# Keeping Things in Perspective!

Judge success in reaching a goal by the distance travelled, rather than the distance remaining

## Lower Hunter Valley & Central Coast Environmental Management Strategy

## Challenges & Opportunities for Subdivision Design

# Resolving Stakeholder Fear and Doubt, and Managing Stormwater at the Source :

*How We are Making it Happen at Burnaby Mountain in British Columbia*

CH2MHILL

Simon Fraser University
on top of Burnaby Mountain

# High Expectations

**Simon Fraser University**

> ***"intends to design and develop a model community integrating residential, commercial and academic uses in a manner that will bring international acclaim, both to the University and the City of Burnaby".***

# The #1 Solution

## Earning trust through a process . . .

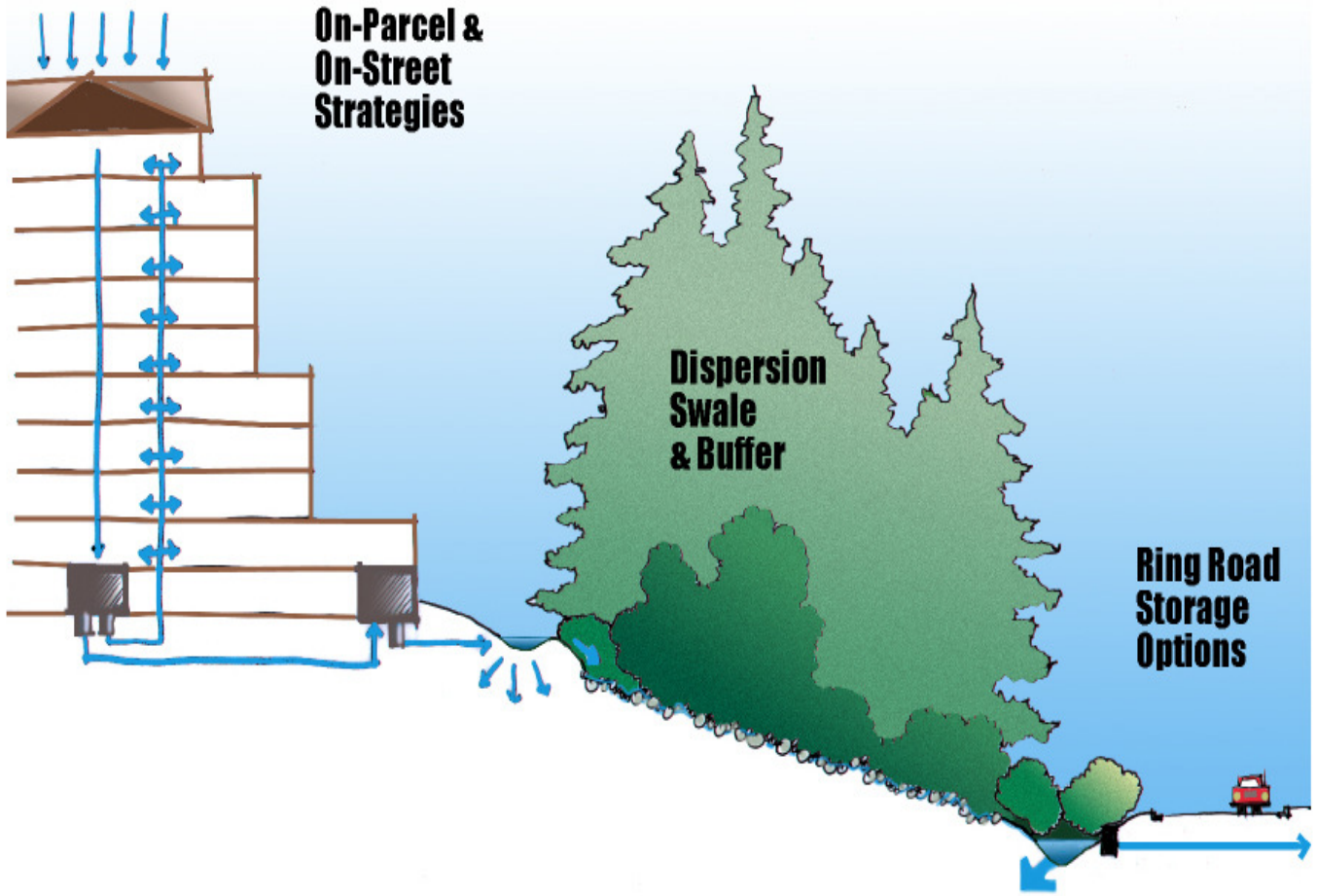
1. True interdisciplinary teamwork
2. Introductory forum
3. Stakeholder round tables
4. Technical sessions
5. Assured delivery

# 1. Interdisciplinary Teamwork

- Teambuilding by charette - 52 hrs of teamwork in 72 hours of time.
- True integration of disciplines.
- An iterative design process.

# 2. Introductory Forum

- Involved key stakeholders
- Introduced issues and objectives
- Defined concepts
- Created a common language
- Used response form to ensure active listening



