# Stormwater Best Management Practice

# Operations and Maintenance Plan

**Project Name:** **Roseville Senior Living Facility**

**Property Address:** **2600 Dale St. N**
**Roseville, MN 55113**

**Date:** **12/1/2017**

Maintenance Inspection Contact:
Company
Name
Position
Address
Phone Number
Email

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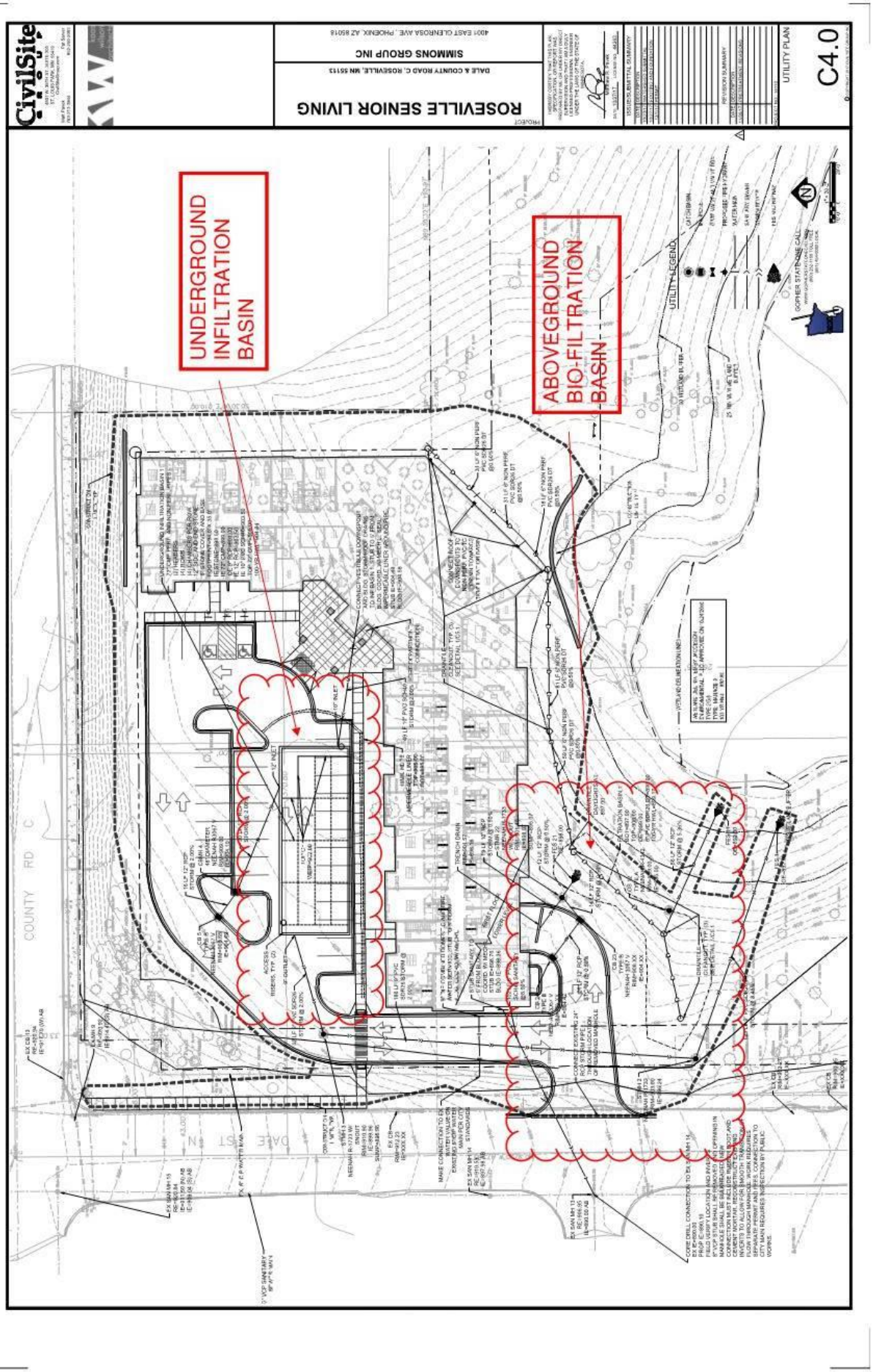
1.


