CHAPTER 3

3.000 STORMWATER MANAGEMENT

3.010 General

The standards established by this chapter are intended to represent the minimum standards for the design and construction of storm drainage facilities.


All newly constructed and/or annexed stormwater facilities shall be owned and maintained by the City with the exception of commercial and multi-family developments which shall be located within easements that allow emergency maintenance by the City.

3.020 Design Standards

The design of storm drainage facilities shall depend on the system type and local site conditions. The design elements of storm drainage systems shall comply with the requirements identified in Stanwood Municipal Code Section 17.140 Stormwater Management Performance Standards, the applicable Standard Details incorporated in this document, and the following additional criteria.

A. Retention/detention facilities may not be located in an area that is used to satisfy an open space requirement unless the design includes a vault or other approved underground system.

The City shall make the sole determination whether the proposed underground stormwater facilities are compatible with open space and satisfy the intent of the City for open space amenities.

B. New detention facilities with slopes greater than 3:1 shall be fenced. Fencing posts, rails, chain-link mesh and accessories for facilities shall be black vinyl coated. Landscaping shall be provided around the perimeter of the fence in accordance with the requirements of the Stanwood Municipal Code Section 17.145.030.

C. Stormwater facilities shall comply with the requirements identified in Stanwood Municipal Code Section 17.140. Stormwater Management Performance Standards

D. Maximum catch basin spacing shall be 200 feet on grades to 3 percent, 300 feet for grades >3 percent. 500 feet may be acceptable for distances between access structures. No surface water shall cross any roadway.

E. The General Notes that follow shall be included on any plans dealing with storm systems.
3.030 Storm Drain Construction General Notes

1. All workmanship and materials shall be in accordance with City of Stanwood standards and the most current copy of the “State of Washington Standard Specifications for Road, Bridge and Municipal Construction” (WSDOT/APWA).

2. Temporary erosion/water pollution measures shall be required in accordance with the Stormwater Management Manual for Western Washington.

3. Comply with all other permits and other requirements by the City of Stanwood or other governing authority or agency.

4. A preconstruction meeting shall be held with the City prior to the start of construction.

5. All storm mains and retention/detention areas shall be staked for grade and alignment by an engineering or surveying firm capable of performing such work.

6. Storm drain pipe shall meet the following requirements:
   
   A. Corrugated Polyethylene storm sewer pipe conforming to WSDOT/APWA standard specifications.
   
   B. Reinforced concrete pipe conforming to the requirements of AASHTO M 170.
   
   C. PVC pipe conforming to ASTM D 3034 SDR 35 or ASTM F 679 with joints and gaskets conforming to ASTM D 3212 and ASTM F 477.
   
   D. Ductile iron pipe conforming to the requirements of AWWA C 151, thickness class as shown on the plans.

7. Special structures, oil/water separators and outlet controls shall be installed per plans and manufacturers’ recommendations.

8. All trenches located in the R.O.W. shall be backfilled with select material.

9. All storm drain pipe and services shall be installed with detectable marking tape installed 18” above the pipe crown, or 12” below finished grade (whichever is deeper). Detectable marking tape shall conform to WSDOT/APWA Standard Specifications, with message conveying “Storm Drain” and be colored coded green. In addition, all curvilinear pipes shall be installed with 14 gauge coated copper wire wrapped around the pipe, brought up bared and wrapped three times around the manhole ring or catch basin frame. Tape and installation shall be per WSDOT/APWA Standards. The contractor shall furnish and install the tape and wire.

10. Provide traffic control plan(s) as required in accordance with MUTCD.

11. Call Underground Utilities at 1-800-424-5555 a minimum of 48 hours prior to any excavations.

3.040 Conveyance

Stormwater conveyance systems and pavement drainage shall be designed in accordance with the applicable sections of the Washington State Department of Transportation's Hydraulics Manual, latest edition.
Catch Basins: At a minimum, catch basins shall be spaced no greater than 150 feet for grades less than one percent, 200 feet for grades between one and three percent; and 300 feet for grades three percent and greater. Catch basins shall be placed at intersections to prevent runoff from flowing through street intersections.

Provide Type 2 catch basins where the depth to the invert of the pipe exceeds 5 feet.

