



January 6, 2025
(updated February 5, 2025)

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

**Re: Pine Residence Multi-Family Residential Development – Comprehensive Permit
Engineering Peer Review – Stormwater
41 North Main Street
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 Pine Residence 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 28 multi-family housing units on approximately 7.24 acres of land. The site is primarily accessed from North Main Street via existing Powerhouse Lane and an access at the signalized intersection of North Main Street and Elliott Street, an access roadway is also proposed to Hunting Lane. The site is bounded by Hunting Lane to the north, North Main Street to the east, existing business to the south and railroad property to the west. The site currently contains a single-family home, a barn and is mostly cleared of vegetation. The Project proposes several at-grade and subsurface stormwater best management practices (BMP's) with what we assume will be a standard curb and gutter system to manage stormwater runoff. A shared septic system is proposed in the southeastern corner of the subject property under the access roadway. Water service will be by proposed well located on the abutting property to the west of the rail line.

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

- A stormwater report titled "Limited Stormwater Management Analysis, Proposed Multi-Family Residential Development, 41 North main Street, Sherborn, MA" dated December 6, 2024, prepared by Highpoint Engineering Inc. (HEI)

As requested by the ZBA, the Plans and accompanying materials were reviewed for stormwater related scope as well as good engineering practice. Our initial comments are provided below.

TT 2/5/25 Update

The Applicant has supplied TT with a revised submission addressing comments provided in our previous letter including the following documents:

- A response to comments letter dated January 28, 2025, prepared by HEI.
- Exhibit Plans titled "Proposed Multi-Family Residential Development, 41 North Main Street, Sherborn, MA 01770, Exhibit 1 – Proposed Site Plan and Exhibit 2 – Preliminary Grading and Drainage Plan", dated September 27, 2024 with revisions through January 28, 2025, prepared by HEI.
- A stormwater report titled "Limited Stormwater Management Analysis, Proposed Multi-Family Residential Development, 41 North Main Street, Sherborn, MA" dated December 6, 2024 with revisions through January 28, 2025, prepared by HEI.

The revised Plans and supporting information were reviewed against our previous comment letter (January 6, 2025) and comments have been tracked accordingly. Text shown in gray represents information contained in previous correspondence while new information is shown in black text.

STORMWATER

The Project scope includes development of 28 units of housing with proposed access roadways and driveways clustered on approximately 7.24 acres of land with a total impervious coverage of approximately 315,778 square feet (sf). Several stormwater basins are proposed which include an at-grade detention basin, at-grade infiltration basin, a rain garden and a subsurface detention basin. The Applicant has not shown proposed stormwater infrastructure on the Plans, but we assume stormwater runoff generated by the Project will be routed through traditional piped infrastructure to the proposed basins. The Applicant has provided a 'limited stormwater report' detailing the Projects' stormwater design and analysis. NOAA Atlas 14 24-hour rainfall depths were used in the stormwater model which is current accepted practice across the industry. The Site is located in the Town's Regulated MS4 area (MS4 Area) and the southern end of the site is mapped within an interim wellhead protection area (IWPA) as shown on MassMapper.

Stormwater scope was reviewed for compliance with Massachusetts Department of Environmental Protection Stormwater Standards (Standards) and associated Stormwater Handbook (Handbook) as well as good engineering practice. It should be noted that minimal details were provided for the entirety of the stormwater system and assumptions had to be made to determine viability of the conceptual design. We reserve the right to provide additional comments and/or amend the below comments as more detailed information is provided by the Applicant.

MA DEP Stormwater Standards/Handbook

1. We recommend the Applicant include the existing culvert located adjacent to the northwest corner of the site as a Design Point in the analysis and evaluate conditions at the culvert during the required storm events in both the pre- and post-development conditions. (Standard 2)
 - *HEI 1/28/25 Response: We are unable to inspect and analyze the culvert due to snow cover during our most recent site visit. We request that this comment be added to the future conditions of approval list.*
 - **TT 2/5/25 Update: We continue to recommend the culvert be assessed during this phase of the Project to ensure the stormwater mitigation design can be implemented without impact to the adjacent resource areas, public right of way, railroad right of way, etc. Understanding any limitations at this location is essential to Project success as nearly all proposed site area is tributary to the culvert.**
2. The Applicant has not provided any test pit data at the proposed Rain Garden location. The Applicant has not provided a cross-section or detail of the Rain Garden to confirm subsurface design of the best management practice (BMP). Rain Gardens are generally considered infiltration BMP's and shall maintain minimum two feet of separation from estimated seasonal high groundwater (ESHGW). (Standard 3)
 - *HEI 1/28/25 Response: This specific area is currently encumbered by an existing use and not available for testing. We have revised the previous "Rain Garden" to act as two forebays in series.*
 - **TT 2/5/25 Update: Sediment forebays shall be used for stormwater pre-treatment only, the post-development HydroCAD analysis includes them as ponds for peak flow attenuation. The Handbook clearly states that a sediment forebay "provides no peak flow attenuation." Therefore, Forebays 2 and 3 (FB-2 & FB-3) shall be removed from the HydroCAD analysis since they are not ponds to be used for peak flow attenuation. Additionally, FB-2 and FB-3 will require groundwater recharge to dewater as the lowest outlet (30 ft x 3 ft broad crested weir) is proposed 1.25 feet from the bottom of the BMP and our original comment regarding test pitting and distance to ESHGW continue to apply at this location.**

3. We recommend the Applicant show the interim wellhead protection area (IWPA, mapped area shown on MassMapper) associated with properties to the south of the site. It appears the proposed Rain Garden may be located within this area which will require additional pre-treatment of runoff prior to discharge of surface runoff to the BMP. (Standard 3)
 - *HEI 1/28/25 Response: The proposed rain gardens in the original submission have been substituted with two sediment forebays that discharge to the noted POA-1. There is no proposed recharge within the sediment forebays, therefore no pre-treatment prior to recharge is required if it is determined this area is located within a potential IWPA. The surface discharge weighted TSS removal efficiency for the entire project is summarized and provided in the revised limited stormwater report. The driveway grading along the sediment forebay will be revised to a cross-pitch condition at the low point to convey runoff from the entire roadway width to the forebays. The Applicant is respectfully requesting this modification be made a condition as part of the comprehensive permit decision.*
 - **TT 2/5/25 Update:** We continue to recommend the IWPA limit be shown on the Plans. The location of this limit has potential impacts to several critical design elements of the Project including stormwater mitigation and septic disposal. Any limits on available area to place those systems can potentially impact development scope and should be understood during this phase of the Project. Additionally, see update at Comment 3 related to recharge conditions at the proposed “sediment forebays”.
4. The Applicant shall provide location of existing septic system and water supply well on the adjacent property to the south of the subject property to confirm general setback requirements from the proposed Rain Garden are maintained. (Standard 3)
 - *HEI 1/28/25 Response: The approximate location of the existing well and soil absorption system on the abutting property to the south has been added to Exhibit 2.*
 - **TT 2/5/25 Update:** In our opinion, this comment is resolved.
5. It appears impervious cover within subcatchment areas PR WS-1D and WS-1E will not be directed to the proposed infiltration basin based on the routing diagram shown in the HydroCAD report. A capture area adjustment shall be provided for any impervious area not directed to infiltration BMP's. (Standard 3)
 - *HEI 1/28/25 Response: The stormwater design has been revised to direct the previously designed detention basin (now a sediment forebay) to the proposed infiltration system (IB-1). We now meet the required 65% min target per SWMP as shown on the stormwater management analysis.*
 - **TT 2/5/25 Update:** The Applicant has not provided the required capture area adjustment calculation which should be added to the Stormwater Report for the record. The 65% target threshold is the first step in determining compliance with the Standard, the remaining step is the calculation of adjusted minimum required recharge volume. We have performed the calculation based on information provided in the Stormwater Report which yielded an adjusted minimum required recharge volume of approximately 4,643 cubic feet (cf) ($117,751 \text{ sf} / 87,489 \text{ sf} = 1.35$, $3,439 \text{ cf} \times 1.35 = 4,643 \text{ cf}$). IB volume below lowest outlet is sufficient to infiltrate the adjusted minimum required recharge volume (9,794 cf > 4,643 cf). We recommend a Condition be provided in the Comprehensive Permit Decision requiring the Applicant provide the required calculation in the Stormwater Report prior to final plan approval.
6. Flow from Subcatchment PR WS-1E does not appear to meet the 80% Total Suspended Solids (TSS) removal requirement. However, the Applicant may provide calculation to show the weighted average of discharge at the outfall yields the required removal rate. (Standard 4)
 - *HEI 1/28/25 Response: We have provided a weighted average TSS removal calculation for POA-1. Please see calculation in drainage report checklist summary.*
 - **TT 2/5/25 Update:** We have discussed the Project with the DPW and we believe the Project should comply with the provisions of the MA MS4 General Permit which the town is covered. Most notably, TSS removal rates for the Project shall meet the 90% minimum threshold as noted in Section 2.3.6.a.ii.3 of the permit. Additionally, Drainage Run 2 TSS removal spreadsheet shows 80% TSS removal credit for the proposed Infiltration Basin (IB). The Applicant has proposed Sediment Forebay-1 (FB-1) as pre-treatment for the IB which may be used in this situation to achieve the TSS

removal credit. However, consistent with prior comments, FB-1 cannot be used as a pond to provide peak flow attenuation from catchment area PR WS-1D and shall be removed from the HydroCAD model.

