

34 Park Avenue – PO Box 426
LYNDHURST, NEW JERSEY 07071
Tel: 201.939.8805 • Fax: 201.939.0846



1119 Raritan Road – Suite 2
CLARK, NEW JERSEY 07066
Tel: 201.939.8805 • Fax: 732.943.7249
Received in Land Division

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FEB 18 2021

PB/ZBA Office City Hall, Rm 403
City of Elizabeth, NJ 07201

STORMWATER MAINTENANCE MANUAL
FOR
ENGEL PROPERTIES
538 – 546 MORRIS AVENUE
TAX ACCOUNTS #11-794A, #11-795 & #11-90
CITY OF ELIZABETH
UNION COUNTY, NEW JERSEY

PROJECT NO.: ELIZPRV20.016
DATE: FEBRUARY 5, 2021

NEGLIA ENGINEERING ASSOCIATES
34 Park Avenue
P.O. Box 426
Lyndhurst, NJ 07071

A handwritten signature in blue ink, appearing to read 'Anthony Kurus', is written over a horizontal line.

Anthony Kurus, Professional Engineer
New Jersey License No. 46445

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PART I: BACKGROUND DATA

A. Introduction

The New Jersey Administrative Code NJAC 7:8-5.8 entitled “Maintenance Requirements” sets forth rules and refers to the New Jersey Stormwater Best Practices Manual (the BMP manual) by the New Jersey Department of Environmental Protection (NJDEP). Chapter 8 of the BMP manual entitled “Maintenance and Retrofit of Stormwater Management Measures” specifically addresses the requirements for maintenance of a major development. Major development is defined in the aforementioned administrative code as any development that provides for ultimately disturbing one or more acres of land or increasing the amount of impervious surface by one quarter of an acre or more. This report is prepared to address the maintenance component of the herein described development to ensure the effective, efficient, and enduring service of a particular stormwater measure. This plan contains preventative and corrective maintenance tasks and procedures.

This manual has been prepared in accordance with the NJDEP Stormwater Best Management Practice Manual dated April 2004, last revised March 2020, and with the City of Elizabeth Chapter 13.24. The plan presented in this manual shall be evaluated for effectiveness at least once annually and revised as necessary. A maintenance report shall be submitted to the Municipal Clerk annually, by February 1 of the following year. The municipality has the right of access for inspection and maintenance.

This document and any future revisions shall be recorded on the property deed.

The party responsible for the preventative and corrective maintenance of the stormwater measures described herein is:

Engel Properties
415 North Broad Street
Elizabeth, NJ 07208
(908) 675-6435
engelgardens@gmail.com

Project Contacts:
City of Elizabeth Engineer
Daniel Loomis, P.E.

City of Elizabeth Municipal Planner and Board Engineer
Harbor Consultants, Inc.
Victor E. Vinegra, P.E. P.L.S., P.P.

Design Engineer
Neglia Engineering Associates
34 Park Avenue, Lyndhurst, NJ 07071

SAFETY AND RESPONSE TO EMERGENCIES

For action to an emergency condition contact:

Samuel Engel
Engel Properties
415 North Broad Street
Elizabeth, NJ 07208
(908) 675-6435
engelgardens@gmail.com

CORRECTIVE RESPONSE TO EMERGENCY CONDITIONS

A major emergency that may occur at this installation is the blockage of stormwater pipes, inlets or outlets by debris. Should this situation occur, the materials must be removed immediately. The inspection and preventative maintenance schedule should be periodically re-evaluated to assess any necessary changes to avoid re-occurrence of the blockage.

SAFETY OF INSPECTION AND MAINTENANCE PERSONNEL

Maintenance and inspection of the stormwater facilities is not expected to pose unusual danger to personnel. However, maintenance personnel are expected to dress in appropriate protective clothing and use the appropriate equipment and safety gear in accordance with OSHA regulations and procedures.

B. Project Description

The Engel Properties redevelopment project proposes a multi-story residential building and on-grade asphalt parking area located at 538 – 546 Morris Avenue also known as Tax Accounts #11-794A, #11-795 & #11-90 in the City of Elizabeth. The total site encompasses 1.1691 acres.

Since the project will disturb greater than 1.0 acres to construct the project, the stormwater management water quantity for the project has been designed in accordance with NJ State Stormwater Management Standards, NJAC 7:8-4.2 as per the City of Elizabeth stormwater control ordinance.

