ARDSA Maintenance Standard Operating Procedures for Storm Water Control

Maintenance and Operations
Municipality of Anchorage

January 2016

Contents

Abbreviations

ADEC	Alaska Department of Environmental Conservation
ADOT&PF	Alaska Department of Transportation and Public Facilities (also known as DOT)
ARDSA	Anchorage Roads and Drainage Service Area
AST	Alaska State Troopers
BMP	best management practice
CBD	Central Business District
CBERRRSA	Chugiak Birchwood Eagle River Rural Road Service Area
DOT	Alaska Department of Transportation and Public Facilities (also known as ADOT&PF)
EPA	U.S. Environmental Protection Agency
LRSA	Limited Road Service Area
MOA	Municipality of Anchorage
M&O	Maintenance and Operations Division (DOT&PF)
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollutant Discharge Elimination System
OGS	Oil and Grit Separator
PWA	Public Works Administration
RMSA	Road Maintenance Service Areas
RRSA	Rural Road Service Area
SA	Service Area
SMD	Street Maintenance Department (MOA)
SOPs	Standard Operating Procedures
WMS	Watershed Management Section

1 Introduction

The storm water collection systems are comprised of a variety of structural controls (e.g., catch basins, manholes, storm drains, and outfalls) that convey storm water from impervious surfaces to receiving waters. Because storm water is discharged to "waters of the United States," a National Pollutant Discharge Elimination System (NPDES) permit must be obtained from the Alaska Department of Environmental Conservation that has been delegated program authority from U.S. Environmental Protection Agency (EPA). Due to the similarities in purpose, function, and areas of service, the Municipality of Anchorage (MOA) and Alaska Department of Transportation and Public Facilities (ADOT&PF, also referred to as DOT) elected to obtain coverage under a single NPDES permit. As they are co-permittees, both agencies have agreed to combine their efforts so that permit requirements can be met in an efficient and effective manner. The agencies have been authorized to discharge stormwater from their municipal separate storm sewer system (MS4) system under the NPDES permit AKS-052558.

Under the current permit (effective August 1, 2015) all street maintenance operators of MOA or ADOT&PF owned MS4 drainage systems are required under part 3.4.4 to prepare and submit standard operational procedures (SOPs) that relate to the inspection and maintenance procedures of storm water controls. SOPs that describe the practices and schedules used by street maintenance personnel to maintain storm water controls and prevent storm water contamination have been prepared and are presented in this report.

2 Description of Street Maintenance Service Areas

Municipal road maintenance services are delineated by road maintenance service areas (RMSA). The RMSA is classified by the type of road maintenance services that can be authorized uses of the service area taxes. A RMSA can be defined either as exclusively for maintenance or as both capital and maintenance improvement areas. Ultimately the Municipal Assembly and the service area voters determine the authority, capacity, and ability of the individual RMSA. Each RMSA has clearly defined boundaries as well as a board of supervisors (Board) elected by each individual area's voters. The main responsibility of each RMSA is to perform or furnish contractual road maintenance services in accordance with state statutes and Municipal ordinances and the NPDES permit. The Board determines the level of maintenance and directs the contractual services accordingly; therefore, each RMSA has a unique set of SOPs depending on their range of responsibilities and are performed by staff whether maintenance operations are outsourced to a contractor.

According to the MOA RMSA Program, a Service Area (SA) has authority to provide basic road maintenance, to make capital improvements and to save for capital projects. In addition, a service area may have other authority, such as fire protection and rescue, as well as parks and recreation.

A SA can be further defined as a Rural Road Service Area (RRSA) or Limited Road Service Area (LRSA). A RRSA has authority to provide basic road maintenance services. RRSAs also have the ability to save taxes for capital improvements and capital road projects. A LRSA has limited authority to provide or issue contracts to provide basic road maintenance services. LRSAs do not have the ability to save taxes for capital projects.

A description of the RMSA Program can be seen below, in Table 2-1.

Table 2-1: RMSA Program

Entity Name	Acronym	Area of Responsibility
Alaska Department of Transportation and Public Facilities Maintenance and Operations	ADOT&PF M&O	All ADOT&PF-owned MS4 streets and drainage ways
Municipality Anchorage Street Maintenance Anchorage Roads and Drainage Service Area	MOA - ARDSA	All MOA-owned MS4 streets and drainage ways within the ARDSA boundaries
Municipality Anchorage Street Maintenance Anchorage Chugiak Birchwood Eagle River Rural Road Service Area	MOA - CBERRRSA	All MOA-owned MS4 streets and drainage ways within the CBERRRSA boundaries
Municipality of Anchorage Public Works Administration	MOA – PWA (LRSA)	(1) All MOA-owned MS4 streets and drainage ways within all established RMSA (RRSAs/LRSAs other than CBERRRSA and ARDSA) that are served by the RMSA Program and (2) All MOA-owned MS4 streets and drainage ways within areas having no formally established road maintenance service (Independent Road Service Areas, IRSAs)
Municipality of Anchorage Parks and Recreation	MOA – Parks and Rec.	all MOA-owned MS4 trails and drainage ways within the Parks and Recreation service area

2.1 ARDSA

The Municipal Street Maintenance and Operations, Anchorage Road and Drainage Service Area (ARDSA) is responsible for maintaining services for the Municipally owned roads and streets within its service area, classified as arterial and collector roads and streets, discharging into the MS4. A map of M&O service area can be found in Appendix A.

3 Standard Operating Procedures for Street Maintenance Activities

Standard operating procedures (SOPs) were prepared for ARDSA to satisfy the current APDES permit requiring that SOPs contain information describing the activity, inspection and maintenance schedules specific to the activity, and any pollution prevention/good housekeeping procedures used during the activity (3.4.4). The permit also specifies that the SOPs address, but are not limited to, the following activities:

- Road deicing
- Anti-icing
- Snow removal practices
- Snow disposal storage areas
- Maintenance of green infrastructure
- BMPs to reduce pollutants from roads and parking lots (i.e. sweeping)

The SOPs developed defines the activity, summarizes any specific permit references, provides a description of the activity, outlines the inspection and maintenance criteria and schedules, and describes pollution prevention and good housekeeping procedures used during the activity to reduce the discharge of pollutants to the maximum extent possible.

Municipality of Anchorage ARDSA
Standard Operating Procedures

SOPs

Inlets/Catchbasins

Manholes/Pipe

Inspections/Weirs Pipe Jetting

and Cleaning

Check Dams

Oil and Grit Separators

Outfalls

Tree and Brush Removal

Drywells

Pothole Repair

Vegetated Swales

Snow Removal and Disposal Practices

Snow Disposal Site Maintenance

Road Deicing Practices and Storage

Flow Conveyance System and Stream Thawing

Aggregate Application and Storage

Contaminated Materials

Litter Control

Mowing

Infiltration Devices and Constructed Wetlands

Drainage Ditch Maintenance

Inlets and Catchbasins

RESOURCE NEEDS

DEFINITIONS:

Catch basins are subsurface concrete structures that receive water through a grate, curb opening, or inlet pipe. These structures can contain flow control and/or water quality devices. The catch basin's function is to collect and convey flow and in low flow conditions, collect debris and sediment to prevent these items from transferring into and obstructing the downstream piped collection system.

PERMIT REFERENCES:

Street Maintenance performs annual inspection and cleaning of catch basins and inlet control measures to meet permit requirements (3.4.2).

ACTIVITY DESCRIPTION:

A detailed inspection is completed for each inlet/catch basin and minor cleaning, such as litter pick-up, is completed as part of the inspection routine. The mapping, inspection and maintenance of stormwater inlets/catchbasins requires accurate and specific record keeping. This task is completed by using MOA's GIS enhanced computerized asset management system (GBA) to inventory all drainage structure locations, track maintenance costs, maintenance histories, and condition assessments. The computerized asset management system (GBA) stores and manages this data providing annual reports as well as formulates work order set-up and preventative maintenance (PM) schedules. During the summer season Street Maintenance prepares grid maps identifying all the catchbasin/inlet structures within the grids and assigns necessary personnel to inspect the subject structures within the grids. Each structure is visually inspected for sediment accumulation and signs of cracks, breaks, displacement, infiltration, or deterioration. The data collected during the inspection effort is then uploaded into the computerized asset management system (GBA) and a work order is created listing the inlet/catchbasins that require maintenance. Crews are assigned and begin by inspecting and preparing the vehicle fleet and equipment, including vactor trucks, to perform maintenance duties. If sediment accumulation reaches a certain level (see maintenance criteria below), vactor trucks remove the sediment and clean the catchbasins. If repairs are required, the location and condition is recorded. The Supervisor collects reports describing the outcome of the assigned maintenance activities and enters this data into the computerized asset management system (GBA). Structures requiring repairs or rebuilding are inventoried and prioritized over the winter season and assigned for repair or additional work when weather permits.. If damage to private property, the right-of-way, or roadway is evident and a hazard, emergency repairs are assigned to the daily field crew..

INSPECTION CRITERIA:

1. Provide appropriate traffic control where necessary and all other required safety equipment. Insure personnel are properly trained on the use of equipment and safety procedures.
2. If sediment depths is within 1" of the lowest pipe invert elevation then maintenance is required.
3. The structure is inspected from the surface to the fullest extent possible (catch basins are not designed for entry, **ENTRY IS NOT PERMITTED**) for structural integrity and/or damage for the following items:
    A. Inlet condition is flowing and free from any blockages
    B. Evidence of infiltration including drips or water flowing into structure at joints and/or grouting and evidence of discoloration above the sump indicating former water intrusion.
    C. Evidence of cracks and deterioration of the structure or grouting including rotting of concrete structure, exposure of rebar or structural matting, discontinuous sections in the grout.

MAINTENANCE CRITERIA:

1. Provide appropriate traffic control where necessary and all other required safety equipment. Insure personnel are properly trained on the use of equipment and safety procedures.
2. Catch basins are confined spaces containing potentially hazardous atmospheres. All maintenance personnel will be trained and properly equipped to work in hazardous confined spaces before entering any type of catch basin structure.
3. Remove sediment using vactor truck. Dispose of sediment from the vactor truck at the sedimentation basin at the Street Maintenance yard. If repairs and/or maintenance are required, record the condition and transfer to the Street Maintenance computerized asset management system for prioritization and scheduling.
4. If repairs and/or maintenance are required or suspected, record the condition and transfer to the Street Maintenance computerized asset management system for prioritization and scheduling.
    A. Remove inlet blockage
    B. Record and/or photograph infiltration condition for Street Maintenance asset management system.