7. It appears the Applicant is proposing a Contech CDS water quality structure to treat discharge from Stormwater Basin B and achieve the required 80% TSS removal rate. It is standard practice to provide these types of structural pre-treatment practices upstream of the basin to limit sediment impact at the basin and reduce frequency of costly maintenance. We recommend an additional CDS unit be proposed in the treatment train upstream of the basin to treat runoff from Subcatchment PR WS-1D which is standard practice and will reduce the basin maintenance burden to future owners/residents of the Project. (Standard 4)
 - *HEI 1/28/25 Response: The stormwater design has been revised to direct the previously designed detention basin (now a sediment forebay) to the proposed infiltration system (IB-1). We no longer need a WQU upstream.*
 - **TT 2/5/25 Update: In our opinion, this comment is resolved.**
8. The Applicant has applied the 50% TSS removal efficiency credit for the Extended Dry Detention Basin (EDDB, Stormwater Basin B). EDDB's require a sediment forebay be designed to achieve the 50% TSS removal rate. (Standard 4)
 - *HEI 1/28/25 Response: We have revised our design for this treatment train. It can be seen on Exhibit 2.*
 - **TT 2/5/25 Update: In our opinion, this comment is resolved.**
9. The Applicant has not provided a Long-Term Pollution Prevention Plan (LTPPP). This plan details practices for pollution prevention as it relates to stormwater runoff and includes procedures for management of snow, storage and use of fertilizers, vehicle washing, pet waste management, etc. (Standard 4)
 - *HEI 1/28/25 Response: This has been provided. See revised stormwater report.*
 - **TT 2/5/25 Update: It appears the Applicant has added language to the Long-Term O&M Plan for several of the required source controls to the O&M Plan, however, not all are included. The Applicant shall refer to Volume 1, Chapter 1, Page 9 of the Handbook for a list of potential pollutant sources that must be addressed in the LTPPP. Additionally, the O&M Plan notes that mowing will not be allowed at the Project site which is unrealistic given the proposed lawn areas.**
10. Snow storage areas are minimal at the site, and we anticipate off-site export of snow will be required during heavy snow events. Snow piles shall also not impede sight distances at intersections. Details of snow management shall be included in the LTPPP. (Standard 4)
 - *HEI 1/28/25 Response: A note on Exhibit 1 stating "All excess snow shall be trucked off-site during heavy snowstorm events", and the relevant language has been added to the LT O&M.*
 - **TT 2/5/25 Update: In our opinion, this comment is resolved.**
11. As noted, a portion of the site is within the interim wellhead protection area (IWPA) which is considered a critical area. The Stormwater Report notes that the site does not discharge to a critical area which does not appear to be consistent with the Project scope provided. The Rain Garden appears to be located within the IWPA and will discharge within that area. (Standard 6)
 - *HEI 1/28/25 Response: The Applicant requests a condition be added as part of the comprehensive permit decision. This item will be addressed prior to the issuance of a building permit.*
 - **TT 2/5/25 Update: See Update at Comment 3.**
12. The Applicant has not provided a Construction Period Pollution Prevention Plan, details of construction period erosion controls should be included on the Plans to ensure protection of adjacent resource areas and public infrastructure during construction. We also recommend earthwork volumes, truck travel routes, construction access points, etc. be provided in a construction management plan (CMP) for review by the Town. (Standard 8)
 - *HEI 1/28/25 Response: The Applicant requests a condition be added as part of the comprehensive permit decision. This item will be addressed prior to the issuance of a building permit.*
 - **TT 2/5/25 Update: The Applicant has provided a Construction-Phase Operation and Maintenance Plan narrative to the Stormwater Report which details construction period structural BMP's. We recommend the Applicant also provide an Erosion and Sediment Control Plan showing location of**

the proposed BMP's as well as details on Project phasing to understand the proposed construction process. Additionally, post-construction stormwater BMP's shall not be used to manage construction period runoff.