Unless otherwise specified, vaned grates shall be used with standard frame in the traveled way, gutter, or shoulder. Vaned grates shall not be located within crosswalks.

At sag vertical curves, on the end of downgrade cul-de-sacs, or before intersections with a grade four percent or greater, an analysis shall be done to assure that typical catch basin grates will collect the surface runoff. Through-curb inlet frames on vertical curbs shall be provided as necessary to collect excessive volumes of runoff or protect against plugged grates and overflow situations.

Pipe: Storm drain pipe within a public right-of-way or easement shall be sized to carry the maximum anticipated runoff from the possible contributing area.

The minimum main size shall be 12 inches in diameter. Cross street lateral lines may be 8 inches in diameter. Nothing shall preclude the City from requiring the installation of a larger-sized main if the City determines a larger size is needed to serve adjacent areas or for future service.

All storm drain pipe and culvert material except ductile iron shall be covered by a minimum two feet of cover. All ductile iron storm drain pipe and culvert material shall be covered by a minimum of one foot of cover.

Channels: Any open channels proposed to be located within public right-of-way shall be maintained by the developer/property owner.

General: Roof and yard drains, or other concentrated flow from adjacent property shall not discharge over the surface of roadways, sidewalks, walkways, or shoulders.

3.050 Staking

All surveying and staking shall be performed by an engineering or surveying firm capable of performing such work. The engineer or surveyor directing such work shall be licensed as a professional engineer or professional land surveyor by the State of Washington.

A preconstruction meeting shall be held with the City prior to commencing staking. All construction staking shall be inspected by the City prior to construction.

The minimum staking of storm sewer systems shall be as directed by the City Engineer as follows:

A. Stake centerline alignment every 50 feet with cut or fill to invert of pipe.

B. Stake location of all catch basins, manholes and other fixtures for grade and alignment with cut or fill to rim and invert of all pipes.

C. Grade stake or slope stake (as appropriate) at intervals, sufficient to control location, size and depth of retention/detention facilities.
3.060 Trench Excavation

Trench excavation shall be in accordance with WSDOT/APWA Standards and these Standards in Chapter 2 Transportation and Streets.

3.070 Backfilling

Backfilling shall be in accordance with WSDOT/APWA Standards and these Standards in Chapter 2 Transportation and Streets.

3.080 Street Patching and Restoration

Street patching and restoration shall be per WSDOT/APWA Standards, these Standards in Chapter 2 Transportation and Streets and specific requirements of the agency with jurisdiction.

3.090 Stormwater Manual Revisions for Projects in Stanwood

Minimum Requirement #7: Flow Control:

For projects that drain to the Irvine Slough strictly through man-made conveyance components, the existing conditions shall be those that existed on the site as of December 31, 1992 and Flow Control BMPs shall be designed using the Santa Barbara Urban Hydrograph (SBUH) hydrologic analysis sized as follows:

- Limit the developed 2-year, 24-hour peak flow to the existing 2-year, 24-hour peak flow;
- Limit the developed 10-year, 24-hour peak flow to the existing 10-year, 24-hour peak flow;
- Limit the developed 100-year, 24-hour peak flow to the existing 100-year, 24-hour peak flow;
- Volume Correction Factor: A volume correction factor of shall be applied to the volume of the BMP without changing the depth or the design of the outlet structure. The correction factor shall be determined as follows:

  \[
  \text{Correction Factor} = 1.11 + 0.0039 \times \text{site impervious area in percentage}.
  \]
STORM SYSTEM STANDARD DETAILS INDEX