Inlets and Catchbasins

   D. Structural integrity including barrel sections is in good alignment, grade rings show no evidence of cracking, lifting, or movement.
   E. Evidence of abrasion and/or corrosion and deterioration of pipes.
   F. Evidence of any other unusual condition that may impede or impair the function of the structure.
4. If the structure cannot be inspected the inspection record will indicate one or more of the following;
   A. Could not locate.
   B. Defective or non-compliant construction.
   C. Obstructed access.
   D. Grate or cover could not be removed.
   E. Unsafe conditions.
   F. Structure has been declared a hazard to life and limb and may not be disturbed for any reason.
   G. Unit not properly raised to grade preventing maintenance access

C. Record and/or photograph cracks and deterioration for Street Maintenance asset management system.
D. Record and/or photograph structural integrity for Street Maintenance asset management system.
E. Record and/or photograph corrosion or abrasion for Street Maintenance asset management system.
F. Record and/or photograph any other condition that may impede or impair the function of the structure for Street Maintenance asset management system.

INSPECTION SCHEDULE:	**MAINTENANCE SCHEDULE:**
Routine inspection is completed on an annual basis for each catch basin and inlet.	Maintenance will be scheduled and performe based on the outcome of the annual inspection effort... Maintenance requirements are logged after inspection, noted, and prioritized in the Street Maintenance computerized asset management database. Maintenance activities are completed as warranted by the priority assigned.

POLLUTION PREVENTION/GOOD HOUSEKEEPING PROCEDURES

Train field crews annually and provide frequent verbal reminders on how to operate the equipment and what to look for during routine inspections prior to the field season.

Keep training records that include attendees, date, and description of training.

Check all vehicles, including vactor trucks, used for stormwater infrastructure inspection and maintenance for operational condition, leaks, and deficiencies prior to leaving the Street Maintenance yard. For equipment inspection and maintenance:

- Place drip pans under equipment parts that may leak. Empty drip pans when they are more than ½ full.
- Clean up all drips and leaks immediately
- Empty fuel and oil filters where drips cannot reach stormwater
- Do not wash equipment or pavement surrounding equipment where wash water can enter storm drains

Check fittings associated with the vactor truck prior to starting operation of the vactor truck to remove accumulated sediment material.

Remove all litter and debris found during the inspection procedure. Dispose of litter/debris from the site in solid waste containers located at the Street Maintenance yard.

Inlets and Catchbasins

Transfer sediment and debris collected in the vactor truck to the vactor wash-out/sediment basin located at the Street Maintenance yard. If sediment is spilled or released during collection or disposal clean the area thoroughly and immediately.

Manhole Inspection of Pipes and Weirs

RESOURCE NEEDS

DEFINITIONS:

Manholes allow surface access to underground storm water piping conveyances for inspection and maintenance operations. Pipes within the storm water system convey storm water flow to receiving bodies of water. Weirs installed within manholes provide flow control.

PERMIT REFERENCES:

This SOP was prepared according to the permit requirements (3.4.4).

ACTIVITY DESCRIPTION:

The inspection and maintenance of manholes, weirs, and pipes require accurate and specific record keeping. This task is completed by using MOA's GIS enhanced computerized asset management system (GBA) to inventory all drainage structure locations, track maintenance costs, maintenance histories, and condition assessments. The computerized asset management system (GBA) stores and manages this data providing annual reports as well as formulates work order set-up and preventative maintenance (PM) schedules. During the summer season Street Maintenance prepares grid maps identifying all the manholes, weirs, and pipes within the grids and assigns necessary personnel to inspect the subject structures within the grids. Each structure is visually inspected for sediment accumulation and signs of cracks, breaks, displacement, infiltration, or deterioration. Inspections include weirs and/or adjacent pipe within the manhole. The data collected during the inspection effort is then uploaded into the computerized asset management system (GBA) and a work order is created listing the manholes, weirs, and pipes that require maintenance. Crews are assigned and begin by inspecting and preparing the vehicle fleet and equipment, including vactor trucks, to perform maintenance duties. If sediment accumulation reaches a certain level (see maintenance criteria below), vactor trucks remove the sediment and clean the manholes, weirs, and pipes. If repairs are required, the location and condition is recorded. The Supervisor collects the reports describing the outcome of the assigned maintenance activities and enters this data into the computerized asset management system (GBA). Manholes, weirs, and pipes requiring repairs or rebuilding are inventoried and prioritized over the winter season and assigned for repair or additional work when weather permits. If damage to private property, the right-of-way, or roadway is evident and a hazard, emergency repairs are assigned to the daily field crew

INSPECTION CRITERIA:

1. Provide appropriate traffic control where necessary and all other required safety equipment. Insure personnel are properly trained on the use of equipment and safety procedures.
2. Storm drain manholes, weirs, and pipes are confined spaces containing potentially hazardous atmospheres. All inspection and maintenance personnel will be trained and properly equipped to work in hazardous confined spaces before entering manhole structures.
3. If the depth of sediment accumulation in the manhole catchment is within 6" of the lowest invert then maintenance is required.
4. The structure is checked for structural integrity and/or damage for the following items:
    A. Evidence of infiltration including drips or water flowing into structure at joints and/or grouting, and evidence of discoloration above the sump indicating former water intrusion.
    B. Cracks and deterioration of the structure or grouting including

MAINTENANCE CRITERIA:

1. Provide appropriate traffic control where necessary and all other required safety equipment. Insure personnel are properly trained on the use of equipment and safety procedures
2. Storm drain manholes, weirs, and pipes are confined spaces containing potentially hazardous atmospheres. All inspection and maintenance personnel will be trained and properly equipped to work in hazardous confined spaces before entering manhole structures.
3. Remove sediment using vactor truck. Dispose of sediment from the vactor truck at the sedimentation basin at the Street Maintenance yard.
4. If repairs and/or maintenance are required, record the condition and transfer to the Street Maintenance computerized asset management system for prioritization and scheduling.
    A. Record and/or photograph infiltration condition for Street Maintenance asset management system
    B. Record and/or photograph cracks and deterioration for Street

Manhole Inspection of Pipes and Weirs

rotting of concrete structure, exposure of rebar or structural matting, discontinuous sections in the grout.

C. Structural integrity including barrel sections is in good alignment, grade rings show no evidence of cracking, lifting, or movement.
D. Signs of abrasion and/or corrosion and deterioration of pipes
E. Evidence of any other unusual condition that may impede or impair the function of the structure(s).

5. Measure the depth of sediment accumulation in the upstream and downstream pipes. If the sediment level in pipes is more than 25% of the pipe diameter, schedule the pipes to be jetted and cleaned. Please see Pipe Jetting/Cleaning SOP for detail.
6. If the structure cannot be inspected the inspection record will indicate one or more of the following;
    a. Could not locate.
    b. Defective or non-compliant construction.
    c. Obstructed access.
    d. Grate or cover could not be removed.
    e. Unsafe conditions.
    f. Structure has been declared a hazard to life and limb and may not be disturbed or entered for any reason.

Maintenance asset management system.
C. Record and/or photograph structural integrity for Street Maintenance asset management system.
D. Record and/or photograph corrosion or abrasion for Street Maintenance asset management system.
asset management system
E. Record and/or photograph any other condition that may impede or impair the function of the structure for Street Maintenance asset management system.

INSPECTION SCHEDULE:

Manholes and associated weirs and pipes are inspected on a three year rotation.

MAINTENANCE SCHEDULE:

Maintenance is performed as identified during inspections or as predicated by the preventative maintenance schedule in the asset management system. .

POLLUTION PREVENTION/GOOD HOUSEKEEPING PROCEDURES

Train field crews annually and provide frequent verbal reminders on how to operate the equipment and what to look for during routine inspections prior to the field season.

Keep training records that include attendees, date, and description of training.

Check all vehicles, including vactor trucks, used for stormwater infrastructure inspection and maintenance for operational condition, leaks, and deficiencies prior to leaving the Street Maintenance yard. For equipment inspection and maintenance:

- Place drip pans under equipment parts that may leak. Empty drip pans when they are more than ½ full.
- Clean up all drips and leaks immediately
- Empty fuel and oil filters where drips cannot reach stormwater
- Do not wash equipment or pavement surrounding equipment where wash water can enter storm drains

Check fittings associated with the vactor truck prior to starting operation of the vactor truck to remove accumulated sediment material.

Manhole Inspection of Pipes and Weirs

Remove all litter and debris found during the inspection procedure. Dispose of litter/debris from the site in solid waste containers located at the Street Maintenance yard.

Transfer sediment and debris collected in the vactor truck to the vactor wash-out/sediment basin located at the Street Maintenance yard. If sediment is spilled or released during collection or disposal clean the area thoroughly and immediately.

Pipe Jetting and Cleaning

RESOURCE NEEDS

DEFINITIONS:

Pipe jetting and cleaning is the process of threading a high pressure water nozzle through a pipe to break up and remove debris and sediment from the pipe. Sediment and debris are collected and removed through an access point using a vactor truck.

PERMIT REFERENCES:

This SOP was prepared according to the permit requirements (3.4.4).

ACTIVITY DESCRIPTION:

Stormwater pipes are inspected during routine manhole inspections in compliance with the SOP for Manholes/Pipe Inspection/Weirs. If a significant blockage is observed or if sediment and debris levels exceed those established in the SOP for Manholes/Pipe Inspection/Weirs, the condition is recorded in the Street Maintenance computerized asset management system and a work order is created. When work orders for pipe jetting and cleaning are assigned, crews inspect and prepare the equipment fleet, including vactor trucks and water pumps as needed. At the site the pipes are cleaned or blockages removed by use of a properly sized jetting nozzle attached to a high pressure water pump. The high pressure nozzle transfers energy from the pressure of the nozzle to velocity, pulling the hose behind it. A hydraulic reel controls the pressure and distance the nozzle travels through the pipe, cleaning and removing debris.. A downstream bladder collects water, sediment, and debris to ensure that sediment plumes are not released into the receiving waters. . The Supervisor collects the reports describing the outcome of the assigned maintenance activities and enters this data into the computerized asset management system (GBA). . If the field notes indicate repairs need immediate attention, the Street Maintenance Supervisor assigns this repair via work order to daily field crews.

