

**NOTES:**

1. See City of Portland Standard Construction Specifications Section 00415 - Vegetated Stormwater Facilities.
2. Width of swale: 8' minimum from inside curbs. Depth of swale: 6" minimum from inlet at gutter elevation to bottom of swale.
3. Longitudinal slope of swale: matches road. (Typical cross slope of road 2-6%, cross slope of gutter 8%.)
4. Special requirements may be necessary on steep slopes & for swales designed to include disposal.
5. Include beginning and ending station elevations for each facility. Provide the top and bottom elevation of facility at each station specified. Include elevations at every inlet and outlet.
6. Sidewalk elevation must be set above inlet and outlet elevations to allow overflow to drain to street before sidewalk.
7. Inlets and outlets required: See sheets D-1 & D-2 for details.
8. Check dams required: See sheet P-1 for details.
9. Monitoring port required for facilities designed for stormwater storage: See sheet P4 for detail
10. Special soil and planting requirements: See sheets P-1, P-2 & P-3 for details.
11. Special requirements for water lines, meters, and fire hydrants: See sheet W-1 for details.
12. Depending on location, utility lines may need to be sleeved.
13. Curb and Gutter: ODOT Standard Roadway Drawing RD700. Use 1'-6" gutter with bike lanes and 2' gutter without bike lanes.

**IMPORTANT:** Utility conflicts and existing conditions can create major design variables. Locate utilities and survey existing conditions prior to beginning design work.

The Portland Department of Transportation (PDOT), Portland Water Bureau (PWB), and Bureau of Environmental Services (BES) are responsible for the review and approval of Stormwater Swales in the public right of way. Stormwater facilities in *Well Field Protection Areas* may require special containment measures.

For more information contact:  
 PDOT (503) 823-7884  
 PWB (503) 823-7368  
 BES (503) 823-7189

**VEGETATED STORMWATER FACILITIES IN THE PUBLIC RIGHT-OF-WAY**

TITLE		SWALE		SHEET NUMBER		1	
APPROVED	<i>Willie Fly</i>	NO.	REVISIONS	DATE	BY		
CHIEF ENGINEER, BES	<i>Steve Tom</i>	1	PDOT REVS - SWAT.DWG	6/1/07	RMS		
CITY ENGINEER, PDOT	<i>Mark O'Shea</i>		FINAL DRAFT - SWAT.DWG	2/16/07	RMS		
CHIEF ENGINEER, PWB	<i>Mark O'Shea</i>		DRAFT - SWAT.DWG	11/16/06	RMS		

file name: SWAT.dwg Aug 07, 2007 - 11:05am -ricksc

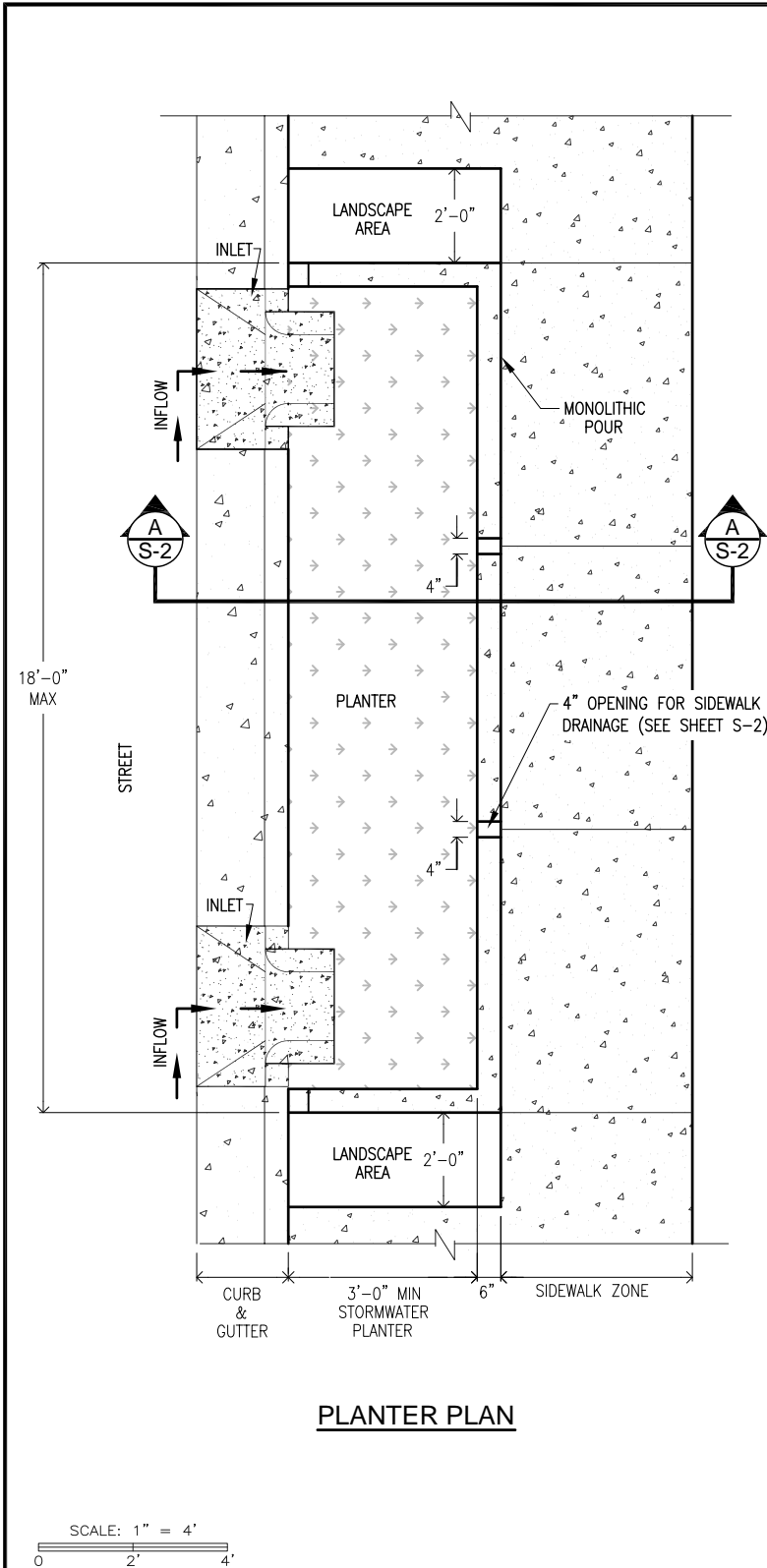
**NOTES:**

1. See City of Portland Standard Construction Specifications Section 00415 - Vegetated Stormwater Facilities.
2. Width of planter: 3' minimum from inside curbs  
Length of planter based on engineering calculations: 18' maximum, 12' minimum.  
Depth of planter: 12" max from top of curb to top of soil.
3. Longitudinal slope of planter matches road: flat as possible, 3% maximum. Longitudinal and cross slope of soil within planter: none, flat as possible. (Typical cross slope of road 2-6%, cross slope of gutter 8%.)
4. Special requirements may be necessary on steep slopes & for planters designed to include disposal.
5. Include beginning and ending station elevations for each facility. Provide the top and bottom elevation of facility at each station specified. Include elevations at every inlet and outlet.
6. Sidewalk elevation must be set above inlet and outlet elevations to allow overflow to drain to street before sidewalk.
7. Inlets and outlets required:  
See sheets D-1 and D-2 for details.
8. Check dams may be required:  
See sheet P-1 for details.
9. Special soil and planting requirements:  
See sheets P-1, P-2 & P-3 for details.
10. Special requirements for water lines, meters, and fire hydrants: See sheet W-1 for details.
11. Depending on location, utility lines may need to be sleeved.
12. Curb and Gutter: ODOT Standard Roadway Drawing RD700 with thickened 12" gutter. Use 1'-6" gutter with bike lanes and 2' gutter without bike lanes.

**IMPORTANT:** Utility conflicts and existing conditions can create major design variables. Locate utilities and survey existing conditions prior to beginning design work.


The Portland Department of Transportation (PDOT), Portland Water Bureau (PWB), and Bureau of Environmental Services (BES) are responsible for the review and approval of Stormwater Swales in the public right of way. Stormwater facilities in *Well Field Protection Areas* may require special containment measures.

For more information contact:  
 PDOT (503) 823-7884  
 PWB (503) 823-7368  
 BES (503) 823-7189

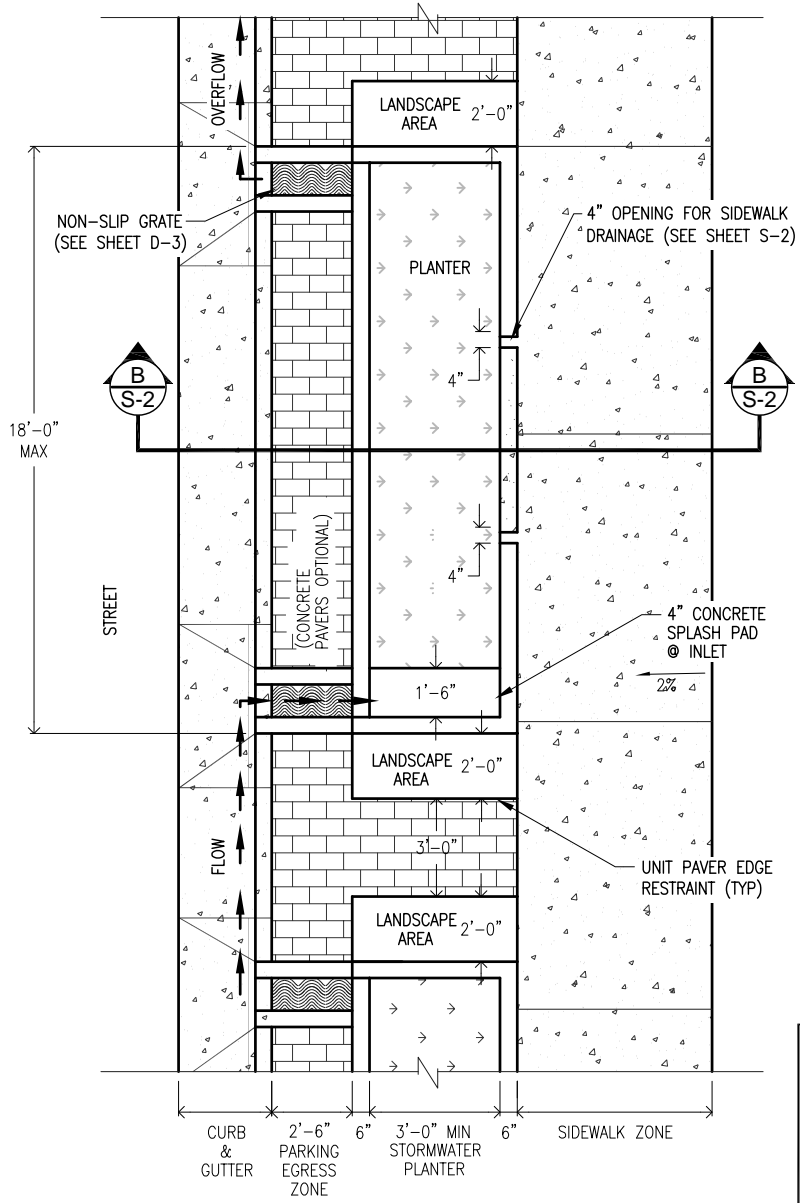


**PLANTER PLAN**

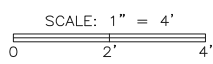
**VEGETATED STORMWATER FACILITIES IN THE PUBLIC RIGHT-OF-WAY**

TITLE		SHEET NUMBER	
<b>PLANTER</b> - Without Parking -		 <b>2</b>	
APPROVED	NO.	REVISIONS	DATE BY
<i>Wick FR</i>		FINAL DRAFT - SWAT.DWG	2/16/07 RMS
CHIEF ENGINEER, BES		DRAFT - SWAT.DWG	11/16/06 RMS
DATE			
2/16/07			
CITY ENGINEER, PDOT			
DATE			
2/20/07			
CHIEF ENGINEER, PWB			
DATE			

file name: SWAT.dwg Aug 07, 2007 - 11:05am -ricksc



**PLANTER PLAN**



**NOTES:**



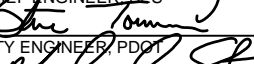

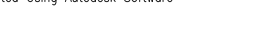
1. See City of Portland Standard Construction Specifications Section 00415 - Vegetated Stormwater Facilities.
2. Width of planter: 3' minimum from inside curbs  
Length of planter based on engineering calculations: 18' maximum, 12' minimum.  
Depth of planter: 12" max from top of curb to top of soil.
3. Longitudinal slope of planter matches road: flat as possible, 3% maximum. Longitudinal and cross slope of soil within planter: none, flat as possible. (Typical cross slope of road 2-6%, cross slope of gutter 8%.)
4. Special requirements may be necessary on steep slopes & for planters designed to include disposal.
5. Include beginning and ending station elevations for each facility. Provide the top and bottom elevation of facility at each station specified. Include elevations at every inlet and outlet.
6. Sidewalk elevation must be set above inlet and outlet elevations to allow overflow to drain to street before sidewalk.
7. Inlets and outlets required:  
See sheet D-3 for details.
8. Check dams may be required:  
See sheet P-1 for details.
9. Special soil and planting requirements:  
See sheets P-1, P-2 & P-3 for details.
10. Special requirements for water lines, meters, and fire hydrants: See sheet W-2 for details.
11. Depending on location, utility lines may need to be sleeved.
12. Curb and Gutter: ODOT Standard Roadway Drawing RD700. Use 2' gutter without bike lanes.

**IMPORTANT:** Utility conflicts and existing conditions can create major design variables. Locate utilities and survey existing conditions prior to beginning design work.

The Portland Department of Transportation (PDOT), Portland Water Bureau (PWB), and Bureau of Environmental Services (BES) are responsible for the review and approval of Stormwater Swales in the public right of way. Stormwater facilities in *Well Field Protection Areas* may require special containment measures.

For more information contact:  
 PDOT (503) 823-7884  
 PWB (503) 823-7368  
 BES (503) 823-7189

**VEGETATED STORMWATER FACILITIES IN THE PUBLIC RIGHT-OF-WAY**

TITLE				SHEET NUMBER	
<p><b>PLANTER</b> - With Parking -</p>				<b>3</b>	
APPROVED		NO.	REVISIONS	DATE	BY
CHIEF ENGINEER, BES			FINAL DRAFT - SWAT.DWG	2/16/07	RMS
CITY ENGINEER, PDOT			DRAFT - SWAT.DWG	11/16/06	RMS
CHIEF ENGINEER, PWB					

file name: SWAT.dwg Aug 07, 2007 - 11:05am -ricksc

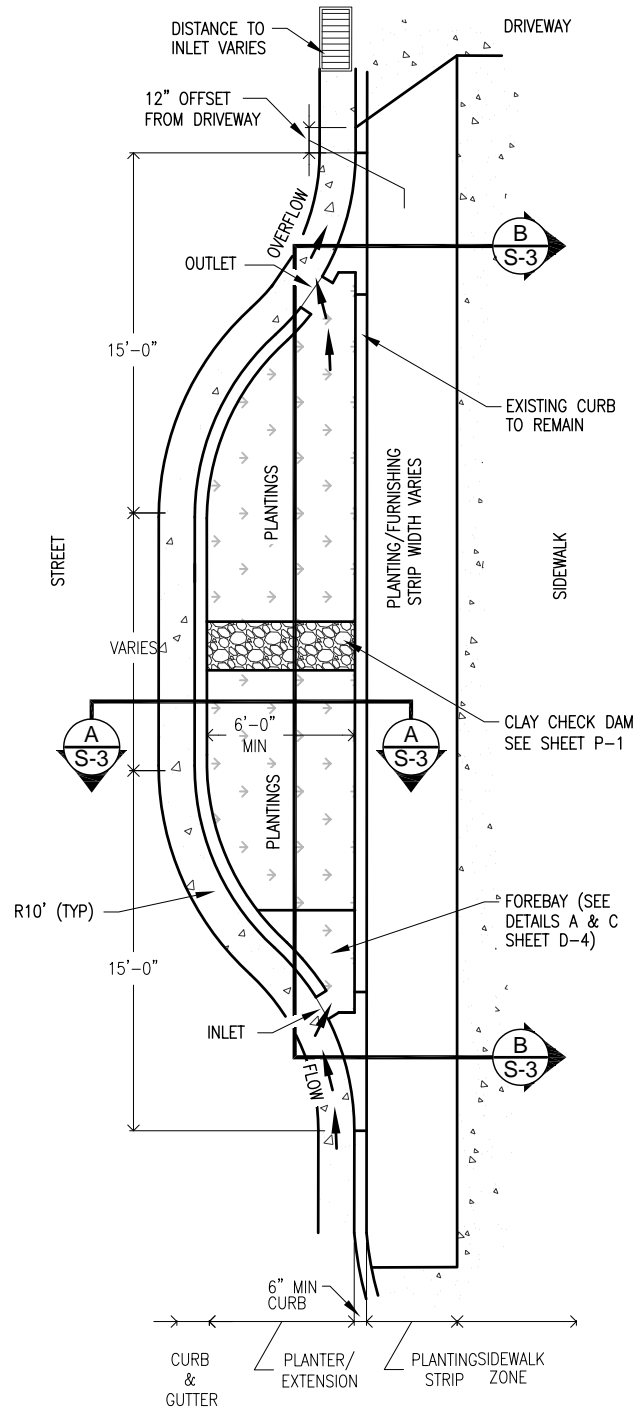
**NOTES:**

1. See City of Portland Standard Construction Specifications Section 00415 - Vegetated Stormwater Facilities.
2. Width of curb extension: 6' minimum from inside curbs. Depth of curb extension: 6" minimum from inlet at gutter elevation to bottom of facility.
3. Longitudinal slope of planter matches road: flat as possible, 3% maximum. Longitudinal and cross slope of soil within planter: none, flat as possible. (Typical cross slope of road 2-6%, cross slope of gutter 8%.)
4. Special requirements may be necessary on steep slopes & for facilities designed to include disposal.
5. Include beginning and ending station elevations for each facility. Provide the top and bottom elevation of facility at each station specified. Include elevations at every inlet and outlet.
6. Sidewalk elevation must be set above inlet and outlet elevations to allow overflow to drain to street before sidewalk.
7. Inlets and outlets required: See sheet D-1 and D-2 for details.
8. Check dams required: See sheet P-1 for details.
9. Special soil and planting requirements: See sheets P-1, P-2 & P-3 for details.
10. Special requirements for water lines, meters, and fire hydrants: See sheet W-3 for details.
11. Depending on location, utility lines may need to be sleeved.
12. Curb and Gutter: ODOT Standard Roadway Drawing RD700 with 1'-6" gutter. Modified curb may be necessary to avoid conflict with water line (see sheet D-4 for details).
13. Where feasible width of stormwater facility may extend into existing planting strip, in which case, existing curb would be removed.

**IMPORTANT:** Utility conflicts and existing conditions can create major design variables. Locate utilities and survey existing conditions prior to beginning design work.

The Portland Department of Transportation (PDOT), Portland Water Bureau (PWB), and Bureau of Environmental Services (BES) are responsible for the review and approval of Stormwater Swales in the public right of way. Stormwater facilities in *Well Field Protection Areas* may require special containment measures.

For more information contact:  
 PDOT (503) 823-7884  
 PWB (503) 823-7368  
 BES (503) 823-7189

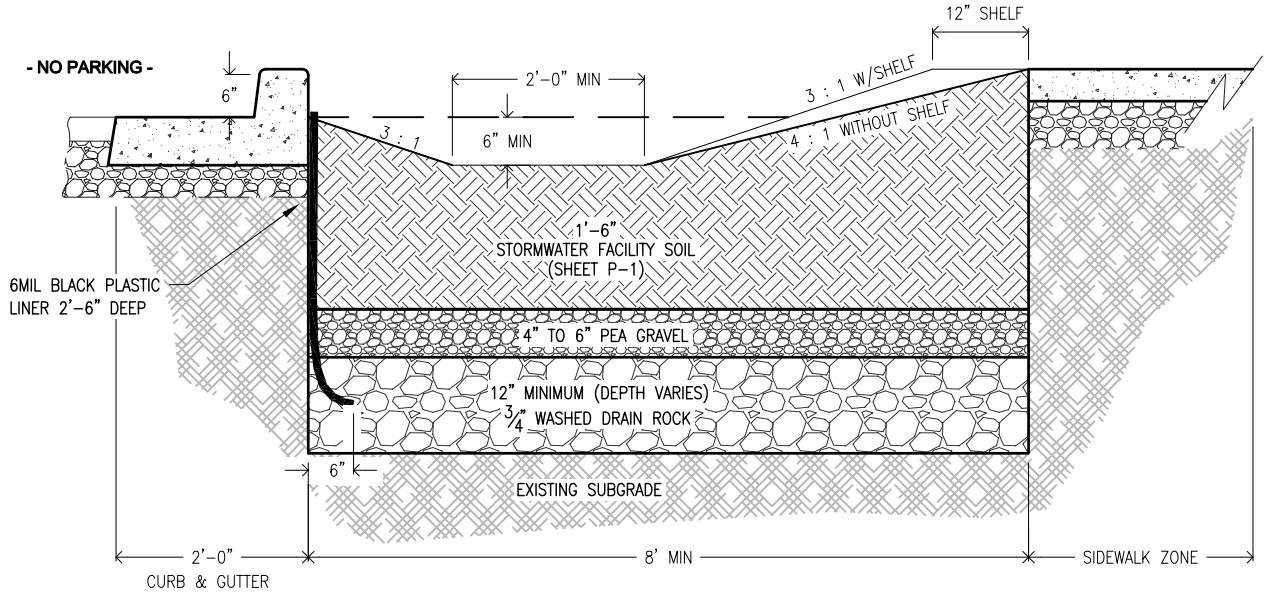


**CURB EXTENSION PLAN**

**VEGETATED STORMWATER FACILITIES IN THE PUBLIC RIGHT-OF-WAY**

TITLE		SHEET NUMBER	
<b>CURB EXTENSION</b>		<b>4</b>	
APPROVED	NO.	REVISIONS	DATE BY
<i>Wick FR</i>		FINAL DRAFT - SWAT.DWG	2/16/07 RMS
CHIEF ENGINEER, BES		DRAFT - SWAT.DWG	11/16/06 RMS
<i>Steve Tomlin</i>			
CITY ENGINEER, PDOT			
<i>Michael Shih</i>			
CHIEF ENGINEER, PWB			

