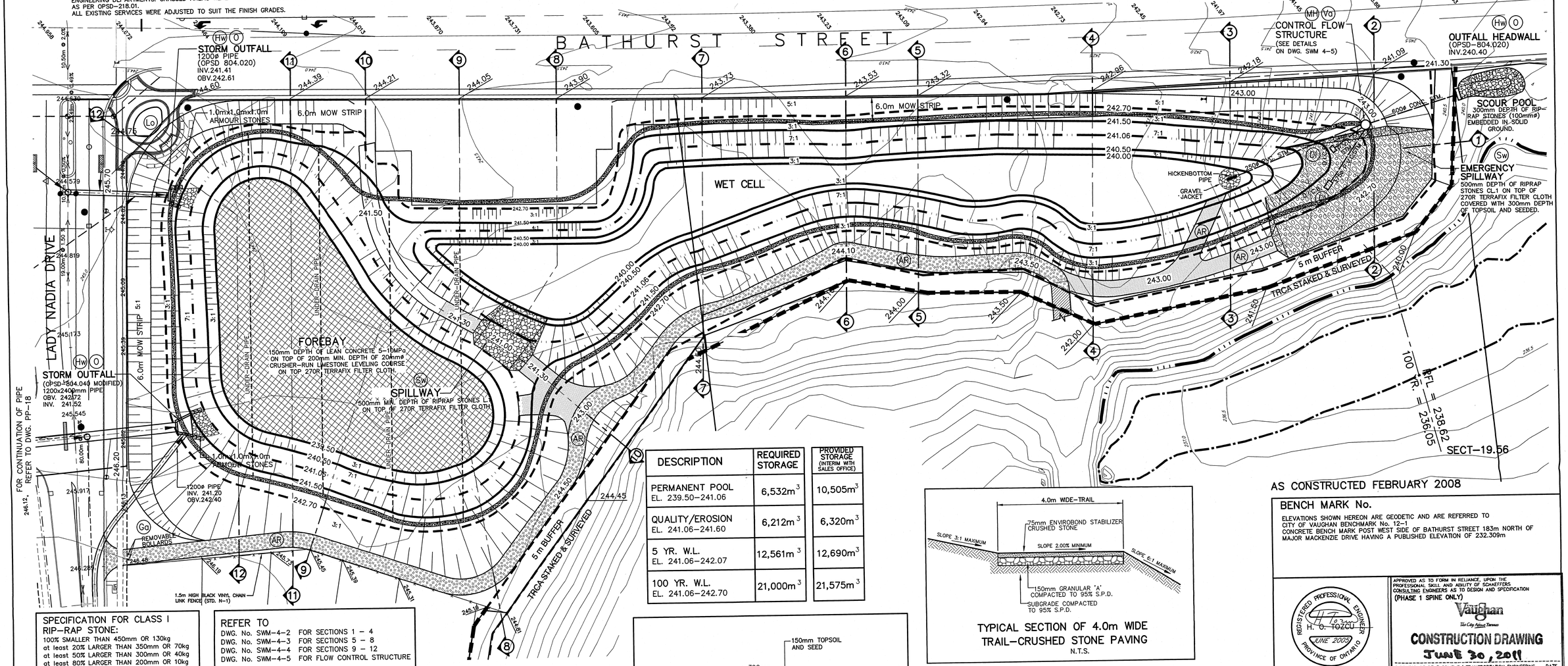
APPENDIX D

SWM Pond Drawings

NOTES

1. THE LOCATIONS OF ALL UNDERGROUND AND ABOVEGROUND UTILITIES AND STRUCTURES WERE NOT NECESSARILY SHOWN ON CONTRACT DRAWINGS. WHERE SHOWN THE ACCURACY WAS NOT GUARANTEED. PRIOR TO COMMENCING CONSTRUCTION, THE CONTRACTOR VERIFIED THE EXACT LOCATIONS AND ELEVATIONS AND ASSUMED ALL LIABILITIES FOR DAMAGE.
2. ALL AREAS DISTURBED DURING CONSTRUCTION OF SEWERS WERE RESTORED TO ORIGINAL CONDITION OR BETTER AND TO THE SATISFACTION OF THE CITY OF VAUGHAN AND REGION OF YORK ENGINEERING DEPARTMENTS. GRASSED AREAS WERE TOPPED WITH 100mm TOPSOIL AND SODDED AS PER OPSD-218.01.
   ALL EXISTING SERVICES WERE ADJUSTED TO SUIT THE FINISH GRADES.
3. CUT AREAS OF POND AND FOREBAY WERE INSPECTED BY THE GEOTECHNICAL INSPECTOR, WHO ADVISED AS TO THE TYPE OF EROSION PROTECTION THAT WAS REQUIRED.
4. ALL TOPSOIL AND ORGANIC MATERIALS FROM POND AREAS WERE STRIPPED BEFORE PLACING ANY FILL.
5. ALL EXISTING STRUCTURES, DRIVEWAYS, CULVERTS, BRIDGES WERE REMOVED AND DISPOSED OFF SITE.
6. SEEDING AND SODDING OF PONDS AS PER LANDSCAPE ARCHITECT DRAWINGS & SPECIFICATIONS.
7. WHERE SAND WAS ENCOUNTERED DURING CONSTRUCTION OF POND, THE UPPER LAYER OF THE SIDE SLOPE AND THE BOTTOM OF THE POND WAS REPLACED WITH A LAYER OF SILTY CLAY TILL MATERIAL. THE THICKNESS WAS DETERMINED BY THE SOIL CONSULTANT AND COMPACTED TO 95% OR + STANDARD PROCTOR DRY DENSITY. AN INTERCEPT SUBDRAIN SYSTEM (SEE DETAIL) WAS ALSO CONSTRUCTED TO STABILIZE THE SIDE.
8. IN ALL SEWER TRENCHES, WHERE SUBGRADE CONSISTS OF WET SANDS AND SANDY SILT, THE PIPE JOINTS WERE WRAPPED WITH WATERPROOF MEMBRANE.



DESCRIPTION	REQUIRED STORAGE	PROVIDED STORAGE (INTERIM WITH SALES OFFICE)
PERMANENT POOL EL. 239.50-241.06	6,532m^3	10,505m^3
QUALITY/EROSION EL. 241.06-241.60	6,212m^3	6,320m^3
5 YR. W.L. EL. 241.06-242.07	12,561m^3	12,690m^3
100 YR. W.L. EL. 241.06-242.70	21,000m^3	21,575m^3

TYPICAL SECTION OF 4.0m WIDE TRAIL-CRUSHED STONE PAVING
N.T.S.

AS CONSTRUCTED FEBRUARY 2008

BENCH MARK No.

