TRIECA CONFERENCE

Great Lakes Chapter

Toronto and Region Conservation for The Living City

Thank you to all of our 2015 sponsors:

AQUATECH DEWATERING COMPANY

Lake Simcoe Region Conservation Authority

CVC Credit Valley Conservation

GEMS

RM CONSTRUCTION

DYNEX CONSTRUCTION INC Since 1989

filtrexx CANADA SUSTAINABLE TECHNOLOGIES let nature do it.

GEOSTORM

Holland Pioneers in international business

Geosyntec consultants

NILEX CIVIL ENVIRONMENTAL GROUP Unearthing better results.

terrafix geosynthetics inc.

UNILOCK

VERDYOL Biotic Earth AN ORGANIC APPROACH TO SOIL BUILDING

York Region

Canada Green Building Council – Conseil du bâtiment durable du Canada – Chapter – Greater Toronto

Media Partner

WATER CANADA THE COMPLETE WATER MAGAZINE

TRIECA CONFERENCE

LID Implementation: From an international Perspective to a Canadian One

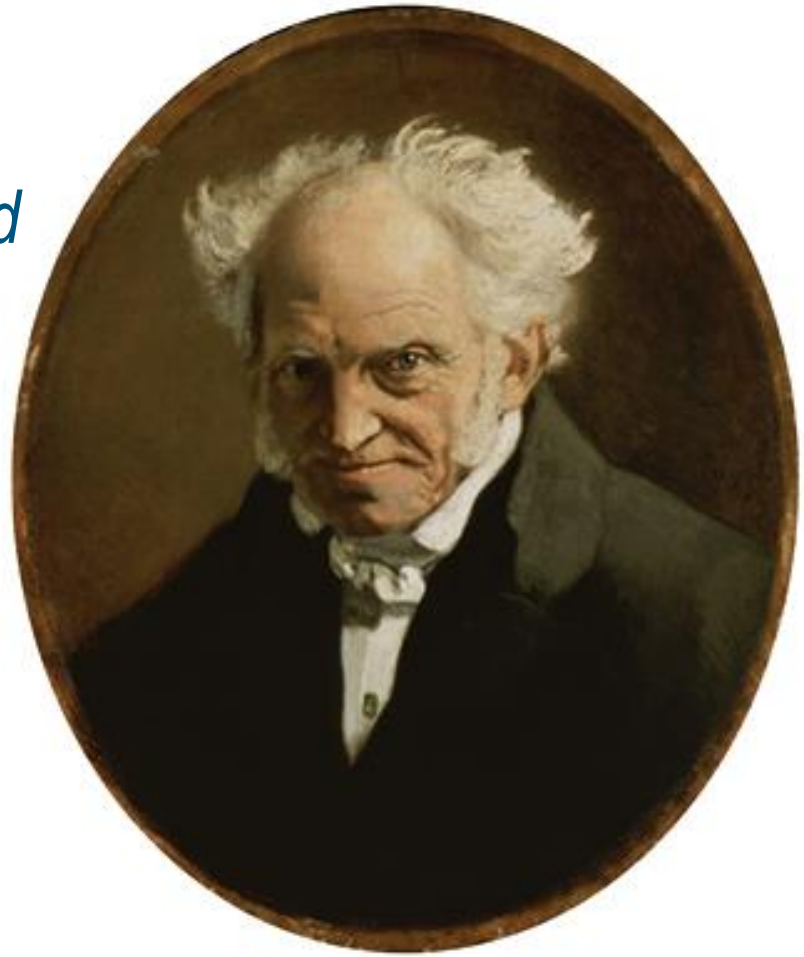
Synthesis of the SOCOMA (Source Control Management) Activities Specific Needs for Successful Projects in Canada

Gilles Rivard, ing. M. Sc.
Vice-President
lasalle nhc

LaSalle
nhc northwest hydraulic consultants

SCHOPENHAUER

All truth passes through three stages. First, it is ridiculed. Second, it is violently opposed. Third, it is accepted as being self-evident.



The world is my idea

(The World as Will and Idea -1819)

OUTLINE

- SOCOMA
- URBAN DRAINAGE – A BRIEF HISTORY
- TERMINOLOGY IN STORMWATER MANAGEMENT
- QUEBEC GUIDELINES AND REVISION
- BARRIERS
- WAY FORWARD AND SUCCESS FACTORS

SOCOMA

http://graie.org/SOCOMA/

The SOCOMA group is a working group part of the IWA / IAHR Joint Committee on Urban Drainage (JCUD) operated jointly by the International Water Association (IWA) and the International Association on Hydraulic Engineering and Research (IAHR).

lasalle nhc

SOCOMA

Joint Committee on Urban Drainage

http://www.jcud.org/

- Urban Drainage Modelling (UDM) Sept. 2015 Quebec City
- NOVATECH (Lyon, France) July 2016
- International Conference on Urban Drainage (ICUD), Prague, 2017

ICUD 2014 Malaysia

SOCOMA

Other Working Groups

Joint Committee on Urban Drainage

Real-Time Control of Urban Drainage Systems (RTCUDS)

Int. Working Group on Data & Models (IWGDM)

Urban Streams

Sewer Systems and Processes Working Group (SS&PWG)

Int. Working Group on Urban Rainfall (IGUR)

Urban Storm Water Harvesting (USWH)

Water Sensitive Urban Design

Urban Drainage in Cold Climate

lasalle nhc

SOCOMA

The SOCOMA working group studies source controls defined as all measures applied to control stormwater before it enters sewers or the surface receiving waters.

- Development and dissemination
- Relation to WSUD Group but focus on more technical aspects related to source control

SOCOMA

WORKSHOPS

2013 Multicriteria analysis and catchment-scale modelling and for the development of stormwater source control and harvesting strategies

2010 Design, modelling and implementation of stormwater source control technologies

NOVATECH 2010

2010 Water management in a cold climate

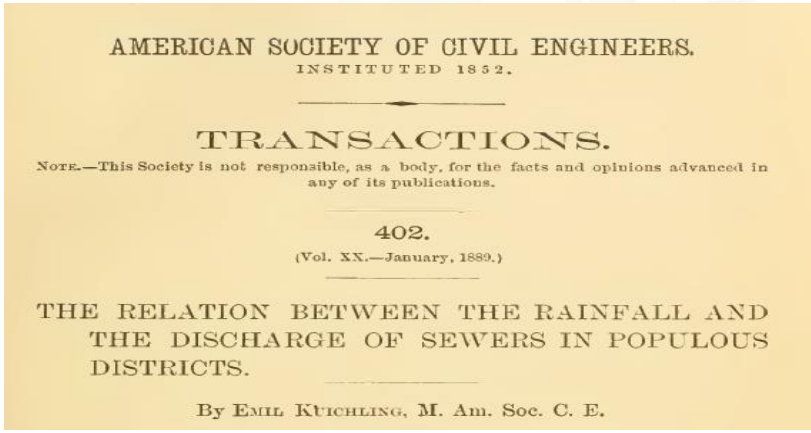
2007 Source Control : Managing Stormwater with a Water Balance Approach

lasalle nhc

URBAN DRAINAGE

- From the mid-1800s and for the next 100 years: very few changes in the design approach
- Main objective:

  Rapid and efficient drainage



AMERICAN SOCIETY OF CIVIL ENGINEERS.
INSTITUTED 1852.

TRANSACTIONS.

NOTE.—This Society is not responsible, as a body, for the facts and opinions advanced in any of its publications.

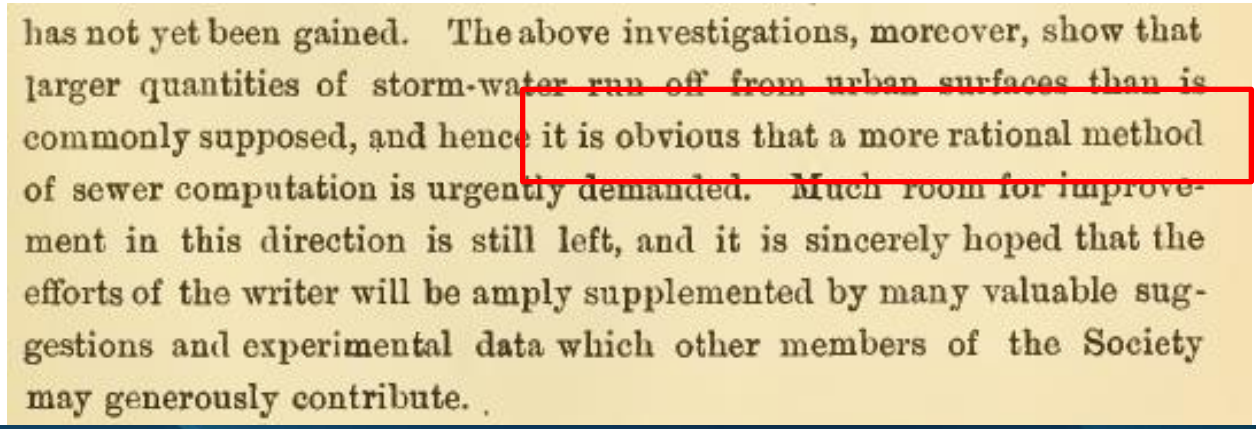
402.

(Vol. XX.—January, 1889.)

THE RELATION BETWEEN THE RAINFALL AND THE DISCHARGE OF SEWERS IN POPULOUS DISTRICTS.

By EMIL KUICHLING, M. Am. Soc. C. E.

Rational Method (1851-Mulvaney and1889-Kuichling)

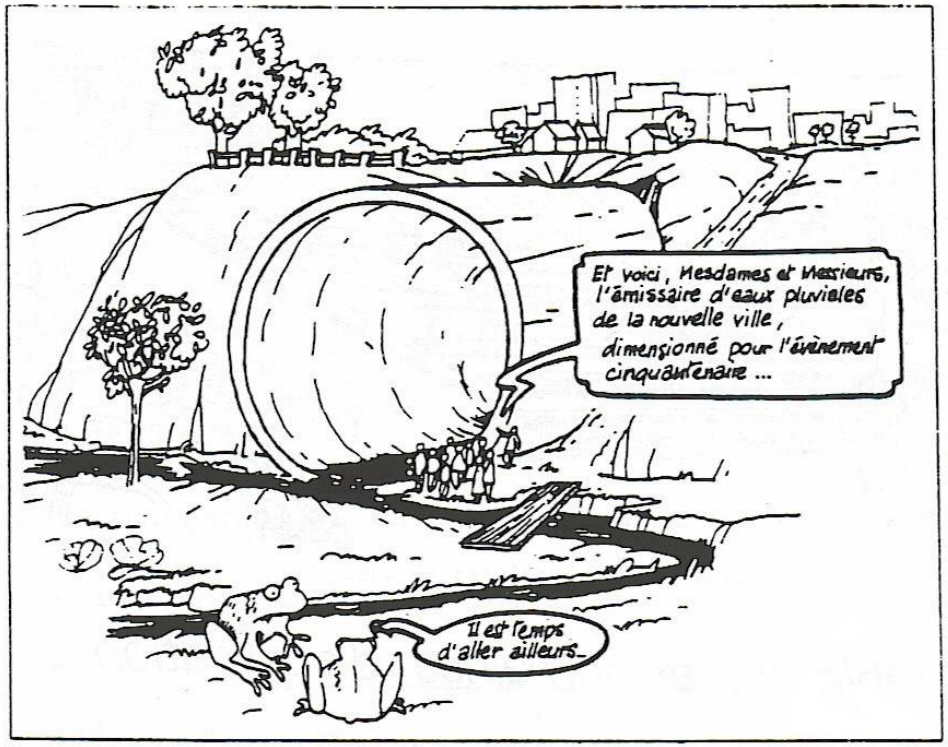


has not yet been gained. The above investigations, moreover, show that larger quantities of storm-water run off from urban surfaces than is commonly supposed, and hence it is obvious that a more rational method of sewer computation is urgently demanded. Much room for improvement in this direction is still left, and it is sincerely hoped that the efforts of the writer will be amply supplemented by many valuable suggestions and experimental data which other members of the Society may generously contribute.

