

November 11, 2016

Margaret Hoffman, AICP
Planning Coordinator
Town of Wenham
138 main Street
Wenham, MA

Re: Engineering, Conservation and Zoning Review
Wenham Pines, Wenham, MA

Dear Ms. Hoffman:

Design Consultants Inc. (DCI) is pleased to submit this follow-up up to Hancock Associates (Engineer) responses dated October 13, 2106 for the above reference project. This letter is limited to the Notice of Intend filing. The Project Applicant is Wenham Pines LLC (Applicant). The following documents have been provided by the Town of Wenham (Town) for review:

- Hancock Associates., “Notice of Intent, 56 & 60 Main Street in Wenham, MA, 13 October, 2016”, (NOI).

The following are DCI’s comments on the Notice of Intent submitted to the Wenham Conservation Commission. Comments on the Flexible Development Application will be submitted under separate cover. It is important to note that the comments in this letter also apply to the Flexible Development Application, and will be duplicated in the Flexible Development Application only as necessary.

Notice of Intent

A. General Information

1. WPA Form 3 (2) Applicant – Robert F. Tambone is listed on the Commonwealth’s Certificate of Organization. Anthony Tambone is not listed as a member of the LLC. Contact information is not provided.
Hancock: Contact information will be provided.
DCI: Comment addressed.
2. WPA Form 3 (2) Property Owner – Contact information not provided.
Hancock: Contact Information will be provided.
DCI: Comment Addressed
3. The Notice of Intent Filing is incomplete. Project details are not included. A Riverfront Alternatives Analysis is not included.
Hancock: A Riverfront alternatives analysis will be provided.
DCI: Riverfront Alternatives Analysis not provided.

B. Buffer Zone & Resource Area Impacts

4. a. Bank is checked however no footage is provided.
Hancock: As re-designed the bridge spans the stream and a considerable margin of upland on both sides. No bank alteration is proposed.
DCI: Comment addressed
5. b. Bordering Vegetated Wetland (BVW) is checked however a value of 0 is provided for the size of the proposed alteration and the proposed replacement.
Hancock: Activity is in Buffer zone only. No BVW replacement is required.
DCI: Comment addressed.
6. f. 3. Riverfront Area – The applicant has indicated there are 240,000 square feet of Riverfront on site. Our calculations indicate that there are 257,161 square feet north of the “River”.
Hancock: There is 257,161 SF north of Alewife brook and 169,598 SF south of Alewife brook for a total riverfront Area of 426,759 SF on the site.
DCI: Comment addressed.
7. f.4. The amount of Riverfront alteration is significantly under estimated. The NOI indicates that a total of 8,390 square feet are altered, that 6,000 square feet are altered within 100 feet and 2,390 square feet are altered between 100 feet and 200 feet. DCI estimates that 33,800 total square feet are proposed to be altered with 14,700 square feet within 100 feet and 19,100 square feet within 100 feet. In addition, the NOI Plans do not show the proposed trail to be constructed in the Riverfront Area that has been submitted with the Flexible Development Application.
Hancock: As proposed, 17,000 SF of Riverfront Area will be altered. Of the 426,759 SF of Riverfront Area on the site, alteration of up to 42,676 SF (10%) is permissible.
DCI: Comment addressed.
8. f.5. An alternatives analysis is required.
Hancock: A Riverfront alternatives analysis will be provided.
DCI: The Riverfront analysis has not been provided.

D. Additional Information

9. 3. The NOI need to provide the methodology for BVW and other resource area boundary delineations.
Hancock: The wetland boundary has been reviewed by the Wenham Conservation Commission and an ORAD is in effect and a copy will be supplied by the Wenham Conservation Commission.
DCI: It is DCI’s understanding that an ANRAD has been submitted and the ORAD has been drafted. The ORAD needs to be issued and recorded prior to issuing conditions for this project.

Project Narrative

Note – A revised Project Narrative has not been submitted for DCI’s review.

