CHAPTER 4

DRAINAGE AND EROSION CONTROL DESIGN STANDARDS

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Prepared by:

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Public Works / Community Development

CHAPTER 4 - STORM DRAINAGE DESIGN STANDARDS

CHAPTER 4

STORM DRAINAGE

4-000 PURPOSE

It is the purpose of this Chapter to implement the City of Marysville Storm Drainage Ordinance No. 2245, and to provide the Construction Standards and Specifications of Marysville Municipal Code (MMC)14.15.100.

It is expressly the purpose of this Chapter to provide for and promote the health, safety, and welfare of the general public through sound development policies and construction procedures which respect and preserve the City's watercourses; to minimize water quality degradation and control of sedimentation of creeks, streams, ponds, lakes, and other water bodies; to preserve and enhance the suitability of waters for contact recreation and fish habitat; to preserve and enhance the aesthetic quality of the waters; to maintain and protect valuable groundwater quantities, locations, and flow patterns; to ensure the safety of City roads and rights-of-way; and to decrease drainage-related damages to public and private property.

The Standards established by this Chapter are intended to represent the **minimum design standards** for the construction of storm drainage facilities, erosion control, and stream channel improvements. Additional requirements may be contained in the adopted edition of the State Department of Ecology's (D.O.E.) Stormwater Management Manual for Western Washington. Compliance with these Standards does not relieve the designer of the responsibility to apply conservative and sound professional judgment to protect the health, safety, and welfare of the general public. Special site conditions and environmental constraints may require a greater level of protection than would normally be required under these Standards. The designer must apply these Standards bearing in mind these constraints.

4-010 APPLICABILITY

A. All persons taking any of the following actions or applying for any of the following permits and/or approvals, shall, unless otherwise excepted or exempted, be required to submit for approval by the Public Works Director or Designee, a Site Plan with their application and/or request:

1. Creation or alteration of new or additional impervious surfaces.
2. New development.
3. Redevelopment.
4. Building permit.
5. Grading permit.
6. Flood control zone permit.
7. Subdivision approval.
8. Short subdivision approval.
9. Commercial, industrial, or multifamily site plan approval.
10. Planned unit development or Master Plan Development.
11. Conditional use permits.
12. Substantial development permit required under RCW 90.58 (Shoreline Management Act).
13. Right-of-Way use.
14. Logging, clearing, and other land disturbing activities.
15. Contain, or be adjacent to, a floodplain, stream, lake, wetland or closed depression, or a sensitive area as defined by the Sensitive Areas Ordinance No 1928.

Site Plan shall indicate the character of the existing site, topography, natural drainage features on or adjacent to the site, the location and dimensions of all impervious surfaces, flow arrows indicating the direction of stormwater flows onsite, and any offsite flows entering the site, the proposed method of utilizing the existing drainage system.

B. Commencement of construction, grading, or site alteration work under any of the permits or approvals listed in subsection above shall not begin until such time as final approval of the Construction Stormwater Pollution Prevention Plan (SWPPP)has been granted by the Public Works Director or Designee.

C. Guidance on preparing a Permanent Stormwater Control Plan s contained in the adopted edition of the State Department of Ecology's (D.O.E.) Stormwater Management Manual for Western Washington, which is the City's adopted Technical Manual.

D. Other agencies such as those listed below may require drainage review for a proposed project's impact on surface and storm waters. The applicant should take care to note that these other agency drainage requirements are separate from, and in addition to, City of Marysville drainage requirements. The applicant will be responsible to coordinate joint agency drainage review, including resolution of any conflicting requirements between agencies.

Agency	Permit/Approval
Snohomish County Health District	On-Site Sewage Disposal and Well Permits
Washington State Department of Transportation	Developer/Local Agency Agreement
Washington State Department of Ecology	Short Term Water Quality Modification Approval
Washington State Department of Fish and Wildlife	Hydraulic Project Approval
Washington State Department of Ecology	Dam Safety Permit
United States Army Corps of Engineers	Section 10 Permit
United States Army Corps of Engineers	Section 404 Permit
Washington State Department of Ecology	Industrial Stormwater Permit
Washington State Department of Ecology	Construction Stormwater Permit
Washington State Department of Ecology	Underground Injection Control Permit
Department of Natural Resources	Aquatic Land Use Permit
Washington State Department of Ecology	401 Water Quality Permit

Refer to Volume I of the D.O.E Stormwater Management Manual for additional permit information.

4-020 EXEMPTIONS

A. Stormwater facilities owned and maintained, or development undertaken by the Washington State Department of Transportation in state highway rights-of-way which are regulated by and meet the requirements of Chapter 173-270 WAC, the Puget Sound Highway Runoff Program.

B. Commercial agriculture, including only those activities conducted on lands defined in RCW 84.34.020(2), and production of crops or livestock for wholesale trade.

C. Forest practices regulated under Title 222 Washington Administrative Code, except for Class IV general forest practices, as defined in WAC 222-16-050, that are conversions from timber land to other uses.

D. Activities not requiring machinery for construction or excavation and that are not subject to other environmental regulation.

Requests for exemption shall be filed in writing with the Public Works Director or Designee, and shall adequately detail the basis for granting an exemption.

4-030 ILLICIT DISCHARGES

Illicit discharges to stormwater drainage systems are prohibited. Illicit shall mean all nonstormwater discharges to stormwater drainage systems that cause or contribute to a violation of State water quality, sediment quality, or groundwater quality standards, including but not limited to sanitary sewer connections, industrial process water, interior floor drains, car washing, and gray water systems.

4-040 STORM DRAINAGE DESIGN STANDARDS

A. Stormwater Management Design Manual.

The City adopted edition of the Washington State Department of Ecology Stormwater Management Manual for Western Washington shall be used for design of all developments. Unless otherwise provided, it shall be the developer's and property owner's responsibility to design, construct, and maintain a system which complies with these Design Standards, the Marysville Municipal Code, and the adopted (D.O.E.) Stormwater Management Manual. Low Impact Development facilities and designs may use the Low Impact Development Technical Guidance Manual for Puget Sound for additional design criteria and guidelines.

The latest versions of approved stormwater modeling software shall be used for modeling for all sites and facilities. Digital project files shall be provided to the City for review if requested.

B. Minimum Requirements for New Development and Redevelopment.

Storm Drainage Design shall be in accordance with the minimum requirements for new and redeveloped sites as established in the adopted (D.O.E) Stormwater Management Manual Chapter 2, Volume I (Minimum Requirements for New Development and Redevelopment) as amended by Appendix 1 of the NPDES Phase II Municipal Stormwater Permit. Total new and or redeveloped impervious surfaces shall be calculated as a total for the development, including areas onsite and within public right of way.

C. Stormwater Site Plans.

Minimum Site Plan submittals shall be in accordance with the adopted (D.O.E.) Stormwater Management Manual Chapter 3, Volume I (Preparation of Stormwater Site Plans) as amended by Appendix 1 of the NPDES Phase II Municipal Stormwater Permit. Offsite analysis and mitigation shall be performed per Chapter 3, Volume I of the D.O.E. manual.

D. BMP and Facility Selection Process.

Selection of Facilities and BMP for Permanent Stormwater Control Plans shall be determined in accordance with the BMP and Facility Selection process per the adopted (D.O.E.) Stormwater Management Manual Chapter 4, Volume I (BMP and Facility selection process for Permanent Stormwater Control Plans).

E. Construction Stormwater Pollution Prevention.

Construction Stormwater Pollution Prevention Plans (SWPPP) shall be developed and designed in accordance with the standard plans in this manual & the adopted (D.O.E) Stormwater Management Manual Chapter 3, Volume II on developing and implementing a Construction SWPPP as amended by Appendix 1 of the NPDES Phase II permit. Each of the 12 elements must be included in the Construction SWPPP unless an element is determined to be not applicable to the project. The checklists in section 3 (Appendix 1) may be helpful in preparing the Construction SWPPP.

F. Basin Planning.

Adopted and implemented watershed-based plans may be used to modify any or all of the Minimum Requirements, provided that the level of protection for surface or ground water achieved by the basin plan will equal or exceed that which would be achieved by the Minimum Requirements in the absence of a basin plan. Basin plans shall evaluate and include, as necessary, retrofitting of BMP's for existing development and/or redevelopment in order to achieve watershed-wide pollutant reduction goals. Standards developed from basin plans shall not modify any of the above requirements until the basin plan is formally adopted and fully implemented by the City.

G. Water Quality Sensitive Areas.

Where the Public Works Director or Designee determines that the minimum requirements do not provide adequate protection of water quality sensitive areas, whether on site or within the drainage basin, more stringent controls shall be required to protect water quality. Stormwater treatment BMP's shall not be built within natural vegetated sensitive area buffers except for necessary conveyance systems as approve by the City Planner.

H. Conveyance System Design.

Closed drainage systems or culverts on a major stream or creek as determined by the Public Works Director or Designee, shall be designed to convey flows from a one hundred year recurrence storm event. All other closed drainage systems shall be designed to convey flows from a twenty five year recurrence storm event, unless otherwise required by the Public Works Director or Designee.

I. Temporary Gravel Construction Entrance.

The temporary construction entrance should be cleared of all vegetation, roots, and other objectionable material. Any drainage facilities required because of washing should be constructed according to specifications in the plan. If wash racks are used, they should be installed according to manufacturers recommendations. Construct stabilized construction entrance in accordance with Plan 4-040-014.

G. Oil Control Devices.

Sites shall evaluate the need for an oil control device in accordance with the adopted (D.O.E.) Stormwater Management Manual Chapter 4, Volume I (BMP and Facility Selection Process for Permanent Stormwater Control Plans).

A Coalescing Plate Separator per standard plan 4-040-017 shall be required for Oil/Lube shops, Vehicle Repair, Wash Bays, Car Washes, and any other applications deemed necessary by the City Engineer.

For Fueling Stations an Oil Stop Valve (OSV) such as the AFL/Clark OSV or approved equivalent shall be installed in a manhole or other approved structure prior to the Coalescing Plate Separator. The Oil Stop Valve uses a ballasted float set at a specific gravity between that of oil and water. When an oil spill occurs, the float loses buoyancy as the oil level increases until it finally shuts off the discharge port. The spill will then be confined within the structure and piping for removal and disposal by a hazardous waste hauler.

Tees & Elbows will not be approved as an oil control device. Sites requiring oil control devices per the manual will be required to install a coalescing plate separator or stormfilter type device for oil control and or additional controls deemed necessary by the City Engineer.

H. Debris and trash racks.

To be installed on inlet and outlet piping where trash removal is warranted. Construct and install in accordance with Standard Plans 4-040-006 and 4-040-007.

I. Discharge from Roof Drains.

Runoff from roofs and individual lots may be collected and discharged into the storm drainage system. Refer to Standard Plans 4-040-015 and 4-040-016 for details. Roof drains may also be infiltrated or dispersed in accordance with the adopted D.O.E Stormwater Management Manual, Volume III, Chapter 3 (Roof Downspout Controls). Roof drains shall not be connected to the sanitary sewer.

J. Storm Sewer Extension Required (MMC14.03.300)

(1) The owner of any property which is not connected to the public storm drainage system shall be required to extend any storm drainage line which is within 200

feet of the property, and to connect to and use the same for all developed portions of the property, under any of the following circumstances:

(a) As a condition of final approval of a subdivision;

(b) As a condition of final approval of a short subdivision;

(c) As a condition of final approval of a binding site plan for any mobile home park, condominium, planned unit development, industrial park, or shopping center.

(d) As a condition of any building, grading, paving, or other development approval, including rezones or conditional use permits, which will have a significant adverse impact upon storm drainage; as determined by the Public Works Director or Designee.

(2) The Public Works Director or Designee may waive the requirement of subsection (1) if it is found that the capacity or condition of the existing public storm drainage system is insufficient or inadequate to serve the subject property; or if it would cause a practical difficulty to require the connection of the subject property to the public storm drainage system by reason of circumstances which are unique to the property and not generally shared by other properties in the vicinity.

K. Extension for Full Lot Frontage (MMC14.03.310)

Whenever a property owner desires to connect to the public storm drainage system, the property owner shall be required to extend the storm drainage lines for the full frontage of the lot which is being connected. If it can be shown that no future extensions beyond said lot will occur, a waiver may be obtained from the Public Works Director or Designee and the owner need only extend the line to the nearest point of connection on the lot.

L. Fencing

Detention ponds with side slopes steeper than 3:1 or with a maximum water depth greater than 3 feet shall require a powder or vinyl coated chain link perimeter fence. Side slope averaging shall not be allowed. See Standard Plans 3-501-007 & 008. During construction of drainage facilities and prior to installation of permanent perimeter fence, contractor shall ensure temporary fencing is in place around open cut facilities while construction activities are not underway on said facility and/or at the end of each day until placement of permanent fencing is complete.

M. Signage

Detention ponds shall have a Pond Identification Sign. Signs are designed and provided by the City and paid for and installed by the Developer.

Stream Crossings shall be signed with "This Stream is in Your Care" signs provided by the City and paid for and installed by the Developer.

4-050 MANDATORY REQUIREMENTS FOR ALL STORM DRAINAGE IMPROVEMENTS

A. Commencement of construction, grading or under any of the permits or approvals shall not begin until such time as final approval of the Construction Stormwater Pollution Prevention Plan (SWPPP) has been granted by the Public Works Director or Designee.

B. All engineering plans and specifications submitted for approval shall be stamped by a professional engineer registered in the State of Washington. All site improvement plans and the cover page of copies of the Drainage Report must be signed and dated by the professional engineer approving the design.

C. All land boundary surveys used, and legal descriptions prepared, for preparing preliminary and engineering plans must be stamped by a professional land surveyor registered in the State of Washington. Topographic survey data and mapping prepared specifically for a proposed project may be performed by the professional engineer stamping the engineering plans as allowed by the Washington State Board of Registration for Professional Engineers and Land Surveyors.

D. All retention/detention criteria shall be analyzed using the hydrograph methods and routing procedures included in the (D.O.E.) Stormwater Management Manual for Western Washington, or as approved by the Public Works Director or Designee.

E. Open retention/detention facilities and infiltration facilities shall not be located in dedicated public road right-of-way areas unless specifically approved by the Public Works Director or Designee, or unless part of a Low Impact Development (LID) using approved LID facilities.

F. Emergency overflow provisions shall be installed in such a manner as to direct waters away from all structures without causing failure of those structures. The impact of a system failure should be analyzed both in terms of on-site and off-site effects. The impacts may be to adjacent properties or to elements of the public drainage system or other private systems. Retention/detention and infiltration facility design must take into account overflows which may result from:

1. Higher-intensity or longer-duration storms than the design storm.
2. Plugged orifices.
3. Inadequate storage due to sediment buildup.
4. Debris blockage.
5. Other reasons causing system failure.

G. Maximum allowable release rates from stormwater detention systems shall be based upon the pre-development runoff from the site. The allowable release rate shall be determined as specified in the (D.O.E.) Stormwater Management Manual for Western Washington. The allowable release rate may be decreased on a case-by-case basis due to constraints in the drainage system downstream.

H. All drainage system elements shall provide for adequate maintenance and accessibility at all times. No storm drainage system elements shall be located within ten feet of or underneath any structure and the system shall be designed to eliminate interference from underground utilities and from conditions which exceed design loads for any pipe or other structural elements.

I. All aspects of public health and safety must be carefully reviewed in every drainage control system plan. Protective measures are often necessary and shall be required whenever deemed appropriate by the Public Works Director or Designee. The protective measures themselves shall be designed so as not to constitute hazards or nuisances.

J. The designer should consider system reliability in terms of layout, specification of materials, methods of installation and the influence of other activities in the area both during and after construction.

K. The frequency and difficulty of future maintenance should be minimized by thorough consideration of possible failures in the system during design and what would be required to correct the problem. Design adjustments to ease maintenance should be a major consideration.

L. The designer should consider multiple use of elements of the drainage system. This multiple use may require compromise, but no adjustments to usual policies or standards will be made which would impact the system to the degree that risk of failure, impact of system failure or exposure of the general public to hazard is increased.

M. The use of the site should be evaluated to determine if hazardous materials or other pollutants are likely to be present, and if extraordinary design considerations are necessary.

N. The visual impact and other potential problems (mosquito breeding, smell, etc.) should be considered. Concerns will vary with the site environment, but aesthetics should always be of concern to the designer.

O. Offsite improvements may be required if on-site controls are insufficient to mitigate impacts due to flooding, erosion, sedimentation, pollution, or habitat degradation.

P. Roof drains shall not be connected to the sanitary sewer.

Q. Developer shall meet all applicable federal, state, and local water quality standards prior to discharge to any wetland, stream, river, or lake.

R. Surface water entering the subject property shall be received at the naturally occurring location, and surface water exiting the subject property shall be discharged at the natural location with adequate energy dissipaters to minimize downstream damage and with no diversion at any of these points.

S. Where open ditch construction is used to handle drainage within the subject property, a minimum of 15 feet will be provided between any structures and the top of the bank of the defined channel.

1. In open channel work, the water surface elevation will be indicated on the plan and profile drawings. The configuration of the finished grades constituting the banks of the open channel will also be shown on the drawings.

2. Proposed cross-section of the channel will be shown with stable side slopes. Side slopes will be no steeper than 3H:1V unless stabilized in some manner approved by the Public Works Director or Designee.

3. The 100-year water surface elevation of the design flow will be indicated on the cross-section.

T. Where a closed system is used to handle drainage within the subject property, all structures will be a minimum 10 feet from the closed system.

U. The proposed measures for controlling runoff during construction shall include a statement indicating the proposed staging of all clearing, grading and building activities.

V. Drainage facilities shall be designed and constructed in accordance with City Standards and as directed by the Public Works Director or Designee.

W. Vegetation shall be established on areas disturbed or other locations on the site to protect watercourses from erosion, siltation or temperature increases.

X. Surface water exiting from the subject property shall have pollution control and oil separator devices installed at the discharge point from the subject property when draining parking lots of paved roadway surfaces or handling contaminated storm runoff as required in the manual.

4-060 LOW IMPACT DEVELOPMENT

For all Low Impact Development (LID) practices please refer to MMC 19.49. The purpose of the chapter is to permit design flexibility and provide performance criteria for LID. LID is a stormwater management and land development strategy utilized in site design and construction that emphasizes conservation and use of on-site natural features integrated with engineered, small-scale hydrologic controls to mimic natural hydrologic functions. Implementation of LID benefits streams, lakes, and Puget Sound by moderating the impacts of stormwater runoff generated by the built environment. LID techniques may supplant or augment traditional, structural stormwater management solutions. Low impact best management practices (BMPs) are described in the current Low Impact Development Technical Guidance Manual for Puget Sound, published by the Puget Sound Action Team. LID objectives are:
(1) To retain or restore native forest cover to capture, infiltrate, and evaporate all or a portion of the rainfall on a site;
(2) To confine development to the smallest possible footprint and minimize land disturbance and site grading;
(3) To preserve or restore the health and water-holding capacity of soils;
(4) To incorporate natural site features that promote stormwater infiltration;
(6) To minimize all impervious surfaces and especially those that drain to conventional piped conveyance;
(7) To manage stormwater through infiltration, bioretention, and dispersion; and
(8) To manage stormwater runoff as close to its origin as possible in small, dispersed facilities.

4-070 RESERVED

4-080 ROADWAY DRAINAGE

A. General

1. Designs: Drainage facilities shall be designed consistent with City of Marysville Drainage and Erosion Control Design Standards and the (D.O.E.) Stormwater Management Manual for Western Washington, adopted edition. Structures shall be placed and constructed as shown in these Standard Plans.

   Roadway storm detention facilities shall be provided for all improvements to public roads exceeding 5000 sq. ft. of impervious surface.

   Roadway storm drainage facilities shall be provided for any and all road construction. Roadway storm drainage facilities shall be designed and constructed in such a manner as to provide opportunity for drainage of adjacent properties.

2. Specifications: Materials, construction, and testing are specified in the WSDOT Standard Specifications. The City Engineer may amend, delete, or add Specifications or Standard Plans.

3. Conflicts: Where technical conflicts may occur between this document and other Storm Drainage Design Standards, the City Engineer shall decide which document governs.

B. Storm Sewers and Culverts

1. Minimum pipe size shall be 12-inch diameter. Eight-inch diameter may be permitted on cross street laterals to avoid utility conflict or meet shallow gradient.

2. Driveway culverts shall conform to Standard Plan 4-080-003.

3. The following pipes, specified in Section 9-05 of the WSDOT Standard Specifications are allowed: plain and reinforced concrete storm sewer pipe,

aluminized Type 2 corrugated steel, steel spiral rib and corrugated steel with asphalt coating Type 1, spiral rib and corrugated aluminum, ductile iron, polyvinyl chloride (PVC), lined corrugated polyethylene (LCPE), smooth wall polyethylene (SWPE), high density polyethylene (HDPE) pipe, or any pipe specifically approved by the Director.

4. LCPE pipe shall have a smooth interior wall meeting or exceeding Type III, Category 4 or 5, Grade P33 or P34, Class C per ASTM D1248, minimum cell Class ASTM D3350, 324420C. LCPE shall also meet or exceed the requirements of AASHTO M294, Type S. Pipe shall be placed in accordance with City Specifications.

5. SWPE pipe with maximum SDR of 32.5, minimum cell Class ASTM D3350, 334434C and meeting City Specifications for ductile iron pipe with restrained mechanical joints may be used for outfalls on steep slopes.

6. PVC pipe shall require the use of bedding material for flexible pipe specified in Section 9-03 the of WSDOT Standard Specifications.

7. LCPE and SWPE shall be bedded on gravel backfill for pipe bedding as specified in Section 9-03 of the WSDOT Standard Specifications. Above ground installation of SWPE does not require pipe bedding.

8. When required by the City Engineer, PVC, LCPE and SWPE shall be tested using the deflection test procedure described in Section 7-17.3(2)H of the WSDOT Standard Specifications. Pipe sections failing the mandrel test shall be replaced, except that reshaping SWPE and LCPE sections to meet requirements may be allowed if the original deformation is less than 20 percent.

9. Concrete pipe shall be rubber gasketed and metal pipe shall be gasketed and securely banded.

10. Leak testing shall be conducted if required by the City Engineer or designee.

11. If the depth to the top of pipe exceeds eight feet, the City Engineer shall select the pipe material.

12. Bevel the projecting ends of culverts within the right-of-way per Standard Plans 4-080-004 and 4-080-005.

13. French drains shall be installed where it is desirable to intercept the ground water and transfer it off site. See Standard Plan 4-080-006.

C. Catch Basins and Junctions

1. Catch basins shall be spaced no greater than 150 feet for road grades less than one percent, 200 feet for grades between one and three percent; and 300 feet for grades three percent and greater. Where the width of the tributary road surface exceeds 35 feet, the cross slope exceeds four percent, catch basin spacing analysis is required. The analysis must show the depth of water at the edge of the traveled way does not exceed 0.12 feet or extend more than five feet into the traveled way for the 10-year storm event, using flows generated by the rational formula.

2. New catch basins shall be constructed and installed in conformance with Standard Plans 4-080-007 through 4-080-010, and 4-080-014.

3. With prior approval by the Director, connections to pipe systems may be made without placing a catch basin or manhole on the mainline provided all of the following conditions are met:

   a. The mainline pipe is 48 inches or greater and at least two times the size of the connecting pipe.

   b. All connections shall be performed in accordance with the manufacturer's recommendations. Standard shop fabricated tees, wyes and saddles shall be used. Concrete pipe connections shall be constructed in accordance with Standard Plan 4-080-011.

c. There shall be a catch basin or manhole on the connecting pipe within two to ten feet of the external wall of the main line. See Standard Plan 4-080-011.

d. Offset angle of connecting pipe to mainline, horizontally and vertically, shall be less than 45 degrees.4. Connections to an existing system shall avoid directing project runoff through downstream quality/quantity control facilities. Receiving systems may have separate conveyance facilities: one connecting to quality/quantity facilities and one by-passing them. Connection shall be to the bypass system where available.

5. Use Type 2 catch basins where the depth to the invert of the pipe exceeds five feet or the nominal diameter of the pipe is greater than 18 inches.

6. Manholes may be used in lieu of catch basins if they do not collect surface water. Manholes shall be constructed and installed in conformance with Standard Plans 4-080-012 through 4-080-014.

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

8. Catch basins or manholes are required when joining differing types of pipes.

9. Curb inlets shall be used to collect street runoff when catch basins are not used. See Standard Plan 4-080-015.

D. Frames, Grates, and Covers

1. Unless otherwise specified, use vaned grates with standard frames in the traveled way, gutter, or shoulder. Vaned grates shall not be located within cross walks, (see Standard Plan 4-080-016). When vaned grates are impractical, use Standard Grate (see Standard Plan 4-080-017).

2. At sag vertical curves, or before intersections with a grade 3% or greater, use through curb inlet frames. Where through curb inlets cannot be used, three

vaned inlets shall be used. One shall be located at the approximate low point and another on either side at 25 foot horizontal spacing, but not greater than 0.1 foot above the low point, (see Standard Plan 4-080-018).

3. New & existing catch basins that do not or no longer collect runoff shall use or be replaced with locking frame and solid covers (See Standard Plans 4-080-022, 4-080-023 and 4-080-024).