STANDARD DETAILS

D-1  CHAIN LINK FENCE DETAIL FOR STORM FACILITIES
WSDOT B-2.20-01  CATCH BASIN TYPE 1
WSDOT B-5.40-01  CATCH BASIN TYPE 1L
WSDOT B-5.60-01  CATCH BASING 1P (FOR PARKING LOT)
WSDOT B-10.20-01  CATCH BASIN TYPE 2
WSDOT B-30.90-01  MISCELLANEOUS DETAILS FOR DRAINAGE STRUCTURES
WSDOT B-30.20-02  RECTANGULAR SOLID METAL COVER
WSDOT B-30.10-01  RECTANGULAR FRAME (REVERSIBLE)
WSDOT B-30.30-01  RECTANGULAR VANED GRATE
WSDOT B-30.40-01  RECTANGULAR BI-DIRECTIONAL VANED GRATE
WSDOT B-30.50-01  RECTANGULAR HERRINGBONE GRATE
WSDOT B-10.40-00  CATCH BASIN TYPE 2 WITH FLOW RESTRICTOR
WSDOT B-10.60-00  CATCH BASIN TYPE 2 WITH BAFFLE TYPE FLOW RESTRICTOR
WSDOT B-55.20-00  PIPE ZONE BEDDING AND BACKFILL
WSDOT B-15.20-01  MANHOLE TYPE 1
WSDOT B-15.40-01  MANHOLE TYPE 2
WSDOT B-30.70-03  CIRCULAR FRAME (RING) AND COVER
WSDOT I-30.10-02  SILT FENCE WITH BACKUP SUPPORT
WSDOT I-40.20-00  STORM DRAIN INLET PROTECTION
WSDOT I-80.10-01  MISCELLANEOUS EROSION CONTROL DETAILS
VEHICLE GATE DETAIL

4" O.D. GATE POST
TOP HINGE 180° SWING
ROD MUST SIT 4"-6" IN CONCRETE
14'-0"
20'-0"

PERSONNEL GATE DETAIL

NOTE: FENCING MATERIALS SHALL BE BLACK VINYL COATED

CHAIN LINK FENCE DETAIL

6 GAGE WIRE OR BANDS, Ø 14"
1 3/8" O.D. LINE POST MAX. Ø 10' O.C.

9 GAGE WIRE CLIPS, Ø 24"
1 5/8" O.D. TOP AND BOTTOM RAIL

1 5/8" O.D. INTERMEDIATE BRACE RAIL

9 GAGE FABRIC
2-7/8" O.D. END POST
3/4" TIE ROD AT CORNERS AND PULL POSTS

City of Stanwood
CATCH BASIN TYPE 1

STANDARD PLAN B-5.20-01

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 diameters 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 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

<table>
<thead>
<tr>
<th>PIPE MATERIAL</th>
<th>MAXIMUM INSIDE DIAMETER</th>
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<tr>
<td>REINFORCED OR ARMORED</td>
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<tr>
<td>ALL METAL PIPE</td>
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<td>OAILED or SMOOTH</td>
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<td>SOLID WALL PVC (STD. SPEC. 9-05.12(1))</td>
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</tr>
<tr>
<td>PROFILE WALL PVC (STD. SPEC. 9-05.12(2))</td>
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</tr>
</tbody>
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#3 BAR EACH CORNER
#3 BAR HOOP EACH SIDE
#3 BAR EACH WAY
ONE #3 BAR FOR 6" HEIGHT INCREMENT (SPACED EQUALLY)

NOTE:

1. See Figure 44535 C" AS Y M"E.

FRAME AND VANED GRATE

RECTANGULAR ADJUSTMENT SECTION

PRECAST BASE SECTION

ALTERNATIVE PRECAST BASE SECTION
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 knockout.

2. The knockout shall not be greater than 26", in any direction. 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 9'.

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, steel (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 6'.

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.

CATCH BASIN TYPE 1P (FOR PARKING LOT)
STANDARD PLAN B-5.00-01
SHEET 1 OF 1 SHEET
APPROVED FOR PUBLICATION
Pasco Bakotich III 06-16-11
Washington State Department of Transportation
CATCH BASIN DIMENSIONS

<table>
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<tr>
<th>CATCH BASIN DIAMETER</th>
<th>MIN. WALL THICKNESS</th>
<th>MIN. BASE THICKNESS</th>
<th>MAXIMUM KNOCKOUT SIZE</th>
<th>MINIMUM DISTANCE BETWEEN KNOCKOUTS</th>
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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 Standard Specification 9-04.3.

