



**Civil
Site Planning
Environmental
Engineering**

133 Court Street
Portsmouth, NH
03801-4413

February 18, 2022

Michael Behrendt, Town Planner
Town of Durham
8 Newmarket Road
Durham, New Hampshire 03824

**Re: Third-Party Review
Toomerfs, LLC
Map 5, Lots 1-9, 1-10, 1-15 and 1-16
19 and 21 Main Street
Durham, NH
Altus Project 5166**

Transmitted via email to: mbehrendt@ci.durham.nh.us

Dear Mr. Behrendt,

At the request of the Planning Board, Altus Engineering, Inc. (Altus) has completed an independent engineering review of the Toomerfs, LLC (Applicant) project at 19 and 21 Main Street in Durham, NH prepared by Horizons Engineering of Newmarket, NH (Designer). Altus prepared this report based on the following plans and documents received by this office via email on February 16, 2022:

- A set of plans entitled “Site Plan for Toomerfs, LLC” revised through February 15, 2022;
- “Stormwater Management Plan” revised February, 2022.

The applicant is proposing a substantial revision to the prior design reviewed by Altus approximately one year ago. Specifically, the parking lot layout has been changed and the accompanying grading and drainage design modified accordingly. Altus has tailored our review to grading and drainage-related aspects of the design and its compliance with applicable Town and State regulations and standard engineering practice.

We find that the design approach is reasonable and consistent with what we would expect for a site of this type. The drainage system should provide the reduction in peak rates of runoff required by the Site Plan Regulations and meet NHDES water quality standards.

There are a number of technical issues that should be addressed prior to final site plan approval. After review of the above documents, Altus submits the following comments for the Town's consideration:

1. Sheet C102 shows a 6" pipe directing YD-100 and YD-200 to the landscape island in the parking lot. The 6" pipe size is supported by the Nyloplast Drain Basin Details on Sheet C50. However, the Storm Drainage Structures table on Sheet C102 call out 8" pipes.
2. What appears to be a headwall is shown at the outlet of the 24" pipe from DMH-200. This presumption is supported by a notation on Sheet C105 that calls out "HW-100" but this structure is not listed nor is a detail provided in the plans. This missing information should be added.
3. A level spreader detail is shown on Sheet C503 but we are unable to locate where this BMP is to be located in the plans. The designer should show where this is to be installed or the detail removed from the drawings.
4. A number of the inverts and pipes sizes shown in the OCS-100, OCS-200 and CB-200 details on Sheet C504 do not match the Storm Drainage Structures table on Sheet C102.
5. We find that the detail of the Stormtech systems on Sheet C505 to be very detailed and helpful both in our review and to the contractor in the field. However, a few discrepancies should be pointed out and corrected on both the plans and in the Drainage Analysis:
 - a. The slope of the 24" pipe from CB-100 to the isolator row appears to have a slope of nearly 17% which is excessive. Most pipes directed to isolator rows are installed flat. The 24" outlet invert at CB-100 should be lowered to allow for a more reasonable slope.
 - b. The slope of the 12" pipe from CB-100 to the manifold should be called out. The manifold downstream of the 45° bend should be installed flat.
 - c. We have calculated the slope of the 24" pipe discharging from DMH-200 to be over twice that shown.
 - d. The 18" pipe from CB-200 to DMH-100 is nearly 5.5% where 4% is shown.
 - e. The 18" outlet from DMH-100 to the manifold is shown dropping 0.5'. Manifolds this close to their contributing structures are typically installed flat.
 - f. 6" underdrains are called out in both Stormtech fields. We suggest that they be eliminated in order to allow the required infiltration of the WQV.
6. The plans should specify that a complete structural retaining wall design stamped by a NH-licensed professional structural engineer be provided by the contractor for review by the Building Inspector prior to construction.
7. We understand that the specifications for the fill behind the retaining wall and under the Stormtech systems are in the process of being designed by a geotechnical engineer. We suggest that the Town have this reviewed prior to construction.
8. Sections 1.1.1 and 1.1.5 of the Drainage Analysis both show a table indicating a comparison between pre- and post-development peak rates of runoff (Table 1.0 and 1.3

which is indicated to be a reprint of Table 1.0 respectively). However, the values shown do not match the Drainage Analysis nor do the tables match each other. The Designer should verify the correct pre- and post- peak rates.