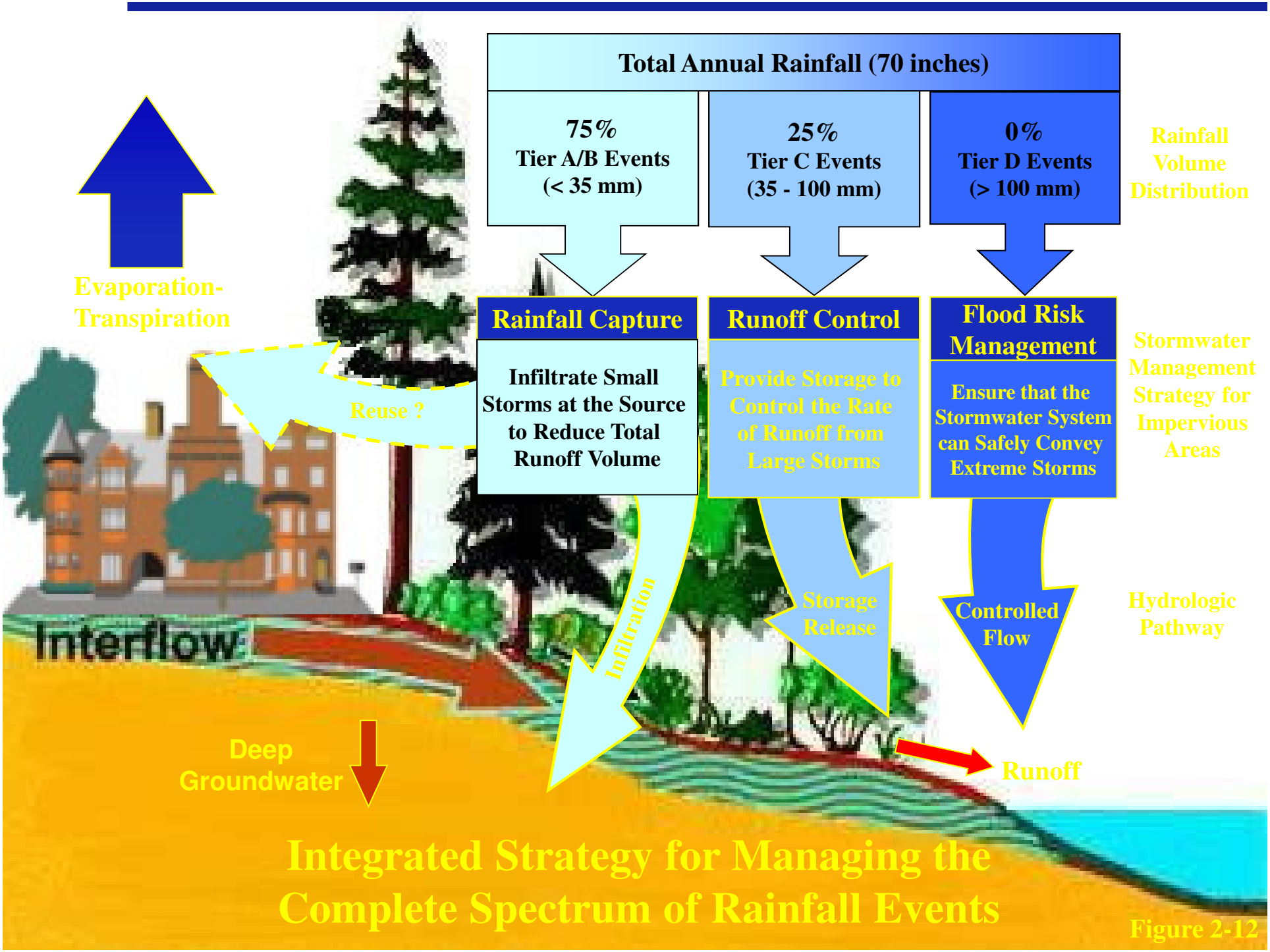

# STORMWATER SYSTEMS

# What is the appropriate balance for stormwater management?

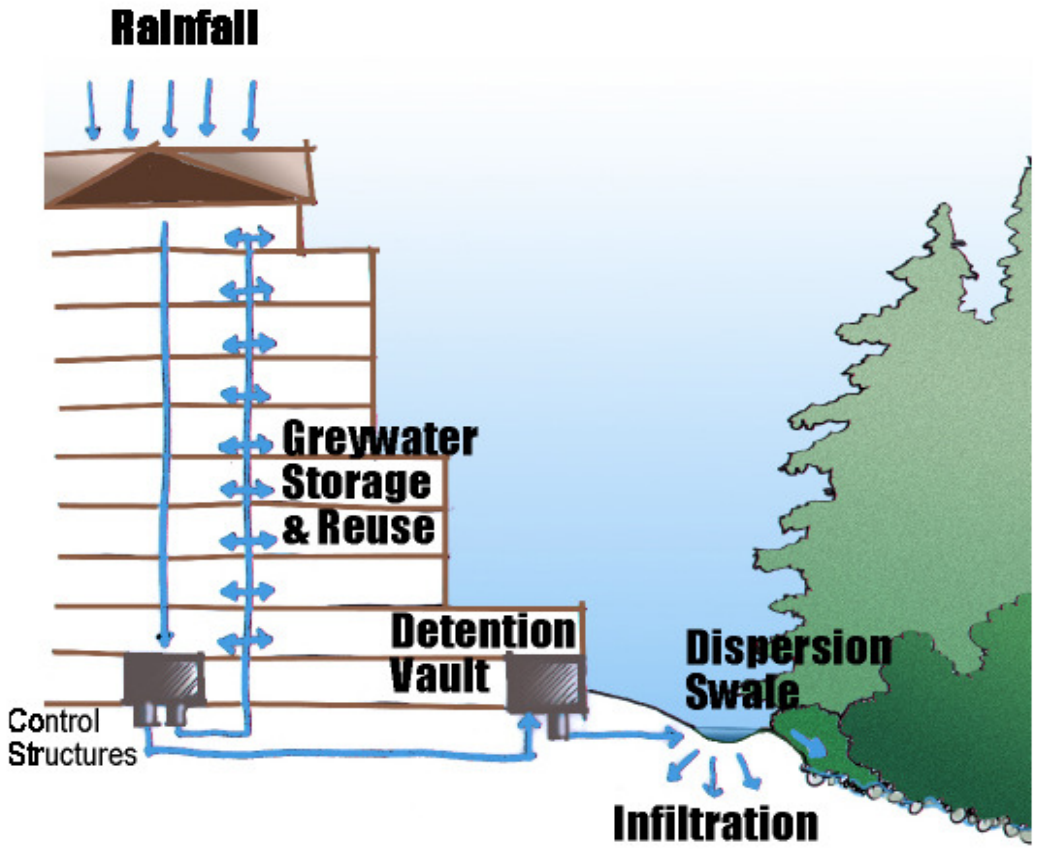
Among:

- On-Parcel Strategies
- On-Street Strategies
- Stormwater Detention Strategies

How much of the problem is addressed at the source (the impervious surface), and how much is passed downstream (to detention ponds)?


Total Annual Rainfall (70 inches)
75%
Tier A/B Events
(< 35 mm)
25%
Tier C Events
(35 - 100 mm)
0%
Tier D Events
(> 100 mm)
Rainfall Volume Distribution
Evaporation-Transpiration
Rainfall Capture
Infiltrate Small Storms at the Source to Reduce Total Runoff Volume
Runoff Control
Provide Storage to Control the Rate of Runoff from Large Storms
Flood Risk Management
Ensure that the Stormwater System can Safely Convey Extreme Storms
Stormwater Management Strategy for Impervious Areas
Reuse ?
Infiltration
Storage Release
Controlled Flow
Hydrologic Pathway
Interflow
Deep Groundwater
Runoff
Integrated Strategy for Managing the Complete Spectrum of Rainfall Events
Figure 2-12

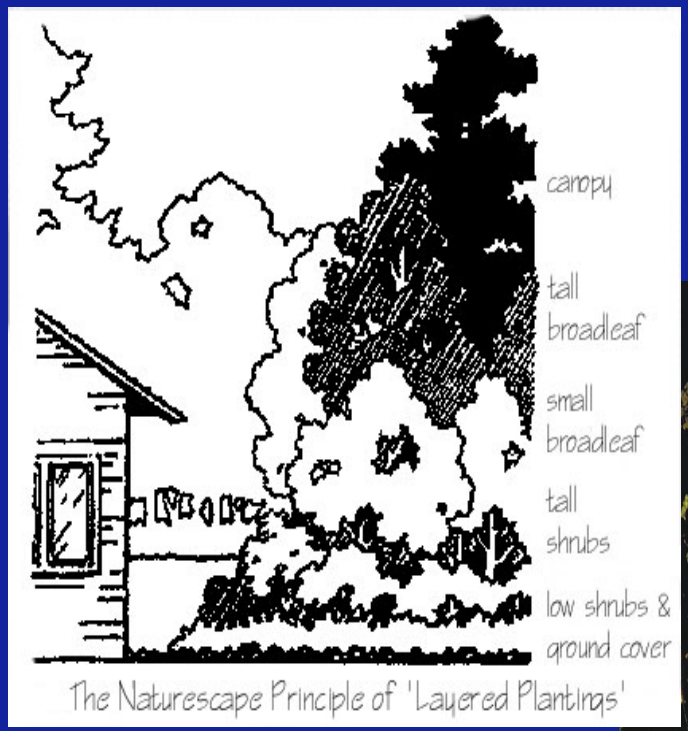
# On-Parcel Stormwater Management Options

