



May 13, 2021
21429

Maureen O'Meara, Town Planner
Town of Cape Elizabeth
320 Ocean House Road
P.O. Box 6260
Cape Elizabeth, Maine 04107

**Subject: Carr Woods Condominium Development - Deep Brook Road
Major Subdivision and Resource Protection Permit Review**

Dear Maureen:

We have received and reviewed an April 30, 2021 submission package for the subject project. The package included the following items:

- an April 30, 2021 cover letter from Travis Letellier of Northeast Civil Solutions;
- an April 28, 2021 Stormwater Management Report as prepared by Northeast Civil Solutions;
- an April 2021 Traffic Impact Study as prepared by William Bray;
- a January 20, 2020 Wetland Delineation Report by Albert Frick Associates along with an April 26, 2021 Vernal Pool Evaluation letter as prepared by Christopher Coppi of Albert Frick Associates
- eight drawings of various architectural building floor plans, renderings, and elevation view exhibits as prepared by Kevin Neprud & Associates and Advance Houseplans;
- and a twenty-four (24) drawing plan set most recently dated April 30, 2021 with twenty-one (21) survey and site civil drawings as prepared by Northeast Civil Solutions and three landscape plans dated April 30, 2021 as prepared by Barry Hosmer ASLA

Based on our review of the submitted material and the project's conformance to the technical requirements of Section 16-2-4 Major Subdivision Completeness and Section 19-8-3 Resource Protection Completeness, we offer the following comments:

1. The applicant is proposing to construct an approximately 1,900 linear foot private roadway, named Deep Brook Road, to serve a multi-unit residential subdivision development consisting of 5-single units, 7-duplexes, and one existing house for a total of 20- residential units on a 14.3-acre mostly wooded parcel with access off Shore Road. Approximately 11,789 square feet of R-2 wetlands would be impacted by the construction of this project. Various areas within the property will be designated as open space.
2. We understand that the Board will be conducting a completeness review for this project at their upcoming meeting. Many of our following comments should be considered beyond the completeness level and have been provided here to facilitate future submissions and reviews of the project. It should be noted that additional submitted information may result in additional

review comments. At this point, we question the completeness of the Stormwater Management Plan given the many issues noted in the Stormwater Comments section of this review letter.

3. We have received and reviewed the May 12, 2021 review memorandum as prepared by Public Works Director Jay Reynolds and the May 11, 2021 review comment letter as prepared by the Town's MS4 Stormwater Compliance Consultant Kristie Rabasca of Integrated Environmental Engineering. We concur with their comments and adopt them as part of the Town's comprehensive review of this submission rather than to reiterate their comments in this review letter. We emphasize the Public Works Director's comment regarding the importance of coordinating the project sanitary sewer connection with the Portland Water District (PWD) to receive a letter of sanitary sewer capacity to confirm that the PWD's collection and treatment system has *capacity* to receive and properly treat the additional sanitary sewer flow from this new development. The application did not include an estimated sanitary daily flow from the development which is typically based on the Maine Subsurface Wastewater Disposal Rules. An estimated flow rate should be part of the requested a capacity determination. The physical connection to the PWD's system needs further information depicted on the plans as currently the existing inverts in the connecting manhole are not shown nor are the specific PWD's installation requirements for the drop manhole component of the proposed connection.
4. The wetland evaluation noted the presence of five RP-2 wetlands, labeled A through E, on the property and no vernal pools. Ideally, the wetland labels would be added to the plan so that they could be referenced throughout the project. If this labeling is done on the plan, it may be confusing as the proposed Wetland Impacts for the project have also been labeled with letter designations A through G on the drawings entitled *Site, Layout & Utility Plans Sheets 1 and 2*. In order to differentiate between the two, perhaps the wetland impacts could be re-labeled with double letters or some other designation approach.
5. The proposed 11,789 square feet of wetland impacts will require a Tier 1 Natural Resource Protection Act (NRPA) from the Maine Department of Environmental Protection (DEP) as well as filing a Self-Notification form to the U.S. Army Corps of Engineers. The *Site, Layout & Utility Plans Sheets 1 and 2* reference to the need for a Maine DEP NRPA permit. These references should include the need for a U.S. Army Corps of Engineers permit.
6. All of the proposed utilities will be placed underground and, as noted in the Public Works Director's memo, will need ability to serve letters and confirmation of the appropriate installation requirements from each utility. In addition, utility services should be extended to each unit within the development with pipe sizes and materials identified.
7. The water and underground electric utilities are proposed to be extended from Shore Road within the existing Deep Brook Road which is to be removed and revegetated as part of this project. The rights to this roadway are called out as a 15-foot right of way easement, Easement A, in the Easements of Record table on the drawing entitled *Boundary and Topographic Survey*. The applicant should confirm that this right of way easement includes provisions to install the utilities to serve the proposed development.
8. The *Boundary and Topographic Survey (Survey Sheet 1 of 2)* seems to indicate that the Portland Water District sanitary sewer that crosses through the project property is not located within its

easement. If this situation can be verified, the applicant should rectify this condition with the PWD as part of this project's development.

