TETRA TECH

May 8, 2025

Mr. John J. McNicholas, Chair
Medfield Zoning Board of Appeals
Town House
459 Main Street
Medfield, MA 02052

Re: Winder Estates Residential Development – Comprehensive Permit
Engineering Peer Review – Site/Civil
86 Plain Street
Medfield, Massachusetts

Dear Mr. McNicholas:

Tetra Tech (TT) has reviewed specific submittal materials for the above-referenced Project to assist the Medfield Zoning Board of Appeals (Board) in its Comprehensive Permit review of the proposed Winder Estates development located at 86 Plain Street in Medfield, MA. 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 24 single-family residential homes on approximately 14.86 acres of land located at 86 Plain Street. The site is accessed from Plain Street and consists of one existing single-family dwelling and several outbuildings dedicated to the former animal farm at the site. Wetlands and a vernal pool exist on the north side of the subject property. The Project proposes to remove existing dwellings and construct an approximate 1,800-foot private driveway. Each unit is proposed with a porch, two car garage and an additional two parking spaces in the driveway. Three subsurface infiltration systems and a pocket wetland are proposed to promote groundwater recharge and mitigate increase in stormwater runoff as a result of the development and the Project site is located in a Zone II Wellhead Protection Area. Water supply will be through proposed watermain connection to the existing main in Plain Street and a proposed septic system to treat sewage generated by the Project.

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

- A plan set (Plans) titled "Winder Estates Residential Development M.G.L. C. 40B Comprehensive Permit Project", dated February 3, 2025, prepared by Merrill Engineers and Land Surveyors (MELS).
- A Narrative titled "Winder Estates Design Narrative", not dated, prepared by MELS and BF Architects.
- A Stormwater Report titled "Stormwater Management Report", dated February 3, 2025, prepared by MELS.
- A Preliminary List of Waivers dated July 30, 2024, prepared by Winder Estates.
- Architectural revised model sheets, not dated, prepared by BF Architects.
- A Response Letter from MassHousing Agency dated December 10, 2024.

The Plans and accompanying materials were reviewed for good engineering practice, overall site plan efficiency, utilities, stormwater, septic, environmental and public safety as it relates to each of the subject areas. Specifics on review scope are included in the narrative at the beginning of each section. 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 Site Plans were reviewed for good engineering practice and public safety. The following comments are offered to identify areas where additional information is required, or changes are requested to address questions or support further review.

A.1 The Project main access driveway is approximately 1,300 feet in length to its farthest point from Plain Street which exceeds the maximum length allowed under local subdivision regulations (500 feet maximum). The Applicant should coordinate with the Medfield Fire Department (MFD) to determine if emergency access to the site is sufficient and whether each unit may be required to be sprinkled. We recommend the Applicant provide written confirmation from the Medfield Fire Department related to their review of the Project.

A.2 Drive 2 and 3 are greater than 150 feet in length and do not include a turnaround. The Applicant should coordinate with the MFD to determine if the proposed access driveways pose a risk to emergency access.

A.3 The Project includes a dedicated access and egress lane, each lane is 15 feet wide which does not meet the minimum 20-foot width required by NFPA. The Applicant shall coordinate with the MFD to determine if the proposed access/egress from Plain Street poses a risk to emergency response at the Project site.

A.4 We recommend stop signs and stop bars be provided at Drive 2 and 3. All signage and pavement markings should meet MUTCD standards.

A.5 The Applicant shall confirm if the proposed gravel access path to the proposed septic reserve area will be constructed during this phase of the Project. A mountable curb or curb cut should be provided at the intersection of the gravel access and the site driveway. The Applicant should also provide a standard detail of the wetland crossing and provide existing topography and proposed grading. The extent of off grading may require additional wetland fill that should be understood during this review process.

A.6 A detail of the proposed retaining walls has been provided on the Plans. Several walls appear to be greater than four feet in height, which will require structural design and approval by the Building Department. Additionally, we recommend fencing be placed at the top of wall to protect against falls.

A.7 The retaining wall located behind Units 8-10 is nearly coincident with the existing stone wall. We recommend the Applicant provide a reasonable offset from the property line to construct the proposed retaining wall and not impact the existing wall. Additionally, other retaining walls on-site are close to buffers that are not intended to be impacted. All walls should be located a realistic distance away from property lines, buffers, etc. to allow for proper installation.

