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September 08, 2021  
VIA EMAIL

Ipswich Planning Board  
Town Hall  
25 Green Street  
Ipswich, MA 01938

RE: 55 Waldingfield Road  
Site Plan Review & Special Permit Applications  
Initial Drainage and Stormwater Management Review (Task 1)

Mr. Ethan Parsons and Planning Board Members:

As requested, I have conducted an initial drainage and stormwater management review of the above referenced project with respect to regulatory standards of the Planning Board and routine engineering design practice for drainage and stormwater management facilities similar to that being proposed by the Applicant. Pertinent technical material received includes the following plans and documents as prepared by Hancock Associates of Danvers, MA (unless otherwise noted).

- “Permit Site Plan (to accompany a Great Estate Preservation Development Special Permit) 55 Waldingfield Road....” consisting of nine (9) sheets, dated July 12, 2021.
- “Stormwater Report in Support of A Great Estate Preservation Development (GEPD) Special Permit for 55 Waldingfield Road...” dated July 2021, including appendices for Construction Period Pollution Prevention Plan and Operation and Maintenance Plan.

In addition to the above, the following material was received and examined for background and informational purposes only:

- “Special Permit Application for Uses or Activities” dated July 12, 2021.
- “Site Plan Review Application” dated July 12, 2021.
- Correspondence from Laura Gibson, A.S.L.A. dated July 9, 2021, regarding “Waldingfield Landscape: Yesterday and Today” including “Landscape Inventory” plan L1, dated July 9, 2021.
- Architectural Plans prepared by Olson + Lewis Architects, dated July 12, 2021.

At this time, the following comments and opinions are offered for your consideration relative to the proposed drainage and stormwater management design.

**Overview:** The proposed stormwater management design utilizes an infiltration chamber to mitigate runoff from the proposed building addition. This is a common and acceptable approach. Minor concerns are noted in the report below and are anticipated to be easily resolved. By contrast, concern is noted with respect to the analytical approach used to evaluate the proposed peastone areas of the site (i.e., the new parking fields and expanded driveway width). Supplemental analysis/revision should be provided to accurately document the post development runoff impacts in these areas.

## **Stormwater Management, Drainage, and Grading:**

1. NOAA Atlas 14, Volume 10 should be utilized for precipitation values when designing the stormwater management system and infiltration chamber. The design engineer has utilized precipitation values from 'Technical Paper 40' which is generally considered to have been updated by NOAA Atlas 14. Revised calculations should be submitted.
2. Post Development Calculations – The following items should be addressed by the design engineer.
  - a. Exception is taken to the curve number (CN) used for peastone in post development subcatchments P1B and P2. In my opinion, the peastone surface, as detailed, will collect stormwater in a similar fashion as permeable pavement. The stone voids will function as a reservoir while the gravel sub base provides an infiltration media. The compacted gravel sub base will have significantly different infiltration properties than those represented in the analysis. The design engineer should expand, clarify, and revise the analysis approach to represent physical conditions more accurately. In addition, objection to the use of the proposed peastone cross section is noted, and alternative/supplemental measures should be added to the design:
    - i. The stormwater runoff entering the peastone area will receive no pretreatment or filtering. The resulting fines entering the cross section will adversely impact the long term infiltration capacity of the area.
    - ii. The proposed 12 inch thick layer of peastone will be highly unstable. Severe amounts of rutting, shifting and movement of the stone should be anticipated along driveway turns and within the proposed parking field. Supplemental stabilization or alternative methods are strongly suggested.
    - iii. Stormwater infiltration (i.e., peastone areas) should not be located directly adjacent to the sanitary leaching field north of the existing concrete garage (i.e., the traffic aisle adjacent to the existing leaching field).
  - b. On the site plans, identify the roof area intended to be directed to the Infiltration Chamber. If gutter and downspout conveyance is anticipated, it should also be noted.
    - i. Clarify how the roof segments south of the proposed roof ridge line will be conveyed to the Infiltration Chamber (refer to architectural plan A1.11).
  - c. No calculations were provided relative to stormwater impacts associated with the driveway widening (i.e., driveway proposed to be widened to 20 feet). The design engineer should provide numerical analysis of these impacts.
  - d. Graphically clarify the site plans to delineate areas intended to remain 'gravel' versus areas proposed to be 'peastone', consistent with the calculation assumptions.
  - e. Reduce the pipe slope into and out of the Infiltration Chamber. The proposed slope of 15 percent will generate excessive flow velocity at the chamber inlet and the overflow pipe outfall and should be lessened.
3. Soil testing was not conducted within the stormwater infiltration area. Soil testing should be conducted within the boundary of the Infiltration Chamber, in conformance with MA DEP Stormwater Handbook requirements, to confirm soil composition beneath the system, soil infiltration rate, and seasonal high groundwater levels.
4. Specify proposed grading (contours and spot grades as needed) for the expanded driveway and new parking areas. Indicate the hydrologic divide (between subcatchments P1B and P2) consistent with calculation assumptions.
5. The plan should specify a requirement to field verify the location of the existing leach field and septic tank/pump chamber to ensure that the stormwater infiltration chamber is positioned an appropriately (in accordance with DEP Stormwater Handbook and 310CMR15 – Title 5

- requirements). Similarly, the sanitary sewer pipe locations should be verified in the field to confirm adequate clearance and separation is provided from the stormwater infiltration chamber.
6. Provide an inspection port for the infiltration chamber system along with a construction detail.

**DEP Stormwater Management Standards:**

1. Sign, date, and provide a professional engineer stamp on the 'Checklist for Stormwater Report.'
2. Standard 3 – Provide a revised mounding analysis with updated values for R, Sy, x, and y which reflect design assumptions.
3. Standard 4 – Provide a Long Term Pollution Prevention Plan (LTPPP) which addresses all topics contained in the 'Checklist for Stormwater Report.'
4. Standard 8 - The Construction Period Pollution Prevention Plan (CPPPP) should be comprehensively revised to provide all information indicated in the 'Checklist for Stormwater Report' including the following:
  - a. Plans should specify erosion controls needed at the project entrance.
  - b. A location for the stabilized construction entrance should be indicated on the plans.
  - c. Identify the person/entity responsible for CPPPP implementation and compliance.
  - d. Include provisions for dust control during construction.
  - e. Provide construction sequencing.
  - f. Provide an inspection and maintenance schedule along with an Inspection and Maintenance Log Form.
  - g. Include a note in the CPPPP referencing the requirements of the project Stormwater Pollution Prevention Plan (SWPPP).
  - h. Include a note on the plans referencing the requirements of the CPPPP and the SWPPP.
5. Standard 9 – Address and coordinate the following items in the Operation and Maintenance Plan (O&M Plan):
  - a. The O&M Plan should include a reference to the design plan of record and any 'as-built' plans that may be generated after construction.
  - b. Provide estimated annual costs for maintenance of the stormwater management system.
  - c. The narrative and Inspection Checklist should be revised to address the following items:
    - i. Inspection and cleaning of gutters and down spouts (if utilized).
    - ii. Inspection of Infiltration Chamber overflow pipe outfall and rip rap.
    - iii. Inspection of vegetated slopes down gradient of the Infiltration Chamber overflow pipe outfall for evidence of erosion or rills (it should be noted that any observed flow from the pipe would indicate a need for remedial work on the system).
    - iv. Include inspection and maintenance requirements for peastone areas.
6. Standard 10 – Provide a fully executed Illicit Discharge Compliance Statement (i.e., sign and date the document).

Please feel free to contact me if you have any questions or require any additional clarification of the above comments and opinions.

Very truly yours,

*R.E. Puff*

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Robert E. Puff, Jr., PE

cc: C Wear, PE (via email)