Tighe&Bond
Engineers | Environmental Specialists

11-0509-006-03
August 3, 2018

Jeremy Ginsberg, Director
Planning & Zoning
Darien Town Hall
2 Renshaw Road
Darien, CT 06820

Re: **Responses to Engineering Review Comments - Corbin Block**

Dear Mr. Ginsberg:

We have reviewed the most recent comments from Redniss & Mead dated July 30, 2018 and have responded to their comments below. Supplemental calculations and pertinent plan sheets have been provided with these responses reflecting the changes made related to the review comments.

The following summarizes our responses in **bold** text:

1. Corbin Block Engineering Drawings

a. Additional soil testing (deep tests and hydraulic conductivity tests) will be performed during the construction documents phase. If conditions encountered are different than anticipated, the proposed design will be updated accordingly. Provide standard details depicting how the subgrade will be prepared if ledge, hardpan soil, or water are encountered.

Response: Typical sections for the three potential scenarios identified have been provided with these responses. In addition, it is important to note that Section 5(b)(2)(C)(i)(a) of the CT DEEP Stormwater General Permit notes that the permittee shall design the redevelopment to retain runoff volumes to the maximum extent practicable, which provides further relief should an unforeseen rock or groundwater condition be encountered. See Attachment G of Supplemental Engineering Calculations.

b. Provide the ledge profile prepared by the geotechnical engineer demonstrating how the bedrock drops off while moving away from I-95.

Response: A draft copy of the ledge profile through the site has been provided for review. See Attachment E of Supplemental Engineering Calculations.

d. Provide the detail of MH#07 that coincides with the updated Stormwater Retention System #2 configuration.

Response: A detail for MH#07 has been included on detail sheet C8.3, which includes the recent revisions identified elsewhere in these responses. See Attachment H of Supplemental Engineering Calculations.

f. Provide the 50-year storm profile of the pipe network starting at OCS#01 to MH#07 with a tailwater provided equal to the elevation of the high overflow weir. Provide a second profile from MH#07 to the discharge point of the twin 18" pipes into the Goodwives River. The profiles should incorporate any changes made to the drainage and show the HGL line. Provide an Overland Flow Path exhibit for the main courtyard discharging into Stormwater Retention System #1.

Response: The HGL profiles requested have been included with these responses. The starting HGL during a 25 and 50-year peak storm is several feet above the crown of pipe discharging to the Goodwives river; therefore, several of the associated pipes near the outlet are already submerged as a starting point to the profile. In addition, an overland flow path was prepared for the plaza area identifying where this area will drain in the event of localized flooding. The revised Grading Plans for the courtyard area are also included for your review. See Attachments A, D, and H of Supplemental Engineering Calculations.

g. Provide top of stone and bottom of stone elevations on the plan for each retention system. Also confirm the typical center-to center spacing ("C") and typical side wall ("X") shown in each retention system detail depicts the desired design dimension.

Response: The top and bottom of stone elevations have been provided on the plan view and details for each of the 3 stormwater quality systems. In addition, the details for each system were updated to reflect the correct center to center spacing and sidewall dimensions. See Attachment H of Supplemental Engineering Calculations.

h. Revise the inverts in MH#06 to ensure that low flows are directed into the Vortechnics system prior to higher flows bypassing directly into MH#05.

Response: The discharge pipe in MH#06 was elevated 0.67-FT to ensure the water quality flow is conveyed into the Vortechnic's unit prior to any bypass flow occurring. A pipe flow analysis for the associated WQv through a 12-IN pipe was included with these responses to demonstrate the required depth of flow associated with the bypass. See Attachment B of Supplemental Engineering Calculations.

2. Tilly Pond Hydrologic and Hydraulic Calculations

e. Provide the supporting documentation for the compensatory storage calculations included in previous response.

Response: The requested documentation has been included with the supplemental calculations. A typical section of the swale with the calculated flow depth was applied across the length of the swale to estimate the associated storage volume. See Attachment C of Supplemental Engineering Calculations.

f. The culverts were increased in size from 2'x4' to 2'x6'. The peak flow depth in the existing 42" CMP is 2.85' with a flow velocity of 6.42 fps. The peak flow depth in the proposed 2'x6' box culvert immediately downstream is 2' with a flow velocity of 4.69 fps. Consider energy loss occurring in Chamber-1 and Chamber-4.

Response: The proposed chambers will be constructed with formed inverts to better transition flows between the various pipe segments, thus minimizing losses within the system. In addition, the drainage model incorporates the anticipated loses from the various pipe segments, which are incorporated into the reported design flows and hydraulic grade line elevations.

h. Flow paths shown in the provided Overland Flow Paths Exhibit direct runoff along the north face of Building K where ground elevation is set equal to the first floor elevation. Provide updated grading to ensure water does not flood the building in the event the system has reached its capacity.