Pipe Jetting and Cleaning

INSPECTION CRITERIA:	**MAINTENANCE CRITERIA:**
1. Provide appropriate traffic control where necessary and all other required safety equipment. Insure personnel are properly trained on the use of equipment and safety procedures. 2. Storm drain manholes and pipes are confined spaces containing potentially hazardous atmospheres. All inspection personnel will be trained and properly equipped to work in hazardous confined spaces before entering manhole or catch basin structures. 3. The depth of sediment accumulation is noted in the field notes. If sediment depths are greater than 25% of the pipe diameter the pipe is cleaned by jetting. 4. The structure is checked for structural integrity and/or damage for the following items: A. Evidence of infiltration including drips or water flowing into structure at joints. B. Cracks and deterioration of the structure. C. Structural integrity is in good alignment, with no evidence of shifting, shearing, cracking, lifting, or movement. D. Signs of abrasion and/or corrosion. E. Evidence of any other unusual condition that may impede or impair the function of the structure(s). 5. If the structure(s) cannot be inspected the maintenance record will indicate one or more of the following; A. Could not locate. B. Defective or non-compliant construction. C. Obstructed access. D. Grate or cover could not be removed. E. Unsafe conditions. F. Structure has been declared a hazard to life and limb and may not be disturbed or entered for any reason.	1. Provide appropriate traffic control where necessary and all other required safety equipment. Insure personnel are properly trained on the use of equipment and safety procedures 2. Storm drain manholes and pipes are confined spaces containing potentially hazardous atmospheres. All maintenance personnel will be trained and properly equipped to work in hazardous confined spaces before entering manhole or catch basin structures. 3. Remove sediment using vactor truck. Place a downstream bladder to collect water and sediment to ensure sediment plumes are not released into receiving water. Dispose of sediment from the vactor truck at the sedimentation basin at the Street Maintenance yard. 4. If repairs and/or maintenance are required, record the condition and transfer to the Street Maintenance asset management system for prioritization and scheduling. A. Record and/or photograph infiltration condition for Street Maintenance asset management system B. Record and/or photograph cracks and deterioration for Street Maintenance asset management system. C. Record and/or photograph structural integrity for Street Maintenance asset management system. D. Record and/or photograph corrosion or abrasion for Street Maintenance asset management system. E. Record and/or photograph any other condition that may impede or impair the function of the structure for Street Maintenance asset management system.
INSPECTION SCHEDULE: Pipes are inspected during routine manhole inspections (see SOP for Manholes/Pipe Inspection/Weirs).	**MAINTENANCE SCHEDULE:** Maintenance is performed as identified during inspections

POLLUTION PREVENTION/GOOD HOUSEKEEPING PROCEDURES
Train field crews annually and provide frequent verbal reminders on how to operate the equipment and what to look for during routine inspections prior to the field season.

Pipe Jetting and Cleaning

Keep training records that include attendees, date, and description of training.

Check all vehicles, including vactor trucks, used for stormwater infrastructure inspection and maintenance for operational condition, leaks, and deficiencies prior to leaving the Street Maintenance yard. For equipment inspection and maintenance:

- Place drip pans under equipment parts that may leak. Empty drip pans when they are more than ½ full.
- Clean up all drips and leaks immediately
- Empty fuel and oil filters where drips cannot reach stormwater
- Do not wash equipment or pavement surrounding equipment where wash water can enter storm drains

Check fittings associated with the vactor truck prior to starting operation of the vactor truck to remove accumulated sediment material.

Remove all litter and debris found during the inspection procedure. Dispose of litter/debris from the site in solid waste containers located at the Street Maintenance yard.

Transfer sediment and debris collected in the vactor truck to the vactor wash-out/sediment basin located at the Street Maintenance yard. If sediment is spilled or released during collection or disposal clean the area thoroughly and immediately.

Check Dams

RESOURCE NEEDS

DEFINITIONS:

Check dams are used to slow the velocity of concentrated stormwater to prevent erosion. In an unlined channel or vegetative swale. Check dams catch sediment from the channel and are typically constructed of rock but can also be constructed from gravel, sandbags, logs, or treated lumber.

PERMIT REFERENCES:

This SOP was prepared according to the permit requirements (3.4.4).

ACTIVITY DESCRIPTION:

A detailed inspection is completed of each check dam and minor cleaning, such as litter pick-up, is completed as part of the inspection routine. Check dams are visually inspected for sediment accumulation and signs of deterioration, or evidence of previous overtopping or flooding. The check dam condition is recorded in the Street Maintenance computerized asset management system and a work order is created where necessary. When work orders are assigned, crews inspect and prepare the equipment as needed. The Supervisor collects the reports describing the outcome of the assigned maintenance activities and enters this data into the computerized asset management system (GBA). If the field inspection reveals that immediate repairs are necessary, the Street Maintenance Supervisor assigns this repair via work order to daily field crews.

INSPECTION CRITERIA:

1. Provide appropriate traffic control where necessary and all other required safety equipment. Insure personnel are properly trained on the use of equipment and safety procedures.
2. The depth of sediment accumulation at the check dam is noted in the field notes. If sediment depths are greater than 1/3 the height of t he check dam maintenance is needed. The accumulation of sediment and evidence of previous flooding or channel overtopping is checked to ensure functionality of the check dam.

3. The condition of the check dam structure is inspected for the following:
   A. Check for signs of structural deterioration including loss of rock structure, and/or crumbling.
   B. Check for signs of scour on the downstream side of the check dam.
   C. Evidence of any other unusual condition that may impede or impair the function of the check dam.

MAINTENANCE CRITERIA:

1. Provide appropriate traffic control where necessary and all other required safety equipment. Insure personnel are properly trained on the use of equipment and safety procedures.
2. If the sediment and debris level behind the check dam is greater than 1/3 the height of the dam, remove sediment to restore capacity. Dispose of sediment at the sedimentation basin at the Street Maintenance yard. To keep it functioning properly, the sediment and/or debris is removed to restore functionality.

3. If repairs and/or maintenance are required, record the condition and transfer to the Street Maintenance asset management system for prioritization and scheduling.
   A. Record and/or photograph structural condition for Street Maintenance asset management system.
   B. Record and/or photograph scour condition for Street Maintenance asset management system.
   C. Record and/or photograph any other condition that may impede or impair the function of the check dam for Street Maintenance asset management system

INSPECTION SCHEDULE:

MAINTENANCE SCHEDULE:

Check Dams

Check dams are inspected during other routine work, as needed, or as evidence of improper functioning is noticed or reported.	Maintenance is performed as identified during inspections.

POLLUTION PREVENTION/GOOD HOUSEKEEPING PROCEDURES

Train field crews annually and provide frequent verbal reminders on how to operate the equipment and what to look for during routine inspections prior to the field season.

Keep training records that include attendees, date, and description of training.

Check all vehicles, including vactor trucks, used for stormwater infrastructure inspection and maintenance for operational condition, leaks, and deficiencies prior to leaving the Street Maintenance yard. For equipment inspection and maintenance:

- Place drip pans under equipment parts that may leak. Empty drip pans when they are more than ½ full.
- Clean up all drips and leaks immediately
- Empty fuel and oil filters where drips cannot reach stormwater
- Do not wash equipment or pavement surrounding equipment where wash water can enter storm drains

Remove all litter and debris found during the inspection procedure. Dispose of litter/debris from the site in solid waste containers located at the Street Maintenance yard.

Transfer sediment and debris collected in the vactor truck to the vactor wash-out/sediment basin located at the Street Maintenance yard. If sediment is spilled or released during collection or disposal clean the area thoroughly and immediately.

If any work associated with this SOP results in ground disturbance (digging, grading, asphalt removal, etc.), including follow-up repairs that are needed at the structure, the following are implemented:

- Prevent disturbance of or introduction of polluted runoff to receiving waterbodies. Precautions include flow diversion and installation of temporary sediment and erosion control best management practices (such as waddles, matting, or silt fence) as specified in the municipal Storm Water Treatment Plan Review Guidance Manual (SWTPRGM) Appendix A.
- If more than 500 square feet are disturbed, the project may require a Stormwater Pollution Prevention Plan (SWPPP). Follow the requirements set forth in the SWTPRGM Appendix B.
- Stabilize exposed ground, soil, or dirt. Roadways may be stabilized by asphalt or chip seal. Other surfaces, including ditch sideslopes, are reseeded to reestablish vegetation or covered with aggregate (rock or gravel) with no fines.

Oil and Grit Separators

RESOURCE NEEDS

DEFINITIONS:

Oil and grit separators (OGS) are structural Best Management Practice designed to remove hydrocarbons and sediment from runoff. Runoff passes through these compartments to separate grit, oil and sediment before continuing in the downstream conveyance system.

PERMIT REFERENCES:

This SOP was prepared according to the permit requirements (3.4.4).

ACTIVITY DESCRIPTION:

A detailed inspection and maintenance regiment is simultaneously completed on each OGS structure. Sediment and debris removal, , litter pick-up, and evacuating the collection chamber(s) is completed as part of this regiment. The inspection and maintenance of OGSs require accurate record keeping. This task is completed by using MOA's GIS enhanced computerized asset management system (GBA) to inventory all drainage structure locations, track maintenance costs, maintenance histories, and condition assessments. During the summer season Street Maintenance prepares grid maps identifying all the OGS structures within the grids and assigns necessary personnel and equipment to inspect and provide maintenance on the subject structures within the grids. Crews begin by inspecting and preparing the vehicle fleet and equipment, including vactor trucks, to perform maintenance duties. Prior to performing maintenance the OGS is inspected for signs of cracks, breaks, displacement, infiltration, or deterioration. If repairs are required, the location and condition is recorded for upload into the computerized asset management system to schedule repairs. Vactor trucks are used to remove the sediment and clean the OGSs. The Supervisor collects reports describing the outcome of the assigned maintenance activities and enters this data into the computerized asset management system (GBA). Structures requiring repairs or rebuilding are inventoried and prioritized over the winter season and assigned for repair or additional work when weather permits. If damage to private property, the right-of-way, or roadway is evident and a hazard, emergency repairs are assigned to the daily field crew..