C. Stormwater Maintenance Objective

The stormwater system proposed for this development is intended to attenuate and convey the stormwater that impacts the residential development. This maintenance plan is prepared to ensure the system in place is operating efficiently and reliably. The responsible party shall ensure the long-term/perpetual operation, maintenance, repair, and safety of the stormwater management facilities. 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, the responsible party noted in section A. shall take immediate action, to remove the danger. Maintenance procedures are required to maintain the intended operation and safe condition of the stormwater management facility by reducing the occurrence of problems and malfunctions. To be effective, maintenance

shall be performed on a regular basis and include such routine procedures as training of staff, periodic inspections, silt and debris removal and disposal, upkeep of moving parts, control of mosquitoes and other insects, and review of maintenance and inspection work to identify where the maintenance program could be more effective.

Repair procedures are required to correct a problem or malfunction at a stormwater management facility and to restore the facility's intended operation and safe condition. Based upon the severity of the problem, repairs shall be performed on an as-needed or emergency basis and include such procedures as structural repairs, mosquito control, removal of debris, sediment and trash which threaten discharge capacity, erosion repair, snow and ice removal, fence repair, and restoration of vegetation.

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, the responsible party shall immediately initiate maintenance and repair of the facility in a manner that is approved by the municipal engineer or his designee.

LOG MAINTENANCE, DEED FILING & YEARLY PLAN FILING REQUIREMENTS

The responsible party shall maintain a detailed log of all preventive and corrective maintenance for the structural stormwater management measures incorporated into the design of the development, including a record of all inspections and copies of all maintenance-related work orders as required by §13.24.100.B.6.

The responsible party shall ensure that the maintenance plan described herein and any future revisions thereto required by §13.24.100.B.4 be recorded upon the deed of record for the property or properties.

The responsible party shall evaluate the effectiveness of the maintenance plan at least once per year and adjust the plan and the deed as needed. Such party shall report his findings in the form of an annual report in accordance with §13.24.100.B.7, to the Municipal Clerk annually, by February 1 of the following year.

The responsible party shall retain and make available, upon request by any public entity with administrative, health, environmental, or safety authority over the site, the maintenance plan and the documentation required by §13.24.100.B.8.

Should the ownership of the stormwater facilities change, the responsible party noted herein shall update the maintenance plan to include all the updated owner information. The responsible party shall then hand deliver or forward the plan via registered mail to the City of Elizabeth within 90 days of the change of ownership/responsible party.

D. Maintenance of Conveyance Systems

The proposed conveyance system has adequate access for inspection and/or maintenance. The use of the proposed conveyance system is consistent with the community's surroundings for this area.

All conveyance systems including inlets, manholes, concrete chambers and pipes are expected to receive and/or accumulate debris and sediment. These systems must be inspected for clogging and excessive debris and sediment accumulation at four (4) times annually as well as after every storm exceeding 2 inches of rainfall. Sediment removal should take place when all runoff has drained from the conveyance network and the systems are reasonably dry. Disposal of debris, trash, sediment, and other waste material should 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 for cracking, subsidence, breaching, wearing, and deterioration at least annually and after any significant rainstorm event. The condition of surrounding and above lying materials shall be inspected for evidence of potential failures or deterioration.

Two people will be needed to perform routine maintenance of the conveyance systems. The routine equipment expected to be utilized for the maintenance tasks include a jet vacuum vehicle, shovels, lighting equipment and a wheel barrel or truck for the debris hauling. Water, mosquito control chemicals, and concrete repair materials may also be required depending on the structure condition. No manufacturer's instructions or user manuals are available for these components.

COST ESTIMATE FOR INSPECTION AND MAINTENANCE TASKS

The estimated annual cost for inspection and maintenance tasks is anticipated to be approximately \$5,000.00 for this project.

**MAINTENANCE INSPECTION FOR
CONVEYANCE SYSTEMS**

Engel Properties

**NOTE: INSPECTIONS TO BE EVALUATED DURING
A PERIOD OF DRY AND WARM WEATHER AND
LOW TIDE CONDITIONS AT THE PROJECT SITE**

Yes	No	Maintenance Evaluation	Action(s) Required if Answer "Yes"
<input type="checkbox"/>	<input type="checkbox"/>	Is there a buildup of sediment (in excess of 2 inches), trash, debris or any other stormwater pollution?	Remove sediment and evaluate on-site upstream systems. Dispose debris in accordance with local, state and federal requirements.
<input type="checkbox"/>	<input type="checkbox"/>	Is there Standing water?	Evaluate downstream systems for clogging or trash sediment buildup.
<input type="checkbox"/>	<input type="checkbox"/>	Is there any structural failure?	Consult engineer to determine safety and/or stability of the system.
<input type="checkbox"/>	<input type="checkbox"/>	Are there visible signs of cracking, subsidence, erosion or deterioration of any of the storm conveyance systems?	Consult engineer to determine safety and/or stability of the system.
<input type="checkbox"/>	<input type="checkbox"/>	Are there any root intrusions or any other vegetation within catch basins, outlet control structures or storm manholes?	Remove roots and dispose vegetation in accordance with local, state and federal regulations.
<input type="checkbox"/>	<input type="checkbox"/>	Are ladder rungs in manholes or outlet structures damaged, missing or misaligned?	Repair or replace.
<input type="checkbox"/>	<input type="checkbox"/>	Is there a buildup of sediment, trash, debris, leaves or any other pollution clogging conveyance of stormwater.	Remove all pollution.
<input type="checkbox"/>	<input type="checkbox"/>	Is the outlet structure conveying stormwater to the proposed outlet pipe and downstream system	Evaluate outlet structure for clogging or trash sediment buildup and clean/remove any obstructions
<input type="checkbox"/>	<input type="checkbox"/>	Are any covers or grates missing, damaged or only partially in place at any catch basin, outlet control structure or manhole?	Repair or replace.

E. Maintenance of Underground Detention Systems

The proposed underground detention systems provide adequate ability for inspection and/or maintenance. The use of the proposed system allows for an optimized development and a minimization of disturbance.

The underground detention basins, including all chambers, pipe, manholes, outlet control structures and appurtenances must be inspected for clogging and excessive debris and sediment accumulation at least four (4) times annually as well as after every storm exceeding 2 inches of rainfall. Sediment removal should take place when all runoff has drained from the conveyance network and the systems are reasonably dry. Disposal of debris, trash, sediment, and other waste material should 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 for cracking, subsidence, breaching, wearing, and deterioration at least annually and after any significant rainstorm event. The condition of surrounding and above lying materials shall be inspected for evidence of potential failures or deterioration.

Two people will be needed to perform routine maintenance of the underground detention system. The routine equipment to be utilized for the maintenance tasks include a jet vacuum vehicle, shovels, lighting equipment and a wheel barrel or truck for the debris hauling. No manufacturer's instructions or user manuals are available for maintenance of these components. Maintenance would only take place in the adjacent components of the system, i.e. the structures, catch basins, pipes, outlet control structure and other units outside the underground detention system. Water, mosquito control chemicals, and concrete repair materials may also be required depending on the structure condition.

**MAINTENANCE INSPECTION FOR
UNDERGROUND DETENTION SYSTEMS**

Engel Properties

**NOTE: INSPECTIONS TO BE EVALUATED DURING
A PERIOD OF DRY AND WARM WEATHER AND
LOW TIDE CONDITIONS AT THE PROJECT SITE**

Yes	No	Maintenance Evaluation	Action(s) Required if Answer "Yes"
<input type="checkbox"/>	<input type="checkbox"/>	Is there a buildup of sediment (in excess of 2 inches), trash, debris or any other stormwater pollution within the header pipes or outlet control structure?	Remove sediment, trash, debris, etc. Dispose debris in accordance with local, state and federal requirements.
<input type="checkbox"/>	<input type="checkbox"/>	Is there any structural failure?	Consult engineer to determine safety and/or stability of the system.
<input type="checkbox"/>	<input type="checkbox"/>	Are there visible signs of cracking, subsidence, erosion or deterioration of any of the underground detention system?	Consult engineer to determine safety and/or stability of the system.
<input type="checkbox"/>	<input type="checkbox"/>	Are there any signs of unusual color, odor or turbidity within the discharged water?	Evaluate header pipes and structures for possible sediment, trash and debris. Cleanse system if any of the aforementioned obstructions are encountered. Dispose obstructions in accordance with local, state and federal requirements.
<input type="checkbox"/>	<input type="checkbox"/>	Are there root intrusions or any other plant growth occurring with the system(s)?	Remove vegetation and dispose in accordance with local, state and federal regulations.
<input type="checkbox"/>	<input type="checkbox"/>	Are mosquito or other insect habitats consistently present in the area as a result of the structure(s)?	Use appropriate mosquito insecticides or agents to control or eliminate insect breeding.

PART II: MAINTENANCE LOGS

**A. MAINTENANCE LOG
FOR CONVEYANCE SYSTEMS**

**INSTRUCTIONS:
THIS LOG SHALL BE UPDATED TO INCLUDE
ALL MAINTENANCE PERFORMED AT A
SPECIFIC STORMWATER MEASURE**

Engel Properties

DATE	PERSON CONDUCTING MAINTENANCE	AREA OF MAINTENANCE	PROBLEM(S) FOUND	ACTION(S) TAKEN

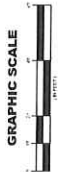
**B. MAINTENANCE LOG
FOR UNDERGROUND DETENTION
SYSTEMS**

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THIS LOG SHALL BE UPDATED TO INCLUDE
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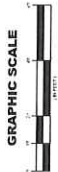
PART III: FIGURES



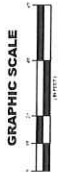
GRAPHIC SCALE
0 10 20 30 40 50
FEET



N



N



N

UTILITY NOTES:

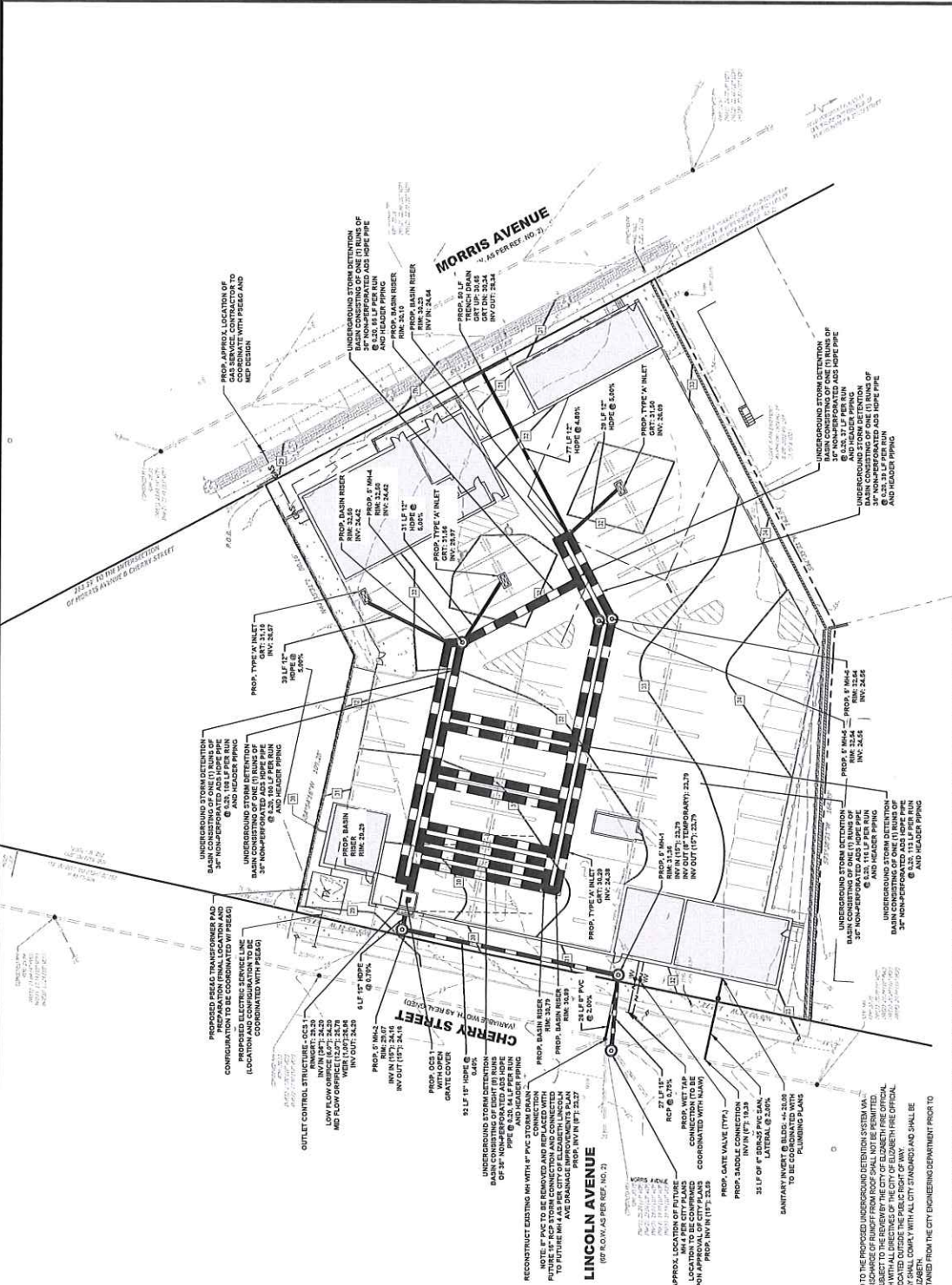
1. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REMOVE, TO TOP, OR AMEND/ADJUST UTILITIES AS NECESSARY TO ACCOMMODATE THE PROPOSED DEVELOPMENT. ALL UTILITIES SHALL BE DEEPER THAN THE PROPOSED CONSTRUCTION. THE CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES LOCATIONS AND DEPTHS PRIOR TO CONSTRUCTION.
2. ALL UNDERGROUND UTILITIES SHALL BE PROTECTED BY A MINIMUM OF 18" OF GRANULAR FILL WITH A MINIMUM DRAINAGE SLOPE OF 1% TO THE OUTLET. ALL UTILITIES SHALL BE PROTECTED BY A MINIMUM OF 18" OF GRANULAR FILL WITH A MINIMUM DRAINAGE SLOPE OF 1% TO THE OUTLET.
3. ALL UNDERGROUND UTILITIES SHALL BE PROTECTED BY A MINIMUM OF 18" OF GRANULAR FILL WITH A MINIMUM DRAINAGE SLOPE OF 1% TO THE OUTLET.
4. THE CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES LOCATIONS AND DEPTHS PRIOR TO CONSTRUCTION.
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15. THE CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES LOCATIONS AND DEPTHS PRIOR TO CONSTRUCTION.

