

# **Amended Stormwater Management Operation and Maintenance Manual**

*For*

*Sharbell Building Company, LLC  
Planned Residential Development – KT Tract*

*17 Research Road  
Block 28005, Lot 66  
Montgomery Township, Somerset County, New Jersey*

Prepared by:



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A handwritten signature in black ink, appearing to read 'Jeffrey S. Haberman', is written over a horizontal line.

**Jeffrey S. Haberman, PE**  
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## **PART I: PROJECT DETAILS**

### ***A. Introduction and Description of Facilities:***

The purpose of this report is to provide guidelines and information regarding the maintenance for the proposed wet pond system to be constructed in association with the development of Block 28005, Lot 66 as shown in the Tax Maps of the Township of Montgomery, Somerset County, NJ. The subject parcel currently consists of a vacated office building with associated site improvements and wooded area.

The scope of the development includes the construction of 107 townhome dwellings, 20-unit stacked townhomes, roadways, parking areas, recreational areas, stormwater management facilities and other related improvements as shown on the accompanying engineering drawings.

Based upon the scope of the project, the development is classified as a major development per the definition set forth in NJAC 7:8 and is therefore subject to the stormwater management design standards in NJAC 7:8. A wet pond retention system and pervious pavement system have been designed in order to satisfy these criteria.

Stormwater runoff is conveyed by way of the on-site stormwater conveyance system and overland flow to the proposed wet pond system. The wet pond has been designed to detain and release stormwater runoff through an outlet control structure at a controlled rate in order to satisfy the stormwater quantity requirements set forth by NJAC 7:8. Additionally, the wet pond has been designed to provide a ratio of permanent pool volume to water quality storm runoff volume greater than 3:1 and a detention time greater than 12 hours. According to the standards set forth by the NJ Stormwater Best Management Practices, the proposed wet pond produces a TSS Removal Rate of 80%, therefore satisfying the water quality standards set forth by NJAC 7:8.

Additionally, for additional stormwater quality management, a section of pervious pavement with underdrains is included on Block 28009 Lot 2.

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 useful information regarding the inspection and maintenance activities.

**B. Project Contacts:**

Developer/Current Owner: Sharbell Building Company, LLC  
1 Union Street, Suite 208  
Robbinsville, NJ 08691  
(609) 918-2400

Future Owner\*\*: Montgomery Crossing Home Owners' Association

\*\*Ownership and maintenance of the stormwater management system is anticipated to be transferred to the Home Owners' Association upon completion of Phase 3 of the project, release of any Bonds and finalization of ownership transition agreements. In the interim, maintenance of the stormwater management system will be the responsibility of the current owner, Sharbell Plainsboro, Inc. and Sharbell Cranbury, Inc.

Design Engineer: Jeffrey S. Haberman, PE, PP  
Dynamic Engineering Consultants, P.C.  
1904 Main Street  
Lake Como, NJ 07719  
(732)-974-0198

**PART II: INSPECTION AND MAINTENANCE:**

**A. Routine Inspection and Maintenance of the Stormwater Management Facilities: Wet Pond Basins**

The stormwater management basin has been designed properly to control stormwater and prevent flooding and degradation of water quality. Without proper routine inspection and maintenance, the basin may lose some or all of its capability to function to its full capacity. Lack of adequate maintenance at this facility could lead to failure.

A consulting professional engineer should perform regularly scheduled maintenance inspections of the stormwater facilities at least twice each year. The primary purpose of these inspections is to ascertain the operational condition and safeties of the facilities, particularly the condition of embankments, outlet structures, rip rap and other safety-related aspects. 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. The Municipal Engineer is to be copied on all inspection reports and any documentation regarding the performance or maintenance of the stormwater management system.

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:

1. Preventative Maintenance Procedures:

The purpose of Preventative Maintenance is to ensure that the stormwater management aspects of the basin remain operational and safe at all times, and to minimize the need for emergency or corrective maintenance. These procedures are as follows:

a) *Algae and Weed Growth:*

Excessive algae growth can cause severe oxygen depletion, causing the development of anaerobic conditions. These low oxygen conditions will eventually result in the emission of foul odors and other unpleasant side effects. Weeds associated with basins typically fall into three (3) categories: submergent, floating and emergent. All three (3) are typically found, to some extent, in a stormwater management system. However, excessive growth of any of these weeds can lead to problems. Submergent vegetation is the most difficult to detect, and can cause the most significant problems with any water level control features.

