401  Concrete Inlet
402  Catch Basin Type 1
403  Catch Basin Type 1L
404  Catch Basin Type 1P (For Parking Lot)
405  Catch Basin Type 2
406  Rectangular Frame (Reversible)
407  Typical Frame and Grate Installation
409  Herringbone Grate for Grate or Solid Cover
410  Solid Cover for Catch Basin or Inlet
411  Vaned Grates for Catch Basin or Inlet
412  Open Curb Face Frame & Grate
413  Floatable Material Separator & Gas Trap For 6” or 8” Lines
414  Floatable Material Separator and/or Gas Trap (12” and Larger)
415  Typical Restrictor Installation
416  Lift Gate Assembly and Secondary Orifice Detail
418  Typical Closed Underground Detention System
421  8” Cleanout
422  Bypass Structure Type A
423  Bypass Structure Type B
424  Bypass Structure Type C
426  Rain Garden with Overflow
427  Rain Garden with Underdrain
429  Typical Detention and/or Wetpond
430  Permeable Asphalt or Concrete Pavement Section
431  Permeable Pavement on Slopes
432  Curb Cut Opening for Bioretention
433  Emergency Overflow for Pond
434  Type 2 Debris Cage
435  Pipe End Debris Barrier
436  Trench Dam
**PIPE ALLOWANCES**

<table>
<thead>
<tr>
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<tr>
<td>SOLID WALL PVC (WSDOT STD. SPEC. 9-05.12(1))</td>
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</tr>
<tr>
<td>PROFILE WALL PVC (WSDOT STD. SPEC. 9-05.12(2))</td>
<td>15&quot;</td>
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* CORRUGATED POLYETHYLENE STORM SEWER PIPE

**NOTES**

1. AS ACCEPTABLE ALTERNATIVES TO THE REBAR SHOWN IN THE PRECAST BASE SECTION, FIBERS (PLACED ACCORDING TO THE WSDOT 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 WSDOT STANDARD SPECIFICATION 9-04.3.

3. THE MAXIMUM DEPTH FROM THE FINISHED GRADE TO THE LOWEST PIPE INVERT SHALL BE 5.5'.

4. THE FRAME AND GRATE MAY BE INSTALLED WITH THE FLANGE DOWN OR INTEGRALLY CAST INTO THE ADJUSTMENT SECTION WITH FLANGE UP.

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.
NOTES

1. AS ACCEPTABLE ALTERNATIVES TO THE REBAR SHOWN IN THE PRECAST BASE SECTION, FIBERS (PLACED ACCORDING TO THE WSDOT 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 WSDOT SPECIFICATION 9-04.3.

3. THE MAXIMUM DEPTH FROM THE FINISHED GRADE TO THE LOWEST PIPE INVERT SHALL BE 5.5'.

4. THE FRAME AND GRATE MAY BE INSTALLED WITH THE FLANGE DOWN, OR INTEGRALLY CAST INTO THE ADJUSTMENT SECTION WITH FLANGE UP.

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.
AS ACCEPTABLE ALTERNATIVES TO THE REBAR SHOWN IN THE PRECAST BASE SECTION, FIBERS (PLACED ACCORDING TO THE WSDOT 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.

1. 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 WSDOT STANDARD SPECIFICATION 9-04.3.

2. THE MAXIMUM DEPTH FROM THE FINISHED GRADE TO THE LOWEST PIPE INVERT SHALL BE 5.5'.

3. THE OPENING SHALL BE MEASURED AT THE TOP OF THE PRECAST BASE SECTION.

4. ALL PICKUP HOLES SHALL BE GROUTED FULL AFTER THE BASIN HAS BEEN PLACED.
NOTES
1. AS ACCEPTABLE ALTERNATIVES TO THE REBAR SHOWN IN THE PRECAST BASE SECTION, FIBERS (PLACED ACCORDING TO THE WSDOT 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 WSDOT STANDARD SPECIFICATION P-04.3.
3. THE MAXIMUM DEPTH FROM THE FINISHED GRADE TO THE LOWEST PIPE INVERT SHALL BE 5.5'.
4. THE FRAME AND GRATE MAY BE INSTALLED WITH THE FLANGE DOWN, OR INTEGRALLY CAST INTO THE ADJUSTMENT SECTION WITH FLANGE UP.
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.

