INSITE
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STORMWATER MANAGEMENT REPORT

For

14 EAST GARFIELD AVENUE

Located at

BLOCK 101; LOT 3

In

BOROUGH OF ATLANTIC HIGHLANDS
MONMOUTH COUNTY, NJ

Has been prepared for

KALIAN MANGEMENT, LLC

2 HENESSEY BOULEVARD, SUITE 1
ATLANTIC HIGHLANDS, NJ 07716

On

December 18, 2023
Revised December 2, 2024

InSite Project No. 23-756-12

Jason L. Fichter, PE, PP
NJPE 43118– NJPP 5726

InSite Engineering, LLC
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Licensed in NJ, PA, DE, NY, CT, NC, DC, & CO

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INTRODUCTION

This stormwater management report is being submitted as part of the development application for 14 East Garfield Avenue, located on Block 101; Lot 3 as shown on Sheet 22 of the Official Tax Map of Atlantic Highlands, Monmouth County, New Jersey. This report was prepared in accordance with the Borough of Atlantic Highlands, the State Soil Conservation District (SCD) Standards, New Jersey Department of Transportation (NJDOT), and the New Jersey Department of Environmental Protection (NJDEP), as well as current industry standards and practices for stormwater management.

The project is not considered a "major development" in terms of stormwater since the project disturbs less than one acre and does not create one quarter acre or more of regulated impervious surfaces. Assuming full build out of the property at the allowable 50% impervious coverage, the project does not increase impervious surfaces by more than one quarter acre from existing conditions. Regardless, drywells are proposed to capture and infiltrate the roof runoff of the proposed houses to alleviate any increase in stormwater volume as part of the development. The drainage pattern of the property has been improved by directing the majority of the developed site to flow towards the East Garfield Avenue right of way rather than overland flow to the western property, Lot 4, as it previously flowed under pre-development conditions.

PROJECT LOCATION

The address of the property is 14 East Garfield Avenue, Atlantic Highlands, NJ 07716 and is zoned within the Sigle Family Residential (R-1) Zone where single family dwellings are a permitted use. The surrounding area consists of residential properties to the north, east and south, and a retail property to the west.

PROJECT DESCRIPTION

The project proposes to demolish the existing masonic hall on the property and subdivide the property into four (4) lots to construct four (4) two-story single-family dwellings. Final plot plans will be provided at time of construction. Geotechnical investigation will be provided prior

to construction of the drywells based on the final locations of the drywells during the plot plan approval process.

FLOOD HAZARD AREA

According to FEMA's current Effective FIRM entitled, "FIRM Flood Insurance Rate Map, Monmouth County, New Jersey (All Jurisdictions)", Map Number #34025C0066F, dated 09/25/09, the site is not within a flood hazard area and is located in Zone X, with no base flood area.

According to FEMA's current Preliminary FIRM entitled, "FIRM Flood Insurance Rate Map, Monmouth County, New Jersey (All Jurisdictions)", Map Number #34025C0066G, dated 01/30/15, the site is not within a flood hazard area and is located in Zone X, with no base flood area.

SOIL CHARACTERISTICS

The existing soil classifications for the site are based on the USDA NRCS Web Soil Survey. The survey is useful at the planning level to draw general conclusions about the suitability of a site for certain land uses. Based on the NRCS data, the site consists of the following soil type:

SOIL NAME	HYDROLOGIC GROUP
ThhB - Tinton-Urban land complex, 0 to 5 percent slopes	A

PRE-DEVELOPMENT CONDITIONS

The site is currently undeveloped with woods. A summary of drainage areas for the pre-development condition follows below:

Area 1i: Impervious site area draining to East Garfield Avenue
Area 1p: Pervious site area draining to East Garfield Avenue
Area 2i: Impervious site area draining to the west, Lot 4
Area 2p: Pervious site area draining to the west, Lot 4
Area 3i: Impervious site area draining to the northern property line
Area 3p: Pervious site area draining to the northern property line

Refer to Appendix B for detailed calculations for each drainage area's runoff curve number (CN), hydrologic soil group(s) (HSG), associated areas, time of concentration (Tc), peak flow rates, and hydrographs. Refer to Appendix E for the Pre-Development Drainage Area Map.

