

DRESDNER ROBIN

STORMWATER MANAGEMENT AND ENGINEER'S REPORT

175 AVENUE A

BLOCK 300.01 LOTS 1, 2, & 3 & BLOCK 301.03 LOTS 2 & 3

CITY OF BAYONNE, HUDSON COUNTY, NEW JERSEY

DRESDNER ROBIN PROJECT NO.: 11063-002

PREPARED FOR

BAYVIEW JV, LLC
1250 ROUTE 27, SUITE 101
BRANCBURG, NJ 08876

PREPARED BY

DRESDNER ROBIN
1 EVERTRUST PLAZA, SUITE 901
JERSEY CITY, NJ 07302

DATE

MAY 2021
REVISED JULY 2021

MATTHEW J. NEULS
PROFESSIONAL ENGINEER
NJ LICENSE NO. 24GE04313300

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1.0 INTRODUCTION

1.1 PURPOSE

This report has been prepared to demonstrate how the proposed improvements meet the criteria of the following standards:

- New Jersey Residential Site Improvement Standards (N.J.A.C. 5:21) (published July 21, 2014).
- Stormwater Management Rules (N.J.A.C. 7:8) (amended April 19, 2010).
- Safe Drinking Water Act Rules (N.J.A.C. 7:10) (amended January 4, 2011).
- Pollutant Discharge Elimination System Rules (N.J.A.C. 7:14A) (amended January 5, 2009).
- Chapter 30 "Stormwater Control" of the City of Bayonne's municipal code.

1.2 PROJECT DESCRIPTION

The project site contains approximately 17.13 acres and has frontage along Avenue A, with the rear of the site abutting the Newark Bay. The site is governed by the Bayview Redevelopment Plan. The site is presently occupied by an existing commercial building, a surface parking lot and contains some areas of vegetation. The property presently drains primarily to a water quality basin at the southwest portion of the site which eventually drains to Newark Bay to the west.

The applicant proposes a development which will include four (4) mixed use buildings (Buildings B2, B3, B4, and B5), consisting of 1,100 residential units with integrated parking, ground level retail and surface parking. An existing building (B1) with a fitness center will remain on site. Additional site improvements include a waterfront park, landscape features, signage, sidewalk areas with various pedestrian plaza areas, and new privately owned roadways throughout the site. The site will continue to drain towards the Newark Bay via a proposed on-site storm sewer collection system, and two (2) new dedicated stormwater outfalls to the Newark Bay. An existing combined sewer main, which collects from residential areas located at the north of the project site, will remain in place. This project does not propose a connection to said main.

1.3 FLOOD ELEVATIONS

Portions of the Project Site are located within regulated flood zone Zone AE (EL. 12) with a Base Flood Elevation (BFE) of 12.0' referenced to the North American Vertical Datum of 1988

(NAVD88), as depicted on the FEMA Preliminary Flood Insurance Rate Map (PFIRM) for Hudson County, New Jersey, Panel 94 of 118, City of Bayonne.

The site is located in a tidal area, and per the NJAC 7:13 Flood Hazard Area Control Act Rules, Section 3 "Determining the Flood Hazard Area and Floodway," the Flood Hazard Area Design Flood Elevation (DFE) in tidal water areas (Method 2, FEMA Tidal method) is equivalent to the BFE. Thus, the DFE for the subject site is elevation 12.0' NAVD88.

2.0 STORMWATER MANAGEMENT

2.1 PURPOSE AND NEED

The proposed development will disturb more than 1 acre of land; therefore, the project is defined as a "major development" in accordance with the City of Bayonne's stormwater control ordinance described above as well as New Jersey's Stormwater Rules at NJAC 7:8. As a result, these regulations mandate the proposed development incorporate measures to address groundwater recharge, stormwater quality, and stormwater quantity.