Oil and Grit Separators

INSPECTION CRITERIA:

1. Provide appropriate traffic control where necessary and all other required safety equipment. Insure personnel are properly trained on the use of equipment and safety procedures.
2. OGS structures are confined spaces containing potentially hazardous atmospheres. All personnel will be trained and properly equipped to work in hazardous confined spaces.
3. The depth of sediment accumulation is noted in the field notes.
4. The structural components of the OGSs are checked to ensure proper flow conveyance.
    A. Evidence of infiltration including drips or water flowing into structure at joints and/or grouting, and evidence of discoloration above the sump indicating former water intrusion.
    B. Cracks and deterioration of the structure or grouting including rotting of concrete structure, exposure of rebar or structural matting, discontinuous sections in the grout.
    C. Structural integrity including barrel sections is in good alignment, grade rings show no evidence of cracking, lifting, or movement.
    D. Signs of abrasion and/or corrosion are inspected
    E. Accessibility issues
5. If the OGS cannot be inspected or maintained the record will indicate one or more of the following;
    A. Could not locate.
    B. Defective or non-compliant construction.
    C. Obstructed access to structure.
    D. Grate or cover could not be removed.
    E. Unsafe conditions.
    F. Structure has been declared a hazard to life and limb and may not be disturbed or entered for any reason.
    G. Unit not properly raised to grade preventing maintenance access.
    H. Maintenance access points not properly aligned on the OGS.

MAINTENANCE CRITERIA:

1. Provide appropriate traffic control where necessary and all other required safety equipment. Insure personnel are properly trained on the use of equipment and safety procedures.
2. OGS structures are confined spaces containing potentially hazardous atmospheres. All personnel will be trained and properly equipped to work in hazardous confined.
3. All Sediment and debris in the OGS are removed via vactor truck.
4. If repairs and/or maintenance are required, record the condition and transfer to the Street Maintenance asset management system for prioritization and scheduling.
    A. Record and/or photograph infiltration condition for Street Maintenance asset management system
    B. Record and/or photograph cracks and deterioration for Street Maintenance asset management system.
    C. Record and/or photograph structural integrity for Street Maintenance asset management system.
    D. Record and/or photograph corrosion or abrasion for Street Maintenance asset management system.
    E. Record and/or photograph accessibility issues for the Street Maintenance asset management system
    F. Record and/or photograph any other condition that may impede or impair the function of the OGS for Street Maintenance asset management system

INSPECTION SCHEDULE:

Each OGS is inspected annually.

MAINTENANCE SCHEDULE:

Sediment and debris are removed on an annual basis.

Other maintenance needs are performed as identified during inspection.

POLLUTION PREVENTION/GOOD HOUSEKEEPING PROCEDURES

Train field crews annually and provide frequent verbal reminders on how to operate the equipment and what to look for during routine inspections prior to the field season.

Keep training records that include attendees, date, and description of training.

Check all vehicles, including vactor trucks, used for stormwater infrastructure inspection and maintenance for operational condition, leaks, and deficiencies prior to leaving the Street Maintenance yard. For equipment inspection and maintenance:

- Place drip pans under equipment parts that may leak. Empty drip pans when they are more than ½ full.
- Clean up all drips and leaks immediately
- Empty fuel and oil filters where drips cannot reach stormwater
- Do not wash equipment or pavement surrounding equipment where wash water can enter storm drains

Check fittings associated with the vactor truck prior to starting operation of the vactor truck to remove accumulated sediment material.

Remove all litter and debris found during the inspection procedure. Dispose of litter/debris from the site in solid waste containers located at the Street Maintenance yard.

Collect liquid and floatable contaminants in the vactor truck and decant to the sanitary sewer system at Anchorage Water and Wastewater Utility (AWWU) receiving stations. AWWU has permitted this discharge to the sanitary sewer system. Solids that remain are delivered to the Street Maintenance yard. Permitting discussions are on-going to potentially use a field filtration unit and field decanting to the sanitary sewer. .

Outfalls

RESOURCE NEEDS

DEFINITIONS:

Outfalls are the discharge points where storm water enters the receiving body of water at the end of a storm water conveyance system.

PERMIT REFERENCES:

This SOP was prepared according to the permit requirements (3.4.4).

ACTIVITY DESCRIPTION:

A detailed inspection is completed of each outfall and minor cleaning, such as litter pick-up, is completed as part of the inspection routine. Outfall inspection is performed between June 1st and August 30th as part of the dry weather screening program. The inspection and maintenance of outfalls requires accurate record keeping. This task is completed by using MOA's GIS enhanced computerized asset management system (GBA) to inventory all drainage structure locations, track maintenance costs, maintenance histories, and condition assessments. During the summer season Street Maintenance prepares grid maps identifying all the outfall structures within the grids and assigns maintenance crews to inspect the structures within the grids. . Crews inspect and prepare the equipment fleet needed to perform the inspection of the assigned structures. Each outfall is visually inspected for functionality, erosion or deterioration at the discharge location, and illicit discharges. The site is also photographed to document conditions during the inspection. The Supervisor collects reports describing the outcome of the assigned maintenance activities and enters this data into the computerized asset management system (GBA).. Outfalls requiring repairs or rebuilding are inventoried and prioritized over the winter season and assigned for repair or additional work when weather permits. If damage to private property, the right-of-way, or roadway is evident and a hazard, emergency repairs are assigned to the daily field crew.

Outfalls

INSPECTION CRITERIA:	**MAINTENANCE CRITERIA:**
1. Provide appropriate traffic control where necessary and all other required safety equipment. Insure personnel are properly trained on the use of equipment and safety procedures. 2. Check for litter, rubbish, and debris around the outfall area. 3. The structural components of the outfalls are inspected to ensure flow conveyance and functionality. The outfall site is inspected for signs of: A. Sediment accumulation and localized erosion. B. Exposed soil material with no vegetative cover. 4. Evidence of illicit discharges should be checked during dry weather conditions and may include the following items: • Odor • Color • Clarity • Floatables • Deposits/stains • Vegetation condition • Structural condition • Biology 5. If the Outfall cannot be inspected or maintained the record will indicate one or more of the following; • Could not locate. • Defective or non-compliant construction. • Obstructed or no access to outfall. • Unsafe conditions.	1. Provide appropriate traffic control where necessary and all other required safety equipment. Insure personnel are properly trained on the use of equipment and safety procedures. 2. Remove liter, rubbish, accumulated sediment, and debris in and around the outfall. 3. If repairs and/or maintenance are required, record the condition and transfer to the Street Maintenance asset management system for prioritization and scheduling. 4. Repair rock or rip rap used for energy dissipation at outfall. Vegetate to re-establish cover.
INSPECTION SCHEDULE: Each outfall is inspected annually.	**MAINTENANCE SCHEDULE:** Maintenance is performed as identified during inspections.

POLLUTION PREVENTION/GOOD HOUSEKEEPING PROCEDURES

Check all vehicles used for stormwater infrastructure inspection and maintenance for operational condition, leaks, and deficiencies prior to leaving the Street Maintenance yard. For equipment inspection and maintenance:

- Place drip pans under equipment parts that may leak. Empty drip pans when they are more than ½ full.
- Clean up all drips and leaks immediately
- Empty fuel and oil filters where drips cannot reach stormwater
- Do not wash equipment or pavement surrounding equipment where wash water can enter storm drains

Remove all litter and debris found during the inspection procedure. Dispose of litter/debris from the site in solid waste containers located at the Street

Maintenance yard.

Obtain appropriate Alaska Fish and Game and/or Corps of Engineers, as applicable or necessary for the associated receiving water.

If any work associated with this SOP results in ground disturbance (digging, grading, asphalt removal, etc.), including follow-up repairs that are needed at the structure, the following are implemented:

- Prevent disturbance of or introduction of polluted runoff to receiving waterbodies. Precautions include flow diversion and installation of temporary sediment and erosion control best management practices (such as waddles, matting, or silt fence) as specified in the municipal Storm Water Treatment Plan Review Guidance Manual (SWTPRGM) Appendix A.
- If more than 500 square feet are disturbed, the project may require a Stormwater Pollution Prevention Plan (SWPPP). Follow the requirements set forth in the SWTPRGM Appendix B.
- Stabilize exposed ground, soil, or dirt. Roadways may be stabilized by asphalt or chip seal. Other surfaces, including ditch sideslopes, are reseeded to reestablish vegetation or covered with aggregate (rock or gravel) with no fines.

Tree and Brush Removal

RESOURCE NEEDS

PERMIT REFERENCES:
This SOP was prepared according to the permit requirements (3.4.4).

ACTIVITY DESCRIPTION:
Tree and brush removal is performed as identified through inspections of stormwater infrastructure, as a safety precaution for proper sight distance. Crews inspect and prepare the equipment fleet needed to perform the tree and brush removal. Vehicles Any trees and brush that are removed or trimmed are chipped in place.

INSPECTION CRITERIA:	**MAINTENANCE CRITERIA:**
1. Provide appropriate traffic control where necessary and all other required safety equipment. Insure personnel are properly trained on the use of equipment and safety procedures. 2. Crews inspect tree and brush encroachment during inspections of other street maintenance activities. If during inspections site distance can be improved, trimming or brush removal may be recommended. Also, crews look for tree and brush encroachment that may cause an obstruction for flow conveyance within the storm water conveyance system.	1. Provide appropriate traffic control where necessary and all other required safety equipment. Insure personnel are properly trained on the use of equipment and safety procedures. 2. Trim tree and brush material to improve site distance or clear obstruction for flow conveyance. As material is cut, chip and spread over the existing right-of-way.
INSPECTION SCHEDULE: Inspect for vegetation encroachment during street maintenance activities.	**MAINTENANCE SCHEDULE:** Tree and brush removal is provided as identified during inspections..

POLLUTION PREVENTION/GOOD HOUSEKEEPING PROCEDURES

Check all vehicles used for stormwater infrastructure inspection and maintenance for operational condition, leaks, and deficiencies prior to leaving the Street Maintenance yard. For equipment inspection and maintenance:

- Place drip pans under equipment parts that may leak. Empty drip pans when they are more than ½ full.
- Clean up all drips and leaks immediately
- Empty fuel and oil filters where drips cannot reach stormwater
- Do not wash equipment or pavement surrounding equipment where wash water can enter storm drains

Remove all litter and debris found during the inspection procedure. Dispose of litter/debris from the site in solid waste containers located at the Street Maintenance yard.

Pick up and dispose of clippings, leaves, sticks, branches, mulching, or other collected vegetation from all impermeable surfaces (driveways, sidewalks, trails, roadsides, etc.) that could runoff into stormdrain collection systems.

Do not dispose of vegetation into waterways or storm drainage systems.

Tree and Brush Removal

During tree and brush removal prevent disturbance of the receiving water body and any best management practices in place to provide treatment or protection to the receiving water body which may include but is not limited to straw waddles, silt fence, jute matting.

Drywells

RESOURCE NEEDS

DEFINITIONS:

Drywells are facilities that collect and infiltrate storm water runoff into the ground.