ELEVATIONS SHOWN HEREON ARE GEODETIC AND ARE REFERRED TO CITY OF VAUGHAN BENCHMARK No. 12-1
CONCRETE BENCH MARK POST WEST SIDE OF BATHURST STREET 183m NORTH OF MAJOR MACKENZIE DRIVE HAVING A PUBLISHED ELEVATION OF 232.309m

REGISTERED PROFESSIONAL ENGINEER H. O. TOZCU JUNE 2005 PROVINCE OF ONTARIO

APPROVED AS TO FORM IN RELIANCE, UPON THE PROFESSIONAL SKILL AND ABILITY OF SCHAEFFERS CONSULTING ENGINEERS AS TO DESIGN AND SPECIFICATION
(PHASE 1 SPINE ONLY)
Vaughan The City Above Toronto
CONSTRUCTION DRAWING
June 30, 2011
DIRECTOR OF DEVELOPMENT/ TRANSPORTATION ENGINEERING DATE

BLOCK 12 SPINE SERVICES

SCHAEFFERS CONSULTING ENGINEERS
SCHAEFFER & ASSOCIATES LTD.
6 Ronrose Drive, Concord, Ontario L4K 4R3
Tel: (905) 738-6100
Fax: (905) 738-6875
E-mail: design@schaeffers.com

PROJECT No. 2004-2644 | DRAWING No. SWM 4-1

SCALE
HORIZONTAL 0 5 10 15 20 25 30 35 40 45 50m
VERTICAL 0 1 2 3 4 5 6 7 8 9 10m

Vaughan The City Above Toronto

19T-

BLOCK 12
PLAN
SWM POND No. 4

DESIGNED BY: A.B.O.	DATE: SEPT. 2004	CHECKED BY:
DRAWN BY: RMM/I.V.		APPROVED BY:
SCALE 1:500	19T-99V08 19T-03V17	DWG. No.

H:\As Constructed\2644-AC\2644Swm4-1.dwg, 10/8/2013 3:43:08 PM, mkhan, User 2 (850.00 x 600.00 MM)

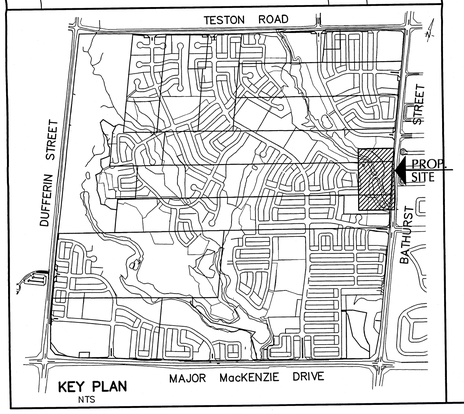
REFER TO

DWG. No. SWM-4-2	FOR SECTIONS 1 - 4
DWG. No. SWM-4-3	FOR SECTIONS 5 - 8
DWG. No. SWM-4-4	FOR SECTIONS 9 - 12
DWG. No. SWM-4-5	FOR FLOW CONTROL STRUCTURE

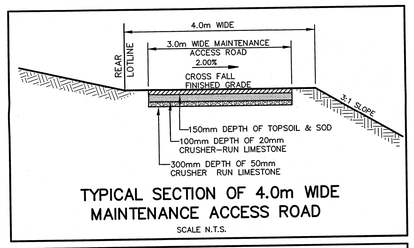
SPECIFICATION FOR CLASS I RIP-RAP STONE:
100% SMALLER THAN 450mm OR 130kg
at least 20% LARGER THAN 350mm OR 70kg
at least 50% LARGER THAN 300mm OR 40kg
at least 80% LARGER THAN 200mm OR 10kg

REVISIONS

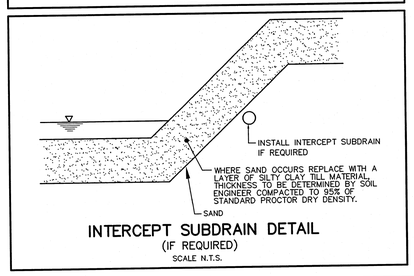
No.	DESCRIPTION	By	Date



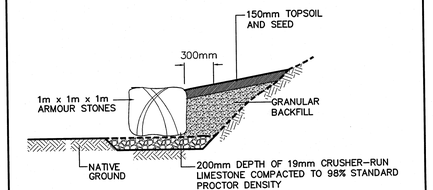
KEY PLAN
NTS



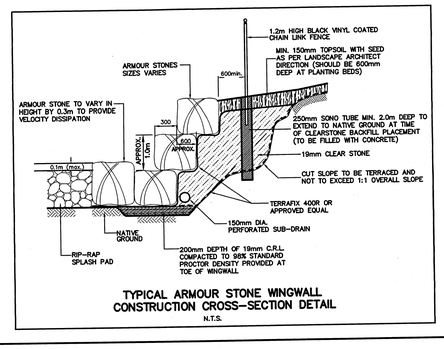
TYPICAL SECTION OF 4.0m WIDE MAINTENANCE ACCESS ROAD
SCALE N.T.S.



INTERCEPT SUBDRAIN DETAIL
(IF REQUIRED)
SCALE N.T.S.



TYPICAL DETAIL OF ARMOUR STONE
N.T.S.

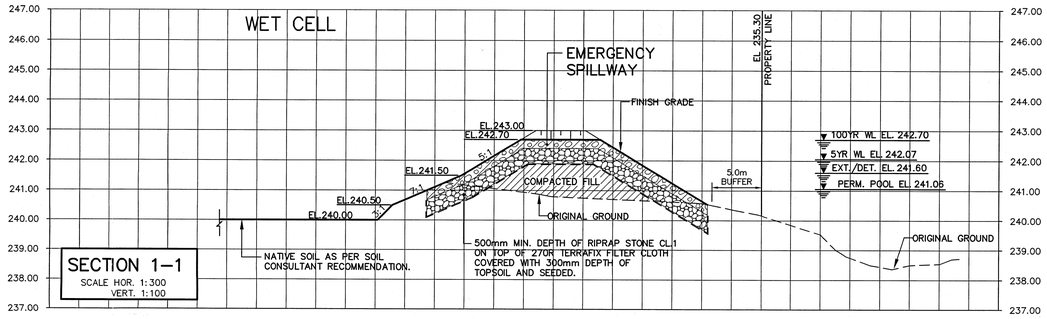


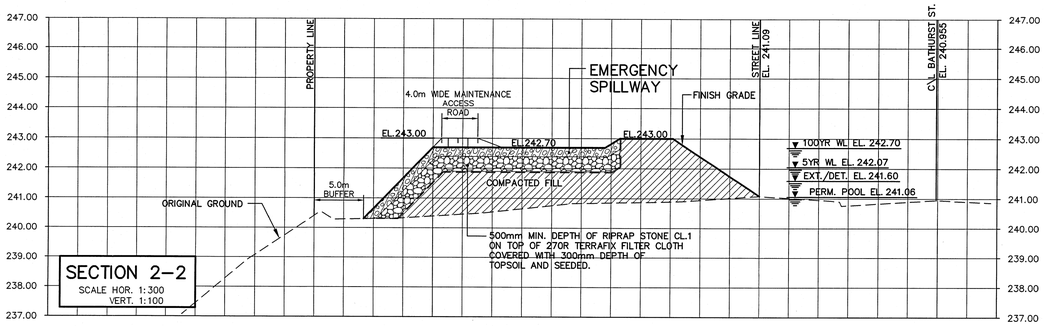
TYPICAL ARMOUR STONE WINGWALL CONSTRUCTION CROSS-SECTION DETAIL
N.T.S.

