TETRA TECH

October 17, 2024

Mr. Zachary McBride, Chair
Sherborn Zoning Board of Appeals
Town Hall
19 Washington Street
Sherborn, MA 01770

Re: Brush Hill Homes Residential Development – Comprehensive Permit
Engineering Peer Review – Site/Civil
34 Brush Hill Road
Sherborn, Massachusetts

Dear Mr. McBride:

Tetra Tech (TT) has reviewed specific submittal materials for the above-referenced Project to assist the Sherborn Zoning Board of Appeals (Board) in its Comprehensive Permit review of the proposed Brush Hill Homes development. The following letter provides comments generated during our review of Applicant submittals and generally focus on substantive concerns that speak to issues whose eventual resolution may substantially impact Project design or could otherwise result in potentially unsafe conditions or unanticipated impacts.

The Project includes development of 8 single-family housing units on approximately 5.1 acres of land with a lot shape commonly referred to as a "flag lot". The site is accessed from Brush Hill Road through an approximate 500-foot by 50-foot strip of land which is bounded by two existing residential lots fronting on Brush Hill Road. The developable portion of the lot is located at the rear of the two abutting residential properties. The remaining site is bordered by Sherborn conservation land to the north and east. The site is currently wooded with an adjacent vegetated wetland in the northeast portion of the site. Each unit is proposed with a driveway, an additional five spaces are proposed for visitor parking. Each unit will be served by its own private well and all units are connected to an on-site septic system. Stormwater will be mitigated by a standard curb and gutter system directing runoff to four subsurface detention/infiltration systems and one at-grade detention basin.

Our review is based on materials received from the Board comprising the following pertinent documents:

- A plan set (Plans) titled "Permit Site Plan for Brush Hill Homes at 34 Brush Hill Road in Sherborn, MA", dated June 4, 2024 with revisions through September 19, 2024, prepared by DGT Associates Surveying & Engineering (DGT).
- An Existing Conditions Plan titled "Plan of Land, 34 Brush Hill Road, Sherborn, MA", dated August 17, 2023, prepared by Samiotes Consultants Inc. (SCI).
- A Stormwater Report titled "Stormwater Management Design and Runoff Calculations Report", dated June 26, 2024 with revisions through September 19, 2024, prepared by DGT.
- A soil report titled "34 Brush Hill Road – Soil Testing", dated November 27, 2024, prepared by DGT.
- A plan set (Plans) titled "Brush Hill Homes, Subsurface Sewage Disposal System Plan", dated June 26, 2024 with revisions through September 23, 2024, prepared by DGT.
- Septic system pump design calculations titled "Pump Design Calculations for the Brush Hill Homes at 34 Brush Hill Road in Sherborn, Massachusetts 01770", dated September 23, 2024, prepared by DGT.
- Architectural plans titled "Brush Hill Road, Sherborn, Massachusetts", dated May 31, 2024, prepared by Union.

The Plans and accompanying materials were reviewed for good engineering practice, overall site plan efficiency, stormwater, utilities and public safety as it relates to each of the subject areas. Traffic review was completed under separate cover. Our initial comments are provided below.

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A. SITE DESIGN

The Site Plans provide a good introduction to the scope of the Project and its various components. The following specific comments are offered to identify areas where additional information is required, or changes are requested to address questions or support further review.

A.1. A roadway profile and cross-section should be included in the Plans.

A.2. The Applicant should coordinate with the Sherborn Fire & Rescue Department related to roadway length. The proposed roadway is approximately 700 feet in length without secondary access.

A.3. It appears several of the contours along the west side of the entrance roadway tie-out to existing conditions just beyond the limit of the property line with the abutter at 36 Brush Hill Road. All work shall be contained within the subject property unless easements have been acquired.

A.4. We anticipate grading activities to the property line may impact vegetation health on the abutting property, particularly since the grading associated with the roadway is a cut.

A.5. A detail of the proposed retaining walls should be provided on the Plans. Several walls are greater than four feet in height which will require structural design and approval by the Building Department.

A.6. A Landscape Plan has not been provided. The Applicant shall confirm if landscaping is proposed at a minimum to provide screening of the Project from abutting properties.

A.7. Project scope is proposed within jurisdiction of the Massachusetts Wetlands protection Act (WPA). Permitting with the Sherborn Conservation Commission is expected.

