Stormwater System

Operations & Maintenance Manual

City of Eugene Public Works Department

Maintenance Division

Revised August 2022

Approved by

Kristi Hayden, PWM Director

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Introduction

Purpose of Manual

The Stormwater System Operations and Maintenance Manual serves as a guide to current operational procedures and practices related to the City's street surface and piped or "closed" stormwater conveyance system and facilities. This manual provides City personnel and the community with a guide to the maintenance activities associated with this portion of the stormwater system. Operations and maintenance responsibilities related to stormwater open waterways reside with the Parks & Open Space (POS) Division and are defined in the Open Waterway Maintenance Plan updated in 2014.

Operational & Maintenance Goals:

The Subsurface and Surface Sections of Public Works Maintenance (PWM) Division are charged with the responsibility of effectively and efficiently managing, operating and maintaining the City's public stormwater collection system. Integrated into these goals is the pursuit of public safety, emergency response on a 24/7 basis, adherence to regulatory permit requirements, response to public service requests, public outreach and education.

Characteristics:

Current O&M Programs

A variety of operations and maintenance (O&M) programs are currently employed to maintain the City of Eugene's stormwater conveyance system. Individual programs range from the inspection and data collection of system components to the cleaning and repair of conveyance facilities. These programs are divided into three program groups.

The first program group is comprised of several individual inspection, monitoring, and data collection efforts involving different areas of the stormwater system. These include current support activities provided by other divisions such as mapping and Geographic Information System (GIS) information. While these efforts do not directly involve work on the physical components of the system, they do provide important information regarding the extent, characteristics, and condition of the system. Mapping provides a vital resource for optimizing O&M activities.

The second program group involves the routine maintenance of the physical components of the system such as storm lines, inlets, culverts, and catch basins. This includes the scheduling of preventive maintenance designed to reduce the need for emergency repairs and provide more information about the condition of the system. Maintenance of the constructed drainage system and natural system requires different operational practices.

The third program group includes the unscheduled corrective maintenance of system components. This involves such activities as the repair and rehabilitation of all aspects of the stormwater conveyance system. Also, corrective maintenance includes any regularly scheduled maintenance activities, apart from the routine maintenance of the system, which requires immediate attention by city personnel.

O&M Program Implementation

In order for the stormwater system to function properly, the inlets, catch basins, and small diameter connecting lines must be kept free of obstructing debris and built-up sediments. To accomplish this, the City operates a program of routine system maintenance.

According to the Comprehensive Stormwater Management Plan (CSWMP): "Operations and Maintenance (O&M) of the storm drainage system are performed on a regular basis to ensure the system functions as designed and to protect the public investment of the constructed system. The costs associated with operations and maintenance include channel cleaning, vegetation management, pipe system cleaning, street sweeping, leaf pickup, storm system rehabilitation, and equipment purchases. The Stormwater Plan requires internal operations to be reviewed to establish guidelines for routine maintenance of pipes, channels, catch basins, inlets and roadside ditches that minimize impact to water quality and natural resources. O&M plans for all public stormwater facilities are to be evaluated and updated to balance flood protection, runoff conveyance, water quality enhancement, and natural resource area management."

O&M Program Status

The stormwater system, from a conveyance standpoint, is presently being maintained as completely and efficiently as possible with the existing facilities, available equipment, and staff.

Fundamental Operations & Maintenance System Needs:

The goals of Maintenance Division's storm system O&M policies are:

- To ensure compatibility with the City of Eugene's Storm Drainage Master Plan
- To ensure compatibility with the City of Eugene's policies regarding the preservation of wetlands
- To establish system maintenance priorities
- To fulfill City responsibilities while limiting and/or reducing the City's liability exposure

Implicit, broader goals of the O&M policies are listed below:

- To effectively manage the existing stormwater collection system
- To provide adequate and necessary levels of flood protection
- To comply with Army Corps of Engineers and Soil Conservation Service maintenance guidelines and regulations
- To improve operation efficiency and reduce costs of continual system maintenance practices
- To eliminate recurring maintenance problems

Collection System Limits & Jurisdictions:

According to the present policy the Public Works Maintenance Division operation and maintenance (O&M) jurisdictional limits include all curb and gutter (C&G) public streets within the city limits, and as defined by adopted agreement within portions of Lane County. Within these boundaries includes all street drainage inlets, public stormwater piped systems, and outlets structures. Presently this system includes about 500 centerline miles of public C&G streets, paved alleys and off-street bike paths, 600 miles of piped mainline, 16,500 inlets and catch basins, and 3,900 inlet/outlets storm pipe to ditch. The City is not responsible to clean or maintain private stormwater systems.
The Parks and Open Space Division accepts the O&M responsibilities for public ditches, channels, and open waterways within these boundaries. In many situations the conveyance drainage network changes between piped vs. open systems. Effective divisional coordination is imperative to effectively meet the permit requirements, best management practices and departmental goals.

