Surface Water Standard Details Index

200.00 – Catch Basin Type 1

200.10 – Catch Basin Type 1L

200.20 – Catch Basin Type 1P (For Parking Lot)

200.30 – Concrete Inlet

200.40 – Conversion Riser

201.00 – Catch Basin Type 2

202.00 – Catch Basin Installation

203.00 – Open Curb Face Frame and Grate Installation Detail

204.00 – Rectangular Frame

204.10 – Rectangular Solid Metal Cover

204.20 – Rectangular Vaned Grate

204.30 – Rectangular Bi-Directional Vaned Grate

204.40 – Rectangular Herringbone Grate

204.50 – Storm Round Frame and Cover

204.60 – Miscellaneous Details for Drainage Structures

205.00 – Drop Inlet Type 1

205.10 – Drop Inlet Type 2

205.20 – Grates for Drop Inlet

210.00 – Downspout Storm Drain, Under Sidewalk

211.00 – Sediment Trap

212.00 – Stake and Wire Fence

213.00 – Surface Roughing

213.10 – Waterway Installations

213.20 – Slope Installations

213.30 – Plastic Covering

213.40 – Straw Wattles

214.00 – Silt Fence

214.10 – Silt Fence Installation by Slicing

215.00 – Wheel Wash and Paved Construction Entrance

215.10 – Stabilized Construction Entrance

216.00 – Sediment Pond Plan View and Cross Section

216.10 – Sediment Pond Riser Detail

216.20 – Filter Fabric Protection

216.30 – Catch Basin Filter

216.40 – Block and Gravel Curb Inlet Protection

216.50 – Curb and Gutter Barrier Protection

217.00 – Interceptor Dike

217.10 – Interceptor Swale

217.30 – Pipe Slope Drain

217.40 – Check Dams Spacing and Cross Sections

217.50 – Level Spreader Detail and Cross Section

218.00 – Sample Small Site Erosion Control Plan

220.00 – Pipe Compaction Design and Backfill

221.00 – Beveled End Sections

221.10 – Flared End Sections

Surface Water Standard Details Index

221.20 – Details for Coupling Bands for Corrugated Metal Pipes

221.30 – Strap Pipe Anchor Detail

221.40 – Coupling Bands for Corrugated Metal Pipes Type D

221.50 – Type F Coupling Bands for Corrugated Metal Pipes

222.00 – Headwalls for Culvert Pipe and Underpass

222.10 – Type 1 Safety Bars for Stepped Culvert Pipe or Pipe Arch

222.20 – Type 2 Safety Bars for Culvert or Pipe Arch (On Cross Roads)

223.00 – Debris Barrier

223.10 – Debris Barrier for Concrete Pipe

224.00 – 50 Foot dispersion Trench with Notched Board

225.00 – Typical Roof Drain Collection Storm System Civil Plans

225.10 – Typical Private Roof Drain Collection System Cross Section

225.20 – Single Family Roof Downspout Infiltration Trench

234.00 – Typical Detention Pond

234.10 – Typical Detention Pond Sections

234.20 – Overflow Structure

235.00 – Typical Detention Tank

235.10 – Detention Tank Access Detail

236.00 – Typical Detention Vault

237.00 – Flow Restrictor Oil Pollution Control Tee

237.10 – Flow Restrictor Oil Pollution Control Baffle

237.20 – Flow Restrictor Oil Pollution Control Weir

237.30 – Frop-T-Shear Gate Detail

238.00 – Typical Infiltration Pond

238.10 – Typical Infiltration Tank

240.00 – Baffle Oil / Water Separator

240.10 – Coalescing Plate Oil / Water Separator

241.00 – Flow Splitter – Option A

241.10 – Flow Splitter – Option B

242.00 – Flow Spreader – Option A Anchored Plate

242.10 – Flow Spreader – Option B Concrete Sump Box

243.00 – Biofiltration Swale Schematic, Cross section and Underdrain Detail

248.00 – Stormfilter Schematic

249.00 – Typical Wetpond

249.10 – Typical Wetpond Sections

249.20 – Wetvault

249.30 – Stormwater Wetland Option A

252.00 – Combined Detention and Wetpond

252.10 – Combined Detention and Wetpond – Sections

Surface Water Standard Details Index

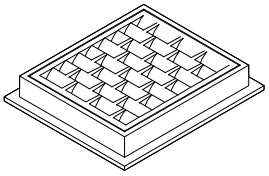
253.00 – Combined Detention and Stormwater Wetland Sections

254.00 – Combined Detention and Wetvault

260.00 – Typical Rain Garden

260.10 – Typical Rain Garden with Containment Berm

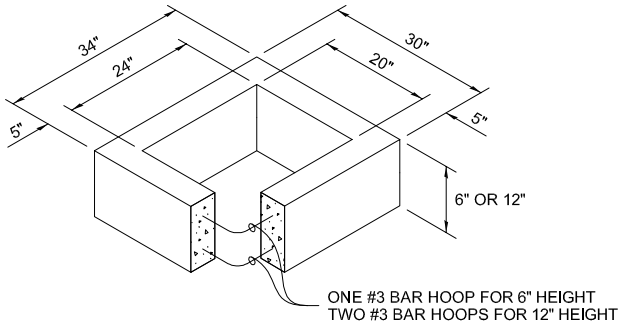
DRAWN BY: MARK SUJKA



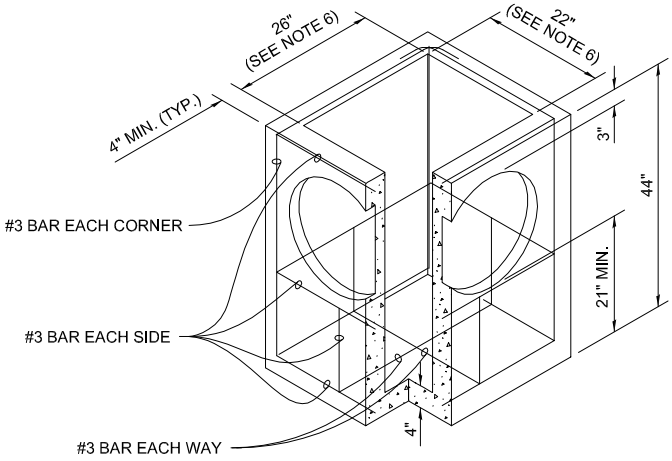
FRAME AND VANED GRATE

PIPE ALLOWANCES	
PIPE MATERIAL	**MAXIMUM INSIDE DIAMETER**
REINFORCED OR PLAIN CONCRETE	12"
ALL METAL PIPE	15"
CPSSP* (STD. SPEC. 9-05.20)	12"
SOLID WALL PVC (STD. SPEC. 9-05.12(1))	15"
PROFILE WALL PVC (STD. SPEC. 9-05.12(2))	15"

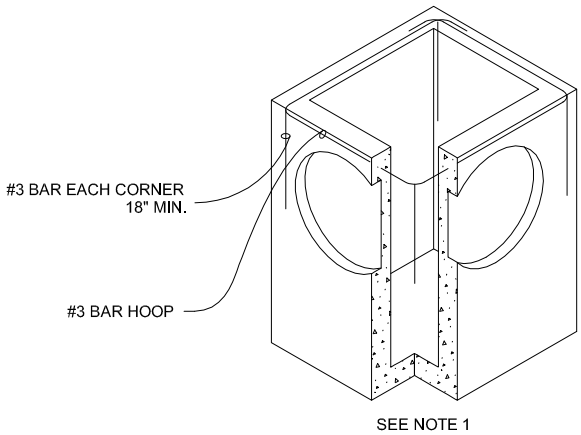
* CORRUGATED POLYETHYLENE STORM SEWER PIPE



RECTANGULAR ADJUSTMENT SECTION



PRECAST BASE SECTION



ALTERNATIVE PRECAST BASE SECTION

NOTES

1. As acceptable alternatives to the rebar shown in the **PRECAST BASE SECTION**, fibers (placed according to the Standard Specifications), or wire mesh having a minimum area of 0.12 square inches per foot shall be used with the minimum required rebar shown in the **ALTERNATIVE PRECAST BASE SECTION**. Wire mesh shall not be placed in the knockouts.
2. The knockout diameter shall not be greater than 20". Knockouts shall have a wall thickness of 2" minimum to 2.5" maximum. Provide a 1.5" minimum gap between the knockout wall and the outside of the pipe. After the pipe is installed, fill the gap with joint mortar in accordance with Standard Specification 9-04.3.
3. The maximum depth from the finished grade to the lowest pipe invert shall be 5'.
4. The frame and grate must be installed with the flange down.
5. The Precast Base Section may have a rounded floor, and the walls may be sloped at a rate of 1:24 or steeper.
6. The opening shall be measured at the top of the precast base section.
7. All pickup holes shall be grouted full after the basin has been placed.
8. All grade rings and castings shall be set in mortar in accordance with Standard Specification 9-04.3.

CITY OF RENTON

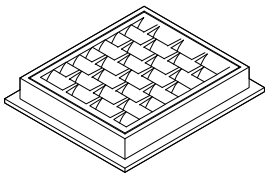
PUBLIC WORKS DEPARTMENT

CATCH BASIN TYPE 1

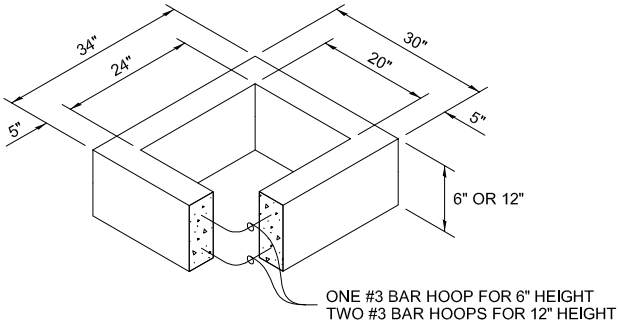
STD. PLAN – 200.00

MARCH 2008

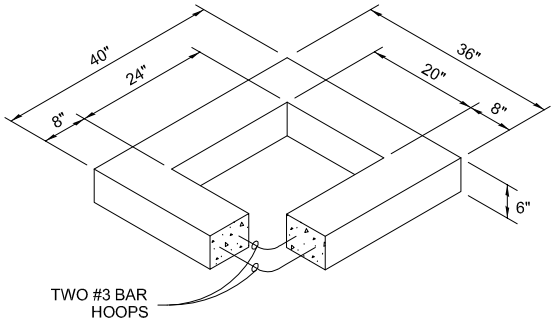
DRAWN BY: MARK SUJKA



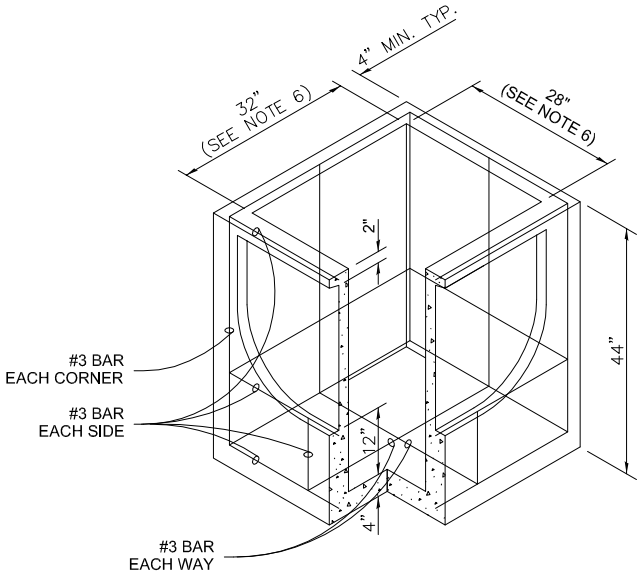
FRAME AND VANED GRATE



RECTANGULAR ADJUSTMENT SECTION



REDUCING SECTION



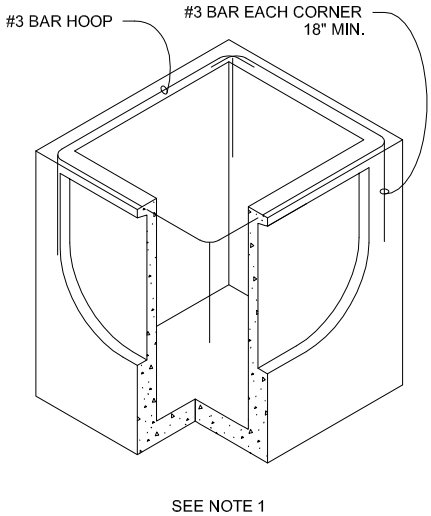
PRECAST BASE SECTION

PIPE ALLOWANCES	
PIPE MATERIAL	**MAXIMUM INSIDE DIAMETER**
REINFORCED OR PLAIN CONCRETE	18"
ALL METAL PIPE	21"
CPSSP* (STD. SPEC. 9-05.20)	18"
SOLID WALL PVC (STD. SPEC. 9-05.12(1))	21"
PROFILE WALL PVC (STD. SPEC. 9-05.12(2))	21"

* CORRUGATED POLYETHYLENE STORM SEWER PIPE

NOTES

1. As acceptable alternatives to the rebar shown in the **PRECAST BASE SECTION**, fibers (placed according to the Standard Specifications), or wire mesh having a minimum area of 0.12 square inches per foot shall be used with the minimum required rebar shown in the **ALTERNATIVE PRECAST BASE SECTION**. Wire mesh shall not be placed in the knockouts.
2. The knockout diameter shall not be greater than 26". Knockouts shall have a wall thickness of 2" minimum to 2.5" maximum. Provide a 1.5" minimum gap between the knockout wall and the outside of the pipe. After the pipe is installed, fill the gap with joint mortar in accordance with Standard Specification 9-04.3.
3. The maximum depth from the finished grade to the lowest pipe invert shall be 5'.
4. The frame and grate must be installed with the flange down.
5. The Precast Base Section may have a rounded floor, and the walls may be sloped at a rate of 1:24 or steeper.
6. The opening shall be measured at the top of the precast base section.
7. All pickup holes shall be grouted full after the basin has been placed.
8. All grade rings and castings shall be set in mortar in accordance with Standard Specification 9-04.3.

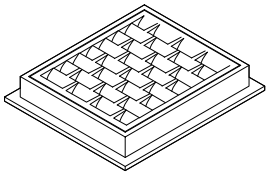


SEE NOTE 1

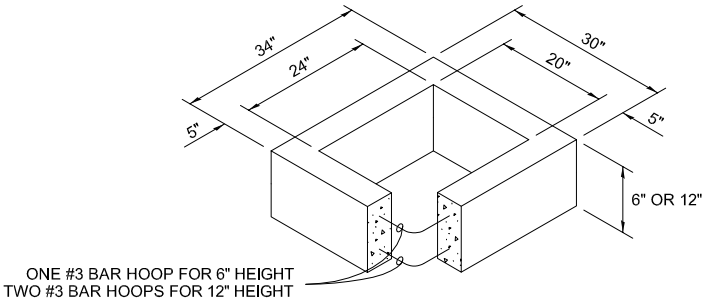
ALTERNATIVE PRECAST BASE SECTION

CITY OF RENTON	PUBLIC WORKS DEPARTMENT	**CATCH BASIN TYPE 1L**	**STD. PLAN – 200.10** MARCH 2008

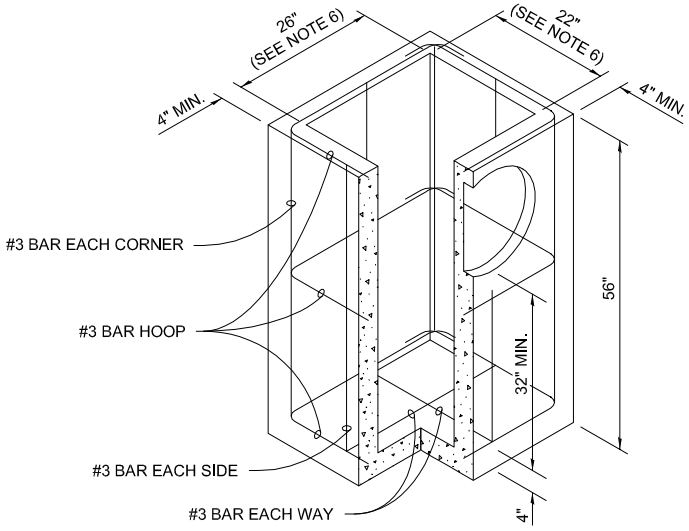
DRAWN BY: MARK SUJKA



FRAME AND VANED GRATE



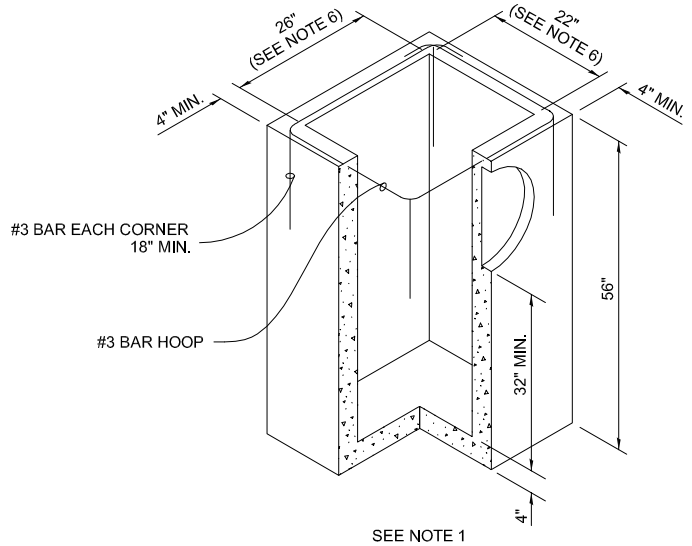
RECTANGULAR ADJUSTMENT SECTION



PRECAST BASE SECTION

NOTES

1. As acceptable alternatives to the rebar shown in the **PRECAST BASE SECTION**, fibers (placed according to the Standard Specifications), or wire mesh having a minimum area of 0.12 square inches per foot shall be used with the minimum required rebar shown in the **ALTERNATIVE PRECAST BASE SECTION**. Wire mesh shall not be placed in the knockouts.
2. The knockout diameter shall not be greater than 18". Knockouts shall have a wall thickness of 2" minimum to 2.5" maximum. Provide a 1.5" minimum gap between the knockout wall and the outside of the pipe. After the pipe is installed, fill the gap with joint mortar in accordance with Standard Specification 9-04.3.
3. The maximum depth from the finished grade to the lowest pipe invert shall be 5'.
4. The frame and grate must be installed with the flange down.
5. The Precast Base Section may have a rounded floor, and the walls may be sloped at a rate of 1:24 or steeper.
6. The opening shall be measured at the top of the precast base section.
7. All pickup holes shall be grouted full after the basin has been placed.
8. All grade rings and castings shall be set in mortar in accordance with Standard Specification 9-04.3.



ALTERNATIVE PRECAST BASE SECTION

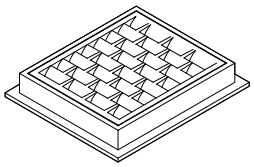
PUBLIC WORKS DEPARTMENT

CATCH BASIN TYPE 1P (FOR PARKING LOT)

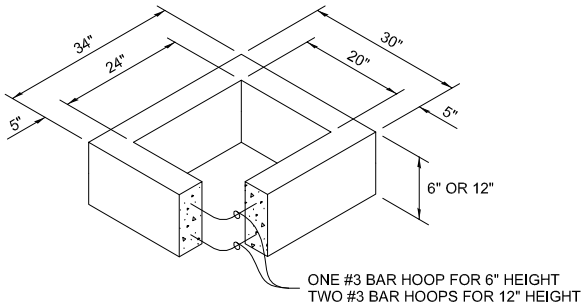
STD. PLAN – 200.20

MARCH 2008

DRAWN BY: MARK SUJKA



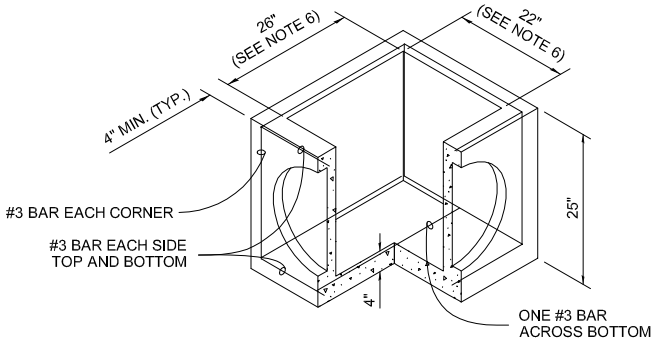
FRAME AND VANED GRATE



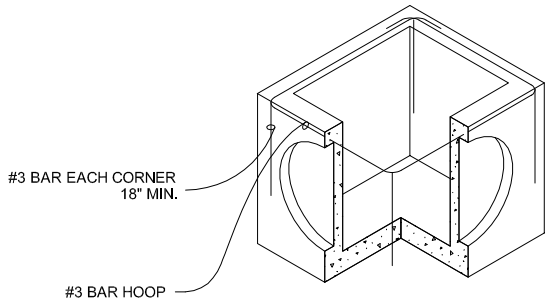
RECTANGULAR ADJUSTMENT SECTION

PIPE ALLOWANCES	
PIPE MATERIAL	**MAXIMUM INSIDE DIAMETER**
REINFORCED OR PLAIN CONCRETE	12"
ALL METAL PIPE	15"
CPSSP* (STD. SPEC. 9-05.20)	12"
SOLID WALL PVC (STD. SPEC. 9-05.12(1))	15"
PROFILE WALL PVC (STD. SPEC. 9-05.12(2))	15"

* CORRUGATED POLYETHYLENE STORM SEWER PIPE



PRECAST BASE SECTION



ALTERNATIVE PRECAST BASE SECTION

NOTES

1. As acceptable alternatives to the rebar shown in the **PRECAST BASE SECTION**, fibers (placed according to the Standard Specifications), or wire mesh having a minimum area of 0.12 square inches per foot shall be used with the minimum required rebar shown in the **ALTERNATIVE PRECAST BASE SECTION**. Wire mesh shall not be placed in the knockouts.
2. The knockout diameter shall not be greater than 18". Knockouts shall have a wall thickness of 2" minimum to 2.5" maximum. Provide a 1.5" minimum gap between the knockout wall and the outside of the pipe. After the pipe is installed, fill the gap with joint mortar in accordance with Standard Specification 9-04.3.
3. The maximum depth from the finished grade to the lowest pipe invert shall be 5'.
4. The frame and grate may be installed with the flange up or down. The frame may be cast into the adjustment section.
5. The Precast Base Section may have a rounded floor, and the walls may be sloped at a rate of 1:24 or steeper.
6. The opening shall be measured at the top of the precast base section.
7. All pickup holes shall be grouted full after the inlet has been placed.

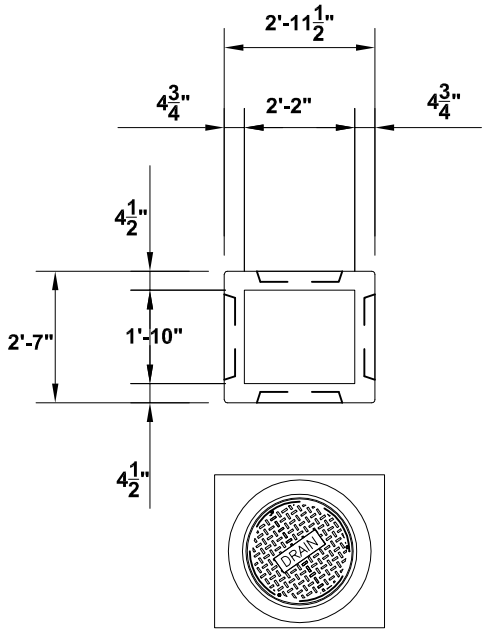
CITY OF RENTON

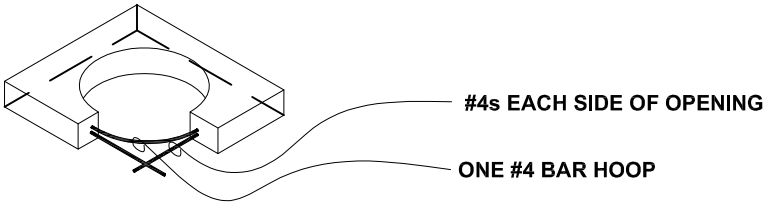
PUBLIC WORKS DEPARTMENT

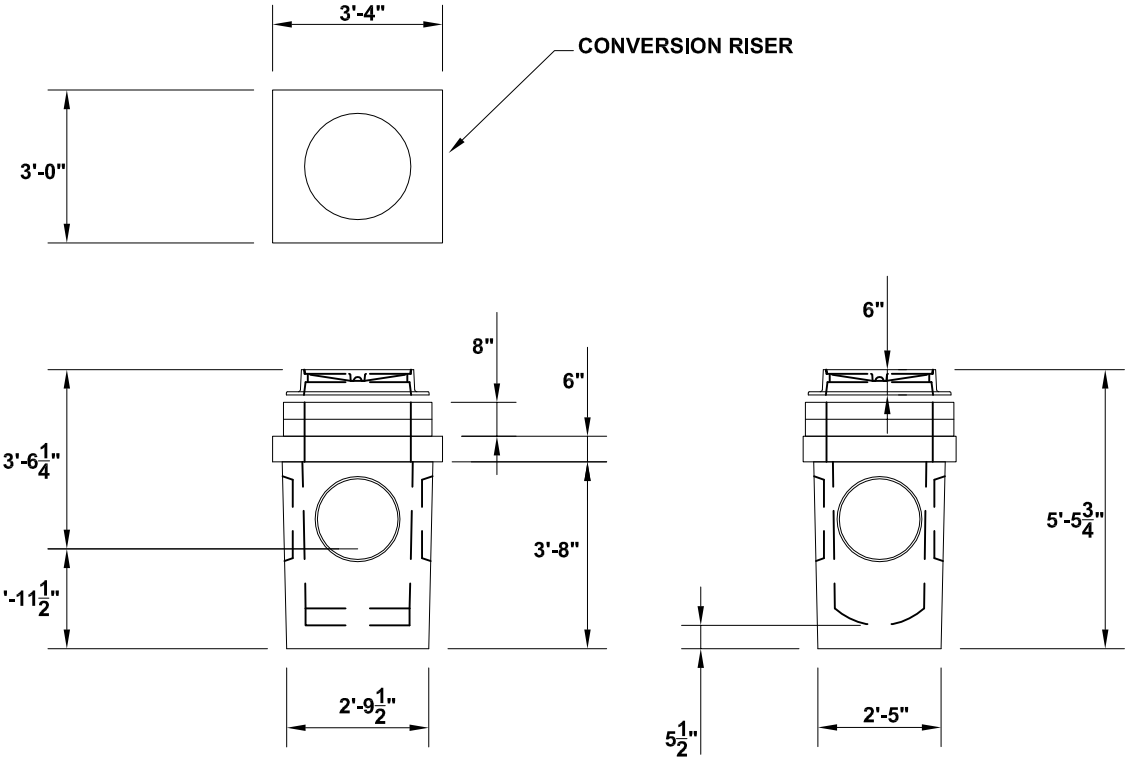
CONCRETE INLET

STD. PLAN – 200.30

MARCH 2008



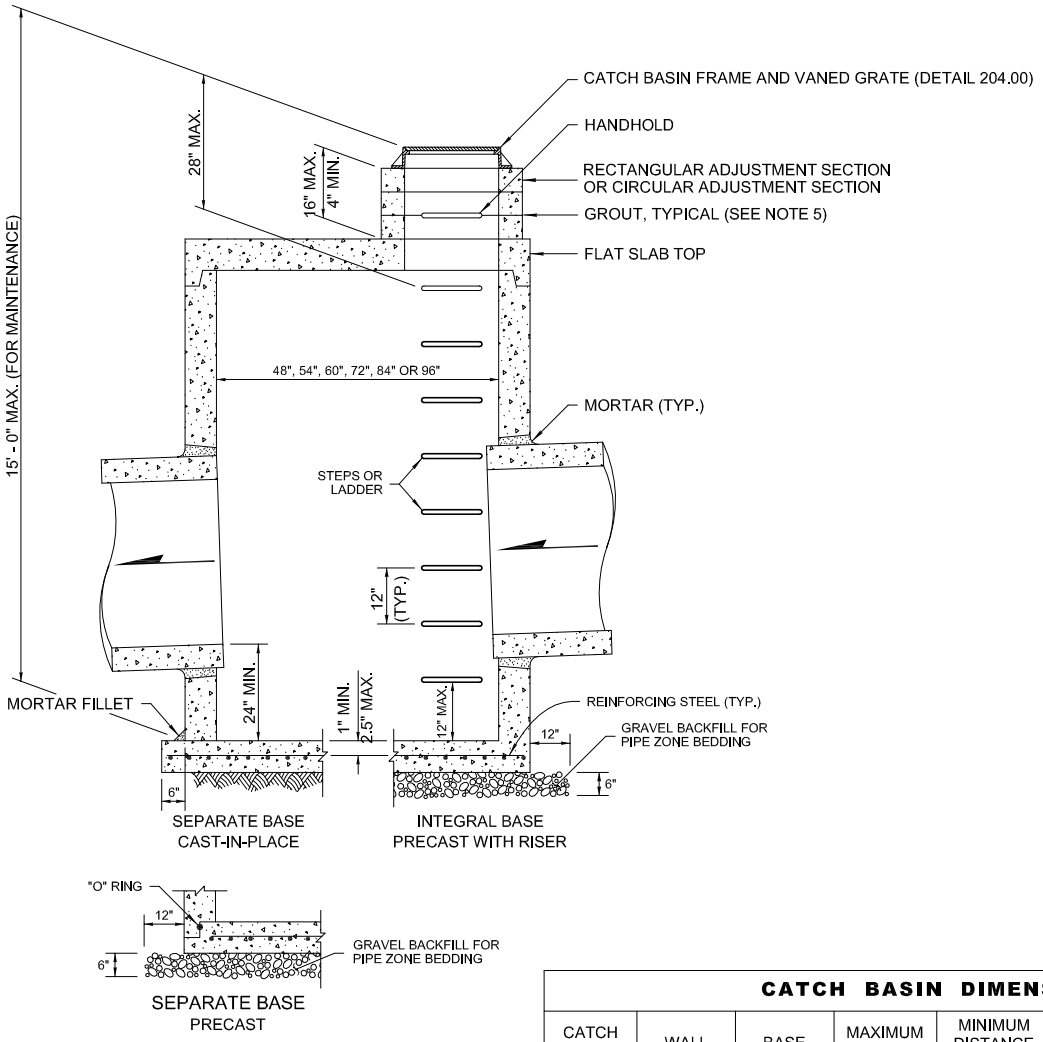




DEPTH: 3.52' TO IE OUT

CITY OF RENTON PUBLIC WORKS DEPARTMENT	**CONVERSION RISER**	STD. PLAN – 200.40 MARCH 2008

DRAWN BY: ADAM COCHRAN



CATCH BASIN DIMENSIONS						
CATCH BASIN DIAMETER	WALL THICKNESS	BASE THICKNESS	MAXIMUM KNOCKOUT SIZE	MINIMUM DISTANCE BETWEEN KNOCKOUTS	BASE REINFORCING STEEL in^2/ft. IN EACH DIRECTION	
					SEPARATE BASE	INTEGRAL BASE
48"	4"	6"	36"	8"	0.23	0.15
54"	4.5"	8"	42"	8"	0.19	0.19
60"	5"	8"	48"	8"	0.25	0.25
72"	6"	8"	60"	12"	0.35	0.24
84"	8"	12"	72"	12"	0.39	0.29
96"	8"	12"	84"	12"	0.39	0.29

NOTES

1. No steps are required when height is 4' or less.
2. The bottom of the precast catch basin may be sloped to facilitate cleaning.
3. The rectangular frame and grate must be installed with the flange down. The frame may be cast into the adjustment section.
4. Knockouts shall have a wall thickness of 2" minimum to 2.5" maximum. Provide a 1.5" minimum gap between the knockout wall and the outside of the pipe. After the pipe is installed, fill the gap with joint mortar in accordance with Standard Specification 9-04.3.
5. All grade rings, risers, and castings shall be set in mortar in accordance with Standard Specification 9-04.3.

PIPE ALLOWANCES					
CATCH BASIN DIAMETER	PIPE MATERIAL WITH MAXIMUM INSIDE DIAMETER				
	CONCRETE	ALL METAL	CPSSP ①	SOLID WALL PVC ②	PROFILE WALL PVC ③
48"	24"	30"	24"	27"	30"
54"	30"	36"	30"	27"	36"
60"	36"	42"	36"	36"	42"
72"	42"	54"	42"	36"	48"
84"	54"	60"	54"	36"	48"
96"	60"	72"	60"	36"	48"

① Corrugated Polyethylene Storm Sewer Pipe (Std. Spec. 9-05.20)
② (Std. Spec. 9-05.12(1))
③ (Std. Spec. 9-05.12(2))

CITY OF RENTON

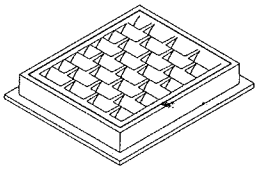
PUBLIC WORKS DEPARTMENT

CATCH BASIN TYPE 2

STD. PLAN – 201.00

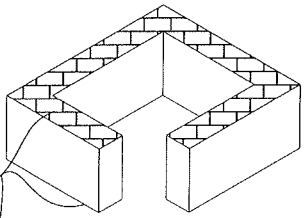
MARCH 2008

DRAWN BY: MARK SUJKA



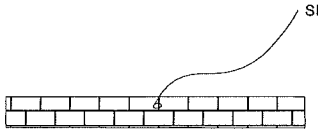
FRAME AND VANED GRATE

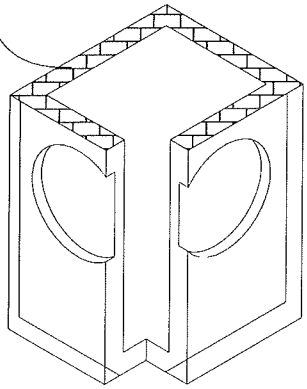
CLEAN SURFACE AND BOTTOM AREA. PROVIDE UNIFORM CONTACT. THE SURFACE AREA OF THE BASE SECTION MUST BE GROUTED TO THE BOTTOM AREA OF THE ADJUSTMENT SECTION.



ADJUSTMENT SECTION

SEE NOTE 4





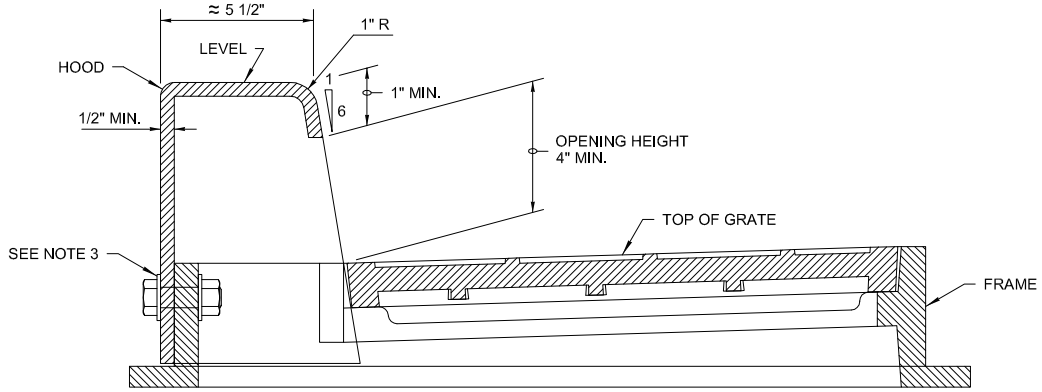
BASE SECTION

NOTES

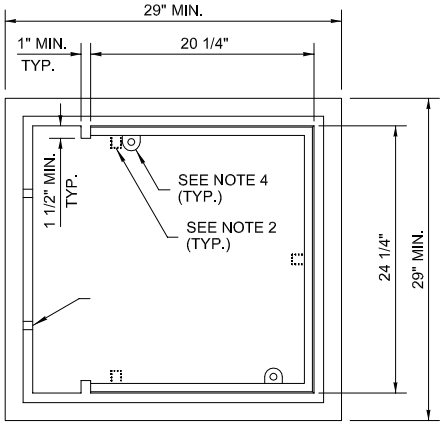
1. THE COVER OR GRATING OF A CATCH BASIN SHALL NOT BE GROUTED TO FINAL GRADE UNTIL THE FINAL ELEVATION OF THE PAVEMENT, GUTTER, DITCH, OR SIDEWALK IN WHICH IT IS TO BE PLACED HAS BEEN ESTABLISHED, AND UNTIL PERMISSION THEREAFTER IS GIVEN BY THE ENGINEER TO GROUT IN PLACE IN ACCORDANCE WITH APWA STANDARD SPECIFICATION 7-05.3.
2. SHIMS SHALL NOT BE USED TO SET FRAME TO GRADE. THE USE OF SHIMS IS PROHIBITED.
3. A CONTINUOUS LAYER OF MORTAR SHALL BE PLACED BETWEEN ADJUSTMENT RINGS AND BRICKS PRIOR TO PLACEMENT.
4. THE USE OF BRICKS IS PERMITTED WHERE THE BRICKS ARE STAGGERED TO CREATE A RUNNING BOND OR ½ BOND.
5. ADJUSTMENT SECTION SHALL BE GROUTED WATERTIGHT TO THE BOTTOM AREA OF THE ADJUSTMENT SECTION WITH NONSHRINK GROUT
6. GROUTING BETWEEN ADJUSTMENT SECTION SHALL BE WATER TIGHT.
7. GROUT IS TO BE NON-SHRINK TYPE GROUT MEETING THE REQUIREMENTS OF ASTM 157 PER APWA STANDARD SPECIFICATION 9-20.3 FOR MAXIMUM PERCENT DRY SHRINKAGE. THE MINIMUM COMPRESSIVE STRENGTH SHALL BE 4,000 PSI AT 7 DAY PER APWA STANDARD SPECIFICATION 9-20.3
8. PICK / LIFTING HOLES ARE TO BE GROUTED WATER TIGHT.

PUBLIC WORKS DEPARTMENT	**CATCH BASIN INSTALLATION**	STD. PLAN – 202.00
		MARCH 2008

DRAWN BY: MARK SUJKA

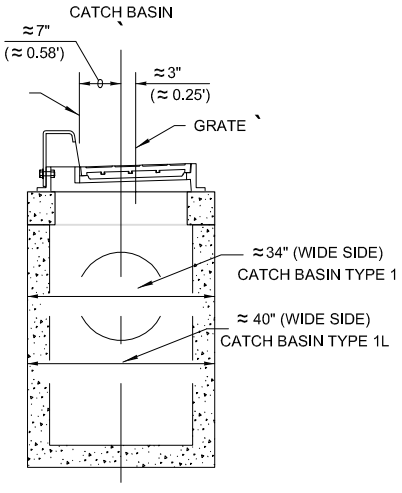


DETAIL SECTION (A)

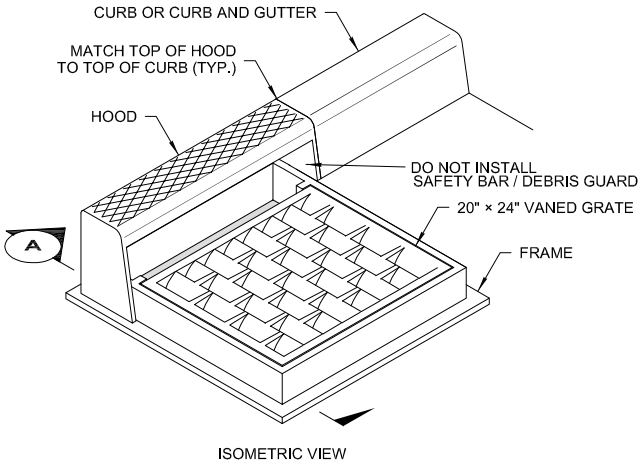


TOP VIEW

FRAME DETAIL



SECTION (A)



ISOMETRIC VIEW

NOTES

1. The asymmetry of the Combination Inlet shall be considered when calculating the offset distance for the catch basin. See **SECTION A**.
2. The dimensions of the Frame and Hood may vary slightly among different manufacturers. The Frame may have cast features intended to support a grate guard. Hood units shall mount outside of the Frame. The methods for fastening the Safety Bar / Debris Guard Rod to the Hood may vary. The Hood may include casting lugs. The top of the Hood may be cast with a pattern.
3. Attach the Hood to the frame with two 3/4" × 2" hex head bolts, nuts, and oversize washers. The washers shall have diameters adequate to assure full bearing across the slots.
4. When bolt-down grates are specified in the contract, provide two holes in the frame that are vertically aligned with the grate slots. Tap each hole to accept a 5/8" × - 11 NC × 2" allen head cap screw. Location of bolt-down holes varies among different manufacturers. See **BOLT- DOWN DETAIL**
5. Only ductile iron Vaned Grates shall be used.
6. This plan is intended to show the installation details of a manufactured product. It is not the intent of this plan to show the specific details necessary to fabricate the castings shown on this drawing.

CITY OF RENTON

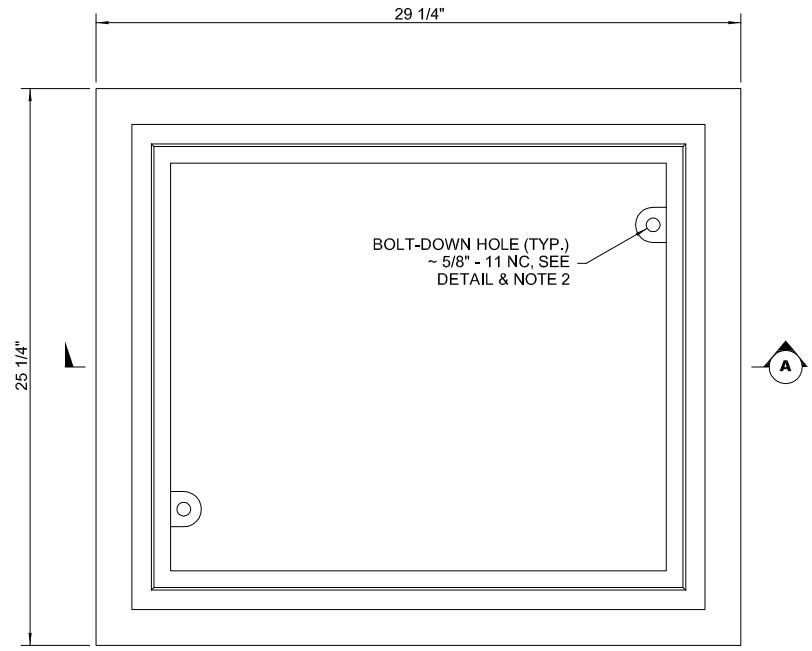
PUBLIC WORKS DEPARTMENT

OPEN CURB FACE FRAME AND GRATE INSTALLATION DETAIL

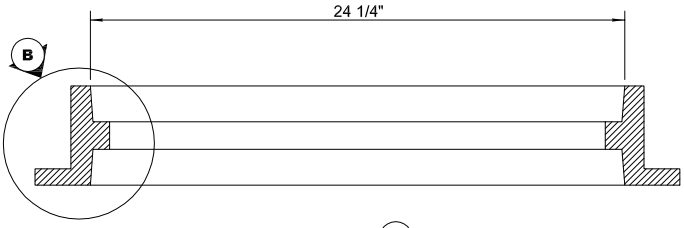
STD. PLAN – 203.00

MARCH 2008

DRAWN BY: MARK SUJKA



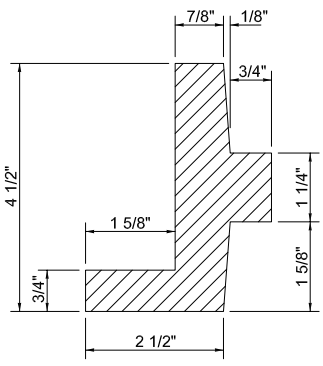
TOP



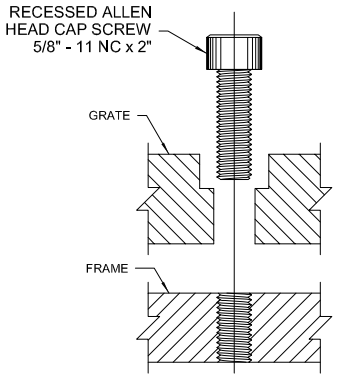
SECTION (A)

NOTES

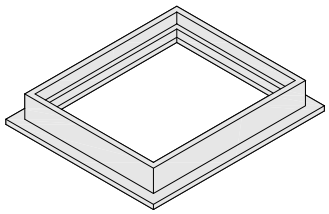
1. This frame is designed to accommodate 20" × 24" grates or covers
2. Provide two holes in the frame that are vertically aligned with t he grate or cover slots. Tap each hole to accept a 5/8" - 11 NC × 2" allen head cap screw. Location of bolt down holes varies among different manufacturers.
3. Refer to Standard Specification 9-05.15(2) for additional requirements.



DETAIL (B)



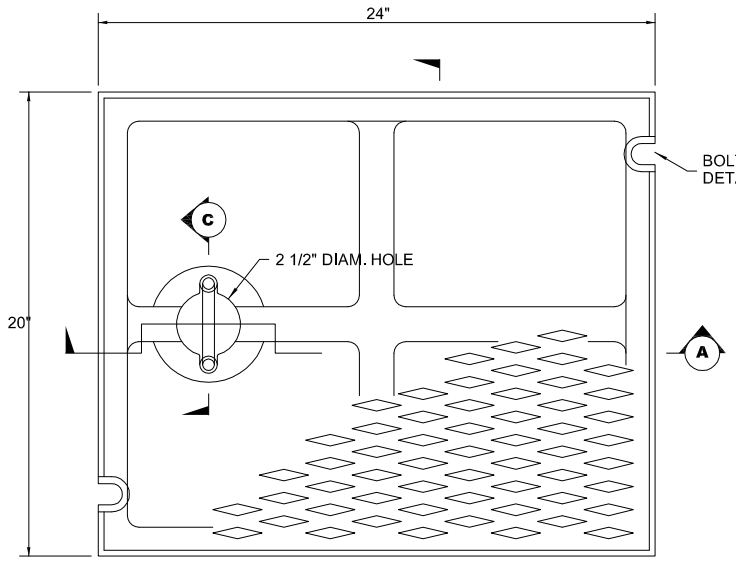
SECTION
BOLT-DOWN DETAIL
SEE NOTE 2



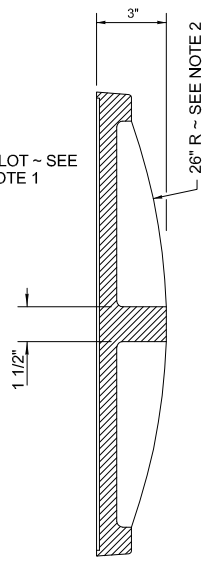
ISOMETRIC VIEW

CITY OF RENTON PUBLIC WORKS DEPARTMENT	**RECTANGULAR FRAME**	**STD. PLAN – 204.00** MARCH 2008

DRAWN BY: MARK SUJKA



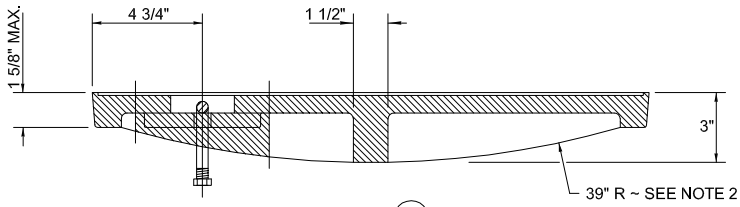
TOP



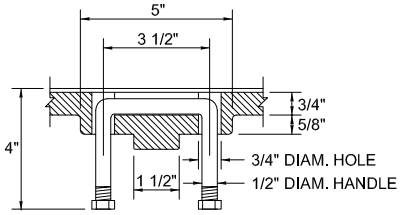
SECTION (B)

NOTES

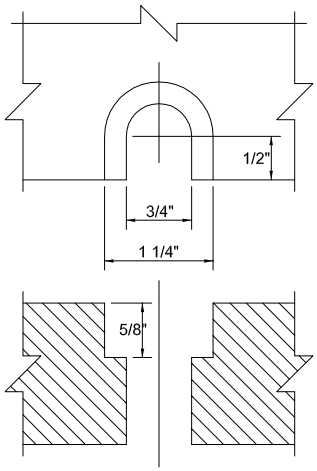
1. Provide two slots in the cover that are vertically aligned with the holes in the frame.Location of bolt-down slots varies among different manufacturers.
2. Alternative reinforcing designs are acceptable in lieu of the rib design.
3. Refer to Standard Specification 9-05.15(2) for additional requirements
4. For Frame details, see City of Renton Standard Plan 204.00.



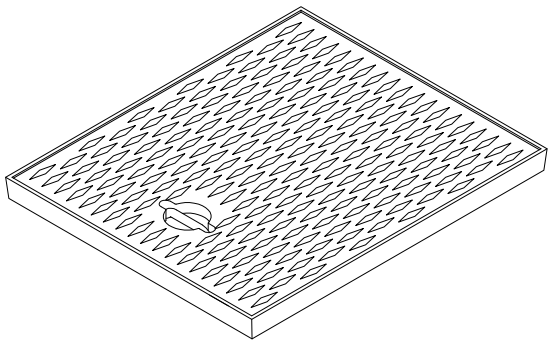
SECTION (A)



SECTION (C)



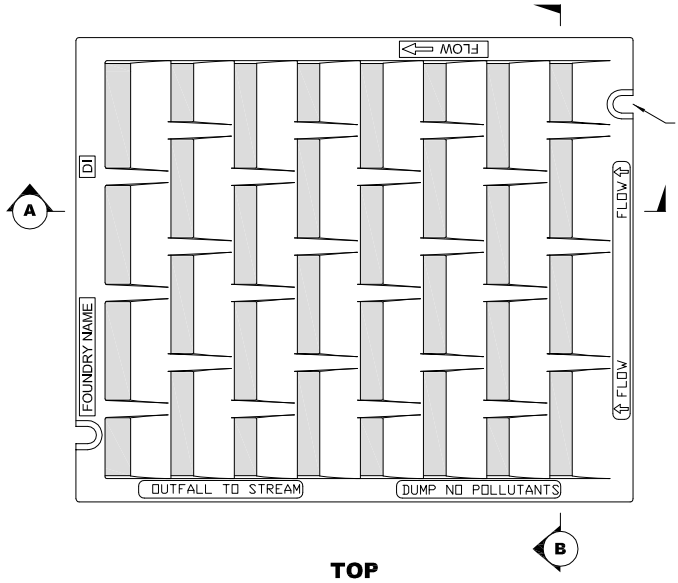
BOLT-DOWN SLOT DETAIL
SEE NOTE 1



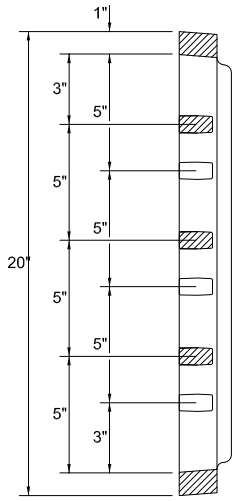
ISOMETRIC

CITY OF RENTON — PUBLIC WORKS DEPARTMENT	**RECTANGULAR SOLID METAL COVER**	**STD. PLAN – 204.10** MARCH 2008

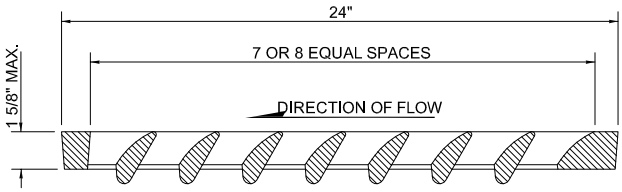
DRAWN BY: MARK SUJKA



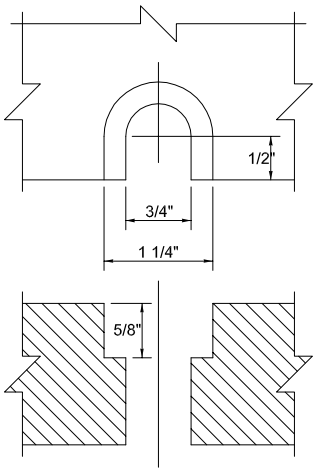
TOP



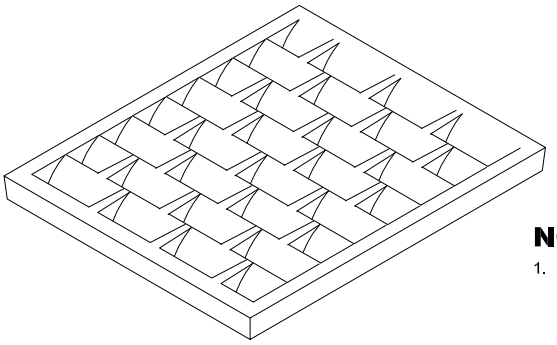
SECTION (B)



SECTION (A)



BOLT-DOWN SLOT DETAIL
SEE NOTE 1



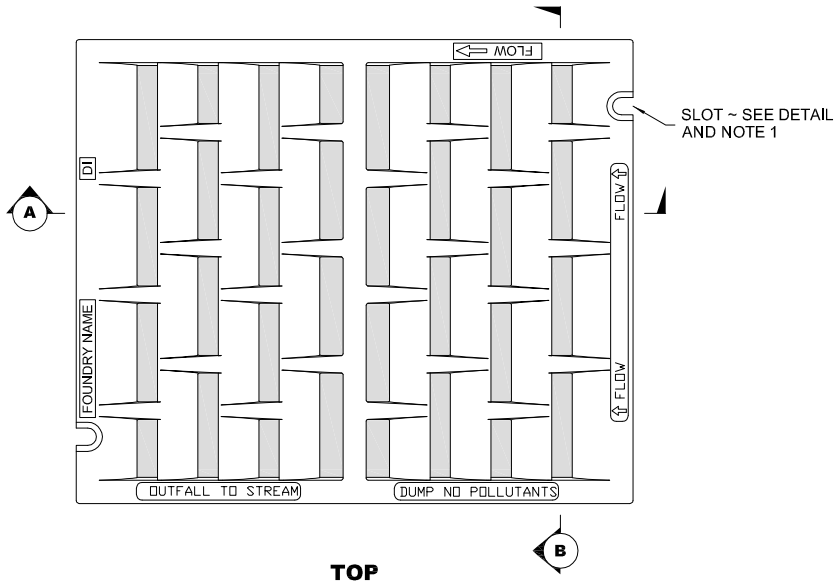
ISOMETRIC

NOTES

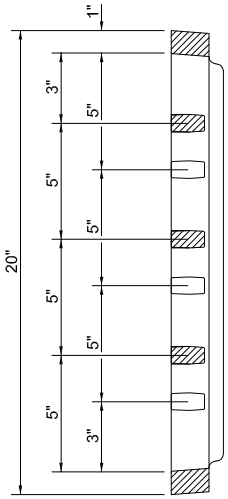
1. Provide two slots in the grate that are vertically aligned with the holes in the frame. Location of bolt-down slots varies among different manufacturers.
2. Refer to Standard Specification 9-05.15(2) for additional requirements.
3. Unless otherwise specified, vaned grates shall be used with standard frame in the travel way, gutter or shoulder. vaned grates shall not be located within crossroads. Use vaned grates along rolled curbs.