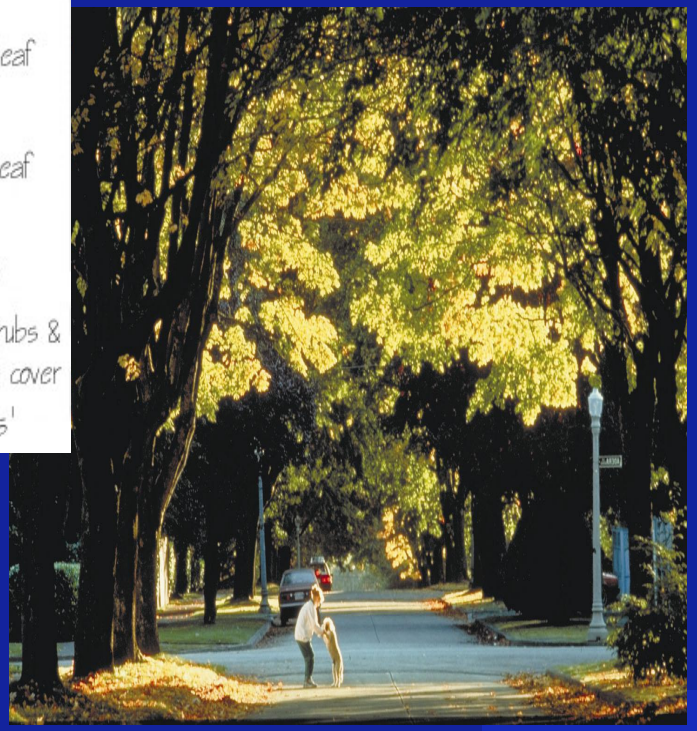



# ON-PARCEL STRATEGIES

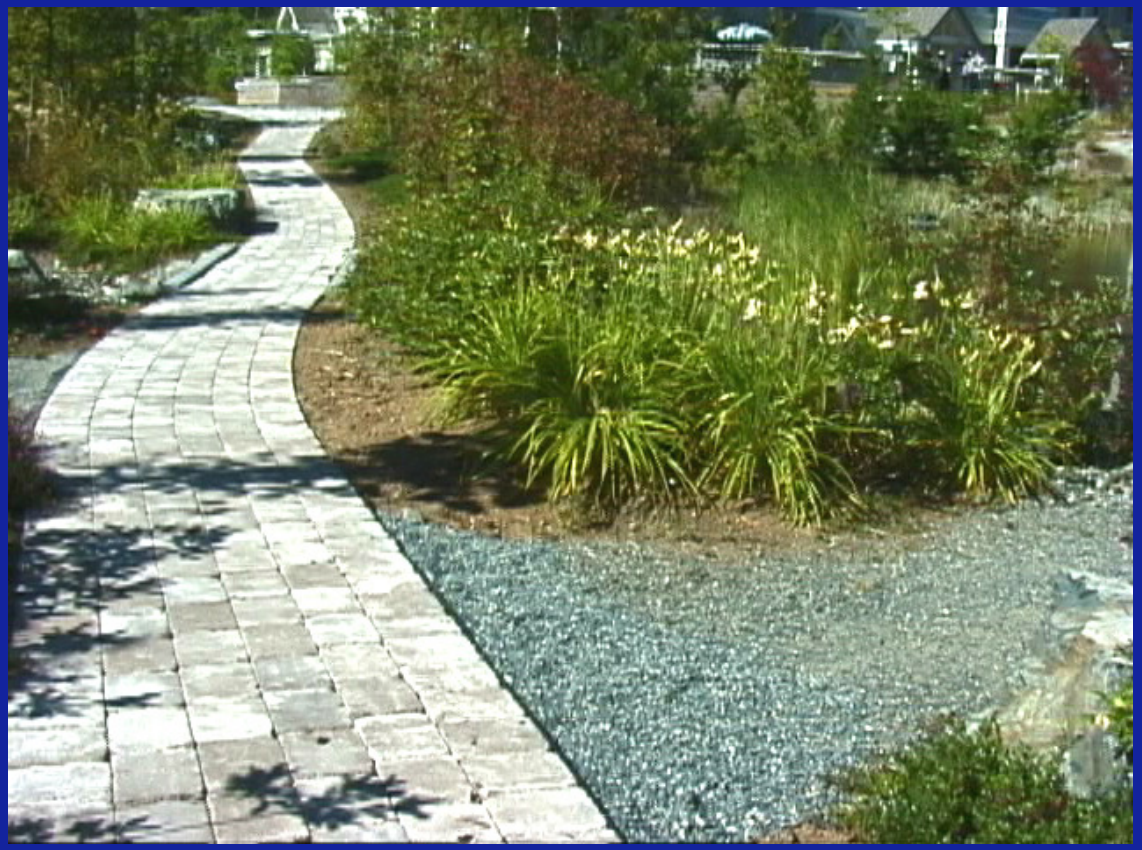
# Multistorey buildings & landscape over underground parking

# Leaf Cover


canopy
tall broadleaf
small broadleaf
tall shrubs
low shrubs & ground cover
The Naturescape Principle of 'Layered Plantings'

