



Operation Procedures  
for  
Inspection and Maintenance  
of  
Drainage Channel

**Eagleview Subdivision**

In association with Project SF-22-42

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## **Introduction**

This plan addresses operation and maintenance of the vegetation within the Falcon Drainage Basin west tributary reaches RWT094 (north of the proposed S. Arroya Lane), RWT092, RWT054, and RWT080 which is constructed as part of the **Eagleview Subdivision (PCD File No: SF-22-42)** development project to the southeast of the intersection of Raygor Road and Arroya Lane.

## **Funding for and Organization of Facility Operation and Maintenance**

Eagleview Metropolitan District (“Metro District”) will be responsible for operations and maintenance of the vegetation of the drainage channel upon acceptance of the drainage facility.

## **Facilities Description**

The drainage channels are located within the Falcon Drainage Basin west tributary reaches RWT094 (north of the proposed S. Arroya Lane), RWT092, RWT054 (south of the property line), and RWT080 (south and east of the property line). The channel design consists of concrete check structures with riprap dissipation, coir matting, and natural vegetation. Per the Stormwater Facility Maintenance Agreement and Easement, the Metro District will maintain and properly manage the grasses, vegetation, and reinforcing fabrics within these channels.

Per the Stormwater Facility Maintenance Agreement, the County is responsible for maintenance of the concrete check structures, upstream and downstream riprap protection for each check structure and maintenance roads along the channel. Per the Falcon DBPS, the County is responsible for the maintenance of channel RWT094 south of South Arroya Lane, which is included into a public drainage easement. This O&M manual does not cover the operations and maintenance for that portion of channel RWT094.

## **Drainage Channel (DC) Description**

The subsections below describe general drainage channel operations and maintenance.

### **DC-1 INSPECTING DRAINAGE CHANNELS**

#### **DC-1.1 Access and Easements**

Inspection and maintenance personnel may utilize the attached stormwater facility map containing the location(s) of the access points and maintenance easements of the drainage channel within this development.

#### **DC-2.2 Stormwater Management Facilities Locations**

Inspection and maintenance personnel may utilize the attached stormwater facility map located containing the location(s) of the drainage channel within this development.

#### **DC-2.2 Drainage Channel Features**

Drainage channels have a number of features that are designed to serve a particular function. Many times the proper function of one feature depends on another. Therefore, it is critical that each feature of the drainage channel is properly inspected and maintained to ensure that the overall facility functions as it was intended. Below is a table and description of the drainage channel features and maintenance inspection items that are the responsibility of the Metro District:

**Table DC-1: Typical Inspection & Maintenance Requirements Matrix**

Channel Features	Weed Control	Trash & Debris Removal	Erosion
Embankment	X	X	X
Channel Bottom	X	X	

Miscellaneous

There are a variety of inspection/maintenance issues that may not be attributed to a single feature within the drainage channel. This category on the inspection form is for maintenance items that are commonly found in the drainage channel but may not be attributed to an individual feature.

- a. *Encroachment in Easement Area* – Private lots/property can sometimes be located very close to the drainage channel, even though they are required to be located in tracts with drainage easements. Property owners may place landscaping, trash, fencing, or other items within the easement area that may affect maintenance or the operation of the facility.
- b. *Public Hazards* – Public hazards include items such as vertical drops of greater than 4-feet, containers of unknown/suspicious substances, exposed metal/jagged concrete on structures. If any hazard is found within the facility area that poses an immediate threat to public safety, contact the Sheriff at 911 immediately!
- c. *Burrowing Animals/Pests* – Prairie dogs and other burrowing rodents may cause damage to the drainage channel features and negatively affect the vegetation within the drainage channel. Consult EPC Environmental Division if this becomes an issue.
- d. *Other* – Any miscellaneous inspection/maintenance items not contained on the form should be entered here.

**DC-2 MAINTAINING DRAINAGE CHANNEL (DC)**

**DC-2.1 Maintenance Personnel**

Maintenance personnel must be qualified to properly maintain drainage channels. Inadequately trained personnel can cause additional problems resulting in additional maintenance costs.

