6 January 2023

Richard Stomber
Vice Chair of the Wayne Environmental Commission
Township of Wayne
475 Valley Road
Wayne, NJ 07470

Re: Wayne Environmental Commission (WEC) Review #1
The Villas at Wayne Hills
1361 Alps Road, Block 2329, Lot 1 & 17
Preliminary & Final Site Plan and Major Subdivision Application
Langan Project No.: 100925301

Dear Mr. Stomber:

We are in receipt of your memorandum dated July 14, 2022 regarding the Wayne Environmental Commission's (WEC) comments as it pertains to The Villas at Wayne Hills Preliminary & Final Site Plan and Major Subdivision application.

Comment 1
Has the soil contamination/remediation area on the original portion of the GAF property been resolved?

Response 1
A report titled "Remedial Investigation Report / Remedial Action Report," dated March 16, 2020, and prepared by Roux Associates, Inc. has been provided in electronic format as part of the submission, given the nearly 7,000 page length of the report. Monitoring wells in the area of contamination shall remain and/or be relocated due to construction activities.

Comment 2
Have surface to bedrock and soil samples been taken to clearly define/validate the surface to bedrock and the drainage soils used in the design? Figure 3 of the Stormwater Management Report Volume I only shows outlines of approximate areas.

Response 2
A geotechnical investigation was performed as part of the stormwater management design in order to determine seasonal high groundwater information, depth to bedrock, and the ability for in-situ soil to infiltrate. Information from this investigation has been included in Appendix G of the stormwater management report.

Comment 3
How old are the measurements defining the contour lines on the maps and have critical areas been validated in the field? Do they reflect what exists today; particularly properties adjacent to

Lots 1 and 17 and the dirt road from Ratzer Rd? Lots 1 and 17 have inlets that lead to pipes on the west side of Kiwanis Drive.

Response 3
Existing survey information, including topography and existing drainage collection systems, was collected by Langan from October-December 2021; refer to the ALTA/NSPS Land Title Survey drawings, prepared by Langan, that were previously submitted. Wetlands and state open water information shown is based upon a delineation performed by Gladstone Design, Inc. A letter of interpretation and verification for the wetland delineation was obtained from NJDEP on May 4, 2018, and a flood hazard area verification approval was obtained from NJDEP for the state open water delineation on May 8, 2018.

Comment 4
The drainage system that exists today is not adequate for some of the residents on the east side of Kiwanis Drive. Residents have drainage issues from the steep hill in their back yards: moisture issues in their house and wet backyards. How do you expect that this will change?

Response 4
Langan has photo-documented the existing drainage conditions along the subject property's western property line abutting the single-family residences fronting on Kiwanis Drive on September 9, 2022 and prepared a memorandum summarizing these findings. The majority of the existing drainage features are located on the properties fronting on Kiwanis Drive, within easements held by the Township of Wayne. The applicant will work with the Township of Wayne and the homeowners to determine the best course of action.

Comment 5
Page 1 of the Executive Summary in Volume I indicates that there is a subsurface conveyance system consisting of inlets, manholes and pipes to convey the stormwater runoff during the 25-year event. Where does the additional water flow during the 100-year event?

Response 5
As an added factor of safety, going beyond analyzing the required 25-year design storm event, the conveyance networks were also analyzed for the 100-year design storm event, and were found to have the capacity to convey the 100-year design storm flows. Refer to Appendix D of the stormwater management report for supporting calculations.

Comment 6
There is a retention system at the northwestern section of the property between Points of Analyses 1 and 2 of FG04. It collects the water from the cul-de-sac and surroundings. There is an overflow from the basin that empties out into a swale during heavy storm events. What are the details of the swale and how is the water channeled to exit the property? During what storm events do you expect the overflow swale will be used?

Response 6
The proposed swale is in place to direct stormwater runoff that is discharged from the bioretention basin's emergency spillway toward an existing swale that discharges to a large diameter outlet pipe located on Block 2328, Lot 23, that ultimately conveys runoff to Packanack Brook. The emergency spillway, and thus the swale, would only be used during

storm events greater than the 100-year storm. The emergency spillway is set to be a minimum 1 foot above the 100-year storm design water surface elevation within the basin.

Comment 7
In order to reduce the total surface water runoff can all parking areas be paved with pervious asphalt?

Response 7
The soils across the site are very unsuitable for infiltration, except for a few select areas which already have proposed infiltration BMPs, in addition to the presence of shallow bedrock. Refer to the geotechnical information located in Appendix G of the stormwater management report for soil logs and infiltration testing data. Pervious asphalt areas will not be able to infiltrate due to these unsuitable soils; pervious asphalt systems can be designed with an underdrain collection system, but this type of design will not provide any reduction in runoff. Therefore, pervious asphalt is not proposed for this project.