UNDERGROUND INFILTRATION BASIN
ABOVEGROUND BIO-FILTRATION BASIN
ROSEVILLE SENIOR LIVING
SIMMONS GROUP INC
C4.0
UTILITY PLAN
COUNTY RD C

2. Underground Infiltration Basin

A. BMP Inspection Activities

| Inspection Activity | Recommended Inspection Frequency | Outcomes/Actions |
|---|---|---|
| 1. Visual inspection for trash and debris in all catch basins, sumps, pretreatement rows, underground infiltration systems and outlet pipes. | Monthly and following large storm events | Notify maintenance staff/contractor of need for debris removal (See Maintenance Activity 1) |
| 2. Sediment accumulation in device | Every 3-6 months depending on drainage area conditions | Notify maintenance staff/contractor of need to remove sediment when depth exceeds manufacturer's specifications (See Maintenance Activity 2) |
| 3. Oil accumulation in device | Every 3-6 months or following a known oil or gasoline spill\ | Notify maintenance staff/contractor of need to remove oil when a layer of oil/gasoline develops on water surface in device (See Maintenance Activity 3) |
| 4. Visual inspection of internal components of device | As part of all inspection visits | Notify maintenance staff/contractor of any broken or missing components of device (See Maintenance Activity 4) |

** For additional information, see the MPCA Stormwater Manual, 2005

http://www.pca.state.mn.us/water/stormwater/stormwater-manual.html

B. BMP Maintenance Activities

| Maintenance Activity | Frequency | Procedure | Maintenance By |
|---|---|---|---|
| 1. Trash and debris removal from device | As needed per inspection | Remove trash and debris from structure as outlined by manufacturer's recommendation | By owner unless designated |
| 2. Sediment removal | Every 6 months or when sediment accumulation has exceeded manufacturer's specifications | Remove accumulated sediment from device per the manufacturer's recommendations | By owner unless designated |
| 3. Oil removal | Remove oil from water surface using method outlined by manufacturer's recommendation | Remove oil from water surface using method outlined by manufacturer's recommendation | By owner unless designated |
| 4. Clean/fix device components | As part of all inspection visits | Dependent on type of damage; Repair structure per manufacturer's recommendations | By owner unless designated |

** For additional information, see the MPCA Stormwater Manual, 2005

http://www.pca.state.mn.us/water/stormwater/stormwater-manual.html

**Local Maintenance Contractors**

Charlie Wilson
Minnesota Utilities & Excavating
(651) 464-5532

Jesse Wilcox
Carl Bolander and Sons
(651) 224-6299

C. Typical Manufacturer's Operation & Maintenance Plan

## Maintenance

Underground storm water detention and retention systems should be inspected at regular intervals and maintained when necessary to ensure optimum performance. The rate at which the system collects pollutants will depend more heavily on site activities than the size or configuration of the system.

## Inspection

Inspection is the key to effective maintenance and is easily performed. CONTECH recommends ongoing quarterly inspections of the accumulated sediment. Sediment deposition and transport may vary from year to year and quarterly inspections will help insure that systems are cleaned out at the appropriate time. Inspections should be performed more often in the winter months in climates where sanding operations may lead to rapid accumulations, or in equipment washdown areas. It is very useful to keep a record of each inspection. A sample inspection log is included for your use.

Systems should be cleaned when inspection reveals that accumulated sediment or trash is clogging the discharge orifice. CONTECH suggests that all systems be designed with an access/inspection manhole situated at or near the inlet and the outlet orifice. Should it be necessary to get inside the system to perform maintenance activities, all appropriate precautions regarding confined space entry and OSHA regulations should be followed.

## Cleaning

Maintaining an underground detention or retention system is easiest when there is no flow entering the system. For this reason, it is a good idea to schedule the cleanout during dry weather.

Accumulated sediment and trash can typically be evacuated through the manhole over the outlet orifice. If maintenance is not performed as recommended, sediment and trash may accumulate in front of the outlet orifice. Manhole covers should be securely seated following cleaning activities.