CITY OF RENTON PUBLIC WORKS DEPARTMENT	**RECTANGULAR VANED GRATE**	**STD. PLAN – 204.20** MARCH 2008

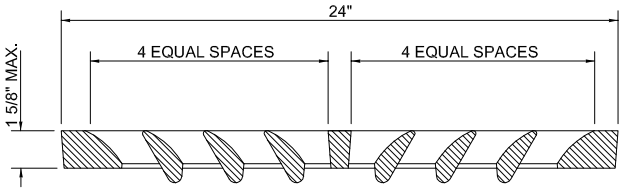
DRAWN BY: MARK SUJKA



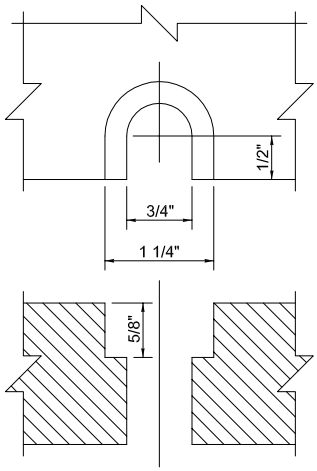
TOP



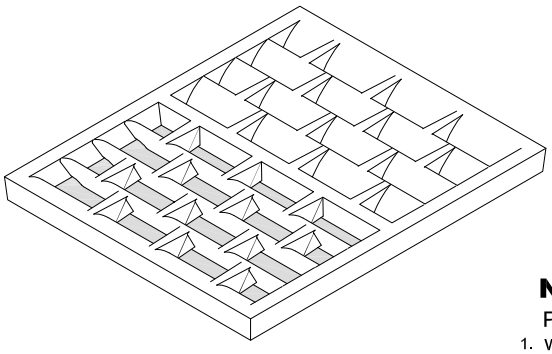
SECTION (B)



SECTION (A)



BOLT-DOWN SLOT DETAIL
SEE NOTE 1



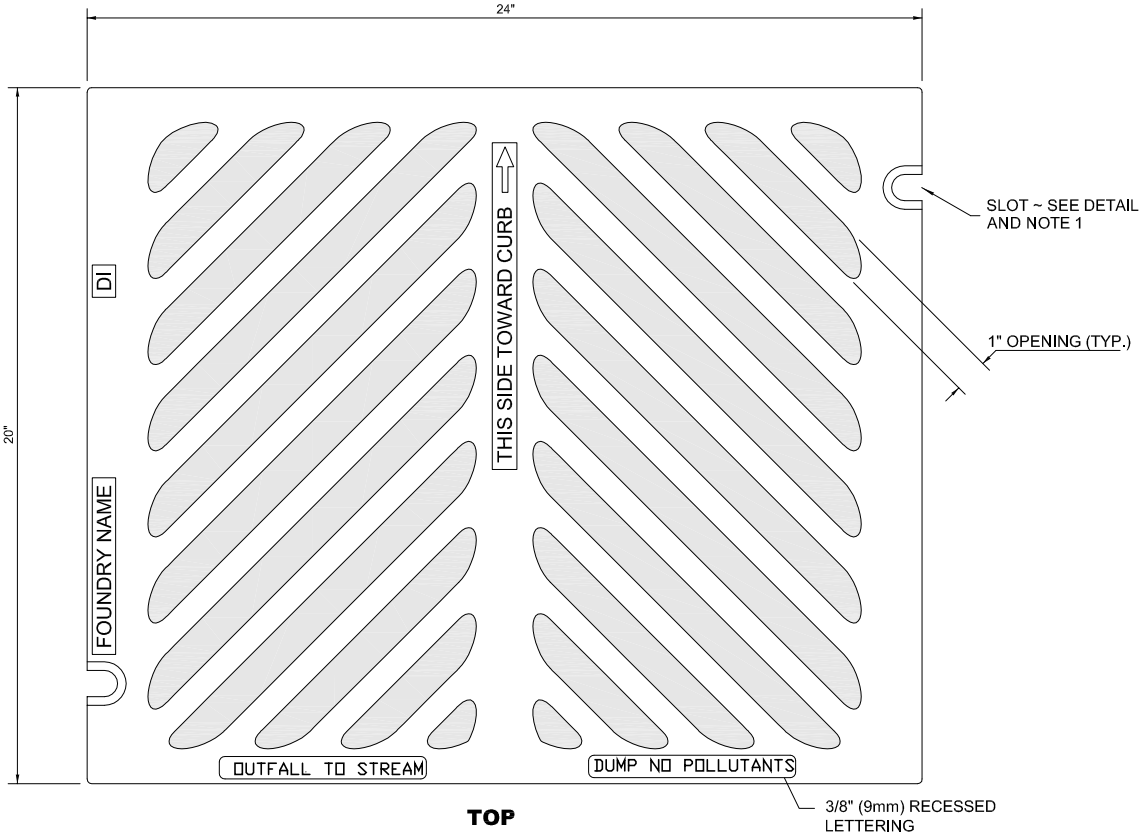
ISOMETRIC

NOTES

1. Provide two slots in the grate that are vertically aligned with the holes in the frame. Location of bolt-down slots varies among different manufacturers.
2. Refer to Standard Specification 9-05.15(2) for additional requirements.
3. Use only on sags and vertical curbs locations.
4. Unless otherwise specified, vaned grates shall be used with standard frame in the travel way, gutter or shoulder. vaned grates shall not be located within crossroads. Use vaned grates along rolled curbs.

CITY OF RENTON PUBLIC WORKS DEPARTMENT	**RECTANGULAR BI-DIRECTIONAL VANED GRATE**	**STD. PLAN – 204.30** MARCH 2008

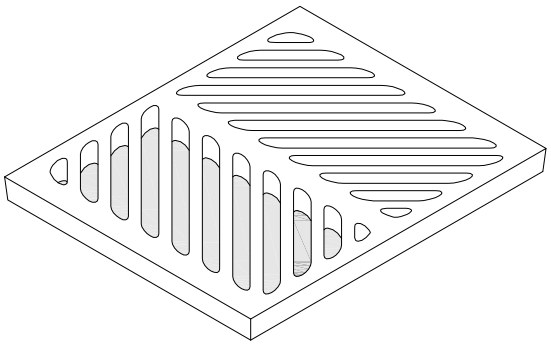
DRAWN BY: MARK SUJKA



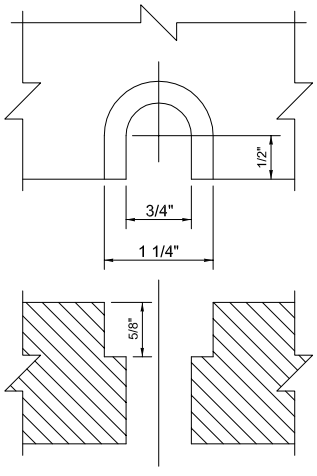
TOP

NOTES

1. Provide two slots in the grate that are vertically aligned with the holes in the frame. Location of bolt-down slots varies among different manufacturers.
2. Refer to Standard Specification 9-05.15(2) for additional requirements.
3. The thickness of the grate shall not exceed 1 5/8".
4. Unless otherwise specified, vaned grates shall be used with standard frame in the travel way, gutter or shoulder. vaned grates shall not be located within crossroads. Use vaned grates along rolled curbs.

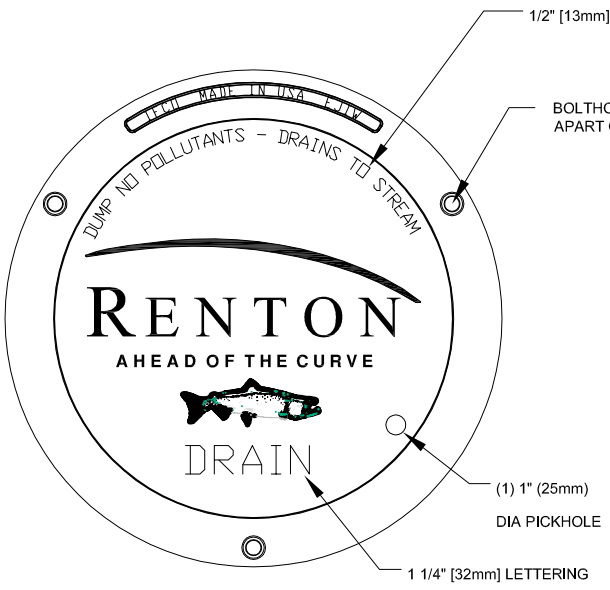


ISOMETRIC

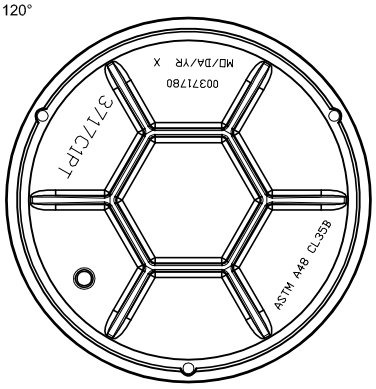


BOLT-DOWN SLOT DETAIL
SEE NOTE 1

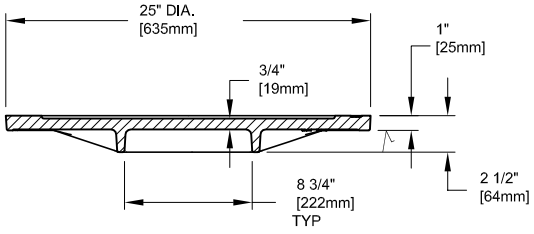
CITY OF RENTON — PUBLIC WORKS DEPARTMENT	**RECTANGULAR HERRINGBONE GRATE**	**STD. PLAN – 204.40** MARCH 2008



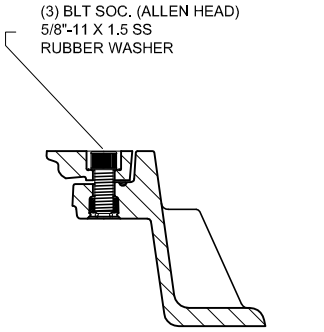
PLAN VIEW



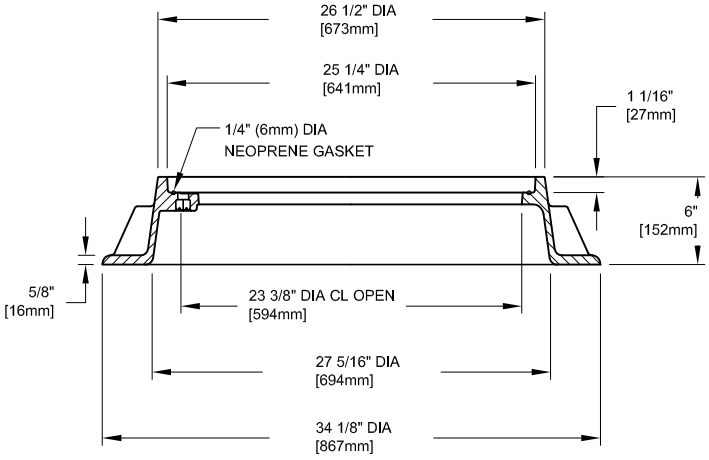
COVER BOTTOM VIEW



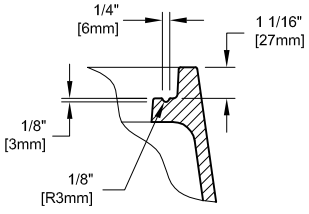
COVER SECTION VIEW



EON BOLTING DETAIL



FRAME SECTION VIEW

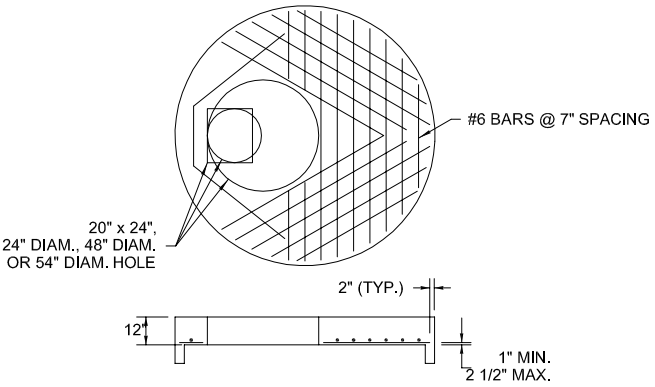


GASKET GROOVE DETAIL

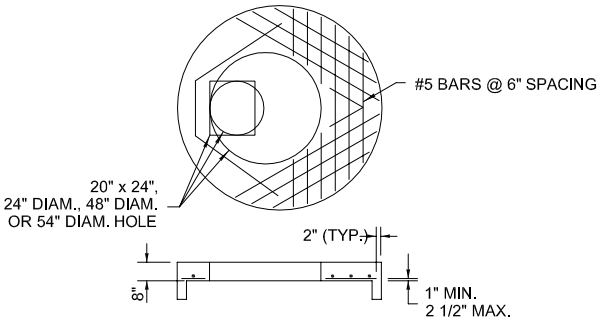
NOTES

ALL COVERS SHALL BE LOCKING LID PER EASTJORDAN IRON WORKS INC. No. 3717C1 OR APPROVED EQUAL.

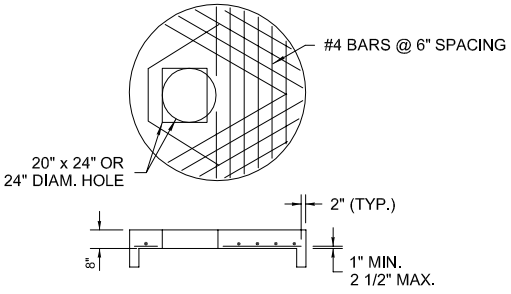
CITY OF RENTON — PUBLIC WORKS DEPARTMENT	**STORM ROUND FRAME AND COVER**	STD. PLAN – 204.50 MARCH 2008



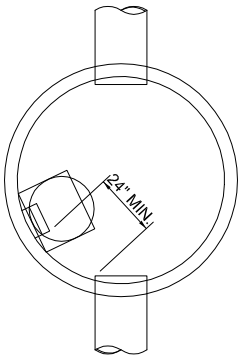
84" or 96" FLAT SLAB TOP



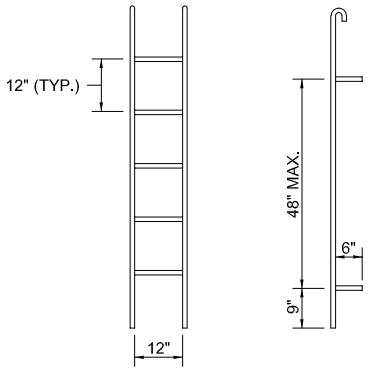
72" FLAT SLAB TOP



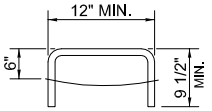
48", 54", or 60" FLAT SLAB TOP



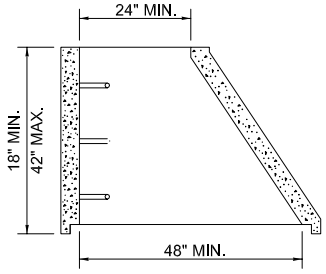
TYPICAL ORIENTATION FOR ACCESS AND STEPS



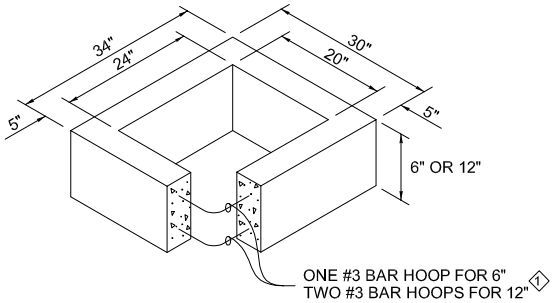
PREFABRICATED LADDER



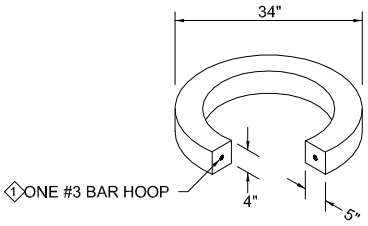
STEP



ECCENTRIC CONE SECTION



RECTANGULAR ADJUSTMENT SECTION

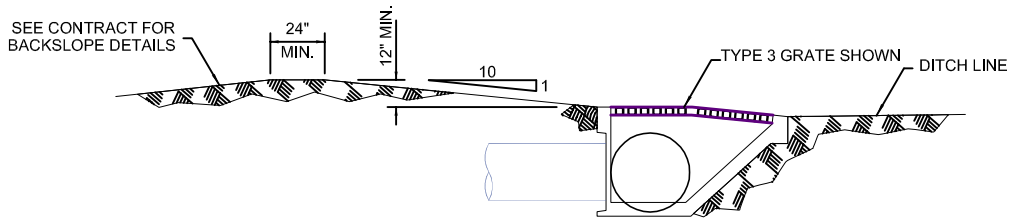


CIRCULAR ADJUSTMENT SECTION

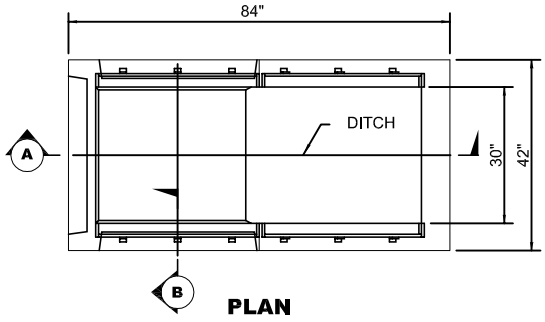
1.0 As an acceptable alternative to rebar, wire mesh having a minimum area of 0.12 square inches per foot may be used for adjustment sections.

CITY OF RENTON PUBLIC WORKS DEPARTMENT	**MISCELLANEOUS DETAILS FOR DRAINAGE STRUCTURES**	STD. PLAN – 204.60 MARCH 2008

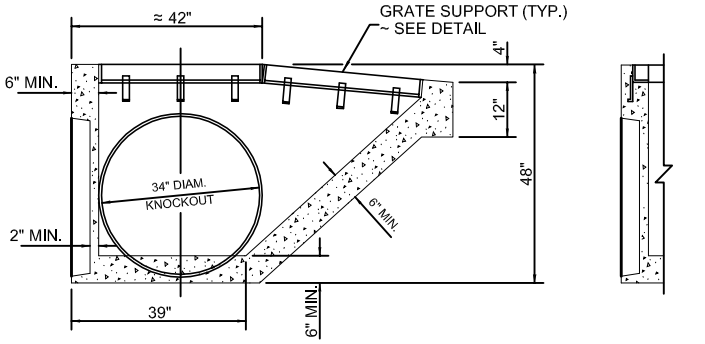
DRAWN BY: MARK SUJKA



SECTION ON DITCH LINE
DIKE INSTALLATION FOR PREFERRED SLOPE



PLAN

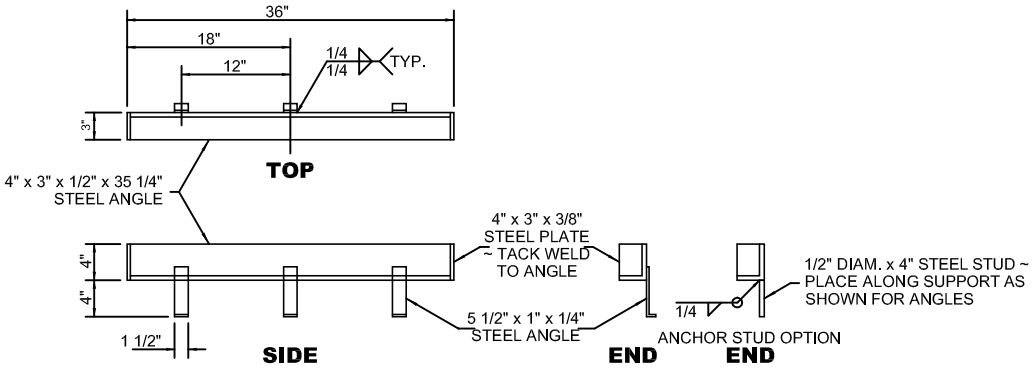


SECTION (A)

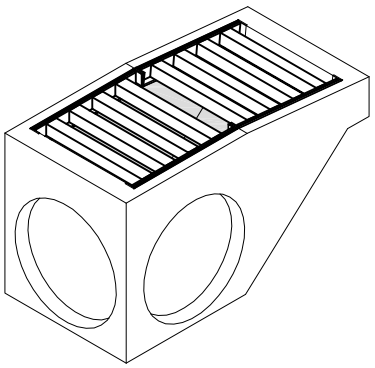
SECTION (B)

NOTES

1. The top of the inlet shall be placed at ground level to present an unobstructed ditch or median section.
2. Bevel or round exposed concrete edges 1/2".
3. Pipes may enter through the knockouts at any reasonable angle provided the outside of the pipe can be contained within the knockout provided.
4. The grade line of the lowest inlet pipe shall enter the structure at an ele-vation equal to or higher than the grade line of the outlet pipe.
5. All pickup holes shall be grouted full after the inlet has been placed.
6. The steel angles shall be set so that each bearing bar of the grate shall have full seating on both ends. The finished top of concrete shall be even with the grate surface.
7. The amount, type, and grade of reinforcing steel is the responsibility of the manufacturer.
8. The inside wall taper for form removal shall not result in any wall section thinner than 6" except in pipe knockout areas.
9. Precast inlets shall be marked with the manufacturer's identification on the inside of the structure in some readily accessible location.



GRATE SUPPORT DETAIL
(FOUR SUPPORTS REQUIRED)



ISOMETRIC
(SHOWN WITH TYPE 1 GRATE)

CITY OF RENTON

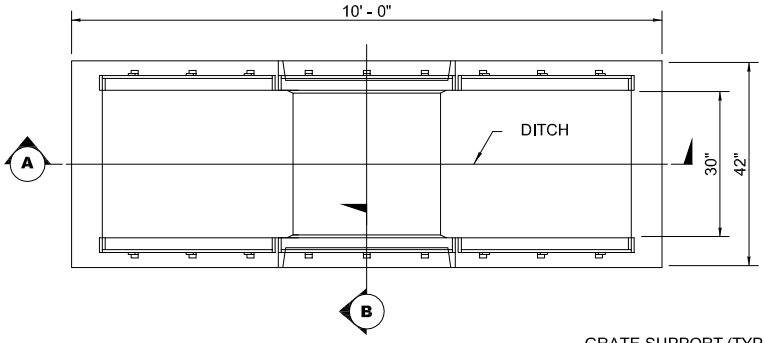
PUBLIC WORKS DEPARTMENT

DROP INLET TYPE 1

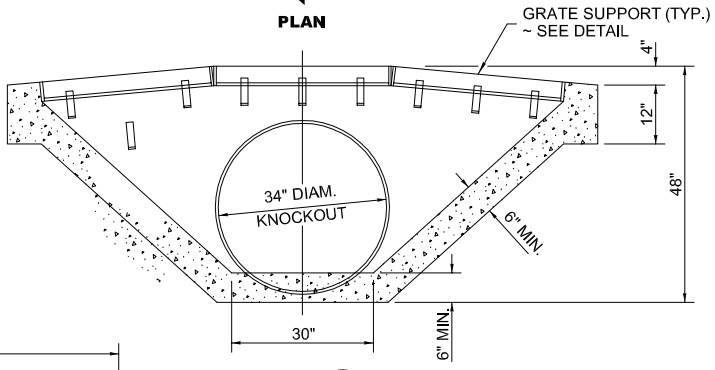
STD. PLAN – 205.00

MARCH 2008

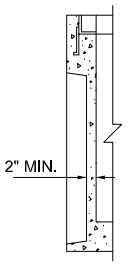
DRAWN BY: MARK SUJKA



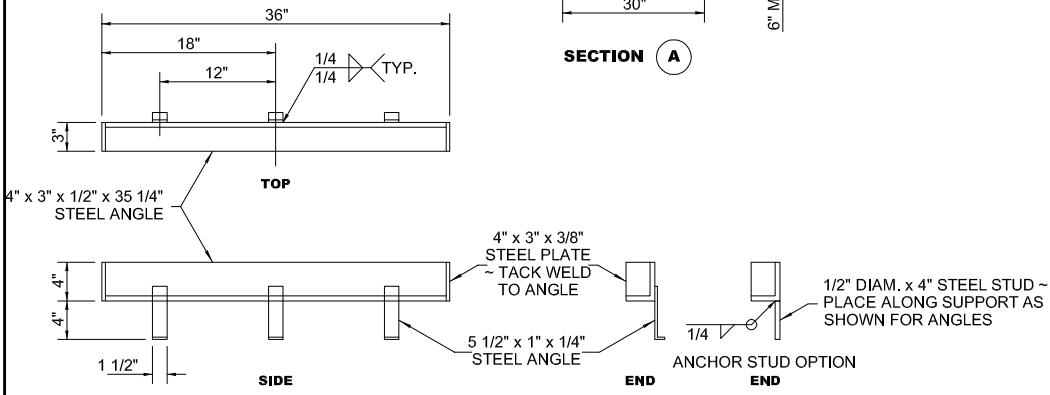
PLAN



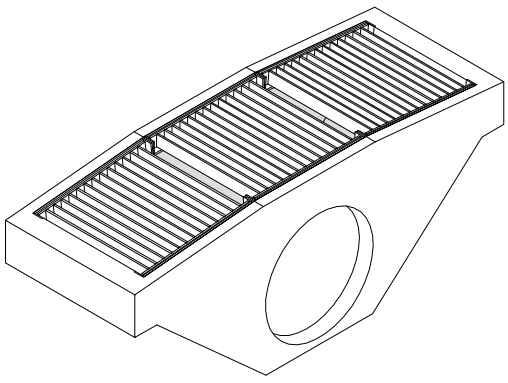
SECTION (A)



SECTION (B)



GRATE SUPPORT DETAIL
(SIX SUPPORTS REQUIRED)



ISOMETRIC
(SHOWN WITH TYPE 2 GRATE)

NOTES

1. The top of the inlet shall be placed at ground level to present an unobstructed ditch or median section.
2. Bevel or round exposed concrete edges 1/2".
3. Pipes may enter through the knockouts at any reasonable angle provided the outside of the pipe can be contained within the knockout provided.
4. The grade line of the lowest inlet pipe shall enter the structure at an elevation equal to or higher than the grade line of the outlet pipe.
5. All pickup holes shall be grouted full after the inlet has been placed.
6. The steel angles shall be set so that each bearing bar of the grate shall have full seating on both ends. The finished top of concrete shall be even with the grate surface.
7. The amount, type, and grade of reinforcing steel is the responsibility of the manufacturer.
8. The inside wall taper for form removal shall not result in any wall section thinner than 6" except in pipe knockout areas.
9. Precast inlets shall be marked with the manufacturer's identification on the inside of the structure in some readily accessible location.

CITY OF RENTON

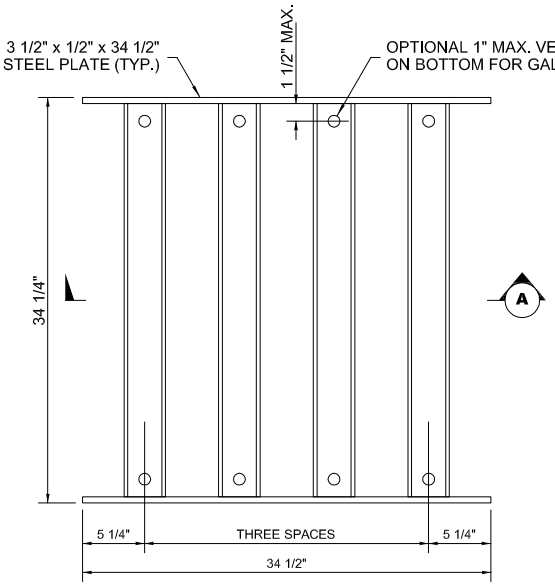
PUBLIC WORKS
DEPARTMENT

DROP INLET TYPE 2

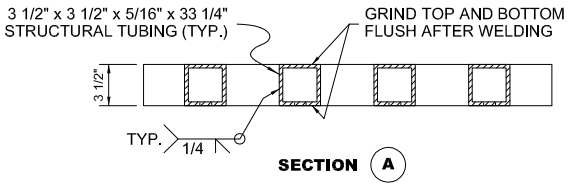
STD. PLAN – 205.10

MARCH 2008

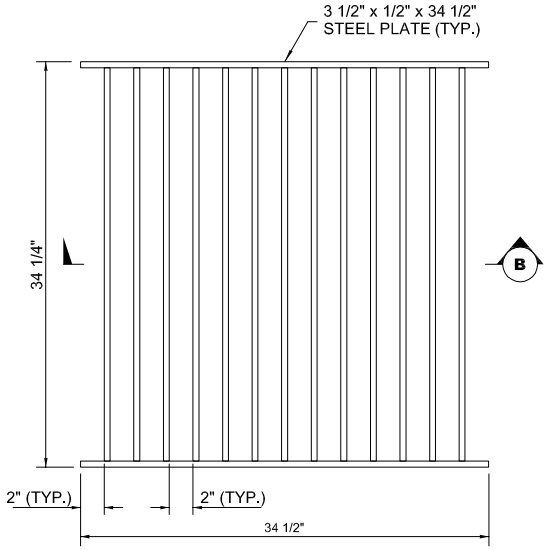
DRAWN BY: MARK SUJKA



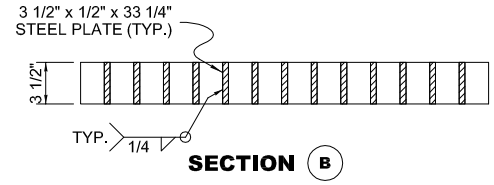
TYPE 1



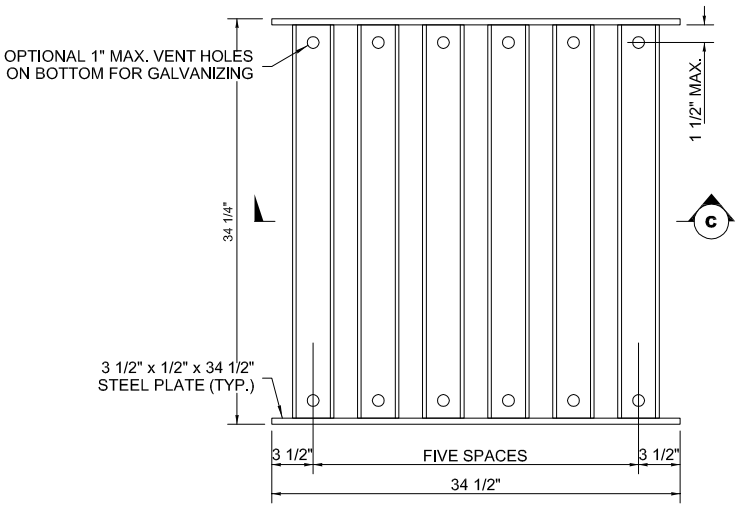
SECTION A



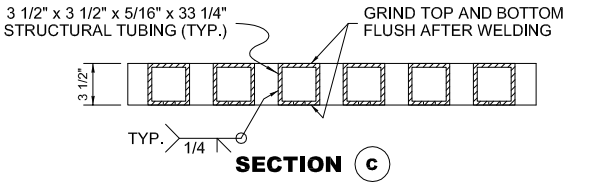
TYPE 2



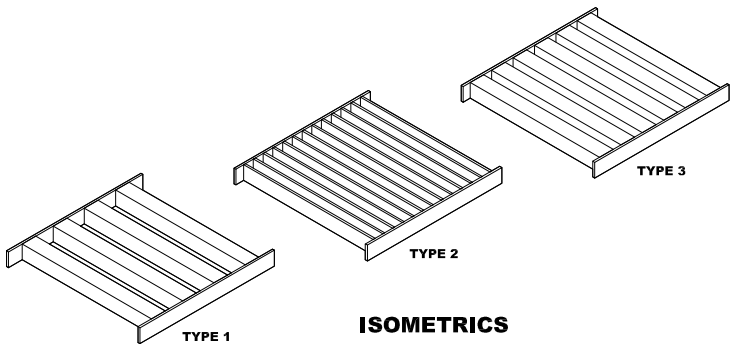
SECTION B



TYPE 3



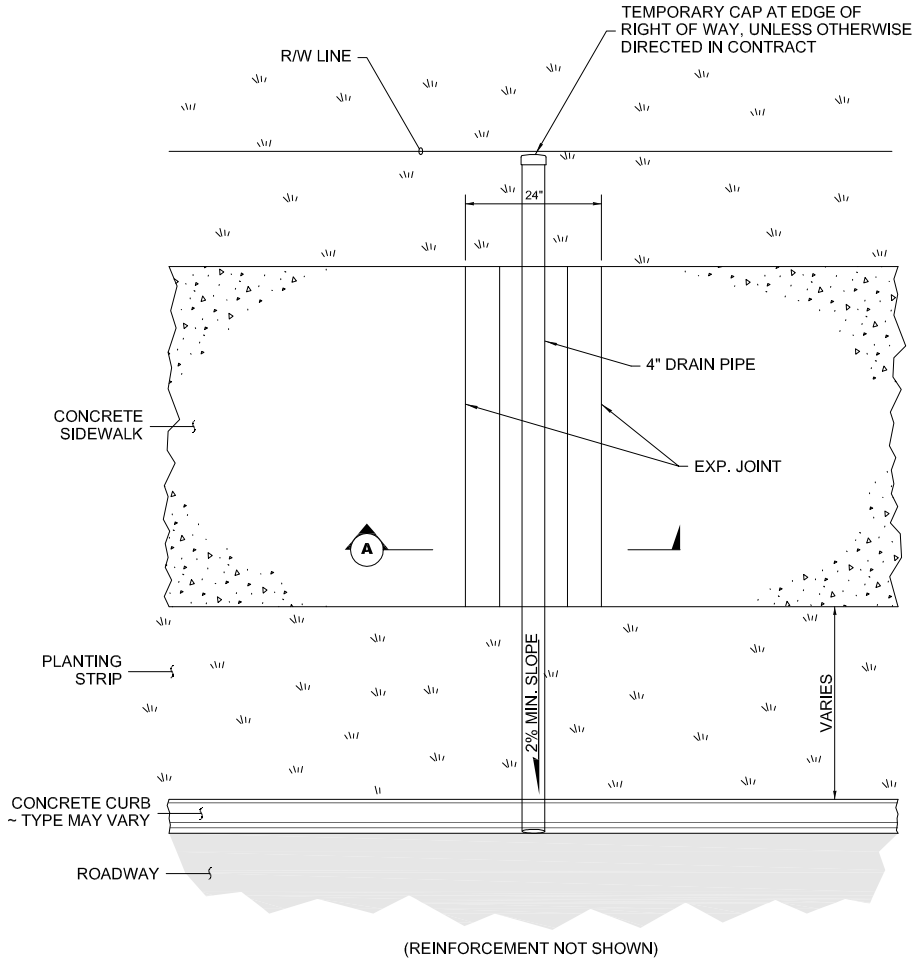
SECTION C



ISOMETRICS

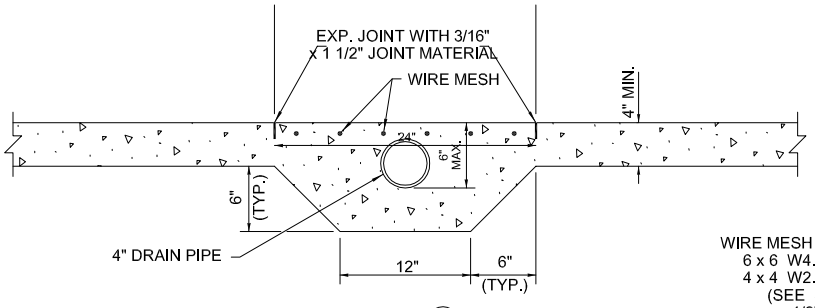
PUBLIC WORKS DEPARTMENT	**GRATES FOR DROP INLET**	STD. PLAN – 205.20
		MARCH 2008

DRAWN BY: MARK SUJKA

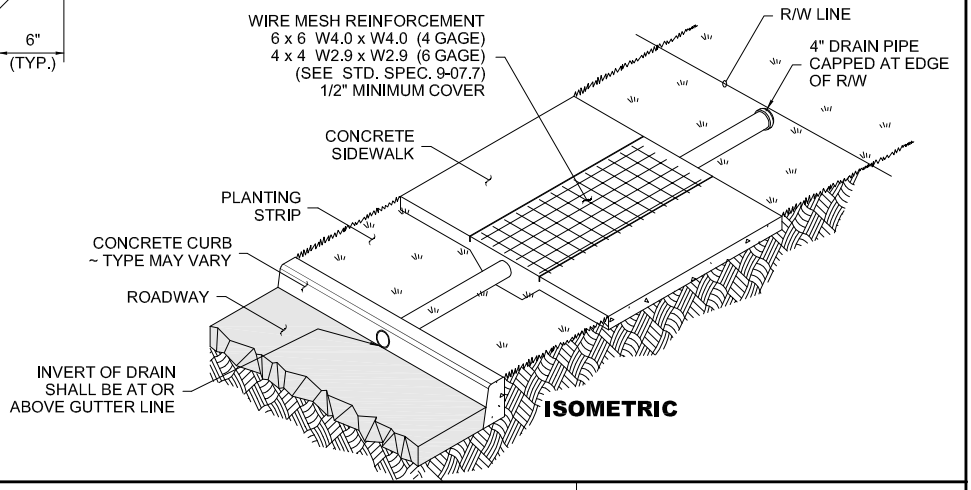


(REINFORCEMENT NOT SHOWN)

PLAN



SECTION (A)



ISOMETRIC

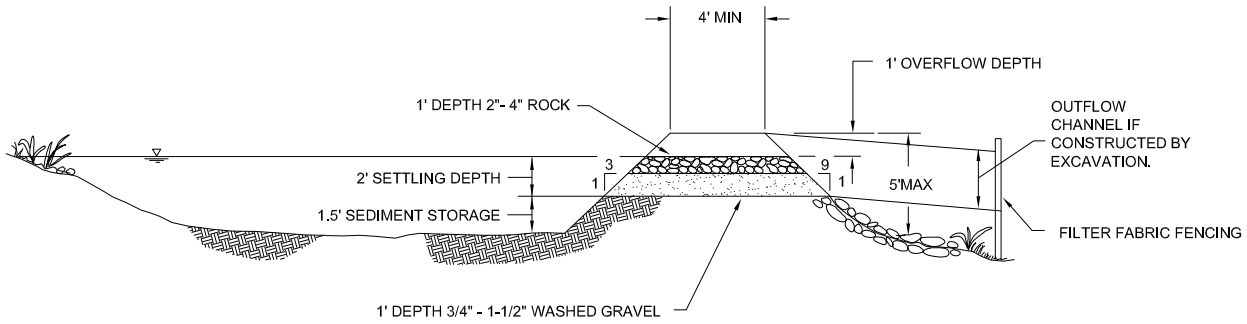
PUBLIC WORKS DEPARTMENT

DOWNSPOUT STORM DRAIN, UNDER SIDEWALK

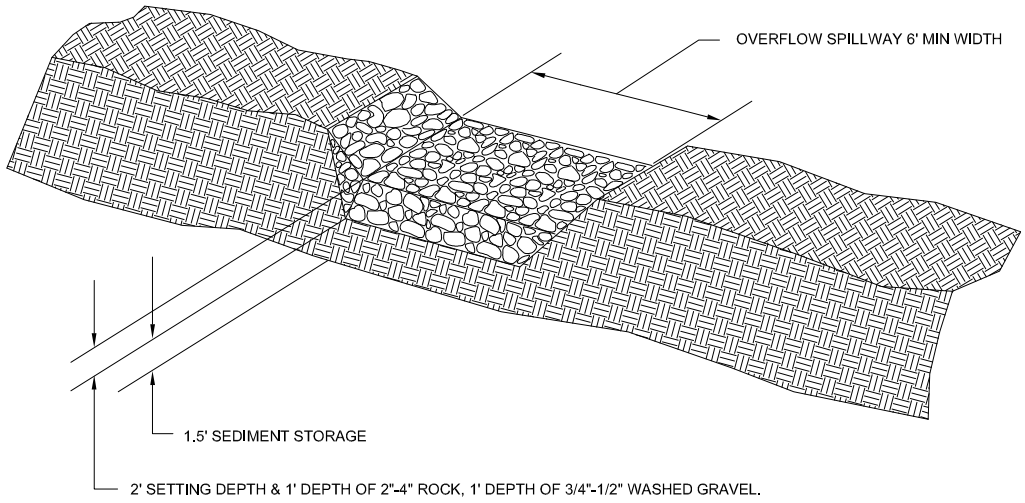
STD. PLAN – 210.00

MARCH 2008

DRAWN BY: MARK SUJKA



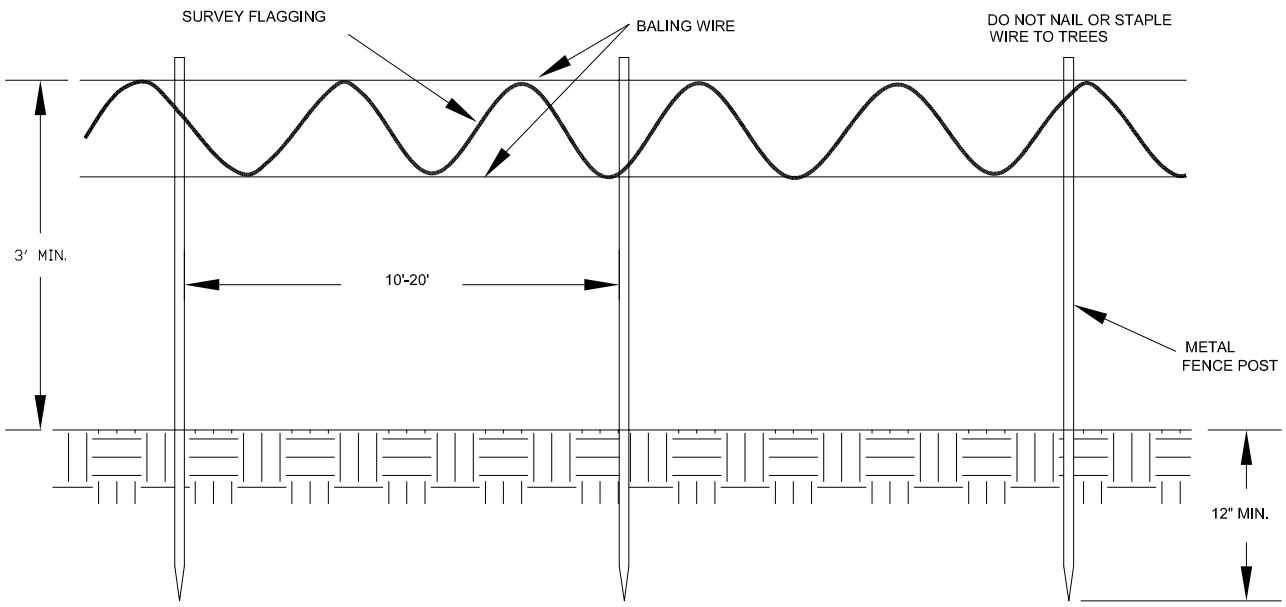
CROSS SECTION
NTS



NOTE:
MAY BE CONSTRUCTED BY EXCAVATION
OR BY BUILDING A BERM

CITY OF RENTON PUBLIC WORKS DEPARTMENT	**SEDIMENT TRAP**	**STD. PLAN – 211.00** MARCH 2008

DRAWN BY: MARK SUJKA



NOTES

1. CONDITION OF USE

1.1. TO ESTABLISH CLEARING LIMITS, STAKE OR WIRE FENCE MAY BE USED:
- 1.1.1. AT THE BOUNDARY OF CRITICAL AREAS, THEIR BUFFERS AND OTHER AREAS REQUIRED TO BE LEFT UNCLEAR.
- 1.1.2. AS NECESSARY TO CONTROL THE VEHICLES TO AND ON THE SITE.

2. MAINTENANCE AND REQUIREMENTS

2.1. IF THE FENCE IS DAMAGED OR VISIBILITY REDUCED, IT SHALL BE REPAIRED OR REPLACED IMMEDIATELY AND VISIBILITY RESTORED.

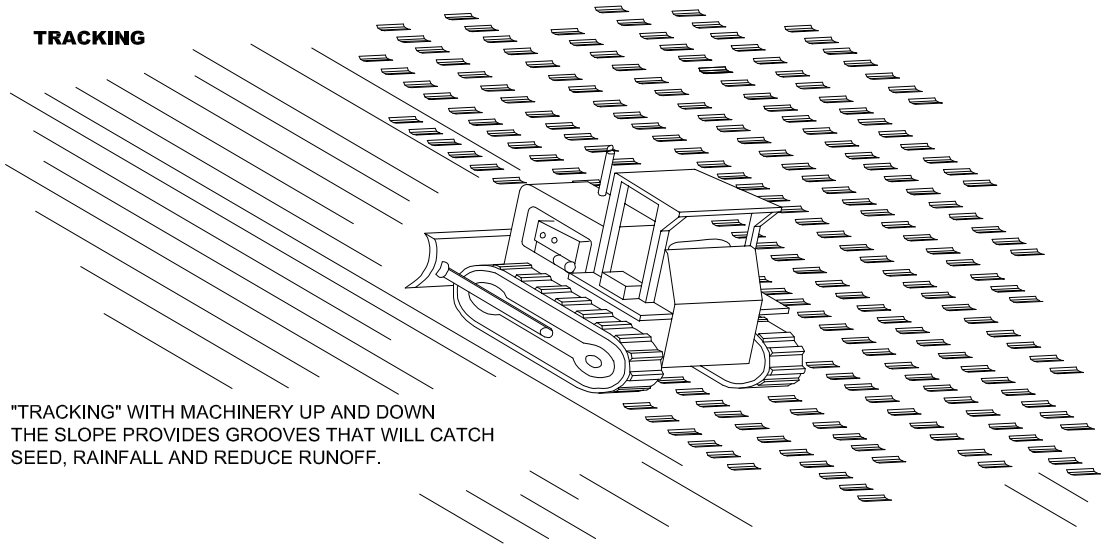
2.2. DISTURBANCE OF A CRITICAL AREA, CRITICAL BUFFER AREA, NATIVE GROWTH RETENTION AREA, OR OTHER AREA REQUIRED TO BE LEFT UNDISTURBED SHALL BE REPORTED TO THE CITY OF RENTON FOR RESOLUTION.

2.3. THE CITY MAY REQUIRED MORE SUBSTANTIAL FENCING IF THE FENCE DOES NOT PREVENT ENCROACHMENT INTO THOSE AREAS THAT ARE NOT TO BE DISTURBED.

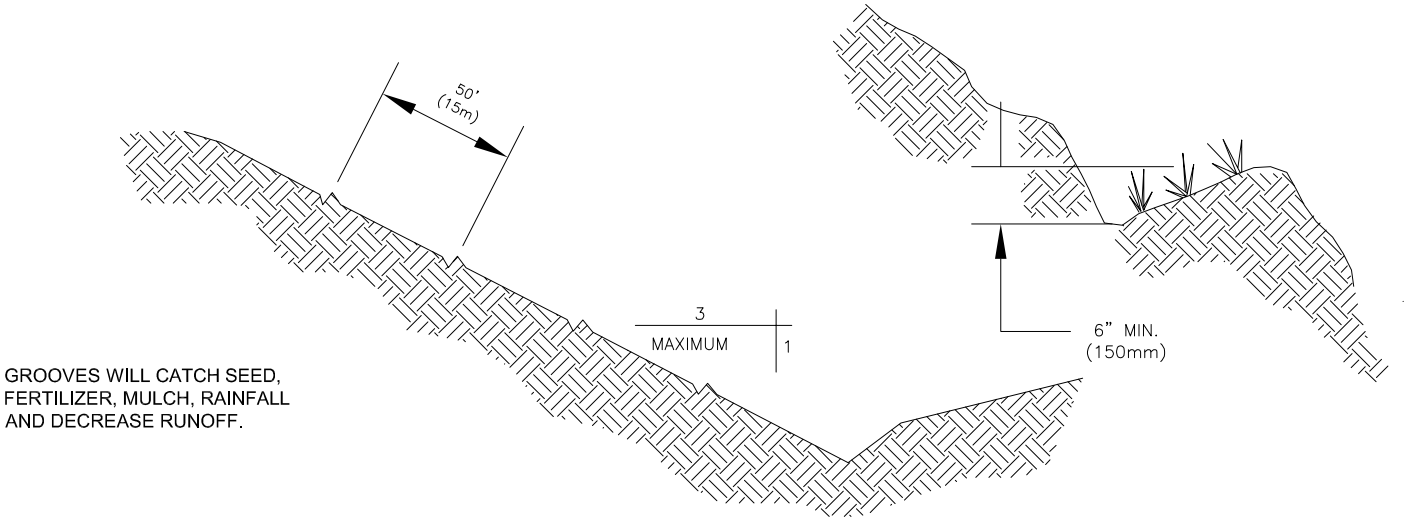
CITY OF RENTON PUBLIC WORKS DEPARTMENT	**STAKE AND WIRE FENCE**	**STD. PLAN – 212.00** MARCH 2008

DRAWN BY: MARK SUJKA

TRACKING



"TRACKING" WITH MACHINERY UP AND DOWN THE SLOPE PROVIDES GROOVES THAT WILL CATCH SEED, RAINFALL AND REDUCE RUNOFF.



GROOVES WILL CATCH SEED, FERTILIZER, MULCH, RAINFALL AND DECREASE RUNOFF.

NOTES

1. CONDITION OF USE

1.1. ALL SLOPES STEEPER THAN 3:1 AND GREATER THAN 5 VERTICAL FEET REQUIRE SURFACE ROUGHENING..
1.2. AREAS WITH GRADES STEEPER THAN 3:1 SHOULD BE ROUGHENED TO A DEPTH OF 2 TO 4 INCHES PRIOR TO SEEDING.
1.3. AREAS THAT WILL NOT BE STABILIZED IMMEDIATELY MAY BE ROUGHENED TO REDUCE RUNOFF VELOCITY UNTIL SEEDING TAKES PLACE.
1.4. SLOPES WITH A STABLE ROCK FACE DO NOT REQUIRE ROUGHENING.
1.5. SLOPES WHERE MOWING IS PLANNED SHOULD NO BE EXCESSIVELY ROUGHENED.