**PIPE ALLOWANCES**

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**FRAME AND VANED GRATE**

CITY OF Everett
PUBLIC WORKS DEPARTMENT

WSDOT STD PLAN B-5.60-01 ACCEPTABLE SUBSTITUTE

CATCH BASIN TYPE 1P
(FOR PARKING LOT)
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 MAY BE INSTALLED WITH THE FLANGE UP OR 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 WSDOT STANDARD SPECIFICATION 9-04.3.

5. CONCRETE STRUCTURE SHALL MEET THE REQUIREMENTS OF AASHTO M199.

6. FOR MANHOLE COVER SEE STANDARD DRAWING 610 AND 611. REFER TO DESIGN AND CONSTRUCTION STANDARDS AND SPECIFICATIONS SECTION 4 FOR ADDITIONAL REQUIREMENTS.

7. STEPS PER STANDARD DRAWING 609.

CATCH BASIN DIMENSIONS

<table>
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<tr>
<th>CATCH BASIN DIAMETER</th>
<th>WALL THICKNESS</th>
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<th>MAXIMUM KNOCKOUT SIZE</th>
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PIECE ALLOWANCES

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a. CORRUGATED POLYETHYLENE STORM SEWER PIPE, WSDOT STANDARD PLAN 9-05.20.

b. WSDOT STANDARD PLAN 9-05.12(1).

c. WSDOT STANDARD PLAN 9-05.12(2).
1. THIS FRAME IS DESIGNED TO ACCOMMODATE 20"X24" GRATES OR COVERS AS SHOWN ON STANDARD DRAWINGS 409, 410 AND 411.

2. BOLT-DOWN CAPABILITY IS REQUIRED ON ALL FRAMES, GRATES AND COVERS UNLESS SPECIFIED OTHERWISE IN THE CONTRACT. PROVIDE TWO HOLES IN THE FRAME THAT ARE VERTICALLY ALIGNED WITH THE GRATE OR COVER SLOTS. THE FRAME SHALL ACCEPT THE 5/8" - 11 NC X 2" STAINLESS STEEL RECESSED ALLEN HEAD CAP SCREW BEING TAPPED, OR OTHER APPROVED MECHANISM. LOCATION OF BOLT DOWN HOLES VARIES BY MANUFACTURER.

3. REFER TO WSDOT STANDARD SPECIFICATION 9-05.15(2) AND DESIGN CONSTRUCTION STANDARDS AND SPECIFICATIONS SECTION 4 FOR ADDITIONAL REQUIREMENTS.
NOTES

1. FRAME AND GRATE SHALL BE INSTALLED WITHIN ± 1/4" OF FLUSH WITH FINISHED GRADE.

2. ADJUST FRAME AND GRATE TO MATCH PAVEMENT SLOPE.
NOTES

1. BOLT-DOWN CAPABILITY IS REQUIRED ON ALL FRAMES, GRATES AND COVERS. PROVIDE TWO HOLES IN THE FRAME THAT ARE VERTICALLY ALIGNED WITH THE GRATE OR COVER SLOTS. THE FRAME SHALL ACCEPT THE 5/8” - 11 NC X 2” STAINLESS STEEL RECESSED ALLEN HEAD CAP SCREW BEING TAPPED, OR OTHER APPROVED MECHANISM. LOCATION OF BOLT DOWN HOLES VARIES BY MANUFACTURER.

2. REFER TO WSDOT STANDARD SPECIFICATION 9-05.15(2) AND DESIGN CONSTRUCTION STANDARDS AND SPECIFICATIONS SECTION 4 FOR ADDITIONAL REQUIREMENTS.

3. FOR FRAME DETAILS, SEE STANDARD DRAWING 406.

4. THE THICKNESS OF THE GRATE SHALL NOT EXCEED 1 5/8”.

5. VANED GRATES SHALL BE SPECIFIED, SEE STANDARD DRAWING 411. THE CITY OF EVERETT SHALL GRANT THE USE OF A HERRINGBONE GRATE ON A CASE BY CASE BASIS.

6. ALL GRATES MUST BE STENCILED OR STAMPED "DUMP NO WASTE, DRAINS TO _", WHERE THE BLANK SHALL BE FILLED IN WITH "STREAM", "LAKE", "RIVER", "PUGET SOUND", OR "WETLAND" AS APPLICABLE TO THE LOCATION WHERE THE GRATE IS TO BE INSTALLED.