Section 1: Supporting Information Management Systems

1.1 Mapping and Geographic System Needs

Purpose

The purpose of mapping and Geographic Information System (GIS) is to create and maintain accurate, up-to-date maps and records of the system components. These records are necessary in maintaining a comprehensive stormwater system inventory and to aid in monitoring conditions within the system. GIS (the City's specific system known as GeoDart a customized version of Arc GIS), is utilized to maintain a visual or graphic record of the physical characteristics of the stormwater conveyance system.

Current Practice

Public Works Engineering (PWE) staff use GIS computer applications to create, update or amend infrastructure maps using data gathered in the field from such sources as as-constructed project plans. A variety of task-specific maps for stormwater operations and maintenance activities are furnished upon request.

1.2 Infrastructure Inventory & Maintenance Management System

Purpose

The Maintenance Management System (MMS) is a computerized data management system designed for entry, analysis, and reporting of infrastructure information. MMS serves as a basis for the current stormwater system infrastructure inventory to be used in the processing of stormwater system-related work orders and for tracking maintenance activities.

Current Practice

Public Works staff collects and assesses infrastructure data from the field. Activities include, but are not limited to the daily tracking, inventory, and maintenance of the stormwater conveyance system.

Operational Stormwater activities are currently managed and tracked through the use of our Maintenance Management System. The SWAT module allows for real-time data entry specific to the ongoing cleaning, inspection and field verifications that are performed daily by our field staff. The results of the activities are tracked and reported on. Additionally, a follow-up work order is generated when a deficiency in the infrastructure is discovered.

1.3 Map Revisions

Purpose

A formal map revision process is maintained to ensure the City's stormwater conveyance system maps and asset attributes are accurate and kept up to date. This responsibility is shared throughout the Public Works Department, however due to the working knowledge of the collection system the Surface and Subsurface Stormwater Sections place a high priority on this practice.

Current Practice

The Field Investigator is lead on this process and mapping inaccuracies once observed, however operations staff share this responsibility. The process includes making a field investigation of the site, system assessment which may include cleaning and closed-circuit television inspection support. Based on field findings revisions are documented. These map corrections are routed to Engineering staff in the Mapping & Development Group who is charged with revising the GIS and updating the MMS and the PWE IMS database.

1.4 Educational Information & Outreach

Purpose

Develop a comprehensive information and education program for the public, school children, city personnel, and others about natural resources and stormwater pollution problems from both non-point and point sources and show the impacts of their actions on Eugene's water quality.

Beginning in the spring of 1991, the City began a public involvement/education process to support the Comprehensive Management Program. Public communication played a central role in leading to the City council's adoption to the Program in November 1993.

Current Practice

Ongoing outreach activities include but are not limited to:

- Bi-annual community survey on awareness of stormwater issues
- Staffed displays at community events.
- Distribution of City-wide newsletters twice a year that focuses on stormwater and surface water-related issues.
- Presentations to civic and community groups, teachers and children.
- Placement of internal policies about recycling and reusing materials.
- Development of curriculum for children taught at local school districts that help children understand how their actions affect water quality.

1.5 Support Role for Public Work's Capital Improvement Projects

Purpose

To perform visual inspections, identify deficiencies and research the stormwater system, during the planning phase of Capital Improvement Projects (CIP) and Pavement Preservation Projects (PPP) within the boundaries of the projects. In addition, Maintenance supplies Engineering with historical information on stormwater issues that are within the project boundaries.

Current Practice

Once PWE identifies the boundaries of (CIP) and (PPP), maintenance staff cleans catch basins, lateral and main lines. Once storm lines are cleaned a visual or television inspection is performed to identify deficiencies and storm line mapping of the stormwater system is correct. Identified structure and or stormwater line deficiencies are documented along with map corrections and sent to PWE's project manager, along with any historical stormwater information. Repair or replacement recommendations are often included.