10. Project Delineation Methodology: The Applicant should attach documentation of the methodology used to delineate the Bordering Vegetated Wetlands (BVW) boundary (e.g. BVW

Field Data Form, Final Order of Resource Area Delineation or other delineation method) as well as methods used to delineate any other resource areas proposed for alteration. The flagging appears consistent with the vegetated wetland boundary existing on-site, however it appears that historical mowing may have encroached on areas that hydraulically function as wetlands and have hydric soils. DCI has not confirmed the resource area delineations.

Hancock: Same as D-9.

DCI: It is DCI's understanding that an ANRAD has been submitted and the ORAD has been drafted. The ORAD needs to be issued and recorded prior to issuing conditions for this project.

11. Project Delineation Methodology: In the final paragraph the Applicant discuss "three (4) wetland resources" areas as identified by the Wetlands Protection Act. Then proceeds to list four. Please clarify.

Hancock: Four Wetland resources is the correct number.

DCI: Comment addressed.

12. Project Delineation Methodology: The Applicant failed to identify Bank, Wetlands, Water Bodies, Waterways and Adjacent Upland Resource Areas under the Town's Wetlands Regulations (100 CCR).

Hancock: Same as D-9.

DCI: The Applicant needs a discussion on how it is meeting the requirements under the Town's Wetlands By-Law and Regulations.

13. Bordering Vegetated Wetlands: The Applicant proposes to replace the 6-inch PVC pipe connecting the B & C Series Wetlands with a 10-inch ductile iron pipe. The Applicant has not provided any discussion regarding the impacts during construction or changes to the hydrology that may arise do to the change in the pipe. In addition, the DI pipe is large and has limited cover. The Applicant should review the pipe profile to determine is it will have adequate cover.

Hancock: Applicant will revert back to the 6" pipe size (Ductile iron).

DCI: Provide calculation showing the cover adequate under the roadway.

14. Bordering Vegetated Wetlands: The Applicant has identified three invasive plants as identified by the Massachusetts Invasive Plant Advisory Group. These plants include: purple loosestrife (invasive), multi-flora rose (invasive) and reed canary grass (invasive).

Hancock: Lythrum salicaria, Rosa multiflora, and Phalaris arundinacea are listed as invasive species by the Massachusetts Invasive Plant Advisory Group. They are prohibited from cultivation and distribution. We are not required to remove the species from the site. If invasive species begin to be a significant problem (ie outcompeting native species), the Applicant might chose to implement invasive species management.

DCI: The Applicant should discuss include invasive species control in its Open Space Plan.

15. Riverfront Area: The Applicant needs to provide an alternatives analysis.

Hancock: A Riverfront alternatives analysis will be provided.

DCI: An alternative analysis has not been provided.

16. Inland Bank: The inland bank is not identified on any of the drawings.

Hancock: Inland Bank associated with Alevife Brook lays within the boundaries of the Bordering Vegetated Wetland, meaning, the 100' buffer zone of the BVW encompasses that of the bank. The bank of the intermittent stream is the centerline of the stream.

DCI: Comment addressed.

Data Report

17. 2.1 Project Site: It is DCI's understanding that the brook which drains Wenham Lake is named "Alewife Brook". Please refer to the brook by name in all documents for consistency.

Hancock: We will change the label to "Alewife Brook".

DCI: Comment addressed.

18. 2.3 Floodplain Analysis: The provided flood plain volume calculations appear to be incorrect. DCI has scaled the areas in the excavation and it appears that the volume in the 37-foot to 38-foot contour is 9,500 cubic feet. Please review the calculations and reduce the area if needed.

Hancock: 9,500 S.F. was shown on the plan, it has been reduced to 4,900 S.F.

DCI: Comment addressed.

19. 3.1 Drainage System: The drainage system should be designed to keep the total volume for each storm event equal.

Hancock: Hancock will adjust the volumes to be equal.

DCI: Comment addressed.

20. 6.0 Erosion and Sedimentation Plan: This site will have great than one acre of disturbance and requires a Stormwater Pollution Prevention Plan (SWPPP) under the EPA's Construction General Permit. This section does not meet the minimum requirements for a SWPPP.

Hancock: S.W.P.P.P. will be provided once a contractor has been selected.