A.8 The proposed development sidewalk ends adjacent to Unit 4 at a crosswalk that dead ends. We recommend the sidewalk extend to Plain Street as it is understood school bus pickup occurs along Plain Street and buses will not enter the Project site for pick-up.

A.9 The Applicant has provided a Landscape Plan but the plan includes minimal detail and does not include plant quantities and their locations.

A.10 The Applicant has not provided a Lighting Plan. The Lighting Plan should show details on proposed lighting as well as photometrics to help the ZBA understand the potential for light trespass on abutting properties.

B. STORMWATER

The Project scope includes development of 24 units of housing on approximately 14.86 acres of land with proposed paved access driveway. The Project site is located in the upgradient portion of the Zone II Wellhead Protection Area for the Mine Brook Wellfield in Walpole, MA and bounded by wetlands to the north and east. Stormwater runoff generated by the Project is proposed to be directed to traditional piped infrastructure which discharges to three proposed subsurface infiltration systems (SIS's) dispersed throughout the main portion of the

development and one at-grade pocket wetland located at the intersection of the development driveway and Plain Street.

Stormwater scope was reviewed against the *Massachusetts Department of Environmental Protection (MA DEP) Stormwater Management Standards (Standards) and Stormwater Handbook (Handbook)*, *Medfield Zoning Bylaw, Article 16 – Aquifer Protection District* and *Medfield Board of Health Regulations for Storm Water and Runoff Management (April 1991 – Amended January 2000)*. 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.

MA DEP Stormwater Standards and Handbook

B.1 The Applicant is proposing a pea gravel diaphragm (PGD) as the sole pre-treatment for approximately 450 feet of proposed driveway that appears to discharge directly to the adjacent wetlands and vernal pool. However, it is unclear if the intent of this discharge is to be directed to the adjacent existing pond or the wetland area since existing topography is limited around the existing pond. PGD's are typically coupled with vegetated filter strips (VFS's) to achieve required pre-treatment prior to discharge. There does not appear to be sufficient vegetated area meeting the design requirements of the best management practice (BMP) beyond the PGD to meet the total suspended solids (TSS) removal efficiency noted in the Handbook. VFS's cannot extend greater than 50 feet into a wetland buffer zone which the current design does not comply with. We believe this is an untreated discharge to the adjacent wetland and vernal pool and the Applicant shall explore alternative options for pre-treatment of this area prior to discharge. (Standard 1)

B.2 The time of concentration (Tc) line in existing subcatchment 1S appears to disregard the existing shallow swale that runs along the south side of the existing driveway. The swale was observed during the Project site walk and appears to run downhill from Plain Street to a low point at approximate STA 3+00 where flow may be intercepted by a culvert. It was difficult to locate the suspected culvert in the field due to leaf litter, but it appears it may cross under the driveway and discharge to a plunge pool on the opposite side of the roadway which ultimately discharges to the adjacent existing pond. We recommend the Applicant explore this condition and add the existing culvert and pond to the analysis, additional detailed survey of the south side of the roadway may also be required. Additionally, Subcatchment 1S may need to be split into separate subcatchments to model this condition. This is required to ensure runoff is properly accounted in the analysis. (Standard 2)

B.3 Consistent with Comment B.2, we believe the existing pond should be added to the HydroCAD model as it appears to intercept flow from the site and provide runoff mitigation in the pre-development condition. This is required to ensure runoff is properly accounted in the analysis. (Standard 2)

B.4 We recommend clearing of the proposed Title 5 reserve area be included in the stormwater design for the Project. Future clearing of this area will affect runoff and should be included in the analysis to limit future modifications to the proposed stormwater system if the reserve area is eventually required. (Standard 2)

B.5 Mounding analysis is required for all of the proposed SIS's. All systems are within four feet of estimated seasonal high groundwater (ESHGW) based on the test pits provided at each system. (Standard 3)

B.6 SIS 2 is located within 50 feet of the adjacent wetland which does not meet the general setback requirements noted in the Handbook. (Standard 3)

B.7 Snow management is included in the Long-Term Pollution Prevention Plan (LTPPP), but the Applicant shall show proposed snow storage locations on the Plans to confirm areas where snow is anticipated to be stockpiled. (Standard 4)