WSDOT STD PLAN B-30.50-01, ACCEPTABLE SUBSTITUTE EXCEPT ALL STEEL RECESSED ALLEN SCREWS MUST BE STAINLESS STEEL
1. Bolt-down capability is required on all frames, grates and covers. Provide two holes in the frame that are vertically aligned with the grate or cover slots. The frame shall accept the 5/8" - 11 NC X 2" stainless steel recessed Allen-head cap screw being tapped, or other approved mechanism. Location of bolt down holes varies by manufacturer.

2. Alternative reinforcing designs are acceptable in lieu of the rib design.

3. Refer to WSDOT Standard Specification 9-05.15(2) and Design Construction Standards and Specifications Section 4 for additional requirements.

4. For frame details, see standard drawing 406.
1. Bolt-down capability is required on all frames, grates, and covers. Provide two holes in the frame that are vertically aligned with the grate or cover slots. The frame shall accept the 5/8" - 11 NC x 2" stainless steel recessed Allen head cap screw being tapped, or other approved mechanism. Location of bolt down holes varies by manufacturer.

2. Refer to WSDOT Standard Specification 9-05.15(2) and Design Construction Standards and Specifications Section 4 for additional requirements.

3. For frame details, see standard drawings 406 and 407.

4. All grates must be stenciled or stamped "DUMP NO WASTE, DRAINS TO __", where the blank shall be filled in with "STREAM", "LAKE", "RIVER", "Puget Sound", or "WETLAND" as applicable to the location where the grate is to be installed.

**NOTES**

WSDOT STD PLAN B-30.30-01 AND B-30.40-01, ACCEPTABLE SUBSTITUTE EXCEPT ALL STEEL RECESSED ALLEN SCREWS MUST BE STAINLESS STEEL
1. **THIS INLET REQUIRES THE PRECAST CATCH BASIN UNIT TO BE ROTATED 90 DEGREES SO THAT THE NARROW SIDE IS PARALLEL TO THE CURB LINE.** WHEN CALCULATING OFFSETS FROM CURB TO CENTERLINE OF THE PRECAST CATCH BASIN, PLEASE NOTE THAT THE CENTERLINE OF THE GRATE IS NOT THE CENTERLINE OF THE PRECAST 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 DEBRIS GUARD. HOOD UNITS MAY BE MOUNTED INSIDE OR OUTSIDE OF THE FRAME. THE METHODS FOR FASTENING THE SAFETY BAR / DEBRIS GUARD 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" STAINLESS STEEL HEX HEAD BOLTS, NUTS, AND OVERSIZE WASHERS. THE WASHERS SHALL HAVE DIAMETERS ADEQUATE TO ENSURE FULL BEARING ACROSS THE SLOTS.


5. ONLY DUCTILE IRON VANED GRATES SHALL BE USED. SEE STANDARD DRAWING 411 FOR GRATE DETAILS. REFER TO WSDOT STANDARD SPECIFICATION 9-05.15(2) AND DESIGN CONSTRUCTION STANDARDS AND SPECIFICATIONS SECTION 4 FOR ADDITIONAL REQUIREMENTS.

6. **THIS PLAN IS INTENDED TO SHOW THE INSTALLATION DETAILS OF A MANUFACTURED PRODUCT. THIS PLAN IS NOT INTENDED TO SHOW THE SPECIFIC DETAILS NECESSARY TO FABRICATE THE CASTINGS DEPICTED IN THIS DRAWING.**
1. INSTALL LOCKING FRAME & GRATE PER STANDARD DRAWING 406. PROVIDE SOLID COVER PER STANDARD DRAWING 410 WHEN STRUCTURE WILL NOT RECEIVE SURFACE RUNOFF.

NOTES

1" VENT HOLE WHEN NOT CONNECTED TO COMBINED SEWER
6" OR 8" PVC FACTORY TEE

6" OR 8" PVC PLUG

ADAPTOR OR PIPE JOINT

6" OR 8" PVC PIPE
SAND COLLAR OR COR-N-SEAL TYPICAL

6" OR 8" PVC PIPE AS REQUIRED

CATCH BASIN TYPE 1L, SEE STANDARD DRAWING 403
1. INSTALL CATCH BASIN TOP, FRAME, GRATE AND SECTIONS SO THAT LIFT GATE IS VISIBLE THROUGH OPENING AND STEPS CLEAR INLET AND RESTRICTOR UNIT.