13. 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)

- *HEI 1/28/25 Response: The Applicant, prior to commencement of construction, will be filing a Notice of Intent with the EPA for coverage. The Applicant requests that a condition be added that this be added as a condition of approval prior to the issuance of a building permit.*
 - **TT 2/5/25 Update: Condition recommended in original comment.**

14. The Applicant has not provided a Long-Term Operation & Maintenance Plan (O&M Plan) which details required inspection and maintenance procedures for the proposed stormwater management system. (Standard 9)

- *HEI 1/28/25 Response: A Long-Term O&M Plan has been provided. See stormwater report.*
 - **TT 2/5/25 Update: The Long-Term O&M Plan does not include sediment removal thresholds for several of the BMP's and an estimated operations and maintenance budget. The Applicant shall refer to Volume 1, Chapter 1, Page 23 of the Handbook for a list of minimum required information that shall be included in the O&M Plan. Additionally, the Applicant shall include provisions for annual reporting to the DPW associated with the Town's MS4 reporting requirement.**

15. The Applicant has not provided an Illicit Discharge Compliance Statement. (Standard 10)

- *HEI 1/28/25 Response: An illicit discharge compliance statement will be provided upon completion of the final approved drainage report. The Applicant requests that a condition be added that a signature be added as a condition of approval prior to the issuance of a building permit.*
 - **TT 2/5/25 Update: We recommend a Condition be provided in the Comprehensive Permit Decision requiring the Applicant provide the illicit discharge compliance statement prior to final plan approval.**

16. The containment embankment for proposed Stormwater Basin B is approximately three feet wide at its top which is not sufficient to allow access by maintenance vehicles and may be prone to failure. Access shall be 15 feet wide as required to allow maintenance of critical components of the basin such as the outlet control structure and sediment forebay. The proposed fence and retaining wall will further limit maintenance access to the basin. EDDB's also require emergency spillways. (Vol. 2, Ch. 2, Pg. 53)

- *HEI 1/28/25 Response: The recommended 15' wide access path around the entire basin is not feasible due to the constraints of the site and is disproportionate to the proposed basin area footprint (7,500± sf). The plans show a 10' wide access path on one side of the basin with gated access at two locations off the driveway. This provides adequate access at each end and along the length of the basin for landscape and medium-sized excavation/hauling equipment to maintain the basin per the Long-Term Operation and Maintenance Plan.*
 - **TT 2/5/25 Update: The berm for proposed FB-1 (formerly Stormwater Basin B) appears to be only three feet wide at its top which may be susceptible to failure and should be widened. Additionally, access to the basin will be blocked by the proposed outlet control structure at its only gated access.**

General Stormwater Comments

17. The 10-year peak water surface elevation in the infiltration basin and subsurface detention basin (hydraulically connected) is above a portion of the driveway adjacent to the intersection with Hunting Lane. This condition will require careful design during development of the final Plans for the Project to limit discharge out of proposed catch basins and limit off-site discharge to Hunting Lane. This site is in the Town's MS4 Area and off-site discharge should be limited to the extent practicable. We recommend the Applicant coordinate with the DPW related to this condition.
 - *HEI 1/28/25 Response: The roadway elevation at the low point of the intersection will be raised approximately 3 ft' to accommodate subsurface conveyance infrastructure. We request that this comment be added to the future conditions of approval list.*
 - **TT 2/5/25 Update: We recommend the grading be revised to fully understand earthwork impacts, roadway slopes at the intersection and if additional infrastructure will be required to implement the proposed Project scope.**
18. Stormwater Basin B is designed with an outlet orifice that is 1.5 feet above the bottom of the basin which requires infiltration to dewater the basin. As such, it appears this basin will function as an infiltration basin and shall meet all necessary requirements for siting and designing infiltration basins including test pits and setbacks to structures, septic systems, wells, etc.
 - *HEI 1/28/25 Response: The stormwater basin has been revised to be designed as a sediment forebay (FB-1). We have added a small orifice at the bottom of the outlet control structure size to dewater the system between 24-72 hours.*
 - **TT 2/5/25 Update: The bottom of a sediment forebay is required to be a minimum of two feet above ESHGW per Volume 2, Chapter 2, Page 15 of the Handbook. Test pits shall be provided at the proposed FB-1 location to confirm.**
19. We recommend the Applicant include assumed piped stormwater infrastructure on the Plans and provide sizing calculations to convey the 25-year storm event.
 - *HEI 1/28/25 Response: The Applicant requests this condition be added as part of the comprehensive permit decision. This item will be addressed prior to the issuance of a building permit.*
 - **TT 2/5/25 Update: We recommend a Condition be provided in the Comprehensive Permit Decision requiring the Applicant size proposed drain infrastructure to convey the 25-year storm event.**
20. Proposed grading between dwellings upgradient of Stormwater Basin B is directing runoff toward foundations which may cause scour against foundation walls. We recommend these areas be graded with shallow swales between the structures to reduce potential impact to building foundations. Additionally, a swale should be proposed to direct runoff around Building 9 as the upgradient areas are graded in a manner that directs stormwater to the rear of that building.
 - *HEI 1/28/25 Response: The grading has been revised to sheet flow away from the dwellings upgradient of (CD-1) to redirect the flow of stormwater away from the foundations.*
 - **TT 2/5/25 Update: The grading appears to be consistent with the prior plan particularly around Units 1-8. We recommend the grading be revised to fully understand earthwork impacts at the site and if additional infrastructure will be required to implement the proposed Project scope.**
21. The proposed 175 contour at the proposed at-grade infiltration basin (Stormwater Basin A) does not appear to tie out correctly at the north end of the basin. A berm should be graded on this end of the basin to limit potential embankment failure.
 - *HEI 1/28/25 Response: The proposed 175 contour at the proposed at-grade infiltration basin (IB-1) has been revised to tie out at the north end of the basin.*
 - **TT 2/5/25 Update: The proposed berm appears to be only three feet wide at its top which may be susceptible to failure and should be widened. Additionally, the Applicant should provide location of the emergency spillway to understand where flow from the basin will discharge in an emergency situation.**