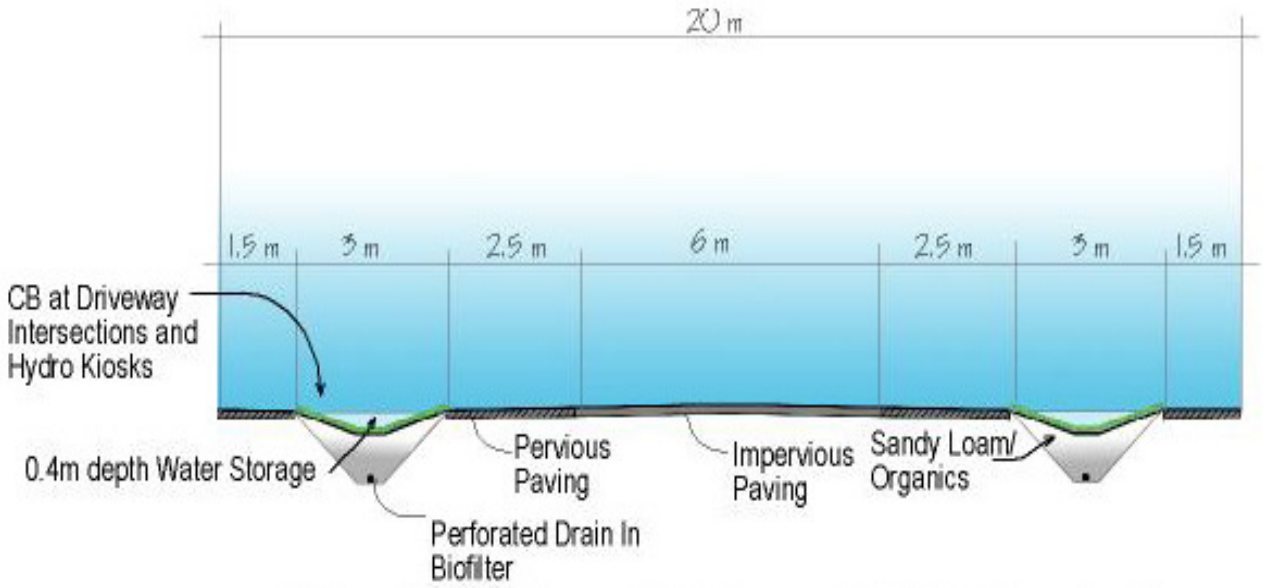


# Permeable paving/landscape



# On-Street Stormwater Management Options

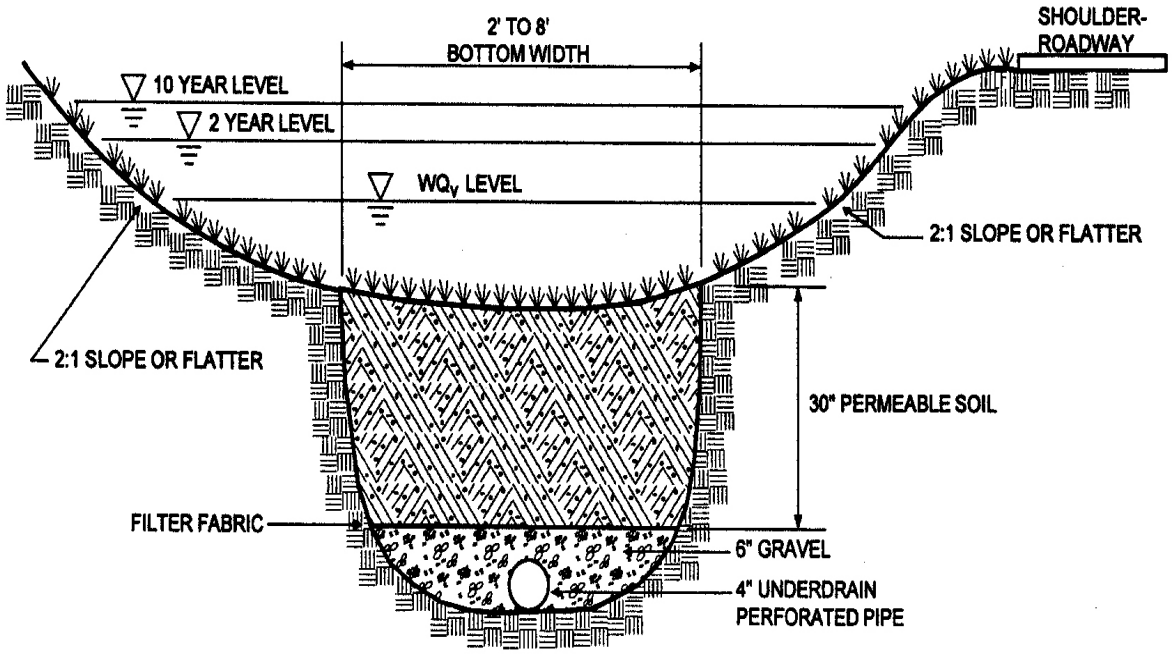
CH2MHILL




**Street Section with Dryswale/ Underdrain**

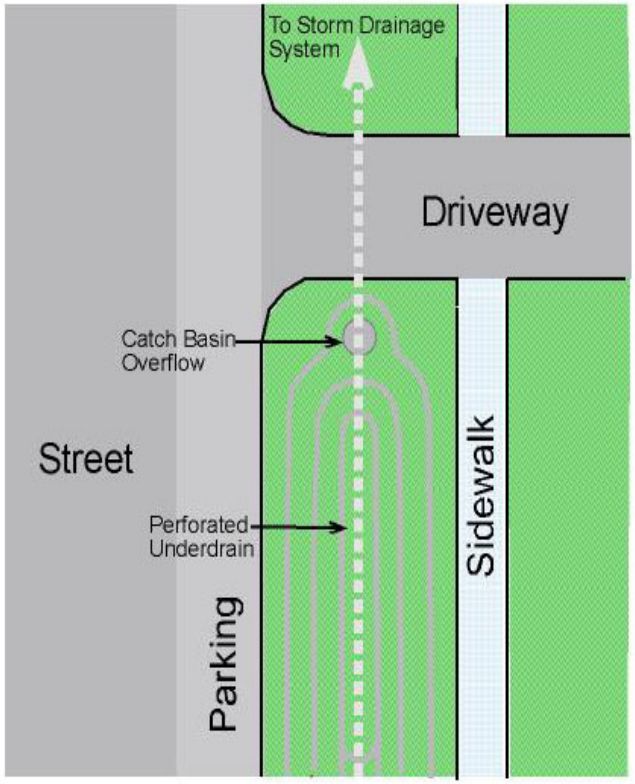
Center for Watershed Protection

# Dry Swale with Underdrain




CH2MHILL

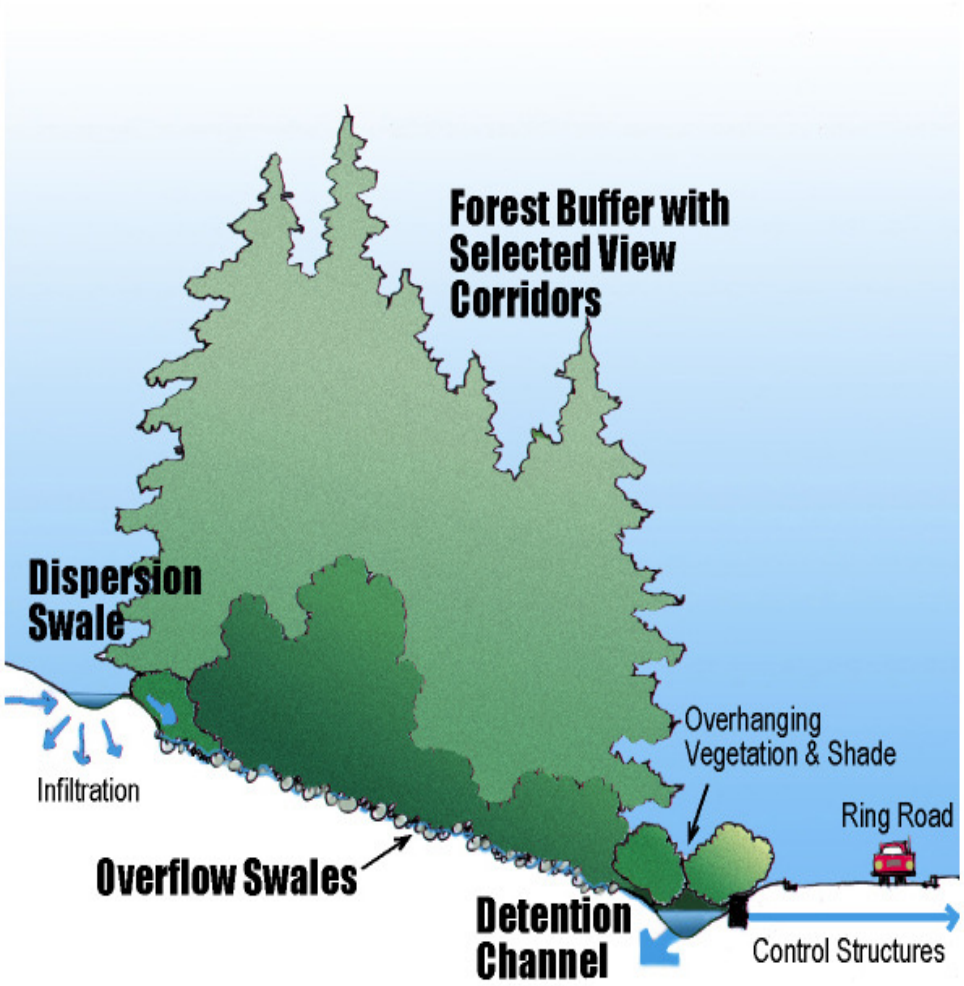
# Catch Basin Overflow



# Detention Stormwater Management Options

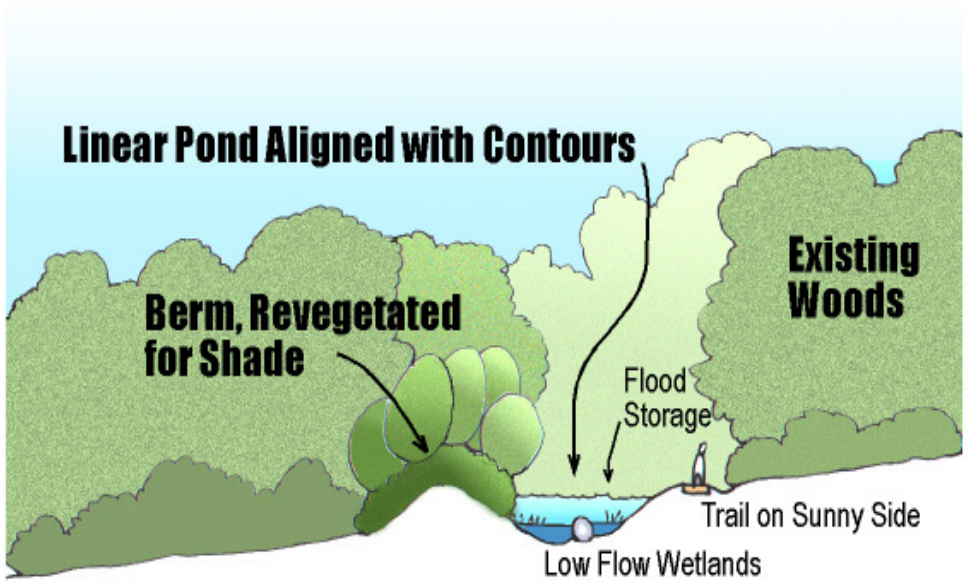
CH2MHILL