DCI: The applicant is going to great mean to construct a crossing over the intermittent stream. However it is our understanding that the temporary construction entrance will be located along the property line initially and appears to encroach on the neighbor's property. The Erosion Control and Sedimentation Plan should provide provisions for this crossing of the intermittent stream. In addition, proof of an easement or agreement permitting access should be provided.

21. 7.0 Stormwater Operation and Maintenance Plan: This plan does not provide any details for a maintaining roof infiltration systems. Typically, an O&M Plan identifies each Best Management Practice, describes the BMP, and provides criteria for inspection and maintenance. A BMP inspection form is provided for each BMP type.

Hancock: Roof calculations have been provided, and were submitted. All applicable BMP's will be added to the Erosion and Sedimentation Control Plan.

DCI: The response does not address the comment. DCI is unsure why the Engineer is discussing the Erosion and Sedimentation Control Plan. The O&M Plan is not adequate to ensure ongoing performance of the infiltration structures.

22. TSS Calculations not included.

Hancock: TSS calculations will be added to the report.

DCI: The TSS calculations do not provide any technical backup for the TSS removal number.

Plans

23. It is important to note that the Plans submitted with the Notice of Intent were incomplete and many of these comments are based on review of the Wenham Pines Permit Plans submitted to the Planning Board.
Hancock: All the additional plans will be added to the revised NOI set.
DCI: Comment addressed.
24. From the site walk, there are many large diameter trees missing on the existing conditions plans. All trees should be shown. Any trees planning to be removed in the Resource Areas should be shown. The alteration caused by the tree removal should be shown.
Hancock: Trees within the limit of work area to be removed, will be identified with an "X".
DCI: Comment addressed.
25. No disturb areas should be shown around the B & C series wetlands and Upland Resources Areas. Typically orange construction fencing is used to delineate areas that should not be disturbed. Clearly show a limit of work line.
Hancock: A "limit of work" line will be added to the plans and also a note regarding "silt fence" application.
DCI: This comment is not responsive.
26. The side slopes of the compensatory flood plain are 3 horizontal to 1 vertical (3:1). These slopes are much steeper than the natural topography. In addition, this area could be moved outside the Adjacent Upland Resource Area and the Riverfront Area by moving it to both sides of the intermittent stream.
Hancock: "Compensatory Flood Storage Area" has been relocated closer to the bridge.
DCI: Comment addressed.
27. The detention basins side slopes are 1.5H:1V. These are extremely steep and unstable. The Engineer needs to provide details and engineering calculations to support this design.
Hancock: The side slopes are 3:1. Note that one foot contours are shown on the plans.
DCI: Comment addressed.
28. Details were not provided with the plans.
Hancock: The engineered details have been prepared and will be added into the resubmittal.
DCI: Comment addressed.
29. The detention basins are not labeled and are actually perform as infiltration basins. For the purposes of this letter, the detention basin to the north will be identified as DB1 and to the south will be identified as DB2. This is consistent with HydroCAD[®] analyses.
Hancock: They will be labeled DB1 and DB2.
DCI: Comment addressed.
30. The flow from DB1 is routed to DB2. As the discharge from DB 1 has been treated, it should not be send into the sediment forebay #2A. The forebay has not been designed to handle these flows and may result in sediment being re-suspended.
Hancock: The plans will be revised to avoid the forebay in DB2.
DCI: Comment addressed.
31. CB#12 and CB# 13 flow into a Drainage Manhole (DMH) that has not been listed. This flows than to Flared End Section (FES) #4 directly into the intermittent stream, without any

erosion protection. In addition it appears that Inland Bank maybe disturbed. This system is not modeled in the Stormwater Calculations.

Hancock: The drain manhole in question will be added to the chart.

DCI: Comment addressed.

32. The alignment of the roadway crossing appears to destroy that natural channel. The structure is not parallel to the crossing.

Hancock: The bridge structure will be adjusted, to better align with the stream.

DCI: Comment addressed.

33. The wing walls for the crossing should be in a straight line with the edge of the crossing to minimize the amount to fill in the resource area.

Hancock: The bridge comes as a precast unit with the angled walls. I have the manufacturer remove the walls.

DCI: The revised plans have not been provided.