4. All storm drain covers and grates shall be locking. Manufacturer as approved by the City Engineer.

5. Where vertical concrete curbs or extruded curbs are used, catch basin frames and grates shall be installed in accordance with Standard Plan 4-080-025.

6. Slit drains may be used when approved by the City Engineer. At a minimum slit drains shall have catch basins at either end unless used as a driveway culvert. The maximum distance between catch basins along a slit drain shall be 50 feet.

E. Erosion Control. Filter fabric fences shall be constructed of material designed specifically for erosion control. The fabric shall be composed of rot-proof woven or non-woven polymeric fibers and be free of chemical treatment or coating that may reduce permeability. The fabric shall meet the following test requirements: minimum 110 lbs. grab tensile strength per ASTM D-1682, minimum 40 lbs. puncture strength per ASTM D-751 Modified, and 20-100 Equivalent Opening Size (EOS) based on U.S. standard sieves. See Standard Plan 4-040-008.

F. Trenches. See Underground Utility Installation - Chapter 3.

4-090 ADDITIONAL INFORMATION REQUIRED

The requirements of this Chapter may be modified at the discretion of the Public Works Director or Designee when more information is deemed necessary for proper review.

4-100 INSPECTION - CONSTRUCTION

A. All activities regulated by this Chapter shall be inspected by the Engineer and/or Construction Inspection Division of Community Development. Projects shall be inspected at various stages of the work to determine that adequate control is being exercised. Stages of work requiring inspection include, but are not limited to: preconstruction, installation of BMP's, land-disturbing activities, installation of utilities, landscaping, retaining walls, and completion of project. When required by the Public Works Director or Designee, special inspection and/or testing shall be performed.

B. At the time of approval of the Construction Stormwater Pollution Prevention Plan or Stormwater Site Plan for the subject property, a schedule for inspection to ensure proper review of construction and facilities will be established by the Public Works Director or Designee. The following inspections may be required as a minimum:

(1) Initial Inspection. Inspection prior to clearing and construction will apply to sites with a high potential for sediment damage, as identified by the applicant during civil review based on definitions and requirements of Appendix 7 of the Western Washington Phase II Municipal Stormwater permit.

(2) Grading Preparation. Whenever work on the site preparation, grading, excavations, or fill is ready to be commenced, but in all cases prior thereto;

(3) Rough Grading. When all rough grading has been completed;

(4) Bury Inspection. Prior to burial of any underground drainage structure;

(5) Finish Grading. When all work including installation of all drainage structures and other protective devices has been completed;

(6) Planting. When erosion control planting shows active growth.

(7) System wide inspections for residential developments will take place after all flow control and water quality treatment facilities are completed during the period of heaviest house construction to identify maintenance needs and enforce compliance with maintenance standards as needed.

In some circumstances not all of the above inspections may be necessary. It shall be the discretion of the Public Works Director or Designee to waive or combine any of the above inspections as dictated by conditions.

C. A final inspection by the City will be required at the end of the 2 year maintenance bond period. The Developer will be responsible for repairing any deficiencies found as a result of the City inspection.

D. Failure to comply with the provisions of this Chapter may result in enforcement pursuant to MMC Chapter 4.

4-110 MODIFICATION OF FACILITIES DURING CONSTRUCTION

The Engineer may require that the construction of drainage facilities and associated project designs be modified or redesigned if conditions occur or are discovered which were not considered or known at the time the permit or approval was issued, such as uncovering unexpected soil and/or water conditions, weather-generated problems, or undue materials shortages. Any such modifications made during the construction of drainage control facilities shall be shown on the final approved drainage plans, a revised copy of which shall be provided to the Engineer for filing as an as-built drawing. All engineered plans, modifications & as-builts are to be on the NAVD 88 Datum.

4-120 RESERVED

4-130 VARIANCES

A. A person requesting a variance from the Standards of this Chapter shall file an application with the Public Works Director or Designee setting forth the location of the development, the owner of the property, the nature of the variance request, and the reason for the variance. An application fee established by the City Council shall accompany the application. The application fee shall be applied to all the costs and expenses incurred by the City in processing the application. In the event the filing fee is inadequate the City shall bill any additional costs to the applicant which shall be paid within 30 days and prior to the granting of any variance herein.

B. When considering an application for variance, the Public Works Director or Designee shall evaluate the following factors:

1. Sufficient capacity of downstream facilities under design conditions.

2. Maintenance of the integrity of the receiving waters.

3. Possibility of adverse effects of retention/detention.

4. Utility of regional retention/detention facilities.

5. Capability of maintenance of the system.

6. Structural integrity of abutting foundations and structures.

7. That the health, safety, and welfare of the City is not adversely affected.

8. The variance provides equivalent environmental protection and is in the overriding public interest; and that the objectives of safety, function, environmental protection, and facility maintenance, based upon sound engineering, are fully met.

9. That there are specific physical circumstances or conditions affecting the property such that the strict application of these provisions would deprive the applicant of all reasonable use of the site in question, and every effort to find creative ways to meet the intent of the minimum standards has been made.

10. That the granting of the variance will not be detrimental to the public health, welfare, and safety, not injurious to other properties in the vicinity and/or downstream, and to the quality of the receiving waters.

11. The variance is the least possible variance that could be granted to comply with the intent of the Minimum Requirements.

C. Requests for variances shall be filed in writing with the Public Works Director or Designee and shall adequately detail the basis for granting a variance.

D. The decision of the Public Works Director or Designee concerning a request for a variance shall be made in writing.

E. The decision of the Public Works Director or Designee may be appealed to the Hearing Examiner by filing written notice of appeal with the City Clerk within 10 days of service of the Public Works Director or Designee's decision.

4-140 ESTABLISHMENT OF REGIONAL FACILITIES

A. In the event that public benefits would accrue due to modification of the Storm Drainage Plan for the subject property to better implement the recommendations of the City's comprehensive drainage plans, the Public Works Director or Designee may recommend that the City should assume some responsibility for the further design, construction, operation, and maintenance of drainage facilities receiving runoff from the subject property. Such decision shall be made concurrently with review and approval of the Storm Drainage Plan.

B. In the event the City decides to assume responsibility for all or any portion of the design, construction, operation, and maintenance of the facilities, the applicant shall be required to contribute a pro rata share to the estimated cost of the facilities, provided that such share shall not exceed the estimated costs of improvements the applicant would otherwise have been required to install. The applicant may be required to supply additional information at the request of the Public Works Director or Designee to aid in determination by the City. Guidelines for implementing this section will be defined by the Public Works Director or Designee.

4-150 BONDS REQUIRED

A. The City is authorized to require all persons constructing retention/detention or other drainage treatment/abatement facilities to post surety and cash bonds.

B. Where such persons have previously posted or are required to post other such bonds on the facility itself or on other construction related to the facility, such persons may, with the permission of the Public Works Director or Designee and to the extent allowable by law, combine all such bonds into a single bond; provided, that at no time shall be

amount thus bonded be less than the total amount which would have been required in the form of separate bonds; and provided, further, that such a bond shall on its face clearly delineate those separate bonds which it is intended to replace.

1. Construction Bond. Prior to commencing construction, the person constructing the facility shall post a construction bond in an amount sufficient to cover the cost of performing the construction per the approved drainage plans. After determination by the Public Works Director or Designee that all facilities are constructed in compliance with the approved plans, the construction bond shall be released. Alternatively, an equivalent cash deposit to an escrow account administered by a local bank designated by the City may be allowed at the City's option.

2. Maintenance Bond. After satisfactory completion of the facilities and release of the construction bond by the City, the person constructing the facility shall commence a two year period of satisfactory maintenance of the facility. A cash bond to be used at the discretion of the City to correct deficiencies in said maintenance affecting public health, safety and welfare must be posted and maintained throughout the two year maintenance period. The amount of the cash bond shall be determined by the City. In addition, at the discretion of the Public Works Director or Designee, a Surety bond or cash bond to cover the cost of design defects or failures in workmanship, shall also be posted and maintained through the two year maintenance period. Alternatively, an equivalent cash deposit to an escrow account administered by a local bank may be allowed at the City's option.

3. Liability Policy. The person constructing the facility shall maintain a liability policy in an amount to be determined by the City which shall name the City of Marysville as an additional insured and which shall protect the City from any liability for any accident, negligence, failure of the facility, of any other liability whatsoever, relating to the construction or maintenance of the facility. The liability policy shall be maintained for the duration of the facility by the owner of the facility, provided that in the case of facilities assumed by the City for maintenance, the liability policy shall be terminated when the City maintenance responsibility commences.

4-160 OPERATION AND MAINTENANCE REQUIREMENTS (PRIVATE SYSTEMS)

A. Maintenance Required. All stormwater facilities shall be maintained in accordance with the adopted D.O.E Stormwater Manual, the LID Technical Guidance Manual (for LID Sites), and the provisions provided herein. Systematic, routine preventive maintenance is preferred.

B. Minimum Standards.

The following are the minimum standards for the maintenance of stormwater facilities:

1. It shall be the duty of the owner to maintain, repair and restore, at the owner's expense, all private stormwater and drainage systems located on the owner's property or within an area of shared interest owned in common with other property owners. Maintenance shall be performed in accordance with the adopted D.O.E Stormwater Manual, and in accordance with any maintenance schedule adopted during the plan review process for constructing the facilities. The City shall be granted to the right to conduct emergency maintenance as deemed necessary by the City Engineer. The City will be reimbursed by the private owner for any emergency maintenance costs incurred.

2. No person shall cause or permit any drainage system located on the owner's property to be obstructed, filled, graded, or used for disposal of debris.

3. Inspection frequency shall be as specified in the D.O.E Stormwater Manual or approved maintenance manual. Records of the inspection shall be retained on site or by the owner or administrator of the facility. If records are requested by the director response is required within 90 days.

C. Disposal of Waste From Maintenance Activities. Disposal of waste from maintenance activities shall be conducted in accordance with the minimum Functional Standards for Solid Waste Handling, Chapter 173-304 WAC, guidelines by the Washington State Department of Ecology for disposal of waste materials from stormwater maintenance activities, and where appropriate, the Dangerous Waste Regulations, Chapter 173-303 WAC.

D. Maintenance of Drainage Swales, Biofiltration Swales, and Ditches.

1. Open drainage ditches located on private property or within public drainage easements shall be cleaned, maintained, and protected in continuous compliance with the standards and specifications of the City. Responsibility for such work shall be borne by the owner of the underlying property; provided, that the City shall bear such responsibility for regional drainage ditches, as determined by the Director of the Department of Public Works, if the same are publicly owned or within public easements which are accessible to City personnel.

3. No person shall cause or permit open drainage ditches to be obstructed, filled, graded, or used for disposal of debris.

4. Upon receiving express approval from the Director of the Department of Public works, a property owner may convert a drainage ditch into an enclosed drainage system. Such work shall be performed in compliance with the standards and specifications of the City and shall be subject to inspection and approval by the Department of Public Works. Culverts and drainage appurtenances installed by private owners may be conveyed to the City, at no cost, by a bill of sale.

E. Authority. The Public Works Director or Designee shall have the authority to enforce this Chapter. The Public Works Director or Designee is authorized to develop an inspection program for stormwater facilities in the City of Marysville. Persons or occupants of the site shall allow any authorized representative of the Public Works Department access at all reasonable times to all parts of the premises for the purpose of inspection, sampling, and record examinations.

F. Maintenance Inspection Program. Whenever implementing the provisions of the inspection program or whenever there is cause to believe that a violation has been or is being committed, the inspector is authorized to inspect during regular working hours and at other reasonable times all stormwater drainage systems within the City to determine compliance with the provisions of these regulations.

Procedures: Prior to making any inspections, the inspector shall present identification credentials, state the reason for the inspection, and request entry.

1. If the property or any building or structure on the property is unoccupied, the inspector shall first make a reasonable effort to locate the owner or other person(s) having charge or control of the property or portions of the property and request entry.

2. If after reasonable effort, the inspector is unable to locate the owner or other person(s) having charge or control of the property, and has reason to believe the condition of the stormwater drainage system creates an imminent hazard to persons or property, the inspector may enter.

3. Unless entry is consented to by the owner or person(s) in control of the property or portion of the property or unless conditions are reasonably believed to exist which create imminent hazard, the inspector shall obtain a search warrant prior to entry, as authorized by the laws of the State of Washington.

4. The inspector may inspect the stormwater drainage system without obtaining a search warrant provided for in Subsection 3 above, provided the inspection can be conducted while remaining on public property or other property when permission to enter has been obtained.

G. Inspection Schedule. The Public Works Director or Designee shall establish a master inspection and maintenance schedule to inspect appropriate stormwater facilities that are not owned by the City.

H. Inspection and Maintenance Records. As existing stormwater facilities are encountered, they shall be added to the master inspection and maintenance schedule. Records of new stormwater facilities shall include the following:

1. As-built plans and locations.

2. Findings of fact from any exemption granted by the local government.

3. Operation and maintenance requirements and records of inspection, maintenance actions and frequencies.

4. Engineering reports, as appropriate.

I. Orders. The Engineer shall have the authority to issue an owner or person an order to maintain or repair a component of a stormwater facility BMP to bring it in compliance with this Chapter, and/or City regulations. The order shall include:

1. A description of the specific nature, extent and time of the violation and the damage or potential damage that reasonably might occur.

2. A notice that the violations or the potential violation cease and desist and, in appropriate cases, the specific corrective actions to be taken.

3. A reasonable time to comply, depending on the circumstances.

4-170 OPERATION AND MAINTENANCE - ASSUMPTION BY CITY

The City may assume the operation and maintenance responsibility of retention/detention or other stormwater drainage system features according to City policy after the expiration of the two-year operation and maintenance period if:

A. All of the requirements of this Chapter have been fully complied with.

B. The facilities have been inspected and approved by the Engineer after two years of operation.

C. All necessary easements entitling the City to properly operate and maintain the facility have been conveyed to the City and recorded with the Snohomish County Auditor.

D. All stormwater drainage system features including but not limited to ponds, vaults, CB's, Control Structures, shall be cleaned to a condition acceptable to the City prior to assumption.

E. The developer has supplied to the City an accounting of capital, construction, and operation and maintenance expenses or other items, for the drainage facilities up to the end of the two-year period, for the purposes of establishing the basis for future bonding requirements for other developments.

4-180 ENFORCEMENT AND PENALTIES

General. Enforcement action shall be in accordance with Chapters 4, 14.15, 14.16, 14.17, and 19.28 of the Marysville Municipal Code.

GENERAL NOTES

1. All work and materials shall be in accordance with current City of Marysville Standards and Specifications; the current edition of the Washington State Department of Transportation Standard Specifications for Road, Bridge, and Municipal Construction; and the adopted edition of the Washington State Department of Ecology Stormwater Management Manual for Western Washington.

2. All work within the plat and City right-of-way shall be subject to the inspection of the City engineer or designated representative.

3. Prior to any site construction including clearing/logging or grading, the site clearing limits shall be located and field identified by the project surveyor (or project engineer) as required by these plans. The project surveyor's name and phone number is _____.

4. The developer, contractor and project engineer is responsible for water quality as determined by the monitoring program established by the project engineer. The project engineer's name and phone number is _____.

5. Prior to any site work, the contractor shall contact the Department of Public Works at 360-363-8100 to schedule a preconstruction conference. Engineered as-built drawings in accordance with the current adopted International Building Code shall be required prior to site approval.

6. The contractor shall be responsible for obtaining all permits for utility, road, and right-of-way construction. The contractor for this project is _____. Contact person is _____. Phone _____, Mobile phone _____, emergency phone _____.

7. The Construction Stormwater Pollution Prevention (SWPP) Best Management Practices (BMP's) shall be constructed in accordance with the approved SWPP plans prior to any grading or extensive land clearing. These facilities must be satisfactorily maintained until construction and landscaping is completed and the potential for on-site erosion has passed. Sediment laden waters shall not enter the city stormwater drainage system or a natural drainage system.

8. Non compliance with the requirements for; erosion controls, water quality and clearing limits may result in revocation of; project permits, plan approval and bond foreclosures.

9. Trench backfill of new utilities and stormwater drainage system features shall be compacted to 95% maximum density (modified proctor) under roadways and 90% maximum density (modified proctor) off roadways. Compaction shall be performed in accordance with Sections 7-08.3(3) and 2-03.3(14)C - Method B as defined in the current edition of the WSDOT Standard Specifications for Road, Bridge, and Municipal Construction.

10. The owner and contractor shall be responsible for locating and protecting all existing utilities prior to beginning construction. Location of utilities shown on construction plans are based on best records available and are subject to variation. For assistance in utility location, call 1-800-424-5555.

11. Prior to construction the owner and/or contractor shall notify the project engineer and the City engineer when conflicts exist between the plans and field conditions. Conflicts shall be resolved (including plan and profile revisions) and resubmitted for approval prior to proceeding with construction.

12. The contractor shall keep two sets of plans on site at all times for recording as-built information; one set shall be submitted to the project engineer, and one set shall be submitted to the City engineer at completion of construction and prior to final acceptance of work.

13. A grading permit issued pursuant to the current adopted International Building Code, and approval of the temporary erosion and sedimentation control plan shall be obtained from the Community Development Department prior to any on-site grading work not expressly exempt by the current adopted International Building Code.

14. Prior to commencement of framing, final drainage inspection and approval of the roof leader and positive footing systems shall be completed by the Building Department. Call 360-363-8100 to schedule the inspection.

STORM DRAINAGE NOTES

1. Prior to any site work including drainage, the contractor shall contact the City of Marysville Construction Inspection Division of Community Development at 360-363-8100 to schedule a pre-construction conference.

2. All pipe shall be placed on stable earth. If in the opinion of the City inspector, the existing trench foundation is unsatisfactory, then it shall be excavated below grade and backfilled with gravel bedding to support the pipe.

3. Backfill shall be placed equally on both sides of the pipe or pipe-arch in 6" average depth loose lifts. Maximum lift depth shall not exceed 9". Each lift shall be thoroughly compacted. Compacted lifts must extend at least one pipe diameter on each side of the pipe or to the side of the trench. Backfill over the pipe shall be performed in accordance with Sections 7-04.3(3) and 2-03.2(14)C - Method B and C of the WSDOT Standard Specifications for Road, Bridge, and Municipal Construction.

4. All grates located in the gutter flow line (inlet and catch basin) shall be depressed 0.1 feet below pavement level.

4a. All catch basins and manholes located outside of paved areas, shall be placed in a six foot square by four inch thick concrete pad.

5. All catch basins to be Type I unless otherwise approved by the City engineer or designated representative. The use and installation of inlets is not encouraged.

6. The contractor shall be responsible for adjusting all manhole, inlet and catch basin frames and grates to grade just prior to curb installation and/or paving.

7. All catch basins with a depth of 5 feet or greater to the flow line shall be Type II catch basins.

8. Vaned grates are required on all storm structures where the roadway profile grade is greater than 3%. All catch basins and manholes shall have locking lids. Rolled grates are not approved for use outside of the City right-of-way or for use with Type II manholes.

9. Polypropylene safety steps and ladder steps shall be provided in all manholes and shall be positioned correctly with the bolt areas on the rim.

10. Catch basin frames and grates shall be Olympic Foundry Model SM60, SM52, or SM44, locking type or equivalent. Model SM52 shall be referred to as a "Through Curb Inlet" on the plans, Model SM44 shall be referred to as a "Rolled Grate Inlet" on the plans.

11. Detention ponds with side slopes steeper than 3:1 or with a maximum water depth greater than 3 feet shall require a powder or vinyl coated chain link perimeter fence per standard plans 3-501-007 & 008. Side slope averaging shall not be allowed. All inlet and outfall pipes shall have a trash rack installed and a mortared riprap headwall. Refer to storm drainage note 18.

12. Prior to sidewalk construction; lot drainage systems, stub-outs and any behind sidewalk drains must be installed as required. Pipe shall be PVC 3034, or SDR-35. Stub-outs shall be marked with a 2" x 4" with 3 feet visible above grade and marked "storm". Locations of these installations shall be shown on the as-built construction plans submitted to the City.

13. Storm water retention/detention facilities, storm drainage pipe and catch basins shall be flushed and cleaned by the developer prior to; City of Marysville final acceptance of the project and; upon commencement and completion of the 2 year warranty period for the storm drainage system.

14. Unless otherwise noted, all storm sewer pipe shall be; (CP) non-reinforced concrete, ASTM C-14; (RCP) reinforced concrete for concrete pipe diameters 24" or greater, ASTM C-76; or (CMP) corrugated metal. CMP to be; galvanized steel with Treatment I asphalt coating or better; or corrugated aluminum; or AASHTO M274-70 aluminized steel. All pipes shall be installed with rubber gaskets as per manufacturers recommendations.

    Coverage Requirements for 12" diameter pipe:

    Backfill over pipe less than 12" requires RCP Class IV.

    Backfill over pipe less than 24" requires RCP minimum.

    Backfill over pipe greater than 24" requires 16 gage CMP minimum.

15. Corrugated Polyethylene Pipe (CPP):

A. All pipe shall be smooth interior. CPP shall be double-walled. All pipe shall meet AASHTO and ASTM specifications.

B. Upon request by the City inspector, all pipe runs shall pass the low pressure air test requirements of Section 7-04.3(1) E & F of the WSDOT Standard Specifications for Road, Bridge, and Municipal Construction. Pipe runs shall be tested with pipe loaded and compacted to finish grade.

C. Upon request by the City inspector, pipe shall be subject to mandrel testing (mandrel size = 90% of nominal pipe diameter).

D. Pipe shall be stored on site in shipping bunks on a flat level surface. This requirement will be strictly enforced; failure to comply may result in rejection of the pipe and/or future restriction on use of material.

E. Minimum depth of cover shall be 2 feet.

F. Couplings shall be integral bell and spigot or double bell separate couplings. Split couplings will not be allowed.

G. Backfill shall comply with Section 7-08.3(3) of the WSDOT Standard Specifications for Road, Bridge, and Municipal Construction modified as follows:

The second paragraph of Section 7-08.3(3) is deleted and replaced with the following:

The material used for backfilling around and to a point 1 foot above the top of the pipe shall be clean earth or sand, free from clay. Any gravel or stones included in the backfill shall pass through a 1 inch sieve.

16. All non-perforated metal pipe shall have neoprene gaskets at the joints. O-ring gaskets may be used for type-F coupling band.

17. Culvert ends shall be beveled to match side slopes. Field cutting of culvert ends is permitted when approved by the City engineer or designated representative.

18. All field cut culvert pipe shall be treated as required in the Standard Specifications or General Special Provisions.

SITE GRADING AND SWPPP NOTES

1. Noncompliance with the erosion control requirements, water quality requirements and clearing limits violations may result in revocation of project permits and plan approval and bond foreclosures.

2. Prior to any site construction, including clearing, logging or grading, the site clearing limits shall be located and field identified by the project surveyor (or project engineer) as required by these plans. The project surveyor's name and phone number is _____.

3. Developer (or project engineer) is responsible for water quality as determined by the monitoring program established by the project engineer. The project engineer's name and phone number is _____.

4. The Construction Stormwater Pollution Prevention Best Management Practices (BMP's) shall be constructed in accordance with the approved SWPPP prior to any grading or extensive land clearing. An inspection by the City of these facilities shall be arranged for by the contractor prior to any grading. These BMP's must be satisfactorily maintained until construction and landscaping is completed and the potential for on-site erosion has passed.

5. All site work must be performed in accordance with the current City adopted International Building Code.

6. All earth work shall be performed in accordance with City Standards. Preconstruction soils investigation may be required to evaluate soils stability.

7. If cut and fill slopes exceed a maximum of two feet horizontal to one foot vertical, a rock or concrete retaining wall may be required. All rock retaining walls greater than four (4) feet in height are to be designed and certified by a professional engineer experienced in soil mechanics.

8. Stockpiles are to be located in safe areas and adequately protected by temporary seeding and mulching. Hydroseeding is preferred.

9. All structural fills shall be compacted to a minimum of 95% maximum density in the upper 4 feet & 90% maximum density below 4 feet as determined by modified proctor.

10. Prior to any site work pertaining to drainage, the contractor shall contact the Construction Inspection Division of Community Development at 360-363-8100 to schedule a preconstruction conference.

11. Construction Stormwater Pollution Prevention Best Management Practices shall be installed prior to any site work. (See attached detailed drainage plan).

12. The surface of all slopes shall be compacted. This may be accomplished by over-building the slopes, then cutting back to final grades; or by compacting each lift as the slope is being constructed. All slopes shall be compacted by the end of each working day.

13. Upon completion of work, final reports must be submitted to the City in conformance with the current City adopted International Building Code.

TEMPORARY GRAVEL CONSTRUCTION ENTRANCE

1. The temporary construction entrance should be cleared of all vegetation, roots, and other objectionable material. Any drainage facilities required because of washing should be constructed according to specifications in the plan. If wash racks are used, they should be installed according to manufactures specifications.

2. Gravel shall be crushed ballast rock, 8" to 12" in depth and installed to the specified dimensions at the entrance.

3. The gravel ballast rock shall be 4" to 8" in diameter and placed across the full width of the vehicular ingress and egress area. The length of entrance shall be a minimum of 100 feet.

4. If conditions on the site are such that most of the mud is not removed from vehicle tires by contact with the gravel, then the tires must be washed before vehicles enter onto a public road. Wash water must be carried away from entrance to a settling area to remove sediment. A wash rack may also be used to make washing more convenient and effective.

