



100 GROVE ST. | WORCESTER, MA 01605

June 23, 2021

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**Subject: Village at Grafton Woods
8 Pine Street, Grafton, Massachusetts
Site Plan and Special Permit Review**

Dear Chris:

We received the following documents on June 11, 2021 via e-mail:

- Correspondence from Tighe & Bond to the Grafton Town Planner dated June 10, 2021 re: Village at Grafton Woods, 8 Pine Street, Plan Approval Applications – Peer Review Response to Comments 2.
- Sheets C-105, C-106, C-108, C-507 and C-509 of plans entitled Village at Grafton Woods, Town of Grafton, Massachusetts dated February 26, 2021 with Sheet C-105 last revised April 30, 2021 and Sheets C-106, C-108, C-507 and C-509 last revised June 10, 2021, prepared by Tighe & Bond for GSX-ODG, LLC. (5 sheets)
- Revised proposed conditions hydrology computations printed on June 11, 2021.
- Document entitled “Village at Grafton Woods, Stormwater Calculations – Revised Surface Basin Calculations” dated June 2021, prepared by Tighe & Bond, Inc.

On behalf of the Grafton Planning Board, Graves Engineering, Inc. (GEI) has been requested to review and comment on the plans’ and supporting documents’ conformance with applicable Grafton Zoning By-Law amended through October 21, 2019; Massachusetts Department of Environmental Protection (MassDEP) Stormwater Handbook and standard engineering practices.

This letter is a follow-up to our previous review letters dated April 6, 2021 and June 3, 2021. For clarity, comments from our previous letter are *italicized* and our latest comments to the design engineer’s responses are depicted in **bold**. For brevity, comments previously addressed by the design engineer and acknowledged as such by GEI have been omitted. Previous comment numbering has been maintained.

Subsequent to our April 6, 2021 review letter to the Planning Board, GEI was requested to review and comment on the documents’ conformance with applicable Regulations for the Administration of the Grafton Wetlands Protection Bylaw (aka Grafton Wetland Regulations) and Town of Grafton Conservation Commission Regulations Governing Stormwater Management on behalf of the Grafton Conservation Commission. Please see “Additional Comments” near the end of this letter.

Our comments follow:

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Zoning By-Law

1. *GEI has no issues with compliance with the Grafton Zoning By-Law except as noted in the following six comments.*

GEI has no issues relative to compliance with the Grafton Zoning By-Law.

7. *The plans should include a sheet with a vehicle turning template for the Grafton Fire Department's largest vehicle (Tower 1) superimposed to demonstrate vehicle maneuverability around the buildings. Of particular concern is maneuverability around the eastern-most building corner; the inside curb radius is 20 feet, the outside curb radius is 40.5 feet, and the building corner and guard rail will be impediments to maneuverability. (§13.7.C.4.z.v)*

June 3, 2021:

A supplemental sheet (in Attachment B) was included in the bound document entitled Village at Grafton Woods, 8 Pine Street, Plan Approval Review – Peer Review Response to Comments dated April 30, 2021. Figure 1 shows that the fire truck should be able to maneuver around the easternmost building corner if a rear tire of the fire truck mounts the curb. GEI defers to the Fire Department if the modeled turning maneuver is acceptable. GEI recommends that the Planning Board include a condition in its decision that allows the Fire Department to test the constructed accessway and, if necessary, require modifications to address access deficiencies prior to the issuance of an occupancy permit.

Upon further review, GEI concurs with the design engineer that the curb is to demarcate the limits of the reinforced turf accessway and will be flush with the surrounding grade. Nevertheless, GEI recommends that the Planning Board include a condition in its decision that allows the Fire Department to test the constructed accessway and, if necessary, require modifications to address access deficiencies prior to the issuance of an occupancy permit.

Hydrology & MassDEP Stormwater Management

The hydrology comments were previously addressed and acknowledged.

19. *Compliance with MassDEP Stormwater Handbook appears to be reasonable except as noted in the following five comments.*

Please see comment #20.

