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Civil & Environmental Engineering

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February 9, 2024

Town of Wareham
Planning Board
Attn: Mike King, Chair
54 Marion Road
Wareham, MA 02571

RE: Responses to Peer Review as prepared by Allen & Major, Inc.
Hidden Trails Definitive Subdivision Plan

Dear Chair Slavin and Members of the Commission:

JC Engineering, Inc. (JCE) has received the following documents from Allen & Major, Inc. (A&M) pertaining to the previously submitted Hidden Trails Definitive Subdivision Plan and Special Permit for a Residential Cluster Development & Site Plan Review, dated September 7, 2023, as prepared by JCE:

- Initial Peer Review letter addressed to the Town of Wareham Planning Board, Attn: Michael King, Chair, dated October 23, 2023

Comments from A&M are shown in italics followed by responses from JCE. Also attached is the revised Definitive Subdivision Plan of Hidden Trail, dated 2/9/24 (Plan), and revised Stormwater Report, dated 2/9/24 (Report), for review.

Wareham By-Laws and Zoning By-Laws

1. *The southeasterly portion of the property is located within the Floodplain Overlay District, therefore subject to subject to Article 4: Overlay Districts, subsection 420 Floodplain Overlay District. Even though no work is proposed within the designated flood zones, the plans should be updated to note and refer to the overlay district. The Floodplain Overlay District is now depicted on the Plan.*
2. *Article 8, §814 Density is “the total number of proposed lots in the development shall not exceed the number of lots which could be developed in the underlying zoning district for single family residential development.” The lot count is relying on a previously approved subdivision plan entitled The Pond at Fearing Hill endorsed by the Planning Board in 2010 showing 44 buildable lots plus several parcels of non-buildable land. The subdivision was never constructed and is considered void per condition 9 of the Covenant as of March 25, 2012 where no installation of utilities or ways occurred. A&M is not aware of any extensions granted by the Planning Board that would extend this date. Map 63 Lot 1013 was*

not included as part of the original subdivision and is currently being used as part of the new subdivision being proposed. Sheet 23 of the plan set shows a conceptual layout showing a total of 12 lots. A&M has the following comment on the conceptual layout:

- a. *The plan does not account for the installation of drainage and the location of a stormwater basin to treat and mitigate stormwater from the subdivision that may reduce the yield number of lots as would be typical for evaluation under a preliminary plan (Section III C. 7.)*

The Conventional Layout plan has been revised to show conceptual drainage easement areas.

Site Plan & Drainage Calculations

3. *The design engineer has determined six (6) design points for the purpose of drainage calculations to confirm and verify that the proposed project will not increase peak discharge rates and volumes to the design points. The calculations demonstrate an increase to two (2) of the design points. The design points are designated as DP-3 (onsite) and DP-6 (onsite). DP-3 (onsite) is an isolated wetland and DP- 6 (onsite) is the pond. A&M understands that both design points are located on the property, but the proposed project is increasing the peak discharge rates and volumes to a design point which is in violation of the Stormwater Standards which requires mitigation of runoff to the nearest property line or jurisdictional resource area as defined under the Wetlands Protection Act. The design engineer should review and reevaluate the proposed stormwater management system to bring the design into compliance with the Stormwater Standards. The drainage calculations have been revised to ensure that post-development peak discharge rates and volumes do not exceed pre-development peak discharge rates and volumes for all offsite and onsite design points. This required the need to install drywells for additional lots to capture roof runoff, which is further described below.*
4. *The proposed stormwater management system is proposing the use of hydrodynamic separators with higher than typical TSS removal rates based on sizing worksheets provided by the manufacturer. No third-party testing data has been provided to demonstrate this removal rate. Proprietary treatment devices are typically maxed out at 50% unless documentation is provided. The design engineer should update the TSS worksheets accordingly or provide the supporting documents to support the TSS removal rates used. The TSS Removal Calculations have been revised to account for a maximum removal rate of 50% for the propriety devices. Pre-infiltration and Total TSS removal rates are still in compliance with the Massachusetts Stormwater Handbook and the Wareham Zoning Bylaw.*
5. *The onsite pond is man-made based on anecdotal records. No information is provided on the pond and its historic use to the extent there may be buried materials and/or contaminants present that may affect the underlying groundwater flow. The pond will be considered jurisdictional under the wetlands protection act and may be discussed further in the Notice of Intent. The existing pond was created by prior gravel removal activities. No work as part of this application is proposed within the pond, but a Notice of Intent has been previously*

submitted for proposed site work within 100 feet of the bordering vegetated wetlands around the pond. JCE agrees that the pond and its associated bordering vegetated wetlands are jurisdictional areas under the wetlands protection act and any future development within 100 feet of these resources will require a separate application to the conservation commission.

6. *Minimal soil testing has been provided around some of the proposed infiltration basins. MassDEP requires that one test pit for each 5,000 square feet of bottom area of the stormwater device be provided. Test pits should be provided to confirm adequate soil conditions and determination of the estimated seasonal high-water table. Additional test pits have been excavated in the areas of the infiltration basins and their locations are depicted on the Plan.*
7. *Groundwater mounding calculations have been provided, but no supporting or backup information was provided to verify/confirm that values used in the spreadsheet. Please provide backup information specifically on the Horizontal Hydraulic Conductivity, Specific Yield and initial saturated thickness parameters. The groundwater mounding calculations have been revised and supporting information has now been provided in the Report.*
8. *The design engineer should review the pre-development and post development watershed areas. The total overall areas are not equal. The post-development area is approximately 0.122 acres less than pre-development. The design engineer should provide a statement on the discrepancy in areas or revise the plans and calculations accordingly. The discrepancy occurs due to the fact that some roof areas are not being directed to the infiltration basins, but are to be captured by roof drywells for certain lots specified on the plans. Additionally, due to the fact that County Road has no stormwater management systems or curbing, some off-site pavement runoff from County Road is anticipated to be captured by the stormwater management system under post-development (CBN1 and CBN 2), which is not accounted for under pre-development.*
9. *The design engineer should review the time of concentration calculation for sheet flow and update the calculations accordingly. The value for the 2-yr event differs from the actual 2-yr rainfall event. The depth for the 2-year event has been updated on the sheet flow calculations to be in conformance with NOAA Atlas 14.*
10. *The design engineer is proposing 2 drywells each for the roof runoff for the back of the houses on lots 27-36. The design engineer should provide a note on the lotting plans as well as the grading and utility plans documenting the design intent so when the lots are sold and being designed by others, the homeowner will be aware of the drywells. The note should also specify the maximum size of roof area accounted for. Please note that these lots will also be required to accommodate a private on-site septic system. The Board may also elect this to be a condition of the covenant to ensure this integral drainage function is not overlooked. A note has been added to the Lot Layout Index Plan specifying the specific lots where drywells are needed and the maximum allowable impervious area that can be constructed on each lot before additional drywells are needed (Note #7 on Sheet 4).*