2.2 GROUNDWATER RECHARGE

The regulations cited above specify minimum design and performance standards for groundwater recharge; however, in accordance with N.J.A.C. 7:8-5.4(a)2.ii., the groundwater recharge requirement does not apply to previously disturbed project sites within the "Metropolitan Planning Area PA-1 Zone", which includes the project site, which has been previously disturbed; therefore groundwater recharge is not required for this project.

2.3 WATER QUALITY

Per NJDEP, "Stormwater management measures shall only be required for water quality control if an additional one-quarter acre of impervious surface is being proposed on a development site." (N.J.A.C. 7:8-5.5). Since the proposed increase in impervious surface coverage is in excess of the threshold of $\frac{1}{4}$ acre, non-structural water quality treatment measures are necessary for compliance with this requirement. This project will include bioretention systems, pervious pavers, and pervious asphalt which will treat 80% of Total Suspended Solids (TSS) per the requirement under the Rules cited above.

2.4 WATER QUANTITY

The City of Bayonne's Stormwater Control Ordinance requires "major developments" to demonstrate through hydrologic and hydraulic analysis that the post-constructed stormwater runoff rates and volumes leaving the site meet specific criteria. The requirements state that proposed peak runoff rates shall be reduced to 50%, 75% and 80% of existing rates for the 2-year, 10-year and 100-year storm events respectively. However, in tidal flood hazard areas, stormwater runoff quantity analysis in accordance with (a)3i, ii and iii above shall only be applied if the increased volume of stormwater runoff could increase flood damages below the point of discharge. Because the proposed storm sewer improvements at the project site will discharge directly to the Newark Bay, a tidal water body, Water Quantity Analysis is not required.

2.5 PIPE CONVEYANCE

The proposed on-site storm sewer collection system has been designed to collect runoff from the proposed surface parking areas, drive aisles, park spaces and proposed buildings. The stormwater collection system will connect to underdrains located in the bioretention areas, pervious pavement areas, and pervious paver areas. The proposed on-site storm sewer conveyance system will connect to the proposed outfall in Newark Bay. A portion of the northern part of the site will connect to a second proposed outfall in Newark Bay. This is consistent with the existing drainage pattern for the site. Permanent soil erosion measures consistent with the New Jersey Standards for Soil Erosion and Sediment Control are proposed at the outfall location.

2.6 CONCLUSION

In conclusion, the proposed drainage pattern for the subject site is generally in keeping with the existing drainage pattern. The project includes non-structural sin order to meet the requirements of City of Bayonne's stormwater control ordinance described above. The proposed on-site storm sewer conveyance system is sized appropriately to handle the 25-year storm for the subject site. The project is not anticipated to have any negative impacts on the drainage patterns of the site, neighboring properties, or the area as a whole.

3.0 WATER AND SEWER DEMAND

3.1 SANITARY SEWER

Survey information indicates the presence of a 12-inch diameter sanitary line in West 5th street. The project proposes four (4) 8-inch sanitary sewer laterals connecting the

buildings to a proposed 8-inch gravity sewer main flowing from north to south. The sanitary main will be located in the proposed private roadways. The main will tie into the existing sewer main on West 5th street. The projected sanitary flow can be found in Appendix A, which was developed based upon the New Jersey Technical Requirements for Treatment Works Approvals at N.J.A.C. 7:14A-23.3.

Because the anticipated flow to be generated by the development is greater than 8,000 gallons per day, a Treatment Works Approval will be required from the New Jersey Department of Environmental Protection (NJDEP) prior to construction.

3.2 WATER SERVICE

Water service to the project site is provided by Suez Northern New Jersey. Survey information indicates the presence of a 12-inch water main running within the Avenue A Right of Way. This project proposes a new 12-inch water main loop within the private roadways within the project site which will connect to the existing water main in Avenue A. The proposed connections, valve enclosure and other related improvements and will be designed to be consistent with Suez details and standards and coordinated with the utility.

The estimated average-daily and peak water demand for the development can be found in Appendix B, which was calculated in accordance with Table 5.1 and 5.2 of the New Jersey Residential Site Improvements Standards (N.J.A.C. 5:21-5.1) and the Safe Drinking Water Act Rules (N.J.A.C. 7:10-12.6, Table 1: Average Daily Water Demand).

APPENDIX A
SANITARY SEWER DEMAND
CALCULATIONS

DRESDNER ROBIN

5/20/2021

SANITARY SEWER CALCULATIONS

175 Avenue A
BLOCK x, Lot X
City of Bayonne, New Jersey
DR PROJECT NO. 11063-002

Type of Establishment	Measurement	# Units	GPD/Unit	GPD
Studio	Per Dwelling	219	150	32,850
1 Bedroom	Per Dwelling	604	150	90,600
2 Bedroom	Per Dwelling	219	225	49,275
3 Bedroom	Per Dwelling	58	300	17,400
Retail	Sq. Ft.	55,000	0.1	5,500
Flow Received				100%
Total Flow (GPD) ($Q_{\text{projected}}$)				195,625
Total Flow (CFS) ($Q_{\text{projected}}$)				0.303

Projected Estimates per N.J.A.C. 7:14A-23.3

Pipe	Length (ft)	n*	Slope	Diameter (in)
8 inch PVC		0.013	2.00%	8

Half Flow Pipe Capacity	
Depth of Flow, h (in)	4
h/D	0.500
Pipe Radius, r (ft)	0.333
Circ. Segment Height, h (ft)	0.333
Central Angle, θ (radians)	3.142
Cross-Sectional Area, A (ft ²)	0.175
Wetted Perimeter, P (ft)	1.047
Hydraulic Radius, R (ft)	0.167
Discharge, Q (cfs)	0.857
$Q_{\text{projected}}$ (x2) (cfs)	0.605
Pipe % Full $[(A/A_{\text{full}})*100\%]$	50.00%
Average Velocity, V (ft/sec)	4.909
$Q_{\text{pipe}} > 2xQ_{\text{projected}}$	TRUE
$V \geq 2.2$ ft/sec	TRUE
Therefore, design is	ADEQUATE

Actual Pipe Velocity	
**Depth of Flow, h (in)	2.240
Pipe Radius, r (ft)	0.333
Circ. Segment Height, h (ft)	0.187
Central Angle, θ (radians)	2.230
Cross-Sectional Area, A (ft ²)	0.080
Wetted Perimeter, P (ft)	0.743
Hydraulic Radius, R (ft)	0.108
Pipe % Full $[(A/A_{\text{full}})*100\%]$	22.92%
Actual Velocity, V (ft/sec)	3.667

**Must have $h < r$

Compare	
Discharge, Q (cfs)	0.293
$Q_{\text{projected}}$ (cfs)	0.303

DRESDNER ROBIN

5/20/2021

Equations used for calculations:

Manning's Formula:

$$Q = \left(\frac{1.49}{n}\right) AR^{2/3}\sqrt{S}$$

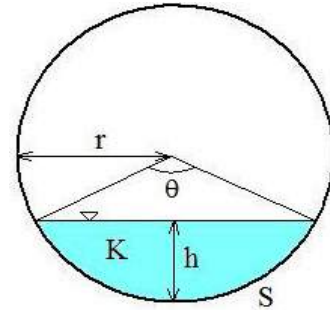
Q = Flow Rate, (ft³/s)

n = Manning's Coefficient

A = Flow Area, (ft²)

R = Hydraulic Radius, (ft)

S = Channel Slope, (ft/ft)



$$\theta = 2 \arccos\left(\frac{r-h}{r}\right)$$

$$A = \frac{r^2(\theta - \sin\theta)}{2}$$

$$P = r\theta$$

APPENDIX B
WATER SERVICE DEMAND
CALCULATIONS

WATER DEMAND CALCULATIONS								
175 Avenue A BLOCK x, Lot X City of Bayonne, New Jersey DR PROJECT NO. 11063-002								
Residential Demand ¹								
Type of Establishment	Measurement	# Units	GPD/Unit	Daily Demand (GPD)	Daily Demand (MGD)	Peaking Factor	Peak Daily Demand (GPD)	Peak Daily Demand (MGD)
Studio	Per Dwelling	219	65	14,235	0.014	3	42,705	0.043
1-Bedroom	Per Dwelling	604	95	57,380	0.057	3	172,140	0.172
2-Bedroom	Per Dwelling	219	140	30,660	0.031	3	91,980	0.092
3-Bedroom	Per Dwelling	58	215	12,470	0.012	3	37,410	0.037
Total Units		1,100						
Total Residential Demand				114,745	0.115		344,235	0.344
Non-Residential Demand ²								
Type of Establishment	Measurement	# Units	GPD/Unit	Daily Demand (GPD)	Daily Demand (MGD)	Peaking Factor	Peak Daily Demand (GPD)	Peak Daily Demand (MGD)
Retail	SF	55,000	0.125	6,875	0.007	3	20,625	0.021
Total Non-Residential Demand				6,875	0.007		20,625	0.021
Total Site Demand				121,620	0.122		364,860	0.365

Notes:

¹ Residential demand as per N.J.A.C. 5:21-5.2

² Non-residential demand as per N.J.A.C. 7:10-12.6 (Table 1)

