


Exhibit - A-12
REMINO BAYONNE,
LLC
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**STORM SEWER REPORT
PROPOSED RESIDENTIAL DEVELOPMENT
120 -122 WEST 33RD STREET
BLOCK 143 LOT 28
BAYONNE, NEW JERSEY**



**SUBMITTED TO
BAYONNE ZONING BOARD OF ADJUSTMENT**

**SUBMITTED BY
REMINO BAYONNE LLC**



**PREPARED BY
DAL DESIGN GROUP
11 WEST 8TH STREET
BAYONNE, NEW JERSEY 07002**



MARCH 31, 2021

**STORM SEWER REPORT
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METHODOLOGY AND DESIGN

This report has been prepared to analyze the impacts of the proposed development and to determine the operational capability of the proposed underground stormwater detention system as well as compliance with the City of Bayonne's stormwater management requirements and the Zoning Ordinance requirements related to maximum lot coverage enumerated at Section 35-5.3.e.7 of the Revised General Ordinances of the City of Bayonne.

The project consists of the construction of a new 4-story building containing 8 residential units and 9 parking spaces on a property located on the south side of West 33rd Street between JFK Boulevard and Avenue A.

This project does not meet the definition of a "major development" under the State of New Jersey Stormwater Management Regulations (NJAC 7:8). The City of Bayonne Planning and Development regulations require that "peak runoff after development be no greater than peak runoff prior to development, computed for the two-, ten-, and one-hundred-year design storm". Additionally, the City of Bayonne Zoning Ordinance permits a maximum lot coverage of 70% (30% pervious and 70% impervious surfaces) for development in the R-2 zoning district.

The stormwater management goal for this project is to gain reduction in post-development peak flows that are significantly greater than that required in the Planning and Zoning Ordinances of the City of Bayonne.

Models were developed for this analysis based on USDA Soil Conservation Service (SCS) Unit Hydrograph Methodologies and the SCS TR-20 runoff method. Runoff Hydrographs were developed for the purpose of this analysis based on USDA-SCS Type III storm distribution for a 24-hour period using the HydroCAD 10.00 Stormwater Modeling System developed by HydroCAD Software Solutions, LLC.

Three separate storms (2-year, 10-year, and 100-year frequencies) were modeled to determine pre-development flows. The detention system for the project was designed to significantly reduce post-development peak runoff rates for the 2-, 10-, and 100-year design storm events. The three storms were modeled in the post-development condition to assess compliance with the design intent.

SOILS

Based upon the Hudson County Soils Survey information available from the USDA Natural Resources Conservation Service WebSoil Surveys, the soil characteristics are typical of Hydrologic Soil Group "D".