PERMIT REFERENCES:

This SOP was prepared according to the permit requirements (3.4.4).

ACTIVITY DESCRIPTION:

A detailed inspection is completed for each inlet/catch basin and minor cleaning, such as litter pick-up, is completed as part of the inspection routine. The mapping, inspection and maintenance of stormwater drywells requires accurate and specific record keeping. This task is completed by using MOA's GIS enhanced computerized asset management system (GBA) to inventory all drainage structure locations, track maintenance costs, maintenance histories, and condition assessments. The computerized asset management system (GBA) stores and manages this data providing annual reports as well as formulates work order set-up and preventative maintenance (PM) schedules. During the summer season Street Maintenance prepares grid maps identifying all the drywell structures within the grids and assigns necessary personnel to inspect the subject structures within the grids. Each structure is visually inspected for sediment accumulation and signs of cracks, breaks, displacement, infiltration, or deterioration. The data collected during the inspection effort is then uploaded into the computerized asset management system (GBA) and a work order is created listing the drywells that require maintenance. Crews are assigned and begin by inspecting and preparing the vehicle fleet and equipment, including vactor trucks, to perform maintenance duties. If sediment accumulation reaches a certain level (see maintenance criteria below), vactor trucks remove the sediment and clean the drywells. If repairs are required, the location and condition is recorded. The Supervisor collects reports describing the outcome of the assigned maintenance activities and enters this data into the computerized asset management system (GBA).. Structures requiring repairs or rebuilding are inventoried and prioritized over the winter season and assigned for repair or additional work when weather permits. If damage to private property, the right-of-way, or roadway is evident and a hazard, emergency repairs are assigned to the daily field crew..

Drywells

INSPECTION CRITERIA:

1. Provide appropriate traffic control where necessary and all other required safety equipment. Insure personnel are properly trained on the use of equipment and safety procedures.
2. Drywells are confined spaces containing potentially hazardous atmospheres. All personnel will be trained and properly equipped to work in hazardous confined spaces.
5. If sediment depths are greater than 2" or if evidence of failed infiltration capacity is observed then maintenance is required.
6. The structure is inspected from the surface to the fullest extent possible for structural integrity and/or damage for the following items:
    A. Inlet condition is flowing and free from any blockages
    B. Evidence of infiltration including drips or water flowing into structure at joints and/or grouting and evidence of discoloration above the sump indicating former water intrusion.
    C. Evidence of cracks and deterioration of the structure or grouting including rotting of concrete structure, exposure of rebar or structural matting, discontinuous sections in the grout.
    D. Structural integrity including barrel sections is in good alignment, grade rings show no evidence of cracking, lifting, or movement.
    E. Evidence of abrasion and/or corrosion and deterioration of pipes.
    F. Evidence of overflowing occurring, including erosion or formation of a channel.
    G. Ponding or other evidence of failed infiltration.
    H. Evidence of any other unusual condition that may impede or impair the function of the structure.
7. :If the structure cannot be inspected the inspection record will indicate one or more of the following;
    A. Could not locate.
    B. Defective or non-compliant construction.
    C. Obstructed access.
    D. Grate or cover could not be removed.
    E. Unsafe conditions.
    F. Structure has been declared a hazard to life and limb and may not be disturbed for any reason.
    G. Unit not properly raised to grade preventing maintenance access

MAINTENANCE CRITERIA:

1. Provide appropriate traffic control where necessary and all other required safety equipment. Insure personnel are properly trained on the use of equipment and safety procedures.
2. Drywells are confined spaces containing potentially hazardous atmospheres. All personnel will be trained and properly equipped to work in hazardous confined spaces.
3. Remove sediment using vactor truck. Dispose of sediment from the vactor truck at the sedimentation basin at the Street Maintenance yard.
4. If repairs and/or maintenance are required, record the condition and transfer to the Street Maintenance asset management system for prioritization and scheduling.
    A. Record and/or photograph erosion condition for Street Maintenance asset management system
    B. Record and/or photograph ponding for Street Maintenance asset management system.
    C. Record and/or photograph structural integrity for Street Maintenance asset management system.

Drywells

INSPECTION SCHEDULE:	**MAINTENANCE SCHEDULE:**
Drywell inspection is performed on an annual basis.	Drywell maintenance is performed as identified through inspections.

POLLUTION PREVENTION/GOOD HOUSEKEEPING PROCEDURES

Train field crews annually and provide frequent verbal reminders on how to operate the equipment and what to look for during routine inspections prior to the field season.

Keep training records that include attendees, date, and description of training.

Check all vehicles, including vactor trucks, used for stormwater infrastructure inspection and maintenance for operational condition, leaks, and deficiencies prior to leaving the Street Maintenance yard. For equipment inspection and maintenance:

- Place drip pans under equipment parts that may leak. Empty drip pans when they are more than ½ full.
- Clean up all drips and leaks immediately
- Empty fuel and oil filters where drips cannot reach stormwater
- Do not wash equipment or pavement surrounding equipment where wash water can enter storm drains

Check fittings associated with the vactor truck prior to starting operation of the vactor truck to remove accumulated sediment material.

Remove all litter and debris found during the inspection procedure. Dispose of litter/debris from the site in solid waste containers located at the Street Maintenance yard.

Transfer sediment and debris collected in the vactor truck to the vactor wash-out/sediment basin located at the Street Maintenance yard. If sediment is spilled or released during collection or disposal clean the area thoroughly and immediately.

Pothole Repair

RESOURCE NEEDS

DEFINITIONS:

Potholes are formed when moisture penetrates cracks in the road surface. Cold weather freezes the water, which causing an expansion further cracking the pavement surface. Dirt and gravel are forced out of the crack by drivers eventually forming a pothole.

PERMIT REFERENCES:

This SOP was prepared according to the permit requirements (3.4.4).

ACTIVITY DESCRIPTION:

Street maintenance has established programs to maintain and repair roads and streets within ARDSA and provide a best management mechanism to reduce road debris. These programs include year-round pothole repair.

Potholes are repaired year-round using asphalt. During the winter months, when asphalt plants are shut down, Street Maintenance prepares batches of asphalt within the Street Maintenance yard. Crews inspect and prepare the vehicle fleet needed to make road repairs before leaving the Street Maintenance yard. They travel to the site and make necessary repairs. Crews log and track areas of pothole repairs and approximate quantity of asphalt used. Supervisor collects field notes that log and track the potholes repaired.

INSPECTION CRITERIA:	**MAINTENANCE CRITERIA:**
1. Potholes are reported by the general public to the Pothole Repair Hotline	1. Provide appropriate traffic control where necessary and all other required safety equipment. Insure personnel are properly trained on the use of equipment and safety procedures. 2. To fill the pothole the following procedure is followed: A. Sweep around the area to be patched to remove loose debris, broken pieces of pavement, and dirt. B. Fill the pothole with asphalt. C. Tamp down the asphalt to compact the material. D. Re-sweep area to remove any leftover material, dirt, or debris.
INSPECTION SCHEDULE: Potholes reported on the Pothole Repair Hotline are verified and repaired within 24 hours	**MAINTENANCE SCHEDULE:** Potholes are repaired within 24 hours of being reported to the Pothole Repair Hotline

POLLUTION PREVENTION/GOOD HOUSEKEEPING PROCEDURES

Train field crews annually and provide frequent verbal reminders on how to operate the equipment and what to look for during routine inspections prior to the field season.

Keep training records that include attendees, date, and description of training.

Pothole Repair

Check all vehicles, including vactor trucks, used for stormwater infrastructure inspection and maintenance for operational condition, leaks, and deficiencies prior to leaving the Street Maintenance yard. For equipment inspection and maintenance:

- Place drip pans under equipment parts that may leak. Empty drip pans when they are more than ½ full.
- Clean up all drips and leaks immediately
- Empty fuel and oil filters where drips cannot reach stormwater
- Do not wash equipment or pavement surrounding equipment where wash water can enter storm drains

Remove all litter and debris found during the inspection procedure. Dispose of litter/debris from the site in solid waste containers located at the Street Maintenance yard.

If any work associated with this SOP results in ground disturbance (digging, grading, asphalt removal, etc.), including follow-up repairs that are needed at the structure, the following are implemented:

- Prevent disturbance of or introduction of polluted runoff to receiving waterbodies. Precautions include flow diversion and installation of temporary sediment and erosion control best management practices (such as waddles, matting, or silt fence) as specified in the municipal Storm Water Treatment Plan Review Guidance Manual (SWTPRGM) Appendix A.
- If more than 500 square feet are disturbed, the project may require a Stormwater Pollution Prevention Plan (SWPPP). Follow the requirements set forth in the SWTPRGM Appendix B.
- Stabilize exposed ground, soil, or dirt. Roadways may be stabilized by asphalt or chip seal. Other surfaces, including ditch sideslopes, are reseeded to reestablish vegetation or covered with aggregate (rock or gravel) with no fines.

Vegetated Swales

RESOURCE NEEDS

DEFINITIONS:

Vegetated swales are gently sloping depressions planted with vegetation that allow stormwater runoff to be treated before entering the flow conveyance system. The vegetation slows the runoff flow, allowing the water to be filtered and, in some cases, infiltrated into the ground.

PERMIT REFERENCES:

This SOP was prepared according to the permit requirements (3.4.4).

ACTIVITY DESCRIPTION:

Vegetated swales are periodically inspected, and maintained, when improper functioning becomes evident. Crews inspect and prepare the equipment fleet needed to perform the inspection. The swale is visually inspected for sediment accumulation, vegetation that inhibits drainage conveyance, signs of erosion, channeling, or signs of flooding. . If repairs are required, the location and condition is recorded. The Supervisor collects reports describing the outcome of the assigned maintenance activities and enters this data into the computerized asset management system (GBA).. Structures requiring repairs or rebuilding are inventoried and prioritized over the winter season and assigned for repair or additional work when weather permits. If damage to private property, the right-of-way, or roadway is evident and a hazard, emergency repairs are assigned to the daily field crew.

INSPECTION CRITERIA:

1. Look for trash, debris, or large objects that could obstruct water flow.
2. Look for vegetation impeding drainage, laying over, or matted down,
3. Inspect for signs of channeling, erosion, and previous flooding to assess the functionality of the swale.
4. If damage to private property is evident, schedule emergency repairs.