# Ring Road Channel Site




# RING ROAD CHANNELS

# Linear Pond in a Natural Setting (2 years after construction)




# Contour Wetlands

# 3. Stakeholder Roundtables

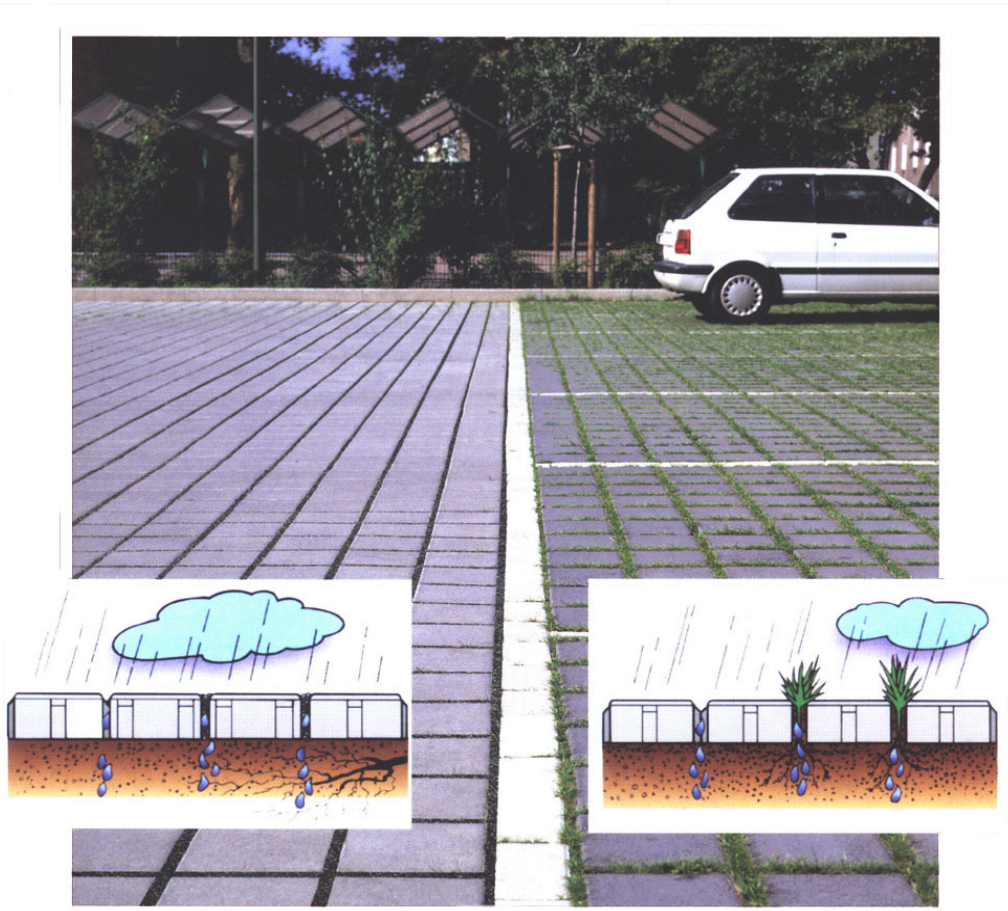
- Involved agencies, NGOs, consultants, & proponent in a collaborative framework.
- Facilitated by City of Burnaby rep. (neutral)
- Emphasis on understanding concerns.
- Defined common principles, customized for this project and site.
- Worked together on plan refinements.
- Four working sessions to build trust and understanding.