D. BMP Inspection and Maintenance Report

| BMP ID # | | |
|---|---|---|

## Inspection and Maintenance Report

Date: _____ Personnel: Inspector: _____ Owner: _____

Location: _____ System Size: _____

System Type: Vault ☐ Cast–In–Place ☐ Linear Catch Basin ☐ Manhole ☐ Other ☐

Sediment Thickness in rorebay: _____ Date: _____

Sediment Depth on Vault rloor: _____

Structural Damage: _____

Estimated rlow from Drainage Pipes (if available): _____

☐ ☐ Depth of Standing Water: _____

Maintenance Activities (check off if done and give description)

☐ Trash and Debris Removal: _____

☐ Minor Structural Repairs: _____

☐ Drainage Area Report _____

Excessive Oil Loading: Yes ☐ No ☐ Source: _____

Sediment Accumulation on Pavement: Yes ☐ No ☐ Source: _____

Erosion of Landscaped Areas: Yes ☐ No ☐ Source: _____

Items Needing rurther Work: _____

Owners should contact the local public works department and inquire about how the department disposes of their street waste residuals.

Other Comments:

_____

_____

_____

_____

_____

_____

_____

_____

Please complete this inspection record for the referenced property. Retain the original for your files.

3. Aboveground Bio-Filtration Basin

A-B. Inspection and Maintenance Activities

| A. Inspection Activity | Recommended Inspection Frequency | B. Maintenance Procedures/Actions |
|---|---|---|
| 1. Visual inspection of basin for trash and debris | Monthly | Inspect and clear contributing drainage area of litter and vegetative debris. Notify maintenance staff/contractor if there is unusual amount of litter or vegetative debris build up |
| 2. Visual inspection for basin dewatering | Monthly | Does basin dewater between storms? Notify maintenance staff/contractor if basin is taking an unusual amount of time to dewater during storms (>48hrs) |
| 3. Visual inspection for vegetation quality | Monthly | Inspect basin to ensure min. mowing depth was not exceeded, undesirable vegetation has been removed, and for evidence of erosion. Notify maintenance staff/contractor if there is unusual activity for any of the above |
| 4. Visual inspection of Rain Guardian pre-treatment device | As needed and after large storm events | Inspect Rain Guardian for debris on grate, filter wall, and inside of chamber. Follow specific Rain Guardian cleaning process on Pretreatment Chamber Cleaning page of this document. Notify maintenance staff/contractor of unusual amounts of debris |
| 5. Visual inspection of sediment/silt accumulation in basin | Every 12 months depending on drainage area conditions | Inspect basin for evidence of sediment build up. Notify maintenance staff/contractor of need to remove sediment when excess sediment has accumulated in gravel filter. Remove winter accumulation of sand each spring. |
| 6. Visual inspection of inlets | Every 12 months | Visually inspect basin inlet for evidence of erosion. Notify maintenance staff/contractor of unusual erosion at inlet structure |
| 7. Visual inspection of outlets | Every 12 months | Visually inspect basin outlet for evidence of erosion. Notify maintenance staff/contractor of unusual erosion at outlet structure |
| 8. Visual inspection of surface aggregate | Every 12 months | Inspect cleanliness of surface aggregate. Notify maintenance staff/contractor if top layer of stone requires replacement |

## C. Inspection and Maintenance Report

| | |
|---|---|
| Project: | |
| Location: | |
| Site Status: | |
| Date: | |
| Time: | |
| Inspector: | |

| Maintenance Item | Satisfactory / Unsatisfactory | Comments |
|---|---|---|
| 1. Debris Cleanout (Monthly) | | |
| Contributing drainage area clear of litter and vegetative debris | | |
| Trench surface clean | | |
| Inflow pipes clear | | |
| Overflow spillway clear | | |
| Inlet area clean | | |
| 2. Sediment Traps or Forebays (Annual) | | |
| Obviously trapping sediment | | |
| Greater than 50% of storage volume remaining | | |
| 3. Dewatering (Monthly) | | |
| Trench dewaters between storms | | |
| 4. Vegetation (Monthly) | | |
| Mowing done per O&M plan | | |
| Minimum mowing depth not exceeded | | |
| Undesirable vegetation removed | | |
| No evidence of erosion | | |
| Fertilized per O&M plan | | |
| 5. Sediment Cleanout of Trench (Annual) | | |
| No evidence of sedimentation in gravel filter | | |
| Sediment accumulation doesn't yet require cleanout | | |

C, cont'd.