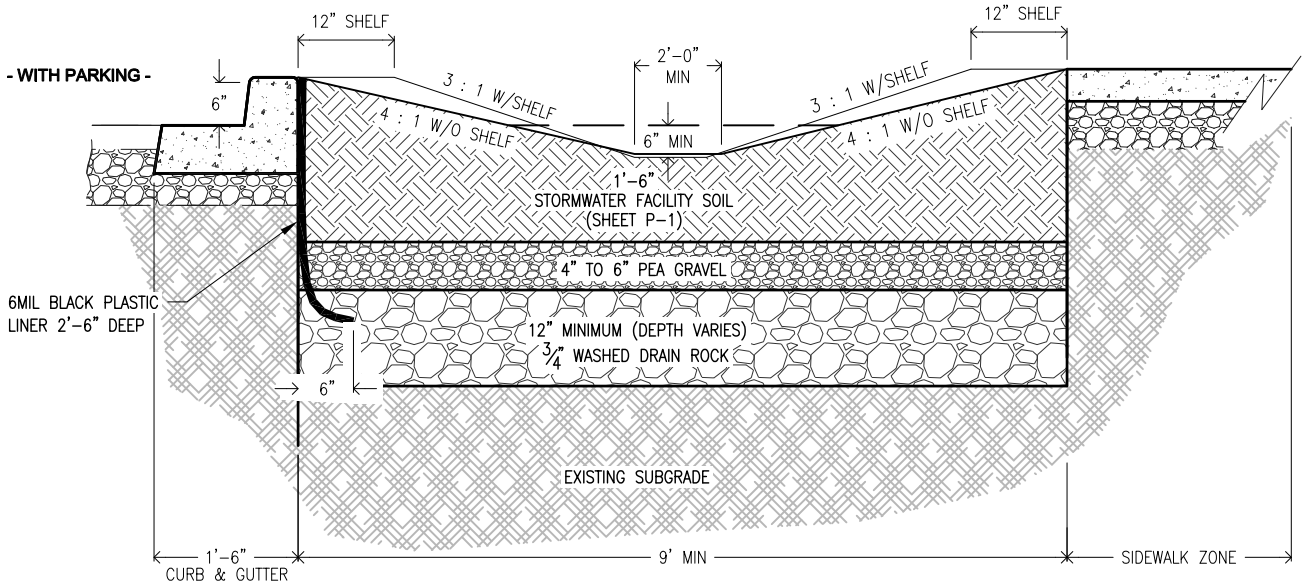
file name: SWAT.dwg Aug 07, 2007 - 11:05am -ricksc



**SECTION A-A (SHEET 1)**  
**SWALE WITHOUT PARKING**

SCALE: 1" = 2'  
0 1 2

SHELF NOT REQUIRED WITH 4:1 SLOPE



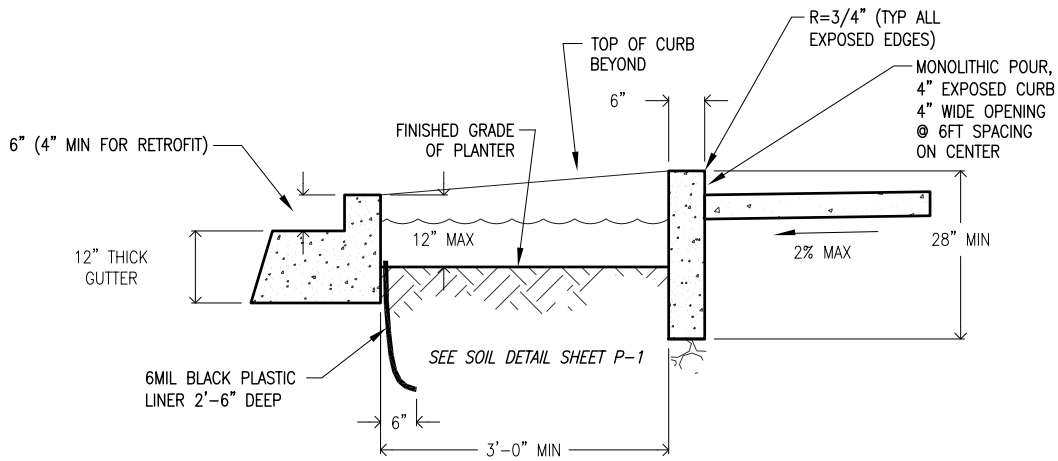
**SECTION A-A (SHEET 1)**  
**SWALE WITH PARKING**

SCALE: NTS

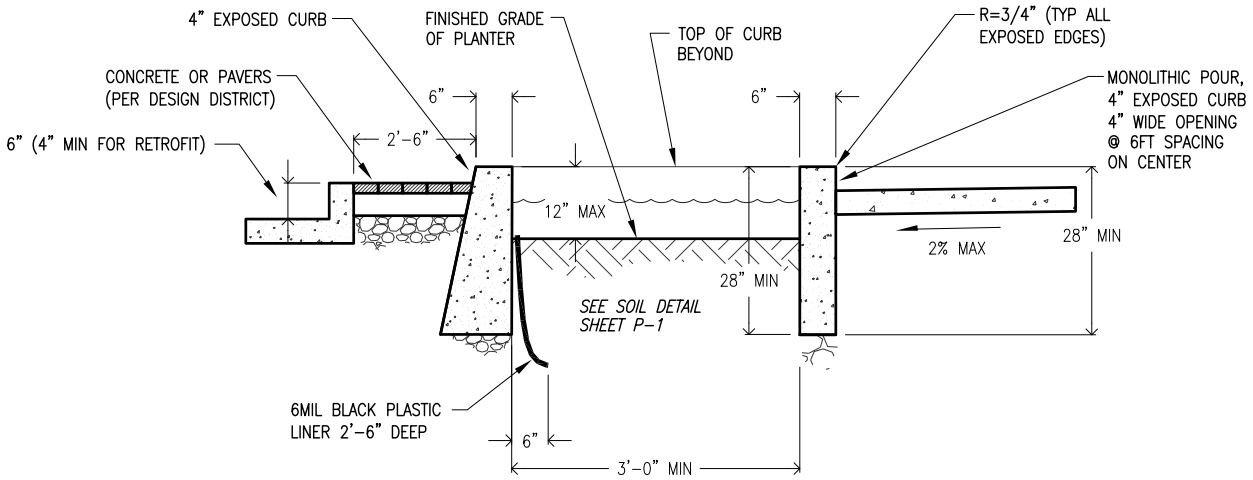
**VEGETATED STORMWATER FACILITIES IN THE PUBLIC RIGHT-OF-WAY**

TITLE		<b>SWALE SECTIONS</b> - With and Without Parking -			SHEET NUMBER  <b>S-1</b>		
APPROVED		NO.		REVISIONS		DATE BY	
<i>Willie Fly</i>		1		PDOT REVS - SWAT.DWG		6/1/07 RMS	
CHIEF ENGINEER, BES		DATE		FINAL DRAFT - SWAT.DWG		2/16/07 RMS	
<i>Steve Tom</i>		7/13/07		DRAFT - SWAT.DWG		11/16/06 RMS	
CITY ENGINEER, PDOT		DATE					
<i>Michael O'Shea</i>		2/16/07					
CHIEF ENGINEER, PWB		DATE					

File name: SWAT.dwg Aug 07, 2007 - 11:05am -ricksc




**SECTION A-A (SHEET 2)**  
**PLANTER WITHOUT PARKING**

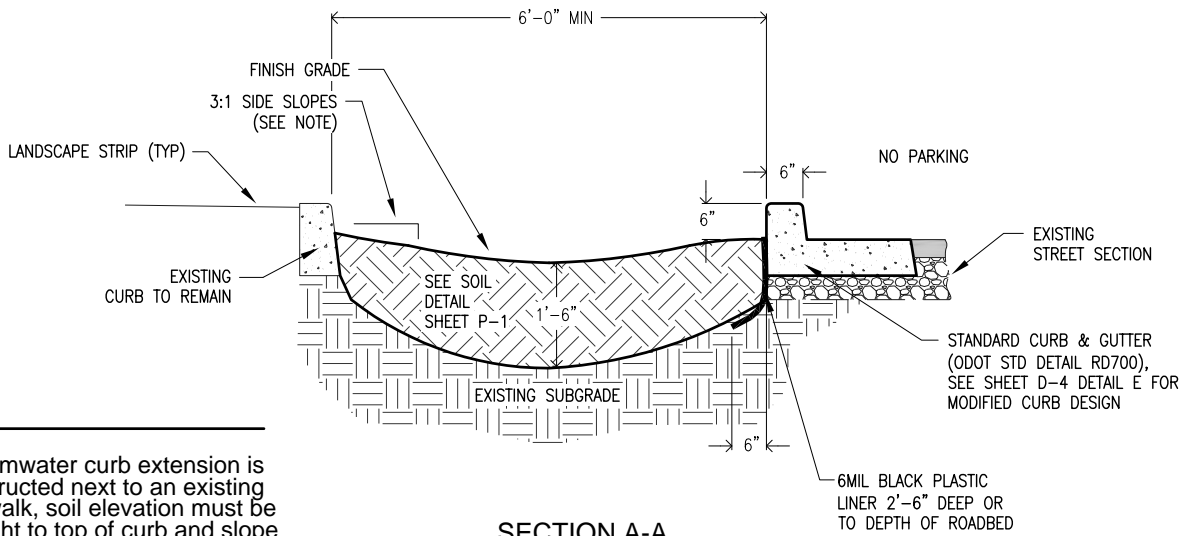


**SECTION B-B (SHEET 3)**  
**PLANTER WITH PARKING**

SCALE: 3/8" = 1'  
0 1' 2'

**VEGETATED STORMWATER FACILITIES IN THE PUBLIC RIGHT-OF-WAY**

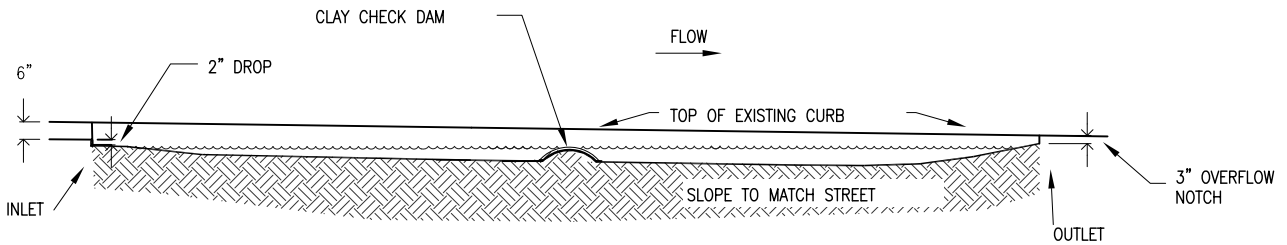
TITLE		PLANTER SECTIONS - With and Without Parking -			SHEET NUMBER	
					<b>S-2</b>	
APPROVED	DATE	NO.	REVISIONS	DATE	BY	
<i>Willie Fly</i>	6/28/07	1	PDOT REVS - SWAT.DWG	6/1/07	RMS	
CHIEF ENGINEER, BES	DATE		FINAL DRAFT - SWAT.DWG	2/16/07	RMS	
<i>Steve Tom</i>	7/13/07		DRAFT - SWAT.DWG	11/16/06	RMS	
CITY ENGINEER, PDOT	DATE					
<i>Mark O'Shea</i>	2/16/07					
CHIEF ENGINEER, PWB	DATE					



**NOTE:**


1. If stormwater curb extension is constructed next to an existing sidewalk, soil elevation must be brought to top of curb and slope away from curb at a 4:1 slope.