Comment 8
In every engineering project there are uncertainties. The designs have a nominal value and they have a tolerance. The more parts that make up the project, the larger the uncertainty. In order to allow for these tolerances a safety factor is typically included in the design so that if the tolerances go in the wrong direction the project still meets the requirements. The worst-case tolerance is developed in a statistical manner not by summing up individual tolerances to make a worst-case condition. What approach was taken in this project to ensure the system meets intended design?

Response 8
The stormwater management basins and subsurface conveyance networks were designed for the 100-year design event. The stormwater management basins were designed with a minimum 1 foot of freeboard between the 100-year design water surface elevation and the crest of the emergency spillway, allowing for additional stormwater runoff volume in excess of the 100-year storm to be retained within the basin. The post-construction peak runoff rates for each point of analysis in which stormwater management basins are being utilized are below the allowable peak runoff rates, going beyond what is required in terms of quantity control. In terms of calculating annual groundwater recharge volume, the field-measured infiltration rates are reduced by a factor of safety of 2.

Comment 9
Stormwater Management report Volume II on Page 13 a NOAA (Volume 2 Version 3) "Point Precipitation Frequency Estimates" Table is identified. The final documentation was released on October 4, 2006. Linda Nardone, a former WEC Commissioner, has indicated that the projections were based on 1999 data. This precipitation data is being used for a design today, 23 years later. A CY 2022 capital improvement project expected to last for decades cannot be based on CY 1999 rainfall results. We know from virtually all climate scientists and technical journals that the atmosphere has been warming and has more energy than it had over the past hundreds of years. Larger rainstorms are more frequent than they have been in the recent past and they will continue to grow and occur more frequently in the future. It is poor judgment to think that a design based on 1999 rainfall data will serve Wayne as a capital improvement for decades to come. The Villas at Wayne property has steep slopes, drains through residential properties, flows over Ratzer

Road and floods the finger region of Packanack Lake including Packanack School property. How can more realistic Precipitation Frequency data be obtained and used so the design reflects the conditions that not only exist today but will certainly intensify in the future? There seems to be a disconnect between the storm sewer design criteria and what it is intended to accomplish.

Response 9
The stormwater management design for the project has been designed in accordance with the rules, regulations, and guidelines set forth by NJDEP at the time of application with both NJDEP and the Township of Wayne. The stormwater management design, based upon the available rainfall data at the time of the application, was reviewed and approved by NJDEP as part of the Flood Hazard Area Individual Permit obtained on October 5, 2022. A copy of this permit has been included as part of the resubmission materials.

Comment 10
Attached is a Title Page of a report prepared by Cornell University titled "Projected Changes in Extreme Rainfall in New Jersey based on an Ensemble of Downscaled Climate Model Projections". It was prepared for the New Jersey Department of Environmental Protection and released in October 2021.

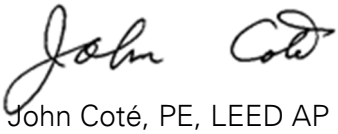
The report is 79 pages long. I have only attached the Abstract. The report indicates that the changes in rainfall (CF) will be greater than 1, indicating an increase in precipitation amounts in New Jersey. The CF values in the northern part of the state are larger in the northern part of the state and smaller in central New Jersey and along the coast. (One size does not fit all.)

The increase is on the order of 10 to 30% for events near the end of the century.

Response 10
The stormwater management design for the project has been designed in accordance with the rules, regulations, and guidelines set forth by NJDEP at the time of application with both NJDEP and the Township of Wayne. The stormwater management design, based upon the available rainfall data at the time of the application, was reviewed and approved by NJDEP as part of the Flood Hazard Area Individual Permit obtained on October 5, 2022. A copy of this permit has been included as part of the resubmission materials.

We trust that these revisions meet your approval and we look forward to your expedited review. Please feel free to contact me directly at 973-560-4987 with any questions.

Sincerely,
Langan Engineering and Environmental Services, Inc.



John Coté, PE, LEED AP
Associate Principal/VP

JCC/kk
Enclosure(s): Preliminary & Final Site Plans, dated last revised 1/6/2023
Major Subdivision Plans, dated last revised 1/6/2023
Stormwater Management Report, dated last revised 1/6/2023
Stormwater Operation & Maintenance Manual, dated last revised 1/6/2023

cc: