REPORT

FINAL

DRAINAGE INVESTIGATION
FOR
STORMWATER CONTROL

361-373-JFK Blvd
Bayonne, NJ

FOR
Bayonne Planning Board

Prepared By:

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Introduction

Presented herein are the results of the drainage investigation conducted for the proposed new multi family house located at 361-373-JFK Blvd. The purpose of the investigation was to explore the pre and post development site conditions for rain runoff conditions. This study addresses pre-existing conditions, and the final post developed site conditions. In order to determine the necessary BMP requirements for the post development, the design used hydraulic software methods to achieve the post developed rain runoff storm-water requirements for the project site.

Project Description

The existing lot of 17498 sf had 100% site existing pervious coverage with weeds and vegetation covering most of the entire lot. The proposed construction has full increase in the imperious coverage a total of 96% for the new building to 16,853SF. The proposed runoff shall collect water in an ADS piping detention with an overflow weir and orifice at the exit to the street sanitary system. See attached plans for reference.

Existing Site Runoff Characteristics

The existing site had no detention of runoff from the site. All water on site flowed to the sidewalk gutters, then to the corner catch basins. The flows were moderate since the site did not have any major slopes.

During a significant storm event the existing site conditions did not contain the rain fall and flows onto Avenue C. The rain flows from a higher elevation and the flow continues onto the existing concrete front area to the street gutter.

Engineering Recommendations for (BMP) Best Management Practice

Proposed Site Characteristics

The proposed building is to be situated on the street with other residential building. The existing site pervious covers 100% of the lot. The proposed design has fulfilled the criteria set by the Bayonne MUA checklist. The new house criteria since our post

is equal to the pre-construction conditions. The placement of storage tanks will decrease the 2, 10, 25 and 100 yr. storm events are individually less than the precondition. Since the site was equal impervious area. This detention system allows for full storage up to a 2 yr. event and REDUCES flow during higher rain events. .The pipes will be placed under the garage floor with outlet and inlet tanks at the building's face

Design Hydrology for On-Site

The hydraulic analysis for the area focused on design the detention facility to meet the required hydrograph based Bayonne MUA requirements. See appendix for the hydraulic study calculations.

The permanent hydraulic and water quality features below have been designed, and the existing features checked on site for this project's work. This section contains the calculations and analyses needed to size detention pipes. Calculations were performed by hydrocad Software by Bentley Systems which include uniform flow spreadsheets, Hydraulic Grade Line (HGL) computations and layouts, software printouts, etc.

The Design Hydrology Software included:

- Analyze post developed conditions and pond sizes for 2, 10, and 100 years storm events.
- Compute outlet rating curves, pond infiltration, pond detention time, and analyzes the channel.
- Rainfall data colleted from the Department of Commerce Precipitation Frequency Data. BASED ON NJDEP REQUIREMENTS FOR A DESIGN STORM OF 2" RAINFALL IN 60 minutes WITHOUT DISCHARGING TO THE STREET. Volume 16853sf ***of property impervious area * 2in/hr/12"/ft = 2808cf of storage required.***

360lf of 3'-0".ft dia. ADS solid piping is equivalent to 4065cf of storage see hydrocad summary results

- Computed Hydrographs for multiple events, and routes them through multiple reaches and ponds.

- Accurate basin maps(s) prepared showing onsite, offsite contributing areas, Tc routes, for existing and developed conditions
- Time of concentration correctly calculated (Tc=max, sheet flow + channel/pipe flow). Minimum Tc=10 min.
- Appropriate methods used to calculate flow rates (rational method, Stormshed, & multiple regression)

Each feature together with calculations is provided in Appendix.

The control practices outlined here are designed to decrease rain event runoff impact.

Table 1 - Pre/Post Runoff Table

Point in Question (PIQ) Pre/Post Storm water Runoff for Property				
Storm Event	Existing Conditions (5S) Q, CFS	Proposed Conditions (5S to 2P) Q, CFS	Change, Q CFS	% reduction
2	1.08	0.00	-0.92	100%
10	1.49	0.91	-0.51	70%
25	1.72	1.	0.72	65%
100	2.05	1.11	-0.96	48%

Conclusion

The existing site conditions of the site were substandard and don't effectively recharge precipitation due to impervious surface. The new building shall detain the water in a collected pond before allowing the water to flow through the weir at a slow rate of discharge. The proposed site improvements will decrease the water runoff from the site for a 2yr storm event and moderately for higher rain events the contractor/owner for properly maintains of the system and will be responsible to adequately slope detention piping to the weir exit.

The proposed final site conditions do reflect the current NJ DEP stormwater Standards for the BMP.

PVC and CPVC Pipes - **Schedule 40**					
Nominal Pipe Size *(inches)*	Outside Diameter *(inches)*	Minimum Wall Thickness *(inches)*	Nominal Inside Diameter *(inches)*	Weight *(lb/ft)*	
				PVC	CPVC
1/2	0.840	0.109	0.622	0.16	0.17
3/4	1.050	0.113	0.824	0.21	0.23
1	1.315	0.133	1.049	0.32	0.34
1 1/4	1.660	0.140	1.380	0.43	0.46
1 1/2	1.900	0.145	1.610	0.51	0.55
2	2.375	0.154	2.067	0.68	0.74
2 1/2	2.875	0.203	2.469	1.07	1.18
3	3.500	0.216	3.068	1.41	1.54
4	4.500	0.237	4.026	2.01	2.20
5	5.563	0.258	5.047	2.73	
6	6.625	0.280	6.065	3.53	3.86
8	8.625	0.322	7.981	5.39	5.81
10	10.750	0.365	10.020	7.55	8.24
12	12.750	0.406	11.938	10.01	10.89
14	14.000	0.438	13.124	11.80	
16	16.000	0.500	15.000	15.43	