2. DESIGN AND INSTALLATION SPECIFICATIONS

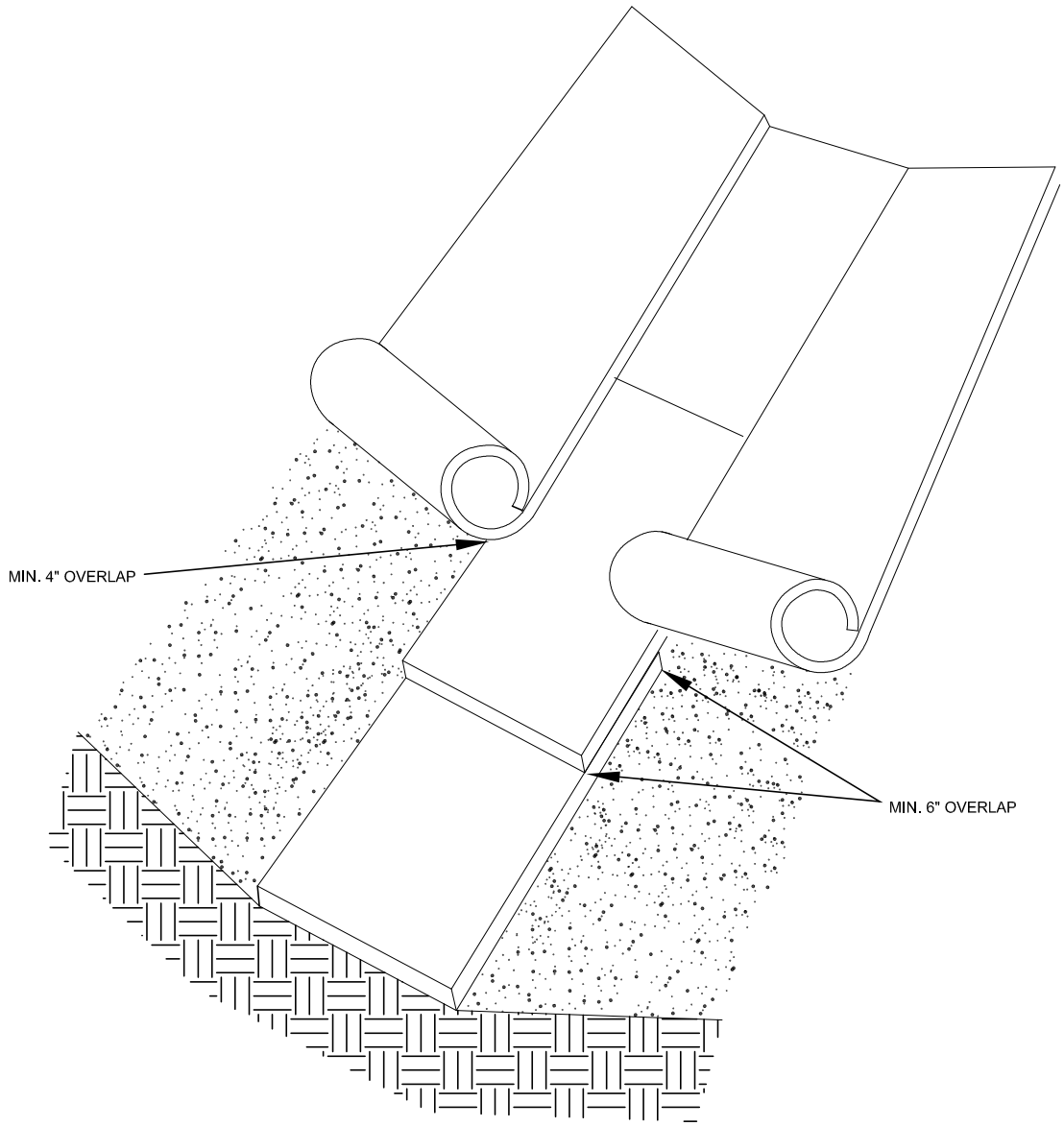
2.1. DISTURBANCE AREAS THAT WILL NOT REQUIRE MOWING MAY BE STAIR-STEO GRADED, GROOVED, OR LEFT ROUGH AFTER FILLING.
2.2. STAIR STEP GRADING IS PARTICULARLY APPROPRIATE IN SOILS CONTAINING LARGE AMOUNTS OF SOFT ROCK. STAIR SHOULD BE WIDE ENOUGH TO WORK WITH STANDARD EARTH MOVING EQUIPMENT. STAIRS STEPS MOST BE ON CONTOURS OR GULLIES WILL FORM ON THE SLOPE.
2.3. AREAS THAT WILL BE MOWED, MAY HAVE SMALL FURROWS LEFT BY DISKING, HARROWING, RANKING, OR SEED-PLANTING MACHINERY OPERATED ON THE CONTOUR.
2.4. GRADED AREAS WITH SLOPES GRATER THAN 3:1 BUT LESS THAN 2:1 SHOULD BE ROUGHED BEFORE SEEDING.

3. MAINTENANCE STANDARDS

3.1. PERIODICALLY CHECK ROUGHENED , SEEDED, PLANTED AND MULCHED SLOPES FOR RILLS AND GULLIES, PARTICULARLY AFTER A SIGNIFICANT STORM EVENT. FILL THIS AREAS SLIGHTLY ABOVE THE ORIGINAL GRADE, THEN RE-SEED AND MULCH AS SOON AS POSSIBLE.

CITY OF RENTON PUBLIC WORKS DEPARTMENT	**SURFACE ROUGHING**	**STD. PLAN – 213.00** MARCH 2008

DRAWN BY: MARK SUJKA



NOTES

1. CONDITION OF USE

1.1. FOR PERMANENT STABILIZATION OF SLOPES 2H:1V OR GREATER AND WITH MORE THAN 10 FEET OF VERTICAL RELIEF.
1.2. IN CONJUNCTION WITH SEED FOR FINAL STABILIZATION OF A SLOPE, NOT FOR TEMPORARY COVER. HOWEVER, THEY MAY BE USED FOR TEMPORARY APPLICATIONS AS LONG AS THE PRODUCT IS NOT DAMAGED BY REPEATED HANDLING.
1.3. THE APPLICATION OF APPROPRIATE NETTING OR BLANKET TO DRAINAGE DITCHES AND SWALES CAN PROTECT BARE SOIL FROM CHANNELIZED RUNOFF WHILE VEGETATION IS ESTABLISHED. NETS AND BLANKETS CAN ALSO CAPTURE GREAT DEAL OF SEDIMENT DUE TO THEIR OPEN, POROUS STRUCTURE. SYNTHETIC NETS AND BLANKETS MAY BE USED TO PERMANENTLY STABILIZE CHANNELS AND MAY PROVIDE A COST-EFFECTIVE, ENVIRONMENTALLY PREFERABLE ALTERNATIVE RIPRAP.

2. DESIGN AND INSTALLATION SPECIFICATIONS

2.1. JUTE MATTING MUST BE USED IN CONJUNCTION WITH MULCH. EXCELSIOR, WOVEN STRAW, BLANKETS, AND COIR (COCONUT FIBER) BLANKETS MAY BE INSTALLED WITHOUT MULCH. OTHER TYPES OF PRODUCT WILL BE EVALUATED INDIVIDUALLY.
2.2. PURELY SYNTHETIC BLANKETS ARE ALLOWED, BUT SHALL ONLY BE USED FOR LONG-TERM STABILIZATION OF WATERWAYS. THE ORGANIC BLANKETS, ARE BETTER FOR SLOPE PROTECTION AND SHORT-TERM WATERWAY PROTECTION

3. MAINTENANCE STANDARDS

3.1. GOOD CONTACT WITH THE GROUND MOST BE MAINTAINED, AND THERE MOST NOT BE EROSION BENEATH THE BET OR BLANKET.
3.2. AREAS OF THE NET OR BLANKET THAT ARE DAMAGED OR NOT CLOSE CONTACT WITH THE GROUND SHALL BE REPAIRED AND STAPLED.
3.3. IF EROSION OCCURS DUE TO POORLY CONTROLLED DRAINAGE, THE PROBLEM SHALL BE FIXED AND THE ERODED AREA PROTECTED.

CITY OF RENTON

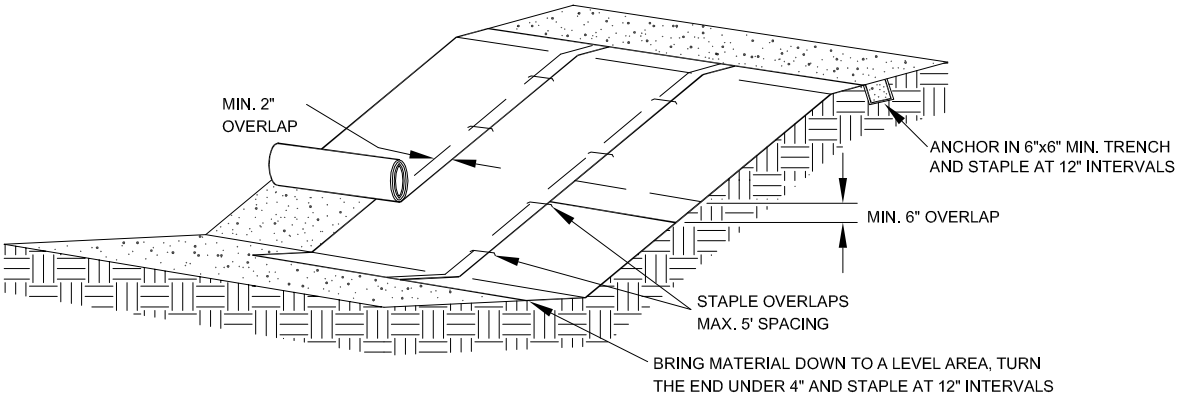
PUBLIC WORKS DEPARTMENT

WATERWAY INSTALLATIONS

STD. PLAN – 213.10

MARCH 2008

DRAWN BY: MARK SUJKA



NOTES

1. CONDITION OF USE

1.1. FOR PERMANENT STABILIZATION OF SLOPES 2H:1V OR GREATER AND WITH MORE THAN 10 FEET OF VERTICAL RELIEF.
1.2. IN CONJUNCTION WITH SEED FOR FINAL STABILIZATION OF A SLOPE, NOT FOR TEMPORARY COVER. HOWEVER, THEY MAY BE USED FOR TEMPORARY APPLICATIONS AS LONG AS THE PRODUCT IS NOT DAMAGED BY REPEATED HANDLING.

2. DESIGN AND INSTALLATION SPECIFICATIONS

2.1. INSTALLATION IS CRITICAL TO THE EFFECTIVENESS IF THIS PRODUCT IF GOOF GROUND CONTACT IS NOT ACHIEVED, RUNOFF CAN CONCENTRATE UNDER THE PRODUCT, RESULTING IN SIGNIFICANT EROSION..
2.2. JUTE MATTING MUST BE USED IN CONJUNCTION WITH MULCH. EXCELSIOR, WOVEN STRAW, BLANKETS, AND COIR (COCONUT FIBER) BLANKETS MAY BE INSTALLED WITHOUT MULCH.
2.3. PURELY SYNTHETIC BLANKETS ARE ALLOWED, BUT SHALL ONLY BE USED FOR LONG-TERM STABILIZATION OF WATERWAYS. THE ORGANIC BLANKETS, ARE BETTER FOR SLOPE PROTECTION AND SHORT-TERM WATERWAY PROTECTION BECAUSE THEY RETAIN AND PROVIDE ORGANIC MATTER TO THE SOIL, SUBSTANTIALLY IMPROVING THE SPEED AND SUCCESS OF RE-VEGETATION.

3. MAINTENANCE STANDARDS

3.1. GOOD CONTACT WITH THE GROUND MOST BE MAINTAINED, AND THERE MOST NOT BE EROSION BENEATH THE BET OR BLANKET.
3.2. AREAS OF THE NET OR BLANKET THAT ARE DAMAGED OR NOT CLOSE CONTACT WITH THE GROUND SHALL BE REPAIRED AND STAPLED.
3.3. IF EROSION OCCURS DUE TO POORLY CONTROLLED DRAINAGE, THE PROBLEM SHALL BE FIXED AND THE ERODED AREA PROTECTED.

CITY OF RENTON

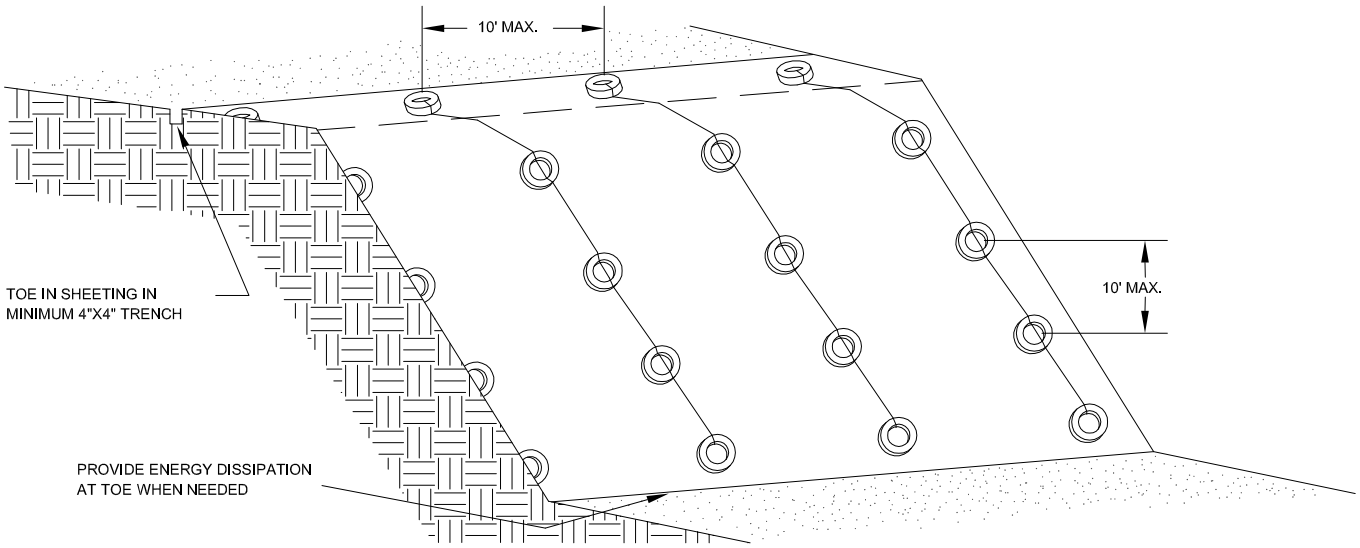
PUBLIC WORKS DEPARTMENT

SLOPE INSTALLATIONS

STD. PLAN – 213.20

MARCH 2008

DRAWN BY: MARK SUJKA



NOTES

1. CONDITION OF USE

1.1. PLASTIC COVERING MAY BE USED ON DISTURBED AREAS THAT REQUIRED COVER MEASURES FOR LESS THAN 30 DAYS.
1.2. PLASTIC IS PARTICULARLY USEFUL FOR PROTECTING CUT AND FILL SLOPES AND STOCKPILES.
1.3. CLEAR PLASTIC SHEETING MAY BE USED OVER NEWLY-SHEEDED AREAS TO CREATE A GREENHOUSE EFFECT AND ENCOURAGE GRASS GROWTH. CLEAR PLASTIC SHOULD NOT BE USED FOR THIS PURPOSE DURING THE SUMMER MONTHS
1.4. THIS METHOD SHALL NOT BE USED UPSLOPE OF AREAS THAT MIGHT BE ADVERSELY IMPACTED BY RUNOFF. SUCH AREAS INCLUDE STEEP AND UNSTABLE SLOPES

2. DESIGN AND INSTALLATION SPECIFICATIONS

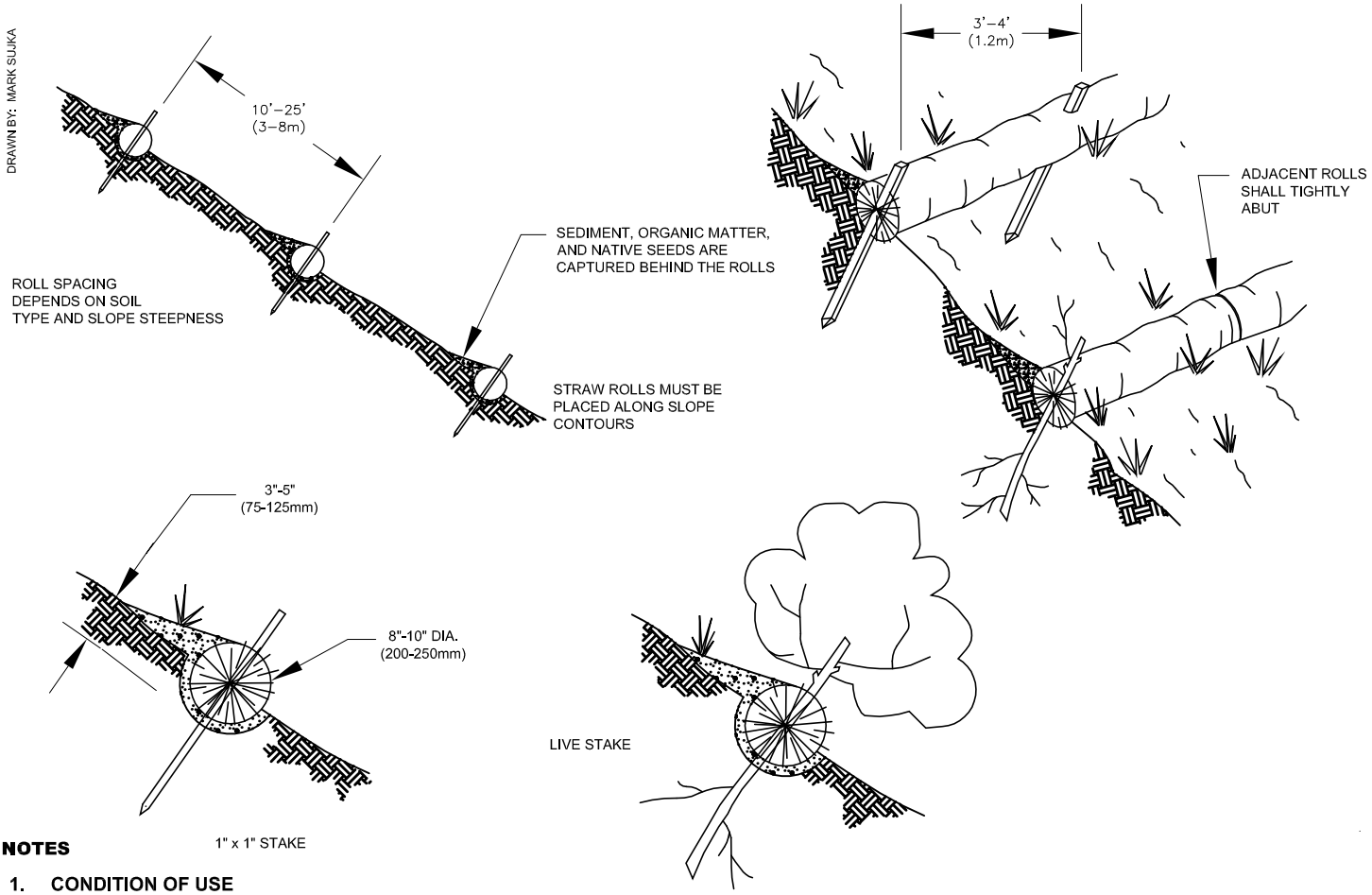
2.1. PLASTIC SHEETING SHOULD HAVE A MINIMUM THICKNESS OF 0.03 MILLIMETERS.
2.2. IF EROSION AT THE TOE OF A SLOPE IS LIKELY, A GRAVEL BERM, RIPRAP, OR OTHER SUITABLE PROTECTION SHALL BE INSTALLED AT THE TOE OF THE SLOPE IN ORDER TO REDUCE THE VELOCITY OF RUNOFF.

3. MAINTENANCE STANDARDS

3.1. TORN SHEETS MOST BE REPLACED AND OPEN SEAMS REPAIRED.
3.2. IF THE PLASTIC BEGINS TO DETERIORATE DIE TO ULTRAVIOLET RADIATION, IT MOST BE COMPLETELY REMOVED AND REPLACED.
3.3. WHEN THE PLASTIC IS NO LONGER NEEDED, IT SHALL BE COMPLETELY REMOVES.

CITY OF RENTON PUBLIC WORKS DEPARTMENT	**PLASTIC COVERING**	**STD. PLAN – 213.30** MARCH 2008

DRAWN BY: MARK SUJKA



NOTES

1. CONDITION OF USE

1.1. SEEDING SHALL BE USED THROUGH THE PROJECT ON DISTURBED AREAS THAT HAVE REACHED FINAL GRADE OR THAT WILL REMAIN UNWORKED FOR MORE THAN 30 DAYS.

1.2. VEGETATION-LINED CHANNELS SHALL BE SEEDED. CHANNELS THAT WILL BE VEGETATED SHOULD BE INSTALLED BEFORE MAJOR EARTHWORK AND HYDROSEEDED OR COVERED WITH A BONDED FIBER MATRIX (BFM)

1.3. RETENTION / DETENTION PONDS SHALL BE SEEDED AS REQUIRED.

1.4. AT THE CITY'S DISCRETION, SEEDING WITHOUT MULCH DURING THE DRY SEASON IS ALLOWED EVEN THOUGH IT WILL TAKE MORE THAN SEVEN DAYS TO DEVELOP AN EFFECTIVE COVER.

1.5. AT THE BEGINNING OF THE WET SEASON, ALL DISTURBANCES AREAS SHALL BE REVIEWED TO IDENTIFY WHICH ONES CAN BE SEEDED IN PREPARATION FOR THE WINTER RAINS. DISTURBED AREAS SHOULD BE SEEDED WITHIN A WEEK OF BEGINNING OF THE WET SEASON. AT FINAL SITE STABILIZATION, ALL DISTURBED AREAS NOT OTHERWISE VEGETATED OR STABILIZED SHALL BE SEEDED AND MULCHED.

2. DESIGN AND INSTALLATION SPECIFICATIONS

2.1. THE BEST TIME TO SEED IS APRIL 1 THROUGH JUNE 30, AND SEPTEMBER 1 THROUGH OCTOBER 15. AREAS MAY BE SEEDED BETWEEN JULY 1 AND AUGUST 31, BUT IRRIGATION MAY BE REQUIRED IN ORDER TO GROW ADEQUATE COVER. AREAS MAY ALSO BE SEEDED DURING THE WINTER MONTHS, BUT IT MIGHT TAKE SEVERAL MONTHS TO DEVELOP A DENSE GROUNDCOVER DUE TO COLD TEMPERATURES.

2.2. TO PREVENT SEED FROM BEING WASHED AWAY CONFIRMED THAT ALL REQUIRED SURFACE WATER CONTROL MEASURES HAVE BEEN INSTALLED.

2.3. THE SEEDBED SHOULD BE FIRM BUT NOT COMPACTED.

2.4. IN GENERAL, 10-20-20N-P-K FERTILIZER MAY BE USED AT A RATE OF 90 POUNDS PER ACRE. IT IS RECOMMENDED THAT AREAS BEING SEEDED FOR FINAL LANDSCAPING CONDUCT SOIL TO DETERMINE THE EXACT TYPE AND QUANTITY OF FERTILIZER NEEDED. DISTURBED AREAS WITHIN 200 FEET OF WATER BODIES AND WETLANDS MUST USE SLOW RELEASE LO-PHOSPHORUS FERTILIZER.

2.5. THE FOLLOWING REQUIREMENTS APPLY FOR MULCHING

2.5.1. MULCH IS ALWAYS REQUIRED FOR SEEDING SLOPES GREATER THAN 3H:1V

2.5.2. IF SEEDING DURING WET SEASON MULCH IS REQUIRED

2.5.3. THE USE OF MULCH MAY BE REQUIRED DURING WET SEASON AT THE CITY'S DISCRETION IF GRASS GROWTH IS EXPECTED TO BE SLOW, THE SOILS ARE HIGHLY ERODIBLE DUE TO SOIL TYPE OR GRADIENT, THERE IS A WATER BODY CLOSE TO THE DISTURBED AREA, OR SIGNIFICANT PRECIPITATION IS ANTICIPATED BEFORE THE GRASS WILL PROVIDE EFFECTIVE COVER.

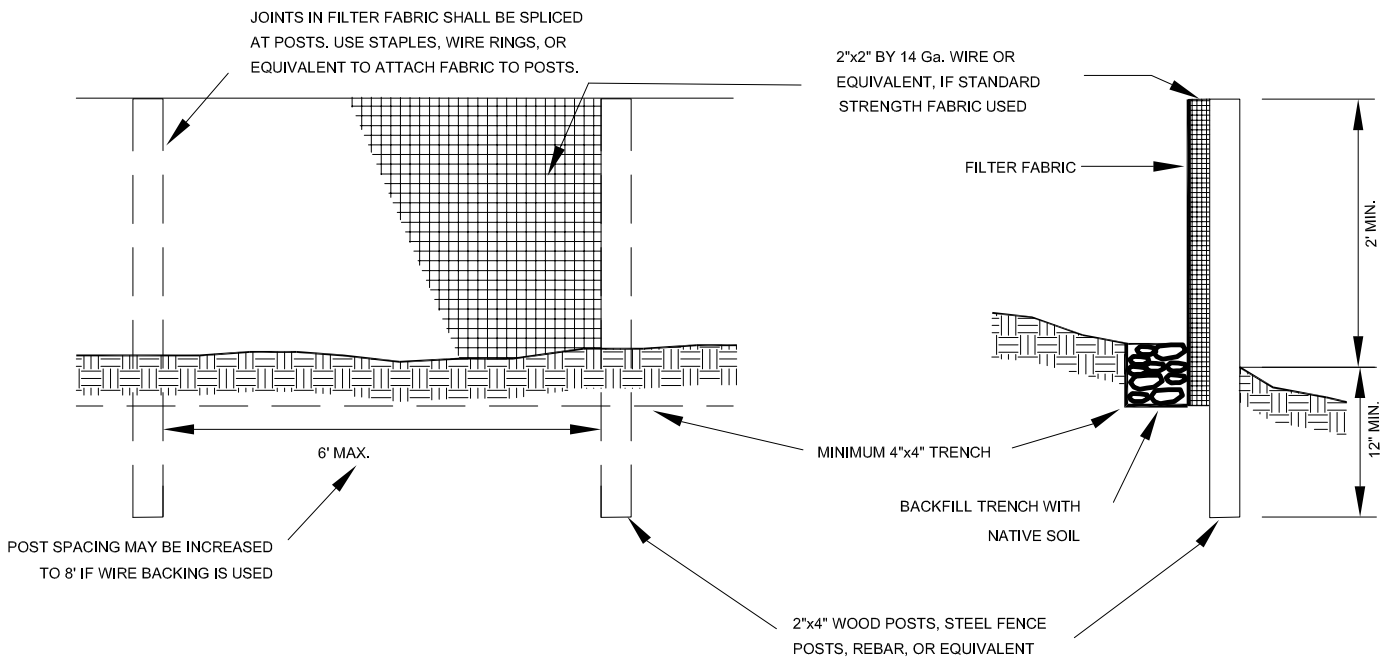
2.5.4. MULCH MAY BE APPLIED IN TOP OF THE SEED OR SIMULTANEOUSLY BY HYDROSEEDING.

2.6. HYDROSEEDING IS ALLOWED AS LONG AS TRACKIFIER IS INCLUDED. HYDROSEEDING WITH WOOD FIBER MULCH IS ADEQUATE DURING THE DRY SEASON. HYDROSEEDING WITH WOOD FIBER MULCH IS ADEQUATE DURING THE DRY SEASON. DURING THE WET SEASON, THE APPLICATION RATE SHOULD BE DOUBLED. IT MIGHT BE NECESSARY IN SOME APPLICATIONS TO INCLUDE STRAW WITH THE WOOD FIBER, BUT THIS CAN BE DETERMINED TO GERMINATION.

2.7. AREAS TO BE PERMANENTLY LANDSCAPED SHALL USE SOIL AMENDMENTS. GOOD QUALITY TOPSOIL SHALL BE TILLED INTO THE TOP SIX INCHES TO REDUCE THE NEED FOR FERTILIZER AND IMPROVED THE OVERALL SOIL QUALITY. MOST NATIVE SOILS WILL REQUIRE THE ADDITION OF 4 INCHES OF WELL-ROTTED COMPOST TO BE TILLED INTO THE SOIL TO PROVIDE A GOOD QUALITY TOPSOIL.

CITY OF RENTON PUBLIC WORKS DEPARTMENT	**STRAW WATTLES**	**STD. PLAN – 213.40** MARCH 2008

DRAWN BY: MARK SUJKA



NOTES

1. CONDITION OF USE

1.1. SILT FENCE MAY BE USED DOWNSLOPE OF ALL DISTURBED AREAS.
1.2. SILT FENCE IS NOT INTENDED TO TREAT CONCENTRATED FLOWS, NOR IS INTENDED TO TREAT SUBSTANTIAL AMOUNTS OF OVERLAND FLOW. ANY CONCENTRATED FLOW MOST BE CONVEYED THROUGH THE DRAINAGE SYSTEM TO A SEDIMENT TRAP OR POND.

2. DESIGN AND INSTALLATION SPECIFICATIONS

2.1. THE GEOTEXTILE USED MOST MET THE STANDARD LISTED BELLOW. A COPY OF THE MANUFACTURER'S FABRIC SPECIFICATIONS MOST BE AVAILABLE ON SITE.

AOS (ASTM D4751)	30-100 SIEVE SIZE (0.60-0.15MM) FOR SILT FILM 50-100 SIEVE SIZE (0.30-0.15MM) FOR OTHER FABRICS
WATER PERMITTIVITY (ASTM D491)	0.02 SEC^-1 MINIMUM
GRAB TENSILE STRENCHT (ASTM D4632)	180 LBS. MIN. FOR EXTRA STRENGH FABRIC 100 LBS. MIN. FOR STANDARD STRENGHT FABRIC
GRAB TENSILE ELONGATION (ASTM D4632)	30 % MAX.
ULTRAVIOLATE RESISTANCE (ASTM D4355)	70 % MIN.

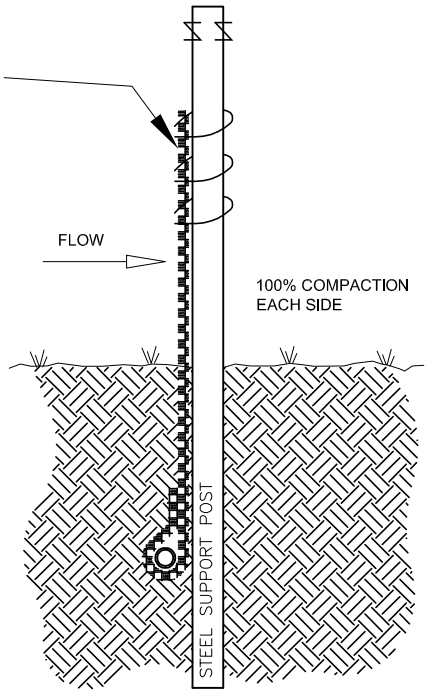
2.2. STANDARD STRENGTH FABRIC REQUIRES WIRE BACKING TO INCREASE THE STRENGTH OF THE FENCE. WIRE BACKING OR CLOSER POST SPACING MAY BE REQUIRED FOR EXTRA STRENGTH FABRIC IF FIELD PERFORMANCE WARRANTS A STRONGER FENCE.
2.3. WHERE THE FENCE IS INSTALLED, THE SLOPE SHALL NOT BE STEEPER THAN 2H:1V
2.4. IF A TYPICAL SILT FENCE IS USED, THE STANDARD 4X4 TRENCH MAY NOT BE REDUCED AS LONG AS THE BOTTOM 8 INCHES OF THE SILT FENCE IS WELL BURIED AND SECURE IN A TRENCH THAT STABILIZES THE FENCE AND DOES NOT ALLOW WATER TO BYPASS OR UNDERMINE THE SILT FENCE.

3. MAINTENANCE STANDARDS

3.1. ANY DAMAGE SHALL BE REPAIR IMMEDIATELY.
3.2. IF CONCENTRATED FLOES ARE EVIDENT UPHILL OD THE FENCE, THEY MUST BE INTERCEPTED AND CONVEYED TO A SEDIMENT TRAP OR POND.
3.3. IT IS IMPORTANT TO CHECK THE UPHILL SIDE OF THE FENCE FOR SIGNS OF THE FENCE CLOGGING AND ACTING AS A BARRIER TO FLOW AND THEN CAUSING CHANNELIZATION OF FLOWS PARALLEL TO THE FENCE. IF THIS OCCURS, REPLACE THE FENCE OR REMOVED THE TRAP SEDIMENT.
3.4. SEDIMENT MOST BE REMOVED WHEN SEDIMENT IS 6 INCHES HIGH.
3.5. IF THE FILTER FABRIC (GEOTEXTILE) HAS DETERIORATED DUE TO ULTRAVIOLET BREAKDOWN, IT SHALL BE REPLACED.

CITY OF RENTON PUBLIC WORKS DEPARTMENT	**SILT FENCE**	**STD. PLAN – 214.00** MARCH 2008

DRAWN BY: MARK SUJKA



NOTES:

1. POST SPACING: 7' MAX. ON OPEN RUNS 4' MAX. ON POOLING AREAS.

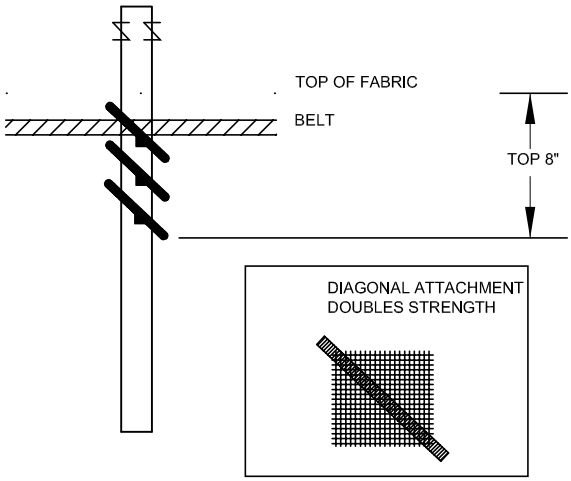
2. POST DEPTH: AS MUCH BELOW GROUND AS FABRIC ABOVE GROUND.

3. PONDING HEIGHT MAX. 24" ATTACH FABRIC TO UPSTREAM SIDE OF POST.

4. DRIVE OVER EACH SIDE OF SILT FENCE 2 TO 4 TIMES WITH DEVICE EXERTING 60 P.S.I. OR GREATER.

5. NO MORE THAN 24" OF A 36" FABRIC S ALLOWED ABOVE GROUND.

6. VIBRATORY PLOW IS NOT ACCEPTABLE BECAUSE OF HORIZONTAL COMPACTION.



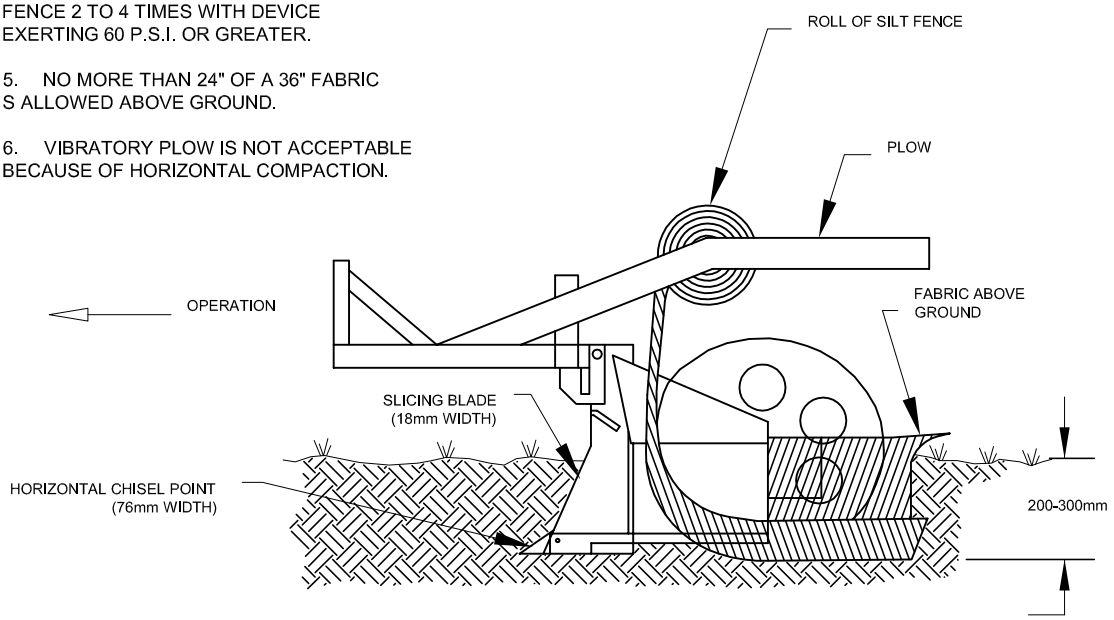
ATTACHMENT DETAILS:

1. GATHER FABRIC AT POSTS, IF NEEDED.

2. UTILIZE THREE TIES PER POST, ALL WITHIN TOP 8" OF FABRIC.

3. POSITION EACH TIE DIAGONALLY, PUNCTURING HOLES VERTICALLY A MINIMUM OF 1" APART.

4. HANG EACH TIE ON A POST NIPPLE AND TIGHTEN SECURELY. USE CABLE TIES (50 LBS) OF SOFT WIRE.



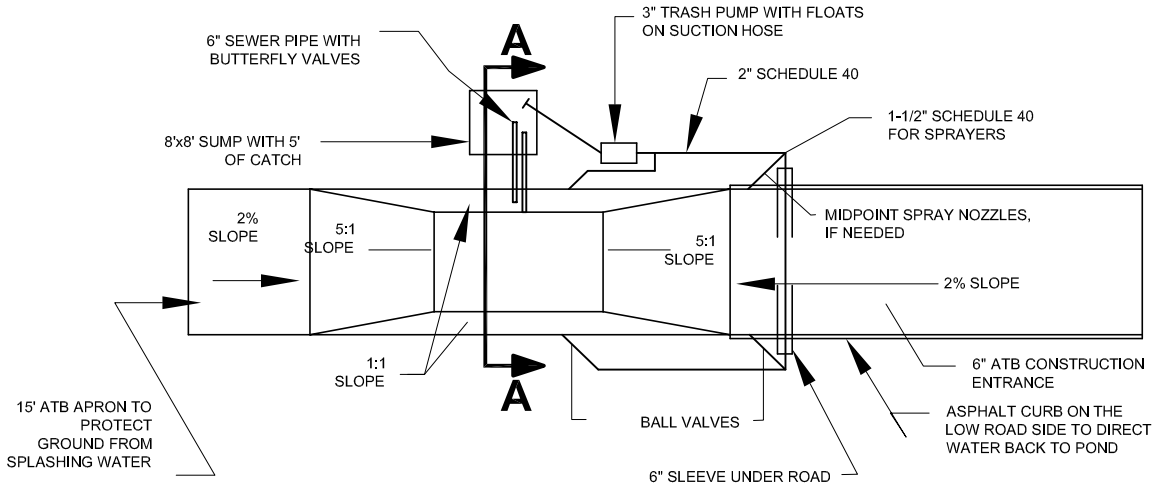
PUBLIC WORKS DEPARTMENT

SILT FENCE INSTALLATION BY SLICING

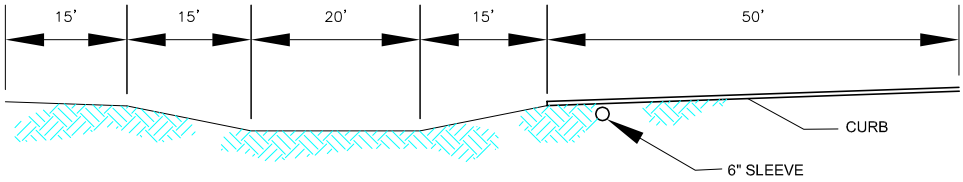
STD. PLAN – 214.10

MARCH 2008

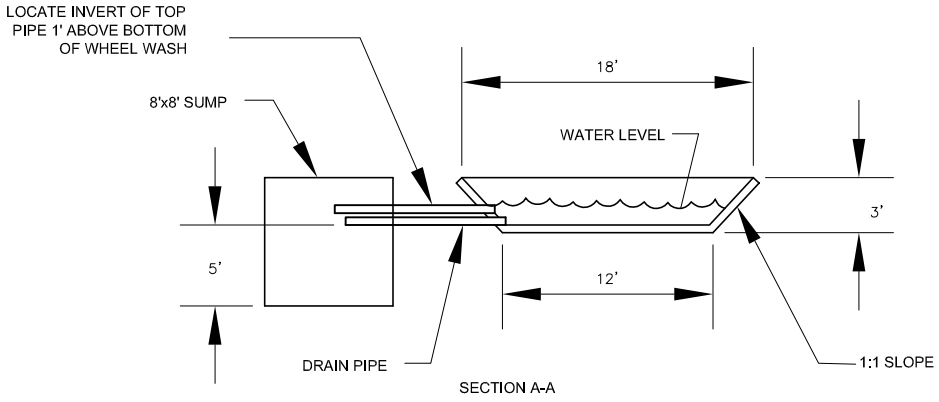
DRAWN BY: MARK SUJKA



PLAN VIEW



ELEVATION VIEW



SECTION A-A

NOTES:

1. BUILD 8'x8' SUMP TO ACCOMODATE CLEANING BY TRACKHOE.

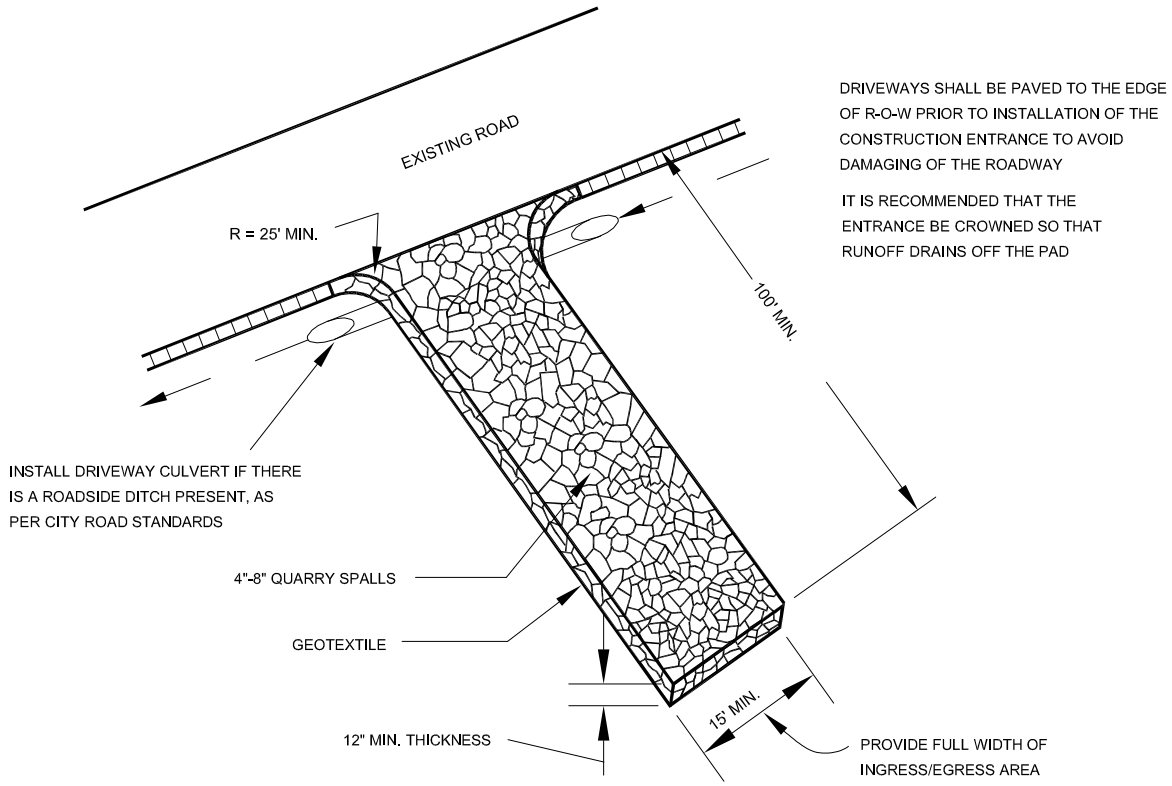
PUBLIC WORKS DEPARTMENT

WHEEL WASH AND PAVED CONSTRUCTION ENTRANCE

STD. PLAN – 215.00

MARCH 2008

DRAWN BY: MARK SUJKA



NOTES

1. CONDITION OF USE

1.1. CONSTRUCTION ENTRANCE SHALL BE STABILIZED WHEREVER TRAFFIC WILL BE LEAVING A CONSTRUCTION SITE AND TRAVELING ON PAVED ROADS OR OTHER PAVED AREAS WITHIN 1,000 FEET OF THE SITE.

GRAB TENSILE STREBNGTH (ASTM D4751)	200 PSI MIN.
GRAB TENSILE ELONGATION (ASTM D4632)	30% MAX.
MULLEN BURST STRENGTH (ASTM D3786-80A)	400 PSI MIN.
AOS (ASTM D4751)	20-45 (U.S. STANDARD SIEVE SIZE)

2. DESIGN AND INSTALLATION SPECIFICATIONS

2.1. HOG FUEL (WOOD BASED MULCH) MAY BE SUBSTITUTED FOR OR COMBINED WITH QUARRY SPALLS IN ARES THAT WILL BOT BE USED FOR PERMANENT ROADS. HOG FUEL IS NOT RECOMMENDED FOR ENTRANCE STABILIZATION IN URBAN AREAS. THE INSPECTOR MAY AT ANY TIME REQUIRE THE USE OF QUARRY SPALLS IF THE HOG FUEL IS NOT PREVENTING SEDIMENT FROM BEING TRACKED ONTO PAVEMENT OR IF THE HOG FUEL IS BEING CARRIED ONTO PAVEMENT.

2.2. FENCING SHALL BE INSTALLED AS NECESSARY TO RESTRICT TRAFFIC TO THE CONSTRUCTION ENTRANCE.

2.3. WHENEVER POSSIBLE, THE ENTRANCE SHALL BE CONSTRUCTED ON A FIRM, COMPACTED SUBGRADE. THIS CAN SUBSTANTIALLY INCREASE THE EFFECTIVENESS OF THE PAD AND REDUCE THE NEED FOR MAINTENANCE.

3. MAINTENANCE STANDARDS

3.1. QUARRY SPALLS SHALL BE ADDED IF THE PAD IS NO LONGER IN ACCORDANCE WITH THE SPECIFICATIONS.

3.2. IF THE ENTRANCE IS NOT PREVENTING SEDIMENT BEING TRACKED ONTO PAVEMENT, THEN ALTERNATIVE MEASURES TO KEEP THE STREETS FREE OF SEDIMENT SHALL BE USED. THIS MAY INCLUDE STREET SWEEPING, AN INCREASE IN THE DIMENSIONS OF THE ENTRANCE, OR THE INSTALLATION OF THE WHEEL WASH. IF WASHING IS USED, IT SHALL BE DONE ON AN AREA COVERED WITH CRUSHED ROCK, AND WASHED WATER SHALL DRAIN TO A SEDIMENT TRAP OR POND.

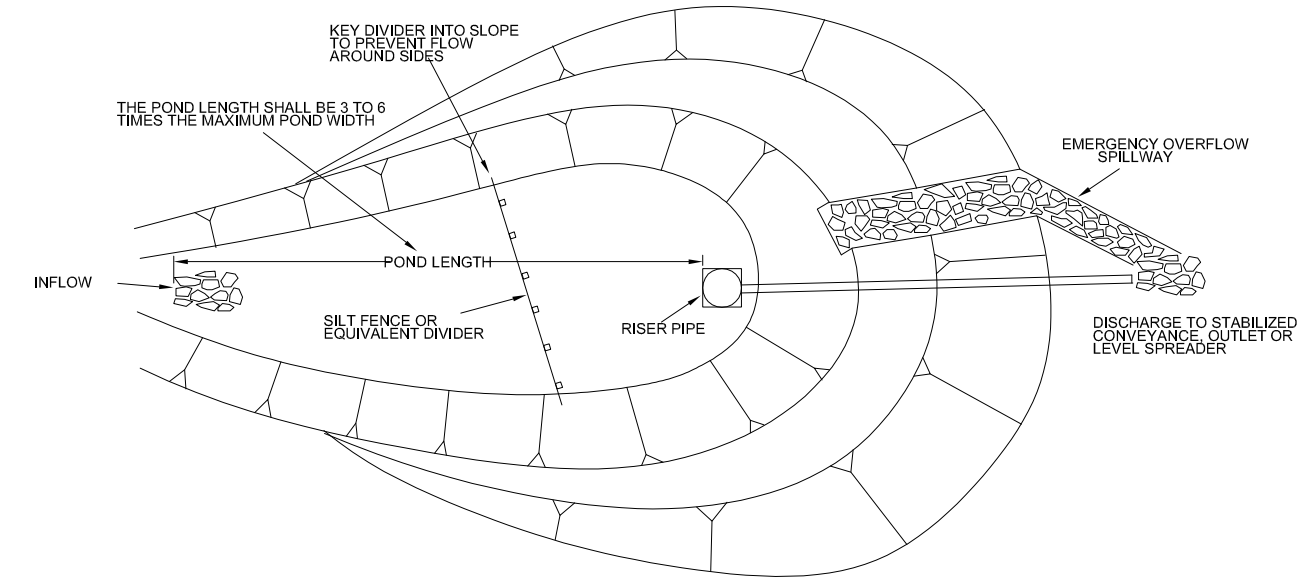
3.3. ANY SEDIMENT THAT IS TRACKED ONTO PAVEMENT SHALL BE REMOVED IMMEDIATELY BY SWEEPING. THE SEDIMENT COLLECTED BY SWEEPING SHALL BE REMOVED OR STABILIZED ON SITE. THE PAVEMENT SHALL NOT BE CLEANED BY WASHING DOWN THE STREET, EXCEPT WHEN SWEEPING IS INEFFECTIVE AND THERE IS A THREAT TO PUBLIC SAFETY. IF IT NECESSARY TO WASH THE STREETS, A SMALL SUMP MUST BE CONDUCTED. THE SEDIMENT WOULD THEN BE WASHED INTO THE SUMP WHERE IT CAN BE CONTROLLED AND DISCHARGED APPROPRIATELY.

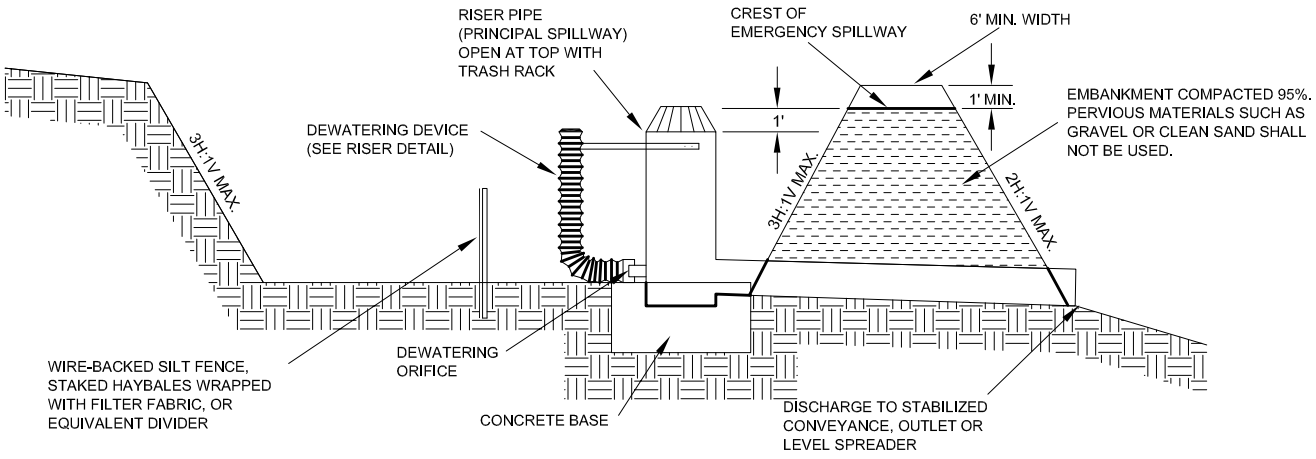
3.4. ANY QUARRY SPALLS THAT ARE LOOSENED FROM THE PAD AND END UP ON THE ROADWAY SHALL BE REMOVED IMMEDIATELY.

