



WASHINGTON STATE DEPARTMENT OF  
ENTERPRISE SERVICES

# CAPITOL CAMPUS STORMWATER MANAGEMENT PLAN

Olympia, WA

DES Project No. 2016-919 B (2)

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PREPARED FOR



PREPARED BY

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## Introduction

The purpose of this Stormwater Management Program (SWMP) Plan is to describe the actions necessary by the Washington State Department of Enterprise Services (DES) to meet the requirements of Western Washington Phase II Municipal Stormwater Permit (MSP). DES received coverage under this permit (Permit No. WAR045210) beginning in 2008, with subsequent versions issued up until the most recent, effective August 1, 2013, through August 31, 2018.

This SWMP covers the Washington State Capitol Campus, which is separated along Capitol Way into the West Campus and East Campus, see Figure 1, Project Boundary. This SWMP generally follows S6-Secondary Management Program for Secondary Permittees of the MSP. The MSP requirements for S6 are stated in italics, followed by current and future activities performed by the Capitol Campus related to the relative sections. The remainder of the document follows Sections S7, S8, and S9 of the MSP, with MSP requirements and current and future activities explained. The SWMP is intended to be reviewed annually for completed and planned activities, with only certain sections requiring annual updates.

### 1. Public Education and Outreach

The SWMP shall include educational programs targeting tenants and visitors. These programs are created with the intention of reducing or eliminating behaviors related to negative stormwater impacts, such as dumping hazardous materials down storm drains.

#### a) Requirement: Label Storm Drains (S6.D.1.a)

*“Storm drain inlets operated by the Secondary Permittee located in maintenance yards, parking lots, along sidewalks, and at pedestrian access points will be labeled with the message, “Dump no waste – Drains to water body” or similar. As identified during visual inspection and regular maintenance of storm inlets per the requirements of S6.D.3.d and S6.D.6.a.i below, or as otherwise reported to the Secondary Permittee, any inlet having a label that is no longer clearly visible and/or easily readable will be relabeled within 90 days.”*

1.a.1.Current Activities: On the West Campus, approximately 50 percent of drains are currently clearly labeled, primarily with plastic disks that identify the drain inlet as draining to the Puget Sound. A number of these disks have become unglued or broken. Some of the drains on the East Campus discharge to the combined sewer system operated by the LOTT Clean Water Alliance (LOTT) and do not need to be labeled. No labels are present on the drains on the East Campus that discharge to the City of Olympia storm system.

1.a.2.Future Activities: All inlets that drain to Capitol Lake or the City of Olympia storm system will be labeled or relabeled as budget allows. Repair of damaged labels will continue as needed. DES is considering partnering with volunteer organizations, such as schools or scouting groups, to label inlets as a public education activity.

#### b) Requirement: Distribution of Educational Materials (S6.D.1.b)

*“Each year beginning no later than three years from the initial date of permit coverage, public ports, colleges, and universities shall distribute educational information to tenants and residents on the impact of stormwater discharges to receiving waters and steps that can be taken to reduce pollutants in stormwater runoff. Distribution may be by hard copy or electronic means.” While the Capitol Campus does not fall under these categories, DES has a mutual understanding with the City of Olympia to participate in the City’s educational materials program.*

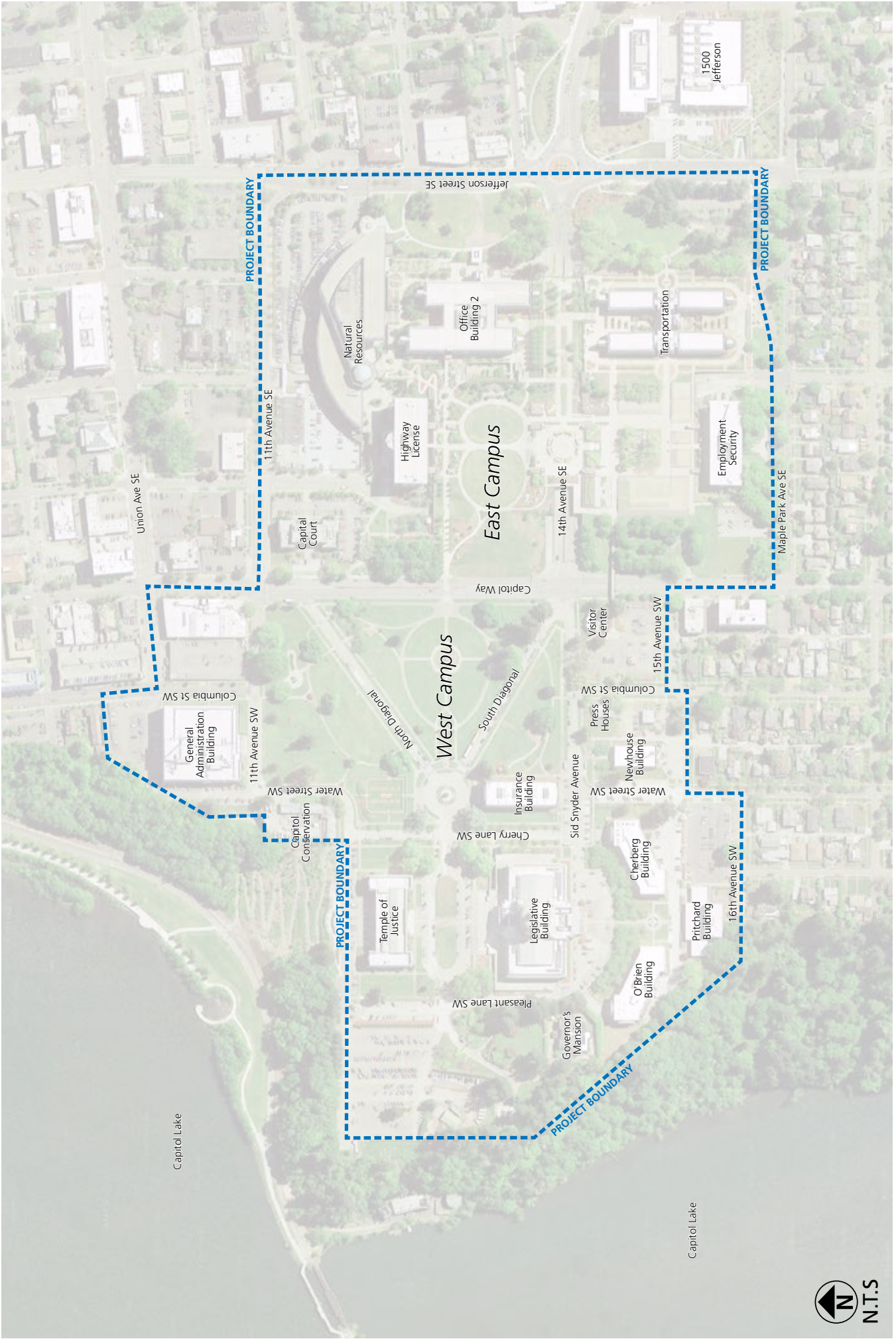


FIGURE 1 – PROJECT BOUNDARY



1.b.1.Current Activities: DES participates in the production of the City of Olympia’s “Stream Team” quarterly newsletter on stormwater pollution prevention. DES also distributes this newsletter to the Capitol Campus tenants and visitors.

1.b.2.Future Activities: DES will continue to participate in the “Stream Team” newsletter production and distribution.

**Table 1. Public Education and Outreach Schedule**

Planned Activity		Permit Due Dates
<b>S6.D.1.a</b>	<b>Label Storm Drains</b>	
	Label remaining storm drain inlets with “Dump no waste” and point of discharge	Ongoing
	Visually inspect storm drain inlets	Ongoing
	Re-label inlets as necessary within 90 days of notification that label is unreadable	Ongoing
<b>S6.D.1.b</b>	<b>Distribute Educational Information</b>	
	Coordinate with City of Olympia (primary permittee) on public education and outreach activities	Ongoing
	Begin distributing educational information to tenants and visitors	Ongoing
	Distribute different topics pertaining to stormwater pollution prevention each year	Annually
	Ensure all educational topics listed under S6.D.1.b have been distributed to tenants and visitors	Annually
<b>S9</b>	<b>Reporting</b>	
	Prepare summary of public education and outreach implementation status for inclusion in Annual Report	Annually, before March 31

## 2. Public Involvement and Participation

This section outlines the opportunities for public involvement.

### a) Requirement: Publication of the annual report (S6.D.2.a)

*“Each year, no later than May 31, each Secondary Permittee shall make the annual report available on the Permittee’s Website.”*

2.a.1.Current Activities: DES publishes the annual report to its website each year. The most recent annual report is located at <http://des.wa.gov/about/forms-publications/publications-reports>.

2.a.2.Future Activities: DES will continue to publish the annual report as required each year.

### b) Requirement: Publication of the SWMP (S6.D.2.b)

*“Each year, no later than May 31, each Secondary Permittee shall make available on the Permittee’s website the latest updated version of the SWMP Plan.”*

2.b.1.Current Activities: DES has the current SWMP posted to the website. The most recent SWMP can be found at <http://des.wa.gov/about/forms-publications/publications-reports>.

2.b.2.Future Activities: DES will continue to publish the most updated version of the SWMP as changes or updates are made.

**Table 2. Public Involvement and Participation Schedule**

Planned Activity		Permit Due Dates
<b>S6.D.2.a</b>	<b>Publication of the Annual Report</b>	
	Post the Annual Report to the DES website	Annually, before May 31
<b>S6.D.2.b</b>	<b>Make SWMP Available to Public</b>	
	Post the most recent SWMP document on DES website	Annually, before May 31
<b>S9</b>	<b>Reporting</b>	
	Prepare summary of public involvement and participation implementation status for inclusion in Annual Report	Annually, before March 31

### 3. Illicit Discharge Detection and Elimination

This section contains the requirements for illicit discharge detection and elimination (IDDE).

#### a) Requirement: Compliance (S6.D.3.a)

*“From the initial date of permit coverage, comply with all relevant ordinances, rules, and regulations of the local jurisdiction(s) in which the Secondary Permittee is located that govern non-stormwater discharges.”*

3.a.1.Current Activities: DES is in compliance with all City of Olympia codes and regulations with regard to non-stormwater discharges.

3.a.2.Future Activities: DES will remain in compliance with current and future City of Olympia codes and regulations.

#### b) Requirement: Implement Illicit Discharge Policies (S6.D.3.b)

*“Implement appropriate policies prohibiting illicit discharges and an enforcement plan to ensure compliance with these policies. These policies shall address, at a minimum: illicit connections, non-stormwater discharges, including spills of hazardous materials, and improper disposal of pet waste and litter.*

*i. Allowable discharges: The policies do not need to prohibit the following categories of non-stormwater discharges:*

- *Diverted stream flows*
- *Rising groundwater*
- *Uncontaminated ground water infiltration*
- *Uncontaminated pumped ground water*
- *Foundation drains*
- *Air conditioning condensation*
- *Irrigation water from agricultural sources that is comingled with urban stormwater*



- Springs
  - Uncontaminated water from crawlspace pumps
  - Footing drains
  - Flows from riparian habitats and wetlands
  - Discharges from emergency firefighting activities in accordance with S2 Authorized Discharges
  - Non-stormwater discharges authorized by another NPDES or state waste discharge permit
- ii. *Conditionally allowable discharge: The policies may allow the following categories of non-stormwater discharges only if the stated conditions are met and such discharges are allowed by local codes:*
- *Discharges from potable water sources, including but not limited to line flushing, hyperchlorinated water line flushing, fire hydrant system flushing, and pipeline hydrostatic test water. Planned discharges shall be dechlorinated to a total residual chlorine concentration of 0.1 ppm or less, pH-adjusted if necessary, and volumetrically and velocity-controlled to prevent resuspension of sediments in the municipal separate storm sewer system (MS4).*
  - *Discharges from lawn watering and other irrigation runoff. These discharges should be minimized through, at a minimum, public education activities and water conservation efforts by the Secondary Permittee and/or the local jurisdiction.*
  - *Dechlorinated swimming pool, spa and hot tub discharges. The discharges shall be dechlorinated to a concentration of 0.1 ppm or less, pH-adjusted and reoxygenated if necessary, and volumetrically and velocity-controlled to prevent resuspension of sediments in the MS4. Discharges shall be thermally controlled to prevent an increase in temperature of the receiving water. Swimming pool cleaning wastewater and filter backwash shall not be discharged to the MS4.*
  - *Street and sidewalk wash water, water used to control dust, and routine external building washdown that does not use detergents. The Secondary Permittee shall reduce these discharges through, at a minimum, public education activities and/or water conservation efforts conducted by the Secondary Permittee and/or the local jurisdiction. To avoid washing pollutants into the MS4, the Secondary Permittee shall minimize the amount of street wash and dust control water used.*
  - *Other non-stormwater discharges shall be in compliance with the requirements of a pollution prevention plan reviewed by the Permittee which addresses control of such discharges.*
- iii. *The Secondary Permittee shall address any category of discharges in (i) or (ii) above if the discharge is identified as a significant source of pollutants to waters of the State.”*

3.b.1. Current Activities: DES has a number of policies in place to prohibit illicit discharges. The current policies related to non-stormwater discharges are below:

*Discharges from potable water/hydrant flushing:* DES does not currently have a systematic program for hydrant flushing.

*Discharges from lawn watering and irrigation runoff:* DES has been reducing the amount of water used for irrigation, with continued reduction as a goal listed in the Sustainability Report. DES staff is also trained in water conservation practices and procedures. The Integrated Pest Management Plan, Pilot Project for Campus Composting, and the West Campus Landscape Master Plan also contain information on steps that can be taken to conserve landscaping water and minimize fertilizer and chemical use.

*Street, building, and sidewalk wash water:* DES does not use detergents when washing buildings and sidewalks. Sidewalks are washed only when hazardous conditions are noticed. Parking garage stairs and the Legislative Building steps are pressure washed as part of preventative maintenance practices. Appropriate best management practices (BMPs) are used to prevent runoff of pollutants.

*Other non-stormwater discharges:* Testing and draining of fire systems and dry systems is part of DES's maintenance work. All fire system discharge water is diverted into the LOTT combined sewer system, not the DES stormwater system.

3.b.2. Future Activities: DES will continue its current IDDE procedures. As a secondary permittee, DES will work with and adopt the City of Olympia's IDDE program as it is developed for any additional city requirements.

**c) Requirement: Develop a Storm Sewer Map (S6.D.3.c)**

*"Maintain a storm sewer system map showing the locations of all known MS4 outfalls and discharge points, labeling the receiving waters (other than groundwater), and delineating the areas contributing runoff to each outfall and discharge point. Make the map (or completed portions of the map) available on request to Ecology and to the extent appropriate to other Permittees."*

3.c.1. Current Activities: The West and East Campuses have been mapped and basins have been delineated. These maps are located in Appendix B of this report.

3.c.2. Future Activities: The storm sewer map shall be updated as changes are made to the storm system.

**d) Requirement: Outfall Inspection (S6.D.3.d)**

*"Conduct field inspections and visually inspect for illicit discharges at all known MS4 outfalls and discharge points. Visually inspect at least one third (on average) of all known outfalls and discharge points each year, beginning no later than two years from the initial date of permit. Implement procedures to identify and remove illicit discharges. Keep records of inspections and follow-up activities."*

3.d.1. Current Activities: Each MS4 outlet to Capitol Lake is inspected quarterly and after significant storm events. DES facility staff maintain records of these inspections.

3.d.2. Future Activities: DES will continue to inspect at least one third of the outfalls each year. These inspections shall be recorded.

**e) Requirement: Spill Response Plan (S6.D.3.e)**

*“Implement a spill response plan that includes coordination with a qualified spill responder.”*

3.e.1.Current Activities: The DES Hazardous Materials Management Emergency Action Plan details the spill response plan for the Capitol Campus, which includes coordination with a qualified spill responder.

3.e.2.Future Activities: The Hazardous Materials Management Emergency Action Plan will be reviewed and updated when necessary.

**f) Requirement: Spill and Illicit Discharge Training (S6.D.3.f)**

*“No later than two years from the initial permit coverage date, provide staff training or coordinate with existing training efforts to educate staff on proper BMPs for preventing illicit discharges, including spills. Train all Secondary Permittee staff who, as part of their normal job responsibilities, have a role in preventing such illicit discharges.”*

3.f.1.Current Activities: All personnel that work with hazardous materials undergo spill-response training under the Hazardous Materials Management Emergency Action Plan. This report is available on the DES website at <http://des.wa.gov/about/forms-publications/publications-reports> . Staff are trained to practice BMPs to prevent illicit discharges in relationship to their specific job roles.

3.f.2.Future Activities: All personnel shall continue to be trained under the Hazardous Materials Management Emergency Action Plan.

**Table 3. Illicit Discharge Detection and Elimination Schedule**

Planned Activity		Permit Due Dates
<b>S6.D.3.a</b>	<b>Compliance</b>	
	Coordinate with City of Olympia (primary permittee) on compiling relevant ordinances, rules, and regulations governing non-stormwater discharge	Ongoing
	Review relevant ordinances, rules, and regulations governing non-stormwater discharges	
	Determine necessary efforts to reach compliance status	
<b>S6.D.3.b</b>	<b>Adopt IDDE Policies</b>	
	Work with City of Olympia to develop and adopt policies prohibiting illicit discharges and illegal dumping	Ongoing
	Work with City of Olympia to Identify enforcement mechanisms for policies	
	Develop and implement an enforcement plan to ensure compliance with IDDE policies	
<b>S6.D.3.c</b>	<b>Develop Storm Sewer Map</b>	
	Update Storm Sewer Map as changes are made to the system	Ongoing
	Make map available on request	
<b>S6.D.3.d</b>	<b>Field Inspection of Outfalls</b>	
	Keep records of outfall inspections and follow-up activities	Annually
	Inspect outfalls (minimum 1/3 yearly)	Annually
<b>S6.D.3.e</b>	<b>Implement Spill Response Plan</b>	
	If necessary, update spill response plan	Ongoing

**Table 3. Illicit Discharge Detection and Elimination Schedule**

Planned Activity		Permit Due Dates
<b>S6.D.3.f</b>	<b>Spill and Illicit Discharge Training</b>	
	Define training needs	
	Review existing staff training efforts regarding spills and illicit discharges	Ongoing
	Provide training opportunities to all relevant staff	
<b>S9</b>	<b>Reporting</b>	
	Prepare summary of IDDE program status for inclusion in Annual Report	Annually, before March 31

#### 4. Construction Site Stormwater Runoff Control

This section describes the stormwater runoff requirements related to construction site controls.