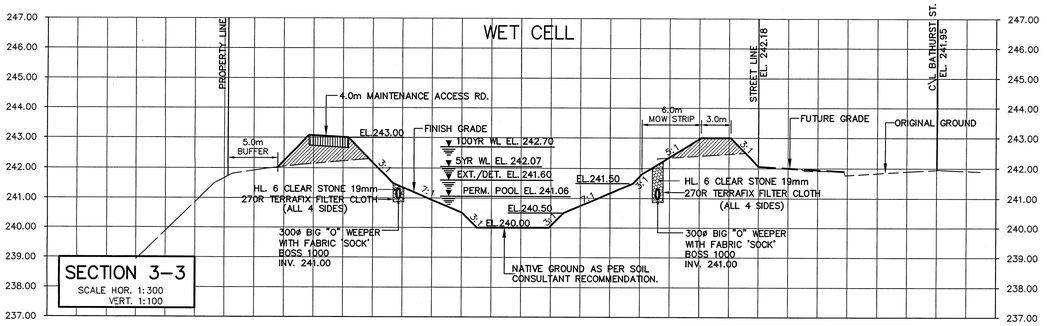
LEGEND:

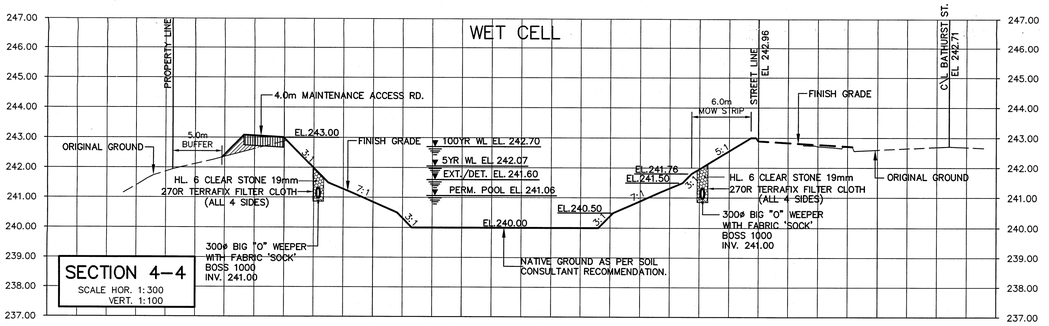
245.0	DENOTES ORIGINAL CONTOUR LINE
	DENOTES PERMANENT POOL LEVEL
	DENOTES 100 YR. WATER LEVEL
	DENOTES FINISH POND CONTOUR LINE
	DENOTES MAINTENANCE ACCESSROAD ONLY (TURFSTONE)
	DENOTES 150mm DEPTH OF LEAN CONCRETE (5-10MPa.) ON TOP OF 200mm DEPTH OF 20mmø CRUSHER RUN LIMESTONE LEVELLING COURSE, ON TOP OF 270R TERRAFIX FILTER CLOTH
	DENOTES TRAIL ONLY (CRUSHED STONE PAVING)
	DENOTES MAINTENANCE ACCESS ROAD(TURFSTONE)
	DENOTES RIPRAP STONE ON TOP OF 270R TERRAFIX FILTER CLOTH
	DENOTES RIPRAP STONE ON TOP OF 270R TERRAFIX FILTER CLOTH, COVERED WITH 300mm TOPSOIL AND SEEDED.
210.07	DENOTES FINISH GRADE
	DENOTES 300ø BIG 'O' WEEPER+F.F.SOCK BOSS 1000
	DENOTES 1m x 1m x 1m LEDGE ROCKS
G.W.L.	DENOTES GROUNDWATER LINE
UNDER-DRAIN PIPE	DENOTES 100ø PERFORATED UNDER-DRAIN PIPE WRAPPED IN FILTER SOCK AND EMBEDDED IN CLEAR STONE.

REVISIONS			
No.	DESCRIPTION	By	Date









AS CONSTRUCTED FEBRUARY 2008

BENCH MARK No.

ELEVATIONS SHOWN HEREON ARE GEODETIC AND ARE REFERRED TO CITY OF VAUGHAN BENCHMARK No. 12–1
CONCRETE BENCH MARK POST WEST SIDE OF BATHURST STREET 183m NORTH OF MAJOR MACKENZIE DRIVE HAVING A PUBLISHED ELEVATION OF 232.309m

REGISTERED PROFESSIONAL ENGINEER H. O. TOZCU PROVINCE OF ONTARIO JUNE 2005

APPROVED AS TO FORM IN RELIANCE, UPON THE PROFESSIONAL SKILL AND ABILITY OF SCHAEFFERS CONSULTING ENGINEERS AS TO DESIGN AND SPECIFICATION (PHASE 1 SPINE ONLY)
Vaughan The City Above Toronto
CONSTRUCTION DRAWING
June 30, 2011
DIRECTOR OF DEVELOPMENT/ TRANSPORTATION ENGINEERING DATE

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Fax: (905) 738-6875
E-mail: design@schaeffers.com

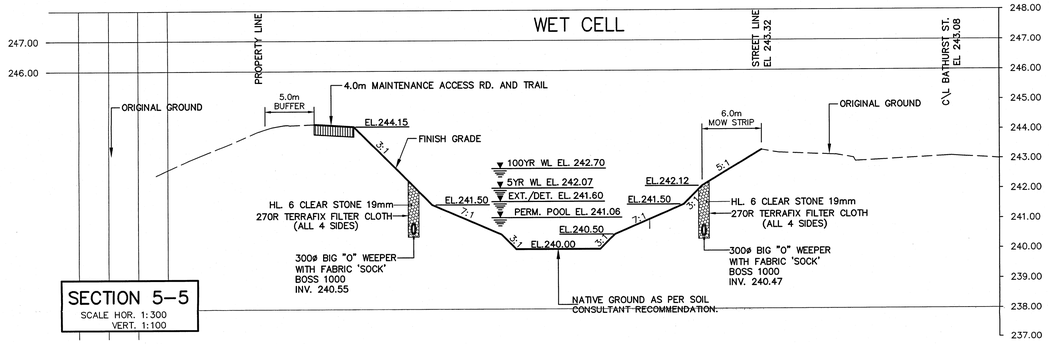
PROJECT No. 2004–2644 DRAWING No. SWM 4–2

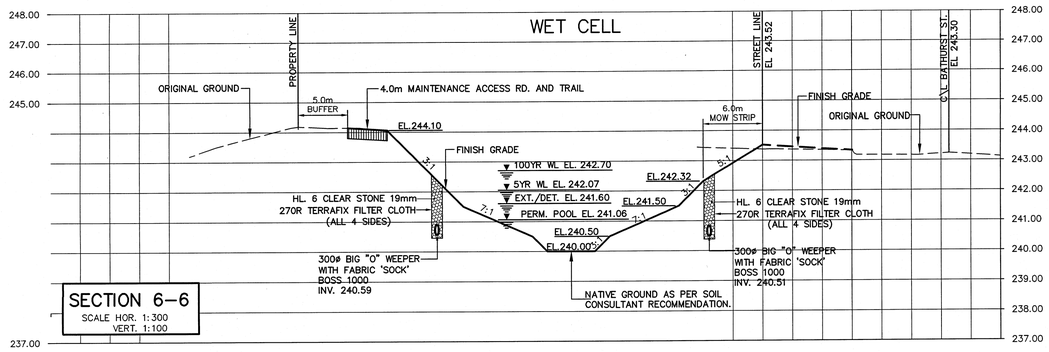
SCALE
HORIZONTAL 0 5 10 15 20 25 30 35 40 45 50m
VERTICAL 0 1 2 3 4 5 6 7 8 9 10m