URBAN DRAINAGE

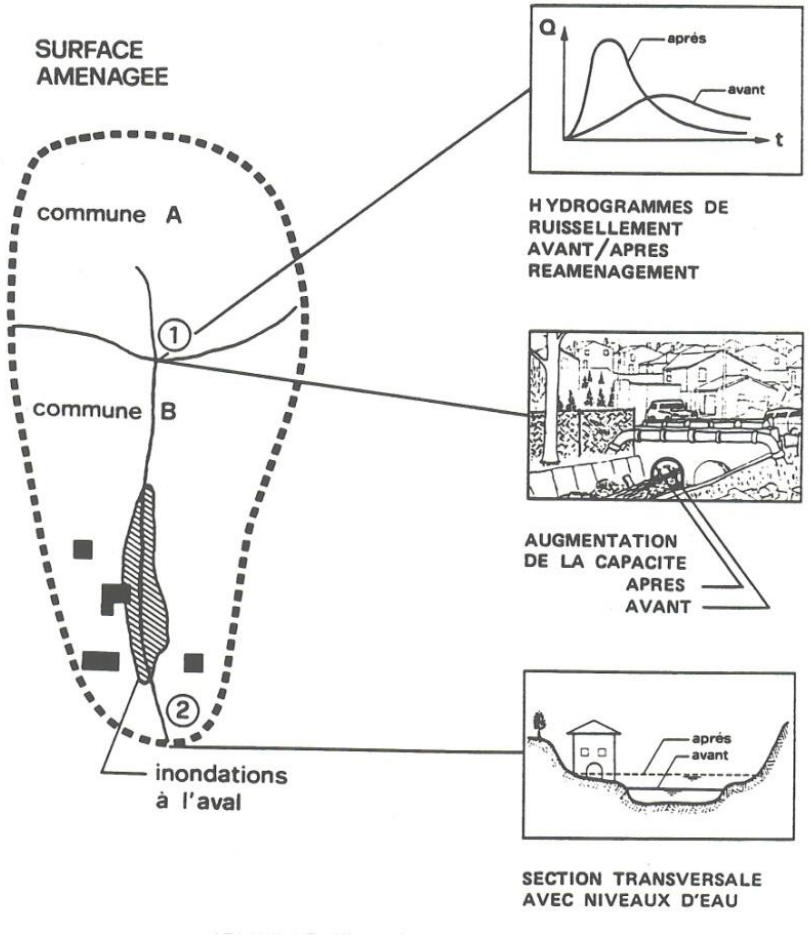
+ Until the 1960s

Rational Method
almost exclusively



URBAN DRAINAGE

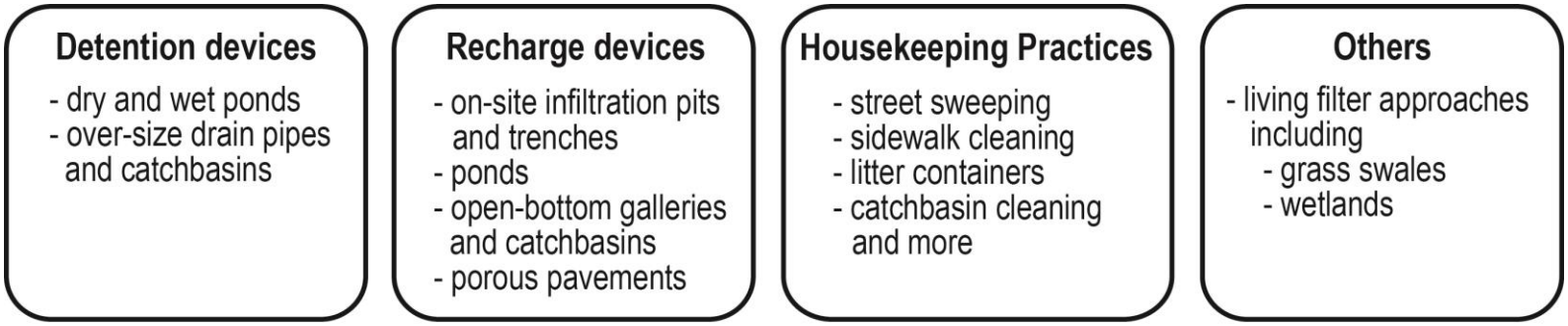
+ 1970s : Quantity Controls



URBAN DRAINAGE

+ 1980s – National Urban Runoff Program (NURP) (USA) : Stormwater is polluted !!

- Measures for quality control
- Best Management Practices (BMPs) are «invented»



lasalle nhc

URBAN DRAINAGE

+ 2000 – New Paradigms

- Sustainability
- Management taking into account ecological systems
- Better understanding of stormwater impacts and more comprehensive criteria
- Approaches to integrate stormwater in the urban landscape
- Watershed Management

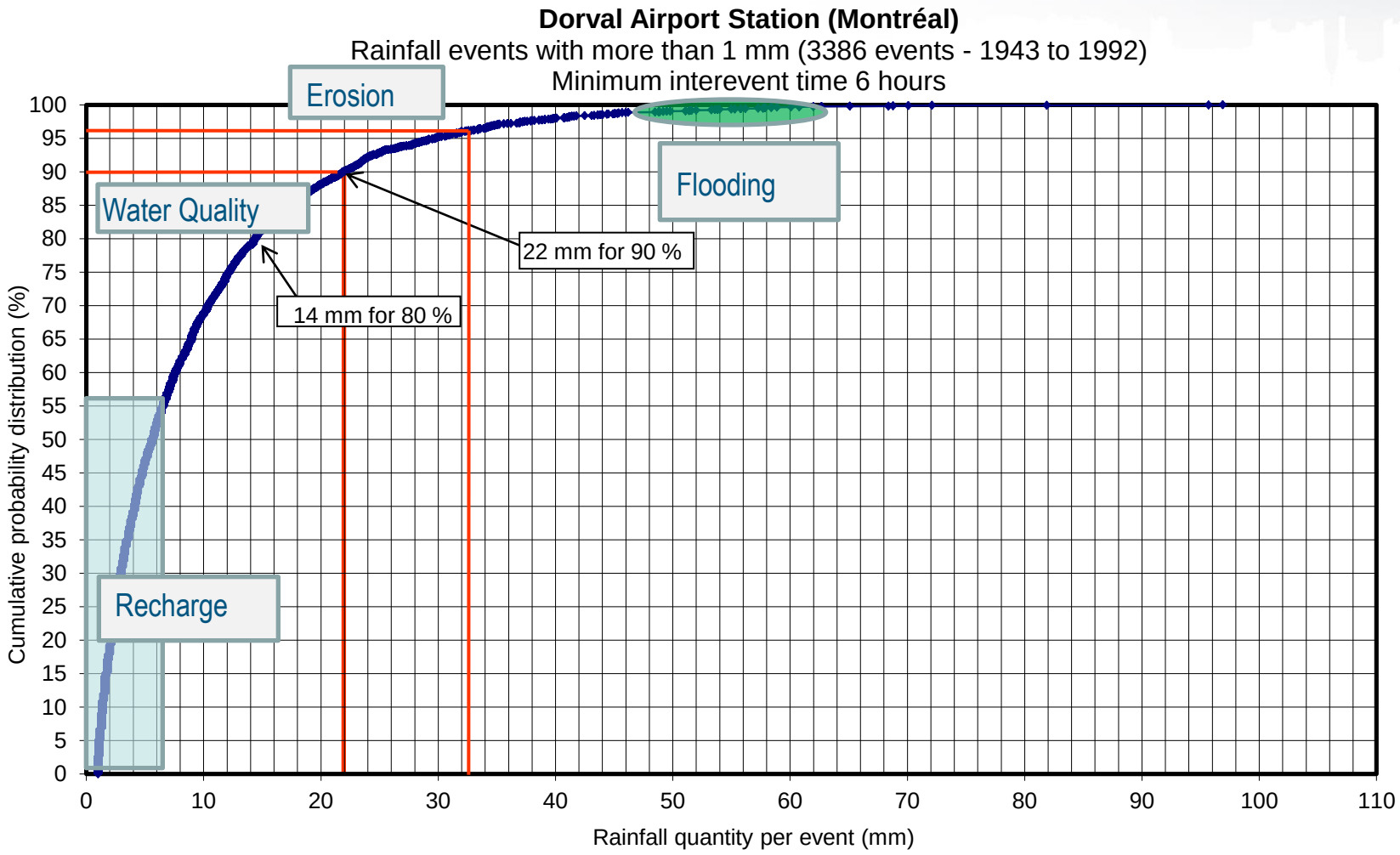
URBAN DRAINAGE

New fundamental paradigm

Reproduce and maintain natural hydrology and minimize the impacts of urban development

- Decentralized controls - Treatment train
- Complete rainfall spectrum
- Runoff Volume Control

