



April 19, 2024

Planning Office Received 4/19/24

Jennifer Copeland  
Town Planner  
Town of Bourne  
Bourne Town Hall  
24 Perry Avenue - Room 201  
Buzzards Bay, MA 02532-3441

Subject: Engineering Peer Review  
Ocean Pines Condominium Development – Lot 61  
Bourne, MA  
CEC Project 335-785

Dear Ms. Copeland:

In support of the Planning Board’s review of the ongoing development within Lot 61 of the Ocean Pines condominium development, on behalf of the Ocean Pines Condominium Trust (the Association”), Civil & Environmental Consultants, Inc. (CEC) has prepared this letter summarizing our findings from a review of the ongoing development proposed along Wildwood Lane in Bourne, Massachusetts (the Site).

In support of the review of the development of the overall condominium development, CEC prepared a summary letter dated October 20, 2023 detailing of our findings from a site visit on October 16, 2023 and review of the available materials provided in support of the condominium development. Additionally, CEC prepared a second memorandum dated December 8, 2023 summarizing our review of additional materials provided by the Applicant and obtained by the Association.

The Town of Bourne Planning Board engaged Merrill Engineers and Land Surveyors to provide third-party engineering review of materials provided by the Applicant in support of the ongoing development. A peer review memorandum was issued on March 19, 2024 summarizing their review. The materials reviewed by the Peer Review Engineer and CEC include the following:

- Site Plans for 61 Wildwood Lane, Bourne, MA, prepared by Existing Grade, Inc dated July 26, 2022 (the “Lot 61 Plans”).
- Stormwater Drainage Report for Wildwood Lane – Lot 61, Bourne, MA, prepared by Existing Grade, Inc, dated January 3, 2024 (the “Drainage Report”).

Additionally, the following Project documentation and materials were included in the original reviews performed by CEC:

- Drainage Analysis – Job 361.01, dated February 5, 1987, prepared by Wilson Hill Associates (the 1997 Drainage Analysis);
- Drainage Analysis – Ocean Pines Subdivision, Bourne, MA, dated December 2, 1998, prepared by Flaherty, Stefani & Bracken, Inc. (the 1998 Drainage Analysis);
- Lot Drainage Analysis Prepared for Ocean Pines, LLC, Dated May 31, 2007, prepared by Existing Grade, Inc (the 2007 Drainage Analysis);
- Narrative for Stormwater Summary – Lot 61, dated November 9, 2022, prepared by Existing Grade, Inc. (the 2022 Drainage Analysis).
- Site Plan for Wildwood Lane, Bourne, MA, prepared by Existing Grade, Inc dated April 12, 2007 (the “2007 Plan”).

The Trust has identified numerous drainage concerns at the Site since the original development. CEC reviewed documents above with respect to the design of the drainage and stormwater management systems for compliance with the standard engineering and design practices and MassDEP Stormwater Management Standards.

## **LOT 61 DEVELOPMENT COMMENTS**

The following is a summary of a number of key items relative to the proposed development on Lot 61.:

- The Drainage Report models most of the Site as newly graded with a CN value of 77. This is much higher than the actual wooded condition with a CN value of 30 which would result in an artificially high amount of runoff in the existing conditions as a baseline condition. Modeling the Site as wooded (CN 30) for the existing conditions would require significantly more stormwater detention to mitigate peak rates of runoff and volumes, meaning the existing stormwater detention systems are too small..
- Per the MA DEP Stormwater Standards, infiltration systems require a minimum 50 ft setback from soil absorption systems (leaching fields), 10 ft setback or greater from buildings and 10 ft setback to property lines. Several infiltration systems do not meet the required setbacks.
- A long-term Operations and Maintenance (O&M) Plan was not provided. Without an O&M Plan, the proposed stormwater management systems will not function as designed..
- The construction of the pavement areas at the driveway and parking areas for the units under construction within Lot 61 does not appear to drain consistent with the drainage analysis and should be corrected to follow the proposed design.
- The design of the units under construction propose fill reducing the storage capacity of the existing natural depression along the northerly property line shared with existing residential properties. This may result in an increase in localized ponding.. This condition should be corrected and a means for emergency overflow should be incorporated into the design.
- The current development includes numerous deviations from the design included in the original 1987 Special Permit Approval. Additionally, the current Site Plans for the development of Lot 61 are significantly different from the 2007 Design Plan.