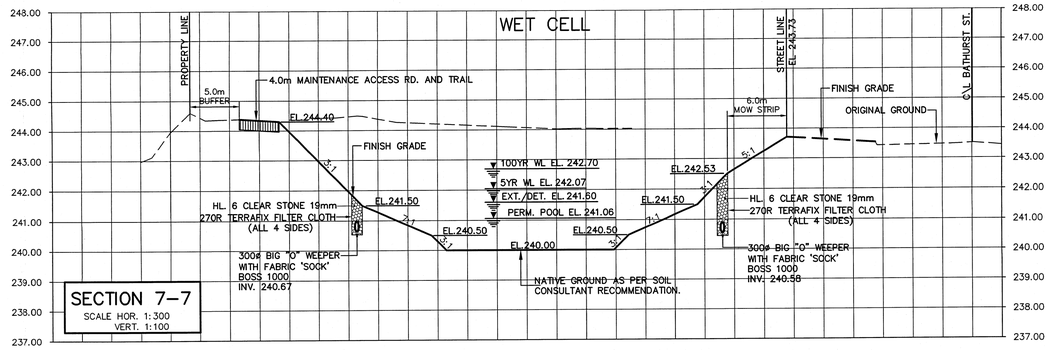
City of Vaughan The City Above Toronto

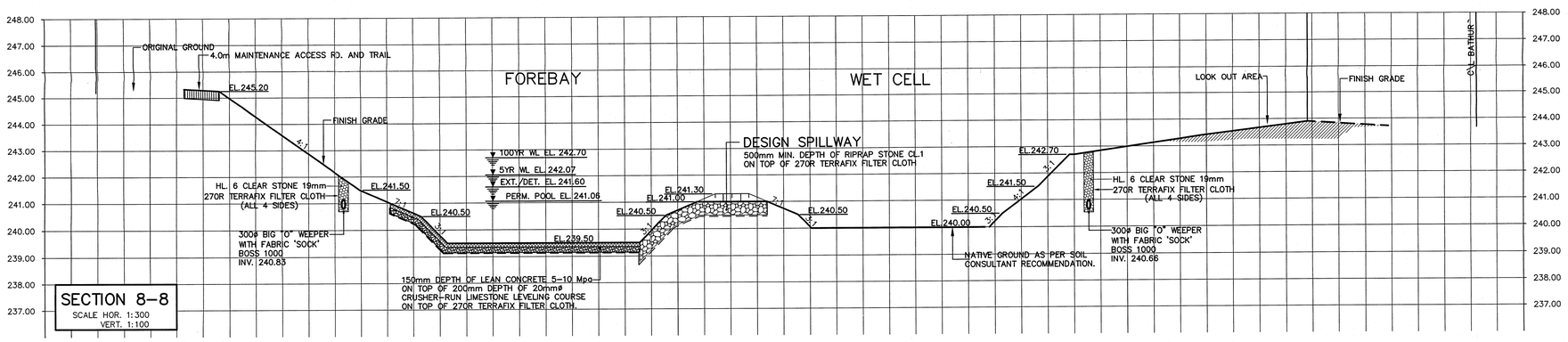
SWM POND No. 4
SECTIONS 1–1 TO 4–4

DESIGNED BY: A.B.O.	DATE: MAY 2005	CHECKED BY: H.T.
DRAWN BY: AMR/Acad		APPROVED BY:
SCALE: AS SHOWN		DWG. No.









REVISIONS			
No.	DESCRIPTION	By	Date

AS CONSTRUCTED FEBRUARY 2008

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E-mail: design@schaeffers.com

PROJECT No. 2004–2644 DRAWING No. SWM 4–3

SCALE
HORIZONTAL 0 5 10 15 20 25 30 35 40 45 50m
VERTICAL 0 1 2 3 4 5 6 7 8 9 10m

City of Vaughan
The City Above Toronto

SWM POND No. 4
SECTIONS 5–5 TO 8–8

DESIGNED BY: A.B.O.	DATE: MAY 2005	CHECKED BY: H.T.
DRAWN BY: AMR/Acad		APPROVED BY:
SCALE: AS SHOWN		DWG. No.

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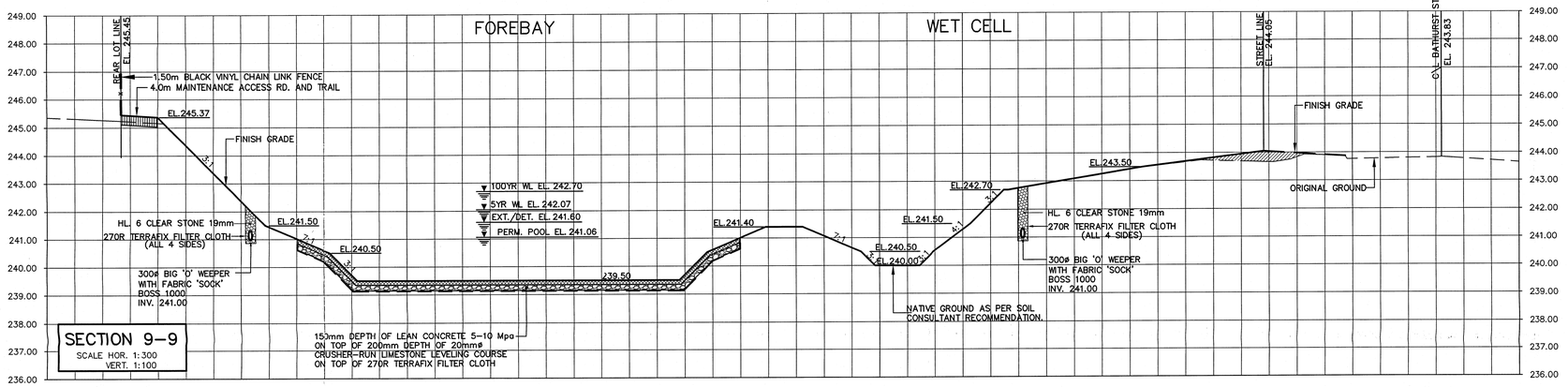

