

MANAGING STORMWATER IN A CHANGING
CLIMATE

HOME DEPOT DEVELOPMENT

COURTENAY

INNOVATIVE ON-SITE

RAINWATER/ STORMWATER MEASURES
AT A COMMERCIAL SITE

PRESENTED BY

KEVIN LAGAN P. ENG
DIRECTOR OF OPERATIONAL SERVICES
CITY OF COURTENAY

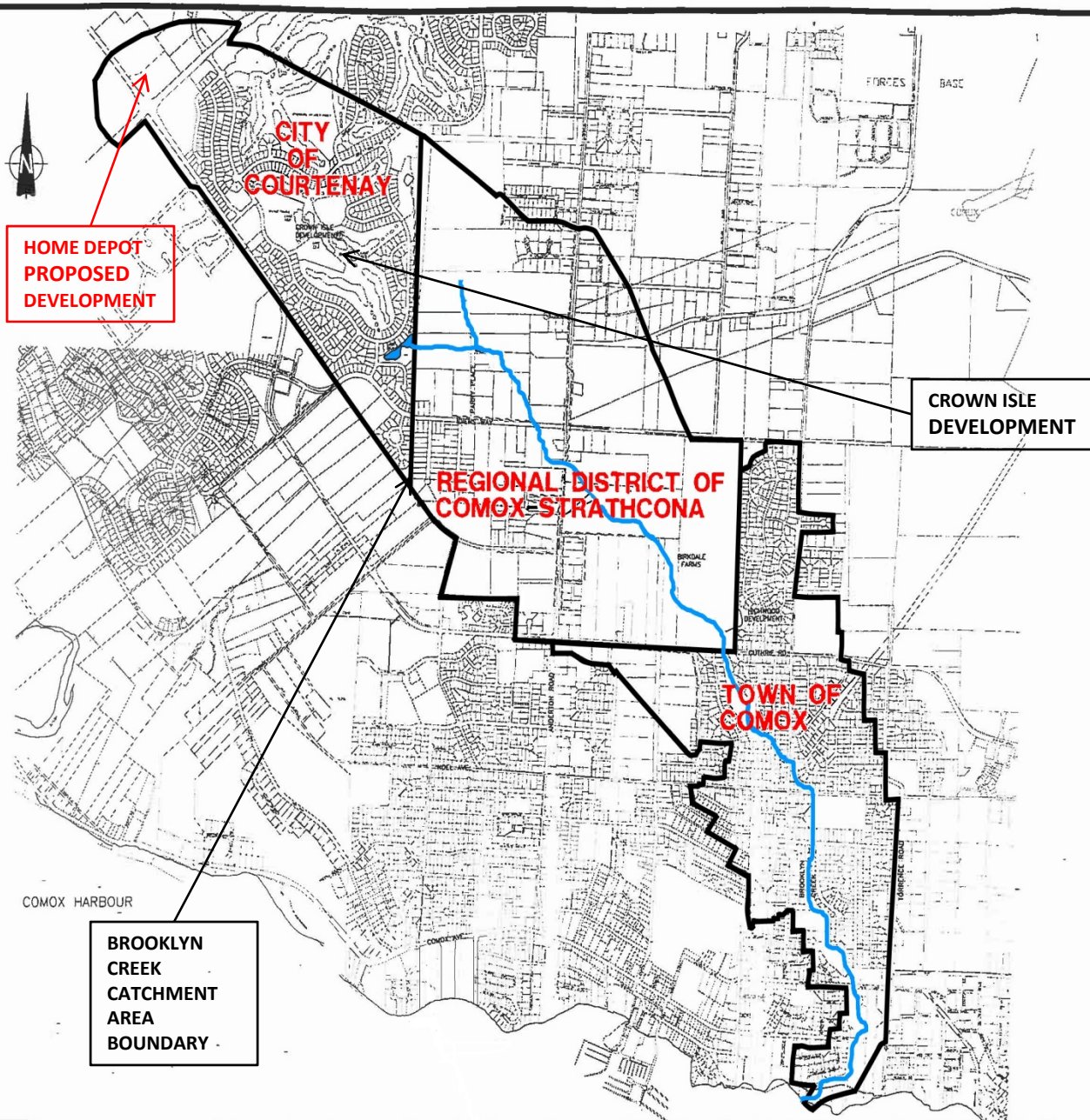
OCTOBER 28, 2010

City Of Courtenay

- Location
- Rain shadow
- Evolution