11. *The stormwater calculations provide for an area of impervious cover on each proposed house lot but it is not specific to each lot. A&M recommends the engineer provide further detail on the amount of house roof area and pavement assumed for each lot as these would become limited factors for development and where areas exceed these on final design additional stormwater volume may be required. The Proposed Drainage Areas plans now depict the anticipated house footprint and driveway for each lot which was used in the drainage calculations. See response to Note #10 above for the additional notes added to the Lot Layout Index Plan.*
12. *Infiltration Basin #2 does not provide the required 1-ft of freeboard. The design engineer should revise the plan and/or calculations accordingly to provide the required 1-ft of freeboard. Infiltration Basin #2 has been resized to ensure a minimum of 1-foot of freeboard is provided above the 100-year storm event.*
13. *No emergency spillways are provided on the proposed infiltration basins. The design engineer is proposing an outlet control structure with a 4-ft weir which is directed through a 12" pipe. The design engineer should review the carrying capacity of the outlet structure/outlet pipe and if it is capable of conveying flows associated with emergency spillways for 100 year storm events. The infiltration basins now provide a rip-rap emergency spillway, except for Infiltration Basin #2 which includes the installation of an outlet control structure. Emergency spillway and outlet control structure calculations based upon the 100-year storm event are included in the Report.*
14. *The lotting sheets (sheets 4-10 of 23), which require recordation at the Registry of Deeds are missing the Registry of Deeds box and certifications. The lotting sheets should also include the notes from sheet 2. The necessary Registry of Deeds box and certification statement has been added to sheets anticipated to be recorded. Additional notes are also included on the Lot Layout Index sheet.*
15. *The lotting sheets should include a note consistent with the intent of Zoning By-Laws Article 8 §819.2 whereas "No lot shown on a plan for which a permit is granted under this section may be further subdivided." A note has been included on the Lot Layout Index sheet (Note #6 on Sheet 4).*
16. *The lotting plans should be updated to include the location of all permanent monuments, both existing and proposed. (Subdivision Rules & Regulations, Section IV, §B.13). Monuments shall be installed at all street intersections, at all points of change in direction or curvature of streets and all other points where in the opinion of the Planning Board, permanent monuments are necessary. (Subdivision Rules & Regulations, Section VI, §I). All existing and proposed monumentation has been shown on the plans. A legend has been included as well on the Lot Layout Index sheet.*
17. *The proposed lotting plan should be revised to include yard setbacks as defined by the Town By-Laws to illustrate the effective buildable area for each lot. The Zoning District information/cluster development requirements should be added to the lotting plan. The applicable zoning setbacks for the R-60 zoning district are now specified and shown on the Lot Layout Sheets.*

18. *The profile should be updated to include the utilities, or otherwise note where not applicable. (Subdivision Rules & Regulations, Section IV, §B.22).* Utilities have been added to the profiles.
19. *The profile should be updated to include the proposed right and left sideline, elevation every 50 feet and 25 feet on vertical curves. (Subdivision Rules & Regulations, Section IV, §B.24).* Additional right and left offset profiles, as well as existing and proposed elevations at 25-foot intervals, are now included on the profile sheets.
20. *The plans should be updated to show the location of street trees. (Subdivision Rules & Regulations, Section IV, §B.26).* The proposed street trees and limit of clearing is shown on the Grading plans. The limit of clearing represents the areas necessary for the construction of the roadway, stormwater management systems and stockpile areas, but are not meant to be a limit of construction when individual lots are permitted.
21. *The drainage easement shown across lots 48 and 49 is only 10-ft wide. The subdivision rules and regulations require a minimum 20-ft wide easement. (Subdivision Rules & Regulations, Section V, §B.1 & Section V, §E).* The drainage easement has been revised to be no less than 20 feet wide.
22. *Sheet 12 of 23 depicts an 18" culvert pipe to be installed within the existing drainage ditch that is approximately 20 in width. No calculations are provided to confirm that the use of an 18" pipe and restriction of the ditch width is justified. Supporting calculations should be provided accordingly.* This pipe is no longer proposed.
23. *Catch basins shall be spaced along both sides of a street at approximately 400-foot intervals and located at all low points and corners at street intersections. (Subdivision Rules & Regulations, Section VI, §A) The following areas should be reviewed:*
 - a. *Street Intersection of Road A and County Road;* The first set of catch basins are set away from the intersection to provide adequate elevation difference between the variable elevation edge of County Road and the rim elevations of the first set of catch basins. Infiltration Basin #1 has been sized to account for surface water runoff from some pavement within County Road.
 - b. *Street Intersection of Road A and Road B;* The high points within Road A and Road B are in close proximity to this intersection. The nearest catch basins are installed to ensure no greater than 400 feet of roadway is directed to a single catch basin.
 - c. *Street Intersection of Road C and Road D;* The high point within Road C in close proximity to this intersection. The low point in Road D is also continuously downgradient from this intersection. The nearest catch basins are installed to ensure no greater than 400 feet of roadway is directed to a single catch basin.
 - d. *Street Intersection of Road B and Road C;* Catch basin #19 is provided along the north side of the intersection to capture gutter flow between Roads B and C. The southern side of the intersection is continuously downgradient between the high point at STA 1+78 (Road C) and Catch basin #20 in Road B. There is no greater than 400 feet of roadway between the