URBAN DRAINAGE

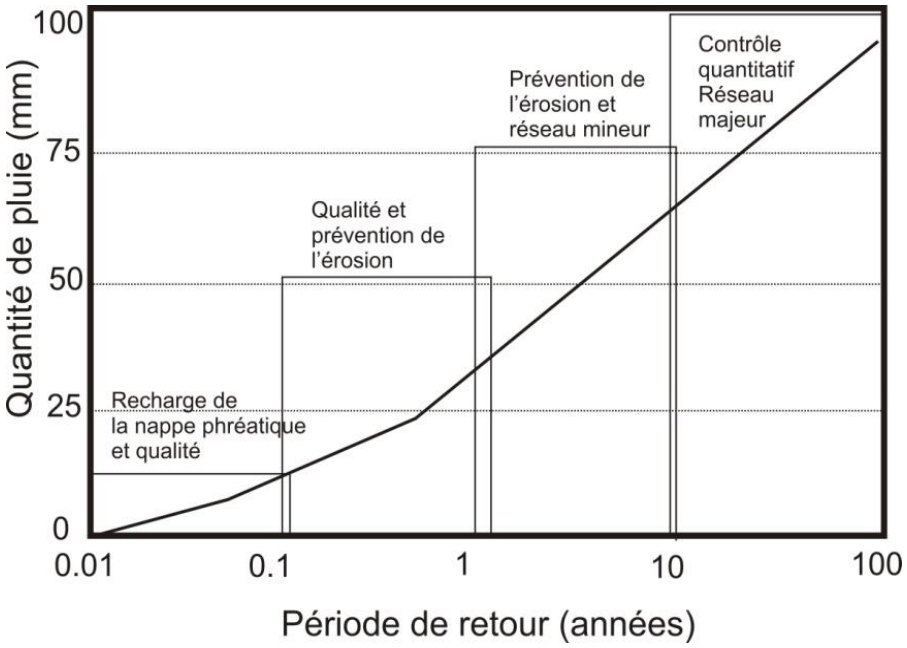


URBAN DRAINAGE

+ New parameters for design criteria

- Volume Control

- Complete rainfall spectrum



TERMINOLOGY

WSUD

Water Sensitive Cities

BMPs

Better Site Design

Source Controls

Design with Nature

SUDS

Conservation Design

Stormwater Control Measures(SCMs)

Smart Growth

Integrated Urban Stormwater Management

LIUDD

Green Infrastructures

Decentralized Stormwater Management

Alternative techniques

Sustainable Rainwater Management

Compensatory techniques

lasalle nhc

TERMINOLOGY

PAPER SPECIFIC FOR OVERVIEW AND DESCRIPTION OF DIFFERENT TERMS

Urban Water Journal

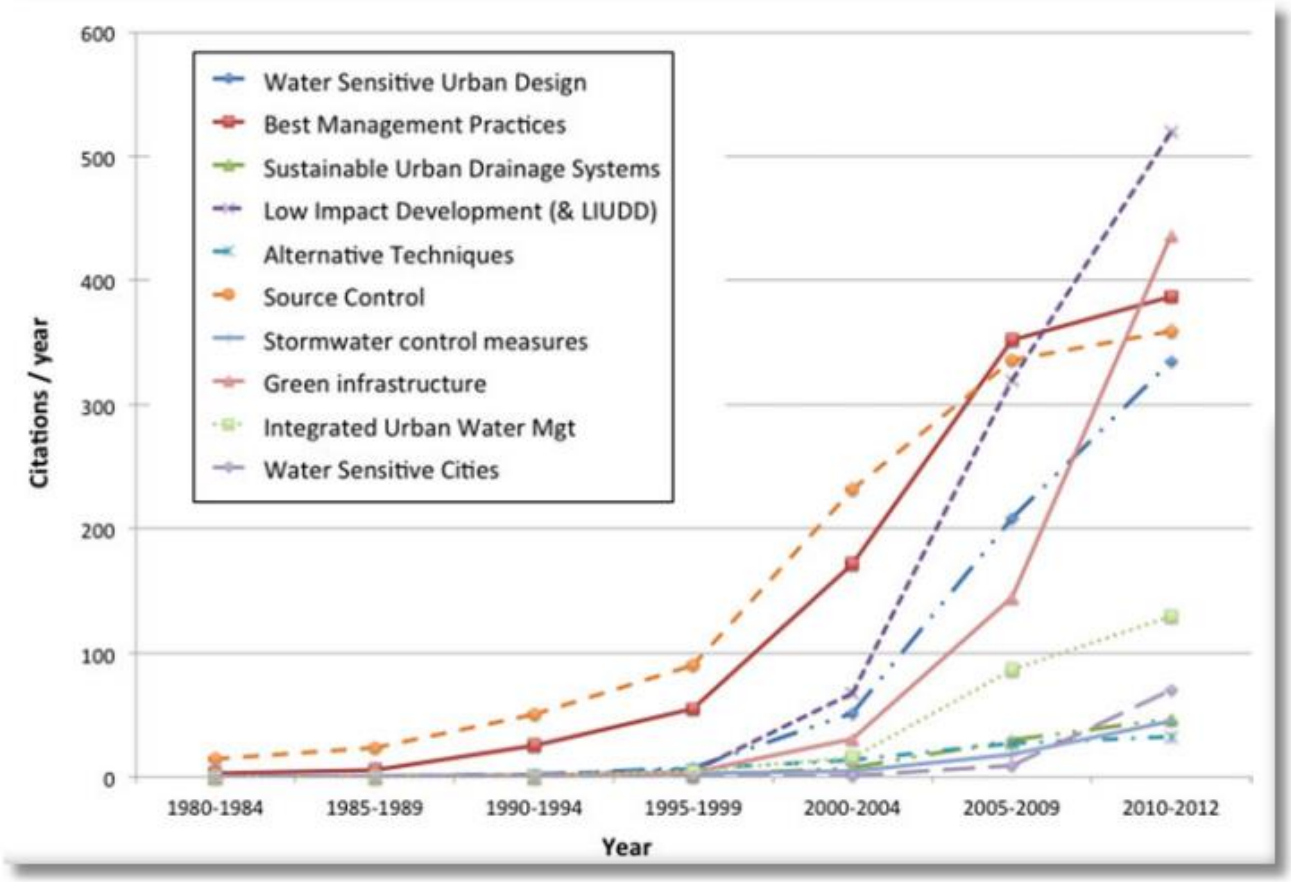
Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/nurw20

SUDS, LID, BMPs, WSUD and more - The evolution and application of terminology surrounding urban drainage

Tim D. Fletcher[a], William Shuster[b], William F. Hunt[c], Richard Ashley[d], David Butler[e], Scott Arthur[f], Sam Trowsdale[g], Sylvie Barraud[h], Annette Semadeni-Davies[i], Jean-Luc Bertrand-Krajewski[h], Peter Steen Mikkelsen[j], Gilles Rivard[k], Mathias Uhl[l], Danielle Dagenais[m] & Maria Viklander[n]

lasalle nhc

TERMINOLOGY

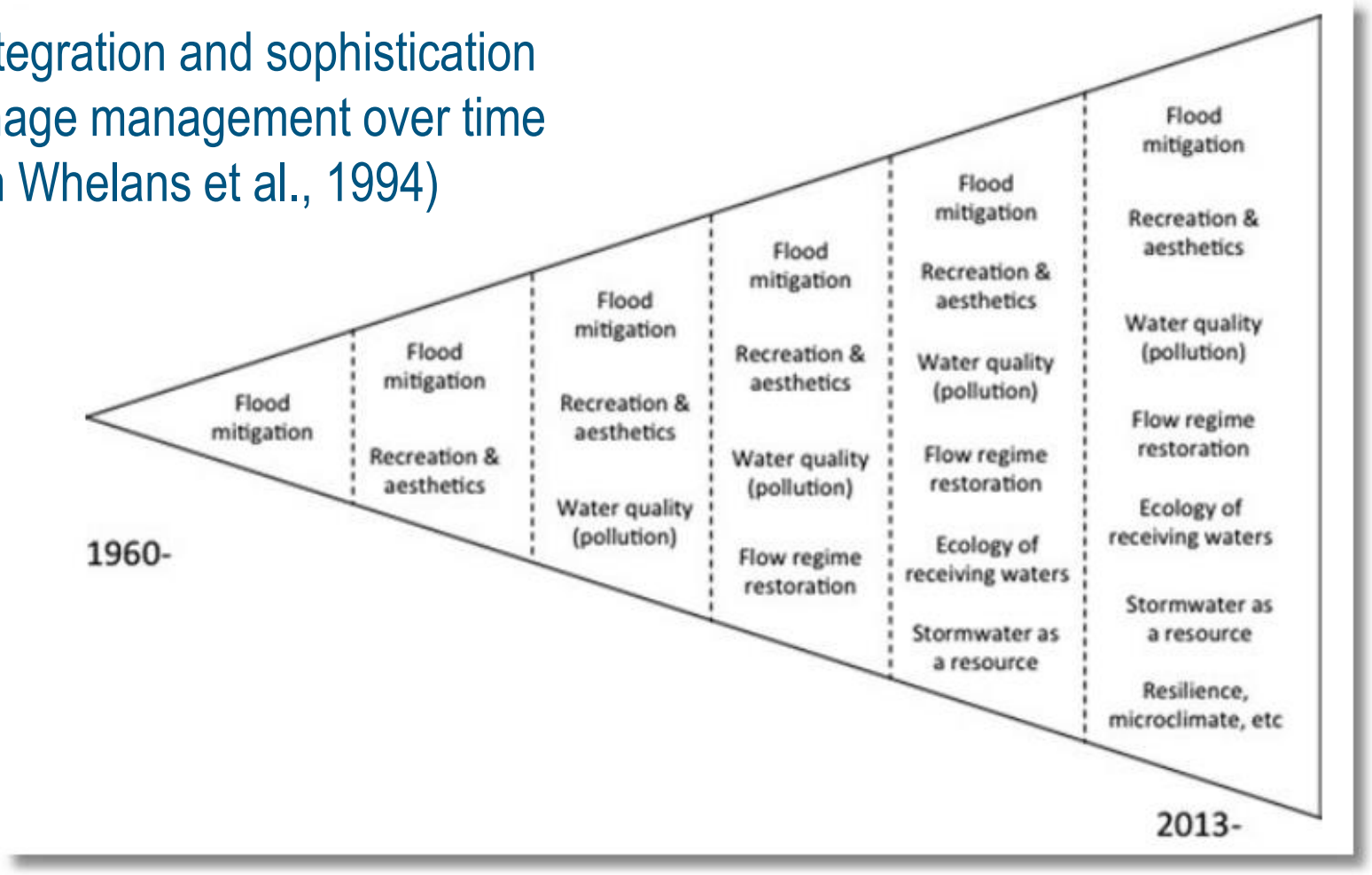


Evolution of new urban drainage terminology in the 32 years from 1980 to 2012 (Fletcher et al., 2014)

lasalle nhc

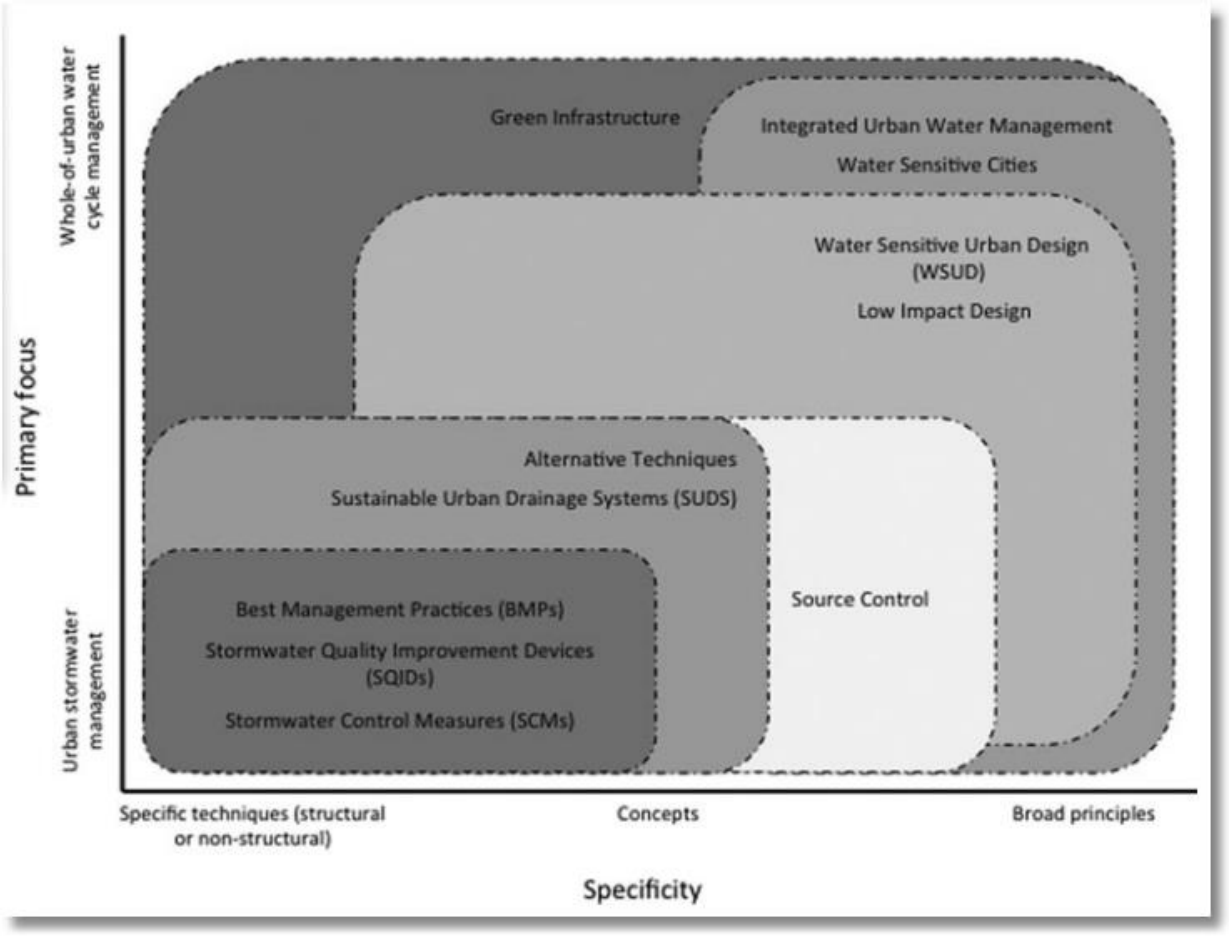
TERMINOLOGY

Increasing integration and sophistication of urban drainage management over time (adapted from Whelans et al., 1994)



TERMINOLOGY

One possible classification of urban drainage terminology, according to their specificity and their primary focus (Fletcher et al., 2014)



QUEBEC GUIDELINES

+ The need to develop Guidelines was well perceived by the Ministry of Environment
+ Champion arrived in 2006
+ Committee formed inside the Ministry in 2007
+ Environment and Municipal Affairs teamed up for a magnificent funding of…75 000 $
+ Committee formed in 2009
  - 20 people – Consulting Engineers, Cities, Manufacturers

QUEBEC GUIDELINES

+ Preliminary publication – 2010
+ Official publication – February 2011
+ Transition up to January 2012

Strategies for land use planning, principles for design and optimal management practices for urban drainage systems

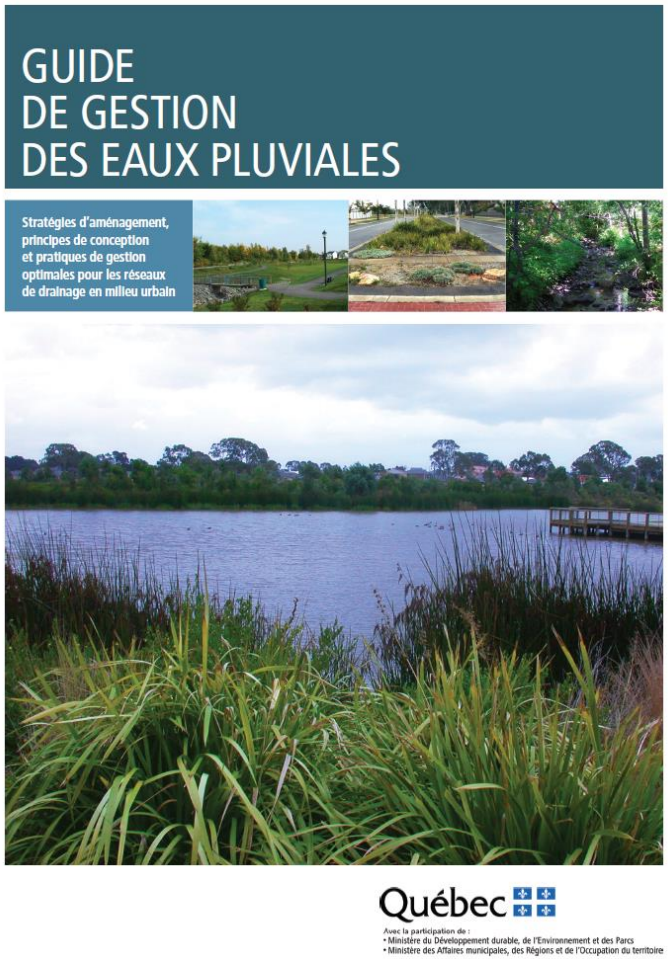
lasalle nhc

QUEBEC GUIDELINES

+ Presents concepts as a basis for objectives

→ Provides practical tools for design (Guidelines)

→ Flexibility built in – case by case pushed within a global context (Protect watercourses)



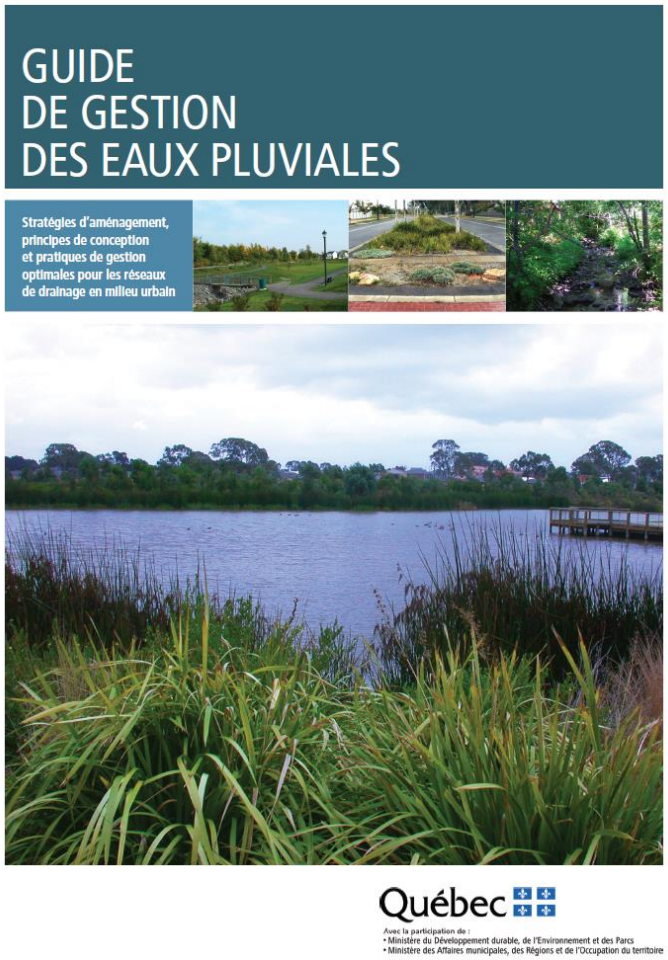
lasalle nhc

QUEBEC GUIDELINES

+ Guide ≠ Directive 004

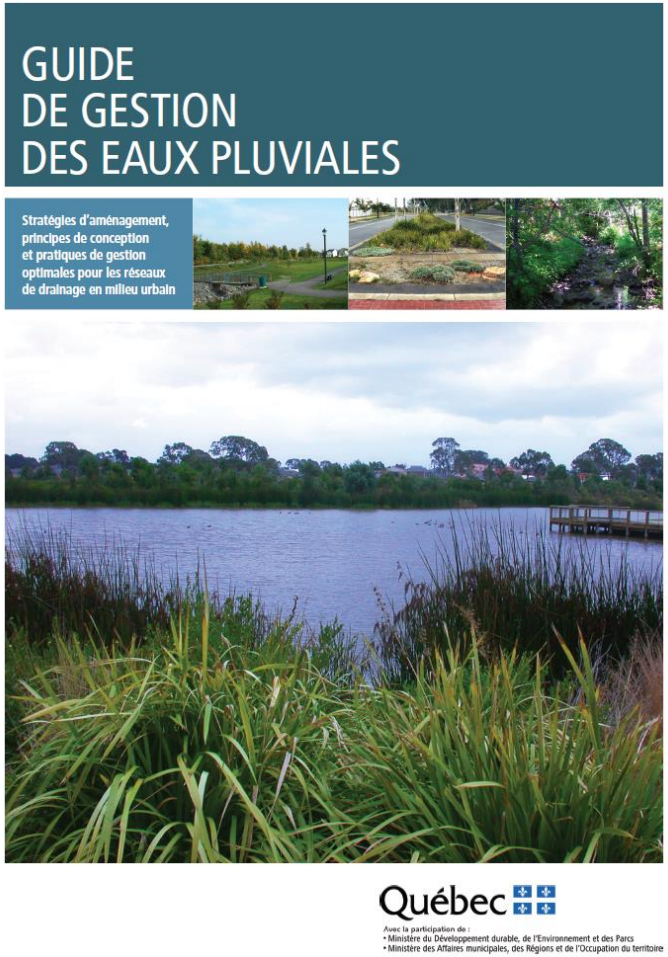
→Management by watershed

→Urban Context (no discussion of rural areas)