The basins should be evaluated regularly to determine whether excessive algae or plant growth is evident. Algae growth can often be attributed to the misuse of fertilizers on adjacent lands. A correction in the application of fertilizers can often solve these problems. Weeds, which have become a problem, can be cleared through harvesting by professional pond maintenance technicians.

b) *Maintenance of Adjacent Areas:*

Grass areas, trees, and shrubs adjacent to the basins require periodic fertilizing, de-thatching and soil conditioning in order to maintain healthy growth and to provide bank stabilization. The application of fertilizers should follow manufacturer's instructions to reduce run-off of these compounds into the basins. 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.

c) *Removal and Disposal of Trash and Debris:*

A regularly scheduled program of debris and trash removal will reduce the chance of outlet structures, catch basins and other components becoming clogged and inoperable during storm events.

Additionally, removal of trash and debris will prevent possible damage to vegetated areas and eliminate potential mosquito breeding habitats. Debris and trash must be properly hauled off the site and transferred to an approved disposal site. These tasks should be performed on a quarterly basis and after any major storm event.

d) *Sediment Removal and Disposal:*

The basins should be evaluated for excessive deposition of sediment. Accumulated sediment should be removed before it threatens the storage volume of the basin. Before de-sedimentation activities are performed, consideration should be given to evacuating all standing water from the basin. This may be accomplished by pumping the water out of the basins and into the outlet structures. Sediment removal should take place when the basin is thoroughly dry. Disposal of sediment must comply with all local, county, state and federal regulations. Only suitable disposal sites should be utilized. These tasks should be performed as needed. If stable soil conditions exist around the basins, sediment deposition should not be a problem. Should a recurrent problem develop, the inspector should identify the upstream sources of sediment and recommend required stabilization measures.

e) *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 become the source of a large mosquito population. A maintenance program dedicated to eliminating potential breeding areas is certainly 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.

## 2. Corrective Maintenance Procedures:

### a) *Removal of Debris and Sediment:*

Sediment, debris and trash that threaten the discharge capacity of the basin should be removed immediately and properly disposed. As noted previously, it is recommended that all water be evacuated from the basin before any significant amount of sediment, settled debris or trash is removed from the basins. The lack of an available disposal site should not delay the removal of trash, debris and sediment.

Temporary disposal sites should be utilized if necessary.

### b) *Structural Repairs:*

Structural damage to outlet and inlet structures, access hatches, roadways and headwalls 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 and the design and performance of structural repairs should only be undertaken by the consulting Professional Engineer.

### c) *Embankment and Slope Repairs:*

Damage to embankments, and side slopes must be repaired promptly. This damage can be the result of rain or flood events, vandalism, animals, vehicles or neglect. Typical problems include settlement, scouring, cracking, sloughing, seepage and rutting. The urgency of the repairs will depend upon the nature of the damage and its effect on the safety and operation of the facility. The analysis of damage and the design and performance of geotechnical repairs should only be undertaken by qualified personnel a direction of the consulting Professional Engineer. All basin embankments shall be inspected quarterly and after each significant storm. Any damage or indication of erosion shall be immediately inspected by a professional engineer.

### d) *Weed Harvesting:*

It may be necessary to remove congested weeds from the basin. Companies with specialized harvesters should be contacted to perform these operations. Note that such work may require the approval of various regulatory agencies.

### e) *Extermination of Mosquitoes:*

If neglected, basins can become an ideal 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.

*f) 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 riprap, gabion lining, sod, seeding, concrete lining and re-grading.

*g) Elimination of Trees, Brush, Roots and Animal Burrows:*

The stability of embankments can be impaired by large roots and animal burrows. Additionally, burrows can present a safety hazard for maintenance personnel. Trees and brush with extensive, woody root systems should be completely removed to prevent destabilization and the creation of seepage routes. Roots should also be completely removed to prevent decomposition within the embankment. Root voids and burrows should be filled with material similar to the existing material, and capped just below grade with stone, concrete or other material. If the filling of the burrows does not discourage the animals from returning, further measures should be taken to either remove the animal population or to make critical areas of the facility unattractive to them.

*h) Snow and Ice Removal:*

Accumulations of snow and ice can threaten the functioning of the inlets, outlets and emergency spillways. 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.

3. Aesthetic Maintenance Procedures:

a) *Graffiti Removal:*

The timely removal of graffiti will restore the aesthetic quality of the basin. 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) *Grass Trimming/Landscape Maintenance:*

The lawn areas around the basins shall be mowed on a regular basis as necessary to maintain the lawn at a height of 2 to 3-inches (at least once a month during the growing season). These areas shall also be fertilized twice a year, once in the spring and once in the fall. Fertilizer for lawn areas shall be 10-20-10 applied at a rate of 11 lbs. per 1,000 sf. or as determined by a soil test. Any bare, dead or damaged lawn areas shall be re-seeded in accordance with the original procedures as outlined in the Soil Erosion and Sediment Control Plans using the same mix and seeding rates. Stabilization of bare or damaged areas shall be done in a timely fashion so as to avoid exposing the soil to erosion.

If season prevents the re-establishment of turf cover, exposed areas should be stabilized with straw or salt hay mulch as described in the Soil Erosion and Sediment Control Plans until permanent seeding can be done. Seeding can be done between March 15<sup>th</sup> and June 15<sup>th</sup> and between September 15<sup>th</sup> and December 1<sup>st</sup>, only if adequate water is provided.

The shrubs around the basin should also be maintained in order to promote a neat appearance and healthy, vigorous growth. All shrubs should be allowed to grow together in masses as shown on the plans and not pruned into individual plants. The planting beds should be mulched with hardwood mulch every two (2) years in order to provide a suitable growing medium for the shrubbery and to retain moisture around the root zones.

Pruning of shrubs should also be done on a regular basis to maintain the shape and appearance of the shrub masses. The height of the shrubs may vary according to the plants natural growth habits, but should not exceed 6-feet. Pruning should be done as necessary throughout the year to remove dead branches and to control new growth. Any pruning, other than the removal of dead branches, should be done in either late winter/early spring or after the shrub has flowered in the spring.

In the event that a shrub should experience more than 2/3 die back, it should be replaced in kind as soon as possible in either the spring or fall planting season. The replacement shrub should be the same species as the original and installed at the size

and condition as specified on the original landscape plans. If, for any reason, a substitution of species or size must be made, it shall be subject to the approval of the project Landscape Architect.

The trees surrounding the basin areas shall be maintained regularly to ensure good health and exhibit an attractive appearance. Their maintenance should include fertilization twice annually, with one application in the spring and another in early fall. The trees shall be pruned in the late winter or early spring. However, dead branches should be removed as soon as they are noticed. Care should be taken to avoid cutting off the central leader of a tree if one is present.

If a tree is severely damaged or experiences more than 2/3 die back, it should be replaced in either the spring or fall planting season, whichever comes first. The only exception to this is if the replacement tree has a fall transplanting hazard. In this case, it should be replanted in the spring. Replacement trees should be planted at the same size and condition as specified on the landscape plans. If it is necessary to make a substitution of species or size, it shall be subject to the approval of the project Landscape Architect.

c) *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 monitored closely so as not to affect the ecosystems within the detention basin. Excessive growth of weeds within the basin 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. All recorded information should be directed to the owners of the dam for review and subsequent follow-up on recommendations. Data obtained from informal inspections should be retained, however, this data does not have to be submitted to NJDEP.

4. Summary of Maintenance Procedures:

**Preventative Maintenance**

- a) Algae and Weed Growth
- b) Maintenance of Adjacent Areas
- c) Removal and Disposal of Trash and Debris
- d) Sediment Removal and Disposal
- e) Elimination of Mosquito Breeding Habitats

## **Corrective Maintenance**

- a) Removal of Debris and Sediment
- b) Structural Repairs
- c) Embankment and Slope Repairs
- d) Weed Harvesting
- e) Extermination of Mosquitoes
- f) Erosion Repair
- g) Elimination of Trees, Brush, Roots and Animal Burrows from Embankments
- h) Snow and Ice Removal

## **Aesthetic Maintenance**

- a) Graffiti Removal
- b) Grass Trimming/Landscape Maintenance
- c) Control of Weeds

### ***B. Routine Inspection and Maintenance of the Stormwater Management Facilities: Pervious Pavement***

#### **1. Preventative Maintenance Procedure:**

The primary goal of pervious pavement maintenance is to prevent the pavement surface and/or the underlying storage bed from being clogged with fine sediments. To keep the system clean throughout the year and prolong its lifespan, the pavement surface should be vacuum swept at least four times a year. All inlet structures within or draining to the storage beds should also be inspected on a biannual basis and after major storm events and cleaned of debris as necessary. An underdrain piping system has been proposed to convey overflow runoff from the stormwater runoff storage area pervious pavement system's surface course. Should the pervious pavement system's storage area not drain within 72 hours, the various system components and groundwater levels must be evaluated and appropriate measures taken to comply with the maximum drain time requirements and maintain the proper functioning of the system.

Planted areas adjacent to pervious pavement should be well maintained to prevent soil washout onto the pavement. If any washout does occur it should be cleaned off the pavement immediately to prevent further clogging of the pores. Furthermore, if any bare spots or eroded areas are observed within the planted areas, they should be replanted and/or stabilized at once. Superficial dirt does not necessarily clog the paver voids. However, dirt that is ground in repeatedly by tires can lead to clogging. Therefore, trucks or other heavy vehicles should be prevented from tracking or spilling dirt onto the pavement. Furthermore, all construction or hazardous materials carriers should be prohibited from entering a pervious pavement lot.

a) *Vacuuming*

It is recommended to vacuum pervious pavement with a vacuum sweeper at least four times a year. This should be followed by a high pressure hosing. All dislodged sediment and other particulate matter must be removed and properly disposed. Acceptable types of vacuum sweepers include the Elgin Whirlwind and the Allianz Model 650. Though much less effective than “pure” vacuum sweepers, regenerative air sweepers, such as the Tymco Model 210, Schwarze 348, Victory, and others, are sometimes used. These units contain a blower system that generates a high velocity air column, which forces the air against the pavement at an angle, creating a 'peeling' or 'knifing' effect. The high volume air blast loosens the debris from the pavement surface, then transports it across the width of the sweeping head and lifts it into the containment hopper via a suction tube. Thus, sediment and debris are loosened from the pavement and sucked into the unit. (Note: simple broom sweepers are not recommended for pervious pavement maintenance.) If the pavement surface has become significantly clogged such that routine vacuum sweeping does not restore permeability, then a more intensive level of treatment may be required. Recent studies have revealed the usefulness of washing pervious pavement with clean, low pressure water, followed by immediate vacuuming. Combinations of washing and vacuuming techniques have proved effective in cleaning both organic clogging as well as sandy clogging.

Maintenance crews are encouraged to determine the most effective strategy of cleaning their pervious pavement installations.

For smaller installations, such as sidewalks, plazas, or small parking lots, “walk behind” vacuum units may prove most effective. Though these units can be loud and somewhat messy to the operator due to the lack of dust suppression, they are also relatively easy to operate and inexpensive. Examples of acceptable “walk behind” units include the Billy Goat models, the 5700 industrial-strength Scrubber by Tennant, and the sidewalk class vacuum sweepers made by Nilfisk, Advance and Hako. If “walk behind” units are used, it is recommended that the scrub pressure be kept relatively low. The dirtiest areas may need to be power washed after scrubbing to get out the dirt that has been deeply ground in.

b) *Winter Maintenance*

Winter maintenance for a pervious pavement parking lot may be necessary, but is usually less intensive than that required for a standard asphalt lot. By its very nature, a pervious pavement system with subsurface aggregate bed has superior snow melting characteristics than standard pavement. Therefore, ice and light snow accumulation are generally not as problematic. However, snow will accumulate during heavier storms. Abrasives such as sand or cinders should not be applied on or

adjacent to the pervious pavement. Snow plowing is necessary for significant snow accumulation, but should be done carefully (i.e. by setting the blade slightly higher than usual, about an inch). Standard road salt is acceptable for use as a deicer on pervious pavement, although a non-toxic, organic deicer applied either as a blended, magnesium chloride-based liquid product or as pretreated rock salt, is recommended. Acceptable liquid deicers include Magic-O, Ice B' Gone, Ice Ban, and Geomelt, etc. Magic Salt is an example of an acceptable pretreated salt product. Other acceptable deicer alternatives to standard sodium chloride include calcium chloride, magnesium chloride, potassium chloride, urea, and calcium magnesium acetate. Follow supplier recommendations when applying deicers to pavement.

## 2. Corrective Maintenance Procedures:

### a) *Structural Repairs:*

Structural damage to outlet and inlet structures, trash racks, access hatches, roadways and headwalls 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 and the design and performance of structural repairs should only be undertaken by the consulting Professional Engineer.

### b) *Snow and Ice Removal:*

Accumulations of snow and ice can threaten the functioning of the inlets and outlets. 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.

### c) *Pervious Pavement System Repair:*

Potholes in the pervious pavement are extremely unlikely, though settling might occur if a soft spot in the subgrade is not removed during construction. Damaged pavers should be replaced. Under no circumstance is the pavement surface to ever be seal coated. Any required repair of drainage structures should be done promptly to ensure continued proper functioning of the system.

With minimal maintenance, pervious pavement systems can function effectively for well over 20 years. However, in the event that maintenance of the pervious pavement system is neglected and it becomes clogged over time, the owner shall vacuum the lot until the original permeability is restored. (If the original permeability of the lot cannot be restored, the pavement should be removed and replaced with new pavers.) Recent research has shown that one of the most effective ways of pervious pavement is applying a pressurized dose of a non-toxic detergent cleaning solution, allowing

adequate soak time, and then vacuuming with a high performance unit (Elgin Whirlwind and the Allianz Model 650). Once again, it is important to note that high pressure washing may drive contaminants further into the pervious surface and even into the underlying aggregate. It is therefore recommended that, prior to vacuum sweeping, a low performance pressure washer is used to get the solution to break the surface tension and reach into the pores.

### 3. Summary of Maintenance Procedures:

#### *Preventative Maintenance*

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

#### *Corrective Maintenance*

- a) Structural Repairs
- b) Snow and Ice Removal
- c) Pervious Pavement System Repair

### *C. Maintenance Equipment and Materials*

#### Recording and Logging of all Maintenance Activities:

The recording of all maintenance work and inspections provides valuable data on the facility's condition. Review of this information will also help to establish more efficient and beneficial maintenance procedures and practices. All recorded information should be directed to the owners of the facilities for review and subsequent follow-up on recommendations. Data obtained from informal inspections should be retained; however, this data does not have to be submitted to NJDEP. A copy of all records and logs of maintenance activities shall be submitted to the City Engineer annually for review.

- 1. 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

2. Vegetative Maintenance Equipment
  - a) Saws
  - b) Pruning Shears
  - c) Hedge Trimmers
  - d) Wood Chippers
  - e) Aquatic Weed Harvester (owned/operated by subcontractor)
  
3. Transportation Equipment
  - a) Trucks for Transportation of Materials
  - b) Trucks for Transportation of Equipment
  - c) Vehicles for Transportation of Personnel
  
4. Debris, Trash and Sediment Removal Equipment
  - a) Loader
  - b) Backhoe
  - c) Grader
  - d) Dredging Equipment
  - e) Portable Pump for Dewatering
  
5. Miscellaneous Equipment
  - a) Shovels
  - b) Rakers
  - c) Picks
  - d) Wheel Barrows
  - e) Painting Equipment
  - f) Gloves
  
6. Standard Mechanics Tools
  
7. Tools for Maintenance of Equipment
  
8. 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

## **APPENDIX**

**MAINTENANCE WORK ORDER & CHECKLIST**

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

NAME OF FACILITY: \_\_\_\_\_  
 LOCATION: \_\_\_\_\_ DATE: \_\_\_\_\_  
 WEATHER: \_\_\_\_\_ WORK STARTED: \_\_\_\_\_  
 MAINTENANCE PERFORMED BY: \_\_\_\_\_ WORK COMPLETED: \_\_\_\_\_

<b>A. PREVENTATIVE MAINTENANCE</b>			
<b>WORK ITEMS</b>	<b>ITEMS REQUIRED</b>	<b>ITEMS DONE</b>	<b>COMMENTS AND SPECIAL INSTRUCTIONS</b>
<b>1. GRASS CUTTING</b>			
A. BOTTOMS			
B. EMBANKMENTS AND SIDE SLOPES			
C. PERIMETER AREAS			
D. ACCESS AREAS AND ROADS			
E. 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. POISONOUS PLANTS			
E. OTHERS			
<b>4. TRASH AND DEBRIS REMOVAL</b>			
A. BOTTOMS			
B. EMBANKMENTS AND SIDE SLOPES			
C. PERIMETER AREAS			
D. ACCESS AREAS AND ROADS			
E. INLETS			
F. OUTLETS AND TRASH RACKS			
G. OTHERS			
<b>5. SEDIMENT REMOVAL</b>			
A. INLETS			
B. OUTLETS AND TRASH RACKS			
C. LOW FLOW CHANNELS			
D. BOTTOMS			
E. OTHERS			
<b>6. PEST CONTROL</b>			
A. GEESE			
B. MOSQUITO BREEDING			
C. RODENTS / RODENT HOLES			
D. OTHERS			
<b>7. STRUCTURAL REPAIRS</b>			
A. VALVES			
B. SLUICE GATES			
C. PUMPS			
D. FENCE GATES			
E. LOCKS			
F. ACCESS HATCHES			
G. OTHER:			
<b>8. POND MAINTENANCE</b>			
A. AERATION EQUIPMENT			
B. DEBRIS AND TRASH REMOVAL			
C. WEED REMOVAL			
D. OTHER:			
<b>9. OTHER PREVENTIVE MAINTENANCE</b>			
A. PARKING LOT SWEEPING			
B. EMPTYING TRASH RECEPTACLES			
C. PUMPS AND VALVES			
D. ELECTRICAL PANEL AND WIRING			
E. DEWATERING			
F. GRAFFITI REMOVAL			
E. OTHER:			

B. CORRECTIVE MAINTENANCE			
WORK ITEMS	ITEMS REQUIRED	ITEMS DONE	COMMENTS AND SPECIAL INSTRUCTIONS
1. REMOVAL OF DEBRIS AND SEDIMENT			
2. STRUCTURAL REPAIRS			
3. EMBANKMENTS AND SIDE SLOPES			
4. DEWATERING			
5. BASIN MAINTENANCE			
6. CONTROL OF MOSQUITOES			
7. EROSION REPAIR			
8. FENCE REPAIR			
9. SNOW AND ICE REMOVAL			
10. SAND LAYER REPLACEMENT			
11. OTHER			

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

GENERAL NOTES AND REMARKS:

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

WORK COMPLETED BY: \_\_\_\_\_

# **MAINTENANCE LOG**



B. CORRECTIVE MAINTENANCE										
WORK ITEM	(√) COMPLETED									
1. REMOVAL OF DEBRIS AND SEDIMENT										
2. STRUCTURAL REPAIRS										
3. EMBANKMENTS AND SIDE SLOPES										
4. DEWATERING										
5. BASIN MAINTENANCE										
6. CONTROL OF MOSQUITOES										
7. EROSION REPAIR										
8. FENCE REPAIR										
9. SNOW AND ICE REMOVAL										
10. SAND LAYER REPLACEMENT										
11. OTHER										

C. AESTHETIC MAINTENANCE										
FACILITY ITEM	(√) COMPLETED									
1. GRAFFITI REMOVAL										
2. GRASS TRIMMING										
3. WEEDING										
4. OTHERS										

**GENERAL NOTES AND REMARKS (REFER TO ITEM NUMBER IF APPLICABLE)**

# **INSPECTION LOG**



7. EMERGENCY SPILLWAY										
A. VEGETATION										
B. LINING										
C. EROSION										
D. TRASH AND DEBRIS										
E. OTHER:										
8. PERIMETER										
A. VEGETATION										
B. EROSION										
C. TRASH AND DEBRIS										
D. FENCES AND GATES										
E. AESTHETICS										
G. OTHER:										
9. ACCESS ROADS										
A. VEGETATION										
B. ROAD SURFACE										
C. FENCES AND GATES										
D. EROSION										
E. AESTHETICS										
F. OTHER:										
10. MISCELLANEOUS										
A. EFFECTIVENESS OF EXIST. MAINT. PROGRAM										
B. DAM INSPECTIONS										
C. POTENTIAL MOSQUITO HABITATS										
D. MOSQUITOES										

- (1) ITEM CHECKED IS IN GOOD CONDITION, AND THE MAINTENANCE PROGRAM IS
- (2) ITEM CHECKED REQUIRES ATTENTION, BUT DOES NOT PRESENT AN IMMEDIATE THREAT  
FUNCTION OR OTHER FACILITY COMPONENTS.
- (3) THE ITEM CHECKED REQUIRES IMMEDIATE ATTENTION TO KEEP THE FACILITY  
DAMAGE TO OTHER FACILITY COMPONENTS.
- (4) PROVIDE EXPLANATION AND DETAILS IF COLUMNS 2 OR 3 ARE CHECKED.

GENERAL NOTES AND REMARKS (REFER TO ITEM NUMBER IF APPLICABLE)										