**DC-2.2 Equipment**

It is imperative that the appropriate equipment and tools are taken to the field with the operations crew. The types of equipment/tools will vary depending on the task at hand. Below is a list of tools, equipment, and material(s) that may be necessary to perform maintenance on the drainage channel:

- 1.) Shovels
  - 2.) Rakes
  - 3.) All Surface Vehicle (ASVs)
  - 4.) Filter Fabric
  - 5.) Erosion Control Blanket(s)
  - 6.) Seed Mix (Native)
  - 7.) Trash Bags
- include mowing equipment
- 

Some of the items identified above may not be needed for every maintenance operation. However, this equipment should be available to the maintenance operations crews should the need arise.

**DC-2.3 Safety**

Vertical drops may be encountered in areas located within and around the facility. Avoid walking on top of the concrete check structures or other structures that have a significant vertical drop. If a vertical drop is identified within the drainage channel that is greater than 48” in height, make the appropriate note/comment on the maintenance inspection form.

**DC-2.4 Maintenance Categories and Activities**

A typical Maintenance Program will consist of three broad categories of work: routine, minor, and major maintenance activities. Within each category of work, a variety of maintenance activities can be performed on the drainage channel. A maintenance activity can be specific to each feature within the drainage channel, or general to the overall facility. The maintenance activities range in magnitude from routine trash pickup to the reconstruction of embankments. The following three sub-sections (2.5, 2.6, and 2.7) explain each of the categories and briefly describes the typical maintenance activities for a drainage channel, including the objectives and frequency of actions.

**DC-2.5 Routine Maintenance Activities**

The majority of this work consists of regularly scheduled weed control and trash and debris pickups for stormwater management facilities during the growing season. These activities will normally be performed numerous times during the year. These items can be completed without any prior correspondence with the EPC Stormwater; however, completed inspection and maintenance forms shall be retained for each inspection and maintenance activity.

The Maintenance Activities are summarized below, and further described in the following sub-sections.

**TABLE – DC-2 Summary of Routine Maintenance Activities**

MAINTENANCE ACTIVITY	MINIMUM FREQUENCY	LOOK FOR	MAINTENANCE ACTION
<b>Trash/Debris Removal</b>	Twice annually	Trash & debris along embankment and channel bottom	Remove and dispose of trash and debris to impedes flow or caught in structures
<b>Weed control</b>	Minimum twice annually	Noxious weeds; Unwanted vegetation	Treat w/ herbicide or hand pull; Consult the local weed specialist

mowing should be included as the district is responsible for the grasses and vegetation. Revise.

### DC-2.5.2 Trash/Debris Removal

Trash and debris must be removed from the embankments of the drainage channel to minimize outlet clogging and to improve aesthetics. This activity must be performed prior to mowing operations.

*Frequency* – Routine – Prior to mowing operations and minimum of twice annually.

### DC-2.5.3 Weed Control

Noxious weeds and other unwanted vegetation must be treated as needed throughout the drainage channel. This activity can be performed either through mechanical means (mowing/pulling) or with herbicide. Consultation with the Environmental Division at 719-520-7878 is highly recommended prior to the use of herbicide.

*Frequency* – Routine – As needed based on inspections.

include in the maintenance activities: vegetation removal and revegetation

## **DC- 2.6 Minor Maintenance Activities**

This work consists of a variety of isolated or small-scale maintenance or operational problems. Most of this work can be completed by a small crew, tools, and small equipment. These items may require prior correspondence with EPC Stormwater and require completed inspection and maintenance forms to be submitted to EPC upon request for each inspection and maintenance activity.

**Table – DC-3 Summary of Minor Maintenance Activities**

<b>MAINTENANCE ACTIVITY</b>	<b>MINIMUM FREQUENCY</b>	<b>LOOK FOR</b>	<b>MAINTENANCE ACTION</b>
<b>Erosion Repair</b>	As needed, based upon inspection	Rills/gullies forming on embankments, other than the natural state	Repair eroded areas Revegetate; address source of erosion

### DC-2.6.1 Erosion Repair

The repair of eroded areas along the embankments is necessary to ensure the proper function of the drainage channel, minimize sediment transport, and to reduce potential impacts to other features. The repair of eroded areas may require the use of excavators, earthmoving equipment, riprap, concrete, erosion control blankets, and turf reinforcement mats. Major erosion repair to the drainage channel embankments will require consultation with EPC Stormwater Staff.

