

# STORMWATER MANAGEMENT FACILITIES OPERATIONS & MAINTENANCE MANUAL

*for*

## Proposed CVS Pharmacy with Drive-Thru Store #11241

*Prepared for*

**Moreland Development, LLC**  
1900 Route 70 East & 1803 Springdale Road  
Block 470.01, Lots 14, 15, 16 & 18  
Tax Map Sheet #275  
Township of Cherry Hill  
Camden County, New Jersey  
Limited Office (O1) Zone

*Prepared by*



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### **Appendix**

1. “Maintenance Work Order and Checklist” – a comprehensive form outlining both required and completed maintenance work.
2. “Maintenance Log” – a summary table for recording of all maintenance work at the site.
3. “Inspection Log” – a summary table for recording the results of all inspections of the basins.

## 1.0 PROJECT DETAILS

### 1.1 Introduction and Description of Facilities:

The project site is located on the intersection of Marlton Pike East (NJSH Route 70) and Springdale Road (County Route 673) within the Township of Cherry Hill, Camden County, New Jersey. The site is bordered to the west by Springdale Road, to the south by NJSH Route 70, to the east by Block 470.11, Lot 1 which is occupied by a professional office building and to the north by Block 470.01, Lot 17, which is occupied by a therapist and executive care building. The subject site is more specifically defined as defined as Block 470.01, Lots 14, 15, 16 & 18.

The various design parameters established by the NJDEP, Township of Cherry Hill, and Camden County will not require the construction of a detention system as a result of the proposed improvements reducing impervious coverage areas. Therefore, the project is exempt from providing water quality analysis since a decrease in impervious coverage is proposed. Furthermore, there will be no groundwater recharge deficit and no increase in peak runoff after construction of the proposed development.

Under post-development conditions, the stormwater management facilities will include inlets and stormwater piping.

This manual consists of three parts. The first part includes the introduction, project description and a list of project contacts. The second part provides the operation and maintenance instructions for the facilities and equipment. The third part (Appendix) provides information regarding the inspection and maintenance activities.

### 1.2 Project Contacts:

#### Municipal Engineer:

Address: Environmental Resolutions, Inc., 815 East Gate Drive, suite 103, Mt. Laurel, NJ 08054  
Tel.: (856) 235-7170  
Attn: Cherry Hill Municipal Engineer

#### Dept. of Public Works:

Address: 1 Perina Boulevard, Cherry Hill, NJ 08003  
Tel.: (856) 424-4422  
Attn: Director of Public Works

#### Site Design Engineer:

Bohler  
Address: 10000 Midlantic Drive, Suite 410W, Mt. Laurel, NJ 08054  
Tel. (856) 930-4000  
Attn: Ahmad Tamous, PE

Party Responsible for Maintaining Stormwater Management Facility:

Moreland Development, LLC

**2.0 INSPECTION AND MAINTENANCE:**

**2.1 Routine Inspection and Maintenance of the Stormwater Conveyance Facilities:**

Regularly scheduled maintenance inspections of the stormwater facilities should be performed at least four (4) times each year. The primary purpose of these inspections is to ascertain the operational condition and safety of the facilities. Inspections will also provide information on the effectiveness of regularly scheduled Preventative and Aesthetic Maintenance Procedures and will help to identify where changes in the extent and scheduling of the procedures are warranted. Finally, the facility inspections should also be used to determine the need for and timing of Corrective Maintenance procedures.

Routine maintenance of these facilities should be separated into two (2) basic types: Functional Maintenance and Aesthetic Maintenance. Functional Maintenance is further broken down into two (2) categories: Preventative and Corrective. Aesthetic Maintenance, which is necessary to maintain the visual appeal and aesthetic quality of these facilities, should be incorporated on the same schedule as the preventative maintenance efforts. Listed below are the Preventative, Corrective and Aesthetic Maintenance Procedures to be performed on a routine basis:

**2.1.1 Preventative Maintenance Procedures:**

The purpose of Preventative Maintenance is to maximize the effectiveness of the stormwater management aspects of the basins so that they remain operational and safe and to minimize the need for potential emergency or extensive corrective maintenance. These procedures are as follows:

*a) Maintenance of Adjacent Areas:*

Grass areas, trees, and shrubs require periodic routine maintenance to include fertilizing, de-thatching, and soil conditioning in order to maintain healthy growth and to provide soil stabilization. The application of fertilizers should follow manufacturer's instructions to reduce run-off of these compounds into the inlets. Additionally, provisions should be made to re-seed and re-establish grass cover in areas damaged by sediment accumulation, stormwater flow, or other causes. These tasks should be performed, or at least evaluated, on a quarterly basis. Lawn areas should be mowed at least once a month during the growing season. Vegetated areas must be inspected at least annually for erosion and scour as well as unwanted growth, which should be removed with minimum disruption to the remaining vegetation.

Note: All use of fertilizers, mechanical treatments, pesticides and other means to ensure optimum vegetation health must not compromise the intended purpose of the stormwater management facility. All vegetation deficiencies should be addressed without the use of fertilizers and pesticides whenever possible and if necessary, to the minimum amount practical.

*b) Removal and Disposal of Trash/Debris and Sediment:*

All stormwater management components expected to receive and/or trap debris and sediment must be inspected for clogging and excessive debris and sediment accumulation at least four times annually, as well as after every storm exceeding one inch of rainfall in 24 hours. Such components should include inlets and swale bottoms.

Removal of trash and debris will prevent possible damage to vegetated areas and minimize potential mosquito breeding habitats. Debris and trash must be properly hauled off the site and transferred to an approved disposal site.

c) *Elimination of Potential Mosquito Breeding Habitats:*

The most effective mosquito control program is one that eliminates potential breeding habitats. Almost any stagnant pool of water can be attractive to mosquitoes and may become the source of a large mosquito population. A maintenance program dedicated to eliminating potential breeding areas is preferable to chemical means of controlling mosquitoes. The most important maintenance function is removal of all obstructions to natural flow patterns before stagnant water conditions can develop.

d) *Parking lot maintenance:*

This management measure involves employing pavement cleaning practices, such as parking lot sweeping on a regular basis, to minimize pollutant export to the stormwater conveyance system and eventually the receiving waters. These cleaning practices are designed to remove sediment, debris, and other pollutants from access drive and parking lot surfaces that are a potential source of pollution impacting urban waterways. Mechanical machines that use vacuum assisted dry sweeping to remove particulate matter shall be utilized as these have the ability to remove finer sediment particles. Parking lots and access drives shall be swept/vacuumed at least semi-annually or more often as conditions warrant. The disposal of the swept material must be properly hauled off the site and transferred to an approved disposal site. Other parking lot maintenance features include the use of on-site trash receptacles. These receptacles should be located in strategic areas where the majority of the pedestrian traffic occurs. These receptacles should be emptied weekly. The disposal of the solid waste must be properly hauled off the site and transferred to an approved disposal site.

**2.1.2 Corrective Maintenance Procedures:**

a) *Removal of Debris and Sediment:*

Sediment, debris and trash which threaten the capacity of the inlets and stormwater pipes should be removed immediately and properly disposed of. As noted previously, it is recommended that all water be evacuated from the inlet and stormwater pipes before any significant amount of sediment, settled debris or trash is removed from the inlets and stormwater pipes.

b) *Structural Repairs:*

Structural damage to inlet structures and roadways as a result of vandalism, flood events, settlement or other causes must be repaired promptly. The urgency of the repairs will depend upon the nature of the damage and its effects on the safety and operation of the facility. The analysis of structural damage if it occurs and the design and performance of structural repairs should only be undertaken by a Professional Engineer.

c) *Extermination of Mosquitoes:*

If neglected, inlets and stormwater conveyance systems can become a potential mosquito breeding area. The extermination of mosquitoes will usually require the services of the County Mosquito Commission. If mosquito control in the facility becomes necessary, the preventative maintenance program should be re-evaluated, and more emphasis should be placed on control of mosquito breeding habitats.

d) *Erosion Repair:*

Vegetative cover or other protective measures are necessary to prevent the loss of soil due to the forces of wind and water. Where a re-seeding program has not been effective in maintaining a non-erosive vegetative cover, or other factors have exposed soils to erosion, corrective steps should be initiated to prevent further loss of soil that may result in danger to the stability of the facility. Soil loss can be controlled by a variety of materials and methods, including rip-rap, gabion lining, geotextile fabrics, sod, seeding, concrete lining and re-grading.

e) *Snow and Ice Removal:*

Accumulations of snow and ice can threaten the functioning of inlets. Provision of the equipment, material and personnel to monitor and remove snow and ice from critical areas will assure the function of the facility during the winter months.

### **2.1.3 Aesthetic Maintenance Procedures:**

a) *Graffiti Removal:*

The timely removal of graffiti will restore the aesthetic quality of the development. Removal can be accomplished by paint or other cover, or removal with scrapers, solvents or cleansers. Timely removal is important to discourage further graffiti and other acts of vandalism.

b) *Control of Weeds:*

Although a regular grass maintenance program will minimize weed intrusion, some weeds will appear. Periodic weeding, either chemically or mechanically, will help to maintain a healthy turf, and keep grassed areas looking attractive. Application of chemicals should be minimized and monitored closely so as not to affect the surroundings. Excessive growth of weeds can be controlled mechanically as discussed in the previous section.

The recording of all maintenance work and inspections provide valuable data on the facility's condition. Review of this information will also help to establish more efficient and beneficial maintenance procedures and practices. As the owner is ultimately responsible for site maintenance, all recorded information should be directed to the owners of the basins for review and subsequent follow-up on recommendations. Data obtained from informal inspections should be retained; however, under current regulations, this data does not have to be submitted to NJDEP.

#### **2.1.4 Summary of Maintenance Procedures:**

##### Preventative Maintenance

- a) Maintenance of Adjacent Areas
- b) Removal and Disposal of Trash/Debris and Sediment
- c) Elimination of Potential Mosquito Breeding Habitats
- d) Parking Lot Maintenance

##### Corrective Maintenance

- a) Removal of Debris and Sediment
- b) Structural Repairs
- c) Extermination of Mosquitoes
- d) Erosion Repair
- e) Snow and Ice Removal

##### Aesthetic Maintenance

- a) Graffiti Removal
- b) Control of Weeds

#### **2.1.5 Maintenance Equipment and Materials**

Note: Only light equipment is allowed to be used within open basins to prevent compaction.

##### Grass Maintenance Equipment

- a) Riding Mowers
- b) Hand Mowers
- c) Gas Powered Trimmers
- d) Gas Powered Edgers
- e) Seed Spreaders
- f) Fertilizer Spreaders
- g) De-Thatching Equipment
- h) Pesticide and Herbicide Application Equipment
- i) Grass Clipping and Leaf Collection Equipment

##### Vegetative Maintenance Equipment

- a) Saws
- b) Pruning Shears
- c) Hedge Trimmers

- d) Aquatic Weed Harvester (owned/operated by subcontractor)

**Transportation Equipment:**

*Debris, Trash and Sediment Removal Equipment*

- a) Loader
- b) Grader
- c) Dredging Equipment
- d) Portable Pump for Dewatering
- e) Jet Vac Equipment for removal of sediment in underground pipe

*Miscellaneous Equipment*

- a) Shovels
- b) Wheel Barrows
- c) Gloves
- d) Hand Pushed Tilling Machine
- e) Brooms

**Tools for Maintenance of Equipment:**

*Materials*

- a) Topsoil
- b) Fill
- c) Seed
- d) Soil Amenities (Fertilizer, Lime, etc.)
- e) Chemicals (Pesticides, Herbicides, etc.)
- f) Mulch
- g) Paint Removers
- h) Spare Parts for Equipment

*Parking Maintenance Equipment*

- a) Sweeping/Vacuuming Equipment
- b) Trash Receptacles
- c) Snow Plowing Equipment
- d) Snow Shovels



### **2.1.6 Checklists and Logs**

Appendix of this report contains sample checklists and logs regarding various aspects of the basin maintenance and inspection. A brief description of the use of each form is listed below:

1. “Maintenance Work Order and Checklist” – a comprehensive form outlining both required and completed maintenance work.
2. “Maintenance Log” – a summary table for recording of all maintenance work at the site.
3. “Inspection Log” – a summary table for recording the results of all inspections of the basins.

# *APPENDIX*

MAINTENANCE WORK ORDER  
&  
CHECKLIST FOR STORMWATER  
MANAGEMENT FACILITIES

**MAINTENANCE WORK ORDER AND CHECKLIST  
FOR STORMWATER MANAGEMENT FACILITIES**

NAME OF FACILITY \_\_\_\_\_  
 LOCATION \_\_\_\_\_ DATE \_\_\_\_\_  
 CREW \_\_\_\_\_ WORK STARTED \_\_\_\_\_  
 EQUIPMENT \_\_\_\_\_ WORK COMPLETED \_\_\_\_\_  
 WEATHER \_\_\_\_\_ TOTAL MANPOWER OF WORK \_\_\_\_\_

**A. PREVENTATIVE MAINTENANCE**

WORK ITEMS	ITEMS REQUIRED	ITEMS DONE	COMMENTS AND SPECIAL INSTRUCTIONS
<b>1. GRASS CUTTING</b>			
A. PERIMETER AREAS			
B. ACCESS AREAS AND ROADS			
C. OTHERS			
<b>2. GRASS MAINTENANCE</b>			
A. FERTILIZING			
B. RE-SEEDING			
C. DE-THATCHING			
D. PEST CONTROL			
E. OTHERS			
<b>3. VEGETATIVE COVER</b>			
A. FERTILIZING			
B. PRUNING			
C. PEST CONTROL			
D. OTHERS			
<b>4. TRASH AND DEBRIS REMOVAL</b>			
A. PERIMETER AREAS			
B. ACCESS AREAS AND ROADS			
C. INLETS			
D. OUTLETS AND TRASH RACKS			
E. OTHERS			
<b>5. SEDIMENT REMOVAL</b>			
A. INLETS			
B. OUTLETS AND TRASH RACKS			
C. BOTTOM			
D. OTHERS			
<b>6. ELIMINATION OF POTENTIAL MOSQUITO BREEDING HABITATS</b>			
<b>7. OTHER PREVENTIVE MAINTENANCE</b>			
A. PARKING LOT SWEEPING			
B. EMPTYING TRASH RECEPTACLES			

**MAINTENANCE WORK ORDER AND CHECKLIST  
FOR STORMWATER MANAGEMENT FACILITIES**

NAME OF FACILITY \_\_\_\_\_  
 LOCATION \_\_\_\_\_ DATE \_\_\_\_\_  
 CREW \_\_\_\_\_ WORK STARTED \_\_\_\_\_  
 EQUIPMENT \_\_\_\_\_ WORK COMPLETED \_\_\_\_\_  
 WEATHER \_\_\_\_\_ TOTAL MANPOWER OF WORK \_\_\_\_\_

**B. CORRECTIVE MAINTENANCE**

WORK ITEMS	ITEMS REQUIRED	ITEMS DONE	COMMENTS AND SPECIAL INSTRUCTIONS
1. REMOVAL OF DEBRIS AND SEDIMENT			
2. STRUCTURAL REPAIRS			
3. DEWATERING			
4. CONTROL OF MOSQUITOES			
5. EROSION REPAIR			
6. SNOW AND ICE REMOVAL			
7. OTHER			

**C. AESTHETIC MAINTENANCE**

WORK ITEMS	ITEMS REQUIRED ( X )	ITEMS DONE ( X )	LOCATION AND COMMENTS
1. GRAFFITI REMOVAL			
2. GRASS TRIMMING			
3. WEEDING			
4. OTHERS			

REMARKS (REFER TO ITEM NO. IF APPLICABLE) \_\_\_\_\_

WORK ORDER PREPARED BY: \_\_\_\_\_

**MAINTENANCE LOG FOR STORMWATER  
MANAGEMENT FACILITIES**

**MAINTENANCE LOG  
FOR STORMWATER MANAGEMENT FACILITIES**

NAME OF FACILITY \_\_\_\_\_  
 LOCATION \_\_\_\_\_ DATE \_\_\_\_\_  
 CREW \_\_\_\_\_ WORK STARTED \_\_\_\_\_  
 EQUIPMENT \_\_\_\_\_ WORK COMPLETED \_\_\_\_\_  
 WEATHER \_\_\_\_\_ TOTAL MANPOWER OF WORK \_\_\_\_\_

**A. PREVENTATIVE MAINTENANCE**

WORK ITEMS	ITEMS REQUIRED	DATE REQUIRED	ITEMS DONE	DATE DONE	COMMENTS AND SPECIAL INSTRUCTIONS
1. GRASS CUTTING					
A. PERIMETER AREAS					
B. ACCESS AREAS AND ROADS					
C. OTHERS					
2. GRASS MAINTENANCE					
A. FERTILIZING					
B. RE-SEEDING					
C. DE-THATCHING					
D. PEST CONTROL					
E. OTHERS					
3. VEGETATIVE COVER					
A. FERTILIZING					
B. PRUNING					
C. PEST CONTROL					
D. OTHERS					
4. TRASH AND DEBRIS REMOVAL					
A. PERIMETER AREAS					
B. ACCESS AREAS AND ROADS					
C. INLETS					
D. OUTLETS AND TRASH RACKS					
E. OTHERS					
5. SEDIMENT REMOVAL					
A. INLETS					
B. OUTLETS AND TRASH RACKS					
C. BOTTOM					
D. OTHERS					
6. ELIMINATION OF POTENTIAL MOSQUITO BREEDING HABITATS					
7. OTHER PREVENTIVE MAINTENANCE					
A. PARKING LOT SWEEPING					
B. EMPTYING TRASH RECEPTACLES					

**MAINTENANCE LOG  
FOR STORMWATER MANAGEMENT FACILITIES**

NAME OF FACILITY \_\_\_\_\_  
 LOCATION \_\_\_\_\_ DATE \_\_\_\_\_  
 CREW \_\_\_\_\_ WORK STARTED \_\_\_\_\_  
 EQUIPMENT \_\_\_\_\_ WORK COMPLETED \_\_\_\_\_  
 WEATHER \_\_\_\_\_ TOTAL MANPOWER OF WORK \_\_\_\_\_

**B. CORRECTIVE MAINTENANCE**

WORK ITEMS	ITEMS REQUIRED	DATE REQUIRED	ITEMS DONE	DATE DONE	COMMENTS AND SPECIAL INSTRUCTIONS
1. REMOVAL OF DEBRIS AND SEDIMENT					
2. STRUCTURAL REPAIRS					
3. DEWATERING					
4. CONTROL OF MOSQUITOES					
5. EROSION REPAIR					
6. SNOW AND ICE REMOVAL					
7. OTHER					

**C. AESTHETIC MAINTENANCE**

WORK ITEMS	ITEMS REQUIRED	DATE REQUIRED	ITEMS DONE	DATE DONE	COMMENTS AND SPECIAL INSTRUCTIONS
1. GRAFFITI REMOVAL					
2. GRASS TRIMMING					
3. WEEDING					
4. OTHERS					

REMARKS (REFER TO ITEM NO. IF APPLICABLE) \_\_\_\_\_

WORK PERFORMED BY: \_\_\_\_\_



INSPECTION LOG FOR  
STORMWATER MANAGEMENT  
FACILITIES

**INSPECTION LOG  
FOR STORMWATER MANAGEMENT FACILITIES**

NAME OF FACILITY \_\_\_\_\_  
 LOCATION \_\_\_\_\_  
 DATE \_\_\_\_\_  
 WEATHER \_\_\_\_\_

**A. PREVENTIVE MAINTENANCE**

FACILITY ITEM	ITEMS REQUIRED	ITEMS DONE	COMMENTS AND SPECIAL INSTRUCTION
<b>1. GRASS CUTTING</b>			
A. PERIMETER AREAS			
B. ACCESS AREAS AND ROADS			
C. OTHERS			
<b>2. GRASS MAINTENANCE</b>			
A. FERTILIZING			
B. RE-SEEDING			
C. DE-THATCHING			
D. PEST CONTROL			
E. OTHERS			
<b>3. VEGETATIVE COVER</b>			
A. FERTILIZING			
B. PRUNING			
C. PEST CONTROL			
D. OTHERS			
<b>4. TRASH AND DEBRIS REMOVAL</b>			
A. PERIMETER AREAS			
B. ACCESS AREAS AND ROADS			
C. INLETS			
D. OUTLETS AND TRASH RACKS			
E. OTHERS			
<b>5. SEDIMENT REMOVAL</b>			
A. INLETS			
B. OUTLETS AND TRASH RACKS			
C. BOTTOM			
D. OTHERS			
<b>6. ELIMINATION OF POTENTIAL MOSQUITO</b>			
<b>7. OTHER PREVENTIVE MAINTENANCE</b>			
A. PARKING LOT SWEEPING			
B. EMPTYING TRASH RECEPTACLES			

**INSPECTION LOG  
FOR STORMWATER MANAGEMENT FACILITIES**

NAME OF FACILITY \_\_\_\_\_  
 LOCATION \_\_\_\_\_  
 DATE \_\_\_\_\_  
 WEATHER \_\_\_\_\_

**B. CORRECTIVE MAINTENANCE**

FACILITY ITEM	ITEMS REQUIRED	ITEMS DONE	COMMENTS AND SPECIAL INSTRUCTION
1. REMOVAL OF DEBRIS AND SEDIMENT			
2. STRUCTURAL REPAIRS			
3. CONTROL OF MOSQUITOES			
4. EROSION REPAIR			
5. SNOW AND ICE REMOVAL			
6. BASIN DRAIN TIME			
7. OTHER			

**C. AESTHETIC MAINTENANCE**

FACILITY ITEM	ITEMS REQUIRED	ITEMS DONE	COMMENTS AND SPECIAL INSTRUCTION
1. GRAFFITI REMOVAL			
2. GRASS TRIMMING			
3. WEEDING			
4. OTHERS			

REMARKS (REFER TO ITEM NO. IF APPLICABLE) \_\_\_\_\_

- (1) ITEMS CHECKED ARE IN GOOD CONDITION, AND THE MAINTENANCE PROGRAM IS ADEQUATE.
  - (2) ITEMS CHECKED REQUIRE ATTENTION, BUT DOES NOT PRESENT AN IMMEDIATE THREAT TO THE FACILITY FUNCTION OR OTHER FACILITY COMPONENTS.
  - (3) THE ITEMS CHECKED REQUIRES IMMEDIATE ATTENTION TO KEEP THE FACILITY OPERATIONAL OR TO PREVENT DAMAGE TO OTHER FACILITY COMPONENTS.
  - (4) PROVIDE EXPLANATION AND DETAILS IF COLUMNS 2 OR 3 ARE CHECKED.
- REMARKS (REFER TO ITEM NO. IF APPLICABLE)

INSPECTOR: \_\_\_\_\_