PIPE ALLOWANCES

<table>
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<tr>
<th>CATCH BASIN DIAMETER</th>
<th>CONCRETE</th>
<th>ALL METAL</th>
<th>C(pp)SP</th>
<th>SOLID WALL PVC</th>
<th>PROFILE WALL PVC</th>
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1. Corrugated Polyethylene Storm Sewer Pipe (Standard Specification 9-05.20)
2. (Standard Specification 9-05.12(1))
3. (Standard Specification 9-05.12(2))
For Access and Steps

TYPICAL ORIENTATION

CIRCULAR ADJUSTMENT SECTION

PREFABRICATED LADDER

NOTE

Ladder rungs for manholes and catch basins shall meet the requirements of AASHTO M 196.

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.

NOTE: THIS PLAN IS NOT A LEGAL ENGINEERING DOCUMENT BUT AN ELECTRONIC DUPLICATE. THE ORIGINAL, SIGNED BY THE ENGINEER AND APPROVED FOR PUBLICATION, IS KEPT ON FILE AT THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION. A COPY MAY BE OBTAINED UPON REQUEST.

EXPIRES JULY 1, 2009

Matthew J. Bakotich III
09-20-07

Washington State Department of Transportation

Sheet 1 of 1 Sheet
NOTES

1. Bolt-down capability is required on all frames, grates, and covers, unless specified otherwise in the Contract. Provide 2 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" Allen head cap screw by 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 Standard Specification 9-05.15(2) for additional requirements.

4. For frame details, see Standard Plan B-30.10.
NOTES

1. This frame is designed to accommodate 20" x 24" grates or covers as shown on Standard Plans B-30.20, B-30.30, B-30.40, and B-30.50.

2. Bolt-down capability is required on all frames, grates, and covers, unless specified otherwise in the Contract. Provide 2 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" Allen head cap screw by being tapped, or other approved mechanism. Location of bolt-down holes varies by manufacturer.

3. Refer to Standard Specification 9-05.15(2) for additional requirements.

DETAIL

SECTION A

FRAME CAST INTO PRECAST ADJUSTMENT SECTION - SEE STANDARD PLAN B-30.90 FOR ADJUSTMENT SECTION DETAILS

SECTION B

RECESSED ALLEN HEAD CAP SCREW
5/8" - 11 NC x 2"

FLANGE UPWARD

ISOMETRIC VIEW
SHOWING THE VARIATIONS
NOTES

1. Bolt-down capability is required on all frames, grates, and covers, unless specified otherwise in the Contract. Provide 2 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" Allen head cap screw by being tapped, or other approved mechanism. Location of bolt-down holes varies by manufacturer.

2. For frame details, see Standard Plan B-30.10.

3. Refer to Standard Specification 9-05.15(2) for additional requirements.

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2. Refer to Standard Specification 9-05.15(2) for additional requirements.

3. For frame details, see Standard Plan B-30.10.

4. The thickness of the grate shall not exceed 1 5/8".
NOTES

1. The pipe supports and the flow restrictor shall be constructed of the same material and be anchored at a minimum spacing of 36”. Attach the pipe supports to the manhole with 5/8” stainless steel expansion bolts or embed the supports into the manhole wall 2”.

2. The vertical riser stem of the flow restrictor shall be the same diameter as the horizontal outlet pipe with a minimum diameter of 6”.

3. The flow restrictor shall be fabricated from one of the following materials:
   - 0.050” Corrugated Aluminum Alloy Drain Pipe
   - 0.064” Corrugated Galvanized Steel Drain Pipe with Treatment 1
   - 0.064” Corrugated Aluminum Drain Pipe
   - 0.060” Aluminum alloy flat sheet, in accordance with ASTM B 209, 5052 H32 or EPS High Density Polyethylene Storm Sewer Pipe

4. The frame and ladder or steps are to be offset so that: the shear gate is visible from the top; the climb-down space is clear of the riser and gate; the frame is clear of the curb.

5. The multi-orifice elbows may be located as shown, or all placed on one side of the riser to assure ladder clearance. The size of the elbows and their placement shall be specified in the Contract.