# 4. Technical Sessions

. . . how many people does it take to change an engineering standard?

. . . many people are involved and detailed issues come to the forefront.

# Pervious Pavers
## (SF Rima is shown)

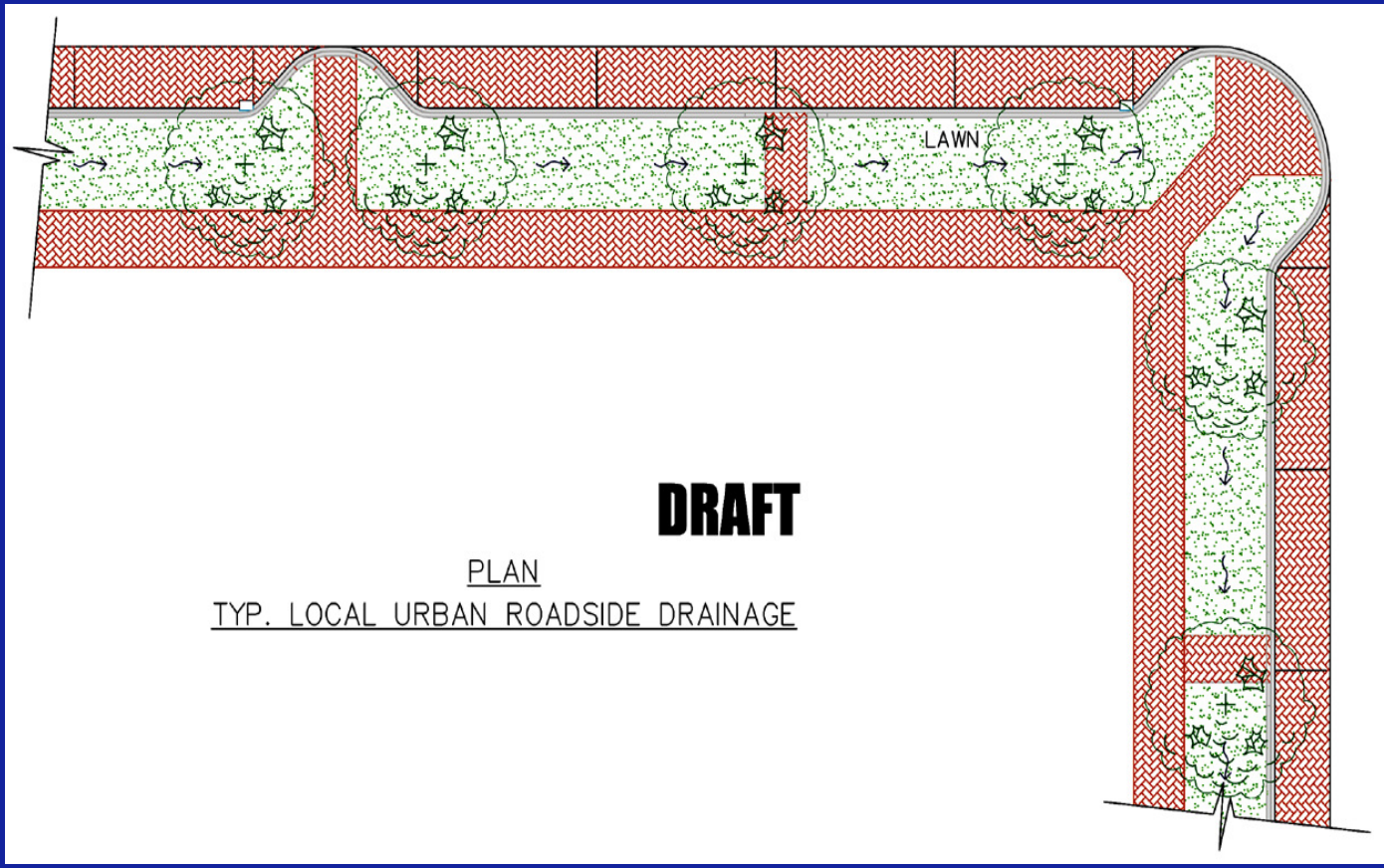


# Weed Control in Pervious Pavers

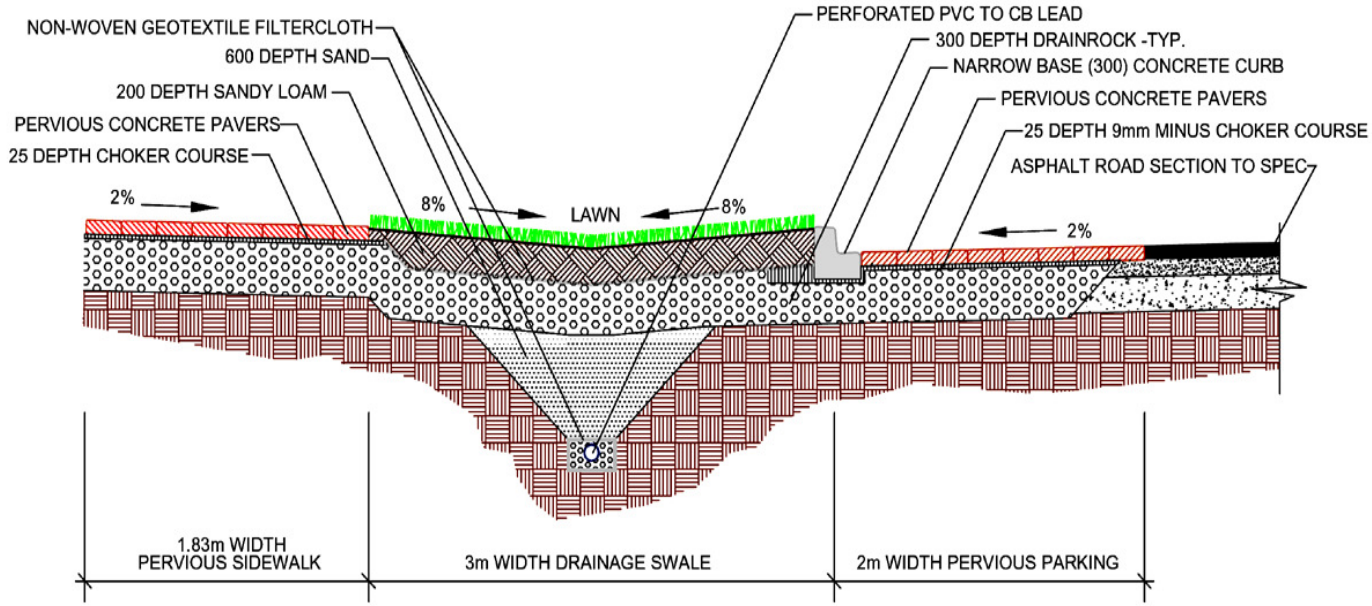
## Puzzy-Boy 800

CH2MHILL

# Urban Roadside w/ Pervious Pavers



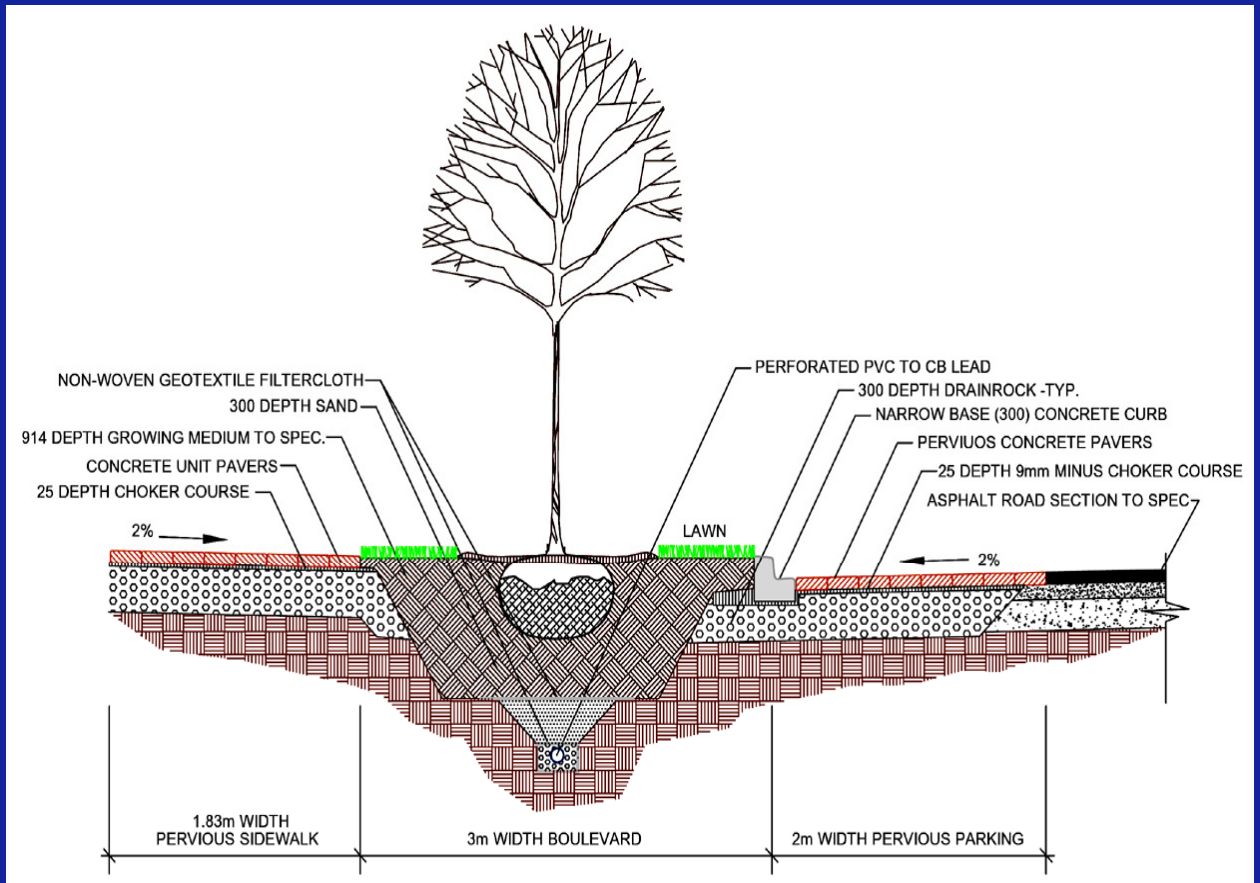
# Reservoir Base Course




DRAFT

SECTION A

TYP. LOCAL URBAN ROADSIDE DRAINAGE CONCEPT AT LAWN



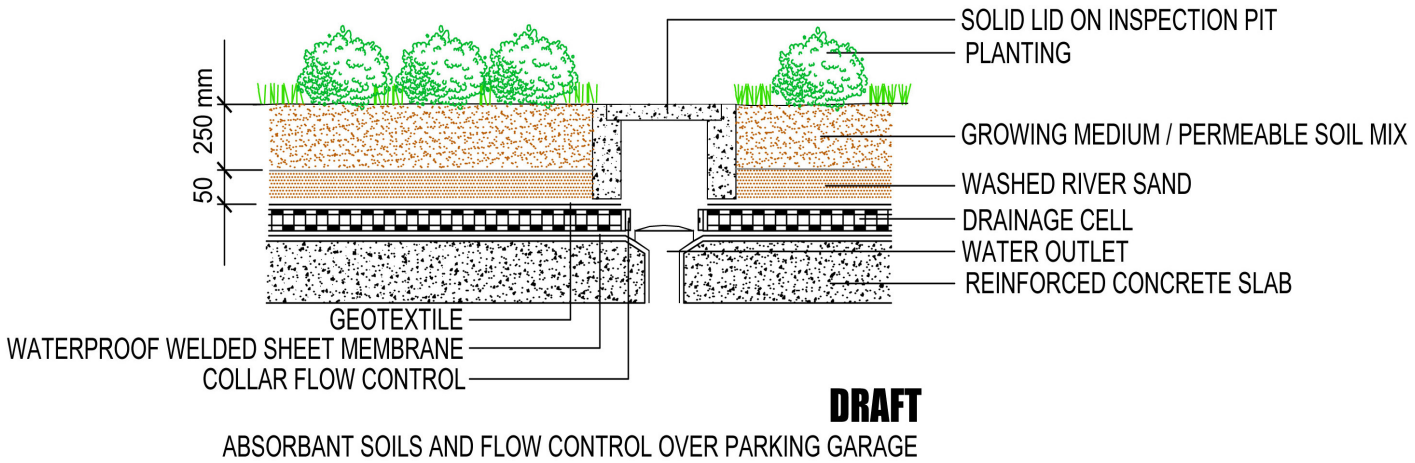

DRAFT

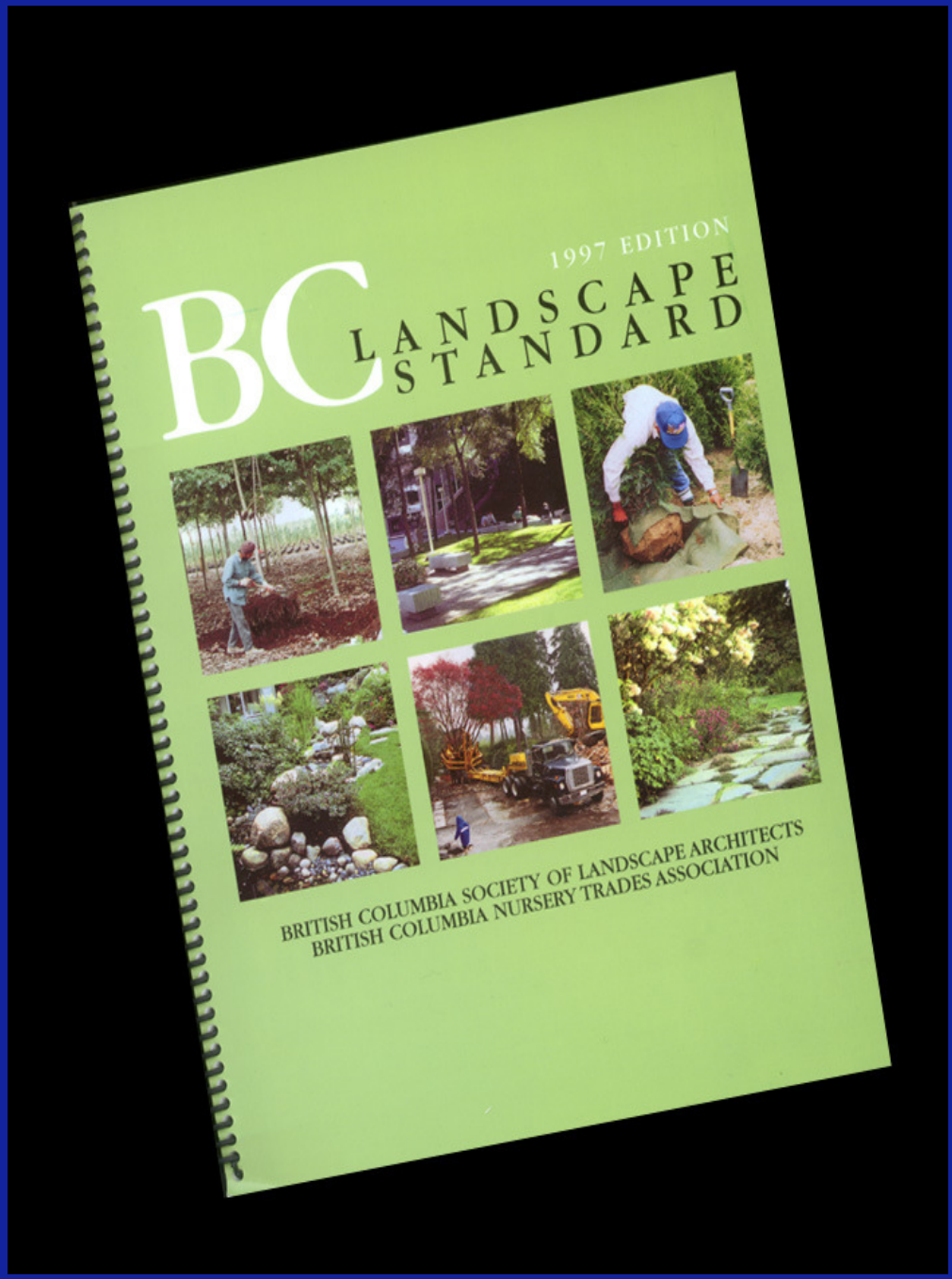
SECTION B

