MidAtlantic
Engineering Partners

June 12, 2020
Revised August 24, 2020

Project # APR-184

# OPERATION & MAINTENANCE MANUAL FOR STORMWATER MANAGEMENT FACILITIES FOR HERITAGE AT WEST WINDSOR

**BLOCK 28, LOTS 15 & 21**

**TOWNSHIP OF WEST WINDSOR, MERCER COUNTY, NEW JERSEY**

**PREPARED FOR:**

**AMERICAN PROPERTIES, LLC**

**PREPARED BY:**

**MidAtlantic Engineering Partners**
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**Hamilton, New Jersey 08691**

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**APPENDICES**

## I. PROJECT OVERVIEW

This O&M Manual has been prepared in support of the Stormwater Management Plan for Heritage at West Windsor. The project is located on Old Trenton Road (C.R. 535) in the Township of West Windsor and proposes to construct forty-four (44) two-story residential buildings consisting of a mix of 193 townhouse units and 60 apartment units, one 4-bedroom group home (by others) one (1) clubhouse building and amenity area, proposed internal roadways, associated parking, stormwater management measures and associated grading.

## II. RESPONSIBLE PARTIES

The responsible party for the execution of preventative and corrective maintenance, including replacement of all stormwater management systems to ensure proper functionality, shall be the owner of Block 28, Lots 15 & 21. The maintenance plan and any future revisions shall be recorded upon deed of record for each property on which the maintenance described in this maintenance plan must be undertaken by the current property owner.

The ultimate project and property owner is:
American Properties at West Windsor, LLC
517Route 1 South, Suite 2100
Iselin, NJ 08830

## III. STORMWATER SYSTEM OVERVIEW

| Type of Stormwater Management System | BMP No. | Location Description | State Plane Coordinates |
|---|---|---|---|
| Wet Pond | Basin #1 | Northern Side of the site near Wetlands | 528,877' N<br>472,360' E |

Stormwater will be conveyed via a combination of overland flow, roof leaders and underground. Runoff from will be collected via a conventional piped stormwater collection system and conveyed to a wet pond located in the northern portion of the development. Runoff from 29.8 acres of the 35.1 acre developed area is sent to the wet pond, and 4.8 acres is directed overland away from the development to the existing wetlands and pond. The proposed stormwater basin is a wet pond designed to store and reduce the developed runoff to 50%, 75% and 80% of the 2, 10 and 100-year storm pre-development flows. In accordance with the NJDEP Stormwater rules, the proposed stormwater management measures must achieve an 80% reduction in the post-developed total suspended solids (TSS) runoff from the new impervious surfaces through the use of prescribed best management practices (BMPs). The design of the proposed wet pond will achieve a TSS removal rate of approximately 89%.

By reducing stormwater runoff generated by any major development in the associated drainage areas, the adequacy of existing culverts and channels will be ensured, and the

likelihood of damage to life and property from flooding will be reduced. This approach will also reduce the possibility of soil erosion discharges to surrounding streams, thereby establishing protection of the stream corridors in order to maintain the integrity of the stream channels for their biological functions, as well as for drainage. The design criteria are discussed in further detail below.

## IV. MAINTENANCE / INSPECTIONS

The following summarizes general maintenance items and basin drainage times:

1. Removal of debris and sediment from pipe system;
2. General maintenance and repairs to the outlet structure;
3. Removal of all accumulated debris from the outlet structure trash racks;

| Stormwater Management Element | Time to Drain after WQ (24 Hr) Storm Event | Time to Drain after 2-yr (24 Hr) Storm Event | Time to Drain after 10-yr (24 Hr) Storm Event | Time to Drain after 100-yr (24 Hr) Storm Event |
|---|---|---|---|---|
| Wet Pond | 35.8 hours | 89.6 hours | 90.9 hours | 92.2 hours |

| Stormwater Management Element | WQ W.S.E. | 2-Year W.S.E. | 10-Year W.S.E. | 100-Year W.S.E. |
|---|---|---|---|---|
| Wet Pond | 93.32 | 94.74 | 95.91 | 98.09 |

## V. REGULAR MAINTENANCE ITEMS

Regular maintenance items, as itemized in the checklist enclosed as Appendix B includes the following items:

1. Removal and Disposal of Trash and Debris: Immediately following any significant rainfall event, and at least once every 6 months, all trash and debris should be removed from the impoundment area.

2. Sediment Removal and Disposal: Accumulated sediment should be removed before it threatens the operation or storage volume of the facility. Sediment volume should be monitored on a quarterly basis to assure the outlets are not blocked. Disposal of sediment should be in accordance with current Howell Township standards and regulations of the New Jersey Department of Environmental Protection.

A. Corrective Maintenance

Corrective maintenance should be provided as soon as practicable after a situation that requires attention is reported. Corrective maintenance includes repair of damage caused by vandalism, removal of debris and sediment that threatens the operational capacity of the facility, and corrections of any problems that jeopardize the safety or operation of the facility.

B. Maintenance Inspection
An inspection of the facility should be made a minimum of once every year in order to determine the effectiveness of the maintenance work and the condition of the facility. In addition, an inspection should be made whenever a severe storm warning is issued in order to determine the readiness of the facility.

C. Records
Included in this report as Appendix B are checklists and logs for use by maintenance personnel and inspectors. These should be utilized every time maintenance or inspection is performed on the facility. The reports should be appropriately filed and used to determine the effectiveness of the existing maintenance and inspection schedules. The Report can also be used to update the schedules as necessary to effectively maintain the operational integrity of the facility. The Township Engineer's office must be copied on all reports.

## VI. BEST MANAGEMENT PRACTICES

The NJDEP Stormwater Management Rules, N.J.A.C. 7:8, have been adopted to address the adverse impacts of land development. The stormwater management measures taken to meet these requirements are collectively known as Best Management Practices (BMPs). BMPs can be non-structural, as in the effective management of impervious surface, or structural, as in the stormwater management facilities discussed in this manual.

### A. Wet Pond

The following is taken from New Jersey Stormwater Best Management Practices Manual, Chapter 9.11: Standard for Wet Ponds.

Definition
A wet pond is a stormwater management facility that has an elevated outlet structure that creates a permanent pool where stormwater runoff is detained and attenuated. When designed in accordance with this chapter, the total suspended solids (TSS) removal rate is 50 - 90%, depending on the storage volume in the permanent pool and the duration of detention time, if extended detention is provided.

Purpose
Wet ponds can be designed as multi-stage, multi-function systems; extended detention in the permanent pool provides pollutant treatment for runoff from the Water Quality Design Storm through sedimentation and biological processing; detention and attenuation is also provided for larger storm events through the higher elevation outlets.

Wet ponds can also be used to provide wildlife habitat, recreational benefits and water supply for fire protection; they can also be used to enhance the aesthetics of a site. However, these systems are designed primarily for stormwater treatment, so they should

not be located within natural areas because they will not have the same range of ecological function.

## VII. GENERAL MAINTENANCE

### A. Wet Pond

All wet pond components expected to receive and/or trap debris and sediment must be inspected for clogging and excessive accumulation at least twice annually, or as needed; these components may include bottoms, trash racks, outlet structures, and riprap or gabion aprons.

- Disposal of debris, trash, sediment and other waste material must be done at suitable disposal/recycling sites and in compliance with all applicable local, state and federal waste regulations.
- All structural components must be inspected, at least once annually, for cracking, subsidence, spalling, erosion and deterioration.
- Two (2) times per year: Inspect for signs of damage to structures, repair eroded areas, check for signs of petroleum contamination, and remediate.

1. Vegetated Areas

- When establishing or restoring vegetation, inspections should be performed biweekly.
- Once established, inspections of health, density and diversity should be performed at least twice annually during both the growing and non-growing seasons.
- The vegetative cover must be maintained at 85%; if vegetation has greater than 50% damage, the area must be reestablished in accordance with the original specifications and the inspection requirement above.
- Mowing/trimming of vegetation must be performed on a regular schedule based on specific site conditions; perimeter grass should be mowed at least once a month during growing season.
- Vegetated areas must be inspected at least once annually for erosion, scour and unwanted growth; any unwanted growth should be removed with minimum disruption to the remaining vegetation.
- All use of fertilizers, pesticides, mechanical treatments and other means to ensure optimum vegetation health must not compromise the intended purpose of the sand filter.

2. Drain Time

- The approximate time it would normally take to completely drain the Water Quality Design Storm volume above the permanent pool is indicated within the separate Stormwater Management Report.
- If the actual drain time is significantly different from the design drain time, the components that could provide hydraulic control must be evaluated and appropriate measures taken to return the wet pond to minimum and maximum drain time requirements.
- If the actual drain time is significantly different than the design drain time, the outlet structure and both groundwater and tailwater levels must be evaluated and appropriate measures taken to comply with the maximum drain time requirements.

## B. Stormwater Conduits and Inlets

Stormwater conduits convey runoff from inlets and roof drains throughout the site to the detention basin and water quality control structure BMPs listed above as well as ultimate discharge of runoff from the site. All conduits, inlet structures, rip rap aprons and appurtenances must be inspected for cracking, subsidence, erosion, and deterioration at least annually. Conduits and inlets should be inspected for sediment or debris after every significant rainfall or at least every three months. Any structural damage from vandalism, flood events or other causes must be repaired promptly. The analysis of the structural damage and the design and performance of the structural repairs should only be performed by a licensed professional engineer. Corrective maintenance, inspections and recording procedures are as described above in the detention basin section.

# ***APPENDIX A***

- **LOCATION MAP**
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Location Map


## TOOLS AND EQUIPMENT

The following is a list of required inspection equipment for routine operation and maintenance procedures and inspections.

1. A clipboard, a pencil and the inspection checklist – the inspection checklist is included in the following section.

2. A standard 6-foot collapsible ruler.

3. A camera – photographs or observed portions of the basin will provide a measure of performance when comparing past and present maintenance practices or conditions.

4. A probe – any stiff light stick or rod with a blunt tip of sufficient strength to penetrate soil. The probe can provide information on conditions below the surface of the detention basin, such as the depth and softness of a saturated area.

5. A weed whacker – can be used to clear non-visible areas and to perform routine maintenance on the embankments.

6. A flashlight – a flashlight can be used to observe the inside of inlet pipes and structural components.

Maintenance of the wet pond may include heavy equipment including the following:

1. Chainsaw
2. Stump grinder
3. Wheelbarrow
4. Backhoe
5. Dump truck

Sources of the following materials should be identified for immediate use if warranted by the inspection.

1. Clean sand or gravel for filling erosion rills and gullies
2. Topsoil mixture, fertilizer and seed
3. Large stone riprap for emergency repairs caused by erosion
4. Synthetic geo-fabric netting and stakes to prevent seed and top soil from blowing away

## LANDSCAPE MAINTENANCE PLAN FOR ALL STORMWATER FACILITIES

All vegetation deficiencies should be addressed without the use of pesticides and fertilizers whenever possible, to maintain 85% vegetative cover.

December through March

1. All winter debris shall be removed from lawn, shrub, embankment and surrounding areas on a once per month basis.

2. All detention basin appurtenances shall be inspected and repaired as necessary on a once per month basis.

March

1. All bare turf areas shall be reseeded using the following mixture, as recommended by Rutgers University: Triplex Bluegrass – Pennlawn Fescue – Triplex Ryegrass.

April

1. The embankment and surrounding areas shall be treated with Trimec herbicide to control broadleaf weeds.

2. The embankment and surrounding areas shall be treated with Betasan pre-emergence herbicide for crabgrass control.

April through November

1. The embankment and surrounding areas shall be mowed, edged, and trimmed on a bi-weekly basis to attain optimum health and appearance. The height of cut shall not be less than 2-1/2 inches nor more than 3 inches.

2. All secondary turf areas shall be mowed and trimmed on a twice per month basis.

3. All meadow areas shall be mowed three times per season.

4. All clippings shall be collected on primary lawn areas as necessary to maintain a neat and clean appearance.

5. All clippings shall be blown from the concrete outlet control structure (OCS) after each mowing to maintain a neat and clean appearance.

6. All leaves shall be removed as needed in the fall.

7. The embankment and surrounding areas shall be treated with a preventative insect control for Chinch Bug, Hyperodes Weevil, Black Turfgrass Aetenius, Sod Webworm, Japanese Beetle, and European Chafer.

May

1. If necessary, for control of nuisance conditions, application of Aquashade shall be made to the embankment area for seasonal control of weeds and algae. Where nuisance conditions do not exist and consequently weed and algae control is not required, Aquashade shall not be applied.

June

1. The embankment and surrounding areas shall be fertilized using a 20-8-8 granular fertilizer consisting of 50 percent organic nutrient in order to apply one pound of nitrogen per 1,000 square feet.

June through September

1. All evergreen deciduous shrubs and trees in the areas along the embankment shall be pruned and shaped to attain optimum appearance. All dead, diseased, or interfering branches and limbs shall be pruned from shrubs and trees (limited to trees less than five inches in caliber).

September

1. The embankment and surrounding areas shall be fertilized using a 20-8-8 granular fertilizer consisting of 50 percent organic nutrient in order to apply one pound of nitrogen per 1,000 square feet.

2. The embankment and surrounding areas shall be treated with Trimec herbicide to control broadleaf weeds.

3. All shrubs and ground cover shall be fertilized with a 100 percent organic slow release fertilizer.

4. All thin turf areas shall be reseeded using the following mixture as recommended by Rutgers University: Triplex Bluegrass – Pennlawn Fescue – Triplex Ryegrass. Reseeding shall be done using an Olathe Thatcher-seeder, which removes the thatch layer and injects the grass seed into the soil all in one operation.

October

1. The embankment and surrounding areas shall be limed using granular limestone at a rate determined by a pH test.

November

1. The embankment and surround areas shall be fertilized using a 29-3-5 granular fertilizer consisting of 25 percent organic nutrient in order to attain one pound of nitrogen per 1,000 square feet.

The above monthly landscape maintenance schedule was recommended by a landscape contractor (DuBrow, 1983) and the pesticides and fertilizers recommended are approved by the Rutgers University Horticulture School.

## REGULAR MAINTENANCE ITEMS

Regular maintenance items, includes the following items:

1. Grass Cutting: The embankments should be mowed on a regular basis, generally along the same schedule as the common grounds. Additional mowing and trimming will be performed if necessary, to prevent undesirable growth on the embankment.

2. Removal and Disposal of Trash and Debris: Immediately following any significant rainfall event, and at least once every three months, all trash and debris should be removed from the inlet pipe and embankment.

3. Grass Maintenance: An annual program of fertilizing and soil conditioning should be provided in order to maintain healthy grass growth. Reseeding should be done as necessary to maintain soil stabilizing grass cover.

4. Vegetative Cover: Trees, shrubs, and ground cover should be maintained at least annually, including pruning, pest control, and fertilizing. Trees and shrubs should not be allowed to grow on the embankment. Once per year inspect BMP's for unwanted tree growth and remove, if necessary.

## MAINTENANCE CATEGORIES

American Properties, LLC is responsible for maintenance to all structures and utilities related to the detention basin. There are three (3) categories of maintenance: immediate maintenance, corrective maintenance, and continuing maintenance. Accordingly, each of the maintenance conditions will be determined during the inspection. This portion of the report also contains a section on technical guidance describing corrective action.

1. **Immediate Maintenance:** demands immediate attention and usually requires construction equipment and professional guidance. Immediate maintenance is characterized by the following:

   a. A severe slope failure.

   b. A breach or near breach caused by severe progressive erosion. Deterioration of the pipes and appurtenances.

   c. Increasing uncontrolled seepage through the embankment.

2. **Corrective Maintenance:** should be performed as soon as possible after an inspection. Corrective maintenance consists of the following:

   a. Clearing of trees, shrubs and underbrush on the basin embankment or crest.

   b. Filling eroded areas or gullies and seeding to stabilize the turf areas or replacing and/or regarding sand beds.

   c. Repairing or greasing the stem of the relief valve

   d. Removal of burrowing animals and filling the holes.

   American Properties, LLC, with some technical guidance, can perform corrective maintenance.

3. **Continuing Maintenance:** will occur on a regular basis and can be performed during the inspections or in accordance with the maintenance schedule outlined by American Properties, LLC. Continuing maintenance includes:

   a. Observation of any wet areas, springs or potential seepage in the embankments.

   b. Removing small shrubs or underbrush on the embankments.

   c. Filling small, eroded gullies.

   d. Filling or ruts caused by pedestrian traffic along the crest.

   e. Removing accumulated trash and debris.

   f. Monitoring upstream development within the watershed.

   g. Removal of burrowing animals and their dens from the detention basins.

   h. Fertilizing and over seeding grassed area.

   i. Mowing grass areas.

   American Properties, LLC or Consultants can perform continuing maintenance on an ongoing basis. Some technical guidance for routine operations follows:

4. **Technical Guidance (Animal Burrows):** The proper operations of the detention basin and burrowing animal control are essential to the proper operation of the facilities. The technical maintenance tips provided in this section should be followed to ensure proper operation.

Animal Burrow Control: Rodents such as woodchucks, ground squirrels, rabbits, and moles, endanger the integrity of the embankment. Animal burrows are easily recognized in the spring because fresh soil is generally found at the mouth of the burrows. Early detection and control in April is essential in controlling burrowing activity. Animals should be removed immediately upon detection. Woodchucks, squirrels, rabbits, and moles can be exterminated or flushed out with smoke. Beavers must be relocated. The animal burrow must be filled with soil or a mixture of water to 9 parts soil and 1 part cement. The soil mixture should be placed as deep as possible and compacted with a pole.

## DISPOSAL AND RECYCLING PROCEDURES

All trash/debris, floatables, oils and sediment removed from the water quality structures shall be disposed of off-site at an appropriate facility. The removal and disposal of this debris shall conform to any applicable federal, state or local regulations.

## MAINTENANCE INSPECTION

An inspection of the facility should be made a minimum of once every three months in order to determine the effectiveness of the maintenance work and the condition of the facility. In addition, an inspection should be made whenever a severe weather warning is issued in order to determine the readiness of the facility.

Reports should be appropriately filed and used to determine the effectiveness of the existing maintenance and inspection schedules. The reports should also be used as a guide to revising the schedules as necessary to effectively maintain the operational integrity of the facility.

## INSPECTONS AND INSPECTION CHECKLIST

Prior to performing inspections, the inspector must notify American Properties, LLC of the time and date on which the inspection is to be performed. At the time of inspection, the Inspector must observe the water level in the reservoir. The reservoir must be lowered in order to drain the basin. This procedure allows the Inspector to freely observe the inlet pipes. If the inspector identifies a need for immediate maintenance and/or repair of the earthen berm, the reservoir should be lowered the necessary amount to facilitate the work.

The most effective means of conducting the inspection is to treat each basin component as an individual element, inspect it thoroughly, and fill out the checklist prior to moving on to the next element. The checklist sequence for inspection of each basin element is as follows:

1. The Crest: Walk along the top of the earthen berm from one end to the other and look for erosion, puddles, or settlements, cracks in the surface or animal burrows, etc.

2. The Embankments: Walk along the upstream and downstream sides and to the water's edge and observe erosion, puddles or wet areas, slumps, wood vegetation or animal burrows. Look below the waterline for any additional irregularities or animal burrows.

3. The Reservoir: Stand on the crest (earthen berm) and observe any irregular conditions within the reservoir that may ultimately impact the berms, embankment or the spillway.

## SAFETY MEASURES AND PROCEDURES

All personnel performing inspections and maintenance on or near the stormwater systems shall follow all written procedures to ensure the safety of all those involved.

1. Inspections and maintenance activities shall be planned to have a proper number of personnel available to ensure that activities can be performed taking proper precautions.

2. Proper safety equipment shall be worn and/or used during inspection and maintenance activities. This includes but is not limited to, hardhats, safety glasses, protective gloves, steel-toed boots, and hearing protection.

3. Any individual operating machinery that requires special training shall have complete required training. During operation, the proper safety precautions shall be taken to ensure the safety of the operator and those in the immediate vicinity.

4. All state and local regulation regarding occupational health and safety shall be followed including all those set forth by the Occupational Safety and Health Administration.

## TRAINING PLAN AND RECORDS

Prior to performing inspections, all inspection personnel are required to be properly trained in accordance with NJDEP Best Management Practices Manual. Each individual is required to be trained for the usage of the NJDEP Field Manuals as well as Stormwater Management Basic Training. All inspection personnel shall be trained for occupational safety as well as subcontractor training if applicable.

1. Stormwater Management Basic Training: Inspection and maintenance personnel shall be familiar with the general purposes and functions of BMPs. Personnel shall also be trained in specialized inspection and maintenance tasks and/or the specialized maintenance equipment. Training shall also be provided for the need

and use of all required safety equipment and procedures. Training material call be found in the NJDEP Stormwater BMP Manual, Chapters 9.1: Bioretention Systems and 9.5 Infiltration Basins. More information on training is available at NJStormwater.org (nj.gov/dep/stormwater/training.htm).

2. Vegetation Care: All Inspection and maintenance personnel shall be familiar with the general purpose and functions of the vegetation and landscaping used in conjunction with the BMPs. Training material is available in NJDEP Stormwater BMP Manual, Chapter Seven: Landscaping. The NJDEP Stormwater BMP Manual provided information on vegetation and landscaping for stormwater management measures.

3. Field Manual Usage Training: Inspection and maintenance personal shall be familiar and trained to use the field Manuals attached to this Operation and Maintenance Plan in Appendix D.

4. Occupational Safety Training: Inspection and maintenance personal shall be properly trained and certified through OSHA.

Training attendance sheets and certification for inspection and maintenance personnel shall be attached by the responsible party after each training. Sheets can be attached immediately following this section.

## ANNUAL EVALUATION OF THE EFFECTIVENESS OF THE PLAN

Per N.J.A.C. 7:8-5.8(g), the responsible party shall evaluate the effectiveness of the maintenance plan at least once per year and adjust the plan accordingly. The responsible party shall evaluate the effectiveness of the plan shall include at minimum the following;

- Whether the inspections have been performed as scheduled;
- Whether preventative maintenance has been performed properly and as scheduled;
- Whether the preventative maintenance needs to increase or decrease;
- Whether repairs were completed in a timely manner;
- Whether actual repair and maintenance costs were consistent with estimates;
- Whether proper records of inspection, maintenance, and training have been kept.

The responsible party shall find the causes of any deviations from the maintenance plan and implement solutions in a revised plan.

## ANNUAL EVALUATION RECORDS

| Evaluator(s) | Date of Evaluation | Decision |
|---|---|---|
| | | __ Maintain Current Version<br><br>__ Revisions Required<br>Last Revision Date_____ |
| | | __ Maintain Current Version<br><br>__ Revisions Required<br>Last Revision Date_____ |
| | | __ Maintain Current Version<br><br>__ Revisions Required<br>Last Revision Date_____ |
| | | __ Maintain Current Version<br><br>__ Revisions Required<br>Last Revision Date_____ |

# ***APPENDIX B***

- **BASIN INSPECTION CHECKLISTS**
- **BASIN MAINTENANCE CHECKLIST**
- **BASIN MAINTENANCE LOG**

## Basin Inspection Checklist

| | |
|---|---|
| **Name of Facility:** | |
| **Location:** | |
| **Date of Inspection:** | |
| **Weather:** | |

**Embankments and Side Slopes**

Inspection Interval: **3 Months**

| Facility Item | O.K.[I] | Routine[ii] | Urgent[iii] | Comments[iv] |
|---|---|---|---|---|
| A. Vegetation | | | | |
| B. Linings | | | | |
| C. Erosion | | | | |
| D. Settlement | | | | |
| E. Sloughing | | | | |
| F. Trash and Debris | | | | |
| G. Seepage | | | | |
| H. Aesthetics | | | | |
| I. Other | | | | |

**Basin Invert**

Inspection Interval: **3 Months**

| Facility Item | O.K. | Routine | Urgent | Comments |
|---|---|---|---|---|
| A. Vegetation | | | | |
| B. Erosion | | | | |
| C. Settlement | | | | |
| D. Standing Water | | | | |
| E. Trash and Debris | | | | |
| F. Seepage | | | | |
| G. Aesthetics | | | | |
| H. Other | | | | |

**Low Flow Channels**

Inspection Interval: **12 Months**

| Facility Item | O.K. | Routine | Urgent | Comments |
|---|---|---|---|---|
| A. Vegetation | | | | |
| B. Linings | | | | |
| C. Erosion | | | | |
| D. Settlement | | | | |
| E. Standing Water | | | | |
| F. Trash and Debris | | | | |
| G. Sediment | | | | |
| H. Other | | | | |

## Basin Inspection Checklist

**Inlet Structure**

Inspection Interval: **12 Months**

| Facility Item | O.K. | Routine | Urgent | Comments |
|---|---|---|---|---|
| A. Condition of Structure | | | | |
| B. Erosion | | | | |
| C. Trash and Debris | | | | |
| D. Sediment | | | | |
| E. Aesthetics | | | | |
| F. Other | | | | |

**Outlet Structure**

Inspection Interval: **12 Months**

| Facility Item | O.K. | Routine | Urgent | Comments |
|---|---|---|---|---|
| A. Condition of Structure | | | | |
| B. Erosion | | | | |
| C. Trash and Debris | | | | |
| D. Sediment | | | | |
| E. Trash Rack | | | | |
| F. Aesthetics | | | | |
| G. Other | | | | |

**Perimeter**

Inspection Interval: **3 Months**

| Facility Item | O.K. | Routine | Urgent | Comments |
|---|---|---|---|---|
| A. Vegetation | | | | |
| B. Erosion | | | | |
| C. Fences and Gates | | | | |
| D. Trash and Debris | | | | |
| E. Aesthetics | | | | |
| F. Other | | | | |

## Basin Inspection Checklist

**Access Roads**

Inspection Interval: **12 Months**

| Facility Item | O.K. | Routine | Urgent | Comments |
|---|---|---|---|---|
| A. Vegetation | | | | |
| B. Road Surface | | | | |
| C. Fences and Gates | | | | |
| D. Erosion | | | | |
| E. Aesthetics | | | | |
| F. Other | | | | |

**Miscellaneous**

Inspection Interval: **12 Months**

| Facility Item | O.K. | Routine | Urgent | Comments |
|---|---|---|---|---|
| A. Effectiveness of Existing Maintenance Program | | | | |
| B. Dam Inspection | | | | |
| C. Potential Mosquito Habitats | | | | |
| D. Mosquitoes | | | | |

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**Remarks:**

## Basin Maintenance Checklist

| | |
|---|---|
| **Name of Facility:** | |
| **Location:** | |
| **Date of Inspection:** | |
| **Weather:** | |

## Preventive Maintenance

### Grass Cutting

Maintenance Interval: **1 Month**

| Facility Item | Required | Completed | Location, Comments and Special Instructions |
|---|---|---|---|
| A. Basin Invert | | | |
| B. Embankment | | | |
| C. Side Slopes | | | |
| D. Perimeter | | | |
| E. Access Areas | | | |
| F. Other | | | |

### Grass Maintenance

Maintenance Interval: **6 Months**

| Facility Item | Required | Completed | Location, Comments and Special Instructions |
|---|---|---|---|
| A. Fertilizing | | | |
| B. Re-Seeding | | | |
| C. De-Thatching | | | |
| D. Aeration | | | |
| E. Pest Control | | | |
| F. Other | | | |

### Vegetative Cover

Maintenance Interval: **6 Months**

| Facility Item | Required | Completed | Location, Comments and Special Instructions |
|---|---|---|---|
| A. Fertilizing | | | |
| B. Pruning | | | |
| C. Pest Control | | | |
| D. Removal | | | |
| E. Other | | | |

## Basin Maintenance Checklist

**Trash and Debris Removal**

Inspection Interval: **6 Months**

| Facility Item | Required | Completed | Location, Comments and Special Instructions |
|---|---|---|---|
| A. Invert | | | |
| B. Side Slopes | | | |
| C. Perimeter Areas | | | |
| D. Outlet / Trash Rack | | | |
| E. Access Areas | | | |
| F. Inlets | | | |
| G. Other | | | |

**Sediment Removal**

Inspection Interval: **3 Months**

| Facility Item | Required | Completed | Location, Comments and Special Instructions |
|---|---|---|---|
| A. Inlets | | | |
| B. Outlet | | | |
| C. Invert | | | |
| D. Other | | | |

**Mosquito Habitat Removal**

Inspection Interval: **12 Months**

| Facility Item | Required | Completed | Location, Comments and Special Instructions |
|---|---|---|---|
| A. Inlets | | | |
| B. Outlets | | | |
| C. Low Flow Channel | | | |
| D. Invert | | | |
| E. Other | | | |

**Other Preventative Maintenance**

Inspection Interval: **12 Months**

| Facility Item | Required | Completed | Location, Comments and Special Instructions |
|---|---|---|---|
| A. Gates / Fences | | | |
| B. | | | |
| C. | | | |
| D. | | | |

## Basin Maintenance Checklist

### Corrective Maintenance

Maintenance Interval: **As Required**

| Facility Item | Required | Completed | Location, Comments and Special Instructions |
|---|---|---|---|
| A. Removal of Debris and Sediment | | | |
| B. Structural Repairs | | | |
| C. Slope Repairs | | | |
| D. Embankment Repairs | | | |
| E. Pond Maintenance | | | |
| F. Dewatering | | | |
| G. Mosquito Control | | | |
| H. Erosion Repair | | | |
| I. Fence / Gate Repair | | | |
| J. Elimination of Trees/Brush | | | |
| K. Elimination of Burrows | | | |
| L. Snow and Ice Removal | | | |
| M. Other | | | |

### Aesthetic Maintenance

Maintenance Interval: **As Required**

| Facility Item | Required | Completed | Location, Comments and Special Instructions |
|---|---|---|---|
| A. Graffiti Removal | | | |
| B. Grass Trimming | | | |
| C. Weeding | | | |
| D. Other | | | |

---

**Remarks:**

## Basin Maintenance Log

| | |
|---|---|
| **Name of Facility:** | |
| **Location:** | |

## Preventive Maintenance

### Grass Cutting

| Facility Item | Date | Date | Date | Date | Date | Date | Date |
|---|---|---|---|---|---|---|---|
| A. Basin Invert | | | | | | | |
| B. Embankment | | | | | | | |
| C. Side Slopes | | | | | | | |
| D. Perimeter | | | | | | | |
| E. Access Areas | | | | | | | |
| F. Other | | | | | | | |

### Grass Maintenance

| Facility Item | Date | Date | Date | Date | Date | Date | Date |
|---|---|---|---|---|---|---|---|
| A. Fertilizing | | | | | | | |
| B. Re-Seeding | | | | | | | |
| C. De-Thatching | | | | | | | |
| D. Aeration | | | | | | | |
| E. Pest Control | | | | | | | |
| F. Other | | | | | | | |

### Vegetative Cover

| Facility Item | Date | Date | Date | Date | Date | Date | Date |
|---|---|---|---|---|---|---|---|
| A. Fertilizing | | | | | | | |
| B. Pruning | | | | | | | |
| C. Pest Control | | | | | | | |
| D. Removal | | | | | | | |
| E. Other | | | | | | | |

## Basin Maintenance Log

**Trash and Debris Removal**

| Facility Item | Date | Date | Date | Date | Date | Date | Date |
|---|---|---|---|---|---|---|---|
| A. Invert | | | | | | | |
| B. Side Slopes | | | | | | | |
| C. Perimeter Areas | | | | | | | |
| D. Outlet / Trash Rack | | | | | | | |
| E. Access Areas | | | | | | | |
| F. Inlets | | | | | | | |
| G. Other | | | | | | | |

**Sediment Removal**

| Facility Item | Date | Date | Date | Date | Date | Date | Date |
|---|---|---|---|---|---|---|---|
| A. Inlets | | | | | | | |
| B. Outlet | | | | | | | |
| C. Invert | | | | | | | |
| D. Other | | | | | | | |

**Mosquito Habitat Removal**

| Facility Item | Date | Date | Date | Date | Date | Date | Date |
|---|---|---|---|---|---|---|---|
| A. Inlets | | | | | | | |
| B. Outlets | | | | | | | |
| C. Low Flow Channel | | | | | | | |
| D. Invert | | | | | | | |
| E. Other | | | | | | | |

**Other Preventative Maintenance**

| Facility Item | Date | Date | Date | Date | Date | Date | Date |
|---|---|---|---|---|---|---|---|
| A. Gates / Fences | | | | | | | |
| B. | | | | | | | |
| C. | | | | | | | |
| D. | | | | | | | |

## Basin Maintenance Log

## Corrective Maintenance

| Facility Item | Date | Date | Date | Date | Date | Date | Date |
|---|---|---|---|---|---|---|---|
| A. Removal of Debris and Sediment | | | | | | | |
| B. Structural Repairs | | | | | | | |
| C. Slope Repairs | | | | | | | |
| D. Embankment Repairs | | | | | | | |
| E. Pond Maintenance | | | | | | | |
| F. Dewatering | | | | | | | |
| G. Mosquito Control | | | | | | | |
| H. Erosion Repair | | | | | | | |
| I. Fence / Gate Repair | | | | | | | |
| J. Elimination of Trees/Brush | | | | | | | |
| K. Elimination of Burrows | | | | | | | |
| L. Snow and Ice Removal | | | | | | | |
| M. Other | | | | | | | |

## Aesthetic Maintenance

| Facility Item | Date | Date | Date | Date | Date | Date | Date |
|---|---|---|---|---|---|---|---|
| A. Graffiti Removal | | | | | | | |
| B. Grass Trimming | | | | | | | |
| C. Weeding | | | | | | | |
| D. Other | | | | | | | |

---

**Remarks:**

_____

[i] The item checked is in good condition, and the maintenance program is adequate.
[ii] The item checked requires attention, but does not present an immediate threat to the facility function or other facility components.
[iii] The item checked requires immediate attention to keep the facility operational or to prevent damage to other facility components.
[iv] Provide explanation and details if column 2 or 3 is checked.

# ***APPENDIX C***

- **OPERATION AND MAINTENANCE SCHEDULE FOR WET POND**
- **CORRECTIVE AND PREVENTATIVE MAINTENANCE COST ESTIMATE**

# Maintenance Schedule for Wet Pond

| General Maintenance | Interval | Facility Item |
|---|---|---|
| Inspect for Debris | Four Times Annually | Riprap Aprons/Scour Holes |
| Mosquito Habitat | Annually | Inlets, Outlets & Low Flow Channels |
| **Vegetated Areas** | | |
| Mowing / Trimming | Monthly | Grass (Growing Season) |
| Inspect for Erosion | Annually | Vegetated Areas |
| Inspected for Unwanted Tree Growth | Annually | Structure |
| General Inspection | Twice Annually | Vegetation Health |
| **Structural Components** | | |
| Inspected for Cracking | Annually | Structural Components |
| Subsidence, Spalling, Erosion & Deterioration | Annually | Structural Components |
| **Other Maintenance Criteria** | | |
| Time to Drain | Refer to Drainage Report | Basin Performance |

# Corrective and Preventative Maintenance Cost Estimate

| Ref. | Description | Frequency (per year) | Cost | Total |
|---|---|---|---|---|
| **Corrective Maintenance Activities** | | | | |
| 1 | Trash/Debris removal from site | 4 | $200.00 | $800.00 |
| 2 | Trash/Debris removal from Inlets | 4 | $100.00 | $400.00 |
| 3 | Sediment Removal from Basin | 1 | $1,000.00 | $1,000.00 |
| 4 | Structure Repair – If required (basin outlet structures) | 1 | $1,000.00 | $1,000.00 |
| **Preventative Maintenance Activities** | | | | |
| 5 | Lawn/Vegetation Maintenance | 12 | $100.00 | $1,200.00 |
| 6 | Revegetate Bare Surfaces | 2 | $100.00 | $200.00 |

Annual Maintenance Cost: $4,600.00

# ***APPENDIX D***

- **DOCUMENTS**
- **FIELD MANUAL**

## DOCUMENTS

The following documents are attached to the maintenance plan;

- Stormwater Management and Conservation Easement Exhibit
- Stormwater Management and Conservation Easement
- As-Built Drawings with Drainage Plans
- Landscape Plan for the Stormwater Management Measures
- Soil Boring Logs w/Permeability Test/Infiltration Test Results
- Plan Details including liner and aerator specifications

- FIELD MANUAL

Attached is the NJDEP Best Management Practices Field Manual for the Wet Pond.

# Wet Pond
# Basin # 1 on the Location Map

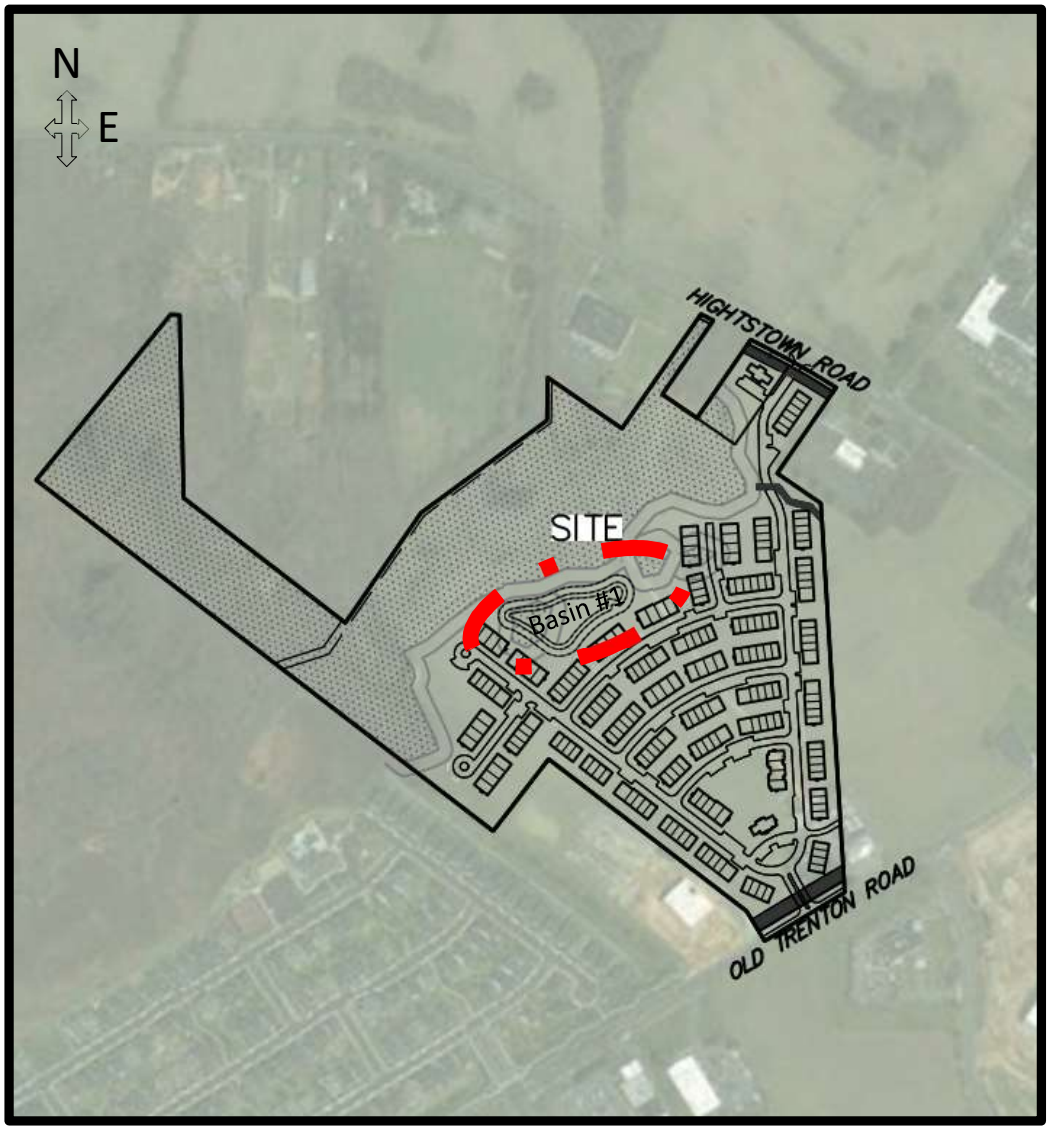
Development Name: **Heritage at West Windsor**

Township, County: West Windsor, Mercer County

Location of Basin: N: 528,877; E: 472,360

Location Description: Northern portion of the property along the wetlands limit to the southeast of Hightstown Road.

Location Map



# Table of Contents

# Wet Pond Overview

## Functionality

Wet ponds, also known as retention basins, are used to address the stormwater quantity and quality impacts of land development. This type of stormwater facility has an elevated outlet structure that creates a permanent pool where stormwater runoff is detained and attenuated. Wet ponds can be designed as multi-stage, multi-function systems; extended detention in the permanent pool provides pollutant treatment for runoff from the Water Quality Design Storm through sedimentation and biological processing; detention and attenuation is also provided for larger storm event through the higher elevation outlets. The total suspended solids (TSS) removal rate is 50 – 90%, depending upon the storage volume in the permanent pool and the duration of detention time, if extended detention is provided.

**Proper care and attention in the long-term maintenance of the stormwater management measure is critically important to the safety and health of the public.**

## Type of BMP – Wet Basin / Extended Detention of Runoff and Settlement of TSS

A wet pond is a type of **wet** basin, in which water is retained in a permanent pool. This wet pond is designed for **extended detention of runoff** and **settlement of TSS**. It is **not** designed to infiltrate runoff.

Wet ponds shall have a water surface elevation approximately at the design water surface elevation year round. If a wet pond has an exposed bottom or a shallow water level, there may be an issue caused by changes to the contributing drainage area, damage to the outlet structure(s), or damage to the bottom liner. An investigation is then required to determine the issue and restore proper function.

# Basic Design Information

This section shall be filled out by the design engineer.

## Hydrology Design Targets

1. The **design detention time** of this pond is approximately 36 hours.
2. This wet pond is design to receive runoff from a drainage area of 29.8 acres.
3. The TSS removal rate of this wet pond is 89%.
4. This basin will be discharged to Bear Brook.

## Hydraulic Design Targets

1. Design parameters

| | **Water Quality Design Storm** | **2-year storm** | **10-year storm** | **100-year storm** |
|---|---|---|---|---|
| **Rainfall Depth (inches)** | 1.25 inch in 2 hours | 3.3 inches in 24 hours | 5.0 inches In 24 hours | 8.3 inches In 24 hours |
| **Runoff Volume (cubic feet)** | 64,730 | 227,034 | 385,811 | 714,209 |
| **Peak Flow Rate (cfs)** | 0.35 | 4.98 | 14.52 | 35.56 |
| **Water Surface Elevation (feet)** | 93.32 | 94.74 | 95.91 | 98.09 |

Note: The design engineer shall fill out the table in accordance with the design of the stormwater management measure. If the item is not applicable, enter **N/A** in the table.

2. The emergency spillway is at EL 98.10 feet.

## Basin Configuration Targets

1. Outlet Information:

| **Outlet Description** | **Outlet Type** | **Orifice Size / Weir Length** | **Invert Elevation** |
|---|---|---|---|
| Water Quality Orifice | Orifice | 3.5” Dia. | 92.00 |
| Outlet #1 | Orifice | 14” H x 26” W | 94.00 |
| Outlet #2 | Orifice | 12” H x 24” W | 96.15 |
| Outlet #3 | Weir | 16’ | 98.05 |

2. This wet pond is designed to have vegetation along its perimeter. Landscaping plans attached.
3. The basin is lined. The liner is constructed of PVC. Plans with details attached.
4. The wet pond does not intercept groundwater.

5. The wet pond is aerated by an aerator. Plans with details attached.
6. The pond is designed without a bottom drain pipe to empty the pond.
7. Safety ledges are installed at 89.5 EL. and 93.0 EL.

**Critical Maintenance Features**

1. Floatables need to be cleaned and removed from the pond.
2. Remove dead vegetation to prevent mosquito problem.
3. The pond needs to maintain aeration or circulation to prevent mosquito problem.
4. Native species when revegetating is preferred.

**Attach the following Disturbance Notices, if applicable to the site:**

**Wetland Disturbance Notice**:
Maintenance of this BMP may disturb a wetland area. Contact NJDEP Division of Land Use Regulation for guidance and any required permit(s) before performing maintenance.

# Visual Aid for Wet Type Stormwater Basin Inspection

Note: Basins shown here include various types of wet basins, not limited to the category of basin in this field manual.

**Issues:** **Algae blooming.**

**Corrective Action:** **Remove algae.**

**Preventative Action:** **Routine inspection and aeration of the pond. Remove algae before blooming. A finding of the nutrient source and method to reduce the nutrient loading may be needed.**


**Issues:** **The outlet grating is covered by trash. Excessive trash in the pond.**

**Corrective Action:** **Clear and remove trash.**

**Preventative Action:** **Routine inspection and removal of trash. A finding of the trash source and method to reduce the trash may be needed.**


**Issues:** **The water level in the wet pond is significantly below the design water surface elevation.**

**Corrective Action:** **Check if the outlet structure or the liner is damaged. Repair any damage.**

**Preventative Action:** **Routine inspection of the basin and the liner.**

**Issues:** **Erosion on the embankment.**

**Corrective Action:** **Repair the embankment. Report to local authority and DEP Dam Safety as required by the local and DEP rules.**

**Preventative Action:** **Construct a riprap apron on the slope. Routine inspection before erosion becomes severe.**

**If the original design information is not available, the pond configuration may signal whether it was designed as a wet basin or dry basin. As shown here, the water level is at the invert elevation of the outlet (orifice behind the trash rack). If the water level is at the first outlet from the basin bottom (this can be determined by checking the inside the outlet box), then it is a wet basin and is at correct water surface level. However, if there is another outlet below the water, then it may signal that it is a failed dry basin now filled with water.**

**Also the pond has a circle of riprap (also known as an energy dissipater) around the edge at the water level. A dry basin will generally not have this configuration; therefore, it suggests a wet pond.**

## Inspection Checklist / Maintenance Actions
## Wet Pond

**Checklist** (circle one)**:** Quarterly / Annual / Monthly / Special Event Inspection

**Checklist No. _____** **Inspection Date: _____**

**Date of most recent rain event: _____**

**Rain Condition** (circle one):
Drizzle / Shower / Downpour / Other _____

**Ground Condition** (circle one):
Dry / Moist / Ponding / Submerged / Snow accumulation

**The inspection items and preventative/corrective maintenance actions listed below represent general requirements. The design engineer and/or responsible party shall adjust the items and actions to better meet the conditions of the site, the specific design targets, and the requirements of regulatory authorities.**

| | For Inspector | | | For Maintenance Crew |
|---|---|---|---|---|
| **Component No. Component Name** | **Inspection Item and Inspection Item No.** | | **Result** | **Preventative / Corrective Maintenance Actions** |
| A1 Pretreatment (Forebay) | 1 | Scouring or erosion is present at inlet structure and/or riprap apron | Y__<br>N__ | Check the flow diversion device before the inlet pipe and whether the bypass flow channel is clogged<br><br>Work Order # _____ |
| | 2 | Clogged pipes or excessive sediment in the forebay | Y__<br>N__ | Remove sediment or debris |
| | 3 | Damaged outlet structure (e.g., cracking, subsidence, spalling, erosion, or deterioration) | Y__<br>N__ | Repair or replace the outlet structure<br><br>Work Order # _____ |
| A2 Pretreatment (MTD, if installed) | 1 | MTD inspection | Y__<br>N__ | (If a MTD is used for pretreatment, see manufacturer's maintenance manual) |
| A3 Pretreatment (Structural BMP) | 1 | BMP No. _____ inspection | Y__<br>N__ | (See BMP No. _____ Field Manual) |
| Note: | | | | |

| | For Inspector | | | For Maintenance Crew |
|---|---|---|---|---|
| **Component No. Component Name** | **Inspection Item and Inspection Item No.** | | **Result** | **Preventative / Corrective Maintenance Actions** |
| B<br>Pond Area | 1 | The water level in the pond is below the design water surface elevation | Y__<br>N__ | Check for:<br>*Changes in inflow<br>*patterns (less runoff,<br>*lower groundwater table)<br>*Damages to the outlet structure<br>*Damages to the liner (if applicable)<br><br>Repair any structural damages<br><br>Work Order # _____ |
| | 2 | Islands or shallow marsh emerging out of the pond | Y__<br>N__ | Check whether there is excessive sediment in the pond<br><br>Check whether the incoming flow has excessive sediment<br><br>Find the source of excessive sediment and method to reduce the source<br><br>Remove excessive sediment<br><br>Work Order # _____ |
| | 3 | The observed detention time is longer than the design detention time.<br><br>The observed detention time is approximately _____ hours. | Y__<br>N__ | Check whether the outlets are clogged, see section E-Outlet of this checklist |
| Note: | | | | |

| | For Inspector | | | For Maintenance Crew |
|---|---|---|---|---|
| **Component No. Component Name** | **Inspection Item and Inspection Item No.** | | **Result** | **Preventative / Corrective Maintenance Actions** |
| B<br>Pond Area | 4 | Debris or trash floating on the water | Y__<br>N__ | Remove debris and trash<br><br>If trash and debris are excessive, find the source and the method to reduce the source. |
| | 5 | Excessive dead vegetation in the pond | Y__<br>N__ | Clear and remove vegetation |
| | 6 | Mosquito breeding | Y__<br>N__ | Aerate or circulate the pond<br><br>Remove dead vegetation<br><br>Consult local mosquito commission for guidance<br><br>Work Order # _____ |
| | 7 | Presence of domestic waterfowl and wildlife | Y__<br>N__ | Minimize mowing at the perimeter of the pong with a no-mow fringe to keep waterfowl from accessing the pond<br><br>Contact NJDEP - Division of Fish and Wildlife for guidance and permits to capture and release |
| Note: | | | | |

| | For Inspector | | | For Maintenance Crew |
|---|---|---|---|---|
| **Component No. Component Name** | **Inspection Item and Inspection Item No.** | | **Result** | **Preventative / Corrective Maintenance Actions** |
| B<br>Pond Area | 8 | Erosion on pond side | Y__<br>N__ | Check whether the surrounding area has uncontrolled drainage into the pond<br><br>Install an energy dissipater to slow down the incoming flow (e.g. deep-rooted riparian vegetation or bioengineering method)<br><br>Check if the liner is damaged (if a liner is installed)<br><br>Work Order # _____ |
| | 9 | Liner of the basin is visible and is damaged (if applicable) | Y__<br>N__ | Repair the liner<br><br>Work Order # _____ |
| | 10 | The aerator/fountain is not working | Y__<br>N__ | Refer to the manufacturer's Operation and Maintenance Manual.<br><br>Work Order # _____ |
| **Note: If emptying the pond is required before sediment removal, it shall be noted that a permit may be required before discharging the pond water. Contact NJDEP Division of Land Use Regulation before discharge**<br><br>Note: | | | | |

| | For Inspector | | | For Maintenance Crew |
|---|---|---|---|---|
| **Component No. Component Name** | **Inspection Item and Inspection Item No.** | | **Result** | **Preventative / Corrective Maintenance Actions** |
| C<br>Vegetation | 1 | Invasive plants are present | Y__<br>N__ | Remove the invasive plants and restore the vegetation in accordance with the landscaping plan<br><br>Work Order # _____ |
| | 2 | Algae blooming | Y__<br>N__ | Remove algae<br><br>Aerate the pond<br><br>Find the nutrient source and the solution to reduce the nutrient loading<br><br>Work Order # _____ |
| D<br>Pond Embankment and Side Slopes | 1 | Signs of erosion, soil slide or bulges, seeps and wet spots, loss of vegetation, or erosion on the basin slope | Y__<br>N__ | Check for excessive overland runoff flow through the embankment.<br><br>Check for any sink hole development<br><br>Direct the overland runoff to the forebay or pretreatment area<br><br>Restabilize the bank<br><br>Work Order # _____ |
| Note: | | | | |

| | For Inspector | | | For Maintenance Crew |
|---|---|---|---|---|
| **Component No. Component Name** | **Inspection Item and Inspection Item No.** | | **Result** | **Preventative / Corrective Maintenance Actions** |
| E Outlet | 1 | Trash or debris accumulation more than 20% | Y__<br>N__ | Clean and remove<br>Determine source of trash and address to reduce future maintenance costs or basin failure |
| | 2 | Trash rack is damaged or rusted greater than 50%<br>Trash rack is bent, loose, or missing parts | Y__<br>N__ | Repair or replace trash rack<br>Work Order #_____ |
| | 3 | Outlet components (e.g., orifice plates or weir plate) skewed, misaligned, or missing | Y__<br>N__ | Repair or replace component<br>Work Order #_____ |
| | 4 | Discharge pipe apron is eroded or scoured | Y__<br>N__ | Restabilize the discharge riprap apron<br>Work Order #_____ |
| | 5 | Standing water is present in the outlet structure longer than 72 hours | Y__<br>N__ | Pump out the standing water<br>Work Order # _____ |
| F Emergency Spillway | 1 | Trees or excessive vegetation present | Y__<br>N__ | Remove trees and roots, and restore berms if necessary<br>Work Order #_____ |
| | 2 | Damaged structure | Y__<br>N__ | Repair<br>Work Order #_____ |
| Note: | | | | |

| | For Inspector | | | For Maintenance Crew |
|---|---|---|---|---|
| **Component No. Component Name** | **Inspection Item and Inspection Item No.** | | **Result** | **Preventative / Corrective Maintenance Actions** |
| G Miscellaneous | 1 | Fence: broken or eroded parts | Y__<br>N__ | Repair or replace<br>Work Order #_____ |
| | 2 | Gate: missing gate or lock | Y__<br>N__ | Repair or replace<br>Work Order #_____ |
| | 3 | Sign/plate: tiled, missing, or faded | Y__<br>N__ | Repair or replace<br>Work Order #_____ |
| | 4 | Excessive or overgrown vegetation blocking access to the basin | Y__<br>N__ | Clear, trim, or prune the vegetation to allow access for inspection and maintenance<br>Work Order #_____ |
| Note: | | | | |

**Follow Up Items (Component No. / Inspection Item No.):**
_(e.g., B/1, C/2)_____

**Associated Work Orders: # _____, # _____, # _____, # _____, # _____**

_____ _____ _____
**Inspector Name** **Signature** **Date**

**Report issues to the local authority and mosquito commission as required by local ordinances and regulatory authorities.**
**File this checklist in the Maintenance Log after performing maintenance.**

# Preventative Maintenance Record

Corresponding Checklist No. _____
Component No._____, Inspection Item No._____

**Work Logs**

| Activities | Components | Date Completed |
|---|---|---|
| Sediment/debris removal **Sediment removal should take place when the basin is thoroughly dry.** | A1/A2/A3 – Pretreatment | |
| | B – Pond Area | |
| | D – Pond Embankment and Side Slopes | |
| | E – Outlet | |
| | | |
| Vegetation removal | A1/A2/A3 – Pretreatment | |
| | B – Pond Area | |
| | D – Pond Embankment and Side Slopes | |
| | E – Outlet | |
| | F – Emergency Spillway | |
| | | |
| (List additional tasks, if applicable) | | |

Vegetation is removed by _____ (type of equipment) with minimum disruption to the remaining vegetation.

All use of fertilizers, pesticides, mechanical treatments, and other means to ensure optimum vegetation health must not compromise the intended purpose of the stormwater management measure. The fertilizer applied is _____ (type), and _____ (quantity per usage) is applied _____ (frequency of use).

Debris, sediment, and trash are handled (onsite / by _____ (contractor name) to disposal site _____). (See Part I: Maintenance Plan – Disposal Plan Section)

**Crew member:_____/_____ Date: _____**
(name/ signature)

**Supervisor:_____/_____ Date: _____**

**A permit may be required to discharge when emptying the pond. Contact NJDEP Division of Land Use Regulation before discharging.**
**File this Preventative Maintenance Record in the Maintenance Log after performing maintenance**

# Corrective Maintenance Record

1. **Work Order # _____ Date Issued _____**

2. **Issue to be resolved**:
(e.g., orifice plate is loose and bent)

3. The issue was from **Corresponding Checklist No. _____, Component No.** (e.g., E – Outlet), **Inspection Item No.___** (e.g., 2, 3) **_____.**

4. **Required Actions**

| Actions | Planned Date | Date Completed |
|---|---|---|
| New bolts to fix the orifice plate | | |
| Repair/replace the trash rack | | |
| Restabilize side slope (indicate location) | | |
| Repair riprap apron with 100 cubic yards of aggregate | | |
| Revegetate | | |
| (If there are additional tasks, list them here.) | | |

5. **Responsible person(s):**
_____

6. **Special requirements**
   - Time of the season or weather condition:_____
   - Tools/equipment:_____
   - Subcontractor (name or specific type):_____

**Approved by** _____/_____ **Date** _____
(name/signature)

**Verification of completion by** _____/_____ **Date** _____
(name/signature)

**File this Corrective Maintenance Record in the Maintenance Log after performing maintenance**