1.6 Response for Request for Service

Purpose

To capture and track details for services that is being requested. A "Request for Service (RFS)" identifies what service is being requested, pertinent information to identify the scope of work, time, date, location, and provide a conduit for follow up with the requesting stake holder.

Current Practice

PWM uses MMS to record and track request for services. When a request for service is taken, the address, service details, caller name and phone number of the caller is logged into the MMS. The request is sent to the Maintenance Team Supervisor or lead person who is responsible for the service that is being requested. The supervisor or lead takes the (RFS) and converts it to a work order (WO) and assigns it to the appropriate staff that responds, inspects and or

performs the work that is needed to complete the service request. Staff may contact the person requesting service for more information. Once the work order has been completed, staff closes out the work order by entering pertinent data, comments and date when the work was completed.

Section 2: System Condition and Monitoring

2.1 Television Inspection

Purpose

Closed circuit television (CCTV) inspection of the stormwater conveyance system provides a means of visually assessing the condition of the system. The technique is well suited for determining pipe joint conditions, root intrusion, and can be used for analyzing structural deficiencies, line and grade. Also, CCTV inspections are utilized for assessing portions of the system in preparation for rehabilitation or reconstruction projects prior to the design phase or construction and serves as an alternative to excavation for assessing problems in enclosed systems.

CCTV inspection is a widely accepted standard of inspection of piped sewer systems where physical inspection is not practical or safe. Monitoring activities, such as TV inspection, provides information for construction, repair, and rehabilitation of the stormwater system.

Current Practice

Although a future program is planned, there is presently no regularly scheduled CCTV inspection program for the stormwater system. Inspection is done on an as-needed basis to assess specific problem areas or in advance of Pavement Preservation Projects.

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2.2 Systematic Field Investigation (SFI)

Purpose

Systematic Field Investigation (SFI) is an important tool to locate and inventory features of the public stormwater collection system; identify and correct sources of pollutants entering the system; gather land use stormwater runoff data for use in pollutant loads assessment modeling; identify stormwater quality problem areas in Eugene; gather baseline data on urban stormwater quality; gather data for use in decision making related to stormwater management programs; locate illicit connections or illegal dumping activities. SFI provides system component location and condition information for construction, repair, and rehabilitation of the stormwater system and is considered an information gathering technique. SFI provides inventory information for construction, repair, rehabilitation and illegal connection/discharge enforcement of the stormwater system. To observe the condition of the stormwater system features to assess system integrity and water quality; field inspect and classify components not yet inventoried in the SFI program; administer pre-storm inspection of flood control facilities with the assistance of the Army Corp of Engineers to qualify for a reduction of Federal Emergency Management Administration municipal insurance rates.

Current Practice

Investigation of the piped and open drainage system commenced in the summer of 1996. Current work activities include:

- Work with the Subsurface Maintenance Crew to assess, inspect and map the details of the public and private stormwater system.
- Work with PWE to inspect and assess piped stormwater system prior to street paving projects.
- Systematically inspect stormwater outfalls to identify illicit discharges.
- Conduct annual dry-weather field screening inspections, and where flow is observed, identify its source.

2.3 New Construction Plan Review

Purpose

PWM has two staff persons that perform plan reviews for the Engineering Division for Public Improvements and the Permit and Information Center for Privately Engineered Public Improvements (PEPI). They perform plan review to provide recommendations to the Engineering Division to ensure that the proposed infrastructure can be maintained by the Maintenance Division.

Current Practice

The PWM works with the PWE to ensure that CIP and privately engineered designs meet maintenance standards for maintainability, efficiency, and effectiveness. To ensure that maintenance needs are met, PWM Surface Techs review and make recommendations on all Engineering CIP plans during the 30%, 60% and 90% completion stage. These reviews result in design changes to reduce risks from traffic during maintenance operations and to increase operational efficiency.

PWM staff are members of the City of Eugene APWA/Eugene Specifications committee. At the end of each construction season and prior to the next Engineering design season PWM staff review specifications and detailed drawings for compliance, maintenance compatibility, and operational efficiency. These reviews result in changes to the specifications and amendments to adopted documents.

PWM staff work with PWE staff in reviewing PEPI plans to ensure that sanitary and storm infrastructure improvements meet maintenance standards and specifications for installation and code compliance.

All land use changes including plats, partitions, and subdivisions are routed from the Planning and Development Department to the PWM Surface Technical staff to ensure that the site has adequate existing infrastructure to support future development and/or that all provisions are in place to provide that infrastructure when needed. Wastewater and stormwater connections to the City's existing infrastructure are subject to approval by the PWM Surface Technical staff through the building permit process.