 - Prior to 1991 - piped system to water bodies
 - 1992 to 2000 - storm detention ponds and piped systems
 - 2001 to date - water balance model
- Area of city 2800 ha
- Precipitation
 - Approximately 1.20 m per year
- Total annual precipitation on the Home Depot site
 - 48,000 cubic metres – (~ 19 Olympic swimming pools)
- Elevation of city
 - Sea level to 93 metres

LOCATION OF PROPOSED DEVELOPMENT





VERIFY SCALES
 BAR IS BASED ON ORIGINAL DRAWING
 0 10mm
 IF NOT 10mm ON THE SHEET, ADJUST SCALES ACCORDINGLY

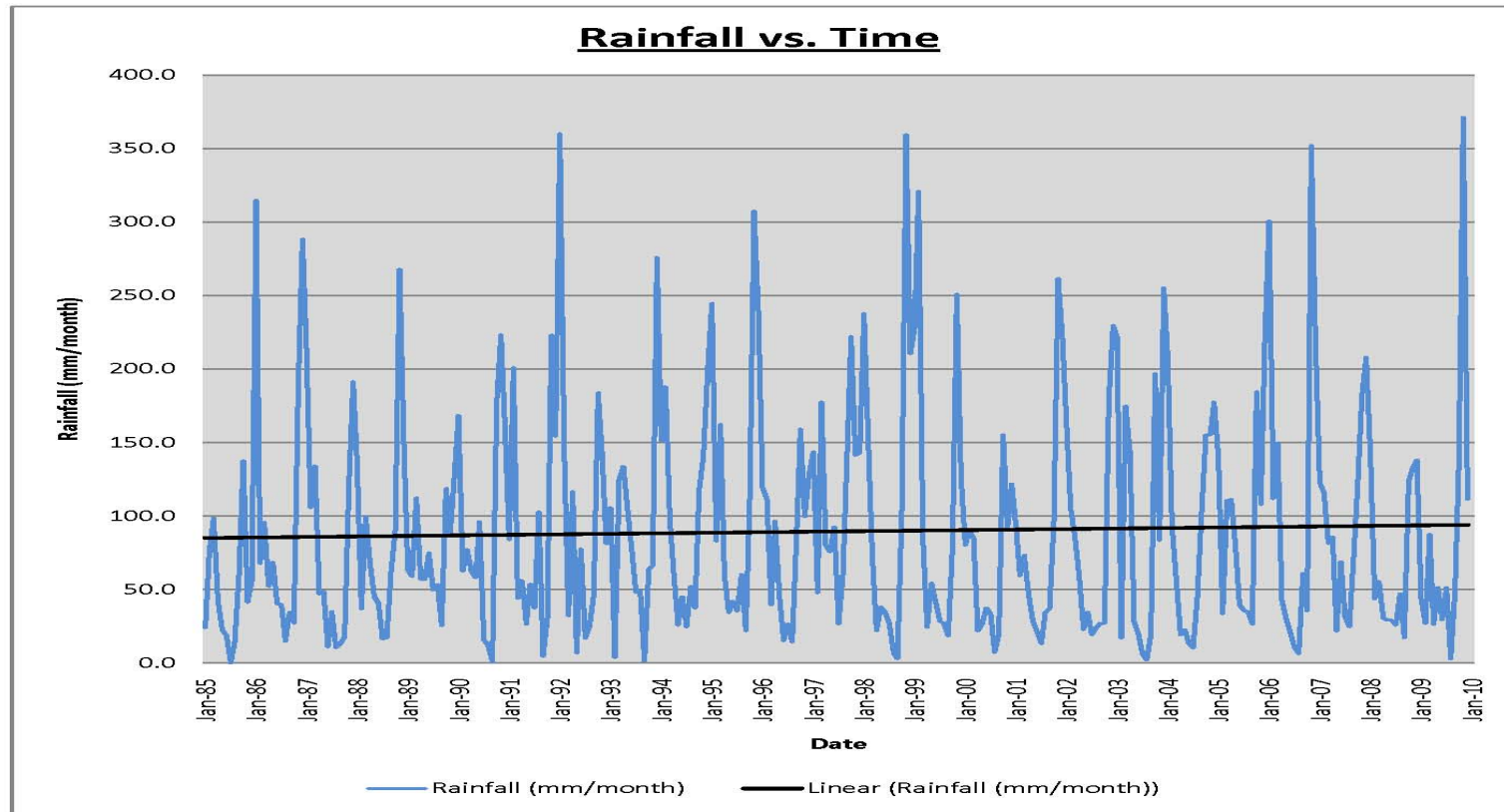
NO.	DATE	ENG.	BY	SUBJECT
REVISIONS				
PROJECT NO.	982879			
SCALE	1:25,000			
DRAWN	R.L.			
DESIGNED	J.L.			
CHECKED				
APPROVED				
DATE	MARCH 1999			

ASSOCIATED ENGINEERING **AE**

BROOKLYN CREEK MASTER DRAINAGE PLAN

WATERSHED PLAN

DRAWING NUMBER	REV. NO.	SHEET
982879-1-100		



DATA SOURCE – CFB COMOX AES WEATHER STATION

The city has tracked the above data for 25 years. The trend is slightly increasing rainfall.

O.C.P. Requirements

- Minimum depth of topsoil 300mm for landscaped areas and lawns (*where applicable*)
- Shrubs and root balls - 450mm depth and 300mm around
- Management of rainwater through the Water Balance Model of B.C. –
 - mimic nature
 - reduce peak runoff
 - retain on site
- Development permit security for landscape work and 5 year maintenance

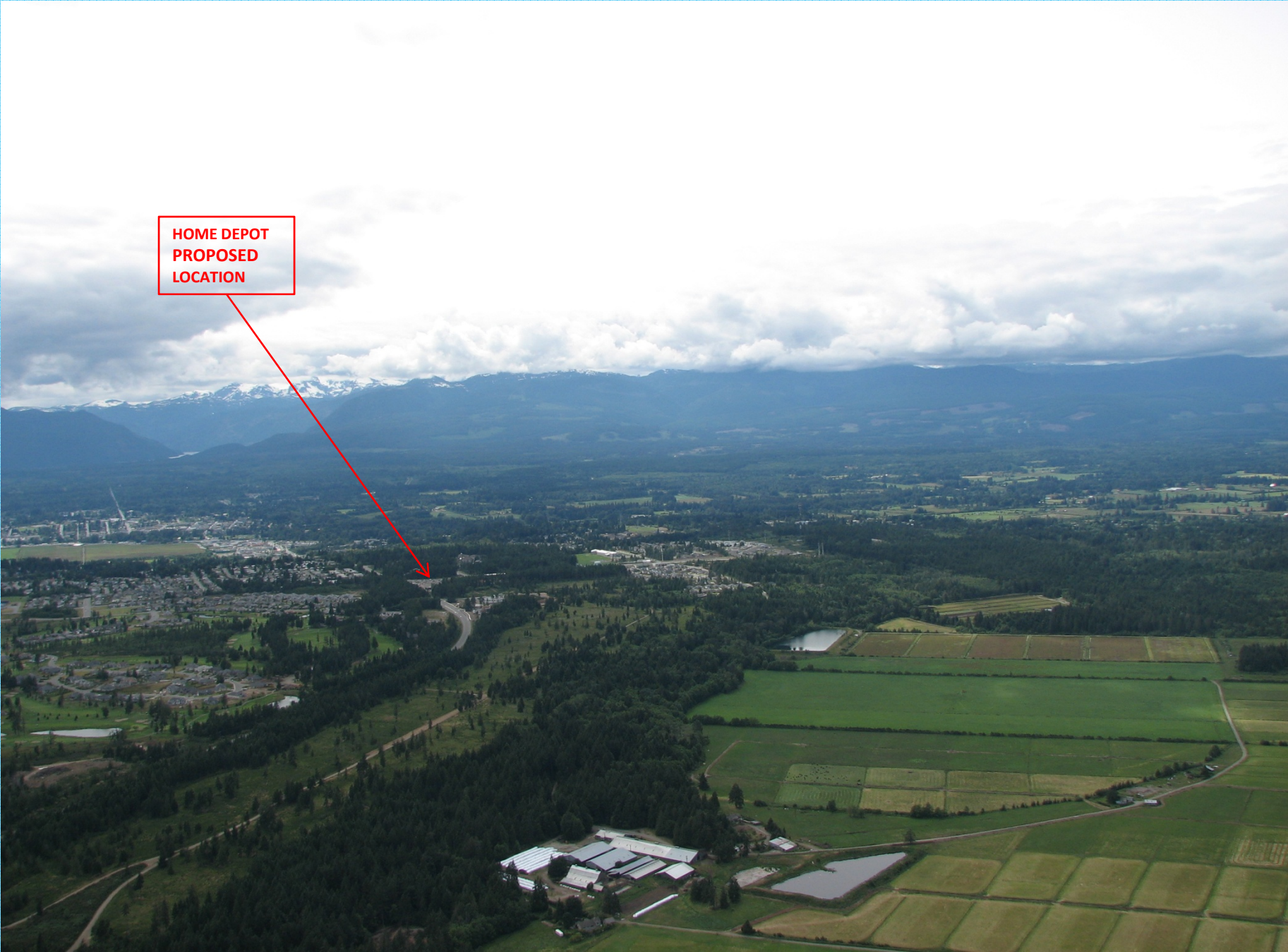
Specs for Storm Drainage

- Post \leq Pre-development (1: 2 yr storm)
- Minor underground (1: 10 yr)
- Major flow paths (1: 100 yr)
- WBM – toolbox
 - infiltration swales,
 - exfiltration,
 - soakaways,
 - green roofs,
 - pervious paving,
 - rain gardens,
 - absorbent landscape

