

# Appendix G.5 Table of Contents

SW-500: Source Control Spill Control Manhole

SW-501: Source Control Oil-Water Separator

SW-510: Source Control Trash Enclosure

SW-511: Spill Control Sign Examples

SW-520: Outfall - Check Dams

SW-521: Outfall - Open Channel Outfall

SW-522: Outfall - Piped Outfall

SW-523: Outfall - Rock Energy Dissipator

SW-524: Outfall - Upland Dispersion

SW-525: Outfall - End Wall Detail

SW-526: Outfall - Grated Protection Detail

SW-530: Culvert

- DRAWING NOT TO SCALE -

## STORMWATER MANAGEMENT MANUAL TYPICAL DETAILS

- Supplemental Details -  
Table of Contents

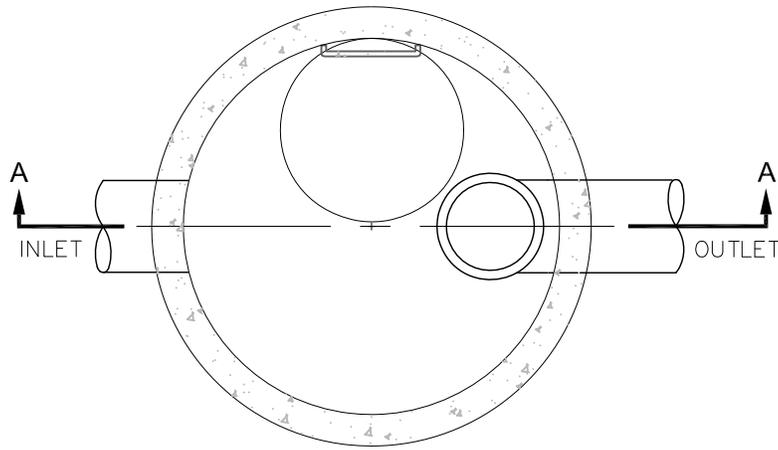
NUMBER

TOC

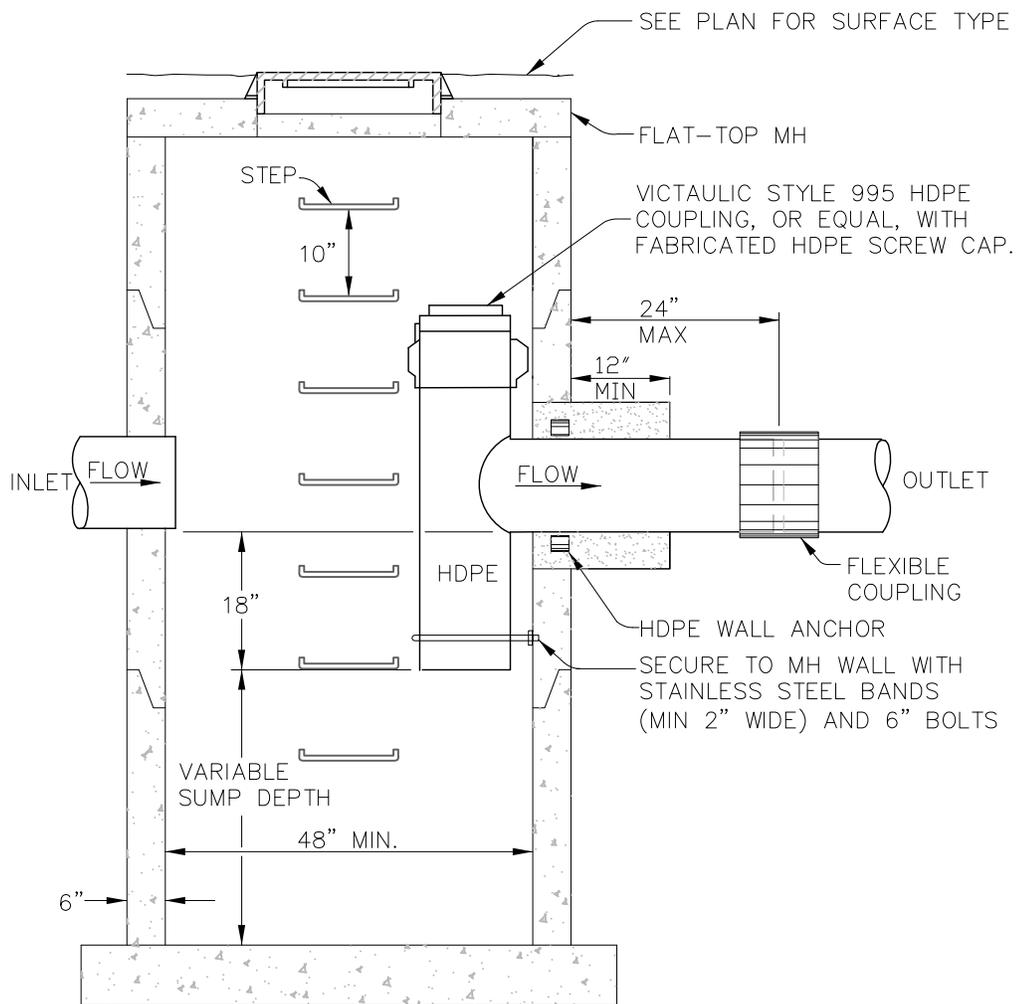


Bureau of Environmental Services





PLAN



- DRAWING NOT TO SCALE -

**STORMWATER MANAGEMENT MANUAL SUPPLEMENTAL DETAILS**

- Supplemental Details -  
**Spill Control Manhole**  
 Source Control

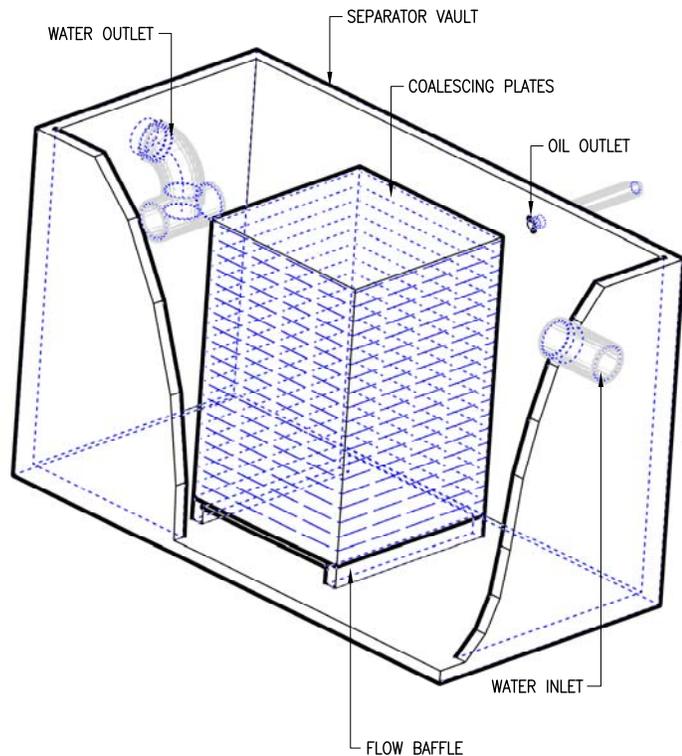
