

STORMWATER MANAGEMENT OPERATION & MAINTENANCE MANUAL

For the Proposed

Newell Place

**Wemple Road
Town of Bethlehem
ALBANY COUNTY
STATE OF NEW YORK**

PREPARED BY:

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LIST OF APPENDICIES

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I. GENERAL PROJECT INFORMATION

A. Project Name and Location

Newell Place
Wemple Road
Bethlehem, NY
Area of Site: 53.91± Ac.

B. Engineer of Record for Stormwater Design

Ingalls & Associates, LLP
C/o David F. Ingalls, P.E.
2603 Guilderland Ave
Phone: (518)393-7725
Schenectady, NY 12306

C. Project and Site Description

The proposed project, Newell Place, is a 51-unit residential development located in the Town of Bethlehem, Albany County. The proposed conservation subdivision consists of the development of 51 single-family lots (including 1 existing dwelling) and associated utilities including water, sanitary sewer and stormwater facilities on the 53.9± acre site. Tax Map ID 97.00-1-11.1 references the site.

The majority of runoff produced from the (51) lots will be routed through the Green Infrastructure Techniques including rain gardens, dry swales, tree plantings and filter strips. Treatment of the required water quality volume will be provided through the combination of Green Infrastructure Techniques and SMP's prior to leaving the site. The outlets have also been sized to provide appropriate downstream channel protection for the one-year storm event (2.5"), and peak outflow control for the 10-year (4.5") and the 100-year (6.5") events. Soil disturbing activities will include:

- A. Construction of temporary construction entrance & exit points for the phase under construction,
- B. Installation of the perimeter silt fence for the phase under construction,
- C. Clearing and grubbing of the phase of the project under construction,
- D. Begin rough grading of development area, taking care to establish temporary swales to divert runoff to temporary sediment basin; stabilize cut and fill slopes as work progresses;
- E. Initial stabilization, by seeding and mulching, of the disturbed areas within the project,
- F. Construction of utilities
- G. Construction of buildings, along with their utility services.

H. Final grading and seeding of disturbed areas.

D. Maintenance & Inspection Schedule During Site Construction Activities

NEW INSTALLATIONS

Check the condition of the devices after every runoff event for the first 30 days. The visual inspection needs to ascertain that the devices are functioning properly (no blockages and/or obstructions to inlet and outlet devices), measuring the amount of solid materials that have accumulated in the devices, embankments do not show signs of failures, and that the devices are in satisfactory condition. Record findings and clean as required.

ONGOING OPERATION

During the rainfall season, the devices will be inspected at least once every week. The devices should be cleaned as determined by the inspections. Cleanout of the devices at the end of the rainfall season is recommended because of the nature of pollutants collected and the potential for odor generation from the decomposition of material collected and retained.

E. Recordkeeping Requirements

The owner shall keep and maintain all of the inspection reports established during the construction phase and post-construction phase of the project in the appropriate appendices in the SWPPP binder located on-site. These reports shall be readily available for inspection. The owner shall provide copies of these reports to the Town of Bethlehem, NYS DEC, and/or the Engineer of Record, as requested.

II. CONSTRUCTION OF STORMWATER FACILITIES

A. SHOP DRAWING & SUBMITTAL REVIEW

The structural design for all devices shall be completed by a N.Y.S. Licensed Professional Engineer, based on the loading, materials, and dimensions shown on the plans. The shop drawings for each device and specification sheets for all materials will be submitted to the Engineer of Record for this project for approval. Once approved by the engineer of record, copies of this approval will be submitted to the Owner and the contractor for their use. No unit is to be constructed or installed without having the Engineer of Record's approval.

B. INSTALLATION INSPECTION

The Engineer of Record, or an employee under his/her direct supervision, will inspect and document the subsurface conditions, including virgin material directly beneath the devices, prior to commencement of installation. The Engineer of Record, or an employee under his/her direct supervision, will witness the installation of the controlled fill placement within the embankments. The fill is to be placed in a maximum of 12" lifts and compacted to a minimum of 90% of the maximum dry density as established by a Modified Proctor Compaction Test (ASTM D-1557). All lab and field geotechnical testing is to be done by a qualified, licensed independent company who will be contracted by the Owner.

C. CERTIFICATION OF DEVICES

As each device is installed, the Engineer of Record will submit a document certifying to the Owner that the unit was installed per the approved plans, shop drawings, SWPPP, and Operations & Maintenance documents. If any modifications were made to any of the before-mentioned documents, appropriate documentation is to be submitted to the Owner along with this certification.

D. OTHER DOCUMENTATION

Provide periodic verbal updates and copies of documentation to the Town of Bethlehem Engineering Division, if requested.

E. CONSTRUCTION INSPECTION REPORT FORMS

The Engineer of Record, or an employee under his/her direct supervision, is to use the Inspection Forms found in Appendix A of this manual for this project. Detailed specifications can be found on the approved plans.

III. FACILITY OPERATION

F. RECOMMENDATIONS TO OWNER

During construction, it is imperative that any catch-basin and/or open-mouthed culvert be protected, as much as possible, from debris and sediment. The proper catch-basin inlet protection devices, which include the use of a drop inlet protection device, need to be installed and maintained in good operating conditions. Trash racks, as well as silt fence protection devices and/or check dams, will be installed at the inlets of the open-mouthed culverts feeding into the stormwater conveyance systems to keep large debris and sands from entering into these systems. By eliminating or reducing the amounts of solids and debris entering into these devices, the less maintenance and damage to the devices will occur.

G. EMERGENCY ACTION PLAN

Should an emergency condition resulting from extreme weather conditions or a structural failure of the facility occur, please contact the applicant. If outside of normal business hours, please use the emergency phone number provided in section I.B of this manual.

IV. FACILITY INSPECTION

A. ROUTINE INSPECTIONS

During the installation of each device, the engineer of record for the project, or an employee directly under his/her supervision, shall be present for the inspections and complete the inspection forms found in Appendix A of this manual for this project.

B. PERIODIC INSPECTIONS

Each device will be inspected by the engineer of record or his representative once every seven days during the construction phase of the project.

C. INSPECTION REPORT FORM

See Appendix A of this manual for inspection forms to be used for these structures during the construction phase.

V. FACILITY MAINTENANCE AFTER FULL BUILD-OUT

A. REGULARLY SCHEDULED MAINTENANCE

The devices will be inspected once every year. However, should the periodic inspections determine that a more frequent inspection and cleaning schedule is needed, a modification to this maintenance schedule will be performed and all parties will be notified of this modification. If any of the devices' internal components are damaged or missing, please contact the owner who will in turn make arrangements to have the damaged items repaired or replaced.

B. MAINTENANCE PLAN

Use the inspection forms located in Appendix B of this manual for the inspection forms that are to be used after the installation of the units and the construction of the immediate area of the project around these devices is completed.

C. RAIN GARDENS

- A. Garden shall be routinely maintained and will require occasional replacement of plants, mulching, weeding, and thinning.
- B. Proper care shall be taken to weed and water especially in the first year.
- C. Sediment accumulations or heavy organic matter should be removed as necessary.
- D. The earthen berm and spillway shall be inspected for possible erosion and failures and repaired as necessary.
- E. Vegetation shall be monitored to ensure adequate cover and root growth. Plants should stand upright and shall be pruned if they start to get floppy.

D. DRY & WET SWALES

- A. The dry swale shall be routinely mowed to an average vegetative height of 4"-6".
- B. Owner shall not fill or otherwise alter the final grade of the swale.
- C. Any debris or sediment shall be cleaned from the swale as necessary.

E. BIORETENION

- A. Sediment should be removed once filtering capacity diminishes or 50% of the total capacity is lost.
- B. Trash and debris shall be removed as necessary.
- C. Stone drop along the inlet shall be repaired as necessary.
- D. Embankments and emergency spillways shall be inspected for possible erosion and failures.
- E. Mulch layer should be replaced annually.
- F. Vegetation should be maintained and pruned annually to remove dead and dying plant material.

- G. Vegetation shall be monitored for disease and to ensure adequate cover and root growth. Plantings may require replacement through-out the life-cycle of the garden.

F. STORMWATER DETENTION PONDS

- A. Sediment should be removed once a year or once 50% of the total capacity is lost.
- B. The grass within the pond should be mowed at least 3 times per growing season, limiting the grass height of no more than 12”.
- C. Embankments and emergency spillways shall be inspected for possible erosion and failures.
- D. Outlet protection rip-rap shall be inspected and any failures shall be repaired.
- E. Vegetation and ground cover shall be monitored to ensure adequate cover. If ground cover has not adequately been established, additional planting may be required.

F. UNSCHEDULED MAINTENANCE

In cases of emergencies, please contact the owner with any information pertinent to the devices to facilitate any unscheduled maintenance. The owner will then make the necessary arrangements with all parties involved to initiate the appropriate maintenance measures.

G. LONG TERM MAINTENANCE AGREEMENT

The HOA will be responsible for maintenance of the individual rain gardens. The Town of Bethlehem highway department will be responsible for maintenance of the ponds, wet swale and closed drainage system within Town right of ways and storm pond parcels.

APPENDIX B

MAINTENANCE INSPECTION CHECKLISTS

Bioretention Operation, Maintenance and Management Inspection Checklist

Project:
Location:
Site Status:

Date:

Time:

Inspector:

MAINTENANCE ITEM	SATISFACTORY / UNSATISFACTORY	COMMENTS
1. Debris Cleanout (Monthly)		
Bioretention and contributing areas clean of debris		
No dumping of yard wastes into practice		
Litter (branches, etc.) have been removed		
2. Vegetation (Monthly)		
Plant height not less than design water depth		
Fertilized per specifications		
Plant composition according to approved plans		
No placement of inappropriate plants		
Grass height not greater than 6 inches		
No evidence of erosion		
3. Check Dams/Energy Dissipaters/Sumps (Annual, After Major Storms)		
No evidence of sediment buildup		

MAINTENANCE ITEM	SATISFACTORY / UNSATISFACTORY	COMMENTS
Sumps should not be more than 50% full of sediment		
No evidence of erosion at downstream toe of drop structure		
4. Dewatering (Monthly)		
Dewaterers between storms		
No evidence of standing water		
5. Sediment Deposition (Annual)		
Swale clean of sediments		
Sediments should not be > 20% of swale design depth		
6. Outlet/Overflow Spillway (Annual, After Major Storms)		
Good condition, no need for repair		
No evidence of erosion		
No evidence of any blockages		
7. Integrity of Filter Bed (Annual)		
Filter bed has not been blocked or filled inappropriately		

Comments:

Actions to be Taken:
