



Engineering
& Design

Stormwater Management Statement

October 2, 2023

Phase 1A Gateway Services District

Block 256.01, Lot 24 & Block 257.02, Lot 1.05
Borough of Sayreville, Middlesex County, New Jersey


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Introduction

This stormwater management statement is being submitted as part of the Phase 1A Gateway Services District application. The Gateway Services District is located on Lot 24, Block 256.01 & Lot 1.05, Block 257.02 in the Borough of Sayreville, Middlesex County, New Jersey.

The purpose of this statement is address minor modifications to the previously approved storm sewer system within Lots 24 & 1.05 and to confirm the modifications maintain compliance with the Borough's storm sewer sizing requirements in Ordinance Section 26-99.3.c.2.(e).

This statement should be reviewed concurrently with plans entitled, "Phase 1A Gateway Services District Amended Site Plan for Sayreville Seaport Associates", prepared by Colliers Engineering and Design, dated September 11, 2023, latest revision.

Relationship To Riverton Village Phase 1

Riverton Village Phase 1 received Preliminary & Final Major Site Plan Approval and Preliminary Final Major Subdivision Approval from the Borough of Sayreville Planning Board per Resolution dated January 8, 2020. The approval included a wet pond to address stormwater management for full build-out of Phase I, future phases of the Riverton development, and certain off-development areas. The New Jersey Department of Environmental Protection (NJDEP) approved the Riverton Phase I wet pond as part of a recent modification to NJDEP Permit Number 1219-10-0003.4.

The Gateway Services District is contained within Phase 1 and was included in the January 8, 2020 approval. As such, the overall stormwater management design for Phase 1 accounts for the Gateway Services District. The Phase 1 stormwater management design addressed compliance with applicable stormwater management regulations including, but not limited to water quantity, water quality, and groundwater recharge. As such, the scope of this statement is limited to addressing minor modifications to the previously approved storm sewer system within the Gateway Services District and to confirm the modifications maintain compliance with the Borough's storm sewer sizing requirements in Ordinance Section 26-99.3.c.2.(e).

Further information regarding the Phase I wet pond and associated stormwater management regulation compliance can be found in the following documents:

1. "Preliminary/Final Major Site and Subdivision Plan for Riverton Village Phase I, Parcel C: Block 257, Lots 3.04 & 3.052, Block 257.01, Lots 1, 1.01, 4, 5, 6, 20, 1.10 & 30.12, Block 257.02, Lots 1, 1.01 & 22, Borough of Sayreville, Monmouth County, New Jersey", prepared by Maser Consulting, dated May 15, 2019, latest revision.
2. "Stormwater Management Report for Riverton Village – Phase I, Parcel C: Block 257, Lots 3.04 & 3.052, Block 257.01, Lots 1, 1.01, 4, 5, 6, 20, 1.10 & 30.12, Block 257.02, Lots 1, 1.01 & 22, Borough of Sayreville, Monmouth County, New Jersey", prepared by Maser Consulting, dated July 2019, latest revision.

Storm Sewer Design

Proposed storm sewer is designed in accordance with current engineering standards and the Borough ordinance, particularly section 26-99.3.c.2.(e). This section of the ordinance requires the pipe size determined to be adequate for the runoff computed shall be increased by at least one standard pipe size in order to provide adequate allowance for normal accumulation of sediment and debris. The minimum proposed pipe size is 15 inches.

Hydraflow Storm Sewer Extension for Autodesk AutoCAD Civil 3D Version 2020 Software by Autodesk was utilized in the design of the storm sewer. The proposed storm sewer was designed using the Rational Method with a minimum time of concentration of 10 minutes and the Trenton Intensity-Duration-Frequency Curve. A 'C' coefficient of 0.98 was used for all areas. The storm sewer was designed to convey the 25-year storm frequency.

The pipes were designed to provide a full flow pipe capacity equal to or greater than the peak flow discharging through the pipe. Once this design was completed, each pipe section was upsized a minimum of one standard pipe diameter. The pipe diameters shown in the storm sewer calculations are the original diameters. The pipe diameters shown on the Plans are the upsized diameters complying with Borough Ordinance Section 26-99.3.c.2.(e). Refer to Appendix A and Appendix B for full storm sewer calculation output and an inlet drainage area map, respectively.

Conclusion

Full compliance with applicable stormwater management regulations as specified by the Borough of Sayreville Ordinance, Standards for Soil Erosion and Sediment Control in New Jersey (SCD), and New Jersey of Environmental Protection (NJDEP) Stormwater Management Regulations at N.J.A.C. 7:8 was previously addressed during the Riverton Village Phase 1 Application. This Statement is provided to address minor modifications to the storm sewer system within the Gateway Services District. As indicated herein, the modified storm sewer system within the Gateway Services District maintains compliance with Borough Ordinance Section 26-99.3.c.2.(e).

