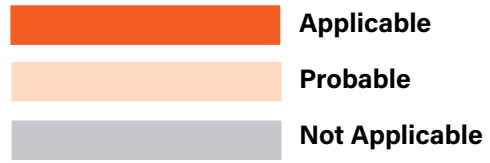
- general and product-specific installation and maintenance requirements and criteria;
- tools for a quick reference of ESC measures based on functional need and appropriate application;
- specific installation and maintenance requirements for various types of ESC implementations, including catch basin protections, check dams, hydraulically applied measures, retaining structures, sediment bags and ponds, slope drains, vegetative filter strips, wheel wash stations; and more.

Notes:

Appendix C: How Municipalities Could Integrate CSA Community Water Standards Into Their Planning Processes

The City of Colwood, British Columbia	Overarching Standards		
	Stormwater Management and Flood Resiliency		
Applicable Provincial and Municipal Plans, Policies and Guidelines	CSA W211:21 <i>Management standard for stormwater systems</i>	CSA W204:19 <i>Flood resilient design of new residential communities</i>	CSA W210:21 <i>Prioritization of flood risk in existing communities</i>
Regional Plans and Documents			
Capital Regional District Regional Growth Strategy			
Municipal Long Range Planning Documents			
City of Colwood Official Community Plan			
Colwood Land Use Bylaw			
Development Approval Documents			
Subdivision and Development of Land Bylaw			
Internal Operations Documents			
Operations / Maintenance Manual*			

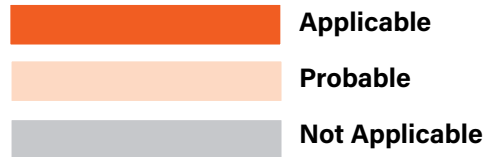
*If available



Design and Construction Standards			
Low Impact Development		Erosion and Sediment Control	
CSA W200-18 <i>Design of bioretention systems</i>	CSA W201-18 <i>Construction of bioretention systems</i>	CAN/CSA-W202-18 <i>Erosion and sediment control inspection and monitoring</i>	CSA W208-20 <i>Erosion and sediment control installation and maintenance</i>
Regional Plans and Documents			
Municipal Long Range Planning Documents			
Development Approval Documents			
Internal Operations Documents			

Town of High River, Alberta	Overarching Standards		
	Stormwater Management and Flood Resiliency		
Applicable Provincial and Municipal Plans, Policies and Guidelines	CSA W211:21 <i>Management standard for stormwater systems</i>	CSA W204:19 <i>Flood resilient design of new residential communities</i>	CSA W210:21 <i>Prioritization of flood risk in existing communities</i>
Regional Plans and Documents			
South Saskatchewan Regional Plan			
Calgary Metropolitan Region Growth Plan			
Municipal Long Range Planning Documents			
High River Town Plan			
High River Land Use Bylaw			
High River Growth Management Strategy			
High River Utility Master Plan (Stormwater)			
Development Approval Documents			
High River General Engineering and Construction Standard			
Subdivision Application /Development Permit Application			
High River Development Permit Handout			
Internal Operations Documents			
Operations / Maintenance Manual*			

*If available



Design and Construction Standards			
Low Impact Development		Erosion and Sediment Control	
CSA W200-18 <i>Design of bioretention systems</i>	CSA W201-18 <i>Construction of bioretention systems</i>	CAN/CSA-W202-18 <i>Erosion and sediment control inspection and monitoring</i>	CSA W208-20 <i>Erosion and sediment control installation and maintenance</i>
Regional Plans and Documents			
Municipal Long Range Planning Documents			
Development Approval Documents			
Internal Operations Documents			