Pine Residence Multi-Family Residential Development – Comprehensive Permit
Engineering Peer Review – Stormwater
February 5, 2025 Review Letter

22. We recommend roof runoff be piped to proposed basins to limit intermingling flow with surface runoff. Roof runoff (non-metal roofs) is considered clean and can be directly discharged to infiltration BMP's without pre-treatment.

- *HEI 1/28/25 Response: The Applicant requests this condition be added as part of the comprehensive permit decision. This item will be addressed prior to the issuance of a building permit.*
- **TT 2/5/25 Update: We recommend a Condition be provided in the Comprehensive Permit Decision requiring the Applicant design all roof drainage be directly discharged to proposed infiltration BMP's.**

23. The proposed subsurface detention system appears to accept surface runoff and we recommend the Cultec Separator Row be implemented in the final design to capture first flush flow and extend the life of the system.

- *HEI 1/28/25 Response: We have added a Water Quality Unit (WQU-1) upstream of the underground system (UDS-1). The WQU exceeds the TSS efficiency of a separator row. See revised stormwater report.*
- **TT 2/5/25 Update: The Applicant has not provided any details of the proposed system. It is common practice for systems accepting surface runoff to be designed with a Separator Row and an access manhole as it allows the system to be properly inspected and maintained, the manufacturer will also likely recommend this. Lack of these elements may drastically limit the lifespan of the system. We recommend a Condition be provided in the Comprehensive Permit Decision requiring the Applicant add a separator row and access manhole(s) to the design to ensure the system can be properly inspected and maintained.**

ADDITIONAL COMMENTS

24. The subject property is located in the Town's MS4 regulatory area and the Upper/Middle Charles River Watershed with associated nutrient Total Maximum Daily Load (TMDL). The pollutant of concern for this section of the river is Phosphorus and the Town is required as part of compliance with the MS4 permit to meet the TMDL for the watershed. Town regulations require compliance with the MA MS4 General Permit by way of the general Town bylaw (Ch. 25 Comprehensive Stormwater Management Bylaw) and Planning Board regulations (Ch. 380 Planning Board Regulations §380-1.20.B.16). Grant of waiver from this local regulation is not recommended as phosphorus reduction in development projects is critical to the Town's ability to meet applicable requirements of the MS4 permit. The Applicant shall provide calculations in the Stormwater Report related to phosphorus reduction for the Project using Attachment 1 to Appendix F of the MA MS4 General Permit titled "*Method to Calculate Baseline Phosphorus Load (Baseline), Phosphorus Reduction Requirements and Phosphorus load increases due to development*".

25. The Applicant shall revise the HydroCAD analysis to remove all ponds that have been re-designated as sediment forebays. As noted herein, forebays shall not be used for peak flow attenuation.

26. The Applicant shall provide third-party testing of the proposed Contech CDS water quality units to confirm the tested TSS removal efficiency. The Applicant is utilizing a 91% removal rate for the structures in the TSS removal worksheets.

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 them 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

P:\1323009\143-323009-24003 (ZBA PINE RESIDENCES)\DOCS\PINE RESIDENCES-ZBAREV(2025-02-05)_STORMWATER.DOCX