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Appendix A

Storm Sewer Capacity Calculations

Line No.	Line ID	Inlet ID	DnStm Ln No	Drng Area (ac)	Runoff Coeff (C)	Incr CxA	Total CxA	i Inlet (in/hr)	Incr Q (cfs)	Total Runoff (cfs)	Capac Full (cfs)	Vel Ave (ft/s)	Line Size (in)	n-val Pipe	Line Length (ft)	Line Slope (%)
1	P-P1A-9J	ELBOW S-P1A-9J	Outfall	0.00	0.00	0.00	22.05	0.00	0.00	124.98	1955.55	7.90	60	0.012	15.532	48.03
2	P-P1A-96	S-P1A-96	1	0.50	0.98	0.49	22.05	6.95	3.40	125.43	141.56	10.04	54	0.012	88.335	0.44
3	P-P1A-97	S-P1A-97	2	0.31	0.98	0.30	18.59	6.95	2.11	107.21	143.18	6.74	54	0.012	225.852	0.45
4	P-P1A-98	S-P1A-98	3	0.37	0.98	0.36	17.99	6.95	2.52	105.25	143.18	6.62	54	0.012	225.840	0.45
5	P-PS1-99	S-P1A-99	4	0.32	0.98	0.31	16.97	6.95	2.18	100.20	108.73	10.42	42	0.012	227.187	1.00
6	P-P1A-100	S-P1A-100	5	0.42	0.98	0.41	15.95	6.95	2.86	95.08	97.37	9.88	42	0.012	218.000	0.80
7	P-P1A-101A	S-P1A-101A	6	0.00	0.98	0.00	8.68	0.00	0.00	52.27	53.52	7.40	36	0.012	174.938	0.55
8	P-P1A-101	S-P1A-101	7	0.31	0.98	0.30	5.69	6.95	2.11	34.46	53.58	4.88	36	0.012	58.183	0.55
9	P-P1A-102	S-P1A-102	8	0.24	0.98	0.24	4.47	6.95	1.63	27.58	32.98	5.62	30	0.012	250.503	0.55
10	P-P1A-103	S-P1A-103	9	0.00	0.98	0.00	3.62	0.00	0.00	22.42	24.51	7.14	24	0.012	72.955	1.00
11	P-P1A-103B	S-P1A-103B	10	0.05	0.98	0.05	3.33	6.95	0.34	20.74	24.50	6.60	24	0.012	56.000	1.00
12	P-P1A-103C	S-P1A-103C	11	0.29	0.98	0.28	2.37	6.95	1.97	15.02	17.33	4.78	24	0.012	181.812	0.50
13	P-P1A-103D	S-P1A-103D	12	0.04	0.98	0.04	2.01	6.95	0.27	12.82	17.30	4.08	24	0.012	63.160	0.50
14	P-P1A-103E	S-P1A-103E	13	0.05	0.98	0.05	1.86	6.95	0.34	11.99	22.79	3.82	24	0.012	74.540	0.87
15	P-P1A-139A	S-P1A-139A	14	0.19	0.98	0.19	0.92	6.95	1.29	5.94	7.00	4.84	15	0.012	10.000	1.00
16	P-P1A-140	S-P1A-140	15	0.21	0.98	0.21	0.74	6.95	1.43	4.81	6.95	3.92	15	0.012	120.939	0.99
17	P-P1A-140A	S-P1A-140A	16	0.34	0.98	0.33	0.53	6.95	2.31	3.47	3.85	4.42	12	0.012	35.754	1.00
18	P-P1A-141	S-P1A-141	17	0.20	0.98	0.20	0.20	6.95	1.36	1.36	3.83	1.73	12	0.012	195.694	0.99
19	P-P1A-103F	S-P1A-103F	14	0.07	0.98	0.07	0.67	6.95	0.48	4.58	6.57	3.73	15	0.012	197.182	0.88
20	P-P1A-103G	S-P1A-103G	19	0.27	0.98	0.26	0.26	6.95	1.84	1.84	3.62	2.34	12	0.012	22.731	0.88
21	P-P1A-143	S-P1A-143	11	0.36	0.98	0.35	0.86	6.95	2.45	5.81	7.00	4.74	15	0.012	13.000	1.00
22	P-P1A-144AA	S-P1A-144AA	21	0.00	0.98	0.00	0.51	0.00	0.00	3.49	3.86	4.44	12	0.012	142.000	1.00
23	P-P1A-144A	S-P1A-144A	22	0.23	0.98	0.23	0.51	6.95	1.57	3.51	3.86	4.47	12	0.012	45.000	1.00

Project File: 231002 - Run A - Capacity-Gateway Services.stm

Number of lines: 72

Date: 10/3/2023

NOTES: Intensity = 102.61 / (Inlet time + 16.50) ^ 0.82 -- Return period = 25 Yrs. ; i Inlet control; ** Critical depth

Line No.	Line ID	Inlet ID	DnStm Ln No	Drng Area (ac)	Runoff Coeff (C)	Incr CxA	Total CxA	i Inlet (in/hr)	Incr Q (cfs)	Total Runoff (cfs)	Capac Full (cfs)	Vel Ave (ft/s)	Line Size (in)	n-val Pipe	Line Length (ft)	Line Slope (%)
24	P-P1A-146A	S-P1A-146A	14	0.06	0.98	0.06	0.23	6.95	0.41	1.56	7.00	1.27	15	0.012	30.000	1.00
25	S-P1A-146	S-P1A-146	24	0.17	0.98	0.17	0.17	6.95	1.16	1.16	3.86	1.47	12	0.012	10.000	1.00
26	P-P1A-139	S-P1A-139	13	0.11	0.98	0.11	0.11	6.95	0.75	0.75	3.87	1.94	12	0.012	18.138	1.00
27	P-P1A-144	S-P1A-144	23	0.29	0.98	0.28	0.28	6.95	1.97	1.97	3.86	3.26	12	0.012	56.337	1.00
28	P-P1A-147	S-P1A-147	19	0.13	0.98	0.13	0.33	6.95	0.88	2.30	3.62	2.93	12	0.012	30.000	0.88
29	P-P1A-148A	S-P1A-148A	28	0.00	0.00	0.00	0.21	0.00	0.00	1.42	3.62	1.81	12	0.012	5.750	0.88
30	P-P1A-148	S-P1A-148	29	0.21	0.98	0.21	0.21	6.95	1.43	1.43	3.62	1.82	12	0.012	11.019	0.88
31	P-P1A-135	S-P1A-135	11	0.05	0.98	0.05	0.05	6.95	0.34	0.34	3.86	2.68	12	0.012	28.000	1.00
32	P-P1A-137A	S-P1A-137A	12	0.08	0.98	0.08	0.08	6.95	0.54	0.54	3.86	0.69	12	0.012	28.000	1.00
33	P-P1A-101B	S-P1A-101B	7	0.07	0.98	0.07	2.99	6.95	0.48	19.46	24.48	6.19	24	0.012	28.653	1.00
34	P-P1A-101C	S-P1A-101C	33	0.04	0.98	0.04	2.92	6.95	0.27	19.20	24.45	6.11	24	0.012	123.521	1.00
35	P-P1A-101D	S-P1A-101D	34	0.17	0.98	0.17	2.88	6.95	1.16	19.04	24.53	6.06	24	0.012	64.869	1.00
36	P-P1A-101E	S-P1A-101E	35	0.14	0.98	0.14	1.57	6.95	0.95	10.41	11.40	6.99	18	0.012	66.717	1.00
37	P-P1A-101F	S-P1A-101F	36	0.04	0.98	0.04	0.27	6.95	0.27	1.90	3.86	3.19	12	0.012	254.522	1.00
38	P-P1A-101G	S-P1A-101G	37	0.24	0.98	0.24	0.24	6.95	1.63	1.63	3.86	2.95	12	0.012	30.000	1.00
39	P-P1A-102A	S-P1A-102A	9	0.06	0.98	0.06	0.24	6.95	0.41	1.58	3.87	2.01	12	0.012	24.689	1.00
40	P-P1A-102B	S-P1A-102B	39	0.12	0.98	0.12	0.18	6.95	0.82	1.19	3.85	3.85	12	0.012	54.509	1.00
41	P-P1A-102C	S-P1A-102C	40	0.06	0.98	0.06	0.06	6.95	0.41	0.41	3.86	1.58	12	0.012	82.758	1.00
42	P-P1A-101H	S-P1A-101H	36	0.29	0.98	0.28	1.16	6.95	1.97	7.72	11.39	4.37	18	0.012	32.311	1.00
43	P-P1A-101I	S-P1A-101I	42	0.31	0.98	0.30	0.67	6.95	2.11	4.52	7.00	3.68	15	0.012	114.712	1.00
44	P-P1A-101J	S-P1A-101J	43	0.37	0.98	0.36	0.36	6.95	2.52	2.52	3.86	3.21	12	0.012	150.948	1.00
45	P-P1A-116	S-P1A-116	8	0.17	0.98	0.17	0.51	6.95	1.16	3.42	3.85	4.36	12	0.012	21.047	1.00
46	P-P1A-117	S-P1A-117	45	0.12	0.98	0.12	0.21	6.95	0.82	1.39	3.86	4.04	12	0.012	77.865	1.00

Project File: 231002 - Run A - Capacity-Gateway Services.stm

Number of lines: 72

Date: 10/3/2023

NOTES: Intensity = 102.61 / (Inlet time + 16.50) ^ 0.82 -- Return period = 25 Yrs. ; i Inlet control; ** Critical depth

Line No.	Line ID	Inlet ID	DnStm Ln No	Drng Area (ac)	Runoff Coeff (C)	Incr CxA	Total CxA	i Inlet (in/hr)	Incr Q (cfs)	Total Runoff (cfs)	Capac Full (cfs)	Vel Ave (ft/s)	Line Size (in)	n-val Pipe	Line Length (ft)	Line Slope (%)
47	P-P1A-118	S-P1A-118	46	0.09	0.98	0.09	0.09	6.95	0.61	0.61	3.85	1.86	12	0.012	89.194	1.00
48	P-P1A-101K	S-P1A-101K	42	0.21	0.98	0.21	0.21	6.95	1.43	1.43	3.85	1.82	12	0.012	55.165	1.00
49	P-P1A-119	S-P1A-119	45	0.14	0.98	0.14	0.14	6.95	0.95	0.95	3.86	3.61	12	0.012	63.640	1.00
50	P-P1A-136A	S-P1A-136A	10	0.29	0.98	0.28	0.28	6.95	1.97	1.97	3.87	2.51	12	0.012	34.344	1.00
51	P-P1A-101M	S-P1A-101M	35	0.44	0.98	0.43	1.02	6.95	2.99	7.04	7.82	6.77	15	0.012	49.162	1.25
52	P-P1A-101N	S-P1A-101N	51	0.60	0.98	0.59	0.59	6.95	4.08	4.08	4.32	5.20	12	0.012	53.500	1.25
53	P-P1A-100A	S-P1A-100A	6	1.24	0.98	1.22	2.62	6.95	8.44	16.58	24.45	5.28	24	0.012	38.768	1.00
54	P-P1A-100G	S-P1A-100G	53	0.05	0.98	0.05	0.19	6.95	0.34	1.27	3.85	3.92	12	0.012	114.497	1.00
55	P-P1A-100H	S-P1A-100H	54	0.14	0.98	0.14	0.14	6.95	0.95	0.95	3.86	2.36	12	0.012	90.464	1.00
56	P-P1A-101L	S-P1A-101L	35	0.13	0.98	0.13	0.13	6.95	0.88	0.88	3.86	1.13	12	0.012	30.000	1.00
57	P-P1A-100F	S-P1A-100F	53	0.09	0.98	0.09	0.09	6.95	0.61	0.61	3.86	3.18	12	0.012	50.271	1.00
58	P-P1A-100B	S-P1A-100B	53	0.06	0.98	0.06	1.13	6.95	0.41	7.16	7.83	6.82	15	0.012	46.979	1.25
59	P-P1A-100C	S-P1A-100C	58	0.11	0.98	0.11	1.07	6.95	0.75	6.85	7.00	5.58	15	0.012	102.000	1.00
60	P-P1A-100J	S-P1A-100J	59	0.13	0.98	0.13	0.28	6.95	0.88	1.96	3.86	2.50	12	0.012	66.527	1.00
61	P-P1A-100K.	S-P1A-100K.	60	0.16	0.98	0.16	0.16	6.95	1.09	1.09	3.86	1.39	12	0.012	15.186	1.00
62	P-P1A-100D	S-P1A-100D	59	0.14	0.98	0.14	0.60	6.95	0.95	4.12	4.31	5.25	12	0.012	43.528	1.25
63	P-P1A-100E	S-P1A-100E	62	0.47	0.98	0.46	0.46	6.95	3.20	3.20	3.85	4.07	12	0.012	53.425	1.00
64	P-P1A-133	S-P1A-133	9	0.39	0.98	0.38	0.38	6.95	2.65	2.65	3.86	3.38	12	0.012	73.001	1.00
65	P-P1A-100I	S-P1A-100I	59	0.08	0.98	0.08	0.08	6.95	0.54	0.54	3.86	0.69	12	0.012	112.850	1.00
66	P-P1A-115	S-P1A-115	8	0.42	0.98	0.41	0.41	6.95	2.86	2.86	3.86	4.06	12	0.012	73.000	1.00
67	P-P1A-112	S-P1A-112	6	0.16	0.98	0.16	4.24	6.95	1.09	29.19	30.05	9.29	24	0.012	72.998	1.50
68	P-P1A-113	S-P1A-113	67	3.94	0.98	3.86	3.86	6.95	26.82	26.82	27.44	8.54	24	0.012	103.655	1.25
69	P-P1A-110	S-P1A-110	5	0.49	0.98	0.48	0.71	6.95	3.34	4.87	7.00	3.97	15	0.012	86.000	1.00

Project File: 231002 - Run A - Capacity-Gateway Services.stm

Number of lines: 72

Date: 10/3/2023

NOTES: Intensity = 102.61 / (Inlet time + 16.50) ^ 0.82 -- Return period = 25 Yrs. ; i Inlet control; ** Critical depth

Line No.	Line ID	Inlet ID	DnStm Ln No	Drng Area (ac)	Runoff Coeff (C)	Incr CxA	Total CxA	i Inlet (in/hr)	Incr Q (cfs)	Total Runoff (cfs)	Capac Full (cfs)	Vel Ave (ft/s)	Line Size (in)	n-val Pipe	Line Length (ft)	Line Slope (%)
70	P-P1A-108	S-P1A-108	4	0.49	0.98	0.48	0.66	6.95	3.34	4.52	7.00	3.69	15	0.012	72.994	1.00
71	P-P1A-106	S-P1A-106	3	0.30	0.98	0.29	0.29	6.95	2.04	2.04	7.00	1.66	15	0.012	73.005	1.00
72	P-P1A-104	S-P1A-104	2	0.65	0.98	0.64	2.97	6.95	4.42	20.58	30.08	6.55	24	0.012	73.000	1.51

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Number of lines: 72

Date: 10/3/2023

NOTES: Intensity = 102.61 / (Inlet time + 16.50) ^ 0.82 -- Return period = 25 Yrs. ; i Inlet control; ** Critical depth

Invert Up (ft)	Invert Dn (ft)	
14.71	7.25	
15.60	15.21	
16.62	15.60	
17.64	16.62	
21.76	19.50	
25.42	23.68	
27.37	26.41	
27.69	27.37	
29.57	28.19	
30.80	30.07	
31.36	30.80	
32.27	31.36	
32.58	32.27	
37.80	37.16	
38.65	38.55	
39.84	38.65	
40.44	40.09	
42.37	40.44	
40.29	38.55	
40.74	40.54	
36.82	36.69	
38.49	37.07	
38.94	38.49	

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NOTES: i Inlet control; ** Critical depth

Invert Up (ft)	Invert Dn (ft)	
39.10	38.80	
39.45	39.35	
41.30	41.11	
41.67	41.11	
40.80	40.54	
40.85	40.80	
40.95	40.85	
40.33	40.05	
33.55	33.27	
28.66	28.37	
29.89	28.66	
30.54	29.89	
36.02	35.35	
39.07	36.52	
39.37	39.07	
34.98	34.73	
38.56	38.02	
39.39	38.56	
36.34	36.02	
37.74	36.59	
39.50	37.99	
32.57	32.36	
37.51	36.73	

Project File: 231002 - Run A - Capacity-Gateway Services.stm	Number of lines: 72	Date: 10/3/2023
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NOTES: i Inlet control; ** Critical depth

Invert Up (ft)	Invert Dn (ft)	
38.40	37.51	
37.39	36.84	
37.37	36.73	
36.72	36.38	
36.09	35.48	
37.01	36.34	
27.80	27.41	
35.85	34.71	
36.75	35.85	
31.84	31.54	
35.21	34.71	
32.46	31.87	
33.48	32.46	
34.40	33.73	
34.55	34.40	
34.27	33.73	
34.80	34.27	
34.80	34.07	
34.86	33.73	
33.79	33.06	
28.02	26.92	
29.32	28.02	
25.42	24.56	

Project File: 231002 - Run A - Capacity-Gateway Services.stm	Number of lines: 72	Date: 10/3/2023
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NOTES: i Inlet control; ** Critical depth

Invert Up (ft)	Invert Dn (ft)	
23.08	22.35	
22.25	21.52	
18.70	17.60	

Project File: 231002 - Run A - Capacity-Gateway Services.stm	Number of lines: 72	Date: 10/3/2023
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NOTES: i Inlet control; ** Critical depth

Appendix B

Inlet Drainage Area Map



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