Municipality of Lakeshore, Ontario	Overarching Standards		
	Stormwater Management and Flood Resiliency		
Applicable Provincial and Municipal Plans, Policies and Guidelines	CSA W211:21 <i>Management standard for stormwater systems</i>	CSA W204:19 <i>Flood resilient design of new residential communities</i>	CSA W210:21 <i>Prioritization of flood risk in existing communities</i>
Regional Plans and Documents			
County of Essex Official Plan			
ERCA Environmental Impact Assessment (EIA) Guidelines			
Windsor/Essex Region Stormwater management Standards Manual			
Municipal Long Range Planning Documents			
Municipality of Lakeshore Official Plan (2021)			
Town of Lakeshore** Comprehensive Zoning By-law			
Town of Lakeshore** Stormwater Master Plan Phase 1			
Shoreline Management Plan (under development)			
Charter for Flood Mitigation (under development)			
Development Approval Documents			
Town of Lakeshore** Development Manual			
Subdivision Agreement			
Internal Operations Documents			
Operations / Maintenance Manual*			

*If available

**The Town of Lakeshore was renamed "Municipality of Lakeshore"

	Applicable
	Probable
	Not Applicable

Design and Construction Standards			
Low Impact Development		Erosion and Sediment Control	
CSA W200-18 <i>Design of bioretention systems</i>	CSA W201-18 <i>Construction of bioretention systems</i>	CAN/CSA-W202-18 <i>Erosion and sediment control inspection and monitoring</i>	CSA W208-20 <i>Erosion and sediment control installation and maintenance</i>

Regional Plans and Documents

Municipal Long Range Planning Documents

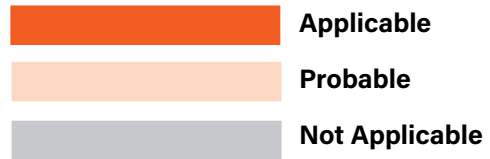
Development Approval Documents

Internal Operations Documents

--	--	--	--

City of Cambridge, Ontario	Overarching Standards		
	Stormwater Management and Flood Resiliency		
Applicable Provincial and Municipal Plans, Policies and Guidelines	CSA W211:21 <i>Management standard for stormwater systems</i>	CSA W204:19 <i>Flood resilient design of new residential communities</i>	CSA W210:21 <i>Prioritization of flood risk in existing communities</i>
Regional Plans and Documents			
Regional Official Plan			
Region of Waterloo and Area Municipalities Design Guidelines and Supplemental Specifications for Municipal Services			
GRCA Policies for the Administration of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulations			
Municipal Long Range Planning Documents			
Cambridge Official Plan			
City of Cambridge Zoning By-law			
City of Cambridge Stormwater Management Master Plan			
City of Cambridge Stormwater Management Policies and Guidelines			
Development Approval Documents			
Engineering Standards and Development Manual			
Erosion & Sediment Control Guidelines for Urban Construction			
Internal Operations Documents			
Operations / Maintenance Manual*			

*If available



Design and Construction Standards

Low Impact Development		Erosion and Sediment Control	
CSA W200-18 <i>Design of bioretention systems</i>	CSA W201-18 <i>Construction of bioretention systems</i>	CAN/CSA-W202-18 <i>Erosion and sediment control inspection and monitoring</i>	CSA W208-20 <i>Erosion and sediment control installation and maintenance</i>

Regional Plans and Documents

Municipal Long Range Planning Documents

Development Approval Documents

Internal Operations Documents

--	--	--	--

About CSA Group

CSA Group is a global organization dedicated to safety, social good and sustainability. We are a leader in Standards Development and in Testing, Inspection and Certification around the world including Canada, the U.S., Europe and Asia. Our mandate is to hold the future to a higher standard.

The mission of CSA Group's Standards Development organization is to enhance the lives of Canadians through the advancement of standards in the public and private sectors. We are a leader in standards research, development, education, and advocacy. The technical and management standards developed with our more than 10,000 members improve safety, health, the environment, and economic efficiency in Canada and beyond.

CSA Group always strives to provide up to date and accurate information. However, no representation or warranty, expressed or implied, is made that this information meets your specific needs and any reliance on this information is at your own risk. Please contact CSA Group for more information about our services.