high point and the catch basin.

- e. *400-ft interval exceeded between high point 3+01.74 to low point 7+45.41 for Road A; The spacing has been corrected.*
 - f. *400-ft interval exceeded between low point 24+45.20 to high point 29+80.91 Road A; An additional set of catch basin have been added to the Plan.*
24. *Radii's at street intersections and at cul-de-sac should be added to the plans to verify and confirm compliance. (Subdivision Rules and Regulations Section V, §C.2f and §C.5.b). Curb radii are now specified at each intersection rounding and cul-de-sac.*
25. *The design engineer should review all the labels associated with the proposed infiltration basins and outlet control structures on the grading and utility plans. There are duplicate names throughout the plans. The labeling has been updated to correct duplicate names.*
26. *The plans should be updated to show the rip rap at the ends of all pipes to verify and confirm they can be constructed as designed and show the limit of work required for installation. Calculations should be provided to confirm the provided rip-rap is designed for the anticipated discharge flows. Rip-rap outlet sizing calculations have been provided in the Report. Additionally, the required rip rap protection is also depicted at each outlet on the Plans.*
27. *The design engineer should review the outlet pipe from the outlet control structure associated with Infiltration Basin #2, which is directed towards an abutter. Can the outlet pipe be directed towards the pond on the property to minimize off-site impacts? The outlet has been moved to the east side to ensure any emergency overflow is not directed towards an abutter.*
28. *Smaller diameter drainage pipes should be designed to match crowns. The design engineer should review the following structures:*
- a. *DMH 5*
 - b. *DMH 9*
 - c. *DMH 11*
 - d. *DMH 12*
 - e. *DMH 13*
 - f. *DMH 16*
 - g. *DMH 18*
 - h. *DMH 21*
 - i. *DMH 22*
 - j. *DMH 23*
 - k. *DMH 26*

I. *DMH 29*

All drainage inverts have been reviewed and revised as necessary to match crown of pipes.

29. *A&M suggests the applicant include information on the anticipated impacts during construction which include a statement on the anticipated earthwork required to construct the roadways as shown including truck traffic for import and export of material. The construction of the roadways and infiltration basins will result in an excess of approximately 4,700 cubic yards of material. We anticipate that the excess fill will be used for grading around each dwelling, as well as restoration of some of the highlighted areas on the Plan within the open space around the stockpile areas. Also, portions of Lots 48 thru 53 will utilize excess topsoil from the roadway construction when the houses are developed, as portions of these lots are mostly void of any topsoil that can be reused. It is not anticipated that any significant amount of material will be imported to get the roadway subbase constructed to the appropriate elevations. The most significant amount of material to be imported is the gravel base of the roadway and sidewalk. This requires about 9,000 cubic yards of gravel to be imported. It is anticipated that the roadways will be constructed over a 2-3 year period. All required materials to be imported will be delivered over this time period, thereby significantly lessening the needed for a constant flow of deliveries. As this site is accessed from County Road, the delivery of most imported materials will be from Route 495 and Route 195.*
30. *The project will require a Stormwater Pollution Prevention Plan during the construction period to control sediment, ground erosion, and wind-blown erosion. The SWPPP should be maintained onsite at all times and reports made available to the Town if desired by the Planning Board. A SWPPP will be prepared by the contractor prior to construction and maintained onsite at all times.*
31. *The project report makes mention of appropriate sight distance at County Road to support the proposed development. The sight distance should be calculated and added to the plans. The sight distance triangle shall be maintained to prevent accumulation of snow, tree limb clearing that may be necessary, and any other elements to confirm that safe sight distance shall be provided. Internal sight distances at each intersection should also be calculated and provided on the plans. The minimum required intersection sight distance triangles have been added to the Plan (sheet 25).*
32. *Each of the 56 residential lots shall rely on individual sewage disposal systems constructed on the lot with access to municipal potable water. The individual septic systems shall be designed and permitted in accordance with the Wareham Board of Health and permitted accordingly. Lots 27 through 36 will also have individual roof drainage systems onsite that require consideration for individual lot planning. No comment necessary.*