| Maintenance Item | Satisfactory / Unsatisfactory | Comments |
|---|---|---|
| 6. Sediment deposition of Basin (Annual) | | |
| Clean of sediment | | |
| Winter accumulation of sand removed each spring | | |
| Contributing drainage area stabilized and free of erosion | | |
| 7. Inlets (Annual) | | |
| Good condition | | |
| No evidence of erosion | | |
| 8. Outlet/Overfl ow Spillway (Annual) | | |
| Good condition, no need for repair | | |
| No evidence of erosion | | |
| 9. Aggregate Repairs (Annual) | | |
| Surface of aggregate clean | | |
| Top layer of stone does not need replacement | | |
| Trench does not need rehabilitation | | |
| Comments: | | |
| Actions to be taken: | | |

Appendix
Aboveground Bio-Filtration Basin Cross Section




TYPICAL SECTION VIEW

## CONSTRUCTION SEQUENCING

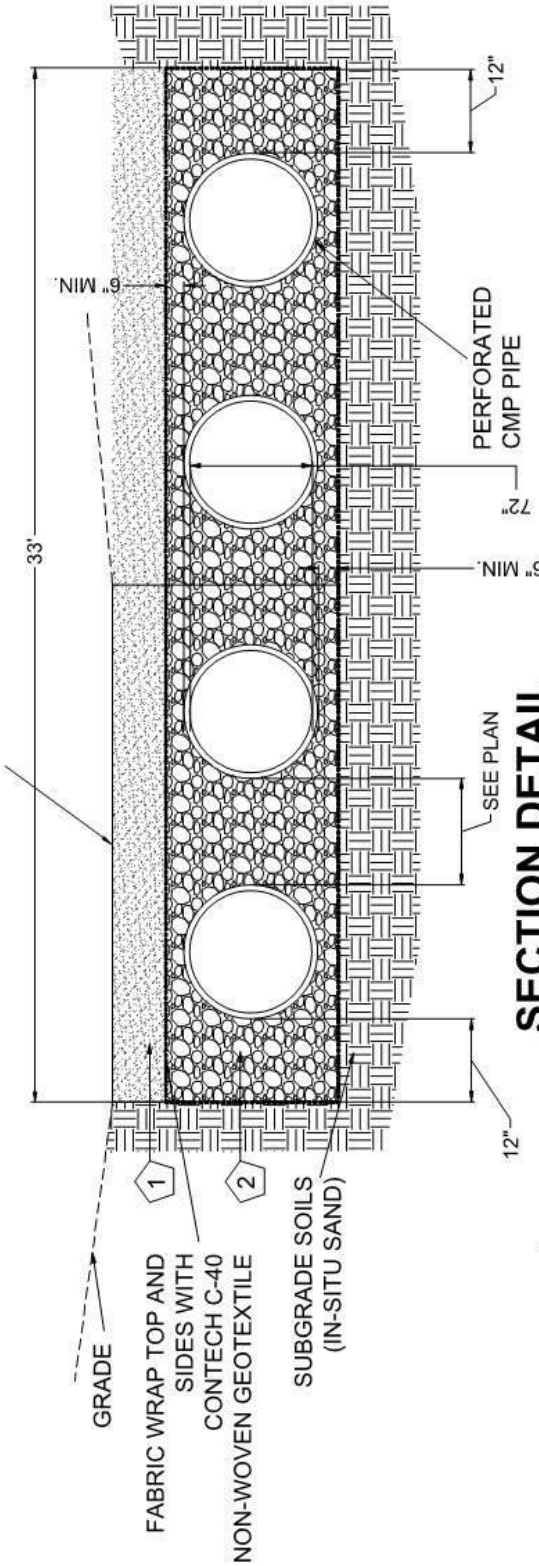
1. INSTALL SILT FENCE AND/OR OR OTHER APPROPRIATE TEMPORARY EROSION CONTROL DEVICES TO PREVENT SEDIMENT FROM LEAVING OR ENTERING THE PRACTICE DURING CONSTRUCTION.
2. ALL DOWN-GRADIENT PERIMETER SEDIMENT CONTROL BMP'S MUST BE IN PLACE BEFORE ANY UP GRADIENT LAND DISTURBING ACTIVITY BEGINS.
3. PERFORM CONTINUOUS INSPECTIONS OF EROSION CONTROL PRACTICES.
4. INSTALL UTILITIES (WATER, SANITARY SEWER, ELECTRIC, PHONE, FIBER OPTIC, ETC) PRIOR TO SETTING FINAL GRADE OF BIORETENTION DEVICE
5. ROUGH GRADE THE SITE. IF BIORETENTION AREAS ARE BEING USED AS TEMPORARY SEDIMENT BASINS LEAVE A MINIMUM OF 3 FEET OF COVER OVER THE PRACTICE TO PROTECT THE UNDERLYING SOILS FROM CLOGGING.
6. PERFORM ALL OTHER SITE IMPROVEMENTS.
7. PLANT ALL AREAS AFTER DISTURBANCE.
8. CONSTRUCT BIORETENTION DEVICE UPON STABILIZATION OF CONTRIBUTING DRAINAGE AREA.
9. IMPLEMENT TEMPORARY AND PERMANENT EROSION CONTROL PRACTICES.
10. PLANT AND/OR ROCK MULCH BIORETENTION DEVICE.
11. REMOVE TEMPORARY EROSION CONTROL DEVICES AFTER THE CONTRIBUTING DRAINAGE AREA IS ADEQUATELY VEGETATED.