NUMBER

**SW-500**

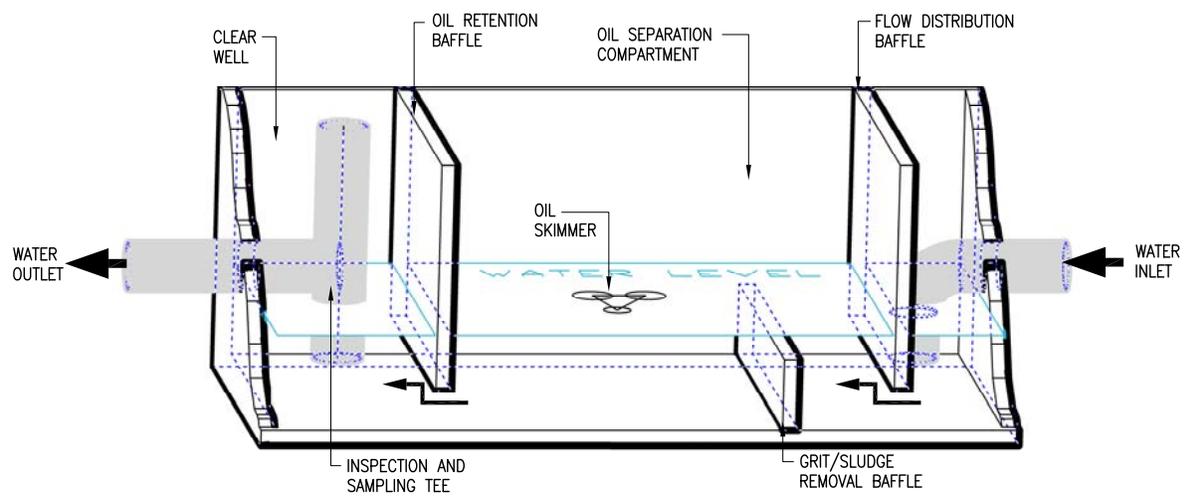


Bureau of Environmental Services





COALESCING PLATE (CP) SEPARATOR



AMERICAN PETROLEUM TYPE (API) SEPARATOR

- DRAWING NOT TO SCALE -

**STORMWATER MANAGEMENT MANUAL SUPPLEMENTAL DETAILS**

- Supplemental Details -  
**Oil-Water Separators**  
 Source Control

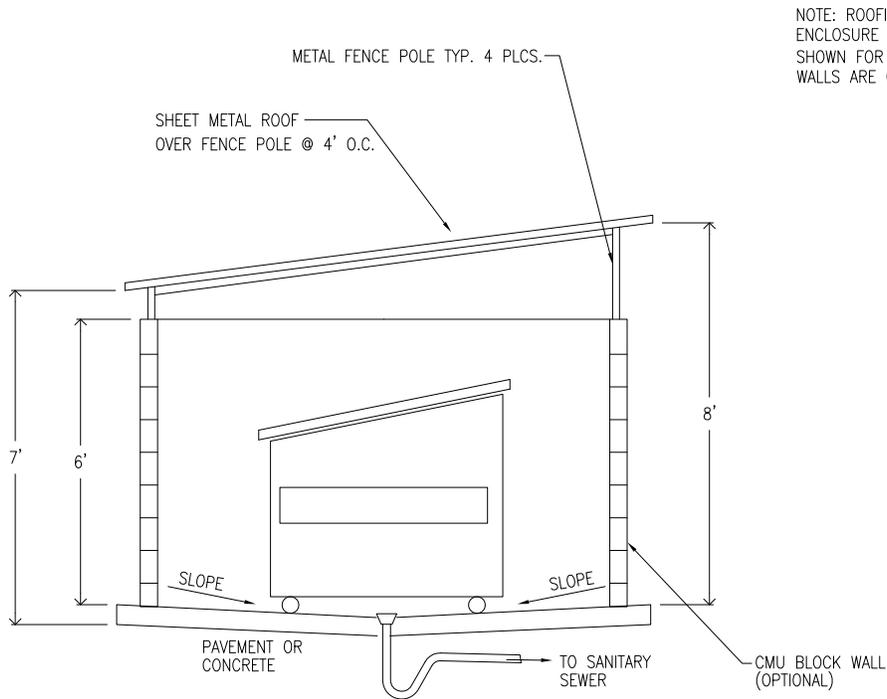
NUMBER

**SW-501**



Bureau of Environmental Services





- DRAWING NOT TO SCALE -

STORMWATER MANAGEMENT MANUAL SUPPLEMENTAL DETAILS

- Supplemental Details -  
**Trash Enclosure**  
 Source Control

NUMBER

**SW-510**



Bureau of Environmental Services



Pollution Control

# IN THE EVENT OF A SPILL

USE Safety Precautions

- Wear protective gear
- Keep vehicles and people out of spill
- Contain materials with the spill kit
  - 1) Seal off drains
  - 2) Berm to contain the spill
  - 3) Clean up with absorbent materials

