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## CHAPTER 5

### 5.000 STORM DRAINAGE

#### 5A General Considerations

##### 5A.010 General

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

The City of Lacey 2010 Stormwater Design Manual document is considered a part of the Public Works Standards. This Drainage Manual sets forth minimum drainage and erosion control requirements. Where conflicting information occurs between this chapter and the City of Lacey 2010 Stormwater Design Manual, the most appropriate standard as determined by the Drainage Manual Administrator shall apply.

A Grading Permit may be required when constructing storm ponds. See Chapter 2 and Chapter 3.080 for more information.

##### 5A.020 Design Standards

The design of storm drainage and/or retention/detention system shall depend on their type and local site conditions. The design elements of storm drainage systems shall conform to City standards as set forth herein and follow current design practice as set forth in Chapter 3.010 and 3.040. The following design considerations shall apply:

- A. No retention/detention facility shall be located in an area that is used to satisfy an open space requirement unless it is approved during SPR or by the City.
- B. Use of designated open space areas for stormwater detention/retention and for infiltration shall satisfy all conditions of the City of Lacey for usability and landscape conformity. See Chapter 5A.030 for landscape considerations.
- C. In determining usability of open space where drainage concepts are involved, staff will apply two main tests: orientation of design and overall aesthetic impression.
- D. Because the primary purpose of consolidated open space is to provide usable area for recreation activities, buffer zones, and green belt areas, the open space must be designed for this intent. Any use of this area for stormwater detention/retention must clearly be subordinate to and not detract from open space uses. Because active recreation requires primarily flat topography, the usable open space will be predominantly flat. In no event shall slopes exceed 4:1 (horizontal: vertical) where drainage facilities

are present and a minimum of 50 percent of the linear slope length shall not exceed 7:1. Design of the combined facility, as well as ease of access into and out of the facility, will be considered by the City in review of the design of such facilities.

- E. Open space also serves an aesthetic function by providing areas of green space that are attractive and an amenity to the project site. The second test applied to open space will be that of the general impression the open space provides. The open space must be designed to give the impression of an attractive open space area available for park uses.
- F. The City shall make the sole determination whether the proposed stormwater facilities are compatible with open space and satisfy the intent of the City for open space amenities.
- G. Infiltration trenches shall not be located under a public roadway prism. Infiltration trenches and swales may be located within the public right-of-way within a planter strip or green belt as long as the trench or swale does not interfere with the original intent of the planter strip or green belt.
- H. Stormwater facilities shall not have utilities located within them unless approved by the City during the civil plan review. Adequate separation (as determined by the City) between stormwater facilities and other utilities will also be required.
- I. Swales designed for transporting, storing and/or infiltrating stormwater shall not be located on a lot designated for single family occupancy. Easements proposed for such swales shall not be allowed. This is necessary due to the complexity of operating and maintaining the integrity of such facilities within fenced and landscaped private property.
- J. The use of commercial parking lots for detention of storm water will be reviewed by the Director of Public Works and approved or denied based on the design. The detention area shall be situated away from areas of pedestrian movement unless means for the rapid closing of the area is incorporated into the design. The maximum depth of water in parking lot storage shall be limited to 12 inches.
- K. Maximum catch basin spacing shall be 300 feet on boulevards, arterials and collectors and 500 feet on all other street classifications.
- L. The maximum depth of a retention or detention pond shall be 4.5 feet from the pond bottom to the top of the pond slope (not the water elevation). Deeper ponds may be allowed by the City's Drainage Manual Administrator. If ponds over 4.5 feet deep have side slopes steeper than 4:1 (horizontal:vertical), then benches that are a minimum 3 feet wide shall be required for every 4.5 feet of depth. If ponds over 4.5 feet deep have sides flatter than 4:1, benches are not required.

#### 5A.030 Landscape Considerations

The final landscape design shall be prepared by a licensed landscape architect or certified nursery person. Wherever possible, existing trees and other native vegetation around the facility shall be saved. This allows for a smooth transition to other undeveloped areas and helps retain the character of the site.

New vegetation will need to be planted regardless of how much is cleared. Plantings should be designed with specific functions in mind: soil preservation, erosion control, evapotranspiration, screening, space definition, sun and shade, and others. Use a combination of trees, shrubs and groundcovers to provide variety and interest. Plant at least three different species of trees and shrubs.

Native plants that will tolerate flooding and wet conditions are preferred. To ensure survival of newly planted native vegetation, it is recommended that the plants be irrigated for the first season. In wet ponds with standing water, wetland herbaceous species (cattails, sedges, rushes, etc.) must be included.

Regional wet ponds located in commercial developments should be designed with consideration for pedestrian and passive recreation facilities. Amenities around regional wet ponds such as picnic tables, benches, gazebos, etc. are encouraged. Aeration and/or recirculation of the water, such as waterfalls, cascades and fountains, should be considered to reduce the potential for odors to develop during the warmer months, to add visual interest, and to mask unwanted traffic noise.

Consult City staff for additional details on plant and landscape design criteria.

#### 5A.035 Storm Signage

Residential subdivisions shall provide signage (see detail) to enhance the protection of the storm drainage system. Signage for stormwater facilities and pet waste stations shall be installed by the developer prior to final Public Works approval.

#### 5A.040 Conveyance

Pipe: Storm drain pipe within a public right-of-way or easement shall be sized to carry the maximum anticipated runoff from the possible contributing area using a 25 year, 24 hour storm event model or a continuous time series model with 25 year conditions, whichever is more stringent.

All storm pipe shall be a minimum of 12 inch diameter for mains within the right-of-way. Laterals less than 12 inch in diameter must be approved by City staff as supported by situation variables. When private stormwater (i.e. roof, lot or footing drains) cannot be infiltrated on individual lots, the minimum standard piping connection to the public system shall be 8 inch PVC. The 8 inch main used for connection shall begin at the right-of-way, the connection to the catch basin or manhole shall be cored.

The minimum cover above the top of the storm drain pipe shall be 2 feet. Where the minimum depth includes the roadway section, structural calculations for the appropriate H-loading shall be submitted along with the plans. All pipe specified where the cover is 2 feet or less shall be concrete or ductile iron of a class determined by the structural calculations.

All pipe for storm mains shall comply with the requirements specified in the Storm General Notes on the following pages.

Channels: The City encourages the use of open vegetated channels to convey stormwater runoff when possible. Any open channels proposed to be located within public right-of-way shall require special approval from the Director of Public Works.

Private stormwater conveyance piping shall not be located within the public right-of-way. Where soils or other conditions prohibit infiltration on individual parcels (as determined by the Drainage Manual Administrator), stormwater may be conveyed to the stormwater facilities associated with the residential or commercial development. In that case, the stormwater conveyance system located in the public right-of-way shall be sized to accommodate the additional stormwater. The minimum private stormwater conveyance pipe size within the right of way shall be 8 inch in diameter. Multiple roof drains shall be terminated at a common junction structure outside of the Right of Way (i.e. catchbasin or manhole). The connection from the common junction structure to the City's storm system shall be through an 8 inch main connecting to a City catchbasin or Manhole.

### 5A.050 Staking

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

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

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

- A. Stake centerline alignment every 50 feet with station and cut or fill to invert of pipe.
- B. Stake location of all catch basins, manholes and other fixtures for grade and alignment with cut or fill to rim and invert of all pipes.
- C. Grade stake or slope stake (as appropriate) at intervals, sufficient to control location, size and depth of retention/detention facilities.

5A.060 Erosion Control

See Chapters 1 and 4 of the City of Lacey 2010 Stormwater Design Manual for specific erosion control requirements. Sites subject to a Construction Stormwater Pollution Prevention Plan (SWPPP) must have the SWPPP approved prior to any site disturbing activity. All erosion control measures shall be implemented and maintained throughout the entire site development process and a financial vehicle shall be provided to ensure removal of temporary erosion control measures after the project is developed. At time of building permit issuance, the permit holder will be issued an erosion control sign. The sign shall be posted and maintained in a visible location on the project site. The removal or lack of a posted erosion control sign will result in a stop work order until the erosion control sign is properly posted.

5A.070 Trench Excavation

See Chapter 3.170 for requirements regarding trench excavation.

5A.080 Backfilling

See Chapter 3.180 for requirements regarding backfilling.

5A.090 Street Patching and Restoration

See Chapter 4B.170 and 4B.180 for requirements regarding street patching and trench restoration.

5A.100 Maintenance

The City shall maintain all stormwater system elements located within the public rights-of-way. The developer, homeowner association, or other responsible entity shall be responsible for maintaining stormwater system elements located outside of the rights-of way.

The Agreement to Maintain Stormwater Facilities and its attachment "A", known as Appendix K of the *Drainage Design and Erosion Control Manual for Lacey* has been superseded. All projects regardless of year of construction shall be maintained per the standards described in the City of Lacey 2010 Stormwater Design Manual. Developers in Lacey are required to use the amended version of this document located in Appendix Q of this manual.

The General Notes on the following pages shall be included on any plans dealing with storm systems in the City in lieu of the notes in Appendix S of the Drainage Manual.

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**GENERAL NOTES (STORM DRAIN CONSTRUCTION)**

1. All approvals and permits required by the City of Lacey shall be obtained by the contractor prior to the start of construction. A grading permit for storm pond construction may be required.
2. Storm drain pipe shall be on the WSDOT Qualified Products list for the specification listed below:
  - A. Plain Concrete Storm Sewer Pipe or Reinforced Concrete Storm Sewer Pipe per WSDOT Standard Specification 9-05.7.
  - B. Solid Wall PVC Storm Sewer Pipe per WSDOT Standard Specification 9-05.12(1).
  - C. Ductile Iron Sewer Pipe per WSDOT Standard Specification 9-05.13.
  - D. Hancor Blue Seal <sup>TM</sup> and Advanced Drainage Systems (ADS/Hancor) N-12 HDPE and (ADS/Hancor) SaniTite up to 36" in diameter per WSDOT Standard Specifications 9-05.20 and 9-05.24.
  - E. Contech DuroMaxx steel rib reinforced polyethylene pipe, in diameters from 24 inch to 60 inch per WSDOT Standard Specification 9-05.22.
3. All storm drainage systems shall be air tested at 4 psi except concrete pipe which shall be tested per WSDOT/APWA standard for concrete storm pipe. All flexible pipe shall be mandrel tested per WSDOT/APWA standards. Testing shall be done by the contractor.
4. Testing of the storm sewer shall include video taping of the main by the contractor. Immediately prior to video taping, enough water shall be run down the line so it comes out the lower catchbasin. A copy of the video tape shall be submitted to the City of Lacey. Acceptance of the line will not be made until after the tape has been reviewed and approved by the City. Testing shall take place after all underground utilities are installed and compaction of the roadway subgrade is complete.
5. Special structures, oil/water separators and outlet controls shall be installed per plans and manufacturers' recommendations. Where oil/water separators are connected to a sewer system, they shall be installed with a P-trap or check valve to prevent odors.
6. All disturbed areas shall be stabilized in accordance with the, Core Requirement 2 of the City of Lacey 2010 Stormwater Design Manual. For sites where vegetation has been planted through hydroseeding, the financial guarantee will not be released until the vegetation has been thoroughly established.
7. Where connections require "field verifications", connection points will be exposed by contractor and fittings verified 48 hours prior to distributing shut-down notices.
8. All catch basins/manholes shall have pads per Lacey standard detail.

9. Any changes to the design shall first be reviewed and approved by the project engineer and the City of Lacey.
10. All storm pipe shall be a minimum of 12 inch diameter for mains and crossings. When private stormwater (i.e. roof, lot or footing drains) cannot be infiltrated on individual lots, the minimum standard piping connection to the public system shall be 8 inch PVC. The 8 inch main used for connection shall begin at the right-of-way, the connection to the catch basin or manhole shall be cored.
11. All storm mains and retention/detention areas shall be staked for grade and alignment by an engineering or survey firm licensed to perform such work.
12. The minimum staking of storm sewer systems shall be as follows:
  - A. Stake location of all catch basins, manholes and other fixtures for grade and alignment.
  - B. Stake location, size, and depth of retention/detention facility.
  - C. Stake finished grade of all stormwater features, including but not limited to catch basin/manhole rim elevations, overflow structures, weirs, and invert elevations of all pipes in catch basins, manholes, and pipes that daylight.
13. Pipe materials used for stormwater conveyance shall be as approved by the jurisdiction. Pipe size, slope, cover, etc., shall be as specified in the City of Lacey Development Guidelines and Public Works Standards.
14. All driveway culverts shall be of sufficient length to provide a minimum 3:1 slope from the edge of the driveway to the bottom of the ditch. Culverts shall have beveled end sections to match the side slope.
15. If drainage outlets (stub-outs) are to be provided for each individual lot, the stub-outs shall conform to the following:
  - A. Each outlet shall be suitably located at the lowest elevation on the lot, so as to service all future roof downspouts and footing drains, driveways, yard drains, and any other surface or subsurface drains necessary to render the lots suitable for their intended use. Each outlet shall have free-flowing, positive drainage to an approved storm water conveyance system or to an approved outfall location.
  - B. Outlets on each lot shall be located with a five-foot-high, 2"x 4" stake marked "storm" or "drain." The stub-out shall visibly extend above surface level and be secured to the stake.
  - C. Pipe material shall be as approved by the jurisdiction.
  - D. Drainage easements are required for drainage systems designed to convey flows through individual lots.