PROJECT DATA

Rainfall Data - 24-hour rainfall depths

Storm Frequency	Depth of rainfall, inches
2	3.3
10	5.0
100	8.3

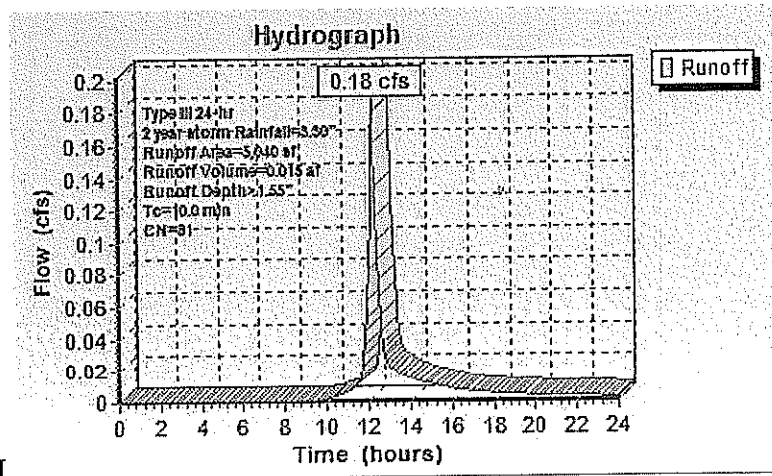
Existing Site Data

Drainage Area	Area, sf	CN	Tc, minutes
Pavement	291	98	6
Landscaping	4,749	80	6

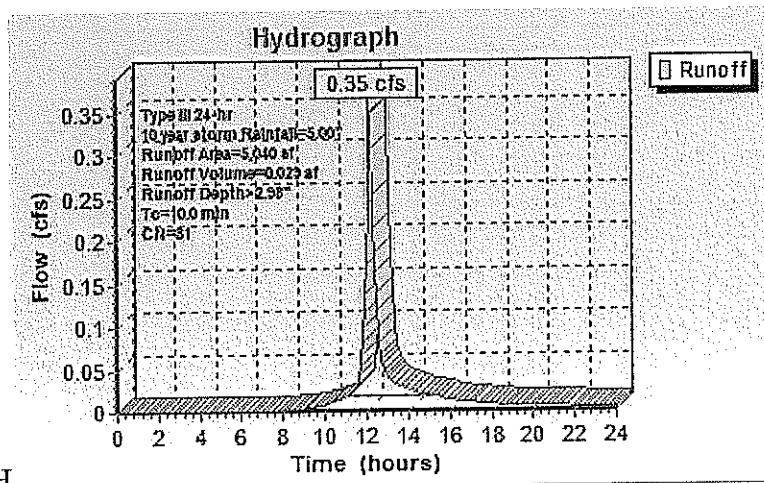
Proposed Site Data

Drainage Area	Area, sf	CN	Tc, minutes
Building/Pavement	4,800	98	6
Landscaping	240	80	6

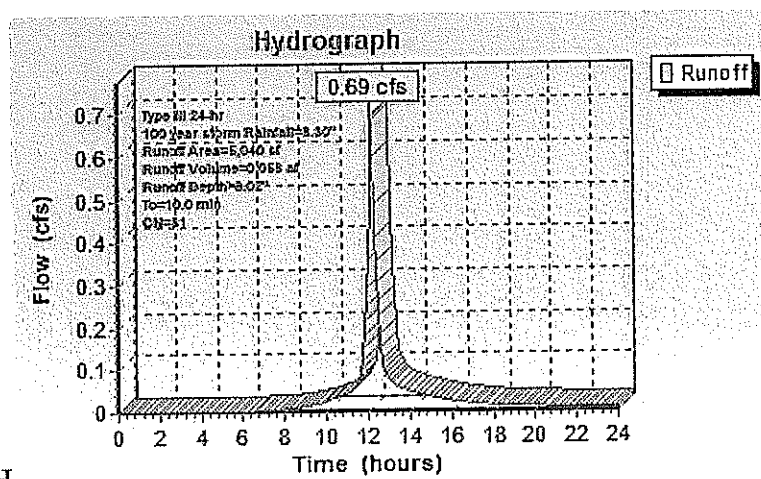
PRE - DEVELOPMENT HYDROGRAPHS



2 YR. HYDROGRAPH



10 YR. HYDROGRAPH



100 YR. HYDROGRAPH

SUBSURFACE DETENTION SYSTEM

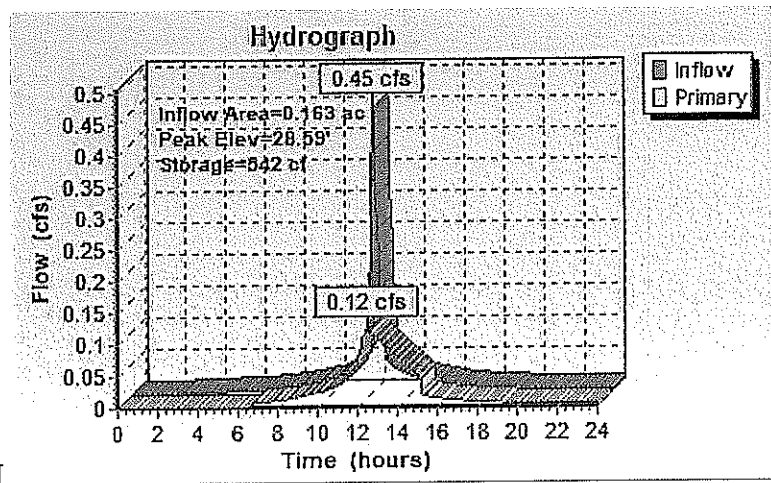
The underground storm water detention system draining to the combined sewer in West 33rd Street consists of a detention vault with a full capacity of 2410 cubic feet. Outlet control is provided by a flow control riser. Roof generated storm water is transported to this underground detention system via direct connection of roof leaders to the system.