MAINTENANCE CRITERIA:

1. Provide appropriate traffic control where necessary and all other required safety equipment. Insure personnel are properly trained on the use of equipment and safety procedures.
2. Remove trash or debris from swale. Dispose of at the Street Maintenance yard.
3. Remove sediment and debris in and around the swale if drainage is blocked.
4. Conduct mulch-mowing (see Mowing SOP). Set mulching blade to 3 to 6-inches for mowing operations.
5. If signs of channeling, erosion, or flooding are present indicating sediment transfer through the swale, record and transfer to the Street Maintenance asset management system for prioritization and scheduling for repairs.
   A. Record and/or photograph condition for Street Maintenance asset management system
   B. Consider adding energy dissipation rock, check dams, or stabilizing vegetation to minimize sediment transfer and slow water velocity within the swale

INSPECTION SCHEDULE:

Vegetative swales are inspected during other routine work, as needed, or if

MAINTENANCE SCHEDULE:

Maintenance is performed based on inspection results.

improper functioning is noticed or reported.	

POLLUTION PREVENTION/GOOD HOUSEKEEPING PROCEDURES

Train field crews annually and provide frequent verbal reminders on how to operate the equipment and what to look for during routine inspections prior to the field season.

Keep training records that include attendees, date, and description of training.

Check all vehicles used for stormwater infrastructure inspection and maintenance for operational condition, leaks, and deficiencies prior to leaving the Street Maintenance yard. For equipment inspection and maintenance:

- Place drip pans under equipment parts that may leak. Empty drip pans when they are more than ½ full.
- Clean up all drips and leaks immediately
- Empty fuel and oil filters where drips cannot reach stormwater
- Do not wash equipment or pavement surrounding equipment where wash water can enter storm drains

Remove all litter and debris found during the inspection procedure. Dispose of litter/debris from the site in solid waste containers located at the Street Maintenance yard.

Pick up and dispose of clippings, leaves, sticks, branches, mulching, or other collected vegetation from all impermeable surfaces (driveways, sidewalks, trails, roadsides, etc.) that could runoff into storm drain collection systems.

Do not dispose of vegetation into waterways or storm drainage systems.

If any work associated with this SOP results in ground disturbance (digging, grading, asphalt removal, etc.), including follow-up repairs that are needed at the structure, the following are implemented:

- Prevent disturbance of or introduction of polluted runoff to receiving waterbodies. Precautions include flow diversion and installation of temporary sediment and erosion control best management practices (such as waddles, matting, or silt fence) as specified in the municipal Storm Water Treatment Plan Review Guidance Manual (SWTPRGM) Appendix A.
- If more than 500 square feet are disturbed, the project may require a Stormwater Pollution Prevention Plan (SWPPP). Follow the requirements set forth in the SWTPRGM Appendix B.
- Stabilize exposed ground, soil, or dirt. Roadways may be stabilized by asphalt or chip seal. Other surfaces, including ditch sideslopes, are reseeded to reestablish vegetation or covered with aggregate (rock or gravel) with no fines.

Infilitration Devices and Constructed Wetlands

RESOURCE NEEDS

DEFINITIONS:

Infiltration devices and constructed wetlands are areas designed to treat stormwater runoff and reduce the amount of water entering a receiving water body.

PERMIT REFERENCES:

This SOP was prepared according to the permit requirements (3.4.4).

ACTIVITY DESCRIPTION:

Infiltration devices and constructed wetlands are periodically inspected and maintained as needed basis, when improper functioning is observed. Crews inspect and prepare the equipment fleet needed to perform the inspection. Upon arriving at the site crews visually inspect for sediment accumulation, vegetation overgrowth that inhibits drainage, conveyance, and signs of erosion. . If repairs are required, the location and condition is recorded. The Supervisor collects reports describing the outcome of the assigned inspection activities and enters this data into the computerized asset management system (GBA).. Structures requiring repairs or rebuilding are inventoried and prioritized and a work order is created and repair crews are assigned. If damage to private property, the right-of-way, or roadway is evident and a hazard, emergency repairs are assigned to the daily field crew.

INSPECTION CRITERIA:

1. Look for sediment accumulation, trash, debris, or large objects that could obstruct water flow.
2. Look for vegetation impeding drainage, laying over, or matted down,
3. Inspect for signs of channeling, erosion, and previous flooding to assess the functionality of the wetland.
4. If damage to private property is evident, schedule emergency repairs.

MAINTENANCE CRITERIA:

1. Provide appropriate traffic control where necessary and all other required safety equipment. Insure personnel are properly trained on the use of equipment and safety procedures.
2. Remove sediment and debris if drainage is blocked. Remove trash or litter and dispose of at the Street Maintenance yard.
3. Remove vegetative overgrowth by hand (when practical) to reduce damage to wetland feature.
4. If signs of channeling, erosion, or flooding are present indicating sediment transfer through the wetland, record and transfer to the Street Maintenance asset management system for prioritization and scheduling for repairs.
   A. Record and/or photograph condition for Street Maintenance asset management system

INSPECTION SCHEDULE:

Inspection is performed on an as needed basis, as evidence of improper functioning is noticed or reported.

MAINTENANCE SCHEDULE:

Maintenance is performed based on inspection results.

POLLUTION PREVENTION/GOOD HOUSEKEEPING PROCEDURES

Train field crews annually and provide frequent verbal reminders on how to operate the equipment and what to look for during routine inspections prior to the field season.

Keep training records that include attendees, date, and description of training.

Check all vehicles used for stormwater infrastructure inspection and maintenance for operational condition, leaks, and deficiencies prior to leaving the Street Maintenance yard. For equipment inspection and maintenance:

- Place drip pans under equipment parts that may leak. Empty drip pans when they are more than ½ full.
- Clean up all drips and leaks immediately
- Empty fuel and oil filters where drips cannot reach stormwater
- Do not wash equipment or pavement surrounding equipment where wash water can enter storm drains

Remove all litter and debris found during the inspection procedure. Dispose of litter/debris from the site in solid waste containers located at the Street Maintenance yard.

Do not dispose of vegetation into waterways or storm drainage systems.

If any work associated with this SOP results in ground disturbance (digging, grading, asphalt removal, etc.), including follow-up repairs that are needed at the structure, the following are implemented:

- Prevent disturbance of or introduction of polluted runoff to receiving waterbodies. Precautions include flow diversion and installation of temporary sediment and erosion control best management practices (such as waddles, matting, or silt fence) as specified in the municipal Storm Water Treatment Plan Review Guidance Manual (SWTPRGM) Appendix A.
- If more than 500 square feet are disturbed, the project may require a Stormwater Pollution Prevention Plan (SWPPP). Follow the requirements set forth in the SWTPRGM Appendix B.
- Stabilize exposed ground, soil, or dirt. Roadways may be stabilized by asphalt or chip seal. Other surfaces, including ditch sideslopes, are reseeded to reestablish vegetation or covered with aggregate (rock or gravel) with no fines.

Snow Removal and Disposal Practices

RESOURCE NEEDS

DEFINITIONS:

Snow removal and disposal refers to the clearing of snow from the road surface, the temporary storage of plowed snow in the road right-of-way (ROW), and the removal and disposal of accumulated snow in the road ROW at Municipal owned snow storage facilities.

PERMIT REFERENCE:

This SOP was prepared according to the permit requirements (3.4.4).

ACTIVITY DESCRIPTION:

After a snowfall event (3 to-4 inch accumulation city wide), roads and streets are plowed within 72 hours, a process referred to as a "Plow Out", which is declared by the Superintendent of Street Maintenance. Crews inspect and prepare the vehicle fleet needed to plow the snow before leaving the Street Maintenance yard. Snow is plowed and stored on the adjacent road right-of-way (ROW), until the available storage on the ROW is filled to capacity and prevents additional storage. Once road storage is full, crews remove the snow via blowers and loaders into haul trucks that dump the snow at one of the municipal snow disposal sites. At the disposal site snow is removed from the haul trucks and moved to form lifts of snow, in an effort to maximize snow storage capacity within the disposal site.

INSPECTION CRITERIA:	**MAINTENANCE CRITERIA:**
1. Plow trucks are used after a snow event greater than 3-4 inches in accumulation referred to as a "Plow Out" to clear the roadways. Plow trucks may also be used to clear main arterial roads at any accumulation or during a snow event to help maintain traffic movement in the city. 2. Loaders and blowers remove accumulated snow in ROW when storage is no longer available.	1. Snow is plowed from the road and pushed onto the adjacent ROW. 2. Accumulated snow is removed from the ROW via blowers, loaders and contracted haul trucks and taken to designated snow disposal sites (see Snow Disposal Site Maintenance SOP).
INSPECTION SCHEDULE: "Plow Outs" are declared by the Director of Street Maintenance. Plows may be also be used to clear main roads (non-residential) during snow events of any accumulation as directed by the Street Maintenance Director.	**MAINTENANCE SCHEDULE:** During a declared "Plow Out" all ARDSA serviced roads must be cleared within 72 hours of the declaration.

POLLUTION PREVENTION/GOOD HOUSEKEEPING PROCEDURES

Train field crews annually and provide frequent verbal reminders on how to operate the equipment and what to look for during routine inspections prior to the field season.

Keep training records that include attendees, date, and description of training.

Check all vehicles used for stormwater infrastructure inspection and maintenance for operational condition, leaks, and deficiencies prior to leaving the Street Maintenance yard. For equipment inspection and maintenance:

- Place drip pans under equipment parts that may leak. Empty drip pans when they are more than ½ full.

Snow Removal and Disposal Practices

- Clean up all drips and leaks immediately
- Empty fuel and oil filters where drips cannot reach stormwater
- Do not wash equipment or pavement surrounding equipment where wash water can enter storm drains

Snow Disposal Site Maintenance

RESOURCE NEEDS

DEFINITIONS:

The Municipality owns and maintains several snow disposal sites. These sites are used to store snow that is removed from stored snow from plowing operations accumulated in the road right-of-way by the Municipality of Anchorage or Alaska Department of Transportation.

PERMIT REFERENCES:

This SOP was prepared according to the permit requirements (3.4.4).

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ACTIVITY DESCRIPTION:

Snow removed from the road surfaces by ARDSA Street Maintenance crews is brought to one of the Municipal snow storage sites. Snow is dumped from the haul trucks and placed as a lift of snow. Water is sprayed on top of each snow lift to provide a horizontal platform for additional lifts of snow.

All snow disposal sites are operated in accordance with their own Storm Water Pollution Prevention Plan which specifies the Best Management Practices employed at the site, and defines the monitoring and maintenance of the stormwater control measures. All snow disposal sites have BMPs in place to capture run off before it enters the storm water conveyance system.