B.8 The Project site is located in a Zone II Wellhead Protection Area and requires additional stormwater treatment prior to discharge to the proposed SIS's. Table CA 3 (Vol. 1, Ch. 1, Pg. 19) of the Handbook requires specific stormwater BMP's in a treatment train that include pre-treatment, treatment and infiltration BMP's. Additionally, the standard requires the Applicant meet all applicable requirements of the local aquifer protection district (Medfield Zoning Bylaw, Article 16 – Aquifer Protection District) as

required by the Handbook in Table CA 3 (Vol. 1, Ch. 1, Pg. 19). Review of the Project against Article 16 is included later in this section. (Standard 6)

B.9 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.10 The Applicant shall provide an estimated operation and maintenance budget to the Operation and Maintenance Plan (O&M Plan). This budget shall also include scope for inspection by qualified personnel and reporting. (Standard 9)

B.11 The Applicant has not provided a signed illicit discharge compliance statement. The form was included in the Stormwater Report, but it is not signed. (Standard 10)

B.12 The Applicant shall provide water budget for the proposed pocket wetland. The Applicant shall confirm if sufficient water will be present in the BMP to ensure wetland plants are sustained throughout a dry period of not more than two months. Redoximorphic features were noted in the test pit log (T.H. 24-18 conducted October 29, 2024) at the BMP location but no groundwater infiltration into the pit was noted. Groundwater may be deeper than ESHGW during much of the summer and fall months which have recently been dry due to changing weather patterns. (Vol. 2, Ch. 2, Pg. 42)

B.13 An emergency spillway shall be proposed at the Pocket Wetland to provide controlled release of stormwater when the BMP reaches maximum storage capacity. (Vol. 2, Ch. 2, Pg. 45)

Medfield Zoning Bylaw, Article 16 – Aquifer Protection District

B.14 The Project proposes impervious lot coverage of 17.3% which exceeds the allowable 15% impervious coverage. The Applicant is proposing groundwater recharge in the Project scope as mitigation, but additional treatment of stormwater is required to limit degradation of groundwater quality. Specifically, as noted in the section above, stormwater treatment BMP's are required to be implemented as part of the treatment train and include bioretention areas, sand filters, etc. to filter out nutrients, metals and other pollutants that may degrade groundwater quality in the Zone II. (Ch. 300 §300-16.7.B.8.g)

Medfield Board of Health Stormwater Regulations/Checklist

B.15 The Applicant has not provided the 2-inch, 1- and 50-year storm events in the HydroCAD analysis.

B.16 A summary of runoff volume has not been provided in the Stormwater Report.

B.17 The Applicant calculated proposed water quality volume using 1-inch times the impervious coverage at the site. Water quality volume to remove contaminants from runoff shall be calculated using 2-inch times the impervious coverage at the site.

B.18 Soil conductivity testing has not been provided at any of the proposed SIS locations.

B.19 Groundwater mounding is required to determine if the bottom of the SIS's (including the mound) is within two feet of groundwater.

General Stormwater Comments

B.20 We recommend additional pre-treatment of runoff prior to discharge to the proposed Pocket Wetland particularly with the subject Property's location within the Zone II. The Applicant is proposing trench drains to intercept surface runoff from impervious surfaces which do not discharge to a deep sump, hooded structure.

B.21 SIS 1 is located on a proposed 3:1 fill slope, and the bottom of system elevation is above the toe of slope. We anticipate groundwater breakout may occur on the slope. The Applicant shall provide sufficient evidence through mounding analysis to confirm if groundwater breakout from the slope is anticipated as a result of the basin recharge and provide mitigation to prevent the breakout if expected.

B.22 SIS 2 is located approximately five feet from the adjacent retaining wall and the Applicant shall confirm if a liner is required at the edge of the system to ensure proposed recharge from the system is not intercepted by the adjacent wall drain and discharged to grade.

B.23 The Applicant shall provide existing and proposed topography at the proposed gravel access path wetland crossing and provide a cross-culvert if the crossing will impact water flow in the wetland.

B.24 Location of inspection ports at all subsurface systems should be shown on the Plans. We recommend inspection ports be placed at a minimum at each inlet, outlet and midpoint in the system.

B.25 We recommend the Applicant propose Stormtech Isolator Rows and appropriate access manholes at all proposed SIS's to ensure the systems can be properly maintained. Isolator Rows are additional protection for the systems and capture sediment and debris that may bypass upgradient pre-treatment. This will extend lifespan of the systems and reduce cost burden on future residents of the Project.