APPENDIX C
STORM PIPE CONVEYANCE
CALCULATIONS

DRESDNER ROBIN DRAINAGE CALCULATIONS

MADE BY: GRG
REV. BY: MJN

DATE: 5/19/21
DATE: 5/19/21

RAINFALL CURVE: RSIS Standard

PROJECT: Avenue A - Bayview
PROJECT NO.: 11063-002

FROM	TO	INLET AREA	"C"	CA	TC	DES. STORM	"I"	"Qa"	SLOPE	PIPE DIAM	Mannings Number	VELOCITY (fps)	LENGTH	FLOW TIME (min)	CAPACITY Qf (cfs)	% Full (Qa/Qf)	GROUND ELEVATION		INVERT ELEVATION		REMARKS
																	Upper	Lower	Upper	Lower	
120	121	0.07	0.99	0.07	6	25	6.70	0.45	0.0040	15	0.013	3.33	33	0.2	4.1	11%	13.50	13.50	10.26	10.13	RCP
121	122	0.06	0.99	0.06	6	25	6.70	0.86	0.0040	15	0.013	3.33	84	0.4	4.1	21%	13.50	18.50	10.13	9.80	RCP
122	123	0.28	0.60	0.17	6	25	6.70	1.98	0.0040	15	0.013	3.33	60	0.3	4.1	49%	18.50	19.40	9.80	9.56	RCP
123	112	0.14	0.90	0.12	6	25	6.70	2.81	0.0040	15	0.013	3.33	53	0.3	4.1	69%	19.40	18.95	9.46	9.24	RCP
112	111	0.00	N/A	N/A	6	25	6.70	2.81	0.0040	18	0.013	3.76	214	0.9	6.6	42%	18.95	15.75	9.14	8.29	RCP
124	111	0.27	0.99	0.27	6	25	6.70	1.81	0.0100	15	0.013	5.26	29	0.1	6.5	28%	15.85	15.75	8.54	8.29	RCP
111	110	0.00	N/A	N/A	6	25	6.70	4.62	0.0040	18	0.013	3.76	308	1.4	6.6	70%	15.75	14.50	8.19	7.05	RCP
125	110	0.10	0.99	0.09	6	25	6.70	0.64	0.0100	15	0.013	5.26	29	0.1	6.5	10%	14.50	14.50	7.34	7.05	RCP
110	109	0.00	N/A	N/A	6	25	6.70	5.26	0.0040	18	0.013	3.76	43	0.2	6.6	79%	14.50	14.50	6.95	6.88	RCP
126	109	0.03	0.75	0.03	6	25	6.70	0.17	0.0040	15	0.013	3.33	10	0.1	4.1	4%	14.50	14.50	6.83	6.78	RCP
109	108	0.00	N/A	N/A	6	25	6.70	5.43	0.0040	18	0.013	3.76	10	0.0	6.6	82%	14.50	14.50	6.78	6.72	RCP
108	107	0.00	N/A	N/A	6	25	6.70	5.43	0.0040	18	0.013	3.76	206	0.9	6.6	82%	14.5	15.9	10	5.69	RCP
127	116	0.34	0.99	0.34	6	25	6.70	2.26	0.0100	15	0.013	5.26	21	0.1	6.5	35%	14.38	15.10	10.92	10.71	RCP
128	116	0.34	0.99	0.34	6	25	6.70	2.26	0.0100	15	0.013	5.26	21	0.1	6.5	35%	14.80	15.10	10.92	10.71	RCP
116	107	0.00	N/A	N/A	6	25	6.70	4.51	0.0100	15	0.013	5.26	153	0.5	6.5	70%	15.10	15.90	10.61	9.08	RCP
134	132	0.07	0.80	0.06	6	25	6.70	0.38	0.0100	12	0.013	4.53	99	0.4	3.6	11%	18.50	21.00	14.93	13.94	RCP
133	132	0.09	0.80	0.07	6	25	6.70	0.47	0.0100	12	0.013	4.53	96	0.4	3.6	13%	21.50	21.00	14.90	13.94	RCP
132	131	0.13	0.97	0.12	6	25	6.70	1.67	0.0100	12	0.013	4.53	58	0.2	3.6	47%	21.5	20.5	13.84	13.37	RCP
131	115	0.10	0.95	0.10	6	25	6.70	2.31	0.0100	12	0.013	4.53	27	0.1	3.6	65%	20.50	21.50	13.27	13.00	RCP
115	114	0.00	N/A	N/A	6	25	6.70	2.31	0.0040	15	0.013	3.33	269	1.3	4.1	57%	21.05	15.89	11.65	10.47	RCP
129	114	0.19	0.99	0.19	6	25	6.70	1.29	0.0100	15	0.013	5.26	24	0.1	6.5	20%	15.89	15.89	10.81	10.47	RCP
130	114	0.19	0.99	0.19	6	25	6.70	1.26	0.0100	15	0.013	5.26	26	0.1	6.5	20%	15.89	15.89	10.83	10.37	RCP
114	107	0.00	N/A	N/A	6	25	6.70	4.86	0.0040	18	0.013	3.76	94	0.4	6.6	73%	15.89	15.89	10.83	10.37	RCP
107	106	0.00	N/A	N/A	6	25	6.70	14.80	0.0040	30	0.013	5.28	89	0.3	25.9	57%	15.90	15.15	5.69	5.34	RCP
135	106	0.09	0.99	0.09	6	25	6.70	0.59	0.0100	15	0.013	5.26	79	0.3	6.5	9%	15.00	15.15	5.34	5.49	RCP
106	105	0.00	N/A	N/A	6	25	6.70	15.39	0.0040	30	0.013	5.28	31	0.1	25.9	59%	15.15	15.8	5.34	5.21	RCP
105	104	0.12	0.99	0.12	6	25	6.70	15.39	0.0040	30	0.013	5.28	57	0.2	25.9	59%	15.80	15.72	5.11	4.88	RCP
137	113	0.21	0.99	0.21	6	25	6.70	1.38	0.0100	15	0.013	5.26	23	0.1	6.5	21%	15.89	16.30	10.70	10.47	RCP
136	113	0.21	0.99	0.21	6	25	6.70	1.38	0.0100	15	0.013	5.26	23	0.1	6.5	21%	15.89	16.3	10.74	10.47	RCP
113	104	0.00	N/A	N/A	6	25	6.70	2.76	0.0040	18	0.013	3.76	93	0.4	6.6	42%	16.30	15.72	10.37	10.00	RCP
104	103	0.00	N/A	N/A	6	25	6.70	18.15	0.0040	30	0.013	5.28	165	0.5	25.9	70%	15.72	15.8	4.38	3.72	RCP
138	103	0.34	0.95	0.33	6	25	6.70	2.18	0.0100	12	0.013	4.53	20	0.1	3.6	61%	15.00	15.38	13.00	12.50	RCP
103	102	0.00	N/A	N/A	6	25	6.70	20.34	0.0040	30	0.013	5.28	198	0.6	25.9	78%	15.80	15.30	0.63	2.83	RCP
102	101	0.00	N/A	N/A	6	25	6.70	20.34	0.0040	30	0.013	5.28	50	0.2	25.9	78%	15.30	15.50	2.73	2.53	RCP
101	100	0.00	N/A	N/A	6	25	6.70	20.34	0.0040	30	0.013	5.28	107	0.3	25.9	78%	15.50	2.00	2.43	2.00	RCP