34. Test pits should be excavated in the compensatory flood storage area to determine the estimated season high ground water table. Based on a review of ground water elevations and surface water elevations, it appears that the excavation will intercept the groundwater table. This may result in seepage at the toe of the slope, which might result in slope failure.

Hancock: Additional test pits will be performed. The flood storage area will be placed in the best available area.

DCI: Test pit information not provided.

35. The overflow from each sediment forebay into the detention basins needs to be detailed.

Hancock will provide a detail.

DCI: Comment addressed.

36. The invert of FES#1 is at elevation 44-feet. This invert is at the same elevation of the bottom of the forebay and will result in re-suspension of sediment. The Stormwater Handbook shows the outlet above the sediment volume and outlet invert.

Hancock: Invert FES #1 will be adjusted as suggested.

DCI: Detail not provided. Revised elevations appear to be too low.

37. Several cart paths, bridges and pipes are located within the wetlands. DCI recommends removing the bridges and pipes, and the extra fill from the cart paths. The cart paths should be removed to a depth of six inches below grade and the soil replaced with an organic mix suitable for wetlands plant and seeded with a wetlands mix. A Certified Wetlands Scientist should oversee the work.

Hancock: The applicant prefers to keep those existing features.

DCI: This needs to be reviewed with the Commission and the Open Space Plan needs to be revised to address this.

38. The plans do not indicate the type and model number of the Votrtechnics Unit to be installed. Design data is not included.

Hancock: Those units are a Vortsentry HS 36. Hancock will provide design data.

DCI: Information not provided.

39. Units No. 12 to 15 could be re-orientated to move the driveways out of the buffer zone.

Hancock: The applicant prefers to keep the driveways and units 12 & 15 in their current location.

DCI: This issue should be addressed with the Commission.

40. The erosion and sedimentation controls shown on the plans are minimal. A separate drawing showing the erosion and sediment controls should be provided. The site is large and has steep slopes in locations. The minimal perimeter controls shown are not adequate.

Hancock: A separate drawing with more detail will be provided.

DCI: Comment stands.

41. Units No. 1 to 4 and Detention Pond No. 2 could be moved outside of the Riverfront Area.
Hancock: The applicant prefers to keep the current configuration of detention pond and units 1 & 4 in their current location. Many concepts were developed and this configuration is the best design.

DCI: This issue should be discussed with the Commission.

42. FES#3 discharges to the Buffer Zone and Adjacent Upland Resource. Details have not been provided for preventing erosion at this outfall.

Hancock: A detail will be added to the new Erosion and Sedimentation Control Plan.

DCI: Not added.

Stormwater Calculations

43. Roof Drainage Design: The units scale from 2,700 to 2,900 square feet, not the 2,400 square feet used in the calculations.

Hancock: The 2,400 S.F. Is correct for the roof area. The 2,700 – 2,900 S.F. area which you mention, actually includes the outside decks and concrete stoops which are not to be included in the roof calculations.

DCI: Comment addressed.

44. Roof Drainage Design: How are the roofs accounted for in the HydroCAD[®] analyses?

Hancock: The roof areas will be infiltrated and not included in the HydroCAD analysis.

DCI: Provide roof infiltration calculations and details.

45. The flow paths and design points should be shown on the Drawings EW – Existing Watersheds and PW-Proposed Watersheds.

Hancock: The flow paths and design points will be added to both plans.

DCI: Comment addressed.

46. Sediment Forebay Design – The impervious surface areas for Sediment Forebays #2A and #2B in the HydroCAD[®] do not match the areas in the sediment forebay design calculations.

Hancock: The sediment fore bays (2A & 2B) as shown in the HydroCAD model actually include all the impervious areas upstream of the fore bay. The area shown in the fore bay design calculation is actually smaller than the HydroCAD number.

DCI: Provide sediment forebay sizing calculations.

47. Sub-watershed PR1A discharges 2,949 square feet of untreated stormwater from impervious surfaces, resulting to no removal of Total Suspended Solids (TSS).

Hancock: The two areas of concern in PR1A are either discharged into DB2, or treated by the Vortsentry.