B.26 The proposed grass shoulder along the driveway retaining wall (north side of the proposed driveway) is graded toward the wall. We recommend the shoulders be graded toward the roadway to provide positive drainage away from the wall structure.

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 a cut-fill analysis on the Plans to confirm extent of material import/export required on the Project. Additionally, we recommend the Applicant provide a Construction Management Plan (CMP) which notes total import/export volume, truck routes, construction phasing, staging and stockpile areas, etc. to limit nuisances to abutting residents and the Town.

C.2 The Applicant shall confirm location of temporary sediment basins, particularly at low points where runoff may impact the abutting wetland resources during construction. Temporary Sediment Basins shall not be sited at proposed post-development BMP locations.

C.3 Details of proposed erosion controls should be included on the Plans. The Erosion Control and Demolition Plan notes a silt sock is the only linear erosion control proposed. We anticipate additional controls (silt fence, additional rows of silt sock, etc.) may be required, particularly at points of runoff channelization during construction.

C.4 As noted, the Project appears to meet the requirements for coverage under the US EPA NPDES CGP. We anticipate additional detail will be provided prior to construction in order to meet the requirements of the permit including submission of a stormwater pollution prevention plan (SWPPP).

D. UTILITIES

The Project proposes connecting to the municipal water system located in Plain Street. Private utilities (electric, telephone and cable) are proposed underground, no gas main is shown on the Plans and it is presumed the units will use either propane or electric appliances. Gravity sewer main is proposed which will discharge to a proposed pump chamber for force main discharge to proposed Presby Enviro-Septic soil absorption system (SAS), septic is discussed in the next section. 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.

D.1 The Applicant should provide water demand calculations for review and coordinate with Medfield DPW to confirm sufficient supply exists to serve the Project.

D.2 The Applicant should provide size and type of proposed watermain. Additionally, watermain at Drive 2 and 3 dead ends at a cap. We recommend the watermain end at a hydrant which will allow for flushing to maintain appropriate water quality.

D.3 If the units require sprinklers as determined by the Medfield Fire Department and/or Building Department, the Applicant shall perform pressure testing of the municipal water system to determine if sufficient pressure exists to meet applicable fire safety standards.

E. SEPTIC

The Project scope includes development of 24 units (90 bedrooms) of housing on approximately 14.86 acres of land. The Project site is located in the upgradient portion of the Zone II Wellhead Protection Area for the Mine Brook Wellfield in Walpole, MA. Sewage generated by the Project is directed to two septic tanks which flow by gravity to a proposed pump chamber where effluent is pumped via force main to the proposed Presby Enviro-Septic SAS. A reserve SAS area has been proposed on the northeast side of the Project site in a pocket of upland away from the primary SAS location. The septic scope was reviewed against the MA DEP State Environmental Code, Title V (310 CMR 15.00) (Title 5) and *Medfield Board of Health Regulations for the Siting, Construction, Inspection, Upgrade, Repair, and Expansion of On-Site Wastewater Disposal Systems* for the benefit of the ZBA. The Project was also reviewed for general septic design elements and good engineering practice.

MA DEP Title 5

E.1 The proposed Title 5 septic system for the Project consists of two gravity collection systems for 90 bedrooms. The Title 5 design flow (310 CMR 15.203.1) would be 110 gallons per day (gpd) per bedroom for a combined design flow of 9,900 gpd.

E.2 The Project site is located in the upgradient portion of the Zone II for the Mine Brook Wellfield in Walpole. The wellfield is approximately 4,000 feet from the Project site. Title 5 considers Zone II areas to be nitrogen sensitive (310 CMR 15.215) and in nitrogen sensitive areas, flow for new construction is restricted to 440 gpd per acre. The Project site is approximately 14.86 acres which would limit flow to the proposed system to 6,538 gpd or 59 bedrooms to meet the nitrogen loading requirement. Title 5 allows for addressing this requirement through nitrogen aggregation or the use of approved nitrogen reduction treatment systems (310 CMR 15.217).

E.3 Medfield Water Department data shows the site has access to public water via an 8-inch ductile iron main in Plain Street. However, the MassDEP well viewer indicates domestic bedrock water supplies at both 88 and 92 Plain Street. These wells appear to be greater than 200 feet from the SAS but the Applicant shall provide confirmation on the Plans.