##### a) Requirement: Compliance (S6.D.4.a)

*“Comply with all relevant ordinances, rules, and regulations of the local jurisdiction in which the Secondary Permittee is located that govern construction phase stormwater pollution prevention measures.”*

4.a.1.Current Activities: All DES projects comply with City of Olympia construction stormwater codes, ordinances, regulations, and rules.

4.a.2.Future Activities: DES projects will continue to follow City of Olympia construction stormwater codes, ordinances, rules, and regulations.

##### b) Requirement: NPDES Construction Permit (S6.D.4.b)

*“Ensure that all construction projects under functional control of the Secondary Permittee that require a construction stormwater permit obtain coverage under the NPDES General Permit for Stormwater Discharges Associated with Construction Activities or an individual NPDES permit prior to discharging construction-related stormwater.”*

4.b.1.Current Activities: DES obtains coverage under the *NPDES General Permit* for all construction projects that require coverage.

4.b.2.Future Activities: DES will continue to obtain coverage for all construction projects that require the coverage.

##### c) Requirement: Local Jurisdiction Coordination (S6.D.4.c)

*“Coordinate with local jurisdiction regarding projects owned or operated by other entities which discharge into the Secondary Permittee’s MS4, to assist the local jurisdiction with achieving compliance with all relevant ordinances, rules, and regulations of the local jurisdictions.”*

4.c.1.Current Activities: At this time, there are no outside jurisdictions that discharge into the Capitol Campus storm sewer system.

4.c.2.Future Activities: Coordination with outside jurisdictions will occur if any discharges are to be made into the Capitol Campus storm sewer system and MS4 outfalls.

**d) Requirement: Erosion and Sediment Control Training (S6.D.4.d)**

*“Provide training or coordinate with existing training efforts to educate relevant staff in erosion and sediment control BMPs and requirements, or hire trained contractors to perform the work.”*

4.d.1.Current Activities: Work requiring erosion and sediment control is primarily small-scale operations and maintenance (O&M) work that involves some land disturbance. DES trains staff involved in O&M projects in appropriate BMPs for this work.

4.d.2.Future Activities: DES will continue to implement BMPs regarding erosion and sediment control and will continue to train staff as required.

**e) Requirement: Inspection Access (S6.D.4.e)**

*“Coordinate as requested with Ecology or the local jurisdiction to provide access for inspection of construction sites or other land disturbances which are under the functional control of the Secondary Permittee during land-disturbing activities and/or construction period.”*

4.e.1.Current Activities: Inspection access is coordinated with Ecology and the City of Olympia as necessary.

4.e.2.Future Activities: The practice of coordinating access on a project as necessary will continue.

**Table 4. Construction Site Stormwater Runoff Control Schedule**

	Planned Activity	Permit Due Dates
<b>S6.D.4.a</b>	<b>Compliance</b>	
	Review ordinances, rules, and regulations governing construction phase stormwater pollution prevention measures	Ongoing
	Identify any ordinances, rules, or regulations requiring additional efforts to be in compliance	
	Implement any necessary activities to be in compliance	
<b>S6.D.4.b</b>	<b>NPDES Permit for Construction</b>	
	Ensure DES construction projects obtain coverage under NPDES General Permit for Stormwater Discharges Associated with Construction Activities	Ongoing
<b>S6.D.4.c</b>	<b>Local Jurisdiction Coordination</b>	
	Determine local jurisdictions with upcoming construction projects discharging to DES’s municipal separate storm sewer systems	Ongoing
	Coordinate with those local jurisdictions to ensure compliance with ordinances, rules, and regulations	
<b>S6.D.4.d</b>	<b>Erosion/Sediment Control Training</b>	
	Define training needs	Ongoing
	Provide staff training	
<b>S6.D.4.e</b>	<b>Inspection Access</b>	
	Develop process for local jurisdictions or Ecology to access Capitol Campus construction sites for inspection	Ongoing
	Coordinate access to construction sites for inspection on project-by-project basis	
<b>S9</b>	<b>Reporting</b>	
	Prepare summary of construction site stormwater runoff control program status for inclusion in Annual Report	Annually, before March 31

## 5. Post-Construction Stormwater Management for New Development and Redevelopment

This section describes stormwater management requirements for new development and redevelopment projects. It includes compliance requirements and coordination with outside entities.

### a) Requirement: Compliance (S6.D.5.a)

*“Comply with all relevant ordinances, rules, and regulations of the local jurisdictions in which the Secondary Permittee is located that govern post-construction stormwater pollution prevention measures.”*

5.a.1. Current Activities: DES complies with all City of Olympia ordinances, rules, and regulations related to post-construction stormwater pollution prevention measures.

5.a.2. Future Activities: DES will continue to be in compliance with City of Olympia stormwater pollution prevention measures.

### b) Requirement: Local Jurisdiction Coordination (S6.D.5.b)

*“Coordinate with local jurisdiction regarding projects owned or operated by other entities that discharge into the Secondary Permittee’s MS4, to assist the local jurisdiction with achieving compliance with all relevant ordinances, rules, and regulations of the local jurisdiction.”*

5.b.1. Current Activities: At this time, no other entities discharge to the Capitol Campus MS4.

5.b.2. Future Activities: Coordination with outside entities will occur in the future if any discharges will be connected to the Capitol Campus MS4.

**Table 5. Post-Construction Stormwater Management Schedule**

Planned Activity		Permit Due Dates
<b>S6.D.5.a</b>	<b>Compliance</b>	
	Review ordinances, rules, and regulations governing post-construction phase stormwater pollution prevention measures	
	Identify any ordinances, rules, or regulations requiring additional efforts to be in compliance	Ongoing
	Implement any necessary activities to be in compliance	
<b>S6.D.5.b</b>	<b>Local Jurisdiction Coordination</b>	
	Determine local jurisdictions with projects discharging to Capitol Campus municipal separate storm sewer systems	
	Coordinate with those local jurisdictions to ensure compliance with post-construction ordinances, rules, and regulations	Ongoing
<b>S9</b>	<b>Reporting</b>	
	Prepare summary of post-construction site stormwater runoff control program status for inclusion in Annual Report	Annually, before March 31

## 6. Pollution Prevention and Good Housekeeping for Municipal Operations

### a) Requirement: Implement Operations and Maintenance Plan (S6.D.6.a)

*“Implement a municipal operation and maintenance (O&M) plan to minimize stormwater pollution from activities conducted by the Secondary Permittee. The O&M Plan shall include the appropriate pollution prevention and good housekeeping procedures for all of the following operations, activities, and/or types of facilities that are present within the Secondary Permittee’s boundaries and under the functional control of the Secondary Permittee.*

- i. **Stormwater collection and conveyance systems**, including catch basins, stormwater pipes, open channels, culverts, and stormwater treatment and flow control BMPs/Facilities. The O&M plan shall address, at a minimum: scheduled inspections and maintenance activities, including cleaning and proper disposal of waste removed from the system. Secondary Permittees shall properly maintain stormwater collection and conveyance systems owned or operated by the Secondary Permittee and regularly inspect and maintain all stormwater facilities to ensure facility function.

*Secondary Permittees shall establish maintenance standards that are as protective or more protective of facility function than those specified by Chapter 4, Volume V, of the Stormwater Management Manual for Western Washington. Secondary Permittees shall review their maintenance standards to ensure they are consistent with the requirements of this section.*

*Secondary permittees shall conduct spot checks of potentially damaged permanent stormwater treatment and flow control BMPs/facilities following major storm events.*

- ii. **Roads, highways, and parking lots.** The O&M Plan shall address, but is not limited to: deicing, anti-icing and snow removal practices; snow disposal areas; material (salt, sand, or chemicals) storage areas; all-season BMPs to reduce road and parking lot debris and other pollutants from entering the MS4.
- iii. **Vehicle Fleets:** The O&M plan shall address, but is not limited to: storage, washing, and maintenance of Secondary Permittee vehicle fleets and fueling facilities. Secondary Permittees shall conduct all vehicle and equipment washing and maintenance in a self-contained covered building or in designated wash and/or maintenance areas.
- iv. **External building maintenance:** The O&M plan shall address: building exterior cleaning and maintenance, including cleaning, washing, painting; and maintenance and management of dumpsters and other maintenance activities.
- v. **Parks and open spaces:** The O&M plan shall address but is not limited to: proper application of fertilizer, pesticides, and herbicides; sediment and erosion control; BMPs for landscape maintenance and vegetation disposal; and trash and pet waste management.
- vi. **Material storage and heavy equipment maintenance or storage yards:** Secondary Permittees shall develop and implement a Stormwater Pollution Prevention Plan (SWPPP) to protect water quality at each of these facilities owned or operated by the Secondary Permittee and not covered under the General NPDES Permit for Stormwater Discharges Associated with Industrial Activities or another NPDES permit that authorizes discharges associated with the activity.

vii. ***Other facilities that would reasonably be expected to discharge contaminated runoff will be addressed within the O&M Plan.***”

6.a.1. Current Activities: DES has multiple documents that cover different aspects of operations on the Capitol Campus. These documents outline the O&M procedures for the specific task they are related to. The required items listed above are addressed as followed in the listed documents and programs:

*Stormwater Collection and Conveyance:* Maintenance activities, such as cleaning and disposal of system waste, are conducted by the Buildings and Grounds Preventative Maintenance Program, which establishes, tracks, and records the time and materials associated with tasks. Inspections required by the permit are managed by the Preventative Maintenance Program. Maintenance BMPs are included in Appendix A of this report.

*Roads, Highways, and Parking Lots:* The Buildings and Grounds Preventative Maintenance Program manages routine street sweeping and cleaning practices, and establishes, tracks, and records time and materials spent on these tasks. Deicing procedures, BMPs, approved areas for deicing, and approved and reviewed materials are documented and training is provided to appropriate staff.

*Vehicle Fleets:* The State Motor Pool conducts drop off/pick up activities on the Capitol Campus. Window detailing and interior vacuuming are the only maintenance activities conducted on the campus. Relevant staff are trained on proper methods to control and minimize discharges associated with detailing and in spill response procedures.

Fueling for maintenance vehicles occurs on campus from a UL listed, double-walled fuel tank. Spill response procedures are outlined in the Hazardous Materials Management Emergency Action Plan.

*External Building Maintenance:* The Buildings and Grounds Preventative Maintenance Program is used to manage routine external maintenance and cleaning practices. Procedures and training are provided to staff on BMPs to minimize and control environmental issues associated with these tasks.

*Parks and Open Spaces:* The Buildings and Grounds Preventative Maintenance Program is used to manage the proper application of fertilizer, pesticides, and herbicide practices. The Integrated Pest Management Plan is in place, with certification training for all herbicide/pesticide application, notifications, and posting requirements. On-site composting programs assist with the management of vegetation disposal.

*Material Storage Areas, Heavy Equipment Storage Areas, and Maintenance Areas:* Materials storage areas, heavy equipment storage, and maintenance areas are covered under the Facilities Planning and Management Division Hazardous Materials Management Emergency Action Plan.

Future Activities:

DES will continue to review and update their O&M Plan as necessary to incorporate any changes to pollution prevention and housekeeping procedures as necessary. The



fueling station O&M procedures shall be updated to include the use of drip pans at the tank and under the vehicle being fueling, not topping off tanks, and having an attendant present at all times during fueling. A cover shall be constructed over the fueling station to provide additional protection in accordance with the current Fueling Station Source Control BMP.

**b) Requirement: NPDES Permit Coverage for all Industrial Activities (S6.D.6.b)**

*“From the initial date of the permit coverage, Secondary Permittees shall also have permit coverage for all facilities operated by the Secondary Permittee that are required to be covered under the General NPDES Permit for Stormwater Discharges Associated with Industrial Activities or another NPDES permit that authorizes discharges associated with the activity.”*

6.b.1.Current Activities: DES does not perform any industrial activities on the Capitol Campus site. Industrial activities that are required to be covered under the *General NPDES Permit for Stormwater Discharges Associated with Industrial Activities* are listed in that permit and include activities like mining operations, manufacturing processes, and sewage treatment.

6.b.2.Future Activities: DES does not perform any industrial activities on the Capitol Campus.

**c) Requirement: O&M Plan Documentation (S6.D.6.c)**

*“The O&M Plan shall include sufficient documentation and records as necessary to demonstrate compliance with the O&M Plan requirements in S6.D.6.a (i) through (vii) above.”*

6.c.1.Current Activities: DES has multiple documents that cover different aspects of operations and maintenance on the Capitol Campus. These documents address the good housekeeping (good operation) procedures required. Buildings and Grounds staff maintain the stormwater system, streets, buildings, open spaces, and materials storage. Areas are maintained and cleaned regularly.

6.c.2.Future Activities: The multiple O&M documents will be updated to include documentation of compliance with Permit requirements.

**d) Requirement: O&M Training (S6.D.6.d)**

*“No later than three years from the initial date of permit coverage, Secondary Permittees shall implement a program designed to train all employees whose primary construction, operations, or maintenance job functions may impact stormwater quality. This training shall address:*

- i. The importance of protecting water quality*
- ii. The requirements of this Permit*
- iii. Operations and maintenance requirements*
- iv. Inspection procedures*
- v. Ways to perform their job activities to prevent or minimize impacts to water quality*
- vi. Procedures for reporting water quality concerns, including potential illicit discharges (including spills)”*

6.d.1.Current Activities: Appropriate staff are trained in O&M policies and procedures, and records are kept of staff training.

6.d.2.Future Activities: DES will incorporate a specific stormwater protection education program into its O&M manual. This will educate staff on IDDE, BMP use, and general water quality measures. Staff will continue to be trained as needed and as changes are made to staff, staff responsibilities, and O&M program requirements.

**Table 6. Operations and Maintenance Schedule**

Planned Activity		Permit Due Dates
<b>S6.D.6.a</b>	<b>Implement O&amp;M Plan</b>	
	Evaluate current stormwater pollution prevention and O&M Plan	
	Identify O&M activities listed in S6.D.6.a not addressed in Plan	
	Update O&M Plan	Ongoing
	Implement new activities outlined in O&M Plan	
<b>S6.D.6.b</b>	<b>NPDES Permit for Industrial Activities - DOES NOT APPLY</b>	
	Ensure permit coverage for all facilities required to be covered under the General NPDES Permit for Stormwater Discharges Associated with Industrial Activities	N/A
<b>S6.D.6.c</b>	<b>O&amp;M Plan Compliance</b>	
	Review O&M Plan for compliance with S6.D.6.a.i through S6.D.6.a.vii of Permit	
	Develop tracking system for inspections, maintenance, and repairs	Ongoing
	Include tracking documentation in O&M Plan	
<b>S6.D.6.d</b>	<b>O&amp;M Training</b>	
	Review current training program for all staff whose construction, operations, or maintenance job functions may impact stormwater quality	
	Define training needs	Ongoing
	Improve responsibility organization chart for O&M activities to ensure all required staff receive the proper O&M training and information	
	Implement training program	
<b>S9</b>	<b>Reporting</b>	
	Prepare summary of O&M program status for inclusion in Annual Report	Annually, before March 31

## 7. Compliance with Total Maximum Daily Load Requirements (TMDLs)

### a) Requirement: Compliance with TMDLs in Appendix 2 (S7.A)

*“For applicable TMDLs listed in Appendix 2, affected Permittees shall comply with the specific requirements listed in Appendix 2. Each Permittee shall keep records of all actions required by this Permit that are relevant to applicable TMDLs within their jurisdiction. The status of the TMDL implementation shall be included as part of the annual report submitted to Ecology. Each annual report shall include a summary of the relevant SWMP and Appendix 2 activities conducted in the TMDL area to address the applicable TMDL parameter(s).”*

7.a.1.Current Activities: No TMDLs listed in Appendix 2 of the MSP are applicable to the Capitol Campus. These TMDLs apply to specific water bodies, none of which the Capitol Campus stormwater system discharges to.

7.a.2.Future Activities: No applicable TMDLs are currently listed in Appendix 2.

**b) Requirement: Compliance with TMDLs not in Appendix 2 (S7.B)**

*“For applicable TMDLs not listed in Appendix 2, compliance with this Permit shall constitute compliance with those TMDLs.”*

7.b.1.Current Activities: There are no TMDLs in place outside of Appendix 2 that are applicable to the Capitol Campus.

7.b.2.Future Activities: DES will comply with any future TMDLs that are approved that are applicable to the Capitol Campus.

**c) Requirement: Compliance with Future TMDLs approved by the EPA (S7.C)**

*“For TMDLs that are approved by the EPA after the Permit is issued, Ecology may establish TMDL related permit requirements through future permit modification if Ecology determines implementation of actions, monitoring, or reporting necessary to demonstrate reasonable further progress toward achieving TMDL waste load allocations, and other targets, are not occurring and shall be implemented during the term of this Permit or when this Permit is reissued. Permittees are encouraged to participate in development of TMDLs within their jurisdiction and to begin implementation.”*

7.c.1.Current Activities: Ecology is in the process of establishing TMDLs for Budd Inlet/Capitol Lake due to Dissolved Oxygen and Total Phosphorus levels, with an expected submittal to the U.S. Environmental Protection Agency (EPA) for approval in 2019. DES has representatives in the Advisory Group for this project, which provides input on the development of this TMDL.

7.c.2.Future Activities: DES will continue to provide input on the TMDL for Budd Inlet/Capitol Lake as it is developed. DES will develop programs to begin implementation of TMDLs once the TMDL has been approved and established.

## **8. Monitoring and Assessment**

**a) Requirement: Annual Report on Stormwater Monitoring/Studies (S8.A)**

*“All Permittees, including Secondary Permittees, shall provide, in each annual report, a description of any stormwater monitoring or stormwater-related studies conducted by the Permittee during the reporting period. If other stormwater monitoring or stormwater-related studies were conducted on behalf of the Permittee during the reporting period, or if stormwater-related investigations conducted by other entities were reported to the Permittee during the reporting period, a brief description of the type of information gathered or received shall be included in the annual report.*

*Permittees are not required to provide descriptions of any monitoring, studies, or analyses conducted as part of the Regional Stormwater Monitoring Program (RSMP) in annual reports. If a Permittee conducts independent monitoring in accordance with requirements in S8.B or S8.C below, annual reporting of such monitoring must follow the requirements specified in those sections.”*

8.a.1.Current Activities: DES does not currently conduct any monitoring or stormwater studies. As a Secondary Permittee to the City of Olympia, the Capitol Campus is covered under the City of Olympia’s actions. The City of Olympia pays the Puget Sound Regional Monitoring

Program (PSRMP) to monitor its outfalls. The Capitol Campus outfalls are included in this monitoring. As this is a RSMP, this is not required to be mentioned in the Annual Report.

8.a.2.Future Activities: If there are any changes to DES's monitoring programs, they will be incorporated into the annual report.

## **9. Reporting Guidelines (S9)**

This section details the applicable requirements for the annual report on SWMP requirement compliance. Current and future activities for Section 9 are all noted under S9.E

### **a) Annual Report (S9.A)**

*"No later than March 31 of each year, each Permittee shall submit an annual report. The reporting period for the first annual report will be from January 1, 2014, through December 31, 2014. The reporting period for all subsequent annual reports will be the previous calendar year unless otherwise specified.*

*Permittees shall submit annual report electronically using Ecology's Water Quality Permitting Portal."*

### **b) Record Retention (S9.B)**

*"Each Permittee is required to keep all records related to this permit and the SWMP for at least five years."*

### **c) Public Access to Reports (S9.C)**

*"Each Permittee shall make all records related to this permit and the Permittee's SWMP available to the public at reasonable times during business hours. The Permittee will provide a copy of the most recent annual report to any individual or entity upon request."*

### **d) Annual Report for Cities, Towns and Counties (S9.D)**

This section is not applicable to the Capitol Campus.

### **e) Annual Report for Secondary Permittees (S9.E)**

*"Each annual report shall include the following:*

- i. Submittal of annual report form as provided by Ecology pursuant to S9.A describing the status of implementation of requirements of this permit during the reporting period.*
- ii. Attachments to the annual report form, including summaries, descriptions, reports, and other information as required, or as applicable, to meet the requirements of this permit during the reporting period. Refer to Appendix 4 for annual report questions.*
- iii. If applicable, notice that the MS4 is relying on another government entity to satisfy any obligations under the permit.*
- iv. Certification and signature pursuant to G19.D, and notification of any changes to authorization pursuant to G19.C.*
- v. A notification of any jurisdictional boundary changes resulting in an increase or decrease in the Secondary Permittee's geographic area of permit coverage during the reporting period."*

9.e.1.Current Activities: DES completes and submits the annual report to Ecology as required.

9.e.2.Future Activities: DES will continue to submit the annual report as required.

## **10. Maintenance Guidelines**

The inclusion of maintenance guidelines in the SWMP is not a requirement of the NPDES MSP. This section is included to allow DES maintenance staff to quickly access these guidelines. The stormwater system at the Capitol Campus consists of different components, including catch basins, pipes, underground detention pipes, manholes, bioretention facilities, flow control structures, and detention vaults. Proper maintenance of these structures is an important part of a stormwater management program.

Ecology has developed maintenance Best Management Practices (BMPs) for stormwater facilities, as has the City of Olympia. These BMPs, developed by the two different organizations, are consistent. These maintenance BMPs outline how and when to maintain different stormwater facilities and shall be used as guidelines by the Capitol Campus maintenance staff for routine maintenance of the stormwater system. As a Secondary Permittee to the City of Olympia, DES has selected the City standards, and the applicable City of Olympia standard maintenance BMPs are compiled and included in Appendix A.

## References

1. Western Washington Phase II Municipal Stormwater Permit-January 16, 2014
2. City of Olympia 2016 Stormwater Management Program Plan-May 2016
3. City of Olympia Drainage Design and Erosion Control Manual-December 2016

## Acronyms

BMP	Best Management Practice
DES	Department of Enterprise Services
EPA	Environmental Protection Agency
IDDE	Illicit Discharge Detection and Elimination
LOTT	Lacey, Olympia, Tumwater and Thurston County Clean Water Alliance
MS4	Municipal Separate Storm Sewer System
MSP	Municipal Stormwater Permit
O&M	Operations and Maintenance
RSMP	Regional Stormwater Monitoring Program
SWMP	Stormwater Management Program
TMDL	Total Maximum Daily Load

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## **Appendix A: Maintenance BMPs and Guidelines**

This appendix contains BMPs and maintenance guidelines for the components of the existing stormwater system at the Capitol Campus. The system consists of catch basins, pipes, underground detention pipes, manholes, bioretention facilities, flow control structures, and detention vaults. All of the attached BMPs were established either by Ecology or the City of Olympia. This appendix is intended to be used by operations staff as a reference for regular maintenance operations.

## Catch Basins, Manholes, and Grate Inlets

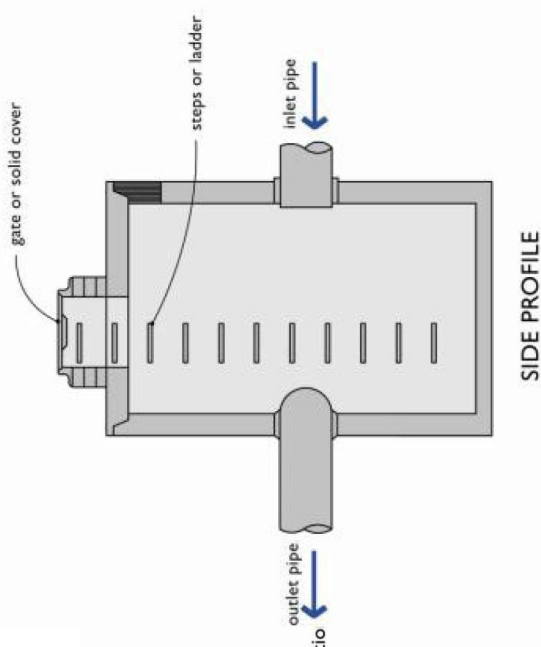
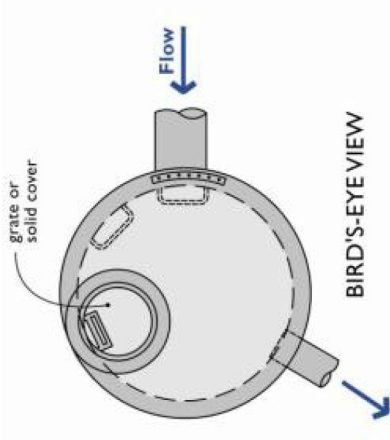
Catch basins are underground concrete structures typically provided with a slotted grate to collect stormwater runoff and route it through underground pipes. Catch basins can also be used as a junction in a pipe system and may have a solid lid. There are two catch basin types.

A Type 1 catch basin is a rectangular box with approximate dimensions of 3"x2"x5". Type 1 catch basins are utilized when the connected conveyance pipes are less than 18 inches in diameter and the depth from the grate to the bottom of the pipe is less than 5 feet.

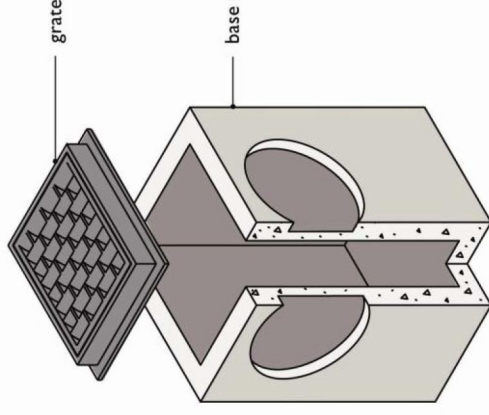
Type 2 catch basins, also commonly referred to as storm manholes, are round concrete structures ranging in diameter of 4 feet to 8 feet. Type 2 catch basins typically have manhole steps mounted on the side of the structure to allow for access. Type 2 catch basins or manholes can have either a solid access cover or a slotted grate inlet similar to a Type 1 catch basin.

Both catch basin types typically provide a storage volume (sump) below the outlet pipe to allow sediments and debris to settle out of the stormwater runoff. Some catch basins are also provided with a spill control device (inverted elbow on outlet pipe) intended to contain large quantities of grease or oils within the basin.

The most common cleaning method for catch basins is to utilize a truck with a tank and vacuum hose (vacor truck) to remove sediment and debris from the sump. Catch basins may be an enclosed space where harmful chemicals and vapors can accumulate. Therefore, if the inspection and maintenance requires entering a catch basin, it should be conducted by an individual with training and certification in working in hazardous confined spaces.



**Type 2**



**Type 1**



## Catch Basins, Manholes, and Grate Inlets

Component	Required Inspection Frequency <sup>1</sup>	Issue or Condition Requiring Maintenance (Standards)	Issue Exists?	Corrective Action (Procedures)
<b>Cleaning</b>				
Standing water	As needed	Standing water present during maintenance activities.	Yes No	Remove/dispose with other material in accordance with state and federal regulations. Do not pump to downstream stormwater system.
Trash, debris, sediment, vegetation	A2	Accumulated material within 6 inches of the bottom of the lowest pipe entering or exiting the structure or filling greater than 60 percent of the sump depth.	Yes No	Remove/dispose in accordance with state and federal regulations.
	A	Sediment, debris, or vegetation blocking 1/3 the diameter of any pipe.	Yes No	Remove/dispose in accordance with state and federal regulations.
	B, W, E	Vegetation/debris blocking 10 percent or more of inlet grate capacity.	Yes No	Clean and dispose of material
Pollution	A	Dead animals or vegetation that could generate odors and cause complaints or dangerous gases (e.g., methane).	Yes No	Remove/dispose
	A2, E	Any visible accumulation of oil, gas, paint, or other contaminant (includes concrete debris or slurry).	Yes No	Remove/dispose in accordance with state and federal regulations. If possible, identify and control source
<b>Structure</b>				
Frame and/or top slab	A	Corner extends more than 0.75 inches past curb face or street surface (where applicable).	Yes No	Repair so frame even with curb
	A	Holes greater than 2 inches or cracks greater than 0.25 inches in top slab.	Yes No	Repair to water tight condition
	A	Frame not flush with top slab (separation >0.75 inches) or not securely attached.	Yes No	Repair

## Catch Basins, Manholes, and Grate Inlets

Component	Required Inspection Frequency <sup>1</sup>	Issue or Condition Requiring Maintenance (Standards)	Issue Exists?	Corrective Action (Procedures)
Catch Basin structure	A	Cracks wider than 0.5 inches and longer than 1 foot, missing bricks, evidence of water of soil entering, or judged to be structurally unsound by maintenance personnel.	Yes No	Repair; Grout where feasible; Catch basin may require replacement where found to be structurally unsound
		Cracks wider than 0.5 inches and longer than 1 foot at pipe inlet/outlet.	Yes No	RegROUT and reseal pipe at basin wall
Cover/Grate Inlet	A	Cover/grate missing, damaged, or only partially in place.	Yes No	Repair/replace
		Grate openings are wider than 7/8 inch.	Yes No	Replace
		Cannot be opened by one person. Locking bolts missing, damaged, or have less than ½ inch of thread.	Yes No	Repair/replace
Ladder	A	Buried.	Yes No	Expose and restore to surface grade
		Ladder rungs damaged, missing, or misaligned.	Yes No	Repair/replace

<sup>1</sup> Inspection frequency:

A = Annually;

B = Biannually (twice per year);

W = Recommend that at least one inspection occur during the wet season, preferably after trees have lost their leaves;

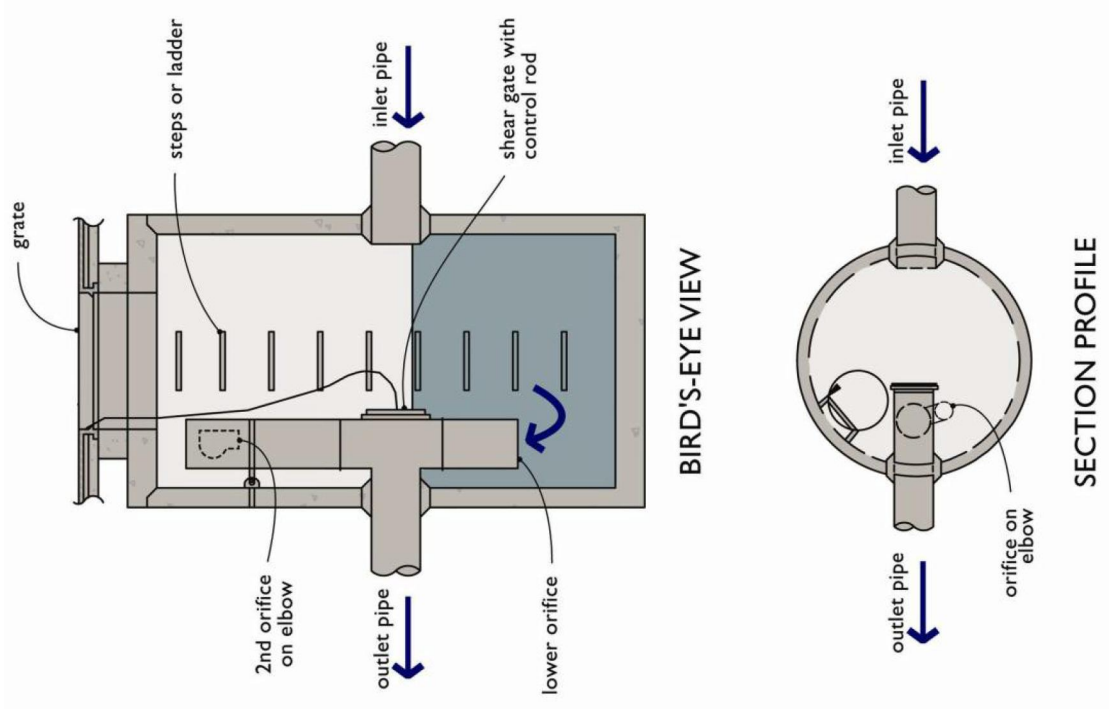
E = Recommend that additional inspections be performed as appropriate after major events (e.g., >1 inch of precipitation in 24 hours or environmental incident which causes contaminant release).

<sup>2</sup> Minimum requirement is for annual inspections. More frequent inspections and maintenance may be required depending on site conditions.

## Flow Control Structures/Flow Restrictors

Flow control structures/flow restrictors are located on the outlet pipe of a detention system. The control structure is typically a Type 2 concrete catch basin with a riser (vertical pipe). The control structure reduces the discharge rate of stormwater from a detention facility to the rate at which water was leaving the site prior to development. The flow is regulated by a combination of orifices (holes in the riser pipe with specifically sized diameters) and weirs (rectangular or V-shaped notches in the riser pipe or a separate plate). Lack of maintenance of the control structure can result in the plugging of an orifice. This can result in a backup of stormwater in the detention facility, flooding of the stormwater system, and/or an increase in the rate of discharge from the site potentially damaging downstream property.

Flow control structures are an essential component to the function of a detention pond to limit downstream flooding, undue erosion and stream degradation, and function of the storm and surface water infrastructure maintained by the City of Olympia. While it may be unnerving to watch the water level in a pond fill up dramatically during a major storm event and water slowly trickle out, this is the designed intent of the detention pond and flow control device. Removing the flow restrictor to alleviate pond levels should never be attempted as this will cause downstream damage and flooding. Damage, plugging, or removal of flow control devices is the leading cause of failed detention facilities and flooding.



Flow Control Structures/Flow Restrictors

Component	Required Inspection Frequency <sup>1</sup>	Issue or Condition Requiring Maintenance (Standards)	Issue Exists?	Corrective Action (Procedures)	
<b>General</b>					
Trash and Debris (Includes Sediment)	A	Material exceeds 25% of sump depth or 1 foot below orifice plate.	Yes	Control structure orifice is not blocked. All trash and debris removed.	
			No		
Structural Damage	A	Structure is not securely attached to manhole wall.	Yes	Structure securely attached to wall and outlet pipe.	
			No		
			Yes		Structure in correct position.
			No		
Connections to outlet pipe are not watertight and show signs of rust.	A	Connections to outlet pipe are not watertight and show signs of rust.	Yes	Connections to outlet pipe are water tight; structure repaired or replaced and works as designed.	
			No		
Any holes--other than designed holes--in the structure.	A	Any holes--other than designed holes--in the structure.	Yes	Structure has no holes other than designed holes.	
			No		
<b>Cleanout Gate</b>					
Damaged or Missing	A	Cleanout gate is not watertight or is missing.	Yes	Gate is watertight and works as designed.	
			No		
			Yes		Gate moves up and down easily and is watertight.
			No		
Chain/rod leading to gate is missing or damaged.	A	Chain/rod leading to gate is missing or damaged.	Yes	Chain is in place and works as designed.	
			No		
Gate is rusted over 50% of its surface area.	A	Gate is rusted over 50% of its surface area.	Yes	Gate is repaired or replaced to meet design standards.	
			No		
<b>Orifice Plate</b>					
Damaged or Missing	B, D	Control device is not working properly due to missing, out of place, or bent orifice plate.	Yes	Plate is in place and works as designed.	
			No		

## Flow Control Structures/Flow Restrictors

Component	Required Inspection Frequency <sup>1</sup>	Issue or Condition Requiring Maintenance (Standards)	Issue Exists?	Corrective Action (Procedures)
Obstructions	B, D	Any trash, debris, sediment, or vegetation blocking the plate.	Yes No	Plate is free of all obstructions and works as designed.
<b>Overflow Pipe</b>				
Obstructions	A	Any trash or debris blocking (or having the potential of blocking) the overflow pipe.	Yes No	Pipe is free of all obstructions and works as designed.

<sup>1</sup> Inspection frequency:

A = Annually;

B = Biannually (twice per year);

W = Recommend that at least one inspection occur during the wet season, preferably after trees have lost their leaves;

E = Recommend that additional inspections be performed as appropriate after major events (e.g., >1 inch of precipitation in 24 hours or environmental incident which causes contaminant release);

D = Inspection and Maintenance of facility should occur during dry weather (summer/early fall) prior to rainy season.

<sup>2</sup> Minimum requirement is for annual inspections. More frequent inspections and maintenance may be required depending on site conditions.