- E. The developer and/or contractor is responsible for coordinating the locations of all stub-out conveyance lines with respect to the utilities (e.g., power, gas, telephone, television).
  - F. All individual stub-outs shall be privately owned and maintained by the lot home owner.
16. The storm drainage system shall be constructed according to approved plans on file with the jurisdiction. Any material deviation from the approved plans will require written approval from the jurisdiction.
  17. All disturbed areas shall be seeded and mulched or similarly stabilized to the satisfaction of the jurisdiction. For sites where grass has been planted through hydroseeding, the performance bond will not be released until the grass has been thoroughly established, unless otherwise approved by the jurisdiction.
  18. All building downspouts on commercial sites shall be connected to the storm drainage system, unless otherwise approved by the jurisdiction.
  19. All erosion control and stormwater facilities shall be regularly inspected and maintained by the contractor during the construction phase of the development project.
  20. No final cut or fill slope shall exceed two (2) horizontal to one (1) vertical without stabilization by rockery or by a structural retaining wall.
  21. The project engineer shall verify the locations, widths, thicknesses, and elevations of all existing pavements and structures, including utilities and other frontage improvements, that are to interface with new work, provide all trimming, cutting, saw cutting, grading, leveling, sloping, coating, and other work, including materials as necessary to cause the interface with existing works to be proper, without conflict, acceptable to the engineer and the jurisdiction, complete in place, and ready to use.
  21. Compaction of all fill areas shall be per current APWA specifications. Fill shall be provided in 6" maximum lifts and shall be compacted to 95 percent of its maximum relative density.

Revised: 03/2014

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**5B STORMWATER MAINTENANCE CODE**

## 5B.010 Purpose

The provisions of this Chapter are intended to:

- A. Provide standards and procedures for inspection, maintenance, and repair of stormwater facilities in Lacey to help contribute to an effective and functional stormwater system.
- B. Comply with Washington Department of Ecology (Ecology) regulations and requirements for local governments.
- C. Authorize the Lacey Stormwater Utility to require that stormwater facilities be inspected, maintained, and repaired in conformance with this Chapter.
- D. Establish the minimum level of compliance, which must be met.
- E. Guide and advise all who conduct inspection, maintenance, and repair of stormwater facilities.
- F. Prevent harmful materials from leaking, spilling, draining, or being dumped into any public or private stormwater system.
- G. Provide a method of enforcement for compliance with this Chapter.

## 5B.020 Definitions

For the purpose of this Chapter, the following definitions apply:

All Known, Available, and Reasonable methods of prevention, control, and Treatment (AKART) -- See also the State Water Pollution Control Act, sections 90.48.010 RCW and 90.48.520 RCW.

“Best management practice” or “BMP” -- physical, structural, and/or managerial practices that, when used singly or in combination, prevent or reduce pollution of stormwater. BMP’s are listed and described in the Stormwater Management Manual.

“Director” -- the Public Works department director and/or designees.

“Ground Water” -- water in a saturated zone or stratum beneath the surface of the land or below a surface water body.

“Harmful materials” -- substances that may create a public nuisance or constitute a hazard to humans, animals, fish or fowl, or any solid, dangerous, or extremely hazardous waste, as defined by the Chapter 173-304 of the Washington Administrative Code (WAC) or Chapter 173-303 WAC. “Harmful materials” also include substances that, when released into the environment, may cause non-compliance with the following Chapters of the Washington Administrative Code: 246-290, 173-200, 173-201, 173-204, and/or 173-340.

“Hyperchlorinated” -- water that contains more than 10mg/Liter chlorine.

“Illicit Discharge” -- any direct or indirect non-stormwater discharge to the city’s storm drain system, except as expressly allowed by this chapter.

“Illicit connection” -- any man-made conveyance that is connected to a municipal separate storm sewer without a permit, excluding roof drains and other similar type connections. Examples include sanitary sewer connections, floor drains, channels, pipelines, conduits, inlets, or outlets that are connected directly to the municipal separate storm sewer system.

“Municipal separate storm sewer system (MS4)” -- a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):

- a. Owned or operated by the City of Lacey;
- b. Designed or used for collecting or conveying stormwater;
- c. Which is not part of a Publicly Owned Treatment Works (POTW). “POTW” means any device or system used in treatment of municipal sewage or industrial wastes of a liquid nature which is publicly owned; and
- d. Which is not a combined sewer. “Combined sewer” means a system that collects sanitary sewage and stormwater in a single sewer system.

“National Pollutant Discharge Elimination System (NPDES) Stormwater Discharge Permit” -- a permit issued by the Environmental Protection Agency (EPA) (or by the Washington Department of Ecology under authority delegated pursuant to 33 USC Section 1342(b)) that authorizes the discharge of pollutants to waters of the United States, whether the permit is applicable on an individual, group, or general area-wide basis.

“Non-stormwater discharges to the stormwater system” -- discharges to any portion of the public or privately owned stormwater system that are not composed entirely of rainfall or snow melt. Examples may include, but are not limited to, sanitary wastewater, laundry wastewater, non-contact cooling water, vehicle wash wastewater, radiator flushing wastewater, spills from roadway accidents, and improperly disposed motor oil, solvents, lubricants, and paints.

“Person” -- any individual, partnership, corporation, association, organization, cooperative, public or municipal corporation, agency of the state, or local governmental unit, however designated.

“Pollutant” -- anything which causes or contributes to pollution. Pollutants may include, but are not limited to: paints, varnishes and solvents; oil and other automotive fluids; nonhazardous liquid and solid wastes and yard wastes; refuse, rubbish, garbage, litter, or other discarded or abandoned objects and accumulations, so that same may cause or contribute to pollution; floatables; pesticides, herbicides, and fertilizers; hazardous substances and wastes; sewage, fecal coliform and pathogens; dissolved and particulate metals; animal wastes; wastes and residues that result from constructing a building or structure; and noxious or offensive matter of any kind.

“Premises” -- any building, lot, parcel of land, or portion of land, whether improved or unimproved, including adjacent sidewalks and parking strips.

“Stormwater” -- that portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, channels, or pipes into a defined surface water channel or a constructed infiltration facility.

“Stormwater facility” -- a constructed component of a stormwater system, designed or constructed to perform a particular function or multiple functions. Stormwater facilities include, but are not limited to, pipes, swales, ditches, culverts, street gutters, detention basins, retention basins, constructed wetlands, infiltration devices, catch basins, oil/water separators, and sediment basins. Stormwater facilities are described in the Stormwater Management Manual. “Stormwater facility” includes both public and privately owned facilities.

“Stormwater Management Manual” or “Manual” -- the Stormwater Management Manual for Western Washington prepared by the State Department of Ecology and dated February 2005 or any other technically equivalent manual.

“Stormwater system” -- constructed and natural features which function together as a system to collect, convey, channel, hold, inhibit, retain, detain, infiltrate, divert, treat, or filter stormwater. “Stormwater system” includes both public and privately owned features.

### 5B. 030 Maintenance Requirements

All stormwater facilities in the City of Lacey, both public and private, shall be maintained according to this Chapter, maintenance guidelines specific to the stormwater facility, and the Minimum Maintenance Requirements and Standards of the Manual.

### 5B. 040 Minimum Requirements

- A. All stormwater facilities shall be inspected at regular intervals and maintained and repaired as needed to comply with: Section 5B.080 of this Chapter, the approved designs for stormwater facilities, stormwater permits which may be issued by the City of Lacey, the State Department of Ecology or the Environmental Protection Agency (EPA), applicable construction standards, and the minimum requirements as stated in the Stormwater Management Manual.
- B. All stormwater facilities shall be inspected by the City on a periodic basis, as described in Section 5B.080. If, during an inspection, a facility is found to not be in compliance with Section 5B.080, all subsequent inspection and maintenance intervals shall be scheduled more frequently if determined by the City to be necessary in order to assure future compliance.

5B. 050 Disposal of Waste from Maintenance Activities

- A. Disposal of waste from maintenance activities shall be conducted in accordance with Chapters 173-304 and 173-303 of the WAC, the State Department of Ecology guidelines for disposal of waste materials from stormwater maintenance activities, and the Stormwater Management Manual.
- B. In addition to any of the above mentioned existing regulations and guidelines, the Stormwater Utility may develop additional requirements for handling and disposal of waste generated from maintenance activities within Lacey which, upon adoption, shall also apply. Additional requirements shall be placed in the Stormwater Management Manual.

5B. 060 Compliance Required

Unless otherwise specified by agreement, property owners are responsible for the maintenance, operation, and repair of stormwater systems and BMP's within their property. Property owners shall maintain, operate, and repair these facilities in compliance with the requirements of this Chapter and the City of Lacey 2010 Stormwater Design Manual.

5B. 070 Inspection Authority

During routine maintenance inspections to determine compliance with the provisions of Section 5B.080 or whenever there is cause to believe that a violation of the Chapter has been or is being committed, the City is authorized to inspect during regular working hours and at other reasonable times, all stormwater systems within Lacey to determine compliance with the provisions of this Chapter.

5B. 080 Inspection and Minimum Maintenance Requirements

These maintenance standards are intended to give support and guidance to all persons and property owners who must comply with local stormwater management requirements.. All privately owned stormwater systems shall be maintained by the owner at his/her expense. The City of Lacey Public Works will complete and file a status report with the property owner or his/her designee after inspections have been completed. The minimum requirements listed herein will be subject to review and revision by the City on an annual basis in January.

- A. All parts of privately owned stormwater systems shall be maintained and/or restored to assure performance as designed and intended. All physical parts of the stormwater system shall be repaired and maintained per the City of Lacey, Development Guidelines and Public Works Standards, City of Lacey 2010 Stormwater Design Manual and any guidelines specific to the respective facility.
- B. Stormwater system modifications or major repairs must be reviewed and approved by the City of Lacey prior to implementation. This is required to ensure that the intent of the originally approved stormwater system is

achieved. The City may require the property owner to submit detailed drawings and/or specifications regarding proposed modifications and/or repairs.

- C. The City may require either partial or complete cleaning of a stormwater system whenever a prohibited substance (see item I, this section) is found to be present in a stormwater system.
- D. A licensed, bonded, and insured contractor must accomplish all maintenance of privately owned stormwater systems except for normal vegetation maintenance of facilities.
- E. All State and Federal confined space entry regulations and requirements must be followed.
- F. All maintenance work shall be completed in accordance with Section - 5B.040.
- G. All privately owned pipes, catch basins, manholes, inlets, ditches, swales/bioswales, detention/retention systems, vaults, water quality facilities, flow control oil/water separators, sedimentation ponds, and stream channels located on (or running through) commercial properties, multi-family developments, private plats, and private short plats shall be inspected annually unless vested under a different frequency of inspection by the City and/or property owner and shall be maintained by the property owner.
- H. stormwater system maintenance shall be required and performed in accordance with Chapter 9 of the City of Lacey 2010 Stormwater Design Manual:
- I. Prohibited Discharges. The following materials/substances will not be allowed to enter any surface or sub-surface part of the public and/or private stormwater system. All listed prohibited materials shall be stored, handled and disposed of in a manner that will prevent them from entering any part of the public, private stormwater system, or groundwater system:
  - All non-stormwater discharges to the stormwater system, unless such discharges are authorized in accordance with Chapter 173-216 of the Washington Administrative Code. (WAC) (State Waste Discharge Permit Program) or Chapter 173-220 WAC (National Pollutant Discharge Elimination System Permit Program).
  - Any solid, dangerous, or extremely hazardous waste, as defined by Chapters 173-304 WAC (Minimum Functional Standards for Solid Waste Handling) or Chapter 173-303 WAC (Dangerous Waste Regulations).
  - Any substance that, when released into the environment, may cause non-compliance with Chapters 246-290 WAC (Public Water Supplies); 173-200 WAC (Water Quality Standards for Ground Waters of the State of Washington), 173-201 WAC (Water Quality Standards

for Surface Waters of the State of Washington), 173-204 WAC (Sediment Management Standards); or 173-340 WAC (The Model Toxics Control Act Cleanup Regulation).

- Petroleum products including, but not limited to oil, gasoline, grease, fuel oil and heating oil.
- Trash and debris
- Chemicals and/or paint
- Animal waste
- Steam cleaning waste
- Uncured concrete wash water (generated during cleaning, finishing or during exposure of aggregate).
- Laundry wastes or other soaps
- Pesticides, herbicides or fertilizers
- Sewage
- Heated water
- Degreasers and/or solvents
- Bark or other fibrous or organic material
- Antifreeze and/or other automotive products
- Animal carcasses or any portion thereof
- Earth in quantities which cause violation of State water quality standards.
- Acids, alkalis, or bases
- Recreational vehicle wastes
- Dyes unless prior permission has been granted by the Director
- Construction materials and residues
- Wash water, sediment, and debris from street sweeping and street washing
- Metals in either particulate or dissolved form
- Flammable or explosive materials
- Radioactive material
- Batteries
- Drain cleaners
- Swimming pool or spa filter backwash
- Recreational vehicle waste
- Food wastes
- Lawn clippings, leaves, or branches
- Chemicals not normally found in uncontaminated water.

J. Allowable Discharges. The following types of discharges shall not be considered illegal discharges for the purposes of this chapter unless the director determines that the type of discharge, whether singly or in combination with others, is causing or is likely to cause pollution of surface water or groundwater:

- Diverted stream flows
- Rising ground waters
- Uncontaminated ground water infiltration – as defined in 40 CFR 35.2005(20).
- Uncontaminated pumped ground water
- Foundation drains
- Air conditioning condensation

- Irrigation water from agricultural sources that is commingled with urban stormwater
  - Springs
  - Uncontaminated water from crawl space pumps
  - Footing drains
  - Flows from riparian habitats and wetlands
  - Discharges from emergency fire fighting activities.
  - Non stormwater discharges authorized by another NPDES or State Wastewater Discharge Permit
- K. Conditional Discharges. The following types of discharges shall not be considered illegal discharges for the purposes of this chapter if they meet the stated conditions, or unless the director determines that the type of discharge, whether singly or in combination with others, is causing or is likely to cause pollution of surface water or groundwater:
1. Potable water, including water from water line flushing, hyperchlorinated water line flushing, fire hydrant system flushing, and pipeline hydrostatic test water. Planned discharges shall be de-chlorinated to a concentration of 0.1 ppm or less, pH-adjusted, if necessary and in volumes and velocities controlled to prevent re-suspension of sediments in the stormwater system;
  2. Lawn watering and other irrigation runoff are permitted but shall be minimized;
  3. De-chlorinated swimming pool, spa and hot tub discharges. These discharges shall be de-chlorinated to a total residual chlorine concentration of 0.1 ppm or less, pH-adjusted, and re-oxygenated, if necessary and in volumes and velocities controlled to prevent re-suspension of sediments in the stormwater system. Discharge shall be thermally controlled to prevent increase in temperature of the receiving water;
  4. Street and sidewalk wash water, water used to control dust, and routine external building wash down that does not use detergents are permitted if the amount of street wash and dust control water used is minimized. At active construction sites, street sweeping must be performed prior to washing the street;
  5. Non-stormwater discharges covered by another NPDES permit, provided, that the discharge is in full compliance with all requirements of the permit, waiver, or order and other applicable laws and regulations; and provided, that written approval has been granted for any discharge to the storm drain system;
  6. Other non-stormwater discharges. The discharges shall be in compliance with the requirements of a stormwater pollution prevention plan (SWPPP) reviewed and approved by the city or county which addresses control of such discharges by

applying AKART to prevent contaminants from entering surface or ground water.

L. Prohibition of Illicit Connections

1. The construction, use, maintenance, or continued existence of illicit connections to the storm drain system is prohibited.
2. This prohibition expressly includes, without limitation, illicit connections made in the past, regardless of whether the connection was permissible under law or practices applicable or prevailing at the time of connection.
3. A person is considered to be in violation of these provisions if the person connects a line conveying sewage to the MS4, or allows such a connection to continue.

5B. 090 Stormwater Maintenance Inspection Procedures

- A. Inspection procedures will be maintained and updated as necessary in the “Private Stormwater Facilities Inspection Program” standard operating procedure within Public Works Operations.
- B. Prior to making any inspections on private property that has no dedicated access easements to the City, the inspector shall present identification credentials, state the reason for the inspection, and request entry.
- C. 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.
- D. 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 system creates an immediate hazard to persons or property, the inspector may enter the property.
- E. Unless entry is consented to by the owner or person(s) in control of the property or portion of the property, conditions are reasonably believed to exist which create imminent hazard, or an access easement to the storm facility was dedicated to the City, the inspector shall obtain a search warrant prior to entry as authorized by the laws of the State of Washington.
- F. The inspector may inspect the stormwater system without obtaining a search warrant provided for in Subsection D, provided the inspection can be conducted while remaining on public property or other property on which permission to enter is obtained.

5B. 100 Inspection and maintenance records

Owners of storm drainage systems will be required to provide the City with all existing inspection, maintenance, and repair records, as well as any record drawings or diagrams that they may have for their storm drainage systems when requested.

5B. 110 Enforcement Authority

The City of Lacey is obligated to monitor and enforce water quality standards in conformance with the Clean Water Act of 1972. In addition, the State Department of Ecology requires a public as well as a private stormwater inspection and maintenance program under the NPDES Phase II program. The City or its designee shall administer and enforce this Chapter and shall have the authority to adopt and implement administrative procedures for such enforcement.

5B. 120 Enforcement Policy

- A. Where maintenance and repair is found necessary to correct health or safety problems, to control harmful materials entering the stormwater system, or to remove harmful materials that have entered the stormwater system, such work shall be completed by the owner or operator of the stormwater system or stormwater facility within twenty-four (24) hours of notification of the person or entity responsible for maintenance of the non-compliance. When maintenance and repair is found necessary to prevent water quality degradation, such work shall be completed within seven (7) calendar days of notification, unless there is a severe water quality hazard, in which case such work shall be completed immediately. Other related problems, maintenance, or repairs shall be completed within thirty (30) calendar days of notification of the person or entity responsible for such maintenance of the non-compliance.
- B. In the event a valid response is not received nor the violations corrected, a second letter describing the violations shall be sent in accordance with the procedures set forth above. This second notice shall allow fourteen (14) calendar days for abatement of the violation, or a valid response, to negotiate a schedule as noted in Subsection A, above.
- C. Failure to abate the violation or negotiate a schedule as noted in Subsection B, above within fourteen (14) calendar days of the issuance of the second letter shall be deemed a misdemeanor.

5B. 130 Orders

The City shall have the authority to issue to an owner or person(s) representing an owner an order to maintain or repair a component of a stormwater facility or BMP to bring it into compliance with this Chapter, the City of Lacey 2010 Stormwater Design Manual, and/or other City regulations. The order shall include:

- A. A description of the specific nature, extent and time of the violation, and the damage or potential damage that reasonably might occur.
- B. A notice that the violation or the potential violation cease and desist, and in appropriate cases, the specific corrective action to be taken.
- C. A reasonable time to comply, in conformance with Section 13.66.040 of the Lacey Municipal Code. However, in the event the violation is reasonably believed to create an imminent hazard the City shall have the authority to issue an emergency cease and desist order. Such order shall require immediate compliance with the provisions of this chapter by halting operations and/or terminating discharges.
- D. Penalties may be incurred by any owner of a stormwater system not in compliance with this Chapter.
- E. An order to the owner to provide to the City a detailed plan which may include drawings and steps that will be taken to achieve compliance within a specified time. This plan is subject to approval by the City.

5B. 140 Penalty for Violations

- A. **Persons Subject to Penalty.** Any person who violates or fails to comply with the requirements of this Chapter or who fails to conform to the terms of an approval or order issued by the City may be charged with a misdemeanor. Each day of continued violation shall constitute a separate violation for purposes of this penalty.
- B. **Aiding and Abetting.** Any person who, through an act of commission or omission, aids or abets in the violation shall be considered to have committed a violation of the Chapter, and be subject to enforcement action.
- C. **Re-inspection Fees.** In addition to the penalties to be imposed, the City may impose a re-inspection fee for any account or storm drainage facility found to be not compliance with this Chapter. This inspection fee shall be independent of any current or future penalties that may be incurred by the property owner for noncompliance with this Chapter.
- D. **Disconnection from the MS4.** Illicit connections, illicit discharges, or continued failure of the property owner to comply with the provisions of this chapter may result in disconnection from the MS4.

5B. 150 Severability

If any portion of this Chapter or its application to any person, entity, or circumstance is held invalid, the remainder of this Chapter or the application of the provision to other persons, entities, or circumstances shall not be affected.

5B. 160 Abrogation and Restrictions

It is not intended that this Chapter repeal, abrogate, or impair any existing regulations, easements, covenants, or deed restrictions. However, where this Chapter imposes greater restrictions, the provisions of this Chapter shall prevail.

5B. 170 State Statutes and Regulations

The following states statutes and administrative regulations should be reviewed in conjunction with this Chapter to ensure that all state requirements are satisfied:

A. Revised Code of Washington (RCW)

<u>Title</u>	
43.20	Drinking Water
70.95	Dangerous and Solid Waste
70.105	Dangerous Waste, MTCA, Sediment Standards
90.48	Ground Water, Surface Water, Sediment
90.54	Ground Water
90.70	Sediment

B. Washington Administrative Code (WAC)

<u>Title</u>	
173-200	Water Quality Standards for Ground Waters of the State of Washington
173-201	Water Quality Standards for Surface Waters of the State of Washington
173-216	State Waste Discharge Permit Program
173-220	National Pollutant Discharge Elimination
173-204	Sediment Management Standards
173-303	Dangerous Waste Regulations
173-304	Minimum Functional Standards for Solid Waste Handling
173-340	The Model Toxics Control Act Cleanup Regulation
246-290	Public Water Supplies

5C.180 Violation deemed misdemeanor:

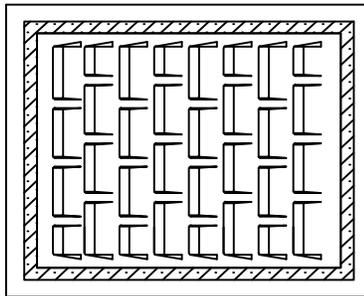
Any violation of the provisions of this Chapter as adopted is a misdemeanor.

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**LIST OF DRAWINGS****CHAPTER 5 - STORM DRAINAGE**

<u>Title</u>	<u>Drawing</u>
Catch Basin Message No Dumping Flows to Waterways .....	5-1
Catch Basin Anti-Dump Message, Type II .....	5-2
Storm Drain Manhole and Logo Lid and Frame Installation .....	5-3
Silt Trap Tee and Depression Detail for Catch Basin .....	5-4
Curb Inlet Grate and Catch Basin Installation .....	5-5
Standard Valve Box Installation.....	5-6
Curb Inlet Grate and Manhole Installation.....	5-7
Optional Storm Manhole Baffle for Pipes Smaller than 24 inches .....	5-8
Optional Storm Manhole Baffle for Pipes 24 inches and Larger .....	5-8.1
Private Storm Connection to Catch Basin in Right-Of-Way.....	5-9
Public Roadway Rain Garden Setback .....	5-10
L.I.D. Curb Inlet Type 1 .....	5-11
Don't Let Your Pooch Pollute! .....	5-16

