



November 28, 2023

Alan Fryer, Chair  
Zoning Board of Appeals  
Dover Town House  
P.O. Box 250  
Dover, MA 02030

**Re:** Tetra Tech Peer Review Letter 1  
**Trout Brook Comprehensive Permit**  
Dover, Massachusetts

Dear Mr. Chairman:

Tetra Tech (TT) has reviewed submittal materials for the above-referenced Project. The Plans and accompanying materials were reviewed for good engineering practice, overall site plan efficiency, stormwater, utilities, and public safety. In general, the plans and supporting materials were very thoughtfully prepared and we appreciate the clarity and completeness of documents provided. Each of the sites are substantially constrained by wetlands and/or flood plain resulting in development plans that leave little, or no, room for error or miscalculation and we have reviewed the information accordingly.

The following documents formed the basis of our review.

- "Preliminary Site Plan of Land" Sheets C1-C4 for "Dover Homes" (Lots 1A, 2A, 4 and 45) dated June 7, 2023 (Revised 2023-11-15) prepared by Legacy Engineering (Legacy) hereafter referred to as Site Plans.
- Stormwater Report for "Dover Homes" dated June 7, 2023 (Revised November 15, 2023) prepared by Legacy.
- Architectural Plans Sheet DD1-DD8 dated November 15, 2023 prepared by CME Architects, Inc. (CME).
- Corresponding Cover Letters from Legacy and CME dated November 15, 2023
- Related Exhibits
- Comment letters from town departments and abutters.

Our primary concern relates to the substantial change in drainage patterns that result from proposed fills at each site. In most cases the proposed fills will block runoff which currently flows uninterrupted off the right-of-way toward the wetland. In our opinion the design (1) does not adequately demonstrate how the flows will be rerouted without negatively impacting the right-of-way and (2) includes design elements which direct flow from the development parcels to the right-of-way which exacerbates the condition. We expect design solutions are available to address these concerns, but they need to be shown clearly on the plans and accurately reflected in the analysis.

We also have some concern that no information has been provided to demonstrate the septic systems shown are adequate to meet proposed wastewater demands. While the designs seem appropriate, in most cases they barely meet minimum criteria leaving little or no room to accommodate change if needed.

The comments below are intended to guide discussion and we expect additional/refined comments as the design and discussion advances.

### General Comments

1. We recommend the plans show the location of homes and driveways on adjacent lots to better understand potential impacts associated with the significant fills being proposed on all lots. Locations can be approximated based on aerial photos.
2. Similarly, we recommend contours be extended at least 15 feet onto abutting property to better understand grading patterns and any potential impacts from proposed fills. Grading can be approximated based on LiDar data available from MassGIS if needed.
3. Please provide a summary of required cuts and fills on each lot to estimate the volume of fill required to raise the sites as shown. If possible, include a summary of cut volume associated with the required compensatory storage mitigation as well. This information will assist the Board in addressing/qualifying any trucking related concerns.

### Site Plan Comments

The bulk of the comments provided below apply to all four development lots but have been listed under each lot to provide for possible diverging solutions or responses. Comments that substantially duplicate prior comment are *italicized* for convenience.

#### Lot 1A

4. Proposed grade is substantially higher than existing grade (6' fill) which blocks runoff currently flowing directly off the road and the proposed grading does not clearly show how runoff accumulating at the edge of the right-of-way will be addressed. We request the applicant clearly show how runoff will be conveyed from the roadway to the wetland without ponding in the public way. At a minimum this should include definition of a channel cross section and all associated grading including resolution of the 109 contours.
5. The plan shows area drains and a trench drain collecting runoff from paved surfaces but provides no pretreatment prior to infiltration. At a minimum applicant must demonstrate how the project intends to protect the infiltration system from the inevitable fouling from sediment if no treatment is provided.
6. Although the septic system design appears reasonable it barely meets minimum setback criteria in several cases but provides no basis on which the system was designed to demonstrate viability at the dimensions shown. We recommend the applicant provide enough basic design information to demonstrate system compliance with 310 CMR 15.00 (Title 5) so the Board has a factual basis on which to conclude the wastewater needs of the project can be safely met.
7. The work on Lot 1A includes creation of compensatory storage to offset flood plain fill required for the septic system on Lot 2A. While we know of no prohibition for providing compensatory storage on an adjacent lot the Board should be aware that a portion of the work shown on Lot 1A is required for development of Lot 2A.
8. Access, drainage, and utility easements are required over Lot 2A to serve Lot 1A. We recommend any required easements be clearly shown and described on the plans.
9. Test pits indicate Estimated Seasonal High Groundwater (ESHGW) several feet below the adjacent wetland elevation which seems counterintuitive as we would expect groundwater to flow toward the wetland rather than away from it. Records indicate test pits were performed by a licensed soil evaluator and approved by the Dover Board of Health and as such we have no reason to question the results.

However, we request a brief explanation for the results and confirmation the test pits were witnessed as part of the BOH approval.

10. Recommend the Lot 2A sewer line be shown on the plans for Lot 1A.
11. The proposed stormwater infiltration system is located approximately 55' from the proposed well location which does not meet the minimum 100' setback requirement from private wells as noted in Table RR – Rules for Groundwater Recharge in Volume 1 of the Massachusetts Stormwater Handbook. We recommend the applicant consider NOT connecting paved surfaces to the infiltration systems if possible.

#### Lot 2A

12. *Proposed grade is substantially higher than existing grade (6' fill) which blocks runoff currently flowing directly off the road and the proposed grading does not clearly show how runoff accumulating at the edge of the right-of-way will be addressed. We request the applicant clearly show how runoff will be conveyed from the roadway to the wetland without ponding within the public way. At a minimum this should include definition of a channel cross section and all associated grading including resolution of the 109 contour which is currently unaddressed.*
13. *The plan shows area drains and a trench drain collecting runoff from paved surfaces but provides no pretreatment prior to infiltration. At a minimum applicant must demonstrate how the project intends to protect the infiltration system from the inevitable fouling from sediment if inadequate treatment is provided.*
14. *Although the septic system design appears reasonable it barely meets minimum setback criteria in several cases but provides no basis on which the system was designed to demonstrate viability at the dimensions shown. We recommend the applicant provide enough basic design information to demonstrate system compliance with 310 CMR 15.00 (Title 5) so the Board has a factual basis on which to conclude the wastewater needs of the project can be safely met.*
15. *The work on Lot 2A includes proposed filling of the flood plain for the septic system with compensatory storage proposed on Lot 1A to offset the flood plain fill required on Lot 2A. While we know of no prohibition for providing compensatory storage on an adjacent lot the Board should be aware that development of Lot 2A is predicated on compensatory storage on Lot 1A.*
16. The plans should include enough detail on the proposed grading plan to demonstrate the actual limits of work required to provide compensatory storage. None of the proposed compensatory storage extends beyond the flood plain boundary which suggests no connection. We recommend plans be revised to show spot grades and actual extent of required disturbance to offset proposed flood plain fills.
17. *Access, drainage, and utility easements are required over Lot 2A to serve Lot 1A. We recommend any required easements be clearly shown and described on the plans.*
18. *Test pits indicate Estimated Seasonal High Groundwater (ESHGW) several feet below the adjacent wetland elevation which seems counterintuitive. Records indicate test pits were performed by a licensed soil evaluator and approved by the Dover Board of Health and as such we have no reason to question the results. However, we request a brief explanation for the results and confirmation the test pits were witnessed as part of the BOH approval.*
19. Recommend the Lot 2A sewer line be shown on the plans for Lot 1A.

20. *The proposed stormwater infiltration system is located approximately 45' from the proposed well location which does not meet the minimum 100' setback requirement from private wells as noted in Table RR – Rules for Groundwater Recharge in Volume 1 of the Massachusetts Stormwater Handbook. We recommend the applicant consider NOT connecting paved surfaces to the infiltration systems if possible.*

Lot 4

21. *Proposed grade is substantially higher than existing grade including as much as 3' of fill over an existing gas line. Please provide documentation or response that the resulting change in soil load is within gas company accepted tolerances.*
22. *The proposed contours suggest a portion of the Project runoff will be directed toward the Gordon property with no obvious outlet in contrast to what happens under existing conditions where runoff appears to flow from the Gordon property through the subject property to the wetlands. This change in runoff pattern is further complicated by the proposed use of a portion of the drainage path for compensatory storage to offset flood plain fills elsewhere on site.*
23. *The plan shows a french drain collecting runoff from paved surfaces but provides no pretreatment prior to infiltration. At a minimum applicant must demonstrate how the project intends to protect the infiltration system from the inevitable fouling from sediment if inadequate treatment is provided.*
24. *Although the septic system design appears reasonable it barely meets most minimum setback criteria and does not meet minimum 25' Soil Absorption System to downhill slope setback requirements. The system is located within a constrained area where any required design changes will likely impact other site features, and nothing is provided to demonstrate viability at the dimensions shown. We recommend the applicant provide enough basic design information to demonstrate system compliance with 310 CMR 15.00 (Title 5) so the Board has a factual basis on which to conclude the wastewater needs of the project can be safely met.*
25. *The plans should include enough detail on the proposed grading plan to demonstrate the actual limits of work required to provide compensatory storage. None of the proposed compensatory storage extends beyond the flood plain boundary which suggests no connection. We recommend plans be revised to show spot grades and actual extent of required disturbance to offset proposed flood plain fills.*
26. *Test pits indicate Estimated Seasonal High Groundwater (ESHGW) several feet below the adjacent wetland elevation which seems counterintuitive. Records indicate test pits were performed by a licensed soil evaluator and approved by the Dover Board of Health and as such we have no reason to question the results. However, we request a brief explanation for the results and confirmation the test pits were witnessed as part of the BOH approval.*
27. *The proposed stormwater infiltration system is located approximately 35' from the proposed well location which does not meet the minimum 100' setback requirement from private wells as noted in Table RR – Rules for Groundwater Recharge in Volume 1 of the Massachusetts Stormwater Handbook. We recommend the applicant consider NOT connecting paved surfaces to the infiltration systems if possible.*

Lot 45

28. *Proposed grade is substantially higher than existing grade (3' fill) which blocks runoff currently flowing directly off the road and appears to result in additional flow being directed to the catchbasin in the street. We request the applicant clearly show how runoff will be conveyed from the roadway to the wetland*

*without ponding within the public way (see low spot created near catch basin). At a minimum this should include resolution of the 109 contour which is currently unaddressed.*

29. *The plan shows a french drain collecting runoff from paved surfaces but provides no pretreatment prior to infiltration. At a minimum applicant must demonstrate how the project intends to protect the infiltration system from the inevitable fouling from sediment if inadequate treatment is provided.*
30. *Although the septic system design appears reasonable it barely meets minimum setback criteria in several cases but provides no basis on which the system was designed to demonstrate viability at the dimensions shown. We recommend the applicant provide enough basic design information to demonstrate system compliance with 310 CMR 15.00 (Title 5) so the Board has a factual basis on which to conclude the wastewater needs of the project can be safely met.*
31. *The plans should include enough detail on the proposed grading plan to demonstrate the actual limits of work required to provide compensatory storage. The compensatory storage does not extend far enough into the flood plain to mitigate fills near elevation 105. We recommend plans be revised to show spot grades and actual extent of required disturbance to offset proposed flood plain fills.*
32. *Test pits indicate Estimated Seasonal High Groundwater (ESHGW) several feet below the adjacent wetland elevation which seems counterintuitive. Records indicate test pits were performed by a licensed soil evaluator and approved by the Dover Board of Health and as such we have no reason to question the results. However, we request a brief explanation for the results and confirmation the test pits were witnessed as part of the BOH approval.*
33. *The proposed stormwater infiltration system is located approximately 36' from the proposed well location which does not meet the minimum 100' setback requirement from private wells as noted in Table RR – Rules for Groundwater Recharge in Volume 1 of the Massachusetts Stormwater Handbook. We recommend the applicant consider NOT connecting paved surfaces to the infiltration systems if possible.*

### **Storm Water Report**

#### **Lot 1A**

34. *The stormwater model does not include flow from the street that results from the damming effect of the site fills noted in prior comments. We recommend the model be modified to match design conditions.*
35. *The model suggests the infiltration system is designed to overflow to the public way by surcharging the trench/area drains near the driveway. In our opinion this is unacceptable and exacerbates the damming conditions created by the site fills. We recommend the design be modified so that infiltration system surcharges are directed toward the wetland and not toward the public way.*

#### **Lot 2A**

36. *The model applies an exfiltration rate of 2.41 in/hr when test pit results indicate sandy loams beneath the infiltration system rather than loamy sands. Model should incorporate an exfiltration rate for sandy loams of 1.04 in/hr.*
37. *The model suggests the infiltration system is designed to overflow to the public way by surcharging the trench/area drains near the driveway. In our opinion this is unacceptable and exacerbates the damming conditions created by the site fills. We recommend the design be modified so that infiltration system surcharges are directed toward the wetland and not toward the public way.*

Lot 4

38. *The model suggests the infiltration system is designed to overflow to the public way by surcharging the trench/area drains near the driveway. In our opinion this is unacceptable and exacerbates the damming conditions created by the site fills. We recommend the design be modified so that infiltration system surcharges are directed toward the wetland and not toward the public way.*
39. The outlet geometry used in the model does not match design conditions. The model shows a 288" x 12" horizontal orifice grate when the french drain is installed on a slope with only a very small portion of it being at elevation 110.3 resulting in the model understating the depth of discharge at the street. We expect this problem to be addressed in response to prior comment, but the model must accurately reflect as-shown design conditions.

Lot 45

40. *The model suggests the infiltration system is designed to overflow to the public way by surcharging the trench/area drains near the driveway. In our opinion this is unacceptable and exacerbates the damming conditions created by the site fills. We recommend the design be modified so that infiltration system surcharges are directed toward the wetland and not toward the public way.*
41. The elevations shown for pond 16P do not appear to reflect elevations noted on the site plans. Please address as needed.

These comments are offered as guides for use during the Town's review and additional comments are likely to be generated as additional or revised documentation is submitted. If you have any questions or comments, please feel free to contact me at (508) 786-2230.

Very truly yours,



Sean P. Reardon, P.E.  
Vice President

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