2. INSTALL LOCKING FRAME & GRATE OR COVER PER STANDARD DRAWINGS 406 AND 610. FRAME AND COVER PER STANDARD DRAWING 610 IS REQUIRED IF INSTALLATION IS NOT IN PAVED AREA OR IS NOT TO FUNCTION AS A CATCH BASIN.

3. 1" VENT HOLE WHEN NOT CONNECTED TO COMBINED SEWER SYSTEM.

4. SEPARATOR ASSEMBLY SEE STANDARD DRAWING 415 AS APPLICABLE.

5. STEPS PER STANDARD DRAWING 609.

6. MIN CLEARANCE: 36" FOR OUTLETS OF 24" AND LARGER 18", FOR OUTLETS OF 18" AND SMALLER

7. BAND STRAP WITH GASKET

8. SECURE SEPARATOR TO CATCH BASIN WITH 8 GA ALUMINUM STRAP. BOLT TO CATCH BASIN WALL WITH STAINLESS STEEL ANCHOR BOLTS AND TO SEPARATOR UNIT.

9. FOR LIFT GATE ASSEMBLY AND ALUMINUM ROD LIFT HANDLE ASSEMBLY SEE STANDARD DRAWING 416.
1. INSTALL CATCH BASIN TOP, FRAME, GRATE AND SECTIONS SO THAT LIFT GATE IS VISIBLE THROUGH OPENING AND STEPS CLEAR INLET AND RESTRICTOR UNIT.

2. INSTALL LOCKING FRAME AND GRATE OR COVER SEE STANDARD DRAWINGS 405 OR 610. FRAME AND COVER PER STANDARD DRAWING 610 IS REQUIRED IF INSTALLATION IS NOT IN PAVED AREA OR IS NOT TO FUNCTION AS A CATCH BASIN.

3. RESTRICTOR ASSEMBLY SEE DETAIL B AND STANDARD DRAWING 416, DETAIL C.

4. FOR STEPS SEE STANDARD DRAWING 609.

5. BAND STRAP WITH GASKET.

6. SECURE RESTRICTOR TO CATCH BASIN WITH 8 GAUGE ALUMINUM STRAPS AND BOLT TO CATCH BASIN WALL WITH STAINLESS STEEL ANCHOR BOLTS. ONE STRAP ABOVE AND BELOW OUTLET REQUIRED, INTERMEDIATE STRAPS REQUIRED FOR RESTRICTOR RISERS GREATER THAN 12" ABOVE OUTLET.

7. FOR ALUMINUM ROD LIFT HANDLE ASSEMBLY SEE STANDARD DRAWING 416.
DETAIL "A" SECONDARY ORIFICE

LIFT GATE SHALL BE CONSTRUCTED OF:
1/4" R-6061-T6 ALUMINUM WITH CLOSED CELL NEOPRENE PER ASTM 1056-67 CHEMICAL RESISTANT (OIL & GREASE), OZONE RESISTANT, -20° TO 180° F SERVICE TEMPERATURE

ALL PARTS TO BE R-6061-T6 ALUMINUM

INVERT ELEV PER PLANS

BAND ELBOW TO STUB WITH REMOVABLE WATER TIGHT COUPLING

DETAIL "C" LIFT GATE ASSEMBLY & GATE DETAIL

ALUMINUM LIFT GATE

OVERFLOW EL=

OPTIONAL NOTCH WEIR ORIFICE EL= , LENGTH=

RESTRICTOR UNIT SHALL BE CONSTRUCTED OF CORRUGATED ALUMINUM PIPE ALC-LAD 3004-H34, ASSHTO M 197-82(1986) OR EQUAL. GALVANIZED STEEL WILL NOT BE PERMITTED.