5. The entrance shall be maintained in a condition which will prevent tracking or flow of mud onto public rights-of-way. This may require periodic top dressing with 2" stone, as conditions demand, and repair and/or clean out any structures used to trap sediment. All materials spilled, dropped, washed or tracked from vehicles onto roadway or into storm drains must be removed immediately.

HYDROSEEDING GENERAL NOTES

1. Construction Acceptance: Will be subject to a well established ground cover that fulfills the requirements of the approved construction plans and City of Marysville Standards.

2. All disturbed areas such as retention facilities, roadway backslopes, etc., shall be seeded with a perennial ground cover grass to minimize erosion. Grass seeding will be done using an approved hydroseeder or as otherwise approved by the City of Marysville.

3. Preparation of Surface: All areas to be seeded shall be cultivated to the satisfaction of the City Inspector. This may be accomplished by disking, raking, harrowing, or other acceptable means.

4. Immediately following finish grading permanent vegetation shall be applied consistent with the design and maintenance standards for Temporary and Permanent Seeding in the City adopted Department of Ecology Stormwater Management Manual for Western Washington.

5. All hydroseeding firms shall have a printout of the application rate for each job readily available for inspection by the Construction Inspection Division of Community Development.

6. The City of Marysville Construction Inspection Division of Community Development shall be notified of potential hydroseeding prior to the commencement of same to ensure compliance of these specifications.

MAINTENANCE OF SILTATION BARRIERS

1. Siltation barriers shall be inspected immediately after each rainfall and at least daily during prolonged rainfall. Close attention shall be paid to the repair of damaged bales, end runs and undercutting beneath bales. Necessary repairs to barriers or replacement of bales shall be accomplished promptly. Sediment deposits should be removed after each rainfall. Sediment deposits must be removed when sediment level reaches approximately one-half the siltation barrier height. Any sediment deposits remaining in place after the straw bale barrier is no longer required shall be dressed to conform to the existing grade, prepared and seeded.

STAND PIPE AND SEDIMENT POND MAINTENANCE

1. The embankment of the basin should be checked regularly to insure that it is structurally sound and has not been damaged by erosion or construction equipment. The emergency spillway should be checked regularly to insure that the lining is well established and erosion resistant. The siltation basin should be checked for sediment cleanout after each rainfall which produces runoff. When the sediment reaches the cleanout level, it shall be removed and properly disposed.

BIOFILTER SWALE PLANTING NOTES

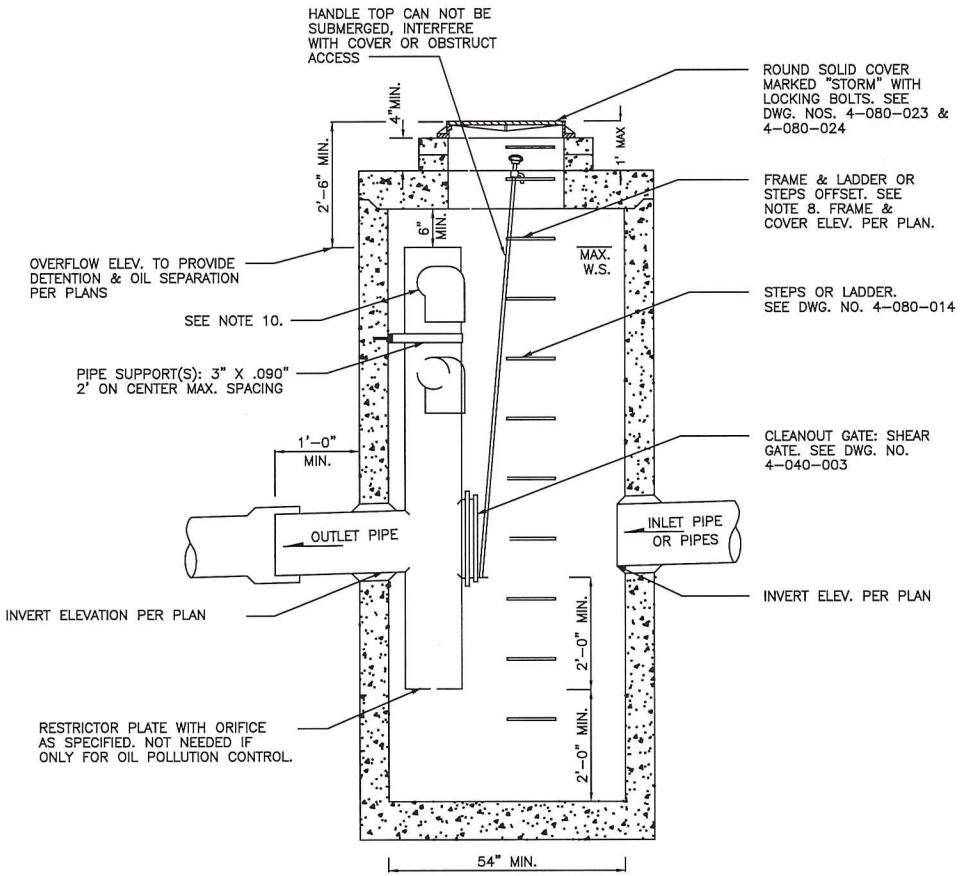
1. Final engineering approval is contingent on swale inspection by the City of Marysville Construction Inspection Division of Community Development.

2. Inspection must be requested by calling the City of Marysville Construction Inspection Division of Community Development at 360-363-8100 at least 24 hours prior to inspection date.

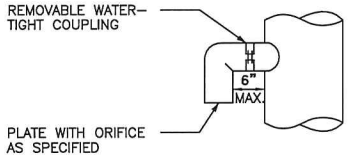
3. Erosion control seed mix or shingle-weave sod, as determined by the City Engineer or designated representative, shall be placed above the design water surface for the 6-month, 24-hour storm event. A minimum topsoil depth of 4" shall be placed within the swale. The topsoil surface shall be at design grade for the swale. An erosion control blanket shall cover the topsoil to prevent erosion of topsoil and seed mix until a well defined ground cover is established. The wetted surface area as defined by the 6-month, 24-hour storm event shall be planted with wet tolerant plant species.

4. Recommended Seed Mix for Bioswales:

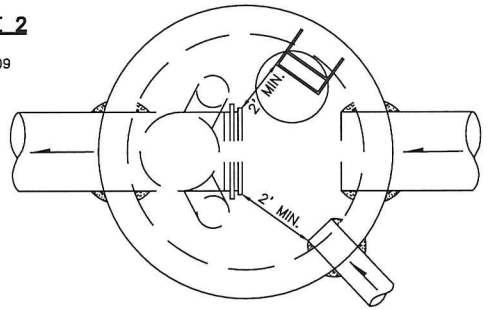
	% Weight	% Purity	% Germination
Tall or meadow fescue *Festuca arundinacea* or *Festuca elatior*	75-80	98	90
Seaside/Creeping bentgrass *Agrostis palustris*	10-15	92	85
Redtop bentgrass *Agrostis alba* or *Agrostis gigantea*	5-10	90	80



CATCH BASIN TYPE 2
DIAM. AS REQUIRED
SEE DWG. NO. 4-080-009



ELBOW DETAIL



PLAN

NOTES:

1. PIPE SIZES AND SLOPES: PER PLANS.
2. OUTLET CAPACITY: NOT LESS THAN COMBINED INLETS.
3. EXCEPT AS SHOWN OR NOTED, UNITS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS FOR CATCH BASIN TYPE 2, 54" MIN. DIAM.
4. PIPE SUPPORTS AND RESTRICTOR/SEPARATOR SHALL BE OF SAME MATERIAL, AND BE ANCHORED AT 3' MAX. SPACING BY 5/8" DIAM. STAINLESS STEEL EXPANSION BOLTS OR EMBEDDED 2" IN WALL.
5. THE RESTRICTOR/SEPARATOR SHALL BE FABRICTED FROM .060" ALUMINUM, OR .064" ALUMINIZED STEEL, OR .064" GALVANIZED STEEL PIPE; IN ACCORDANCE WITH AASHTO M 36, M 196, M 197 AND M 274. GALVANIZED STEEL SHALL HAVE TREATMENT 1.
6. OUTLET SHALL BE CONNECTED TO CULVERT OR STORM DRAIN WITH A STANDARD COUPLING BAND FOR CORRUGATED METAL PIPE, OR GROUTED INTO THE BELL OF CONCRETE PIPE.
7. THE VERTICAL RISER STEM OF THE RESTICTOR/SEPARATOR SHALL BE THE SAME DIAM. AS THE HORIZONTAL OUTLET PIPE, WITH AN 8" MIN. DIAM.
8. FRAME AND LADDER OR STEPS OFFSET SO THAT:
   A. CLEANOUT GATE IS VISIBLE FROM TOP.
   B. CLIMB DOWN SPACE IS CLEAR OF RISER AND CLEANOUT GATE.
   C. FRAME IS CLEAR OF CURB.
9. IF METAL OUTLET PIPE CONNECTS TO CEMENT CONCRETE PIPE: OUTLET PIPE TO HAVE SMOOTH O.D. EQUAL TO CONCRETE PIPE I.D. LESS 1/4".
10. MULTI-ORIFICE ELBOWS MAY BE LOCATED AS SHOWN OR ALL ON ONE SIDE OF RISER TO ASSURE LADDER CLEARANCE.

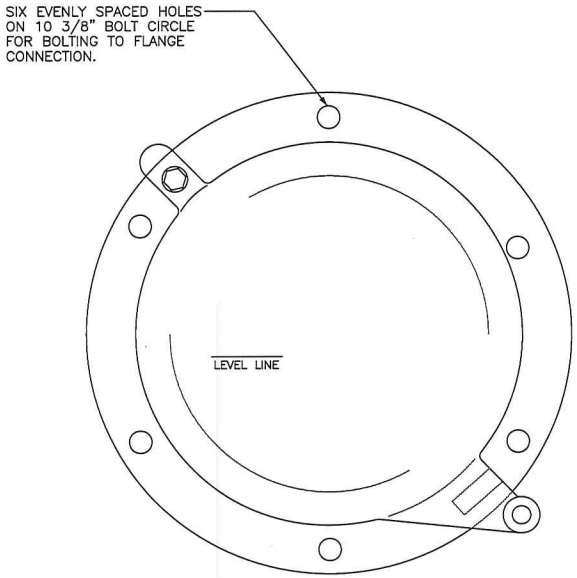
APPROVED BY _____ 5/15/15
MARYSVILLE CITY ENGINEER DATE

CITY OF Marysville WASHINGTON

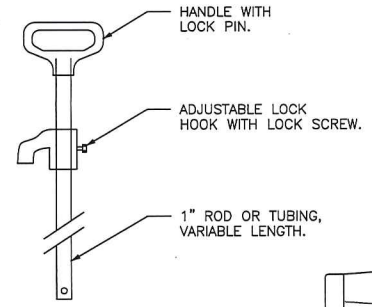
FLOW RESTRICTOR/OIL POLLUTION DEBRIS CONTROL DEVICE, TEE TYPE (FROP-T) INSTALLATION

STANDARD PLAN 4-040-002

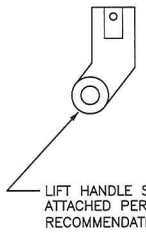
LAST REVISED 05/15/09

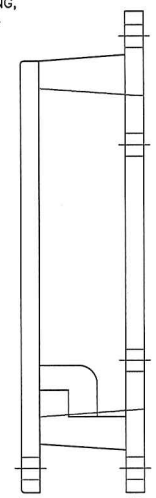


FRONT

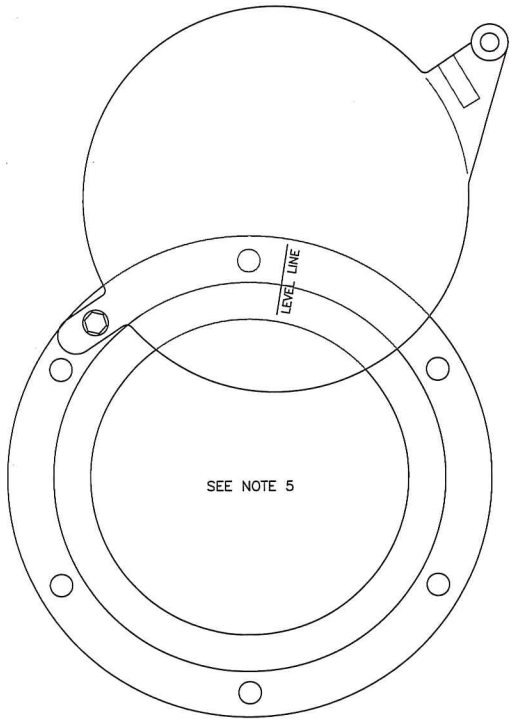


LIFT HANDLE





SIDE



MAXIMUM OPENING OF GATE

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" 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" 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" BOLT CIRCLE FOR BOLTING TO THE FLANGE CONNECTION.

APPROVED BY _____ 5/9/07

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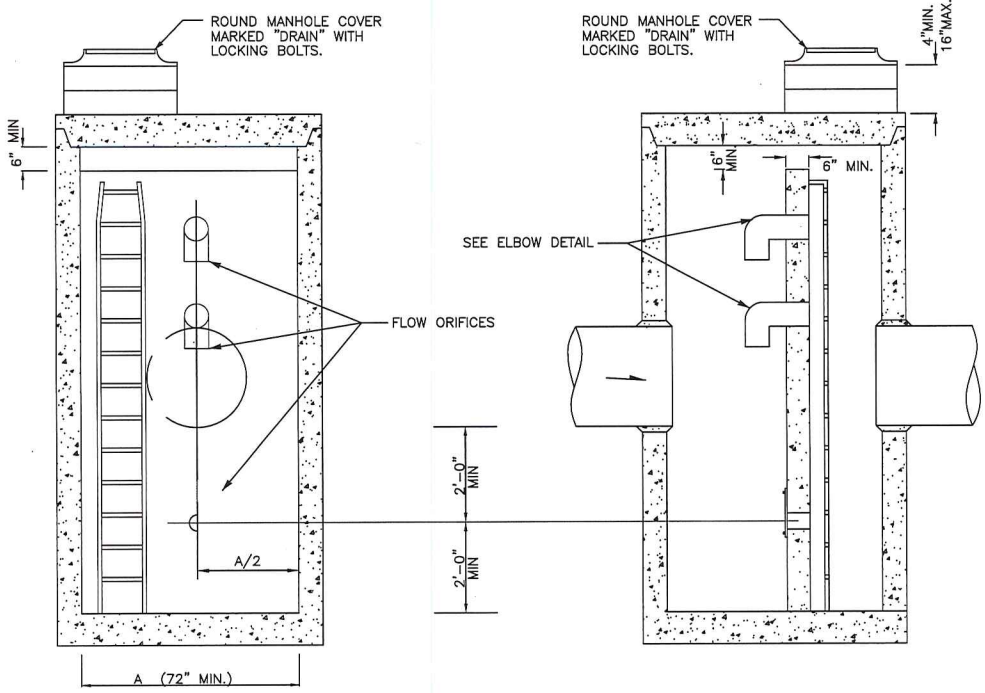
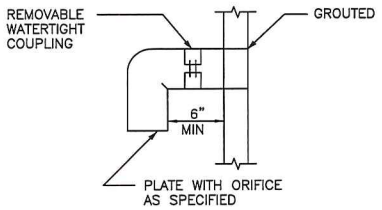
CITY OF Marysville WASHINGTON

FROP-T SHEAR GATE DETAIL

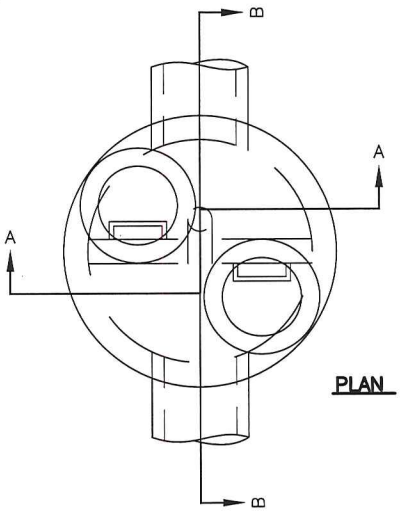
STANDARD PLAN 4-040-003

LAST REVISED 07/14/06





ELBOW DETAIL



PLAN

NOTES:

1. PIPE SIZE, SLOPES AND ALL ELEVATIONS: PER PLANS.
2. OUTLET CAPACITY: NOT LESS THAN COMBINED INLETS.
3. CATCH BASIN: TYPE 2, TO BE CONSTRUCTED IN ACCORDANCE WITH DWG. NO. 4–080–009 AND AASHTO M199 UNLESS OTHERWISE SPECIFIED
4. COVERS: ROUND, SOLID MARKED "DRAIN," WITH LOCKING BOLTS
5. ORIFICES: SIZED AND LOCATED AS REQUIRED, WITH LOWEST ORIFICE MINIMUM 2' FROM BASE
6. BAFFLE WALL SHALL HAVE #4 BAR AT 12" SPACING EACH WAY.
7. PRECAST BAFFLE WALL SHALL BE KEYED AND GROUTED IN PLACE.
8. BOTTOM ORIFICE PLATE TO BE 1/4" MIN. GALVANIZED STEEL AND ATTACHED WITH 1/2" STAINLESS STEEL BOLTS. OMIT ORIFICE PLATE IF ONLY FOR OIL SEPARATION.
9. UPPER FLOW ORIFICE SHALL BE ALUMINUM, ALUMINIZED STEEL OR GALVANIZED STEEL. SEE DWG. NO. 4–040–002. GALVANIZED STEEL SHALL HAVE TREATMENT 1.

APPROVED BY _____ 5/17/17

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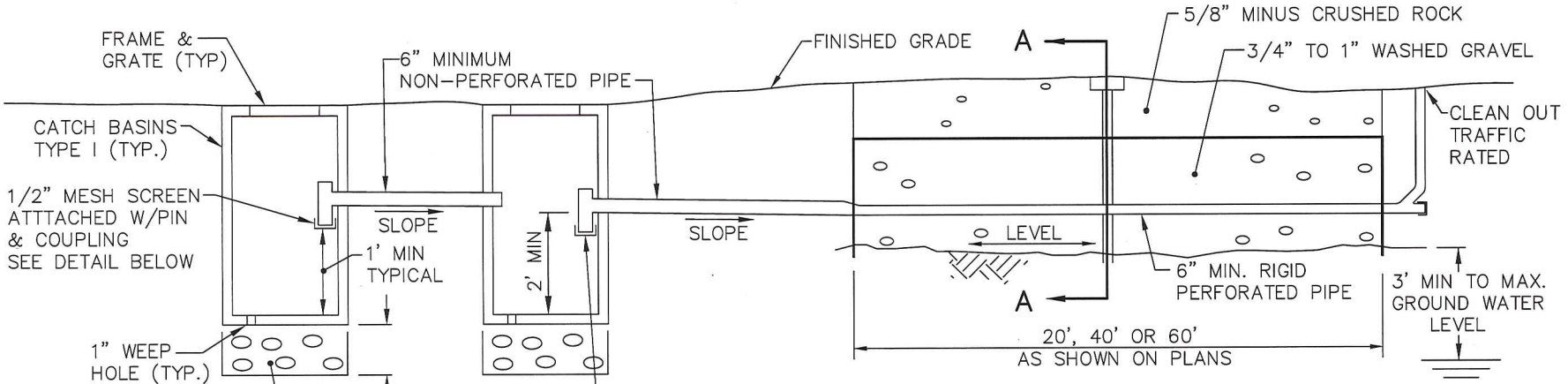
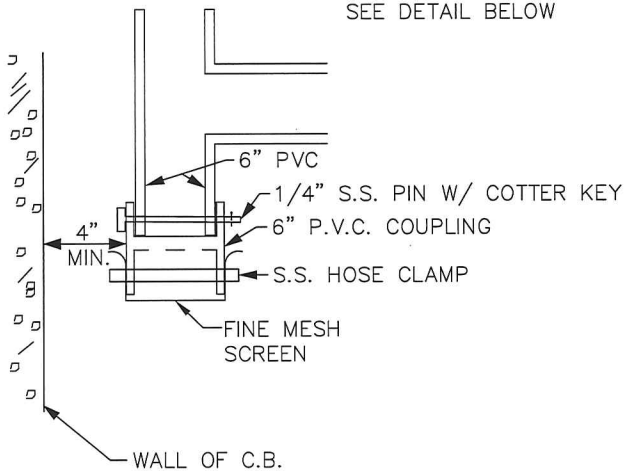
FLOW RESTRICTOR/DEBRIS POLLUTION CONTROL DEVICE BAFFLE TYPE (FROP–B)

STANDARD PLAN 4–040–004

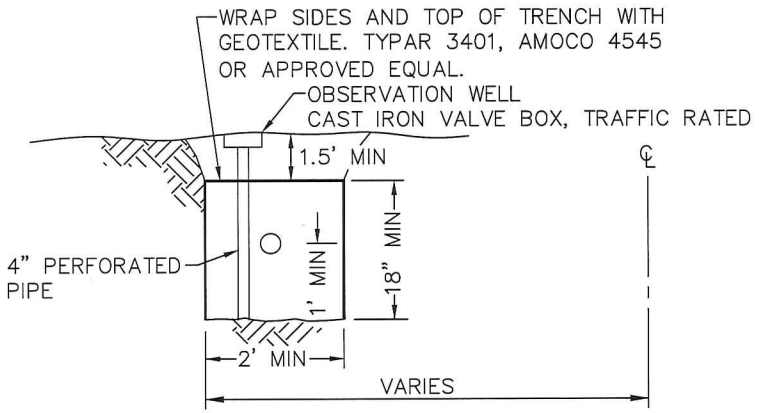
LAST REVISED 07/14/06



PROFILE
N.T.S.



SCREEN CONNECTION DETAIL
N.T.S.



SECTION A-A
N.T.S.

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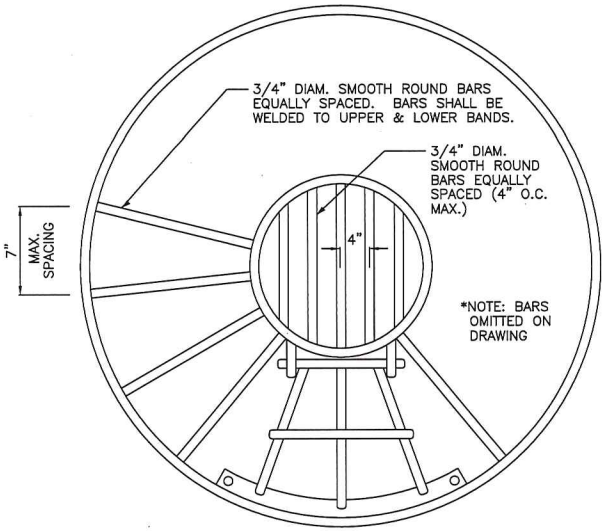
CITY OF Marysville WASHINGTON

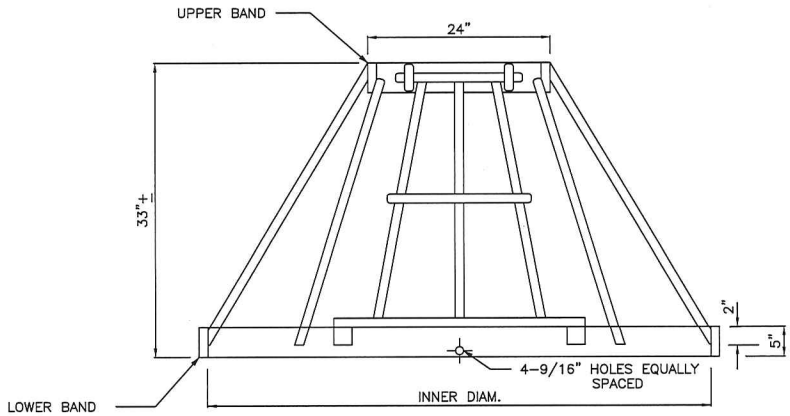
INFILTRATION SYSTEM DETAIL

STANDARD PLAN 4-040-005

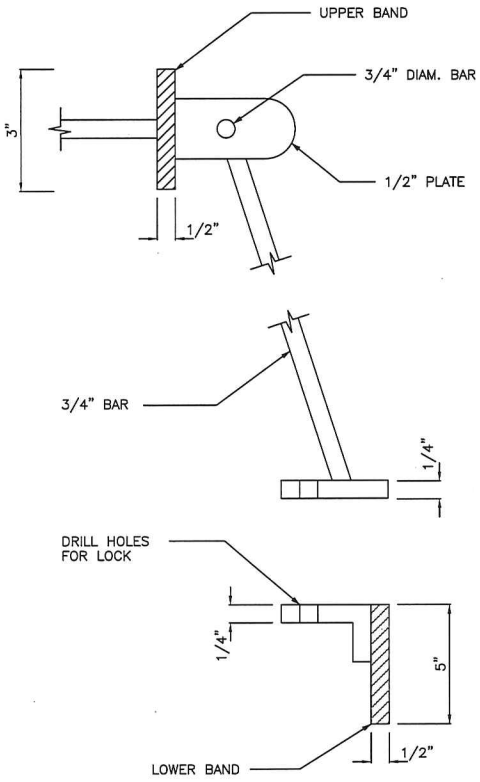
LAST REVISED 07/14/06



PLAN



ELEVATION



ENTRY GATE DETAIL

NOTES:

1. ALL STEEL IN PLATES, BARS AND BANDS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A36.
2. DEBRIS CAGE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A123 (AASHTO M111).

