



STORMWATER MANAGEMENT REPORT

CANTERBURY DEVELOPMENT, BLOCK 320, LOTS 10.03 & 10.04
204 Maple Drive, Township of Wyckoff, Bergen County, New Jersey

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June 9, 2022

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CANTERBURY DEVELOPMENT

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I. INTRODUCTION

This report is provided in support of the proposal to develop lots 10.03 & 10.04 of block 320 in the Township of Wyckoff. Lots 10.03 & 10.04 have recently been formed by minor subdivision of lots 10.02 and lot 11. As a result of this minor subdivision, lot 10.04, a 21.01-acre parcel has been created and dedicated to the Township as Open Space. The balance of the site, lot 10.03, is proposed to be developed into a 61-unit mid-rise apartment complex. A utility easement has been retained by the applicant over lot 10.04 for access to an existing sanitary sewer line.

The purpose of this report is to demonstrate that the proposed development complies with the current Township of Wyckoff Land Development Regulations, and NJAC 7:8. The development will result in the creation of more than a ¼ acre of new impervious, an increase in net motor vehicle surface, and disturbance of more than 1 acre. Therefore, the proposed project is considered a Major Development.

II. EXISTING SITE CONDITIONS

The proposed site, lot 10.03 block 320 is 5.437 acres. The lot is significantly sloped to the north and is adjacent to lot 10.04 which contains wetlands. Other than a ruinous foundation the property is undeveloped. A Pond and a brook running to the east are along the northern border of the site.

Access to the property is from Maple Drive to the east. A right of way has been established to improve access to the site from Maple Drive. The property is bounded on the east, south and west by single family residential developments, and to the north, lot 10.04 and the New York Susquehanna and Western Railroad ROW.

III. PROPOSED DEVELOPMENT

The proposed development is to develop lot 10.03 as multi family residential. The project will include three mid-rise four-story buildings. The total unit count between all three buildings is 61 units. Parking will be provided at grade, and a portion underneath the buildings. Also included as part of the development will be structural retaining walls to the south of the buildings to provide for level grade. Also provided will be landscaping lighting and other utilities. A sanitary sewer easement has been reserved on lot 10.04 to provide a sewerage connection to the project to an existing main.

Stormwater management facilities proposed include an underground infiltration basin which provides stormwater quantity control and groundwater recharge and an above ground detention basin which provides stormwater quantity control. On-line flow through devices will be provided for water quality control prior to discharge into the infiltration basin.

IV. HYDROLOGIC & HYDRAULIC ANALYSIS

The following assumptions/observations were made to analyze the impacts of the proposed development on the existing drainage patterns:

- Per the Township stormwater management ordinance, only the portions of the site that are disturbed as a result of the development are considered in this hydrologic analysis.
- Hydrologic analysis was conducted using HydroCAD software utilizing the SCS (TR-20) method.
- Flows are shown to the nearest tenth of a CFS.

V. HYDROCAD INPUT DATA

Drainage area maps are provided in Appendix A.

Existing Conditions:

1S: EXISTING CONDITIONS

Cover: Woods

Area: 167,164 square feet

Weighted CN: 73

Time of concentration: 11.2 minutes = 0.187 hours

Total Area = 167,164 square feet = 3.84 Acres

Proposed Conditions:

2S: DETAINED

Cover: Impervious cover, grass cover, & detention basin

Area: 112,834 square feet

Weighted CN: 90

Time of concentration: 6 minutes = 0.1 hours

3S: UNDETAINED

Cover: Woods

Area: 43,947 square feet

Weighted CN: 73

Time of concentration: 6 minutes = 0.1 hours

4S: ROOF

Cover: Impervious Cover

Area: 10,366 square feet

Weighted CN: 98

Time of concentration: 17.4 minutes = 0.29 hours

Total Area = 167,164 square feet = 3.84 Acres

VI. STORMWATER MANAGEMENT FACILITIES

A combination of an underground infiltration facility and an above ground detention basin have been designed. The underground infiltration system will be utilized for stormwater quantity control and groundwater recharge requirements. The above ground detention basin will be utilized for stormwater quantity controls. The underground infiltration system will consist of a single row of MC-3500 arches by Stormtech.

Proposed Stormtech MC-3500 Arch System:

Effective Volume per arch segment: 110 CF

Number of arch segments: 17 chambers

End cap volume = 14.9 CF

Number of end caps = 2

Total Chamber Volume = 1,899 CF

Stone base depth = 1 foot

Stone side width = 1 foot

Stone envelope height = 3.75 feet

Stone voids = 40%

Total Stone Volume = 1,646 CF

Total Storage Volume = 3,545 CF

<u>Stage(ft.)</u>	<u>Storage(cf)</u>
282.9(bottom)	0
283.9(stone)	430
284.9	1,279
285.9	2,079
286.9	2,786
287.73(overflow)	3,201
288.0	3,330
288.5(top)	3,545

Discharges:

Infiltration: A conservative 2 in./hr was used for infiltration. Infiltrated stormwater was set to be discarded from the model.

8" pipe out: @ Inv. 287.73. Stormwater discharged through the 8" outflow pipe was set as the primary discharge and routed to the above ground Detention Basin.

Proposed Above Ground Detention Basin:

<u>Stage(ft.)</u>	<u>Storage(cf)</u>
277.0(5" orifice)	0
278.0	6,000
278.75(24"Wx8"H)	10,500
279.0	12,000
280.0	18,000
280.75(overflow)	22,500
280.9 (spillway)	23,400
281.0	24,000
281.9	29,400

Discharges:

Infiltration: No infiltration was accounted for based on the USDA Web Soil Survey Mapping.
5" pipe out: @ Inv. 277.0 matching the bottom elevation of the basin.

24"Wx8"H out: @ Inv. 278.75.

Horiz. Gate: @ Inv. 280.75. An overflow grate is provided on top of the control structure.

Emergency Spillway: @ Inv. 280.9. A 28.5 foot wide emergency spill way was designed to handle the 100-yr peak rate +50% and invert of crest is set 1 foot below the top of the retaining wall.

The control structure will discharge through the retaining wall via a 15" HDPE pipe and will daylight to grade into a scour hole adjacent to the basin.

VII. GROUNDWATER RECHARGE

As required, the NJGRS spreadsheet was completed for the entire project site. The solution of the spreadsheet demonstrates that the provided underground infiltration system, as designed, provide recharge in excess of the target requirement.

Calculated BMP Volume per NJGRS spreadsheet: **2,320 CF**

Provided BMP Volume: 3,201 CF (below outflow orifice)

Volume Infiltrated @ 2-yr Storm per HydroCAD Analysis = 0.063 acre-ft = **2,744 CF**

VIII. CONCLUSION

Peak runoff rates as calculated discharging off-site towards Goffle Brook:

Outlet Peak Flow Table		
Storm Frequency	Peak Flow Existing	Peak Flow Proposed
2-year	4.0	1.9 (47.5%)
5-year	6.7	3.4
10-year	9.1	5.8 (63.7%)
25-year	13.0	9.4
100-year	20.5	14.5 (70.7%)

The proposed project will result in a decrease in peak stormwater runoff and will not present any adverse drainage impacts to the surrounding areas. Required reductions in runoff are achieved for the 2-yr, 10-yr, and 100-yr storm events. Stormwater Quality is achieved through the implementation of, on-line, flow through devices and groundwater recharge is achieved by the implementation of the proposed underground infiltration basin. Additionally, all applicable design criteria set forth by the town ordinance have been met.