GENERAL NOTES

1. IN THE EVENT THAT SEDIMENT IS INTRODUCED INTO THE BMP DURING OR IMMEDIATELY FOLLOWING EXCAVATION, THIS MATERIAL SHALL BE REMOVED FROM THE PRACTICE PRIOR TO CONTINUING CONSTRUCTION.
2. GRADING OF BIORETENTION DEVICES SHALL BE ACCOMPLISHED USING LOW-COMPACTION EARTH-MOVING EQUIPMENT TO PREVENT COMPACTION OF UNDERLYING SOILS
3. ALL SUB MATERIALS BELOW THE SPECIFIED BIORETENTION DEPTH (ELEVATION) SHALL BE UNDISTURBED, UNLESS OTHERWISE NOTED
4. SEE GRADING PLAN FOR ADDITIONAL INFORMATION.

Underground Infiltration Basin Shop Drawing and Cross Section

Cross Section




## SECTION DETAIL

NTS

KEY
1. TOPSOIL
2. FREE DRAINING ANGULAR WASHED STONE 3/4" - 2" PARTICLE SIZE (GRANITE OR APPROVED EQUAL, NOT LIMESTONE OR OTHER CARBONATE MATERIAL). INSTALL TO MIN. 95% STANDARD DENSITY PER AASHTO T99.

## CONSTRUCTION SEQUENCING

1. INSTALL SILT FENCE AND/OR OTHER APPROPRIATE TEMPORARY EROSION CONTROL DEVICES TO PREVENT SEDIMENT FROM LEAVING OR ENTERING THE PRACTICE DURING CONSTRUCTION.
2. ALL DOWN-GRADIENT PERIMETER SEDIMENT CONTROL BMP'S MUST BE IN PLACE BEFORE ANY UP GRADIENT LAND DISTURBING ACTIVITY BEGINS.
3. PERFORM CONTINUOUS INSPECTIONS OF EROSION CONTROL PRACTICES.
4. INSTALL UTILITIES (WATER, SANITARY SEWER, ELECTRIC, PHONE, FIBER OPTIC, ETC) PRIOR TO SETTING FINAL GRADE OF BIORETENTION DEVICE.
5. PERFORM ALL OTHER SITE IMPROVEMENTS.
6. SEED AND MULCH ALL AREAS AFTER DISTURBANCE.
7. CONSTRUCT RETENTION DEVICE UPON STABILIZATION OF CONTRIBUTING DRAINAGE AREA.
8. IMPLEMENT TEMPORARY AND PERMENATE EROSION CONTROL PRACTICES.
9. PLANT AND MULCH SITE.
10. REMOVE TEMPORARY EROSION CONTROL DEVICES AFTER THE CONTRIBUTING DRAINAGE AREA IS ADEQUATELY VEGETATED.

GENERAL NOTES

1. IN THE EVENT THAT SEDIMENT IS INTRODUCED INTO THE BMP DURING OR IMMEDIATELY FOLLOWING EXCAVATION, THIS MATERIAL SHALL BE REMOVED FROM THE PRACTICE PRIOR TO CONTINUING CONSTRUCTION.
2. GRADING OF RETENTION DEVICES SHALL BE ACCOMPLISHED USING LOW-COMPACTION EARTH-MOVING EQUIPMENT TO PREVENT COMPACTION OF UNDERLYING SOILS.
3. ALL SUB MATERIALS BELOW THE SPECIFIED RETENTION DEPTH (ELEVATION) SHALL BE UNDISTURBED, UNLESS OTHERWISE NOTED.

Underground Infiltration Basin Shop Drawing
Shop Drawing