Section 3: Related Street Maintenance

3.1 Street Sweeping

Purpose

The purpose of the street sweeping program is to collect street debris and refuse material from all public curb and gutter streets and a select group of unimproved streets. Also, sweeping is effective in removing safety hazards such as broken glass, sand, and other debris, particularly after vehicular accidents or winter sanding operations. In addition, sweeping operations are effective at reducing stormwater pollutants such as sediments, hydrocarbons, heavy metals, and debris/litter. Furthermore, keeping refuse and debris out of the stormwater system helps the stormwater conveyance by decreased solids loading, and lowers the risk of system blockages.

Current Practice

The Stormwater Surface Maintenance Team currently uses mechanical broom high dump sweepers, regenerative air recirculation high dump sweepers, and regenerative air recalculating rear dump sweepers for use on streets, alleys, shared-use paths, protected bike lanes and as a backup. Mechanical broom and air sweepers operate on a fixed route schedule determined by the supervisor. Daily routing may be interrupted to respond to special situations such as post-vehicular accident cleanup or winter street sand recovery. The sweeping cycle for a given street alternates between the use of a mechanical broom and a regenerative air sweeper. Sweepers use centralized dumpsters to offload collected debris. This practice eliminates the need to dump swept street debris onto the street surface for later retrieval and prevents material from coming into contact with the stormwater system. All sweeping debris placed in dumpsters is transported by a contracted waste hauler and taken to an approved facility for recycling that is monitored by Department of Environmental Quality (DEQ).

The sweeping schedule is as follows; downtown core streets are swept approximately once a week, industrial core, primary University streets, and arterial/ collector streets approximately every two weeks depending on the debris loading. Depending on the number of special sweeping requests, emergency call-outs, and equipment availability residential streets are swept approximately every 8 weeks outside of Leaf Collection season. During leaf collection season residential streets are swept once during each round of collection. Since the City only has one sweeper small enough for shared-use paths, protected bike lanes, and alleys, these facilities get swept approximately twice a year.

3.2 Autumn Leaf Collection

During autumn months, leaves piled up in the public right-of-way are collected from the street, gutter and catch basin grates to minimize blockage of gutters and inlets. This practice allows stormwater to enter the system more freely, effectively reducing the potential of flooding streets and private property.

Current Practice

After raking the fallen leaves in their yard, residents may place the leaves in the public rights-of-way the weekend prior to their scheduled leaf collection by PWM. Residents are required to place leaves in such a manner as not to plug the gutter and catch basins. Property owners with driveway culverts are responsible for keeping their culverts clear of leaves during rainstorms.

Unless a weather emergency or other hazard exists, which requires an immediate response, PWM crews follow an established schedule that ensures systematic coverage and provides efficient leaf collection service for Eugene citizens. Collection usually begins the first week or two of November and continues until collection is complete in mid-January. The program provides two rounds of collection on both improved and unimproved streets. Established priority bike lanes receive service on a weekly basis during the program scheduled timeframe. Planned collection schedules are published in advance, and weekly updates confirm any necessary adjustment and provide a convenient reminder for citizens. Maps and scheduling information are available on the City web site at: http://www.eugene-or.gov/leaf

3.3 Debris Removal in Right-of-Way & Litter Control

Purpose

To collect large items of illegally dumped refuse and debris in public rights-of-way prior to street sweeping operations. To keep streets, sidewalks, and other public rights-of-way clear of impediments or obstructions; keep stormwater systems clear of debris; maintain aesthetically pleasing public areas and rights-of-way.

Current Practice

The Stormwater Surface Maintenance Team investigates illegal dumping in public rights-of-ways and waterway channels and follows up with cleaning operations. This includes the recovery of dead animals from streets and sidewalks. Cleanup of trash from illegal dumping in public rights-of-way and channels is conducted on an as-needed basis. The Amazon Channel is inspected by POS on a regular basis for litter and debris. The removal of shopping carts, tires, bed springs, and other household appliances from the City's channels reduces the risk of further pollution and promotes public perception of these channels as public assets rather than common dumping grounds. With the City divided into grids, areas of high illegal dumping activity are inspected and cleaned up more frequently. When illegal dump sites are located the debris is searched for items, such as mail that might identify the responsible party. Any information found at the dump site that identifies the responsible party is turned over to the City of Eugene Police Department Daily schedules may be interrupted to respond to special situation call-outs from the City of Eugene Police Department Illegal dump materials are recycled whenever possible.

