REPORT

FINAL

DRAINAGE INVESTIGATION
FOR
STORMWATER CONTROL

292 Whitton Street
Jersey City

FOR
JCMUA

Prepared By:

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Introduction

Presented herein are the results of the drainage investigation conducted for the proposed 3 story building located at 292 Whiton Steet. 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 1667sf has 100% site pervious coverage with weeds. The proposed construction has a increase in the imperious coverage with a total of 65% for the new building and concrete patio. The proposed runoff shall collect water in a dry well detention with a overflow pipe at the exit to the rear yard. See attached plans for reference.

Existing Site Runoff Characteristics

The existing site had no detention of runoff from the site. All water on site flows to the street, 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 Street. 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 situated on the lot adjacent to the other residential buildings. The design has fulfilled the criteria set by the NJDEP checklist. Our post is less than the pre construction conditions. The 2, 10, and 100 yr storm events are individually

less than the pre condition. This detention system allows for full storage up to a 2 yr. event and REDUCES flow during higher rain events. No water shall flow onto other adjacent properties

Design Hydrology for On-Site

The hydraulic analysis for the area focused in on design the detention facility to meet the required hydrograph based NSHA 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 Pond Pack Design 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.
- 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=5 min.
- Appropriate methods used to calculate flow rates (rational method, Stormshed, & multiple regression)
- Capacity of a new 4" storm PVC pipe to the street manhole at 2% slope is

Q= q x A = 0.039/(.5^2pie/4) = 0.013

n = Manning coefficient of roughness 0.011 for PVC

S = slope of pipe (ft/ft)

D req = 16 [(Qnf x n)/S^0.5] ^3/8

D req = 16 [(0.-12 x 0.021)/0.002^0.5]^3/8 = 1.85" required

D designed = 4 in >> 1.85" ok

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	0.05	0.0	-0.05	100%
10	0.06	0.05	-0.01	20%
100	0.08	0.07	-0.01	20%

Conclusion

The existing site conditions of the site were substandard and don't effectively recharge precipitation due to lack of vegetation and gravel surface. Verification of the bottom of the dry well at the installation is required as not to be below the water table. The new building shall detain the water in a collected pond before allowing the water to flow through the soil at a slow rate of discharge. The proposed site improvements will decrease the water runoff from the site for a 100yr 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. A new storm pipe will flow to sidewalk clean out and then to existing combine line to street sanitary sewer line

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