POST-DEVELOPMENT CONDITIONS

The project proposes to construct four (4) single family residential homes, as well as site improvements such as, driveways and utilities. A summary of drainage areas for the post-development condition follows below:

Area 1Ai: Impervious site area draining to East Garfield Avenue assuming maximum allowable coverage
Area 1Bi: Clean roof area draining to drywells on each property
Area 1p: Pervious site area draining to East Garfield Avenue
Area 2p: Pervious site area draining to the west, Lot 4
Area 3p: Pervious site area draining to the northern property line

Refer to Appendix C for detailed calculations for each drainage area's runoff curve number (CN), hydrologic soil group(s) (HSG), associated areas, time of concentration (Tc), peak flow rates, and hydrographs. Refer to Appendix E for the Post-Development Drainage Area Map.

GREEN INFRASTRUCTURE (N.J.A.C. 7:8-5.3)

For Green Infrastructure compliance, the design engineer shall utilize BMPs from Table 5-1 or from Table 5-2 and/or an alternative stormwater management measure approved in accordance with N.J.A.C. 7:8-5.2(g). Although green infrastructure is not required since this is not a major development, the drywell system is listed in Table 5-1 and therefore complies.

STORMWATER MANAGEMENT SUMMARY (N.J.A.C. 7:8-5.7)

Methods of determining stormwater runoff and peak discharge follow the procedures as outlined in "Urban Hydrology for Small Watersheds", Soil Conservation Service Technical Release No. 55. The rainfall precipitation values for the design storm events have been determined utilizing NOAA, National Weather Service's Atlas 14 Point Precipitation Frequency Estimates, based on 24-hour storm events for Monmouth County. The storm events were studied using the SCS TR-20 runoff method, NOAA Region D rainfall distribution, and the Delmarva Unit Hydrograph.

Stormwater hydrographs were performed using HydroCAD Software Solutions' "HydroCAD" (ver. 10.0) computer program. Pervious and impervious CN values are computed separately rather than a composite CN value. Pervious and impervious areas have separate time of concentration (TC) within each site area.

The proposed development is analyzed based on the maximum allowable lot coverage per the zoning ordinance of 50%. Geotechnical investigation will be provided prior to construction of the drywells based on the final locations of the drywells during the plot plan approval process. Geotechnical results for the adjacent property encountered groundwater at elevation 11.5-11.0. The drywells will be placed a minimum of 2 feet above. The tested infiltration rates are 20 inches per hour (iph) or greater, therefore a design rate of 10 iph can be utilized, incorporating a factor of safety of two. A conservative design infiltration rate of 1 iph has been utilized.

WATER QUANTITY N.J.A.C. (7:8-5.6)

Pre- and Post-development computations for the resultant hydrographs, routing computations, and runoff volumes are appended, respectively, to this report. For each drainage area, the following summaries were generated:

Pre- and Post-Development Flow Rates to East Garfield Avenue

Storm (Year)	Pre-Development Peak Flow (cfs)	Post-Development Peak Flow (cfs)	Difference (cfs)
2	0.3	1.4	1.1
10	0.5	2.1	1.6
25	0.7	2.6	1.9
100	1.1	3.8	2.7

The table above demonstrates that the post-development peak flow rates are increased from pre-development rate, which is expected after development. As stated, the proposed development is analyzed based on the maximum allowable lot coverage per the zoning ordinance of 50%. The flows are directed to the East Garfield Avenue right of way, which is the preferred receiving area. The stormwater will then be managed by the municipal stormwater infrastructure.

Pre- and Post-Development Flow Rates to Lot 4 (West)

Storm (Year)	Pre-Development Peak Flow (cfs)	Post-Development Peak Flow (cfs)	Difference (cfs)
2	0.8	0.0	-0.8
10	1.2	0.0	-1.2
25	1.5	0.0	-1.5
100	2.2	0.1	-2.1

The table above demonstrates that the post-development peak flow rates are reduced for all storm events. Previously, the majority of the existing property flowed overland to the west. The post development conditions direct the majority of the property to East Garfield Avenue via swales and overland sheet flow.