CB	INNER DIAM.
48"	58"
54"	65"
60"	72"
72"	86"
96"	114"

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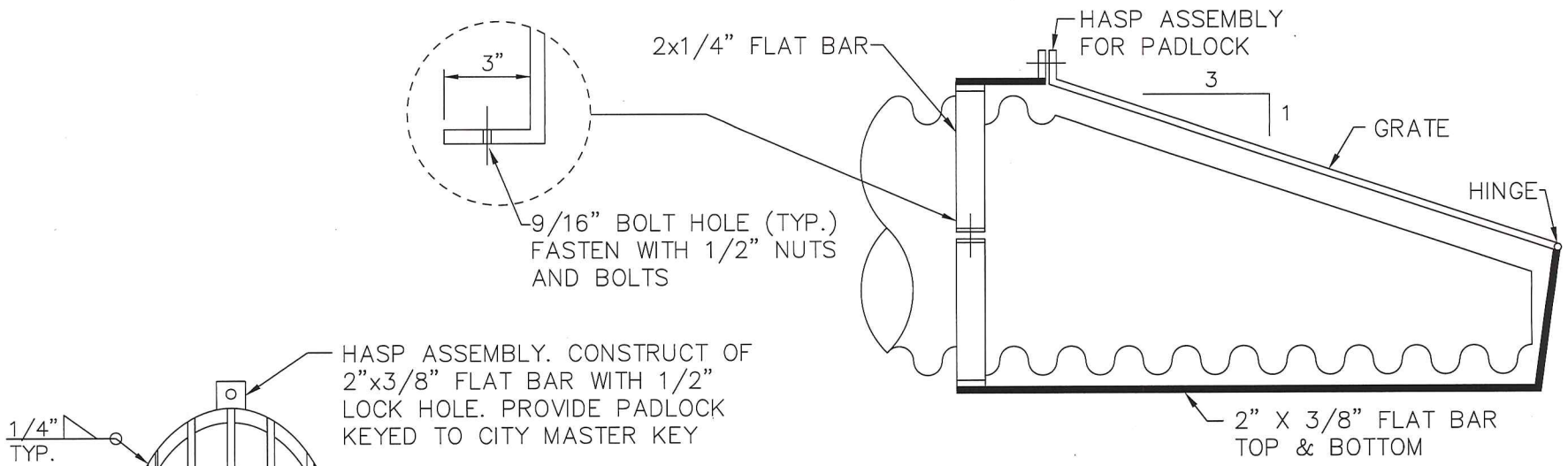
CITY OF Marysville WASHINGTON

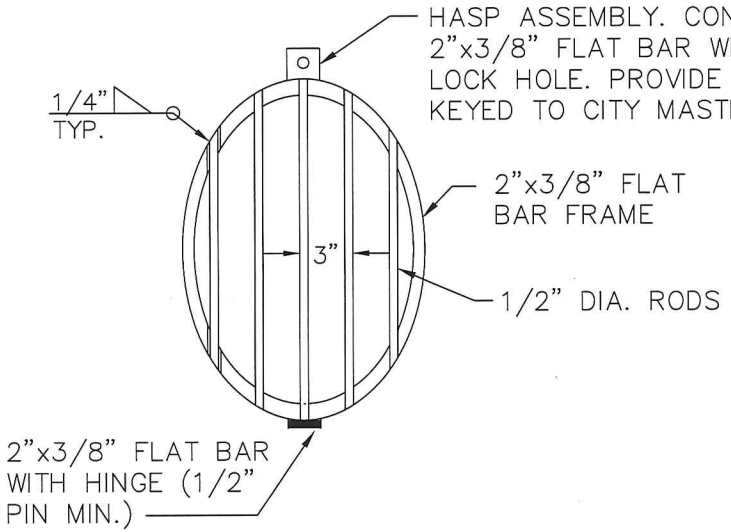
DEBRIS CAGE

STANDARD PLAN 4-040-006

LAST REVISED 07/14/06



LONGITUDINAL PROFILE



END VIEW

NOTES:

INSTALL AT INLETS AND OUTLETS OF ALL STORM PIPE 18 INCHES AND GREATER AND AT INLETS OF ALL STORM PIPE SMALLER THAN 18 INCHES.

CONTRACTOR TO PROVIDE SHOP DRAWINGS PRIOR TO FABRICATION. SHOP FABRICATE.

CONSTRUCTION SHALL BE ALL STEEL. HOT DIP GALVANIZE AFTER FABRICATION.

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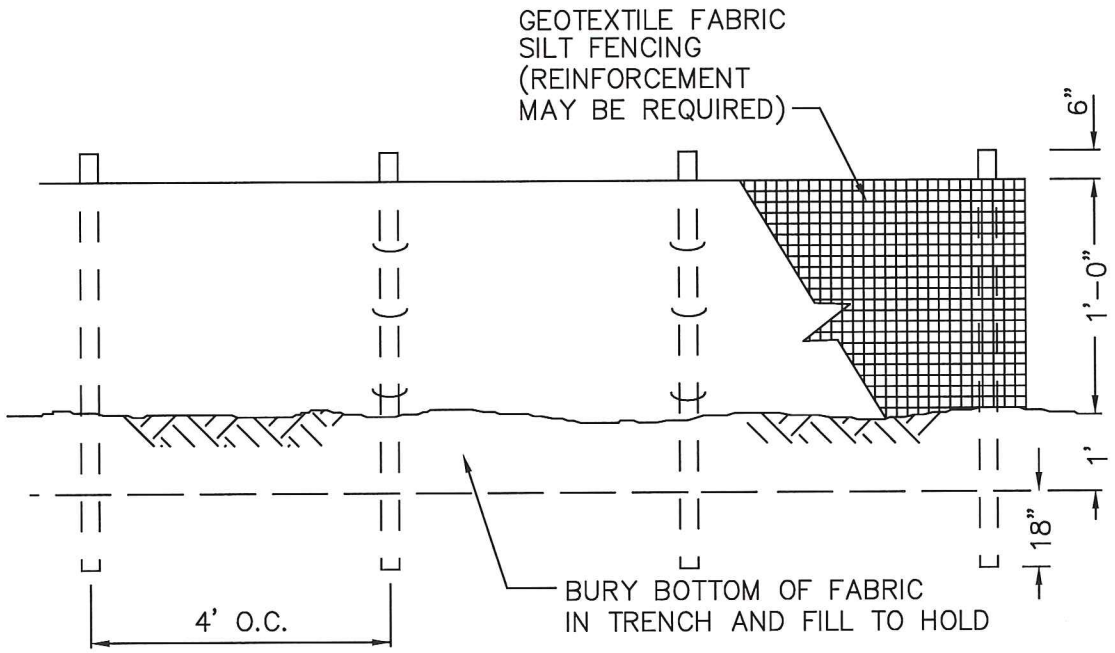
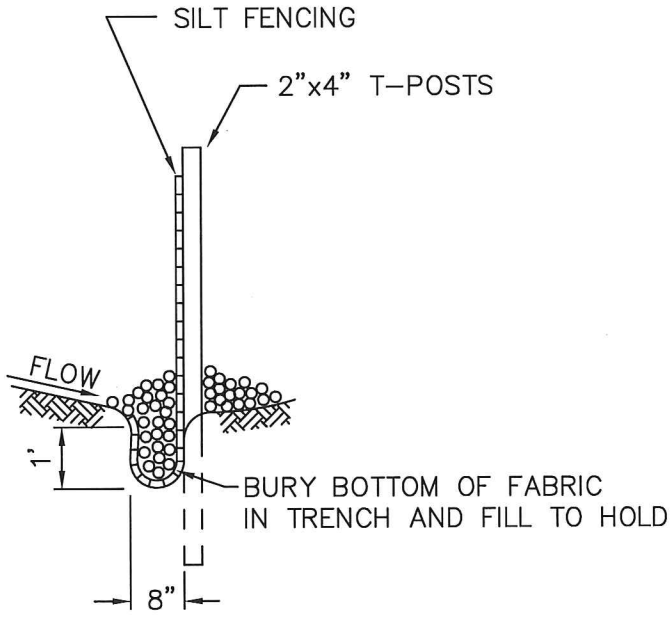
CITY OF Marysville WASHINGTON

TRASH RACK

STANDARD PLAN 4-040-007

LAST REVISED 07/14/06





NOTE:

1. SEE SECTION 4-080E FOR FABRIC SPECIFICATIONS

APPROVED BY Kevin Nielson 5/15/15

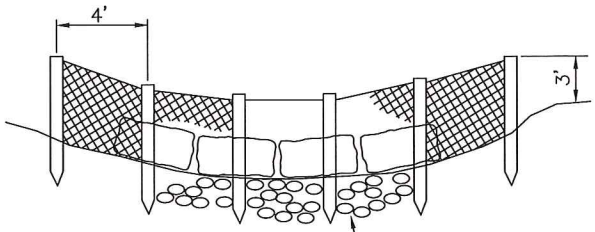
MARYSVILLE CITY ENGINEER DATE

SILT FENCE DETAIL

CITY OF Marysville WASHINGTON

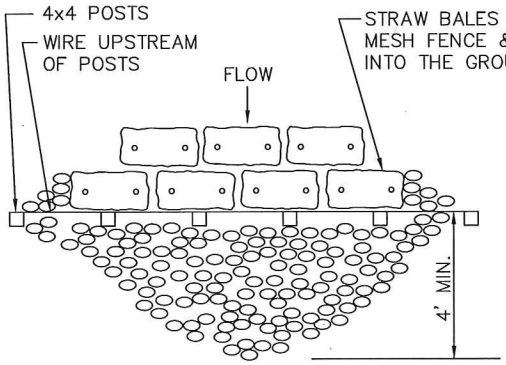
LAST REVISED 03/24/15

STANDARD PLAN 4-040-008



HAND PLACE LARGE RIVER ROCK APRON TO PREVENT FORMATION OF SCOUR HOLE

SECTION



PLAN

STRAW BALE CHECKS

N.T.S.

NOTE:

STRAW/HAY BALE CHECKS WILL BE TEMPORARILY INSTALLED ACROSS EXISTING DRAINAGEWAYS TO COLLECT AND STORE RUNOFF AND SEDIMENT PRIOR TO DISCHARGE. STRAW/HAY BALE CHECKS WILL BE INSTALLED IN DRAINAGEWAYS, BEFORE ANY UPSLOPE GRADING, OR CONSTRUCTION ACTIVITIES, COMMENCE. STRAW/HAY BALE CHECKS WILL BE CONSTRUCTED TO THE FOLLOWING GENERAL SPECIFICATIONS:

1. STRAW/HAY BALES SHALL BE LAID PERPENDICULAR TO FLOW, TIGHTLY ABUTTED, STACKED SECURELY IN PLACE WITH AT LEAST TWO STAKES PER BALE, AND KEYED INTO THE GROUND 6 TO 8 INCHES.

2. STRAW/HAY BALE CHECKS SHALL BE CONSTRUCTED TO A SUFFICIENT WIDTH TO RETARD RUNOFF AND TRAP SEDIMENT.

3. STRAW/HAY BALE CHECKS SHALL BE LOCATED AT 100 FOOT INTERVALS TO PROVIDE MAXIMUM CAPACITY FOR TRAPPING SEDIMENT, AS WELL AS GREATEST EASE OF CLEANOUT AND DISPOSAL OF TRAPPED SEDIMENTS.

4. STRAW BALE CHECKS SHALL BE MAINTAINED IN SATISFACTORY CONDITION UNTIL SUCH TIME THAT CLEARING AND/OR CONSTRUCTION IS COMPLETED AND PERMANENT DRAINAGE FACILITIES ARE OPERATIONAL.

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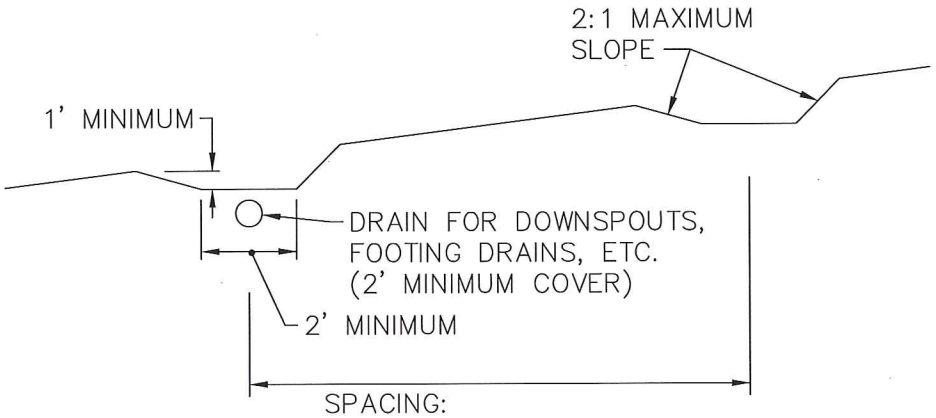
STRAW BALE CHECKS DETAIL

LAST REVISED 07/14/06

STANDARD PLAN 4-040-009



MAINTENANCE STANDARDS

1. DAMAGE RESULTING FROM RUNOFF OR CONSTRUCTION ACTIVITY SHALL BE REPAIRED IMMEDIATELY
2. IF THE FACILITIES DO NOT REGULARLY RETAIN STORM RUNOFF, THE CAPACITY AND/OR FREQUENCY OF THE DIKES/ SWALES SHALL BE INCREASED
3. MAINTENANCE TO BE PERFORMED BY PROPERTY OWNER

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5/9/07
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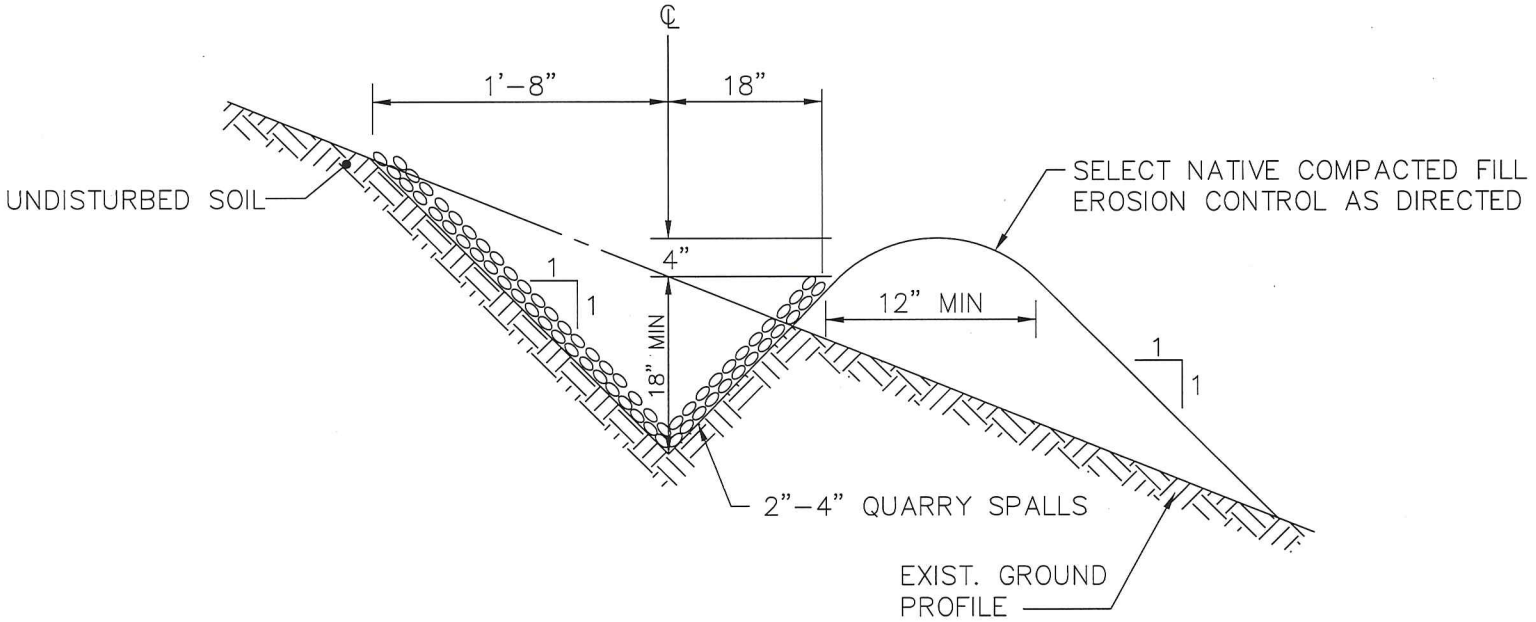
INTERCEPTOR SWALE DETAIL

LAST REVISED 07/14/06

STANDARD PLAN 4–040–010



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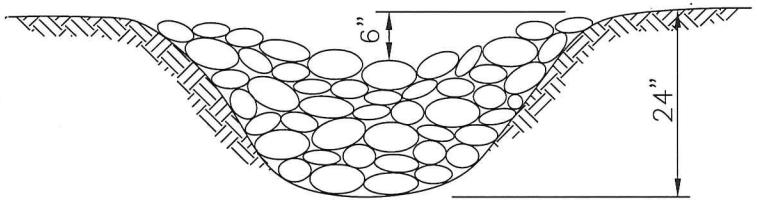
DATE

CITY OF Marysville WASHINGTON

ROCK LINED DRAINAGE SWALE

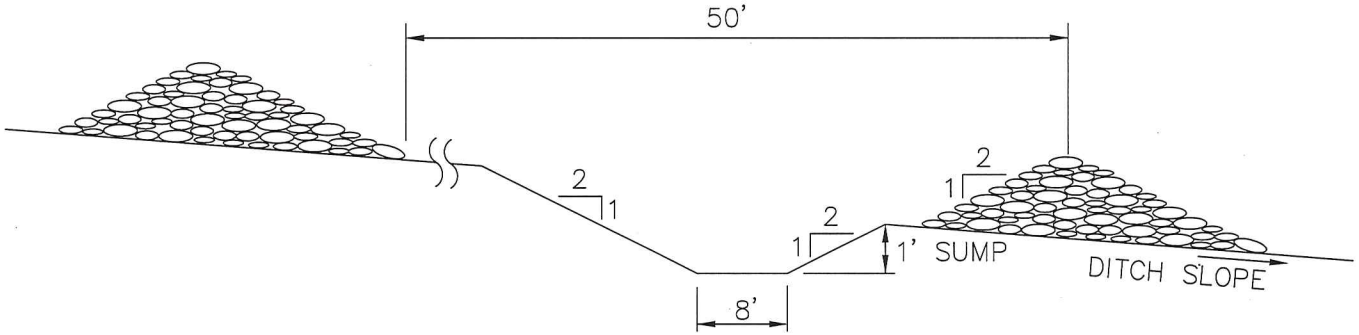
STANDARD PLAN 4–040–011

LAST REVISED 07/14/06



ROCK CHECK DAM

NTS



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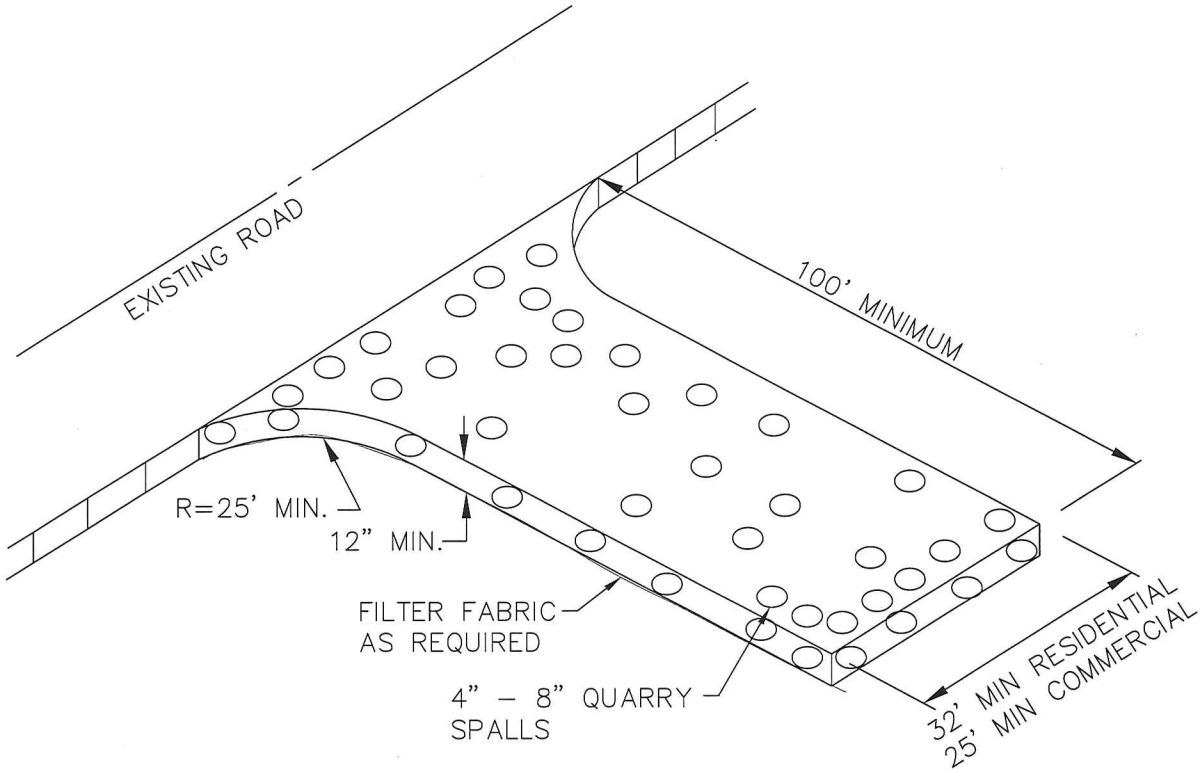
CITY OF Marysville WASHINGTON

SPACING BETWEEN ROCK CHECK DAMS

STANDARD PLAN 4-040-013

LAST REVISED 07/14/06



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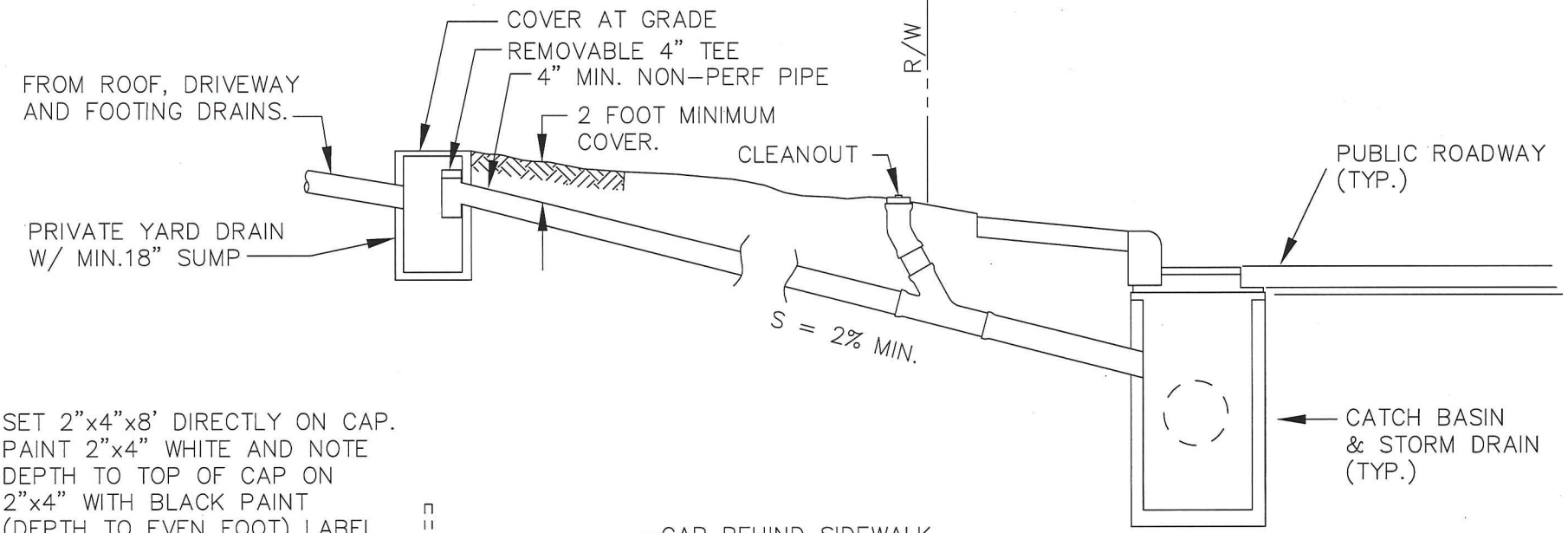
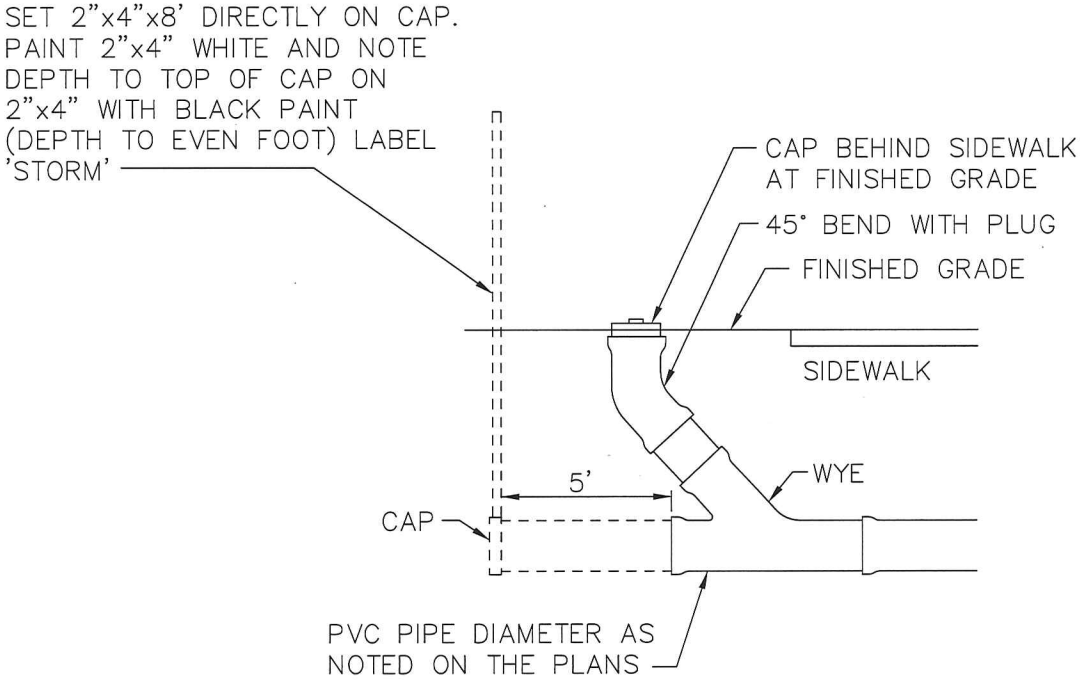
STABILIZED CONSTRUCTION ENTRANCE

