

**MEMORANDUM-05**

TO: Jessica Pearson
Planning Board
Township of Verona
Verona Town Hall
600 Bloomfield Avenue
Verona, New Jersey 07044

FROM: Alvaro Gonzalez, Ph.D., P.E.

DATE: July 25, 2023

SUBJECT: **Stormwater Management Review**
Pending Comments and Geotechnical Report, Bioretention Basin Memo, and Grading and Drainage Exhibit Review
Verona Sunset Urban Renewal, LLC
One Sunset Avenue
Block 303, Lot 4 (Verona)
Block 301, Lots 5 and Block 401, Lot 1 (Montclair)
Township of Verona,
Essex County, New Jersey
Our File No. VAES-104

Based on the review of the documents referenced below, this is what I have to offer:

Documents Reviewed

Name	Dated	Comments
"2023-07-05 Cover Letter_Neale"	July 5, 2023	Prepared by MATRIXNEWORLD and signed by Sean Savage, P.E. (NJ License No. 24GE04451000).
"2023-06-14 Bioretention Basin Memo"	June 14, 2023	Prepared by MATRIXNEWORLD (Sean Savage, P.E.). Estimation of the proposed Bioretention Basin drain time.
"2023-06-27 Grading and Drainage Exhibit_SMS Signed_LQ"	June 27, 2023	Grading and Drainage Exhibit. Prepared by MATRIXNEWORLD and signed by Sean Savage, P.E. (NJ License No. 24GE04451000). The figure displays the test pit locations.
"2023-06-30 REv Geotech Report (S+S)"	Oct., 2019 Revised June 2023	Preliminary Geotechnical Assessment Report. Prepared by MATRIXNEWORLD and signed by Michael J. Soltys, P.E. (NJ License No. GE49308).

Background

In our letter dated June 6, 2023, we (Boswell) commented on the seasonal high-water table (SHWT) of the three proposed basins (A, B, and C) not complying with some of the guidelines set forth in the NJDEP BMP Manual; specifically, the separation between the bottom of said basins and the seasonal high-water table (SHWT).

As a result, on June 21, 2023, *Matrixneworld* issued a technical memorandum (prepared by Richard Britton, P.G., LSRP – Professional Geologist), where the mottling reported in the test pits (performed on October 5 and 6, 2022) was chiefly attributed to three rainfall events registered on October 4, 5, and 6, 2022, which could have caused a false groundwater level. Also, the memorandum briefly described the geological formations of the site to reinforce its argument by explaining the presence of an overburden cover on a rocky ridge, which reduces the possibility of having groundwater on the subject lot.

On June 22, 2023, *Matrixneworld* issued another technical memorandum (prepared by Michael J. Soltys, P.E. – Geotechnical Engineer), which basically provided a similar explanation as the June 21, 2023 memorandum.

Geotechnical Report and Bioretention Basin Memo Review

Geotechnical Report

1. The document named “2023-06-30 REv Geotech Report (S+S)” described the subsurface conditions: surficial materials (consisted of 6” of asphalt), upper stratum (presence of sand and silt with varying amounts of gravel), intermediate strata (presence of silt, sand, and clay), decomposed bedrock (presence of decomposed bedrock underneath the intermediate strata), and bedrock (basalt underneath the previous layers).

The report concluded that “[...] since the Site is located on a rocky ridge and the elevation of the Site is higher than the surrounding area and tributary, the water table can be anticipated in the valley rather than at a shallow depth on Site. Heavy rainfall was noted in the days prior to and during the test pit excavations conducted in October 2022. The saturation and soil mottling in some of the test pits can be attributed to these heavy rainfall events [...].” Additionally, the report stated that “[...] the ground water and mottling encountered in the geotechnical investigation are not the result of the true groundwater level but instead a perched water condition.”

Boswell Comment: After reviewing the rainfall reported at *Rain Gage NJ-ES-40* of the Co-Co-Rahs network (**Community Collaborative Rain, Hail and Snow Network**), it was confirmed that rainfall was registered on October 4, 5, and 6, 2022 as follows:

- October 4, 2022: 1.45” (no soil test performed this date). This event is nearly equivalent to a 60-minute 2-year storm.

