

# HANCOCK ASSOCIATES

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24679

March 4, 2022

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

RE: 55 Waldingfield Road – Phase 1B  
Site Plan Review & Special Permit Applications  
Response to Drainage and Stormwater Management Review (Task 1)

Mr. Ethan Parsons and Planning Board Members:

On behalf of Ora, Inc., Hancock Associates is pleased to respond to comments given by Robert Puff, P.E. in his drainage and stormwater management review dated January 21, 2022, for the above referenced project with respect to regulatory standards of the Planning Board and good engineering design practice for drainage and stormwater management facilities.

The following comments are offered in response to Robert Puff's letter.

## Stormwater Management, Drainage, and Grading:

*Peer review comment:*

1. *Proposed Rain Garden – Revise the design and calculations as needed to address the following:*
  - a. *The assumed infiltration rate of the Rain Garden (8.27 in/hr.) is excessively high. While this value may reflect the capacity of the native soil material, the two foot thick 'soil mix' placed within the Rain Garden will introduce a restrictive soil layer with an infiltration rate significantly less than that used in the calculations. A reduced value, reflective of the proposed 'soil mix' characteristics, should be utilized in a revised calculation. It is anticipated that this revision may require geometric changes to the Rain Garden.*

## Hancock's response:

**The rain garden's infiltration rate has been lowered from 8.27 in/hr. to 0.52 in/hr. The design of the rain garden has been revised to accommodate this change in infiltration rate.**

*Peer review comment*

- b. *Grading within and around the proposed Rain Garden should be revised/coordinated with the assumptions made in the hydrologic/hydraulic calculations of the 'Stormwater Report.'* Conflicting information is presented within the various documents.

## Hancock's response:

**The grading and Stormwater Report have been revised to address this issue.**

*Peer review comment*

- c. *The DEP Handbook (Volume 2, Chapter 2) stipulates that adequate pretreatment of runoff must be provided prior to the Rain Garden. No pretreatment is proposed for runoff from the proposed peastone area (i.e., runoff is conveyed directly into the Rain Garden via stone swale). It can be reasonably anticipated that the concentrated runoff from the proposed peastone surface will contain sediment. Hence, suitable pretreatment should be provided for surface runoff into the Rain Garden.*

**Hancock's response:**

**A forebay has been added to the rain garden to provide pretreatment to the incoming runoff.**

*Peer review comment:*

- d. *A landscape plan and/or planting schedule should be provided for the Rain Garden.*

**Hancock's response:**

**A landscaping plan with a planting schedule will be provided by the landscape architect.**

*Peer review comment:*

2. *It is noted that a majority of the peastone parking and driveway area will not be conveyed to the Rain Garden. To improve the quality of this runoff, it is strongly suggested that additional water quality treatment be provided in the lower portion (southeasterly section) of the peastone/gravel area (i.e., where a majority of the runoff is flowing off of the peastone/gravel). Viable options would include a pea gravel diaphragm in areas where the parking surface is level and/or down gradient pervious berm below steeper segments of the entrance driveway adjacent to and below the proposed gate (refer to DEP Handbook Volume 2, Chapter 2).*

**Hancock's response:**

**A drainage swale has been added to the plan that will convey stormwater from the majority of the peastone drive to the rain garden. Additionally a 3-foot-wide pea gravel diaphragm has been added along the southern portion of the driveway.**

*Peer review comment:*

3. *Consistent with the calculations, the Site Plan should include a note specifying that all roof runoff shall be conveyed to the rain garden.*

**Hancock's response:**

**The roof runoff note has been added to the Site Plan, sheet 4.**

*Peer review comment:*

4. *The proposed peastone parking area located between the two proposed buildings requires additional grading information to convey design intent. Provide supplemental spot grades or contours.*

**Hancock's response:**

**Additional contours and spot grades have been added to the plan.**

*Peer review comment:*

- a. *In addition to the above, a note on plan sheet 9 states that the peastone area between the two proposed buildings "...drains under proposed barn." The plans should clarify how this is intended to be achieved (i.e., no architectural plans or sections were received, and it is not obvious that the existing/proposed barn construction provides an accessible area below the floor level to facilitate storm flowage). Note that if this intent is accurate, a pretreatment water quality element should be provided for this tributary area.*

**Hancock's response:**

**The barn was constructed on piles with an open space for livestock under the barn. The area between the barn and the house actually drains under the barn and to the natural catchment area.**

Peer review comment:

5. *Proposed grading and hydrologic calculations imply that a drainage swale will be located along the southerly side of the barn, flowing in an east-west direction (to the Rain Garden). It is strongly suggested that this swale be better defined on the plan, and that an alternative construction material be considered. The proposed peastone will be unstable when subjected to concentrated flow. Material such as cobblestone, rip rap stone, or pavement would be more durable and stable than the proposed peastone.*

**Hancock's response:**

**The Drainage swale in the driveway area south of the barn has been removed. Stormwater will now sheet overland to a new drainage swale located east of the peastone parking area which will convey stormwater to the rain garden.**

- a. *In addition to the above, the Applicant may wish to consider relocating the parking space adjacent to the barn so that it is not positioned within the path of the drainage swale.*

**Hancock's response:**

**The swale in the parking/ drive area has been removed. See above.**

Peer review comment:

6. *Grading and surface treatment for the patio area (between the two proposed buildings) is not specified. Stormwater management calculations assume this area to be a grass surface which is graded to direct runoff in a northerly direction. Supplemental grading and material specification should be on the plans for this area.*

**Hancock's response:**

**It is the applicant's understanding that this area is intended to be a wooden deck where stormwater will flow between the slats in the decking to bare earth underneath.**

Peer review comment:

7. *A note is included on plan sheet 10 that states "Rooftop stormwater to be collected in underground cistern, to be used for garden irrigation. Location and sizing of cistern to be determined." The detailed Site Plan (plan sheet 9) does not reflect this intent. While no engineering exception is taken to the intent, the design engineer should clarify the intent by coordinating the two plan sheets. Furthermore, the plans should stipulate that any cistern overflow is required to be conveyed to the rain garden with the conveyance methods specified on the plans.*

**Hancock's response:**

**The intent is to use the cistern for the watering of horses. We have added the note to the plans. Details of this to be worked out at a future time.**

Peer review comment:

8. *Storm drains are shown on both the northerly and southerly sides of the proposed buildings, however, no inlets are indicated. The intended purpose of these pipes should be explained and inlets for the proposed pipe lines specified on the plans.*

**Hancock's response:**

**These storm drains capture runoff from the roof leaders and convey stormwater to the Rain Garden. The roof connections have been added to the plans.**

Peer review comment:

- a. *Pipe size, invert elevations, and slopes should be indicated for the pipe lines.*

**Hancock's response:**

**Plans have been updated as requested.**

*Peer review comment:*

- b. *Drain manholes should be utilized at changes in pipe direction, rather than the cleanouts indicated on the plans.*

**Hancock's response:**

**Directional change cleanouts have been changed to manholes on the plans as requested.**

*Peer review comment:*

9. Coordinate the storage volumes stated in Section 2.0 of the Stormwater Report narrative and the volume calculations in Appendix D with the site grading plans and stormwater calculations for the rain garden. Contradictory information is provided.

**Hancock's response:**

**Storage volumes have been corrected across all documents as requested.**

*Peer review comment:*

10. *Provide more detailed topographic information on plan sheet 10 to address the following:*
  - a. *Clarify the limits of elevation 35.5 to document the area/volume of storage assumed in calculations for the existing on-site low area.*

**Hancock's response:**

**Noted. The elevation 35.5 contour is shown as the dark dashed line on sheet 10.**

*Peer review comment:*

- b. *Specify the location, size, and elevation of the on-site low area overflow point.*

**Hancock's response:**

**Noted. The overflow point has been added to sheet 10.**

*Peer review comment:*

- c. *Provide additional grading in the southeasterly corner of the property to document that the entirety of subcatchments EB-1 and PB-1 will flow to the existing on-site low area.*

**Hancock's response:**

**There is an existing gravel driveway that acts as a berm along the easterly property line that has the effect of directing stormwater to the natural depression. The Survey indicates that the existing topography of the road directs stormwater to the natural depression as well.**

*Peer review comment:*

11. *Construction details should be provided for the following drainage/stormwater elements indicated on the site plan:*

- a. Pipe cleanout detail.
- b. Drain manhole detail.
- c. Drainage swale (adjacent to barn).
- d. Earthen embankment cross section and material specifications for Rain Garden.
- e. Spillway cross section and material specification for Rain Garden. Note that care should be given to the design of the spillway crest to ensure that the detail reflects assumptions made in the calculations.