**SECTION A-A  
CURB EXTENSION SECTION**

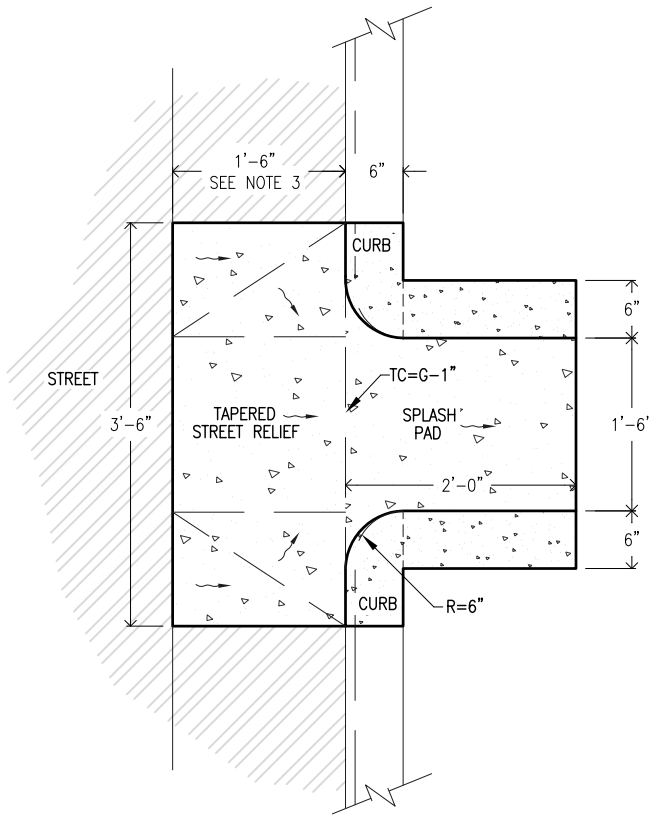


**SECTION B-B  
CURB EXTENSION PROFILE**

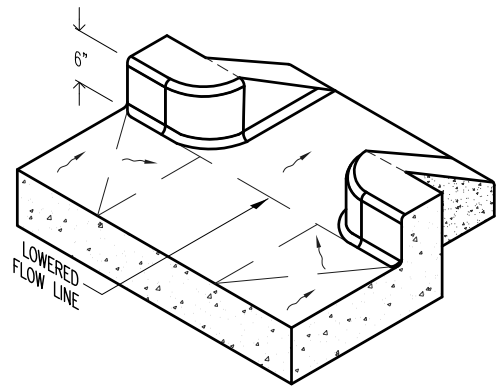
**VEGETATED STORMWATER FACILITIES IN THE PUBLIC RIGHT-OF-WAY**

TITLE		<b>CURB EXTENSION SECTIONS</b>				SHEET NUMBER	
						<b>S-3</b>	
APPROVED	<i>W. F. Ry-</i>	NO.	REVISIONS	DATE	BY		
CHIEF ENGINEER, BES	<i>W. F. Ry-</i>	1	PDOT REVS - SWAT.DWG	6/1/07	RMS		
	<i>Steve Tomm</i>		FINAL DRAFT - SWAT.DWG	2/16/07	RMS		
CITY ENGINEER, PDOT	<i>Steve Tomm</i>		DRAFT - SWAT.DWG	11/16/06	RMS		
	<i>Mark S. Sh...</i>						
CHIEF ENGINEER, PWB	<i>Mark S. Sh...</i>						

file name: SWAT.dwg Aug 07, 2007 - 11:05am -ricksc



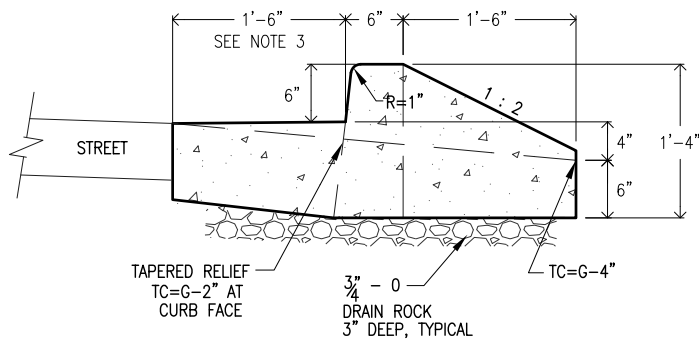
**PLAN**



**ISOMETRIC**

**NOTES:**

1. Concrete splash pad necessary where water enters and/or exits facility.
2. For planters, install washed pea gravel or river rock to transition from splash pad to topsoil.
3. Reference ODOT Standard Drawing RD 700. Use 1'-6" gutter with bike lanes and 2' gutter without bike lanes or match existing.



TC = TOP OF CONCRETE  
G = GUTTER

**SECTION**

**VEGETATED STORMWATER FACILITIES IN THE PUBLIC RIGHT-OF-WAY**

TITLE  
**CONCRETE INLET, TYPE SW**  
- For Local Service Streets -



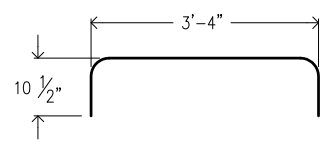
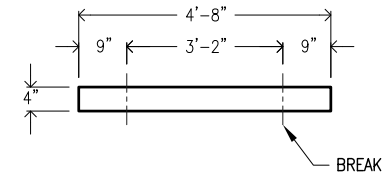
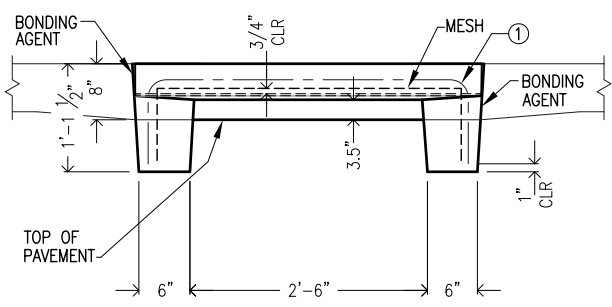
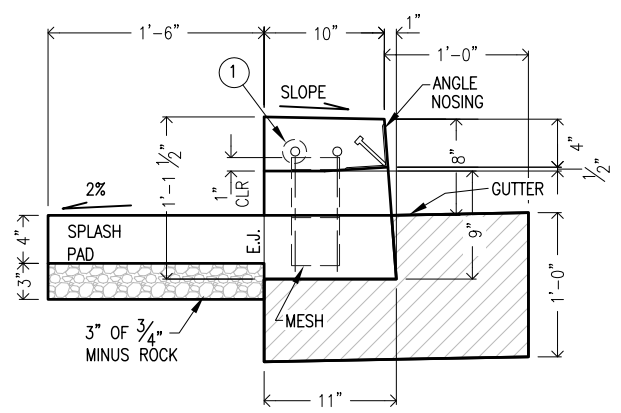
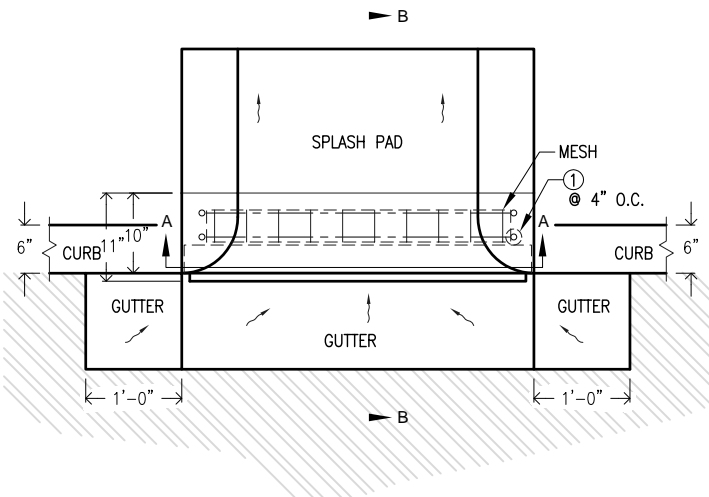
SHEET NUMBER

**D-1**

APPROVED	NO.	REVISIONS	DATE	BY
<i>Willie RB</i>	1	PDOT REVS - SWAT.DWG	6/1/07	RMS
<i>Steve Tom</i>		FINAL DRAFT - SWAT.DWG	2/16/07	RMS
<i>Mark O'Shea</i>		DRAFT - SWAT.DWG	11/16/06	RMS

file name: SWAT.dwg Aug 07, 2007 - 11:05am -ricksc






E.J. = EXPANSION JOINT  
 CLR. = CLEAR  
 O.C. = ON CENTER

**STRUCTURAL NOTES:**

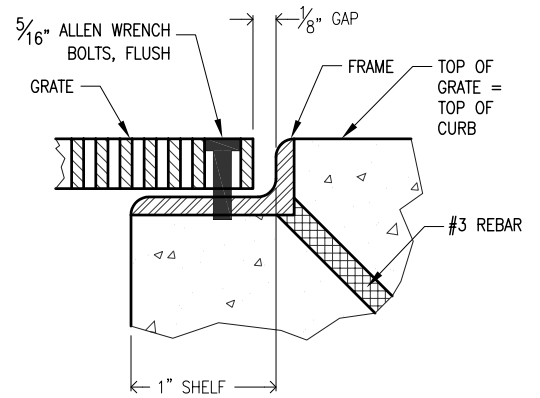
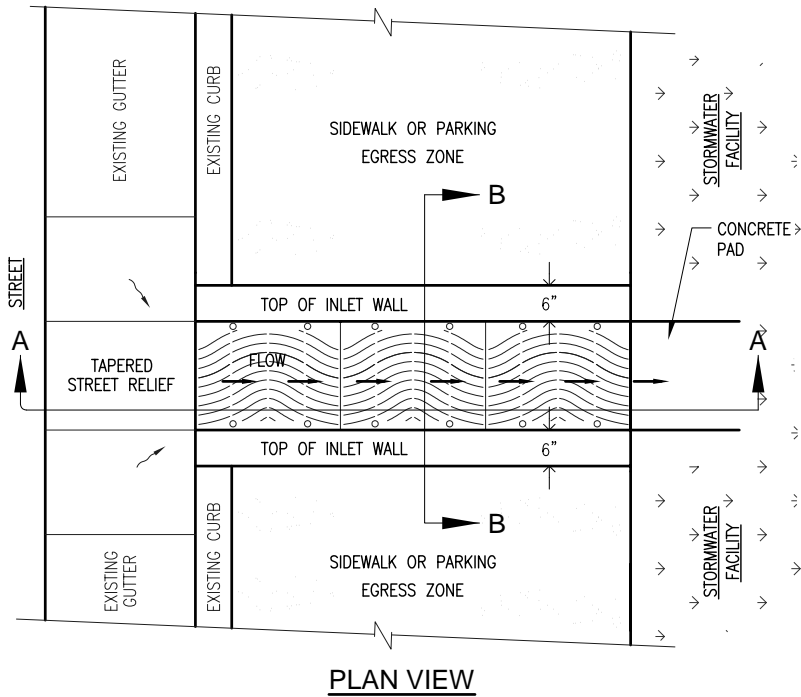
- Concrete: 28 Day Strength  $f'c = 5,500$  PSI.
- Rebar: ASTM A-615 Grade 60.
- Mesh: ASTM A-185 Grade 65.
- Design: ACI-318 Building Code, ASTM C-857  
 "Min structural design loading for underground precast concrete utility structures".
- Loads: H-20 truck wheel w/ 30% impact.

