

# **A Changing Climate for Infrastructure: Adapting our Communities**

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**Credit Valley Conservation Conference  
Transforming to a Green Economy  
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# About CSA

- *Independent*
- *Not-for-profit*
- *Member-based*

## Serving

- *Government*
- *Industry*
- *Consumers*



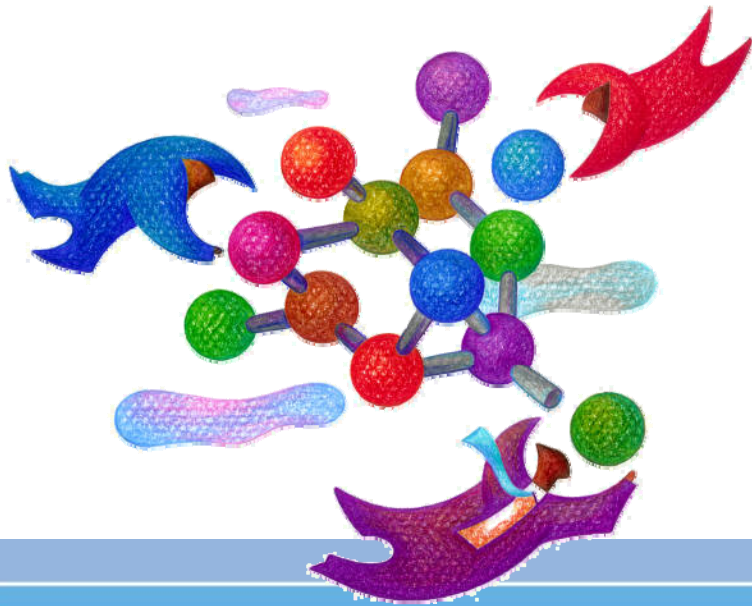
***Creating a better, safer, more sustainable world where standards work for people and business.***

# CSA Climate Change Initiatives



- Leaders on International standards
  - Environmental ISO 14000 Series
  - Social Responsibility & Sustainability
- Training and support services
- Adapting to a changing climate
- Environmental labels and certifications

Over 400 of CSA's existing standards have a direct impact on Canada's public and private infrastructure



- Design and Construction
- Sustainability in Construction Processes
- Building Products and Components
- Water, Wastewater, Stormwater
- Electricity Generation and Distribution
- Alternative Energy Technologies
- Environmental Management Systems Advisory Services

# Key Issues for Capital Projects



# CSA Registered Carbon Neutral™ Program

- Recognizes carbon neutral claims
- Independent, transparent process compliant with ISO 14064 Standards
  - Measure and verify carbon footprint
  - Offset what you can't reduce with credible reduction projects
- Programs for Organizations, Buildings & Tenants
- Communication:
  - Label – marketing materials, plaques, banners
  - Registry listing
- Benefits:
  - Financial – investors, tenants
  - Demonstrates environmental leadership
  - Avoids “greenwashing”

CSA Registered  
Carbon Neutral™  
Program

Declare your  
environmental  
leadership



# Stakeholders and Customers

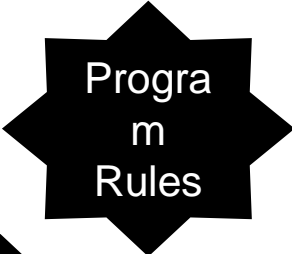


- **Government**
  - *Federal (Industry Canada, Environment Canada)*
  - *Provincial (Alberta, Nova Scotia, Quebec)*
  - *Local (ICLEI, FCM, municipalities)*
- **Consumers and NGOs**
  - *IISD, Pollution Probe, Pembina*
- **Business and Industry**
  - *Citizens Bank, Canadian Tire, Wal-Mart*
- **Service Providers and Consultants**
  - *Green Business Standards (a joint collaboration of Cushman & Wakefield and Integrity Energy)*

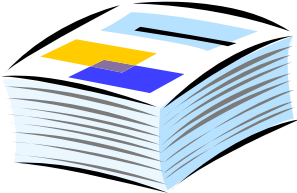
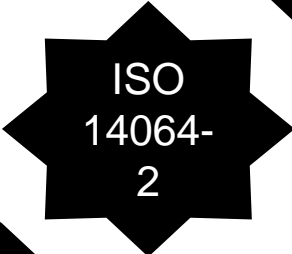
# Steps to Carbon Neutrality