**Hancock's response:**

**An additional detail sheet has been added to the plan set (Sheet 7) to address this. A Landscape Plan for material and planting of Rain Garden are to follow.**

*Peer review comment:*

12. The following drafting and typographical errors should be addressed:

- a. The proposed 'Soil Stabilizer' detail should include manufacturer product information and/or material specifications. In addition, the intended use of the product should be indicated on the plans and in the 'Section for Pea Stone' detail.
- b. Specify the required minimum stone size and gradation in the 'Drain Outlet' detail.
- c. In the stormwater report narrative Section 1.0 (page 1) stormwater runoff is stated to flow to the west. As mapped, stormwater flow at the locus is to the east.
- d. In the stormwater report narrative Section 1.0 (page 1) and in Appendix G (the CPPPP), the proposed site description refers to Phase 1B buildings on the western side of the property. As mapped, Phase 1B is on the eastern side of the property.
- e. In the General Notes on plan sheet 1, indicate the correct municipality in note 4, and the correct FIRM Panel in note 11.
- f. On plan sheet 9, coordinate the ESHWT elevation with the estimated depth to ESHWT and test pit surface elevation as indicated in the Soil Testing data.
- g. Provide the correct graphic and bar scale on plan sheet 10.

**Hancock's response:**

**The plans and stormwater report have been revised in accordance with these comments.**

DEP Stormwater Management Standards:

*Peer review comment:*

- 1. Standards 4 and 8 – The Long Term Pollution Prevention Plan (LTPPP) and the Construction Period Pollution Prevention Plan (CPPPP) should both be revised and reformatted to address all topics contained in the 'Checklist for Stormwater Report.'
  - a. The LTPPP is written largely with respect to construction, but does not contain substantial instruction with respect to long term operation at the site. The document should be revised to address all topics contained in the 'Checklist for Stormwater Report.'

**Hancock's response:**

**The Stormwater Report has been revised as requested.**

*Peer review comment:*

- b. Include a note on the Site Plan referencing the requirements of the LTPPP.

**Hancock's response:**

**Note has been added to the plan on Sheet 1.**

*Peer review comment:*

- c. *Include reference to the requirements of the CPPPP and the SWPPP in the 'Erosion Control Notes' on plan sheet 11.*

**Hancock's response:**

**This note has been added as requested.**

*Peer review comment:*

- d. *Specify additional erosion control barriers on the site plan to be located upgradient of the Rain Garden (i.e., to intercept surface runoff from the adjacent fill area southwesterly of the Rain Garden) and also at the toe of the Rain Garden slope to protect finished work until the site is fully vegetated and stable.*

**Hancock's response:**

**Additional erosion controls have been added to the plans on Sheet 9 and detailed on Sheet 12.**

*Peer review comment:*

- e. *The CPPPP contains various items that are more applicable to the LTPPP and should be included therein. The document should be revised accordingly.*

**Hancock's response:**

**The CPPPP and the LTPPP has been revised as requested.**

*Peer review comment:*

- f. *The CPPPP should also be revised to provide the following:*
- i. *A location for the stabilized construction entrance should be indicated on the plans.*
  - ii. *Identify the person/entity responsible for CPPPP implementation and compliance.*
  - iii. *Include reference to the requirements of the Stormwater Pollution Prevention Plan (SWPPP) in the CPPPP.*

**Hancock's response:**

**The CPPPP and plans have been revised as requested.**

*Peer review comment:*

2. *Standard 9 – Address and coordinate the following items in the Operation and Maintenance Plan (O&M Plan):*
- a. *Include a note on the Site Plan referencing the requirements of the O&M Plan.*
  - b. *The narrative and Inspection Checklist should be revised to include the following items:*
    - i. *Recovery and inspection of drainage system cleanouts shown on the plans.*
    - ii. *Inspection and maintenance of the proposed swale and rip rap channel located on the southerly side of the barn.*

**Hancock's response:**

**A note has been added to the title sheet and the O&M has been revised as suggested.**

*Peer review comment:*

- iii. *Modify the 'Rain Garden' narrative relative to the outlet control structure. There is no outlet control structure per se. The only outlet is the proposed spillway. Inspection and maintenance protocols for the spillway should be specified in the narrative and included in the 'Inspection Checklist.'*

*The spillway maintenance has been added to the O&P plan.*

**Hancock's response:**

**The Operation and Maintenance plan has been updated as suggested.**

*Peer review comment:*

- iv. Add a narrative description and 'Inspection Checklist' item for inspection of the existing on-site low area being used for stormwater mitigation. Specifically, inspect/maintain the discharge/overflow location for alteration, erosion, etc. Stipulate that future alteration of the overall low area and the discharge/overflow should not be conducted without appropriate hydrologic/hydraulic evaluation and regulatory approval. Include a similar note on the plans.*

**Hancock's response:**

**The operation and maintenance plan and site plans have been revised as suggested.**

We look forward to discussing these issues with you further.

Sincerely,

HANCOCK ASSOCIATES on behalf of Ora, Inc.

A handwritten signature in blue ink, appearing to read 'C. E. Wear, III', with a stylized flourish at the end.

Charles E. Wear, III, P.E.  
Engineering Manager/Senior Project Manager

cc: Robert Puff, P.E.