BILL OF MATERIAL				
PART	DESCRIPTION	QTY.	SIZE	TOTAL WT. LBS.
	ANGLE NOSING	1	3.5"x3.5"x3'-7" GALV.	
MESH	W2.9/W2.9 4x4	1	SEE DETAIL MESH	2 SF
①	#6 GR 60	2	SEE DETAIL 1	15

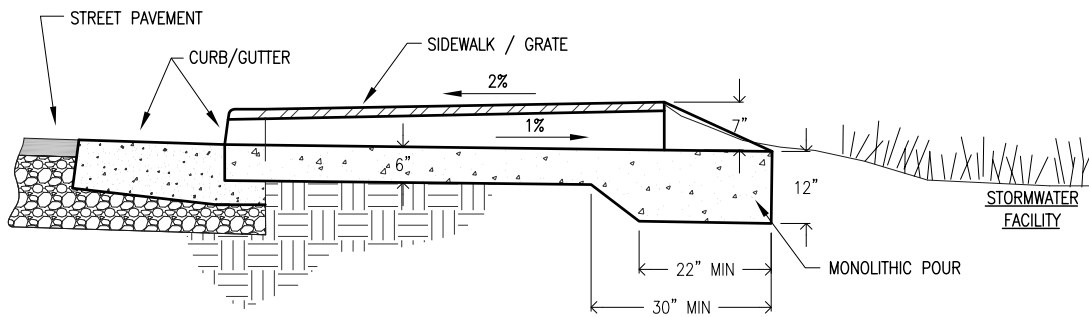
**VEGETATED STORMWATER FACILITIES IN THE PUBLIC RIGHT-OF-WAY**

TITLE		<b>CONCRETE INLET, TYPE PB</b> - For Neighborhood Collectors and Above -			SHEET NUMBER	
		<b>D-2</b>				
APPROVED	<i>Willie RB</i>	NO.	REVISIONS	DATE	BY	
CHIEF ENGINEER, BES		1	PDOT REVS - SWAT.DWG	6/1/07	RMS	
CITY ENGINEER, PDOT	<i>Steve Tom</i>		FINAL DRAFT - SWAT.DWG	2/16/07	RMS	
CHIEF ENGINEER, PWB	<i>Mark O'Shea</i>		DRAFT - SWAT.DWG	11/16/06	RMS	

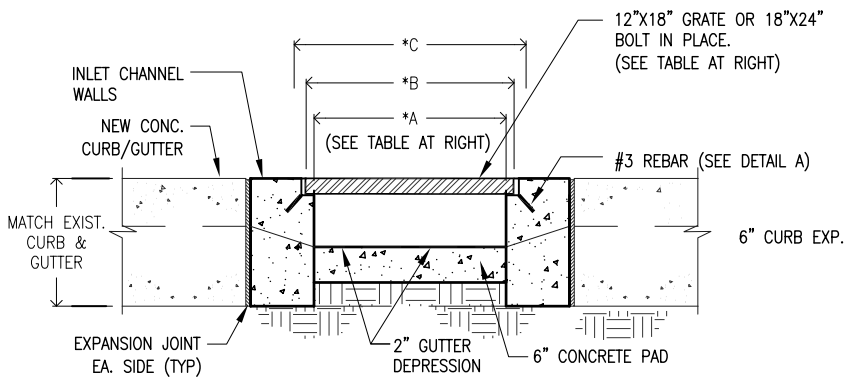
File name: SWAT.dwg Aug 07, 2007 - 11:05am -ricksc



**DETAIL A**



**SECTION A-A**




**SECTION B-B**

**\*TRENCH GRATING**

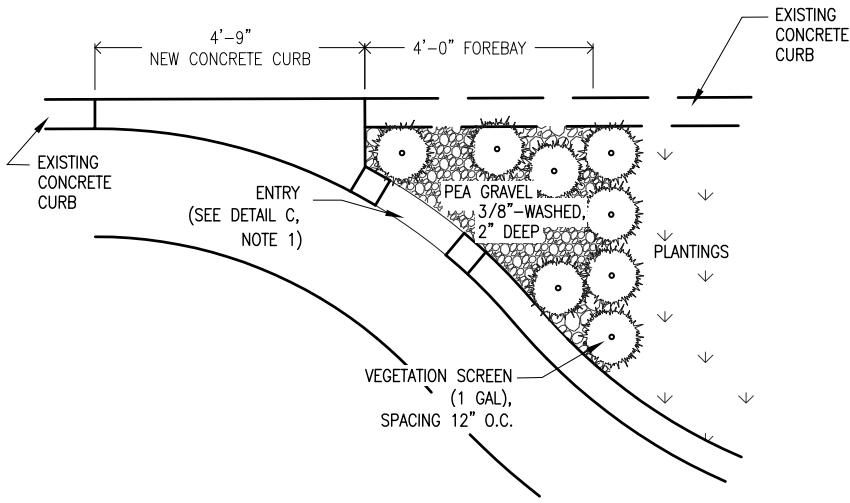
A TRENCH WIDTH	B GRATE WIDTH	C FRAME WIDTH
10"	11 7/8"	12 1/8"
16"	17 7/8"	18 1/8"

NOTE: MAXIMUM GRATE HOLE WIDTH (OPEN) 1/4 INCH. GRATE SIZE 12"x18" OR 18"x24". CAST IRON URBAN ACCESSORIES TRENCH GRATE AND FRAME. TITLE WAVE MODEL OR EQUAL.

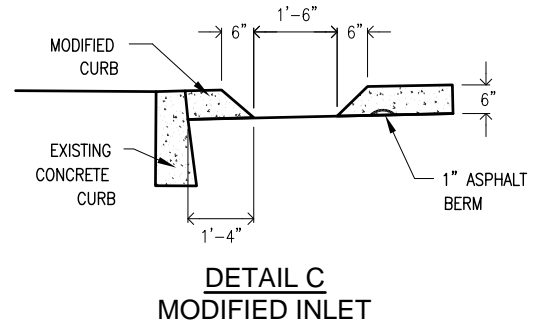
**VEGETATED STORMWATER FACILITIES IN THE PUBLIC RIGHT-OF-WAY**

TITLE				SHEET NUMBER	
<p align="center"><b>CONCRETE INLET, TYPE CHANNEL &amp; GRATE</b></p>				<p align="center"><b>D-3</b></p>	
APPROVED	NO.	REVISIONS		DATE	BY
<i>Willie Fly</i>	1	PDOT REVS - SWAT.DWG		6/1/07	RMS
CHIEF ENGINEER, BES		FINAL DRAFT - SWAT.DWG		2/16/07	RMS
<i>Steve Tom</i>		DRAFT - SWAT.DWG		11/16/06	RMS
CITY ENGINEER, PDOT					
<i>Mark O'Shea</i>					
CHIEF ENGINEER, PWB					

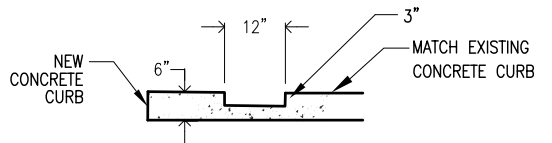
File name: SWAT.dwg Aug 07, 2007 - 11:05am -ricksc



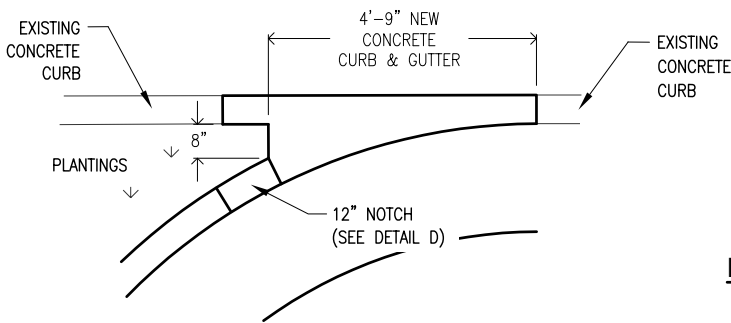
**DETAIL A**  
PEA GRAVEL FOREBAY



**DETAIL C**  
MODIFIED INLET



**DETAIL D**  
MODIFIED OUTLET



**DETAIL B**  
OUTLET CURB PLAN

**NOTES:**

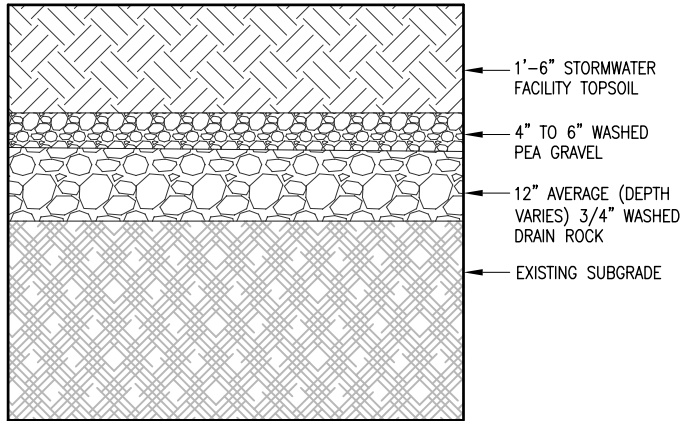
1. Detail A: Pea gravel forebay for use with stormwater curb extensions only. Pea gravel forebay replaces standard concrete splash pad.
2. Detail C: To prevent ponding, position inlet closer to existing curb if the street cross-slope is >2%. Additional inlets can be added if necessary (preferably immediately downstream of each check dam to minimize potential backflow). Additional inlets are not recommended for streets sloped <1%.
3. Details B, C & D: For use on local service streets only.

**VEGETATED STORMWATER FACILITIES IN THE PUBLIC RIGHT-OF-WAY**

TITLE		SHEET NUMBER	
<b>INLET / OUTLET DETAILS</b> - For Curb Extensions -		<b>D-4</b>	
APPROVED	NO.	REVISIONS	DATE BY
<i>Willie FB</i>	1	PDOT REVS - SWAT.DWG	6/1/07 RMS
CHIEF ENGINEER, BES		FINAL DRAFT - SWAT.DWG	2/16/07 RMS
<i>Steve Tom</i>		DRAFT - SWAT.DWG	11/16/06 RMS
CITY ENGINEER, PDOT			
<i>Mark O'Shea</i>			
CHIEF ENGINEER, PWB			

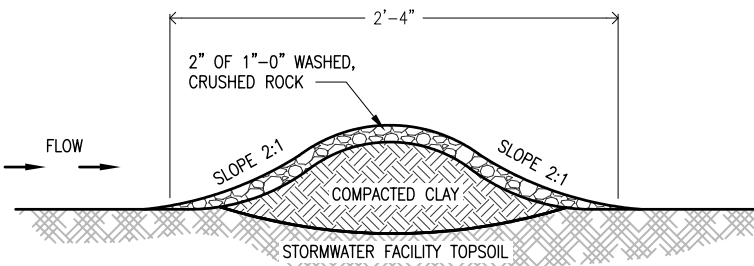
file name: SWAT.dwg Aug 07, 2007 - 11:05am -ricksc

**SOIL NOTES:**



**SOIL PROFILE**

1. See City of Portland Standard Construction Specifications Section 01040.14 (d) - Stormwater Facility Topsoil.
2. The soil mix shall consist of 67% sandy loam topsoil and 33% compost material by volume. Topsoil shall be a sandy loam as defined by the ASTM soil texture classification. Soil classification and other specifications must be evaluated and reported by an accredited soils testing laboratory and approved by the engineer prior to delivery of topsoil to project site.
3. If no drain rock or pea gravel is specified, excavate native soil 18" below the finish grade of the facility and rototill exposed native soil.
4. Install topsoil in a manner that ensures adequate infiltration. Place in two equal lifts. (If no drain rock is specified rototill the first lift into native soil.) Lifts should not be compacted, but rather placed in a manner to reduce excessive erosion or settlement. Lifts may be lightly watered to encourage natural compaction or, if necessary, rolled with a water-filled landscape roller. Slightly overfill the facility above proposed finished grade to accommodate natural settlement.
5. Pea gravel is specified to separate topsoil from drain rock, when drain rock is specified. Geotextile fabric can be used for this purpose but is prone to clogging when used in combination with soils than have high clay and/or silt content. Geotextile fabric can also be used when there are concerns for lateral flow along the walls of the facility or other specific design concerns.



**CHECK DAM**

CHECK DAM SPACING			
Facility Length	Longitudinal Street Slope	# of Check Dams *	Additional Inlets **
30	<=1%	0	None
	>1%	1	None
31 - 50	<=1%	1	None
	>1%	2	1
51 - 70	<=1%	2	1
	>1%	3	2
71-90	<=1%	3	2
	>1%	4	3
91 +	<=1%	4	3
	>1%	5	4

**TABLE 1**

**CHECK DAM NOTES:**

1. Check Dams to be evenly spaced between inlet and outlet. Additional requirements may be necessary on steep slopes.
2. Additional inlets to be placed downstream of check dams.
3. Height of check dam 2" less than depth of facility typical.

**VEGETATED STORMWATER FACILITIES IN THE PUBLIC RIGHT-OF-WAY**

TITLE		SHEET NUMBER	
<b>SOIL &amp; CHECK DAM DETAILS</b>		<b>P-1</b>	
APPROVED	NO.	REVISIONS	DATE BY
<i>Walter Fry</i>	1	BES REVS - SWAT.DWG	7/25/07 RMS
CHIEF ENGINEER, BES		FINAL DRAFT - SWAT.DWG	2/16/07 RMS
<i>Steve Jones</i>		DRAFT - SWAT.DWG	11/16/06 RMS
CITY ENGINEER, PILOT			
<i>Michael O'Shea</i>			
CHIEF ENGINEER, PWB			

file name: SWAT.dwg Aug 07, 2007 - 11:05am -ricksc

**RECOMMENDED PLANTS FOR VEGETATED STORMWATER FACILITIES IN THE PUBLIC RIGHT-OF-WAY**

**ZONE A - Bottom of Facility**

*For wet conditions. Grows no taller than 30". Typically 1 gallon pots, planted 12" on center.*

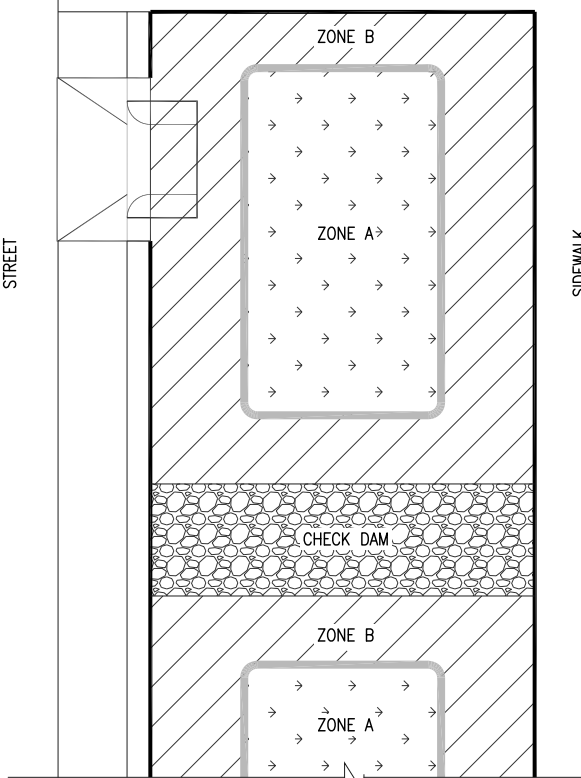
BOTANICAL NAME	COMMON NAME
<b>EVERGREEN GROUNDCOVERS -</b>	
<i>Carex comans</i>	New Zealand hair sedge
<i>Carex densa</i>	Dense sedge
<i>Carex stipata</i>	Sawbeak sedge
<i>Carex obnupta</i>	Slough sedge
<i>Carex testacea</i>	Orange sedge
<i>Deschampsia cespitosa</i>	Tufted hairgrass
<i>Deschampsia cespitosa 'Northern Lights'</i>	Northern Lights tufted hairgrass
<i>Juncus patens</i>	Spreading rush
<i>Juncus patens 'Elk Blue'</i>	Elk Blue spreading rush
<b>OPTIONAL FLOWERING ACCENTS -</b>	
<i>Camassia quamash</i>	Common camas
<i>Camassia leichtlinii</i>	Great camas

**ZONE B - Side Slopes of Facility**

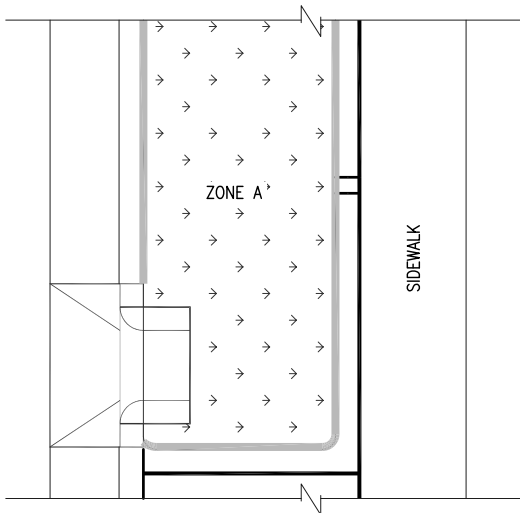
*Drought tolerant to moist conditions. Grows no taller than 24". Typically 1 gallon pots, planted 12" on center.*

BOTANICAL NAME	COMMON NAME
<b>GROUNDCOVERS -</b>	
<i>Arctostaphylos uva-ursi</i>	Kinnikinnick
<i>Fragaria chiloensis</i>	Coastal strawberry
<i>Helictotrichon sempervirens</i>	Blue oat grass
<i>Mahonia repens</i>	Creeping Oregon grape
<b>DECIDUOUS SHRUBS -</b>	
<i>Cornus sericea 'Kelseyi'</i>	Kelsey redtwig dogwood
<i>Spiraea bumalda 'Dart's Red'</i>	Dart's red spiraea
<i>Spiraea bumalda 'Magic Carpet'</i>	Magic carpet spiraea
<i>Viburnum opulus 'Nanum'</i>	Dwarf European cranberry
<b>EVERGREEN SHRUBS -</b>	
<i>Euonymus japonicus 'Microphyllus'</i>	Boxleaf evergreen euonymus
<i>Mahonia nervosa</i>	Low Oregon grape
<b>EVERGREEN SHRUBS REQUIRING PARTIAL TO FULL SHADE -</b>	
<i>Gaultheria shallon</i>	Salal
<i>Polystichum munitum</i>	Sword fern
<b>OPTIONAL FLOWERING ACCENTS -</b>	
<i>Iris tenax</i>	Oregon iris
<i>Iris douglasiana</i>	Douglas iris

TABLE 1



**SWALE & CURB EXTENSION  
PLANTING TEMPLATE**



**PLANTER PLANTING TEMPLATE**

**VEGETATED STORMWATER FACILITIES IN THE PUBLIC RIGHT-OF-WAY**

TITLE		SHEET NUMBER	
<b>PLANTING TEMPLATE DETAILS</b>		<b>P-2</b>	
APPROVED	NO.	REVISIONS	DATE BY
<i>Willie Fly</i>	1	PDOT REVS - SWAT.DWG	6/1/07 RMS
CHIEF ENGINEER, BES		FINAL DRAFT - SWAT.DWG	2/16/07 RMS
<i>Steve Tom</i>		DRAFT - SWAT.DWG	11/16/06 RMS
CITY ENGINEER, PDOT			
<i>Mark O'Shea</i>			
CHIEF ENGINEER, PWB			

File name: SWAT.dwg Aug 07, 2007 - 11:05am -ricksc

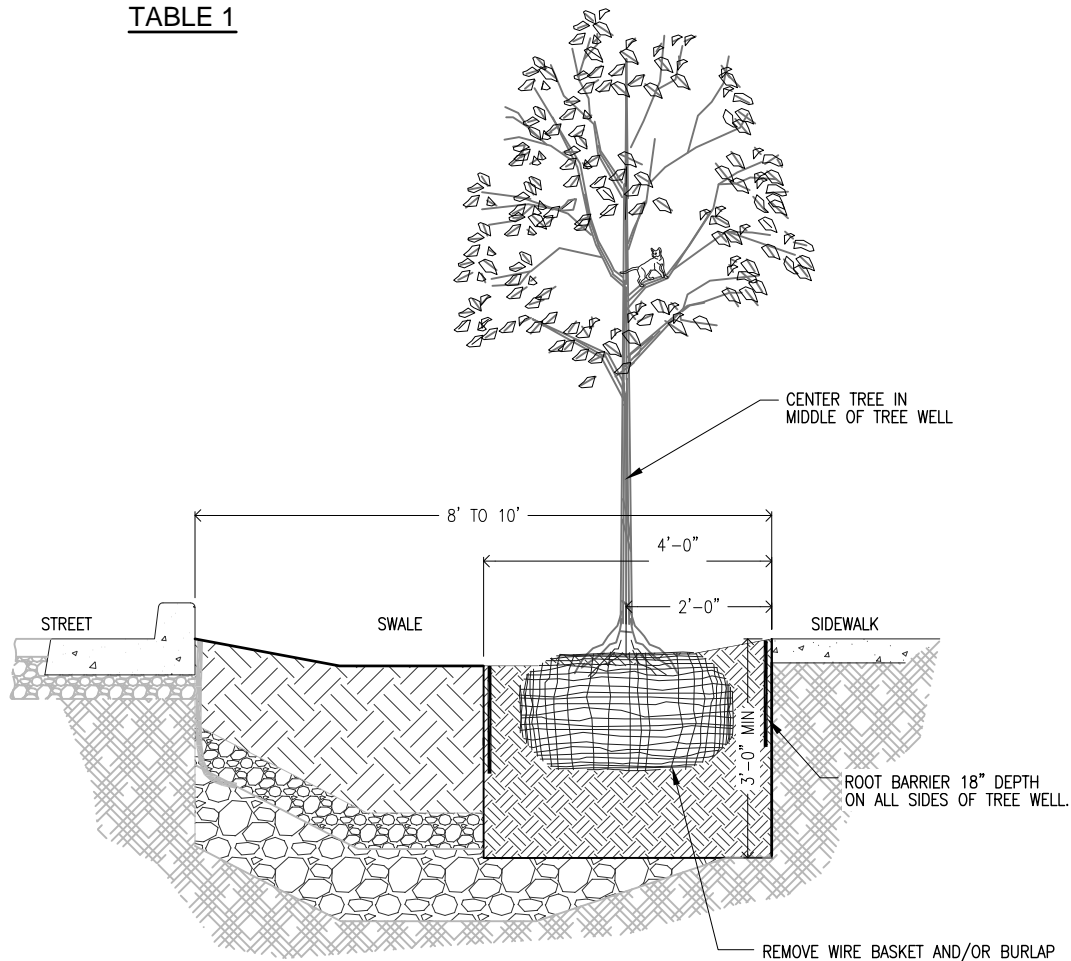
**RECOMMENDED STREET TREES**

Botanical Name	Common Name
<b>WITH power lines</b>	
Carpinus caroliniana	American Hornbeam
Cercis canadensis	Eastern Redbud
Fraxinus pennsylvanica 'Johnson'	Leprechaun Ash
Gleditsia triacanthos 'Impcole'	Imperial Honeylocust
Koelreuteria paniculata	Goldenrain Tree
Prunus virginiana "Canada Red'	Canada Red Chokecherry
<b>WITHOUT power lines</b>	
Nyssa sylvatica	Black tupelo
Celtis occidentalis	Hackberry
Quercus shumardii	Shumard Oak
Betula jacquemontii	Jacquemontii Birch
Acer campestre 'Evelyn'	Queen Elizabeth Hedge Maple
Gleditsia triacanthos 'Skycole'	Skyline Honeylocust

**NOTES:**

1. Contact Urban Forester for review of tree installation (503) 823-4025.
2. Remove wire and burlap from root ball prior to backfilling.
3. Set top of root ball a minimum of 1" above topsoil surface.
4. Distance between trees varies: 20'-30' on center.
5. Minimum clearance of 10' between trees and water lines or meets Standard Plan 5-109 (tree root barrier).