TYP. LOCAL URBAN ROADSIDE DRAINAGE CONCEPT AT TREE

# Soil / Compost Mixes

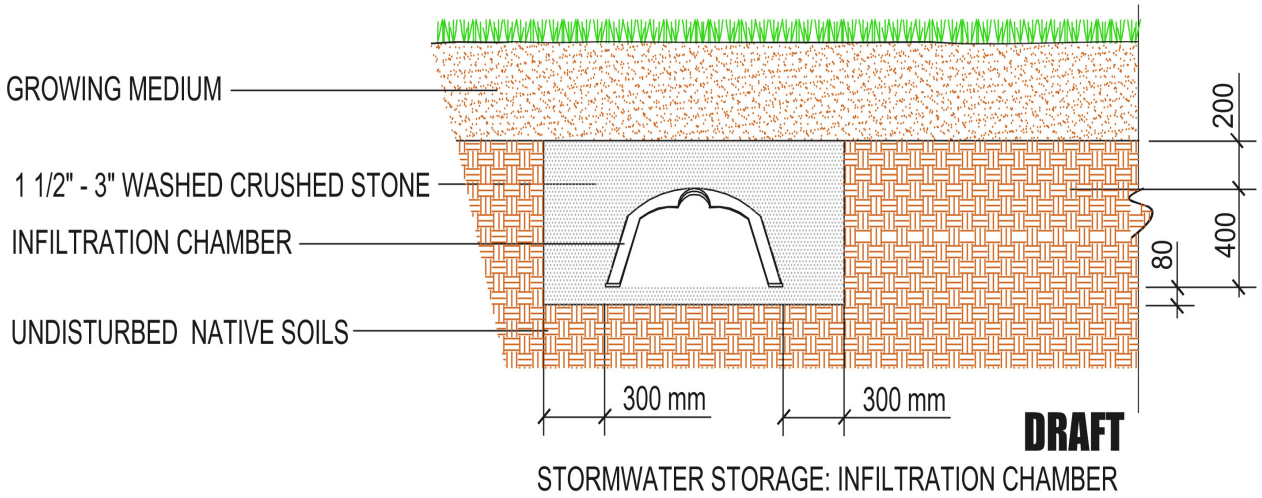
# Absorbent Soil over Parking Garage




1997 EDITION
BC LANDSCAPE STANDARD
BRITISH COLUMBIA SOCIETY OF LANDSCAPE ARCHITECTS
BRITISH COLUMBIA NURSERY TRADES ASSOCIATION

# Infiltrator Chambers

# Infiltration Trench
## (using Infiltrator Chamber and overflow)




STORMWATER STORAGE: INFILTRATION CHAMBER

# Appreciating old solutions:
## Spaced wood deck over absorbent ground

# 5. Assured Delivery

- Clear performance targets
- Continuous Monitoring (computerized and human)
- Example solutions, details and specs
- Contractor Watershed Awareness Training (& Certification?)
- Feedback and Adaptive Management
- Long term Commitment

# Bumps along the way . . .

- Shortcuts that didn't work
- Uncovering people's worst fears
- Imperfect base information
- Imperfect personality matches
- Difficulty finding local built precedents
- Accepting some risk . . .

# Overcoming Barriers means earning trust through a process

1. Interdisciplinary teamwork
2. Introductory forum
3. Stakeholder round tables
4. Technical sessions
5. Assured delivery

# Web Sites

- Burnaby Mountain Project: www.sfu.ca/bmcp
- Headwaters Project (East Clayton): www.sustainable-communities.agsci.ubc.ca