3.5. IF VEHICLES ARE ENTERING OR EXITING THE SITES AT POINTS OTHER THAN THE CONSTRUCTION ENTRANCE(S), FENCING SHALL BE INSTALLED TO CONTROL TRAFFIC.

CITY OF RENTON PUBLIC WORKS DEPARTMENT	**STABILIZED CONSTRUCTION ENTRANCE**	**STD. PLAN – 215.10** MARCH 2008

DRAWN BY: MARK SUJKA





NOTES

1. CONDITION OF USE

1.1. A SEDIMENT POND SHALL BE USED WHERE THE CONTRIBUTING DRAINAGE AREA IS 3 ACRES OR MORE.

2. DESIGN AND INSTALLATION SPECIFICATIONS

2.1. THE POND SHALL BE DIVIDED INTO TWO ROUGHLY EQUAL VOLUME CELLS BY A PERMEABLE DIVIDER THAT WILL REDUCE TURBULENCE WHILE ALLOWING MOVEMENT OF WATER BETWEEN CELLS. THE DIVIDER SHALL BE AT LEAST ONE HALF OF THE HEIGHT OF THE RISER. WIRE - BACKED, 2-TO 3 FOOT HIGH, EXTRA STRENGTH FILTER FABRIC SUPPORTED BY TREATED 4"X4"s MAY BE USED AS A DIVIDER. ALTERNATIVELY, STAKED STRAW BALES WRAPPED WITH FILTER FABRIC MAY BE USED.

2.2. IF THE POND IS MORE THAN 6 FEET DEEP, A DIFFERENT MECHANISM MUST BE PROPOSED.

2.3. TO AID IN DETERMINING SEDIMENT DEPTH, ONE-FOOT INTERVALS SHALL BE PROMINENTLY MARKED ON THE RISER.

3. MAINTENANCE STANDARDS

3.1. SEDIMENT SHALL BE REMOVED FROM THE POND WHEN IT REACHES 1 FOOT IN DEPTH.

3.2. ANY DAMAGES TO THE POND EMBANKMENTS OR SLOPES SHALL BE REPLACED.

CITY OF RENTON

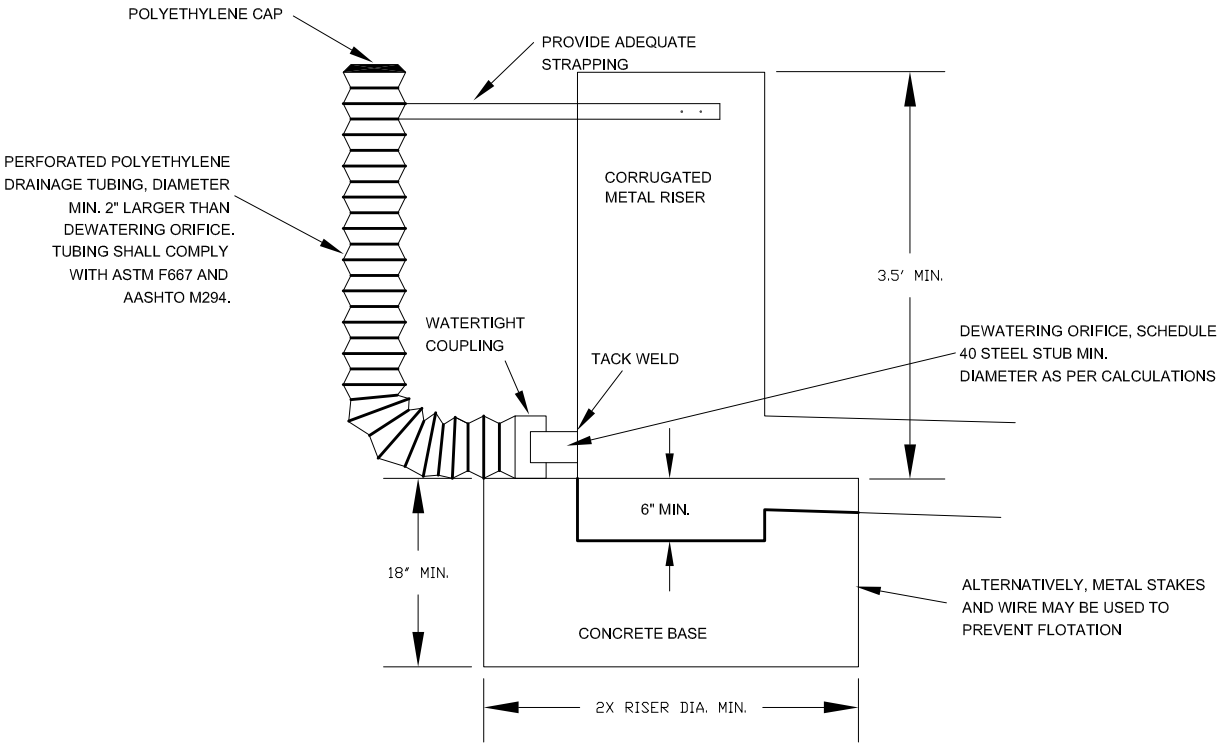
PUBLIC WORKS DEPARTMENT

SEDIMENT POND PLAN VIEW AND CROSS SECTIONS

STD. PLAN – 216.00

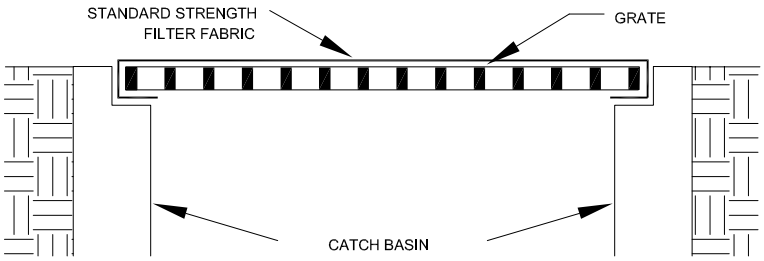
MARCH 2008

DRAWN BY: MARK SUJKA



CITY OF RENTON — PUBLIC WORKS DEPARTMENT	**SEDIMENT POND RISER DETAIL**	**STD. PLAN – 216.10** MARCH 2008

DRAWN BY: MARK SUJKA



NOTES

1. CONDITION OF USE

1.1. SHALL BE PROVIDED FOR ALL STORM DRAIN INLETS DOWNSLOPE AND WITHIN 500 FEET OF A DISTURBED OR CONSTRUCTION AREA, UNLESS THE RUNOFF THAT ENTERS THE CATCHBASIN WILL BE CONVEYED TO A SEDIMENT POND OR TRAP.
1.2. MAY BE USED ANYWHERE AT THE APPLICANT'S DISCRETION TO PROTECT DRAINAGE SYSTEM.
1.3. THE CONTRIBUTING DRAINAGE AREA MOST NOT BE LARGER THAN 1 ACRE.

2. DESIGN AND INSTALLATION SPECIFICATIONS

2.1. FILTER FABRIC IS ONLY ALLOWED WERE PONDING WILL NOT BE A TRAFFIC CONCERN AND WHERE SLOPE EROSION WILL NOT RESULT IF THE CURB IS OVERTOPPED BY PONDED WATER.
2.2. THE PLACEMENT OF A FILTER FABRIC UNDER GRATES IS GENERALLY PROHIBITED AND THE USE OF FILTER FABRIC OVER GRATES IS STRICTLY LIMITED AND DISCOURAGED.

3. MAINTENANCE STANDARDS

3.1. ANY ACCUMULATED SEDIMENT ON OR AROUND INLET PROTECTION SHALL BE REMOVED IMMEDIATELY. SEDIMENT SHALL NOT BE REMOVED WITH WATER AND ALL SEDIMENT MUST BE DISPOSED OF AS FILL ON SITE OR HAULED OFF SITE.

CITY OF RENTON

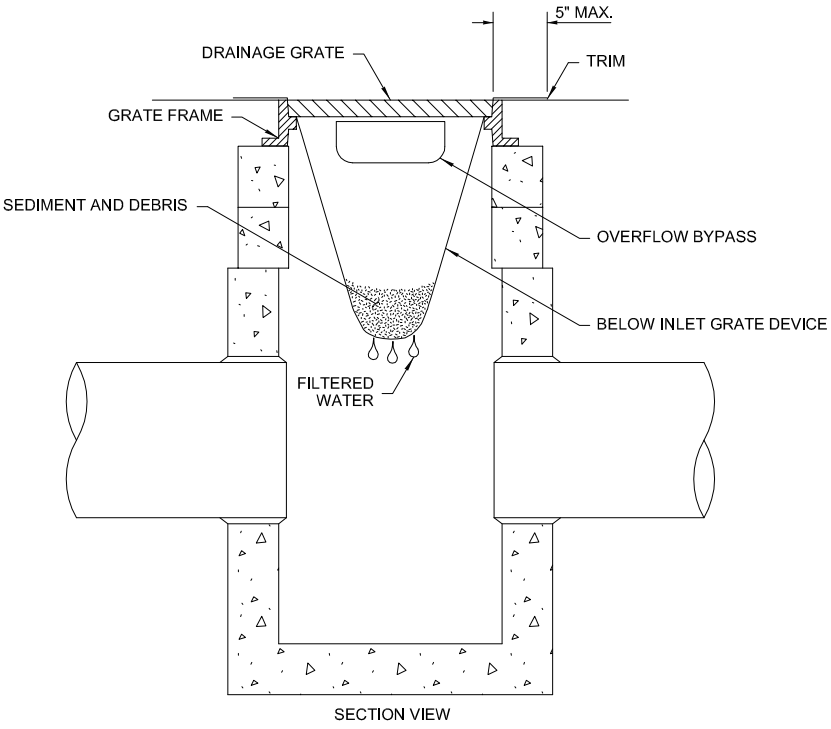
PUBLIC WORKS DEPARTMENT

FILTER FABRIC PROTECTION

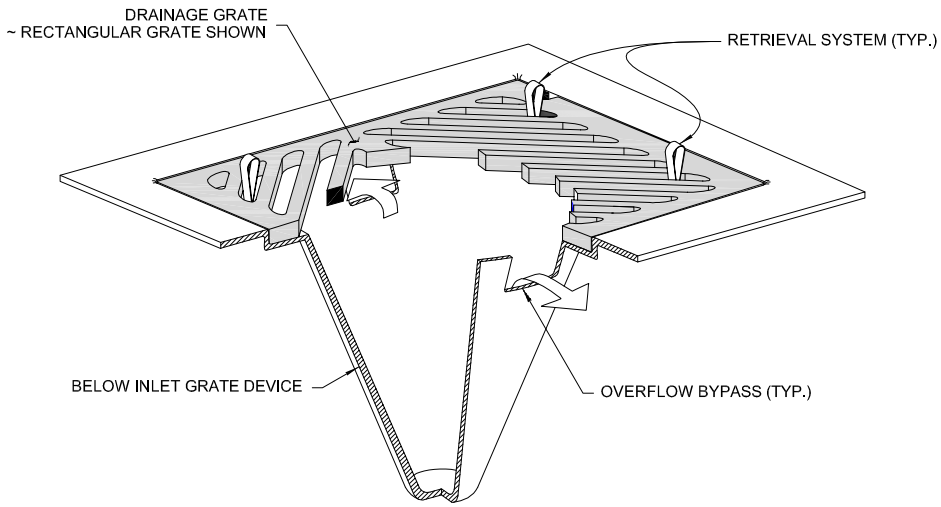
STD. PLAN – 216.20

MARCH 2008

DRAWN BY: MARK SUJKA



SECTION VIEW



ISOMETRIC VIEW

NOTES

1. Size the Below Inlet Grate Device (BIGD) for the storm water structure it will service.

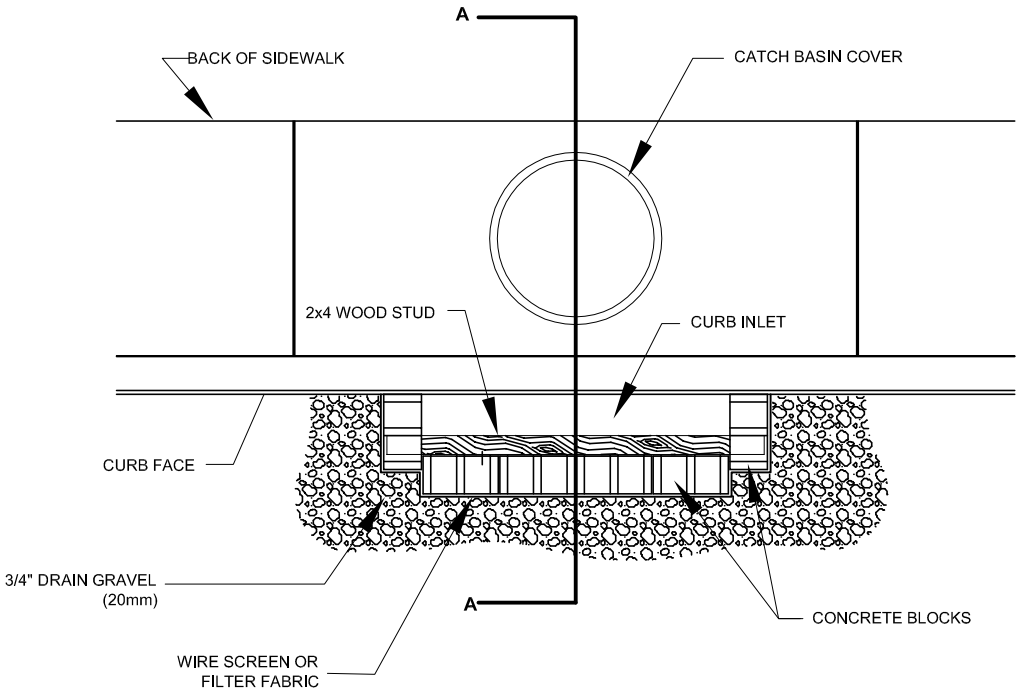
2. The BIGD shall have a built-in high-flow relief system (overflow bypass).

3. The retrieval system must allow removal of the BIGD without spilling the collected material.

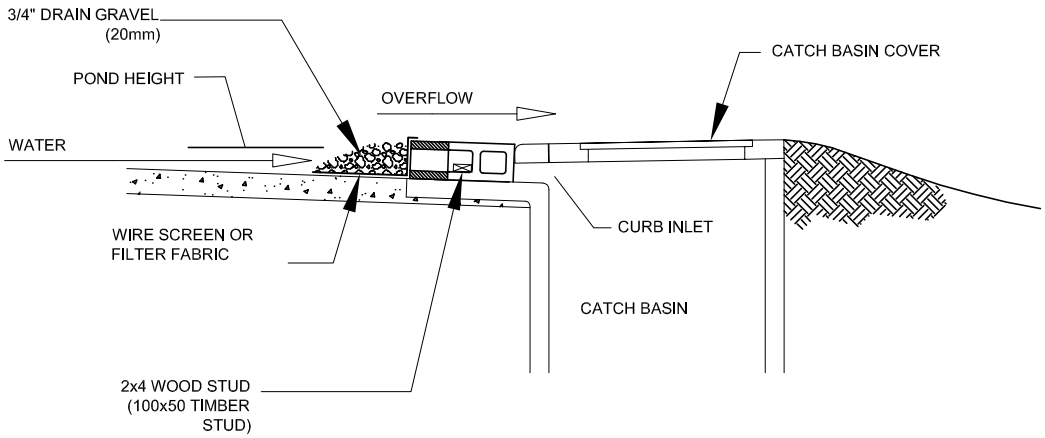
4. Perform maintenance in accordance with Standard Specification 8-01.3(15).

CITY OF RENTON PUBLIC WORKS DEPARTMENT	**CATCH BASIN FILTER**	**STD. PLAN – 216.30** MARCH 2008

DRAWN BY: MARK SUJKA



PLAN VIEW



SECTION A-A

NOTES:

1. USE BLOCK AND GRAVEL TYPE SEDIMENT BARRIER WHEN CURB INLET IS LOCATED IN GENTLY SLOPING SEGMENT, WHERE WATER CAN POND AND ALLOW SEDIMENT TO SEPARATE FROM RUNOFF.
2. BARRIER SHALL ALLOW FOR OVERFLOW FROM SEVERE STORM EVENT.
3. INSPECT BARRIERS AND REMOVE SEDIMENT AFTER EACH STORM EVENT. SEDIMENT AND GRAVEL MUST BE REMOVED FROM THE TRAVELED WAY IMMEDIATELY.

CITY OF RENTON

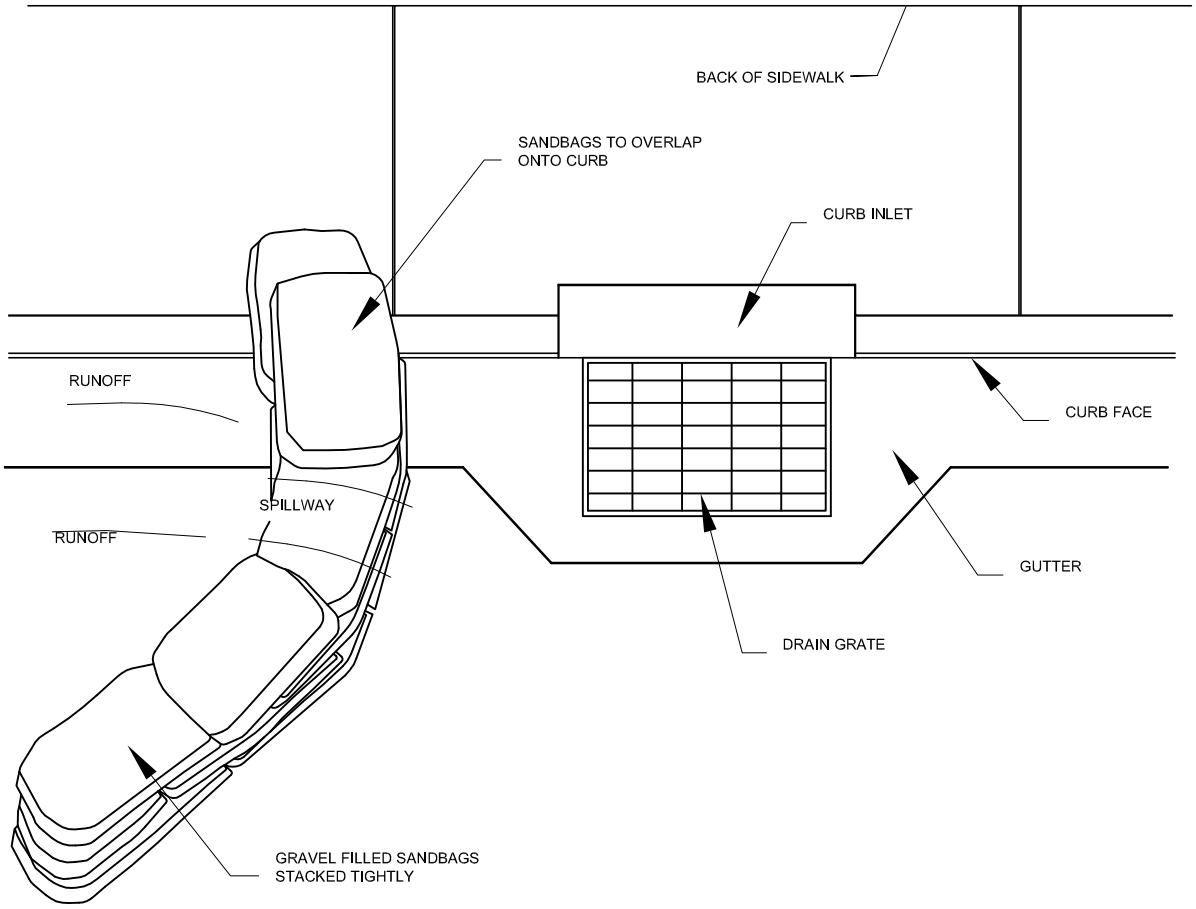
PUBLIC WORKS DEPARTMENT

BLOCK AND GRAVEL CURB INLET PROTECTION

STD. PLAN – 216.40

MARCH 2008

DRAWN BY: MARK SUJKA



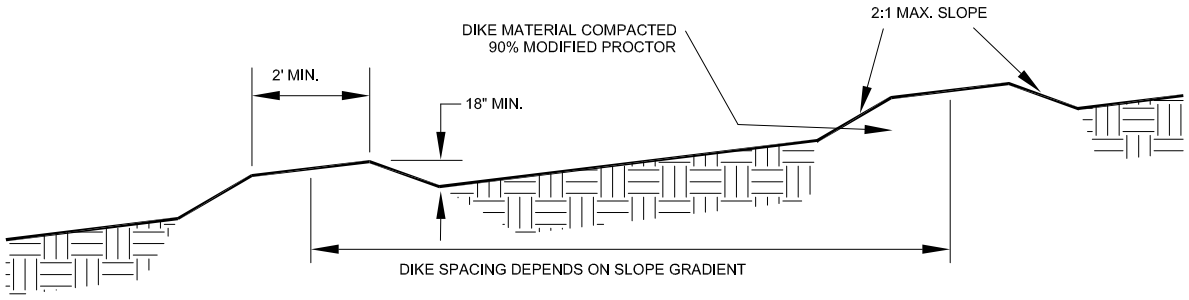
PLAN VIEW

NOTES:

1. PLACE CURB TYPE SEDIMENT BARRIERS ON GENTLY SLOPING STREET SEGMENTS, WHERE WATER CAN POND AND ALLOW SEDIMNENT TO SEPARATE FROM RUNOFF.
2. SANDBAGS OF EITHER BURLAP OR WOVEN GEOTEXTILE FABRIC, ARE FILLED WITH GRAVEL, LAYERED AND PACKED TIGHTLY.
3. LEAVE A ONE SANDBAG GAP IN THE TOP ROW TO PROVIDE A SPILLWAY FOR OVERFLOW.
4. INSPECT BARRIERS AND REMOVE SEDIMENT AFTER EACH STORM EVENT. SEDIMENT AND GRAVEL MUST BE REMOVED FROM THE TRAVELED WAY IMMEDIATELY.

CITY OF RENTON PUBLIC WORKS DEPARTMENT	**CURB AND GUTTER BARRIER PROTECTION**	**STD. PLAN – 216.50** MARCH 2008

DRAWN BY: MARK SUJKA



NOTES

1. CONDITION OF USE

1.1. REQUIRED AT:
1.1.1. THE TOP OF ALL SLOPES IN EXCESS OF 3H:1V AND WITH MORE THAN 20 FEET OF VERTICAL RELIEF.
1.1.2. AT INTERVALS ON ANY SLOPES THAT EXCEEDS THE DIMENSIONS SPECIFIED BELLOW.

AVERAGE SLOPE	SLOPE PERCENT	FLOWPATH LENGTH
20H:1V	3-5%	300 FEET
(10 TO 20)H:1V	5-10%	200 FEET
(4 TO 10)H:1V	10-25%	100 FEET
(2 TO 4)H:1V	25-50%	50 FEET

2. DESIGN AND INSTALLATION SPECIFICATIONS

2.1. FOR SLOPES STEEPER THAN 2H:1V WITH MORE THAN 10 FEET OF VERTICAL RELIEF, BENCHES MAY BE CONSTRUCTED OR CLOSER SPACED INTERCEPTOR DIKES MAY BE USED. THE DESIRE MEASURE MOST BE DESIGNED BY AN ENGINEER TO EFFECTIVELY INTERCEPT THE HIGH VELOCITY RUNOFF TO A SEDIMENT POND OR TRAP.
2.2. CONSTRUCTION TRAFFIC OVER TEMPORARY DIKES SHALL BE MINIMIZED.

3. MAINTENANCE STANDARDS

3.1. DAMAGE RESULTING FROM RUNOFF OR CONSTRUCTION ACTIVITY SHALL BE REPAIRED IMMEDIATELY.
3.2. IF THE FACILITY DO NOT REGULARLY RETAIN STORM RUNOFF, THE CAPACITY AND/OR FREQUENCY OF THE DIKES SHALL BE INCREASED.

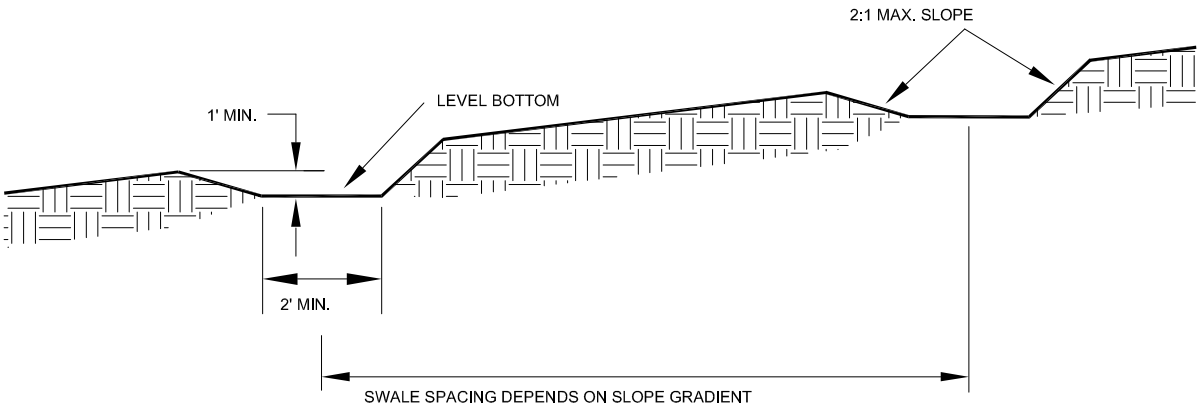
CITY OF RENTON
PUBLIC WORKS DEPARTMENT

INTERCEPTOR DIKE

STD. PLAN – 217.00

MARCH 2008

DRAWN BY: MARK SUJKA



NOTES

1. CONDITION OF USE

1.1. REQUIRED AT:
1.1.1. THE TOP OF ALL SLOPES IN EXCESS OF 3H:1V AND WITH MORE THAN 20 FEET OF VERTICAL RELIEF.
1.1.2. AT INTERVALS ON ANY SLOPES THAT EXCEEDS THE DIMENSIONS SPECIFIED BELLOW.

AVERAGE SLOPE	SLOPE PERCENT	FLOWPATH LENGTH
20H:1V	3-5%	300 FEET
(10 TO 20)H:1V	5-10%	200 FEET
(4 TO 10)H:1V	10-25%	100 FEET
(2 TO 4)H:1V	25-50%	50 FEET

2. DESIGN AND INSTALLATION SPECIFICATIONS

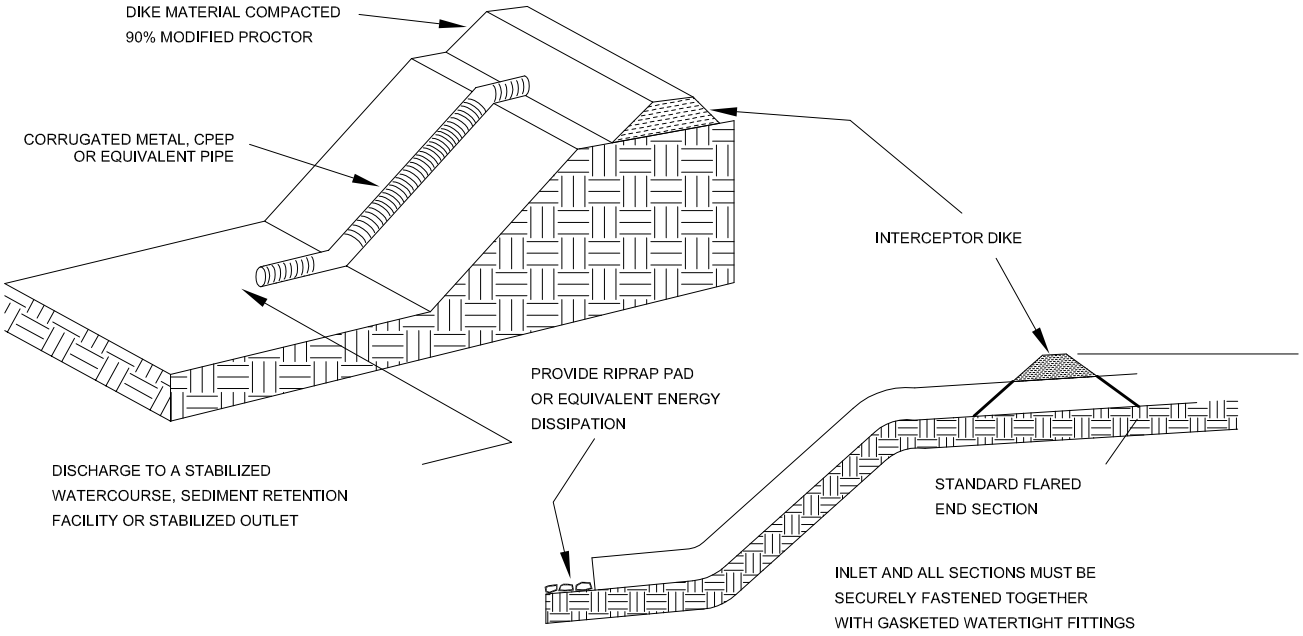
2.1. FOR SLOPES STEEPER THAN 2H:1V WITH MORE THAN 10 FEET OF VERTICAL RELIEF, BENCHES MAY BE CONSTRUCTED OR CLOSER SPACED INTERCEPTOR SWALES MAY BE USED. THE DESIRE MEASURE MOST BE DESIGNED BY AN ENGINEER TO EFFECTIVELY INTERCEPT THE HIGH VELOCITY RUNOFF TO A SEDIMENT POND OR TRAP.
2.2. CONSTRUCTION TRAFFIC OVER TEMPORARY SWALES SHALL BE MINIMIZED.

3. MAINTENANCE STANDARDS

3.1. DAMAGE RESULTING FROM RUNOFF OR CONSTRUCTION ACTIVITY SHALL BE REPAIRED IMMEDIATELY.
3.2. IF THE FACILITY DO NOT REGULARLY RETAIN STORM RUNOFF, THE CAPACITY AND/OR FREQUENCY OF THE SWALES SHALL BE INCREASED.

CITY OF RENTON PUBLIC WORKS DEPARTMENT	**INTERCEPTOR SWALE**	**STD. PLAN – 217.10** MARCH 2008

DRAWN BY: MARK SUJKA



NOTES

1. CONDITION OF USE

1.1. SHOULD BE USED TO CARRY CONCENTRATED RUNOFF DOWN STEEP SLOPES WITHOUT CAUSING EROSION, OR SATURATION OF SLIDE-PRONE SOILS.
1.1. WHEN A TEMPORARY OR PERMANENT STORMWATER CONVEYANCE IS NEEDED TO MOVE WATER DOWN A STEEP SLOPE TO AVOID EROSION.
1.1. MAY BE USED TO DIVERT WATER AWAY FROM OR OVER BARE SOIL TO PREVENT GULLIES, CHANNEL, AND SATURATION OF SLIDE PRONE SOILS.

2. DESIGN AND INSTALLATION SPECIFICATIONS

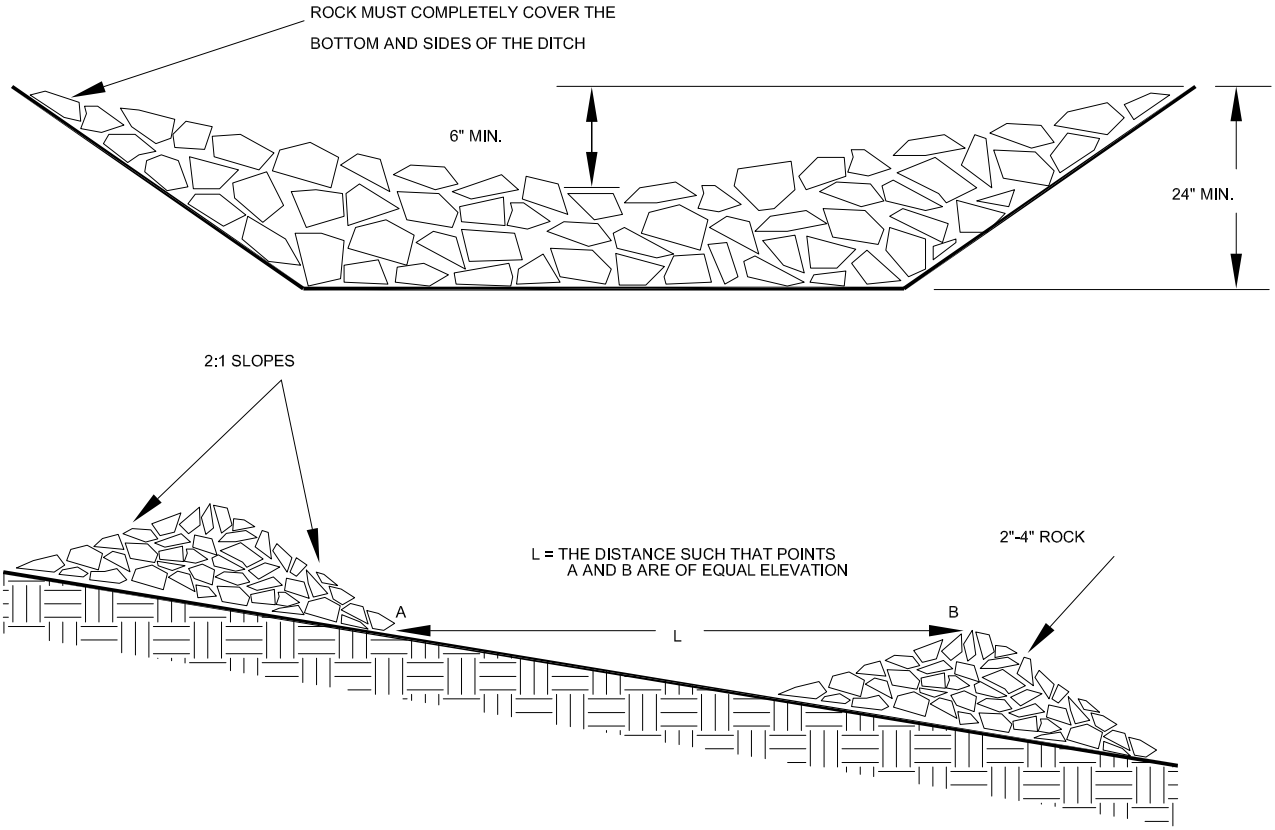
2.1. THE MAXIMUM DRAINAGE AREA ALLOWED FOR ANY SIZED PIPE IS 10 ACRES. FOR LARGER AREAS MORE THAN ONE PIPE SHALL BE USED OR A ROCK-LINES CHANNEL HALL BE INSTALLED.
2.2. THE SOIL AROUND AND UNDER THE PIPE AND ENTRANCE SECTION SHALL BE THOROUGHLY COMPACTED.
2.3. THE FLARED INLET SECTION SHALL BE SECURELY CONNECTED TO THE SLOPE DRAIN AND BE FUSED OR WELDED, OR HAVE FLANGE-BOLTED MECHANICAL JOINTS TO ENSURE WATERTIGHT SEAL.
2.4. SLOPE DRAINS SHALL BE CONTINUOUSLY FUSED, WELDED OR FLANGE-BOLTED MECHANICAL JOINT PIPE SYSTEM WITH PROPER ANCHOR TO THE SOIL.
2.5. WHERE THE SLOPE DRAIN CROSS STEEP SLOPE HAZARD AREA OR THEIR ASSOCIATED BUFFERS, THE INSTALLATION SHALL BE IN THE GROUND SURFACE. ANY AREA DISTURBED DURING INSTALLATION AND MAINTENANCE MUST BE IMMEDIATELY STABILIZED.

3. MAINTENANCE STANDARDS

3.1. THE INLET SHALL NOT BE UNDERCUT OR BYPASSED BY WATER. IF THERE ARE PROBLEMS, THE HEAD WALL SHALL BE APPROPRIATELY REINFORCED.
3.2. NO EROSION SHALL OCCUR ON THE OUTLET POINT. IF EROSION OCCURS ADDITIONAL PROTECTION SHALL BE ADDED.

CITY OF RENTON PUBLIC WORKS DEPARTMENT	**PIPE SLOPE DRAIN**	**STD. PLAN – 217.30** MARCH 2008

DRAWN BY: MARK SUJKA



NOTES

1. CONDITION OF USE

1.1. WERE CONCENTRATED RUNOFF FROM DISTURBED AREAS TO AND FROM PONDS OR TRAPS.
1.2. TO CONVEY RUNOFF INTERCEPTED FROM UNDISTURBED AREAS AROUND THE SITE TO A NON-EROSIVE DISCHARGE POINT.

2. MAINTENANCE STANDARDS

2.1. ANY SEDIMENT DEPOSITION OF MORE THAN 0.5 FEET SHALL BE REMOVED SO THAT THE CHANNEL IS RESTORED TO ITS ORIGINAL DESIGN CAPACITY.
2.2. THE CHECK DAMS SHALL BE EXAMINED FOR SIGNS OF SCOURING AND EROSION OF THE BED AND BANKS. IF SCOURING AND EROSION HAS OCCURRED, AFFECTED AREAS SHALL BE PROTECTED BY RIPRAP OR AN EROSION CONTROL BLANKET.

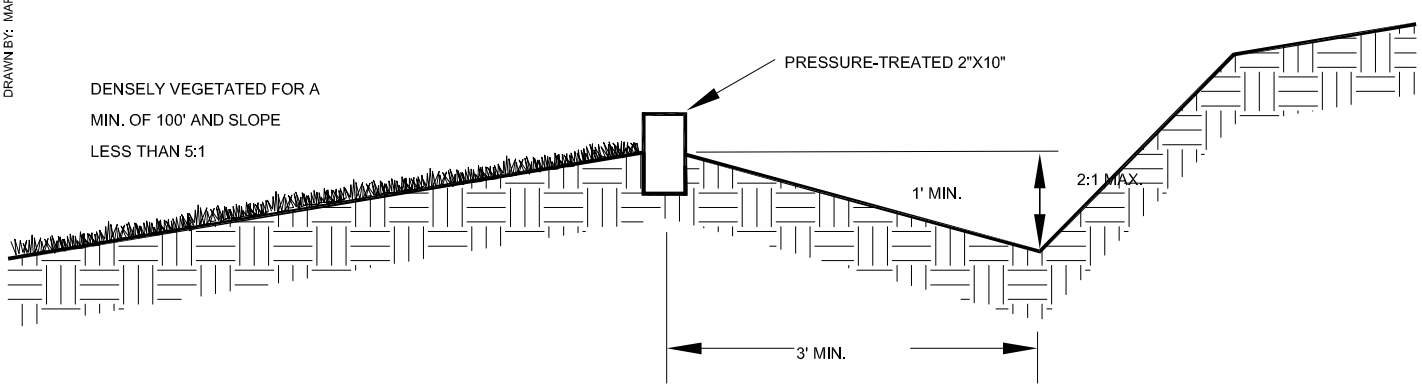
CITY OF RENTON
PUBLIC WORKS DEPARTMENT

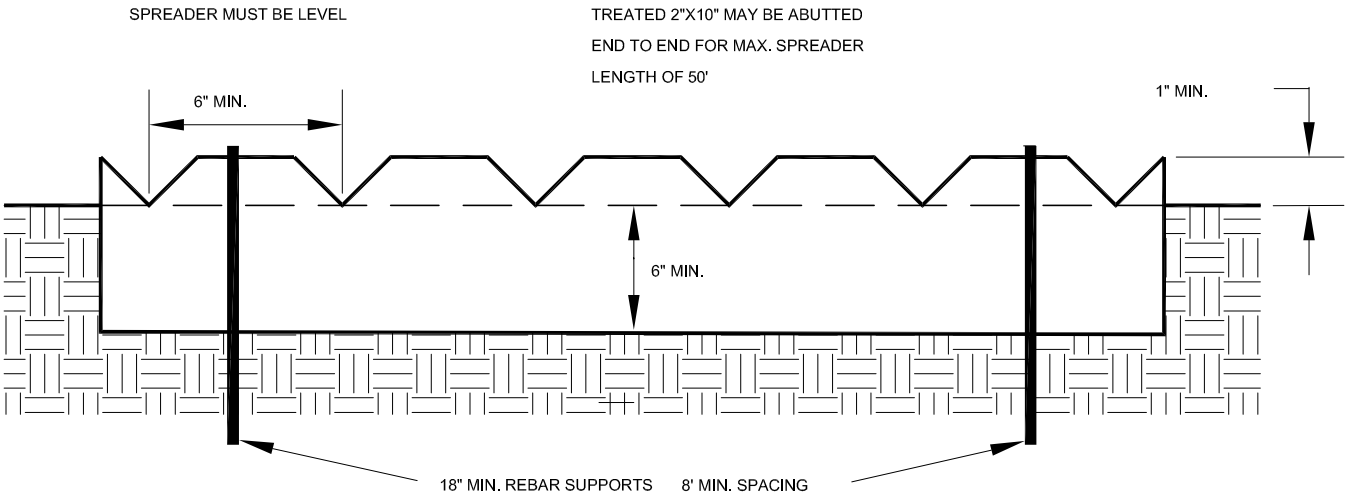
CHECK DAMS SPACING AND CROSS SECTIONS

STD. PLAN – 217.40

MARCH 2008

DRAWN BY: MARK SUJKA





ALTERNATIVELY, 6" DIA. CMP MAY BE USED AS A SPREADER.

THE PIPE SHALL BE BURIED SO THAT ONLY 1" EXTENDS ABOVE GROUND.

NOTES

1. CONDITION OF USE

1.1. MAY BE USED WHERE RUNOFF FROM UNDISTURBED AREAS OR SEDIMENT RETENTION FACILITIES IS DISCHARGED.
1.2. APPLIES ONLY WHERE THE SPREADER CAN BE CONSTRUCTED ON UNDISTURBED SOIL AND THE AREA BELOW THE LEVEL IS VEGETATED AND LOW GRADIENT.

2. DESIGN AND INSTALLATION SPECIFICATIONS

2.1. THE TOTAL SPREADER LENGTH SHALL BE AT LEAST THE SQUARE ROOT OF THE CATCHMENT AREA.
2.2. MAXIMUM LENGTH FOR AN INDIVIDUAL SPREADER IS 50 FEET.
2.3. MULTIPLE SPREADERS SHALL NOT BE PLACED UPHILL OR DOWNHILL FROM ONE ANOTHER.
2.4. THE AREA BELLOW THE SPREADER FOR A HORIZONTAL DISTANCE OF 100 FEET SHALL NOT EXCEED 20 PERCENT AND SHALL BE COMPLETELY VEGETATED WITH NO AREAS OF INSTABILITY OR EROSION.

3. MAINTENANCE STANDARDS

3.1. ANY DAMAGE TO THE SPREADER SHALL BE IMMEDIATELY REPAIRED.
3.2. THE DOWNSLOPE AREA SHALL BE CHECKED FOR SIGNS OF EROSION AND VERIFY THAT THE SPREADER IS NOT FUNCTIONING AS A POINT OF DISCHARGE.
3.2.1. ANY ERODED AREAS SHALL BE IMMEDIATELY STABILIZED, AND THE CAUSE DETERMINED AND ELIMINATED IF POSSIBLE.

CITY OF RENTON

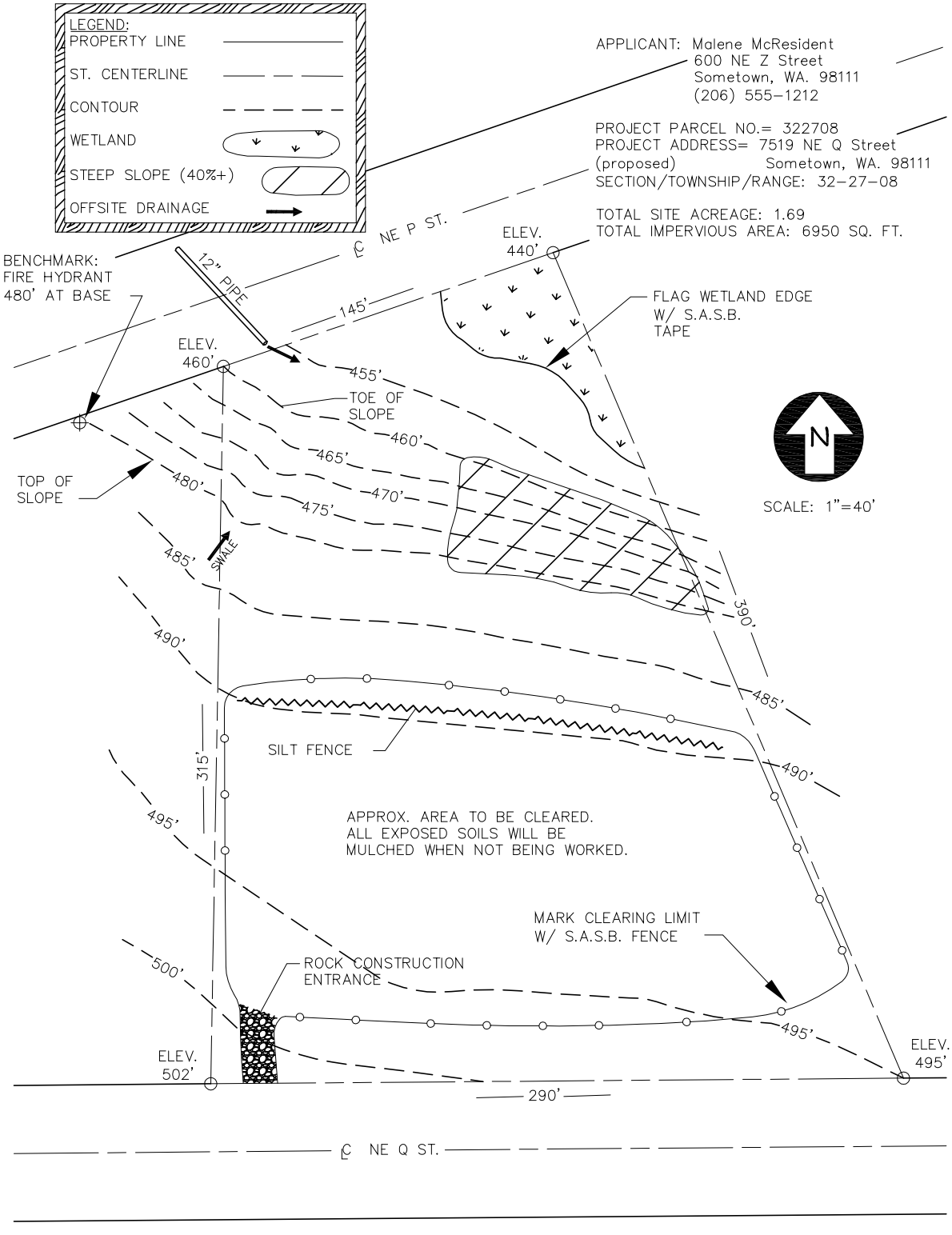
PUBLIC WORKS DEPARTMENT

LEVEL SPREADER DETAIL AND CROSS SECTION

STD. PLAN – 217.50

MARCH 2008

DRAWN BY: MARK SUJKA



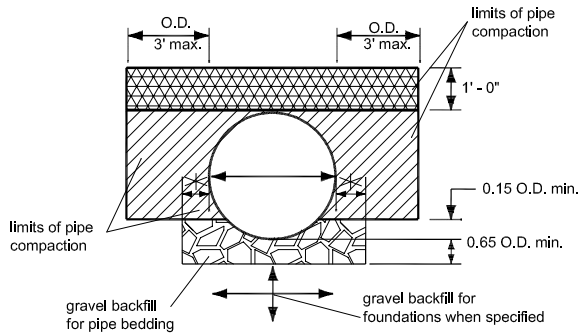
PUBLIC WORKS DEPARTMENT

SAMPLE SMALL SITE EROSION CONTROL PLAN

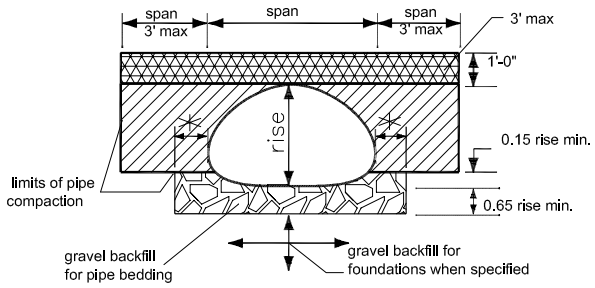
STD. PLAN – 218.00

MARCH 2008

DRAWN BY: MARK SUJKA



A. Metal and Concrete Pipe

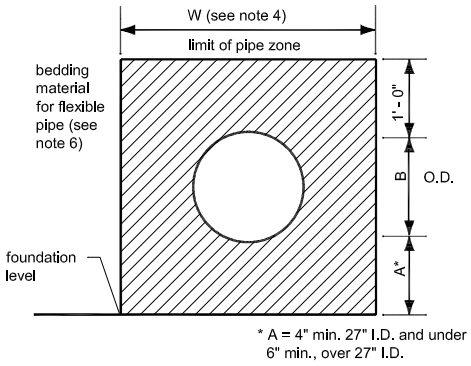


B. Pipe - Arch Installation

Rigid Pipe NOTES:

1. Pipe compaction limits shown on this plan are for pipe construction in an embankment. For pipe construction in a trench, the horizontal limits of the pipe compaction zone shall be the walls of the trench.
2. All steel and aluminum pipe and pipe-arches shall be installed in accordance with design A.
3. Concrete pipe with elliptical reinforcement shall be installed in accordance with design A.
4. Concrete pipe, plain or with circular reinforcement, shall be installed with design A.
5. O.D. is equal to the outside diameter of a pipe or the outside span of pipe-arch. The dimensions shown as O.D. with 3' maximum shall be O.D. until O.D. equals 3'; at which point 3' shall be used.

* 1'-0" for diameters 12" through 42" and spans through 50". 2'-0" for diameters greater than 42" and spans greater than 50".



Bedding for Flexible Pipe

Flexible Pipe NOTES:

1. Provide uniform support under barrels.
2. Hand tamp under haunches.
3. Compact bedding material to 95% max. density; directly over pipe, hand tamp only.
4. See "Excavation and Preparation of Trench" in sanitary sewers section of the standard WSDOT/APWA specifications for trench width "W" and trenching options. The pipe zone will be the actual trench width. The minimum concrete width shall be 1 $\frac{1}{2}$ I.D. = 18".
5. Trench backfill shall conform to "Backfilling Sewer Trenches" in the sanitary sewers section of the WSDOT/APWA standard specifications, except that rocks or lumps larger than 1" per foot of pipe diameter shall not be used in the backfill material.
6. See "Bedding Material for Flexible Pipe" in aggregates section of the WSDOT/APWA standard specifications for the material specifications.

Backfill material placed in 0.5' loose layers and compacted to 95% maximum density.

Method B or C compaction (WSDOT/APWA) standard specifications.)