3.4 Dead Animal Pick Up

Purpose

Dead animals (typically dogs, cats, or deer) in the right-of-way should be removed as soon as possible once notice is received. Procedures are in place to ensure that animal carcasses are disposed of promptly and properly with regard for employee and public health.

Current Practice

Dead animal removal from the right-of-way is the responsibility of the PWM Division. Once aware of the animal location maintenance staff responds to the location the same work day and use the following procedures to ensure proper removal and disposal.

All proper personal protective equipment (PPE) is provided to staff that include protective gloves, coveralls, safety vest and biodegradable bags. If the removal is from the street, the vehicle is equipped with a strobe light and four-way flashers.

Domestic animals such as cats and dogs are taken to the Greenhill Humane Society tri-agency animal regulation authority. Tags are filled out with location, animal type and color information are given to the animal regulation staff to allow pet owners the opportunity to identify their animals. These animals are then properly disposed of by the animal regulation authority.

Non-domestic animals such as squirrels, raccoons, possum, nutria and deer are removed from the right-of way, bagged if practical and taken to Short Mountain Lane County Landfill and buried.

The Stormwater Surface Maintenance supervisor tracks the location, date and animal type for statistical assessment. This information is used by the Transportation Section to determine if the animal crossing signs are needed at particular street locations. In addition, service requests are prepared for animal collections and used by field staff to track specific site information. Service request information is entered into a database system and used in tracking the various work activities performed by the PWM.

3.5 Surface Vegetation Control

Purpose

The purpose of the vegetation control is to remove over grown vegetation that has become a safety hazard to the public or is creating a stormwater conveyance issue on pedestrian paths, bike paths or all curb and gutter streets. Furthermore, keeping vegetation out of the stormwater system helps the stormwater conveyance by decreasing the chance of blockage.

Current Practice

Vegetation removal is performed annually during the summer months. By using the vegetation removal route books of pedestrian/bike paths and traffic calming devices staff can systematically remove vegetation from the right-of-way. Proper signing and traffic control in the work area is required at all times. Vegetation is removed by the use of hand and power tools. Once vegetation is removed and the work area cleaned, the debris is either taken to the recycle area at PWM facility or to the local debris recyclers. When an area has been completed it is logged completed, dated and signed in the route books.

The proper PPE shall be used when removing vegetation with all power and hand tools. All proper PPE is provided to staff that include protective gloves, safety vest, protective eye wear, hard hat, ear plugs, face shield and chaps. Staff receives training on traffic control and proper equipment usage along with safety procedures on all equipment used for vegetation removal.

3.6 Periodic Review of Street Sweeper Routes

Purpose

Route design plans are developed and periodically reviewed for effectiveness; routing may be affected by topography, neighborhood boundaries, crew sizes, available equipment, or other conditions.

Current Practice

It is policy for the Surface Operations Section to do an annual review of the City's sweeper routes. This review will be conducted by the Surface Stormwater Supervisor and Team during the summer months to avoid peak leaf and sweeping seasons. The purpose of the review is to gauge the effectiveness and efficiency of the City's sweeping program in meeting the community's need and producing equivalent workloads for the operators and different work shifts. The review will take into account available equipment, new equipment, new streets or subdivisions, staffing resources, parking requirement, streets widths, availability of through driveways and alleys, operational needs and traffic patterns. Review will be done through a combination of experience, mathematical evaluation and observations by the supervisor and assigned sweeper staff. Changes to routes will be documented on route maps and turned in to the Technology Services Section for the proper updates.

Section 4: Stormwater System: Scheduled-Preventive Maintenance & Repair

4.1 Catch Basin Cleaning

Purpose

Routine cleaning of the piped stormwater system is required to maximize or facilitate proper function of the system. This insures relatively trouble-free operation of the City's stormwater catch basins, curb inlets, and bubbler systems. These structures must be kept free of obstructions, such as debris to minimize street and surface flooding. Cleaning is also undertaken to reduce the amount of contaminants, sediments, and other pollutants entering the MS4.

Current Practice

The Subsurface Maintenance Team routinely cleans catch basins on improved streets. The cleaning program currently combines specialized sewer jet-vacuum trucks with crews assigned to this work group to vacuum and collect sediment, debris and trash from catch basins, as well as, pressure jet open the catch basin system and connecting lines. Additional wastewater collection jet-vacuum trucks are available if required during flooding conditions.