- October 5, 2022: 0.50” (soil test performed).
- October 6, 2022: 0.16” (soil test performed).

Also, rainfall data was retrieved for the months of January through April 2022 and 2023, which are summarized in Table 1 below:

Table 1. Rainfall reported at Station NJ-ES-40 (Verona Township)

Month	Date	Maximum Rainfall Depth (inches)	Comments
January	1/17/2022	1.78	Total for the month: 3.70”
	1/28/2023	1.99	Total for the month: 4.77”
February	2/4/2022	0.90	Total for the month: 3.07”
	2/28/2023	0.83	Total for the month: 1.19”
March	3/10/2022	0.61	Total for the month: 1.92”
	3/4/2023	1.48	Total for the month: 3.63”
April	4/8/2022	3.26	Total for the month: 6.43”
	4/29/2023	2.11	Total for the month: 3.53”

Source: Co-Co-Rahs (<https://www.cocorahs.org/ViewData/ListDailyPrecipReports.aspx>)

The table above indicates that the storm events during the months of January through April are typically larger in magnitude than those reported in October. Therefore, it is recommended that new test pits be performed during the months of January through April at the location of the proposed Basins A and B. This will allow to determine the presence (or not) of not only SHWT in a more accurate manner, but also potential ponding areas due to the reported site’s low infiltration.

Bioretention Basin Memo

2. The Applicant provided the drain time calculation of the proposed bioretention basin (Basin C). The estimated drain time was 1.70 hours, which complies with the maximum drain time of 72 hours set forth in the NJDEP BMP Manual Chapter 9.7. However, the Applicant shall adjust the bottom of Bioretention Basin (Basic C) to comply with the BMP requirements (2-ft separation) as discussed during the Planning Board meeting of June 6, 2023. This shall be part of the adjustments to be made for the next Stormwater Management Report resubmission.

Additional Pending Comments

Stormwater

3. The Applicant shall revise and provide in the report an explanation about the post-development flow volume values provided in the latest version of the Stormwater Management Report (dated May 5, 2023) as they are equal to the flow volume values reported in previous versions of said report, despite the fact the peak flow values increased.

4. The Applicant shall provide in the report the reduction of peak flow in drainage areas 1, 3, and 4 (DA-1, DA-3, and DA-4). A table with the values pre- and post-development might be provided.
5. The Applicant shall provide in the report a section displaying the assessment of the existing stormwater sewer capacity in the context of the 2-, 10-, and 100-year flow coming out of the site. A table with the values might be provided.

The outstanding issues and recommendations summarized in this stormwater management section are intended to serve the Board as conditions of approval for this application.

The Applicant shall be aware that the new version of the Stormwater Management Report addressing all outstanding issues must be submitted for review. Also, the Stormwater Management Report shall be presented and discussed before the Board for the final approval.

Sanitary

6. The Applicant shall assess the adequacy of the existing sanitary sewer capacity to handle the additional wastewater flow generated by the proposed development.

Drinking Water

7. Project's water demand: According to documentation provided by the Applicant, the average water demand is 32,308 GPD (or 22.4 gpm). Using a peaking factor of three [per NJAC 5:21-5.2(d)], the peak flow will be 96,924 GPD (or 67.3 gpm). The Township's water system capacity to supply the demand shall be assessed/determined.
8. Project's fire flow demand: Per both NJAC 5:21-5.3(i)3 and NJAC 7:10-12.37(b), "*the design capacity of every distribution main and every service line shall be such as to provide a minimum pressure of 20 psi at ground level under all flow conditions.*" The Applicant should calculate their fire flow demand, which must be compared to the flow available (resulting from the hydrant test) in order to assess whether the Township's water system has enough capacity to handle the fire flow. This should be also evaluated by the Township Fire Official. Lastly, the fire flow demand calculation might be performed irrespective of the current Township water capacity.

Should you have any questions or comments, please feel free to contact me.