<table>
<thead>
<tr>
<th>400</th>
<th>STORM AND SURFACE WATER</th>
</tr>
</thead>
<tbody>
<tr>
<td>401</td>
<td>Concrete Inlet</td>
</tr>
<tr>
<td>402</td>
<td>Catch Basin Type 1</td>
</tr>
<tr>
<td>403</td>
<td>Catch Basin Type 1L</td>
</tr>
<tr>
<td>404</td>
<td>Catch Basin Type 1P (For Parking Lot)</td>
</tr>
<tr>
<td>405</td>
<td>Catch Basin Type 2</td>
</tr>
<tr>
<td>406</td>
<td>Rectangular Frame (Reversible)</td>
</tr>
<tr>
<td>407</td>
<td>Typical Frame and Grate Installation</td>
</tr>
<tr>
<td>409</td>
<td>Herringbone Grate for Grate or Solid Cover</td>
</tr>
<tr>
<td>410</td>
<td>Solid Cover for Catch Basin or Inlet</td>
</tr>
<tr>
<td>411</td>
<td>Vaned Grates for Catch Basin or Inlet</td>
</tr>
<tr>
<td>412</td>
<td>Open Curb Face Frame &amp; Grate</td>
</tr>
<tr>
<td>413</td>
<td>Floatable Material Separator &amp; Gas Trap For 6” or 8” Lines</td>
</tr>
<tr>
<td>414</td>
<td>Floatable Material Separator and/or Gas Trap (12” and Larger)</td>
</tr>
<tr>
<td>415</td>
<td>Typical Restrictor Installation</td>
</tr>
<tr>
<td>416</td>
<td>Lift Gate Assembly and Secondary Orifice Detail</td>
</tr>
<tr>
<td>418</td>
<td>Typical Closed Underground Detention System</td>
</tr>
<tr>
<td>421</td>
<td>8” Cleanout</td>
</tr>
<tr>
<td>422</td>
<td>Bypass Structure Type A</td>
</tr>
<tr>
<td>423</td>
<td>Bypass Structure Type B</td>
</tr>
<tr>
<td>424</td>
<td>Bypass Structure Type C</td>
</tr>
<tr>
<td>426</td>
<td>Rain Garden with Overflow</td>
</tr>
<tr>
<td>427</td>
<td>Rain Garden with Underdrain</td>
</tr>
<tr>
<td>429</td>
<td>Typical Detention and/or Wetpond</td>
</tr>
<tr>
<td>430</td>
<td>Permeable Asphalt or Concrete Pavement Section</td>
</tr>
<tr>
<td>431</td>
<td>Permeable Pavement on Slopes</td>
</tr>
<tr>
<td>432</td>
<td>Curb Cut Opening for Bioretention</td>
</tr>
<tr>
<td>433</td>
<td>Emergency Overflow for Pond</td>
</tr>
<tr>
<td>434</td>
<td>Type 2 Debris Cage</td>
</tr>
<tr>
<td>435</td>
<td>Pipe End Debris Barrier</td>
</tr>
<tr>
<td>436</td>
<td>Trench Dam</td>
</tr>
</tbody>
</table>
### 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.

### Pipe Allowances

<table>
<thead>
<tr>
<th>Pipe Material</th>
<th>Maximum Inside Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reinforced or Plain Concrete</td>
<td>12&quot;</td>
</tr>
<tr>
<td>All Metal Pipe</td>
<td>15&quot;</td>
</tr>
<tr>
<td>CPSSP (WSDOT STD. SPEC. 9-05.20)</td>
<td>12&quot;</td>
</tr>
<tr>
<td>Solid Wall PVC (WSDOT STD. SPEC. 9-05.12(1))</td>
<td>15&quot;</td>
</tr>
<tr>
<td>Profile Wall PVC (WSDOT STD. SPEC. 9-05.12(2))</td>
<td>15&quot;</td>
</tr>
</tbody>
</table>

* Corrugated Polyethylene Storm Sewer Pipe

### Rectangular Adjustment Section

- One #3 bar hoop for 6" height increment, spaced equally
- 2", 4", 6", 12" or 24"

### Precast Base Section

- One #3 bar across bottom
- #3 bar each corner

### Alternative Precast Base Section

(see note 1)
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.
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 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.