9. The PWD will need to approve of the proposed water system design and, in particular, the new meter pit and backflow preventor at the entrance to the development, the reducer in the water main from 8-inches to 6-inches after the proposed hydrant around Station 9+60, and the 2-inch blow off at the end of the roadway. Details of these elements should be added to standard Portland Water District details shown on the Construction Details – Sheet 2. It should also be noted that the water installation will follow the PWD's standards.
10. The *Site, Layout & Utility Plan -Sheet 1* drawing contains Plan Note #9 which indicates that "All residential buildings constructed within this subdivision shall be equipped with automatic fire control sprinklers" which is a positive requirement from the Fire Chief's perspective.
11. Plan Note #16 on *Site, Layout & Utility Plan -Sheet 1* states that all roofs will incorporate a gutter system that collects runoff and hard pipes the runoff to the underground drainage system in the road. The utility plans should show these connection locations into the Deep Brook Road drainage system along with information on the pipe sizes, slopes, and materials.
12. Likewise, the plans should indicate the means in which foundation drainage for each unit will be provided. Given the raised elevation of the proposed terrain on the north side of the property along the westerly portion of the roadway and the proximity of the residences to the south, the foundation drain connections should connect to the Deep Brook Road drainage system to avoid nuisance conditions to the sidewalk, roadway, and abutting properties. Again, the utility plans should show the connection locations into the Deep Brook Road drainage system along with information on the pipe sizes, slopes, and materials. The designer may also need to extend the drainage system of Deep Brook Road further to the west to accommodate the condominium units at that end of the roadway.
13. The drawings entitled *Carr Woods Condominium Plat – Sheet 1 and Sheet 2* should define the L.C.E. and the C.E. labels on these plans. These plans when complete should also be sealed by a Maine Professional Land Surveyor.
14. In addition to the stop sign shown on the *Site, Layout & Utility Plan - Sheet 1* at the Shore Road intersection with Deep Brook Road, the plan should indicate the installation of a street sign on a suitable post. Granite curbing tip downs should be added at the end of each radii and a detail of the tip down added to the plan set.
15. The 22-foot-wide dimension for the roadway turnaround as shown on the *Site, Layout & Utility Plan - Sheet 2* does not meet the 24-foot-wide Ordinance requirement for a turnaround. Given the presence of the proposed foot path at the end of the roadway, a "No Parking" sign should be added at the leg of the turnaround. We question the viability of the additional walking path shown extending to the north from the end of the turnaround leg as it appears that this route would traverse up a very steep 2:1 slope that would require stairs to become a usable walking route.
16. The designer should review the grading shown on the plans entitled *Grading & Drainage Sheets 1 and 2* for constructability issues. In addition to having relatively steep slopes on several driveways, the grading of the driveways appears to transition abruptly from both Deep Brook Road and into

the garages for the units. The designer should add first floor elevations of the garages and dwelling units on the plan. In order to make less abrupt transitions and more reasonable driveway slopes, the garage elevations may also need to be less in elevation than the dwelling unit portion of the new residences.

17. It appears that a culvert may also be needed at the Carr Lot driveway as well as at the driveways for Units 1 and 2. Swales, culverts, and/or drain inlet may also be needed at the westerly end of the development as the runoff from the lawn areas as shown on the current grading would be flowing over the sidewalk and into the roadway. Collecting and conveying the runoff to connect into the proposed Deep Brook Road drainage system prior to crossing over the sidewalks would be much more desirable condition from a safety and maintenance standpoint.
18. The effects of the grading on the Stormwater Management Plan will be discussed below, but the designer should review the grading on the north sides of Units #4 through #12. The intent of the Stormwater Management Plan appears to contain the surface water draining from the excavated slope to the north of these units within a continuous swale running along the back (north) side of the units to eventually drain into the inlet of a proposed cross culvert inlet near Station 10+00. The current grading would not create a continuous swale and would instead direct surface water directly toward several of the units. The designer should also review the proposed 2:1 slope and other areas of slopes directly adjacent to the units (e.g., the east side of Unit #13) where the placement of a retaining wall may provide a more suitable grade transition and usable space alongside the new units. The designer should also provide direction on how ledge slopes will be addressed during construction and the desired slopes of any exposed ledge.
19. The proposed erosion and sediment control measures have been depicted on the 1-inch equals 80-foot scale *Erosion & Sedimentation Control Plan*. Unfortunately, the scale of this plan is too small to depict the necessary elements of the Erosion & Sedimentation Control (ESC) plan to provide direction to the contractor as to the project needs. For instance, it does not appear that an erosion control barrier has been proposed along the southerly side of the Deep Brook Road sideslope at the beginning section of the roadway and stone check dams have not been provided to protect the culvert inlet around Station 2+70. The designer should review the ESC plan needs and depict them on a suitably scaled drawing so that the contractor will be able to implement the ESC plan effectively during construction. A stone check dam detail should also be added to the plans.
20. The *Construction Details – Sheet 1* has a curb tip down detail that should be supplemented by an ADA compliant sidewalk ramp detail. Also, several of the detail provisions appear to have dated utility information. As noted earlier in this letter, the designer should coordinate with the appropriate utilities to depict their current standards in these details.
21. Deep Brook Drive will be a private roadway, but must be built to Town roadway standards as contained in Chapter 16 - Subdivision Regulations. The Typical Road Cross Section on the plan entitled *Construction Details – Sheet 1* indicates discrepancies with the Ordinance standards that should be either revised or be requested to be waived. For example, the typical section depicts an offset centerline within the right of way. The applicant should request a waiver of centering the road within the right of way if an offset centerline is truly desired. The reduction of the esplanade width from a standard of 8-feet to the proposed 6-feet may also be another waiver that the applicant may wish to request that the Planning Board consider.

22. The Typical Road Cross Section should also revise the specifications for the roadway pavement materials to reflect a 9.5mm hot mix asphalt surface course and a 19mm hot mix asphalt surface course as well as provide two, 1.25-inch layers of the sidewalk pavement layers consisting of a 9.5mm (fine) hot mix asphalt product. The esplanade area should also be noted to not contain gravel and consist of soil suitable for tree growth. Also, Note #2 on the Typical Section should be revised to reflect a maximum stone size of 3-inches for aggregate subbase and base gravel materials. The section should include a note regarding the need to compact the gravel materials to 95% compaction. Finally, the gravel buildup under the sidewalk could be reduced to 8-inches in depth, if desired, to meet the Subdivision Regulations.
23. The designer should review the gravel material specifications as shown on the Vertical Granite Curb Detail on *Construction Details – Sheet 1* drawing as the gravel specified for the base and the subbase courses does not match the materials as shown in the roadway typical section.
24. Likewise, the designer should review the gravel material specifications as shown on the Sewer Trench Detail on *Construction Details – Sheet 3* drawing as the gravel specified for the base and the subbase courses does not match the materials as shown in the roadway typical section.
25. Additional items that should be addressed on the *Construction Details – Sheet 3* drawing include:
 - The Drop Sewer Manhole Inside Connection detail should come from the Portland Water District standards as the connection will be made to one of their existing manholes.
 - The Precast Concrete Catch Basin Detail sump dimension of 3-feet does not match the information shown for the catch basin sumps on the *Deep Brook Road Profile Sheets 1 and 2*.
 - In Note #2 of the Precast Concrete Sewer Manhole Type A Detail, it appears that a cascade grate is being specified instead of a solid cover.
26. On the Landscape Plans, it should be noted that the proposed trees to be planted behind (i.e., to the north) of Units #4 through #12 will be planted on relatively steep 2:1 slopes and may include ledge excavation. The designer should provide any special planting provisions that should be employed to address these slope constraints. Adding north arrows on the two landscape plan view drawings would also be beneficial.

Stormwater Comments:

27. The submission package included a Stormwater Management Report narrative with supporting calculations which detail the proposed improvements, the stormwater methodology, the regulatory requirements, and the results of the stormwater modeling. The report does not include any discussion as to the proposed stormwater quality treatment methods or water quantity control measures before stormwater is discharged to the Town's enclosed drainage system Shore Road. This report is supplemented by information on the *Pre-Development Drainage Area Plan* and the *Post-Development Drainage Area Plan*.