CITY OF Marysville WASHINGTON

STANDARD PLAN 4–040–014

LAST REVISED 07/14/06





ROOF DRAIN CLEANOUT DETAIL

NOTE:

IF CLEANOUT FALLS IN DRIVEWAY USE STANDARD PLAN 5-145-001 FOR UPPER RING AND COVER

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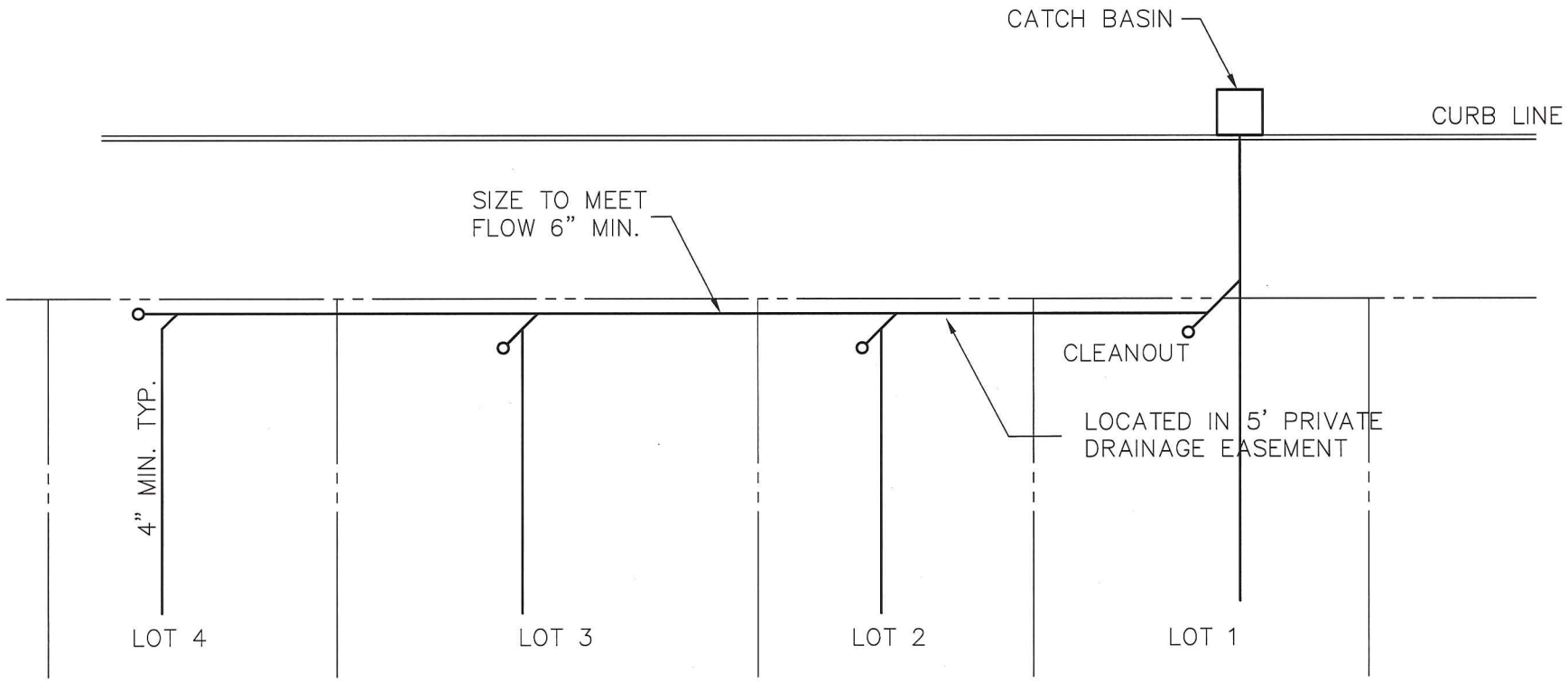
5/9/07
DATE

CITY OF Marysville WASHINGTON

INDIVIDUAL LOT & ROOF PLAN DETAILS

STANDARD PLAN 4-040-015

LAST REVISED 11/01/06



NOTE: YARD DRAINS TO BE LOCATED ON THE LOWER ELEVATION OF THE LOT.

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5/9/07
DATE

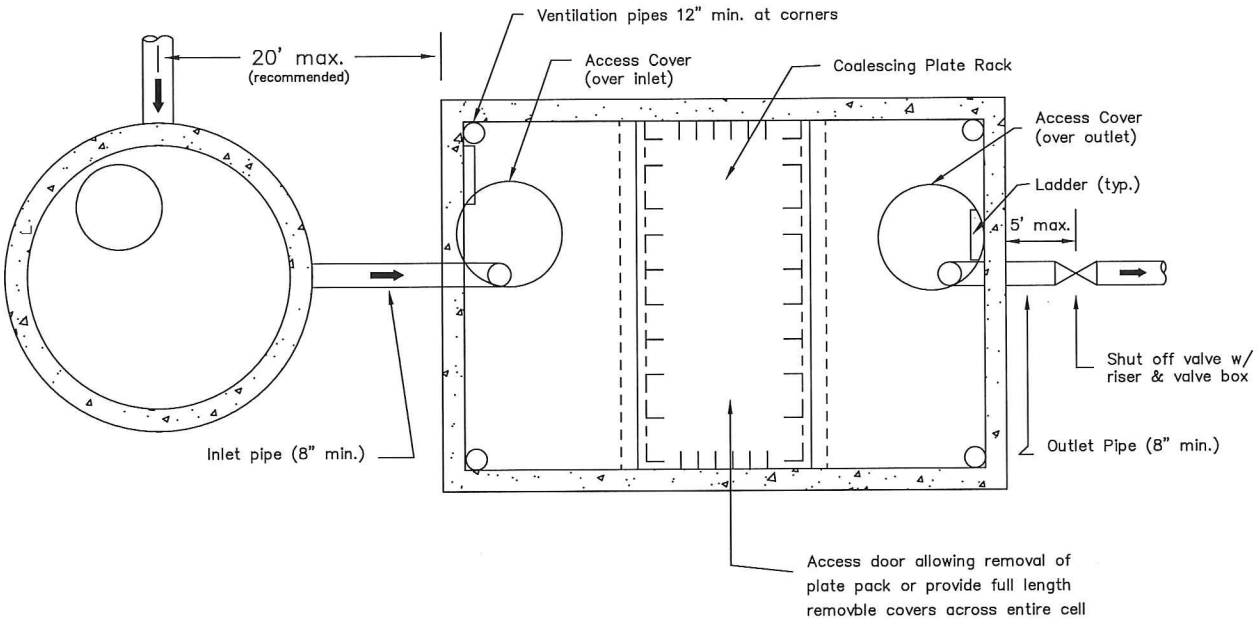
LOT AND ROOF PLAN
MULTI–LOTS

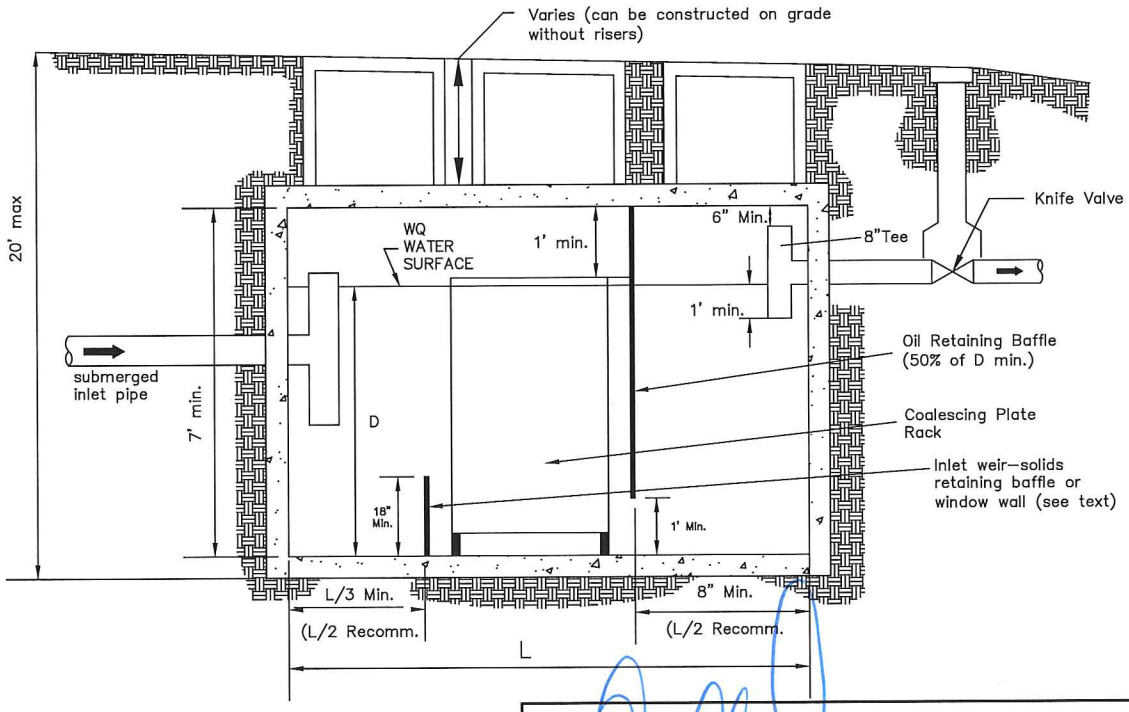
CITY OF Marysville WASHINGTON

STANDARD PLAN 4–040–016

LAST REVISED 11/01/06

PLAN VIEW





APPROVED BY

MARYSVILLE CITY ENGINEER

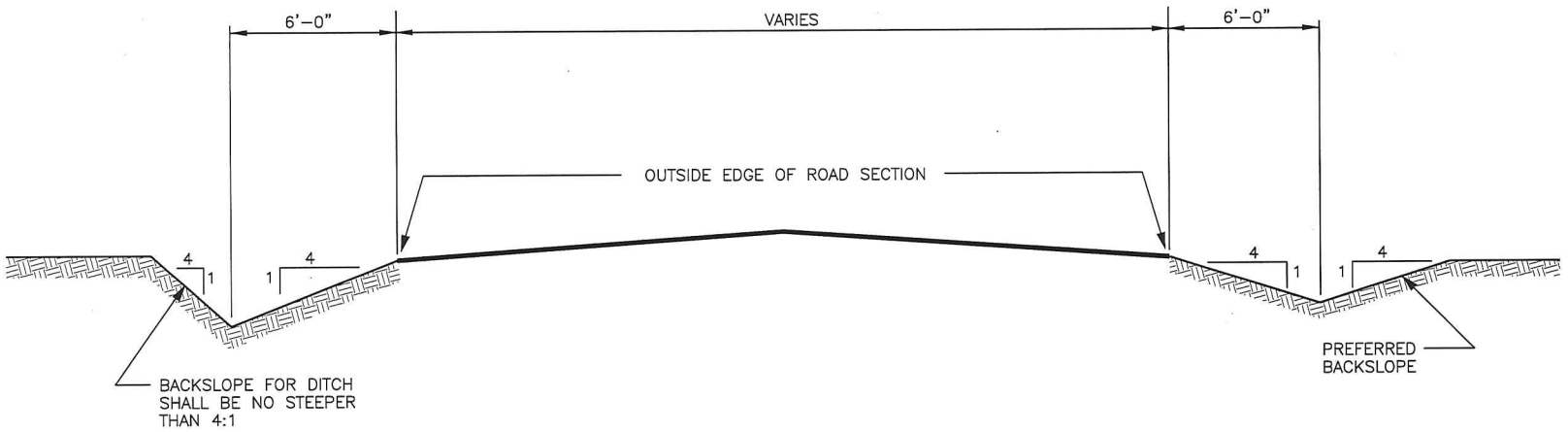
5/15/15
DATE

STANDARD COALESCING PLATE SEPARATOR

CITY OF Marysville WASHINGTON

LAST REVISED 05/13/09

STANDARD PLAN 4-040-017



NOTES:

1. ACTUAL ROAD SURFACING DESIGN SHALL BE BASED ON SOILS AND TRAFFIC ANALYSIS PER SECTION 3-3.
2. DITCH SECTION AND/OR LOCATIONS MAY VARY TO MEET REQUIREMENTS OF THE STORMWATER MANAGEMENT MANUAL FOR THE PUGET SOUND BASIN.
3. REFER TO SECTION 3-4 FOR MAIL BOX LOCATIONS.
4. FINISHED ROAD GRADE:
   MINIMUM 0.50%
   MAXIMUM 7.0%
   GREATER THAN 7% SEE STD. PLAN 4-080-002
5. SEE SECTION 3-1 FOR MINIMUM ROAD WIDTH REQUIREMENTS.

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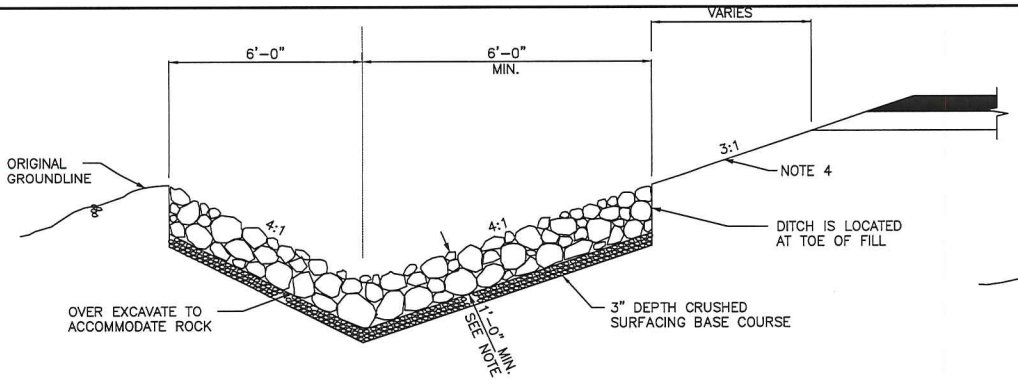
CITY OF Marysville WASHINGTON

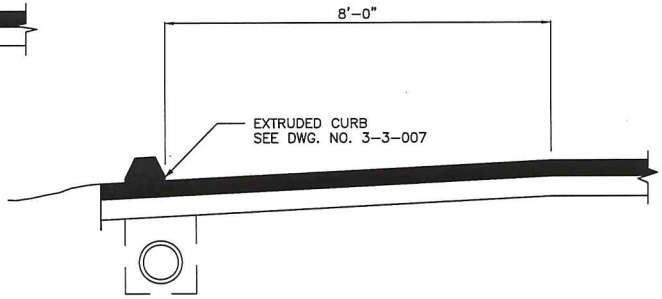
DITCH SECTIONS

STANDARD PLAN 4-080-001

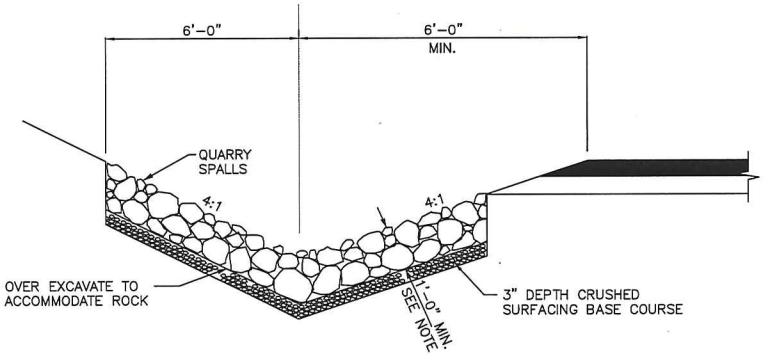
LAST REVISED 01/02/07



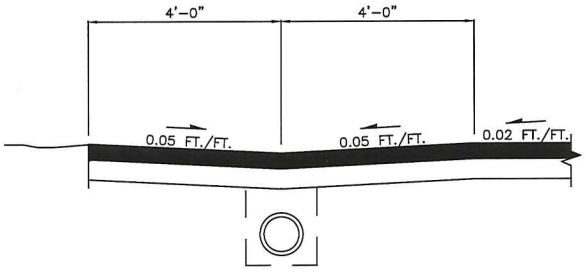
ROCK–LINED SHOULDER DITCH
IN FILL SECTION



CURBED SHOULDER



ROCK–LINED SHOULDER DITCH
IN CUT SECTION



TURNPIKE SHOULDER

NOTES FOR ROCK LINED DITCHES

1. DEEPER ROCK FILL MAY BE SPECIFIED.
2. USE FOR FINISH ROAD GRADES – 0.5% TO 9%
3. FOR SLOPES GREATER THAN 7% PROTECT SLOPE WITH ROCK
   FOR SLOPES LESS THAN 7% PLACE CRUSHED ROCK OR HYDROSEED.

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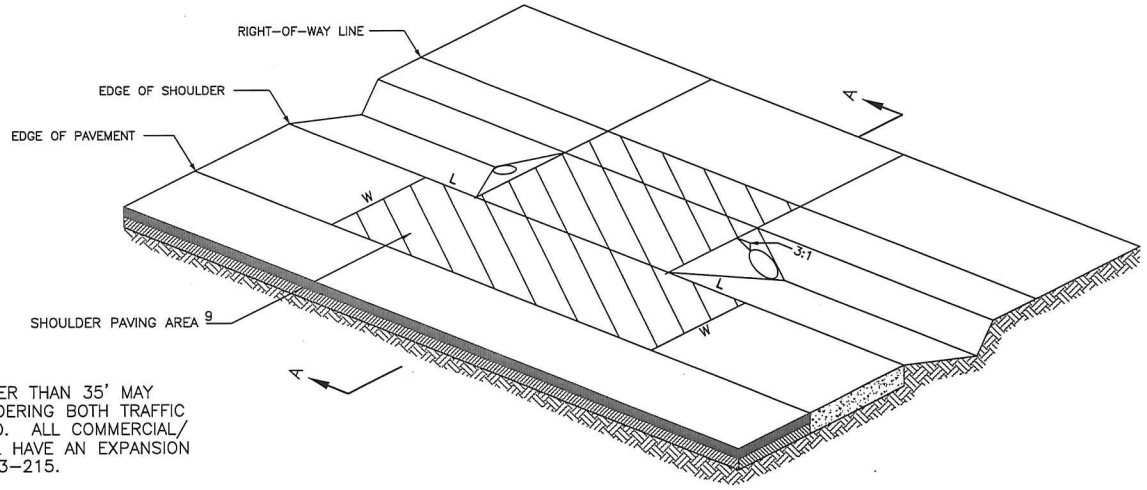
MARYSVILLE CITY ENGINEER DATE

CITY OF Marysville WASHINGTON

ROCK LINED SHOULDER DITCHES & CURBED OR TURNPIKE SHOULDERS

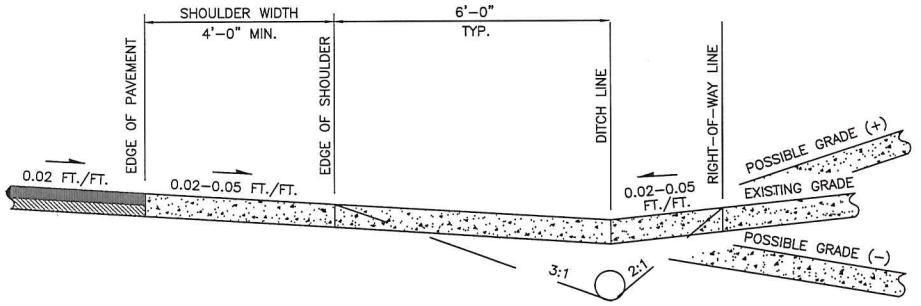
STANDARD PLAN 4–080–002

LAST REVISED 01/02/07



NOTES:

1. COMMERCIAL/INDUSTRIAL DRIVEWAYS WIDER THAN 35' MAY BE APPROVED BY THE ENGINEER CONSIDERING BOTH TRAFFIC SAFETY AND THE ACTIVITY BEING SERVED. ALL COMMERCIAL/ INDUSTRIAL CONCRETE DRIVEWAYS SHALL HAVE AN EXPANSION JOINT LOCATED MID-WIDTH. SEE SEC. 3-215.
2. PIPE SHALL BE:
   A. SIZED TO CONVEY COMPUTED STORM WATER RUNOFF, AND
   B. MIN. 12" DIAM., AND
   C. EQUAL TO OR LARGER THAN EXISTING PIPES WITHIN 500' UPSTREAM.
3. EXPOSED PIPE ENDS SHALL BE BEVELED TO MATCH THE SLOPE FACE AND PROJECT NO MORE THAN 2" BEYOND SLOPE SURFACE. PROJECTING HEADWALLS ARE NOT ACCEPTABLE.
4. CONCRETE PIPE SHALL HAVE MIN. COVER OF 6" TO FINISH GRADE. ALL OTHER TYPES OF PIPE SHALL HAVE MIN. 24" COVER.
5. PIPE SHALL BE INSTALLED IN A STRAIGHT UNIFORM ALIGNMENT AT A MIN. 0.5% SLOPE (0.5 FT. PER 100 FT.) WITH THE DOWNSTREAM END LOWER THAN THE UPSTREAM END.
6. PIPE MAY BE OMITTED IF ROADSIDE DITCH DOES NOT EXIST AND DRIVEWAY DOES NOT BLOCK NATURAL FLOW.
7. DRIVEWAY SLOPE SHALL MATCH TO BACK EDGE OF SHOULDER, BUT SHOULDER SLOPE AND EDGE OF SHOULDER SHALL NOT BE ALTERED AS A RESULT OF DRIVEWAY CONSTRUCTION.
8. PAVED DRIVEWAYS SHALL BE PAVED THROUGH RIGHT-OF-WAY WITH A.C. OR B.S.T., BUT NOT P.C.C.
9. GRAVEL DRIVEWAYS SHALL BE PAVED BETWEEN THE EDGE OF PAVEMENT AND R/W WITH A.C. OR B.S.T. ONLY WITH DIMENSIONS L=W.
10. TOTAL DRIVEWAY WIDTHS SHALL BE LIMITED TO 30% OF FRONTAGE UNLESS VARIANCE IS GRANTED.