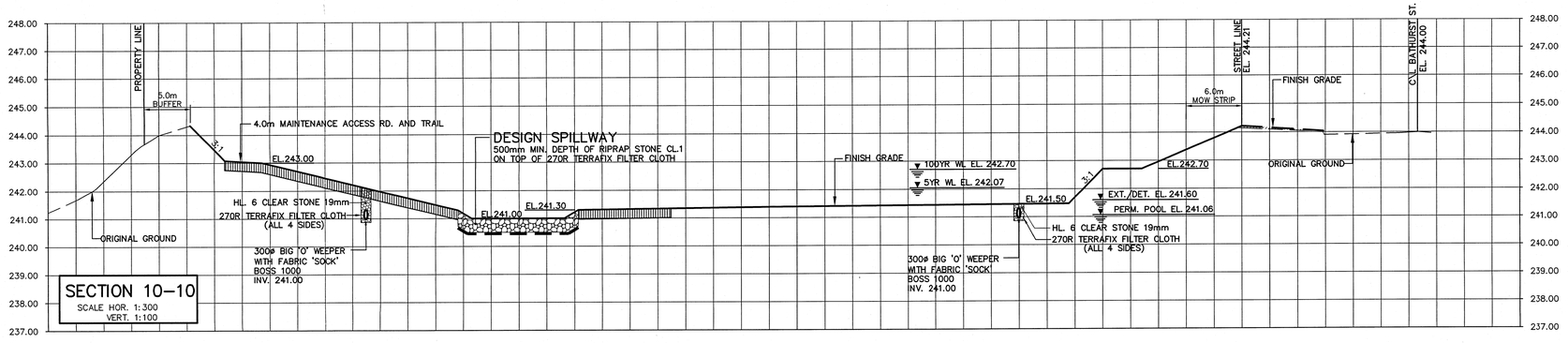

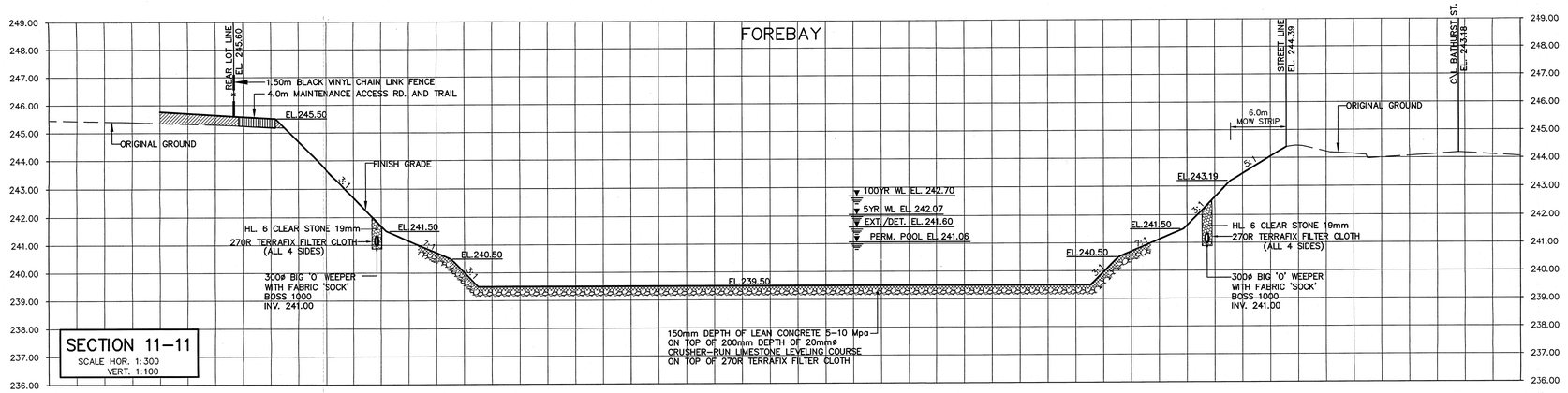

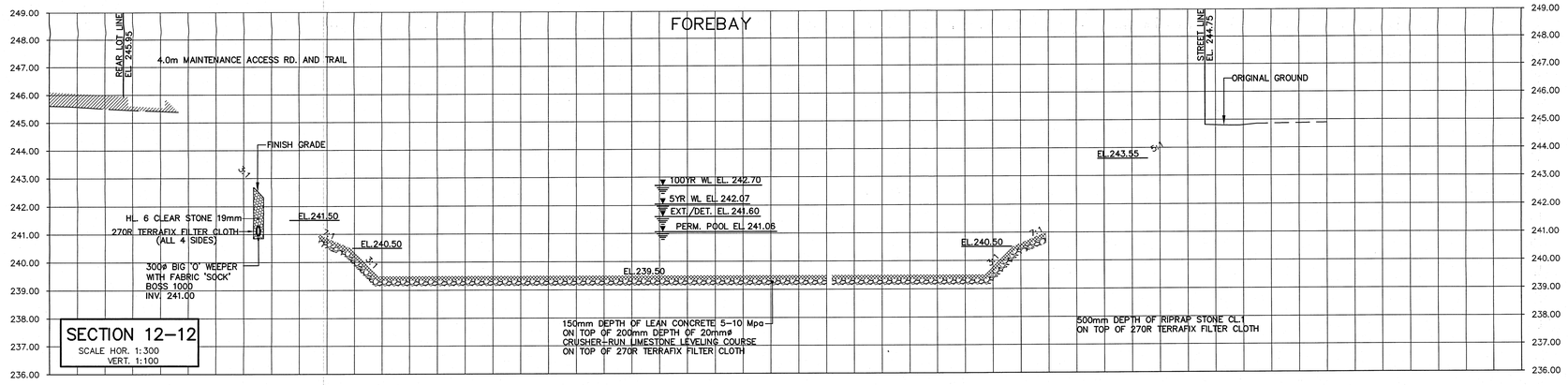

REVISIONS			
No.	DESCRIPTION	By	Date

AS CONSTRUCTED FEBRUARY 2008

BENCH MARK No.

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REGISTERED PROFESSIONAL ENGINEER
H. T. TOZZI
JUNE 2005
PROVINCE OF ONTARIO

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Vaughan
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Fax: (905) 738-6875
E-mail:
design@schaeffers.com

PROJECT No. 2004-2644 DRAWING No. SWM 4-4

SCALE
HORIZONTAL 0 5 10 15 20 25 30 35 40 45 50m
VERTICAL 0 1 2 3 4 5 6 7 8 9 10m

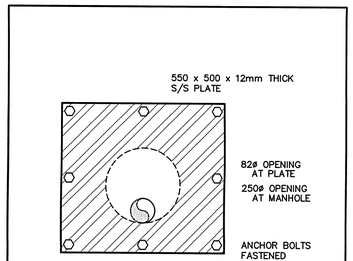
City of Vaughan
The City Above Toronto

SWM POND No. 4
SECTIONS 9-9 TO 12-12

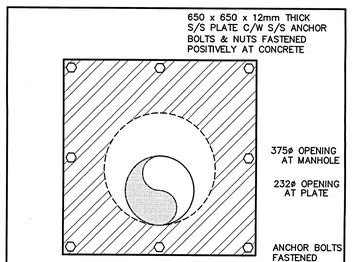
DESIGNED BY: A.B.O.	DATE: MAY 2005	CHECKED BY: H.T.
DRAWN BY: AMR/Acad		APPROVED BY:
SCALE: AS SHOWN		DWG. No.

H:\As Constructed\2644-AC\2644SWM4-4.dwg, 10/2/2013 10:07:42 AM, mkhan, User 2 (850.00 x 600.00 MM)

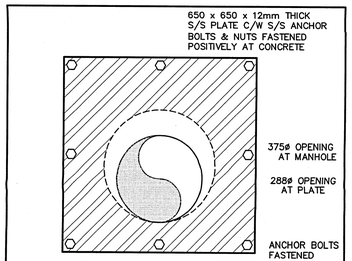
REVISIONS			
No.	DESCRIPTION	By	Date



DETAIL OF 82 DIA. ORIFICE PLATE
N.T.S.



