



Stormwater Management Statement

Portion of Block 469, Lot 38.05
City of Linden, Union County, New Jersey

September 2020

Prepared For

Linden Development, LLC
8144 Walnut Hill Lane, Suite 1200
Dallas, TX 75231

Prepared By

Maser Consulting, Inc.
Corporate Headquarters
331 Newman Springs Road
Red Bank, NJ 07701
732.383.1950
N.J. C.O.A. #: 24GA27986500

A handwritten signature in blue ink, appearing to read 'R. J. Curley', is positioned above a horizontal line.

Robert J. Curley, PE
N.J. Professional Engineer License No. 34705

MC Project No. 20002641A



TABLE OF CONTENTS

INTRODUCTION.....	1
SOIL CHARACTERISTICS.....	1
FLOOD HAZARD AREAS	2
RIPARIAN ZONES.....	2
WETLAND AREAS	2
COMPLIANCE STATEMENT.....	2
STORM SEWER DESIGN	2
GROUNDWATER RECHARGE NJAC 7:8-5.4(a)2.....	3
SOIL EROSION AND SEDIMENT CONTROL	3
CONCLUSION	3

APPENDIX A

TAX MAP
SOILS MAP
AERIAL MAP
FEMA MAP
USGS MAP

APPENDIX B

STORMWATER CONVEYANCE CALCULATIONS

APPENDIX C

INLET DRAINAGE AREA MAP



INTRODUCTION

This stormwater management statement is being submitted as part of the development application known as Amended Preliminary and Final Major Site Plan for Linden Development located on Out-Lot 1 within Lot 38.05, Block 469, as shown on Sheet 96 of the Official Tax Map of the City of Linden, Union County, New Jersey. This statement was prepared in accordance with the New Jersey Department of Environmental Protection (NJDEP), City of Linden, Somerset-Union Soil Conservation and current industry standards and practices for stormwater management. The purpose of this report is to summarize the stormwater management requirements and the proposed development compliance.

The existing site is currently under construction for Phase 1 and has received Preliminary and Final approval for Phase 2 and Preliminary approval for Phase 3. The proposed application is for a pad site within a previously preliminary approved Phase 3 overall shopping site known as Legacy Square.

The proposed development consists of the construction of a 7,147 sf medical office with associated parking areas as well as various site improvements which include, but are not limited to, the construction of pavement, sidewalk and curb, storm sewers, sanitary sewers and water service lines.

SOIL CHARACTERISTICS

The existing soil classifications for the site are based on the USDA NRCS Web Soil Survey prepared by United States Department of Agriculture, Natural Resources Conservation Service. 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 Web Soil Survey, the site and its surrounding area consist of the following soil type:

SOIL NAME

UR - Urban Land,

HYDROLOGIC GROUP

D*

* No specific Hydraulic Group was defined for the Urban Land soil, but it is known to have the same properties of an HSG of 'D'.



FLOOD HAZARD AREAS

Based on the Flood Insurance Rate Map (FIRM) prepared by the Federal Emergency Management Agency for Union County, New Jersey, Community Panel No. 34039C0044F dated September 20, 2006 the entire pad site is located outside of the 100-year flood plain.

RIPARIAN ZONES

In accordance with NJ-GeoWeb the project site is located more than 300 feet from a water body. Therefore, there are no riparian zones associated with the development.

WETLAND AREAS

In accordance with NJ-GeoWeb no freshwater wetlands are known to exist on-site or in the close proximity of the site.

COMPLIANCE STATEMENT

As previously stated, the proposed development is a pad site and is part of a previously approved overall shopping center. This shopping center provides a stormwater management system for the overall center that each individual pad site connects into. This system was designed to account for the maximum allowable impervious coverage of 90% for each pad site and was designed to comply with the water quality and water quantity requirements. The proposed development proposes less than the 90% allowable impervious coverage; and therefore, complies with the previously approved stormwater design. The previously approved stormwater report is entitled “Stormwater Management Report for Proposed Retail Development prepared for Linden Development, LLC” prepared by Bohler Engineering dated March 2014, last revised January 2018.

STORM SEWER DESIGN

The proposed storm sewer was designed using Manning’s Equation with a minimum time of concentration of 10 minutes. An “n” value was utilized of 0.012 for HDPE. The storm sewer was



designed to convey the 25-year storm frequency. The storm sewer design calculations can be found in the Appendix.

GROUNDWATER RECHARGE NJAC 7:8-5.4(a)2

Since the proposed development is less than the approved maximum impervious coverage of the approved design, the proposed development complies with the groundwater recharge requirement.

SOIL EROSION AND SEDIMENT CONTROL

In accordance with the Somerset-Union Soil Conservation District soil erosion and sediment control requirements, soil erosion measures were incorporated into the design and graphically depicted on the Soil Erosion and Sediment Control Plans. These measures include, but are not limited to:

- Silt Fences
- Topsoil Stockpile
- Temporary and Permanent Stabilization
- Storm Sewer Inlet Protection

CONCLUSION

The overall stormwater management system for the overall shopping center was previously designed and approved. The proposed development has been designed in accordance with the previously approved system, and meets the requirements for water quality, water quantity, groundwater recharge. The site also has been designed in accordance with the Somerset-Union Soil Conservation District, the City of Linden and current industry standards and practices for stormwater management.

\\maserconsulting.com\ren\General\Projects\2020\20002641A\Reports\Drainage\200900 SWM.docx



APPENDIX A

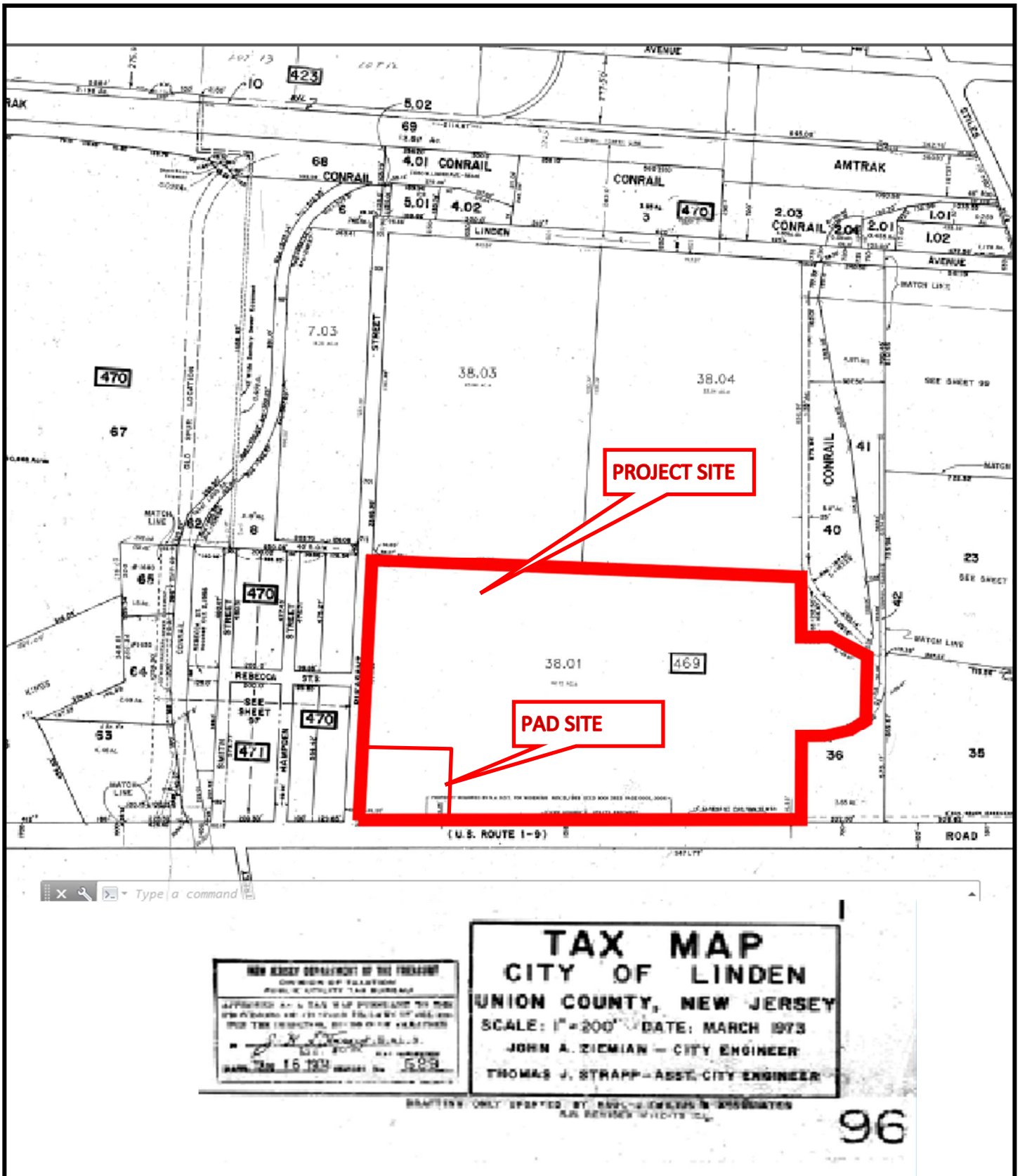
TAX MAP

SOILS MAP

AERIAL MAP

FEMA MAP

USGS MAP



Corporate Headquarters
 331 Newman Springs Road
 Suite 203
 Red Bank, NJ 07701
 T: 732.383.1950
 F: 732.383.1984
www.maserconsulting.com

Tax Map

Lots 38.05, Block 469
 City of Linden
 Source: Linden Tax Map Sheet 96

Scale: NTS

Date: September 4, 2020

MC Project No. 200002641A



Summary by Map Unit – Union County, New Jersey (NJ039)

Summary by Map Unit – Union County, New Jersey (NJ039)

Map unit symbol	Map unit name	Rating
UR	Urban land	



Corporate Headquarters
 331 Newman Springs Road
 Suite 203
 Red Bank, NJ 07701
 T: 732.383.1950
 F: 732.383.1984
www.maserconsulting.com

Soils Map

Lots 38.05, Block 469
City of Linden

Source: USDA NRCS Web Soil Survey

Scale: NTS

Date: September 4, 2020

MC Project No. 200002641A



Corporate Headquarters
 331 Newman Springs Road
 Suite 203
 Red Bank, NJ 07701
 T: 732.383.1950
 F: 732.383.1984
www.maserconsulting.com

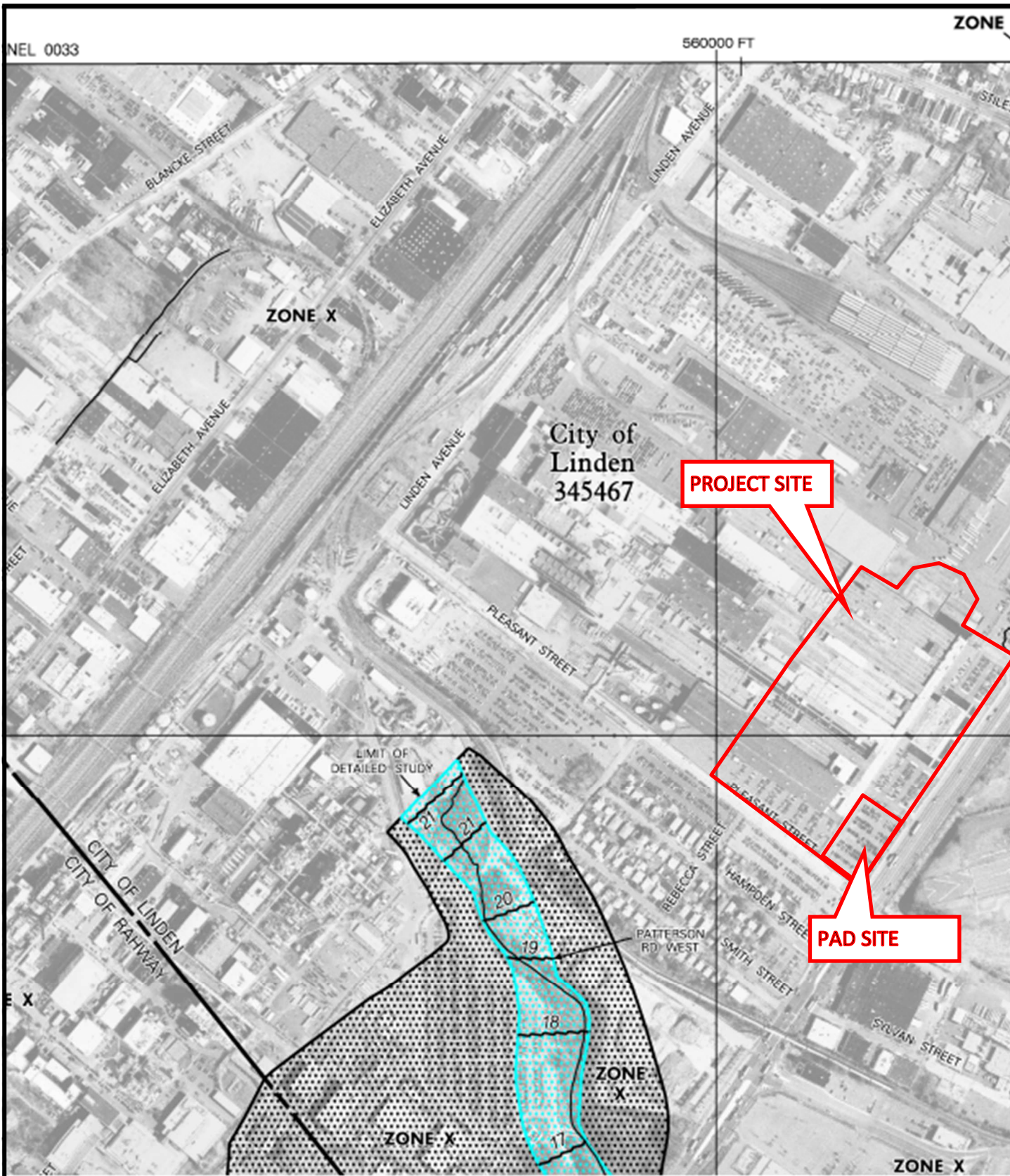
Aerial Location Map

Lots 38.05, Block 469
City of Linden
Source: Google Maps

Scale: NTS

Date: September 4, 2020

MC Project No. 200002641A



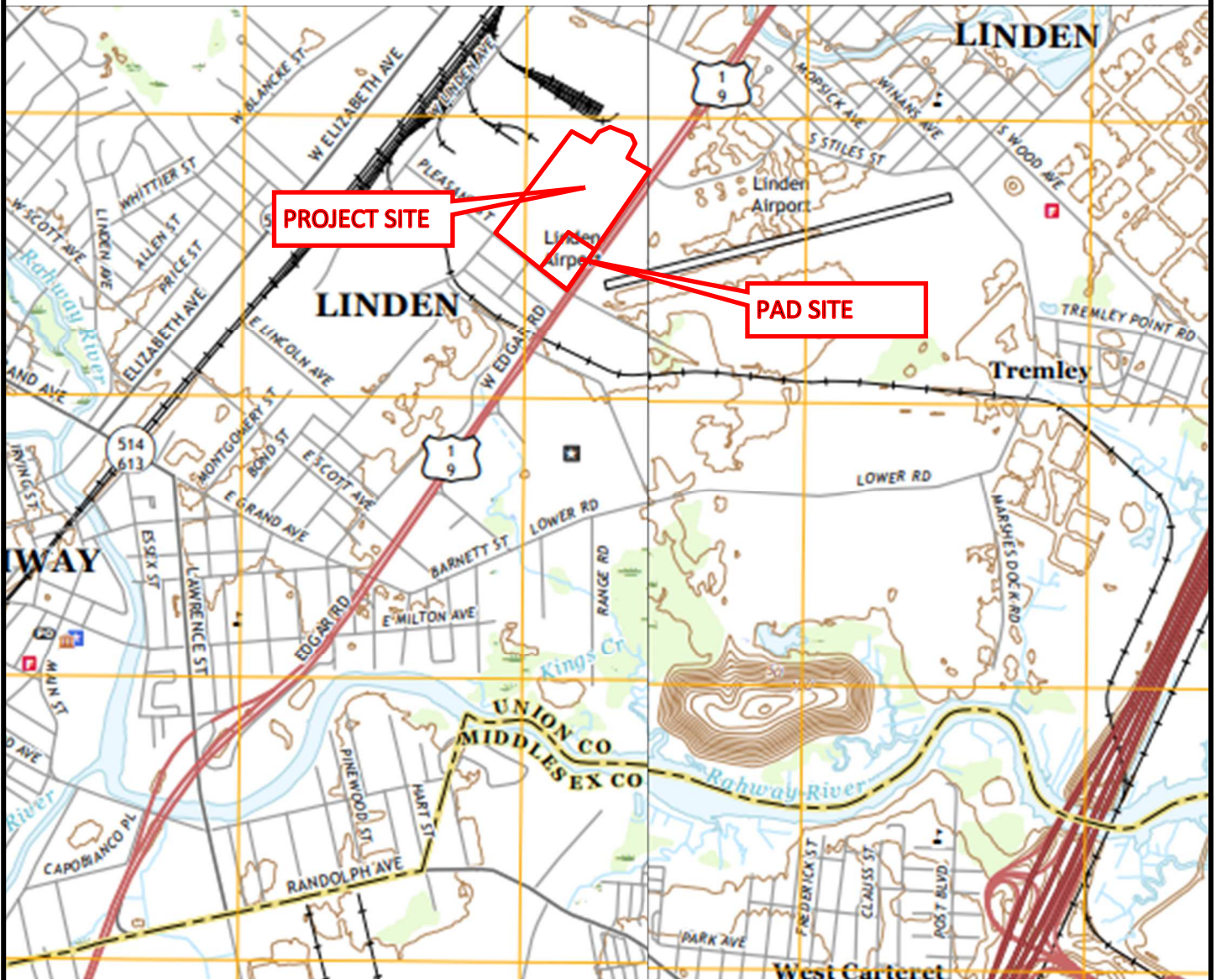
Corporate Headquarters
331 Newman Springs Road
Suite 203
Red Bank, NJ 07701
T: 732.383.1950
F: 732.383.1984
www.maserconsulting.com

FEMA Map
Lots 38.05, Block 469
City of Linden
Source: FEMA FIRMS 34039C0044F,
Prelim. Date 09/20/2006

Scale: NTS

Date: September 4, 2020

MC Project No. 200002641A



Corporate Headquarters
331 Newman Springs Road
Suite 203
Red Bank, NJ 07701
T: 732.383.1950
F: 732.383.1984
www.maserconsulting.com

USGS Map

Lots 38.05, Block 469
City of Linden

Source: Perth Amboy, NJ & Arthur Kill,
NY, NJ Quadrangles, 7.5-Minute Series, 2019

Scale: NTS

Date: September 4, 2020

MC Project No. 200002641A



APPENDIX B

STORMWATER CONVEYANCE CALCULATIONS

Line No.	Line ID	DnStm Ln No	Inlet ID	Drng Area (ac)	Runoff Coeff (C)	Incr CxA	Total CxA	i Inlet (in/hr)	Incr Q (cfs)	Flow Rate (cfs)	Capac Full (cfs)	Vel Ave (ft/s)	Line Size (in)	Line Type	n-val Pipe	Line Length (ft)	Line Slope (%)	Invert Up (ft)	Invert Dn (ft)	Gnd/Rim El Up (ft)	
8	P-8	6	S-9	0.13	0.70	0.09	0.09	5.71	0.52	0.52	4.92	1.79	15	Cir	0.012	60.7	0.49	23.30	23.00	25.75	
7	P-1	6	S-1	0.16	0.84	0.13	0.13	5.71	0.77	0.77	7.82	3.43	15	Cir	0.012	30.4	1.25	25.23	24.85	28.48	
6	P-2	5	S-2	0.10	0.90	0.09	0.32	5.71	0.51	1.77	5.22	2.63	15	Cir	0.012	122.0	0.56	23.00	22.32	28.48	
5	P-3	4	S-3	0.06	0.90	0.05	0.37	5.71	0.31	2.01	5.09	1.80	15	Cir	0.012	68.1	0.53	22.32	21.96	28.74	
4	P-4	3	S-4	0.13	0.87	0.11	0.48	5.71	0.65	2.57	5.20	2.10	15	Cir	0.012	37.9	0.55	21.96	21.75	26.47	
3	P-5	2	S-5	0.03	0.87	0.03	0.51	5.71	0.15	2.69	5.27	2.19	15	Cir	0.012	26.4	0.57	21.75	21.60	26.45	
2	P-6	1	S-6	0.16	0.81	0.13	0.64	5.71	0.74	3.35	5.20	2.73	15	Cir	0.012	99.7	0.55	21.60	21.05	26.51	
1	P-7	Outfall	S-7	0.10	0.76	0.08	0.71	5.71	0.43	3.68	4.94	3.00	15	Cir	0.012	48.0	0.50	21.05	20.81	29.80	

Project File: PROP STORM.stm

Number of lines: 8

Date: 9/22/2020

NOTES: Intensity = 35.62 / (Inlet time + 7.40) ^ 0.64 -- Return period = 25 Yrs. ; ** Critical depth

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)		Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)		
	(in)	(cfs)									(ft)											(K)	(ft)
8	15	0.52	23.00	23.53	0.53	0.21	1.06	0.10	23.63	0.000	60.7	23.30	23.58 j	0.28**	0.21	2.53	0.10	23.68	0.000	0.000	n/a	0.50	n/a
7	15	0.77	24.85	25.11	0.26*	0.19	4.05	0.12	25.24	0.000	30.4	25.23	25.57	0.34**	0.27	2.81	0.12	25.70	0.000	0.000	n/a	0.50	n/a
6	15	1.77	22.32	23.33	1.01	0.49	1.67	0.20	23.53	0.000	122.0	23.00	23.53 j	0.53**	0.49	3.59	0.20	23.73	0.000	0.000	n/a	0.80	0.16
5	15	2.01	21.96	23.25	1.25	1.23	1.64	0.04	23.29	0.083	68.1	22.32	23.29	0.97	1.02	1.97	0.06	23.35	0.092	0.087	0.059	0.60	0.04
4	15	2.57	21.75	23.17	1.25	1.23	2.10	0.07	23.24	0.135	37.9	21.96	23.21	1.25	1.23	2.10	0.07	23.28	0.134	0.135	0.051	0.60	0.04
3	15	2.69	21.60	23.09	1.25	1.23	2.19	0.07	23.17	0.148	26.4	21.75	23.13	1.25	1.23	2.19	0.07	23.20	0.148	0.148	0.039	0.60	0.04
2	15	3.35	21.05	22.80	1.25	1.23	2.73	0.12	22.92	0.229	99.7	21.60	23.03	1.25	1.23	2.73	0.12	23.15	0.229	0.229	0.229	0.50	0.06
1	15	3.68	20.81	22.56	1.25	1.23	3.00	0.14	22.70	0.276	48.0	21.05	22.69	1.25	1.23	3.00	0.14	22.83	0.276	0.276	0.133	0.80	0.11
Project File: PROP STORM.stm														Number of lines: 8					Run Date: 9/22/2020				
Notes: * Normal depth assumed; ** Critical depth.; j-Line contains hyd. jump ; c = cir e = ellip b = box																							



APPENDIX C

INLET DRAINAGE AREA MAP