6. Restrictor plate with orifice as specified in the Contract. The opening is to be cut round and smooth.

7. The riser and gate shall be made of aluminum alloy in accordance with ASTM B 28 and ASTM B 276, designation 2024A; or cast iron in accordance with ASTM A-48, Class 30B.

   a. The lift handles shall be made of a similar metal to the gate (to prevent galvanic corrosion), it may be of solid rod or hollow tubing, with adjustable hook as required.
   b. A neoprene rubber gasket is required between the riser mounting flange and the gate flange.
   c. Install the gate so that the level-line mark is level when the gate is closed.
   d. The mating surfaces of the lid and the body shall be machined for proper fit.
   e. All shear gate bolts shall be stainless steel.

8. The riser maximum opening shall be controlled by limited hinge movement, a stop tab, or some other device.

9. Alternative shear gate designs are acceptable if material specifications are met and flange bolt pattern matches.

Pipes shall be 3” x 0.075” Aluminum or 3” x 0.079” Steel. (See Note 1)

Alternative pipe support designs are acceptable if loading requirements are met.
1. See Contract for size and location of all pipes and orifices.
2. Baffle wall shall have #4 Bar at 12" spacing each way.
3. Precast baffle shall be keyed and grouted in place.
4. Bottom orifice plate shall be galvanized steel with a minimum thickness of 1/4". Attach orifice with 1/2" stainless steel bolts.
5. Upper flow orifice plates and elbows shall be aluminum, aluminized steel or galvanized steel. Galvanized steel shall have Treatment 1.

See Contract for size and location of all pipes and orifices.
Baffle wall shall have #4 Bar at 12" spacing each way.
Precast baffle shall be keyed and grouted in place.
Bottom orifice plate shall be galvanized steel with a minimum thickness of 1/4". Attach orifice with 1/2" stainless steel bolts.
Upper flow orifice plates and elbows shall be aluminum, aluminized steel or galvanized steel. Galvanized steel shall have Treatment 1.
NOTES:
1. See Standard Specifications Section 7-08.3(3) for Pipe Zone Backfill.
2. See Standard Specifications Section 9-03.12(3) for Gravel Backfill for Pipe Zone Bedding.
4. For sanitary sewer installations, concrete pipe shall be bedded to spring line.

### Pipe Zones
- **Concrete and Ductile Iron Pipe:**
  - O.D. 6”
  - Trench Width (see note 3)
  - 15% O.D.
  - 85% O.D.

- **Thermoplastic Pipe:**
  - O.D. 6”

- **Metal Pipe:**
  - O.D. 6”

### Pipe Archies
- **Clearance Between Pipes for Multiple Installations**

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<thead>
<tr>
<th>Pipe Type</th>
<th>Size</th>
<th>Minimum Distance Between Barrels</th>
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<tbody>
<tr>
<td>Circular Pipe</td>
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<td>12”</td>
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<td>30“ to 99”</td>
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<td>102“ to 180”</td>
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<td>Pipe Arch</td>
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**Gravel Backfill for Pipe Zone Bedding** (see note 2)

**Trench Width** (see note 3)

**Pipe Zone Bedding and Backfill**

**Standard Plan B-55.20-06**

**Sheet 1 of 1 Sheet**

**Approved for Publication**

Harold J. Peterfeso 06-01-06

**Washington State Department of Transportation**

**EXPIRES JULY 1, 2007**
1. Knockouts shall have a wall thickness of 2" minimum to 2.5" maximum.
2. For pipe allowances, see Standard Plan B-10.20.

**MANHOLE DIMENSION TABLE**

<table>
<thead>
<tr>
<th>DIAM.</th>
<th>MIN. WALL THICKNESS</th>
<th>MIN. 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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<tr>
<td>60&quot;</td>
<td>5&quot;</td>
<td>8&quot;</td>
<td>48&quot;</td>
<td>8&quot;</td>
</tr>
</tbody>
</table>

**MANHOLE TYPE 1**

STANDARD PLAN B-15.20-01

APPROVED FOR PUBLICATION

Pasco Bakotich III 02-07-12

Washington State Department of Transportation
NOTES
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2. For pipe allowances, see Standard Plan B-10.20.