DETAIL OF 232 DIA. ORIFICE PLATE
N.T.S.



DETAIL OF 288 DIA. ORIFICE PLATE
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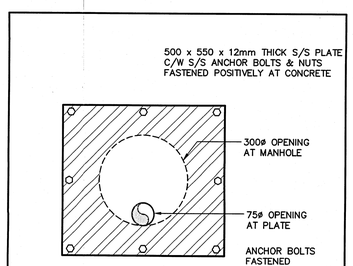
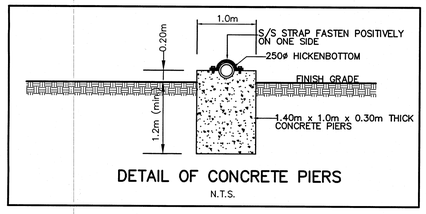
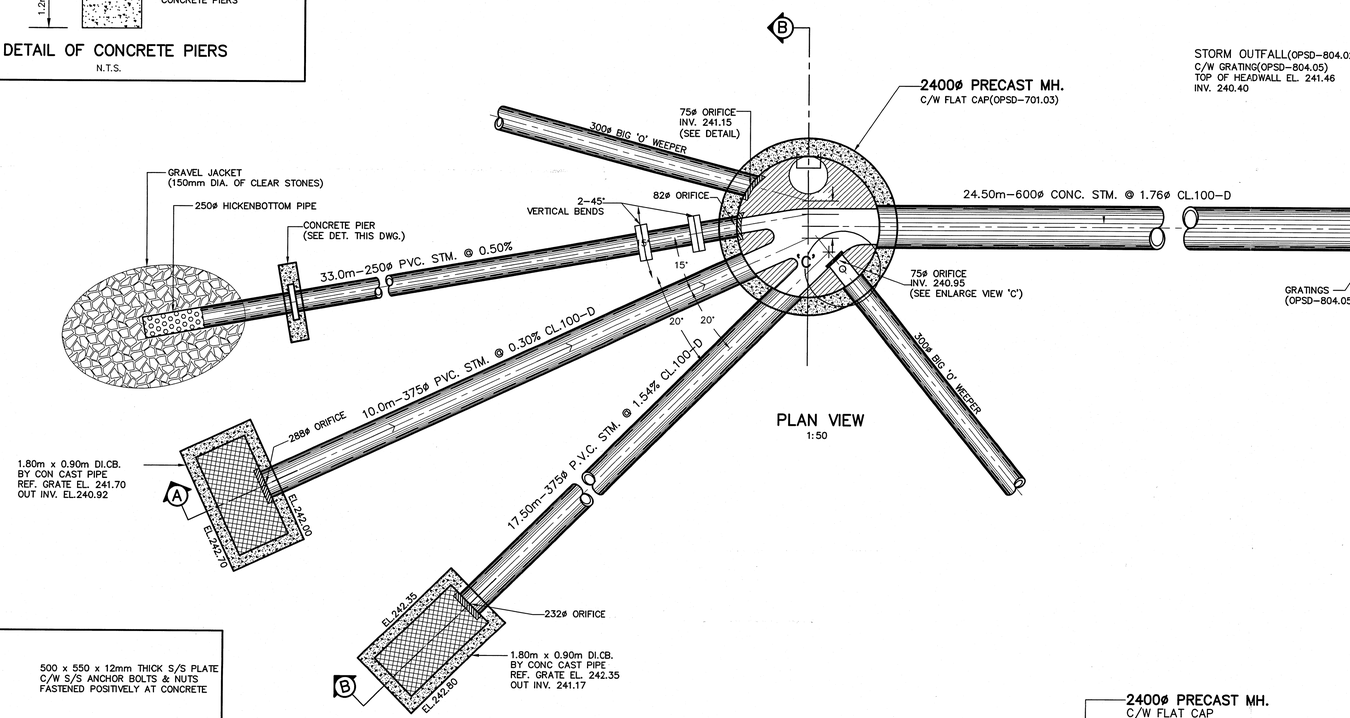
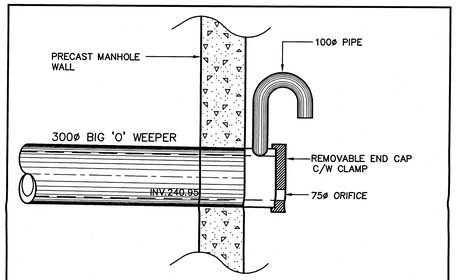


DETAIL OF 75 DIA. ORIFICE PLATE AT 300ø OPENING
N.T.S.



DETAIL OF CONCRETE PIERS
N.T.S.





ENLARGE VIEW 'C'
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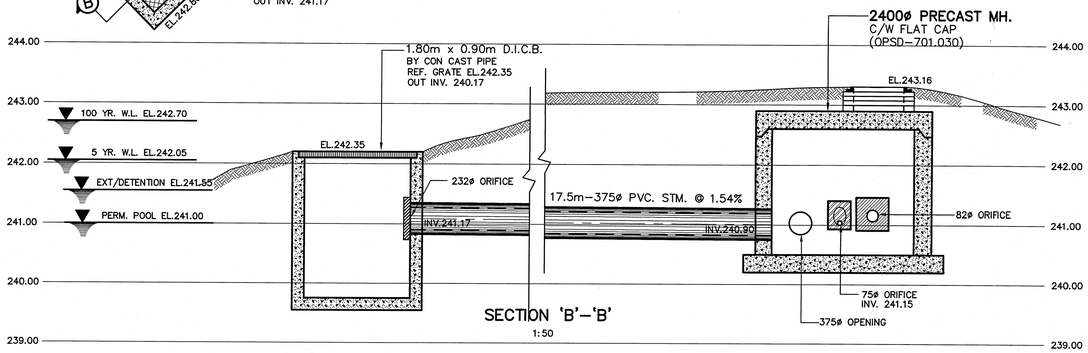
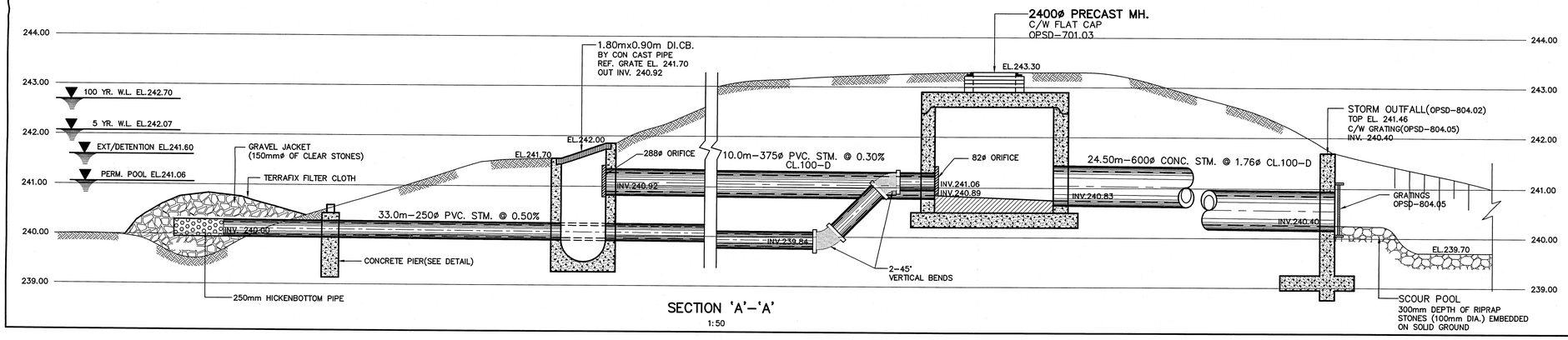