During summer months BMPs are inspected and maintained to ensure proper functioning for winter and spring months. This may include the following: grading the site to drain, maintaining swales, inspecting and cleaning oil and grit separators, inspecting and maintaining sedimentation basins and constructed wetlands. All of these BMPs have individual SOPs developed for the inspection and maintenance procedures. During spring and summer months crews collect litter at the snow disposal sites as work and available time allows.

INSPECTION CRITERIA:	**MAINTENANCE CRITERIA:**
1. Sites are inspected for litter 2. Site BMPs are inspected in accordance with appropriate SOP	1. Crews collect litter and dispose of waste in solid waste containers 2. Site BMPs are maintained in accordance with SOP
INSPECTION SCHEDULE: Litter control is provided year round, especially as sites begin to thaw. Snow disposal site BMPs are inspected and maintained year round Snow disposal site BMPs are inspected annually.	**MAINTENANCE SCHEDULE:** Litter is collected as needed. BMPs are maintained as needed.

POLLUTION PREVENTION/GOOD HOUSEKEEPING PROCEDURES

Train field crews annually and provide frequent verbal reminders on how to operate the equipment and what to look for during routine inspections prior to the field season.

Keep training records that include attendees, date, and description of training.

Road Deicing and Anticing Practices and Storage

RESOURCE NEEDS

DEFINITIONS:

Anti-Icing refers to the placement of materials to a road surface to prevent the formation or development of ice from bonding to the road surface. Anti-icing materials are often applied in a timely manner in anticipation of an event or promptly at the onset of a winter event before snow or ice accumulation has occurred.

Deicing refers to the placement of materials to a road surface in reaction to a winter event once snow and ice have bonded to the road surface. These materials add traction to the surface or assist in the removal of snow and ice from the road surface

PERMIT REFERENCE:

Street Maintenance has prepared this standard operating procedure to meet the permit requirement of section (II.B.4.c.i).

ACTIVITY DESCRIPTION:

Road anti-icing and deicing practices are used to prevent ice build-up on roads and streets prior to snow accumulation or at the onset of freezing conditions. These activities are separate from aggregate application used once snow and ice have accumulated on roads. Deicing and anti-icing agents are applied by a deicer truck that sweeps in the front and sprays the deicing and anti-icing agents from the back. Crews inspect and prepare the vehicle fleet needed for deicing and anti-icing practices, before leaving the Street Maintenance yard. The inspection and application of the chemical agents requires accurate record keeping. Crews log and track the areas of where chemicals have been applied and estimate the quantities applied. The Supervisor collects field notes/logs and records the information for future use.

Commented [j1]: I don't remember them tracking this information

There are two primary chemicals used to prevent ice build-up, potassium acetate and magnesium chloride. Potassium acetate is less corrosive and aggressive than chloride salts and is typically applied in the Central Business District (CBD). Magnesium chloride is applied to roadways outside the CBD. Either deicing chemical may be used. This is determined based on availability and costs. Chloride slats in very small volumes are depth on hand to be used in severe Chinook conditions or when the ARDSA receives significant rain in the winter months. These conditions happen rarely, with a 20 percent annual probability (one in five years frequency) of occurring.

INSPECTION CRITERIA:	**MAINTENANCE CRITERIA:**
1. Roads are inspected for black ice when temperatures are near freezing, but prior to any new snow or ice accumulation on the road surface.	Chemical agents are applied to roads and streets prior to predicted freezing rain and icing events. If deicing conditions are warranted, chemical agents are applied to streets and roads at a rate of 3 to 5 percent brine mixture to mitigate icing conditions.
INSPECTION SCHEDULE: When weather forecast predictions freezing temperatures crews are sent to inspect major intersections for black ice.	**MAINTENANCE SCHEDULE:** Maintenance is performed as needed.

POLLUTION PREVENTION/GOOD HOUSEKEEPING PROCEDURES

Train field crews annually and provide frequent verbal reminders on how to operate the equipment and what to look for during routine inspections prior to the field season.

Keep training records that include attendees, date, and description of training.

Road Deicing and Anticing Practices and Storage

Check all vehicles used for chemical application for operational condition, leaks, and deficiencies prior to leaving the Street Maintenance yard. For equipment inspection and maintenance:

- Place drip pans under equipment parts that may leak. Empty drip pans when they are more than ½ full.
- Clean up all drips and leaks immediately
- Empty fuel and oil filters where drips cannot reach stormwater
- Do not wash equipment or pavement surrounding equipment where wash water can enter storm drains

Minimize application of de-icing and anti-icing agents to extent possible.

CHEMICAL STORAGE:

Store magnesium chloride and potassium acetate at the Street Maintenance yard, inside plastic drums indoors. Prevent drums from stormwater runoff exposure.

Keep drums closed except when chemical is removed.

Use pans or graded containment/catchment placed beneath the transfer site to catch any liquid that may be spilled, when transferring chemicals to the application equipment for deicing and anti-icing applications. If any chemical is spilled during transfer operations, clean up and dispose of properly.

Flow Conveyance System and Stream Thawing

RESOURCE NEEDS

PERMIT REFERENCES:

This SOP was prepared according to the permit requirements (3.4.4).

ACTIVITY DESCRIPTION:

Pipe and ditch thawing is performed when flooding occurs as a result of blockages of a flow conveyance system or stream from freezing. Problems may be most evident during the spring during break-up or rainstorms. Typically the maintenance group is notified of a problem from residents. Crews inspect and prepare the vehicle fleet needed for thawing practices, before leaving the Street Maintenance yard. Areas with a known history of freezing problems are monitored more frequently.

Thawing is performed by one of two devices, portable steam boilers or thaw wire systems. Street maintenance owns and operates a steam boiler truck(s). The boiler has several versatile fittings that can be used to thaw sections of frozen conveyance systems or streams. The type of fitting used for thawing is unique to the drainage problem. The second method of thawing is a low voltage transformer, is not used for stream thawing purposes. Electrical current passes through conductors, heat element, in the flow conveyance system by the transformer. The current in the heating element may be adjusted due to the length and rating of heat as required.

INSPECTION CRITERIA:	**MAINTENANCE CRITERIA:**
1. Conveyance systems and streams are inspected for flooding of ROW or private property or blocked drainage creating hazardous drainage conditions, or in response to a customer complaint.	1. If thawing is warranted, either a steam boiler or transformer is used to mitigate the drainage problem.
INSPECTION SCHEDULE: During spring break-up, street maintenance crews monitor roads and streets for drainage concerns. The general public inform personnel of drainage issues.	**MAINTENANCE SCHEDULE:** Thawing practices are performed as drainage conditions warrant.

POLLUTION PREVENTION/GOOD HOUSEKEEPING PROCEDURES

Keep training records that include attendees, date, and description of training.

Check all vehicles used for thawing are checked for operational condition, leaks, and deficiencies prior to leaving the Street Maintenance yard. For equipment inspection and maintenance:

- Place drip pans under equipment parts that may leak. Empty drip pans when they are more than ½ full.
- Clean up all drips and leaks immediately
- Empty fuel and oil filters where drips cannot reach stormwater
- Do not wash equipment or pavement surrounding equipment where wash water can enter storm drains

Aggregate Application and Storage

RESOURCE NEEDS

PERMIT REFERENCE:

This SOP was prepared according to the permit requirements (3.4.4).

ACTIVITY DESCRIPTION:

After a snowfall event, roads and streets are plowed, and aggregate (well graded sand, meeting the requirements of the gradation limits below) is applied to help vehicle traction. Well graded sand is used for this aggregate traction and is applied shortly after snow has been plowed.

Crews inspect and prepare the vehicle fleet needed to apply the aggregate. Before leaving the Street Maintenance yard, the sand is treated with magnesium chloride at a rate of 3-5%to keep it from freezing and in a spreadable condition. Sand is loaded from a stockpile that is stored in a covered building into a spreader truck by a loader. Before the loader dumps its bucket in the spreader truck, magnesium chloride is sprayed onto the sand via an electronic spraying device.

INSPECTION CRITERIA:	**MAINTENANCE CRITERIA:**
1. Accumulation of snow during and after snow fall event requiring plowing 2. Diminished traction on the road surface	1. Aggregate is applied to areas of inspected concern 2. Aggregate is applied after snow has been plowed from the roads
INSPECTION SCHEDULE: After snowfall events, as needed.	**MAINTENANCE SCHEDULE:** After snowfall events, as needed.

POLLUTION PREVENTION/GOOD HOUSEKEEPING PROCEDURES

Keep training records that include attendees, date, and description of training.

Check all vehicles used for aggregate application are checked for operational condition, leaks, and deficiencies prior to leaving the Street Maintenance yard. For equipment inspection and maintenance:

- Place drip pans under equipment parts that may leak. Empty drip pans when they are more than ½ full.
- Clean up all drips and leaks immediately
- Empty fuel and oil filters where drips cannot reach stormwater
- Do not wash equipment or pavement surrounding equipment where wash water can enter storm drains

AGGREGATE STORAGE:

Store aggregate inside a building designed to keep aggregates from freezing.

Prevent overloading the trucks with aggregate and spilling excessive aggregate onto the ground.

Spray aggregate load with magnesium chloride prior during loading process to prevent freezing during application.
Store magnesium chloride and potassium acetate at the Street Maintenance yard, inside plastic drums indoors. Prevent drums from stormwater runoff exposure.

Aggregate Application and Storage

Keep drums closed except when chemical is removed.

Use pans placed beneath the transfer site to catch any liquid that may be spilled, when transferring chemicals. If any chemical is spilled during transfer operations, it is cleaned up and disposed of properly.

AGGREGATE GRADATION LIMITS:

Sieve Size	Cumulative % Passing By Weight
3/8”	100
No. 4	70-100
No. 8	0-35
No. 16	0-10
No. 30	0-5
No. 200	0-1

Moisture content not-to-exceed four percent (4%)
Aggregate shall consist of washed sand and gravel and shall be sound, durable, free of adherent coatings of clay, dust, dirt and any other objectionable matter and shall have a percentage of wear not-to-exceed 30 after 500 revolutions as determined by ASTM C-131.

Contaminated Materials

RESOURCE NEEDS
PERMIT REFERENCE: This SOP was prepared according to the permit requirements (3.4.4). **ACTIVITY DESCRIPTION:** Release of contaminated materials or spills within ARDSA are responded to by the Anchorage Fire Department. Any contaminated materials found in the Street Maintenance yard are reported immediately to the Street Maintenance Supervisor. Response will be handled in accordance with the agency's hazardous materials operating policy.