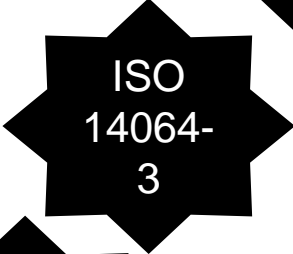
- CSA Registered Carbon Neutral



- Offset with credible reduction projects



- Third party verification of the GHG report



- Measure emissions and prepare a GHG report



# For more information please visit: [www.csa.ca/climatechange](http://www.csa.ca/climatechange)

The screenshot shows the CSA Standards website interface. At the top left is the CSA Standards logo. To the right, there are links for 'Search', 'Français', and 'Go to CSA America'. Below the logo is a navigation menu with 'Home', 'About CSA', 'Contact Us', 'Careers', and 'News'. On the right side of the header, there are links for 'Public Review', 'Member Login', and 'ShopCSA'. The main content area has a breadcrumb trail: 'Home > Standards > Climate Change'. A large blue banner contains the text 'Climate Change'. Below this, there are two tabs: 'Overview' and 'Current Standards Activities'. The 'Overview' tab is active, showing a sub-header 'Climate Change' and a paragraph: 'At CSA Standards, our goal is simple: To provide you with solutions that makes your environmental management easier.' This is followed by a paragraph about the multi-functional perspective and resources offered. A third paragraph states that CSA Standards is a worldwide leader in standards development. A fourth paragraph describes the organization's role in developing international environmental and carbon management standards. A fifth paragraph mentions the suite of GHG Management products, services, and tools. A sixth paragraph lists the GHG Management Services. To the right of the text is a small thumbnail image of the website's Climate Change page with a green button that says 'Click here to find out more'. On the far right, there is a vertical sidebar with sections for 'Standards' (Buy Online!, Subscription, Keep Me Informed), 'Training' (Buy Online!, Login to Courses), and 'Product Certification'. At the top right of the sidebar, there are links for 'Standards Development', 'Membership', and 'Consumers'.

# Climate Change Impacts on Infrastructure: Water Resource Management

## Direct Impacts

- Changes in seasonality and type of precipitation
- Intensity of precipitation
- More river flooding

## Indirect Impacts

- More frequent and severe water shortages
- Reduced service levels or product quantity/quality
- Critical failures



# Challenge: Precipitation Variations

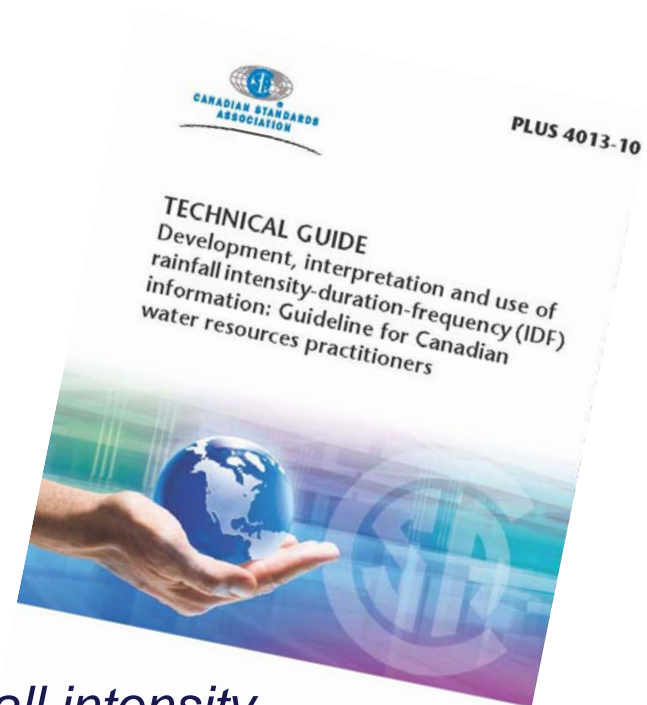
A 5% increase in heavier short duration (24 hours or less) rain events has been observed and is expected to continue in future decades.