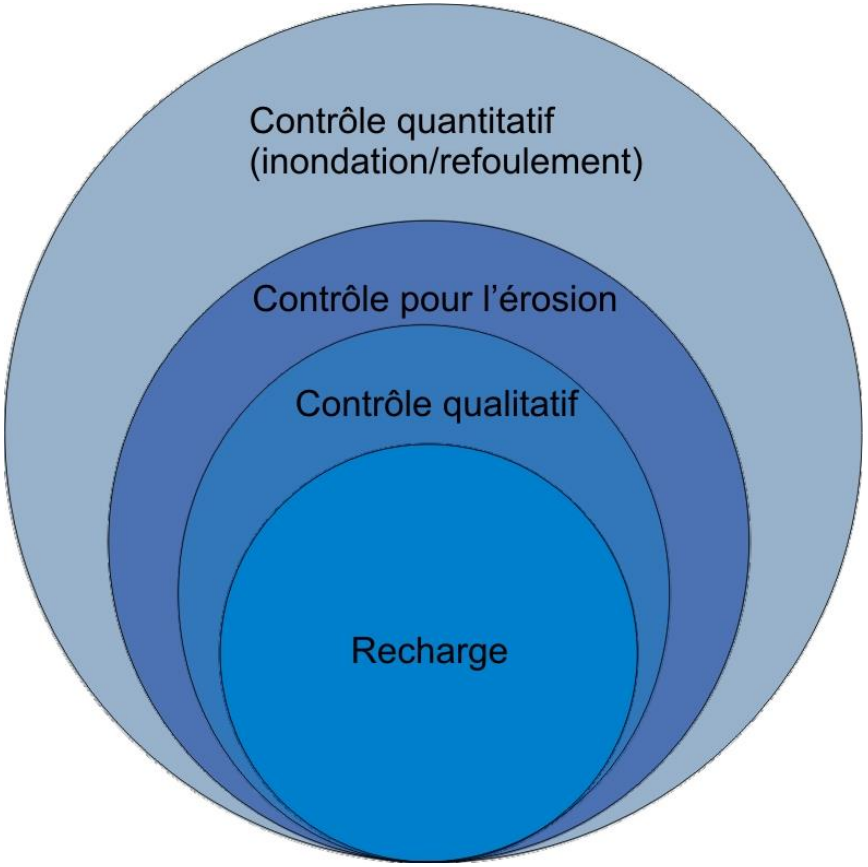


QUEBEC GUIDELINES

+ Criteria for 4 aspects
  - Recharge
  - Quality
  - Erosion
  - Conveyance/Flooding



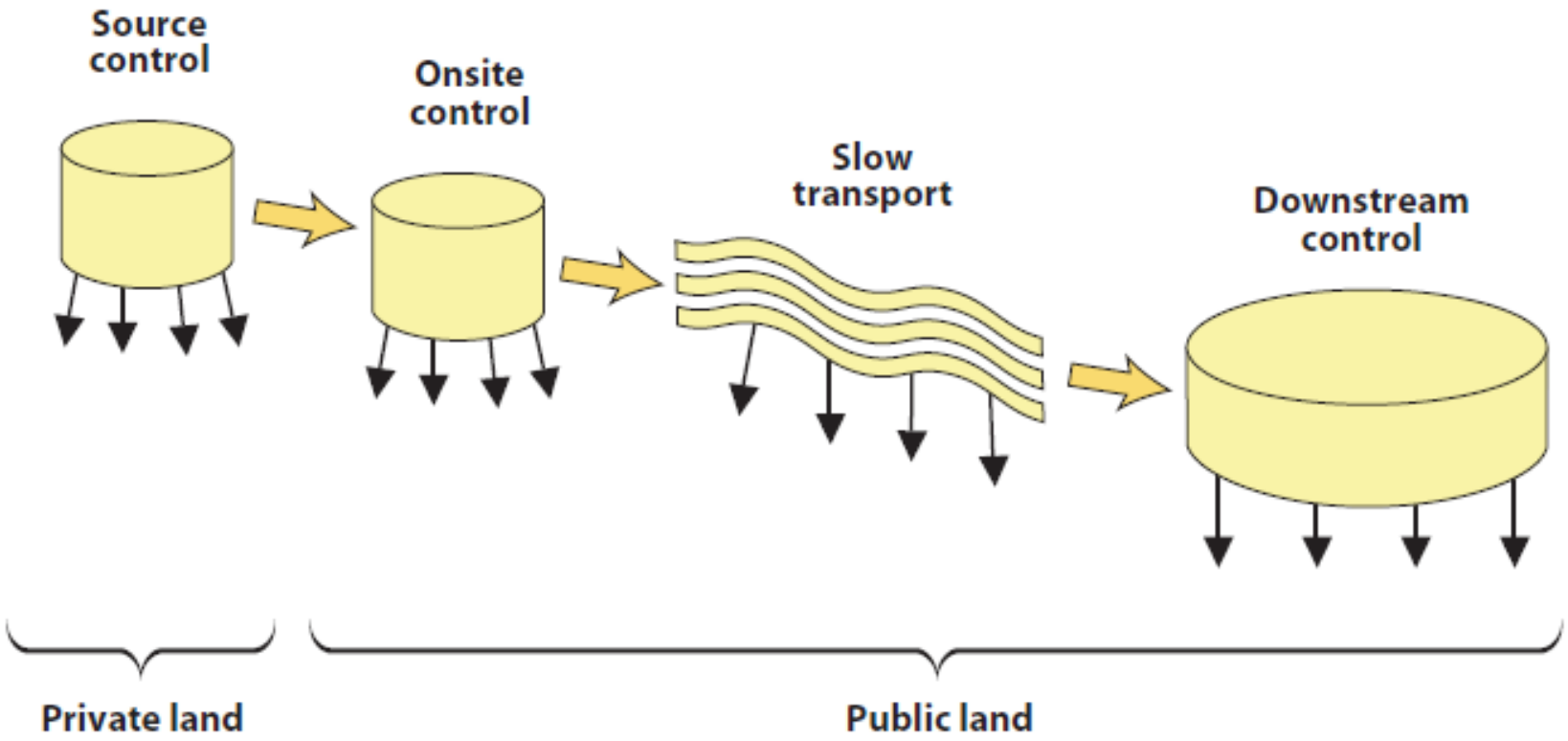
QUEBEC GUIDELINES



- Recharge– 5 to 10 mm
- Quality – 25 mm (90 % of events)
- Erosion – 1:1 an detained for 24 to 48 h
- Quantity – 1:2 ans; 1:10 ans et 1:100 ans to pre-development levels