To control the quantity of stormwater flow from the project, the designer is proposing several underground storage tanks consisting of large diameter pipes which would be located under Deep

Brook Road and connected in series. Stormwater release from each of these storage pipes would be throttled by a corresponding outlet control structure which would limit the rate of flow with the use of an orifice in an interior weir wall. The proposed stormwater treatment method to be employed would consist of a Contech Stormfilter system which would consist of 30 filtration cartridges located in a 14-foot by 8-foot concrete vault that would receive and treat runoff prior to being discharged off-site.

28. In concept, this Stormwater Management Plan approach appears to be a viable solution provided that it is suitably designed. As runoff from this project will eventually be discharged into the Town's public stormwater system in Shore Road which is then conveyed down Cottage Lane to an outfall at Casino Beach, it is imperative that the peak rate of runoff not be increased from its current level. At this point in our review, we have serious concerns as to the Stormwater Management Plan design and the methodology of its development.
29. As was noted in Public Works Director Jay Reynolds review memorandum, the stormwater from this development will need to pass through a privately owned underground stormwater conveyance system before connecting to the Town's drainage system in Shore Road. This off-site system is not well defined on the current plans and there are several catch basins, drainage manholes, and drainage pipes shown in this area that may or may not contribute to the drainage system. In addition, from the invert information that is provided on the plans, the system appears to be very flat and consist of 12-inch diameter pipes which will have a limited capacity. The designer will need to accurately portray the off-site system, confirm that the development has the right to utilize the system, confirm that the condition of the existing system is suitable to receive the flow and identify any immediate repairs, and, most importantly, confirm that the drainage system has the capacity to handle the flow from the development and that the development will not increase the rate of flow to this system.
30. There also appears to be several issues with the stormwater model. One issue relates to the time of concentration path passing off-site beyond the southern property line in Pre-Development Subcatchment 1 and Post-Development Subcatchment 50 and then returning on-site to cross back into the property. This is not a typical modeling approach. The designer should add an additional study point along the southern property line where the time of concentration is shown to exit the property to assess the flow to that point.
31. Similarly, an additional study point should be evaluated at the Frick Associates labeled Wetland C as it appears drainage exits the property in that location as well. It should be noted that the time of concentration path for Subcatchment 10 also appears more likely to exit the site in this location rather than to follow the time of concentration route to Study Point 1.
32. The model does not appear to be treating the functions of the wetlands in a comparable fashion between the pre- and post-development conditions. The on-site wetlands were essentially discounted in the pre-development analysis, but were included as reaches and as a pond in the post-development analysis. In doing so, the post-development flow rate was shown to be reduced after passing through the wetlands. Therefore, the comparison between post- and pre-development peak flow rates is no longer a valid as they have been treated differently in the model. Typically, the detention functions of wetlands are not modeled due to the difficulty of modeling their actual storage capability and the unpredictability of static water levels throughout

the year. Regardless in order for the results to be fairly comparable, both the pre- and post-development model needs to treat the wetland functions in the same manner.

33. In addition, there are several instances within the post-development model where various subcatchments are routed through the wetlands in an illogical manner. The designer should review the model and strive to provide a consistent analysis that can be logically followed to accurately assess the project's pre- and post-development conditions.
34. The use of round pipes for detention storage is likely needed due to their placement in the limited space within the roadway. Underground storage is typically done now with manufactured chambers, however, which has the advantage of greater storage volumes at lower elevations in comparison to circular pipes which have relatively little storage in the lower portions of the pipe. The model appears to be taking the full-storage volume at the invert (bottom) elevation of the orifice at the bottom of each storage tank. This tactic is not correct as the storage volume of the tank at the invert elevation is zero and increases incrementally as the water elevation increases. The designer should establish stage-storage data within the model to accurately project the storage within the detention pipe just as would be done in a detention pond where the available storage increases as the pond fills. The model as submitted appears to be overinflating the storage capabilities of the storage tanks.
35. As a minor point, the designer should review the time of concentration values used in the model as values of less than 6 minutes have been used in the modeling for the post-development condition. Typically, 6 minutes is often used and considered the minimum time of concentration value to be used in stormwater modeling.
36. No calculations appear to have been provided for the three cross culverts. The off-site drainage area to the south which drains through the culvert at Station 2+70+/- will need to be assessed and factored into the overall capacity of the receiving system. Off-site contributions from the north, although much less in area, should also be factored into the design.
37. As noted earlier, the grading of the overall site needs to be in line with the stormwater modeling assumptions. The entire roof of the proposed buildings has been included within the subcatchment limits roof peaks are often followed by subcatchment limits. The subcatchment limits should be adjusted or the provisions to convey the entire roof structure into a subcatchment identified and shown on the plans.
38. The Stormwater Management Report includes a table which totals the two study areas and cumulatively indicates that the total peak flow off-site in post-development is equal to or less than the total peak flow off-site in pre-development. This comparison is meaningless as it doesn't take into account the time differential between the various peaks, but more importantly doesn't consider that vast difference in locations from the two study points or that they are located in different watersheds.
39. The Stormwater Management Report also indicates that there is a small increase in peak flow for Study Point 2 which discharges onto property owned by the Town. While it is true that the increase in peak flow is less than a cubic foot per second for the 25-year storm, the increases in peak flow were three times the peak rate for the 10-year storm event and almost double the peak rate for the 25-year storm event. Since no attempts were made to mitigate the post-development