**TABLE 1**



**STREET TREE IN SWALE**

**VEGETATED STORMWATER FACILITIES IN THE PUBLIC RIGHT-OF-WAY**

TITLE		SHEET NUMBER	
<b>STREET TREE DETAILS</b>		<b>P-3</b>	
APPROVED	NO.	REVISIONS	DATE BY
<i>Wick FRy</i> 2/16/07		FINAL DRAFT - SWAT.DWG	2/16/07 RMS
CHIEF ENGINEER, BES		DRAFT - SWAT.DWG	11/16/06 RMS
<i>Steve Tomlin</i> 2/21/07			
CITY ENGINEER, PDOT			
<i>Mark Stoltz</i> 2/20/07			
CHIEF ENGINEER, PWB			



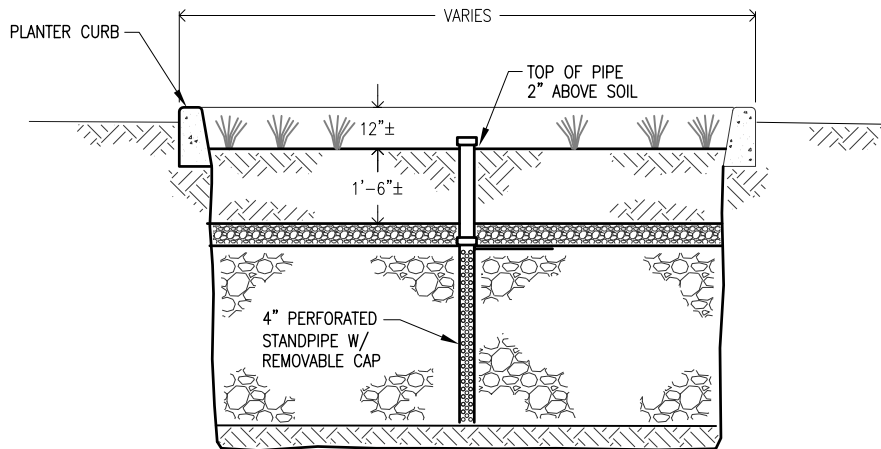
file name: SWAT.dwg Aug 07, 2007 - 11:05am -ricksc

# SPECIFICATIONS UNDER DEVELOPMENT

**NOTE:** \_\_\_\_\_

1. Curb marker provided by owner.

## CURB MARKER DETAIL



## FACILITY MONITORING PORT

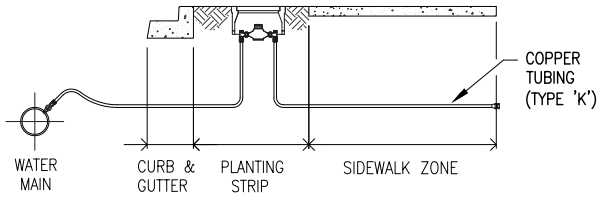
**NOTE:** \_\_\_\_\_

1. Monitoring port required in facilities with rock trench that is designed for stormwater storage.

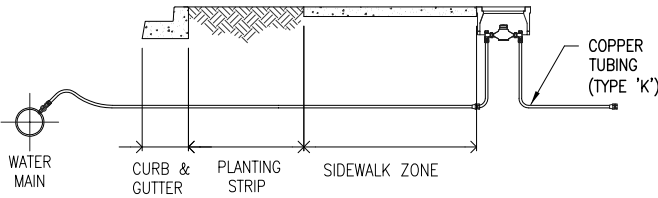
### VEGETATED STORMWATER FACILITIES IN THE PUBLIC RIGHT-OF-WAY

TITLE		SHEET NUMBER	
<h2 style="margin: 0;">CURB MARKER &amp; MONITORING PORT</h2>		<div style="display: flex; align-items: center; justify-content: center;"> <h1 style="font-size: 48px; margin: 0;">P-4</h1> </div>	
APPROVED		NO.	REVISIONS
<i>W. F. Ry-</i>	2/16/07		
CHIEF ENGINEER, BES	DATE		DATE
<i>Steve Tom...</i>	2/21/07		2/16/07
CITY ENGINEER, PDOT	DATE		DATE
<i>Michael...</i>	2/20/07		11/16/06
CHIEF ENGINEER, PWB	DATE		BY
			RMS
			RMS

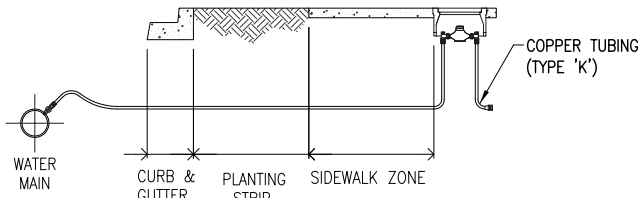
file name: SWAT.dwg Aug 07, 2007 - 11:05am -ricksc



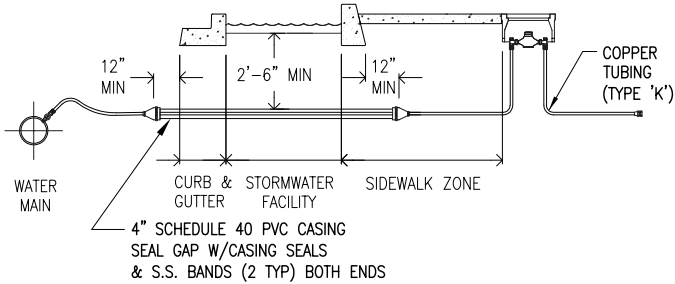
**SECTION A-A**



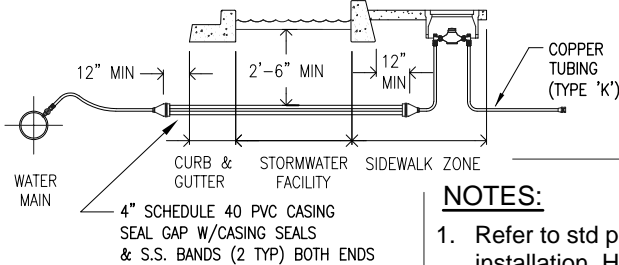
**SECTION B-B**



**SECTION C-C**



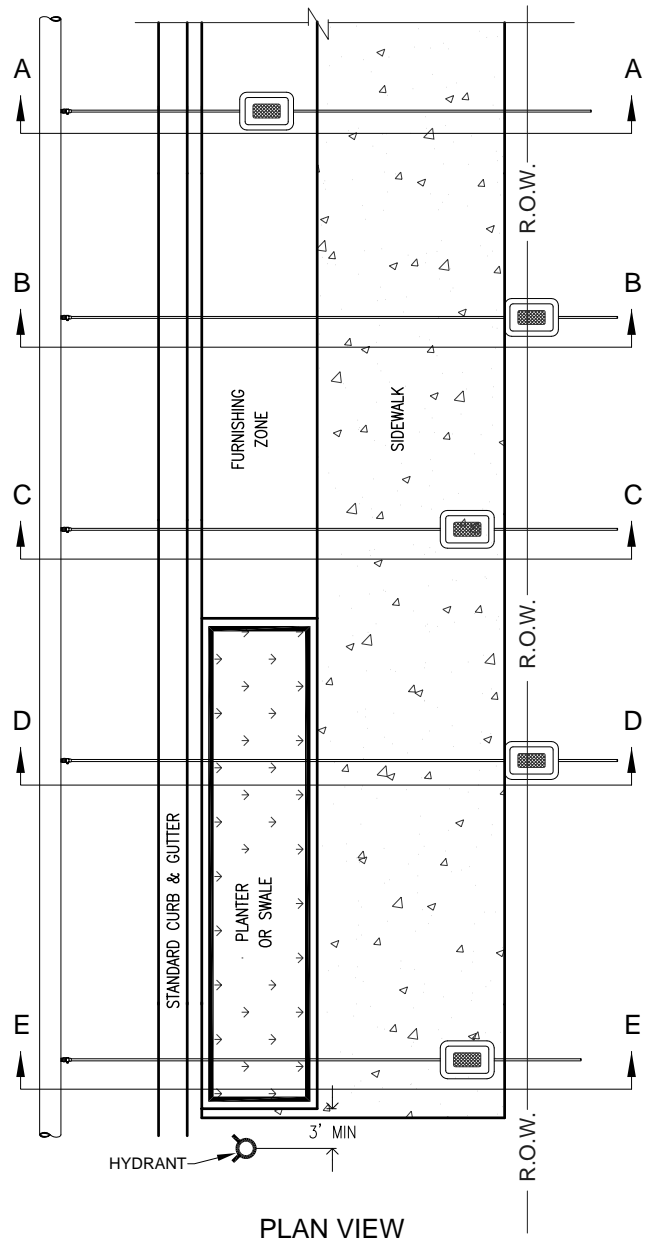
**SECTION D-D**



**SECTION E-E**


**NOTES:**

1. Refer to std plan 5-101 for fire hydrant installation. Hydrants must have min 3' clearance from the edge of stormwater facility.
2. Preferred order of meter location is A, B, C, D, then E. Option B or D can be used only if meter box is fully within the Right-of-Way.
3. Refer to std plan 5-201, 5-202 & 5-205 for std small service installation or similar. For larger services or other appurtenances, contact PWB development services @ 503 823-7368. Water service line must be 2'-6" min below lowest point of ground surface of stormwater facility, typical.



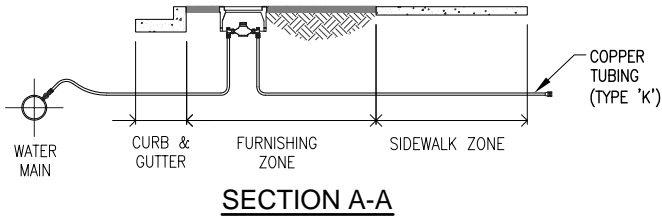
**PLAN VIEW**

**VEGETATED STORMWATER FACILITIES IN THE PUBLIC RIGHT-OF-WAY**

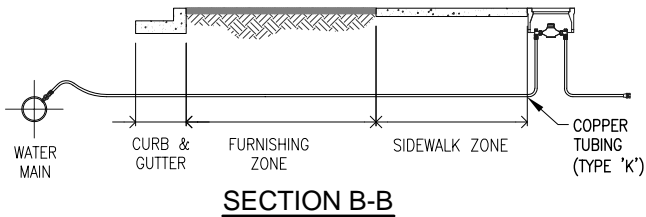
TITLE		SHEET NUMBER	
<b>METER &amp; HYDRANT LOCATION DETAILS</b>		<b>W-1</b>	
- For Swales with or without Parking & Planters without Parking -			
APPROVED	NO.	REVISIONS	DATE BY
<i>Wick FR</i>		FINAL DRAFT - SWAT.DWG	2/16/07 RMS
CHIEF ENGINEER, BES		DRAFT - SWAT.DWG	11/16/06 RMS
<i>Steve Tom</i>			
CITY ENGINEER, PDOT			
<i>Michael Shih</i>			
CHIEF ENGINEER, PWB			