Recent events in 2004 and 2005 suggest there may be even more rapid trends towards an increasing magnitude of heavy rain events in isolated storms.



# CSA's Infrastructure Solutions Program

- Consultation with experts
- Identify needed training & publications solutions
  - Focus on implementation
- Complement other initiatives
- Avoid duplication of effort



*Development, interpretation and use of rainfall intensity-duration-frequency (IDF) information: Guideline for Canadian water resources practitioners*

# Sustainable Stormwater Practices: Fundamentals

Training  
1 Day Course

Broad knowledge of techniques at the property, neighbourhood, and watershed levels.

Covers planning, design, construction, operations & maintenance and economic considerations for new and retrofit development.



## Sustainable Stormwater Practices: **Large Scale Applications Selection & Design**

Applications include institutional, commercial and industrial development as well as multi-residential builds and retrofits.



Training  
1 Day Course

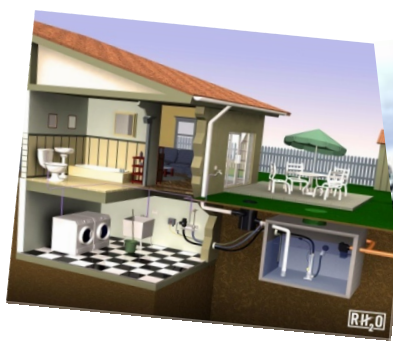
## Sustainable Stormwater Practices **Public Realm Applications Selection & Design**



Featuring road right-of-way, parks and other public space oriented water resource management facilities.

Training  
1 Day Course

# Sustainable Stormwater Practices: Rainwater Harvesting: Fundamentals and Implementation Strategies



Location	Cost (C\$/m <sup>3</sup> )		Details
Seattle, USA	1.65	–	Stormwater collection for irrigation
	6.53	–	Toilet flush
	18.14	–	Toilet flush
Sydney, AU	2.53	–	RWH system
Canberra, AU	4.31	–	Indoor and
	10.30	–	Retrofit for
Amsterdam	22.55	–	Communi
Denmark	6.85 – 21.37	–	Case study
	2.56	–	Home-
Newcastle, AU	0.35	–	9000L consumer



- Can be a key component in water conservation strategies.
- Course addresses issues and offers practical suggestions and experiences related to successfully incorporating rainwater harvesting programs in a municipality.

Training  
1 Day Course

# Adapting Your Infrastructure to Climate Change

- Tools and techniques for:
- Vulnerability Assessment
  - Risk Evaluation
  - Response Planning

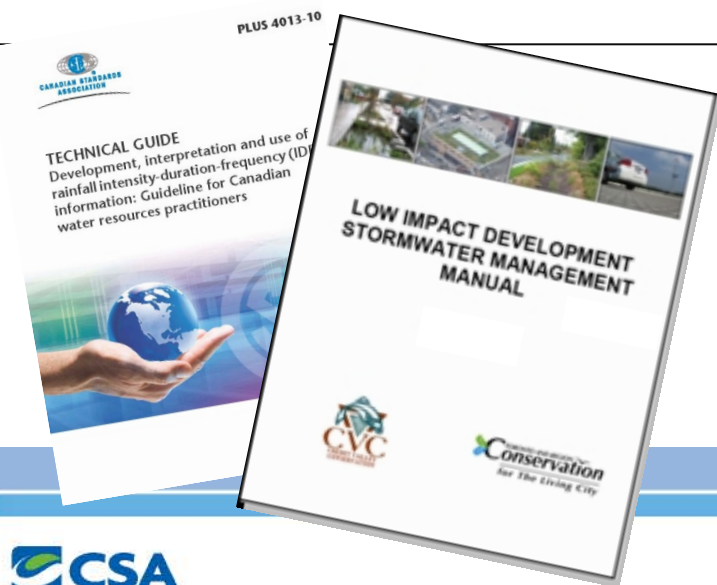
The screenshot shows a web-based training interface. At the top, the title 'Adapting your Infrastructure to Climate Change' is displayed in a blue header. Below the title is a navigation menu with the following items: MODULE INTRODUCTION, CLIMATE CHANGE, GREENHOUSE GASES, SEA LEVEL RISE, POSITIVE FEEDBACK, IT'S COMPLICATED, SECTION SUMMARY, SOME CLIMATE CHANGE SCIENCE, THE GREENHOUSE EFFECT, THE CARBON CYCLE, GREENHOUSE GAS EMISSIONS, PRECIPITATION, IMPACTS OF CLIMATE CHANGE, SECTION SUMMARY, CLIMATE CHANGE MITIGATION AND ADAPTATION, and SECTION SUMMARY. The 'PRECIPITATION' item is highlighted. To the right of the menu, the text 'CORE A - PART ONE' is visible. The main content area is titled 'Precipitation' and contains a sub-section 'Extreme Events'. The text in this section reads: 'Over the last fifty years or so, changes in the frequency of extreme temperature and precipitation events in Canada have been observed, including (from Vincent and Mekis, 2006):' followed by a bulleted list: 'fewer extreme cold nights', 'fewer extreme cold days', 'fewer frost days', 'more extreme warm nights', 'more extreme warm days', 'more days with precipitation', and 'decrease in maximum number of consecutive dry days'. Below the list, a paragraph states: 'Looking ahead, extreme rainfall events are expected to intensify and occur more frequently across much of Canada, and peak wind speeds may increase in intensity and frequency in some areas. The frequency of extreme warm summer temperatures (exceeding 30°C) is expected to increase across Canada. Heat waves are projected to become more intense and more frequent. At the same time, extreme cold days are projected to decline significantly.' At the bottom of the page, there are two circular navigation buttons labeled 'Previous Page' and 'Next Page'.

Online  
Training

# Accelerating the Implementation of Proven Solutions

Critical resources, such as Standards and Guidelines, are now available and effective policy instruments for mainstreaming 'green' technology

Even the best solutions are only as effective as the people who implement them. Develop competencies through training and experience.



**For more information please visit:**  
**www.csa.ca/infrastructure**

The screenshot shows the CSA Standards website page for Infrastructure & Public Works. The header includes the CSA Standards logo, a search bar, and navigation links for Home, About CSA, Contact Us, Careers, and News. A secondary navigation bar includes Public Review, Member Login, and ShopCSA. The main content area features a large blue header for 'Infrastructure & Public Works' and a sub-header for 'Overview'. The main text describes the importance of infrastructure for Canadians and mentions the Municipal Infrastructure Solutions Program (MISP). A large, stylized 'Thank You' banner is overlaid on the bottom right of the page.

CSA STANDARDS

Search | Français | Go to CSA America

MAKING STANDARDS WORK FOR PEOPLE & BUSINESS

Home | About CSA | Contact Us | Careers | News

Public Review | Member Login | ShopCSA

Home > Standards > Infrastructure & Public Works

## Infrastructure & Public Works

Standards Development  
Membership  
Consumers

Overview | Products | PACP® / CSA PLUS 4012 | Current Standards Activities

### Infrastructure & Public Works

Infrastructure affects all Canadians: where they live, work and play. Municipal infrastructure assets, including watermains, drainage networks, roads and buildings, are tasked daily with dependable delivery of the services Canadians expect. In addition to physical assets, enhanced management practices can help address important infrastructure-related issues, such as adapting to and/or withstanding the impacts of climate change.

CSA's Municipal Infrastructure Solutions Program (MISP) is a multi-year initiative aimed at municipal engineers, planners, technologists and trades people. MISP develops and delivers a range of training programs and publications related to infrastructure operations & maintenance, management and technology, with the goal of ensuring these professionals have access to the most up-to-date knowledge and know-how available, and to accelerate proven solutions into mainstream use across the country.

CSA wishes to acknowledge the generous contributions of our funding partners, and especially our volunteer technical committee members, in the development of MISP products and solutions (for a complete list of program funders, [click here](#)). We are committed to ongoing development and refinement of products and solutions within the MISP program, and to interested parties who would like to participate in future program development to contact [us](#).

### Standards

Buy Online!  
Subscription  
Keep Me Informed

### Training

Buy Online!  
Login to Course

*Thank You*