GRADING AND DRAINAGE NOTES:

1. ALL EXISTING AND PROPOSED GRADING MUST BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AMERICAN SURVEYING AND MAPPING ACT. STREETS SHALL BE CONSTRUCTED TO MEET A MINIMUM CROSS SLOPE OF 1% TO THE SIDEWALK AND 2% TO THE CURB. ALL DRIVEWAYS SHALL BE CONSTRUCTED TO MEET A MINIMUM CROSS SLOPE OF 2% TO THE SIDEWALK AND 4% TO THE CURB.
2. ALL ROOF DRAIN DOWNSPUTS SHALL BE CONNECTED TO THE DRAINAGE SYSTEM. ALL DOWNSPUTS SHALL BE COORDINATED WITH ADJACENT PROPERTIES AND SHALL BE PROTECTED BY A MINIMUM OF 18" OF GRANULAR FILL WITH A MINIMUM DRAINAGE SLOPE OF 1% TO THE OUTLET.
3. THE CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES LOCATIONS AND DEPTHS PRIOR TO CONSTRUCTION. ALL UTILITIES SHALL BE DEEPER THAN THE PROPOSED CONSTRUCTION.
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GENERAL NOTES:

1. ALL ELEVATIONS ARE IN MDP AS DATUM UNLESS OTHERWISE SPECIFIED.
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15. ALL ELEVATIONS ARE IN MDP AS DATUM UNLESS OTHERWISE SPECIFIED.



CERTIFICATE OF AUTHORIZATION IN L.S.A. 45:5481; 5481:2009

<p>NEGLIA ENGINEERING ASSOCIATES NEW JERSEY L.S.A. 45:5481; 5481:2009</p> <p>MICHAEL J. NEGLIA, P.E., P.L.S., P.P. PROFESSIONAL ENGINEER REG. NO. 10526</p>	<p>DRAINAGE & UTILITY PLAN PROPOSED MULTI-STORY RESIDENTIAL DEVELOPMENT TAX ACCOUNTS #11-794A, #11-795 & #11-90 CITY OF ELIZABETH UNION COUNTY NEW JERSEY</p> <p>DATE: 11/11/2023 SCALE: AS SHOWN PROJECT: ELZPRV0016 SHEET: C4.00</p>
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