file name: SWAT.dwg Aug 07, 2007 - 11:05am -ricksc

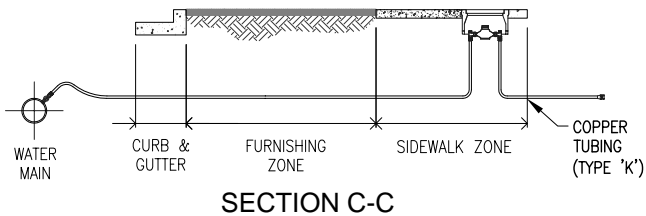




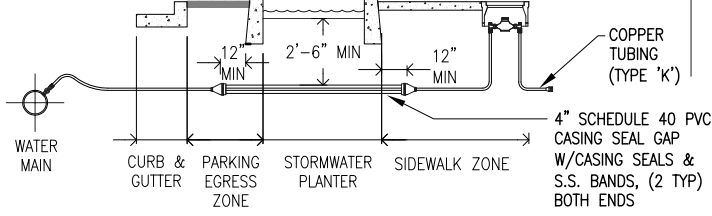
**SECTION A-A**



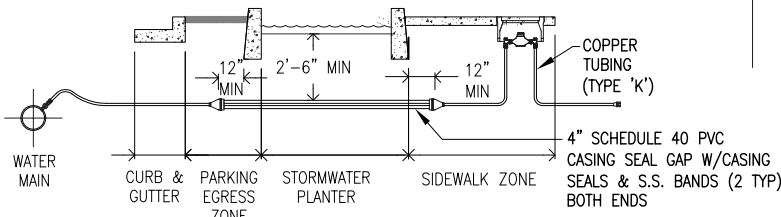
**SECTION B-B**



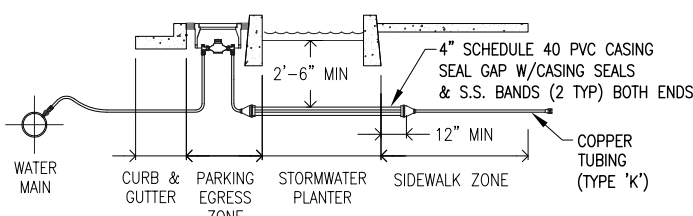
**SECTION C-C**



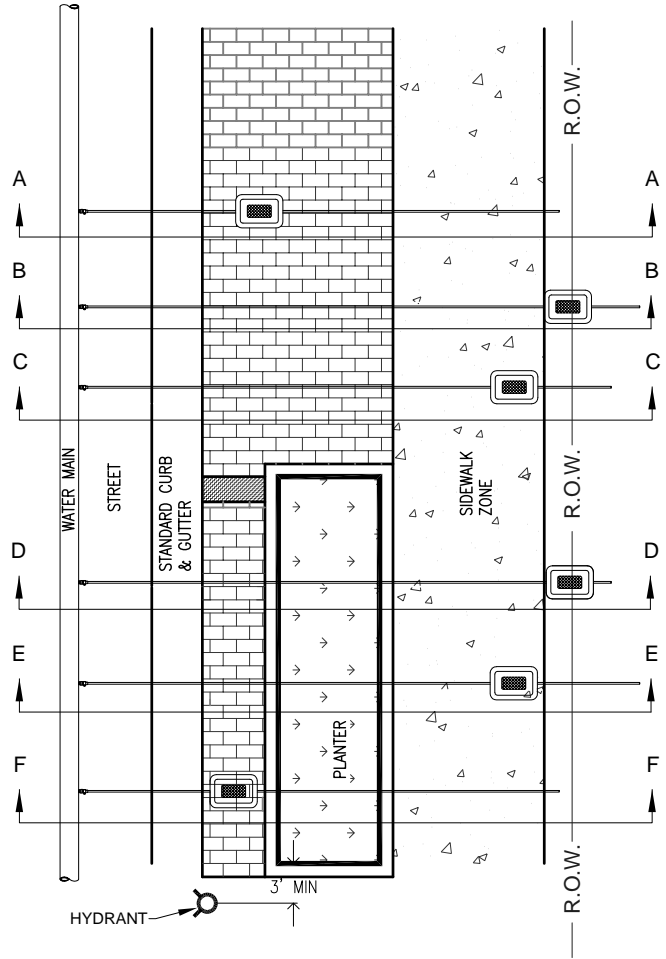
**SECTION D-D**



**SECTION E-E**



**SECTION F-F**



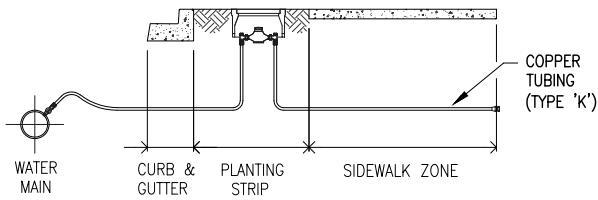
**NOTES:**

1. Refer to std plan 5-101 for fire hydrant installation. Hydrants must have min 3' clearance from the edge of a stormwater facility.
2. Preferred order of meter location is A, B, C, D, E, then F. Option B or D can only be used if the meter box is fully within the Right-of-Way.
3. Refer to std plan 5-201, 5-202 & 5-205 for std small service installation or similar. For larger services or other appurtenances, contact PWB development services @ 503 823-7368. Water service line must be 2'-6" min below lowest point of ground surface of stormwater facility, typical.

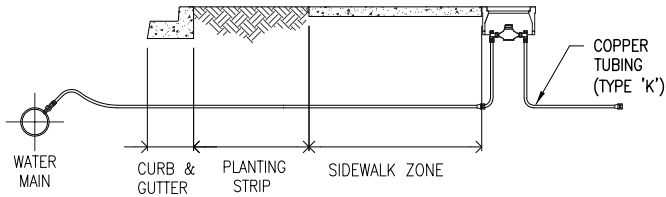
**VEGETATED STORMWATER FACILITIES IN THE PUBLIC RIGHT-OF-WAY**

TITLE		SHEET NUMBER	
<b>METER &amp; HYDRANT LOCATION DETAILS</b>		<b>W-2</b>	
- For Planters with Parking -			
APPROVED	NO.	REVISIONS	DATE BY
<i>Wick FRy</i>		FINAL DRAFT - SWAT.DWG	2/16/07 RMS
CHIEF ENGINEER, RES		DRAFT - SWAT.DWG	11/16/06 RMS
<i>Steve Tomlin</i>			
CITY ENGINEER, PDOT			
<i>Mark Shih</i>			
CHIEF ENGINEER, PWB			

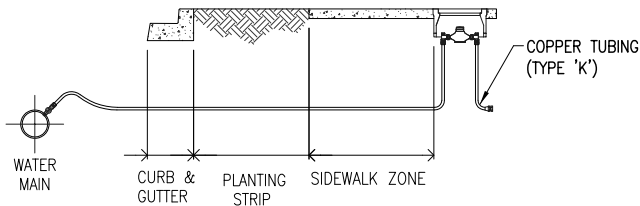
file name: SWAT.dwg Aug 07, 2007 - 11:05am -ricksc



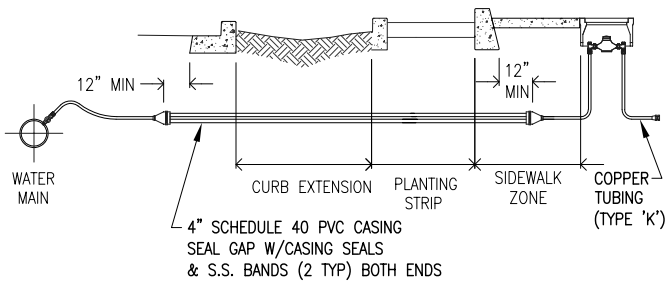
**SECTION A-A**



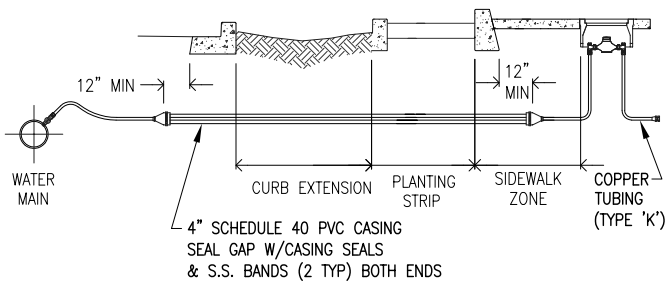
**SECTION B-B**



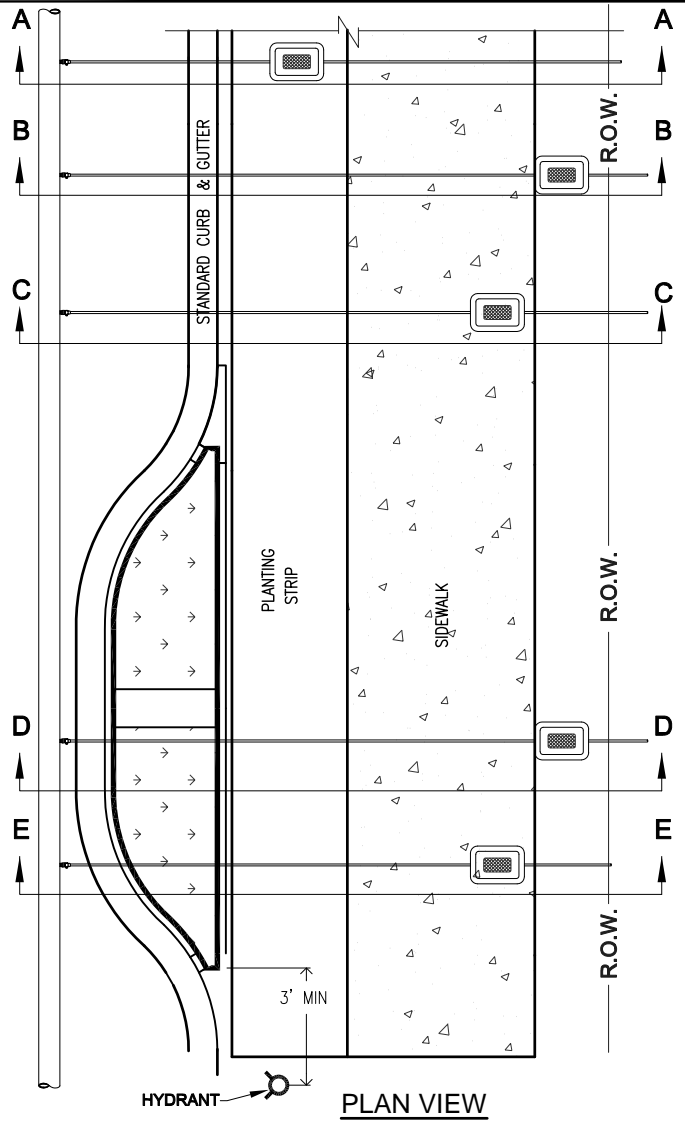
**SECTION C-C**



**SECTION D-D**



**SECTION E-E**



**PLAN VIEW**

**NOTES:**

- 1) Refer to std plan 5-101 for fire hydrant installation. Fire hydrants must have min 3' clearance from the edge of a stormwater facility.
- 2) Preferred order of meter location is A, B, C, D, then E. Option B or D can only be used if the meter box is fully within the Right-of-Way.
- 3) Refer to std plan 5-201, 5-202 & 5-205 for std small service installation or similar. For larger services or other appurtenances, contact PWB development services @ 503 823-7368. Water service line must be 2'-6" min below lowest point of ground surface of stormwater facility, typical.

**VEGETATED STORMWATER FACILITIES IN THE PUBLIC RIGHT-OF-WAY**

TITLE		SHEET NUMBER	
<b>METER &amp; HYDRANT LOCATION DETAILS</b>		<b>W-3</b>	
- For Curb Extensions -			
APPROVED	DATE	NO.	REVISIONS
<i>Wick FRy</i>	2/16/07		
CHIEF ENGINEER, BES	DATE		
<i>Steve Tomlin</i>	2/21/07		
CITY ENGINEER, PDOT	DATE		
<i>Mark Stoltz</i>	2/20/07		
CHIEF ENGINEER, PWB	DATE		

file name: SWAT.dwg Aug 07, 2007 - 11:05am -rickksc