ALUMINUM LIFT HANDLE ASSEMBLY

STAINLESS STEEL BOLTS WITH LOCKING NUTS

LIFT GATE & PIPE, SEE DETAIL "B"

INVERT

WELD GATE ASSEMBLY TO PIPE

LIFT GATE SHALL BE CONSTRUCTED OF:
1/4" R-6061-T6 ALUMINUM WITH CLOSED CELL NEOPRENE PER ASTM 1056-67 CHEMICAL RESISTANT (OIL & GREASE), OZONE RESISTANT, -20° TO 180° F SERVICE TEMPERATURE

DETAIL "B" TYPICAL RESTRICTOR ASSEMBLY

DIM | DESCRIPTION | SIZE
--- | --- | ---
A | OUTLET | 18" AND SMALLER 24" AND LARGER
B | CLEAN OUT | 8" ID 10" ID
C | GATE SIZE | 8" OPENING 12" OPENING
D | ANGLE | 42°± 34°±

DETAIL "C" LIFT GATE ASSEMBLY & GATE DETAIL
NOTES

1. DETENTION STRUCTURE SHALL BE FABRICATED FROM ONE OF THE FOLLOWING:
   A. CORRUGATED ALUMINUM PIPE 12 GAGE MIN.
   B. HIGH DENSITY POLYETHYLENE PIPE.
   C. CORRUGATED POLYETHYLENE STORM SEWER PIPE.
   D. STEEL RIB REINFORCED POLYETHYLENE PIPE.

2. ANNUAL INSPECTIONS AND CLEANING REQUIRED BY OWNER TO ENSURE PROPER OPERATION OF DETENTION SYSTEM.

3. W = MAXIMUM WIDTH OF TRENCH FOR PIPE/VAULT PER MANUFACTURER INSTALLATION INSTRUCTIONS.

4. COMPACT IN 8" LIFTS TO 90% MAX DENSITY.

5. INLET AND OUTLET PIPE INVERTS SHALL MATCH BOTTOM OF VAULT ELEVATION.

6. DISTANCE BETWEEN ACCESS POINTS SHALL NOT EXCEED 100'. PROVIDE ACCESS RISERS AS NEEDED BETWEEN THE MANHOLES.

7. TANKS LARGER THAN 48" IN DIAMETER MAY BE CONNECTED TO ADJOINING STRUCTURES WITH A SHORT LENGTH OF 48" DIAMETER PIPE. PIPE SHALL BE OF THE SAME MATERIAL AS THE TANK. CONNECTING PIPE BANDS AND/OR COUPLINGS SHALL BE AS APPROVED BY THE CITY OF EVERETT.

8. THE OUTLET PIPE FROM THE FLOW CONTROL RISER SHALL BE ELEVATED 6" ABOVE THE DETENTION PIPE BOTTOM TO CREATE DEAD STORAGE FOR SEDIMENT.
NOTES
1. 8" PVC THREADED PLUG MAYBE SUBSTITUTED FOR CAST IRON RING AND COVER IN LANDSCAPING AREA.

PLAN

SECTION A-A
CAST IRON RING AND COVER

1/2" WIDE, 1/8" HIGH RAISED BORDER

3/4" RAISED SQUARES, 3/4" APART, 1/8" HIGH

FIBER JOINT PACKING
45° BEND

CAST IRON RING AND COVER
3/4" RAISED SQUARES, 3/4" APART, 1/8" HIGH

1/2" WIDE, 1/8" HIGH RAISED BORDER
1. Water quality outflow pipe sized to convey the water quality flow rate at the runoff treatment design water surface elevation.

2. The runoff treatment design water surface elevation shall be a minimum of 2x the pipe diameter above the pipe invert. Weir height shall be at runoff treatment design water surface elevation.

3. Inlet pipe may be at or below the runoff treatment design water surface elevation, but backwater effects on the upstream system must be accounted for.