Response: The grading plan was updated to include additional spot grades to reflect the desired overland flow path away from Building K. The revised grading plans and Overland Flow Path sheet (OV-1) have been provided for review. See Attachments D and H of Supplemental Engineering Calculations.

i. Provide the survey information depicting the inlet inverts of the existing twin 24: elliptical RCP pipes.

Response: The surveyor was able to confirm that the missing invert was 38.42 at the headwall, this is 0.1-FT lower than the assumed invert of 38.52 used in the prior model. The current model has been updated to include this corrected invert information and rerun to confirm adequate conveyance for the 50-year storm. A revised summary report for the 50-year storm to Design Point B has been included for review, along with a field sketch showing the correct invert elevation from the surveyor. See Attachment C of the Supplemental Engineering Calculations.

3. Corbin Block Hydrologic and Hydraulic Calculations

d. Update the site plan to remove the roof leader connecting Building B to CB#19 or update the drainage model to reflect the connection.

Response: The roof leader was adjusted on the plans, and the model updated to show the associated roof area draining into Stormwater Quality System-1. The water quality volumes were also adjusted to accurately reflect the various revisions that were made as part of this revision. The revised watershed map and WQv spreadsheets are included with these responses for your review. See Attachment B of the Supplemental Engineering Calculations.

h. Update the Hydraflow model to show Stormwater Retention System #2 as a pond equipped with two weirs matching the elevations found in MH#07 and OCS#02 instead of using the upstream diversion nodes and only a single high overflow weir. Remove low flow orifice or update the retention system to ensure that the Water Quality Volume is treated by the system.

Response: The drainage model has been updated to reflect the revised outlet control. The outlet control is now modeled as one 10' weir at elevation 43.70, MH 07 and OCS-02 both have a 5' weir at elevation 43.70. The low-level orifice was eliminated, and the water quality volume of 9,063 CF associated with this area is entirely maintained

below the overflow weir elevation of 43.70. Some of the roof area for building F was taken from System #2 over to System #1, to balance the water quality volumes within each system and ensure the full volume is being infiltrated. The revised water quality volume calculations and drainage model output has been included with the Supplemental Calculations. See Attachments B, F, and H of the Supplemental Engineering Calculations.

k. The tributary areas have been updated. Review the tributary areas to Design Point B in the Hydraflow Model and Tilly Pond Model. No change in area is shown between existing to proposed in the Tilly Pond Model while a 0.067 acre decrease from existing to proposed is shown from existing to proposed in the Hydraflow Model.

Response: The conflicting area within the Hydraflow model has been adjusted. Sub-watershed area GRT5-080 was not correctly shown on the existing and proposed watershed map. The numbers were adjusted, and the discrepancy was corrected. The revised spreadsheets have been included with these responses for your review. See Attachments B and C of the Supplemental Engineering Calculations.

m. No changes were made. Per the conveyance calculations, pipe 53, 55, and 56 are shown as overcapacity in the 25-year storm. All three pipes are immediately downstream of Stormwater Retention System #2. Provide HGL to allow for further analysis.

Response: The HGL for the 25-year storm has been provided in the Supplemental Calculations for your review. The outlet tailwater elevation at the Goodwives River during the 25-year storm results in these pipes being submerged as a starting condition. See Attachment A of the Supplemental Engineering Calculations.

n. Provide an analysis of the tributary drainage basin to the Stormwater Quality Basin and the calculated flows passing through the system. Town GIS and drainage mapping acceptable for the model along with the use of assumed CN's based on the Town of Darien Zoning Map.

Response: A Hydraflow model of the proposed Stormwater Quality Basin including the contributing drainage area watershed map, have been provided with the supplemental calculations for review. See Attachments F and H of the Supplemental Engineering Calculations.

q. The low flow orifice designed for Retention System #2 results in roughly 2,700 cf of storage beneath the outlet, 24% of the tributary Water Quality Volume.

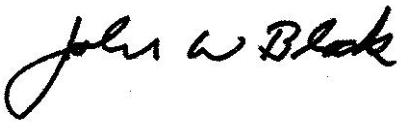
Response: The low flow orifice has been removed from the system. The revised Hydraflow model reflecting this change, along with the updated Water Quality Volume calculations are included with the Supplemental Calculations for your review. See Attachments B and H of the Supplemental Engineering Calculations.

If you have any questions, please feel free to contact us at 203-712-1100.

Very truly yours,

TIGHE & BOND, INC.

Erik W. Lindquist, P.E., LEED AP
Project Manager



John W. Block, P.E., L.S
Senior Vice President

Enclosures:
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