APPENDIX D
STORMWATER OPERATIONS AND
MAINTENANCE MANUAL

DRESDNER ROBIN

STORMWATER MANAGEMENT OPERATION AND MAINTENANCE MANUAL

175 AVENUE A

BLOCK 300.01 LOTS 1, 2, & 3 & BLOCK 301.03 LOTS 2 & 3

CITY OF BAYONNE, HUDSON COUNTY, NEW JERSEY

DRESDNER ROBIN PROJECT NO.: 11063-002

PREPARED FOR

BAYVIEW JV, LLC
1250 ROUTE 27, SUITE 101
BRANCBURG, NJ 08876

PREPARED BY

DRESDNER ROBIN
1 EVERTRUST PLAZA
SUITE 901
JERSEY CITY, NEW JERSEY 07302
(201) 217-9200

DATE
JULY 2021



MATTHEW J. NEULS
PROFESSIONAL ENGINEER
NJ LICENSE NO. 24GE04313300

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- B. Maintenance Log**

1.0 INTRODUCTION

The applicant proposes a development which will include four (4) mixed use buildings (Buildings B2, B3, B4, and B5), consisting of 1,100 residential units with integrated parking, ground level retail and surface parking. An existing building (B1) with a fitness center will remain on site. Additional site improvements include a waterfront park, landscape features, signage, sidewalk areas with various pedestrian plaza areas, and new privately owned roadways throughout the site. The site will continue to drain towards the Newark Bay via a proposed on-site storm sewer collection system, and two (2) new dedicated stormwater outfalls to the Newark Bay. An existing combined sewer main, which collects from residential areas located at the north of the project site, will remain in place. This project does not propose a connection to said main.

As part of the project, stormwater pipes, inlets, and manholes will be constructed to attenuate stormwater runoff from the project site. As such, maintenance personnel should be properly trained, equipped, certified and supervised when performing maintenance on or within the stormwater management system.

This manual has been prepared in accordance with the New Jersey Stormwater Management Rules (N.J.A.C. 7:8) to describe on-going maintenance procedures that must be undertaken to ensure the successful continued operation of the stormwater management features and should be reviewed in conjunction with related drawings for the project.

The effectiveness of this maintenance plan should be evaluated at least once a year and be adjusted as necessary to ensure proper maintenance and function of the system.

2.0 RESPONSIBLE ENTITY

In accordance with N.J.A.C. 7:8-5.8(b), the following information is provided to identify the person responsible for preventative and corrective maintenance (including replacement) of the stormwater management measures for this project:

Bayview JV, LLC
1250 Route 27, Suite 101
Branchburg, NJ 08876
(T): (908) 874.5438

3.0 MAINTENANCE PLAN EFFECTIVENESS

In accordance with N.J.A.C. 7:8-5.8(g), the person responsible for maintenance identified above shall evaluate the effectiveness of this maintenance plan at least once per year and adjust the plan and the recorded deed as needed.