① Turn off valve located at \_\_\_\_\_  
 (your location, ie: NE corner of parking lot)

② CALL: Supervisor @ 503 XXX-XXXX  
 and Environmental Services  
 Emergency Spill Response  
 @ 503 823-7180

**SAMPLE**



Pollution Control

# IN THE EVENT OF A SPILL

① Turn off valve located at \_\_\_\_\_  
 (your location, ie: NE corner of parking lot)

② CALL: Supervisor @ 503 XXX-XXXX  
 and Environmental Services  
 Emergency Spill Response  
 @ 503 823-7180

USE Safety Precautions

- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>• Wear protective gear</li> <li>• Keep vehicles and people out of spill</li> </ul> | <ul style="list-style-type: none"> <li>• Contain materials with the spill kit           <ol style="list-style-type: none"> <li>1) Seal off drains</li> <li>2) Berm to contain the spill</li> <li>3) Clean up with absorbent materials</li> </ol> </li> </ul> |
|---|--|

**SAMPLE**

- DRAWING NOT TO SCALE -

## STORMWATER MANAGEMENT MANUAL SUPPLEMENTAL DETAILS

- Supplemental Details -

### Spill Control Sign Examples

Source Control

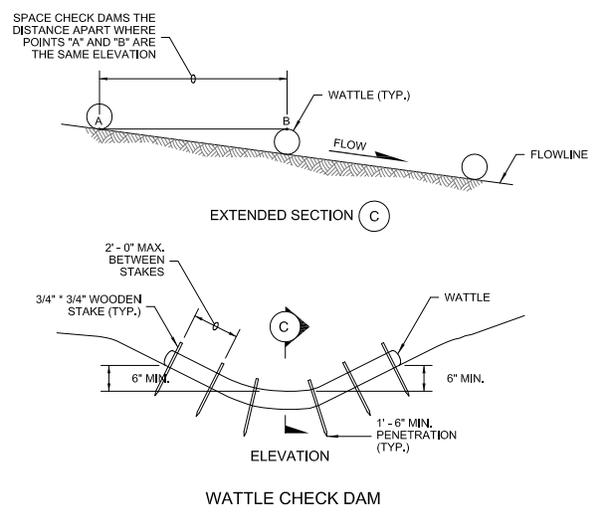
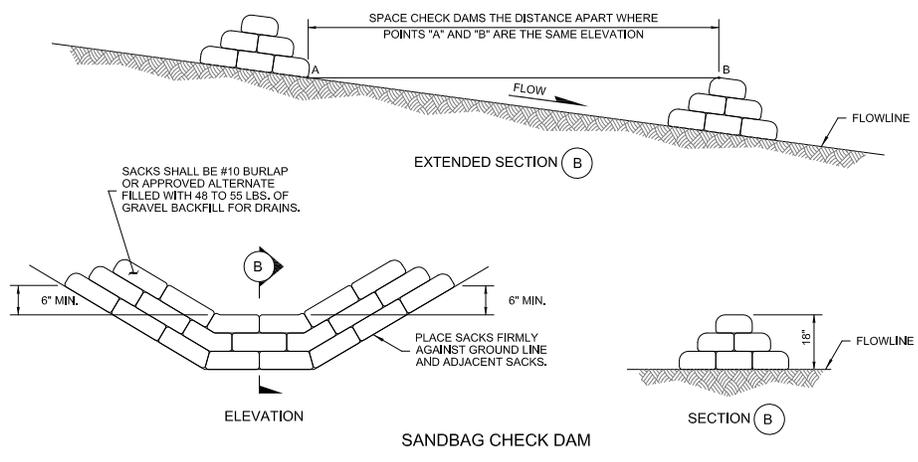
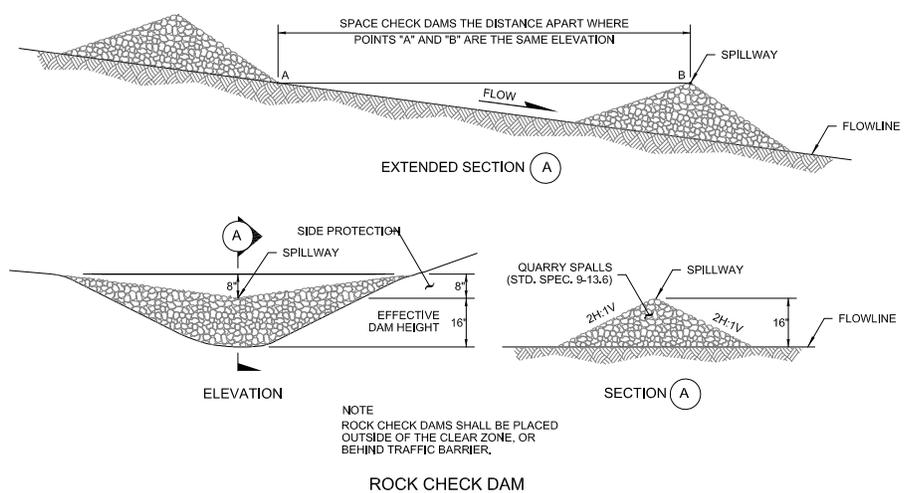
NUMBER