DCI: From your response, it appears that the watersheds are delineated incorrectly.

48. Several inverts do not match between the HydroCAD[®] and the Drainage Data Table. The following table identifies these discrepancies.

Structure or Node	Structure Out Invert (Drawings)	Pipe In Invert (HydroCAD®)
DMH 6	45.7	46.6
VORT#1	36.5	33.9
	Structure In Invert (Drawings)	Pipe Out Invert (HydroCAD®)
DMH6	45.8	46.7

Hancock has adjusted the HydroCAD inverts.

DCI: Comment addressed.

49. The sediment forebays are included in the detention calculations and are designed to permit infiltration. By their nature, forebays do not allow water to infiltrate as the sediment clogs the soil surface. In addition, the forebays are not detention ponds, but pretreatment BMPs and should not be used in the detention calculations.

Hancock: The sediment fore bay areas were removed from the detention basin calculation.

DCI: Comment addressed.

50. The two detention/infiltration basins are located in soils classified as Wareham Loamy Sands. According to the Web Soil Survey¹, these soils consist of Sand below 24-inches in depth. The groundwater table is typically 0 to 18 inches below grade and the saturated hydraulic conductivity is high to very high (6 to 20 inches per hour). Test pits should be excavated in each detention basin location and permeability testing be performed. In addition, the season high groundwater table should be determined in each of the basin locations. As the soils appear to have rapid infiltration rates (>2.4 inches/hour), pretreatment must remove 40% of the TSS².

Hancock: Additional testing was done.

DCI: Provide.

Town of Wenham Water Resources Protective By-Law And Regulations

51. 10.51 General Provisions (1) Limited Projects (a) Access Road: The access road as designed impacts of 2,500 square feet of *10.02(1) (b) Any land subject to flooding*. The proposed access road appears to impact of 9,000 square feet. In addition, the access road appears to impact 60 linear feet of bank, which is greater than the maximum 20 linear feet specified in this section.

Hancock: As re-designed the bridge spans the stream and a considerable margin of upland on both sides. No bank alteration is proposed.

DCI: Comment addressed.

52. 10.54 Adjacent Upland Resource Areas (3) (b): This project discharges roof and driveway run-off from a total impervious area greater than 4,000 square feet.

¹ <http://websoilsurvey.sc.egov.usda.gov/>

² Vol 2. Ch 2.Structural BMP Specifications for the Massachusetts Stormwater Handbook

Hancock: All of the impervious areas are being collected and treated and released into a 20' wide strip of naturally vegetated cover, which will be maintained by the applicant.

DCI: Review regulation and provide a narrative regarding this section of the Local Regulation.

53. 10.54 Adjacent Upland Resource Area (4)(d): It is DCI's understanding that a foot path is planned. The Applicant should provide the details of this foot path and ensure that it meets the requirements of this section.

DCI: As discussed previously, the Open Space Plan needs to address these paths and structures.

Wetlands Protection Act And Regulations

54. 10.53: General Provisions(30)(e): The current design restricts flow as its foundations are located in the existing intermittent stream, the structure and fill is larger than needed and the crossing is not perpendicular to the stream. In addition, this crossing requires approval of the Planning Board.

Hancock: The angle of the bridge was adjusted so that the foundation avoids the intermittent stream.

DCI: Comment addressed.

55. 10.57 Bordering Land Subject to Flooding (4) General Performance Standards: Compensatory volume shall be provided within the same reach of the river, stream or creek. DCI recommends that the compensatory storage be moved along the intermittent stream.

Hancock will move the compensatory storage area closer to the proposed bridge.

DCI: Comment addressed.

56. 10.58 Riverfront Area (4) General Performance Standards (c) Practicable and Substantially Equivalent Economic Alternatives: An alternatives analysis in accordance with this section of the Wetlands Protection Act should be provided the Notice of Intent.

Hancock: An alternatives analysis will be provided.

DCI: Not provided.

We trust that the contents of this report satisfies your current needs. Should you have any questions, please do not hesitate to contact me at (781) 733-1214.

Sincerely,
Design Consultants Inc.



Michael F. Clark, P.E.
Associate