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.
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.
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>
<thead>
<tr>
<th>Catch Basin Diameter</th>
<th>Wall Thickness</th>
<th>Base Thickness</th>
<th>Maximum Knockout Size</th>
<th>Minimum Distance Between Knockouts</th>
</tr>
</thead>
<tbody>
<tr>
<td>48&quot;</td>
<td>4&quot;</td>
<td>6&quot;</td>
<td>36&quot;</td>
<td>8&quot;</td>
</tr>
<tr>
<td>54&quot;</td>
<td>4.5&quot;</td>
<td>8&quot;</td>
<td>42&quot;</td>
<td>8&quot;</td>
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<td>60&quot;</td>
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<td>8&quot;</td>
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<td>96&quot;</td>
<td>8&quot;</td>
<td>12&quot;</td>
<td>84&quot;</td>
<td>12&quot;</td>
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</tbody>
</table>

### Pipe Allowances

<table>
<thead>
<tr>
<th>Catch Basin Diameter</th>
<th>Pipe Material with Maximum Inside Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Concrete</td>
</tr>
<tr>
<td>48&quot;</td>
<td>24&quot;</td>
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<td>72&quot;</td>
<td>42&quot;</td>
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<tr>
<td>84&quot;</td>
<td>54&quot;</td>
</tr>
<tr>
<td>96&quot;</td>
<td>60&quot;</td>
</tr>
</tbody>
</table>

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.

FLANGE UP

Frame cast into 6" or 12" precast adjustment section. See standard drawings 401, 402, 403 or 404 for adjustment section details.

FLANGE DOWN

WSDOT STD PLAN B-30.10-01, ACCEPTABLE SUBSTITUTE EXCEPT ALL STEEL RECESSED ALLEN SCREWS MUST BE STAINLESS STEEL.
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 STENCILLED 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.
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.
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" x 2" stainless steel hex head bolts, nuts, and oversize washers. The washers shall have diameters adequate to ensure full bearing across the slots.

4. Bolt-down capability is required on all frames, grates and covers, unless specified in the contract. Provide two holes in the frame that are vertically aligned with the grate slots. The frame shall accept the 5/8"-11 NC x 2" stainless steel Allen head cap screw by being tapped, or other approved mechanism. The location of bolt-down holes varies among different manufacturers. See bolt-down detail, standard drawing 406.

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. WSDOT STD PLAN B-25.20-01, ACCEPTABLE SUBSTITUTE EXCEPT ALL STEEL RECESSED ALLEN SCREWS MUST BE STAINLESS STEEL.
1. INSTALL LOCKING FRAME & GRATE PER STANDARD DRAWING 406. PROVIDE SOLID COVER PER STANDARD DRAWING 410 WHEN STRUCTURE WILL NOT RECEIVE SURFACE RUNOFF.
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 STANDARD DRAWING 416.

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

DETAIL "C" LIFT GATE ASSEMBLY & GATE DETAIL

ALUMINUM LIFT GATE

INVERT ELEV PER PLANS

OVERFLOW EL=\_

OPTIONAL NOTCH WEIR ORIFICE EL=\_, LENGTH=\_

RESTRICOR UNIT SHALL BE CONSTRUCTED OF CORRUGATED ALUMINUM PIPE ALCALD 3004-H34, ASSHTO M 197-82(1986) OR EQUAL.

GALVANIZED STEEL WILL NOT BE PERMITTED.

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 "B" TYPICAL RESTRICTOR ASSEMBLY
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.

SECTION A-A

ELEVATION

LOCKING COVER SEE STANDARD DRAWING 610

2" MIN DIA AIR VENT PIPE REQUIRED WHEN THERE IS NO ACCESS RISER ON VAULT

FINISHED GRADE. SEE PLANS & SPECIFICATIONS

NORMAL WATER LEVEL

48" DIA

2" MAX

LEVEL

SEE NOTE 8

FLOW

FLOW

LEVEL

2" MAX

DETENTION PIPE/VAULT
(DIA & LENGTH PER PLANS)

RESTRICCTOR INSTALLATION
PER STANDARD DRAWING 415

48" DIA

FLOW

FLOW

RESTRICTOR INSTALLATION
PER STANDARD DRAWING 415

48" DIA

FLOW

FLOW

RESTRICTOR INSTALLATION
PER STANDARD DRAWING 415

48" DIA

FLOW

FLOW

RESTRICTOR INSTALLATION
PER STANDARD DRAWING 415

48" DIA

FLOW

FLOW
NOTES

1. 8" PVC THREADED PLUG MAYBE SUBSTITUTED FOR CAST IRON RING AND COVER IN LANDSCAPING AREA.