# NO DUMPING FLOWS TO WATERWAYS

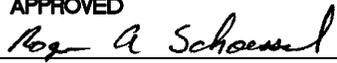


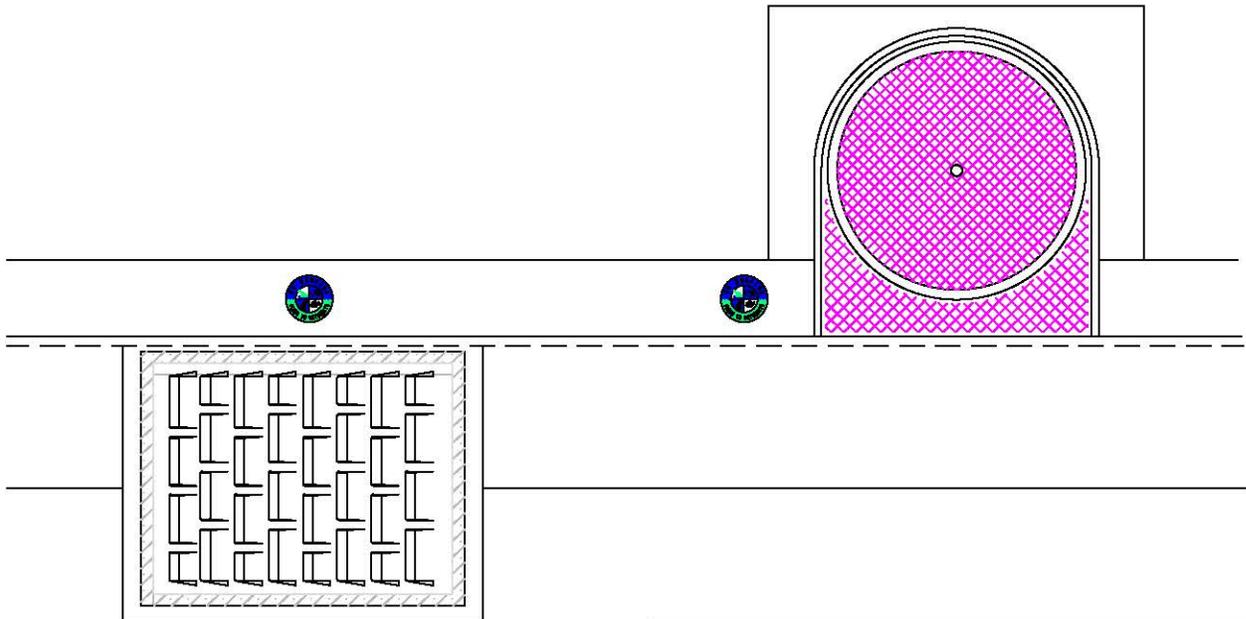
**NO DUMPING  
FLOWS TO  
WATERWAYS**



**NOTES:**

1. CENTER STENCIL 3" FROM ROADSIDE EDGE OF CATCH BASIN.
2. STENCIL LETTERING MUST BE 2" IN HEIGHT AND INSTALLED AS SHOWN ABOVE.
3. STENCIL LETTERING MUST BE WHITE.

<b>CITY OF LACEY, WASHINGTON DEPT. OF PUBLIC WORKS</b>			
<b>CATCH BASIN MESSAGE NO DUMPING FLOWS TO WATERWAYS</b>			
APPROVED  CITY ENGINEER			DWG. NO. 5-1
DES WHO	DWN WHO	CKD RAS	DATE 12/15/2014



**GENERAL NOTES:**

1. ALL DECALS SHALL BE DAS #4.0 TUM-FW MANUFACTURER SPECIFIC.
2. DECALS AND DAS CURB MARKER ADHESIVE (#RS-222) SHALL BE PURCHASED AND AFFIXED BY THE CONTRACTOR/DEVELOPER.
3. DECALS SHALL BE ADHERED TO CLEAN, DRY CONCRETE (EXCLUSIVELY WITH SPECIFIED ADHESIVE) A MINIMUM OF 1" FROM EDGE OF CURB.
4. FINISHED PRODUCT SHALL BE INSPECTED AS PART OF THE CITY'S FINAL WALK THROUGH PROCESS.

DG5-2.DWG

**CITY OF LACEY, WASHINGTON  
DEPT. OF PUBLIC WORKS**

**CATCH BASIN  
ANTI-DUMP MESSAGE  
TYPE II**

APPROVED

*Reg A Schoenel*

CITY ENGINEER

DWG. NO.

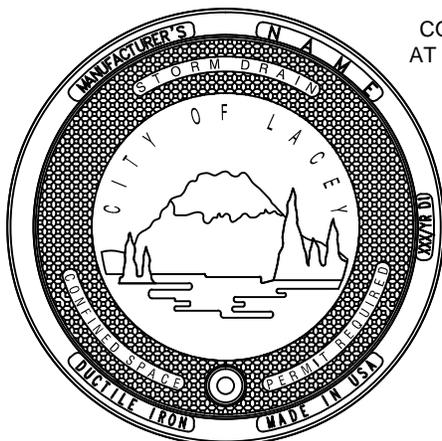
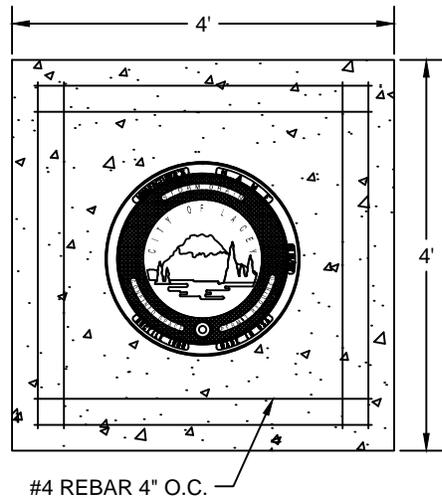
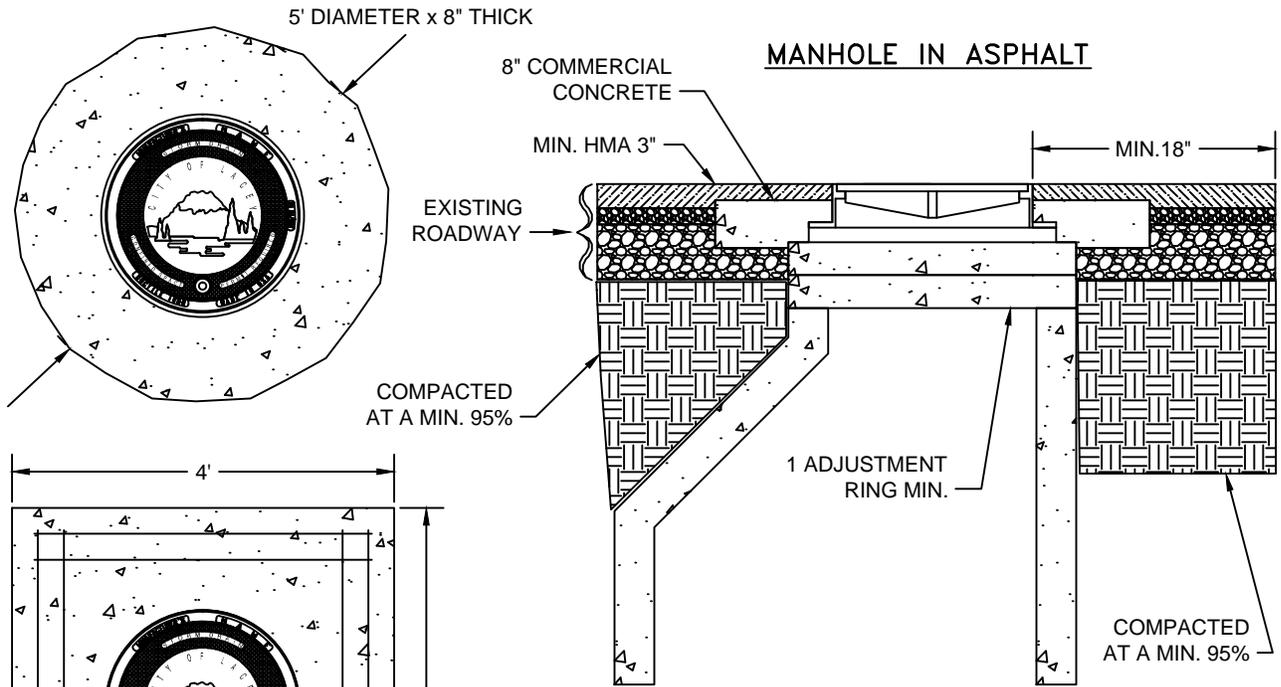
5-2

DES.  
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DATE  
12/15/2014



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GENERAL NOTES:

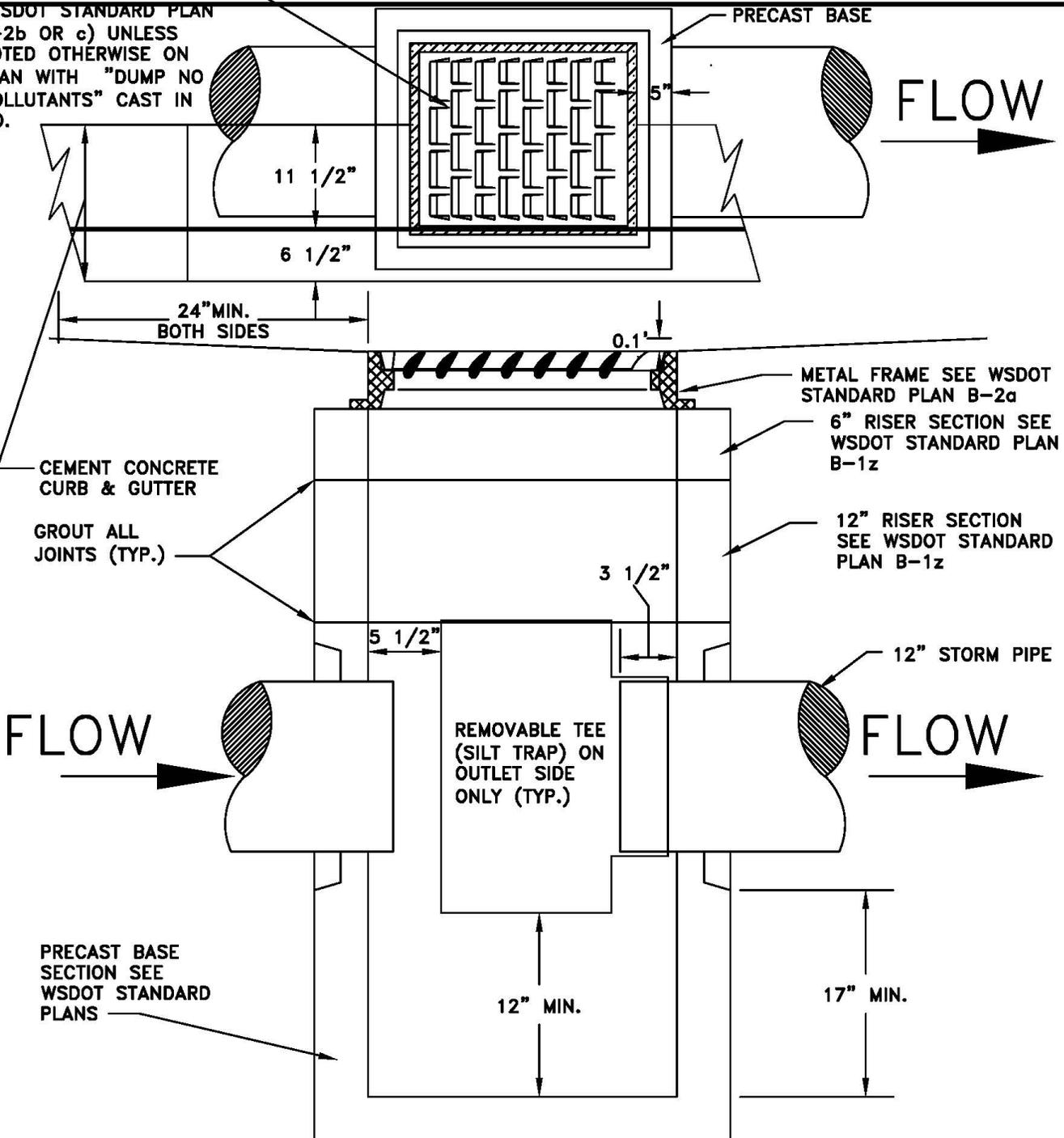
1. ALL CONCRETE PADS FOR MANHOLES OUTSIDE THE ASPHALT SHALL HAVE REINFORCING STEEL AS SHOWN ABOVE, REBAR TO MEET ASTM A615 GRADE 60 FY=60,000 P.S.I.
2. ALL MANHOLE FRAME AND COVER ASSEMBLIES SHALL BE EJCO OR OLYMPIC FOUNDRY, WSDOT STYLE #41 WITH THE CITY LOGO STAMPED IN IT, DUCTILE IRON AND MANUFACTURED IN THE U.S.A.
3. ADJUST GRADE RINGS WITH BRICK WEDGES OR GROUT. NO WOOD OR ROCKS SHALL BE USED AS ADJUSTMENT SPACERS.