Pipe	Size	Min. dist. between barrels
circular pipe conc., LCPE, CMP (diameter)	12" to 24"	12"
	30" to 96"	diam. / 2
	102" to 180"	48"
pipe - arch metal only (span)	18" to 36"	12"
	43" to 142"	span / 3
	148" to 199"	48"

CITY OF RENTON

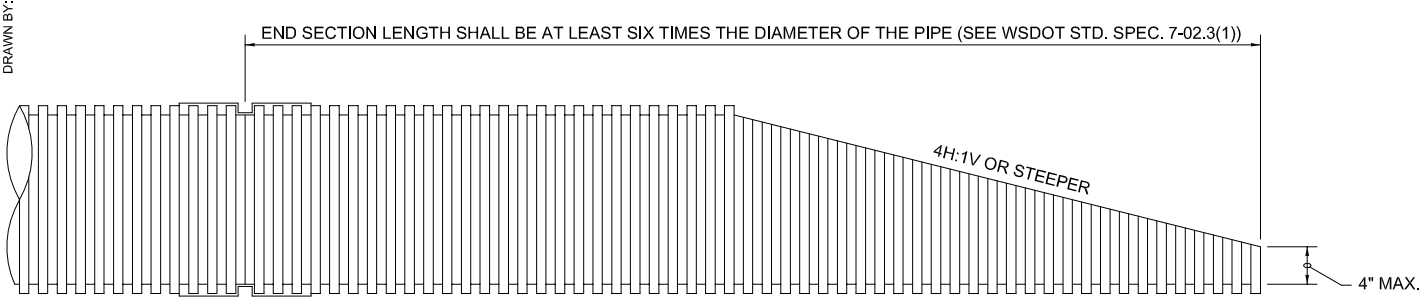
PUBLIC WORKS DEPARTMENT

PIPE COMPACTION DESIGN AND BACKFILL

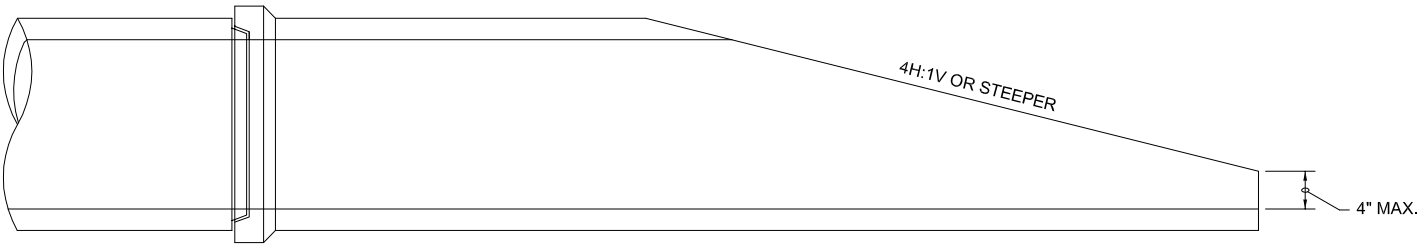
STD. PLAN – 220.00

MARCH 2008

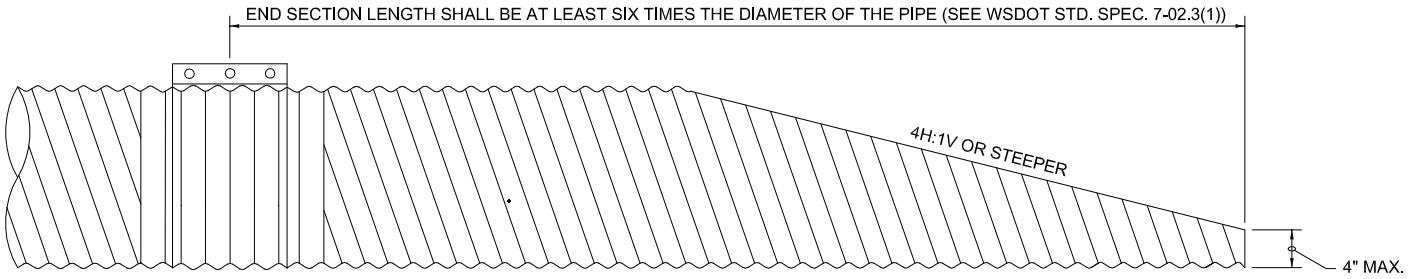
DRAWN BY: MARK SUJKA



THERMOPLASTIC PIPE



CONCRETE PIPE

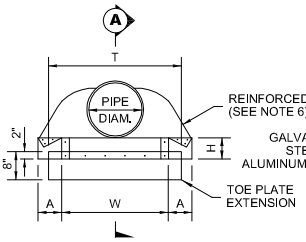


METAL PIPE

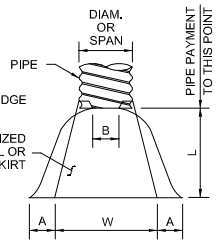
NOTES

1. The culvert ends shall be beveled to match the embankment or ditch slope and shall not be beveled flatter than 4H:1V. When slopes are between 4H:1V and 6H:1V, shape the slope in the vicintiy of the culvert end to ensure that no part of the culvert protrudes more than 4" above the ground line.
2. Field cutting of culvert ends is permitted when approved by the Engineer. All field-cut culvert pipe shall be treated with treatment as shown in the Standard Specifications or General Special Provisions.

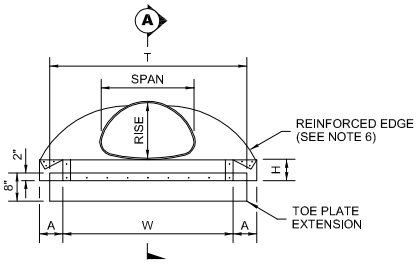
CITY OF RENTON PUBLIC WORKS DEPARTMENT	**BEVELED END SECTIONS**	**STD. PLAN – 221.00** MARCH 2008



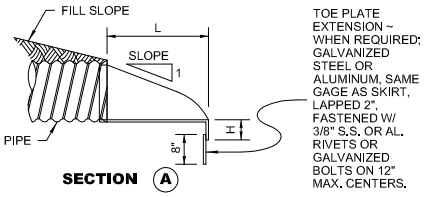
PIPE ~ ELEVATION



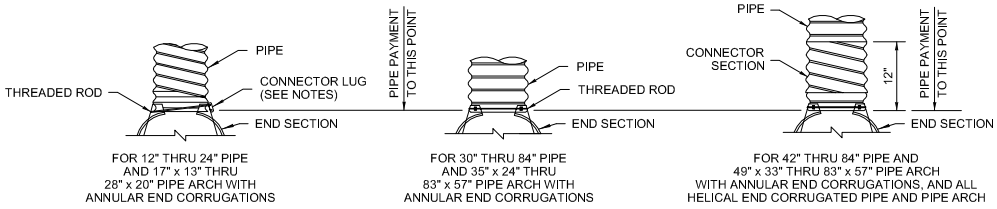
PIPE & PIPE ARCH ~ PLAN



PIPE ARCH ~ ELEVATION

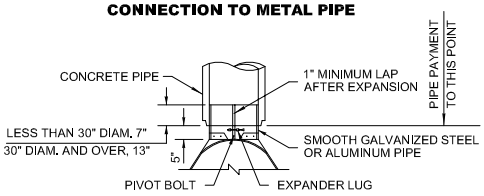


SECTION (A)

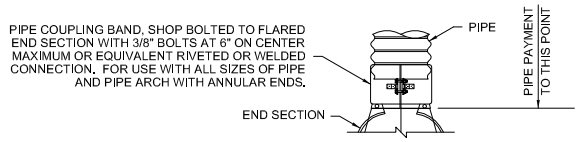


TYPE 1 **TYPE 2** **TYPE 3**

DESIGN A
CONNECTION TO METAL PIPE



DESIGN B
CONNECTION TO CONCRETE PIPE INLET END ONLY



DESIGN C
CONNECTION TO METAL OR CONCRETE PIPE OUTLET ONLY

NOTES

1. The diameter of the end section of Design B shall match the inside diameter of the concrete pipe.
2. Skirt sections shall be made in one piece for round pipe with a diameter of 12" to 24" inclusive and for pipe arches with a rise of 13" to 20" inclusive. Skirt sections for larger sizes of pipes may be multiple pieces in conformance with the tabulated values shown.
3. Design A end sections for 42" thru 84" diameter and 49" x 33" thru 83" x 57" arch with annular corrugations and all helically corrugated pipe arch include one foot of pipe length as a connector section. The connector section shall be attached to the end section by welds, rivets or bolts and shall be the same thickness as the end section.
4. Design C may be used in lieu of Design A for all metal pipe sizes except as noted. Coupling bands may be any acceptable type for the pipe specified.
5. Multiple panel skirts shall have 2" lap seams tightly joined by 3/8" stainless steel rivets or galvanized bolts on 6" max. centers.
6. The reinforced edges of the following size End Sections shall be supplemented with galvanized steel stiffener angles:

   60" thru 72" diameter pipe ..... 2" x 2" x 1/4" angle

   78" and 84" diameter pipe, and

   77" x 52" & 83" x 57" pipe arch ..... 2 1/2" x 2 1/2" x 1/4" angle

   The above galvanized angles shall be attached by 3/8" galvanized nuts and bolts.
7. Galvanized steel angle reinforcement will be placed under the center panel seams on the 72" thru 84" diam. pipe and 77" x 52" & 83" x 57" pipe arch End Sections.
8. As an alternative to the connector lug and threaded rod used on 12" thru 24" culvert pipe, the attachment may be made with a 1" wide strap, 16 gage galvanized steel fastened with a 1/2" diam., 6" long galvanized bolt and one squarehead nut.

PIPE

PIPE DIAM. (INCHES)	THICKNESS (INCHES)		DIMENSIONS (INCHES)						SKIRT	END SECTION SLOPE (H:V)
			A	B	H	L	W	T		
	STEEL	ALUM.	TOL. 3/64 1"	MAX.	TOL. 3/64 1"	TOL. 3/64 1 1/2"	TOL. 3/64 2"	TOL. 3/64 2"		
12	0.064	0.060	6	6	6	21	24	34	1 PC.	2 1/2 : 1
15	0.064	0.060	7	8	6	26	30	40	1 PC.	2 1/2 : 1
18	0.064	0.060	8	10	6	31	36	46	1 PC.	2 1/2 : 1
21	0.064	0.060	9	12	6	36	42	52	1 PC.	2 1/2 : 1
24	0.064	0.075	10	13	6	41	48	58	1 PC.	2 1/2 : 1
30	0.079	0.075	12	16	8	51	60	70	2 PC.	2 1/2 : 1
36	0.079	0.105	14	19	9	60	72	94	2 PC.	2 1/2 : 1
42	0.109	0.105	16	22	11	69	84	106	2 PC.	2 1/2 : 1
48	0.109	0.105	18	27	12	78	90	112	2 PC.	2 1/2 : 1
54	0.109	—	18	30	12	84	102	122	2 PC.	2 1/2 : 1
60	0.109 0.138	—	18	33	12	87	114	134	3 PC.	1 3/4 : 1
66	0.109 0.138	—	18	36	12	87	120	142	3 PC.	1 1/2 : 1
72	0.109 0.138	—	18	39	12	87	126	146	3 PC.	1 1/3 : 1
78	0.109 0.138	—	18	42	12	87	132	152	3 PC.	1 1/4 : 1
84	0.109 0.138	—	18	45	12	87	138	158	3 PC.	1 1/6 : 1

PIPE ARCH

PIPE ARCH DIMENSION (INCHES)		THICKNESS (INCHES)		DIMENSIONS (INCHES)						SKIRT	END SECTION SLOPE (H:V)
				A	B	H	L	W	T		
SPAN	RISE	STEEL	ALUM.	TOL. 3/64 1"	MAX.	TOL. 3/64 1"	TOL. 3/64 1 1/2"	TOL. 3/64 2"	TOL. 3/64 2"		
17	13	0.064	0.060	7	9	6	19	30	40	1 PC.	2 1/2 : 1
21	15	0.064	0.060	7	10	6	23	36	46	1 PC.	2 1/2 : 1
24	18	0.064	0.060	8	12	6	28	42	52	1 PC.	2 1/2 : 1
28	20	0.064	0.075	9	14	6	32	48	58	1 PC.	2 1/2 : 1
35	24	0.079	0.075	10	16	6	39	60	70	1 PC.	2 1/2 : 1
42	29	0.079	0.105	12	18	8	46	75	85	2 PC.	2 1/2 : 1
49	33	0.109	0.105	13	21	9	53	85	103	2 PC.	2 1/2 : 1
57	38	0.109 0.138	0.105	18	26	12	63	90	114	3 PC.	2 1/2 : 1
64	43	0.109 0.138	0.105	18	30	12	70	102	130	3 PC.	2 1/2 : 1
71	47	0.109 0.138	0.135	18	33	12	77	114	146	3 PC.	2 1/2 : 1
77	52	0.109 0.138	—	18	36	12	77	126	152	3 PC.	1 3/4 : 1
83	57	0.109 0.138	—	18	39	12	77	138	158	3 PC.	1 1/2 : 1

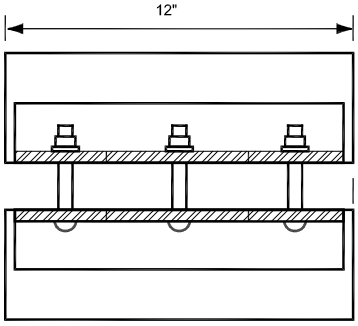
PUBLIC WORKS DEPARTMENT

FLARED END SECTIONS

STD. PLAN – 221.10

MARCH 2008

DRAWN BY: MARK SUJKA



Smooth Coupling Band
for Smooth Pipe

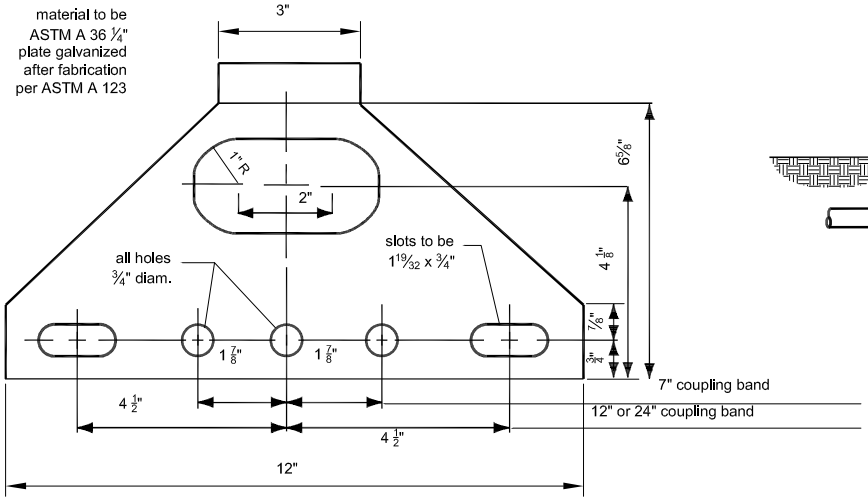
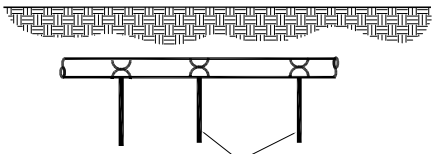
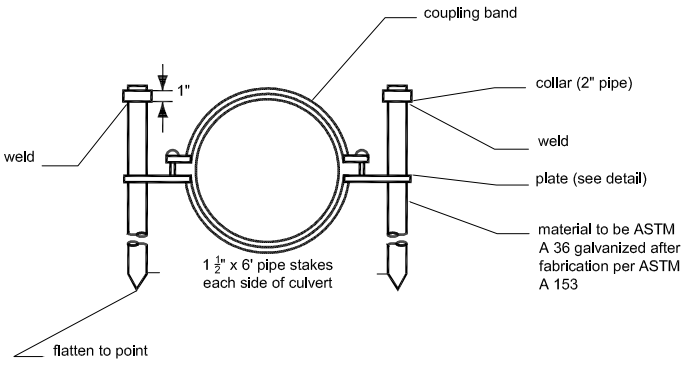


Plate Detail



Pipe stakes



Anchor Assembly
Corrugated Metal Pipe

NOTE:

1. The smooth coupling band shall be used in combination with concrete pipe.
2. Concrete pipe without bell and spigot shall not be installed on grades in excess of 20%.
3. The first anchor shall be installed on the first section of the lower end of the pipe and remaining anchors evenly spaced throughout the installation.
4. If the pipe being installed has a manhole or catch basin on the lower end of the pipe, the first pipe anchor may be eliminated.
5. When CMP is used, the anchors may be attached to the coupling bands used to join the pipe as long as the specified spacing is not exceeded.
6. All pipe anchors shall be securely installed before backfilling around the pipe.

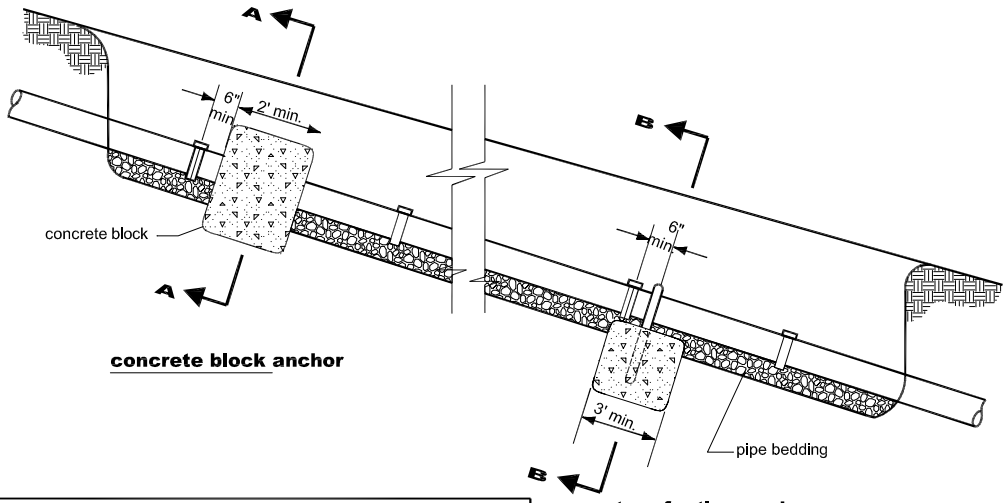
PUBLIC WORKS DEPARTMENT

DETAILS FOR COUPLING BANDS FOR CORRUGATED METAL PIPES

STD. PLAN – 221.20

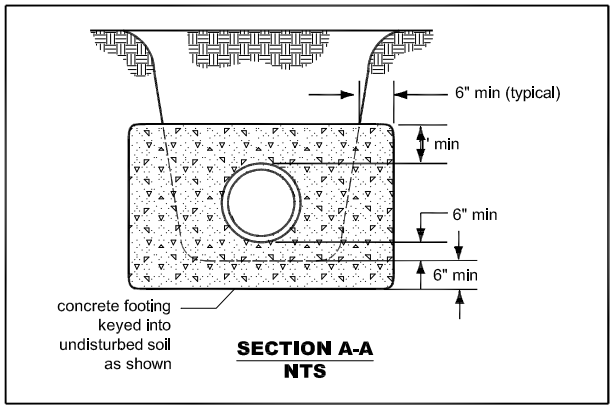
MARCH 2008

DRAWN BY: MARK SUJKA

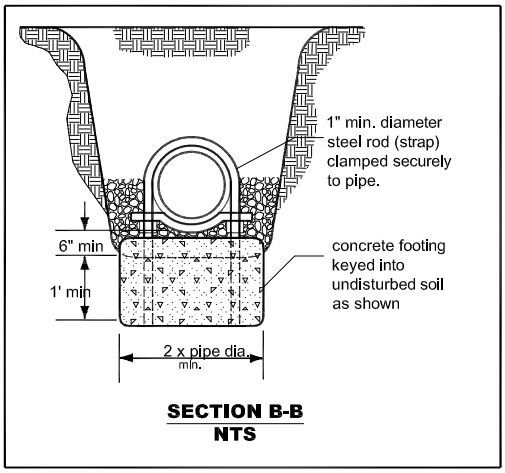


concrete block anchor

strap-footing anchor



SECTION A-A
NTS



SECTION B-B
NTS

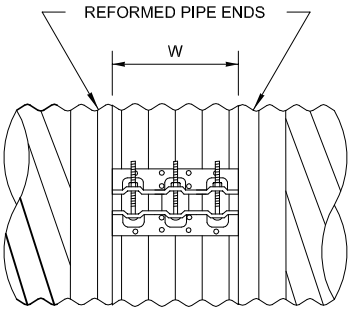
Note:
For SWPE, pipe must be free to slide inside a 4' long section of pipe one size diameter larger.

PUBLIC WORKS DEPARTMENT

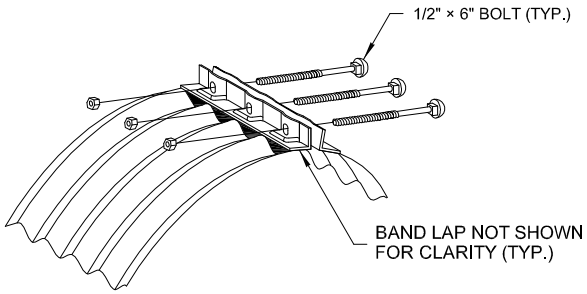
STRAP PIPE ANCHOR DETAIL

STD. PLAN – 221.30

MARCH 2008



TYPE D
ANNULAR CORRUGATED BAND



TYPE D
BAND ANGLE CONNECTOR DETAIL

COUPLING BAND DIMENSION TABLE
(ALL DIMENSIONS ARE IN INCHES)

BAND TYPE		CORRUGATION PITCH × DEPTH	PIPE DIAM.	MIN. W	GASKET TYPE
STEEL	D	2 2/3 × 1/2 OR 3 × 1 REFORMED TO 2 2/3 × 1/2	12 ~ 84	12	SLEEVE
		3 × 1 REFORMED TO 2 2/3 × 1/2	90 ~ 144	24	SLEEVE
ALUMINUM	D	3 × 1 REFORMED TO 2 2/3 × 1/2	36 ~ 60	12	SLEEVE
			66 ~ 108	24	

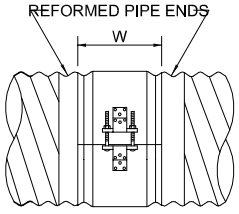
PUBLIC WORKS DEPARTMENT

COUPLING BANDS FOR CORRUGATED METAL PIPES TYPE D

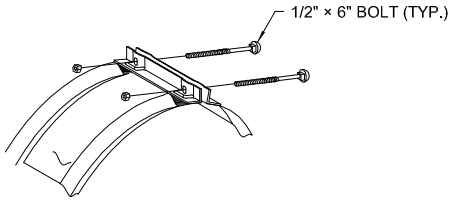
STD. PLAN – 221.40

MARCH 2008

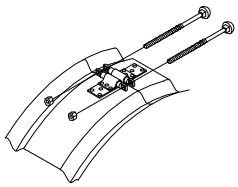
DRAWN BY: MARK SUJKA



TYPE F
SEMI-CORRUGATED BAND



TYPE F
BAND ANGLE CONNECTOR DETAIL



TYPE F
BAR & STRAP CONNECTOR DETAIL

COUPLING BAND DIMENSION TABLE
(ALL DIMENSIONS ARE IN INCHES)

BAND TYPE		CORRUGATION PITCH × DEPTH	PIPE DIAM.	MIN. W	GASKET TYPE
STEEL	F	2 2/3 × 1/2 OR 3 × 1 REFORMED TO 2 2/3 × 1/2	12 ~ 84	10 1/2	O-RING
ALUMINUM	F	2 2/3 x 1/2	12 ~ 48	10 1/2	O-RING

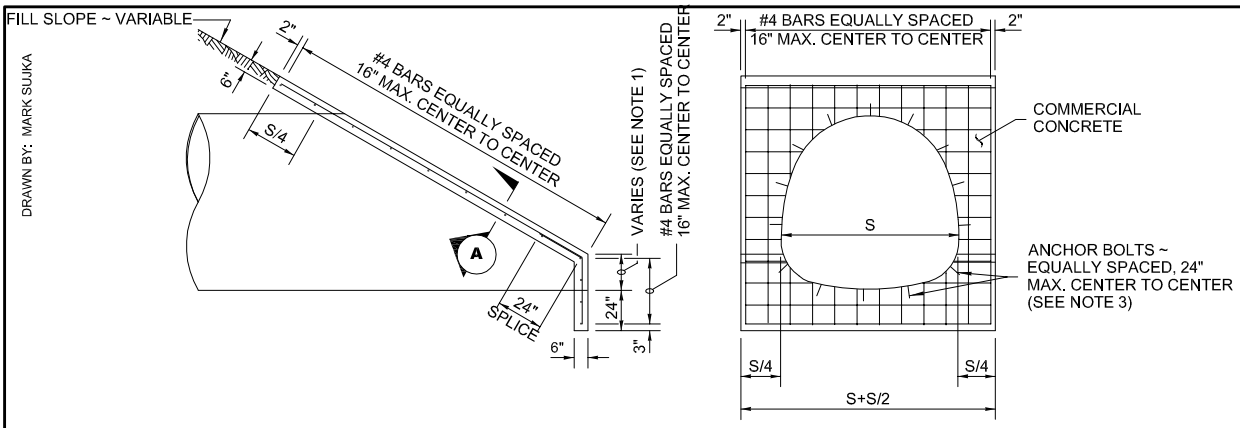
PUBLIC WORKS DEPARTMENT

TYPE F
COUPLING BANDS FOR CORRUGATED METAL PIPES

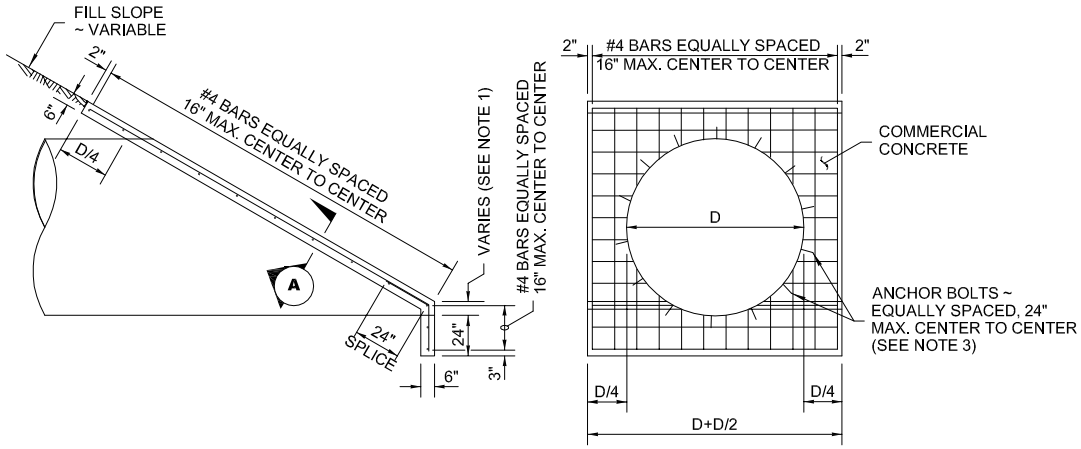
STD. PLAN – 221.50

MARCH 2008

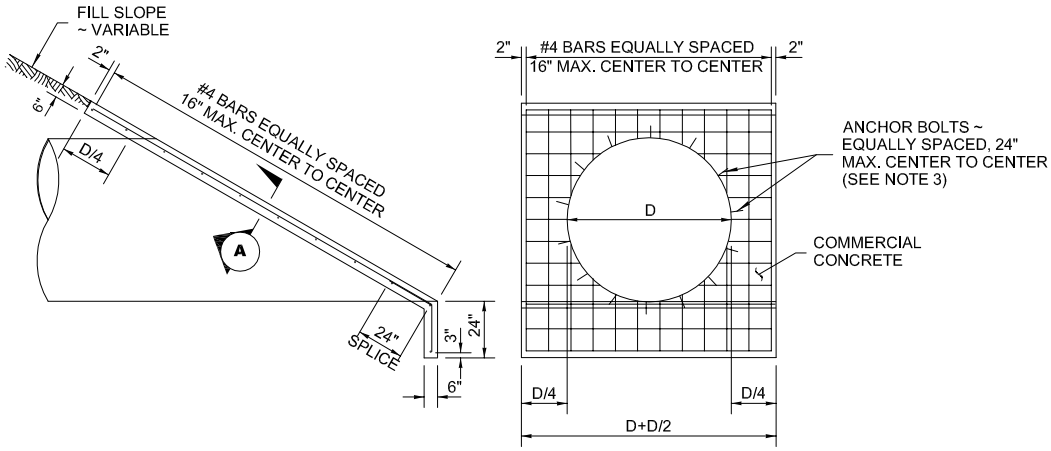
DRAWN BY: MARK SUJKA



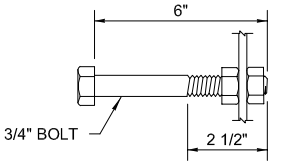
STRUCTURAL PLATE PIPE ARCHES AND UNDERPASSES



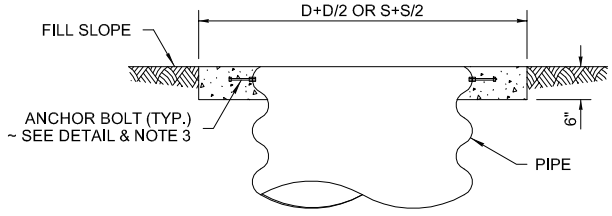
PIPES AND STRUCTURAL PLATE PIPES - STEP MITERED PIPE



PIPES AND STRUCTURAL PLATE PIPES - FULL MITERED PIPE



ANCHOR BOLT DETAIL



SECTION (A)

NOTES

1. The variable dimension indicated for the height of step for step mitered pipes shall conform to the manufacturers recommendations unless specified differently on the plans or in the Special Provisions.
2. Reinforcing steel shall have 1 1/2" min. clear cover to all concrete surfaces.
3. Headwalls for concrete culvert pipe may omit anchor bolt attachment.
4. When steel pipe safety bars ar used, headwall thickness shall be increased to 8".

CITY OF RENTON

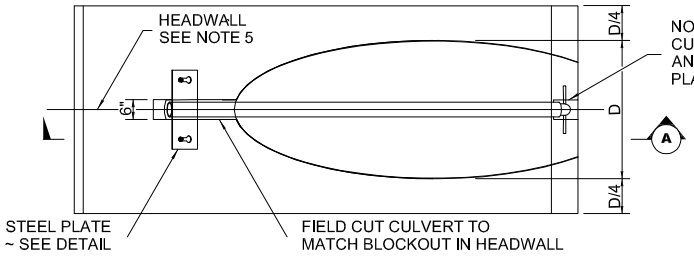
PUBLIC WORKS DEPARTMENT

HEADWALLS FOR CULVERT PIPE AND UNDERPASS

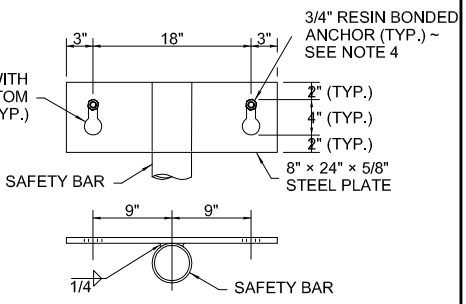
STD. PLAN – 222.00

MARCH 2008

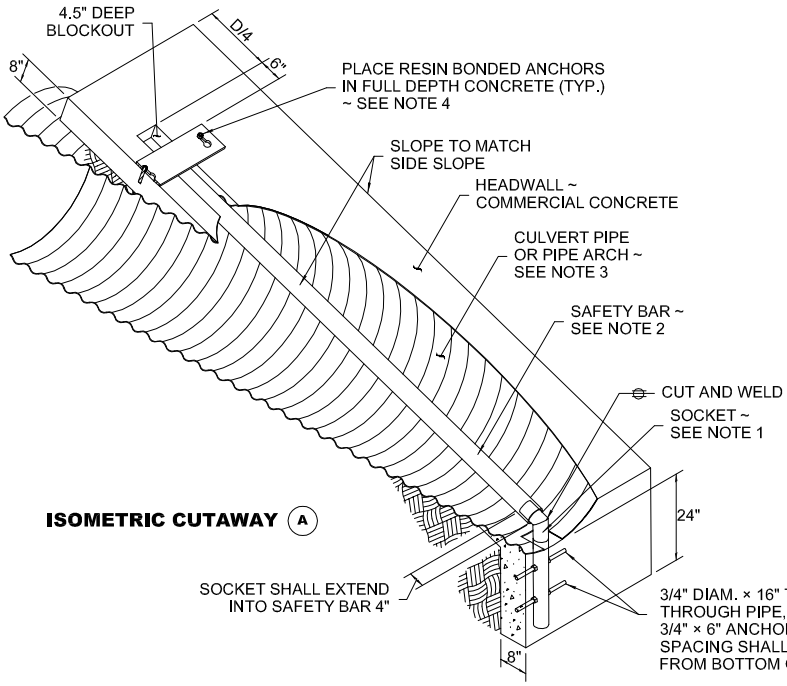
DRAWN BY: MARK SUJKA



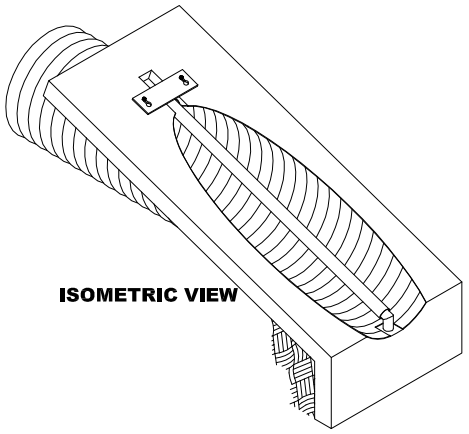
TOP VIEW
CULVERT IS PERPENDICULAR TO ROADWAY



STEEL PLATE DETAIL

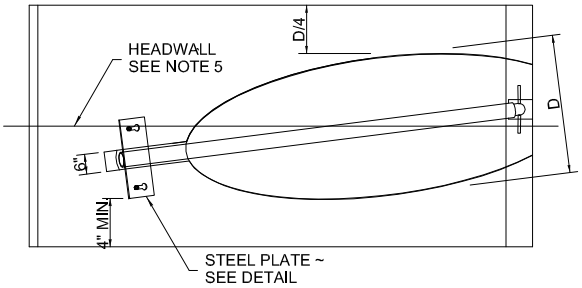


ISOMETRIC CUTAWAY (A)



ISOMETRIC VIEW

CULVERT DIAM.	NUMBER OF BARS REQUIRED
UP TO 36"	NONE
42" ~ 60"	1
66" ~ 90"	2
96" ~ 120"	3



TOP VIEW
CULVERT IS SKEWED TO ROADWAY

NOTES

1. Sockets shall be 3" extra strong steel pipe (3 1/2" O.D.). Sockets must be the proper angle and height so that safety bars are parallel with headwall and side slope, and are easily removable.

2. Safety Bars shall be 4" extra strong steel pipe (4 1/2" O.D.), or 4 1/2" O.D. (.250" wall thickness) steel tubing. Length (20' maximum) shall be the minimum required to achieve Resin Bonded Anchor placement in full depth concrete. When multiple bars are required (see table) place bars at equal spacing (30" max.).

3. Bevel culvert pipe to match side slope.

4. Resin bonded anchors shall be 7" in length (5" embedment).

5. Centerline of headwall shall be normal to roadway centerline.

CITY OF RENTON

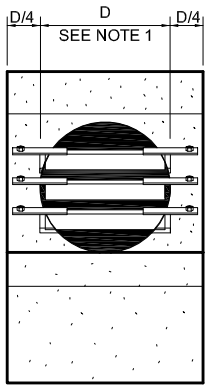
PUBLIC WORKS DEPARTMENT

TYPE 1 SAFETY BARS FOR STEPPED CULVERT PIPE OR PIPE ARCH

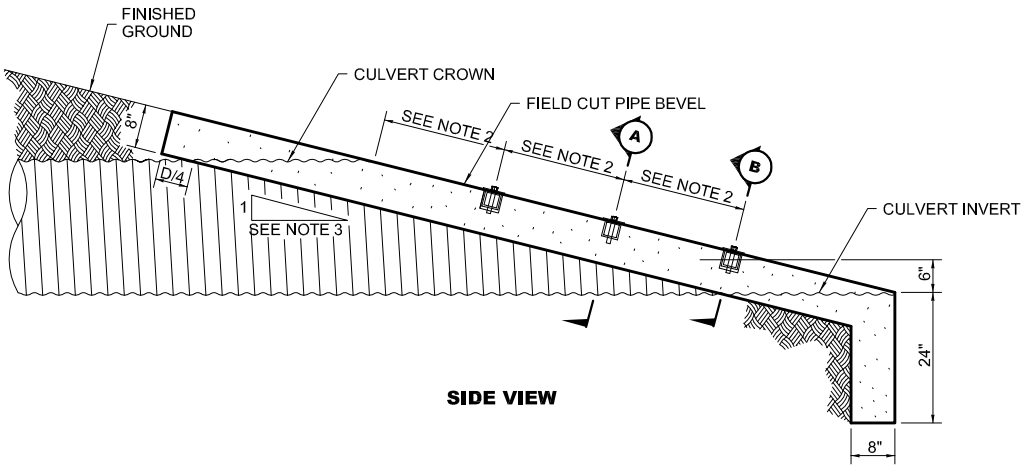
STD. PLAN – 222.10

MARCH 2008

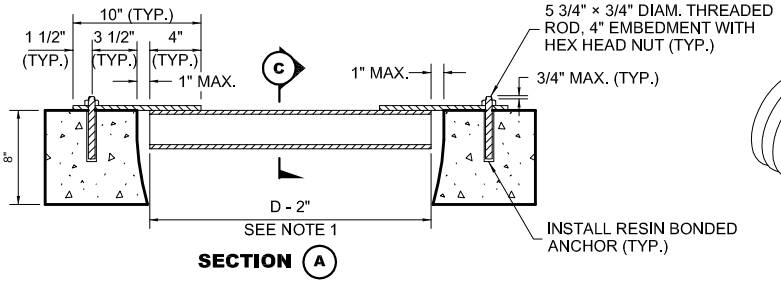
DRAWN BY: MARK SUJKA



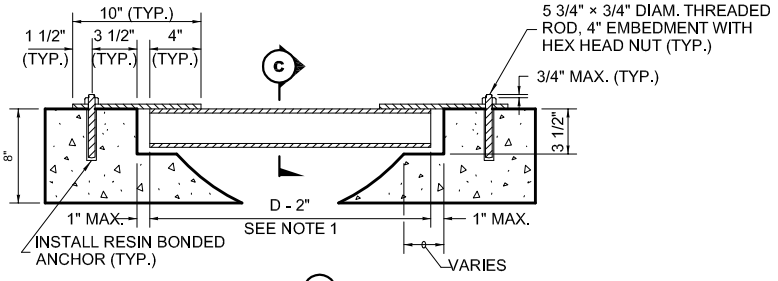
FRONT VIEW



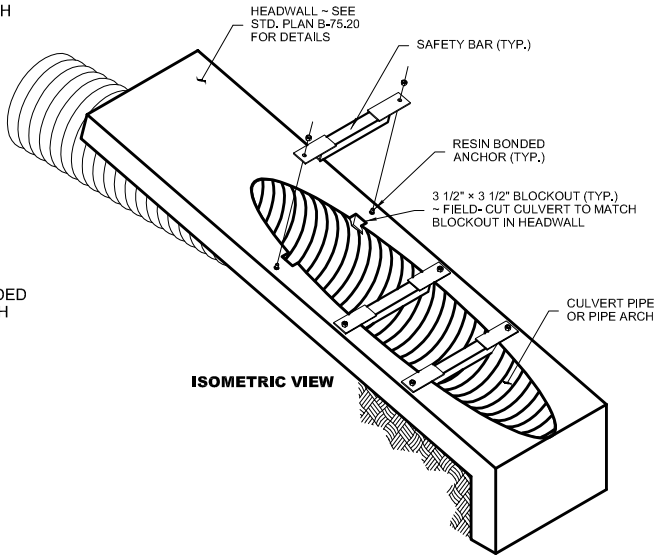
SIDE VIEW



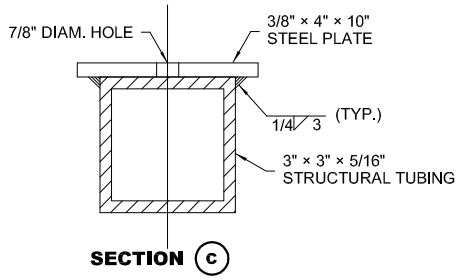
SECTION A



SECTION B



ISOMETRIC VIEW



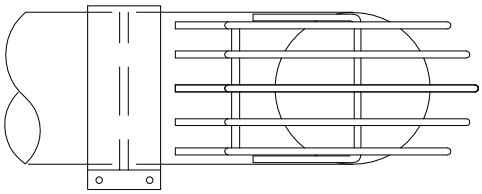
SECTION C

NOTES

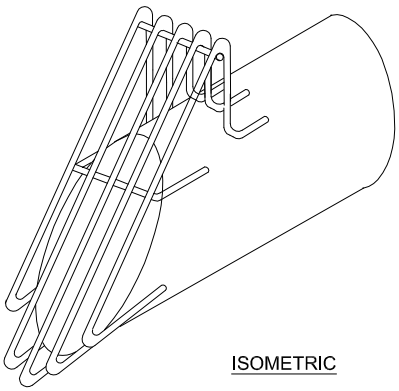
1. D = Inside Diameter of Culvert Pipe, or Pipe Arch Span Width, 36" maximum.
2. The distance between the safety bars, and between the top bar and the culvert crown, shall be equal spaces of no more than 24". The distance may vary $\frac{35}{64}$1" between bars to facilitate placement.
3. Slope shall match Side Slope; 6H:1V preferred, not steeper than 4H:1V.

CITY OF RENTON PUBLIC WORKS DEPARTMENT	**TYPE 2 SAFETY BARS FOR CULVERT OR PIPE ARCH (ON CROSS ROADS)**	STD. PLAN – 222.20 MARCH 2008

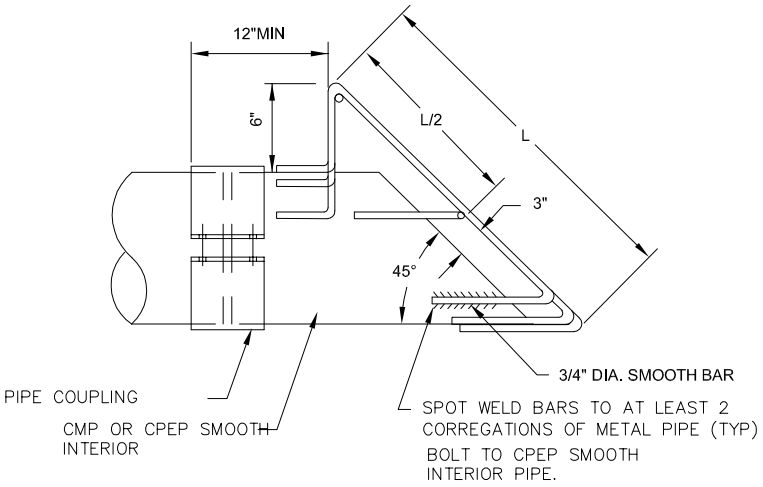
DRAWN BY: MARK SUJKA



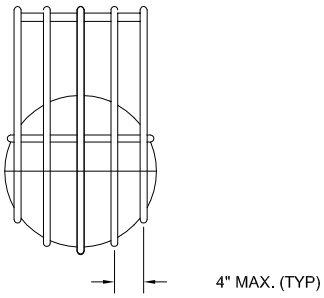
PLAN



ISOMETRIC



SIDE VIEW



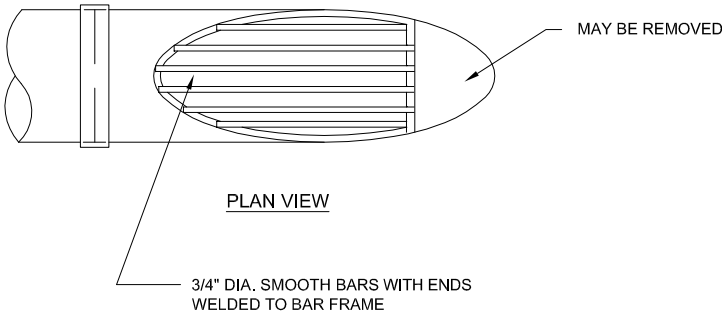
END VIEW

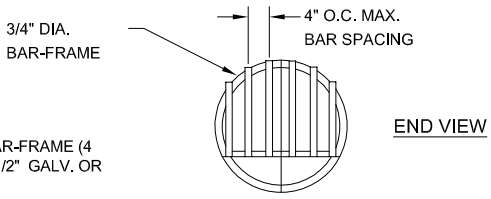
NOTE:

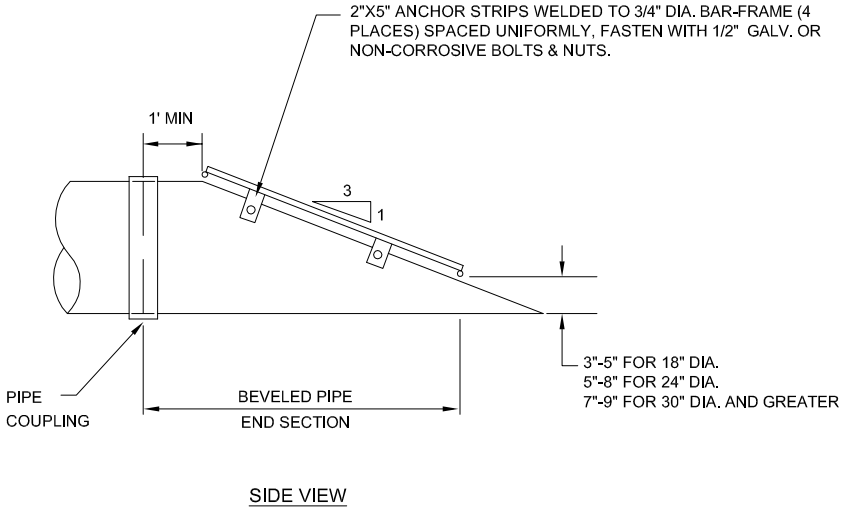
1. This debris barrier is for use outside roadways on pipes 36" dia. and smaller.
2. See drawing 223.10 for debris barriers on pipes projecting from driveways or roadway side slopes.
3. All steel parts must be galvanized and asphalt coated. (Treatment 1 or better).
4. CPEP-smooth interior pipe requires bolts to secure debris barrier to pipe.

CITY OF RENTON PUBLIC WORKS DEPARTMENT	**DEBRIS BARRIER**	**STD. PLAN – 223.00** MARCH 2008

DRAWN BY: MARK SUJKA



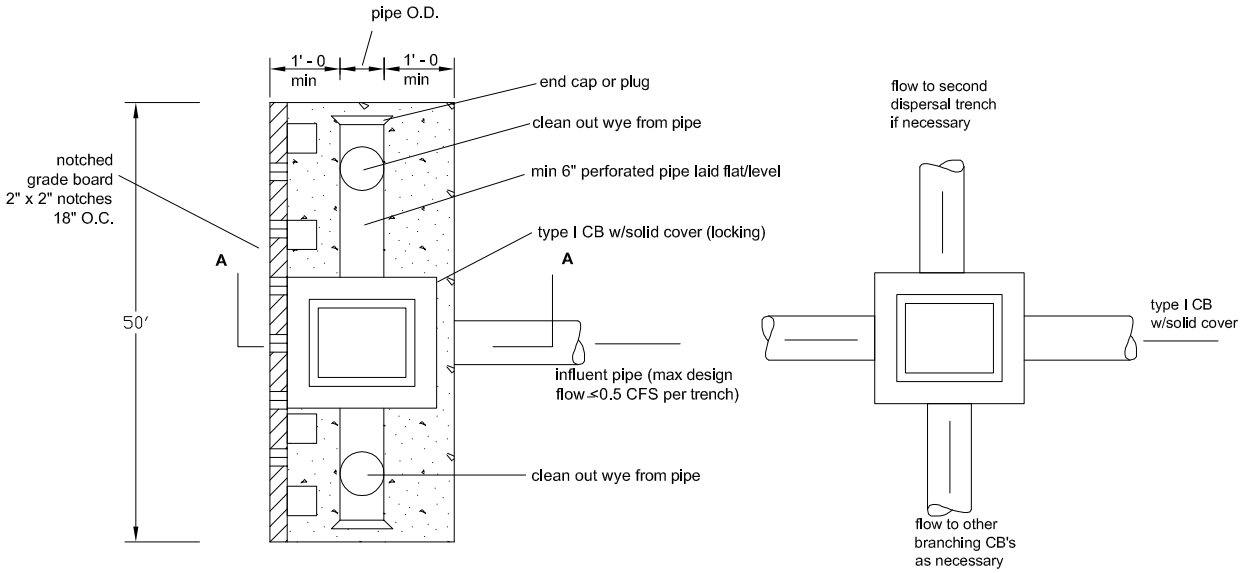




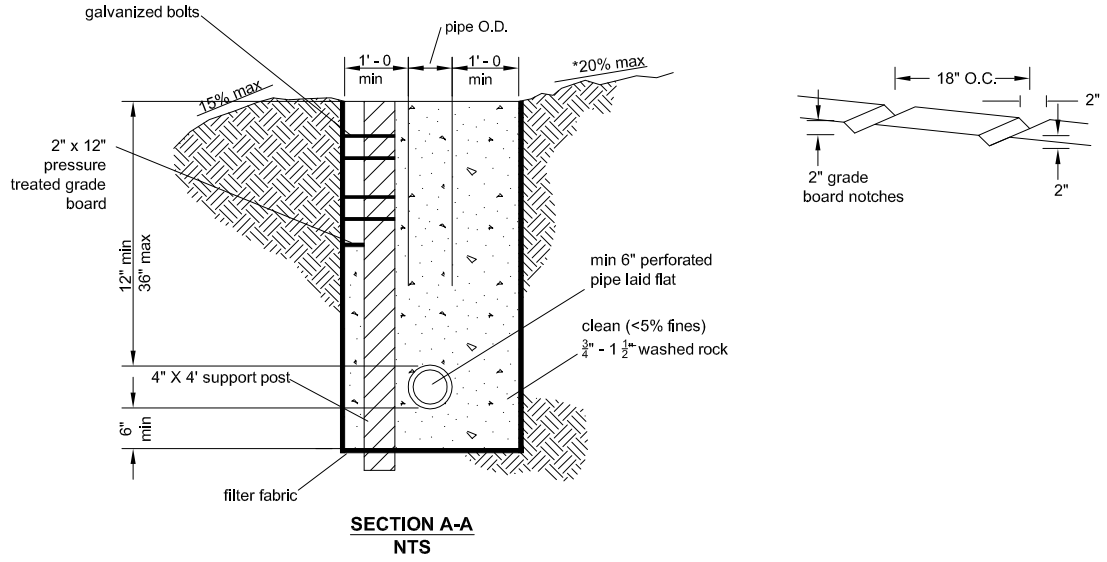
NOTES:
1. CMP* end-section shown
2. All steel parts must be galvanized and asphalt coated (Treatment 1 or better).
   *or CPEP smooth interior

CITY OF RENTON PUBLIC WORKS DEPARTMENT	**DEBRIS BARRIER FOR CONCRETE PIPE**	**STD. PLAN – 223.10** MARCH 2008

DRAWN BY: MARK SUJKA



PLAN
NTS



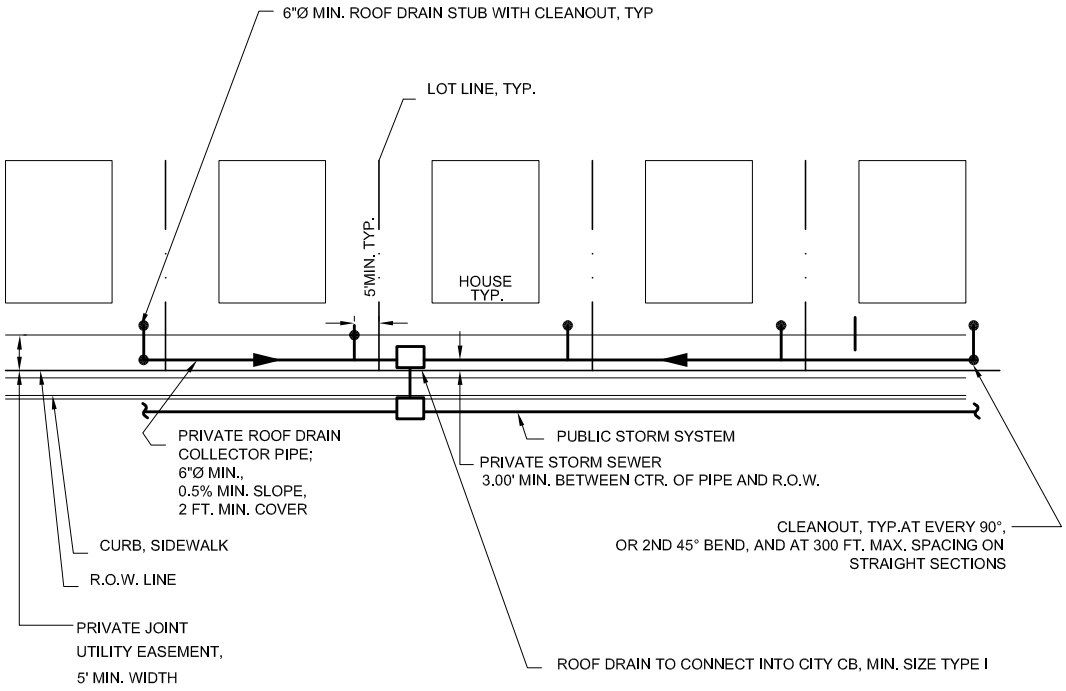
SECTION A-A
NTS

*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.

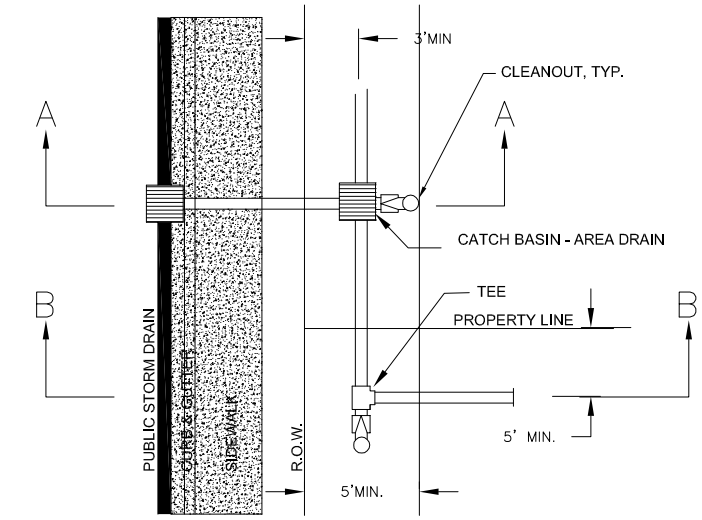
CITY OF RENTON PUBLIC WORKS DEPARTMENT	**50 FOOT DISPERSION TRENCH WITH NOTCHED BOARD**	**STD. PLAN – 224.00** MARCH 2008

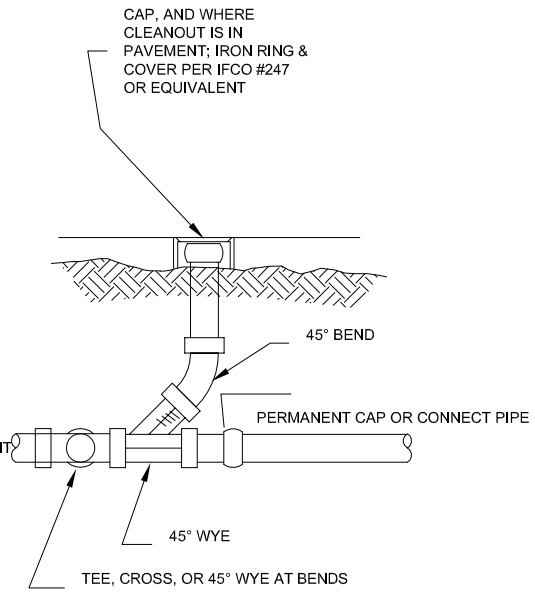


NOTES:
1. PIPE MATERIALS ALLOWED: PVC, LCPE, TRIPLE WALL POLYETHYLENE (& DI. IF NECESSARY FOR STRENGTH)
2. THE ROOF & FOOTING DRAIN SYSTEMS ARE PRIVATELY MAINTAINED
3. FLOW PATTERN SHOULD BE TO THE NEAREST CB IF GRADE ALLOWS, OR TO THE NEXT DOWNSTREAM CB.
4. ROOF DRAIN COLLECTORS MUST BE ANALYZED FOR CAPACITY, SIZED FOR 25-YEAR PEAK FLOW.

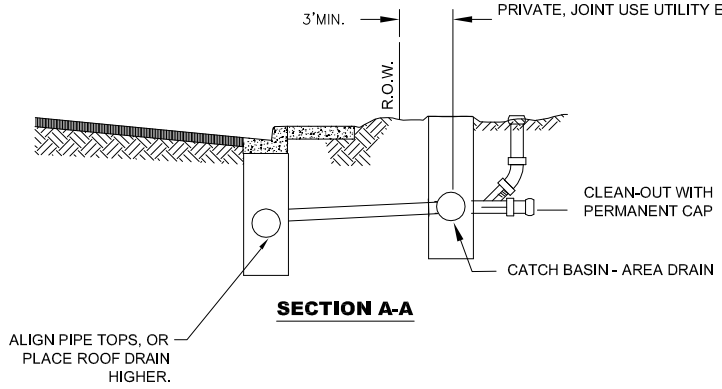
CITY OF RENTON PUBLIC WORKS DEPARTMENT	**TYPICAL ROOF DRAIN COLLECTION STORM SYSTEM CIVIL PLANS**	**STD. PLAN – 225.00** MARCH 2008

DRAWN BY: MARK SUJKA

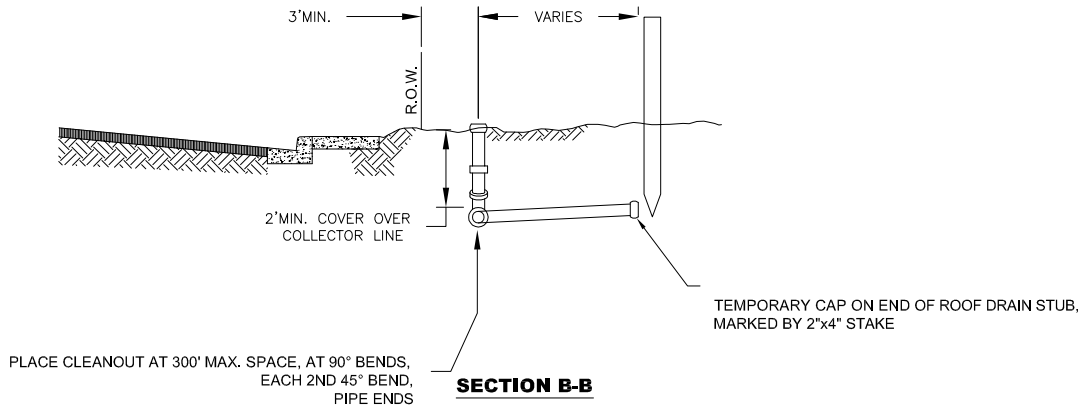




CLEAN-OUT DETAIL
N.T.S.



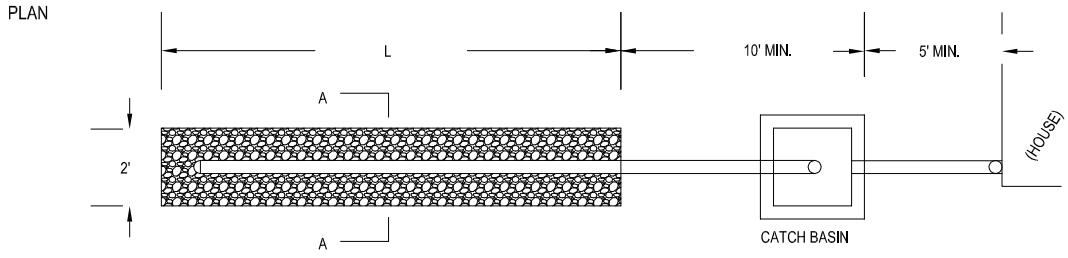
SECTION A-A

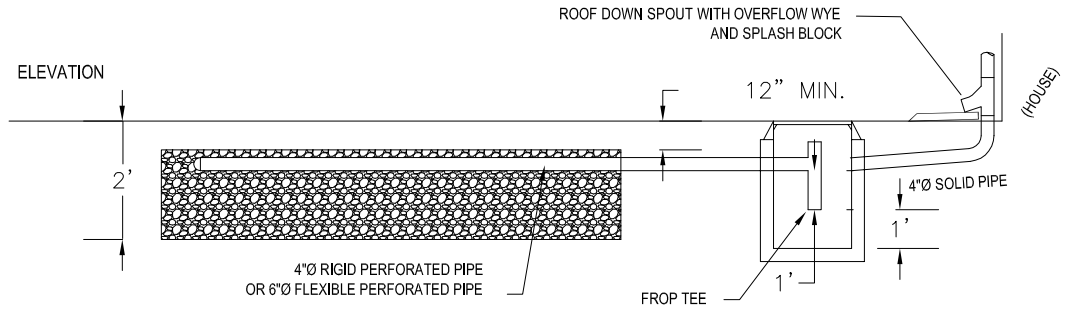


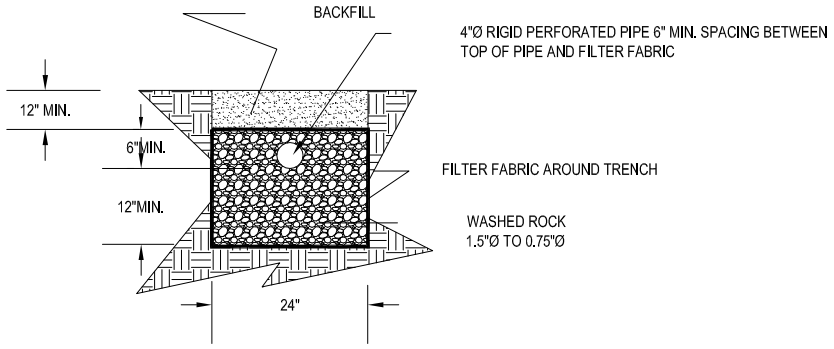
SECTION B-B

NOTE:
MIN. PIPE SIZE 6"Ø
PIPE MATERIALS ALLOWED: PVC, LINED CPE, TRIPLE WALL POLYETHYLENE, DI (IF NEEDED FOR STRENGTH).

CITY OF RENTON PUBLIC WORKS DEPARTMENT	**TYPICAL PRIVATE ROOF DRAIN COLLECTION SYSTEM CROSS SECTION**	**STD. PLAN – 225.10** MARCH 2008







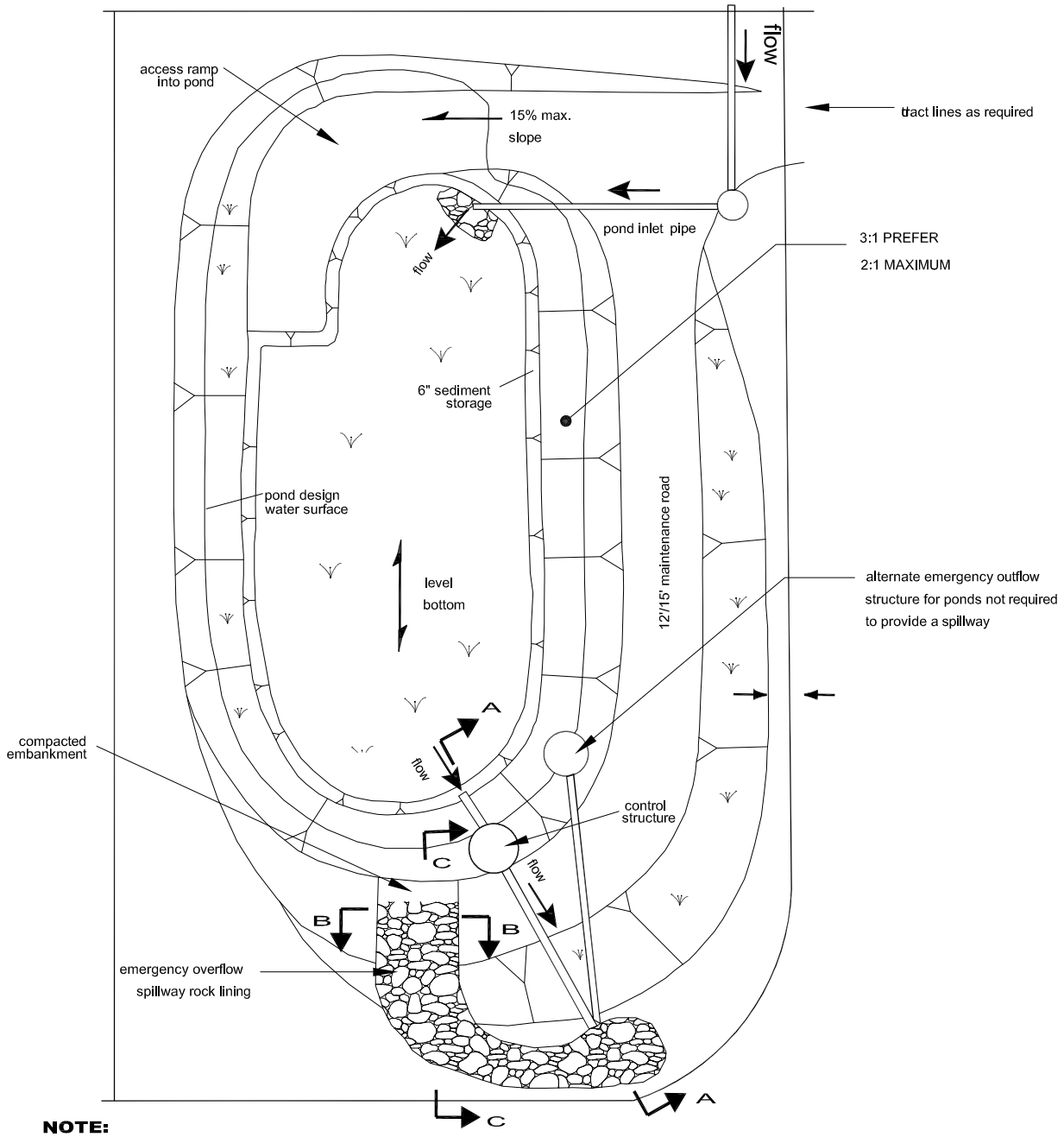
SECTION A-A

PUBLIC WORKS DEPARTMENT

SINGLE FAMILY ROOF DOWNSPOUT INFILTRATION TRENCH

STD. PLAN – 225.20

MARCH 2008

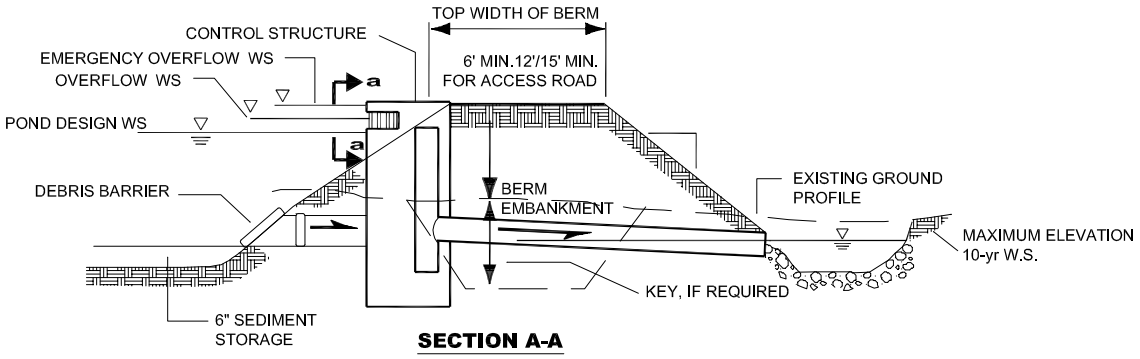


NOTE:

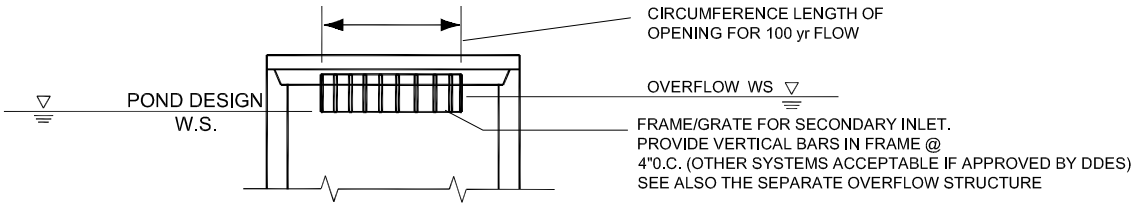
1. This detail is a schematic representation only. Actual configuration will vary depending on specific site constraints and applicable design criteria.
2. Access Road shall meet the following design criteria.
   - 2.1. maximum grade shall be 15 % for asphalt paving and 12 % for gravel or modular grid paving.
   - 2.2. Outside turning radius shall be 40 feet, minimum.
   - 2.3. Fence gates shall be located only on straingh section of road.
   - 2.4. Access roads shall be 15 feet in width on curves and 12 feet n straight sections.
   - 2.5. A paved apron shall be provided where access roads connect to paved public roadways.
3. All facilities shall be fences. Fence shall be provided around facility allowing proper maintenance per standard details unless otherwise specified.

CITY OF RENTON — PUBLIC WORKS DEPARTMENT	**TYPICAL DETENTION POND**	**STD. PLAN – 234.00** MARCH 2008

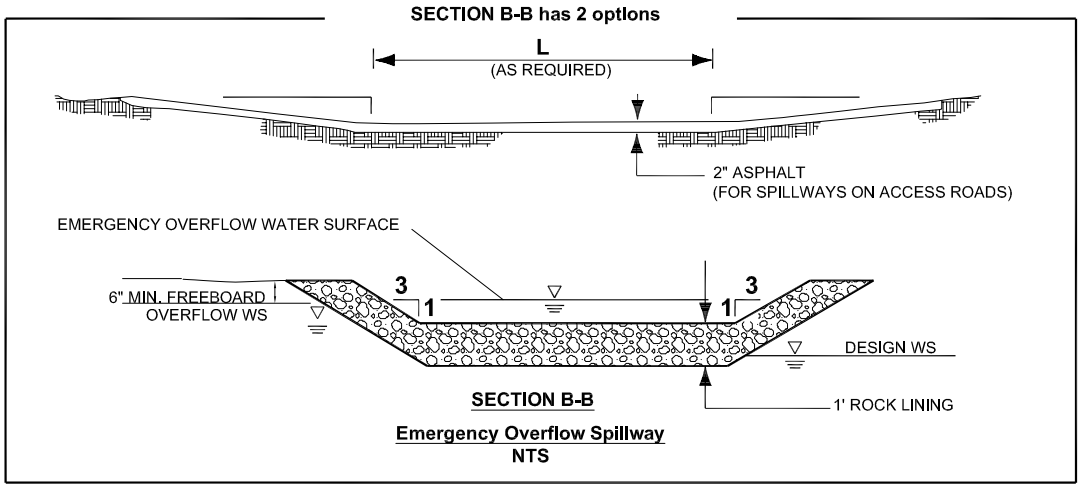
DRAWN BY: MARK SUJKA



SECTION A-A

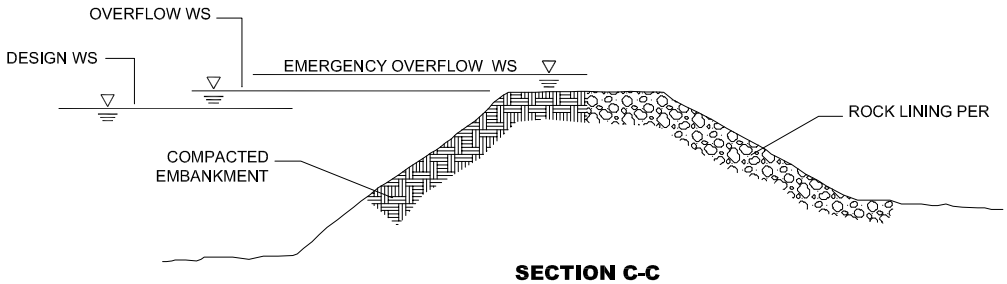


SECTION a-a



SECTION B-B

Emergency Overflow Spillway
NTS



SECTION C-C

NOTE:

1. This detail is a schematic representation only. Actual configuration will vary depending on specific site constraints and applicable design criteria.
2. Access Road shall meet the following design criteria.
   - 2.1. maximum grade shall be 15 % for asphalt paving and 12 % for gravel or modular grid paving.
   - 2.2. Outside turning radius shall be 40 feet, minimum.
   - 2.3. Fence gates shall be located only on straingh section of road.
   - 2.4. Access roads shall be 15 feet in width on curves and 12 feet n straight sections.
   - 2.5. A paved apron shall be provided where access roads connect to paved public roadways.
3. All facilities shall be fences. Fence shall be provided around facility allowing proper maintenance per standard details unless otherwise specified.

CITY OF RENTON

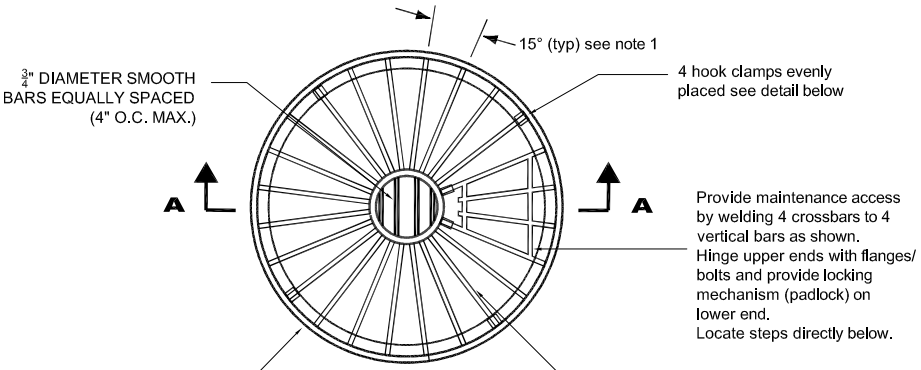
PUBLIC WORKS DEPARTMENT

TYPICAL DETENTION POND SECTIONS

STD. PLAN – 234.10

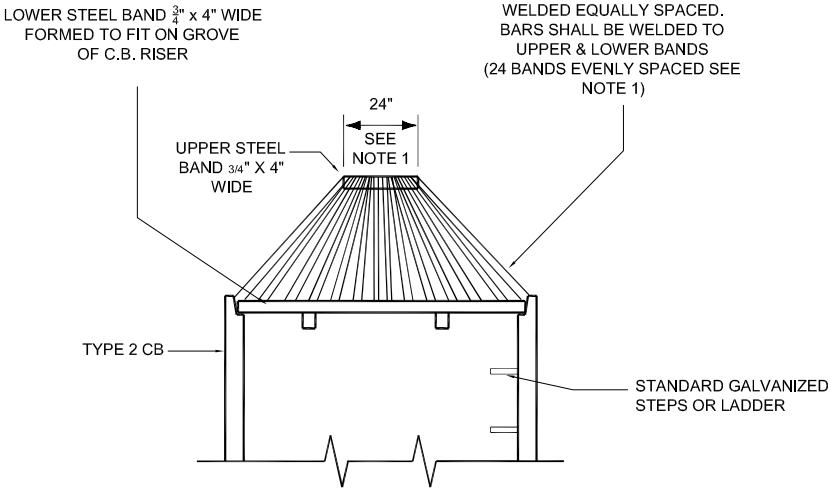
MARCH 2008

DRAWN BY: MARK SUJKA



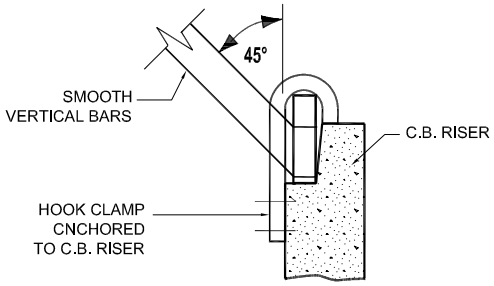
PLAN VIEW

NTS



SECTION A-A

NTS



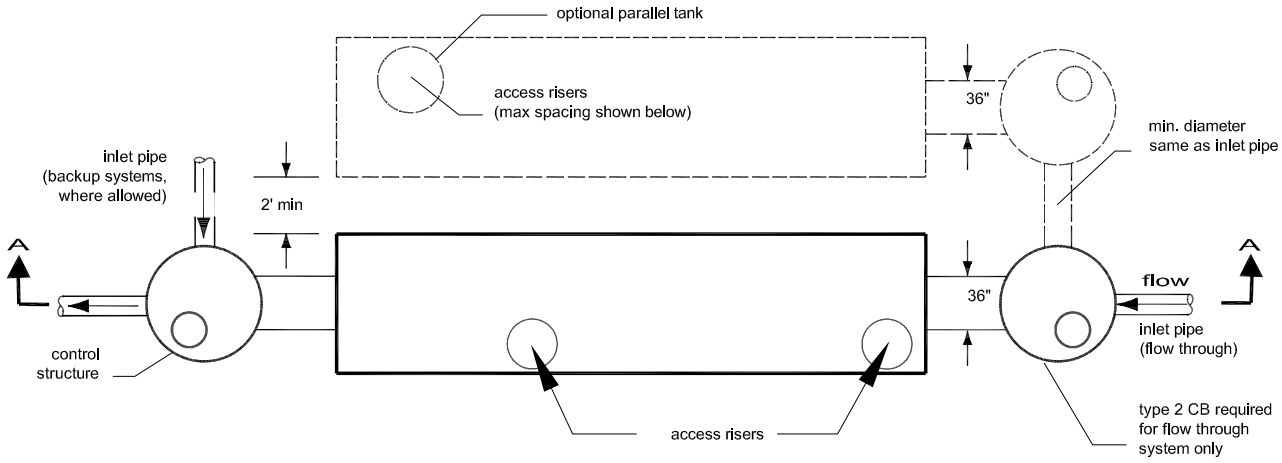
DETAIL HOOK CLAMP

NTS

NOTES:

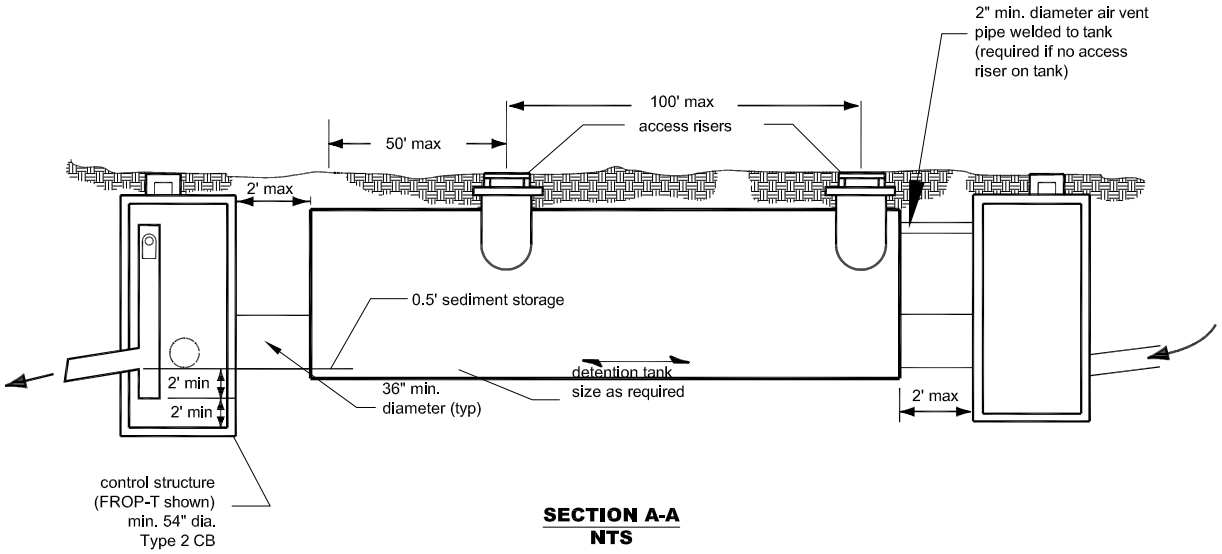
1. Dimensions are for illustration on 54" diameter CB. For different diameter CB's adjust to maintain 45°angle on "vertical" bars and 7" o.c. maximum spacing of bars around lower steel band.
2. Metal parts must be corrosion resistant; steel bars must be galvanized. The use of steel is prefer.
3. This debris barrier is also recommended for use on the inlet to roadway cross-culverts with high potential for debris collection (except on type 2 streams)
4. This debris barrier is for use outside of road right-of-way only. For debris cages within road right-of-way

CITY OF RENTON PUBLIC WORKS DEPARTMENT	**OVERFLOW STRUCTURE**	**STD. PLAN – 234.20** MARCH 2008



PLAN VIEW
NTS

"Flow-through" system shown solid.
Designs for "flow backup" system and
parallel tanks shown dashed



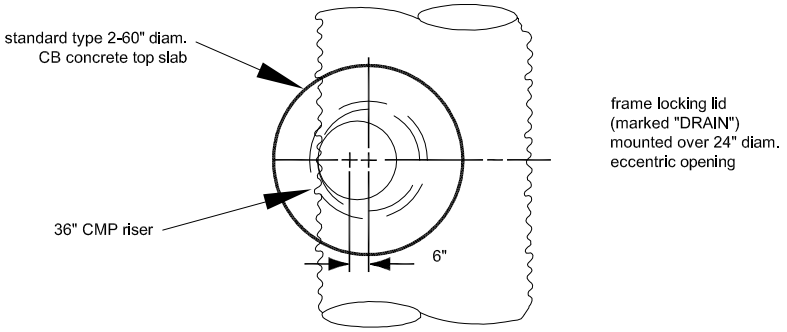
SECTION A-A
NTS

"Flow-through" system shown solid.

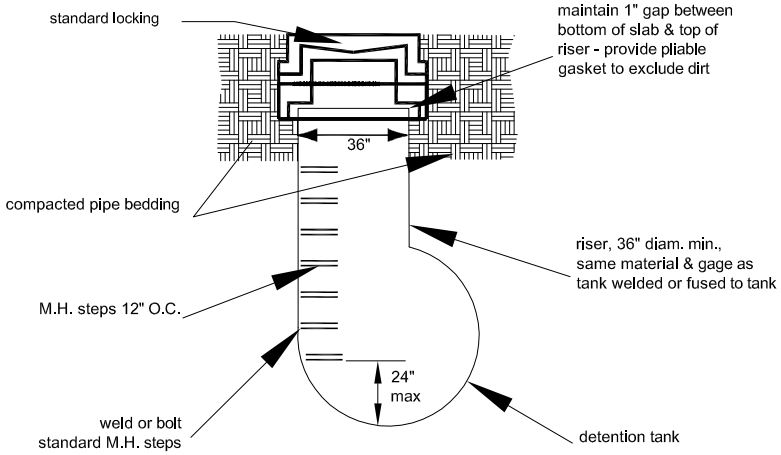
NOTE:

All metal parts corrosion resistant.
Steel parts galvanized and asphalt
coated (Treatment 1 or better)

CITY OF RENTON PUBLIC WORKS DEPARTMENT	**TYPICAL DETENTION TANK**	**STD. PLAN – 235.00** MARCH 2008



PLAN
NTS

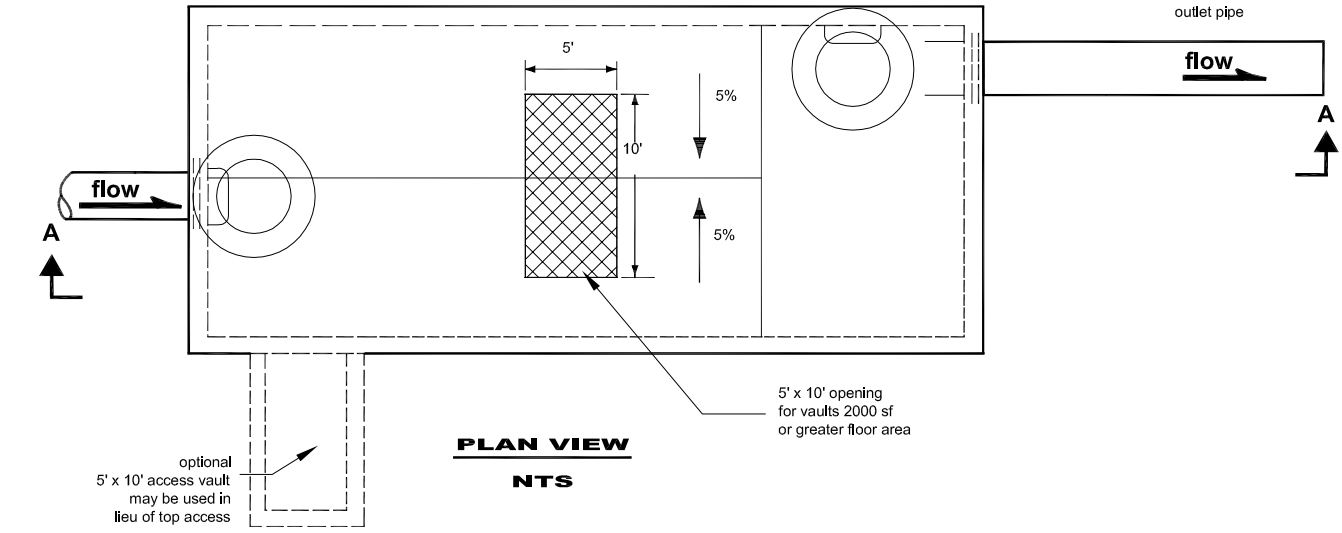


SECTION
NTS

NOTES:

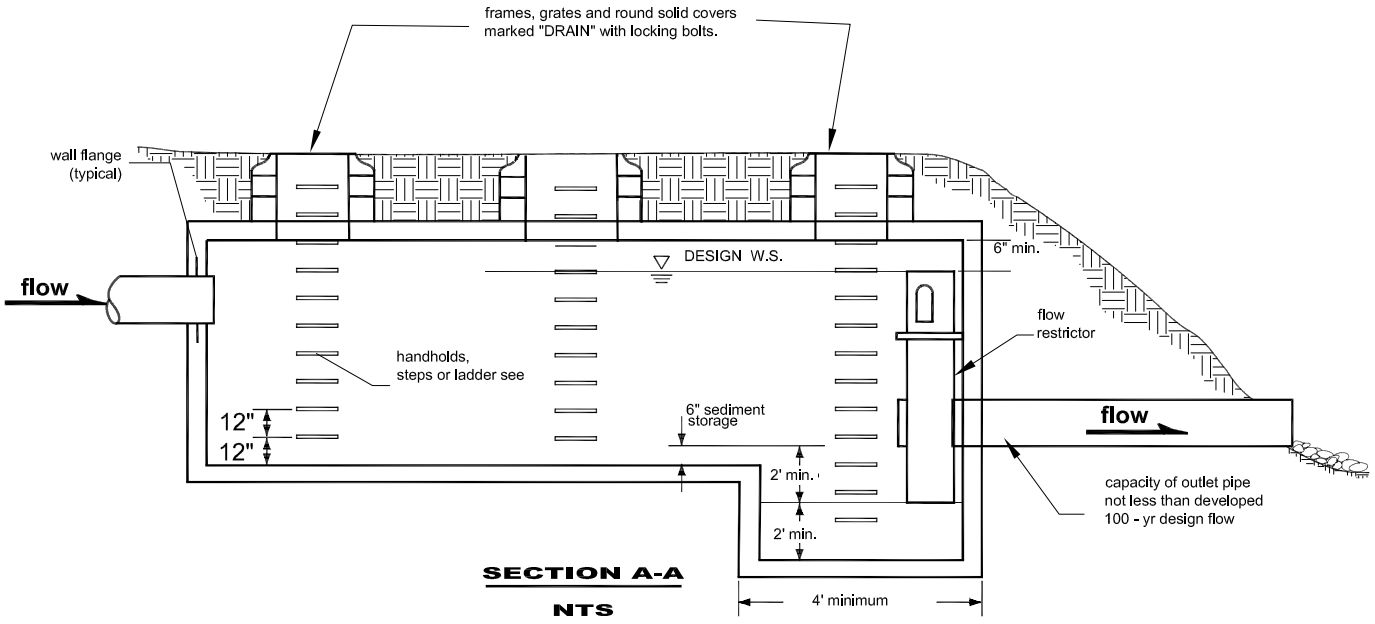
1. Use adjusting blocks as required to bring frame to guide.
2. All materials to be aluminum or galvanized and asphalt coated (Treatment 1 or better).
3. Must be located for access by maintenance vehicles.
4. May substitute WSDOT special Type IV manhole (RCP only).

CITY OF RENTON PUBLIC WORKS DEPARTMENT	**DETENTION TANK ACCESS DETAIL**	**STD. PLAN – 235.10** MARCH 2008



PLAN VIEW

NTS



SECTION A-A

NTS

NOTES:

1. All metal parts must be corrosion resistant. Steel parts must be galvanized and asphalt coated (Treatment 1 or better).
2. Provide water stop at all cast-in-place construction joints. Precast vaults shall have approved rubber gasket system.
3. Vaults <10' wide must use removable lids.
4. Prefabricated vault sections may require structural modifications to support 5' x 10' opening over main vault. Alternatively, access can be provided via a side vestibule as shown.
5. All vault areas must be within 50' of an access point.
6. For vaults under roadways, the removable panel must be located outside the travel lanes. Alternatively, multiple standard locking manhole covers may be provided. Spacing of manhole covers shall be 12 feet, measured on center, to facilitate removal of sediment. Ladders and hand-holds need only be provided at the outlet pipe and inlet pipe,

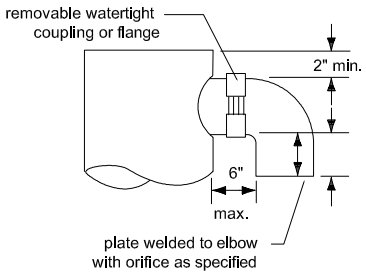
CITY OF RENTON

PUBLIC WORKS DEPARTMENT

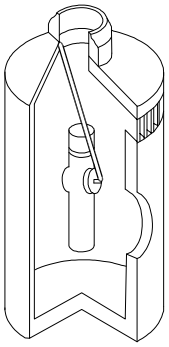
TYPICAL DETENTION VAULT

STD. PLAN – 236.00

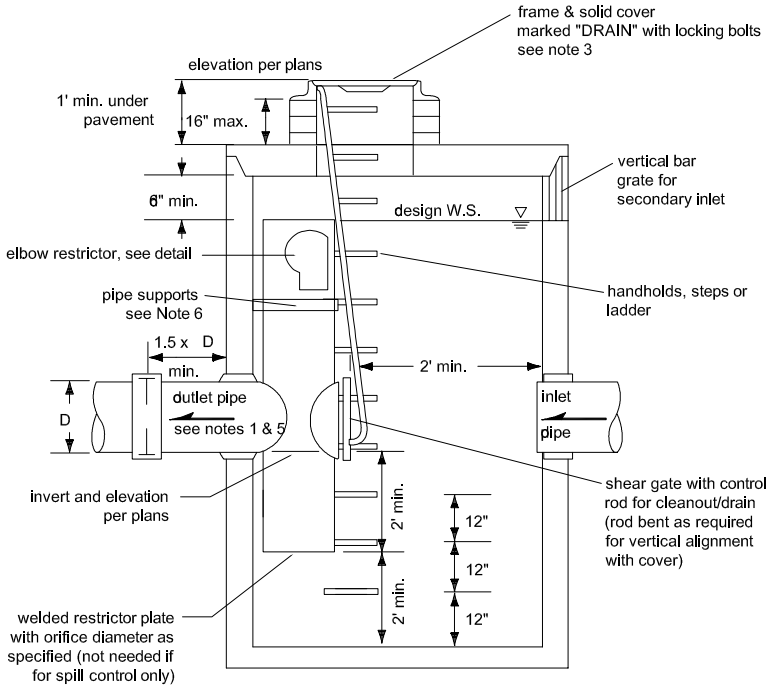
MARCH 2008



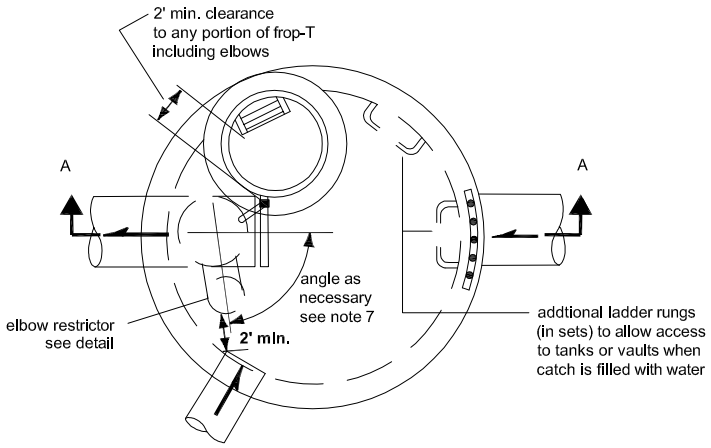
ELBOW RESTRICTOR DETAIL



ISOMETRIC



SECTION A-A



PLAN VIEW

NOTES:

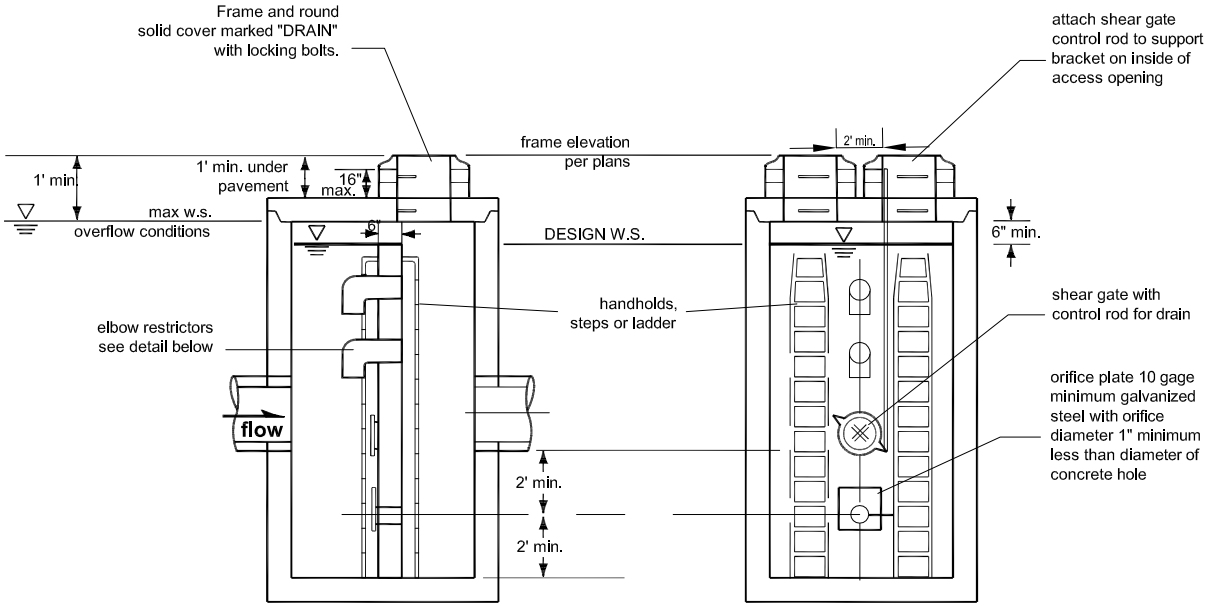
1. Use a mimimum of a 54" diameter type 2 catch basin.
2. Outlet Capacity: 100-Year developed peak flow.
3. Metal Parts: Corrosion resistant. Non-Galvanized parts perferred. Galvanized pipe parts to have asphalt treatment 1.
4. Frame and ladder or steps offset so:
   A. Cleanout gate is visible from top.
   B. Climb-down space is clear of riser and cleanout gate.
   C. Frame is clear of curb.
5. If metal outlet pipe connects to cement concrete pipe: outlet pipe to have smooth O.D. equal to concrete pipe I.D. less $\frac{1}{4}$".
6. Provide at least one 3" X .090 gage support bracket anchored to concrete wall. (maximum 3'-0" vertical spacing)
7. Locate elbow restrictor(s) as necessary to provide minimum clearance as shown.
8. Locate additional ladder rungs in structures used as access to tanks and vaults to allow access when catch basin is filled with water.

PUBLIC WORKS DEPARTMENT

FLOW RESTRICTOR OIL POLLUTION CONTROL TEE

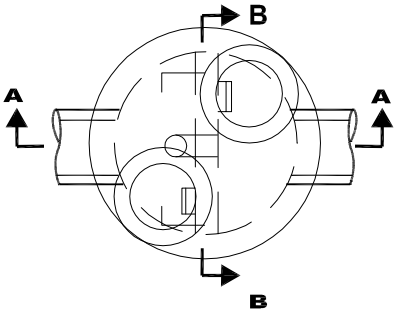
STD. PLAN – 237.00

MARCH 2008

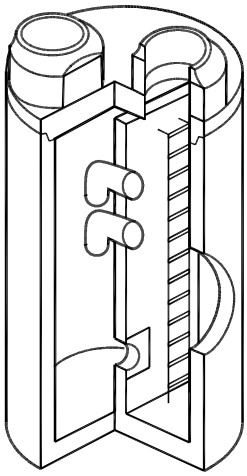


SECTION A-A
NTS

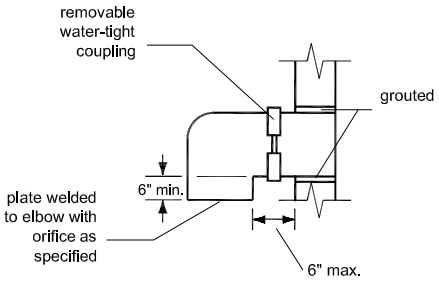
SECTION B-B
NTS



PLAN VIEW
NTS



ISOMETRIC
NTS

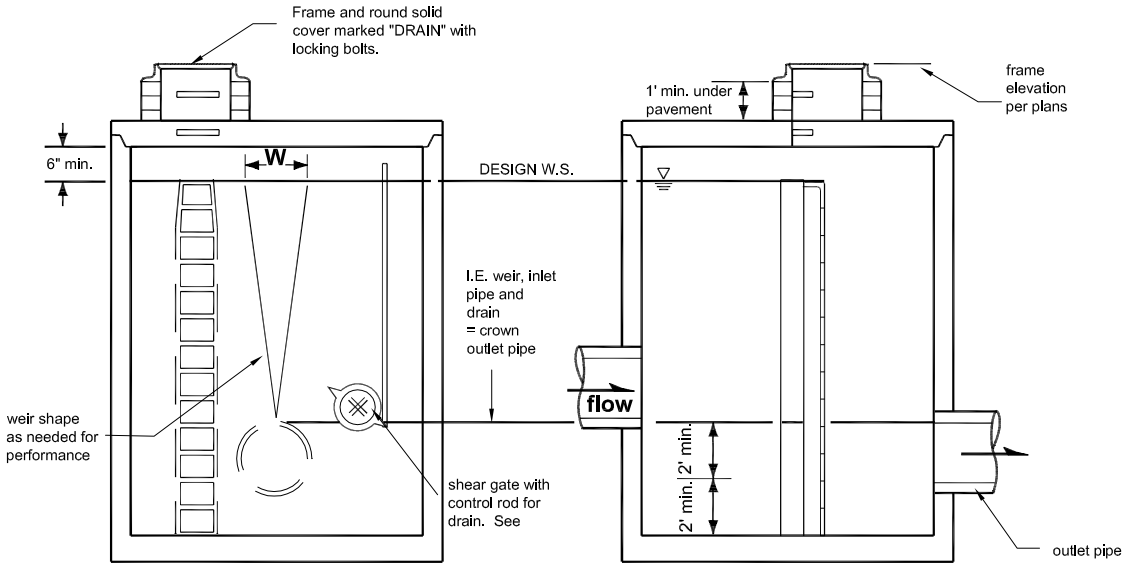


ELBOW RESTRICTOR DETAIL
NTS

NOTES:

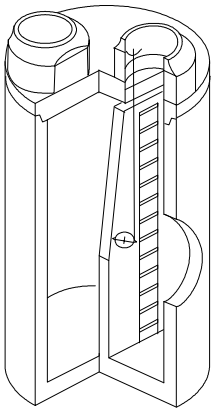
outlet capacity: 100 year developed peak flow
metal parts: corrosion resistant steel parts galvanized and asphalt coated
catch basin: type 2 minimum 72" diameter to be constructed in accordance with AASHTO M-199
unless otherwise spedified
orifices: sized and located as required with lowest orifice a minimum of 2' from base

CITY OF RENTON PUBLIC WORKS DEPARTMENT	**FLOW RESTRICTOR OIL POLLUTION CONTROL BAFFLE**	**STD. PLAN – 237.10** MARCH 2008

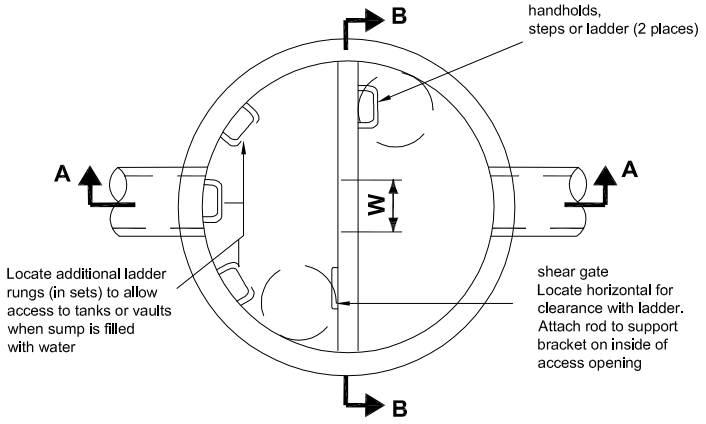


SECTION B-B
NTS

SECTION A-A
NTS



ISOMETRIC
NTS



PLAN VIEW
NTS

NOTES:

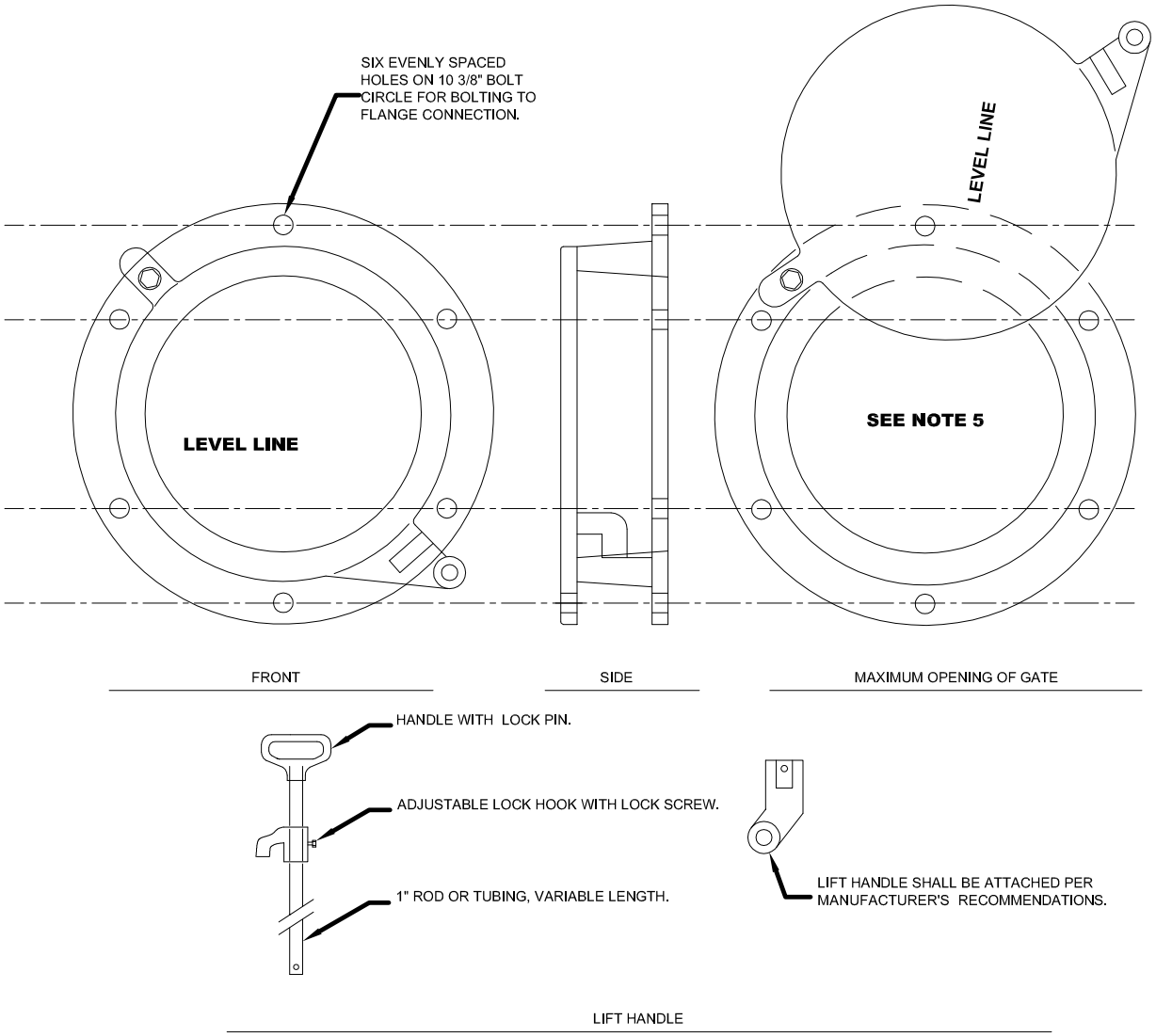
Outlet Capacity: 100-year developed peak flow.
Metal Parts: corrosion resistant steel parts galvanized and asphalt coated.
Catch Basin: type 2 Min. 72" diameter to be constructed in accordance with AASHTO M-199 unless otherwise specified.
Baffle Wall: to be designed with concrete reinforcing as required.
Spill Control Requirements

PUBLIC WORKS DEPARTMENT

FLOW RESTRICTOR OIL POLLUTION CONTROL WEIR

STD. PLAN – 237.20

MARCH 2008

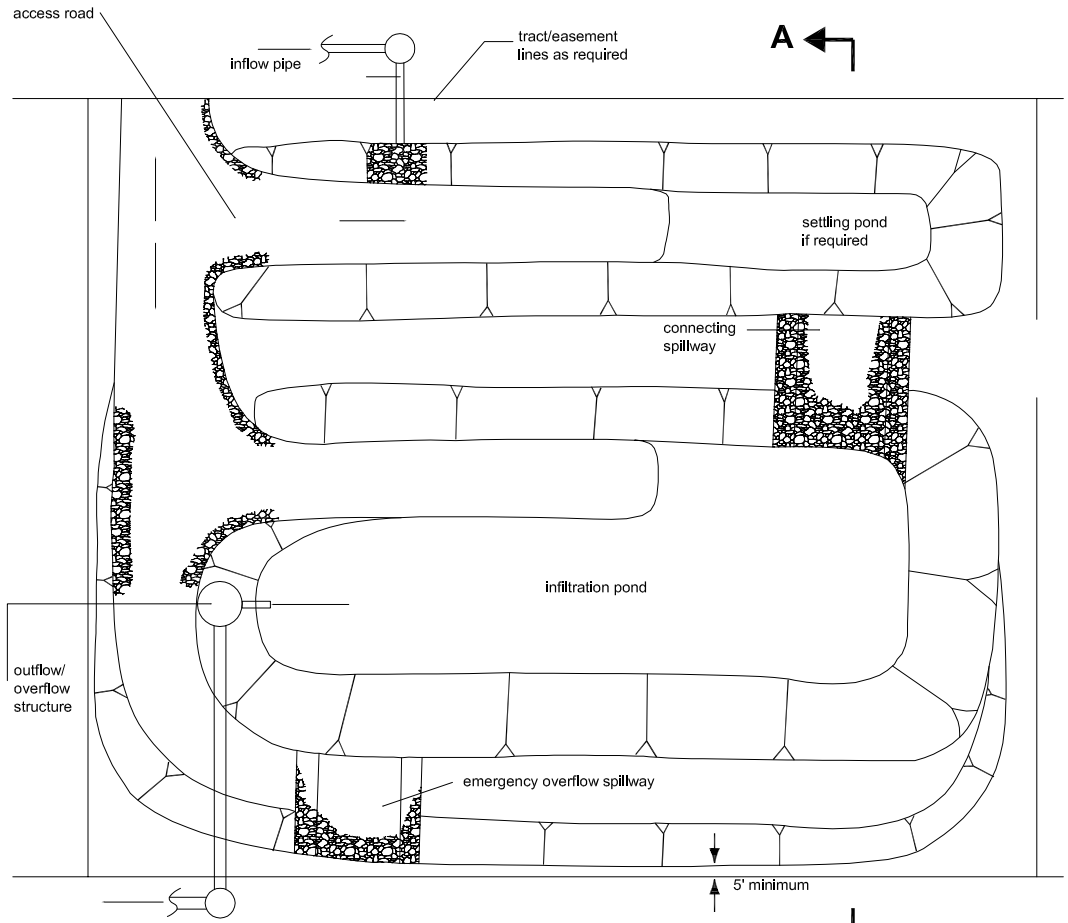


NOTES:

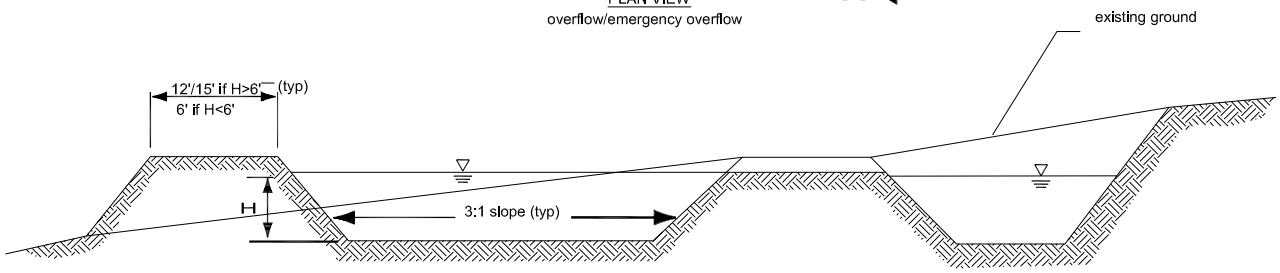
1. SHEAR GATE SHALL BE ALUMINUM ALLOY PER ASTM B-26-ZG-32a OR CAST IRON ASTM A48 CLASS 30B AS REQUIRED.
2. GATE SHALL BE 8 IN. DIAM. UNLESS OTHERWISE SPECIFIED.
3. GATE SHALL BE JOINED TO TEE SECTION BY BOLTING (THROUGH FLANGE), WELDING, OR OTHER SECURE MEANS.
4. LIFT ROD: AS SPECIFIED BY MFR. WITH HANDLE EXTENDING TO WITHIN ONE FOOT OF COVER AND ADJUSTABLE HOOK LOCK FASTENED TO FRAME OR UPPER HANDHOLD.
5. GATE SHALL NOT OPEN BEYOND THE CLEAR OPENING BY LIMITED HINGE MOVEMENT, STOP TAB, OR SOME OTHER DEVICE.
6. NEOPRENE RUBBER GASKET REQUIRED BETWEEN RISER MOUNTING FLANGE AND GATE FLANGE.
7. MATING SURFACES OF LID AND BODY TO BE MACHINED FOR PROPER FIT.
8. FLANGE MOUNTING BOLTS SHALL BE 3/8 IN. DIAM. STAINLESS STEEL.
9. ALTERNATE CLEANOUT/SHEAR GATES TO THE DESIGN SHOWN ARE ACCEPTABLE, PROVIDED THEY MEET THE MATERIAL SPECIFICATIONS ABOVE AND HAVE A SIX BOLT, 10 3/8 IN. BOLT CIRCLE FOR BOLTING TO THE FLANGE CONNECTION.

CITY OF RENTON — PUBLIC WORKS DEPARTMENT	**FROP - T - SHEAR GATE DETAIL**	**STD. PLAN – 237.30** MARCH 2008

DRAWN BY: MARK SUJKA



PLAN VIEW
overflow/emergency overflow



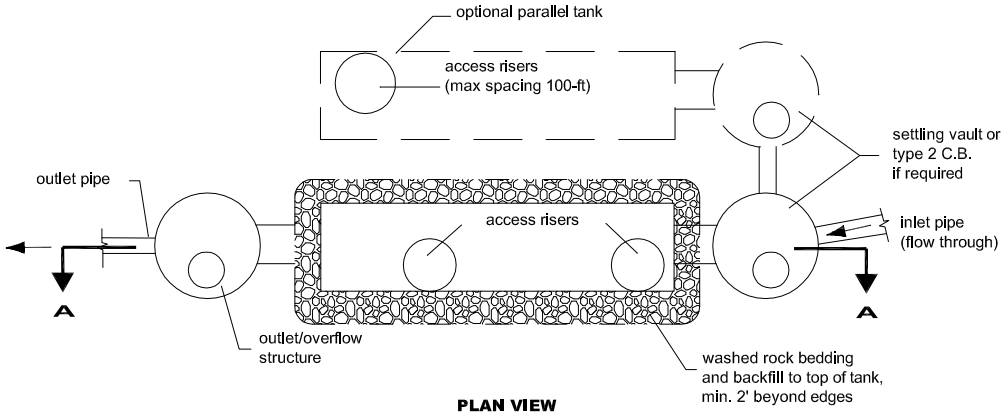
SECTION A-A

NOTE:

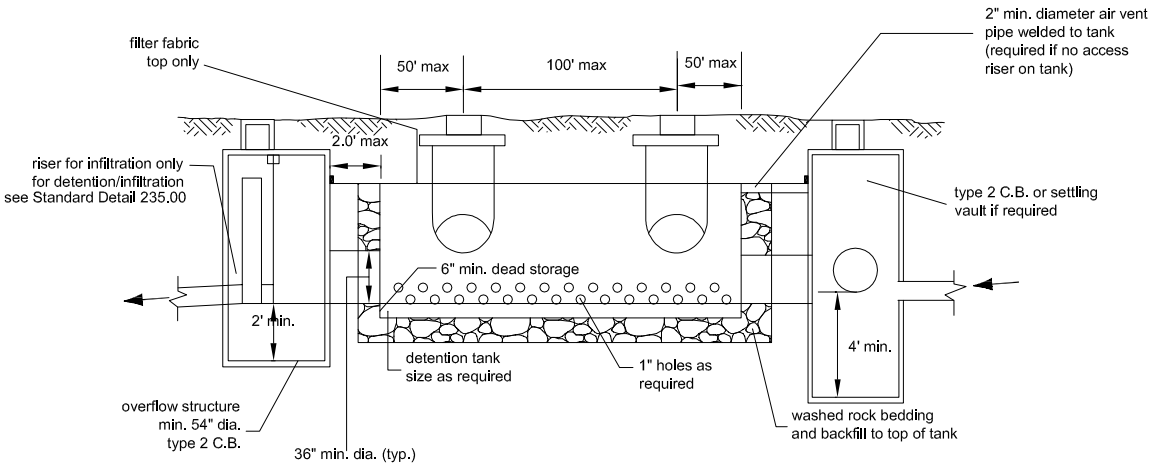
1. This detail is a schematic representation only. Actual configuration will vary depending on specific site constraints and applicable design criteria.
2. Access Road shall meet the following design criteria.
   - 2.1. maximum grade shall be 15 % for asphalt paving and 12 % for gravel or modular grid paving.
   - 2.2. Outside turning radius shall be 40 feet, minimum.
   - 2.3. Fence gates shall be located only on straingh section of road.
   - 2.4. Access roads shall be 15 feet in width on curves and 12 feet n straight sections.
   - 2.5. A paved apron shall be provided where access roads connect to paved public roadways.
3. All facilities shall be fences. Fence shall be provided around facility allowing proper maintenance per standard details unless otherwise specified.

CITY OF RENTON PUBLIC WORKS DEPARTMENT	**TYPICAL INFILTRATION POND**	**STD. PLAN – 238.00** MARCH 2008

DRAWN BY: MARK SUJKA



PLAN VIEW
NTS

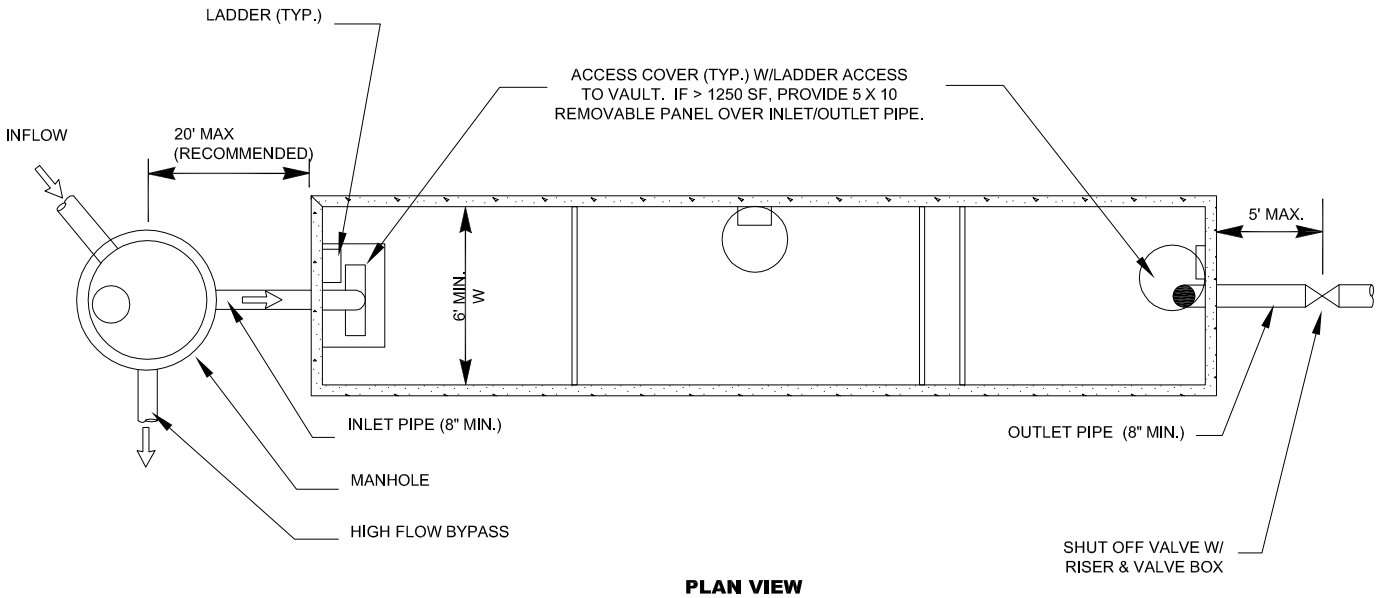


SECTION A-A
NTS

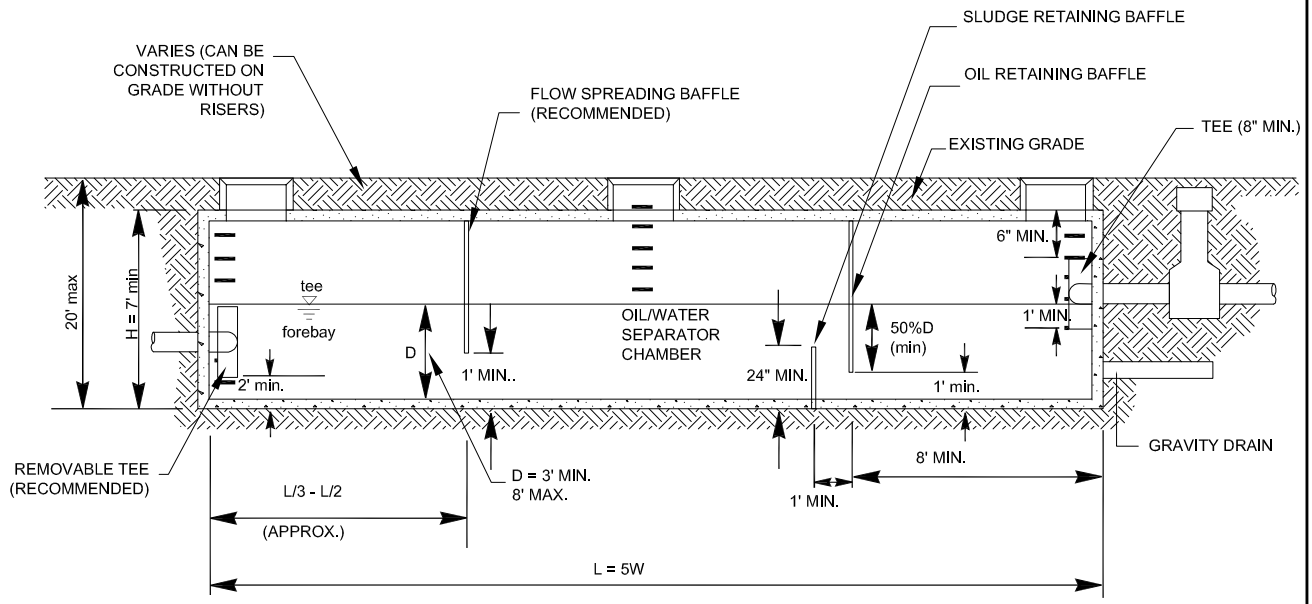
NOTES:
1. All metal parts corrosion resistant.
2. Steel parts galvanized and asphalt coate(treatment 1 or better).
3. Filter fabric to be placed over washed rock backfill.
4. The proposed bottom shall be at least 3 feet above the seasonal high water level and have at least 3 feet of permeable soil beneath the bottom.

CITY OF RENTON PUBLIC WORKS DEPARTMENT	**TYPICAL INFILTRATION TANK**	**STD. PLAN – 238.10** MARCH 2008

DRAWN BY: MARK SUJKA



PLAN VIEW
NTS



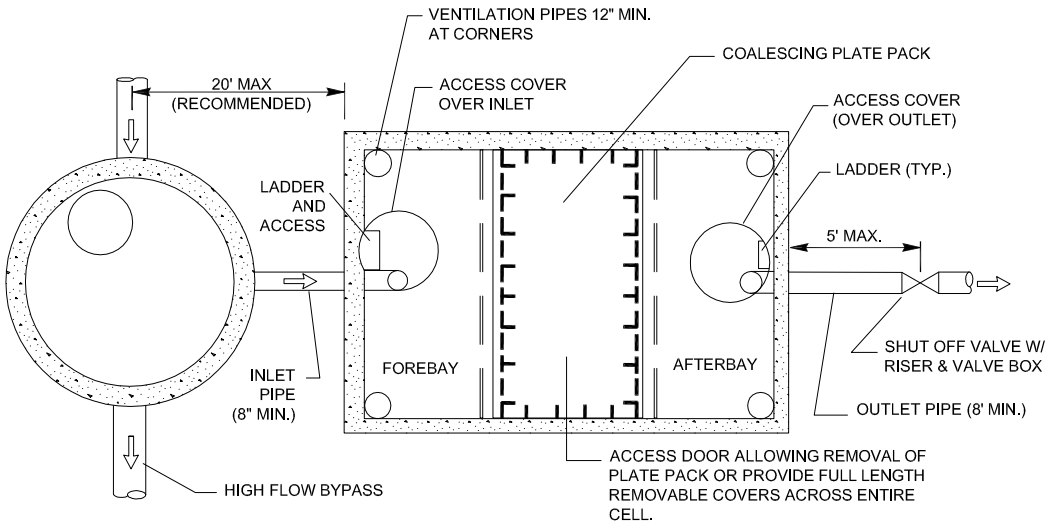
SECTION VIEW
NTS

NOTES:

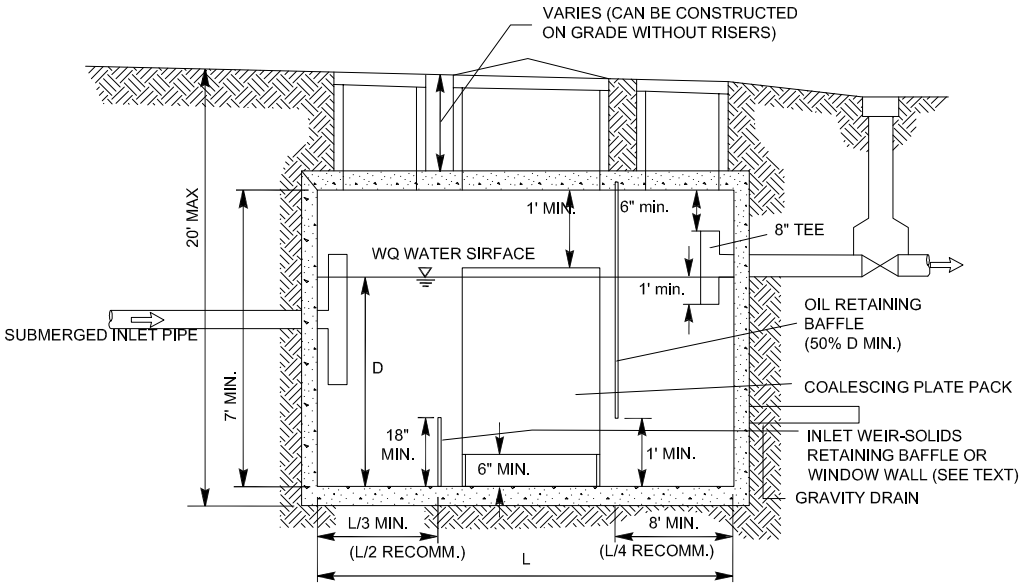
1. GRAVITY DRAIN SHALL BE AT LEAST 8 INCH MINIMUM DIAMETER AND SHALL BE CONTROLLED BY A VALVE . USE OF A SHEAR GATE IS ALLOWED ONLY AT THE INLET OF A PIPE LOCATED WITHIN AN APPROVED STRUCTURE.

CITY OF RENTON PUBLIC WORKS DEPARTMENT	**BAFFLE OIL / WATER SEPARATOR**	**STD. PLAN – 240.00** MARCH 2008

DRAWN BY: MARK SUJKA



PLAN VIEW
NTS



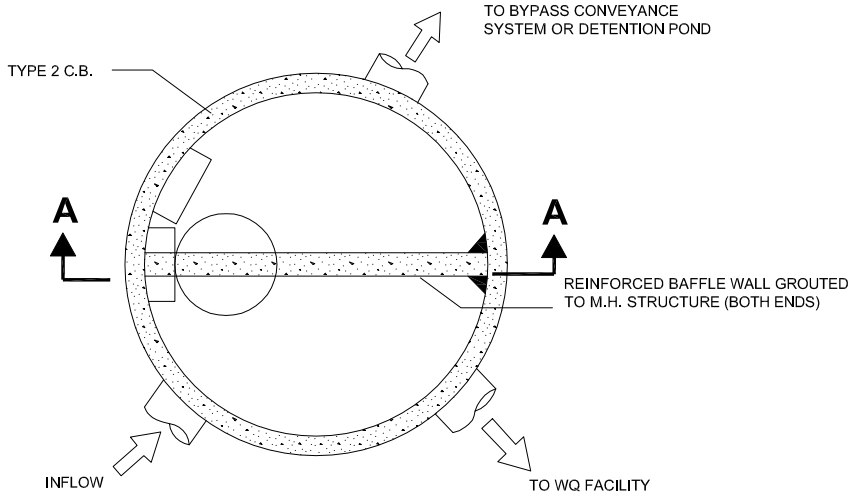
SECTION VIEW
NTS

NOTES:

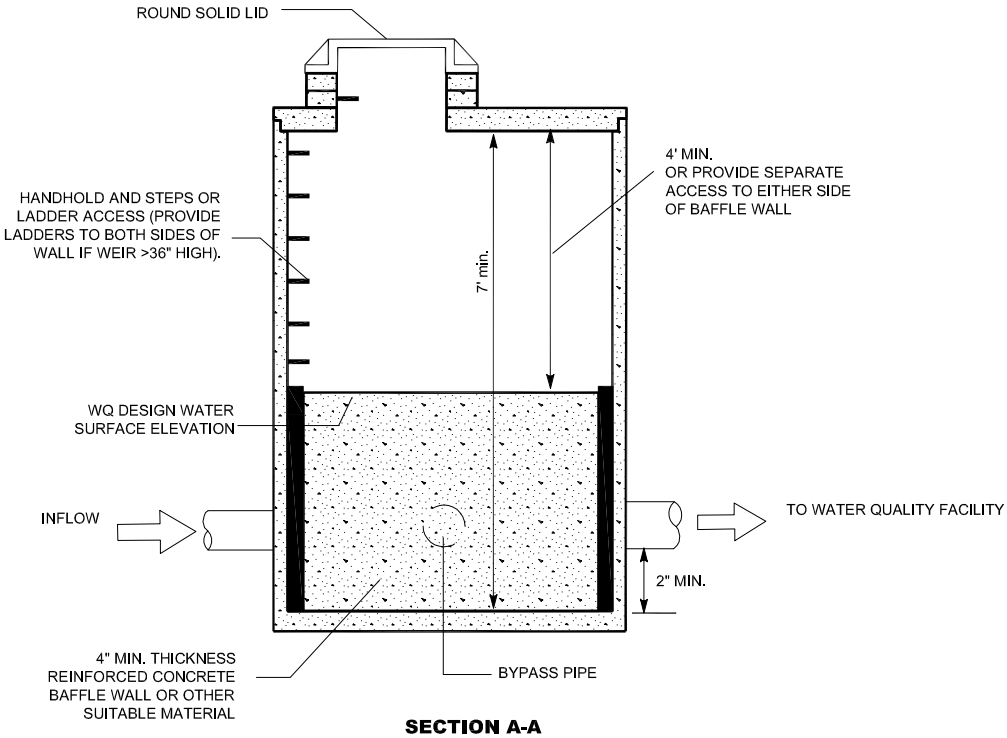
1. GRAVITY DRAIN SHALL BE AT LEAST 8 INCH MINIMUM DIAMETER AND SHALL BE CONTROLLED BY A VALVE . USE OF A SHEAR GATE IS ALLOWED ONLY AT THE INLET OF A PIPE LOCATED WITHIN AN APPROVED STRUCTURE.

CITY OF RENTON PUBLIC WORKS DEPARTMENT	**COALESCING PLATE OIL / WATER SEPARATOR**	**STD. PLAN – 240.10** MARCH 2008

DRAWN BY: MARK SUJKA



PLAN VIEW
NTS

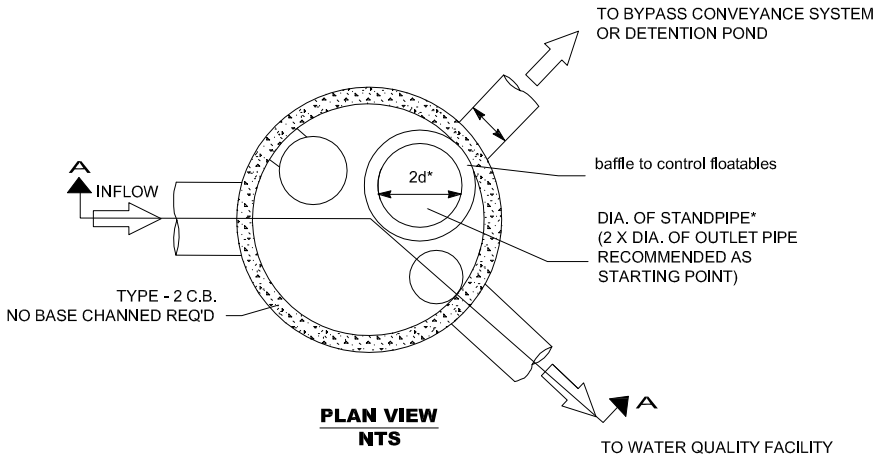


SECTION A-A
NTS

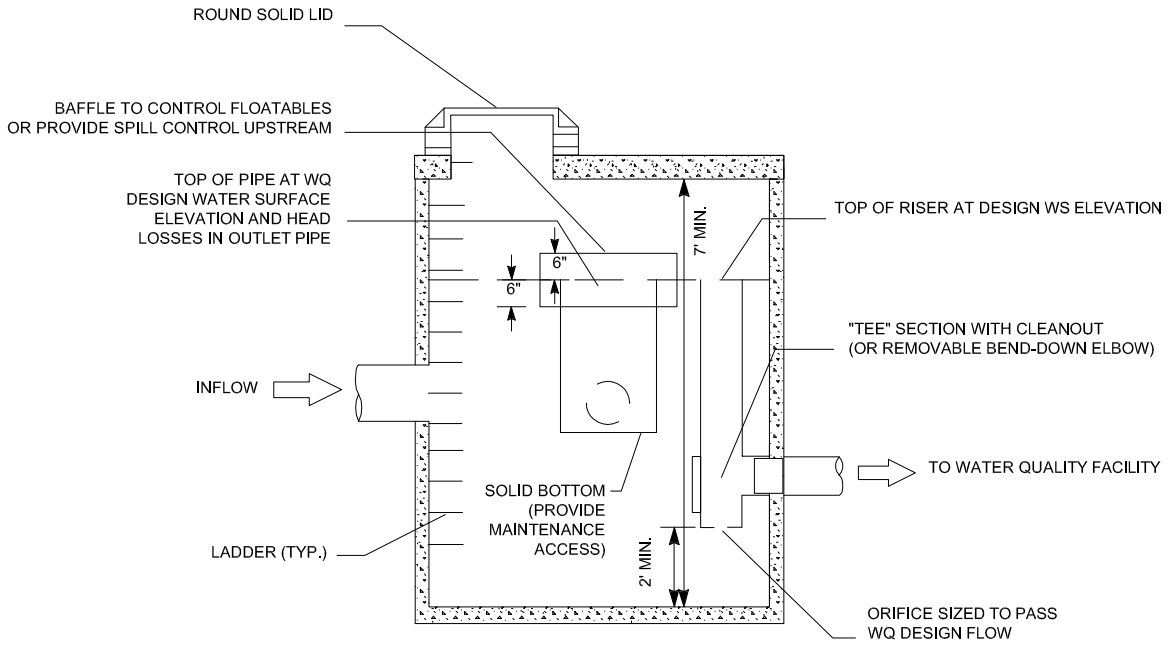
Note:
The water quality discharge pipe may require an orifice plate to be installed on the outlet to control the height of the design water surface (weir height). The design water surface should be set to provide a minimum headwater/diameter ratio of 2.0 on the outlet pipe.

CITY OF RENTON PUBLIC WORKS DEPARTMENT	**FLOW SPLITTER - OPTION A**	**STD. PLAN – 241.00** MARCH 2008

DRAWN BY: MARK SUJKA



PLAN VIEW
NTS



SECTION A-A
NTS

***NOTE:**
Diameter (d) of standpipe should be large enough to minimize head above WQ design WS and to keep WQ design flows from increasing more than 10% during 100-year flows.

PUBLIC WORKS DEPARTMENT

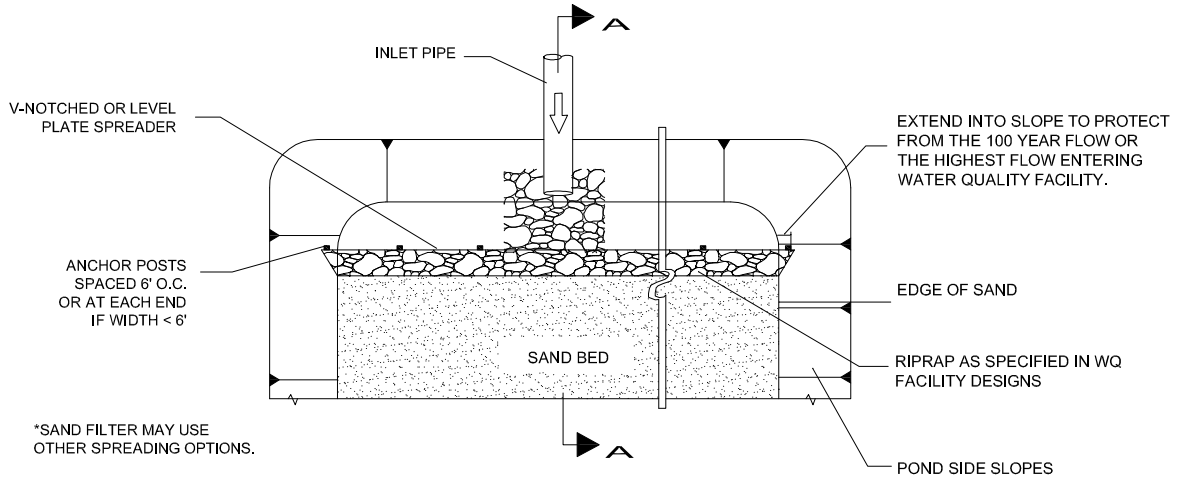
FLOW SPLITTER - OPTION B

STD. PLAN – 241.10

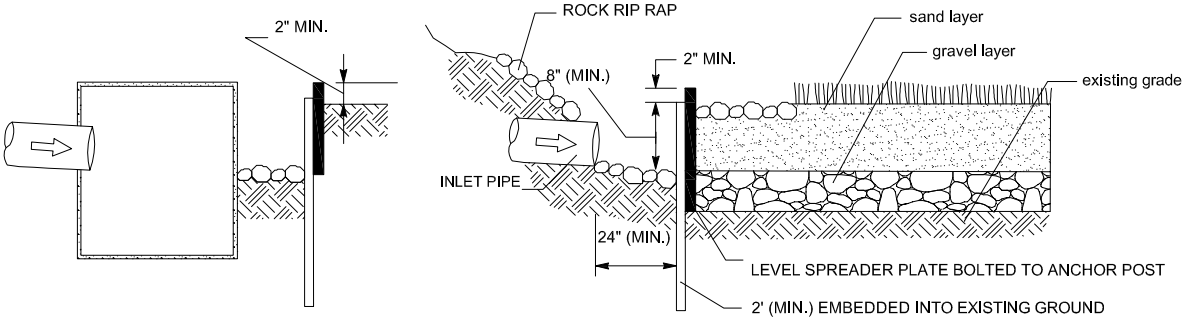
MARCH 2008

DRAWN BY: MARK SUJKA

Example of anchored plate used with a sand filter* (may also be used with other water quality facilities).



PLAN VIEW
NTS



Alternative Design
Catch basin recommended for higher flow situations (generally for inflow velocities of 5 fps or greater for 100 year storm).

SECTION A-A
NTS

NOTES:

1. FLOW SPREADER PLATES MAY BE MADE OF EITHER WOOD, METAL, FIBERGLASS REINFORCED PLASTIC, OR OTHER DURABLE MATERIAL. IF WOOD, PRESSURE TREATED 4 BY 10-INCH LUMBER OR LANDSCAPE TIMBERS ARE ACCEPTABLE.
2. ANCHOR POST SHALL BE 4-INCHES SQUARE CONCRETE, TUBULAR STAINLESS STEEL, OR OTHER MATERIAL RESISTANCE TO DECAY .

PUBLIC WORKS DEPARTMENT

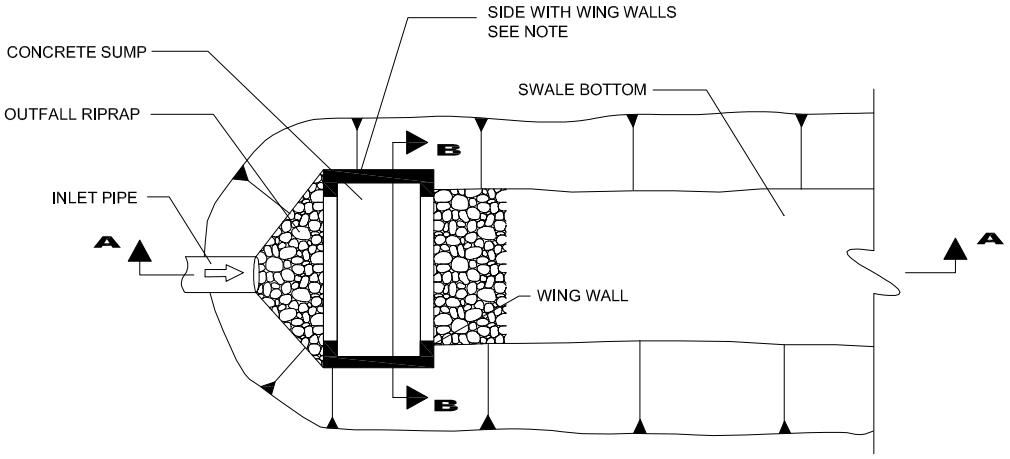
FLOW SPREADER - OPTION A ANCHORED PLATE

STD. PLAN – 242.00

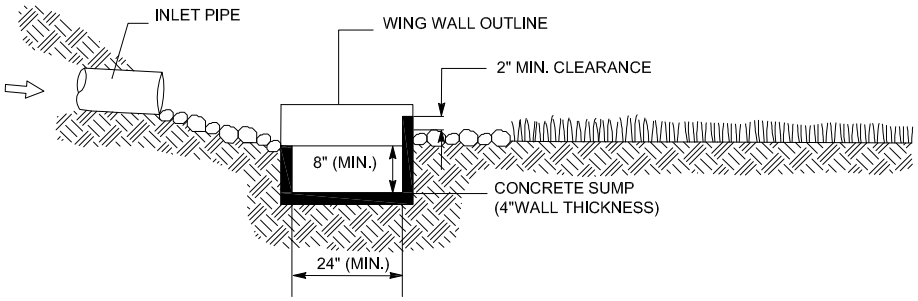
MARCH 2008

DRAWN BY: MARK SUJKA

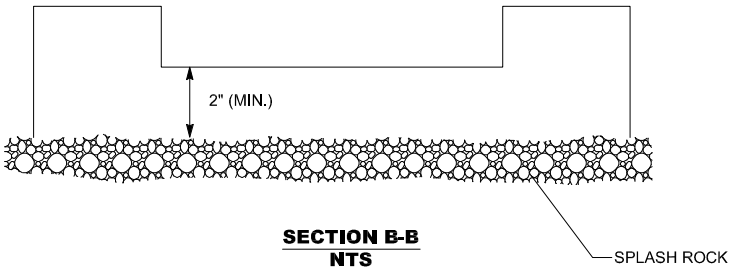
Example of a concrete sump flow spreader used with a biofiltration swale (may be used with other WQ facilities).



PLAN VIEW
NTS



SECTION A-A
NTS



SECTION B-B
NTS

Note:

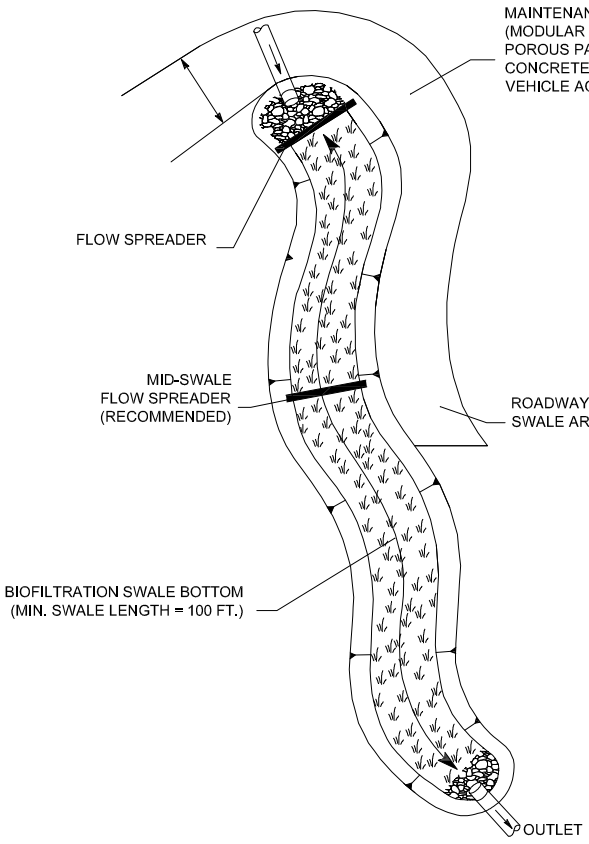
1. Extend sides into slope. Height of side wall and wing walls must be sufficient to handle the 100-year flow or the highest flow entering the facility.

2. Concrete for sump box may be either cast-in-place or pre-cast, but the bottom of the sump shall be reinforced with wire mesh for cast-in-place sumps.

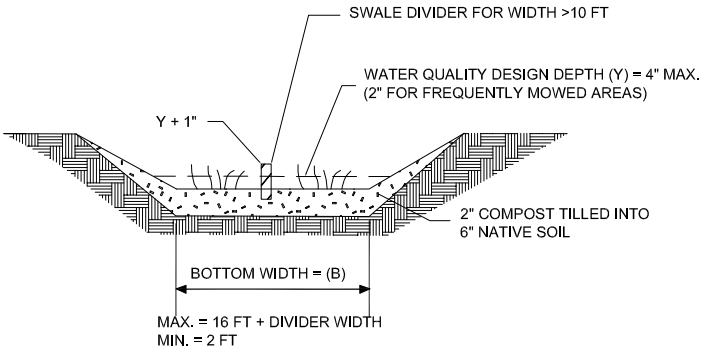
3. Sump boxes shall be placed over bases that consist of 4 inches of crushed rock, $\frac{5}{8}$ - inch minus to help assure the sump remain level.

CITY OF RENTON — PUBLIC WORKS DEPARTMENT	**FLOW SPREADER OPTION B CONCRETE SUMP BOX**	**STD. PLAN – 242.10** MARCH 2008

DRAWN BY: MARK SUJKA



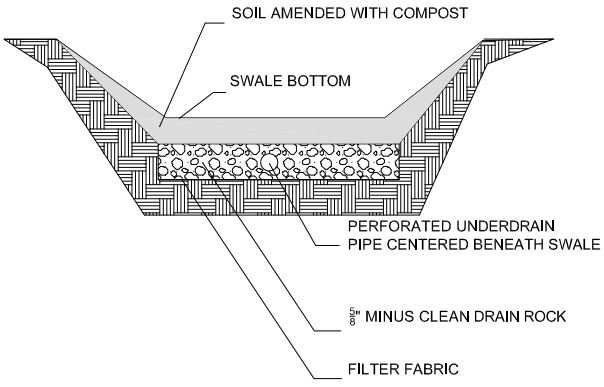
PLAN



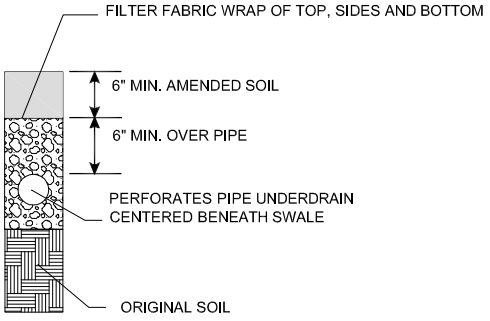
TYPICAL SWALE SECTION

NOTE: Longitudinal slope 1-6%.
Provide underdrain for slopes < 1.5%.

UNDERDRAIN FOR SLOPES < 1.5%



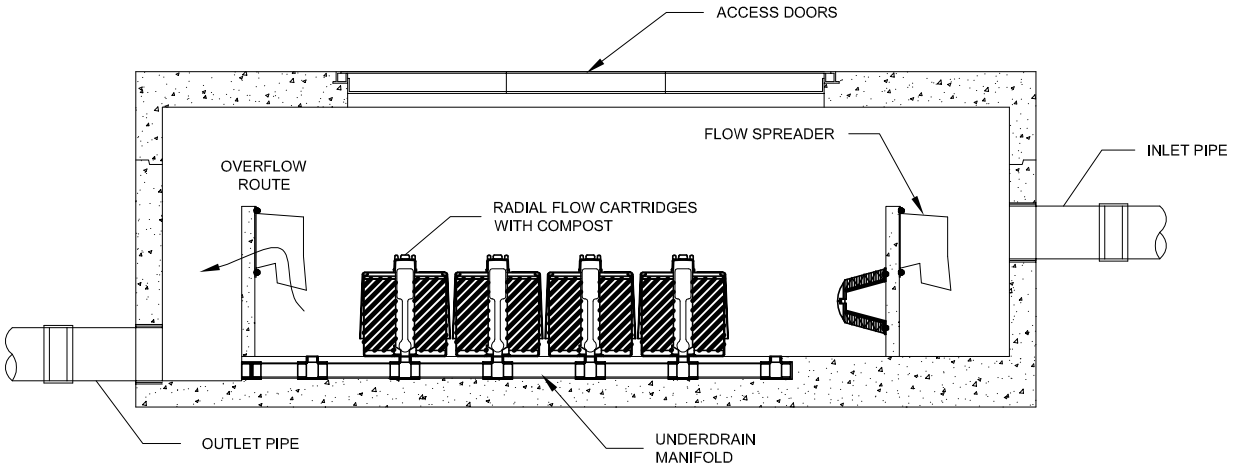
SECTION



DETAIL A

NOTE: Underdrain must infilitrate or drain freely to an acceptable discharge point.

CITY OF RENTON PUBLIC WORKS DEPARTMENT	**BIOFILTRATION SWALE SCHEMATIC, CROSS SECTION AND UNDERDRAIN DETAIL**	**STD. PLAN – 243.00** MARCH 2008



NOTES

1. CONDITION OF USE

1.1. MAY BE USED AS A SECOND WATER QUALITY FACILITY IN ENHANCED BASIC WATER QUALITY TREATMENT.
1.2. MAY BE FILLED WITH SEVERAL TYPES OF FILTER MEDIA INCLUDING PERLITE, ZEOLITE AND IRONINFUSSED MEDIA.

2. DESIGN AND INSTALLATION SPECIFICATIONS

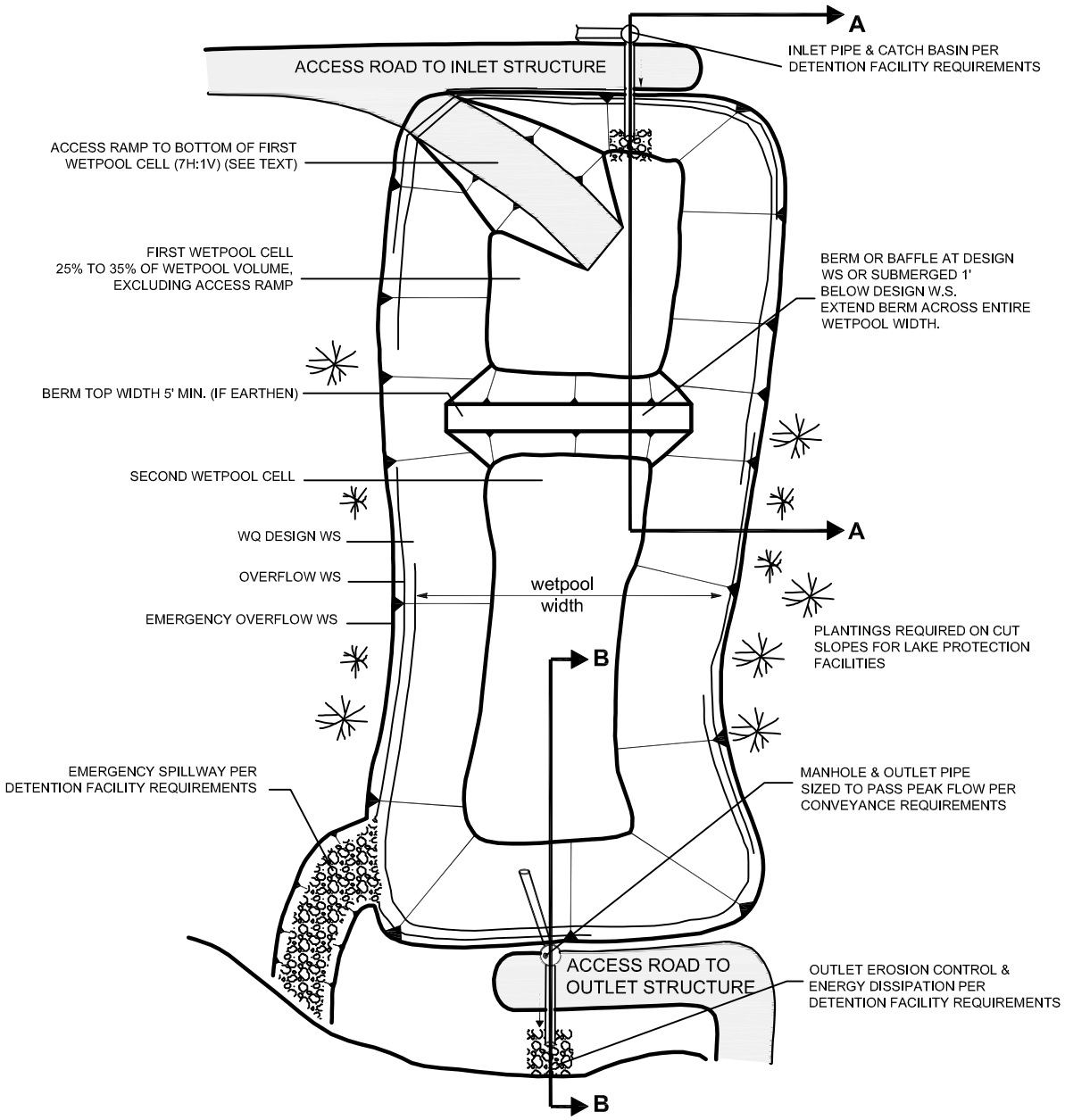
2.1. STORMFILTER SIZING IS BASED ON THE WATER QUALITY FLOW.
2.2. ACCESS MOST BE PROVIDED BY EITHER 3'X9' ACCESS DOOR OR REMOVABLE PANELS TO ALLOW FOR REMOVAL AND REPLACEMENT OF EITHER FILTER CARTRIDGE. REMOVABLE PANELS SHALL BE AT GRADE, HAVE STAINLESS STEEL LIFTING EYES, AND WEIGHT NO MORE THAN 5 TONS PER PANEL.
2.3. ACCESS TO THE INFLOW AND OUTLET CELLS MUST BE PROVIDED.
2.4. LADDER ACCESS IS REQUIRED WHEN VAULT HEIGHT EXCEEDS 4 FEET.
2.5. LOCKING LIDS SHALL BE PROVIDED AS SPECIFIED FOR DETENTION.

3. MAINTENANCE STANDARDS

3.1. ROUTINE MAINTENANCE SHALL INCLUDE INSPECTING FOR DEBRIS, VEGETATION, AND SEDIMENT ACCUMULATION, FLUSHING THE UNDER DRAIN, AND REMOVING OR REPLACING COMPOST MEDIA.
3.2. SEDIMENT SHALL BE REMOVED WHEN THE ACCUMULATION CAUSES THE INFILTRATION CAPACITY TO DROP BELLOW DESIGN FLOW RATE.
3.3. THE MEDIA SHALL BE REPLACED AT LEAST ONCE A YEAR OR WHEN INFILTRATION CAPACITY IS UNRECOVERABLE.
3.4. MEDIA SHALL BE DISPOSED OF IN ACCORDANCE WITH APPLICABLE REGULATIONS INCLUDING THE STATE DANGEROUS WASTE REGULATIONS (WAC-173-303).

CITY OF RENTON PUBLIC WORKS DEPARTMENT	**STORMFILTER SCHEMATIC**	**STD. PLAN – 248.00** MARCH 2008

DRAWN BY: MARK SUJKA



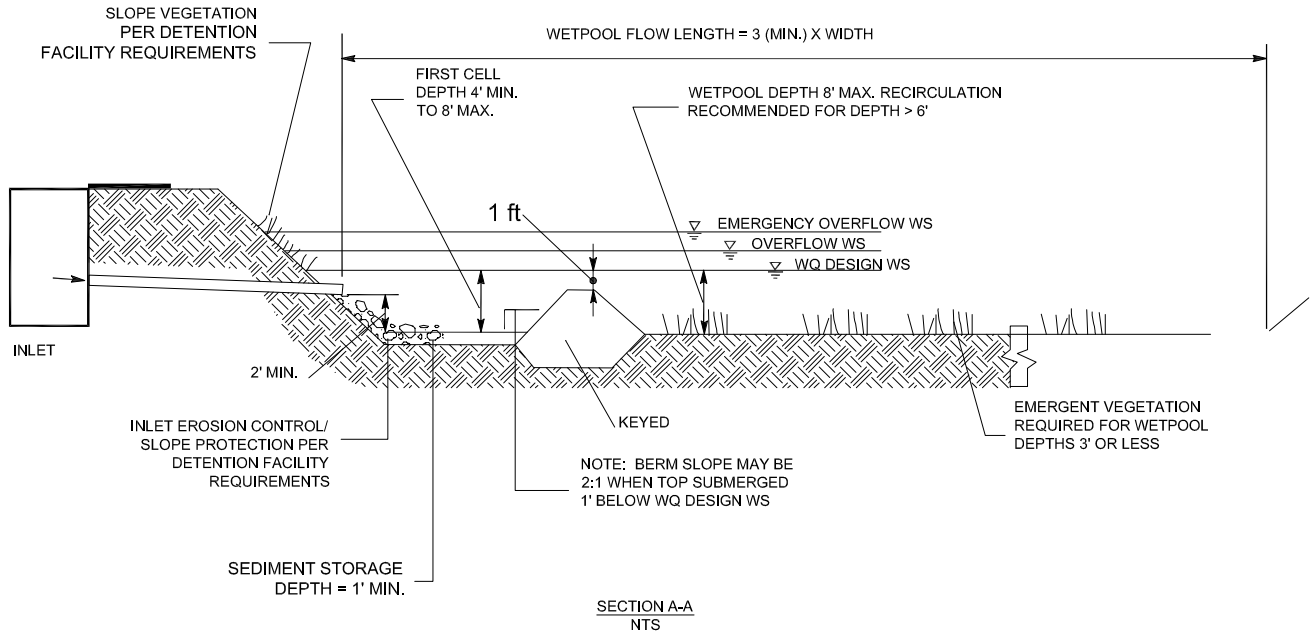
PLAN VIEW
NTS

NOTE:

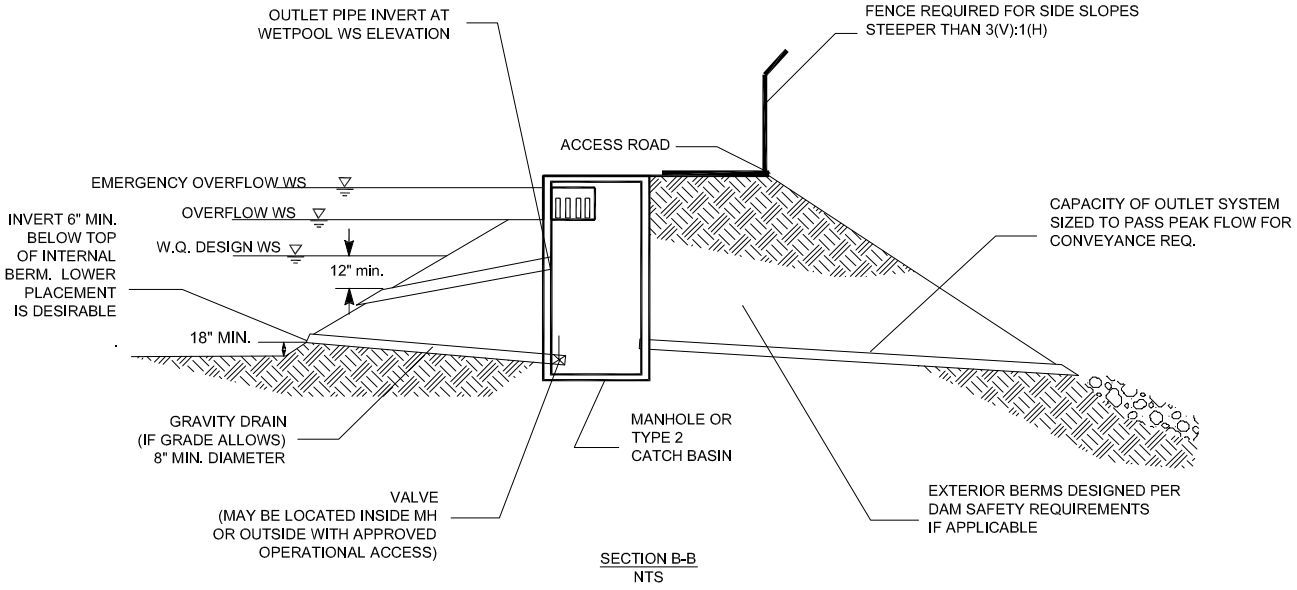
1. This detail is a schematic representation only. Actual configuration will vary depending on specific site constraints and applicable design criteria.
2. Access Road shall meet the following design criteria.
   - 2.1. Maximum grade shall be 15 % for asphalt paving and 12 % for gravel or modular grid paving.
   - 2.2. Outside turning radius shall be 40 feet, minimum.
   - 2.3. Fence gates shall be located only on strafing section of road.
   - 2.4. Access roads shall be 15 feet in width on curves and 12 feet n straight sections.
   - 2.5. A paved apron shall be provided where access roads connect to paved public roadways.
3. All facilities shall be fenced. Fence shall be provided around facility allowing proper maintenance per standard details unless otherwise specified.
4. Wetponds with wetpool volumes less than or equal to 4,000 cubic feet may be single celled (i.e., no baffle or berm is required).

CITY OF RENTON PUBLIC WORKS DEPARTMENT	**TYPICAL WETPOND**	STD. PLAN – 249.00
		MARCH 2008

DRAWN BY: MARK SUJKA



SECTION A-A
NTS



SECTION B-B
NTS

NOTE:

1. See detention facility requirements for location and setback requirements.
2. All facilities shall be fenced. Fence shall be provided around facility allowing proper maintenance of the facility.
3. This detail is a schematic representation only. Actual configuration will vary depending on specific site constraints and applicable design criteria.
4. Access Road shall meet the following design criteria.
   - 4.1. maximum grade shall be 15 % for asphalt paving and 12 % for gravel or modular grid paving.
   - 4.2. Outside turning radius shall be 40 feet, minimum.
   - 4.3. Fence gates shall be located only on straingh section of road.
   - 4.4. Access roads shall be 15 feet in width on curves and 12 feet n straight sections.
   - 4.5. A paved apron shall be provided where access roads connect to paved public roadways.

CITY OF RENTON

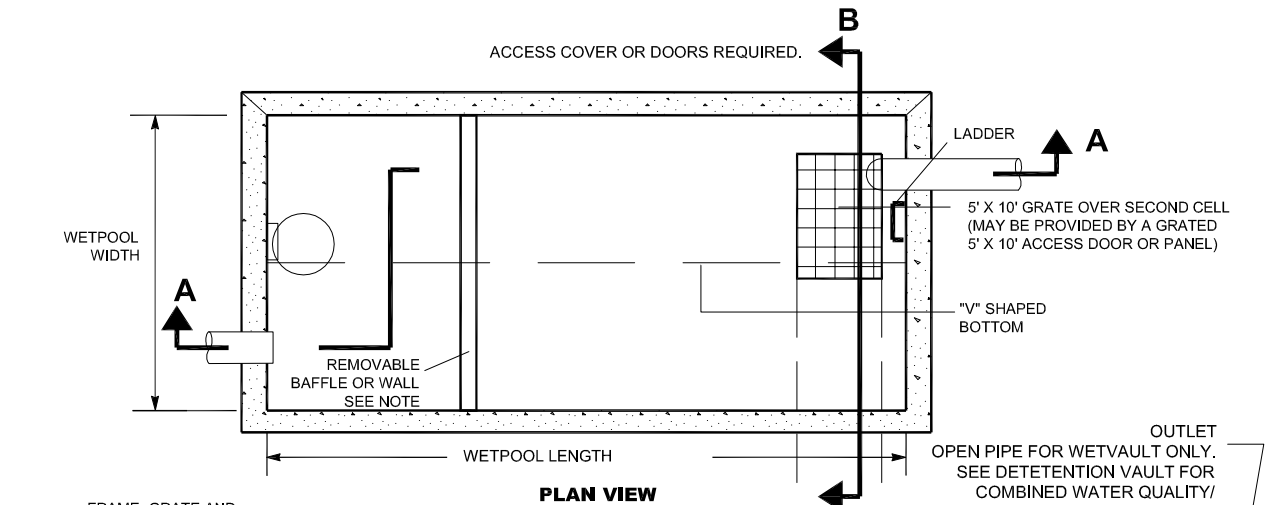
PUBLIC WORKS
DEPARTMENT

TYPICAL WETPOND SECTIONS

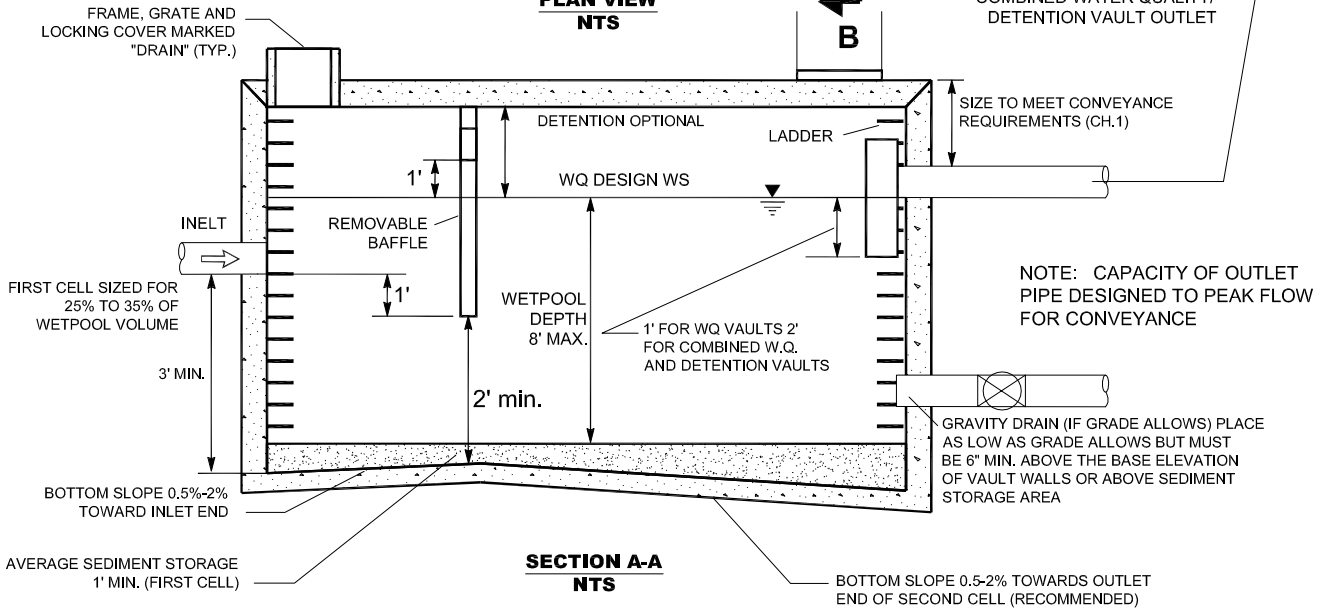
STD. PLAN – 249.10

MARCH 2008

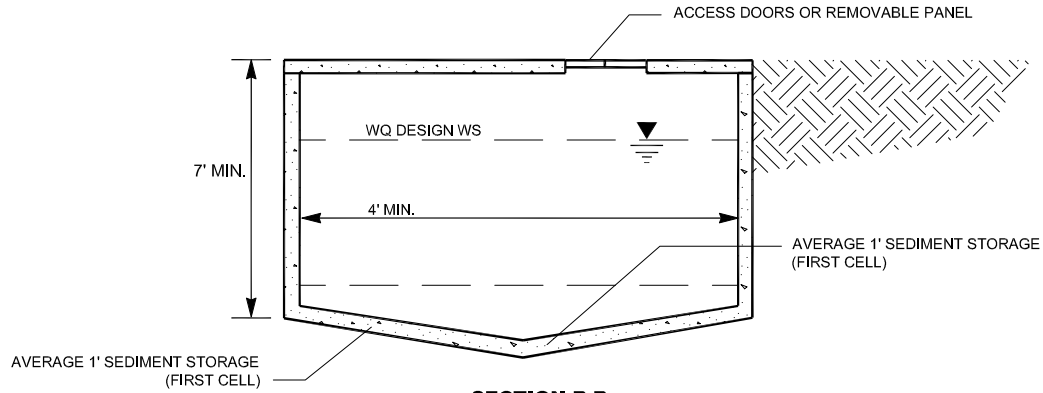
DRAWN BY: MARK SUJKA



PLAN VIEW
NTS



SECTION A-A
NTS



SECTION B-B
NTS

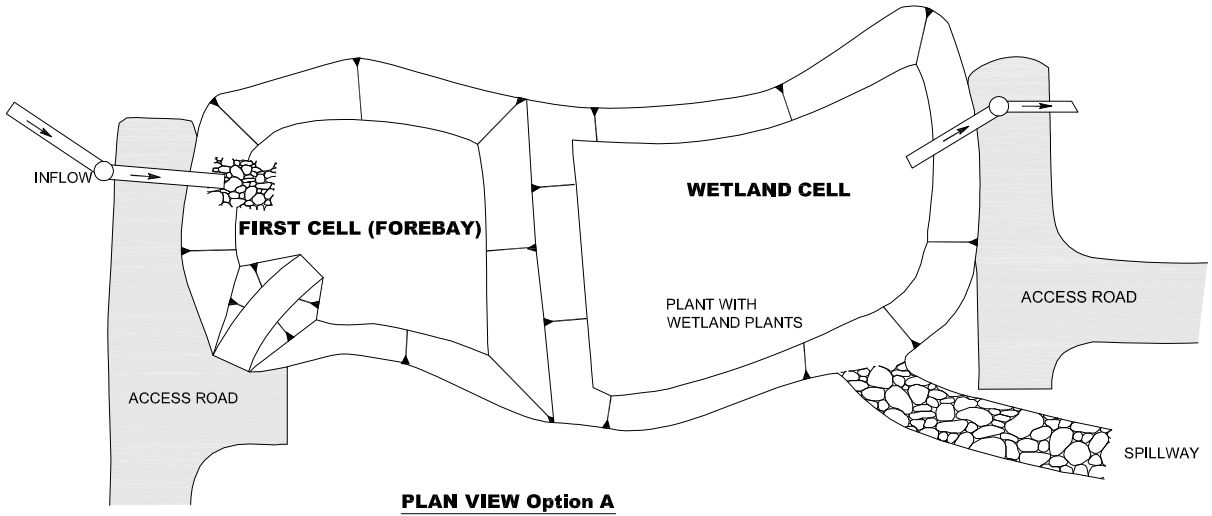
NOTE:

1.1. THE VAULT SHALL BE SEPARATED INTO TWO CELLS BY A WALL OR A REMOVABLE BAFFLE. IF A WALL OR NON REMOVABLE BAFFLE IS USED, A 5-FOOT C X 10-FOOT REMOVABLE REMOVABLE MAINTENANCE ACCESS MOST BE PROVIDED FOR BOTH CELLS.

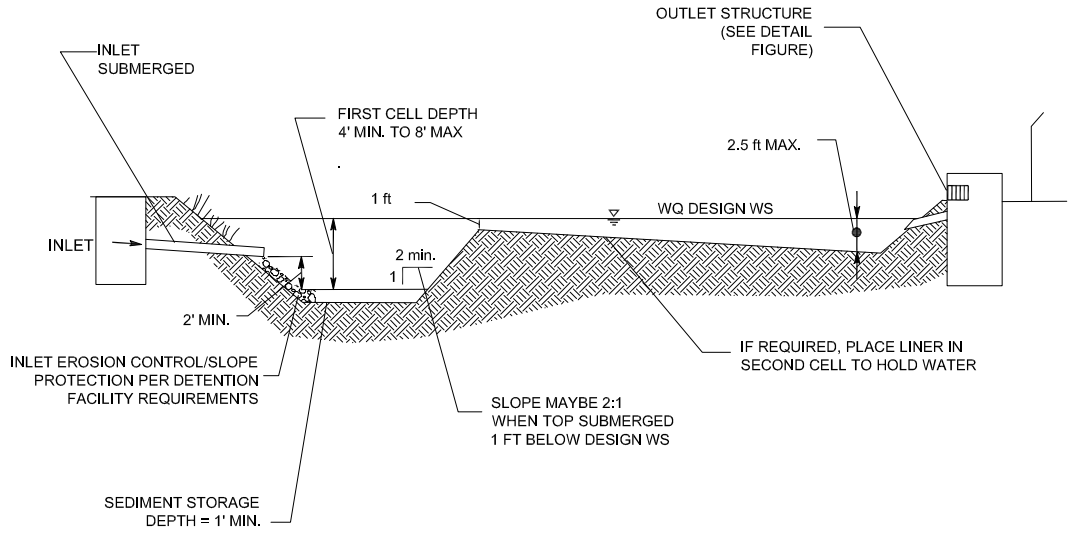
1.2. FOR VAULTS UNDER ROADWAYS, THE REMOVABLE PANEL MUST BE LOCATED OUTSIDE THE TRAVEL LANES. ALTERNATIVELY, MULTIPLE STANDARD LOCKING MANHOLE COVERS MAY BE PROVIDED. SPACING OF MANHOLE COVERS SHALL BE 12 FEET, MEASURED ON CENTER, TO FACILITATE REMOVAL OF SEDIMENT. LADDERS AND HAND-HOLDS NEED ONLY BE PROVIDED AT THE OUTLET PIPE AND INLET PIPE,

CITY OF RENTON PUBLIC WORKS DEPARTMENT	**WETVAULT**	**STD. PLAN – 249.20** MARCH 2008

DRAWN BY: MARK SUJKA



PLAN VIEW Option A
NTS



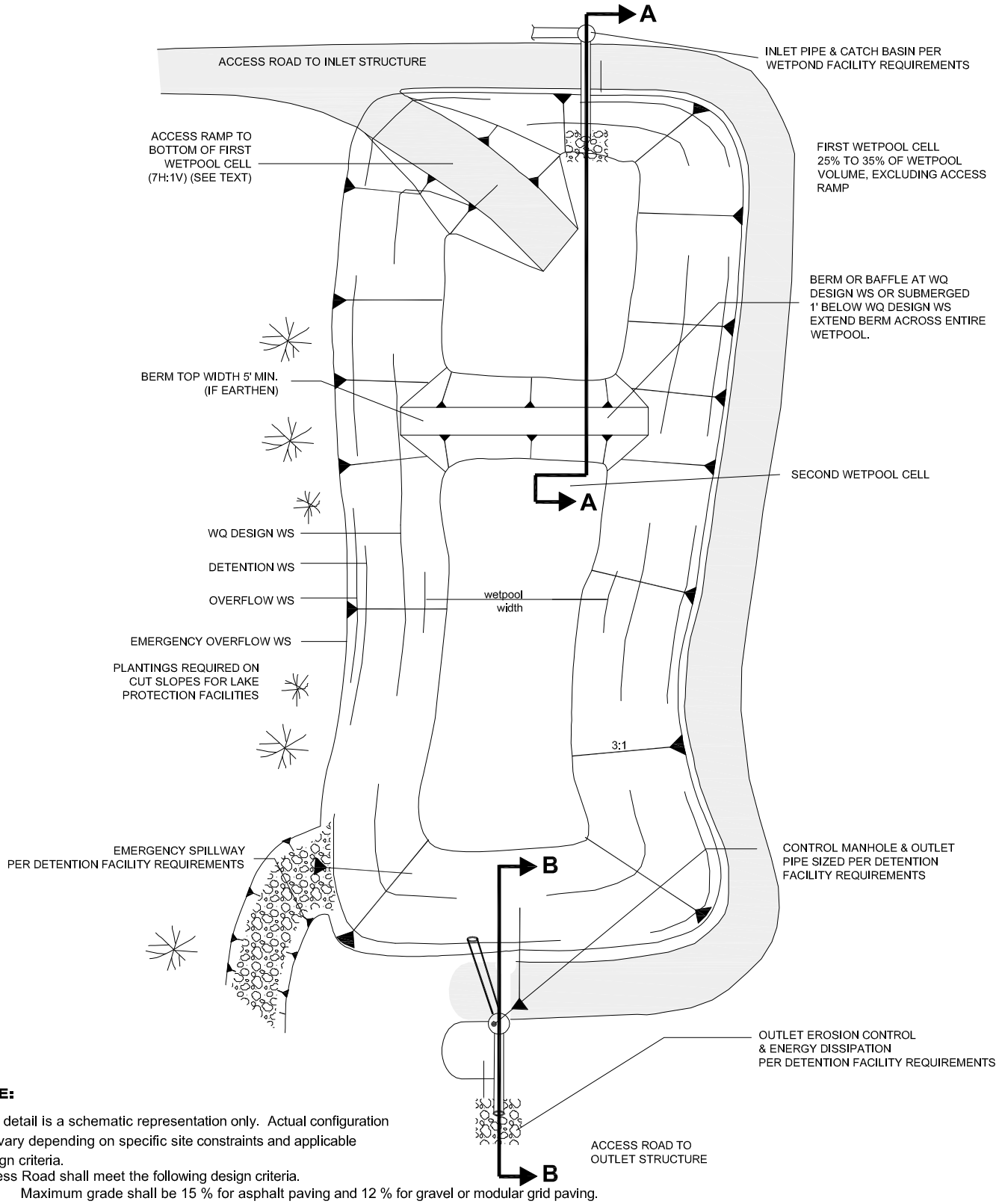
SECTION VIEW Option A
NTS

NOTE:

1. This detail is a schematic representation only. Actual configuration will vary depending on specific site constraints and applicable design criteria.
2. Access Road shall meet the following design criteria.
   - 2.1. Maximum grade shall be 15 % for asphalt paving and 12 % for gravel or modular grid paving.
   - 2.2. Outside turning radius shall be 40 feet, minimum.
   - 2.3. Fence gates shall be located only on straingh section of road.
   - 2.4. Access roads shall be 15 feet in width on curves and 12 feet n straight sections.
   - 2.5. A paved apron shall be provided where access roads connect to paved public roadways.
3. All facilities shall be fences. Fence shall be provided around facility allowing proper maintenance per standard details unless otherwise specified.
4. Wetponds with wetpool volumes less than or equal to 4,000 cubic feet may be single celled (i.e., no baffle ro berm is required).

CITY OF RENTON PUBLIC WORKS DEPARTMENT	**STORMWATER WETLAND OPTION A**	**STD. PLAN – 249.30** MARCH 2008

DRAWN BY: MARK SUJKA

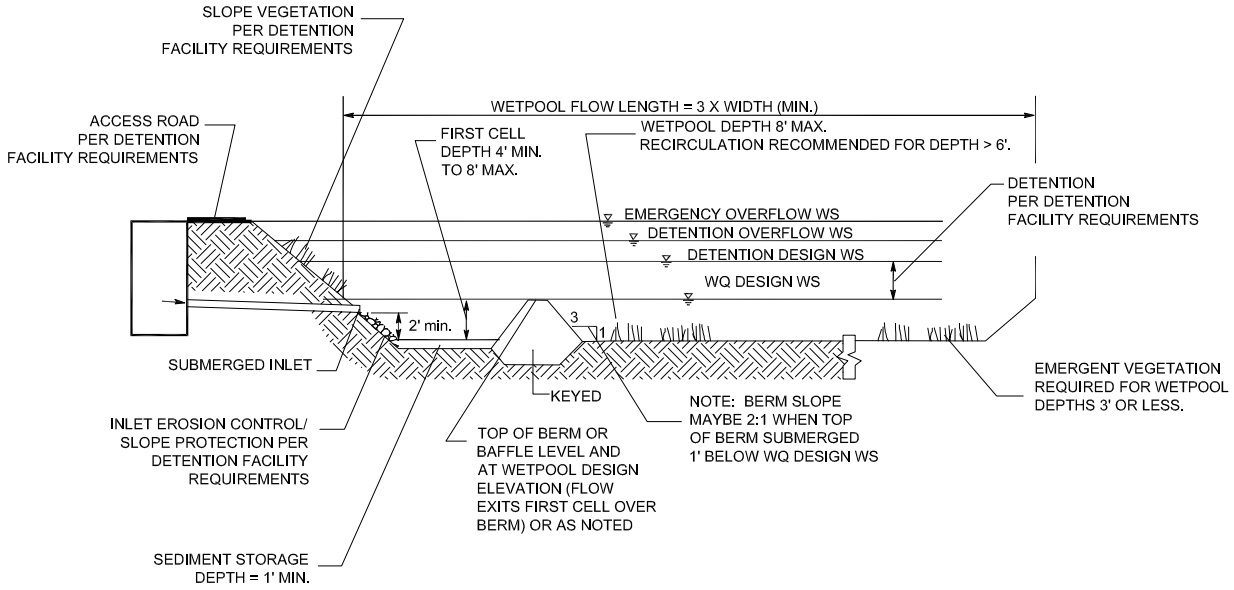


NOTE:

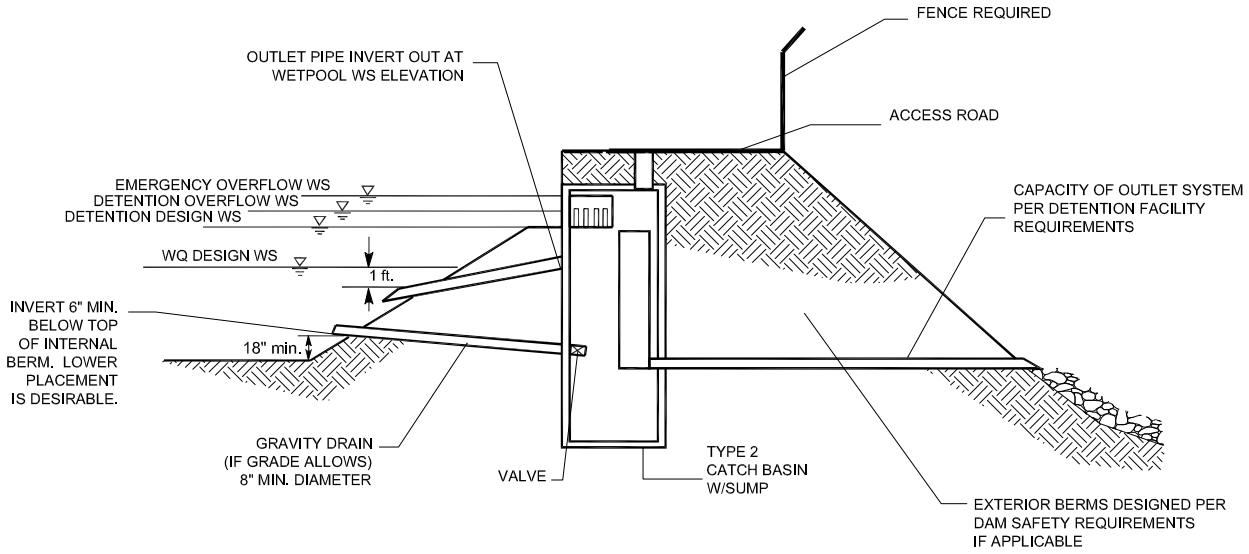
1. This detail is a schematic representation only. Actual configuration will vary depending on specific site constraints and applicable design criteria.
2. Access Road shall meet the following design criteria.
   - 2.1. Maximum grade shall be 15 % for asphalt paving and 12 % for gravel or modular grid paving.
   - 2.2. Outside turning radius shall be 40 feet, minimum.
   - 2.3. Fence gates shall be located only on straight section of road.
   - 2.4. Access roads shall be 15 feet in width on curves and 12 feet n straight sections.
   - 2.5. A paved apron shall be provided where access roads connect to paved public roadways.
3. All facilities shall be fenced. Fence shall be provided around facility allowing proper maintenance per standard details unless otherwise specified.

CITY OF RENTON PUBLIC WORKS DEPARTMENT	**COMBINED DETENTION AND WETPOND**	STD. PLAN – 252.00 MARCH 2008

DRAWN BY: MARK SUJKA



SECTION A-A
NTS



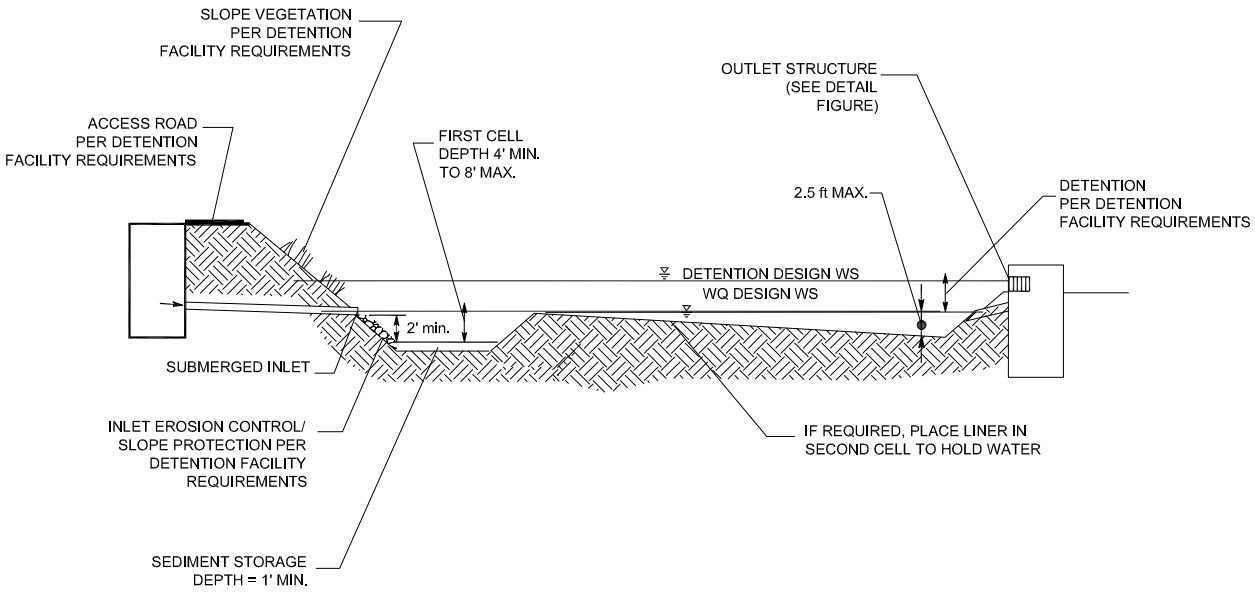
SECTION B-B
NTS

NOTE:

1. This detail is a schematic representation only. Actual configuration will vary depending on specific site constraints and applicable design criteria.
2. Access Road shall meet the following design criteria.
   - 2.1. Maximum grade shall be 15 % for asphalt paving and 12 % for gravel or modular grid paving.
   - 2.2. Outside turning radius shall be 40 feet, minimum.
   - 2.3. Fence gates shall be located only on straight section of road.
   - 2.4. Access roads shall be 15 feet in width on curves and 12 feet n straight sections.
   - 2.5. A paved apron shall be provided where access roads connect to paved public roadways.
3. All facilities shall be fenced. Fence shall be provided around facility allowing proper maintenance per standard details unless otherwise specified.

CITY OF RENTON — PUBLIC WORKS DEPARTMENT	**COMBINED DETENTION AND WETPOND - SECTIONS**	STD. PLAN – 252.10 MARCH 2008

DRAWN BY: MARK SUJKA



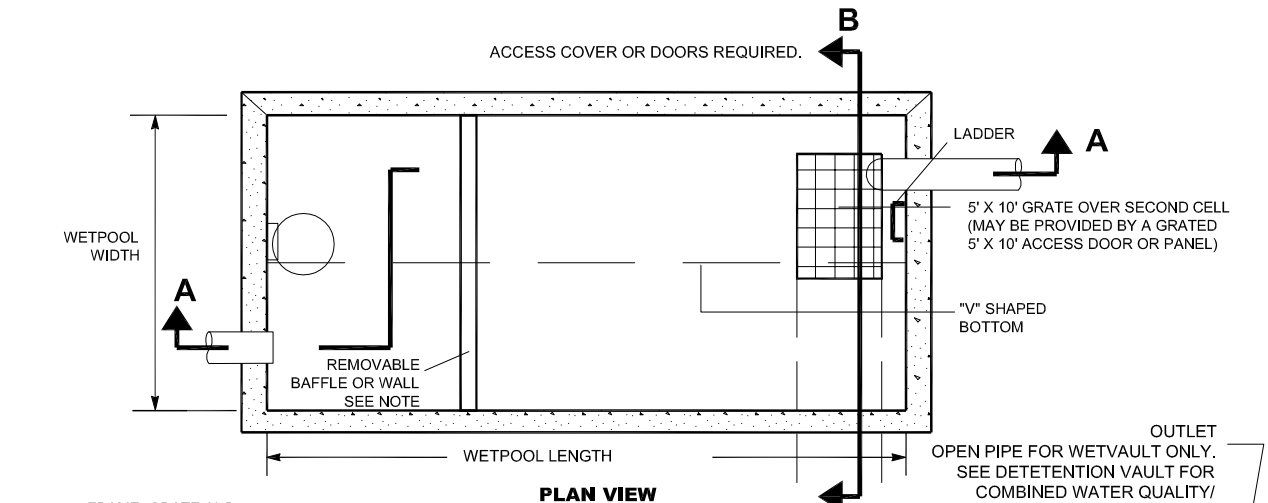
SECTION

NOTE:

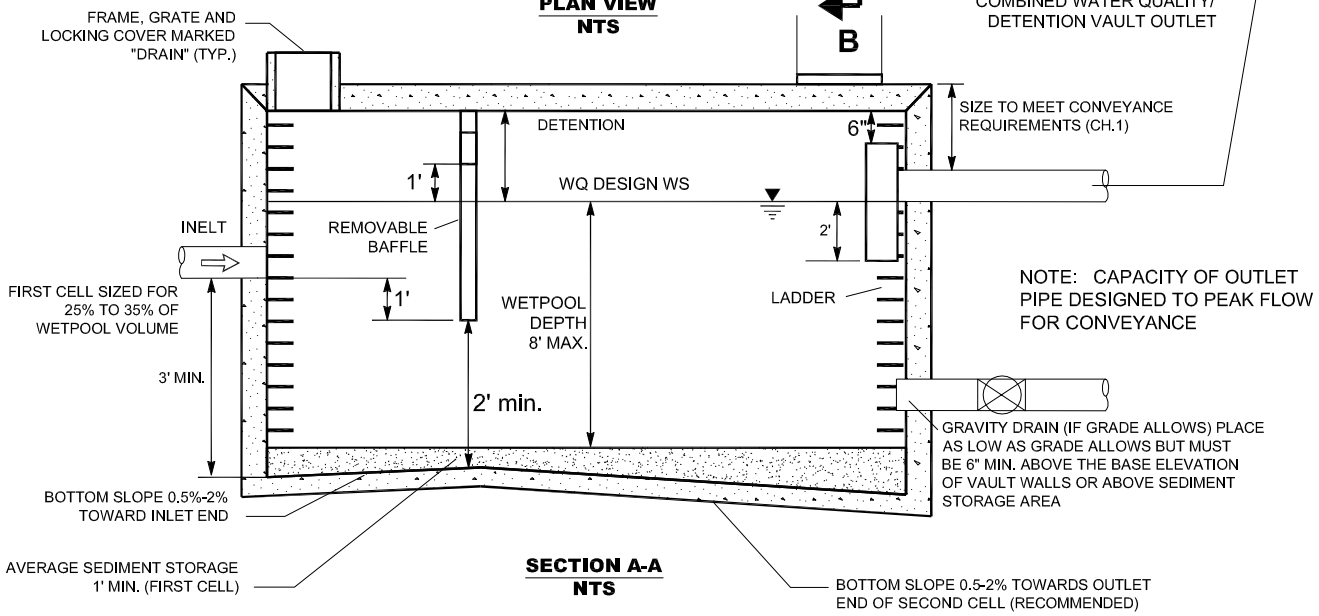
1. This detail is a schematic representation only. Actual configuration will vary depending on specific site constraints and applicable design criteria.
2. Access Road shall meet the following design criteria.
   - 2.1. Maximum grade shall be 15 % for asphalt paving and 12 % for gravel or modular grid paving.
   - 2.2. Outside turning radius shall be 40 feet, minimum.
   - 2.3. Fence gates shall be located only on straingh section of road.
   - 2.4. Access roads shall be 15 feet in width on curves and 12 feet n straight sections.
   - 2.5. A paved apron shall be provided where access roads connect to paved public roadways.
3. All facilities shall be fenced. Fence shall be provided around facility allowing proper maintenance per standard details unless otherwise specified.

CITY OF RENTON PUBLIC WORKS DEPARTMENT	**COMBINED DETENTION AND STORMWATER WETLAND SECTIONS**	**STD. PLAN – 253.00** MARCH 2008

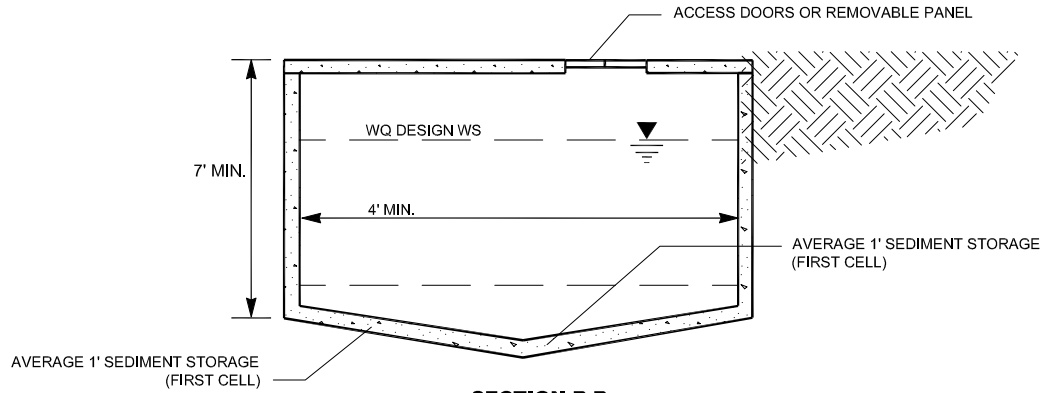
DRAWN BY: MARK SUJKA



PLAN VIEW
NTS



SECTION A-A
NTS



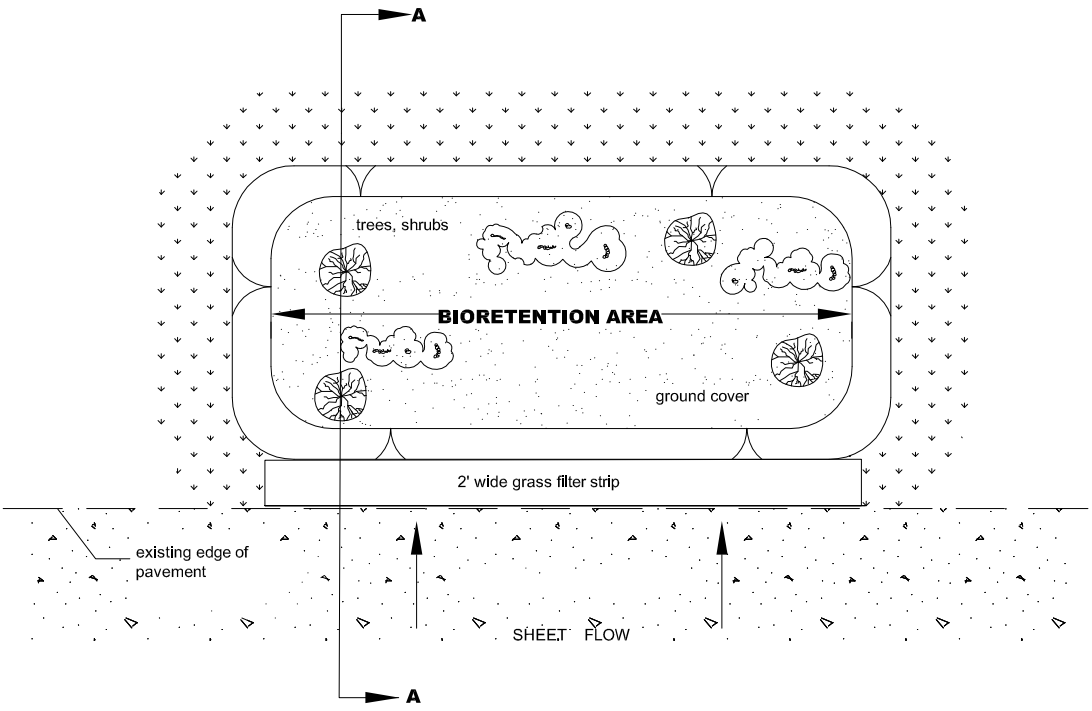
SECTION B-B
NTS

NOTE:

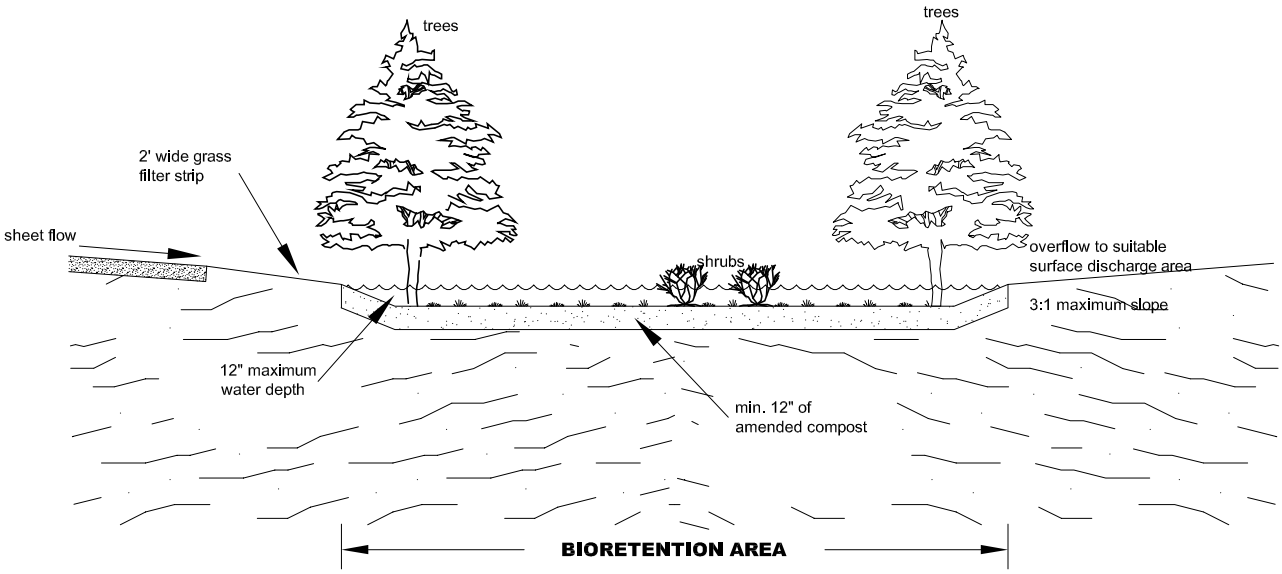
1.1. THE VAULT SHALL BE SEPARATED INTO TWO CELLS BY A WALL OR A REMOVABLE BAFFLE. IF A WALL OR NON REMOVABLE BAFFLE IS USED, A 5-FOOT C X 10-FOOT REMOVABLE REMOVABLE MAINTENANCE ACCESS MOST BE PROVIDED FOR BOTH CELLS.

1.2. FOR VAULTS UNDER ROADWAYS, THE REMOVABLE PANEL MUST BE LOCATED OUTSIDE THE TRAVEL LANES. ALTERNATIVELY, MULTIPLE STANDARD LOCKING MANHOLE COVERS MAY BE PROVIDED. SPACING OF MANHOLE COVERS SHALL BE 12 FEET, MEASURED ON CENTER, TO FACILITATE REMOVAL OF SEDIMENT. LADDERS AND HAND-HOLDS NEED ONLY BE PROVIDED AT THE OUTLET PIPE AND INLET PIPE,

CITY OF RENTON PUBLIC WORKS DEPARTMENT	**COMBINED DETENTION AND WETVAULT**	**STD. PLAN – 254.00** MARCH 2008

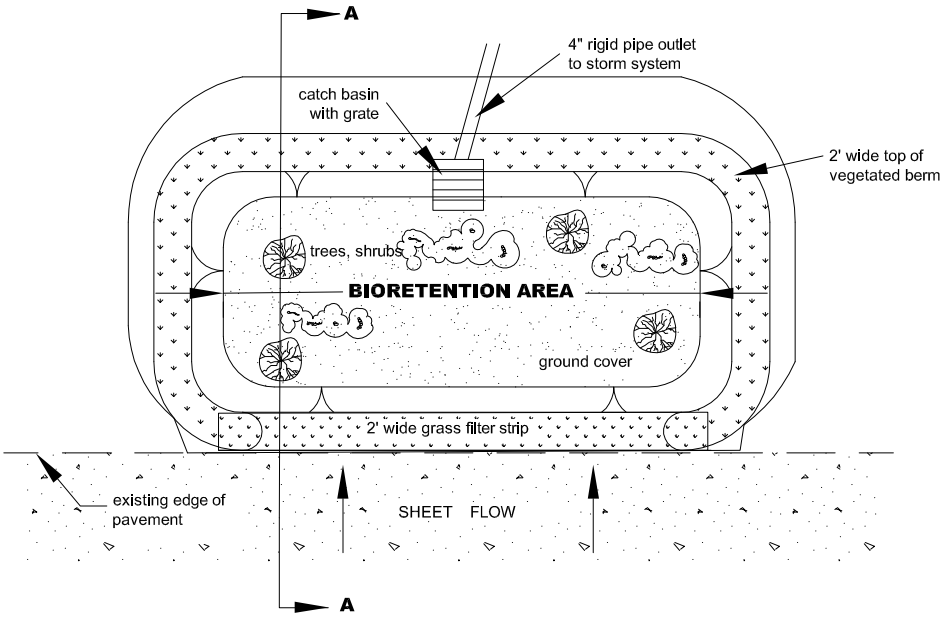


PLAN VIEW

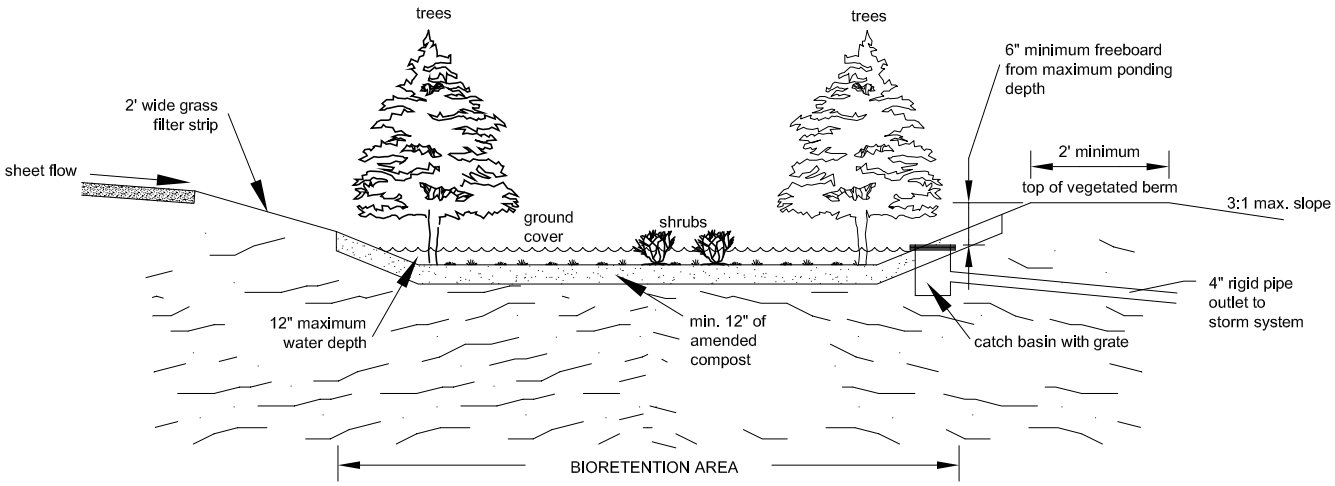


SECTION A-A

CITY OF RENTON PUBLIC WORKS DEPARTMENT	**TYPICAL RAIN GARDEN**	STD. PLAN – 260.00 MARCH 2008



PLAN VIEW



SECTION A-A **(not to scale)**

CITY OF RENTON PUBLIC WORKS DEPARTMENT	**TYPICAL RAIN GARDEN WITH CONTAINMENT BERM**	STD. PLAN – 260.10 MARCH 2008

Utility Specifications

Surface Water Drainage Notes and Specifications

THESE NOTES SHALL APPEAR ON PROJECTS FOR THE SURFACE WATER UTILITY.

1. BEFORE ANY CONSTRUCTION OR DEVELOPMENT ACTIVITY OCCURS, A PRE-CONSTRUCTION MEETING MUST BE HELD WITH THE CITY OF RENTON PLAN REVIEWER.

2. All construction shall be in accordance with the 1996 Standard Specifications for Road, Bridge and Municipal Construction prepared by WSDOT and the American Public Works Association (APWA), as amended by the City of Renton Public Works Department.

3. The surface water drainage system shall be constructed according to the approved plans, which are on file in the Public Works Department. Any deviation from the approved plans will require written approval from the City of Renton Public Works Department, Surface Water Utility Section.

4. A copy of these approved plans must be on the job site whenever construction is in progress.

5. Datum for Vertical Control shall be North American Vertical Datum 1988 Meters, and for Horizontal Control shall be North American Datum 1983/1991 Meters unless otherwise approved by the City of Renton Public Works Department. Reference benchmark and elevations are noted on the plans.

6. All sedimentation/erosion facilities must be in operation prior to clearing and building construction, and they must be satisfactorily maintained until construction is completed and the potential for on-site erosion has passed.

7. All retention/detention facilities must be installed and in operation prior to or in conjunction with all construction activity unless otherwise approved by the Public Works Department, Surface Water Utility Section.

8. Grass seed may be applied by hydroseeding. The grass seed mixture, other than City of Renton approved standard mixes, shall be submitted by a Landscape Architect and approved by the Public Works Department, Surface Water Utility Section.

9. All pipe and appurtenances shall be laid on a properly prepared foundation in accordance with Section 7-02.3(1) of the current State of Washington Standard Specification for Road and Bridge Construction. This shall include necessary leveling of the trench bottom or the top of the foundation material, as well as placement and compaction of required bedding material, to uniform grade so that the entire length of the pipe will be supported on a uniformly dense, unyielding base. All pipe bedding shall be APWA Class “C”, with the exception of PVC pipe. All trench backfill shall be compacted to minimum 95% for pavement and structural fill and 90% otherwise per ASTM D-1557-70. Pea gravel bedding shall be 6 inches over and under PVC pipe.

10. Galvanized steel pipe and aluminized steel pipe for all drainage facilities shall have asphalt treatment #1 or better inside and outside.

Utility Specifications

11. Structures shall not be permitted within 10 feet of the spring line of any storm drainage pipe, or 15 feet from the top of any channel bank.

12. All catch basin grates shall be depressed 0.10 feet below pavement level.

13. Open cut road crossings through existing public right of way will not be allowed unless specifically approved by City of Renton Planning/Building/Public Works Administrator.

14. Rock for erosion protection of roadside ditches, where required, shall be of sound quarry rock placed to a depth of one (1) foot and must meet the following specifications:
    4 - 8 inch rock / 40 - 70% passing;
    2 - 4 inch rock / 30 - 40% passing; and
    less than 2 inch rock / 10 - 20% passing.

15. All building downspouts and footing drains shall be connected to the storm drainage system, unless approved by the City plan reviewer or Surface Water Utility Section. An accurately dimensioned, certified as-built drawing of this drainage system will be submitted to the City upon completion.

16. Issuance of the building or construction permits by the City of Renton does not relieve the owner of the continuing legal obligation and/or liability connected with storm surface water disposition. Further, the City of Renton does not accept any obligation for the proper functioning and maintenance of the system provided during construction.

17. The Contractor shall be responsible for providing adequate safeguard, safety devices, protective equipment, flaggers, and any other needed actions to protect the life, health, and safety of the public, and to protect property in connection with the performance of work covered by the contract. Any work within the traveled right of way that may interrupt normal traffic flow shall require a traffic control plan approve by the Public Works Department, Transportation Systems Division. All sections of the WSDOT Standard Specifications 1-07-23 Traffic Control shall apply.

18. Special drainage measures will be required if the project location is within the aquifer protection area (APA).

Utility Specifications

Erosion Control Notes

THESE NOTES SHALL APPEAR FOR ALL PROJECTS - SITE IMPROVEMENTS, SURFACE WATER UTILITY, WASTEWATER UTILITY, WATER UTILITY, AND TRANSPORTATION PLANS:

1. BEFORE ANY CONSTRUCTION OR DEVELOPMENT ACTIVITY OCCURS, A PRE-CONSTRUCTION MEETING MUST BE HELD WITH THE CITY OF RENTON, PUBLIC WORKS DESIGN ENGINEER.

2. All limits of clearing and areas of vegetation preservation as prescribed on the plan(s) shall be clearly flagged in the field and observed during construction.

3. All required sedimentation/erosion control facilities must be constructed and in operation prior to land clearing and/or construction to ensure that sediment laden water does not enter the natural drainage system. All erosion and sediment facilities shall be maintained in a satisfactory condition until such time that clearing and/or construction is complete and potential for on-site erosion has passed. The implementation, maintenance, replacement and additions to erosion/sedimentation control systems shall be the responsibility of the permitee.

4. The erosion and sedimentation control systems depicted on this drawing are intended to be minimum requirements to meet anticipated site conditions. As construction progresses and unexpected or seasonal conditions dictate, the permitee shall anticipate that more erosion and sedimentation control facilities will be necessary to ensure complete siltation control on the proposed site. During the course of construction, it shall be the obligation and responsibility of the permitee to address any new conditions that may be created by the activities and to provide additional facilities, over and above minimum requirements, as may be needed, to protect adjacent properties and water quality of the receiving drainage system.

5. Approval of this plan is for erosion/sedimentation control only. It does not constitute an approval of storm drainage design, size nor location of pipes, restrictors, channels, or retention facilities.

6. During the time period of October 1st through April 30th, all project distributed soil areas greater than 5,000 square feet, that are to be left un-worked for more than 12 hours, shall be covered by mulch, sodding or plastic covering.

7. In any area which has been stripped of vegetation and where no further work is anticipated for a period 30 days or more, all disturbed areas must be immediately stabilized with mulching, grass planting or other approved erosion control treatment applicable to the time of year. Grass seeding alone will be acceptable only during the months of April through September, inclusive. Seeding may proceed, however, whenever it is in the interest of the permitee, but must be augmented with mulching, netting or other treatment approved by the City of Renton, outside the specified time period.

Utility Specifications

8. For all erosion/sedimentation control ponds where the dead storage depth exceeds 6 inches, a fence is required with a minimum height of three (3) feet, 3:1 side slopes.

9. A temporary gravel construction entrance, 24 feet x 50 feet x 8 inches of 4 to 6 inch quarry spalls shall be located at all points of vehicular ingress and egress to the construction site.