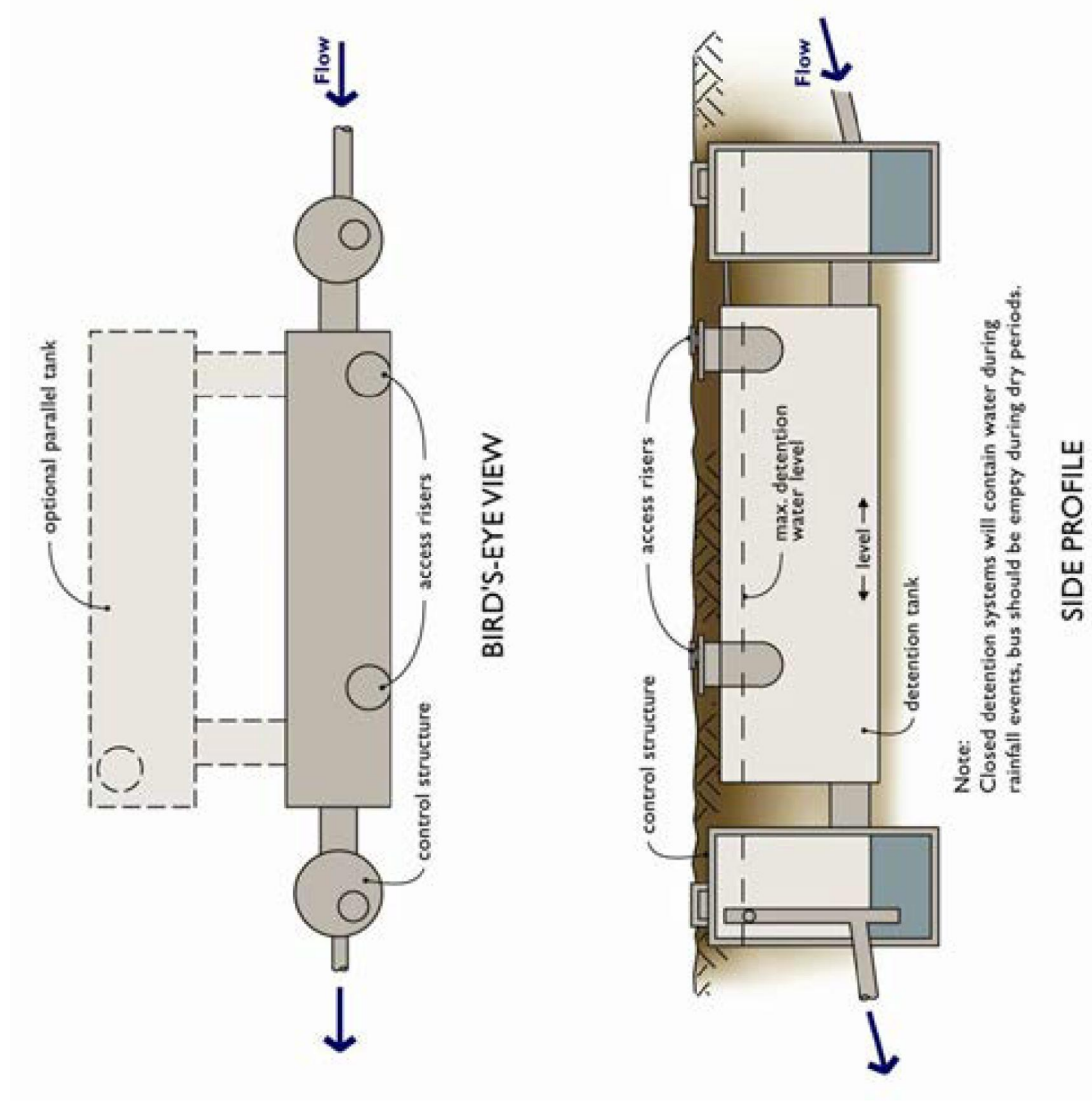
## Closed Detention Systems (Tanks/Vaults)

Closed detention systems function similar to detention ponds with the temporary storage volume provided by an underground structure to regulate the storm discharge rate from the site. The structure is typically constructed of large diameter pipe (48" diameter or greater) or a concrete box (Vault). These systems are typically utilized for sites that do not have space available for an open, above-ground system and are more commonly associated with commercial sites.

Underground detention systems are an enclosed space where harmful chemicals and vapors can accumulate. Therefore, the inspection and maintenance of these facilities should be conducted by an individual with training and certification in working in hazardous confined spaces.

Access to detention vaults and tanks can be made through access risers and inspection ports. Flow control devices may be located within a detention vault or in a separate downstream manhole.

Detention tanks/vaults are designed to drain out completely within 48 hours of a storm event. Facilities that continue to hold water well beyond a storm event should be inspected for damage or blockages at the outlet structure.



Closed Detention Systems (Tanks/Vaults)

Component	Required Inspection Frequency <sup>1</sup>	Issue or Condition Requiring Maintenance (Standards)	Issue Exists?	Corrective Action (Procedures)
<b>Storage Area</b>				
Plugged Air Vents	A	One-half of the cross section of a vent is blocked at any point or the vent is damaged.	Yes No	Vents open and functioning.
Debris and Sediment	A <sup>2</sup>	Accumulated sediment depth exceeds 10% of the diameter of the storage area for 1/2 length of storage vault or any point depth exceeds 15% of diameter. (Example: 72-inch storage tank would require cleaning when sediment reaches depth of 7 inches for more than 1/2 length of tank.)	Yes No	All sediment and debris removed from storage area.
Joints Between Tank/Pipe Section	A	Any openings or voids allowing material to be transported into facility. (Will require engineering analysis to determine structural stability).	Yes No	All joint between tank/pipe sections are sealed.
Tank Pipe Bent Out of Shape	A	Any part of tank/pipe is bent out of shape more than 10% of its design shape. (Review required by engineer to determine structural stability).	Yes No	Tank/pipe repaired or replaced to design.
Vault Structure Includes Cracks in Wall, Bottom, Damage to Frame and/or Top Slab	A	Cracks wider than 1/2-inch and any evidence of soil particles entering the structure through the cracks, or maintenance/inspection personnel determines that the vault is not structurally sound.	Yes No	Vault replaced or repaired to design specifications and is structurally sound.
	A	Cracks wider than 1/2-inch at the joint of any inlet/outlet pipe or any evidence of soil particles entering the vault through the walls.	Yes No	No cracks more than 1/4-inch wide at the joint of the inlet/outlet pipe.
<b>Manhole</b>				
Cover Not in Place	B	Cover is missing or only partially in place. Any open manhole requires maintenance.	Yes No	Manhole is closed.
Locking Mechanism Not Working	A	Mechanism cannot be opened by one maintenance person with proper tools. Bolts into frame have less than 1/2 inch of thread (may not apply to self-locking lids).	Yes No	Mechanism opens with proper tools.

## Closed Detention Systems (Tanks/Vaults)

Component	Required Inspection Frequency <sup>1</sup>	Issue or Condition Requiring Maintenance (Standards)	Issue Exists?	Corrective Action (Procedures)
Cover Difficult to Remove	A	One maintenance person cannot remove lid after applying normal lifting pressure. Intent is to keep cover from sealing off access to maintenance.	Yes No	Cover can be removed and reinstalled by one maintenance person.
Ladder Rungs Unsafe	A	Ladder is unsafe due to missing rungs, misalignment, not securely attached to structure wall, rust, or cracks.	Yes No	Ladder meets design standards. Allows maintenance person safe access.
<b>Catch Basins or Manholes</b>				
See "Catch Basins"	A	See "Catch Basins"	Yes No	See "Catch Basins"

<sup>1</sup> Inspection frequency:

A = Annually;

B = Biannually (twice per year);

W = Recommend that at least one inspection occur during the wet season, preferably after trees have lost their leaves;

E = Recommend that additional inspections be performed as appropriate after major events (e.g., >1 inch of precipitation in 24 hours or environmental incident which causes contaminant release);

D = Inspection and Maintenance of facility should occur during dry weather (summer/early fall) prior to rainy season.

<sup>2</sup> Minimum requirement is for annual inspections. More frequent inspections and maintenance may be required depending on site conditions.



## Bioretention Facilities

Bioretention facilities are engineered facilities that store and treat stormwater by filtering it through a specified soil profile. Water that enters the facility ponds in an earthen depression or other basin (e.g., concrete planter) before it infiltrates into the underlying bioretention soil. Stormwater that exceeds the surface storage capacity overflows to an adjacent drainage system. Treated water is either infiltrated into the underlying native soil or collected by an underdrain and discharged.

### Key Maintenance Considerations

The main components of bioretention facilities are listed below with descriptions of their function and key maintenance considerations.

**Inlet:** Stormwater can flow into a bioretention facility in a number of ways including dispersed flow across vegetated areas, sheet flow across impervious areas, or concentrated flow through curb cuts and/or piped flow inlets. Inlets must be maintained to be unobstructed to ensure that stormwater enters the facility as designed.

**Facility footprint:** The facility footprint is typically an earthen depression or another type of basin (e.g., concrete planter box) that provides surface storage for stormwater before it infiltrates into the underlying bioretention soil. If the facility is located on a slope, low permeability check dams may be included (oriented perpendicular to the slope) to encourage ponding.

**Bioretention soil mix:** Infiltration of stormwater through the engineered bioretention soil mix provides water quality treatment. All maintenance activities must be performed in a manner to prevent compaction of the bioretention soil.

**Mulch:** The bioretention soil is covered by a layer of mulch, comprised of arborist wood chips, compost, and/or rocks. Mulch reduces weed establishment. Organic mulches regulate soil temperatures and moisture, and add organic matter to soil. The mulch layer must be supplemented regularly.

**Vegetation:** Bioretention systems rely on vegetation (i.e., grasses, shrubs, and sometimes trees) to intercept, uptake, and evapotranspire stormwater. In addition, plant roots improve soil structure and increase infiltration capacity. Regular maintenance activities associated with vegetation include weeding and pruning. Plants also require irrigation during the first 2 to 3 years of establishment and during extended dry periods.

**Overflow:** Flows exceeding the capacity of the facility are discharged via an overflow structure (e.g., pipe, curb cut, earthen channel). It is important to maintain clear outlet pipes and overflow structures to ensure that stormwater can be safely conveyed to a designated discharge point (e.g., storm drain system).

**Underdrains (optional):** Underdrains are optional components of a bioretention facility that may be included in bioretention systems where, for example, infiltration to underlying soil is not prudent or feasible. Underdrains are installed under the bioretention soil layer to collect and convey treated water. An underdrain system can be comprised of perforated or slotted pipe, wrapped in an aggregate blanket. It is important to maintain clear drains so that water moves through system as designed.

For a bioretention system to function properly, stormwater must infiltrate freely through the bioretention soil. The soil infiltration rate can be reduced if the soil is subject to compaction (e.g., foot and vehicle traffic loads), and therefore these types of traffic should be avoided.

Bioretention Facilities

Component	Required Inspection Frequency <sup>1</sup>	Issue or Condition Requiring Maintenance (Standards)	Issue Exists?	Corrective Action (Procedures)
<b>Facility Footprint</b>				
Earthen side slopes and berms	B, S	Erosion (gullies/ rills) greater than 2 inches deep around inlets, outlet, and alongside slopes	Yes No	<ul style="list-style-type: none"> <li>Eliminate cause of erosion and stabilize damaged area (regrade, rock, vegetation, erosion control matting)</li> <li>For deep channels or cuts (over 3 inches in ponding depth), temporary erosion control measures should be put in place until permanent repairs can be made.</li> <li>Properly designed, constructed and established facilities with appropriate flow velocities should not have erosion problems except perhaps in extreme events. If erosion problems persist, the following should be reassessed: (1) flow volumes from contributing areas and bioretention facility sizing; (2) flow velocities and gradients within the facility; and (3) flow dissipation and erosion protection strategies at the facility inlet.</li> </ul>
	A	Erosion of sides causes slope to become a hazard	Yes No	Take actions to eliminate the hazard and stabilize slopes.
	A, S	Settlement greater than 3 inches (relative to undisturbed sections of berm)	Yes No	Restore to design height.
	A, S	Downstream face of berm wet, seeps or leaks evident	Yes No	Plug any holes and compact berm (may require consultation with engineer, particularly for larger berms)
	A	Any evidence of rodent holes or water piping in berm	Yes No	<ul style="list-style-type: none"> <li>Eradicate rodents (see "Pest control")</li> <li>Fill holes and compact (may require consultation with engineer, particularly for larger berms)</li> </ul>
Concrete sidewalls	A	Cracks or failure of concrete sidewalls	Yes No	<ul style="list-style-type: none"> <li>Repair/ seal cracks</li> <li>Replace if repair is insufficient</li> </ul>
Rockery sidewalls	A	Rockery side walls are insecure	Yes No	Stabilize rockery sidewalls (may require consultation with engineer, particularly for walls 4 feet or greater in height)

## Bioretention Facilities

Component	Required Inspection Frequency <sup>1</sup>	Issue or Condition Requiring Maintenance (Standards)	Issue Exists?	Corrective Action (Procedures)
Facility Area		Trash and debris present	Yes No	Clean out trash and debris
Facility bottom area	A, S	Accumulated sediment to extent that infiltration rate is reduced (see "Ponded water") or surface storage capacity significantly impacted	Yes No	<ul style="list-style-type: none"> <li>Remove excess sediment</li> <li>Replace any vegetation damaged or destroyed by sediment accumulation and removal</li> <li>Mulch newly planted vegetation</li> <li>Identify and control the sediment source (if feasible)</li> <li>If accumulated sediment is recurrent, consider adding presettlement or installing berms to create a forebay at the inlet</li> </ul>
Low Permeability Check dams and weirs		Accumulated leaves in facility	Yes No	Remove leaves if there is a risk to clogging outlet structure or water flow is impeded.
	A, S	Sediment, vegetation, or debris accumulated at or blocking (or having the potential to block) check dam, flow control weir or orifice.	Yes No	Clear the blockage.
	A, S	Erosion and/or undercutting present.	Yes No	Repair and take preventative measures to prevent future erosion and/or undercutting.
	A	Grade board or top of weir damaged or not level.	Yes No	Restore to level position.

Bioretention Facilities

Component	Required Inspection Frequency <sup>1</sup>	Issue or Condition Requiring Maintenance (Standards)	Issue Exists?	Corrective Action (Procedures)
Ponded water	B, S	Excessive ponding water: Water overflows during storms smaller than the design event or ponded water remains in the basin 48 hours or longer after the end of a storm.	Yes No	<p>Determine cause and resolve in the following order:</p> <ol style="list-style-type: none"> <li>1. Confirm leaf or debris buildup in the bottom of the facility is not impeding infiltration. If necessary, remove leaf litter/debris.</li> <li>2. Ensure that underdrain (if present) is not clogged. If necessary, clear underdrain.</li> <li>3. Check for other water inputs (e.g., groundwater, illicit connections).</li> <li>4. Verify that the facility is sized appropriately for the contributing area. Confirm that the contributing area has not increased.</li> </ol> <p>If steps #1-4 do not solve the problem, the bioretention soil is likely clogged by sediment accumulation at the surface or has become overly compacted. Dig a small hole to observe soil profile and identify compaction depth or clogging front to help determine the soil depth to be removed or otherwise rehabilitated (e.g., tilled). Consultation with an engineer is recommended.</p>
<b>Inlets/Outlets/Pipes</b>				
Bioretention soil media	As needed	Bioretention soil media protection is needed when performing maintenance requiring entrance into the facility footprint	Yes No	<ul style="list-style-type: none"> <li>• Minimize all loading in the facility footprint (foot traffic and other loads) to the degree feasible in order to prevent compaction of bioretention soils.</li> <li>• Never drive equipment or apply heavy loads in facility footprint.</li> <li>• Because the risk of compaction is higher during saturated soil conditions, any type of loading in the cell (including foot traffic) should be minimized during wet conditions.</li> <li>• Consider measures to distribute loading if heavy foot traffic is required or equipment must be placed in facility. As an example, boards may be placed across soil to distribute loads and minimize compaction.</li> <li>• If compaction occurs, soil must be loosened or otherwise rehabilitated to original design state.</li> </ul>

## Bioretention Facilities

Component	Required Inspection Frequency <sup>1</sup>	Issue or Condition Requiring Maintenance (Standards)	Issue Exists?	Corrective Action (Procedures)
Splash block inlet	A	Water is not being directed properly to the facility and away from the inlet structure	Yes No	Reconfigure/ repair blocks to direct water to facility and away from structure
	M (during the wet season and before severe storm is forecasted)	Accumulated leaves at curb cuts	Yes No	Clear leaves (particularly important for key inlets and low points along long, linear facilities)
Pipe inlet/outlet	A	Pipe is damaged	Yes No	Repair/ replace
	W	Pipe is clogged	Yes No	Remove roots or debris
	A, S	Sediment, debris, trash, or mulch reducing capacity of inlet/outlet	Yes No	<ul style="list-style-type: none"> <li>Clear the blockage</li> <li>Identify the source of the blockage and take actions to prevent future blockages</li> </ul>
		Accumulated leaves at inlets/outlets	Yes No	Clear leaves (particularly important for key inlets and low points along long, linear facilities)
		Maintain access for inspections	Yes No	<ul style="list-style-type: none"> <li>Clear vegetation (transplant vegetation when possible) within 1 foot of inlets and outlets, maintain access pathways</li> <li>Consultation with a landscape architect is recommended for removal, transplant, or substitution of plants</li> </ul>
Trash rack	A	Concentrated flows are causing erosion	Yes No	Maintain a cover of rock or cobbles or other erosion protection measure (e.g., matting) to protect the ground where concentrated water enters the facility (e.g., a pipe, curb cut or swale)
	S	Trash or other debris present on trash rack	Yes No	Remove/dispose
Overflow	A	Bar screen damaged or missing	Yes No	Repair/replace
	A, S	Capacity reduced by sediment or debris	Yes No	Remove sediment or debris/dispose

Bioretention Facilities

Component	Required Inspection Frequency <sup>1</sup>	Issue or Condition Requiring Maintenance (Standards)	Issue Exists?	Corrective Action (Procedures)
Underdrain pipe	Clean pipe as needed	<ul style="list-style-type: none"> <li>Plant roots, sediment or debris reducing capacity of underdrain</li> <li>Prolonged surface ponding (see "Ponded water")</li> </ul>	Yes No	<ul style="list-style-type: none"> <li>Jet clean or rotary cut debris/roots from underdrain(s)</li> <li>If underdrains are equipped with a flow restrictor (e.g., orifice) to attenuate flows, the orifice must be cleaned regularly.</li> </ul>
<b>Vegetation</b>				
Facility bottom area and upland slope vegetation	Fall and Spring	Vegetation survival rate falls below 75% within first two years of establishment (unless project O&M manual or record drawing stipulates more or less than 75% survival rate).	Yes No	<ul style="list-style-type: none"> <li>Determine cause of poor vegetation growth and correct condition.</li> <li>Replant as necessary to obtain 75% survival rate or greater. Refer to original planting plan, or approved jurisdictional species list for appropriate plant replacements (See Appendix 3 - Bioretention Plant List, in the LID Technical Guidance Manual for Puget Sound).</li> <li>Confirm that plant selection is appropriate for site growing conditions.</li> <li>Consultation with a landscape architect is recommended for removal, transplant, or substitution of plants.</li> </ul>
Vegetation (general)	As needed	Presence of diseased plants and plant material	Yes No	<ul style="list-style-type: none"> <li>Remove any diseased plants or plant parts and dispose of in an approved location (e.g., commercial landfill) to avoid risk of spreading the disease to other plants.</li> <li>Disinfect gardening tools after pruning to prevent the spread of disease</li> <li>See Pacific Northwest Plant Disease Management Handbook for information on disease recognition and for additional resources</li> <li>Replant as necessary according to recommendations provided for "facility bottom area and upland slope vegetation".</li> </ul>

Bioretention Facilities

Component	Required Inspection Frequency <sup>1</sup>	Issue or Condition Requiring Maintenance (Standards)	Issue Exists?	Corrective Action (Procedures)
Trees and shrubs		Pruning as needed	Yes No	<ul style="list-style-type: none"> <li>● Prune trees and shrubs in a manner appropriate for each species. Pruning should be performed by landscape professionals familiar with proper pruning techniques</li> <li>● All pruning of mature trees should be performed by or under the direct guidance of an ISA certified arborist.</li> </ul>
	A	Large trees and shrubs interfere with operation of the facility or access for maintenance	Yes No	<ul style="list-style-type: none"> <li>● Prune trees and shrubs using most current ANSI A300 standards and ISA BMPs.</li> <li>● Remove trees and shrubs, if necessary.</li> </ul>
	Fall and Spring	Standing dead vegetation is present	Yes No	<ul style="list-style-type: none"> <li>● Remove standing dead vegetation</li> <li>● Replace dead vegetation within 30 days of reported dead and dying plants (as practical depending on weather/planting season)</li> <li>● If vegetation replacement is not feasible within 30 days, and absence of vegetation may result in erosion problems, temporary erosion control measures should be put in place immediately.</li> <li>● Determine cause of dead vegetation and address issue, if possible</li> <li>● If specific plants have a high mortality rate, assess the cause and replace with appropriate species. Consultation with a landscape architect is recommended.</li> </ul>
	Fall and Spring	Planting beneath mature trees	Yes No	<ul style="list-style-type: none"> <li>● When working around and below mature trees, follow the most current ANSI A300 standards and ISA BMPs to the extent practicable (e.g., take care to minimize any damage to tree roots and avoid compaction of soil).</li> <li>● Planting of small shrubs or groundcovers beneath mature trees may be desirable in some cases; such plantings should use mainly plants that come as bulbs, bare root or in 4-inch pots; plants should be in no larger than 1-gallon containers.</li> </ul>

## Bioretention Facilities

Component	Required Inspection Frequency <sup>1</sup>	Issue or Condition Requiring Maintenance (Standards)	Issue Exists?	Corrective Action (Procedures)
	Fall and Spring	Presence of or need for stakes and guys (tree growth, maturation, and support needs).	Yes No	<ul style="list-style-type: none"> <li>Verify location of facility liners and underdrain (if any) prior to stake installation in order to prevent liner puncture or pipe damage.</li> <li>Monitor tree support systems: Repair and adjust as needed to provide support and prevent damage to tree.</li> <li>Remove tree supports (stakes, guys, etc.) after one growing season or maximum of 1 year.</li> <li>Backfill stake holes after removal.</li> </ul>
Trees and shrubs adjacent to vehicle travel areas (or areas where visibility needs to be maintained).	A	Vegetation causes some visibility (line of sight) or driver safety issues.	Yes No	<ul style="list-style-type: none"> <li>Maintain appropriate height for sight clearance.</li> <li>When continued, regular pruning (more than one time/ growing season) is required to maintain visual sight lines for safety or clearance along a walk or drive, consider relocating the plant to a more appropriate location.</li> <li>Remove or transplant if continual safety hazard.</li> <li>Consultation with a landscape architect is recommended for removal, transplant, or substitution of plants.</li> </ul>
Flowering plants	As needed	Dead or spent flowers present.	Yes No	Remove spent flowers (deadhead).
Perennials	As needed	Spent plants.	Yes No	Cut back dying or dead and fallen foliage and stems.
Emergent vegetation	As needed	Vegetation compromises conveyance.	Yes No	<ul style="list-style-type: none"> <li>Hand rake sedges and rushes with a small rake or fingers to remove dead foliage before new growth emerges in spring or earlier only if the foliage is blocking water flow (sedges and rushes do not respond well to pruning)</li> </ul>
Ornamental grasses (perennial)	As needed	Dead material from previous year's growing cycle or dead collapsed foliage.	Yes No	<ul style="list-style-type: none"> <li>Leave dry foliage for winter interest.</li> <li>Hand rake with a small rake or fingers to remove dead foliage back to within several inches from the soil before new growth emerges in spring or earlier if the foliage collapses and is blocking water flow.</li> </ul>



Bioretention Facilities

Component	Required Inspection Frequency <sup>1</sup>	Issue or Condition Requiring Maintenance (Standards)	Issue Exists?	Corrective Action (Procedures)
Ornamental grasses (evergreen)	As needed	Dead growth present in spring.	Yes No	<ul style="list-style-type: none"> <li>Hand rake with a small rake or fingers to remove dead growth before new growth emerges in spring.</li> <li>Clean, rake, and comb grasses when they become too tall.</li> <li>Cut back to ground or thin every 2-3 years as needed.</li> </ul>
Noxious weeds	As needed	Listed noxious vegetation is present (refer to current county noxious weed list).	Yes No	<ul style="list-style-type: none"> <li>By law, class A &amp; B noxious weeds must be removed, bagged and disposed as garbage immediately.</li> <li>Reasonable attempts must be made to remove and dispose of class C noxious weeds.</li> <li>It is strongly encouraged that herbicides and pesticides not be used in order to protect water quality; use of herbicides and pesticides may be prohibited in some jurisdictions.</li> <li>Apply mulch after weed removal (see "Mulch").</li> </ul>
Weeds	As needed	Weeds are present	Yes No	<ul style="list-style-type: none"> <li>Remove weeds with their roots manually with pincer-type weeding tools, flame weeders, or hot water weeders as appropriate</li> <li>Follow IPM protocols for weed management (see "Additional Maintenance Resources" section for more information on IPM protocols)</li> </ul>
Excessive vegetation	As needed	Low-lying vegetation growing beyond facility edge onto sidewalks, paths, or street edge poses pedestrian safety hazard or may clog adjacent permeable pavement surfaces due to associated leaf litter, mulch, and soil.	Yes No	<ul style="list-style-type: none"> <li>Edge or trim groundcovers and shrubs at facility edge</li> <li>Avoid mechanical blade-type edger and do not use edger or trimmer within 2 feet of tree trunks</li> <li>While some clippings can be left in the facility to replenish organic material in the soil, excessive leaf litter can cause surface soil clogging.</li> </ul>

Bioretention Facilities

Component	Required Inspection Frequency <sup>1</sup>	Issue or Condition Requiring Maintenance (Standards)	Issue Exists?	Corrective Action (Procedures)
Excessive vegetation	As needed	Excessive vegetation density inhibits stormwater flow beyond design ponding or becomes a hazard for pedestrian and vehicular circulation and safety.	Yes No	<ul style="list-style-type: none"> <li>• Determine whether pruning or other routine maintenance is adequate to maintain proper plant density and aesthetics.</li> <li>• Determine if planting type should be replaced to avoid ongoing maintenance issues (an aggressive grower under perfect growing conditions should be transplanted to a location where it will not impact flow.)</li> <li>• Remove plants that are weak, broken or not true to form; replace in-kind.</li> <li>• Thin grass or plants impacting facility function without leaving visual holes or bare soil areas.</li> <li>• Consultation with a landscape architect is recommended for removal, transplant, or substitution of plants.</li> <li>• Remove vegetation and sediment buildup.</li> </ul>
<b>Mulch</b>				
Mulch	As needed	Vegetation blocking curb cuts, causing excessive sediment buildup and flow bypass.  Bare spots (without mulch cover) are present or mulch depth less than 2 inches		<ul style="list-style-type: none"> <li>• Supplement mulch with hand tools to a depth of 2 to 3 inches.</li> <li>• Replenish mulch per O&amp;M manual. Often coarse compost is used in the bottom of the facility and arborist wood chips are used on side slopes and rim (above typical water levels).</li> <li>• Keep all mulch away from woody stems.</li> </ul>
<b>Watering</b>				
Irrigation system (if any)		Irrigation system present.		<ul style="list-style-type: none"> <li>• Follow manufacturer's instructions for O&amp;M</li> </ul>
	A	Sprinklers or drip irrigation not directed/located to properly water plants.		<ul style="list-style-type: none"> <li>• Redirect sprinklers or move drip irrigation to desired areas</li> </ul>

Bioretention Facilities

Component	Required Inspection Frequency <sup>1</sup>	Issue or Condition Requiring Maintenance (Standards)	Issue Exists?	Corrective Action (Procedures)
Summer watering (first year)		Trees, shrubs and groundcovers in first year of establishment period.		<ul style="list-style-type: none"> <li>● 10 to 15 gallons per tree.</li> <li>● 3 to 5 gallons per shrub.</li> <li>● 2 gallons water per square foot for groundcover areas.</li> <li>● Water deeply, but infrequently, so that the top 6 to 12 inches of the root zone is moist.</li> <li>● Use soaker hoses or spot water with a shower type wand when irrigation system is not present.</li> <li>● Pulse water to enhance soil absorption, when feasible.</li> <li>● Pre-moisten soil to break surface tension of dry or hydrophobic soils/mulch, followed by several more passes. With this method, each pass increases soil absorption and allows more water to infiltrate prior to runoff.</li> <li>● Add a tree bag or slow-release watering device (e.g., bucket with a perforated bottom) for watering newly installed trees when irrigation system is not present.</li> </ul>
Summer watering (second and third years)		Trees, shrubs and groundcovers in second or third year of establishment period.		<ul style="list-style-type: none"> <li>● 10 to 15 gallons per tree</li> <li>● to 5 gallons per shrub</li> <li>● gallons water per square foot for groundcover areas</li> <li>● Water deeply, but infrequently, so that the top 6 to 12 inches of the root zone is moist</li> <li>● Use soaker hoses or spot water with a shower type wand when irrigation system is not present               <ul style="list-style-type: none"> <li>○ Pulse water to enhance soil absorption, when feasible.</li> <li>○ Pre-moisten soil to break surface tension of dry or hydrophobic soils/mulch, followed by several more passes. With this method, each pass increases soil absorption and allows more water to infiltrate prior to runoff.</li> </ul> </li> </ul>

Bioretention Facilities

Component	Required Inspection Frequency <sup>1</sup>	Issue or Condition Requiring Maintenance (Standards)	Issue Exists?	Corrective Action (Procedures)
Summer watering (after establishment)		Established vegetation (after 3 years).		<ul style="list-style-type: none"> <li>Plants are typically selected to be drought tolerant and not require regular watering after establishment; however, trees may take up to 5 years of watering to become fully established.</li> <li>Identify trigger mechanisms for drought-stress (e.g., leaf wilt, leaf senescence, etc.) of different species and water immediately after initial signs of stress appear.</li> <li>Water during drought conditions or more often if necessary to maintain plant cover.</li> </ul>
<b>Pest Control</b>				
Mosquitoes	B, S	Standing water remains for more than 3 days after the end of a storm.		<ul style="list-style-type: none"> <li>Identify the cause of the standing water and take appropriate actions to address the problem (see "Ponded water").</li> <li>To facilitate maintenance, manually remove standing water and direct to the storm drainage system (if runoff is from non pollution-generating surfaces) or sanitary sewer system (if runoff is from pollution-generating surfaces) after getting approval from sanitary sewer authority.</li> <li>Do not use pesticides or <i>Bacillus thuringiensis israelensis</i> (Bti).</li> </ul>
Nuisance animals	As needed	Nuisance animals causing erosion, damaging plants, or depositing large volumes of feces.		<ul style="list-style-type: none"> <li>Reduce site conditions that attract nuisance species where possible (e.g., plant shrubs and tall grasses to reduce open areas for geese, etc.)</li> <li>Place predator decoys</li> <li>Follow IPM protocols for specific nuisance animal issues (see "Additional Maintenance Resources" section for more information on IPM protocols)</li> <li>Remove pet waste regularly</li> <li>For public and right-of-way sites consider adding garbage cans with dog bags for picking up pet waste.</li> </ul>

## Bioretention Facilities

Component	Required Inspection Frequency <sup>1</sup>	Issue or Condition Requiring Maintenance (Standards)	Issue Exists?	Corrective Action (Procedures)
Insect pests	Every site visit associated with vegetation mgmt.	Signs of pests, such as wilting leaves, chewed leaves and bark, spotting or other indicators.		<ul style="list-style-type: none"> <li>● Reduce hiding places for pests by removing diseased and dead plants.</li> <li>● For infestations, follow IPM protocols (see “Additional Maintenance Resources” section for more information on IPM protocols).</li> </ul>

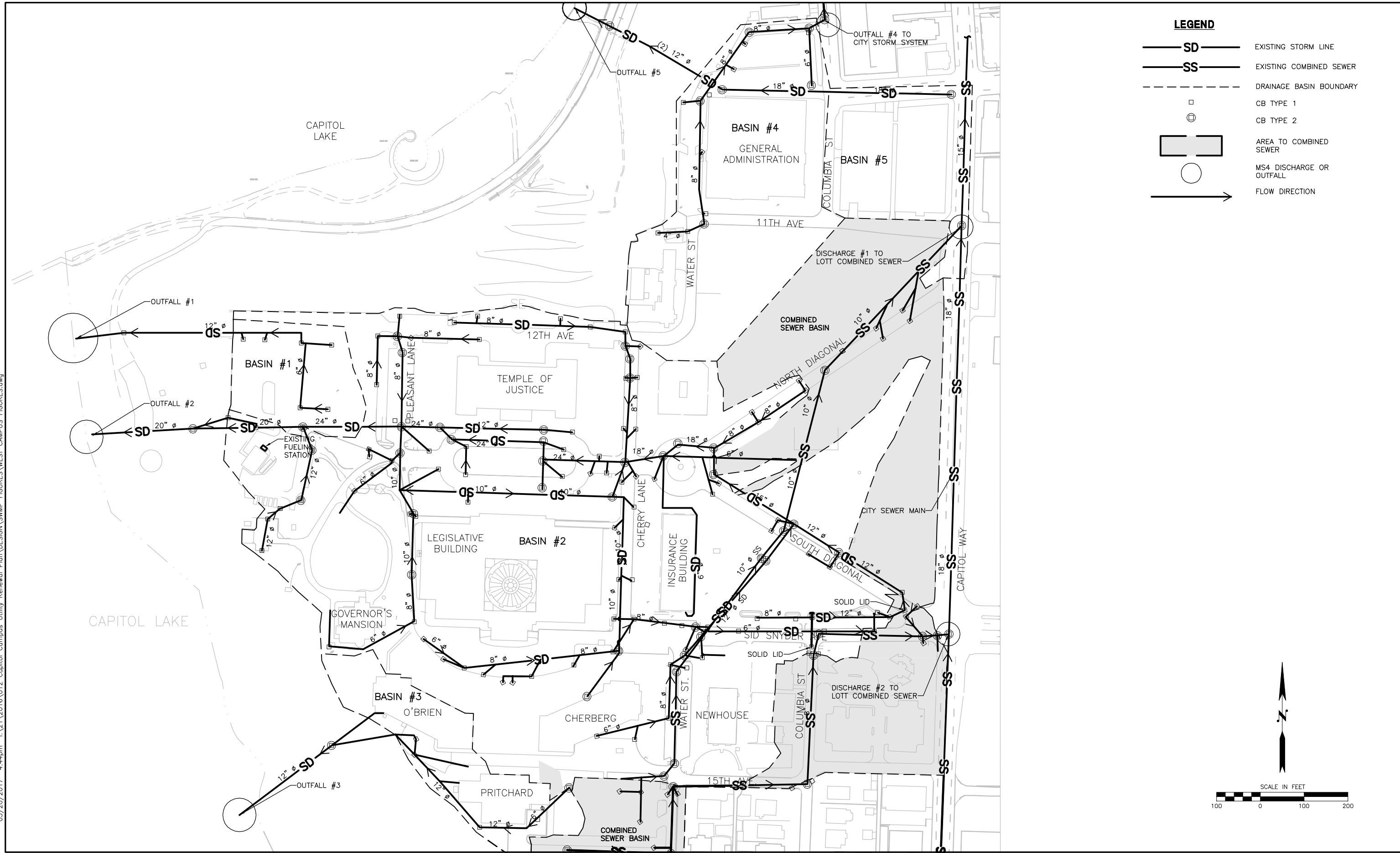
<sup>a</sup> Frequency: A = Annually; B = Biannually (twice per year); M = Monthly; W = At least one visit should occur during the wet season (for debris/clog related maintenance, this inspection/maintenance visit should occur in the early fall, after deciduous trees have lost their leaves); S = Perform inspections after major storm events (24-hour storm event with a 10-year or greater recurrence interval).

IPM – Integrated Pest Management

ISA – International Society of Arboriculture

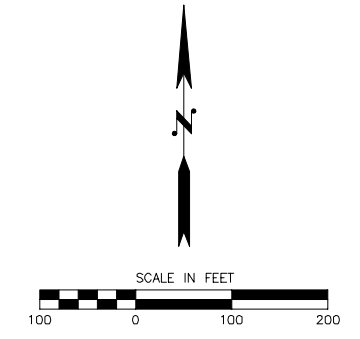
## Appendix B: Stormwater Map

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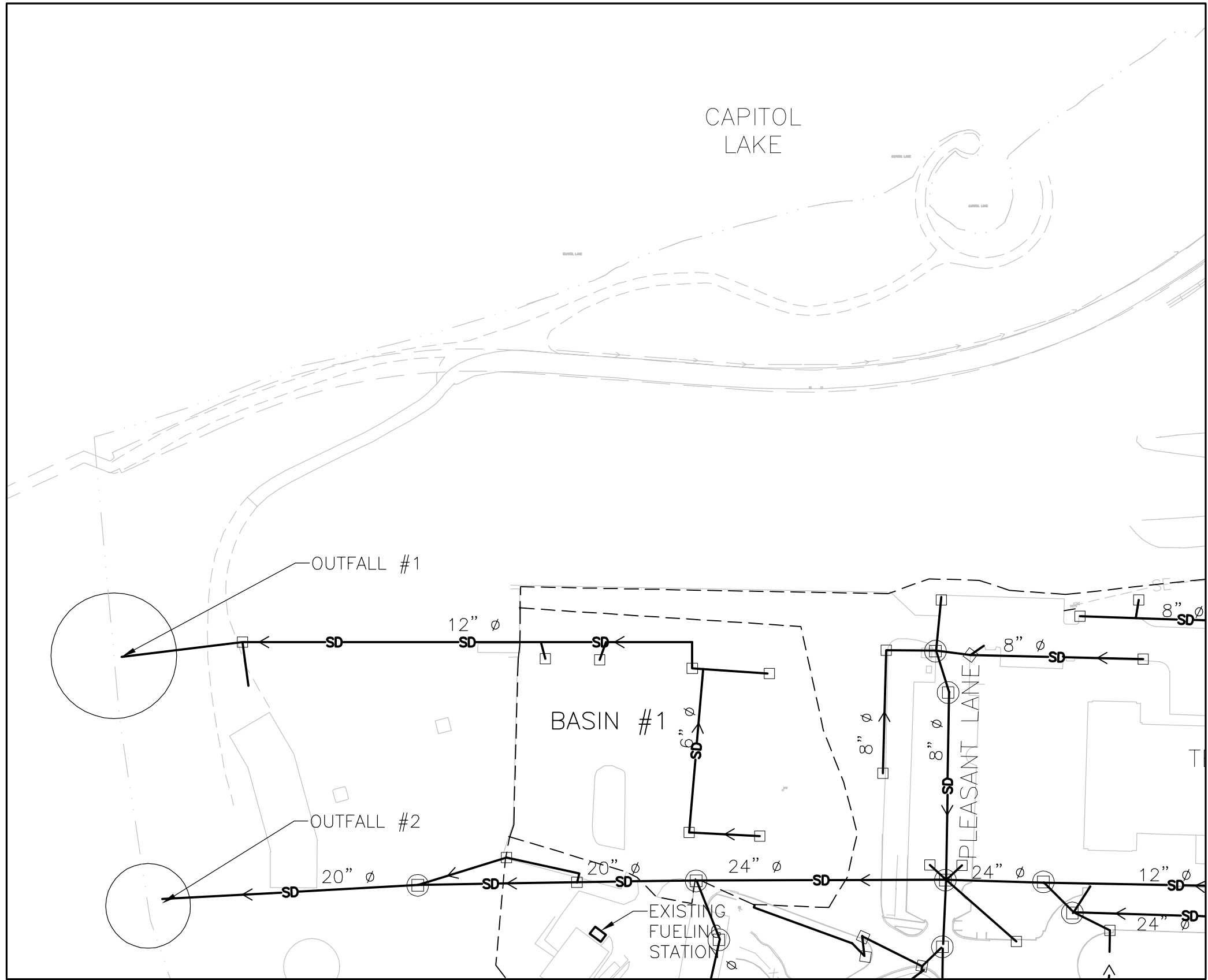


**LEGEND**

	EXISTING STORM LINE
	EXISTING COMBINED SEWER
	DRAINAGE BASIN BOUNDARY
	CB TYPE 1
	CB TYPE 2
	AREA TO COMBINED SEWER
	MS4 DISCHARGE OR OUTFALL
	FLOW DIRECTION

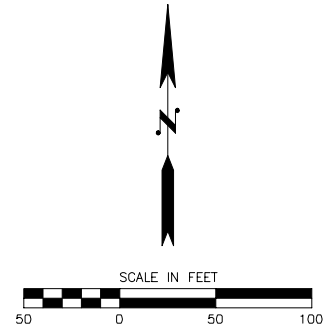
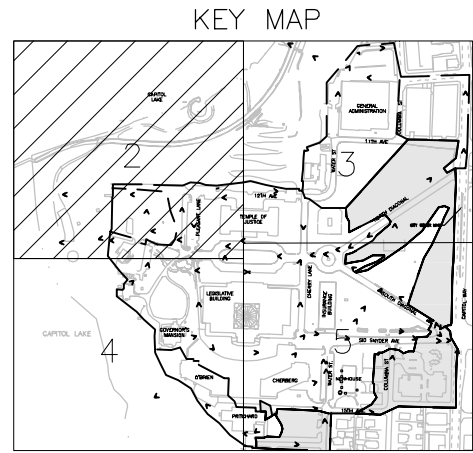


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**LEGEND**

	EXISTING STORM LINE
	EXISTING COMBINED SEWER
	DRAINAGE BASIN BOUNDARY
	CB TYPE 1
	CB TYPE 2
	MS4 DISCHARGE OR OUTFALL
	FLOW DIRECTION



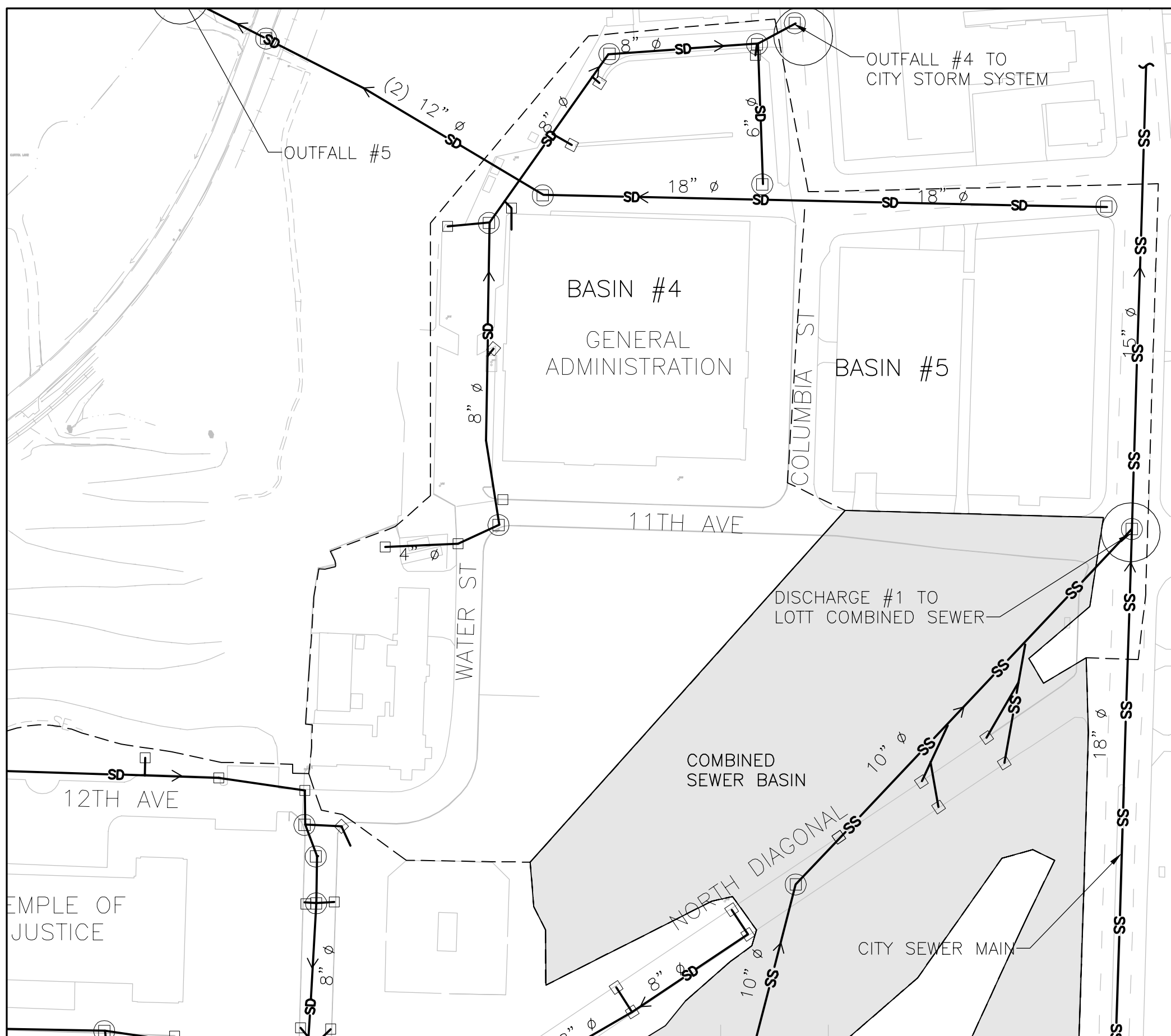
MATCH LINE-SEE FIGURE 3

MATCH LINE-SEE FIGURE 4



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MATCH LINE-SEE FIGURE 2



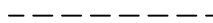







MATCH LINE-SEE FIGURE 5

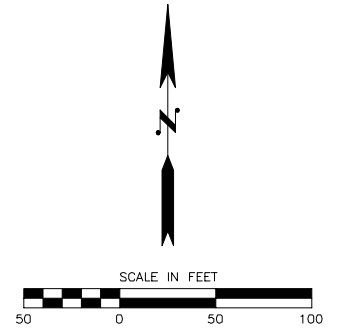
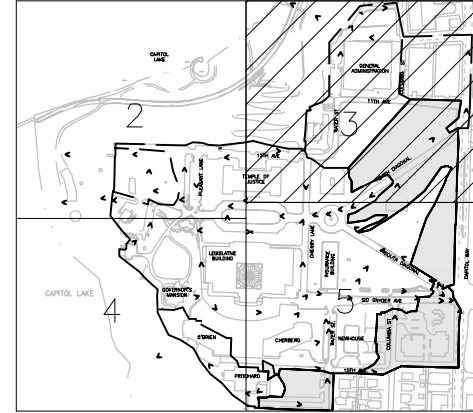
WEST CAMPUS STORMWATER SYSTEM MAP-NE

Capitol Campus Stormwater Management Plan  
March 2017

**LEGEND**

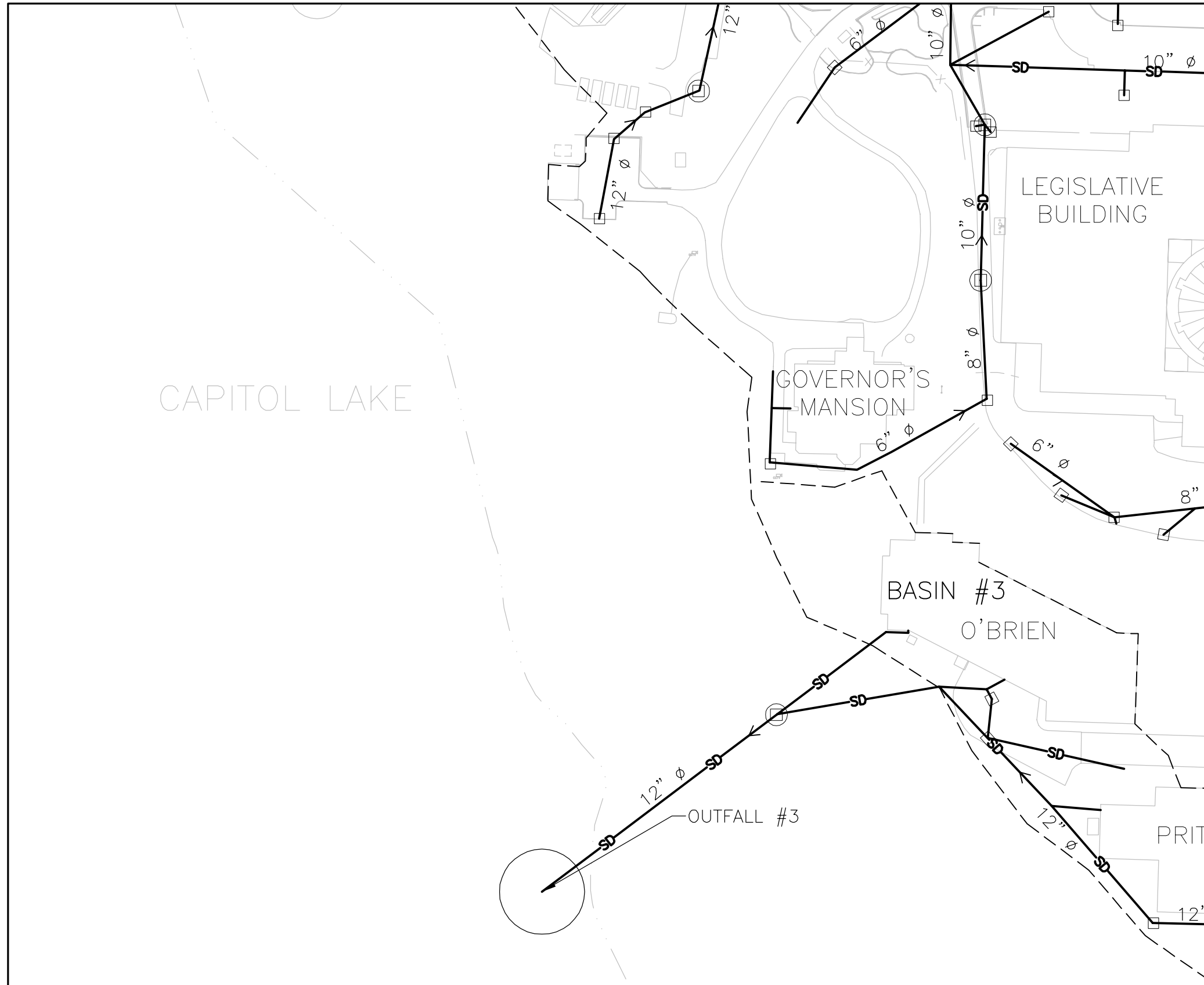
-  EXISTING STORM LINE
-  EXISTING COMBINED SEWER
-  DRAINAGE BASIN BOUNDARY
-  CB TYPE 1
-  CB TYPE 2
-  AREA TO COMBINED SEWER
-  MS4 DISCHARGE OR OUTFALL
-  FLOW DIRECTION

**KEY MAP**



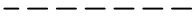







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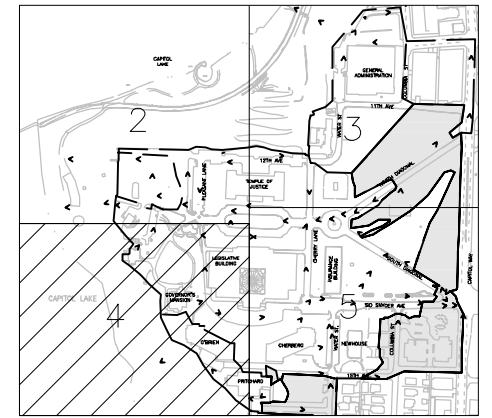
MATCH LINE-SEE FIGURE 2



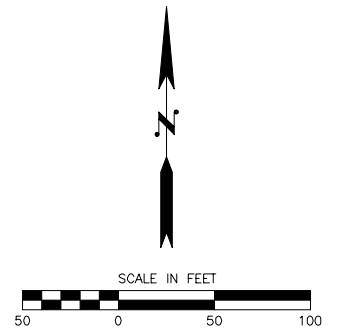
**LEGEND**

-  EXISTING STORM LINE
-  EXISTING COMBINED SEWER
-  DRAINAGE BASIN BOUNDARY
-  CB TYPE 1
-  CB TYPE 2
-  AREA TO COMBINED SEWER
-  MS4 DISCHARGE OR OUTFALL
-  FLOW DIRECTION

**KEY MAP**



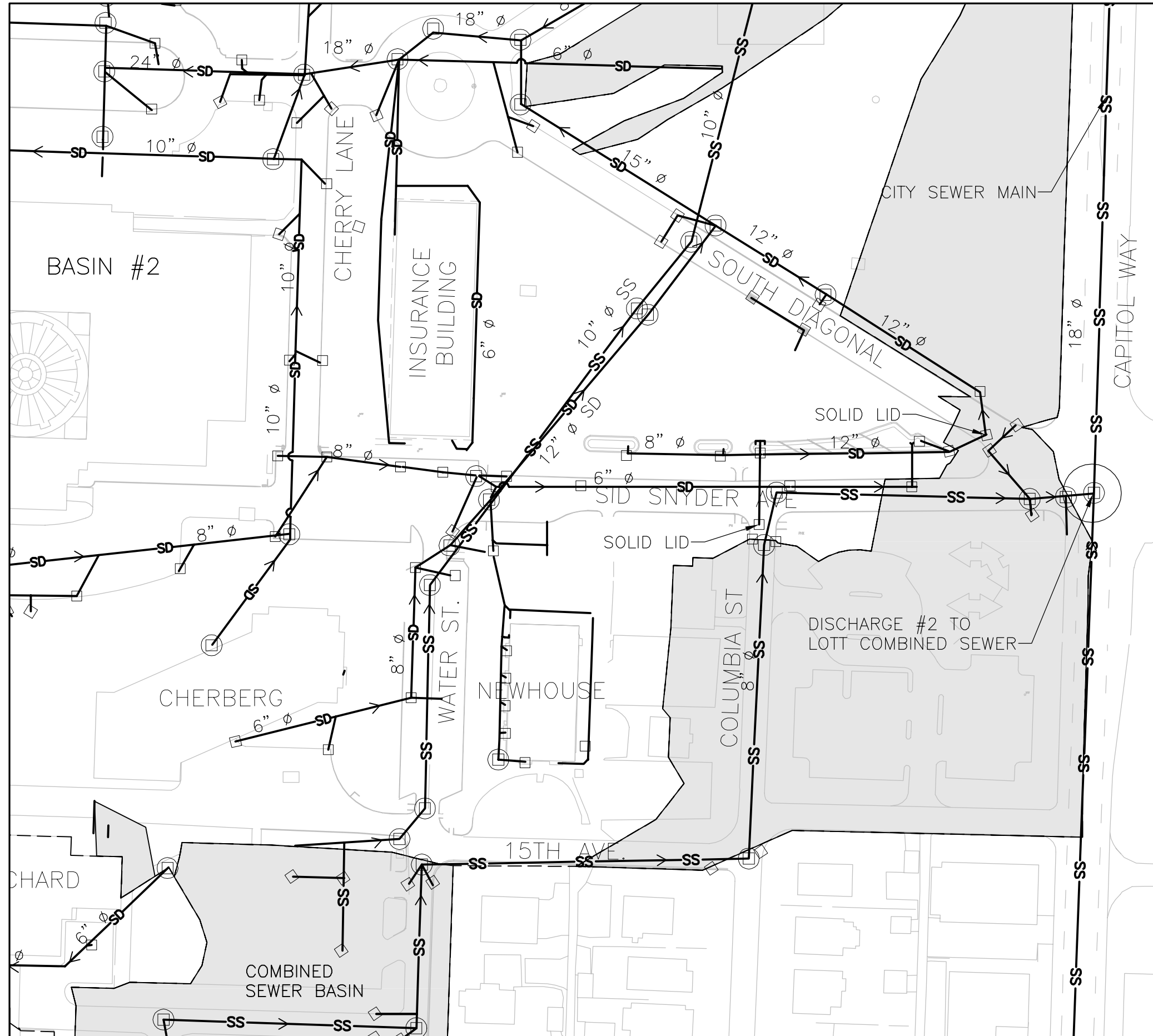
MATCH LINE-SEE FIGURE 5



**WEST CAMPUS STORMWATER SYSTEM MAP-SW**  
 Capitol Campus Stormwater Management Plan  
 March 2017

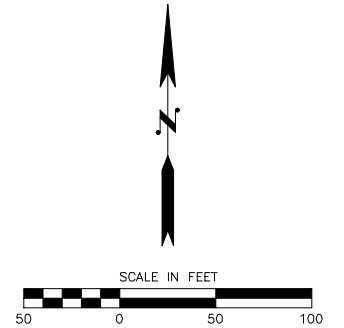
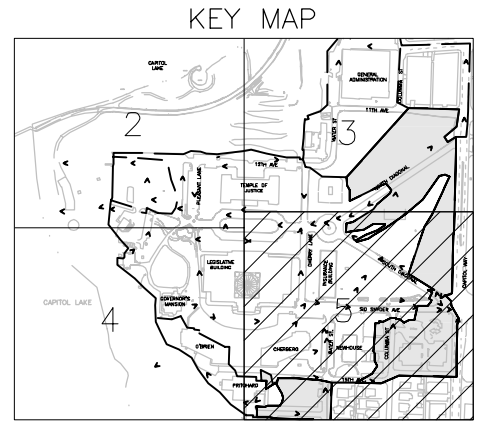
**Figure 4**

MATCH LINE-SEE FIGURE 4



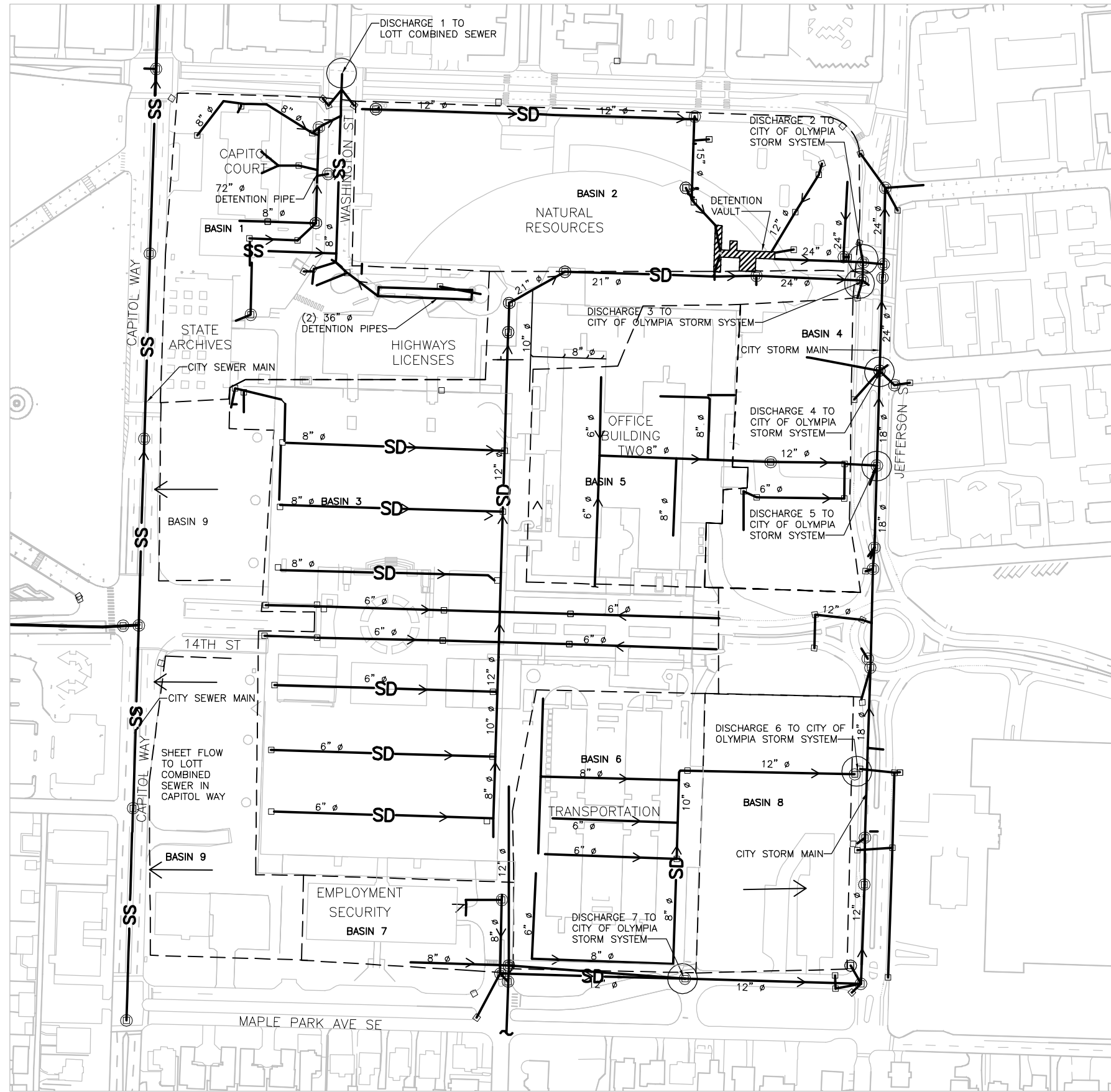
**LEGEND**

	EXISTING STORM LINE
	EXISTING COMBINED SEWER
	DRAINAGE BASIN BOUNDARY
	CB TYPE 1
	CB TYPE 2
	AREA TO COMBINED SEWER
	MS4 DISCHARGE OR OUTFALL
	FLOW DIRECTION

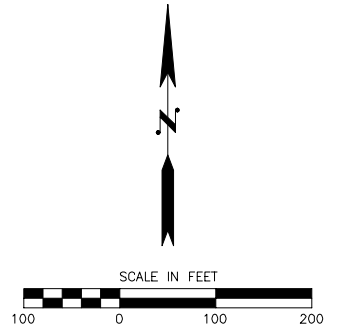


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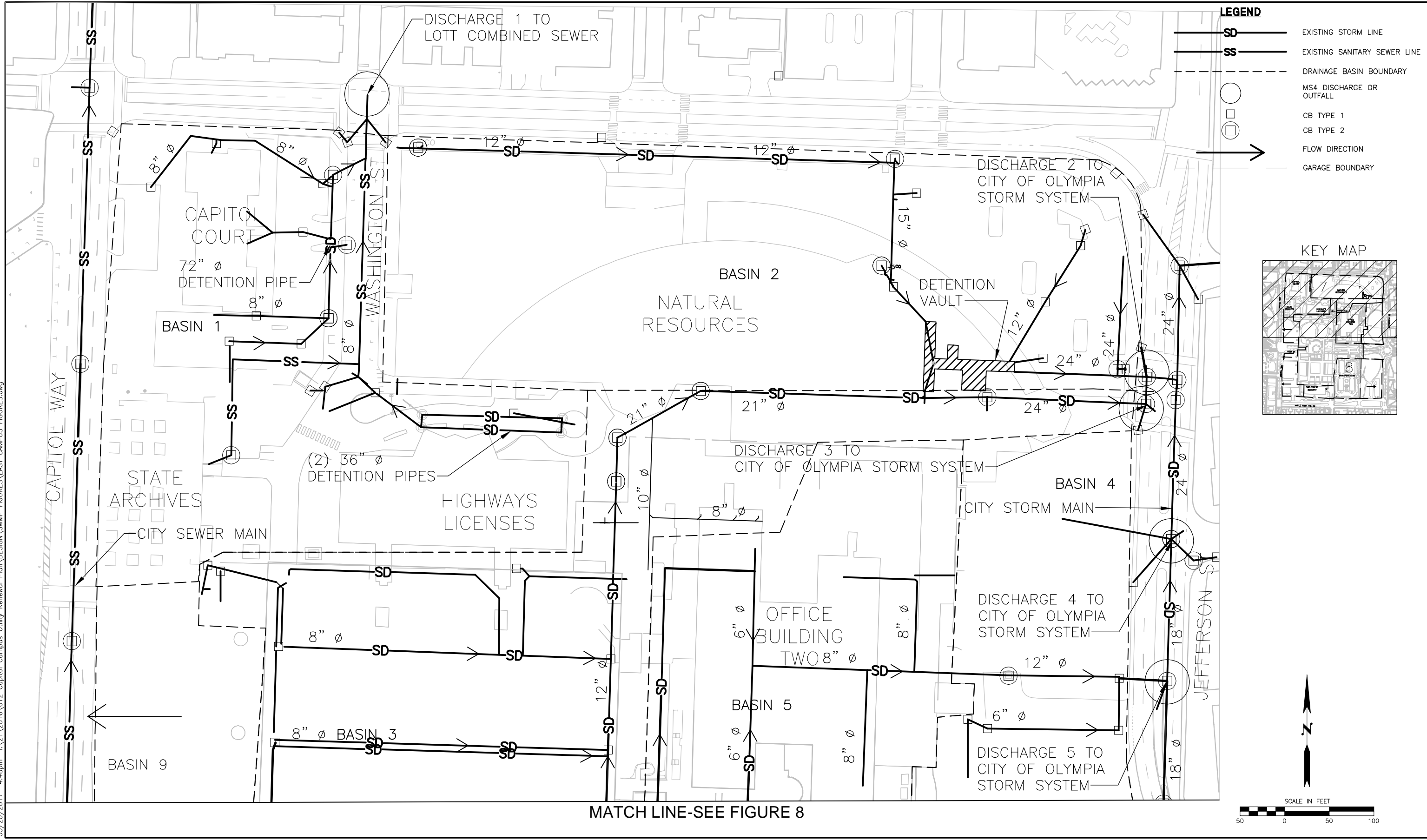
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LEGEND	
	EXISTING STORM LINE
	EXISTING SANITARY SEWER LINE
	DRAINAGE BASIN BOUNDARY
	MS4 DISCHARGE OR OUTFALL
	CB TYPE 1
	CB TYPE 2
	FLOW DIRECTION
	GARAGE BOUNDARY

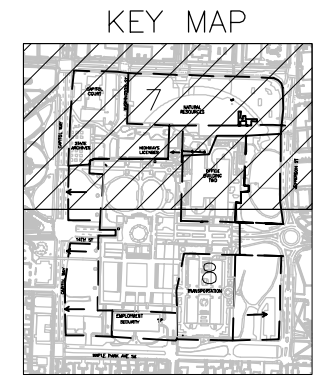


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**LEGEND**

- EXISTING STORM LINE
- EXISTING SANITARY SEWER LINE
- DRAINAGE BASIN BOUNDARY
- MS4 DISCHARGE OR OUTFALL
- CB TYPE 1
- CB TYPE 2
- FLOW DIRECTION
- GARAGE BOUNDARY



SCALE IN FEET

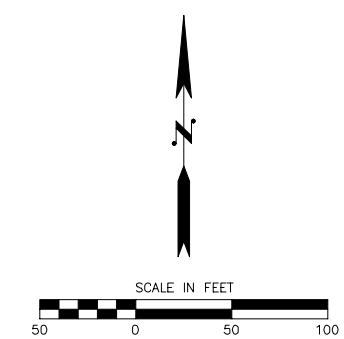
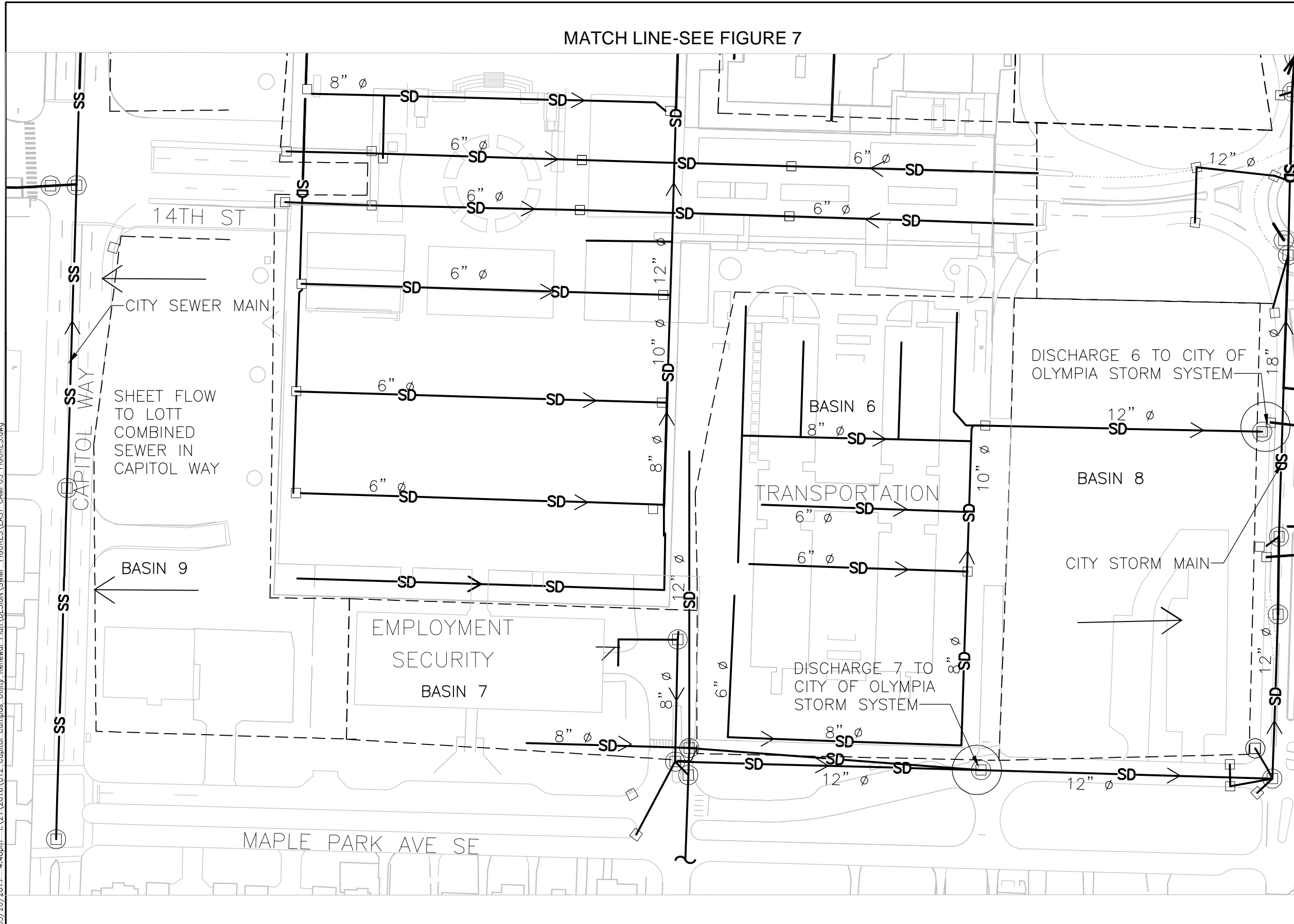
MATCH LINE-SEE FIGURE 8

MATCH LINE-SEE FIGURE 7

LEGEND

- SD** — EXISTING STORM LINE
- SS** — EXISTING SANITARY SEWER LINE
- - - DRAINAGE BASIN BOUNDARY
- MS4 DISCHARGE OR OUTFALL
- CB TYPE 1
- ◻ CB TYPE 2
- FLOW DIRECTION
- - - GARAGE BOUNDARY

KEY MAP



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## Appendix C: City of Olympia Stormwater Management Plan



City of Olympia

# 2016 Stormwater Management Program Plan

May 2016





**City of Olympia**  
**2016 Stormwater Management Program (SWMP) Plan**  
**Prepared February 2016**

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## **INTRODUCTION**

### **Purpose of the Stormwater Management Program Plan (SWMP)**

All stormwater runoff flowing through Olympia's pipes, ponds, and ditches is managed according to the requirements of a permit first issued by the Washington State Department of Ecology (WDOE) in January of 2007. The *Western Washington Phase II Municipal Stormwater Permit* (Permit) requires the City to take actions like; educating the public and encouraging non-polluting behaviors, looking for illegal dumping and cross-connections, enforcing erosion and sediment control at construction sites, and using best practices for land management and stormwater system maintenance.

This SWMP is designed to reduce the discharge of pollutants from Olympia's regulated MS4 (municipal separate storm sewer system) to the maximum extent practicable, meet state AKART (all known and reasonable technologies) requirements, and protect water quality.

### **Implementation Timing**

The Permit is now in its second issuance for the City of Olympia. The current Permit is effective for five years, from August 2013 through August 2018. Each year, the Permit adds new requirements for the City to come into compliance. The low impact development requirements of the Permit are required to be in compliance by December 31, 2016.

### **Olympia Storm and Surface Water Utility – Other Activities**

The Utility maintains over 155 miles of underground pipe, over 7,000 storm drains, and 50 stormwater ponds that carry stormwater runoff from roads and rooftops to our streams and Budd Inlet. We work on many levels to protect water quality, aquatic habitat, and prevent flooding. This involves working closely with residents, businesses and other government agencies to maintain a safe and healthy environment for people and wildlife.