SECTION A-A

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MARYSVILLE CITY ENGINEER

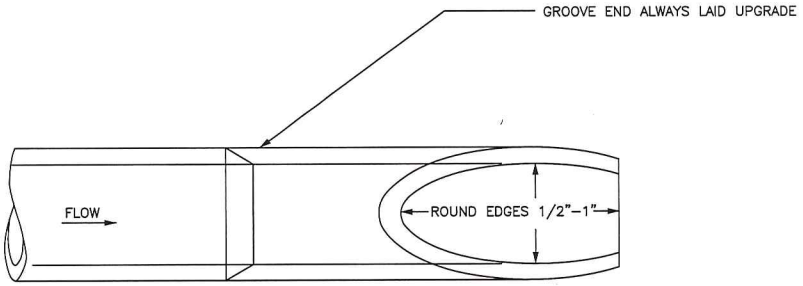
5/9/07
DATE

CITY OF Marysville WASHINGTON

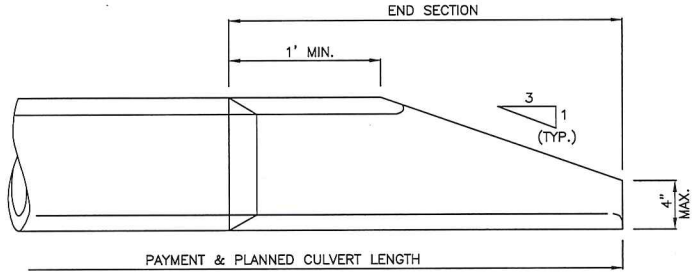
SHOULDER & DITCH SECTION DRIVEWAY

STANDARD PLAN 4-080-003

LAST REVISED 01/02/07

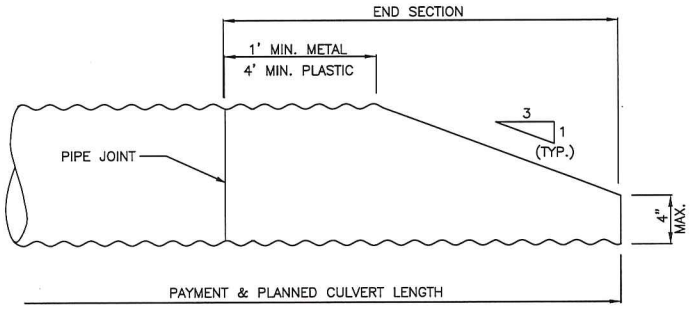


PLAN



ELEVATION

CONCRETE PIPE



METAL & PLASTIC PIPE

NOTE:

SIDE SLOPE SHALL BE WARPED TO MATCH THE BEVELED PIPE END. WHEN CULVERT IS ON SKEW, BEVELED END SHALL BE ROTATED TO CONFORM TO SLOPE. IF SLOPE DIFFERS FROM 3:1, PIPE SHALL BE BEVELED TO MATCH SLOPE.

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MARYSVILLE CITY ENGINEER

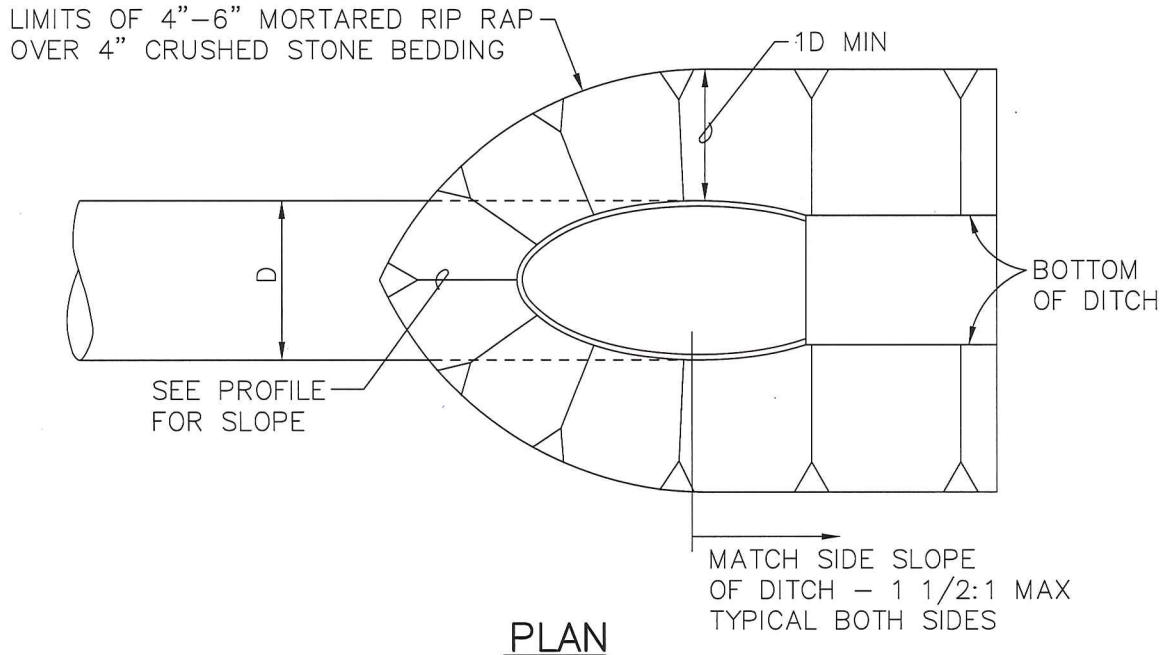
5/9/07
DATE

CITY OF Marysville WASHINGTON

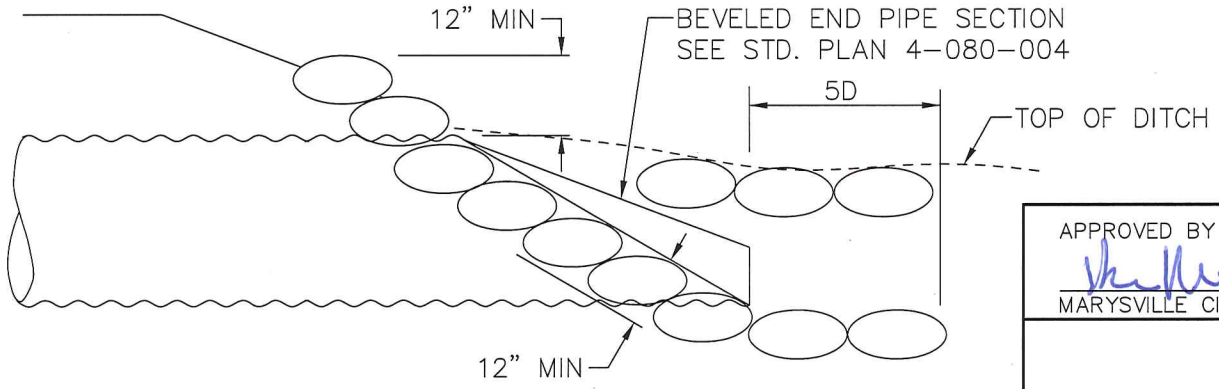
BEVELED END PIPE SECTION

STANDARD PLAN 4–080–004

LAST REVISED 07/14/06



PLAN



PROFILE

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5/9/07
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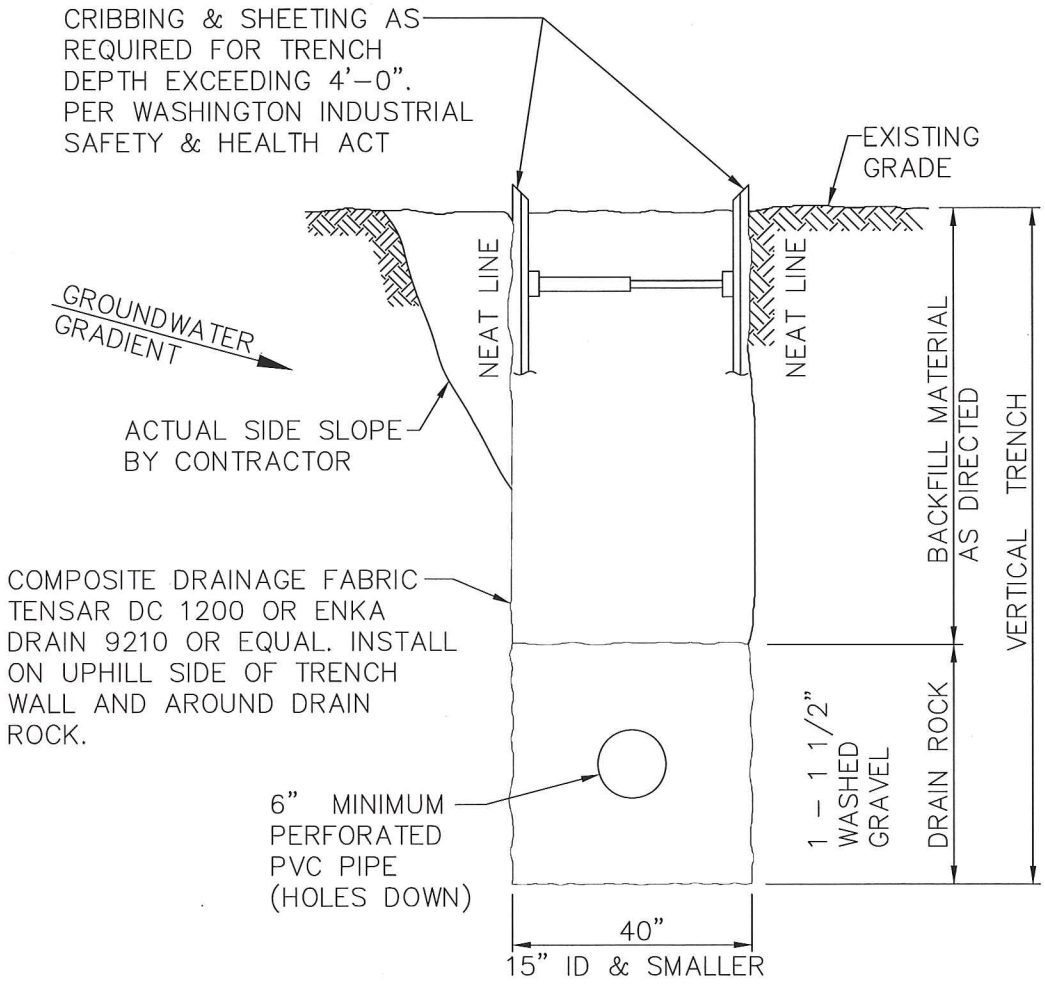
ROCK HEADWALL DETAIL

CITY OF Marysville WASHINGTON

STANDARD PLAN 4–080–005

LAST REVISED 07/14/06



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5/9/07

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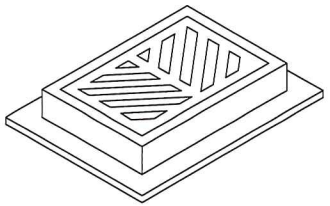
FRENCH DRAIN

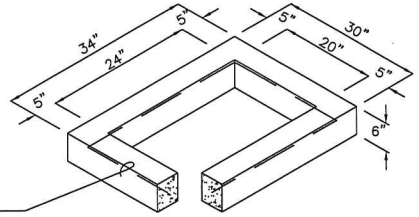
CITY OF Marysville WASHINGTON

LAST REVISED 07/14/06

STANDARD PLAN 4–080–006

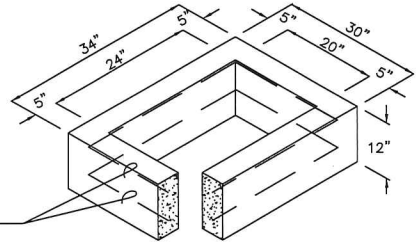


FRAME AND GRATE
SEE SEC. 4-080E AND
APPLICABLE DWGS.



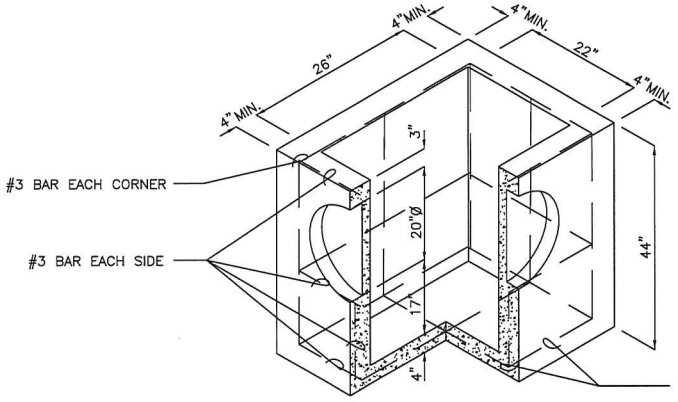
1 #3 BAR HOOP

6" RISER SECTION



2 #3 BAR HOOPS

12" RISER SECTION



#3 BAR EACH CORNER

#3 BAR EACH SIDE

#3 BAR EACH WAY

PRECAST BASE SECTION
(MEASUREMENT AT THE TOP
OF THE BASE)

NOTES:

1. CATCH BASINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASTM C478 (AASHTO M 199) & C890 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE WSDOT/APWA STANDARD SPECIFICATIONS.
2. AS AN ACCEPTABLE ALTERNATIVE TO REBAR, WELDED WIRE FABRIC HAVING A MIN. AREA OF 0.12 SQUARE INCHES PER FOOT MAY BE USED. WELDED WIRE FABRIC SHALL COMPLY TO ASTM A497 (AASHTO M 221). WIRE FABRIC SHALL NOT BE PLACED IN KNOCKOUTS.
3. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000.
4. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MIN. ALL PIPE SHALL BE INSTALLED IN FACTORY PROVIDED KNOCKOUTS. UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS LEFT INTACT.
5. KNOCKOUT OR CUTOUT HOLE SIZE IS EQUAL TO PIPE OUTER DIAM. PLUS CATCH BASIN WALL THICKNESS.
6. ROUND KNOCKOUTS MAY BE ON ALL 4 SIDES, WITH MAX. DIAM. OF 20". KNOCKOUTS MAY BE EITHER ROUND OR "D" SHAPE.
7. THE MAX. DEPTH FROM THE FINISHED GRADE TO THE PIPE INVERT IS 5'-0".
8. THE TAPER ON THE SIDES OF THE PRECAST BASE SECTION AND RISER SECTION SHALL NOT EXCEED 1/2"/FT.
9. CATCH BASIN FRAME AND GRATE SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS AND MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION RR-F-621D. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
10. FRAME AND GRATE MAY BE INSTALLED WITH FLANGE DOWN OR CAST INTO RISER.
11. FOR CATCH BASINS IN PARKING LOTS REFER TO WSDOT/APWA STANDARD DWG. B1-b.
12. EDGE OF RISER OR BRICK SHALL NOT BE MORE THAN 2" FROM VERTICAL EDGE OF CATCH BASIN WALL.
13. MINIMUM 4" ADJUSTMENT SECTION BETWEEN BOTTOM OF GRATE AND TOP OF BASE SECTION.

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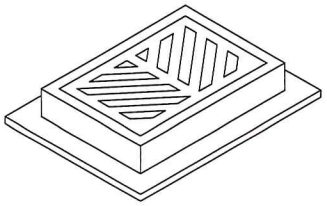
5/9/07
DATE

CITY OF Marysville WASHINGTON

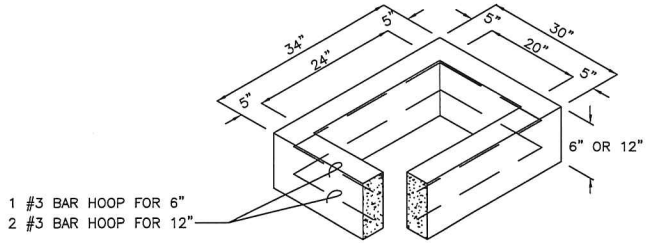
CATCH BASIN TYPE 1 (18" MAX. DIA.)

STANDARD PLAN 4-080-007

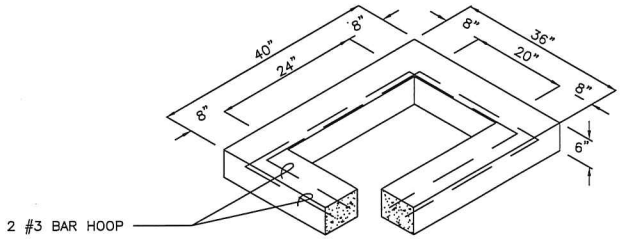
LAST REVISED 07/14/06



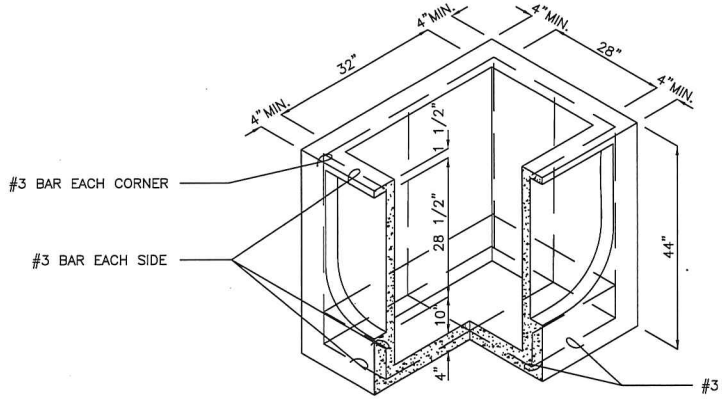
FRAME AND GRATE
SEE SEC. 4-080E AND
APPLICABLE DWGS.



RISER SECTION



6" REDUCING SECTION



PRECAST BASE SECTION
(MEASUREMENT AT THE TOP
OF THE BASE)

NOTES:

1. CATCH BASINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASTM C478 (AASHTO M 199) & C890 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE WSDOT/APWA STANDARD SPECIFICATIONS.
2. AS AN ACCEPTABLE ALTERNATIVE TO REBAR, WELDED WIRE FABRIC HAVING A MIN. AREA OF 0.12 SQUARE INCHES PER FOOT MAY BE USED. WELDED WIRE FABRIC SHALL COMPLY TO ASTM A497 (AASHTO M 221). WIRE FABRIC SHALL NOT BE PLACED IN KNOCKOUTS.
3. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000.
4. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MIN. ALL PIPE SHALL BE INSTALLED IN FACTORY PROVIDED KNOCKOUTS. UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS LEFT INTACT.
5. KNOCKOUT OR CUTOUT HOLE SIZE IS EQUAL TO PIPE OUTER DIAM. PLUS CATCH BASIN WALL THICKNESS.
6. KNOCKOUTS MAY BE ON ALL 4 SIDES WITH MAX. DIAM. OF 28". KNOCKOUTS MAY BE EITHER ROUND OR "D" SHAPE.
7. THE TAPER ON THE SIDES OF THE PRECAST BASE SECTION AND RISER SECTION SHALL NOT EXCEED 1/2"/FT.
8. CATCH BASIN FRAME AND GRATE SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS AND MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION RR-F-621D. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
9. FRAME AND GRATE MAY BE INSTALLED WITH FLANGE DOWN OR CAST INTO RISER.
10. MAX. DEPTH FROM FINISHED GRADE TO PIPE INVERT SHALL BE 5'-0".
11. EDGE OF REDUCING SECTION OR BRICK SHALL NOT BE MORE THAN 2" FROM VERTICAL EDGE OF CATCH BASIN WALL.
12. MINIMUM 4" ADJUSTMENT SECTION BETWEEN BOTTOM OF GRATE AND TOP OF BASE SECTION.

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MARYSVILLE CITY ENGINEER

5/9/07
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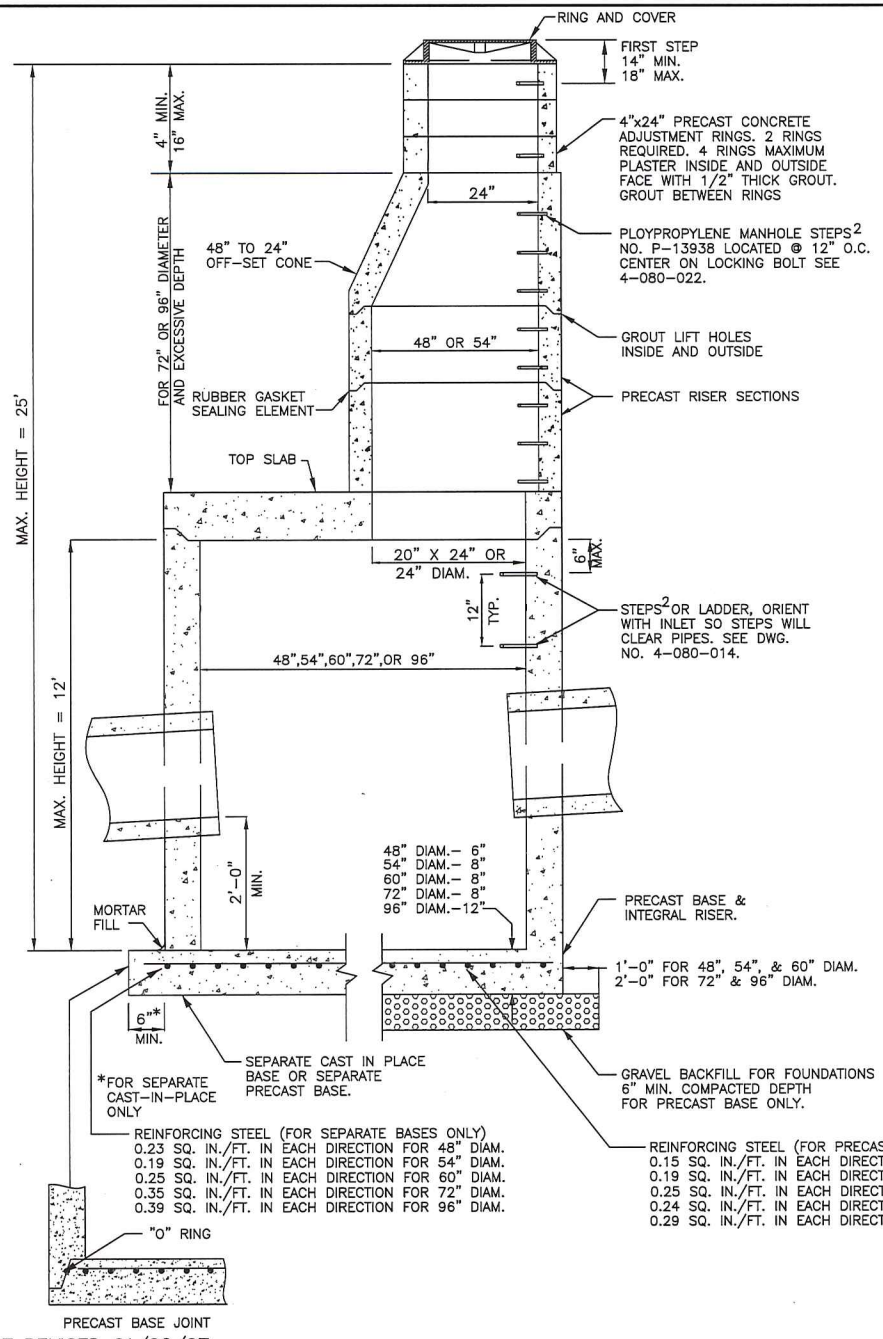
CITY OF Marysville WASHINGTON

CATCH BASIN TYPE 1-L (18"-28" DIA.)

STANDARD PLAN 4-080-008

LAST REVISED 07/14/06



NOTES:

1. CATCH BASINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASTM C478 (AASHTO M199) AND ASTM C890 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE WSDOT/APWA STANDARD SPECIFICATIONS.
2. HANDHOLDS IN ADJUSTMENT SECTION SHALL HAVE 3" MIN. CLEARANCE. STEPS IN CATCH BASIN SHALL HAVE 6" MIN. CLEARANCE. SEE DWG. NO. 4-080-014, CATCH BASIN DETAILS. HANDHOLDS SHALL BE PLACED IN ALTERNATING GRADE RINGS OR LEVELING BRICK COURSE WITH A MIN. OF ONE HANDHOLD BETWEEN THE LAST STEP AND TOP OF THE MANHOLE.
3. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000. ALL PRECAST CONCRETE SHALL BE CLASS 4000.
4. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE WALL THICKNESS OF 2" MIN. UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS LEFT INTACT. PIPES SHALL BE INSTALLED ONLY IN FACTORY KNOCKOUTS UNLESS OTHERWISE APPROVED BY THE ENGINEER.
5. KNOCKOUT OR CUTOUT HOLE SIZE SHALL EQUAL PIPE OUTER DIAM. PLUS CATCH BASIN WALL THICKNESS. MAX. HOLE SIZE SHALL BE 36" FOR 48" CATCH BASIN, 42" FOR 54" C.B., 48" FOR 60" C.B., 60" FOR 72" C.B., 84" FOR 96" C.B. MIN. DISTANCE BETWEEN HOLES SHALL BE 8" FOR 48", 54", AND 60" C.B.; 12" FOR 72" AND 96" C.B.
6. CATCH BASIN FRAMES AND GRATES OR COVERS SHALL BE IN ACCORDANCE WITH SEC. 4-080(D) AND MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION RR-F-621D. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
7. ALL BASE REINFORCING STEEL SHALL HAVE A MIN. YIELD STRENGTH OF 60,000 PSI AND BE PLACED IN THE UPPER HALF OF THE BASE WITH 1" MIN. CLEARANCE.
8. MIN. SOIL BEARING VALUE SHALL EQUAL 3,300 POUNDS PER SQUARE FOOT.
9. FOR DETAILS SHOWING LADDER, STEPS, HANDRAILS AND TOP SLABS, SEE DWG. NO. 4-080-014.
10. SEE THE WSDOT/APWA STANDARD SPECIFICATIONS SEC. 7-05.3 FOR JOINT REQUIREMENTS.

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MARYSVILLE CITY ENGINEER

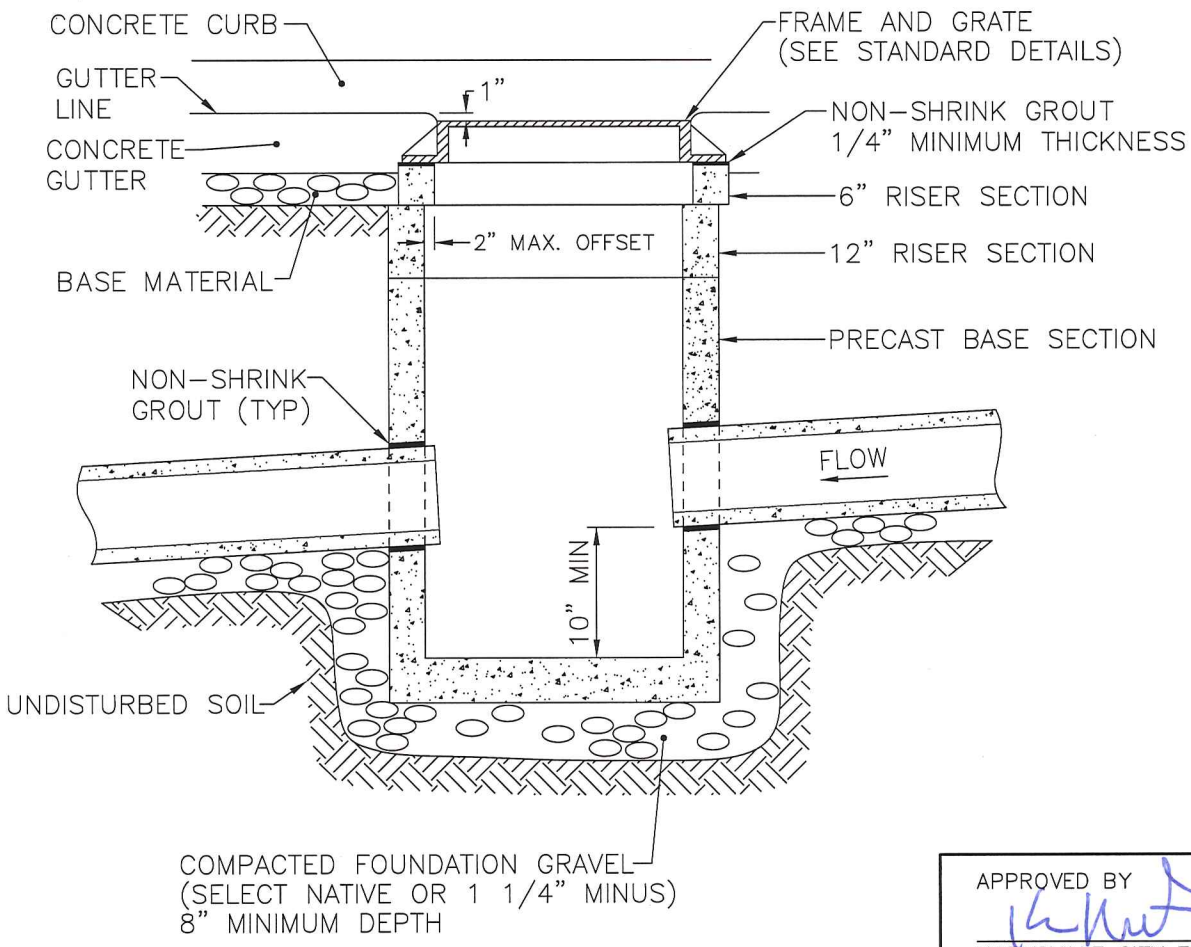
5/9/07
DATE

CATCH BASIN TYPE 2
48",54",72",96"

CITY OF Marysville WASHINGTON

STANDARD PLAN 4-080-009

LAST REVISED 01/02/07



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MARYSVILLE CITY ENGINEER

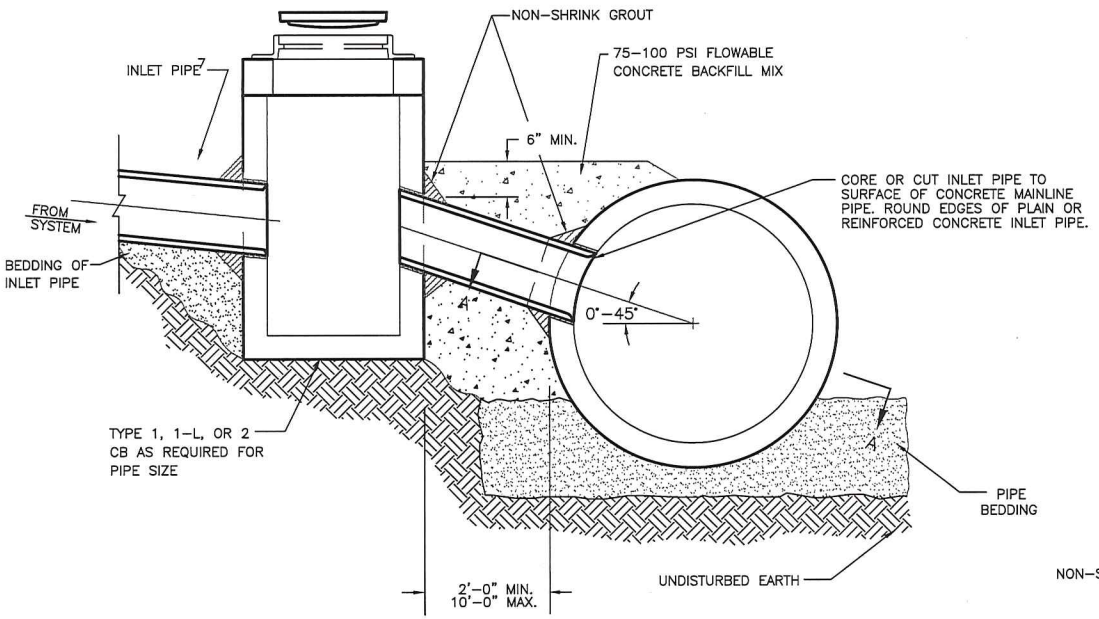
5/9/07
DATE

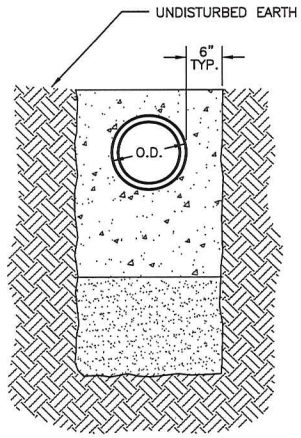
CITY OF Marysville WASHINGTON

CATCH BASIN INSTALLATION DETAIL TYPE 1 & 1L

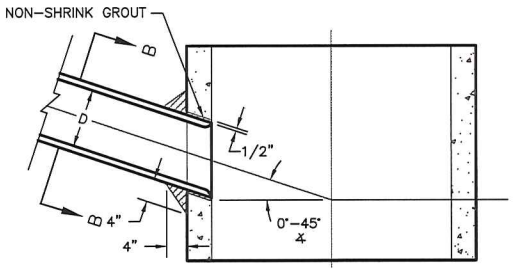
STANDARD PLAN 4-080-010

LAST REVISED 07/14/06





SECTION B-B



SECTION A-A

NOTES:

1. "D", THE INSIDE DIAM. OF THE INLET PIPE, SHALL BE 24" OR LESS. FOR LARGER VALUES OF "D", USE AN APPROVED STRUCTURE.
2. IN NO CASE SHALL THE OUTSIDE DIAM. OF THE INLET PIPE EXCEED ONE-HALF THE INSIDE DIAM. OF THE MAIN STORM SEWER.
3. ℄ OF INLET PIPE SHALL BE ON RADIUS OF MAIN STORM DRAIN.
4. THE MIN. OPENING INTO THE EXISTING STORM DRAIN SHALL BE THE OUTSIDE DIAM. OF THE INLET PIPE PLUS 1 IN.
5. IF ∠ IS GREATER THAN 45° FIELD TAPPING IS NOT ALLOWED.
6. SEE SEC. 4-080(C).
7. SEE SEC. 4-080(B) FOR ALLOWED INLET PIPE TYPE.

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MARYSVILLE CITY ENGINEER

5/9/07
DATE

CITY OF Marysville WASHINGTON

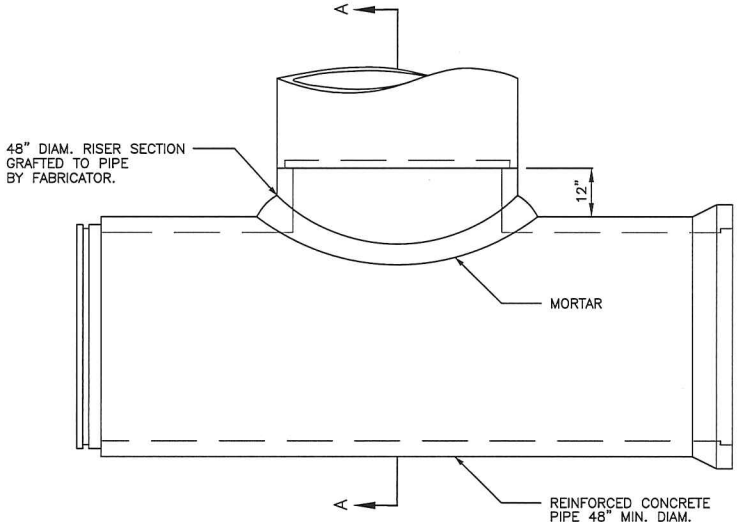
FIELD TAPPING OF CONCRETE PIPE

STANDARD PLAN 4-080-011

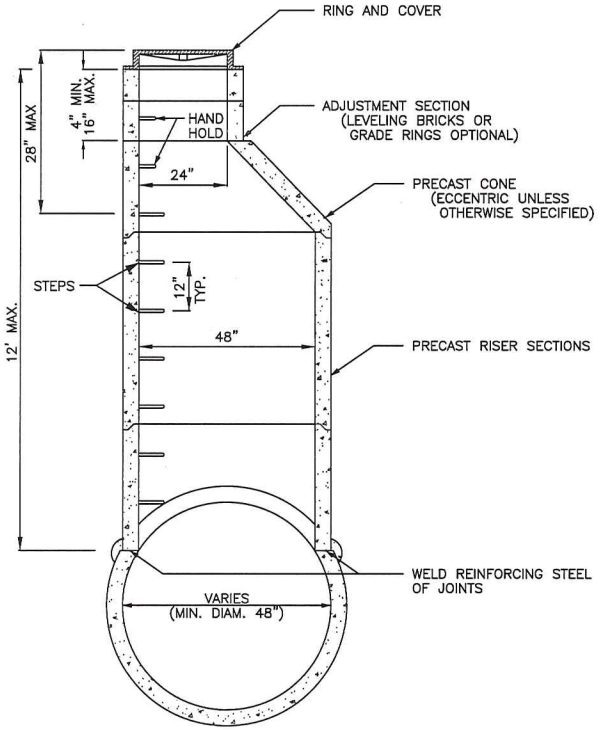
LAST REVISED 01/02/07

NOTES:

1. MANHOLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH AASHTO M199 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE WSDOT/APWA STANDARD SPECIFICATIONS.
2. HANDHOLDS IN ADJUSTMENT SECTION SHALL HAVE 3" MIN. CLEARANCE. STEPS IN MANHOLE SHALL HAVE 6" MIN. CLEARANCE. SEE DWG. NO. 4-080-014, "MANHOLE DETAILS."
3. MANHOLE RINGS AND COVERS SHALL BE IN ACCORDANCE WITH SEC. 4-080(D) AND MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION RR-F-621D. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
4. ALL PRECAST CONCRETE SHALL BE CLASS 4000.
5. FOR DETAILS SHOWING GRADE RING, LADDER, STEPS, HANDHOLDS, AND TOP SLABS, SEE DWG. NO. 4-080-014, "MANHOLE DETAILS".
6. NOT FOR USE IN TRAFFIC BEARING AREAS.



ELEVATION



SECTION A-A

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MARYSVILLE CITY ENGINEER

5/9/07
DATE

CITY OF Marysville WASHINGTON

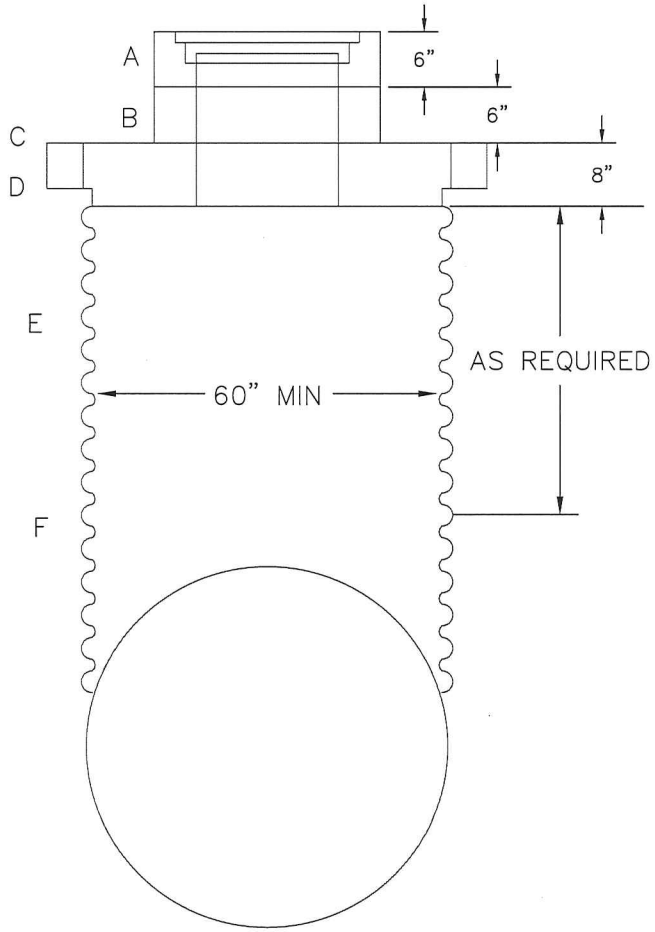
MANHOLE TYPE 4

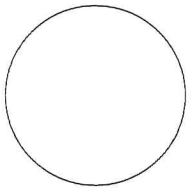
STANDARD PLAN 4-080-012

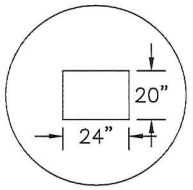
LAST REVISED 01/02/07

A. CONCRETE TOP SLAB: SHORT ADJUSTMENT SECTION WITH DUCTILE IRON FRAME AND GRATE, PER STDS.
B. CONCRETE 6" ADJUSTMENT SECTION AS REQUIRED.
C. CONCRETE REDUCING FLAT SLAB: UNITS "M", "N", "P", OR "R", AS REQUIRED BY PLANS.
D. OPTIONAL STEEL LID FOR HS20 LOAD.
E. RISER: 10 GAUGE 54" HELICAL OR ANULAR CORRUGATED PIPE IN HEIGHTS AS REQUIRED. FOR HEIGHTS GREATER THAN 4' USE PRE FABRICATED LADDER PER APWA STANDARD PLAN B-13.
F. CORRUGATED PIPE 60" AND GREATER IN DIAMETER WITH GAUGE AND SIZE AS REQUIRED ON PLAN.

NOTE: ALL METAL PARTS AND SURFACES MUST BE MADE OF CORROSION RESISTANT MATERIAL OR ASPHALT COATED GALVANIZED, TREATMENT #1 OR BETTER; COMPLETE CORROSION PROTECTION MUST BE ASSURED.




UNIT "M"



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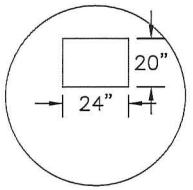

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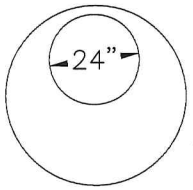


UNIT "R"

NOTE:
NOT FOR PUBLIC
ROADWAY CONSTRUCTION

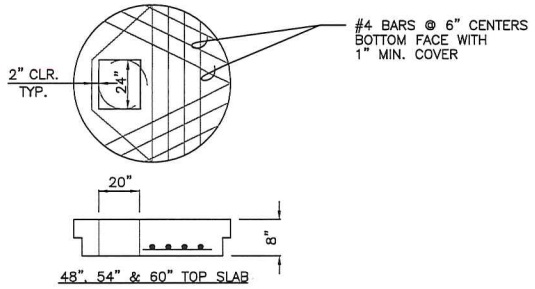
APPROVED BY _____ 5/9/07
MARYSVILLE CITY ENGINEER DATE

CITY OF Marysville WASHINGTON

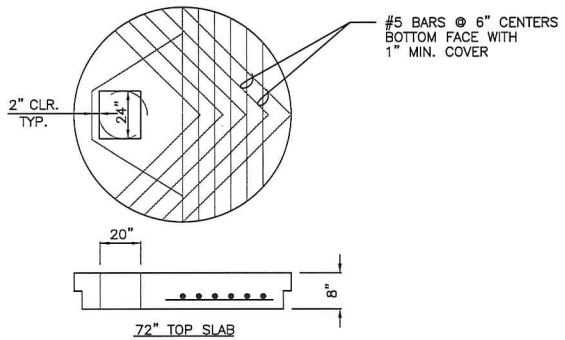
OFFSET CORRUGATED MANHOLE

LAST REVISED 07/14/06

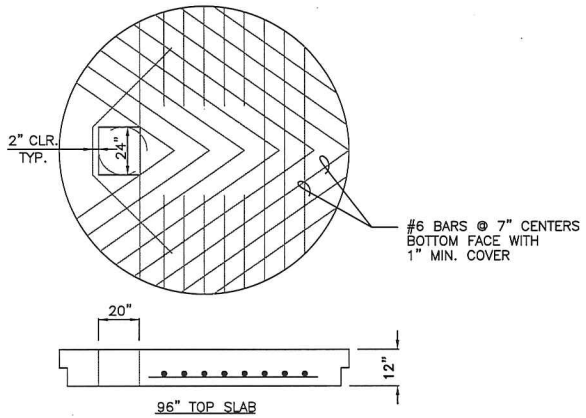
STANDARD PLAN 4-080-013



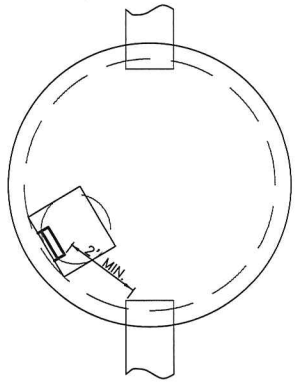
48", 54" & 60" TOP SLAB



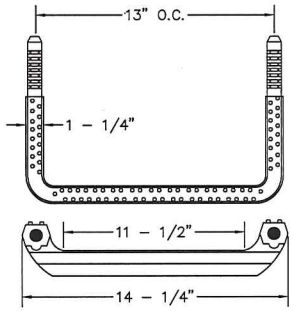
72" TOP SLAB

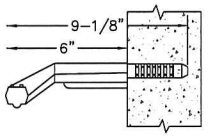


96" TOP SLAB



TYPICAL ORIENTATION
FOR ACCESS AND STEPS



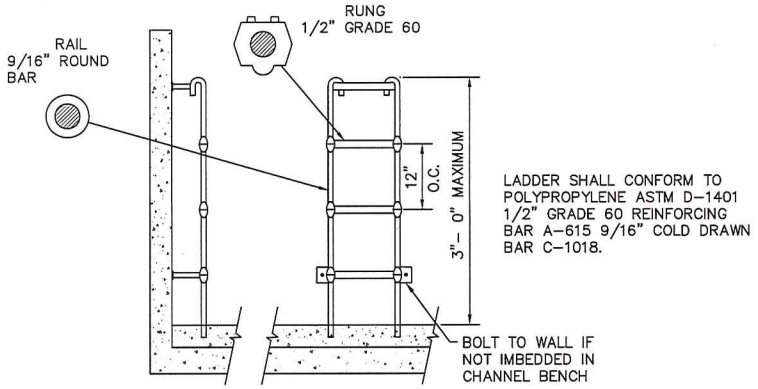


POLYPROPYLENE STEP, LANE
NO. P-13938 OR EQUAL

POLYPROPYLENE MANHOLE STEPS

NOTES:

1. PROPRIETARY CATCH BASIN HANDHOLDS AND STEPS ARE ACCEPTABLE, PROVIDED THAT THEY CONFORM TO SEC. R, ASTM C478, AASHTO M-199 AND MEET ALL WISHA REQUIREMENTS.
2. CATCH BASIN STEP/HANDHOLD LEGS SHALL BE PARALLEL OR APPROXIMATELY RADIAL AT THE OPTION OF THE MANUFACTURER, EXCEPT THAT ALL STEPS IN ANY CATCH BASIN SHALL BE SIMILAR. PENETRATION OF OUTER WALL BY A LEG IS PROHIBITED.
3. SLAB OPENING MAY BE 24" X 20" OR 24" DIAM.
4. AS AN ACCEPTABLE ALTERNATIVE TO REBAR, WELDED WIRE FABRIC HAVING A MIN. AREA OF 0.12 SQUARE INCHES PER FOOT MAY BE USED. WELDED WIRE FABRIC SHALL COMPLY TO ASTM A497.
5. LADDERS OR STEPS SHALL EXTEND TO WITHIN 16" OF BOTTOM OF CATCH BASIN.
6. HANGING LADDERS SHALL BE PERMANENTLY FASTENED AT TOP BY HANGING ON STEP AND BY BOLTING OR EMBEDDING IN CONCRETE. EACH SHALL BE EMBEDDED AT BOTTOM IN BASE.
7. ADDITIONAL SAFETY FEATURES MAY BE REQUIRED IN VERY DEEP OR UNUSUAL STRUCTURES.



LADDER SHALL CONFORM TO POLYPROPYLENE ASTM D-1401 1/2" GRADE 60 REINFORCING BAR A-615 9/16" COLD DRAWN BAR C-1018.

POLYPROPYLENE LADDER

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MARYSVILLE CITY ENGINEER

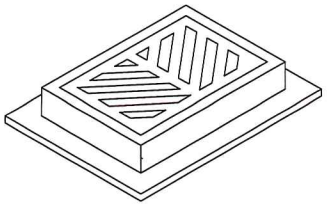
5/9/07
DATE

CITY OF Marysville WASHINGTON

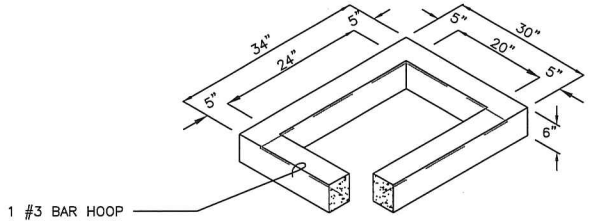
CATCH BASIN & MANHOLE DETAILS

STANDARD PLAN 4-080-014

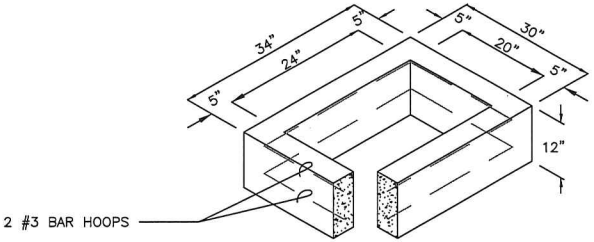
LAST REVISED 07/14/06



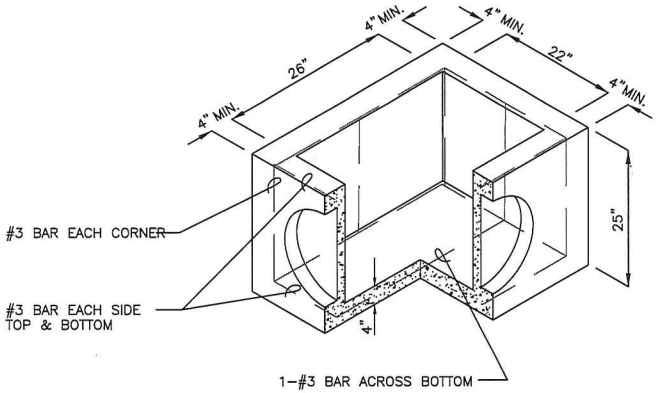
FRAME AND GRATE
SEE SEC. 4-080E AND
APPLICABLE DWGS.



6" RISER SECTION



12" RISER SECTION



PRECAST BASE SECTION
(MEASUREMENT AT THE TOP
OF THE BASE)

NOTES:

1. CURB INLET TO BE CONSTRUCTED IN ACCORDANCE WITH ASTM C478 & C890 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE STANDARD SPECIFICATIONS.
2. AS AN ACCEPTABLE ALTERNATIVE TO REBAR, WELDED WIRE FABRIC HAVING A MIN. AREA OF 0.12 SQUARE INCHES PER FOOT MAY BE USED. WELDED WIRE FABRIC SHALL COMPLY TO ASTM A497. WIRE FABRIC SHALL NOT BE PLACED IN KNOCKOUTS.
3. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000.
4. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MIN. ALL PIPE SHALL BE INSTALLED IN FACTORY PROVIDED KNOCKOUTS. UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS LEFT INTACT.
5. KNOCKOUT OR CUTOUT HOLE SIZE IS EQUAL TO PIPE OUTER DIAM. PLUS CURB INLET WALL THICKNESS.
6. ROUND KNOCKOUTS MAY BE ON ALL 4 SIDES WITH MAX. DIAM. OF 17".
7. THE MAX. DEPTH FROM THE FINISHED GRADE TO THE PIPE INVERT IS 5'-0".
8. THE TAPER ON THE SIDES OF THE PRECAST BASE SECTION AND RISER SECTION SHALL NOT EXCEED 1/2"/FT.
9. CONCRETE INLET FRAME AND GRATES SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS AND MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION RR-F-621D. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY OTHER COVER POSITION.
10. FRAME AND GRATE MAY BE INSTALLED WITH FLANGE DOWN OR CAST INTO RISER.
11. MAXIMUM DIAMETER OUTLET 8", MUST BE DIRECTLY CONNECTED TO CATCH BASIN.

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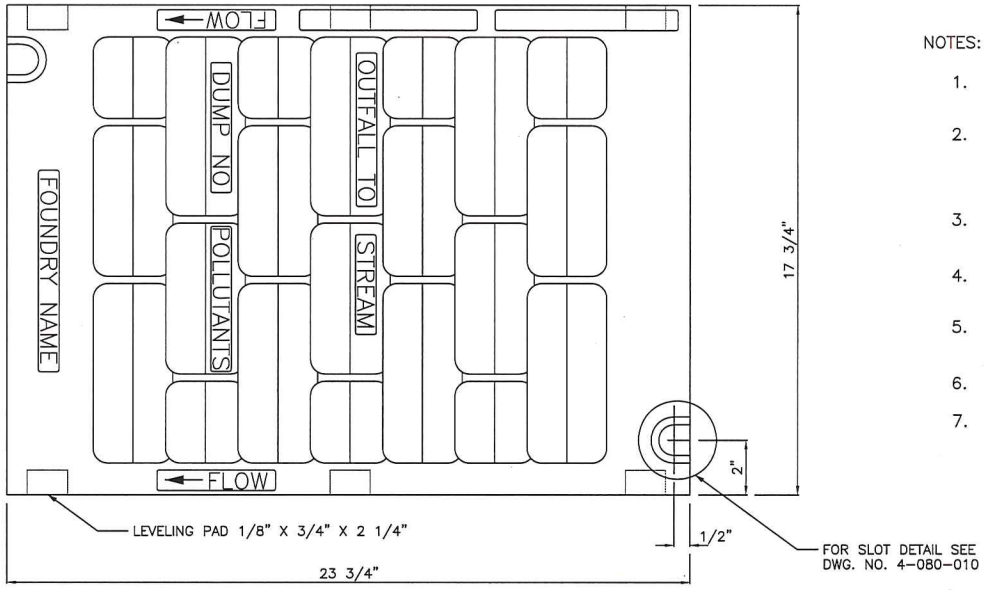
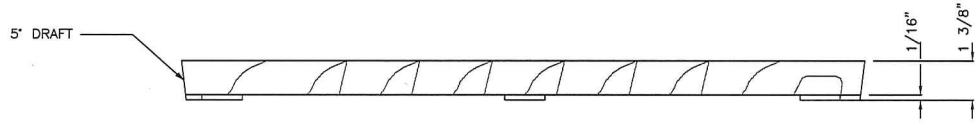
CURB INLET

STANDARD PLAN 4-080-015

LAST REVISED 07/14/06



PLAN



ELEVATION

NOTES:

1. SELF-LOCK VANED GRATE MANUFACTURER SUBJECT TO APPROVAL BY ENGINEER.
2. USE WITH TWO LOCKING BOLTS 5/8"-11 NC STAINLESS TYPE 304 STEEL SOCKET HEAD (ALLEN HEAD) CAP SCREWS 2" LONG. NOTE SLOT DETAIL.
3. MATERIAL IS DUCTILE IRON ASTM A536 GRADE 80-55-06.
4. "OUTFALL TO STREAM DUMP NO POLLUTANTS" MAY BE LOCATED ON BORDER AREA.
5. SEE SEC. 4-080(D).
6. SEE STANDARD PLAN 4-080-025 FOR FRAME.
7. SHALL BE USED ON ALL ROADS WITH SLOPES EQUAL TO OR GREATER THAN 3%.

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5/9/07
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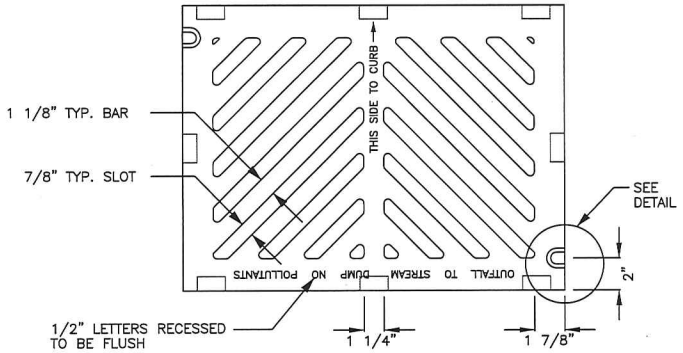
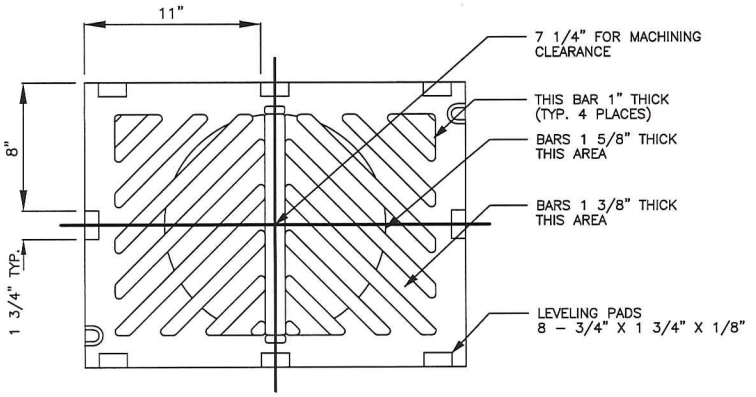
VANED GRATE

LAST REVISED 01/02/07

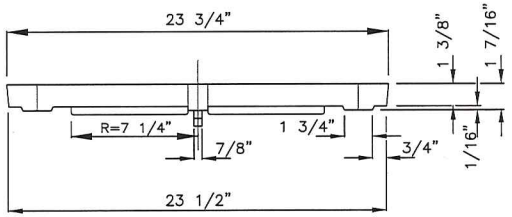
STANDARD PLAN 4-080-016



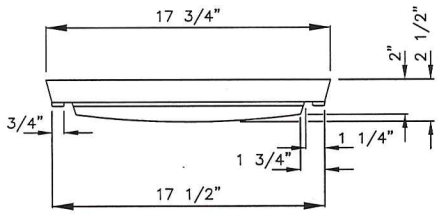
TOP VIEW



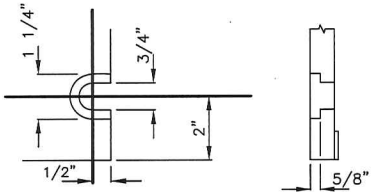
BOTTOM VIEW



SIDE VIEW



END VIEW



SLOT DETAIL

SEE NOTE 1

NOTES:

1. SLOT FORMED AND RECESSED FOR 5/8"–11 NC X 2" SOCKET HEAD (ALLEN HEAD) CAP SCREW. PROVIDE ON ALL GRATES.
2. GRATE SHALL BE CAST IRON PER ASTM A48 CLASS 30 UNLESS OTHERWISE SPECIFIED.
3. SEE SEC. 4–080(D).

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5/9/07

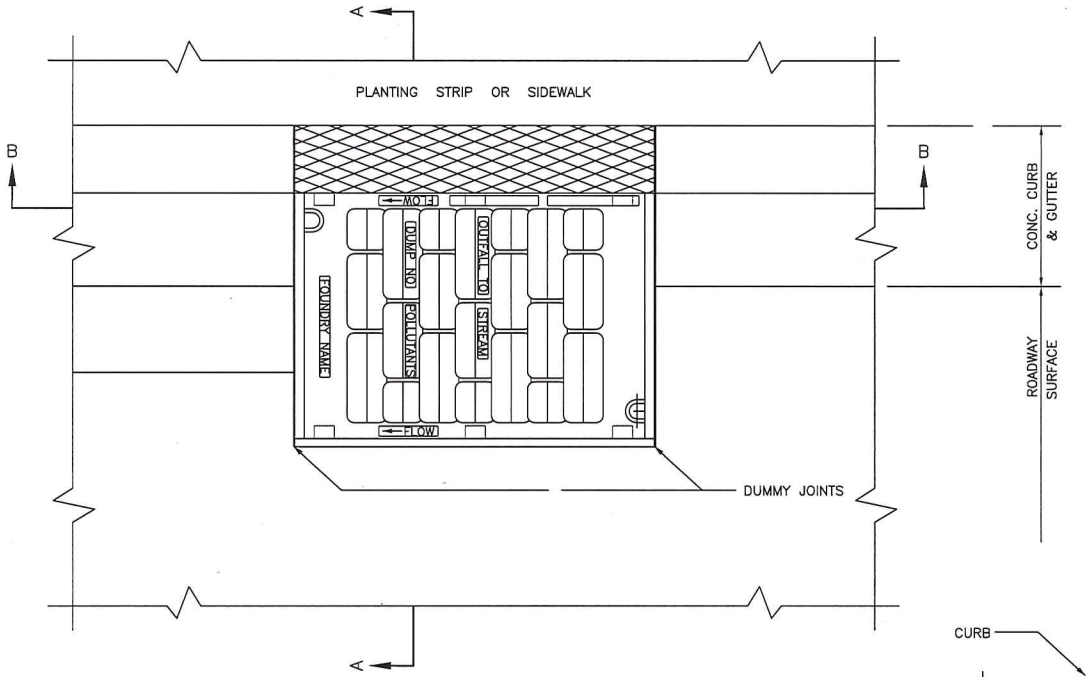
DATE

CITY OF Marysville WASHINGTON

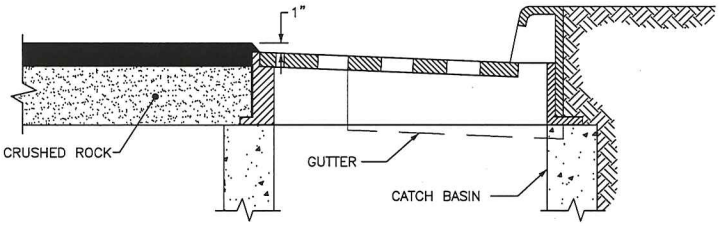
STANDARD GRATE

STANDARD PLAN 4–080–017

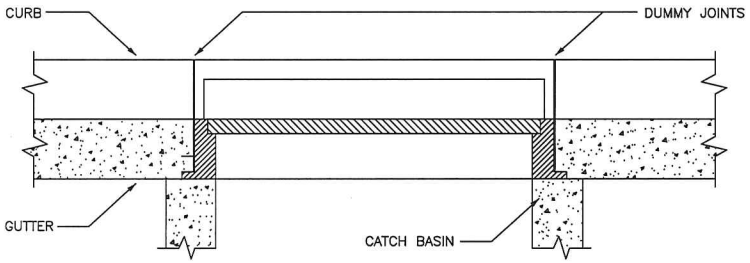
LAST REVISED 01/02/07



PLAN



SECTION A–A



SECTION B–B

NOTES:

1. SET TO GRADE AND CONSTRUCT ROAD AND GUTTER TO BE FLUSH WITH FRAME.
2. SEE EXPANSION JOINT REQUIREMENTS, CHAPTER 3.

APPROVED BY _____ 5/9/05

MARYSVILLE CITY ENGINEER DATE

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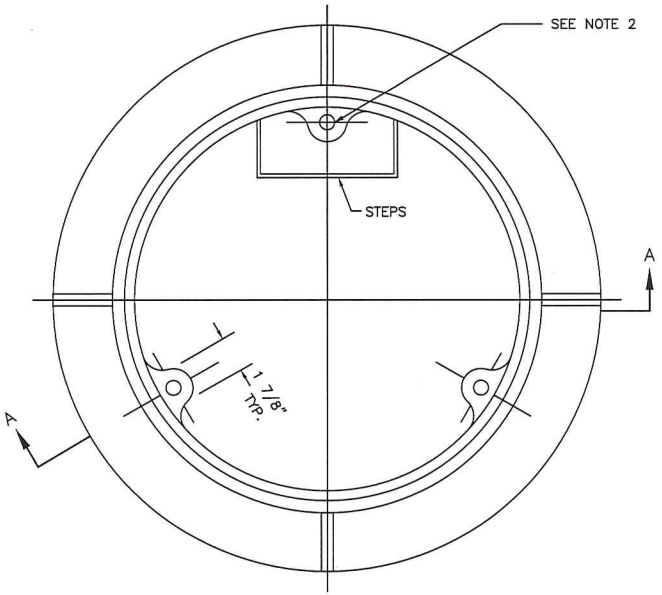
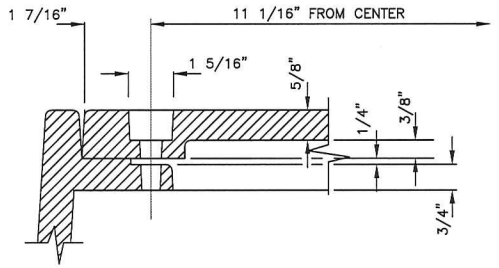
THRU–CURB INLET FRAME & GRATE W/ VERTICAL CURB INSTALLATION

STANDARD PLAN 4–080–018

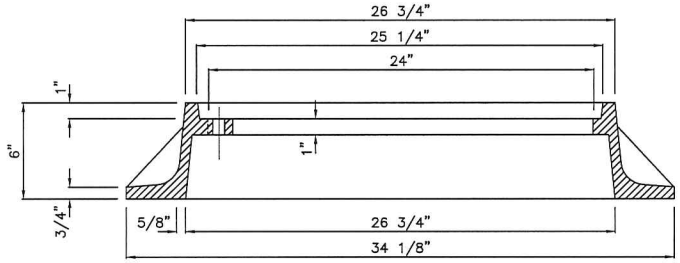
LAST REVISED 8/15/97



PLAN



BOLT–DOWN DETAIL



SECTION A–A

NOTES:

1. MATERIAL IS CAST IRON ASTM A48 CLASS 30.
2. DRILL AND TAP THREE 5/8"–11 NC HOLES THROUGH FRAME AT 120° AND 11 1/16" RADIUS.
3. SEE SEC. 4–080(D)
4. FOR INSTALLATION SEE 4–080–009

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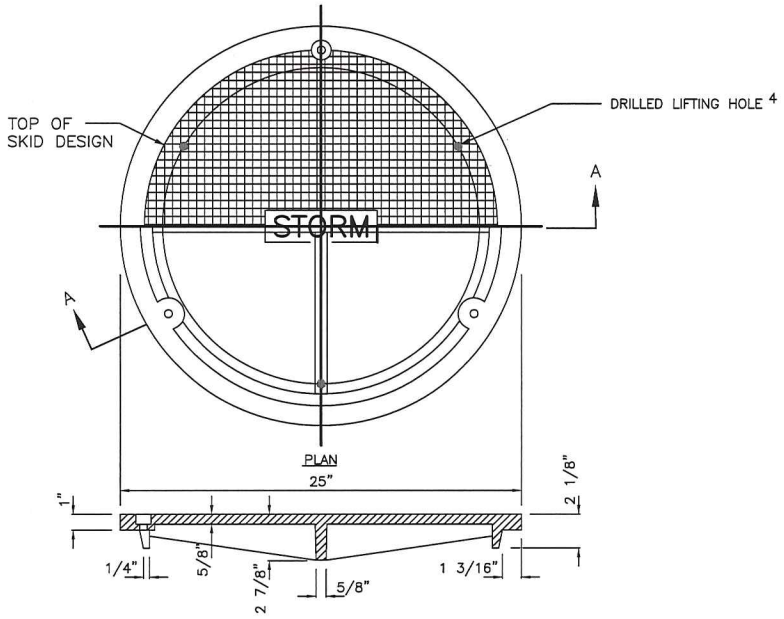
5/9/07
DATE

CITY OF Marysville WASHINGTON

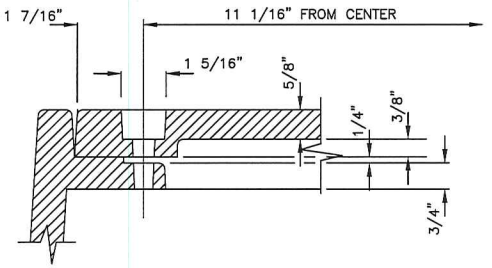
LOCKING MANHOLE FRAME DETAIL

STANDARD PLAN 4–080–022

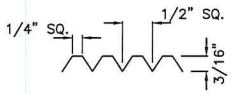
LAST REVISED 01/02/07



SECTION A–A



BOLT–DOWN DETAIL



COVER SKID DESIGN DETAIL

NOTES:

1. USE WITH THREE LOCKING BOLTS 5/8"–11 NC STAINLESS TYPE 304 STEEL SOCKET HEAD (ALLEN HEAD) CAP SCREWS 2" LONG. DRILL HOLES SPACED 120° AT 11 1/16" RADIUS.
2. MATERIAL IS DUCTILE IRON ASTM A536 GRADE 80–55–06
3. SEE SEC. 4–080(D).
4. DRILL THREE 1 INCH HOLES SPACED AT 120° AND 9 1/2" RADIUS.
5. FOR INSTALLATION SEE 4–080–009

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5/9/07
DATE

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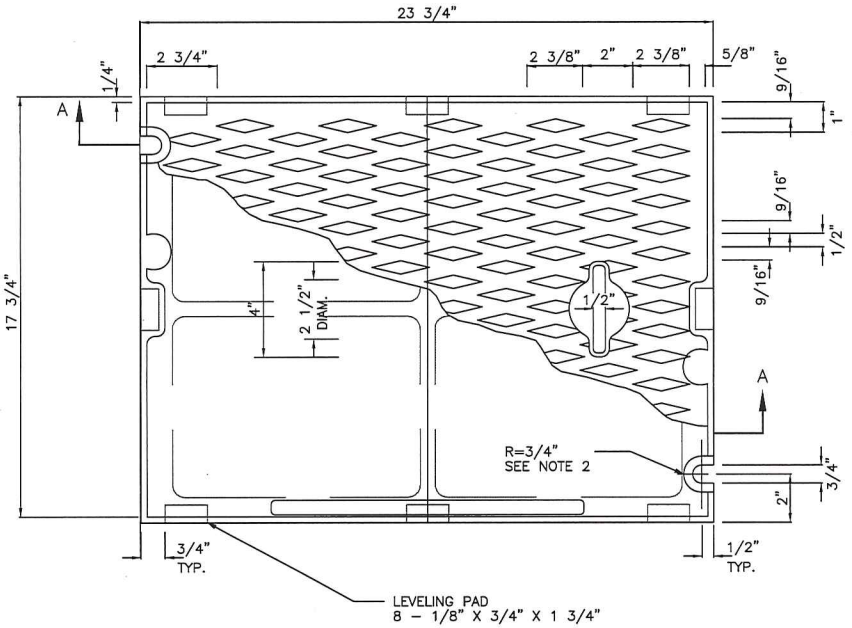
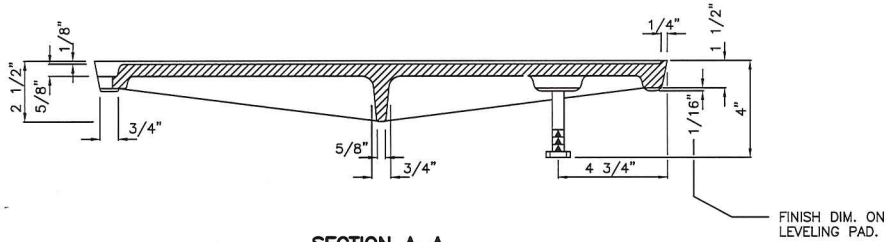
LOCKING MANHOLE COVER DETAIL

STANDARD PLAN 4–080–023

LAST REVISED 01/02/07



PLAN COVER



SECTION A–A

NOTES:

1. USE WITH FRAME (DWG. NO. 4–080–025) DRILLED AND TAPPED FOR LOCKING BOLTS.
2. USE WITH TWO LOCKING BOLTS 5/8"–11 NC STAINLESS STEEL TYPE 304 STEEL SOCKET HEAD (ALLEN HEAD) CAP SCREWS, 2" LONG.
3. MATERIAL IS CAST IRON PER ASTM A48 CLASS 30.
4. SEE SEC. 4–080(D).
5. RAISED WORDING "DRAIN" OR "STORM" ON ALL COVERS.

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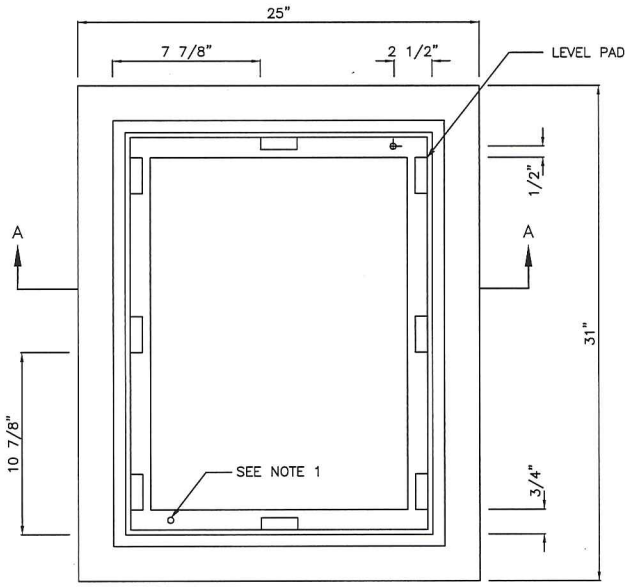
5/9/07
DATE

CITY OF Marysville WASHINGTON

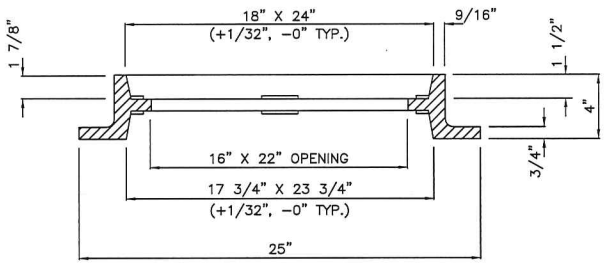
SOLID COVER

STANDARD PLAN 4–080–024

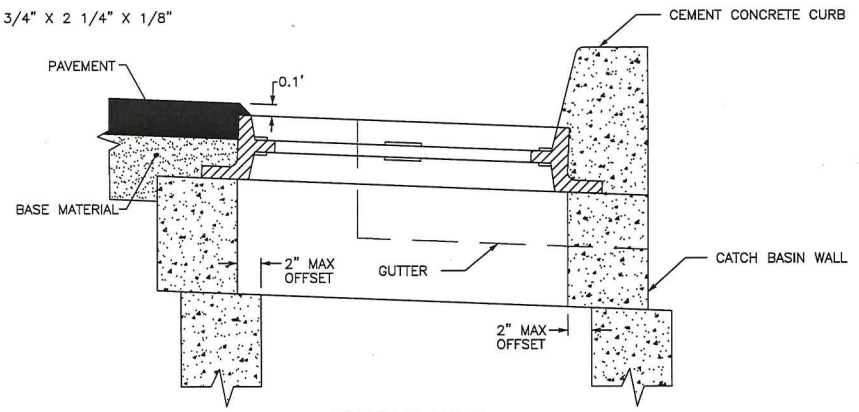
LAST REVISED 01/02/07



PLAN

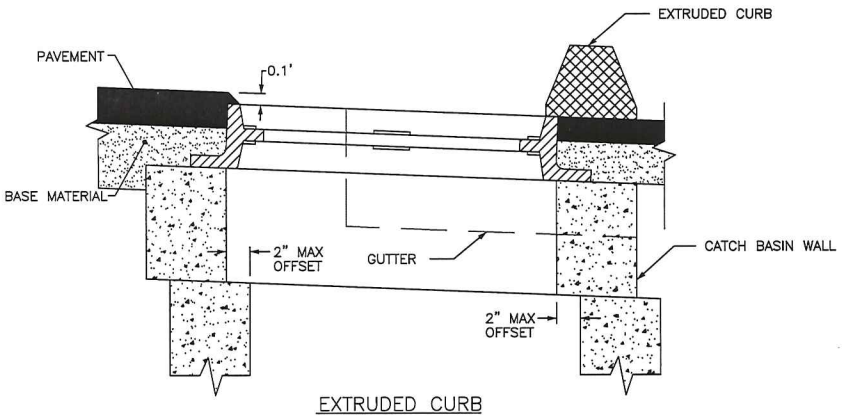


SECTION A–A



VERTICAL CURB

SEE NOTE 4



EXTRUDED CURB

SEE NOTE 4

NOTES:

1. DRILL AND TAP FOR, AND PROVIDE, TWO LOCKING BOLTS 5/8"–11 NC STAINLESS TYPE 304 STEEL SOCKET HEAD (ALLEN HEAD) CAP SCREWS 2" LONG WHEN USED WITH SOLID COVER (DWG. NO. 4–080–024).
2. FRAME MATERIAL IS CAST IRON PER ASTM A48 CLASS 30.
3. SET FRAME TO GRADE AND CONSTRUCT ROAD AND GUTTER TO BE FLUSH WITH FRAME.
4. SEE SEC. 4–080(D).

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MARYSVILLE CITY ENGINEER

5/9/07

DATE

CITY OF Marysville WASHINGTON

STANDARD FRAME W/ VERTICAL OR EXTRUDED CURB INSTALLATION

LAST REVISED 01/02/07

STANDARD PLAN 4–080–025