SECTION 'B'-'B'
1:50



SECTION 'A'-'A'
1:50

AS CONSTRUCTED FEBRUARY 2008

REGISTERED PROFESSIONAL ENGINEER
H. O. TOZCU
JULY 2005
PROVINCE OF ONTARIO

APPROVED AS TO FORM IN RELIANCE, UPON THE PROFESSIONAL SKILL AND ABILITY OF SCHAEFFERS CONSULTING ENGINEERS AS TO DESIGN AND SPECIFICATION
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June 30, 2011
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Fax: (905) 738-6875
E-mail: design@schaeffers.com

PROJECT No. 2004-2644 DRAWING No. SWM 4-5

SCALE
HORIZONTAL 0 5 10 15 20 25 30 35 40 45 50m
VERTICAL 0 1 2 3 4 5 6 7 8 9 10m

City of Vaughan
The City Above Toronto

BLOCK 12
DETAIL OF
CONTROL FLOW STRUCTURE - POND No. 4

DESIGNED BY: A.B.O.	DATE: AUG. 2004	CHECKED BY:
DRAWN BY: AMR/Acad		APPROVED BY:
SCALE		DWG. No.

H:\As Constructed\2644-AC\2644Swm4-5.dwg, 10/2/2013 10:09:49 AM, mkhan, User 2 (850.00 x 600.00 MM)

APPENDIX E

SWM Pond Sizing Calculations

File: 2004-2644
Date: October 2013
SWM Pond 4

Custom Hickenbottom Calculations

Calculate Maximum Amount of holes

Input:		
	Pipe Diameter	250 mm
	Pipe Length	1 m
	Size of holes	25 mm
	Spacing of holes	50 mm
Output:	Number of Holes	117
Check Area	Area of holes	57344 mm^2
	Interpolated Diam	270 mm
	Orifice Diam Req'd	82 mm
	Therefore O.K	

File: 2004-2644
Date: October 2013

Sediment Forebay Berm Sizing - Block 12 SWM Pond 4

Forebay Settling Length

Input:

R=	2.5		Length to width ratio
Q_p=	0.01	m^3/s	Peak flow rate from 25 mm event
Vs=	0.0003	m/s	Setling velocity , typically 0.0003

Output:

Distance=	9	m	Forebay Length

Dispersion Length

Input:

Q=	5.82	m^3/s	Inlet flowrate, typically 5 yr + 10 %
d=	1.56	m	Depth of permanent pool
V_f=	0.5	m/s	desired velocity, typically 0.5

Output:

Distance=	60	m	Forebay Length
Width=	7		Minimum Forebay botton Width

APPENDIX B: Existing Drainage Elements and Site Investigation Photos

Culvert/Site Inspection for Teston Road

Culvert #ED02

Culvert Field Investigation Data Sheet (Culvert #ED02)

Date (mm/dd/yy): *10/26/2022*	Field Crew: *Jenny Dai, Ken Luong*
Client: *York Region*	Highway/Road No.: *Teston rd.*
Culvert Crossing Type: *Centreline Culvert*	Blockage in Culvert: no
Culvert Material: *Concrete*	Culvert Condition: Good
Culvert Shape: *Circular*	Inlet Condition: Good
Culvert Bottom:	Outlet Condition: Good
Culvert Flow Direction: SW (Downstream)	Additional Field Notes:
Culvert Size (mm): *31.5" (800mm)*	*Inlet: Near inlet, two small diameter trees (< 10cm)*
Depth of Water in Culvert: no water	*About 10 cm of sediment at inlet* *Outlet: Outlet has plunge pool* *Overall: Field measured 800mm concrete pipe, with HW* *Good condition, not much sediment* *no water* *Recommendation:*

Site Photograph Photo of Culvert ED02: Upstream End	
	
	

Site Photograph Photo of Culvert ED02: Downstream End

Culvert #ED03

Culvert Field Investigation Data Sheet (Culvert #ED03)

Date (mm/dd/yy): *10/26/2022*	Field Crew: *Jenny Dai, Ken Luong*
Client: *York Region*	Highway/Road No.: *Teston Rd.*
Culvert Crossing Type: *Centreline Culvert*	Blockage in Culvert: no
Culvert Material: *Concrete*	Culvert Condition: good
Culvert Shape: *Circular*	Inlet Condition: good
Culvert Bottom:	Outlet Condition: good
Culvert Flow Direction: north to south	Additional Field Notes:
Culvert Size (mm): *35.4" (900mm)*	*Inlet: Inlet invert perched by about 200mm; headwall*
Depth of Water in Culvert (mm*):*	*Outlet: outlet has a headwall*
	Outlet to ditch and ditch ID to into STM network
	Ditch and culvert flows into STM network via DI
	Recommendation:

Site Photograph Photo of Culvert ED03: Upstream End	
	
	

Site Photograph Photo of Culvert ED03: Downstream End	
	
	
	

Culvert #ED04

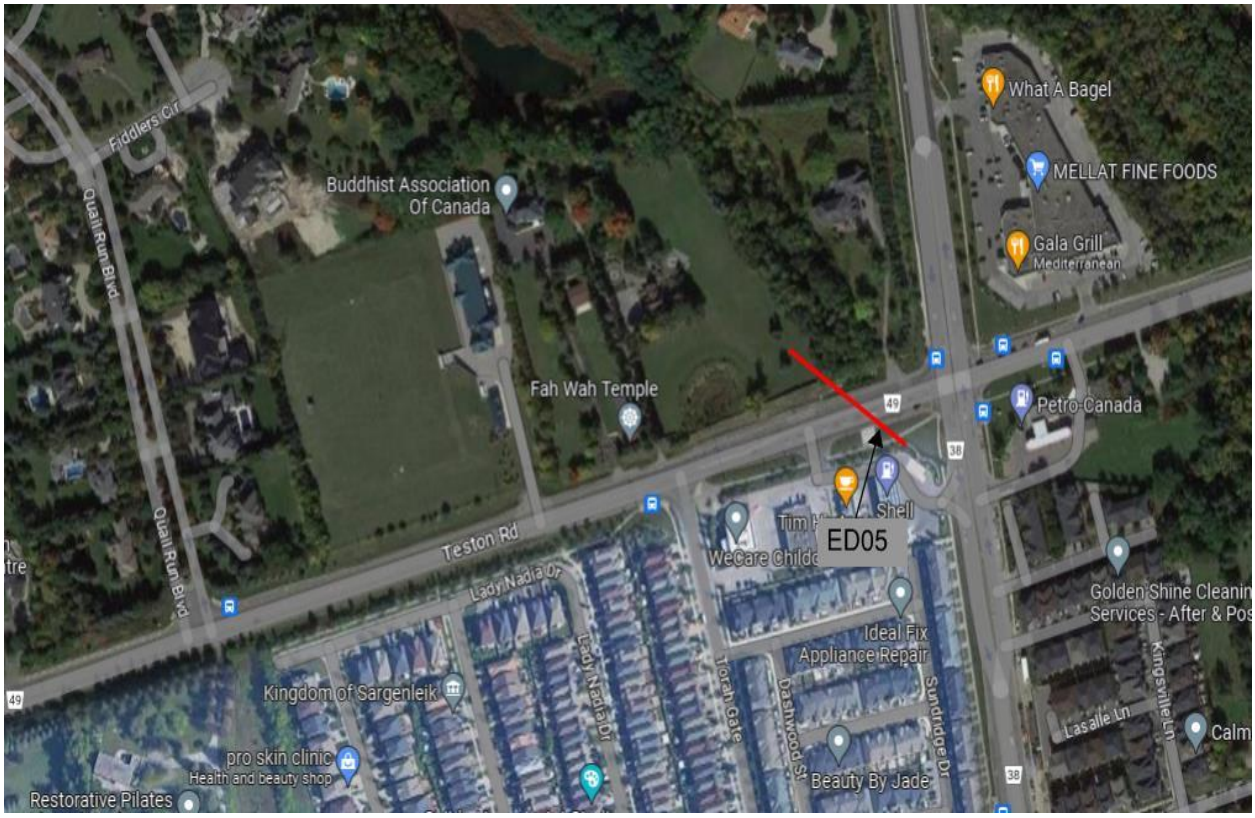
Culvert Field Investigation Data Sheet (Culvert #ED04)