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<td>5&quot;</td>
<td>8&quot;</td>
<td>48&quot;</td>
<td>8&quot;</td>
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<td>12&quot;</td>
<td>12&quot;</td>
<td>108&quot;</td>
<td>12&quot;</td>
</tr>
</tbody>
</table>

For pipe allowances, see Standard Plan B-10.20.
1. The gasket and groove may be in the seat (frame) or in the underside of the cover. The gasket may be "T" shaped in section. The groove may be cast or machined.

2. Bolt-down capability is required on all frames, grates, and covers, unless specified otherwise in the Contract. Provide 3 holes in the frame that are vertically aligned with the grate or cover slots. The frame shall accept the 5/8" - 1 NC x 2" Allen head cap screw by being tapped, or other approved mechanism. Location of bolt down holes varies by manufacturer.

3. For bolt-down manhole ring and covers that are not designated "Watertight," the neoprene gasket, groove, and washer are not required.

4. Washer shall be neoprene (Detail "B").

5. In lieu of blind pick notch for manhole covers, a single 1" pick hole is acceptable. Hole location and number of holes may vary by manufacturer.

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

7. For clarity, the vertical scale of the Cover Section has been exaggerated, it is 1.5 times the horizontal scale (1H:1.5V).
ATTACH IN A MANNER THAT ASSURES FABRIC IS FIRMLY HELD BY THE BACKUP SUPPORT IN A WAY THAT REDUCES THE POTENTIAL FOR FABRIC TEARING

NOTE

DURING EXCAVATION, MINIMIZE DISTURBING THE GROUND AROUND TRENCH AS MUCH AS IS FEASIBLE, AND SMOOTH SURFACE FOLLOWING EXCAVATION TO AVOID CONCENTRATING FLOWS. COMPACTION MUST BE ADEQUATE TO PREVENT UNDERCUTTING FLOWS.

TYPICAL INSTALLATION DETAIL
(STEEL POSTS SHOWN)

POST - SEE STD. SPEC. 8-01.3(9)A
ATTACH IN A MANNER THAT ASSURES FABRIC IS FIRMLY HELD BY THE BACKUP SUPPORT IN A WAY THAT REDUCES THE POTENTIAL FOR FABRIC TEARING

FASTEN GEOTEXTILE TO POST EVERY 6' (IN.) O.C.

SELF-LOCKING TIE- NYLON 5/5 (MIN. GRADE), 120# MIN. TENSILE STRENGTH, UV STABILIZED

BURY GEOTEXTILE IN TRENCH

NOTE

BURY GEOTEXTILE IN TRENCH

BACKFILLED & COMPACTED NATIVE SOIL

BACKUP SUPPORT

SILT FENCE WITH BACKUP SUPPORT

FABRIC

(STEEL POSTS SHOWN)

SPliced FENCE SECTIONS SHALL BE CLOSE ENOUGH TOGETHER TO PREVENT SILT LADEN WATER FROM ESCAPING THROUGH THE FENCE AT THE OVERLAP.

SPlice DETAIL
(STEEL POSTS SHOWN)

POST - WOOD OR STEEL (TYPICAL)

BACKUP SUPPORT (TYPICAL)

GEOTEXTILE FOR SILT FENCE - SEE STANDARD SPECIFICATION SECTION 9-33.2 (1), TABLE 6

NOTE 1

1. Install the ends of the silt fence to point slightly upslope to prevent sediment from flowing around the ends of the fence.
2. Perform maintenance in accordance with Standard Specifications 8-01.3(9)A and 8-01.3(15).
3. Splices shall never be placed in low spots or sump locations. If splices are located in low or sump areas, the fence may need to be reinstalled unless the Project Engineer approves the installation.
4. Install silt fencing parallel to mapped contour lines.
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 materials.
4. Perform maintenance in accordance with Standard Specification 6-01.3(15).

NOTES:

STORM DRAIN INLET PROTECTION
STANDARD PLAN I-40.28-00

STATE OF WASHINGTON
REGISTERED LANDSCAPE ARCHITECT
CERTIFICATE NO. 000598
MARK W. MAURER

Pasco Bakotich III
09-20-07

NOTE: THIS PLAN IS NOT A LEGAL ENGINEERING DOCUMENT. A COPY MAY BE OBTAINED UPON REQUEST.

APPROVED FOR PUBLICATION
WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

STOCK NUMBER: 322588