B. STORMWATER

The Project scope includes development of 8 units of housing clustered on approximately 5.1 acres of land. Stormwater runoff generated by the Project is proposed to discharge to traditional piped infrastructure to direct runoff to five proposed basins. The Stormwater scope was reviewed against the Massachusetts Department of Environmental Protection (MA DEP) Stormwater Management Standards (Standards) and Stormwater Handbook (Handbook). The Project was also reviewed for general stormwater design elements and good engineering practice.

The following comments are offered specific to the Project Stormwater design.

B.1 The Applicant utilizes separate subcatchments (E1 and E2) for off-site areas (abutting properties on either side of the entrance roadway) and routes them each through a channel reach (1R and 2R) to model overland flow through the downgradient subcatchments. We believe this may be complicating the model and introducing channels into the model where they do not appear to exist. We recommend the off-site areas be combined with their respective downgradient subcatchments to each design point and time of concentration be re-calculated through those areas. This method should also be utilized on the post-development model where applicable. This is required to ensure runoff is properly accounted in both development conditions. (Standard 2)

B.2 The Applicant utilizes the “Storage-Indication” pond routing method in the post-development HydroCAD model. In this instance, where multiple basins are connected to each other, the “Dynamic Storage-Indication” method is preferred to account for potential tailwater conditions at downstream basins. This is required to ensure runoff is properly accounted. (Standard 2)

B.3 Test pit information does not include existing ground elevations where each pit was performed. This information is essential to ensure the design is meeting applicable separation to estimated seasonal high groundwater (ESHGW) and soils beneath the basins after the site is stripped of the A and B horizons during construction. (Standard 3)

B.4 It appears the test pit (TH 24-04) at Recharger #3 was not performed within the limits of the basin. The Applicant shall perform test pits within the footprint of the proposed infiltration best management practices (BMP’s). Estimates of existing ground elevation at TP 24-04 (El. 203.50) yield an ESHGW elevation of approximately 201.17. The bottom of Recharger #3 is proposed at elevation 202.50 which does not meet the minimum two-foot separation to ESHGW. (Standard 3)

B.5 Mounding analyses appear to be required for all Recharger systems. All systems appear to be within four feet of ESHGW using approximate existing ground surface elevations for each of the test pits provided. (Standard 3)

B.6 Snow management is included in the Long-Term Pollution Prevention Plan (LTPPP), but the Applicant should show proposed snow storage locations on the Plans to confirm areas where snow is anticipated to be stockpiled during heavy events. (Standard 4)

B.7 The Project appears to meet the requirements for coverage under the US EPA NPDES General Permit for Discharges from Construction Activities (CGP). We recommend a Condition requiring the Applicant provide proof of coverage under the NPDES CGP and provide a copy of the approved Stormwater Pollution Prevention Plan (SWPPP) prior to construction. (Standard 8)

B.8 We recommend the Applicant specify that all system inspections be conducted by qualified personnel. The Operation and Maintenance Plan (O&M Plan) notes that inspections are to be performed by "on-site maintenance personnel". Inspections should be conducted by parties that are properly trained and are knowledgeable in the layout and operation of the systems proposed, particularly since the stormwater design is moderately complex and contains four subsurface systems that require extra attention to ensure their long-term viability. (Standard 9)

B.9 Recharger #1 is within 100 feet of the Unit #1 private water supply well which does not meet the minimum setback guidelines noted in the Handbook. Similar situations are also proposed for Recharger #2 (Unit #4 & #5 wells) and Recharger #3 (Unit #7 well). (Table RR, Vol. 1, Ch.1, Pg 8)

B.10 It appears Recharger #3 is within 10 feet of the property line which does not meet the minimum setback guidelines noted in the Handbook. (Table RR, Vol. 1, Ch.1, Pg 8)

B.11 It appears Detention System #1 (at-grade basin) is located within the groundwater table. Detention basins shall not intercept groundwater per the Handbook. (Vol. 2, Ch. 2, Pg. 51)

B.12 We recommend the Applicant provide pipe, grate sizing and spread calculations to ensure the system is able to effectively convey runoff to the proposed BMP's. Special care should be given to the entrance roadway and its 6% slope to ensure runoff is captured and does not bypass structures during heavier rain events which may cause flooding in the downgradient areas. Cascade grates are recommended along the entrance roadway.

B.13 The current design of the subsurface basins does not allow proper access for maintenance. We recommend the Applicant propose use of the Stormtech Isolator Row and access manhole(s) for any subsurface structure accepting surface flow from impervious roadway areas. This will ensure the system can be cleaned and maintained properly and will extend the useful life of the systems. It is also likely the manufacturer will recommend these during final construction documentation.

B.14 It appears there may be potential for groundwater breakout from Recharger #1 at the proposed adjacent retaining wall. This shall be confirmed with mounding analysis of the basin as requested to comply with Standard 3.