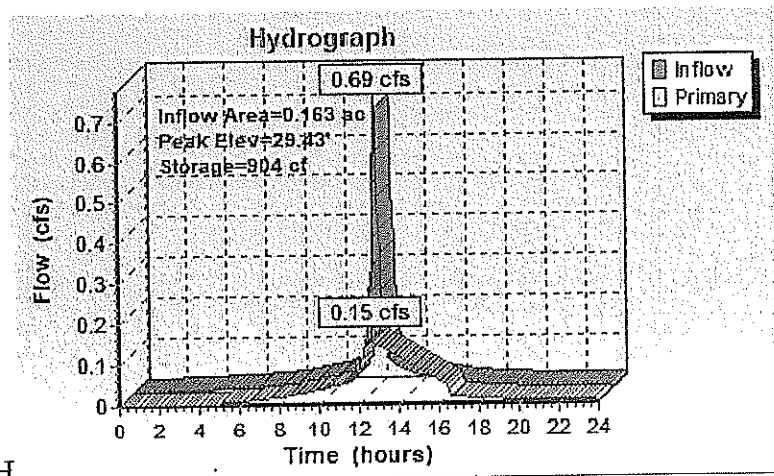
Outlet Connectivity

STRUCTRE	ELEVATION
Orifice (2.0")	27.30
Orifice (2.5")	30.50
Overflow at top of 8" riser	32.60
Maximum Elevation	33.10
Bottom of Sump	24.50

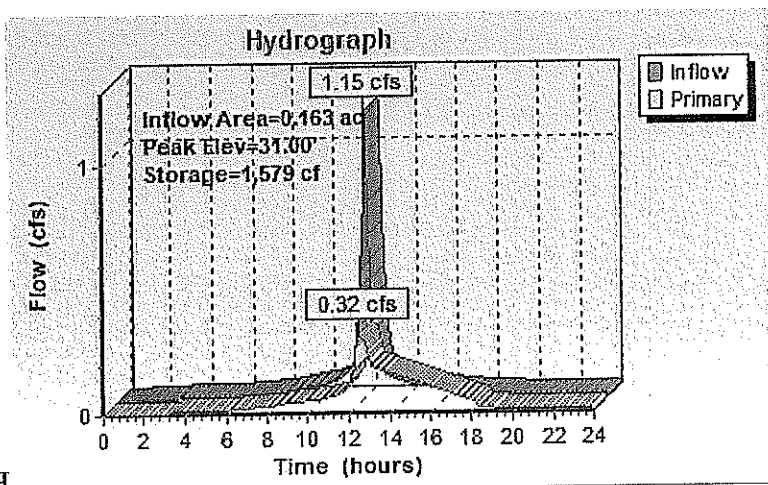
The following post-development hydrographs are for the detention system proposed for the referenced property.

POST - DEVELOPMENT HYDROGRAPHS - DETENTION SYSTEM





10 YR. HYDROGRAPH



100 YR. HYDROGRAPH

CONCLUSIONS

Based on the analysis, the proposed stormwater detention system significantly reduces peak flows in the post-development condition.

The following table represents the peak runoff rates under existing and proposed conditions as well as the reduction in peak runoff rates achieved by the on-site stormwater detention system.

Peak Runoff Reduction

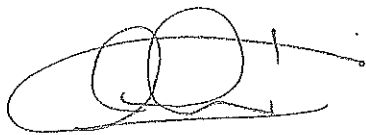
Storm Event (years)	Existing Flow (cfs)	Permitted Flow at 70% coverage*	Proposed Flow - detention (cfs)	% of existing
2	0.18	0.29*	0.12	66
10	0.35	0.46*	0.15	43
100	0.69	0.80*	0.32	46

* permitted flow at 70% coverage exceeds existing peak flow - therefore this design criteria is not considered for compliance assessment

STORM SEWER LATERAL DESIGN

Storm sewer lateral sizing was determined using nomographs for solving Manning's Formula with given criteria of an 8" PVC pipe with a 2% slope and a Manning's roughness coefficient of 0.011.

Based on this initial data, the proposed 8" storm sewer has a carrying capacity of 1.95 cfs, and is sufficiently sized to accommodate the 100-year modeled runoff of 1.15 cfs for the runoff generated at this site assuming failure of the detention system.



A. Sambade, A.I.A., P.E., P.P.

President

DAL DESIGN GROUP

03/31/2021