Statement on Waivers

A&M offers the following comments on the requested waivers for consideration by the Planning Board.

1. *A waiver from installing street lights (Section VI.D).*

As a reminder to the Board, the prior subdivision approval located on this land required the use of lanterns at each driveway as a condition of covenant recorded at the Registry of Deeds (Book 38588 Page 40). The lanterns could be provided to increase the safety of the subdivision while remaining dark sky compliant and not generating increased light source pollution.

This waiver has been removed. The plan depicts the locations of a street light to be installed at the entrance to the subdivision at County Road and at each intersection in accordance with Section VI.D.

2. *A waiver from installing sidewalks on both sides of roads a, b, and c, which are considered residential standard streets. Also, a waiver to allow the sidewalk to be within 3 feet of the roadway edge for portions of the roadway (Section VI.G).*

The request to reduce grass strips in certain locations at wetland/resource area crossings appears reasonable to minimize the scope within sensitive environmental areas. The reduced grass strip does minimize areas that could be used as part of snow plowing operations and requires the sidewalks to be maintained more vigilantly during winter. This should be enumerated in any final homeowner's association documentation that will be responsible for the roadways.

Elimination of one sidewalk does not inhibit connectivity to other areas of the development.

This waiver has been removed. A sidewalk on both sides of the roadway has been included for Roadways B and C. A single sidewalk is provided between the main entrance and the first intersection between Road A and Road B, as this section of roadway has only three house lots on the north side of the roadway. Also, a single sidewalk is provided for each roadway that terminates at a cul-de-sac, as each dead-end cul-de-sac provides access for no more than 25 lots.

3. *A waiver from installing concrete curbing on both sides of the road. Concrete curbing is proposed only in the location where the sidewalk is adjacent to roadway. For the remainder of the streets, a cape cod berm is proposed along both sides of the road. (Section VI.H).*

Cape cod berm curb is less durable than concrete curbing and is susceptible to damage during plowing. Section VI.H allows for the use of berm curbing where grades, curves or traffic justify their installation. The information provided offers no justification of

bituminous curbing. A&M would recommend the applicant justify the request to aid the Board in consideration.

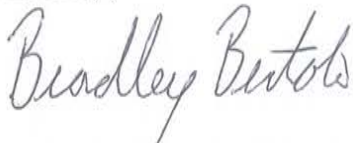
This waiver has been removed. Section VI.H of the Subdivision Rules and Regulations allows bituminous berms to be installed as an alternative to precast concrete curbs. This development proposes the use of concrete curb where the sidewalk is adjacent to the street and cape cod berms elsewhere.

4. *A waiver from installing fire alarms (Section VI.K).*

This waiver should be reviewed in concert with feedback from the Wareham Fire Department upon review of the subdivision plans to determine if granting relief is acceptable to the health and safety of the residents.

The Fire Department has submitted a comment letter, dated December 5, 2023, that states that street boxes are antiquated and currently being phased out in the Wareham Fire District.

Sincerely,



Bradley M. Bertolo, EIT, CSE
Project Engineer

Cc: Sarajon Realty, LLC