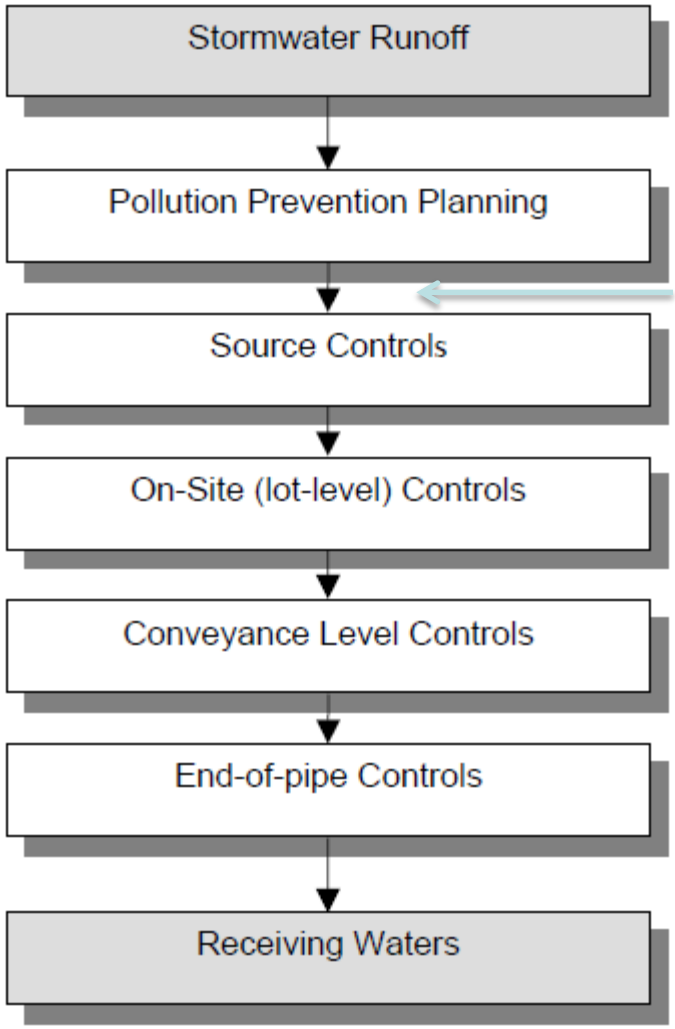
QUEBEC GUIDELINES

+ TREATMENT TRAIN



QUEBEC GUIDELINES

+ TREATMENT TRAIN



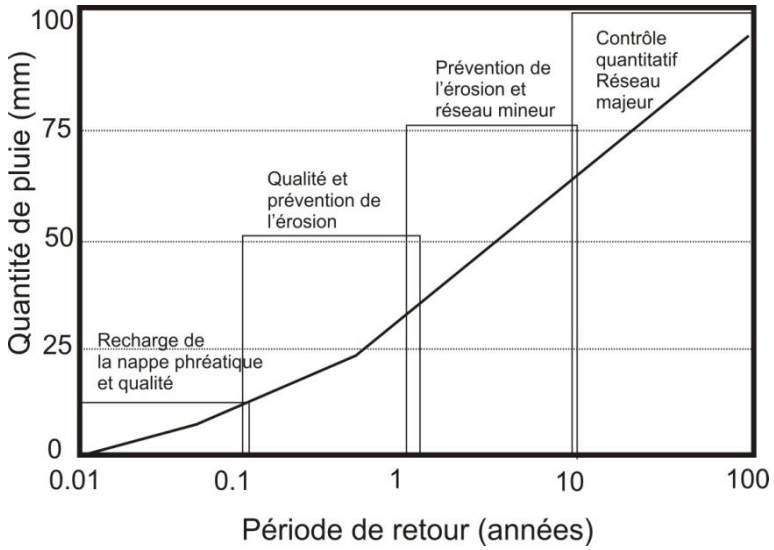
Urban Land Use Planning

QUEBEC GUIDELINES

Criteria

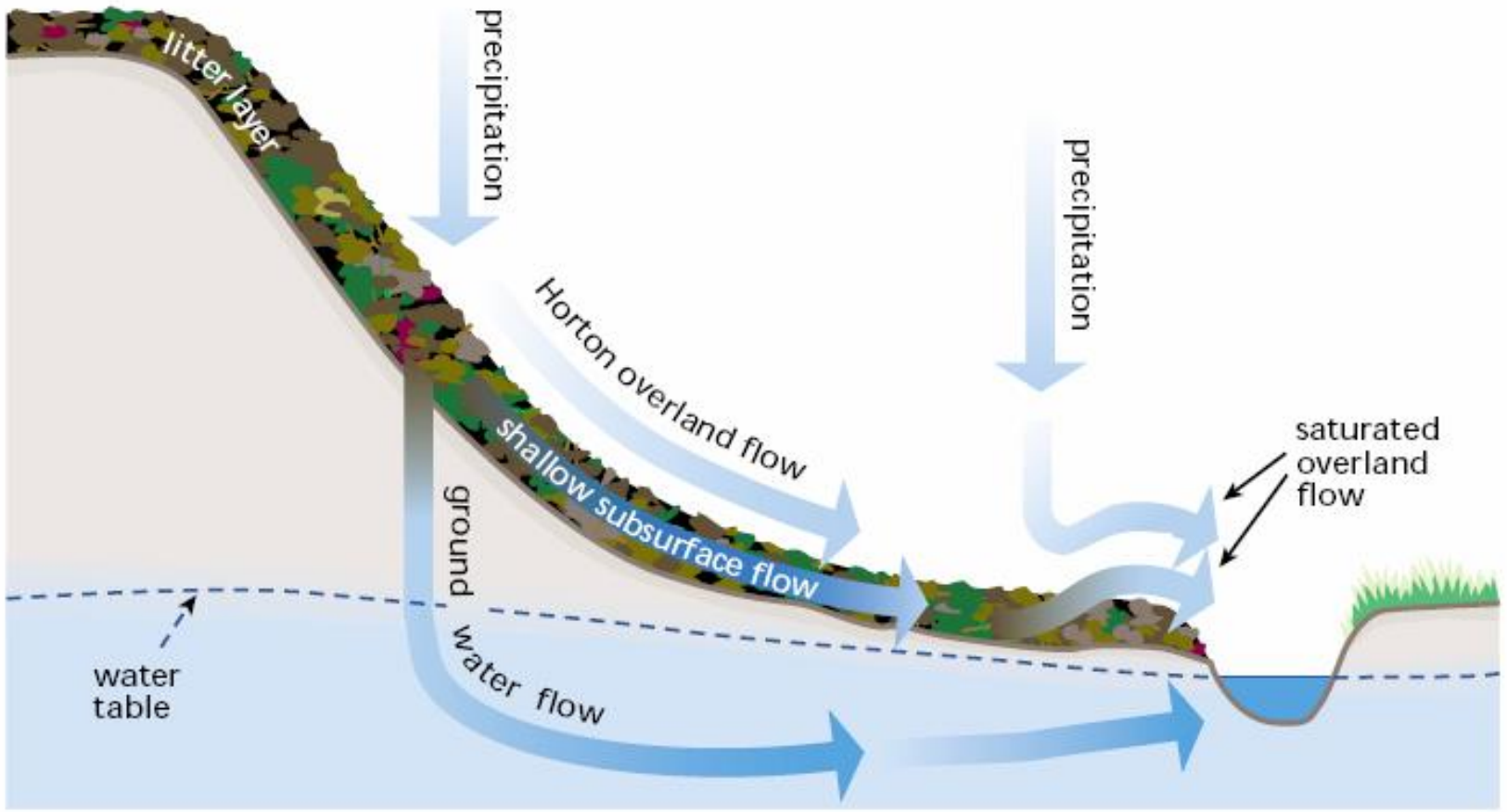
- Volume Control

- Complete spectrum of rainfall



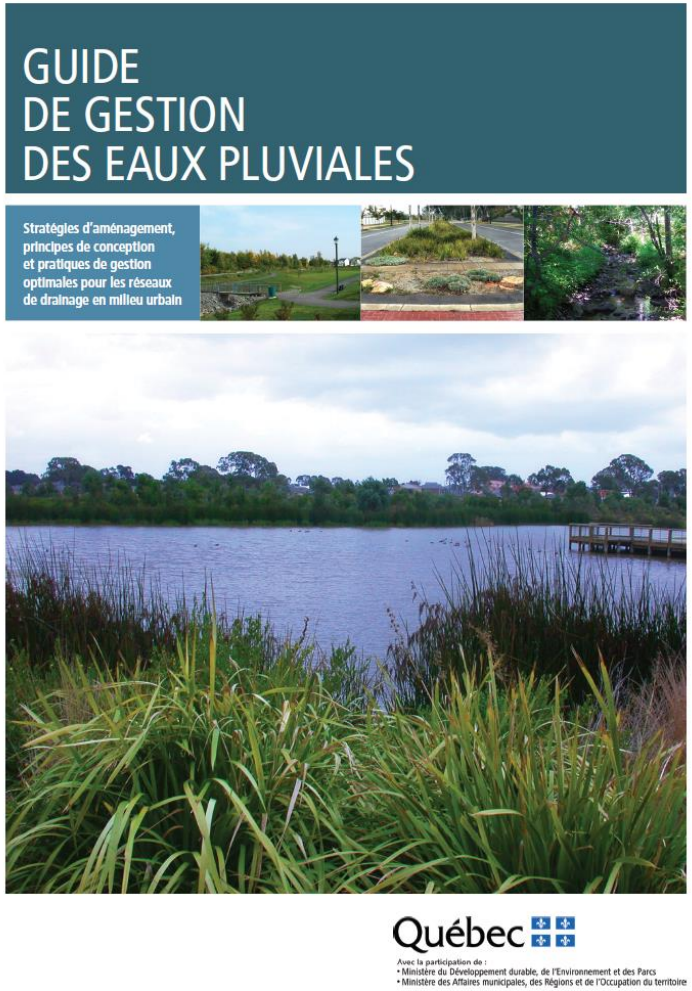
QUEBEC GUIDELINES

+ **PRE-DEVELOPMENT – NOT SO OBVIOUS TO REPRODUCE**



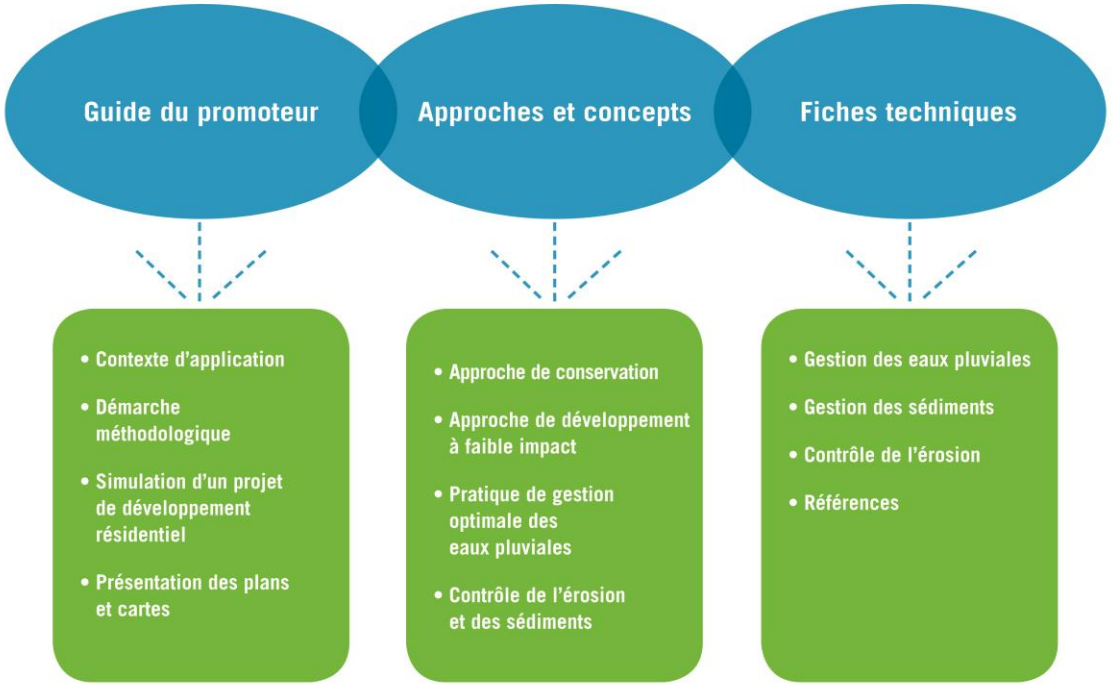
QUEBEC GUIDELINES

- PROVINCIAL GUIDELINES USEFUL FOR UNIFORM PRACTICE
- TRAINING STILL VERY NEEDED
- QUALITY CONTROL – LID APPROACHES TO BE PUSHED FORWARD
- REGULATORY APPROVAL PROCESS UNDER REVISION
- CITIES ARE DEVELOPING THEIR OWN SPECS (LAVAL, QUEBEC CITY)
- TEAMWORK NECESSARY TO REACH THE OBJECTIVES !!
- ON-GOING REVISION WITH 6 SUB-COMMITTEES



QUEBEC GUIDELINES

MANUAL FOR DEVELOPERS IN WATERSHED (QUEBEC CITY)



Le *Guide du promoteur*, le document *Approches et concepts* ainsi que les fiches techniques peuvent être téléchargés au

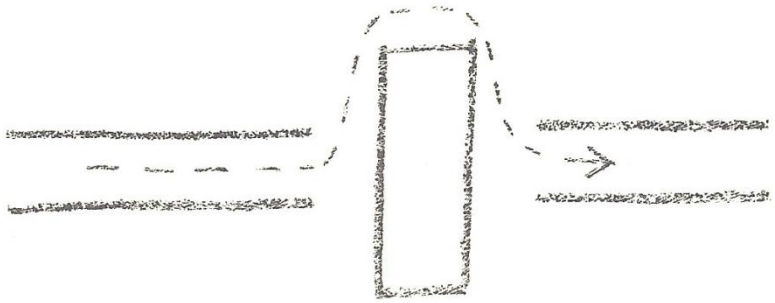
www.ville.quebec.qc.ca/guidedupromoteur

QUEBEC GUIDELINES

- **MANUAL FOR DEVELOPERS IN WATERSHED**
  - Designed to help developers
  - Separate concepts/Design info/Technical Specs
  - Used to create a common technical language

BARRIERS

+ REGULATORY FRAMEWORK
+ DESIGN GUIDELINES AND FEEDBACK
+ MAINTENANCE FOR COLD CLIMATE
+ LEVEL OF SERVICE
+ CONFLICTING LID GUIDANCE
+ PLANNING PROCESS
+ EDUCATION – TRAINING
+ REVIEW PROCESS
+ TERMINOLOGY
+ SAFETY CONSIDERATIONS



BARRIERS

PHYSICAL

- Insufficient Space
- Soil
- High groundwater
- Slopes
- Proximity to water bodies
- Contaminated soils

TECHNICAL

- Inconsistent definitions
- Lifecycle costs
- Risks
- Contaminated soils
- Design guidelines