E.4 Plan C2.1 indicates bedrock outcrops adjacent to the proposed SAS. Additionally, TP 24-05 does not appear to have four feet of naturally occurring pervious material. However, TP 24-13 does appear to meet the four-foot requirement. The Applicant shall confirm if TP 24-05 was excavated to refusal and if it was used for percolation only. The Applicant shall provide DEP Forms 11 and 12 for all test pits.

E.5 Plan C8.3 indicates a groundwater mound of 1.13 feet above the estimated high water. The Applicant shall provide the parameters used to calculate the mound including hydraulic conductivity, saturated thickness and porosity and provide details of the source of the parameters.

E.6 The reserve area identified on Plan C8.4 indicates the soils beneath the proposed reserve SAS meet Title 5 requirements but may need to be re-evaluated if the proposed site flows change. Additionally, the reserve area is located in areas jurisdictional to the Massachusetts Wetlands Protection Act (WPA) and a Notice of Intent would be required for this construction.

E.7 The Applicant shall coordinate with Medfield Board of Health related to removal of the septic system associated with the existing dwelling.

Medfield Board of Health Septic System Regulations

E.8 Local Regulations prohibit septic systems that serve more than one single dwelling. The Project proposes a shared septic system serving 24 single-family dwellings. (§IV.6)

E.9 The Applicant shall provide a statement on the Septic Plans noting setbacks to various required appurtenances noted in the Regulations which include public wells, private wells, bordering vegetated wetlands, etc. (§VII.1)

E.10 The Regulations require a complete design of the reserve area be provided for review. Additionally, the Applicant shall demonstrate they have approved access to the proposed reserve area. It is unclear if the proposed gravel access path to the reserve area is proposed as part of this Project. Approved

access by the Conservation Commission will be required in order to make the proposed reserve area a viable option. (§VII.1)

E.11 Several of the test pits were performed outside of the date range (December 20th to May 29th) required in the Regulations. (§VII.2)

E.12 The Applicant shall submit grain size analysis of the test pit soils to verify soil classification. (§VII.2.d)

E.13 The Regulations require SAS's for single family homes be designed for a minimum of four bedrooms each. The Applicant is proposing 6 three-bedroom units with design included for three bedrooms for each of those units. (§VII.4.D)

E.14 The Regulations require reserve area be proposed between the primary system trenches. (§VII.6)

E.15 The Applicant shall confirm if foundation drains are proposed for units adjacent to the proposed SAS. The SAS shall be located at least 25 feet from any foundation drain. (§VII.7)

E.16 The Applicant is proposing the SAS reserve area adjacent to bordering land subject to flooding (BLSF) with an associated 100-year flood elevation of 177.4 as noted on the Plans. The limit of BLSF line appears to be incorrect as the line does not follow the 177.4 contour which traverses across the proposed reserve SAS location. SAS's shall not be constructed less than one foot above the floodplain elevation. (§VII.9)

E.17 The Applicant shall provide basement elevations on the Plans to confirm compliance with the minimum 2-foot separation to high groundwater elevation requirement. (§VII.9)

E.18 The Applicant has not provided design of the proposed SAS reserve area which we anticipate may require filling of floodplain to meet the Regulations. Compensatory storage shall be provided if filling of floodplain is required. (§VII.11)

E.19 The Applicant has not provided details on the proposed pump station such as pump specifications, performance curves, total dynamic head, etc. (§XII.1)

General Septic Comments

E.20 We recommend the Applicant combine flow from the proposed septic tanks into a single manhole prior to discharge to the proposed pump chamber. This will provide a point of connection in the future if the proposed SAS reserve area is required. Additionally, we recommend a piping run or sleeve be proposed from the recommended manhole and stubbed across the Project driveway to limit construction scope/impact and financial burden to the future homeowners if the reserve area is required. The pipe may be stubbed outside of the recommended manhole for future connection.

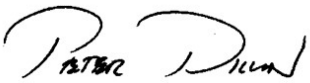
E.21 We recommend signage be provided on the Plans noting the limits of the SAS within the proposed openspace green area above the system. This is recommended to notify anyone who may need to drive on the green with a heavy vehicle to limit potential impacts to the system below.

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)



Peter Dillon, PG
Geoscience Discipline Lead
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