4. Weir shall have #4 bar at 12" spacing each way.

5. Steps per standard drawing 609.

6. Install locking frame and grate or cover per standard drawing 406 and 407. Frame and cover per standard drawing 610 is required if installation is not in paved area or is not to function as catch basin.
NOTES
1. FLOATABLE MATERIAL BAFFLE SEE STANDARD DRAWING 424, WITHOUT VENT HOLE.
2. CAP OR PLATE WITH 1" DIAMETER VENT HOLE
3. RUNOFF TREATMENT DESIGN STORMWATER SURFACE ELEVATION, PER PLANS.
4. FOR LIFT GATE ASSEMBLY AND ALUMINUM ROD LIFT HANDLE ASSEMBLY SEE STANDARD DRAWING 416.
5. WATER QUALITY OUTFLOW PIPE SIZED TO CONVEY THE WATER QUALITY FLOW RATE AT THE RUNOFF TREATMENT DESIGN WATER SURFACE ELEVATION. AN 8" DIAMETER MINIMUM ORIFICE PLATE MAY BE INSTALLED IN THE WATER QUALITY OUTFLOW PIPE TO FURTHER REDUCE DISCHARGE RATES.
6. THE RUNOFF TREATMENT DESIGN WATER SURFACE ELEVATION SHALL BE A MINIMUM OF 2X THE PIPE DIAMETER ABOVE THE PIPE INVERT.
7. INLET PIPE MAY BE AT OR BELOW THE RUNOFF TREATMENT DESIGN WATER SURFACE ELEVATION, BUT BACKWATER EFFECTS ON THE UPSTREAM SYSTEM MUST BE ACCOUNTED FOR.
8. FOR TYPICAL RESTRICTOR ASSEMBLY AND LIFT GATE ASSEMBLY SEE STANDARD DRAWINGS 415 AND 416.
9. STEPS PER STANDARD DRAWING 609.
10. INSTALL LOCKING FRAME AND GRATE OR COVER PER STANDARD DRAWING 406 AND 407. FRAME AND COVER PER STANDARD DRAWING 610 IS REQUIRED IF INSTALLATION IS NOT IN PAVED AREA OR IS NOT TO FUNCTION AS CATCH BASIN.
1. CAP OR PLATE WITH 1" DIAMETER VENT HOLE (INSTALL SEE STANDARD DRAWING 415) FOR RESTRICTOR STANDPIPE WITHOUT SECONDARY OVERFLOW ORIFICE.

2. RESTRICTOR STANDPIPE WITHOUT ANY PRIMARY OR SECONDARY ORIFICES AND WITH FLOATABLE MATERIAL BAFFLE. INSTALLATION SEE STANDARD DRAWING 415.

3. RUNOFF TREATMENT DESIGN STORMWATER SURFACE ELEVATION, PER PLANS.

4. FOR LIFT GATE ASSEMBLY AND ALUMINUM ROD LIFT HANDLE ASSEMBLY SEE STANDARD DRAWING 416.

5. WATER QUALITY OUTFLOW PIPE SIZED TO CONVEY THE WATER QUALITY FLOW RATE AT THE RUNOFF TREATMENT DESIGN WATER SURFACE ELEVATION.

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NOTES

DESIGN:
1. SEE THE RAIN GARDEN HANDBOOK FOR WESTERN WASHINGTON FOR DESIGN AND PLANTING INSTRUCTIONS. NATIVE PLANTS ARE PREFERRED, BECAUSE NON-NATIVE AND INVASIVE SPECIES CAN MOVE DOWNSTREAM AND DAMAGE HABITAT. IF NON-NATIVES ARE CHOSEN, BE SURE THAT THEY WILL NOT DAMAGE DOWNSTREAM HABITAT.

2. RAIN GARDENS MAY BE USED TO MEET STORMWATER MINIMUM REQUIREMENT #5 FOR SITES WHICH ADD OR REPLACE LESS THAN 5000 SF OF NEW OR REPLACED HARD SURFACE.

3. PROVIDE RAIN GARDEN INFORMATIVE SIGNS FOR RAIN GARDEN ASSOCIATED WITH NEW CONSTRUCTION. SIGNS ARE AVAILABLE FROM PERMIT SERVICES.

4. MAINTENANCE AGREEMENTS ARE REQUIRED FOR RAIN GARDEN INSTALLATION USED TO MEET STORMWATER MINIMUM REQUIREMENTS.

CONSTRUCTION:
1. BUILD AND VEGETATE RAIN GARDEN AS EARLY AS POSSIBLE TO ESTABLISH PLANTINGS BEFORE DIRECTING STORMWATER RUNOFF TO IT.


3. DURING EXCAVATION OF NATIVE SOILS TO THE BOTTOM OF THE FACILITY, RAINFALL MAY CAUSE FINES TO CLOG THE SURFACE OF THE FACILITY. IF THE NATIVE SOIL HAS BEEN EXPOSED TO RAINFALL, HAND RAKE THE SURFACE TO A DEPTH OF 3" TO RESTORE INFILTRATION CAPACITY.