B.15 We recommend the Applicant include phosphorus removal calculations in the Stromwater Report to determine extent of phosphorus removal provided with the design.

B.16 A cross-section of the proposed at-grade detention basin should be provided for review.

B.17 Location of inspection ports for all subsurface systems should be shown on the Plans. We recommend inspection ports be placed at minimum at each inlet, outlet and midpoint in the system.

B.18 Catch Basin #6 is proposed at the driveway of Unit #8. We recommend this structure be relocated to the upgradient curbline.

B.19 We recommend underdrains be proposed along the entrance roadway to mitigate potential for groundwater impacts on the roadway section.

C. EROSION AND SEDIMENTATION CONTROL

The Applicant has included provisions for erosion and sediment control as part of the Project scope. The following comments are offered specific to the Project and potential for off-site erosion during construction.

C.1 The Applicant should provide earthwork calculations on the Plans to assist reviewers and the public in understanding the size and scale of earthwork operations for the Project. Additionally, a Construction Management Plan is recommended to detail truck travel routes, project phasing, hours of operation, equipment laydown areas, stockpile locations, etc.

C.2 It appears additional sediment barrier is required along the north side of the proposed driveway. The driveway is primarily a cut but there will be an interim period, particularly at the beginning stages of the Project, where sediment may travel off-site in this area.

C.3 The Applicant is not proposing any temporary sediment basins to help mitigate runoff during construction. The existing site is consistently sloped at approximately 15% and mapped as a hydrologic soil group (HSG) C which have a moderate runoff potential. Area to be utilized for proposed infiltration BMP's infiltration shall not be used to mitigate construction period runoff.

D. WATER SUPPLY

The Plans indicate the Project will be served by 8 private water supply wells for each of the 8 proposed units. The Project proposes a total of 16 bedrooms with a potential resident count of approximately 32 people which may designate this Project as a Public Water Supply. The following comments are offered specific to Project water supply and related analysis or lack thereof.

D.1 The Applicant should provide information related to the ownership of each of the private wells and if any coordination with MA DEP has been initiated. MA DEP has issued preliminary approval of a similar water supply approach on other Projects in Town but the Applicant has not provided any similar documentation from MA DEP related to their review of the Project.

E. SEWER/SEPTIC SYSTEM

The Plans indicate the Project will be served by a centralized Septic System with pump station and sanitary sewer infrastructure to collect sewerage generated from the Project. The Septic System scope was reviewed against the Massachusetts Department of Environmental Protection (MA DEP) State Environmental Code, Title 5 (310 CMR 15) (Title 5). The Project was also reviewed for general sewer/septic system design elements and good engineering practice. The following comments are offered specific to Project septic design and related analysis or lack thereof.

E.1 The design of the Soil Absorption System (SAS) appears to meet the requirements of Title 5.

E.2 Test pits generally indicate a substrate of firm sandy loam to depths of over ten feet. ESHGW was determined by soil mottles (the most accurate method) at a relatively consistent depth of between 29 and 38 inches below the surface. Soil conditions and infiltration rates (by percolation test) meet the requirements of Title 5.

E.3 The site is located in a Title 5 nitrogen sensitive area due to the proposed on-site water supply. The MA DEP nitrogen loading limitations allow 440 gallons per day of standard septic discharge per acre. The Project Site is 5.57 Title 5 acres (40,000 square feet/acre). Therefore, the maximum allowable Title 5 nitrogen discharge for the site is 2,450 gallons per day. The proposed Title 5 discharge rate for the Project is 1,760 gallons per day (16 bedrooms) which is within the allowable Title 5 limit.

E.4 Title 5 can require groundwater mounding analysis for SAS areas discharging over 2,000 gallons per day. However, mounding analysis is not required on this Project as the SAS discharges 1,760 gallons per day.

E.5 Sewer manholes are proposed outside of each of the proposed units which may pose issues with backups. We recommend the Applicant consider installing wye connections to a sewer mainline from the homes as manholes tend to accumulate solids, wipes, etc. and flow will not be high enough to effectively clean the solids from the manholes at each unit.

These comments are offered as guides for use during the Town's review and additional comments are likely to be generated during the course of review. The Applicant shall be advised that any absence of comment shall not relieve him/her of the responsibility to comply with all applicable local, state and federal regulations for the Project. If you have any questions or comments, please feel free to contact us at (508) 786-2200.

Very truly yours,

Steven M. Bouley, PE
Project Manager
(Site/Civil Review)

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