INSTITUTIONAL

- Uncertainty
- No incentives
- Education and training
- No one-size-fits-all

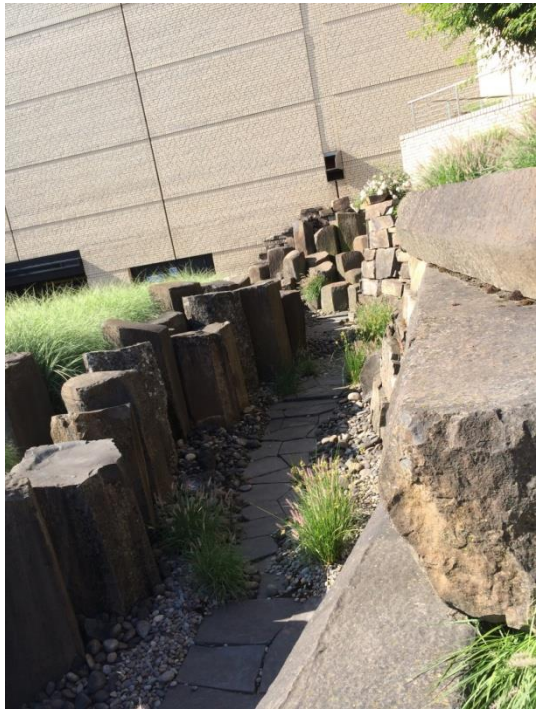
Barriers to Implementing Low Impact Development Approaches in Washington State Roadways and Highways

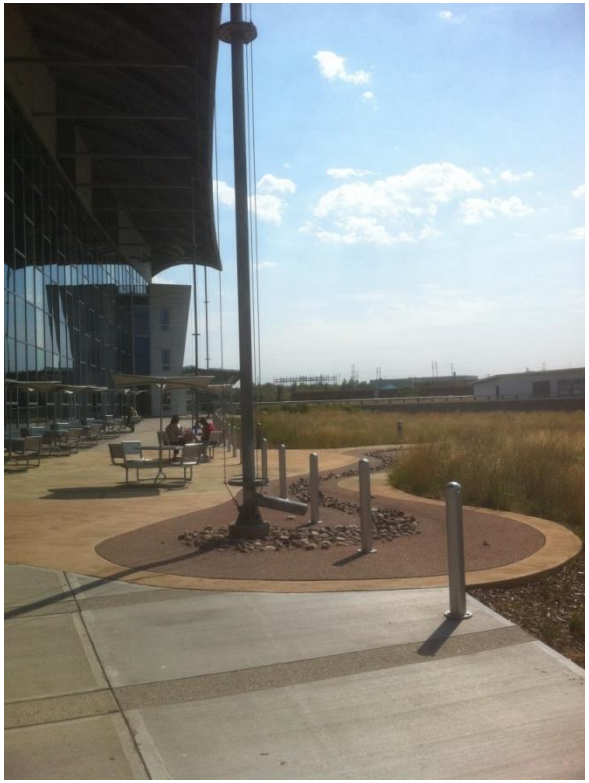
WA-RD 756.1 Claire Elisabeth Miccio June 2010

lasalle nhc

WAY FORWARD

WATER IS VISIBLE AND INTEGRATED





lasalle nhc

WAY FORWARD

SEEING OPPORTUNITIES

WAY FORWARD

ROBUST AND FUNCTIONAL DESIGN

lasalle nhc

WAY FORWARD

EROSION AND SEDIMENT CONTROL : ESSENTIAL !!!

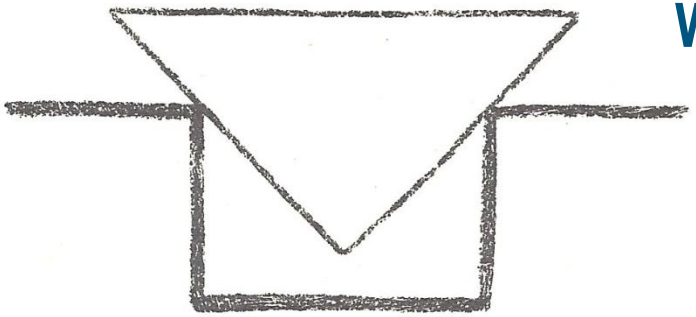
WAY FORWARD

PERVIOUS REVETMENTS SHOULD NOT BE OVERLOOKED

lasalle nhc

WAY FORWARD

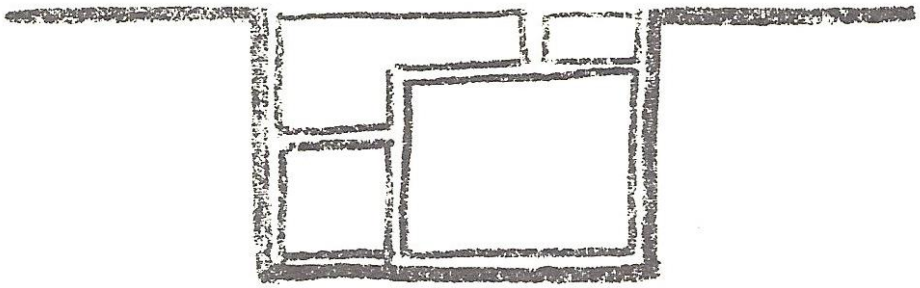
SOLUTIONS

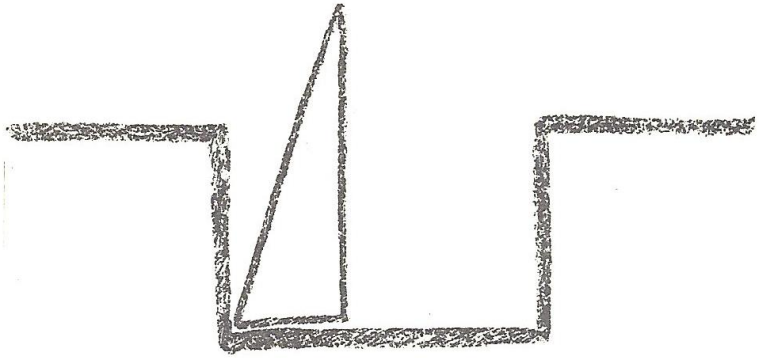


WRONG FIT

INADEQUATE FIT

COMPLICATED

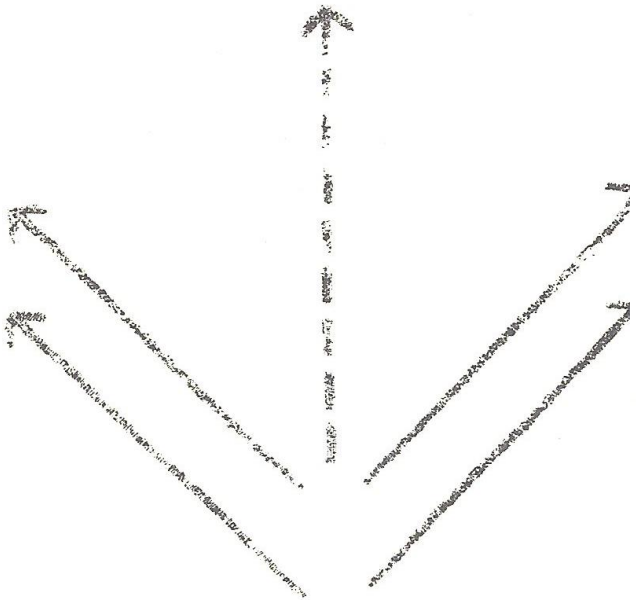




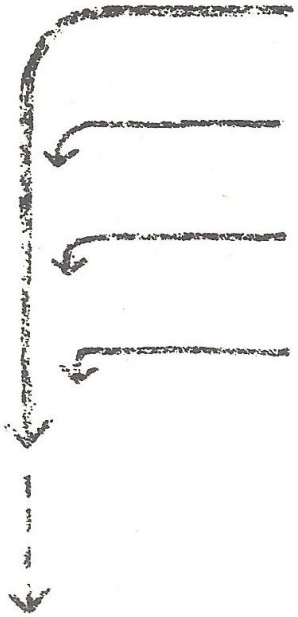
WAY FORWARD

DECISIONS

COMPROMISE



WHO WILL LEAD ?