Date (mm/dd/yy): *10/26/2022*	Field Crew: *Jenny Dai, Ken Luong*
Client: *York Region*	Highway/Road No.: *Teston rd.*
Culvert Crossing Type: *Centreline Culvert*	Blockage in Culvert: no
Culvert Material: Concrete	Culvert Condition: good
Culvert Shape: *Box*	Inlet Condition: good
Culvert Bottom: Open footing	Outlet Condition: good
Culvert Flow Direction: North to South	Additional Field Notes:
Culvert Size (mm): *23.6" * 70.9" (6000mm*1800mm)*	*Inlet: Field measured opening= 1500mm under slab to top of sediment*
Depth of Water in Culvert (mm*)*	*Outlet: Field measured opening= 1400mm under slab to top of sediment*
	Overall: measured outside span = 732cm
	wall thickness = 40cm
	approximate inside span = 650cm
	Skew to roadway alignment
	Recommendation:

Site Photograph Photo of Culvert ED04: Upstream End	
	

Site Photograph Photo of Culvert ED04: Downstream End and EBL Ditch	
	

Culvert #ED05



Culvert Field Investigation Data Sheet (Culvert #ED05)

Date (mm/dd/yy): *10/26/2022*	Field Crew: *Jenny Dai, Ken Luong*
Client: *York Region*	Highway/Road No.: *Teston Rd.*
Culvert Crossing Type: *Centreline Culvert*	Blockage in Culvert: no
Culvert Material: *Concrete (Upstream End) with gabion*	Culvert Condition: good
Culvert Shape: *Circular*	Inlet Condition: good
Culvert Bottom:	Outlet Condition: N/A
Culvert Flow Direction: north to south	Additional Field Notes:
Culvert Size (mm): *55" (1050mm)*	*Inlet:*
Depth of Water in Culvert (mm*): 0.78" (20mm)*	• *Field measured 1000mm concrete pipe embedded with stone substrate* • *2cm of water* *Outlet:* *Cannot see through to another end, suspect pipe is connected to STM sewer downstream* *Recommendation:*

Site Photograph Photo of Culvert 4: Upstream End and WBL Ditch	
	

Site Photograph Photo of Culvert ED05:	
	

Sewer Outlet #9

Field Investigation Data Sheet (Outlet Sewer #9)

Date (mm/dd/yy): *10/26/2022*	Field Crew: *Jenny Dai, Ken Luong*
	Highway/Road No.: *Teston Rd.*
Client: *York Region*	Additional Field Notes: *Twin CSP above outlet 9 (800mm * 12.06mm and 800mm * 12.01mm)*

Site Photograph Photo of Outlet Sewer #9:	
	

Culvert “Rail North”

Culvert Field Investigation Data Sheet (Culvert "Rail North")

Date (mm/dd/yy): *10/26/2022*	Field Crew: *Jenny Dai, Ken Luong*
Client: *York Region*	Highway/Road No.: *Railway*
Culvert Crossing Type: *Centreline Culvert*	Blockage in Culvert:
Culvert Material: *Concrete*	Culvert Condition: good
Culvert Shape: circular	Inlet Condition: good
Culvert Bottom:	Outlet Condition: *good*
Culvert Flow Direction: East to West	Additional Field Notes:
Culvert Size (mm): *35.4" (900mm)*	
Depth of Water in Culvert (mm*): 70.9" (180mm)*	*Overall: Field measured 900mm concrete pipe* *Culvert inlet, about 180cm water depth,* *5cm of sediment.* *Recommendation:*

Site Photograph Photo of Culvert "Rail North"

Culvert “Rail South”

Culvert Field Investigation Data Sheet (Culvert "Rail South")

Date (mm/dd/yy): *07/11/2023*	Field Crew: *Ken Luong*
Client: *York Region*	Highway/Road No.: *Railway*
Culvert Crossing Type:	Blockage in Culvert:
Culvert Material: *concrete*	Culvert Condition:
Culvert Shape: circular	Inlet Condition: good
Culvert Bottom:	Outlet Condition: *buried*
Culvert Flow Direction: East to West	Additional Field Notes:
Culvert Size (mm): 450	
Depth of Water in Culvert (mm*):*	*Overall: Culvert crosses entrance roadway and railway*
	Recommendation:

Site Photograph Photo of Culvert “Rail South”


Culvert #WD7


Sutong Tire Resources, Inc
Sutong Shipping/ Receiving
Global Pre
49
Fabco Plastics
Affinity Aluminum
Vaughan Water Station North
Hytek Plastic Sales
Superior Sprinkler Co. Ltd
RPS Composites
WD07
6
M+CC Modular & Custom Cabinets
Dental supply store
Above Toronto Collision Repair Centre
Parente Garage

Culvert Field Investigation Data Sheet (Culvert #WD7)

Date (mm/dd/yy): *10/26/2022*	Field Crew: *Jenny Dai, Ken Luong*
Client: *York Region*	Highway/Road No.: *Teston Rd.*
Culvert Crossing Type: *Centreline Culvert*	Blockage in Culvert:
Culvert Material: *CSP – Corrugated Steel Pipe*	Culvert Condition: good
Culvert Shape: Circular	Inlet Condition: good
Culvert Bottom:	Outlet Condition: *collapsed*
Culvert Flow Direction:	Additional Field Notes:
Culvert Size (mm): *53.1" (1350mm)*	
Depth of Water in Culvert (mm*):*	*Overall:* • *Field measured 1350mm CSP (u/s) - About 5cm of flowing water* • *There is low lying area draining towards the culvert. But construction at time of visit obstructed actual ditch grades.* *Recommendation:*

Site Photograph Photo of Culvert WD7