*Frequency* – Nonroutine – As necessary based upon inspections.

## **DC-2.7 Major Maintenance Activities**

This work consists of larger maintenance/operational problems and failures within the stormwater management facilities. All of this work requires consultation with EPC Stormwater Staff to ensure the proper maintenance is performed. This work requires that the staff review the original design and construction drawings to assess the situation and assign the necessary maintenance. **An ESQCP permit may be required for major maintenance activities.** This work may also require more specialized maintenance equipment, design/details, surveying, or assistance through private contractors and consultants.

**Table – DC-4 Summary of Major Maintenance Activities**

MAINTENANCE ACTIVITY	MINIMUM FREQUENCY	LOOK FOR	MAINTENANCE ACTION
<b>Major Erosion Repair</b>	As needed – based upon scheduled inspections	Severe erosion including gullies, excessive soil displacement, areas of settlement, holes	Repair erosion – find cause of problem and address to avoid future erosion

DC-3.7.1 Major Erosion Repair

Major erosion repair consists of filling and revegetating areas of severe erosion. Determining the cause of the erosion as well as correcting the condition that caused the erosion should also be part of the erosion repair. Care should be given to ensure design grades and volumes are preserved.

*Frequency* – Nonroutine – Repair as needed based upon inspections.

## Inspection and Maintenance Forms

## DRAINAGE CHANNEL INSPECTION FORM

Date: \_\_\_\_\_

Subdivision/Business Name: \_\_\_\_\_ Inspector: \_\_\_\_\_

Subdivision/Business Address: \_\_\_\_\_

Weather: \_\_\_\_\_

Date of Last Rainfall: \_\_\_\_\_ Amount: \_\_\_\_\_ Inches

**Reason for Inspection:**      Routine                  Complaint                  After Significant Rainfall Event  
(Circle One)

**INSPECTION SCORING** - For each facility inspection item, insert one of the following scores:

0 = No deficiencies identified                  2 = Routine maintenance required  
1 = Monitor (potential for future problem)      3 = Immediate repair necessary  
N/A = Not applicable

**1.) Embankments**

\_\_\_\_ Weed Control  
\_\_\_\_ Trash/Debris Removal  
\_\_\_\_ Erosion Present (beyond natural state) describe below  
\_\_\_\_\_

**2.) Channel Bottom**

\_\_\_\_ Weed Control  
\_\_\_\_ Trash/Debris Removal  
\_\_\_\_ Erosion Present (beyond natural state) describe below  
\_\_\_\_\_

Inspection Summary / Additional Comments: \_\_\_\_\_

**OVERALL FACILITY RATING (Circle One)**

0 = No Deficiencies Identified    2 = Routine Maintenance Required  
1 = Monitor (potential for future problem exists)    3 = Immediate Repair Necessary



**DRAINAGE CHANNEL  
MAINTENANCE FORM**

Subdivision/Business Name: \_\_\_\_\_ Completion Date: \_\_\_\_\_

Subdivision/Business Address: \_\_\_\_\_ Contact Name: \_\_\_\_\_

**Maintenance Category:**                      Routine                      Minor                      Rehabilitation  
(Circle All That Apply)

**MAINTENANCE ACTIVITIES PERFORMED**

**ROUTINE WORK**

- \_\_\_\_ TRASH/DEBRIS REMOVAL
- \_\_\_\_ WEED CONTROL (HERBICIDE APPLICATION)

**MINOR MAINTENANCE**

**MAJOR MAINTENANCE**

- \_\_\_\_ EROSION REPAIR
- \_\_\_\_ EMBANKMENT
- \_\_\_\_ CHANNEL BOTTOM

- \_\_\_\_ EROSION REPAIR
- \_\_\_\_ EMBANKMENT
- \_\_\_\_ CHANNEL BOTTOM

OTHER \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

ESTIMATED TOTAL MANHOURS: \_\_\_\_\_

COSTS INCURRED (include description of costs):

EQUIPMENT/MATERIAL USED (include hours of equipment usage and quantity of material used):

COMMENTS/ADDITIONAL INFO: