STORMWATER MANAGEMENT MAINTENANCE PLAN

For

Home for the Armenian Aged, Inc.

70 Main Street

Block 702, Lot 2

EMERSON

BERGEN COUNTY, NEW JERSEY

PREPARED BY:

LAPATKA ASSOCIATES, INC.
12 ROUTE 17 NORTH, SUITE 230
PARAMUS, NEW JERSEY 07652
(201) 587-1600

PROJECT #03-223

Date: March 24, 2025

DANIEL J. LAMOTHE, PE 42254

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Stormwater Maintenance Contact:

- *Kevin McDonald, Regional Physical Plant Operations*
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The person doing maintenance must be qualified to properly perform the necessary maintenance and keep a detailed log of all preventative and corrective maintenance, including a record of all inspections and copies of maintenance-related work orders, as well as evaluating the effectiveness of the maintenance plan at least once per year and adjust the plan as needed. **As an enforcement mechanism, yearly inspection reports will be required to be submitted to the Borough Engineer. The Borough is given the permission to access the property in order to address maintenance should the property owner not adhere to the maintenance schedule.**

In the event that the stormwater management facility becomes a danger to public safety or public health, or if it is in need of maintenance or repair, the municipality shall notify the responsible person in writing. Upon receipt of that notice, the responsible person shall have 14 days to effect maintenance and repair of the facility in a manner that is approved by the municipal engineer or his designee. The municipality, in its discretion, may extend the time allowed for effecting maintenance and repair for good cause. If the responsible person fails or refuses to perform such maintenance and repair, the municipality of County may immediately proceed to do so and shall bill the cost to the responsible person. Nonpayment of such bill may result in a lien on the property.

Summary:

- The project includes the following stormwater management components:

  1. Small-Scale Bioretention System
  2. Pervious Paving Systems

- See attached Appendix A - Stormwater Management Location Map for locations.

Preventive Maintenance Tasks:

- Preventative and corrective maintenance shall be performed to maintain the function of the stormwater management facility, including repairs to the structures; removal of sediment, debris, or trash; restoration of eroded areas; snow and ice removal; fence repair or replacement; restoration of vegetation; and repair or replacement of non-vegetated linings

- All use of fertilizers, mechanical treatments, pesticides and other means to assure optimum vegetation health must not compromise the intended purpose of the bioretention system. All vegetation deficiencies should be addressed without the use of fertilizers and pesticides whenever possible.

- Mowing and/or trimming of vegetation must be performed on a regular schedule based on specific site conditions.

- Sediment removal should take place when all runoff has drained and the stormwater management facility is dry.

- 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.

- Maintenance personnel to be properly trained to perform specific tasks, such as confined space entry.

- Stormwater BMPs may not be used for stockpiling of plowed snow and ice, compost, or any other material.

General Maintenance Schedule:

- All Stormwater system components expected to receive and/or trap debris and sediment must be inspected for clogging and excessive debris and sediment accumulation at least ***four times annually as well as after every storm exceeding 1 inch of rainfall***. Such components include inlets, storm manholes, detention systems and storm water filters.

- All structural components must be inspected for cracking, subsidence, spalling, erosion, and deterioration ***at least once annually.***

- Mowing and 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 the 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.

- ***Bi-weekly*** inspections are required when establishing/restoring vegetation.

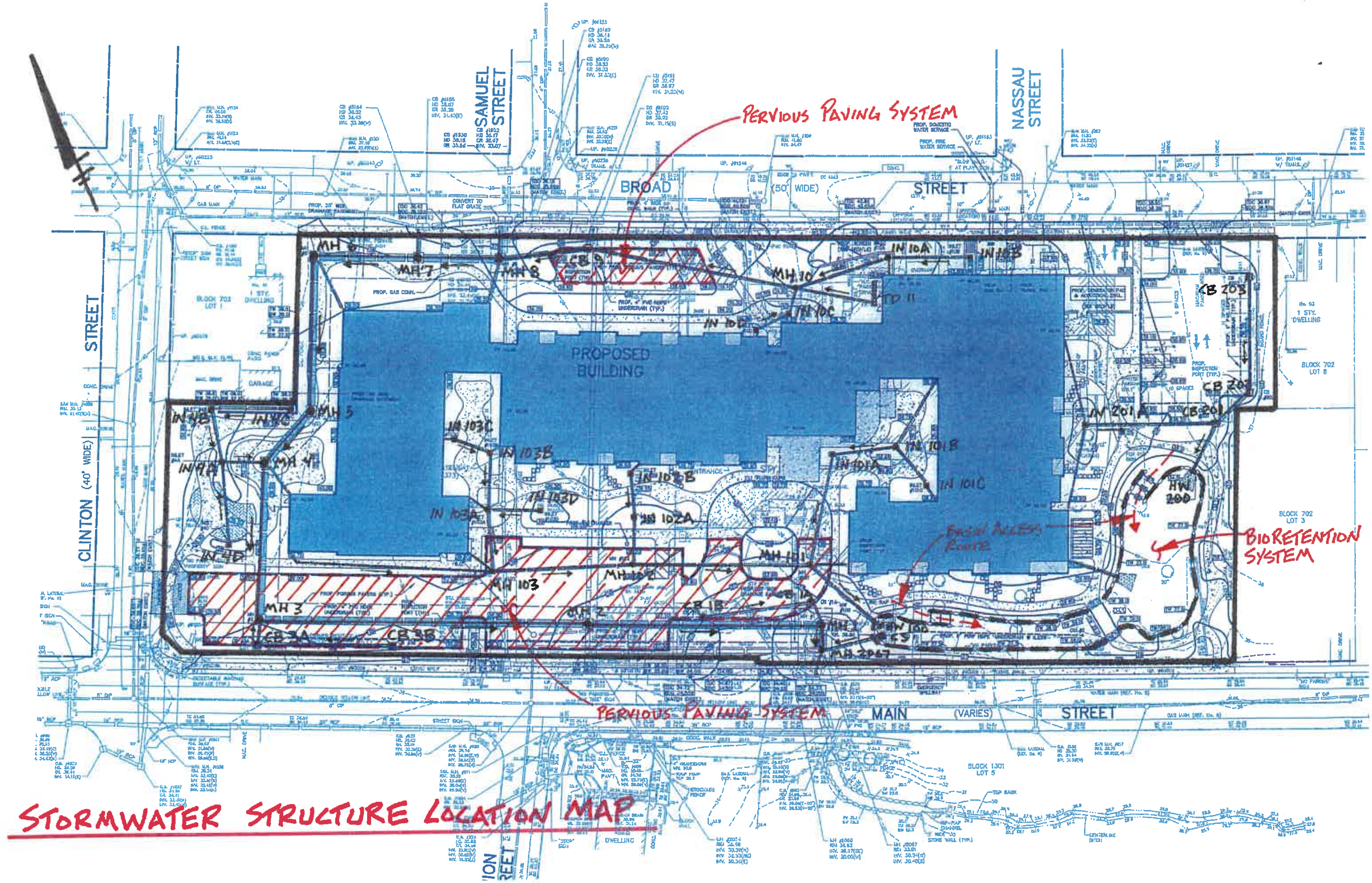
- ***A minimum of one inspection during the growing season and one inspection during the non-growing season*** is required to ensure the health, density and diversity of the vegetation.

- The permeable paved areas and the small-scale bio-retention systems are to be maintained in accordance with NJDEP guidelines attached. (Appendix C and Appendix D)

Appendix A

Stormwater Structure Location Map

STORMWATER STRUCTURE LOCATION MAP



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Appendix B

Sample Maintenance & Inspection Report

Sample Stormwater Management Maintenance and Inspection Data Sheet

Personnel: ______________________________ **Date:** ______________

Structure Inspection:

		MH #2067	CONTROL STRUCTURE	MH #1	CB #1A	CB #1B		
Oil and Grease Accumulation	Yes / No							
Sediment accumulation:	Yes / No							
Structural Damage:	Yes / No							
Trash and Debris Removed	Yes / No							

		MH #2	MH #3	CB 3A	CB #3B			
Oil and Grease Accumulation	Yes / No							
Sediment accumulation:	Yes / No							
Structural Damage:	Yes / No							
Trash and Debris Removed	Yes / No							

		MH #4	INLET #4A	INLET #4B	INLET #4C	INLET #4D		
Oil and Grease Accumulation	Yes / No							
Sediment accumulation:	Yes / No							
Structural Damage:	Yes / No							
Trash and Debris Removed	Yes / No							

		MH #5	MH #6	MH #7	MH #8	CB #9		
Oil and Grease Accumulation	Yes / No							
Sediment accumulation:	Yes / No							
Structural Damage:	Yes / No							
Trash and Debris Removed	Yes / No							

Required Repairs:

Comments: *(Attach photos if needed)*

Drainage Area Report:

Excessive Oil and Grease Loading	Yes / No		If Yes, Source: ______________________
Sediment accumulation on pavement	Yes / No		If Yes, Source: ______________________
Erosion of Landscaped Areas	Yes / No		If Yes, Source: ______________________

Sample Stormwater Management Maintenance and Inspection Data Sheet

Personnel: ______________________ **Date:** ______________

Structure Inspection:

		MH #10	INLET #10A	INLET #10B	INLET #10C	INLET #10D	TRENCH DRAIN #11	
Oil and Grease Accumulation	Yes / No							
Sediment accumulation:	Yes / No							
Structural Damage:	Yes / No							
Trash and Debris Removed	Yes / No							

		HW #100	MH #101	INLET #101A	INLET #101B	INLET #101C		
Oil and Grease Accumulation	Yes / No							
Sediment accumulation:	Yes / No							
Structural Damage:	Yes / No							
Trash and Debris Removed	Yes / No							

		MH #102	INLET #102A	INLET #102B				
Oil and Grease Accumulation	Yes / No							
Sediment accumulation:	Yes / No							
Structural Damage:	Yes / No							
Trash and Debris Removed	Yes / No							

		MH #103	INLET #103A	INLET #103B	INLET #103C	INLET #103D		
Oil and Grease Accumulation	Yes / No							
Sediment accumulation:	Yes / No							
Structural Damage:	Yes / No							
Trash and Debris Removed	Yes / No							

		HW #200	CB #201	INLET #201A	CB #202	CB #203	HW #300	
Oil and Grease Accumulation	Yes / No							
Sediment accumulation:	Yes / No							
Structural Damage:	Yes / No							
Trash and Debris Removed	Yes / No							

Required Repairs:

Comments: *(Attach photos if needed)*

Drainage Area Report:

Excessive Oil and Grease Loading	Yes / No		If Yes, Source: ______________
Sediment accumulation on pavement	Yes / No		If Yes, Source: ______________
Erosion of Landscaped Areas	Yes / No		If Yes, Source: ______________

Appendix C

Small-Scale Bioretention System

Maintenance

Regular and effective maintenance is crucial to ensure effective small-scale bioretention system performance. There are a number of required elements in all maintenance plans, pursuant to N.J.A.C. 7:8-5.8; these are discussed in more detail in *Chapter 8: Maintenance of Stormwater Management Measures*. Furthermore, maintenance activities are required through various regulations, including the New Jersey Pollutant Discharge Elimination System (NJPDES) rules, N.J.A.C. 7:14A. Specific maintenance requirements for bioretention systems are presented below; these requirements must be included in the maintenance plan. Detailed inspection and maintenance logs must be maintained.

General Maintenance

- Proper and timely maintenance is essential to continuous, effective operation; therefore, an access route must be incorporated into the design, and it must be properly maintained.
- All structural components must be inspected, at least once annually, for cracking, subsidence, spalling, erosion and deterioration.
- Components expected to receive and/or trap debris and sediment must be inspected for clogging at least four times annually, as well as after every storm exceeding 1 inch of rainfall.
- Sediment removal must take place when all runoff has drained from the planting bed and the basin is dry.
- 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.
- In systems with underdrains, the underdrain piping must be connected, in a manner that is easily accessible for inspection and maintenance, to a downstream location.
- Access points for maintenance are required on all enclosed areas within a small-scale bioretention system; these access points must be clearly identified in the maintenance plan. In addition, any special training required for maintenance personnel to perform specific tasks, such as confined space entry, must be included in the plan.
- Stormwater BMPs may not be used for stockpiling of plowed snow and ice, compost, or any other material.
- A detailed, written log of all preventative and corrective maintenance performed on the small-scale bioretention system must be kept, including a record of all inspections and copies of maintenance-related work orders. Additional maintenance guidance can be found at https://www.njstormwater.org/maintenance_guidance.htm.

Vegetated Areas

- Bi-weekly inspections are required when establishing/restoring vegetation.
- A minimum of one inspection during the growing season and one inspection during the non-growing season is required ensure the health, density and diversity of the vegetation.
- 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.

- Grasses within the small-scale bioretention system must be carefully maintained with lightweight equipment, such as a hand-held line trimmer, in order to maintain the permeability of the system.
- Vegetative cover must be maintained at 85%; damage must be addressed through replanting in accordance with the original specifications.
- 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 bioretention system.

Drain Time

- The planting bed should be inspected at least twice annually to determine if the permeability of the bed has decreased.
- The design drain time for the maximum design storm runoff volume must be indicated in the maintenance manual.
- If the actual drain time is significantly different from the design drain time, the components must be evaluated, and appropriate measures taken to return the bioretention system to the original tested as-built condition.
- If the bioretention system fails to drain the Water Quality Design Storm within 72 hours, corrective action must be taken and the maintenance manual revised accordingly to prevent similar failures in the future.
- The water surface elevation for each of the design storms must be indicated on the maintenance plan and in the maintenance logs to facilitate inspections. It is suggested that indelible markings be drawn or physical markers be set on the inside of the outlet control structure as visual indicators of the design storm water surface elevations.

Appendix D

Pervious Paving System

Maintenance

Regular and effective maintenance is crucial to ensure effective pervious paving system performance; in addition, maintenance plans are required for all stormwater management facilities on a major development. In addition to the manufacturer's maintenance requirements, there are a number of required elements in all maintenance plans, pursuant to N.J.A.C. 7:8-5.8; these are discussed in more detail in *Chapter 8: Maintenance of Stormwater Management Measures*. Furthermore, maintenance activities are required through various regulations, including the New Jersey Pollutant Discharge Elimination System (NJPDES) rules, N.J.A.C. 7:14A. Specific maintenance requirements for pervious paving systems are presented below; these requirements must be included in the maintenance plan for pervious paving systems. Detailed inspection and maintenance logs must be maintained.

General Maintenance

- Failure to correctly maintain a pervious paving system will shorten its lifespan or result in system failure; therefore, the maintenance plan must ensure proper training of personnel and include the special equipment necessary in accordance with the industry's or manufacturer's requirements.
- The surface course must be inspected after every storm exceeding 1 inch of rainfall. If mud or sediment is tracked onto the surface course, it must be removed as soon as possible. Removal should take place when all runoff has drained from the surface course.
- The surface course must be inspected, at least once annually, for cracking, subsidence, spalling, erosion, deterioration and unwanted vegetation. Remedial measures must be taken as soon as possible. Herbicides must not be applied.
- The surface course of a pervious paving system must be vacuum swept, not power swept, at least four times per year. Vacuum sweeping must be followed by either air blowing or high-pressure power washing performed in accordance with the specifications recommended for the particular type of system. All dislodged material must be promptly removed.
    - The first annual maintenance must be performed in the spring.
    - Maintenance must additionally be performed in the autumn, after the fallen leaves are collected and removed.

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- Each spring, after the last snow or ice event, the infiltration rate of the surface course must be tested in accordance with the methods of either ASTM C1701 or C1781, as corresponds to the post-construction test performed for the system. At least 3 locations must be tested. One of the locations must be in an area where sediment is most likely to be deposited, such as, but not limited to, a parking lot entrance. The other test locations must be evenly spaced across the system surface. The locations and results obtained must be recorded in the maintenance plan for future reference and compared to the as-built testing results as a metric for determining if a system requires corrective action. The chart provided below shows the approximate infiltration rate based upon the time it takes to infiltrate either 8 or 40 pounds of water specified in the above-cited tests. This chart should be included in the maintenance plan for future reference. The infiltration rate, I, is based upon the following calculation:

$$I = (K * M) / (D^2 * t), \text{ where}$$

K = 126,870 in-lbs
M = water mass, lbs
D = ring diameter = 12 inches
t = time, in seconds

Test Methods Per ASTM C1701 or C1781		
Time to Infiltrate the Specified Amount of Water (seconds)	**Approximate Surface Infiltration Rate (inches per hour)**	
	***M* = 8 lbs**	***M* = 40 lbs**
30	235	1175
60	118	587
100	70.5	352
200	35.2	176
350	20.1	100.7
360	19.6	97.9
380	18.5	92.7
900	7.8	39.2
1760	4.0	20.0
1910	3.7	18.5
3600	2.0	9.8
5400	1.3	6.5
5470	1.3	6.4
6000	1.2	5.9

Take note that should the test be performed with a different quantity of water, the values in the chart above cannot be used.

- Corrective action must be immediately taken to restore the infiltration capacity of the pervious paving system under the following scenarios:
  - ☐ Standing water is observed on the surface course; or
  - ☐ The testing methods above show an infiltration rate of 20 inches per hour or less for a system designed for quantity control or 6.4 or less for a system designed for water quality control only.
- 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.
- Under no circumstances may any sealants or coatings be applied to pervious paving systems, except for those approved by the manufacturer to improve surface course resistance to de-icing chemicals or refresh traffic striping.
- Over the lifetime of the surface course, no more than 10% of its surface area may be patched with impervious material such as bituminous asphalt or concrete. All patching must be recorded in the maintenance manual for future reference to prevent exceedance of this maximum.
- A detailed, written log of all preventative and corrective maintenance performed on the pervious paving system must be kept, including a record of all inspections and copies of maintenance-related work orders. Additional maintenance guidance can be found at https://www.njstormwater.org/maintenance_guidance.htm.

Storage Bed Drain Time

- The approximate drain time for the maximum design storm runoff volume below the top of the surface course must be indicated in the maintenance manual.
- If the actual drain time is significantly different from the design drain time, the components and groundwater levels must be evaluated and appropriate measures taken to return the pervious paving system to minimum and maximum drain time requirements.
- If the system fails to drain the maximum design storm volume within 72 hours, corrective action must be taken.

Cold Weather Maintenance

- Care must be taken when removing snow from the surface course; pervious paving surface courses may be damaged by snowplows or loader buckets set too low to the ground or not equipped with a rubber blade guard. Sand, grit or cinders may not be used on surface courses for snow/ice control.
- De-icing chemicals may not be used on pervious concrete less than one year old.
- De-icers containing magnesium chloride, calcium magnesium acetate or potassium acetate may never be used on pervious concrete.