DG5-3.DWG

<b>CITY OF LACEY, WASHINGTON DEPT. OF PUBLIC WORKS</b>			
<b>STORM DRAIN MANHOLE LOGO COVER &amp; FRAME INSTALLATION</b>			
APPROVED <i>Roger A. Schaefer</i> CITY ENGINEER		DWG. NO. 5-3	
DES WHO	DWN WHO	CKD RAS	DATE 12/15/2014

40 A 47 METAL GRATE

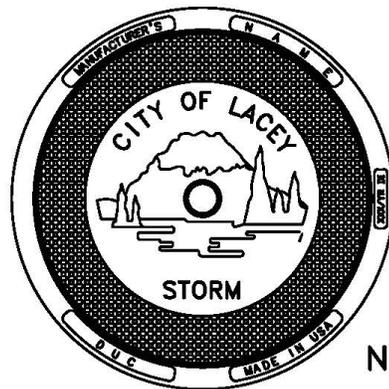
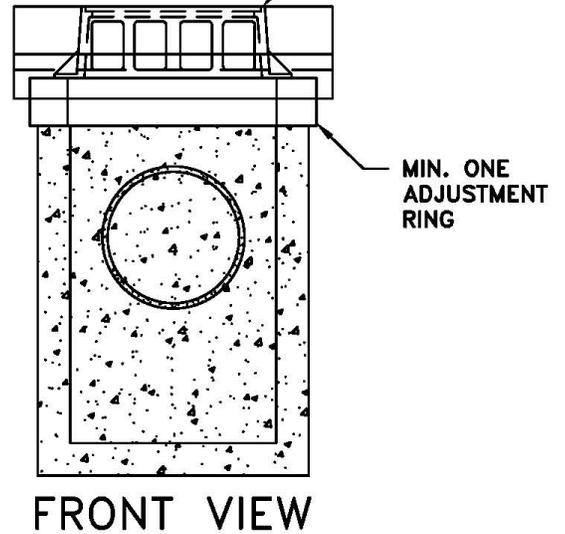
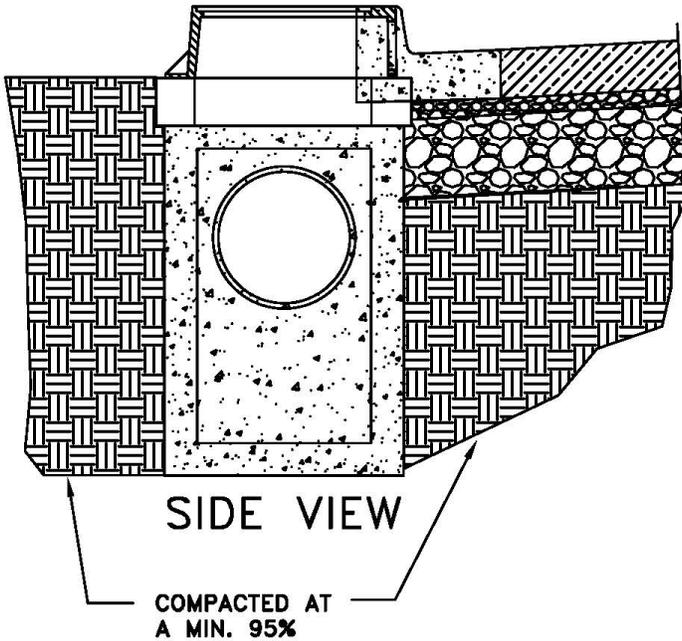
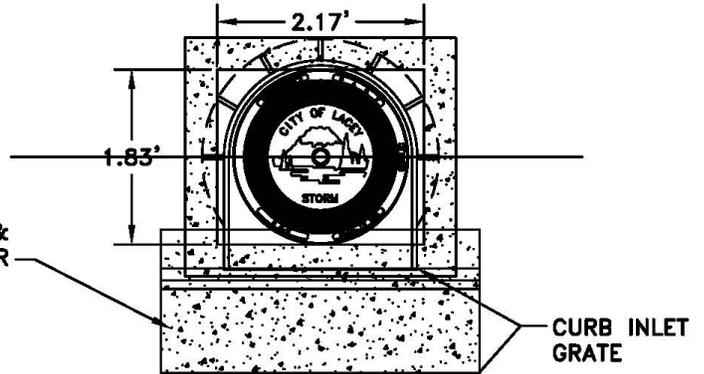
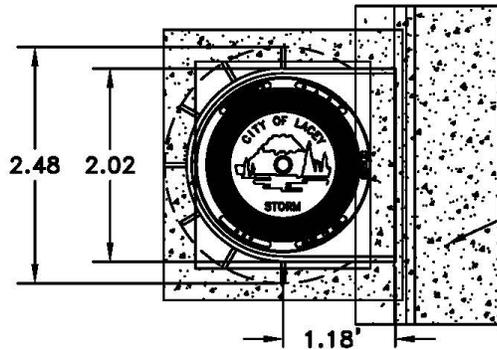
(WSDOT STANDARD PLAN B-2b OR c) UNLESS NOTED OTHERWISE ON PLAN WITH "DUMP NO POLLUTANTS" CAST IN LID.



**GENERAL NOTES:**

1. CATCH BASIN SHALL BE CONSTRUCTED IN ACCORDANCE WITH SPECIFICATIONS IN WSDOT STANDARD PLANS.
2. SEE DETAIL 5-5 FOR PAD REQUIREMENTS.
3. W.S.D.O.T. GRATE B-2C IS FOR BI-DIRECTIONAL FLOWS.
4. REMOVABLE SILT TRAP TEES SHALL BE INSTALLED IN ALL CATCH BASINS.
5. WHEN REMOVABLE SILT TRAP TEES ARE NOT APPLICABLE THE BAFFLE SYSTEM SHALL BE USED SEE DETAILS 5-8 AND 5-8.1.
6. WHEN THE ANGLE OF THE STORM PIPE DOES NOT FIT THE KNOCK-OUT THE BASIN SHALL BE UPGRADED. THE CORNERS OF THE BASIN SHALL NOT BE ALTERED OR BROKEN.

<b>CITY OF LACEY, WASHINGTON DEPT. OF PUBLIC WORKS</b>			
<b>SILT TRAP TEE &amp; DEPRESSION DETAIL FOR CATCH BASINS</b>			
APPROVED <i>Roger A. Schoenfeld</i> CITY ENGINEER		DWG. NO. <b>5-4</b>	
DES WHO	DWN WHO	CKD RAS	DATE 12/15/2014



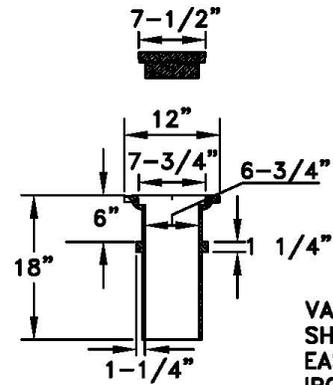
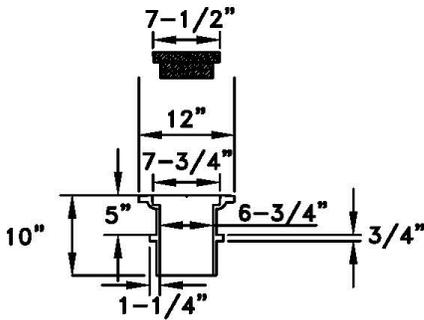
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THE CITY OF LACEY LOGO LIDS SHALL BE USE WHEN AVAILABLE

**GENERAL NOTES:**

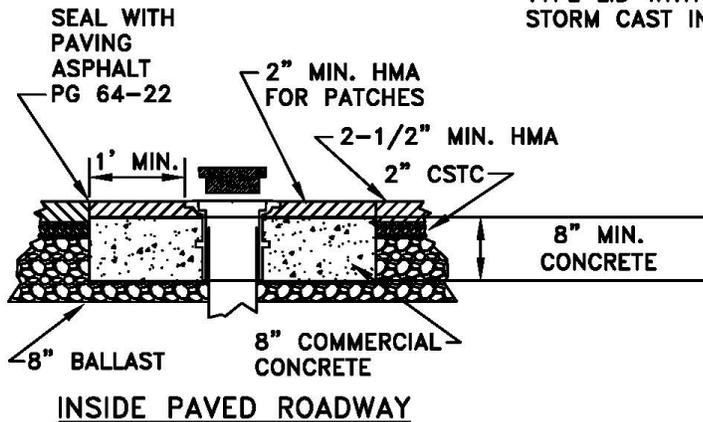
1. CONCRETE PADS FOR ALL CURB INLET BASINS SHALL BE A MINIMUM OF 3' X 3' X 8".
2. ALL STORM MANHOLE LID AND RING ASSEMBLIES SHALL BE EAST JORDAN IRON WORKS OR OLYMPIC FOUNDRY WITH CITY OF LACEY LOGO LIDS WHEN AVAILABLE.
3. ALL STORM MANHOLE LID AND RING ASSEMBLIES SHALL BE DUCTILE IRON AND MANUFACTURED IN THE USA.
4. THIS APPLICATION SHALL BE USED FOR INSTALLATIONS ON ARTERIALS AND BOULEVARDS OR WHEN STORM PIPING IS TOO SHALLOW TO MEET THE MINIMUM 2' OF COVER WHERE THE STORM PIPE ENDS UP IN THE ROADWAY STRUCTURE REGARDLESS OF THE TYPE OF PIPE BEING USED.
5. USE A 2" RECTANGULAR ADJUSTMENT SECTION TURNED LENGTHWISE TO ELIMINATE THE GAP UNDER THE FRAME.

<b>CITY OF LACEY, WASHINGTON DEPT. OF PUBLIC WORKS</b>			
<b>CURB INLET GRATE &amp; CATCH BASIN INSTALLATION</b>			
APPROVED <i>Rog A Schoessel</i> CITY ENGINEER		DWG. NO. <b>5-5</b>	
DES WHO	DWN WHO	CKD RAS	DATE <b>12/15/2014</b>

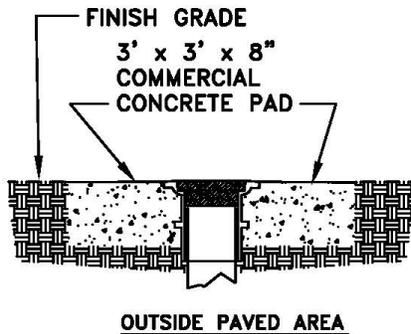


VALVE BOXES SHALL BE EAST JORDAN IRON WORKS (10" OR 18") OR OLYMPIC FOUNDRY (VB-950 10" OR 18")

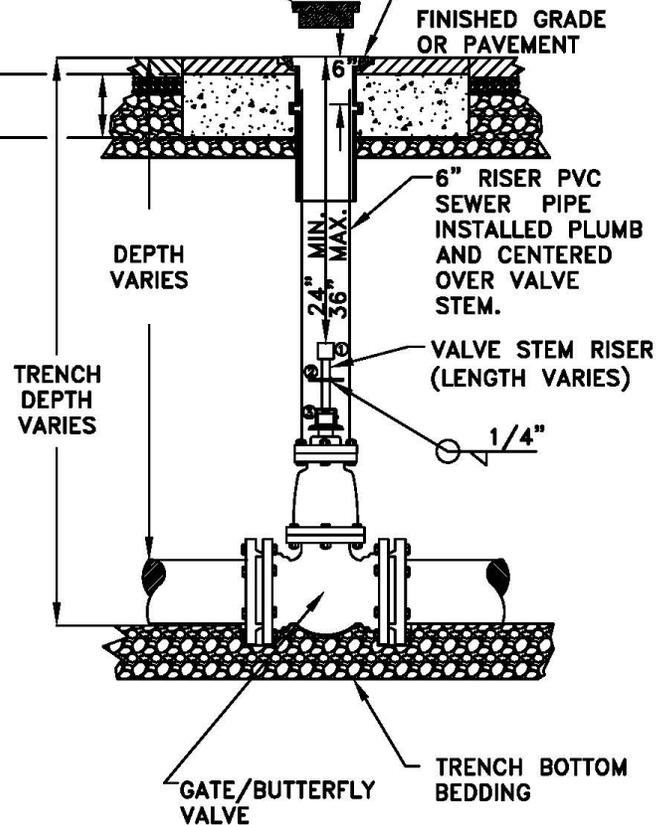
RECESSED HANDLE TYPE LID WITH LACEY STORM CAST IN LID



INSIDE PAVED ROADWAY



OUTSIDE PAVED AREA



**GENERAL NOTES:**

1. ALL WELDS TO THE SHAFT SHALL BE FILLET WELD, AROUND THE ENTIRE PLATE PER #2 BELOW.

**VALVE STEM EXTENSION LEGEND**

- ① VALVE OPERATING NUT OR 1-7/8" X 1-7/8" X 2" HIGH GRADE STEEL WELDED TO GUIDE PLATE. 3/16" THICK X 5 1/5" DIA STEEL GUIDE PLATE WELDED TO RISER SHAFT.
- ② 2"X2"X 3/16" SQUARE STRUCTURAL STEEL TUBING TO FIT OPERATING NUT. LENGTH AS REQUIRED.

CITY OF LACEY, WASHINGTON  
DEPT. OF PUBLIC WORKS

**STANDARD VALVE BOX  
INSTALLATION**

APPROVED

*Rog A Schoessel*  
CITY ENGINEER

DWG. NO.

5-6

DES

WHO

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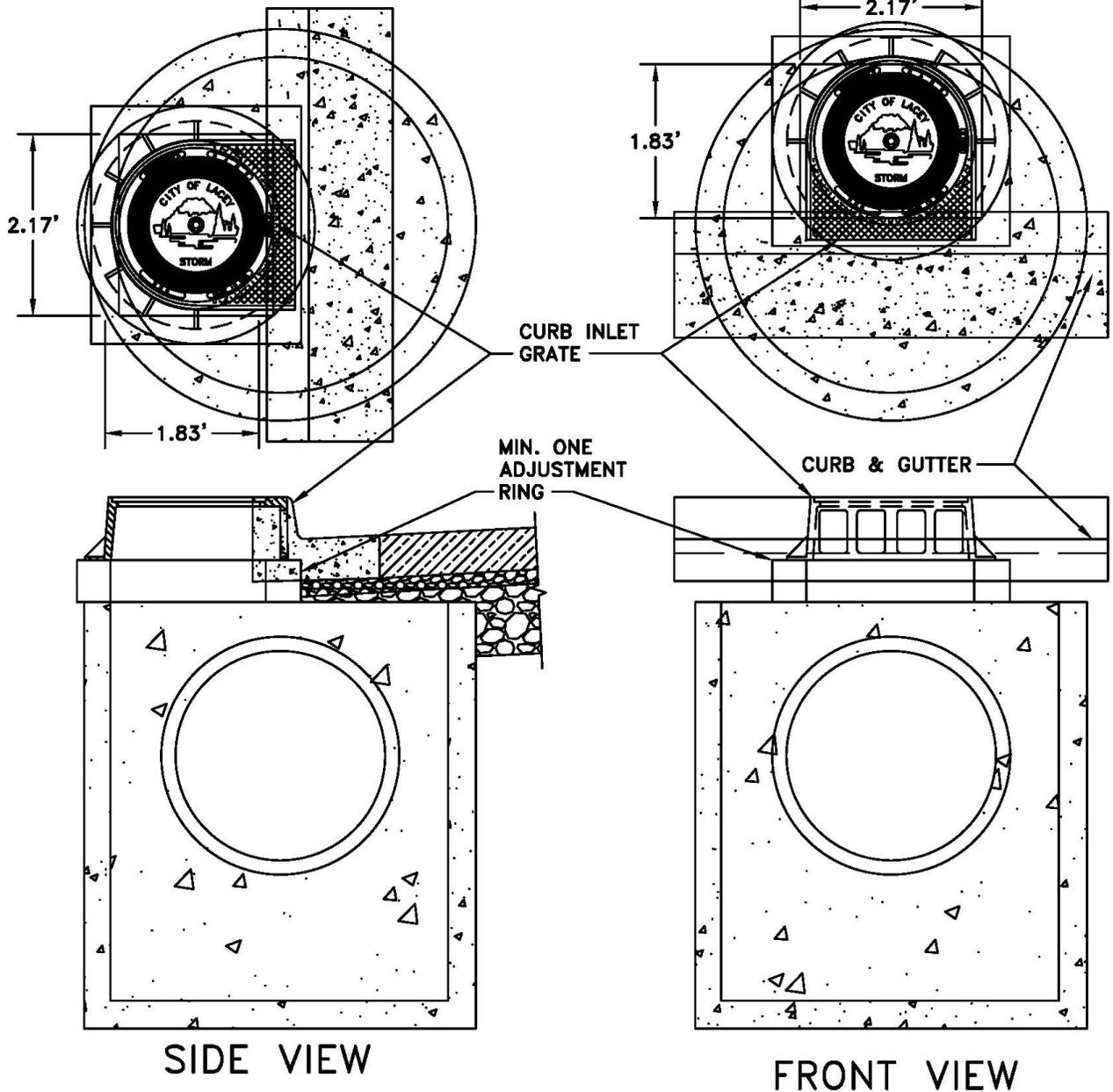
WHO

CKD

RAS

DATE

12/15/2014



**GENERAL NOTES:**

1. ALL STORM MANHOLE LID AND RING ASSEMBLIES SHALL BE EAST JORDAN IRON WORKS OR OLYMPIC FOUNDRY WSDOT STYLE #MH-41 CITY OF LACEY LOGO LIDS.
2. ALL STORM MANHOLE LID AND RING ASSEMBLIES SHALL BE DUCTILE IRON AND MANUFACTURED IN THE USA. NO BOLT DOWN LIDS SHALL BE ALLOWED UNLESS REQUIRED BY THE CITY OF LACEY.
3. USE A 2" RECTANGULAR ADJUSTMENT SECTION TURNED LENGTH WISE TO ELIMINATE THE GAP UNDER THE FRAME.

THE CITY OF LACEY LOGO LIDS SHALL BE USED WHEN AVAILABLE

**CITY OF LACEY, WASHINGTON  
DEPT. OF PUBLIC WORKS**

**CURB INLET GRATE &  
MANHOLE INSTALLATION**

APPROVED

*Reg A Schoessel*  
CITY ENGINEER

DWG. NO.

5-7

DES

WHO

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WHO

CKD

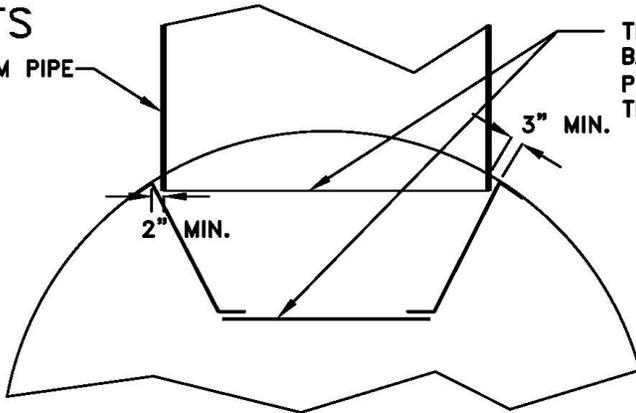
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DATE

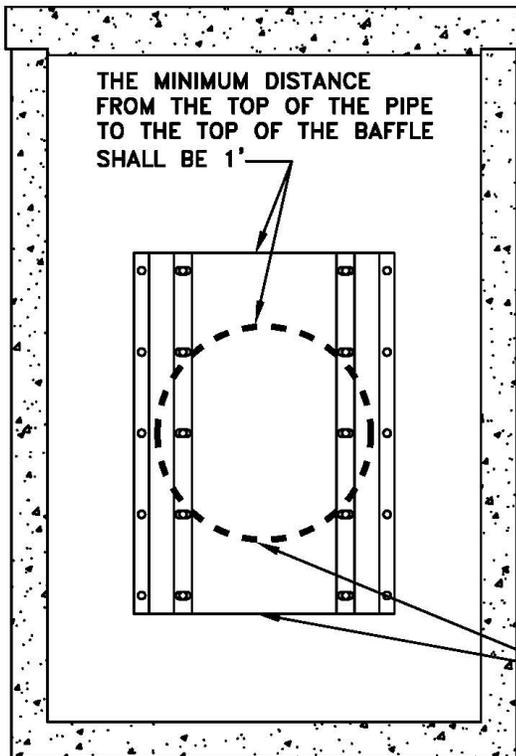
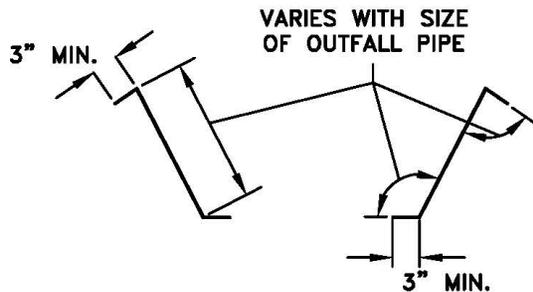
12/15/2014

NTS

STORM PIPE



THE MINIMUM DISTANCE FROM THE BAFFLE TO THE EDGE OF THE OUTFALL PIPE SHALL BE 1' OR AS DESIGNED BY THE DESIGNING ENGINEER

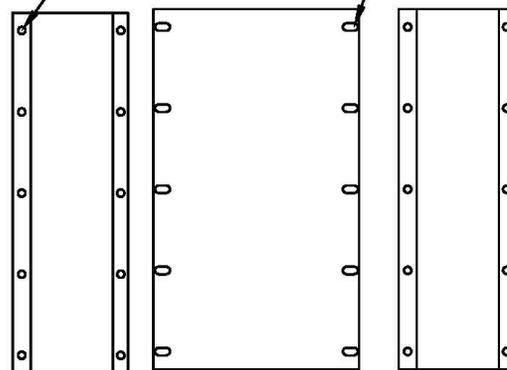


THE MINIMUM DISTANCE FROM THE TOP OF THE PIPE TO THE TOP OF THE BAFFLE SHALL BE 1'

THE MINIMUM SIZE OF THE MANHOLE SHALL BE 54"

5/8" HOLES FOR 1/2" BOLTS

5/8" OBLONG HOLES 1/2" BOLTS



THE MINIMUM DISTANCE FROM THE BOTTOM OF THE PIPE TO THE BOTTOM OF THE BAFFLE SHALL BE 1'

**GENERAL NOTES:**

1. THE BAFFLE SYSTEM SHALL BE USED WHEN SILT TRAP TEES CANNOT BE INSTALLED DUE TO SIZE OF STRUCTURES OR WHEN APPROVED BY THE CITY.
2. ONLY 2 BAFFLES ARE REQUIRED AT THE END OF EACH NEW RUN OR MAIN LINE SYSTEM. THE MINIMUM SIZE OF THE STRUCTURES FOR THE BAFFLES SHALL BE 54". LARGER MANHOLES SHALL BE DETERMINED BY THE SIZE OF THE PIPE(S).
3. THERE SHALL BE A MIN. OF 3 PIECES AND SHALL BE MANUFACTURED TO FIT THROUGH A 24" MANHOLE FRAME.
4. ALL MATERIALS SHALL BE STAINLESS STEEL. THE PANEL THICKNESS SHALL BE 1/8".
5. SEALANT SHALL BE APPLIED TO ALL JOINTS TO PREVENT GAPS IN BAFFLE.
6. THE CITY OF LACEY SHALL DETERMINE IF OTHER STRUCTURES ARE REQUIRED.
7. THE DESIGN AND RESTRICTION CALCULATION SHALL BE DONE BY THE DESIGNING ENGINEER.

CITY OF LACEY, WASHINGTON  
DEPT. OF PUBLIC WORKS

OPTIONAL STORM MANHOLE  
BAFFLE FOR PIPES  
SMALLER THAN 24"

APPROVED

*Roger A. Schoenfeld*

CITY ENGINEER

DWG. NO.

5-8

DES

WHO

DWN

WHO

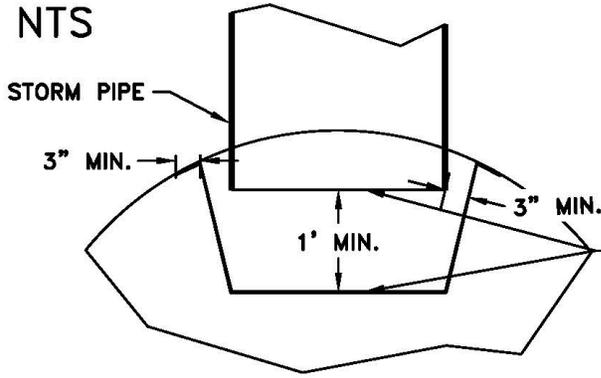
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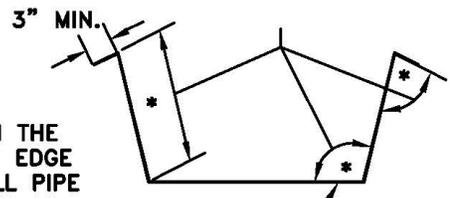
12/15/2014

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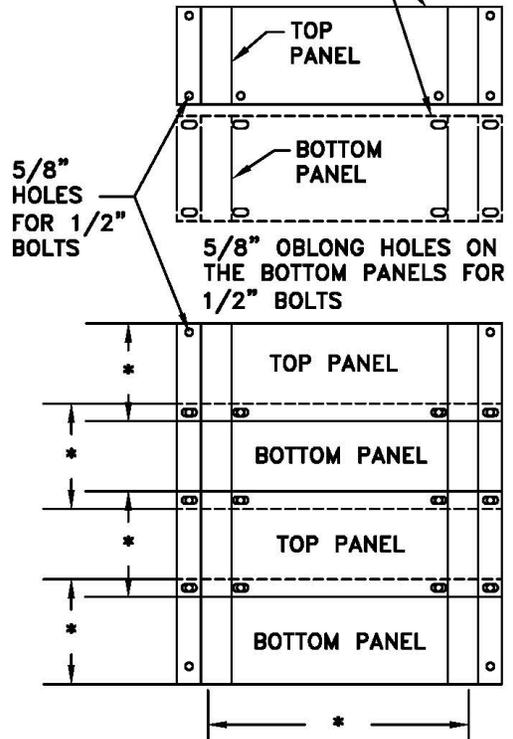
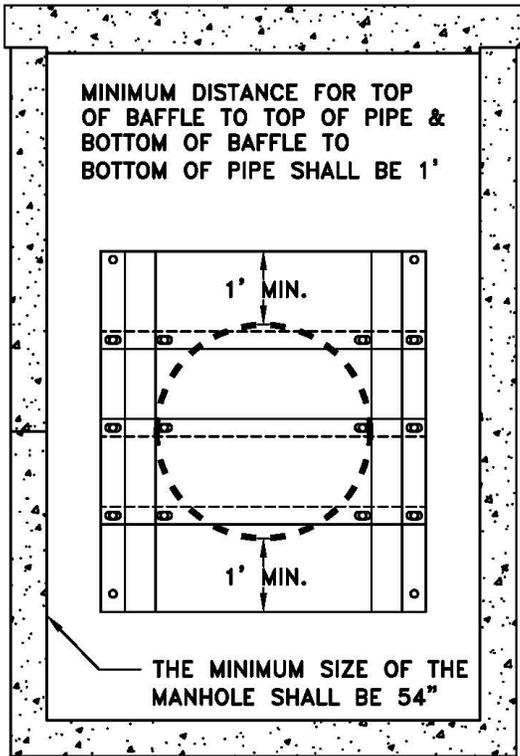


\* LENGTHS, WIDTHS AND ANGLES VARY WITH SIZE OF OUTFALL PIPE

THE MINIMUM DISTANCE FROM THE BAFFLE TO THE EDGE OF THE OUTFALL PIPE SHALL BE 1' OR AS DESIGNED BY THE DESIGNING ENGINEER



PANELS BUILT HORIZONTALLY



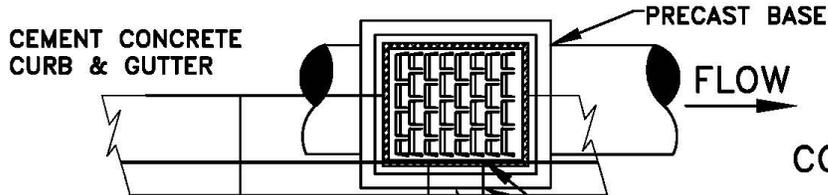
**GENERAL NOTES:**

1. THE BAFFLE SYSTEM SHALL BE USED WHEN SILT TRAP TEES CANNOT BE INSTALLED DUE TO SIZE OF STRUCTURES OR WHEN APPROVED BY THE CITY.
2. ONLY 2 BAFFLES ARE REQUIRED AT THE END OF EACH NEW RUN. THE MINIMUM SIZE OF THE STRUCTURES FOR THE BAFFLES SHALL BE 54". LARGER MANHOLES SHALL BE DETERMINED BY THE SIZE OF THE OUTLET PIPE.
3. THE PANELS FOR 24" AND LARGER PIPES SHALL BE BUILT HORIZONTALLY TO ALLOW FOR THE EASE OF INSTALLATION. THE MAXIMUM HEIGHT OF THE HORIZONTAL PANELS SHALL BE 18".
4. ALL MATERIALS SHALL BE STAINLESS STEEL. THE PANEL THICKNESS SHALL BE 1/8".
5. SEALANT SHALL BE APPLIED TO ALL JOINTS TO PREVENT GAPS IN BAFFLE.
6. THE CITY OF LACEY SHALL DETERMINE IF OTHER STRUCTURES ARE REQUIRED.
7. THE DESIGN AND RESTRICTION CALCULATION SHALL BE DONE BY THE DESIGNING ENGINEER.

8. PANELS FOR PIPES 24" AND SMALLER SEE DETAIL 5-8.
9. \* LENGTHS, WIDTHS AND ANGLES VARY WITH SIZE OF PIPE AND STRUCTURE.

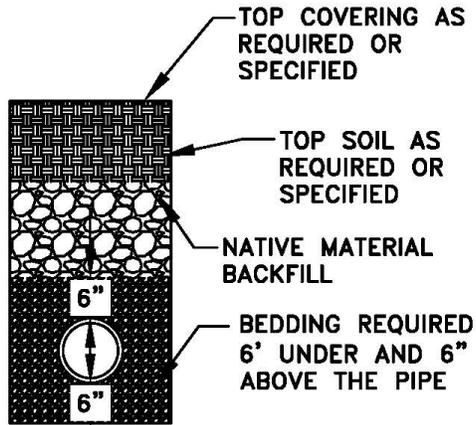
DG5-8.1.DWG

<b>CITY OF LACEY, WASHINGTON</b>			
<b>DEPT. OF PUBLIC WORKS</b>			
<b>OPTIONAL STORM</b>			
<b>MANHOLE BAFFLE FOR</b>			
<b>PIPES 24" &amp; LARGER</b>			
APPROVED CITY ENGINEER <i>Rog A Schoenel</i>		DWG. NO. <b>5-8.1</b>	
DES TJ	DWN WHO	CKD RAS	DATE 12/15/2014



CONNECTION DETAIL

TRENCH DETAIL

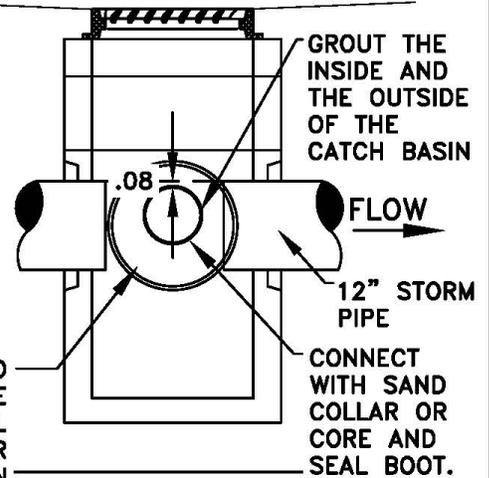


GROUT THE INSIDE AND THE OUTSIDE OF THE CATCH BASIN

CONNECT WITH SAND COLLAR OR CORE AND SEAL BOOT.

MINIMUM SIZE 8" PVC

18" KNOCKOUT IF NO KNOCKOUT IS AVAILABLE THE CATCH BASIN SHALL BE CORE DRILLED FOR THE CONNECTION

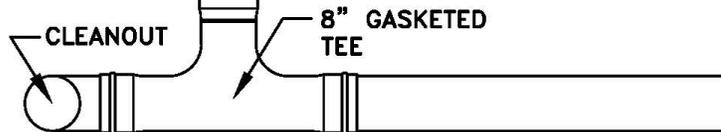


ROOF DRAIN PIPE IN THE RIGHT-OF-WAY SHALL BE AT A MINIMUM 8" PVC ALL OTHER STORM PIPE SHALL BE 12" MINIMUM

SIDEWALK

RIGHT-OF-WAY LINE

1'



GENERAL NOTES:

1. CATCH BASIN SHALL BE CONSTRUCTED IN ACCORDANCE WITH SPECIFICATIONS IN WSDOT STANDARD PLANS.
2. PRIVATE STORM PIPING ENTERING THE PUBLIC RIGHT-OF-WAY SHALL BE AT A MINIMUM 8" PVC 3034 SDR 35.
3. A CLEANOUT SHALL BE INSTALLED AT THE CONNECTION PIPE AS SHOWN ABOVE.
4. CITY OF LACEY CASTINGS ARE NOT ALLOWED ON THE PRIVATE STORM SYSTEMS.
5. WHEN CONNECTING A STORM PIPE TO A CATCH BASIN THAT DOES NOT HAVE A KNOCK-OUT THE BASIN SHALL BE CORE DRILLED.

CITY OF LACEY, WASHINGTON  
DEPT. OF PUBLIC WORKS

PRIVATE STORM  
CONNECTION TO CATCH  
BASIN IN RIGHT-OF-WAY

APPROVED

*Reg A Schoenel*  
CITY ENGINEER

DWG. NO.

5-9

DES

WHO

DWN

WHO

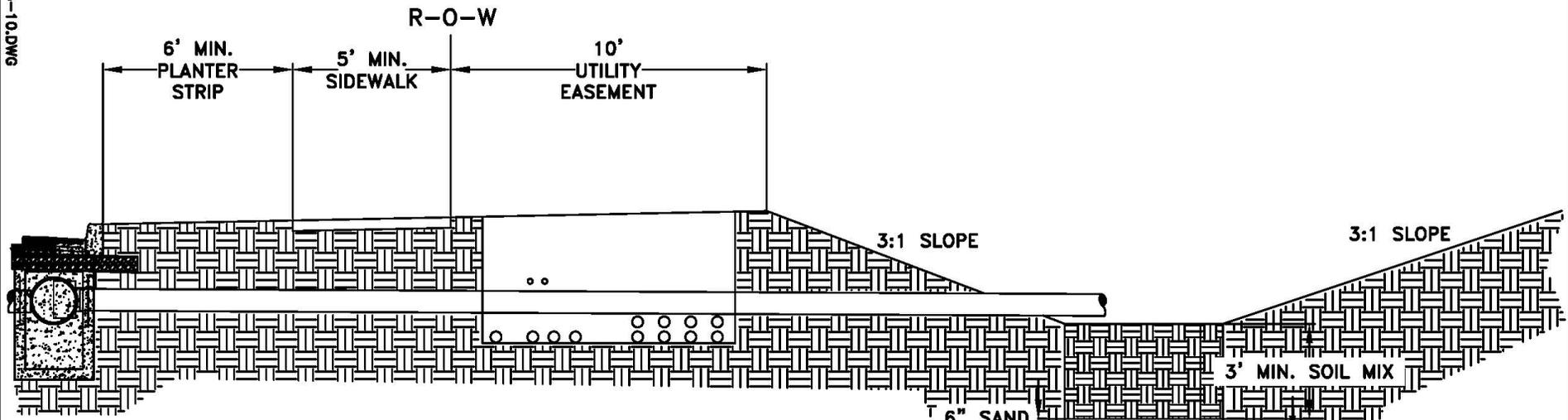
CKD

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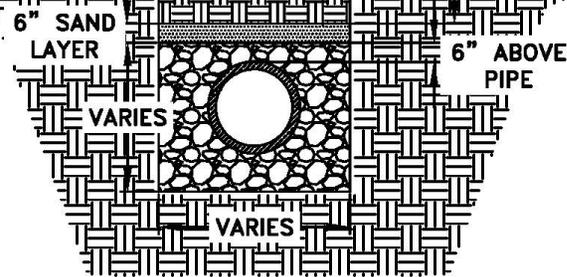
12/15/2014

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**GENERAL NOTES:**

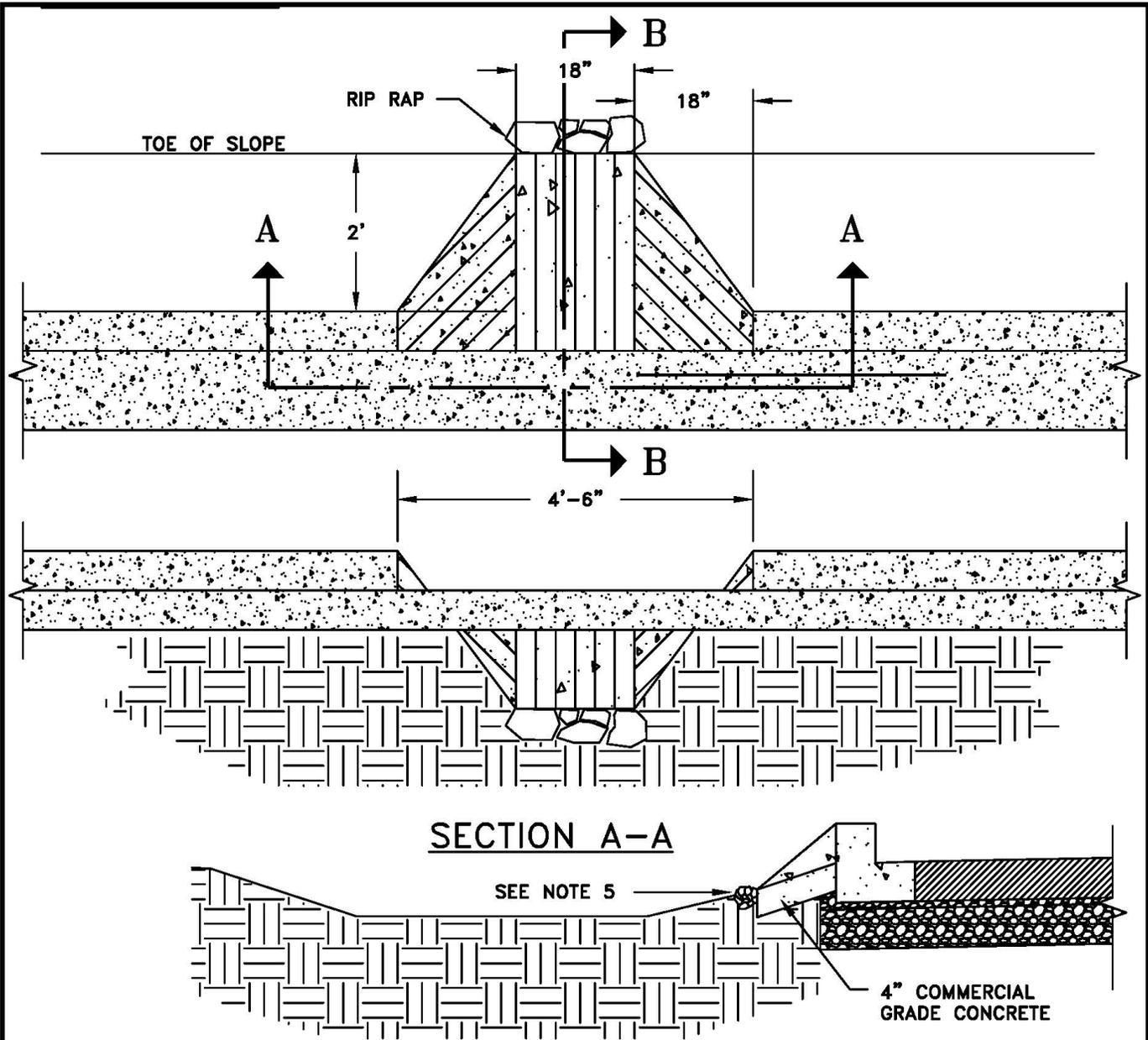
1. BIORETENTION SOIL SHALL BE 40% CONSTRUCTION SAND, 20-30% TOPSOIL WITH LESS THAN 15% MAXIMUM CLAY CONTENT, AND 20-30% ORGANIC LEAF COMPOST. PH SHALL BE BETWEEN 5.5 AND 6.5.
2. PLANTING SHALL CONSIST OF NATIVE SPECIES ABLE TO TOLERATE VARIABLE SOIL MOISTURE CONDITIONS, PONDING WATER FLUCTUATIONS AND VARIABLE SOIL MOISTURE CONTENT.
3. AT LEAST 18 INCHES OF BIORETENTION SOIL MIX IS REQUIRED BELOW THE DESIGN WATER ELEVATION. BEYOND THIS ELEVATION AT LEAST 6 INCHES OF BIORETENTION SOIL MIX IS REQUIRED. COMPACTED SUBSOILS MUST BE SCARIFIED AT 4 INCHES BELOW THE AMENDED LAYER.
4. UNDER DRAINS ARE REQUIRED IN SOILS WITH INFILTRATION RATES INADEQUATE TO MEET MAXIMUM POOL AND SYSTEM DEWATER RATES.
5. SEE DETAIL 5-11(4-4L.6) FOR CURB INLETS.
6. ZONE 1 PLANTINGS SHALL BE USED BELOW THE DESIGN WATER ELEVATION.
7. THE MINIMUM DEPTH OF THE SOIL MIX SHALL BE 3'.
8. THE DESIGN WATER LEVEL SHALL BE BETWEEN 6" TO 8".
9. THE OVERFLOW OR GRATE HEIGHT SHALL BE BETWEEN 9" TO 12".



**GENERAL REQUIREMENTS:**

1. THE SLOPE FOR THE RAIN GARDEN SHALL START AT THE 10' EASEMENT LINE AND SHALL NOT ENCROACH ON THE UTILITY EASEMENT.
2. WHEN CONSIDERING RAIN GARDENS THE DESIGN SHALL NOT BE IN CONFLICT WITH THE NATURAL PATH OF THE DRY UTILITIES. THE STANDARD WIDTH OF THE JOINT UTILITY TRENCH IS 10' AND MAXIMUM DEPTH SHALL BE 4'.
3. STATIONS AND OFFSETS SHALL BE REQUIRED AT ALL RADII FOR TOP OF SLOPE OR BOTTOM OF SLOPE WITH ELEVATIONS.
4. WHEN NO UTILITY EASEMENT IS REQUIRED THE SLOPE FOR THE RAIN GARDENS SHALL BEGIN 2' FROM THE BACK OF THE RIGHT-OF-WAY.

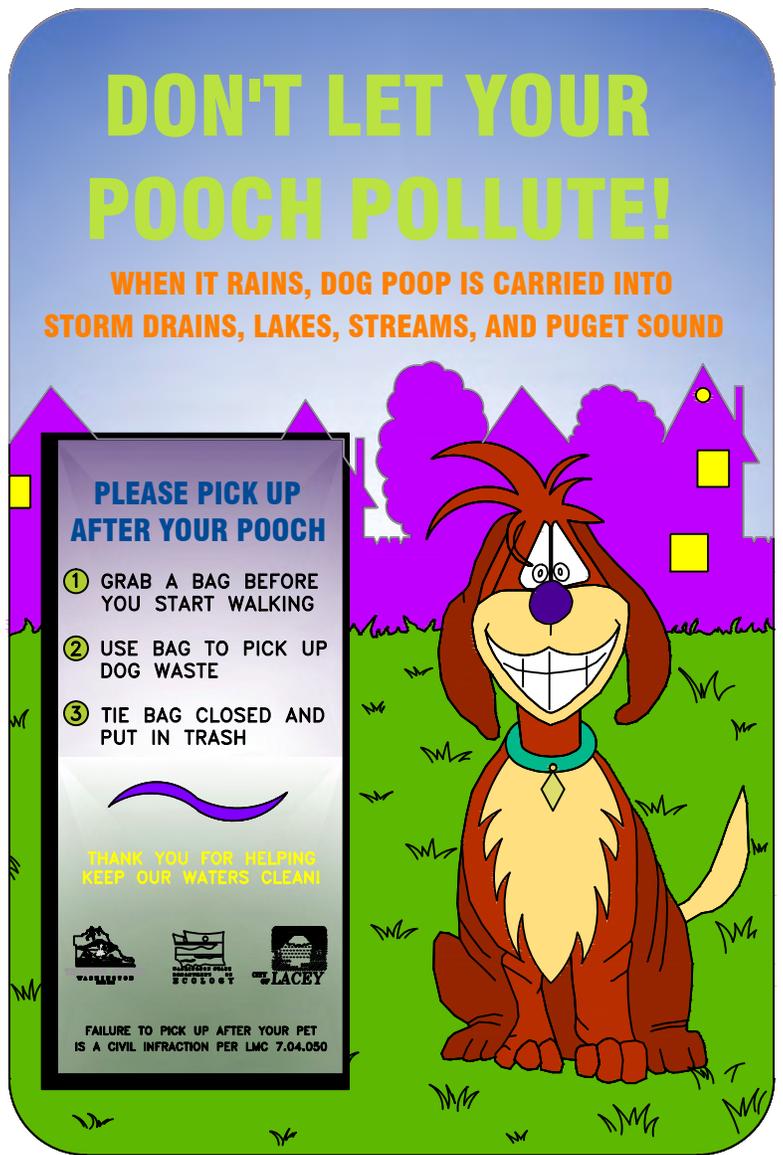
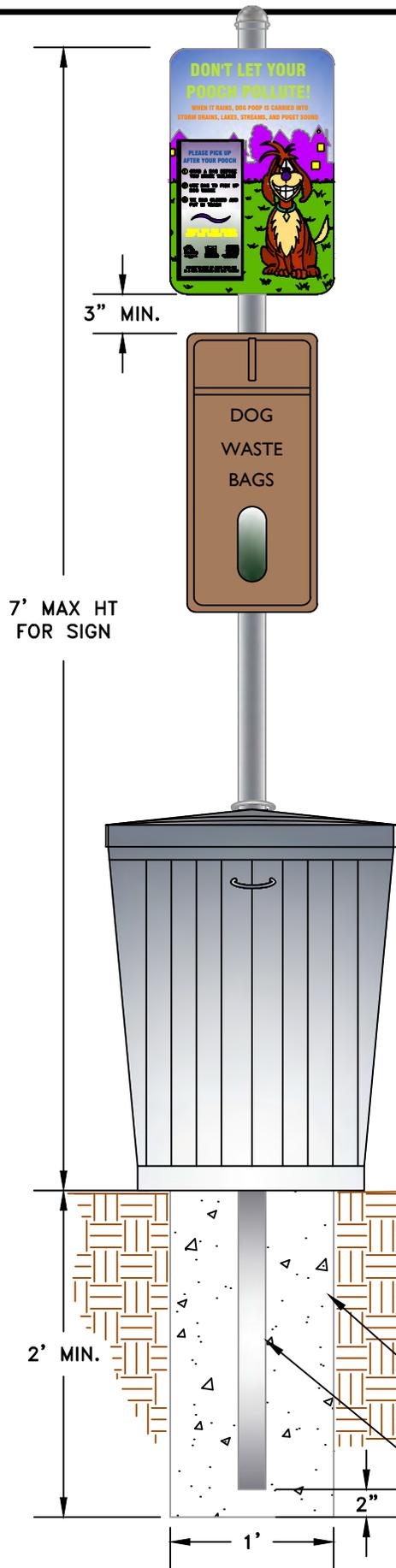
CITY OF LACEY, WASHINGTON DEPT. OF PUBLIC WORKS		PUBLIC ROADWAY RAIN GARDEN SET BACK	
APPROVED	<i>Reg. A. Schauer</i>	DWG. NO.	5-10
CITY ENGINEER		DATE	12/15/2014
DESIGNED BY	WHO	CHECKED BY	RAS



**SECTION B-B**

- GENERAL NOTES:**
1. CURB INLET SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASTM C 478 (AASHTO M 199) & ASTM C 890.
  2. THE TOP SURFACE SHALL BE BROOM FINISHED.
  3. ALL EXTERNAL EDGES NOT LABELED SHALL BE TROWELLED WITH 1/4" RADIUS EDGER.
  4. INLETS SHOULD BE SPACED CONSISTENT WITH CATCH BASIN SPACING REQUIRED IN THE STORM WATER MANUAL.
  5. WHERE CURB INLETS ARE USED, APPROXIMATELY 6 INCHES OF ROCK OR OTHER EROSION PROTECTION MATERIAL SHALL BE USED TO DISSIPATE ENERGY AND/OR FLOW DOWN THE CHUTE.
  6. PERVIOUS PAVING MAY BE USED FOR INLET WITH CITY APPROVAL.
  7. THE SLOPE OF THE CHUTE SHALL BE DETERMINED WHEN THE SWALE IS DESIGNED.

<b>CITY OF LACEY, WASHINGTON DEPT. OF PUBLIC WORKS</b>			
<b>LID CURB INLET TYPE I</b>			
APPROVED <i>Roger A. Schoenel</i> CITY ENGINEER		DWG. NO. <b>5-11</b>	
DES. WHO	DWN. WHO	CKD. RAS	DATE 12/15/2014



**GENERAL NOTE:**

1. THE DIMENSIONS BELOW THE GARBAGE CAN IS FOR THE INSTALLATION OF THE SIGN AND BAG HOLDER POST.

**CITY OF LACEY, WASHINGTON  
DEPT. OF PUBLIC WORKS**

**DON'T LET YOUR  
POOCH POLLUTE!**

APPROVED

*Roger A. Schoenfeld*  
CITY ENGINEER

DWG. NO.

5-16

DES

WHO

DWN

WHO

CKD

RAS

DATE

12/15/2014