SW-511



Bureau of Environmental Services





- DRAWING NOT TO SCALE -

**STORMWATER MANAGEMENT MANUAL SUPPLEMENTAL DETAILS**

- Supplemental Details -  
**Outfall  
Check Dams**

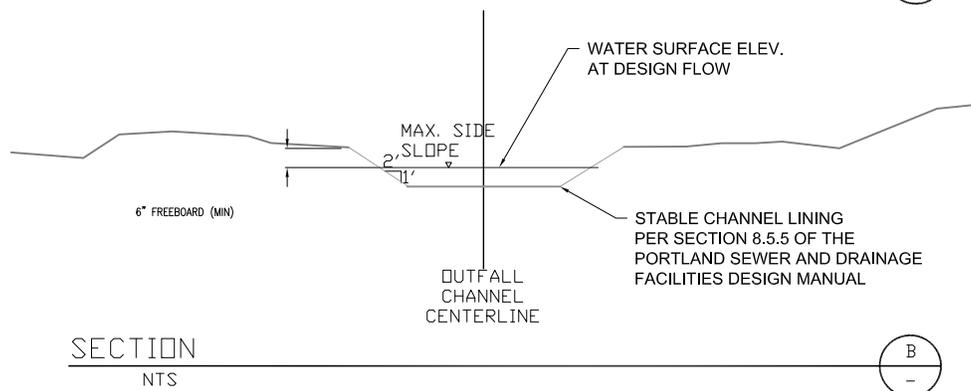
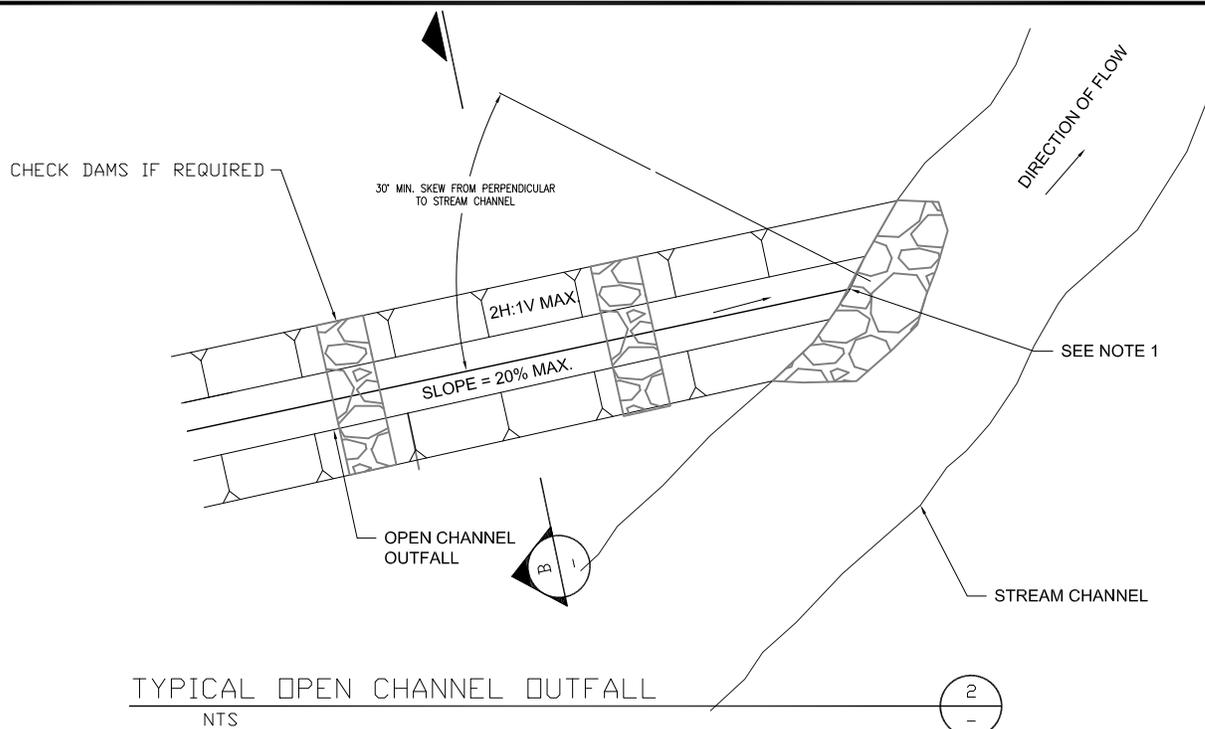
NUMBER

**SW-520**



Bureau of Environmental Services





**NOTES**

1. INVERT ELEVATION OF OPEN CHANNEL OUTFALL AT CONFLUENCE WITH STREAM CHANNEL SHALL BE AT OR NEAR INVERT OF MAIN CHANNEL.
2. OPEN CHANNEL OUTFALLS SHOULD NOT BE CONSTRUCTED IN AREAS WITH UNSTABLE SOILS.
3. MAXIMUM LONGITUDINAL SLOPE FOR OPEN CHANNEL OUTFALL = 20 PERCENT
4. FOR LINING REQUIREMENTS, SEE SECTION 8.5.1 OF THE PORTLAND SEWER AND DRAINAGE FACILITIES DESIGN MANUAL 2006. FLEXIBLE LININGS RECOMMENDED FOR CHANNEL SLOPES > 2 PERCENT.
5. MAXIMUM SIDE SLOPES 2 H: 1 V. SHALLOWER SIDE SLOPES MAY BE REQUIRED DEPENDING ON THE CHANNEL MATERIAL (SEE SECTION 8.5.1 OF THE DESIGN MANUAL)
6. ALL DISTURBED AREAS TO BE REPLANTED WITH NATIVE VEGETATION. SEE SECTION 8.5.6 OF THE PORTLAND SEWER AND DRAINAGE FACILITIES DESIGN MANUAL 2006 AND SECTION 2.7 OF THE STORMWATER MANAGEMENT MANUAL (BES 2004).
7. CHECK DAMS MAY BE PROVIDED AS AN ALTERNATIVE TO LININGS TO MEET VELOCITY RESTRICTIONS OF SECTION 8.5.3 OF THE DESIGN MANUAL (SEE FIGURE 1)
8. 6 TO 12 INCHES OF FREEBOARD ABOVE THE 25-YEAR DESIGN STORM SURFACE WATER ELEVATION REQUIRED.
9. FOR MORE INFORMATION AND DETAILS SEE *CONCEPT DESIGNS AND TECHNICAL GUIDANCE: STORMWATER OUTFALLS* (HERRERA 2007).

- DRAWING NOT TO SCALE -

**STORMWATER MANAGEMENT MANUAL SUPPLEMENTAL DETAILS**

- Supplemental Details -  
**Outfall**  
 Open Channel Outfall

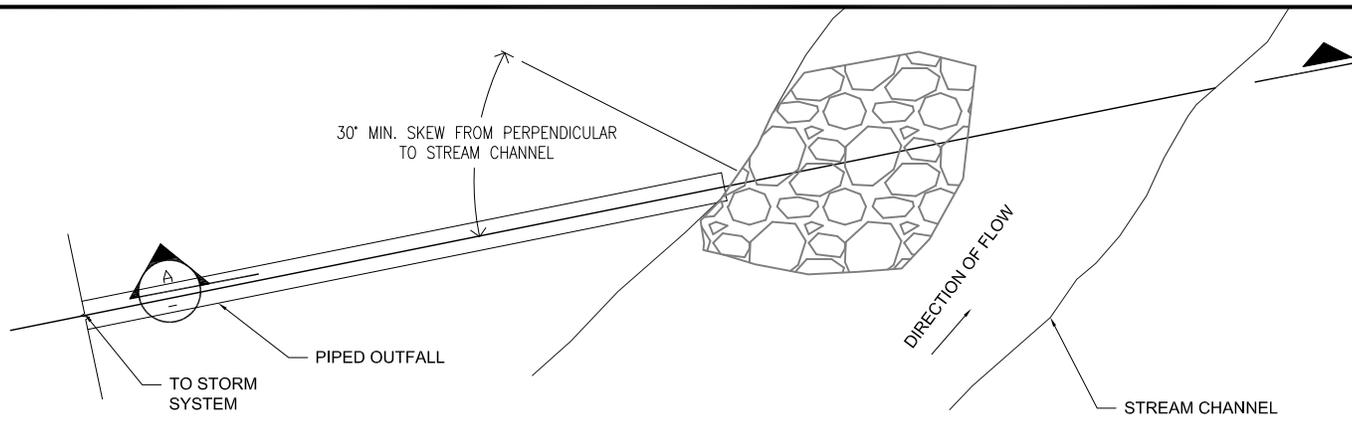
NUMBER

**SW-521**



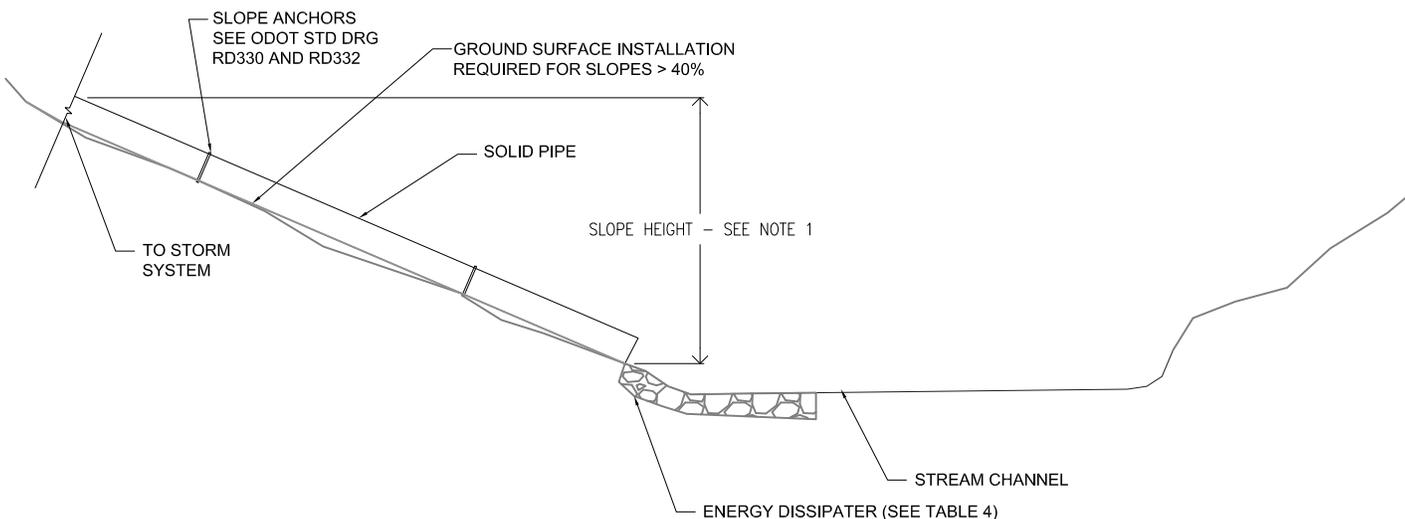
Bureau of Environmental Services





TYPICAL PIPED OUTFALL - TIGHTLINE

1  
-



SECTION

A  
-

Notes:

1. For design guidelines for buried pipe, including materials, minimum cover, and bedding requirements, see Chapter 4 of the Portland Sewer and Drainage Facilities Design Manual 2006.
2. See Part 0400 of the City of Portland Standard Specifications for additional requirements on bedding, backfill and pipe materials.
3. Solid pipe required for slopes higher than 20' with gradient of 15% or greater.
4. Solid pipe may be installed in shallow trench if outfall pipe gradient is between 15 and 40%. ground installation (as shown) recommended for slopes greater than 40%.
5. All disturbed areas to be replanted with native vegetation. See section 8.5.6 of the Portland Sewer and Drainage Facilities Design Manual 2006 and Appendix A.5 of the Stormwater Management Manual.
6. For more information and details see Appendix A.5 of the Stormwater Management Manual.