Pre- and Post-Development Flow Rates to Northern Property Line

Storm (Year)	Pre-Development Peak Flow (cfs)	Post-Development Peak Flow (cfs)	Difference (cfs)
2	0.0	0.0	0.0
10	0.1	0.0	-0.1
25	0.1	0.0	-0.1
100	0.2	0.1	-0.1

The table above demonstrates that the post-development peak flow rates meet pre-development rates or are reduced for all storm events. This area is nearly identical for pre- and post-development conditions.

WATER QUALITY (N.J.A.C. 7:8-5.5)

The project is exempt from stormwater quality requirements since the development does not increase regulated motor vehicle surfaces by one quarter of an acre or more.

GROUNDWATER RECHARGE (N.J.A.C. 7:8-5.4)

In accordance with N.J.A.C. 7:8-5.4(a).2.ii, groundwater recharge does not apply to projects within the "urban redevelopment area". An Urban Redevelopment Area is defined, per N.J.A.C. 7:8 1.2, as development portions of areas delineated on the State Plan Policy Map as the

Metropolitan Planning Area. The proposed development is located within Planning Area 1 (Metropolitan Planning Area) and is not required to meet groundwater recharge.

SOIL EROSION AND SEDIMENT CONTROL

In accordance with the Soil Erosion and Sediment Control Act, soil erosion measures will be incorporated into the design and graphically depicted on the Soil Erosion and Sediment Control Plans. These measures consist of, but are not limited to:

- Sediment Barriers and Silt Fences
- Stabilized Construction Access
- Topsoil Stockpiles
- Temporary and Permanent Stabilization

CONCLUSION

The project is not considered a "major development" in terms of stormwater since the project disturbs less than one acre and does not create one quarter acre or more of regulated impervious surfaces. Assuming full build out of the property at the allowable 50% impervious coverage, the project does not increase impervious surfaces by more than one quarter acre from existing conditions. Regardless, drywells are proposed to capture and infiltrate the roof runoff of the proposed houses to alleviate any increase in stormwater volume as part of the development. The drainage pattern of the property has been improved by directing the majority of the developed site to flow towards the East Garfield Avenue right of way rather than overland flow to the western property, Lot 4, as it previously flowed under pre-development conditions.

APPENDIX A

Tax Map

Soils Map

State Planning Area Map

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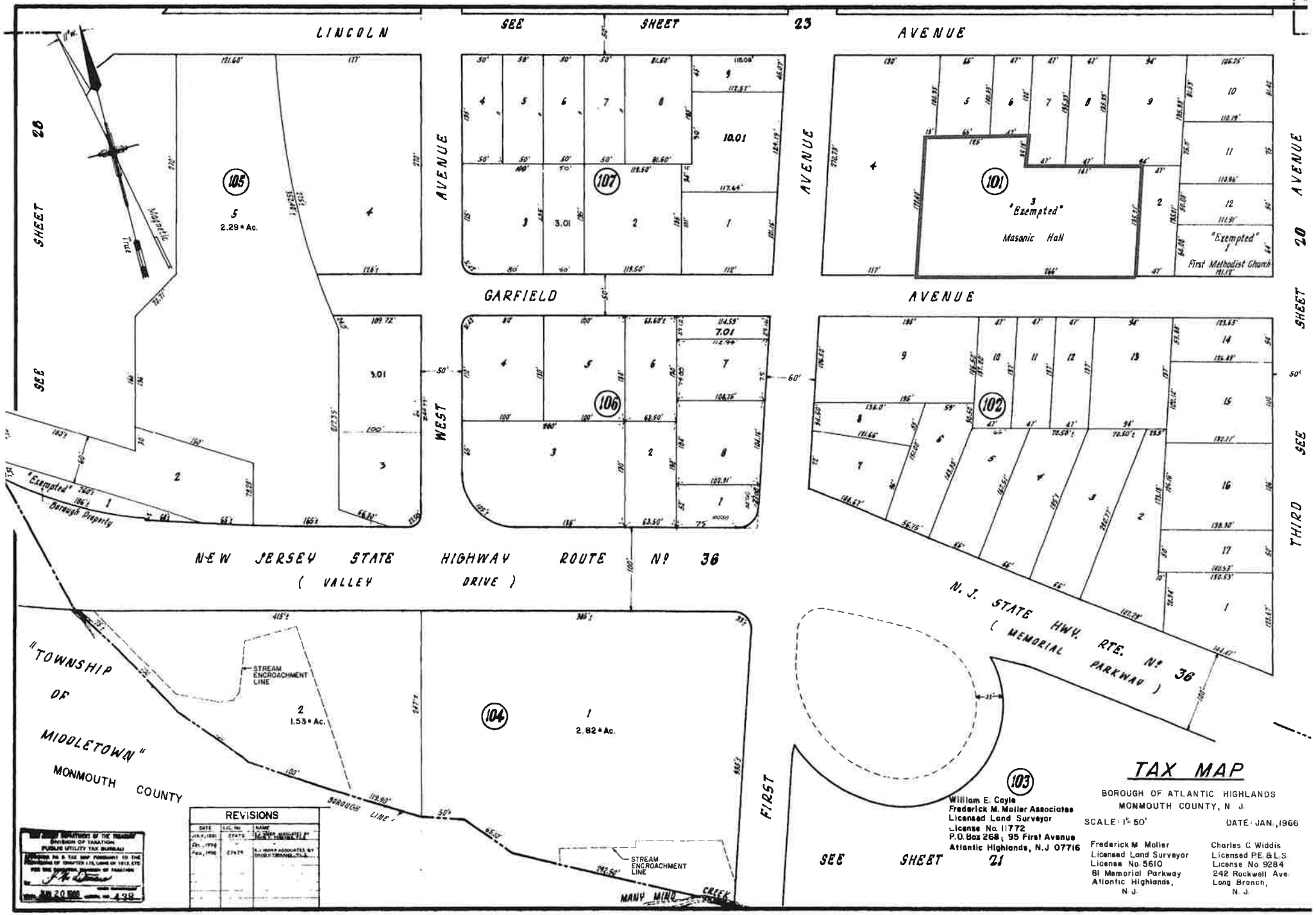


TAX MAP

BOROUGH OF ATLANTIC HIGHLANDS
MONMOUTH COUNTY, N. J.

SCALE: 1" = 50'

DATE: JAN., 1966

REVISIONS

DATE	L.C. No.	NAME
JULY, 1991	27473	
Oct., 1996	"	
Feb., 1998	27479	

DIVISION OF TAXATION
PUBLIC UTILITY TAX BUREAU
JAN 20 1999

William E. Coyle
Frederick M. Mollier Associates
Licensed Land Surveyor
License No. 11772
P.O. Box 268; 95 First Avenue
Atlantic Highlands, N.J. 07716

Frederick M. Mollier
Licensed Land Surveyor
License No. 5610
81 Memorial Parkway
Atlantic Highlands,
N.J.

Charles G. Widdis
Licensed P.E. & L.S.
License No. 9284
242 Rockwell Ave.
Long Branch,
N.J.


74° 2' 21" W
74° 2' 15" W
40° 24' 38" N
40° 24' 35" N
581510
581520
581530
581540
581550
581560
581570
581580
581590
581600
581610
581620
581630
581640
581650
4473790
4473780
4473770
4473760
4473750
4473740
4473730
4473720
4473710
4473700
ThhB
E Garfield Ave
Map Scale: 1:669 if printed on A landscape (11" x 8.5") sheet.
N
Meters
0 5 10 20 30
Feet
0 30 60 120 180
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
ThhB	Tinton-Urban land complex, 0 to 5 percent slopes	A	1.2	100.0%
Totals for Area of Interest			**1.2**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

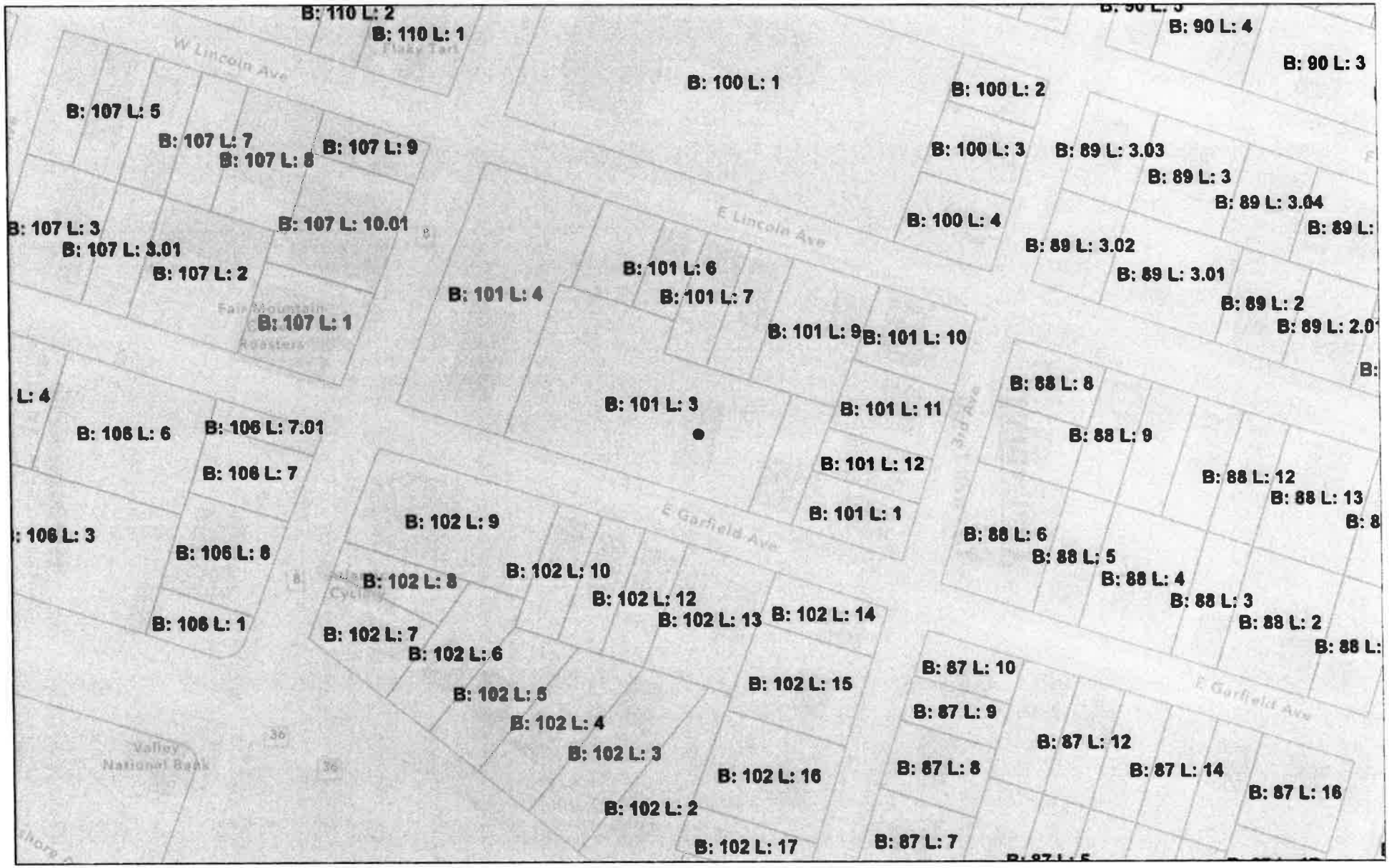
Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

NJ-GeoWeb



12/20/2023, 3:21:37 PM

1:2,257

0 0.01 0.03 0.05 mi

0 0.02 0.04 0.09 km

State Planning Area Boundaries

Metropolitan Planning Area (PA 1)

County Boundaries

Parcels Data (Block and Lot)

APPENDIX D

Drywell Detail

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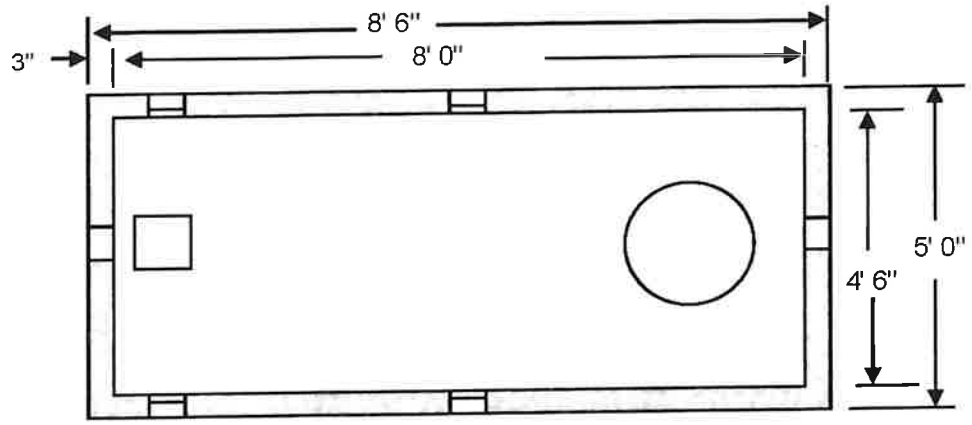
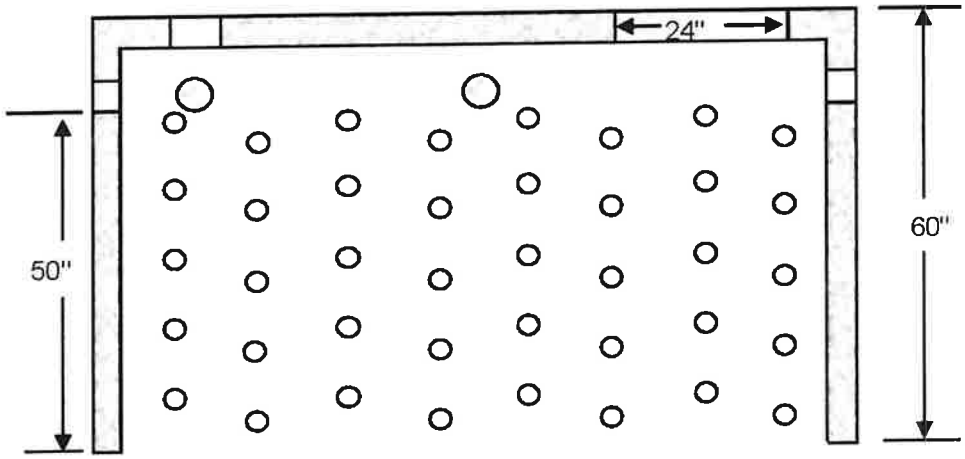
1250 GALLON 1PC DRY WELL





As Manufactured by Mershon Concrete - Bordentown, NJ

Notes:

1. Tank is 4000 psi concrete - steel reinforced
2. Concrete conforms to ACI 318-16-4.5.1 and ACI 318-16-4.5.2
3. In an effort to continually improve our products, Mershon Concrete reserves the right to change product design without notice.

MERSHON CONCRETE

Rt. 130, PO Box 254
Bordentown, NJ 08505

1-609-298-2150

1-800-MERSHON

1-609-298-7969 / FAX#

1250 Gallon Dry Well

APPENDIX E

Pre-Development Drainage Map

Post-Development Drainage Map

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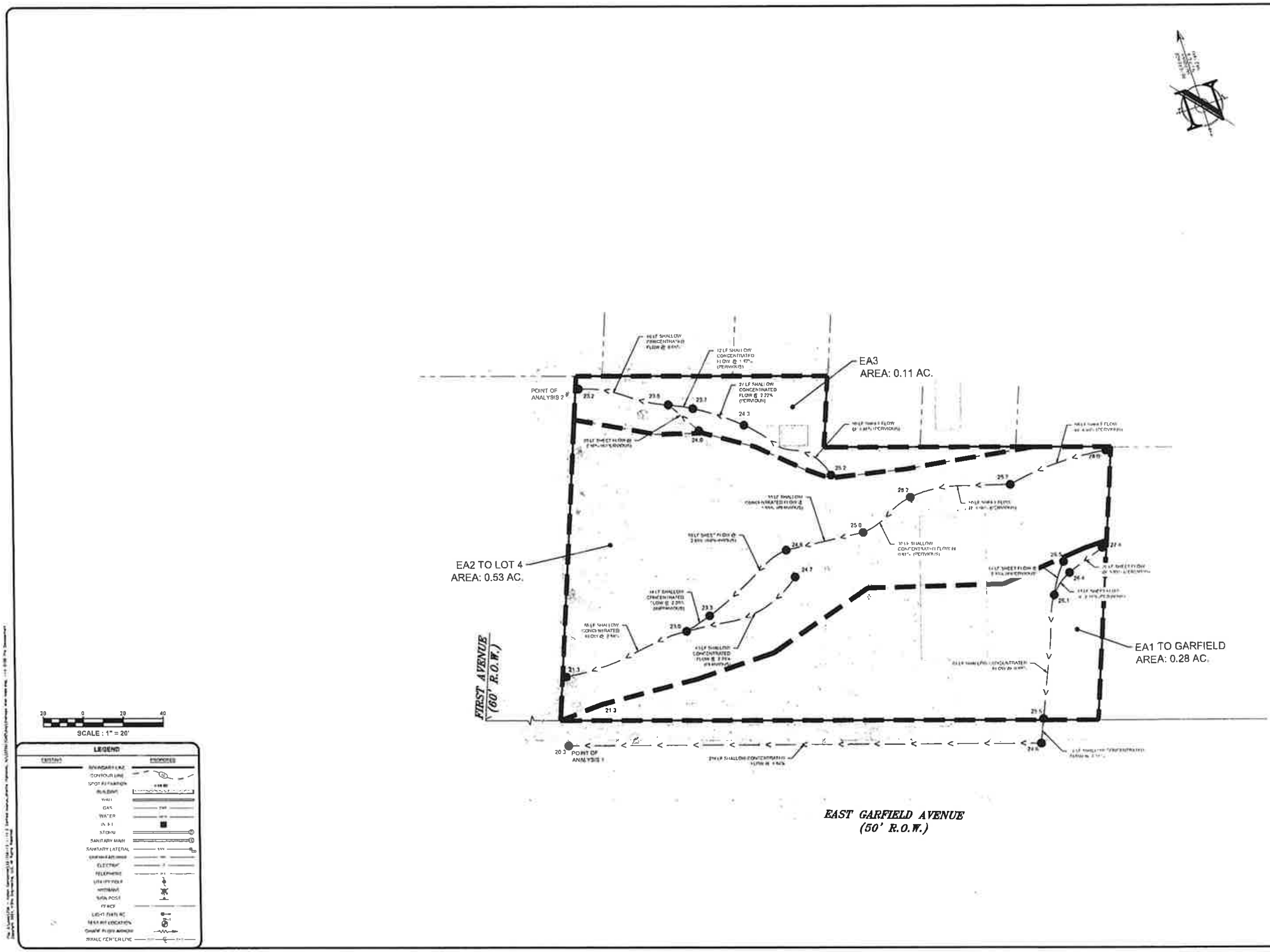


PROJECT INFORMATION

14 EAST GARFIELD AVENUE

MASONIC HALL

112 MAPLE AVENUE

HALIAN MANAGEMENT LLC

APPLICANT'S PROFESSIONALS

ATTORNEY

SURVEYOR

INSITE SURVEYING, LLC

INSITE

REVISIONS

NOT FOR CONSTRUCTION

FOR CONSTRUCTION

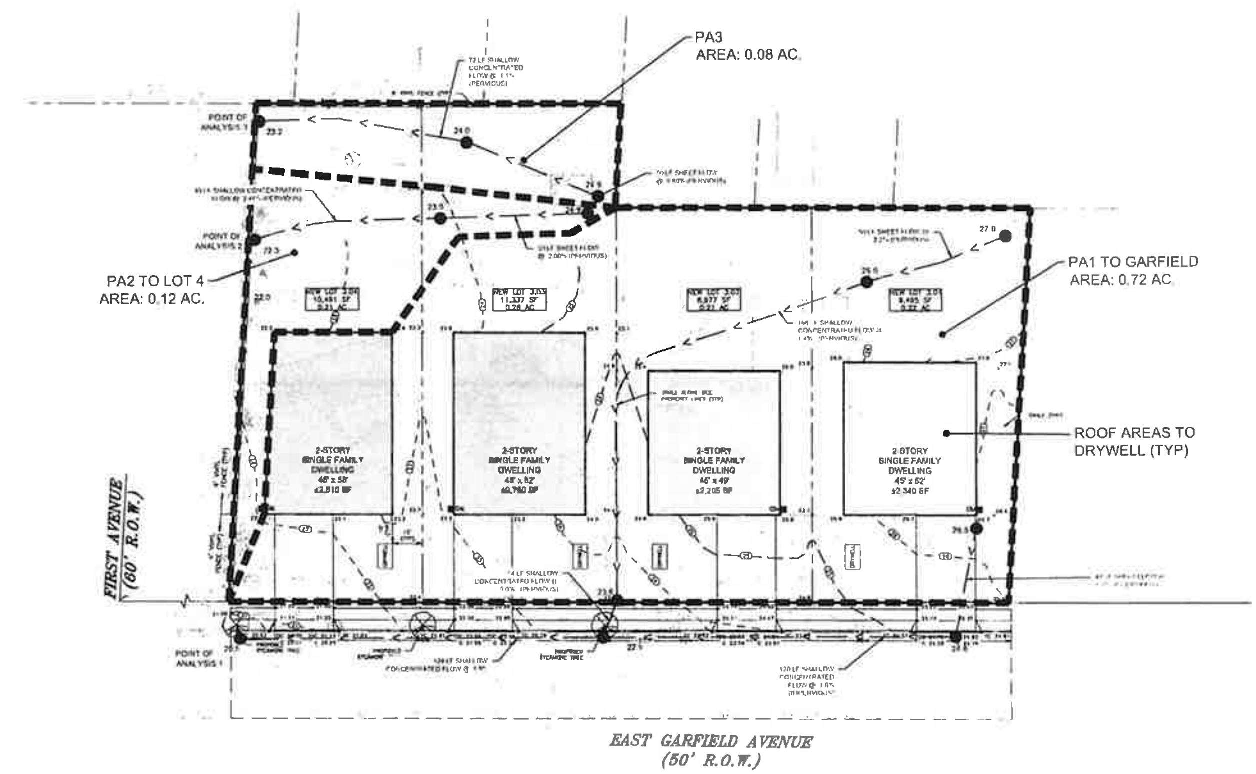
APPROVED

PLAN INFORMATION

PRELIMINARY & FINAL MAJOR SUBDIVISION

PRE-DEVELOPMENT DRAINAGE AREA MAP

D100



SCALE : 1" = 20'

LEGEND

PROJECT INFORMATION

14 EAST GARFIELD AVENUE

MASONIC HALL

KALIAN MANAGEMENT LLC

APPLICANT'S PROFESSIONALS

ATTORNEY

SURVEYOR

INSITE

JASON L. TICHTER, PE, PP, CME, CM

REVISIONS

NOT FOR CONSTRUCTION

FOR CONSTRUCTION

APPROVED

PLAN INFORMATION

PRELIMINARY & FINAL MAJOR SUBDIVISION

POST-DEVELOPMENT DRAINAGE AREA MAP

D200