20. *Soil testing needs to be performed at the proposed locations of the stormwater infiltration facilities to demonstrate that the required groundwater offset will be achieved and that the subsurface conditions are suitable for infiltration.*

June 3, 2021:

Sheet C-100 was revised to include groundwater readings at various borings. Groundwater was measured at depths of five feet to 12.5 feet below the ground surface for those borings 20 feet deep or deeper. Groundwater was not encountered for borings less than ten feet deep. Data at boring TB-1 indicates that the groundwater is higher than the bottom of (subsurface) Infiltration System 1 and data at boring TB-7 indicates that the groundwater is higher than the bottom of (subsurface) Infiltration System 3. Considering the depth of the subsurface infiltration BMP's below the existing ground surface, GEI recommends that soil testing be performed at the infiltration BMP's, including the open basin, during permitting rather than prior to the start of construction.

GEI concurs with the design engineer that there is flexibility to utilize to a shorter infiltration system if needed. The subsurface infiltration system could be replaced with a subsurface detention system or could utilize a mix of infiltration and detention BMP's. In summary, the current design could reasonably be confirmed as a condition of approval and requisite modifications could be made, if needed. Considering the information submitted to date, GEI has no objection to the concept of confirmatory soil testing being required as a condition of approval.

General Engineering Comments

30. *Sheet C-106 has erosion control barriers only proximate to the wetlands. Erosion control barriers need to be provided at all down-gradient sides of the work on Sheet C-105 and C-106.*

June 3, 2021:

GEI could not find symbols or lines for the proposed erosion control barriers on Sheets C-105 and C-106. It appears that the AutoCAD layer for erosion control barriers was accidentally turned off.

Acknowledged. The symbols and lines for the proposed erosion control barriers are present on the revised Sheet C-106.

General Comments

35. GEI did not review for compliance with Grafton Stormwater Regulations or Wetland Regulations. Per my discussion with the Grafton Conservation Agent, GEI will proceed with such a review once we received revised plans and a revised stormwater management report. **GEI reviewed the revised documents on behalf of the Grafton Conservation Commission. Please see comments below.**
36. GEI understands that the Grafton Sewer Department and the Grafton Water District will review the plans relative to their respective utilities.
No further comment necessary.
37. *GEI did not review the architectural plans.*
No further comment necessary.

Additional Comments; June 3, 2021:

38. *Pertinent elevations (e.g. bottom of stone, bottom of chambers) need to be provided on the plans for the subsurface stormwater infiltration systems.*
Acknowledged. The information was added to Sheet C-507 and is consistent with the hydrology computations.
39. *Proposed SMH 6 should be labelled as a drop manhole. GEI defers to the Grafton Sewer Department whether interior or exterior drops are required; in either case a construction detail should be added to the plans.*
Acknowledged. SMH 6 was labeled to be a drop manhole on Sheet C-108 and after consulting with the Sewer Department an interior drop manhole construction detail was added to Sheet C-509.

40. *Groundwater mounding calculations will need to be provided for any stormwater infiltration BMP that has less than four feet of groundwater offset and will attenuate the peak discharge from a 10-year or more intense storm event.*
The mounding analysis would be a detail associated with confirmation of the design or redesign. Please also see comment #20.
41. *GEI has no issues relative to compliance with the Regulations for the Administration of the Grafton Wetlands Protection Bylaw except as noted in Comments #20 (Grafton Wetland Regulations §V.B.3.m) and #42.*
No further comment necessary.
42. *The top of the berm at the open infiltration basin will only be 3.5 feet wide at elevation 411.75 (the 411-foot contours are eight feet apart and the slopes are 3H:1V). The needs to be wide enough for maintenance equipment. (Grafton Wetland Regulations §V.B.5.h.ii)*
Acknowledged. The top of the berm was revised to be ten feet wide and the hydrology computations were updated to reflect the revision.
43. *GEI has no issues relative to compliance with the Town of Grafton Conservation Commission Regulations Governing Stormwater Management except as noted in Comment #20 (Stormwater Management Regulations §6.A).*
No further comment necessary.

We trust this letter addresses your review requirements. Feel free to contact this office if you have any questions or comments.

Very truly yours,
Graves Engineering, Inc.



Jeffrey M. Walsh, P.E.
Principal

cc: Jean E. Christy, P.E.; Tighe & Bond