- DRAWING NOT TO SCALE -

STORMWATER MANAGEMENT MANUAL SUPPLEMENTAL DETAILS

- Supplemental Details -

Outfall  
Piped Outfall

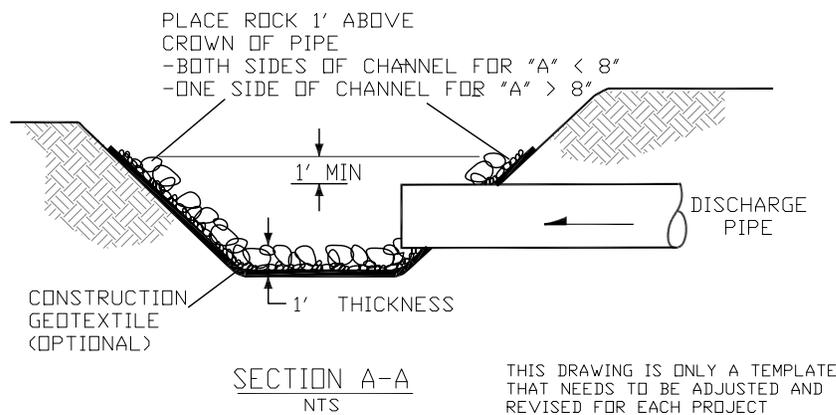
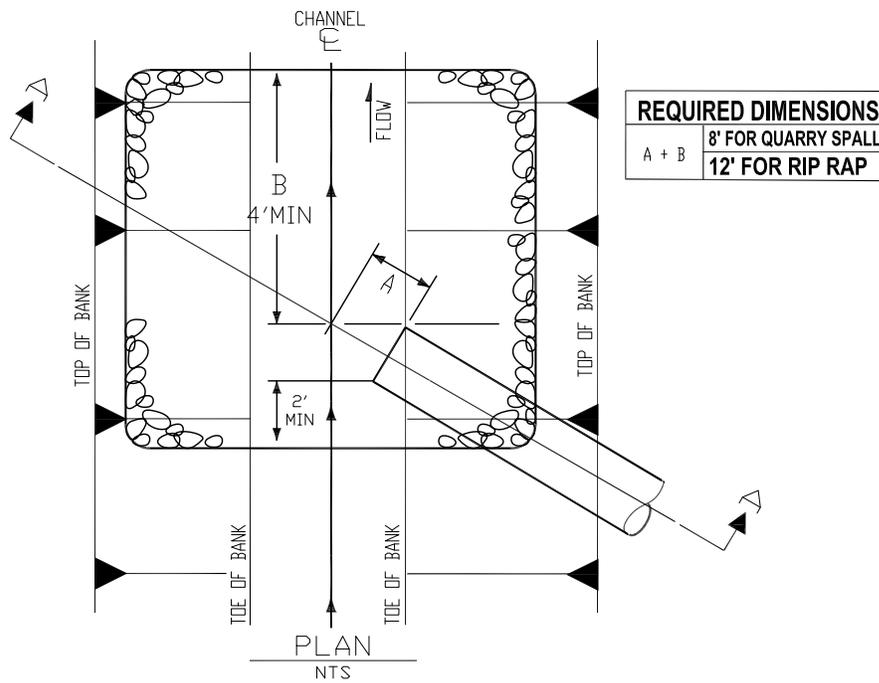
NUMBER

SW-522



Bureau of Environmental Services





PIPE/CULVERT OUTFALL DISCHARGE PROTECTION

**NOTES**

1. SOURCE: WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT) HIGHWAY RUNOFF MANUAL, FIGURE 5.4.3.8.
2. FOR MORE INFORMATION AND DETAILS SEE *CONCEPT DESIGNS AND TECHNICAL GUIDANCE: STORMWATER OUTFALLS* (HERRERA 2007).

- DRAWING NOT TO SCALE -

**STORMWATER MANAGEMENT MANUAL SUPPLEMENTAL DETAILS**

- Supplemental Details -  
**Outfall**  
 Rock Energy Dissipator

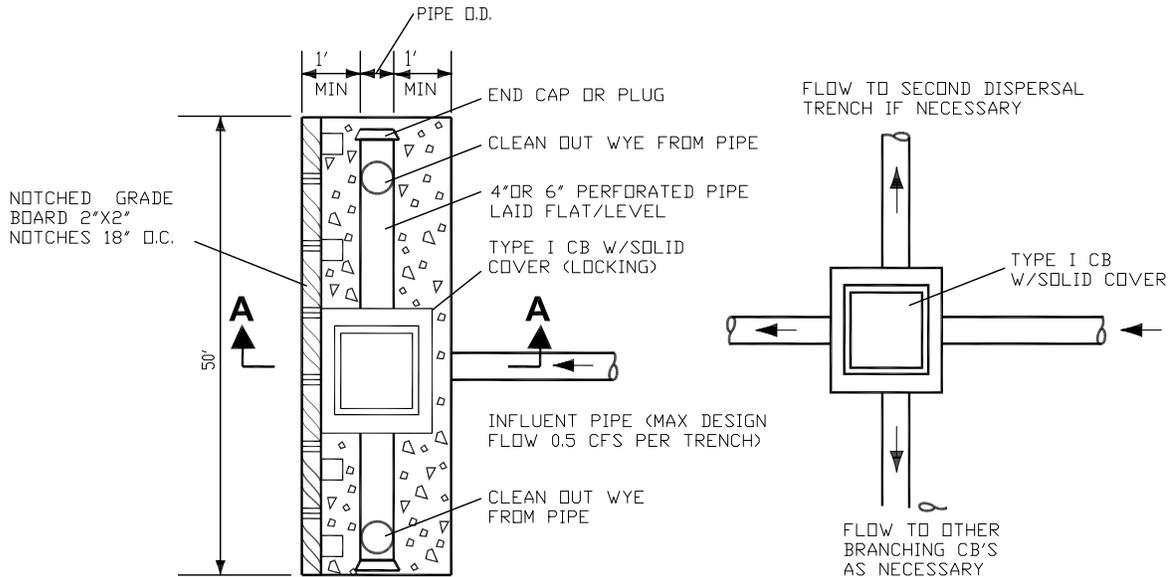
NUMBER

**SW-523**

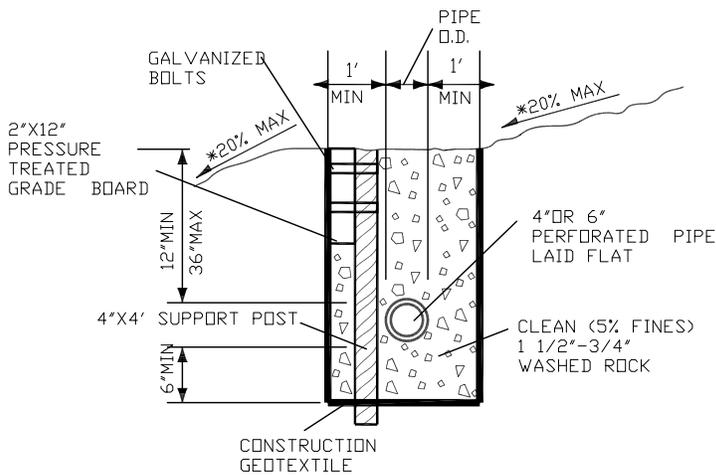


Bureau of Environmental Services



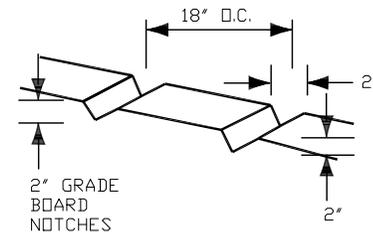


**PLAN  
NTS**



**SECTION A-A  
NTS**

\*15% MAX FOR FLOW CONTROL/WATER QUALITY TREATMENT IN RURAL AREAS.



**NOTES:**

1. THIS TRENCH SHALL BE CONSTRUCTED SO AS TO PREVENT POINT DISCHARGE AND/OR EROSION.
2. TRENCHES MAY BE PLACED NO CLOSER THAN 50 FEET TO ONE ANOTHER. (100 FEET ALONG FLOWLINE)
3. TRENCH AND GRADE BOARD MUST BE LEVEL. ALIGN TO FOLLOW CONTOURS OF SITE.
4. SUPPORT POST SPACING AS REQUIRED BY SOIL CONDITIONS TO ENSURE GRADE BOARD REMAINS LEVEL.

**FLOW DISPERSAL TRENCH**

**NOTES**

1. SOURCE: WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT) HIGHWAY RUNOFF MANUAL, FIGURE 5.4.3.9.
2. FOR MORE INFORMATION AND DETAILS SEE *CONCEPT DESIGNS AND TECHNICAL GUIDANCE: STORMWATER OUTFALLS* (HERRERA 2007).

THIS DRAWING IS ONLY A TEMPLATE THAT NEEDS TO BE ADJUSTED AND REVISED FOR EACH PROJECT

- DRAWING NOT TO SCALE -

**STORMWATER MANAGEMENT MANUAL SUPPLEMENTAL DETAILS**

- Supplemental Details -

**Outfall**  
Upland Dispersion

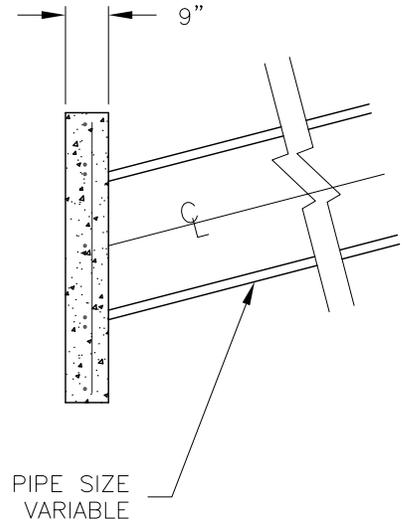
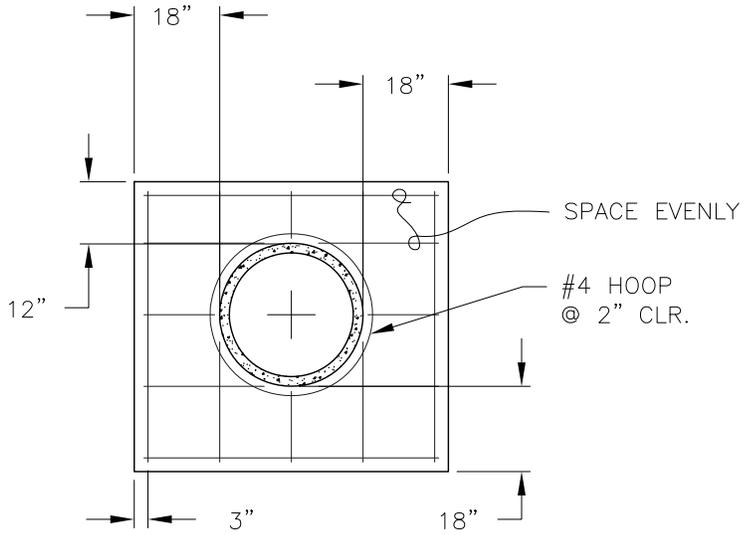
NUMBER

**SW-524**



Bureau of Environmental Services





NOTES:

1. CONCRETE TO BE 3000psi (28 DAYS ULTIMATE STRENGTH, SLUMP OF 2" TO 5" AND 1 1/2" MINUS AGGREGATE).
2. ALL REINFORCING STEEL  $f_y = 60,000\text{psi}$ .
3. FILL AROUND ENDWALLS TO 6" BELOW TOP OF WALL.
4. BASE OF OUTFALL SHALL BE POURED AGAINST UNDISTURBED SOIL.

- DRAWING NOT TO SCALE -

**STORMWATER MANAGEMENT MANUAL SUPPLEMENTAL DETAILS**

- Supplemental Details -

**Outfall  
End Wall**

NUMBER

**SW-525**



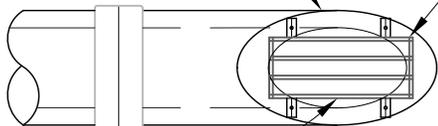
Bureau of Environmental Services



APPLICATION FOR  
18" OR LARGER PIPE.

DEPENDING ON PIPE SIZE,  
APPLY ENOUGH BARS TO  
COVER OPENING IN BEVELED  
END OF PIPE MAINTAINING  
4" O.C. MAX. SPACING.

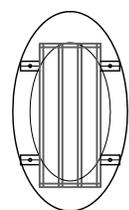
NOTE:  
REFERENCE EXHIBIT 2-22  
FOR GRATES APPLICABLE TO  
OUTFALLS GREATER THAN 24".



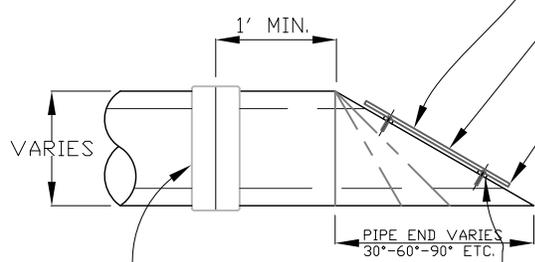
3/4" DIA. SMOOTH BARS  
WITH ENDS WELDED TO  
BAR-FRAME.

3/4" DIA. BAR-FRAME

BUILD FRAME TO COVER  
TOP AND BOTTOM EDGES  
OF INSIDE DIA. OF PIPE  
AS SHOWN ABOVE.

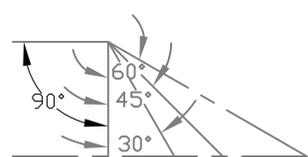


4" O.C.  
MAX. BAR  
SPACING



PIPE COUPLING

2" WIDE ANCHOR STRIPS WELDED  
TO 3/4" DIA. BAR-FRAME AT 4  
PLACES SPACED UNIFORMLY.  
FASTEN WITH 1/2"  
NON-CORROSIVE BOLTS AND  
NUTS.



END ANGLE VARIABLE

- DRAWING NOT TO SCALE -

**STORMWATER MANAGEMENT MANUAL SUPPLEMENTAL DETAILS**

- Supplemental Details -  
**Outfall**  
Grated Protection

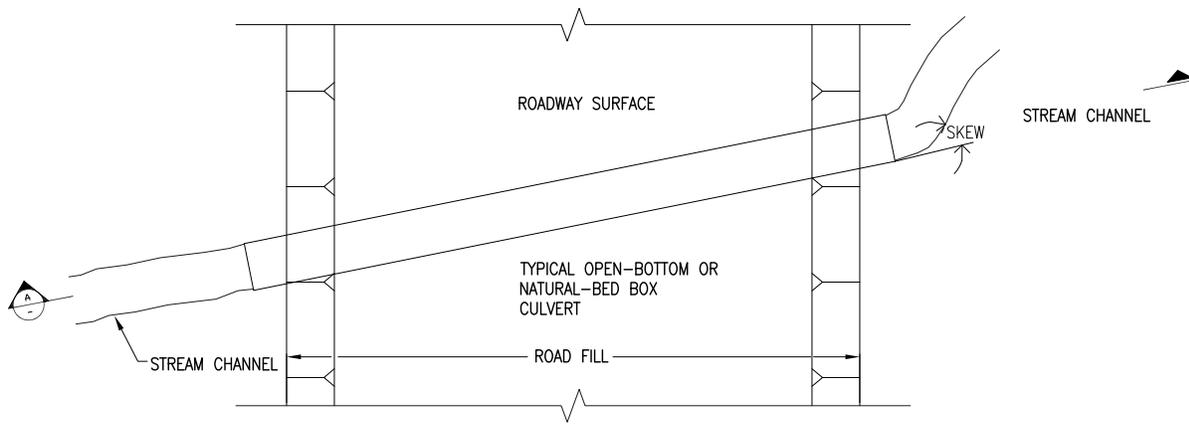
NUMBER

**SW-526**

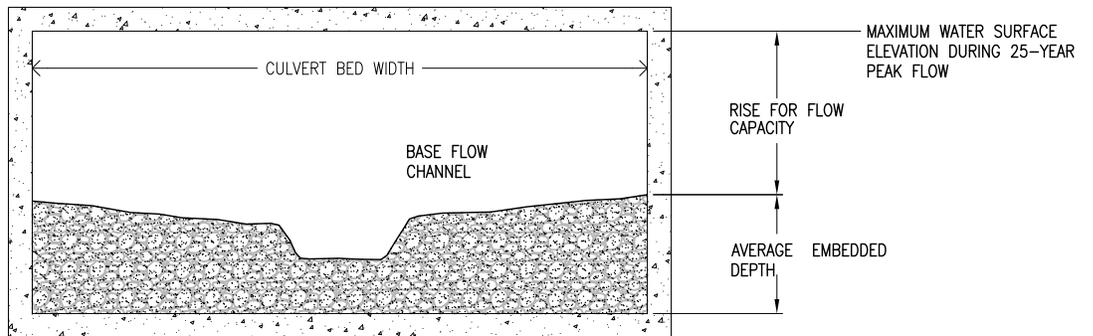


Bureau of Environmental Services

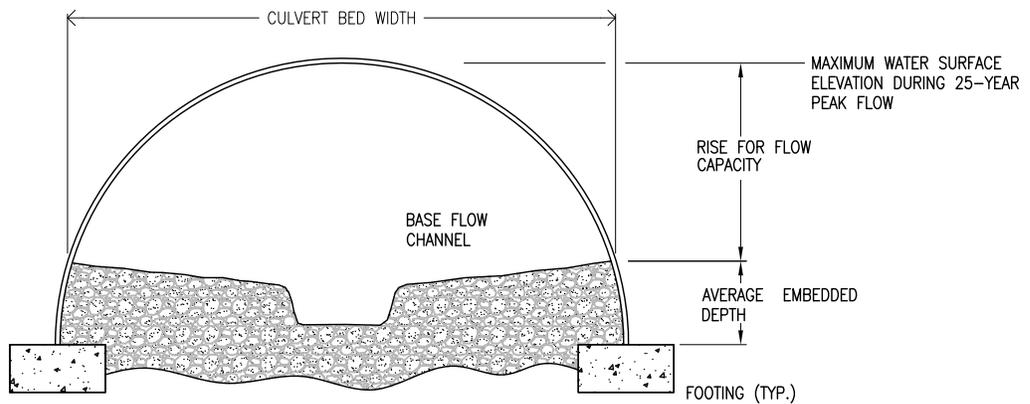




**TYPICAL OPEN-BOTTOM OR NATURAL-BED BOX CULVERT**



**TYPICAL NATURAL-BED BOX CULVERT**



**TYPICAL OPEN-BOTTOM METAL ARCH CULVERT**

- DRAWING NOT TO SCALE -

**STORMWATER MANAGEMENT MANUAL SUPPLEMENTAL DETAILS**

- Supplemental Details -  
**Culvert**  
 Alignment & Profile

NUMBER

**SW-530**



Bureau of Environmental Services