Constraints On Development

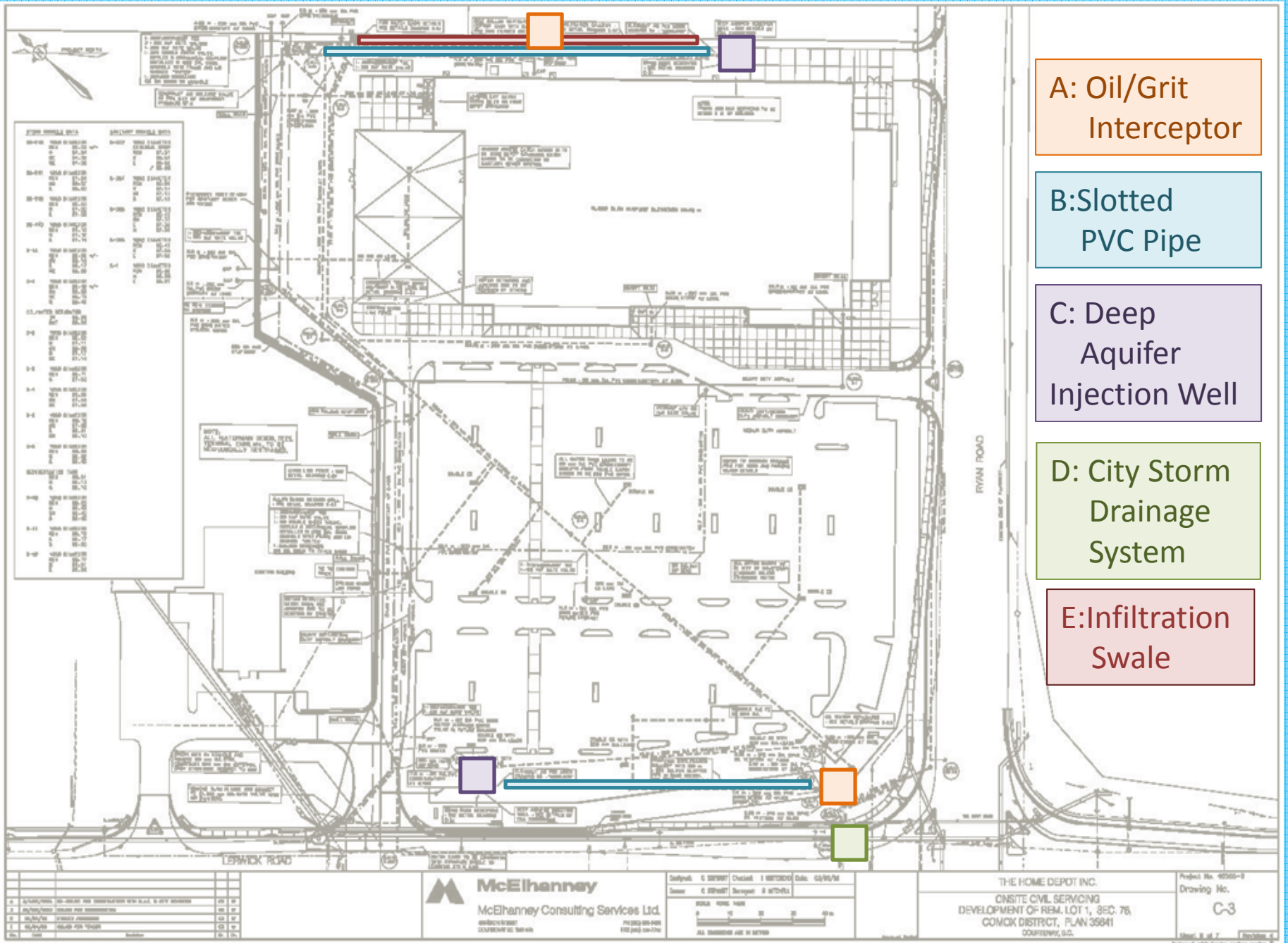
- Second growth coniferous forest covering 4 ha – Rainwater held on site by trees and ground cover
- Pre-development run off for a 1:2 year storm - effectively 'zero'
- Brooklyn Creek – not to exceed catchment area maximum inflows
- Downhill farmer to north - not to alter underground flows
- Downhill farmer to south - surface water flooding

**HOME DEPOT
PROPOSED
LOCATION**



The Solution

- Constructed storm drainage mimics nature
- Roof detention and shallow aquifer recharge trench
- East access road slopes away from the building into an infiltration swale
- Oil/grit interceptor (40 m³ capacity)
- Permeable soils and perforated pipes to exfiltrate storm flows.
- Excess storm water into 2 deep well injection pipes
- Landscaped areas - apply WBM principles and best management practices
- Retains 2-year storm on-site, recharges sub-surface ground water & maintains deep sub-surface flows



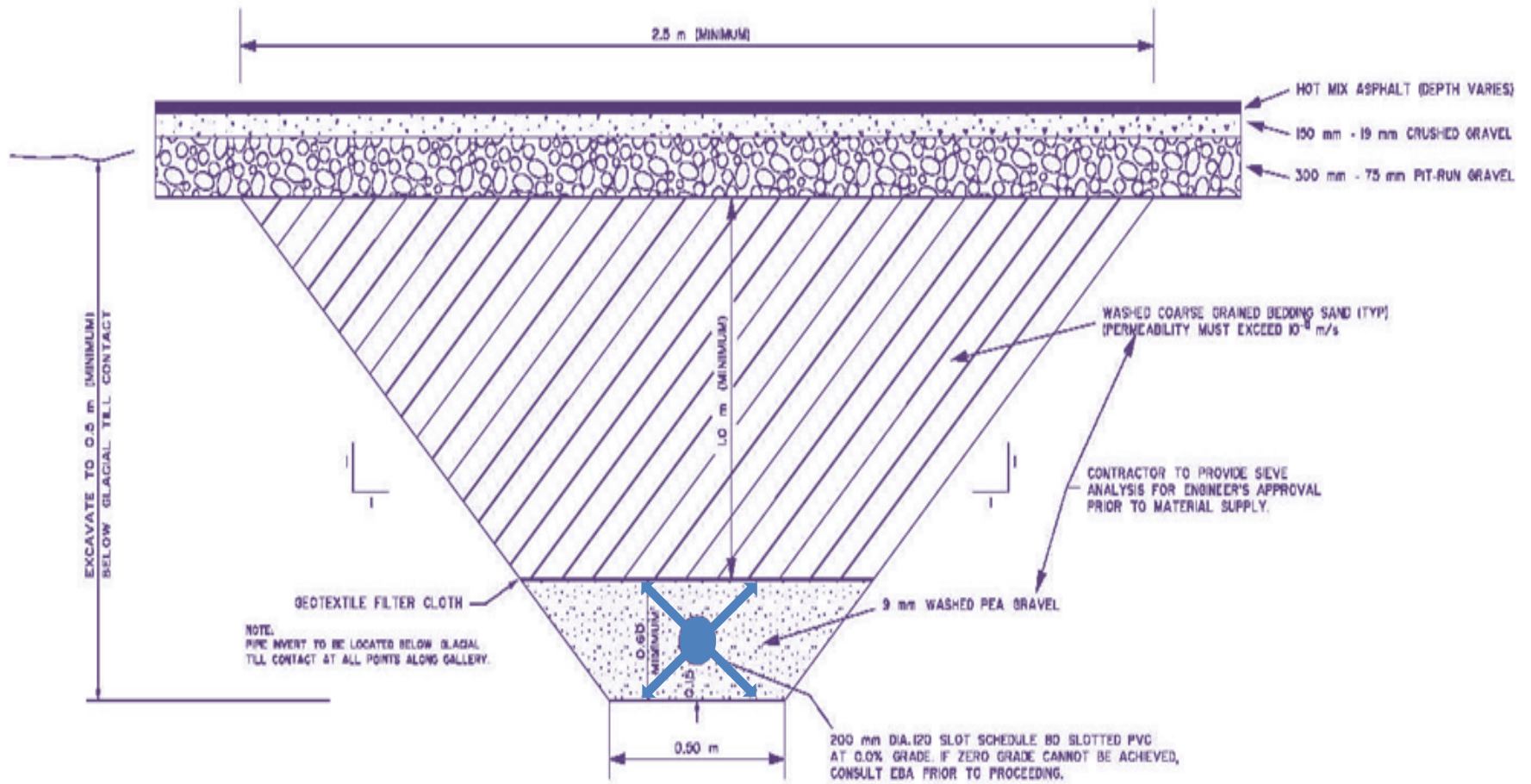
A: Oil/Grit Interceptor

B: Slotted PVC Pipe

C: Deep Aquifer Injection Well

D: City Storm Drainage System

E: Infiltration Swale



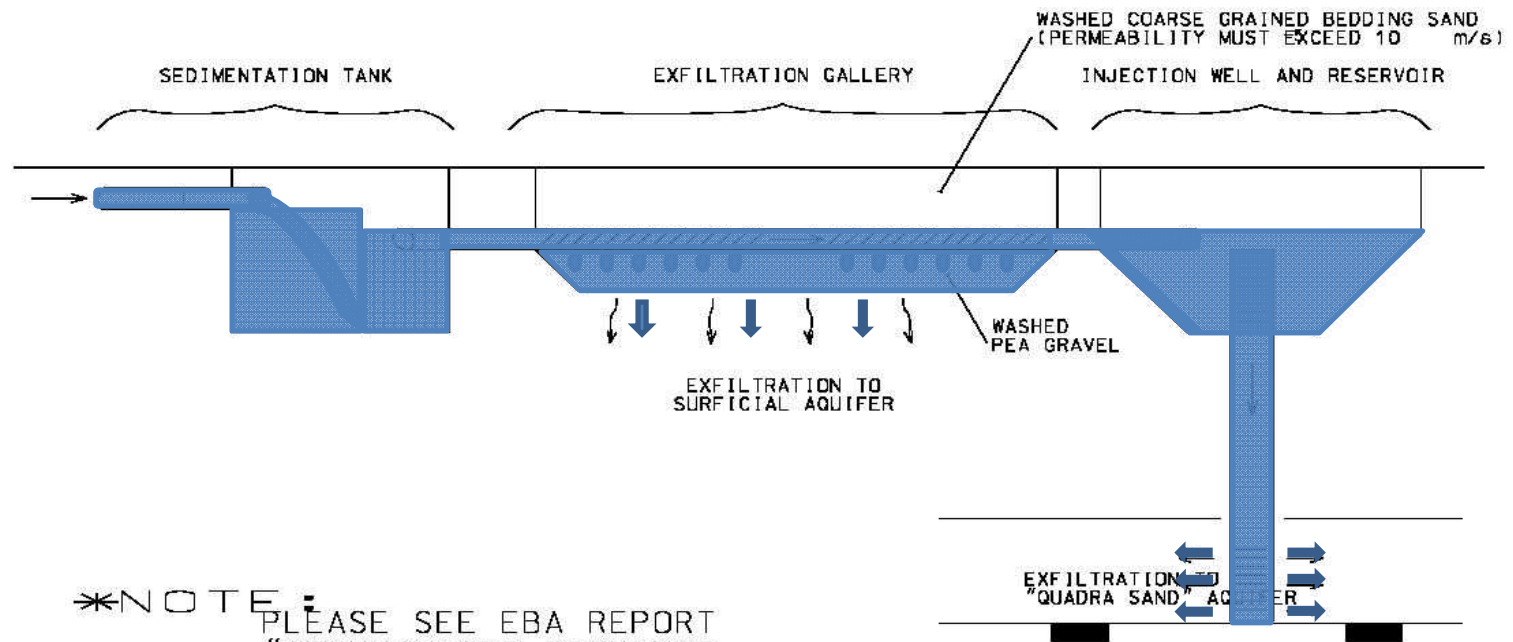
EXFILTRATION GALLERY

SCALE: NTS

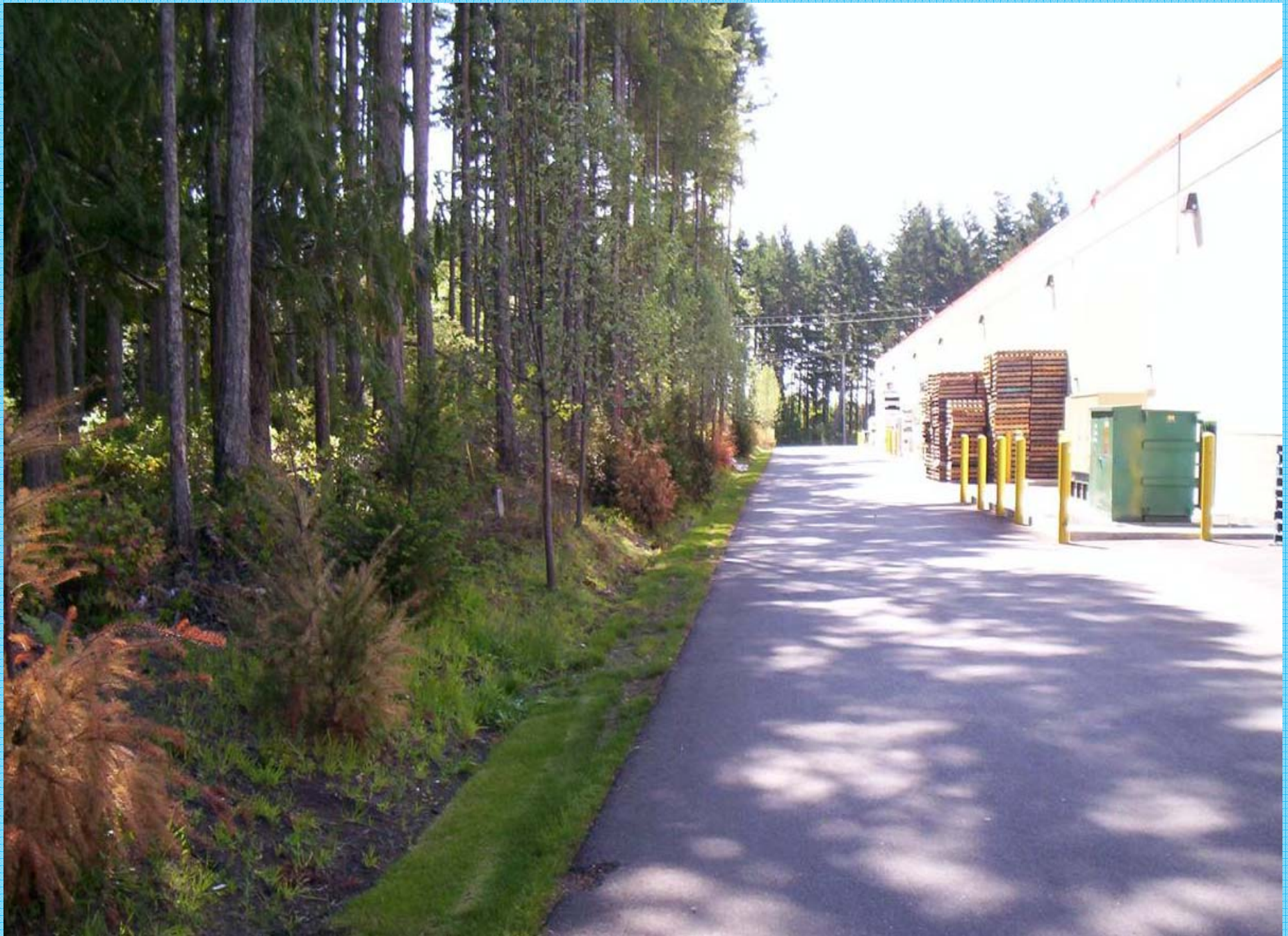




GROUNDWATER RECHARGE SYSTEM DESIGN CONCEPT



*NOTE:
PLEASE SEE EBA REPORT
"GROUNDWATER RECHARGE
SYSTEM FINAL DESIGN FOR
HOME DEPOT, COURTENAY, BC"
FOR SYSTEM DESCRIPTION



System Responsibility and Redundancy

- On-site system - Home Depot's
- 5-yr system monitoring - City
- Valves required on both 300mm dia. well injection pipes
- Off-site municipal system sized to accept excess flows
- Well chambers + recharge facilities = \$400K
- No concerns from farmers / downstream users



Achievements

- Pre / post status
- Minimal Impact on Brooklyn Creek
- Ground Water recharged
- Adherence to WBM objectives
- Inter-municipal cooperation

HOME DEPOT
DEVELOPMENT

COURTENAY

QUESTIONS