The maintenance person responsible shall evaluate the frequency of inspections, specified herein, for any element of the stormwater management system. Upon completion of the first few inspections, the maintenance personnel shall determine the specific elements of the stormwater

management system that may require more frequent inspections. Maintenance issues, such as the accumulation of sediment within the stormwater pipes and structures, are potential instances that would require an increase in inspection or maintenance frequency.

Additionally, the maintenance person responsible shall evaluate the frequency of inspections during less than average rainfall events of more than 1-inch of precipitation.

If any modifications to this report are required based on the above, they shall be properly recorded with the deed of the subject property.

4.0 RECOMMENDED TOOLS AND EQUIPMENT

A variety of tools and equipment will be necessary to observe the efficiency of the stormwater management system for the subject property and make repairs if necessary. A typical list of recommended tools and equipment are provided below. Note that this list may not be all inclusive and may require other tools and equipment based on the maintenance being performed:

- Rake
- Manhole pick
- Standard hand tools, including:
 - Flashlight
 - Screw drivers
 - Ratchets
 - Hammer
- Shovel
- Ladder
- Masonry tools and equipment
- Vacuum truck

5.0 KEY MAINTENANCE ITEMS

5.1 Inlets

Regular site maintenance should remove debris covering the drainage structure rims, grates and curb boxes. Trash, sediment, leaves and other debris should be removed from the rims, grates and curb boxes when the depth of this debris exceeds 6-inches above the bottom of the structure or 20% of the diameter of the outflow pipe, whichever is less. The rims, grates and curb boxes should also be inspected for signs of structural damage, settling or misalignment. Missing, damaged or misaligned grates should be replaced or repaired. Ladder-rungs must be in sound structural condition. If ladder-rungs are deemed to be unsafe, these items must be repaired or replaced. Debris removed from the rims, grates and curb boxes must be disposed of in a manner which complies with applicable local, state and federal laws and regulations.

Personnel must not enter stormwater management structures unless properly trained, equipped and qualified to enter a confined space as identified by local Occupational Safety and Health Regulations. Maintenance personnel must be aware of and avoid contact with any overhead utilities or obstructions when inspecting the stormwater management structures with long sampling devices. Stormwater management structures

are designed so inspection of the facility can be performed from grade (i.e. inspect for obstructions, debris accumulation, etc.).

5.2 Stormwater Manholes

Trash, sediment, leaves and other debris should be removed from the manhole when the depth of this debris exceeds 6-inches above the bottom of the structure or 20% of the diameter of the outflow pipe, whichever is less. The manhole should also be inspected for signs of structural damage, settling or misalignment. Missing, damaged or misaligned manhole covers should be replaced or repaired. Ladder-rungs must be in sound structural condition. If ladder-rungs are deemed to be unsafe, these items must be repaired or replaced. Debris removed from the manhole must be disposed of in a manner which complies with applicable local, state and federal laws and regulations.

Personnel must not enter stormwater manholes unless properly trained, equipped and qualified to enter a confined space as identified by local Occupational Safety and Health Regulations. Maintenance personnel must be aware of and avoid contact with any overhead utilities or obstructions when inspecting the structures with long sampling devices. Manholes are designed so inspection of the facility can be performed from grade (i.e. inspect for obstructions, debris accumulation, etc.).

5.3 Stormwater Pipes

Stormwater pipes are used to convey stormwater runoff. Accumulated sediment and/or debris that exceed 20% of the diameter of the pipe should be removed. Corrective action must be taken when joints are visibly misaligned or disrupted. Structural damage or pipe corrosion must be addressed promptly when identified.

6.0 INSPECTION AND MAINTENANCE SCHEDULE

The person responsible for maintenance identified herein shall maintain a detailed log of all preventative 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. The person responsible for maintenance identified herein 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 specified herein.