4. DURING AREA DRAIN INSTALLATION, DISTURB NATIVE SOILS AS LITTLE AS POSSIBLE.
**NOTES**

**DESIGN:**
1. SEE THE RAIN GARDEN HANDBOOK FOR WESTERN WASHINGTON FOR DESIGN AND PLANTING INSTRUCTIONS. NATIVE PLANTS ARE PREFERRED, BECAUSE NON-NATIVE AND INVASIVE SPECIES CAN MOVE DOWNSTREAM AND DAMAGE HABITAT. IF NON-NATIVES ARE CHOSEN, BE SURE THAT THEY WILL NOT DAMAGE DOWNSTREAM HABITAT.
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4. DURING AREA DRAIN INSTALLATION, DISTURB NATIVE SOILS AS LITTLE AS POSSIBLE.
NOTES

1. FOR ALL PONDS WITHOUT AN INTERNAL BERM ONLY A SINGLE ACCESS RAMP IS REQUIRED. EXTEND ACCESS ROAD MATERIAL ALONG THE ENTIRE LENGTH OF THE POND BOTTOM.

2. SEE TEXT FOR ROAD SURFACING MATERIAL REQUIREMENTS.

3. REFER TO THE CITY OF EVERETT STORMWATER MANAGEMENT MANUAL FOR ADDITIONAL DESIGN REQUIREMENTS.
NOTES

1. PERMEABLE PAVEMENT WITHIN CITY RIGHT-OF-WAY REQUIRES APPROVAL BY THE CITY ENGINEER WHEN PLACED BENEATH A TRAVELED WAY. THESE GUIDELINES PROVIDE A MINIMUM DEPTH FOR THE HYDROLOGIC PERFORMANCE OF THE PERMEABLE PAVEMENT. THE STRUCTURAL CAPACITY OF PAVEMENT SECTIONS WHEN SUBJECT TO VEHICULAR LOADS DEPENDS ON SEVERAL FACTORS AND MUST BE DESIGNED BY A LICENSED PROFESSIONAL ENGINEER.

2. LONGITUDINAL SLOPE, 0 TO 5% MAX. FOR PERMEABLE ASPHALT, 8% MAX. FOR PERMEABLE CONCRETE.

3. USE CHECK DAM OR OTHER METHODS TO MAXIMIZE PONDING IN THE SUBSURFACE FOR LONGITUDINAL SLOPES EXCEEDING 2%. SEE STANDARD DRAWING 431.

4. LEVELING COURSE MATERIALS: 1.5" TO U.S. NO. 8 UNIFORMLY GRADED, CRUSHED (ANGULAR), THOROUGHLY WASHED STONE.

5. GEOTEXTILE SHALL BE PROVIDED BETWEEN RUNOFF TREATMENT LAYER OR NATIVE SOIL AND PERMEABLE BALLAST WHEN RECOMMENDED BY GEOTECHNICAL PROFESSIONAL OR PAVEMENT DESIGNER. GEOTEXTILE SHALL BE PROVIDED WHEN FINES IN NATIVE SUBGRADE EXCEED 7% ON THE #200 SIEVE. GEOTEXTILE SHALL BE PLACED BETWEEN PERMEABLE BALLAST AND TREATMENT LAYER IF A TREATMENT LAYER IS USED. GEOTEXTILE SHALL BE GEOTEXTILE FOR SEPARATION PER WSDOT/APWA STANDARD SPECIFICATION 9-33.2, NON WOVEN, TABLE 3.

6. PERMEABLE CONCRETE MUST BE INSTALLED BY A CERTIFIED PERMEABLE CONCRETE INSTALLER. PERMEABLE ASPHALT MUST BE INSTALLED BY AN EXPERIENCED PERMEABLE ASPHALT INSTALLER.

7. RUNOFF TREATMENT LAYER SHALL BE REQUIRED FOR PAVEMENT WHICH IS SUBJECT TO VEHICULAR TRAFFIC OR OTHER POLLUTANTS WHERE NATIVE SOILS DO NOT MEET THE REQUIREMENTS FOR TREATMENT. SEE THE STORMWATER MANAGEMENT MANUAL.

8. SUBGRADE SHALL BE COMPACTED TO A FIRM AND UN-YIELDING CONDITION IN ACCORDANCE WITH THE PROJECT PAVEMENT DESIGN. DO NOT OVER COMPACT SUBGRADE. HEAVY TRUCK AND CONSTRUCTION EQUIPMENT SHALL BE PROHIBITED FROM DRIVING ON THE SUBGRADE THROUGH OUT CONSTRUCTION.
NOTES

1. CHECK DAM OR INTERCEPTOR REQUIRED FOR LONGITUDINAL SLOPES > 2%.

2. SPACE CHECK DAMS BASED ON SLOPE TO ACHIEVE DESIGN AVERAGE PONDING DEPTH BEFORE OVERTOPPING DAM.

3. CALCULATE STORAGE VOLUME BETWEEN CHECK DAMS BASED ON CHECK DAM HEIGHT AND SLOPE FOR MODELING.

4. CHECK DAMS SHALL EXTEND THE FULL WIDTH OF THE PERMEABLE PAVEMENT INSTALLATION.

5. UNDERDRAIN PIPE SHALL BE PROVIDED AT THE LOWEST END OF ANY PERMEABLE PAVEMENT INSTALLATION WITHIN THE CITY ROW.

6. SEE CITY STANDARDS FOR CONTROLLED DENSITY FILL MIX REQUIREMENTS DCSS SECTION 3-20.1.

7. THE TOP OF THE DOWN SLOPE FILL DAM MUST BE LEVEL WITH OR HIGHER THAN THE BOTTOM OF THE UP SLOPE FILL DAM AT THE NATIVE MATERIAL LINE.
1. Modify inlet to bioretention planter as needed to prevent erosion. The streambed cobbles are optional if not required for stabilization and energy dissipation.
6' MIN
NATIVE SOIL OR
COMPACTED
BACKFILL

MIN 1' DEPTH QUARRY SPALLS

DEEPTH OF FLOW
PER CALCULATIONS

1' MIN
QUARRY SPALLS

4'
MIN

6" MIN
FREE BOARD
QUARRY SPALLS

DISCHARGE TO STABILIZED
CONVEYANCE, OUTLET,
OR LEVEL SPREADER

6 ENG.
FREE BOARD

SECTION A-A

DESIGN WATER SURFACE

MIN 1' DEPTH QUARRY SPALLS

3

1

NATIVE SOIL OR
COMPACTED
BACKFILL

6' MIN

POND CROSS SECTION

POND CROSS SECTION

SECTION A-A
**1.** Dimensions are for illustration on 54" diameter catch basin. For different diameter catch basins adjust to maintain 45 degree 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.

**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).

Provide maintenance access by welding 4 crossbars to 4 vertical bars as shown. Hinge upper ends with flanges/bolts and provide locking mechanism (padlock) on lower end. Locate steps directly below.

**Notes**

1. Dimensions are for illustration on 54" diameter catch basin. For different diameter catch basins adjust to maintain 45 degree 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.

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

MAYBE REMOVED

FLOW

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

4" O.C. MAX BAR SPACING

3/4" DIA BAR-FRAME

2"x5" ANCHOR STRIPS WELDED TO 3/4" DIA BAR-FRAME (4 PLACES) SPACED UNIFORMLY, FASTEN WITH 1/2" GALVANIZED OR NON-CORROSIVE BOLTS AND NUTS

1' MIN

3"-5" FOR 18" DIA
5"-8" FOR 24" DIA
7"-9" FOR 30" DIA AND GREATER

PIPE COUPLING

BEVELED PIPE END SECTION

END VIEW

NOTE:
1. CMP END SECTION SHOWN. MAY USE CEP SMOOTH INTERIOR.
2. ALL STEEL PARTS MUST BE GALVANIZED AND ASPHALT COATED (TREATMENT 1 OR BETTER).
NOTES

1. **USE TRENCH DAM FOR UTILITIES BENEATH PERMEABLE PAVEMENT, AT THE END OF INFILTRATION TRENCHES OR PERFORATED STUBOUTS, OR OTHER LOCATIONS WHERE THERE IS A CONCERN THAT WATER MAY BE CONVEYED DOWN THE TRENCH WITHIN PIPE BEDDING OR BACKFILL.**

2. **ALTERNATE TRENCH DAM CONFIGURATIONS OR METHODS WHICH ACHIEVE THE SAME GOAL WILL BE ACCEPTED ON A CASE BY CASE BASIS.**