9. The Infiltration Practice Criteria worksheets list MC-3500 #2 twice but the node numbers appear correct. This minor discrepancy should be corrected.
10. The Infiltration Practice Criteria worksheets MC-3500 #2 (MC1) and (MC2) indicate top of the practice elevations that do not correspond to the plans and should be revised.
11. Infiltration Practice Criteria worksheet MC-3500 #2 (MC2) calls out a bottom of basin elevations that does not correspond to the plans. This should be corrected.
12. It is possible that Infiltration Practice Criteria worksheets MC-3500 #2 (MC1) and (MC2) have juxtaposed their relevant test pits. As shown, MC-3500 #1 has only a 0.27' separation between the bottom of the practice and a restrictive layer which we do not believe to be the case. We suggest that this be reviewed and the proper test pit data called out.
13. The Drainage Analysis includes a second General Calculations – WQV and WQF worksheet and a third Infiltration Practice Criteria worksheet for a node listed as MC-45. We suspect that these are remnants of the prior revision and should be removed.
14. The total areas shown in the pre- and post- drainage models do not match. Although the difference is only 785 sf, we suggest that the designer correct this minor issue.
15. The Drainage Analysis does not include HydroCAD data for the 50- and 100-year pre-development storm events. These summaries should be added to allow comparison between pre- and post- drainage conditions for these events.
16. The Drainage Analysis does not analyze YD-100 or YD-200. These should be included in the post-development drainage model to assess their functionality.
17. A 24"x24" horizontal grate is included as a primary outlet from HydroCAD Pond CB2. This matches the rim of the catch basin, but if runoff were to reach that level it would have the effect of providing that additional discharge capacity directly to MC-5300 #2 which is not the case. This should be removed from the model.
18. Some of the discharge pipe lengths in HydroCAD Pond CB2 do not match the plans. Although the discrepancies are minor, they should be corrected.
19. The outlet from Pond D2 is shown as being 135' in the HydroCAD model. However, this does not take into account the inflow from CB-200's 12" overflow pipe that enters at a tee 70' from DMH-200. We suggest that a pipe reach be added to the model to analyze the 64' of pipe downstream of the tee.
20. Table 1.5 of the Drainage Analysis shows a Water Quality Volume (WQV) of 1,905 cf that the Designer states is required to be infiltrated per Section 15.5.2(i) of the Site Plan Regulations. The Designer has arrived at this by using the NHDES BMP General

Calculations Worksheet for WQV and WQF. However, the Town regulation is not a mirror image of the NH Stormwater Manual and its intent is to infiltrate a Groundwater Recharge Volume (GRV) which requires a slightly different methodology. Semantics aside, we believe that this is not calculated correctly as shown and that the WQV (or GRV) should be 1,031 cf. Given that the design provides 4,447 cf of storage for infiltration, this system as designed meets the regulation, but the calculations should be verified. They should also provide a stage-storage table of both Stormtech systems so that the stated volume provided can be verified.

21. Sheet C3.3.1 of the Drainage Analysis does not show the limits of existing pavement. This should be included to aid in comparison between this plan and Sheet C3.3.2.
22. The Inspection and Maintenance Plan contained in the Drainage Analysis does not list catch basins or manholes as items requiring inspection or maintenance in the initial table but goes on to discuss them later in the document. These should be included in the table.
23. Sheets Pre and Post indicate an area across Main Street as being tributary to the site. This should be revised to show the subcatchment boundary at the roadway crown.
24. Sheet Post should be revised to indicate the location of all the HydroCAD nodes, not just a select few.

Should the Applicant or the Planning Board desire, Altus is available to meet with them, the Designer, or anyone else to further discuss this review and/or any additional review criteria.

Please feel free to contact us should you need any additional information.

Sincerely,

ALTUS ENGINEERING, INC.



Erik Saari
Vice President



Eric D. Weinrieb, PE
President

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