Maintenance scheduling follows a general goal to clean 1/3 of all public catch basins and connecting lines in the system approximately once a year. Scheduling is currently based on the city stormwater grid maps which are broken down for mapping purposes into rectangular sheets. The practice has been to clean all catch basins within a selected grid area in a given period of time. Historic problem areas and seasonal influences are also controlling factors.

Catch basins on private property, constructed privately for the purpose of draining private lots are not cleaned by city crews. Lines connecting a private catch basin into the city storm system are not the maintenance responsibility of the City; however, catch basins connected to private pipes will often allow material from the private system to migrate into the public catch basin as it is cleaned. When this occurs, the private line as it enters the public catch basin is cleaned to prevent further migration of debris and sediment.

4.2 Jet Cleaning Pipe Segments

Purpose

Routine cleaning and preventive maintenance of the piped stormwater system is required to maximize or facilitate proper function of the system to insure relatively trouble-free operation of the city's stormwater structures. These structures must be kept free of obstructing debris and built-up sediment. Experience has shown that like routine catch basin cleaning, pipe segment and connecting line cleaning helps reduce stormwater system overflow and street flooding during periods of heavy precipitation.

Cleaning is also done to reduce the amount of contaminants reaching waterways and to minimize street and surface flooding. To accomplish this, the City currently supports the program of routine stormwater system maintenance with the general goal of cleaning 1/3 of all inlets, catch basins, and connecting lines at approximately once a year.

Current Practice

In conjunction with catch basin cleaning, the Subsurface Maintenance Team periodically cleans pipe segments and/or manholes on improved streets. The cleaning program currently combines specialized sewer jet/vacuum trucks with crews assigned to the Subsurface Maintenance Team to vacuum and collect sediment and debris from pipe segments and/or manholes as well as pressure jet open the system's connecting lines. Additional jet/vacuum trucks and a jet-only truck from wastewater collections are available if flooding conditions warrant the need for extra resources. Any piped system inlet structures that are obstructed by debris or material that cannot be vacuumed are cleaned by hand. The obstructing material is then removed from the site in a small dump or pickup truck. Collected material is placed in the holding tank and eventually deposited at the regional stormwater waste management facility for drying and pretreatment prior to land filling.

If needed at the time of catch basin cleaning, pipe segments and/or manholes may be cleaned concurrently. The general goal of the program is to clean 1/3 of all inlets, catch basins, and connecting lines annually. Scheduling is currently done through MMS, using an electronic work order system to ensure that 1/3 of all catch basins are cleaned annually.

Beginning in 2022, the Subsurface Maintenance Team is increasing it's focus on cleaning stormwater mainlines to attempt to increase the amount of debris removed from the stormwater system.

Pipe segments and/or manholes constructed privately for the purpose of draining private lots are not cleaned by city crews. Lines connecting a private catch basin into the city storm system are not the maintenance responsibility of the City; however, catch basins connected to private pipes will often allow material from the private system to migrate into a public catch basin as it is cleaned. When this occurs, the private line as it enters the public catch basin is cleaned to prevent further migration of debris and sediment.

4.3 Water Quality Systems

Purpose

Periodic cleaning and preventive maintenance of sedimentation manholes and drywell systems is required to maximize or facilitate proper function of the system to insure their relatively trouble-free operation. These structures must be kept free of obstructing debris and built-up sediment. Cleaning is done to remove sediments and floatable materials (oil, debris) from sedimentation manholes and to minimize clogging of the drywell filtration media (drain rock & fabric) which could cause surcharging of the stormwater system and potential street and surface flooding.

Current Practice

Sedimentation manholes: The Subsurface Maintenance Team cleans sedimentation manholes on as-needed basis. There are many sedimentation manholes in the public stormwater system. Cleaning is combined with the catch basin and pipe segment cleaning program. The program currently utilizes specialized sewer jet/vacuum trucks assigned to the Subsurface Maintenance Team to vacuum and collect sediments and debris from sedimentation manholes as well as pressure jet open the manhole system's connecting lines. Additional wastewater collection combination trucks are available if required by flooding conditions. Debris is disposed of at the regional stormwater waste management facility.

Drywells: Drywells exist as part of the public system. Applications of registration for a majority of the drywells related to the public system have been submitted to the Oregon Department of Environmental Quality (DEQ). The operation and maintenance practices related to drywells are designed to comply with Oregon DEQ Underground Injection Control Rules (UIC) OAR 340-044-0018.

Water Quality Devices: Mechanical stormwater treatment facilities and devices shall be cleaned in accordance with the manufacturers' specifications. Cleaning procedures utilize specialized sewer jet/vacuum trucks assigned to the Subsurface Maintenance Team to vacuum and collect sediments and debris as well as pressure jet clean the devices' connecting lines. Debris is disposed of at the regional stormwater waste management facility.

4.4 Inlet & Outlet Vegetation Control

Purpose

The purpose of the vegetation control is to remove over grown vegetation that has become a safety hazard to the public or is creating a stormwater conveyance issues around inlets and outlets. Furthermore, removing vegetation around inlets and outlets helps the stormwater conveyance by decreasing the chance of blockage.

Current Practice

Annual clearing of vegetation around inlets and outlets is performed in the summer and fall months. Vegetation is removed by the use of hand and power tools. Proper signing and traffic control in the work area is required at all times. During the heavy precipitation months, staff inspects and clears vegetation and debris from inlets and outlets that are

identified in the Rain Storm Check List before heavy rain is predicted. All vegetation that is removed is taken to PWM Facility's recycle area or to the local recyclers.

The proper PPE shall be used when removing vegetation with all power and hand tools. All proper PPE is provided to staff that include protective gloves, safety vest, protective eye wear, hard hat, ear plugs, face shield and chaps. Staff receives training on traffic control and proper equipment usage along with safety procedures on all equipment used for vegetation removal.

The proper PPE shall be used when removing vegetation with all power and hand tools. All proper PPE is provided to staff that include protective gloves, safety vest, protective eye wear, hard hat, ear plugs, face shield and chaps. Staff receives training on traffic control and proper equipment usage along with safety procedures on all equipment used for vegetation removal.

4.5 Pipe System Repairs

Purpose

To repair structural deficiencies in the stormwater piped system when deficiencies are identified through visual inspections such as CCTV. Making repairs on the stormwater piped system is necessary to maintain stormwater conveyance and to maintain the integrity of the City's infrastructure.

Current Practice

Storm line maintenance repairs typically consist of spot repairs, short pipe section replacement, realignment, trenchless lining repairs and pipe bursting.

Conventional open trench point, replacement or realignment repairs can be performed by either City staff, contracted under PWM's prevailing Digs Service Contract, or assigned to PWE under the CIP. Based on depth, location, and complexity the Subsurface Maintenance Team decides the most favorable route to pursue excavation repairs. Generally, repairs over10 feet in depth and over 18 inch in diameter are contracted out.

Lining repairs like open trench repairs can be performed by either City staff or contracted under PWM's prevailing No-Dig Service Contract. Currently the sewer repair crew can perform trenchless repairs up to 4 feet in length and 18-inch diameter. Again, the Subsurface Supervisor can pursue trenchless repairs in larger diameter pipe and of additional length under PWM's service contract or assignment to the CIP.

In both cases repairs are prioritized by the condition of the deficiencies.

Section 5: Piped Stormwater System: Unscheduled-Corrective Maintenance

5.1 Grate Replacement

Purpose

Gutter inlet catch basin grates serve as a screen to allow drainage of street surface runoff while minimizing the amount of obstructing material such as leaves, branches, and debris that can enter the stormwater conveyance system. Grates serve this function while intending to reduce the chances of personal injury or vehicular damage while being driven, ridden, or walked upon. During grate replacement the new grates are installed with the current standard, corrosion resistant, a bike-proof/wheelchair-proof grate design.

Current Practice

The catch basin grate replacement program takes place during the winter months focusing on damaged or missing grates which are replaced on an as-needed basis.

5.2 Concrete Repair: Catch Basins, Manholes, Inlets, Curb & Gutter Sections

Purpose

The primary purpose of concrete repair is to restore the structural integrity and extend the useful life of catch basins, inlets, curb and gutter sections and other related features. Also, repairs are done in an effort to provide unimpeded conveyance of the stormwater that the structures are intended to carry. In areas of close contact with motorists, bikers or pedestrians, keeping these structures in good repair to eliminate or minimize the chances of personal injury or vehicular damage is also an important factor.

Current Practice

Damage and defects to stormwater system structures such as catch basins, inlets, curb and gutter sections are reported by way of citizen complaints or PWM staff observations of the system. After a report of damage has been made, a service request form is submitted, followed by a supervisor or crew leader site visit to assess the damage and determine the type of repair work necessary. The Surface Maintenance Team then performs the necessary repairs.