- A search of active EPA Notice of Intents in Bourne did not appear to indicate a NOI has been issued for this Site. The Developer should confirm a Stormwater Pollution Prevention Plan has been prepared and an NOI has been filed.
- The infiltration systems shown on the proposed site plans are much smaller than what is modeled in the drainage study. The infiltrations systems if constructed per the plan will not accommodate the appropriate amount of stormwater
- The Site Plans are lacking detail for the stormwater facilities such as rim and invert elevations, pipe size, length, slopes and materials. The stormwater components should be labeled to allow for review of the design. It would also be beneficial to provide the proposed grading on the Utility Plan to better understand how the drainage system will collect site stormwater runoff.
- The grading at the catch basin (assumed double grate) at the driveway entrance at Ocean Pines should be reconsidered. The drainage study assumes that all upgradient stormwater runoff will be collected by the catch basin although the driveway has a 4 to 5% slope towards Ocean Pines. This would indicate that there will be significant stormwater bypass. We recommend considering creating a low point at the entrance to encourage stormwater runoff to be collected by the catch basin and/or consider a trench drain across the width of the driveway.
- Additional spot grades and or clarification on intended drainage patterns should be provided to ensure that site is graded as designed. For example, there is a swale proposed behind Building 18 that should have a high point indicated on the proposed watershed delineation plan; additional grades at the SAS field #2/3 should be provided; and a high point east of Building 5(C-D) to split the lawn grading to either side of the building should be shown.
- Per the MA DEP Stormwater Standards, infiltration systems located within an area with a rapid infiltration rate, greater than 2.4 inches/hour are required to have at least 44% TSS prior to the infiltration structure. The leaching pit systems that collect the driveway stormwater runoff require this additional pretreatment.
- The Lot 61 Plans propose five (5) separate septic systems with independent leaching fields placed very closely together for the proposed seven (7) buildings. If viewed as a single system as opposed to individual septic system per 310 CMR 15.011, the design flow would exceed the 2,000 gallon per day (gpd) threshold of 310 CMR 15.20 and the design of the Septic Systems would be required to comply with additional regulatory requirements and include additional features including pressure dosing and/or other elements not currently proposed as part of the design. CEC recommends that this condition be reviewed for conformance with Board of Health and Title V regulations.

## **LARGER OCEAN PINES DEVELOPMENT COMMENTS**

While the focus of the peer review was concentrated on the development of the Lot 61 parcel; the remainder of the Ocean Pines Condominium property and buildings are impacted by similar drainage issues.. A detailed summary of key items from the previous analysis were identified in the October 23, 2023 and December 16, 2023 CEC letters. A summary of some of the key items from the previous reviews includes following:

- The original design of the drainage systems in Ocean Pines Drive were sized for a storm intensity of 2.0 inches/hour, which is significantly less than currently required by the MADEP stormwater standards. If so, this would result in insufficient capacity to convey larger storm events and flooding during larger storm events.
- While the drainage system in Ocean Pines Drive was sized for a 2.0-inch intensity, the components of the stormwater system within the condominium property were analyzed for varying storm event frequencies (1-inch, 10-year and 25-year events). The analysis only includes building roof and pavement areas without consideration for pervious on-site and off-site tributary areas flowing onto the Site. A comprehensive analysis should be performed that includes an analysis including the entire tributary area, modeling the overall stormwater management system utilizing consistent storm events up to and including the 100-year storm event.
- The detention basin located to the east of Unit 12 Ocean Pines is significantly smaller than the original modeled design. The analysis also includes 1.7 acres of tributary drainage areas; where it appears that closer to 5.5 acres of area drains to this basin. The basin also has no means for emergency overflow should the Site experience large storm events. It is recommended that the design of the basin be reviewed to confirm that the basin is large enough and has sufficient capacity to control runoff from storm events up to and including the 100-year storm event. The basin design should incorporate an overflow that provide a means for stormwater to safely drain from the basin should the site experience stormwater flows in excess of the design capacity. If the analysis indicated that the basin may not provide sufficient freeboard from residential units, the basin should be enlarged or design modified to protect the existing Unit 12 building from localized flooding.
- The current development includes numerous deviations from the design included in the original 1987 Special Permit Approval including the number, location and orientation of proposed buildings and associated parking and access aisles. These should be reviewed for conformance with the original permit approval to ensure the design conforms with the necessary town requirements.
- There is localized ponding along the rear of several of the existing units that has resulted in wet soils and backflows into basements. The design of the overflow paths from stormwater systems in the rear yards should be reviewed to ensure backflows from the systems are directed away from the units and do not enter the existing or proposed units.

We hope that you find these comments helpful in your review of the completed and ongoing construction at the Site. Please feel free to contact us with any questions.

Sincerely,

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.



Karlís P. Skulte, P.E.  
Principal



Brian Potvin, P.E.  
Principal