### **Relationship to Other Plans**

The Storm and Surface Water Utility is guided by the Storm and Surface Water Master Plan. The Master Plan aligns with Olympia's Comprehensive Plan and focuses on the programs and policies of the Utility. This SWMP Plan represents a subset of the work performed by the Utility; specifically, those areas that are governed by the Permit.

### **The Permit as Document Map**

This Plan generally follows the S5 section of the Permit. Each year this Plan is required to be updated and planned activities will move to current activities when they are scheduled as work items for the upcoming calendar work year. The current activities listed are the City's on-going, permit-related programs and practices.

The remainder of this document details the required elements of the SWMP as noted in Condition S5.C of the Permit, and notes current and planned compliance activities.

## **PUBLIC EDUCATION AND OUTREACH**

### **Permit Requirements**

Permit Section S5.C.1 outlines the required elements of a public education and outreach program. Specifically:

- Provide an education and outreach program designed to educate target audiences about stormwater problems and provide specific actions they can follow to minimize these problems. Prioritize the target audiences and messages for awareness building campaigns, as well as behavior change campaigns.
- Create stewardship opportunities and encourage residents to participate in activities such as stream teams, storm drain marking, volunteer monitoring, riparian plantings and education activities.
- Measure the understanding and adoption of targeted behaviors for at least one target audience in at least one subject area. Submit a summary of the measurement technique and findings with the 2016 Annual Report. Use the resulting measurements to direct education and outreach resources most effectively, as well as to evaluate changes in adoption of the targeted behaviors.
- Summarize public education and outreach efforts annually and submit with Annual Report.

### **Current Activities**

The Olympia Storm and Surface Water Utility has a long-standing and robust public outreach and education program. The following are some of the current activities of our program.

- Production of a quarterly Stream Team newsletter with distribution of over 1200 copies annually.
- Stormwater-related messaging in the City's Utility Bill Insert, which is produced every other month.
- Distribution and installation of pet waste stations. Three pet waste stations were installed in 2015.
- Provide monetary incentives for the construction of rain gardens. Two incentives were granted in 2015.
- Implement Natural Lawn Care Program where residents reduce their use of quick release nitrogen fertilizers. 141 residents participated in this program in 2015. This program was utilized to meet permit requirements for adoption and evaluation of targeted behaviors.
- Execute the signing of a five year Interlocal contract between Thurston County, City of Lacey, City of Tumwater, to continue funding efforts of Thurston Conservation Districts South Sound Green Program. This program provides stormwater educational and presentation opportunities to school children in grades four through twelve.

### **Planned Activities**

The following activities (Table 1) are planned for 2016 in order to continue Olympia's compliance with permit requirements. The city of Olympia has met the permit obligation of section S5.C.1 through implementation of the Natural Lawn Care Program. The following activities planned for 2016 are because of our commitment to excellence and achievement of clean water.

**Table 1 Public Education and Outreach: 2016 Work Plan**

Action Item	Target Audience	Goal and/or Behaviors Promoted
Construction Site Erosion Control	Construction Businesses	Correct installation of Erosion Control BMPs

**PUBLIC INVOLVEMENT IN SWMP PLAN DEVELOPMENT**

**Permit Requirements**

The Permit (Section S5.C.2) requires the following:

- Create opportunities for the public to participate in the decision-making processes involving the development, implementation and update of the SWMP.
- Make the SWMP Plan and annual report available to the public, including on the City’s website.

**Current Activities**

The most recent SWMP Plan is posted on the City’s website, along with the most current Annual Permit Compliance Report.

**Planned Activities**

Activities planned for continued compliance with Permit Section S5.C.2 are listed below (Table 2).

**Table 2 Public Involvement in SWMP Plan Development: 2016 Work Plan**

Action Item	Staff Involved	Schedule Notes
Present the 2016 SWMP to the Utility Advisory Committee and provide opportunity for public comment.	SSW Utility	Scheduled for March 2016 Utility Advisory Committee meeting.
Post the 2016 SWMP on the City’s website.	SSW Utility	To be completed by May 31, 2016.
Update the SWMP for 2017 planned activities.	SSW Utility, in coordination with other city staff	Begin December 2016

**ILLICIT DISCHARGE DETECTION AND ELIMINATION (IDDE)**

**Permit Requirements**

The Permit (Section S5.C.3) requires the City to implement an ongoing program to prevent, detect, characterize, trace and eliminate illicit connections and illicit discharges into the MS4.

- Continue to update and refine mapping of the municipal stormwater system.
- Implement a regulatory mechanism to effectively prohibit non-stormwater, illicit discharges into the stormwater system to the maximum extent allowable under state and federal law. Update the regulatory mechanism, if necessary, by February 2, 2018.

- Implement a compliance strategy that includes informal compliance actions, as well as the enforcement provisions of the regulatory mechanism.
- Implement a field screening methodology appropriate to the characteristics of the MS4 and water quality concerns. Complete field screening for at least 40% of the MS4 no later than December 31, 2017, and on average 12% each year thereafter.
- Publicly list and publicize a hotline for public reporting of spills and other illicit discharges.
- Implement an ongoing training program for all municipal field staff that might come into contact with or observe an illicit discharge.
- Inform public employees, businesses and the general public of hazards associated with illicit discharges and improper disposal of waste.
- Implement an ongoing program to address illicit discharges into the MS4. Program elements should include:
  - Procedures for characterizing the nature of any illicit discharge. Procedures shall address the evaluation of whether the discharge must be immediately contained and steps to be taken for containment of the discharge.
  - Procedures for tracing the source of an illicit discharge.
  - Procedures for eliminating the discharge.
- Train staff that are responsible for identification, termination, cleanup, and reporting of illicit discharges and illicit connections to conduct these activities. Conduct follow-up training as needed to address changes in procedures, techniques, requirements or staffing.
- Summarize activities in the Annual Report.

### Current Activities

Current illicit discharge detection and elimination activities that are part of ongoing permit compliance include:

- Olympia maintains a GIS (geographic information systems) database of the municipal separate stormwater system. Mapping of the private stormwater system continues. Standard procedures are in place for maintaining the GIS database to document new connections, changes/alterations to the existing system, and corrections based on field verification. Drainage areas and land use have been identified for outfalls 24" or greater in size. Maps are available to Ecology and other permittees (NPDES permitted jurisdictions) upon request.
- Olympia Municipal Code Chapter 13.16 prohibits illicit discharges and provides for escalating enforcement.
- MS4 field screening is accomplished through multiple methodologies including but not limited to video inspections, catch basin/manhole inspections, ditch inspections, and stormwater BMP (best management practices) inspections.
- The City advertises a Spill Hotline and email (360-753-8333 and spills@ci.olympia.wa.us) to the public for reporting spills and illicit discharges. Records are kept of calls and emails received, and follow-up actions are taken by City staff to investigate and respond appropriately.
- The City condition rated a total of 60,370 lineal feet (over 7%) of stormwater pipe in 2015, with 443,100 linear feet (over 52%) of the stormwater pipe system rated by December 31, 2015.

## Planned Activities

In addition to continuing the IDDE programs required previously by the Permit, the following activities (Table 3) are planned for 2016.

**Table 3 Illicit Discharge Detection and Elimination: 2016 Work Plan**

Action Item	Staff Involved	Schedule Notes
Continue to refine and implement the Illicit Discharge Detection and Elimination program.	SSW Utility	Ongoing
Televise and condition rate approximately 50,000 lineal feet of stormwater pipe.	SSW Utility	Required to field screen 40% of the MS4 no later than December 31, 2017.

## CONTROLLING RUNOFF FROM NEW DEVELOPMENT, REDEVELOPMENT AND CONSTRUCTION SITES

### Permit Requirements

The Permit (Section S5.C4) requires Olympia to implement and enforce a program to reduce pollutants in stormwater runoff from new development, redevelopment, and construction sites. The program applies to private and public development, including roads. Specifically:

- Review all stormwater site plans for proposed development activities.
- Require legal authority to inspect private stormwater facilities and enforce maintenance standards.
- Conduct inspections prior to clearing and construction.
- Conduct inspections during construction to verify proper installation and maintenance of required erosion and sediment controls. Enforce as necessary based on the inspection.
- Conduct post-construction inspections to ensure proper installation.
- Conduct inspections during construction for all permanent stormwater treatment and flow control BMPs/facilities and catch basins in new residential developments (every 6 months until 90% of the lots are constructed or when construction is stopped and the site is fully stabilized). Enforce compliance with maintenance standards as needed.
- Implement a regulatory mechanism to require construction site operators to prepare and implement a Construction Stormwater Pollution Prevention Plan.
- Make available the “Notice of Intent for Construction Activity” to representatives of proposed new development and redevelopment. Continue to enforce local ordinances controlling runoff from sites that are covered by other stormwater permits issued by Ecology.
- Implement maintenance standards.
- Train staff involved in construction site inspections and enforcement.
- Implement an ongoing training program for employees who have primary O&M (Operations and Maintenance) job functions that may impact stormwater quality.
- Keep records of inspections and enforcement actions.

## Current Activities

For many years, Olympia has had a program to control stormwater runoff from new development, redevelopment, and construction sites. The following are some of Olympia's ongoing program activities.

- Work began in 2014 to revise the *Drainage Design and Erosion Control Manual for Olympia* and will be equivalent to the Department of Ecology's 2012 *Stormwater Management Manual for Western Washington* and Appendix 1 of the Permit. The City's revised draft is currently moving through the public review process.
- The Community Planning and Development, and Public Works Departments coordinate a program to review development plans, inspect sites during construction, and to take enforcement action when necessary.
- Records of reviews, construction inspections, and enforcement actions are maintained by both the Community Planning and Development and Public Works Department staff.
- The Notice of Intent for Construction Activity and Notice of Intent for Industrial Activity applications are available for project applicants on the City's development applications webpage.
- Staff receive training on erosion control, LID techniques, and stormwater design, inspection and modeling on an ongoing basis as needed.
- Post-construction inspections of private stormwater systems are performed by Storm and Surface Water staff according to the Permit's regulated timelines. Records of these inspections and maintenance compliance are maintained by Storm and Surface Water staff.
- Work began in 2014 to review and revise LID standards as they relate to Olympia's Municipal Code. The City's code update and standards are currently moving through the public review and City Council process.

## Planned Activities

The following activities (Table 4) are planned for 2016 to continue compliance with permit requirements.

**Table 4 Controlling Runoff from New Development, Redevelopment and Construction Sites: 2016 Work Plan**

Action Item	Staff Involved	Schedule Notes
Continue to refine and implement Olympia’s program to Control Runoff from New Development, Redevelopment and Construction Sites.	Community Planning & Development, SSW Utility	Ongoing
Continue to revise the <i>Drainage Design and Erosion Control Manual for Olympia</i> to be equivalent to the 2012 <i>Stormwater Management Manual for Western Washington</i> and Appendix 1 of the Permit.	LID Code Revision Work Group	Manual must be effective no later than December 31, 2016.
Continue to review and revise Olympia’s Municipal Code and Engineering Design and Development Standards to comply with the Permit’s low impact development mandate.	LID Code Revision Work Group	Revisions must be effective no later than December 31, 2016.

## **POLLUTION PREVENTION AND OPERATION AND MAINTENANCE FOR MUNICIPAL OPERATIONS**

### **Permit Requirements**

The Permit (Section S5.C.5) requires the City to:

- Implement maintenance standards at least as protective as those specified in Chapter 4 of Volume V of the 2012 Stormwater Management Manual for Western Washington.
- Perform annual inspections of all municipally owned or operated permanent stormwater treatment and flow control BMPs/facilities, and take appropriate maintenance actions in accordance with maintenance standards.
- Perform spot checks of potentially damaged permanent stormwater treatment and flow control BMPs/facilities after major storm events. Conduct repairs or take appropriate maintenance action in accordance with maintenance standards, based on the results of the inspections.
- Inspect all catch basins and inlets owned or operated by the City at least once no later than August 1, 2017 and every two years thereafter. Clean catch basins if the inspection indicates cleaning is needed to comply with the maintenance standard. Properly dispose of decant water (water that has separated from sludge and is removed from the layer of water above the settled sludge).
- Implement practices, policies and procedures to reduce stormwater impacts associated with runoff from all lands owned or maintained by the City, including road maintenance activities under functional control of the City.
- Implement an ongoing training program for employees whose primary construction, operations or maintenance job functions may impact stormwater quality.
- Implement a Stormwater Pollution Prevention Plan (SWPPP) for all heavy equipment maintenance or storage yards, and material storage facilities owned by the City.
- Maintain records of inspections and maintenance or repair activities.



## Current Activities

The following ongoing programs have been developed to comply with permit requirements.

- Publicly owned and operated stormwater treatment and flow control facilities are inspected annually. If an inspection identifies exceedance of an applicable maintenance standard, the timelines in S5.C.5.a.ii are followed.
- Catch basins are inspected, and cleaned when the maintenance standard is exceeded, on a schedule that meets Permit requirements. Of the 7,500 known catch basins, over 3,800 (50%) were inspected and cleaned in 2015.
- Ongoing pollution prevention training is provided to municipal maintenance and operation field staff.
- Stormwater Pollution Prevention Plans (SWPPPs) have been developed and are continuously implemented at the Olympia Public Works Maintenance Center and Olympia Parks Priest Point Park Maintenance Facility.
- Olympia has an Integrated Pest Management (IPM) Plan that was developed by the Olympia Parks Department.
- Staff maintains a “hot spot” list of potentially vulnerable stormwater infrastructure. These sites are monitored during and after major storm events.

## Planned Activities

Activities planned for 2016 in order to continue compliance with permit requirements are listed below (Table 5).

**Table 5 Pollution Prevention and Operation and Maintenance for Municipal Operations: 2016 Work Plan**

Action Item	Staff Involved	Schedule Notes
Continue to implement and refine Pollution Prevention and Operation and Maintenance activities and programs	SSW Utility, O&M staff city wide	Ongoing

## COORDINATION

### Permit Requirements

Permit Section S5.A.5 requires that there is coordination between Permittees, as well as within departments within the City in order to eliminate barriers to compliance with the terms of the Permit.

- Develop coordination mechanisms to clarify roles and responsibilities for the control of pollutants between physically interconnected MS4s.
- Coordinate stormwater management activities for shared water bodies among Permittees to avoid conflicting plans, policies and regulations.

## Current Activities

Listed below are ongoing coordination activities:

- Public Works Water Resources performs a lead role in coordinating Permit and municipal stormwater related activities among City departments. Most departments in the City are affected in some way by Permit requirements.
- Olympia staff participate in a regional Stormwater Technical Advisory Committee (StormTAC) that includes staff from the other Phase II Permittee jurisdictions (Lacey, Tumwater, Thurston County), as well as, both local Phase II Secondary Permittees (Port of Olympia, Washington State Department of Enterprise Services (DES)). StormTAC meets bi-monthly and discusses stormwater topics related to the Phase II Permit, as well as other watershed planning projects and studies.

## Planned Activities

Coordination activities planned for 2016 are listed below (Table 6).

**Table 6 Coordination: 2016 Work Plan**

Action Item	Staff Involved	Schedule Notes
Continue to implement current coordination activities.	City staff, staff from adjacent Phase II Permit jurisdictions	Ongoing

## COMPLIANCE WITH TOTAL MAXIMUM DAILY LOAD (TMDL) REQUIREMENTS

### Permit Requirements

Olympia has two additional requirements that stem from the Henderson Inlet Watershed TMDL (Appendix 2).

- For areas discharging to Henderson Inlet via the MS4, require phosphorus control for new and redevelopment projects that discharge via MS4 to Woodard Creek and meet the project thresholds in Appendix 1.
- Continue to implement a coordinated plan with the City of Lacey to monitor and reduce fecal coliform bacteria discharges from the Fones/Taylor wetland treatment facilities.

### Current Activities

Current activities for the Henderson TMDL are:

- Development and redevelopment projects that are located within city limits and discharge via MS4 to Woodard Creek and meet the project thresholds in Appendix 1 are required to include phosphorus control in the stormwater design of their project.
- In coordination with the City of Lacey, staff collaborated to update a joint stormwater sampling plan known as Henderson TMDL – Coordinated Sampling Plan (November 6, 2013) to monitor fecal coliform bacteria in the area in and adjacent to the Fones/Taylor wetland treatment facilities. The City of Olympia continues to coordinate with the City of Lacey to implement this sampling plan.

### Planned Activities

In 2016, the following additional Henderson TMDL related activities are planned (Table 7).

**Table 7 Total Maximum Daily Load: 2016 Work Plan**

Action Item	Staff Involved	Schedule Notes
Following completion of sampling activities, draft a summary report on findings.	City of Lacey, SSW Utility	Summary report will be submitted to Ecology in each annual report.
Submit the revised Henderson Sampling Plan to Ecology for approval.	City of Lacey, SSW Utility	The revised Sampling plan was submitted to Ecology January 29, 2016.

## MONITORING AND ASSESSMENT

### Permit Requirements

Section S8 of the Permit outlines requirements for monitoring and assessment.

- Provide a description in each Annual Report of any stormwater monitoring or stormwater-related studies conducted by or on behalf of the City.
- Participate in status and trends monitoring, stormwater management program effectiveness studies, and source identification and diagnostic monitoring. Olympia is given the option to pay money into a regional program to perform these activities or may choose to complete the monitoring activities individually and submit monitoring results annually to Ecology.

### Current Activities

Olympia has chosen to participate in the Puget Sound Regional Monitoring Program (PSRMP) in order to meet the Permit requirements for status and trends monitoring, effectiveness studies, and source identification and diagnostic monitoring. The City of Olympia will continue to submit funds annually to the PSRMP.

Other stormwater monitoring or studies will be undertaken periodically in association with TMDL requirements and as otherwise needed.

### Planned Activities

The following monitoring or assessment activities are planned for 2016 (Table 8).

**Table 8 Monitoring and Assessment: 2016 Work Plan**

Action Item	Staff Involved	Schedule Notes
Continue funding the PSRMP for Puget Sound monitoring activities.	SSW Utility	Annual payment of \$31,338 due in 2016.
Contract with Thurston County Environmental Health Department to conduct monthly sampling on Percival, Chambers, and Moxlie Creeks.	SSW Utility and Thurston County Environmental Health	Not required by the Permit, but sampling of local creeks has been an ongoing activity of the SSW Utility for over a decade.