5.3 Piped System Blockage Response:

Purpose

During heavy rainfall events, the sudden runoff of stormwater on curb and guttered streets can often cause a rapid accumulation of leaves and debris on storm inlet grates. Localized street flooding often occurs as a result of a blockage to the inlets. Blockages may also occur at the downstream inlets from ditches and swales on non-curb and guttered (unimproved) streets, resulting in flooding. Occasionally, leaves and debris or roots will enter the piped system and create a blockage in a manhole or pipe segment. These incidents are responded to by maintenance staff to eliminate the blockages as quickly as possible to protect private and public property from serious or costly damage.

Current Practice

This activity takes place primarily during heavy rainfall events, or as notified by the general public, the Police Department, or Public Works staff. Most blockages are caused by an accumulation of leaf matter on catch basin grates or root blockages in pipes. Depending on the severity of the blockage, removal is performed with hand tools or heavy equipment, such as a jet/vacuum truck or backhoe.

Section 6: Storm Emergency, Flooding and Spill Response

6.1 Storm Readiness and Preparation

Purpose

The purpose of storm readiness and preparation is to have equipment and materials on hand and ready to deal with storm event related problems such as high water and flooding. The idea behind storm readiness is to insure the best possible conveyance capabilities of the public stormwater system during peak storm and flood events. During peak storms, water quality is difficult to control. Most control methods would be included in the cleanup effort after the water level has dropped following a storm event.

Current Practice

Current practice is to keep an ongoing inventory of equipment and supplies to deal with storm event related problems such as high water and flooding. Supplies and equipment are kept at the Public Works Maintenance Facility located at 1820 Roosevelt Boulevard.

6.2 Storm Response and Routing Procedures:

Purpose

To prevent or minimize storm related damage to City property and infrastructure caused by flooding, system component blockage, or mudslides. Additionally, to prevent or minimize private property damage or personal injury caused by storm related actions which could result from a blockage of the public stormwater system. The idea behind storm response is to insure the best possible conveyance capabilities of the public stormwater system during peak storm and flood events. During peak storms, water quality is difficult to control. Most control methods would be included in the cleanup effort after the water levels have dropped following a storm event.

Current Practice

To monitor the weather and respond accordingly, maintenance staff response increases as storm intensity increases. Known problem areas are monitored as the water levels rise. Every effort is made to reduce the risk of property damage.

6.3 Spill Response

Purpose

Maintain a dedicated Spill Response Technician and an on-call team trained in spill response procedures involving environmentally hazardous materials and a vehicle equipped for such spill mitigation. Coordinate efforts with other local response teams such as the City of Eugene Fire and Police Departments, Lane County, and state agencies.

Current Practice

The City's Public Works Department is responsible for protecting the City's infrastructure and drainage ways from environmentally harmful spills and discharges. Quite often, Public Works staff is the first to discover discharges of materials that present a threat to the environment.

Frequently the discharged or dumped material has entered or has the immediate potential to enter the piped stormwater system or an open drainage way. Trained staff responds to spills of minor magnitude as a matter of routine operations and maintenance procedures.

To be prepared for a large, potentially damaging spill, the Maintenance Division keeps a team of twenty to thirty staff members trained in emergency spill response and clean-up. All work teams within the Division are represented, providing the Department with a pool of trained and variously skilled staff that might prove necessary in the event of a major spill or other environmentally threatening situation. Trained on-call personnel include operators of equipment such

as jet/vacuum machines, street sweepers, back-hoes, and hydraulic excavators as well as a team of Public Works supervisors trained in the Incident Command system.

Section 7: Appendix

7.1 List of Acronyms

CCTV	Closed Circuit Television Inspection
CB	Catch Basin
CI	Curb Inlet
C&G	Curb and Gutter
CIP	Capital Improvement Project
CSWMP	Comprehensive Stormwater Management Plan
IGA	Inter Governmental Agreement
MOA	Memorandum of Agreement
MMS	Maintenance Management System
NPDES	National Pollutant Discharge Elimination System
O&M	Operations & Maintenance
PWE	Public Works Engineering
PWM	Public Works Maintenance
PPE	Personal Protective Equipment
PPP	Pavement Preservation Program
POS	Parks & Open Space Division
SFI	Systematic Field Investigation