INSPECTION CRITERIA:	**MAINTENANCE CRITERIA:**
Inspection of contaminated material is performed by appropriate personnel with proper training.	Maintenance is performed in accordance with the agency's hazardous materials operating policy.
INSPECTION SCHEDULE:	**MAINTENANCE SCHEDULE:**
Inspection is performed on an as needed or reported basis.	Maintenance is performed as needed.

POLLUTION PREVENTION/GOOD HOUSEKEEPING PROCEDURES
Prepare spill plans for all areas where chemicals are stored (including fuels). Keep chemicals stored in doors within secondary containment. Clean up small spills or drips immediately. Provide and post notification procedures with contact information and phone numbers. Train all personnel on response procedures. Keep training records.

Litter Control

RESOURCE NEEDS

PERMIT REFERENCE:

This SOP was prepared according to the permit requirements (3.4.4).

ACTIVITY DESCRIPTION:

Litter is collected as part of good housekeeping procedures set forth for the inspection and maintenance activities performed by street maintenance personnel.

Litter along the road system is also collected by volunteer groups and agencies. Litter is collected in trash bags and then set in the right-of-way. Bags are situated in the right-of-way away from drainage structures and flow paths. Appropriate personnel collect the trash bags and dispose of the bags in solid waste containers.

INSPECTION CRITERIA:	**MAINTENANCE CRITERIA:**
1. Litter is monitored by Street Maintenance personnel who determine when maintenance activities are performed. 2. Volunteer groups choose areas within the service area to collect litter.	1. Where litter is found during routine inspections, personnel collect and dispose of it in trash bags. Trash bags are disposed of at the Street Maintenance Yard. 2. Volunteer groups collect litter along roadsides in trash bags. Bags of litter are set in the right-of-way, away from areas of drainage conveyance. The bags of litter are picked up and disposed of properly in solid waste containers.
INSPECTION SCHEDULE: Litter control is part of the good housekeeping procedures set forth in the inspection and maintenance activities performed by Street Maintenance personnel. Volunteer groups pick-up litter within the designated service area three times during the year.	**MAINTENANCE SCHEDULE:** Litter is collected when encountered during routine inspections and other street maintenance work activities. Volunteer groups schedule litter pick-up throughout the spring and summer season.

POLLUTION PREVENTION/GOOD HOUSEKEEPING PROCEDURES

Pick up litter collected in trash bags in a timely manner.

Do not place trash bags within 10 feet of streams or stormwater inlets.

Sedimentation Basin Maintenance

RESOURCE NEEDS

DEFINITIONS:

A settling basin is a device used to treat for settleable solids. Water from the storm drain system enters the basin. The basin design slows the water velocity, allowing particles in the water to settle from solution by gravity.

PERMIT REFERENCE: This SOP was prepared according to the permit requirements (3.4.4).

ACTIVITY DESCRIPTION:

The sedimentation basin is inspected and cleaned to remove accumulation of debris and sediment so that design flows can be maintained and capacity is sufficient for treatment. The sedimentation basin is located at the Street Maintenance yard facilities. Street Maintenance staff inspect the basin, remove trash collected on the trash screen, dredge settled material to maintain capacity, and remove any floatable hydrocarbons with booms.

INSPECTION CRITERIA:	**MAINTENANCE CRITERIA:**
1. Basins are inspected for debris accumulation. 2. Sediment accumulation levels are checked to maintain treatment capacity and flow conveyance. 3. Surface water is inspected for any evidence of sheen or floating hydrocarbons.	1. Trash is removed, transferred, and disposed of at the landfill. 2. Sediment is dredged daily using a front-end loader. Sediment is transferred and recycled as grading material or disposed of at the landfill. 3. Floating, sheen, and oils are removed from the basin by a boom and disposed of at the landfill.
INSPECTION SCHEDULE: Sedimentation basins are inspected on daily basis when runoff events cause flow through them.	**MAINTENANCE SCHEDULE:** Maintenance is performed as needed.

POLLUTION PREVENTION/GOOD HOUSEKEEPING PROCEDURES

Keep training records that include attendees, date, and description of training.

Check all vehicles used for thawing are checked for operational condition, leaks, and deficiencies prior to leaving the Street Maintenance yard. For equipment inspection and maintenance:

- Place drip pans under equipment parts that may leak. Empty drip pans when they are more than ½ full.
- Clean up all drips and leaks immediately
- Empty fuel and oil filters where drips can not reach stormwater
- Do not wash equipment or pavement surrounding equipment where wash water can enter storm drains

Pick up litter found during inspection and dispose of collected litter in solid waste containers.

Mowing

RESOURCE NEEDS

ACTIVITY DESCRIPTION:

Mowing needs are noted as part of the inspection and maintenance activities performed by street maintenance personnel. ARDSA coordinates any mowing maintenance needed within its service area with MOA Parks and Recreation. Upon the completion of mowing, ARDSA street maintenance crews visually inspect the mowing services performed for work completion.

INSPECTION CRITERIA:	**MAINTENANCE CRITERIA:**
1. Mowing inspections are conducted concurrently with stormwater infrastructure/road repair inspection and maintenance activities.	1. Mowing needs are coordinated and performed by MOA Parks and Recreation
INSPECTION SCHEDULE: Inspection is performed as needed on a reported basis as part of the inspection and maintenance activities performed by ARDSA personnel.	**MAINTENANCE SCHEDULE:** Maintenance is coordinated with MOA Parks and Recreation.

POLLUTION PREVENTION/GOOD HOUSEKEEPING PROCEDURES

Check all vehicles used for thawing are checked for operational condition, leaks, and deficiencies prior to leaving the Street Maintenance yard. For equipment inspection and maintenance:

- Place drip pans under equipment parts that may leak. Empty drip pans when they are more than ½ full.
- Clean up all drips and leaks immediately
- Empty fuel and oil filters where drips cannot reach stormwater
- Do not wash equipment or pavement surrounding equipment where wash water can enter storm drains

Remove litter and debris prior to mowing activities. Take any litter collected back to the Street Maintenance yard, and dispose in solid waste containers.

Use a mulching blade to leave clippings in place.

Cease mowing activities within 10 feet of entry points to the stormwater conveyance system.

Do not expose soils when mowing (instance, mow no shorter than 1/3 of grass blade height).

Drainage Ditch Maintenance

RESOURCE NEEDS

ACTIVITY DESCRIPTION:

Cleaning and shaping ditches to restore proper cross-section and flow line, and to ensure proper drainage of the roadway and adjacent roadway.

Work Method:

1. Locate underground utilities before starting work.
2. Place signs, traffic warning devices and necessary
3. Cut the ditch to the correct grade and cross-section; load waste material into dump trucks.
4. Haul the waste for disposal area.
5. Clean up work area. Sweep roadway and/or shoulder as necessary.
6. Hydro seed banks for erosion control.
7. Remove signs and safety devices.

INSPECTION PROCEDURES:

Drainage ditches are inspected as part of the maintenance foreman's activity. Drainage ditches are inspected for proper cross-section, flow line, and debris accumulations. Ditches that need cleaning but are not creating any immediate problems are noted and will scheduled for cleaning when resources are available.

MAINTENANCE PROCEDURES:

Provide appropriate traffic control where necessary and all other required safety equipment. Insure personnel are properly trained on the use of equipment and safety procedures.

Drainage crews are sent to known problem areas first. Once these problematic areas have been addressed, an attempt is made to clean an entire route at once and to systematically work through the entire system, as equipment and resources are available.

INSPECTION CRITERIA:

Action is taken when drainage ditches become clogged enough to cause flooding or significant damage to either the roadway or private property. This emergency type work is prioritized at the time in conjunction with other routine drainage work.

MAINTENANCE CRITERIA:

Drainage ditches are considered operational if they are not creating a significant drainage problem. Drainage ditches are considered clean when approximately 95% of the brush and sediment is removed.

INSPECTION SCHEDULE:

The foreman, crew, and general public monitor drainage structures year-round for problems with most inspections and work occurring during the summer. The problems are most apparent during the spring when the ice and snow are melting or during rainstorms. Personnel are periodically contacted and made aware of problem areas by the general public. In most events maintenance workers responding to problems are able to discern whether the drainage structure needs repairs.

MAINTENANCE SCHEDULE:

Drainage structures causing significant damage to either the road or private property are taken care of ASAP. Structures that have been problematic either during the winter or the spring are scheduled for cleaning and repair on an as needed basis during the summer months.

POLLUTION PREVENTION/GOOD HOUSEKEEPING PROCEDURES

Pollution prevention and good housekeeping procedures are conducted in accordance with the terms and conditions set forth in the contract. Pollution prevention and good housekeeping procedures are conducted in accordance with the terms and conditions set forth in the contract and include the following:

Provide training and frequent reminders on how to operate the equipment.

Drainage Ditch Maintenance

Check all vehicles used for inspection and maintenance for operational condition, leaks, and deficiencies prior to leaving the Contractor yard.

Pick up litter and debris around the site as seen during routine inspection. Take any litter collected back to the Contractor yard, and dispose in solid waste containers.

Where practical, prevent disturbance of vegetation in the ditch.

If any work associated with this SOP results in ground disturbance (digging, grading, asphalt removal, etc.), including follow-up repairs that are needed at the structure, the following are implemented:

- Prevent disturbance of or introduction of polluted runoff to receiving waterbodies. Precautions include flow diversion and installation of temporary sediment and erosion control best management practices (such as waddles, matting, or silt fence) as specified in the municipal Storm Water Treatment Plan Review Guidance Manual (SWTPRGM) Appendix A.
- If more than 500 square feet are disturbed, the project may require a Stormwater Pollution Prevention Plan (SWPPP). Follow the requirements set forth in the SWTPRGM Appendix B.
- Stabilize exposed ground, soil, or dirt. Roadways may be stabilized by asphalt or chip seal. Other surfaces, including ditch sideslopes, are reseeded to reestablish vegetation or covered with aggregate (rock or gravel) with no fines.

Take precaution to prevent mud and dust tracking on the roadways. Clean any tracked sediment or dust from work activities.

Waste Removal:

Dirt and vegetative matter from drainage ditches are removed.

Waste Treatment and Disposal:

Organic material (dirt, weeds, brush, etc.) removed during ditch repair is biodegradable and will be hauled away for proper disposal at the designated fill site. Garbage that is generated from drainage ditches is recycled or disposed of at regional landfills.