peak flow, we believe that the designer should incorporate some means of attenuation for this subcatchment area.

40. The application package includes a letter from Contech regarding their review of the Stormfilter for this project and confirming that 30 filtration cartridges will be needed to treat the runoff and suggesting an annual inspection of the system. This letter will likely need to be revisited as the drainage design evolves to keep the manufacturer's certification current.
41. As the subdivision contains over 1-acre of impervious area, a Maine Department of Environmental Protection (DEP) Stormwater permit will be required.
42. The submitted Stormwater Management Report contains no discussion regarding the underground storage tanks, the outlet control structures, or the use of the Contech Stormfilter to treat the runoff. Future submissions should focus on the content of the design and explain the components of the Stormwater Management Plan being proposed. Given the complexities presented in this project's Stormwater Management Plan, the designer should focus on the steps being taken to address these challenges in the report so that it can be confidently demonstrated that the Stormwater Management Plan for the project will meet the Town Ordinance criteria and not result in an adverse situation.

Traffic Impact:

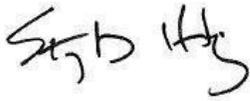
43. The project's application materials included a traffic study completed by Bill Bray, P.E. The study includes trip generation calculations which conclude that the development would generate 148 daily trips, 12 AM Peak Hour Trips, and 14 PM Peak Hour Trips. We are in general agreement with this trip generation calculation. Further, the study noted that there were no high accident locations within the project vicinity.
44. The study provided a capacity analysis of the intersections of Shore Road/Site Roadway, Shore Road/Surf Road/Deep Brook Road, and Shore Road/Fort Williams Park/Littlejohn Road. It is noted that the study states the anticipated trip assignment of project generated trips during the AM Peak Hour would be 65% to Shore Road NB and 35% to Shore Road SB. Figure 3 depicting the trip assignment appears to show 35% to Shore Road NB and 65% to Shore Road SB. However, given the overall low traffic generation of the development we would not expect reversing this trip assignment to affect the overall conclusion of the study and would not require the analysis to be revised. The study concluded that these intersections would operate at a Level of Service A condition.
45. The study states that available sight distance from the proposed development roadway would exceed the distance required by MaineDOT standards. We confirmed this measurement and find it to be accurate. It is noted that Section 16-3-2-A.1.b of Town Subdivision ordinance specifies that sight distance should be measured at a location 15' behind the edge of travel way, opposed to the MaineDOT standard of 10' beyond the edge of travel way. The applicant should confirm that the required sight distance is available by this measurement standard.
46. The applicant notes existing tree(s) and vegetation as indicated on the site plan are to be removed for the construction of the driveway which will allow for the required sight distance to be available. Additionally, the plans note that an existing utility pole will be relocated for the

construction of the roadway. During construction it should be confirmed that this utility pole is relocated as indicated on the plans and does not impede the sight line of a driver leaving the site roadway.

We trust that these comments will assist the Board during their deliberations on this project. Should there be any questions or comments regarding our review, please do not hesitate to contact us.

Sincerely,

SEBAGO TECHNICS, INC.

A handwritten signature in black ink, appearing to read "SDH" followed by a stylized flourish.

Stephen D. Harding, P.E.
Town Engineer

SDH:sdh

cc: Travis Letellier, Northeast Civil Solutions
Jay Reynolds, Public Works Director
Kristie Rabasca, Integrated Environmental Engineering