SECTION A-A
CAST IRON RING AND COVER

PLAN

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

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

SECTION A-A
CAST IRON RING AND COVER

10" 9"
8 3/4" 5/8"
1/2" 1.1/4" 7 3/4" 8" 15"
1/2" 4" 7 3/4"

12" 12" 8" 4 3/4"

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
NOTES

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.

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. STEPS PER STANDARD DRAWING 609.

9. 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

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.
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.
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 unyielding 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

**Permeable Asphalt (4” Min) or Concrete (6” Min) Wearing Course (see Notes 1 and 6)**

**Leveling Course, Optional (see Note 4)**

**Reservoir Course - 6” Min Permeable Ballast** per WSDOT/APWA standard specifications 9-03.9(2)

**Non-Woven Geotextile (if required)** (see Note 5)

**Runoff Treatment Layer (if required)** (see Note 7)

**Native Subgrade** (see Note 8)
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 and on private installations at the transition to a publicly maintained paved surface.
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.

**Notes**

- Water storage within cell (see notes)
- Permeable pavement per standard drawing 430
- Reservoir course
- 6" dam embedment into subgrade
- Geotextile on bottom and sides (if required) see note 5
- Treatment layer (if required)
- Compact subgrade per pavement design requirements
- Native soil compact to 95% max standard proctor density
- Permeable pavement
- Permeable ballast
- Geotextile (if required)
- Treatment layer (if required)
- Alternate check dam
- City engineer’s approval required in right of way
1. Modify inlet to bioretention planter as needed to prevent erosion. The streambed cobbles are optional if not required for stabilization and energy dissipation.
POND CROSS SECTION

1' MIN QUARRY SPALLS

4' MIN

6" MIN FREE BOARD QUARRY SPALLS

DISCHARGE TO STABILIZED CONVEYANCE, OUTLET, OR LEVEL SPREADER

DEPTH OF FLOW PER CALCULATIONS

3

1

3H : 1V MAX

NATIVE SOIL OR COMPACTED BACKFILL

MIN 1' DEPTH QUARRY SPALLS

6" FREE BOARD

DESIGN WATER SURFACE

6' MIN

SECTION A-A

T: ACAD EPS-COE DESIGN & CONSTR SPECS FOR DEVELOPMENT IN WORK
STD433.DWG

PLOTTED: 1/23/2019 4:42 PM

03/17/2017

RYAN SASS
HEATHER GRIFFIN
PAUL WILHELM

EMERGENCY OVER FLOW FOR POND

CITY OF EVERETT
PUBLIC WORKS DEPARTMENT

TITLE

City Engineer

Section Manager

CAD Manager

Drawn By

Current Rev Date

STANDARD DRAWING No.

EMERGENCY OVER FLOW FOR POND

433
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" DIAMETER SMOOTH ROUND BARS WELDED EQUALLY SPACED. BARS SHALL BE WELDED TO UPPER AND LOWER BANDS. (24 BARS EVENLY SPACED, SEE NOTE 1)
- 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.

- STANDARD GALVANIZED STEPS OR LADDER.
- LOWER STEEL BAND 3/4"x4" WIDE FORMED TO FIT IN GROOVE OF CB RISER.
- UPPER STEEL BAND 3/4"x4" WIDE

- 15° TYPICAL SEE NOTE 1
- 4 HOOK CLAMS EVENLY PLACED. SEE DETAIL BELOW
3/4" DIA SMOOTH BARS WITH ENDS WELDED TO BAR FRAME

MAYBE REMOVED

FLOW

PLAN VIEW

3/4" DIA BAR-FRAME

4" O.C. MAX BAR SPACING

SIDE VIEW

2" x 5" 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

BEVELED PIPE END SECTION

NP END DEBRIS BARRIER

NOTES

1. CMP END SECTION SHOWN. MAY USE CPEP SMOOTH INTERIOR.

2. ALL STEEL PARTS MUST BE GALVANIZED AND ASPHALT COATED (TREATMENT 1 OR BETTER).
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.