Inlets will be visually inspected four times annually to ensure debris and obstructions do not impede proper function of these features. While debris removal and structural repairs should be addressed immediately, regular cleaning and maintenance of these features should be conducted on a semiannual basis.

The stormwater manholes, and stormwater pipes will be inspected semiannually. Maintenance items will be identified during the inspection and will be addressed immediately.

Inlets will be inspected after minor storms which produce less than 1 inch of rainfall in 30 minutes to ensure debris and obstructions do not impede proper function of these features. The stormwater manholes and stormwater pipes will be inspected after major storms which produce 1 inch of rainfall in 30 minutes or more to ensure debris and obstructions do not impede proper function of these features.

Paved areas, including parking lots and walkways will be swept, at a minimum, twice per year. At least once a week, collect and remove litter from the walkways and platforms in addition to regular sweeping.

TASK FREQUENCY	INSPECT AND MAINTAIN (IF NECESSARY)
Four Times Annually	Inlets and area drains.
Semi-annually	Storm water manholes, storm water pipes.
After Minor Storms (Less than 1 inch in 30 minutes)	Inlets and area drains
After Major Storms (More than 1 inch in 30 minutes)	storm water manholes, storm water pipes

7.0 OPINION OF PROBABLE ANNUAL MAINTENANCE COSTS

Maintenance costs given on the following page are estimates for standard stormwater management facility maintenance. Costs of major or emergency repairs are not considered within the Opinion of Estimated Annual Maintenance Cost Summary Table.

OPINION OF ESTIMATED ANNUAL MAINTENANCE COSTS SUMMARY			
	Cost per Task	Number of Times/Year	Total Yearly Cost Estimate
Storm Sewer System			
Inspect inlets for trash and debris. Clean as necessary.	\$300	4	\$1,200
Removal of sediment, trash and debris.	\$500	1	\$500
Subsurface Detention Facility			
Inspect and remove trash and debris from basin.	\$5000	2	\$1,000
Removal of sediment, trash and debris.	\$2,000	1	\$2,000
Total Estimated Cost of Standard Maintenance Tasks			\$4,500

APPENDIX A

Inspection Checklist for Stormwater Management Facilities

Name of Facility: Bayview

Location: 175 Avenue A Date: _____

Weather: _____

Facility Item O.K.¹ Routine² Urgent³ Comments⁴

1. Structures

A. Condition of Structure				
B. Trash & Debris				
C. Sediment				
D. Aesthetics				
E. Backflow Preventers:				
F. Other:				

2. Miscellaneous

A. Effectiveness of Exist. Maint. Program				
B.				
C.				
D.				
E.				
F.				

¹ The item checked is in good condition, and the maintenance program is adequate.

² The item checked requires attention, but does not present an immediate threat to the facility function or other facility components.

³ The item checked requires immediate attention to keep the facility operational or to prevent damage to other facility components.

⁴ Provide explanation and details if columns 2 or 3 are checked.

Remarks (Refer to Item No., If Applicable)

Inspector: _____

APPENDIX B

Maintenance Log
for
Stormwater Management Facilities

Name of Facility: Bayview

Location: 175 Avenue A

A. Preventative Maintenance

Date:

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Work Item (v) Completed

1. Trash and Debris Removal

A. Surface Lot										
B. Inlets										
C. Outlet Structure & Trash Rack										
D. Inlet Filter										
E. Other:										

2. Sediment Removal

A. Inlets										
B. Outlets and Trash Racks										
C. Subsurface Detention Basin										
D. Inlet Filter										
E. Other:										

3. Other Prevention Maintenance

A.										
B.										
C.										

B. Corrective Maintenance

Work Item

1. Removal of Debris & Sediment										
2. Structural Repairs										
3. Dewatering										
4. Basin Maintenance										
5. Inlet Filter Replacement										
6. Snow & Ice Removal										
7. Other										

Remarks (Refer to Item No., If Applicable):