Urban Planner

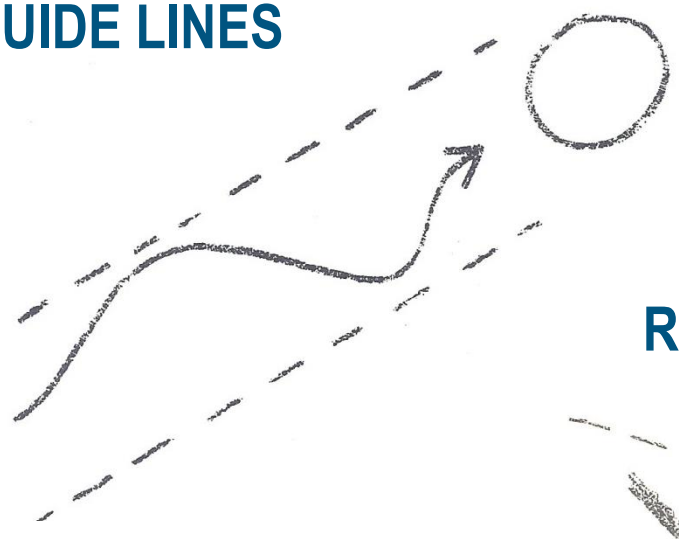
Landscape Architect

Environment

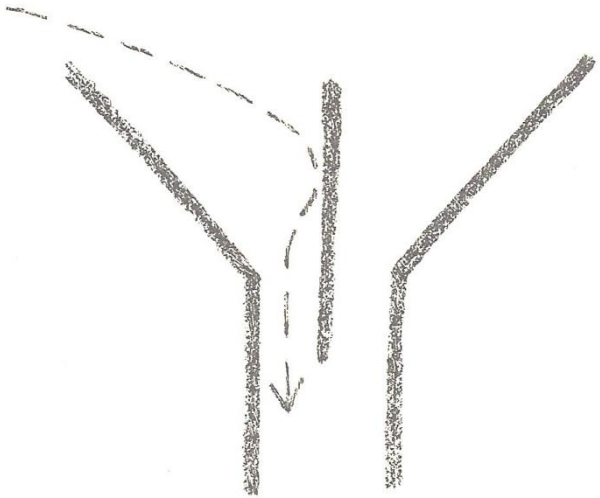
Civil Engineer

WAY FORWARD

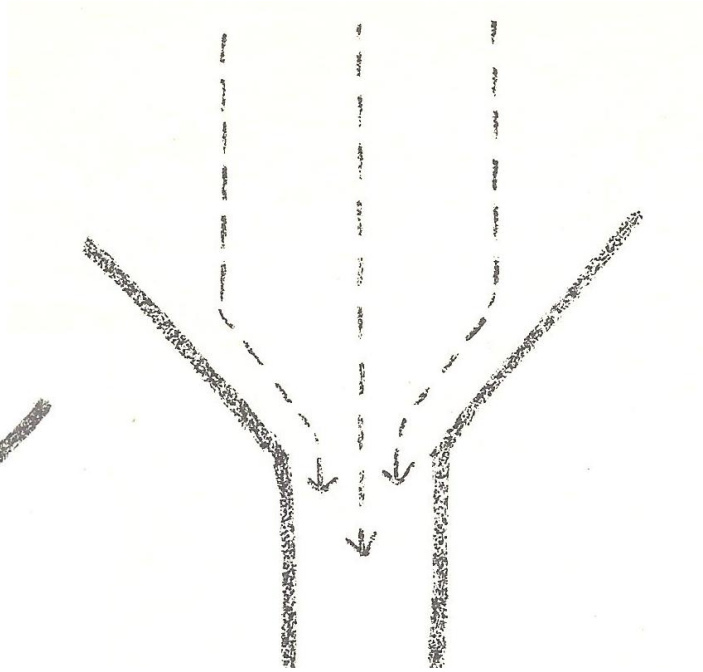
GUIDE LINES



ROBUST DESIGN

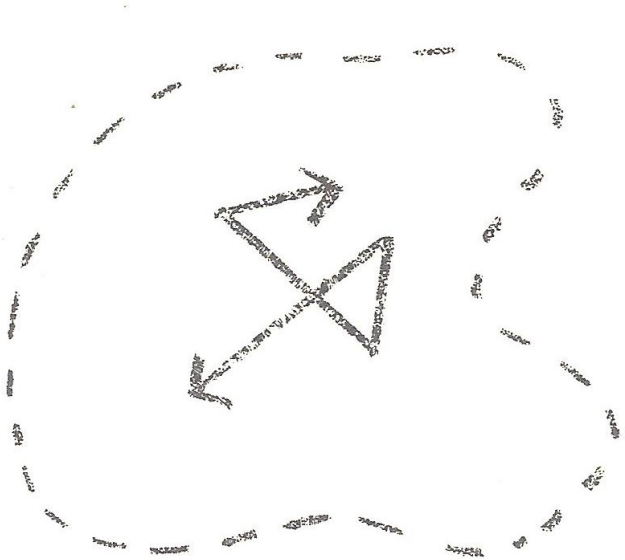


EFFECTIVENESS



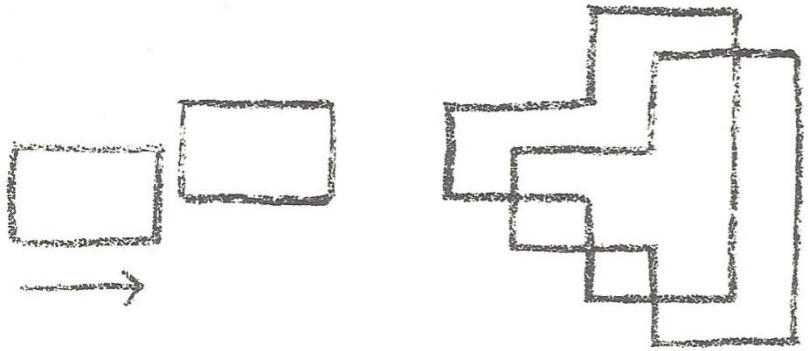
WAY FORWARD

INFORMATION

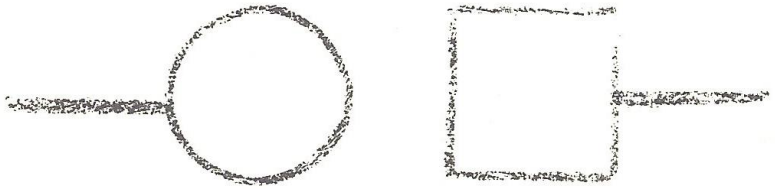


CONFUSION

DIFFERENT PERCEPTIONS



COMMUNICATION

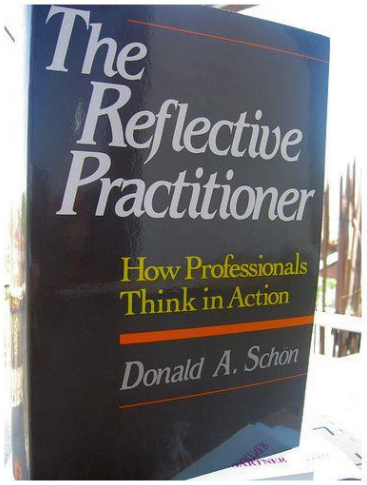


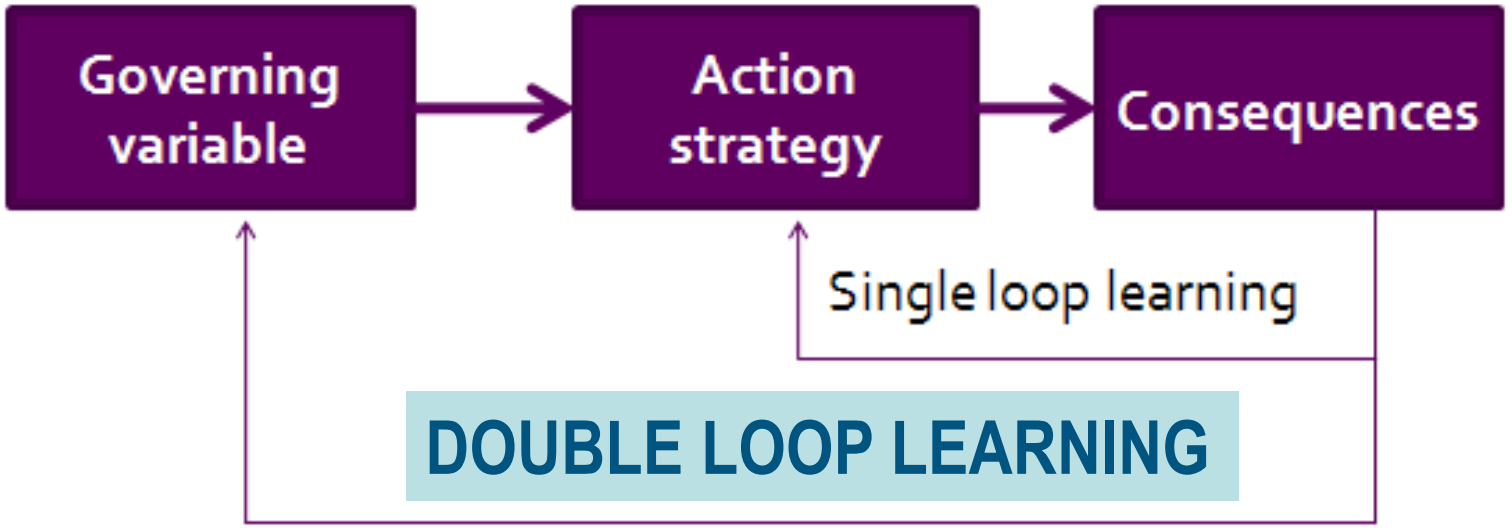
CLOSING THE LOOP

Donald Schon

What are the objectives and values behind your actions ?

If you are fully aware of these, you may be able to change them.

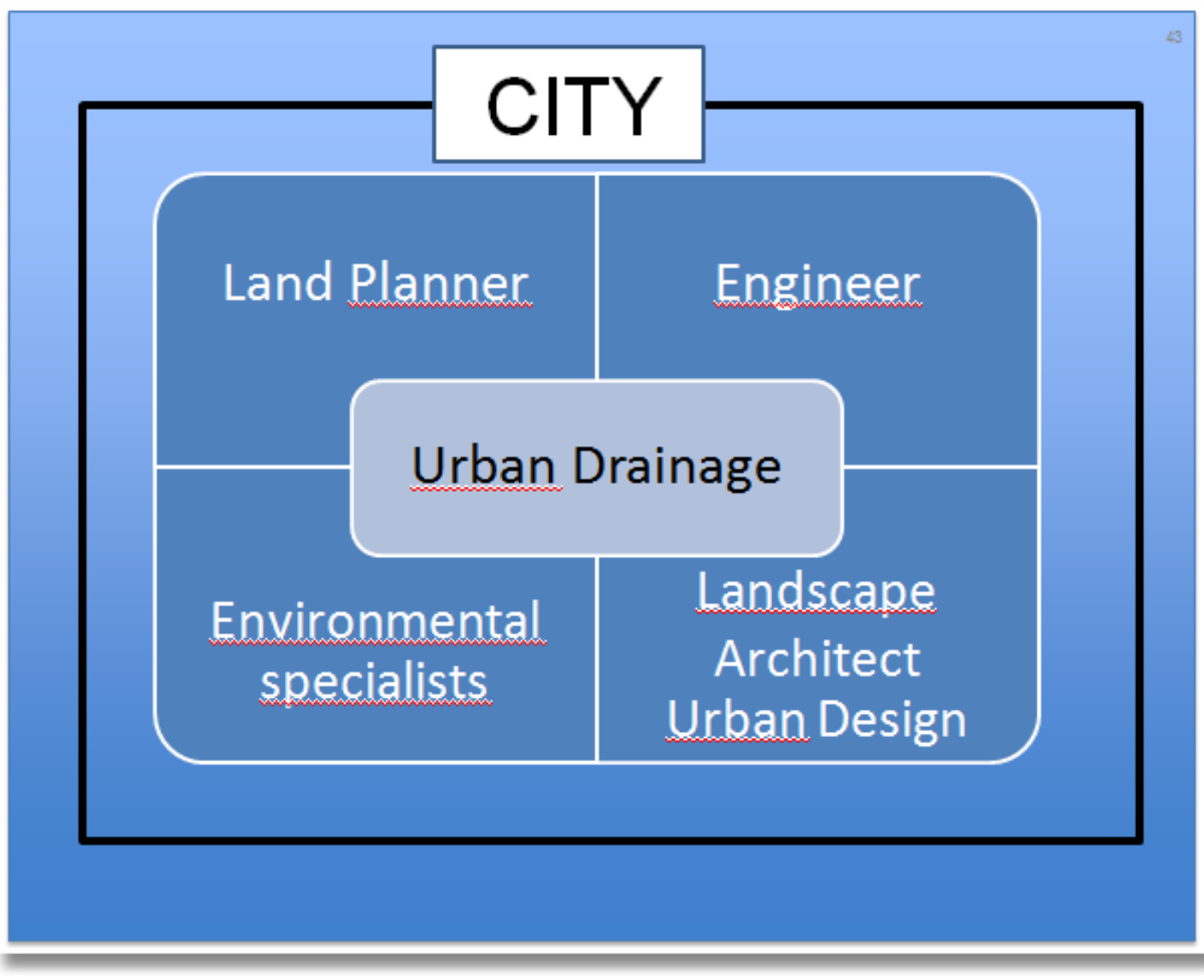




lasalle nhc

CHALLENGES

- Modify design and approaches for cold climate conditions
- Adapt concepts – Robust designs (Standards ?)
- Incentives for new approaches
- Drainage fonctions
- Integration of different disciplines


43
CITY
Land Planner
Engineer
Urban Drainage
Environmental specialists
Landscape Architect Urban Design