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100 GROVE ST | WORCESTER, MA 01605

March 16, 2019

## PLANNING BOARD GRAFTON, MA

Joseph Laydon  
Town Planner  
Grafton Municipal Center  
30 Providence Road  
Grafton, MA 01519

Grafton Conservation Commission  
Grafton Municipal Center  
30 Providence Road  
Grafton, MA 01519  
508-856-0321  
F 508-856-0357  
gravesengineering.com

**Subject: Brigati Village - Proposed Multi-Family Development  
14 West Street and 41 Church Street  
Special Permit, Site Plan, Wetland Regulations and Stormwater  
Regulations Review**

Dear Joe and Conservation Commissioners:

We received the following documents on February 12, 2019:

- Full-size and reduced-size plans entitled Special Permit/Site Plan Approval for Brigati Village in Grafton, Massachusetts dated February 7, 2019, prepared by WDA Design Group for Brigati Village, LLC. (21 sheets)
- Bound document entitled Stormwater Management Report for Brigati Village, 41 Church Street, 14 & 15 West Street, Grafton, Massachusetts, 01519 dated February 7, 2019, prepared by WDA Design Group for David W. Brossi.
- Bound document entitled Traffic Impact and Access Study, Proposed Residential Development, 41 Church Street and 14 West Street, Grafton, Massachusetts dated January 2019, prepared by Tetra Tech for Brigati Village, LLC.
- Correspondence from WDA Design Group to Grafton Planning Board dated February 8, 2019, re: "Special Permit & Site Plan Approval, "Brigati Village" with attachments.

Graves Engineering, Inc. (GEI) has been requested to review and comment on the plans' conformance with applicable "Grafton Zoning By-Law" amended through October 15, 2018; Massachusetts Department of Environmental Protection (MassDEP) Stormwater Handbook and standard engineering practices on behalf of the Planning Board. GEI has also been requested to review and comment on the documents' conformance with applicable "Grafton Wetland Regulations" amended through May 2014 and Grafton Conservation Commission "Regulations Governing Stormwater Management" dated May 28, 2013 on behalf of the Conservation Commission. GEI was authorized to proceed with this review on February 19, 2019. As part of this review, GEI visited the area near the project entrance and the Church Street area on March 14, 2019. Prior to this review, GEI witnessed soil testing at the site on August 2, 2018 and offered preliminary review comments in a letter dated November 2, 2019.

**Our comments follow:**

### Zoning By-Law

1. The plans must include calculations for percentage of lot coverage by pavement. (§1.3.3.3.d.15)

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2. Traffic signs and a "Brigati Village" sign are shown on the Layout and Materials Plan. A construction detail must be provided for the traffic signs. GEI understands the "Brigati Village" sign will be reviewed by the Planning Board and its staff. (§1.3.3.3.d.23)
3. No solid waste disposal area is shown on the plans. The design engineer should confirm that each unit will have an individual waste container. (§1.3.3.3.d.24)
4. The By-Law requires "Adjacent to, and for the length of each side and rear lot line, there shall be a fifteen (15) foot wide area of landscaping." The plans propose tree clearing essentially to the side and rear lot lines near Buildings 8, 9 and 10 without any proposed plantings. (§5.2.2.3)
5. The Zoning Bylaw states "The construction of drainage, utilities and roadways [for Multi-Family Dwellings] shall be performed in accordance with the design and construction standards of the Rules and Regulations Governing the Subdivision of Land in the Town of Grafton. The special permit granting authority shall have the right to waive any of such special requirements" (§5.2.2.10). Considering the anticipated (reduced) vehicle speeds, the "traffic calming" layout and existing topography, GEI does not have an issue with the proposed horizontal or vertical road layouts. However, for the record waivers should be requested for design and/or construction elements that do not comply with the Subdivision Rules and Regulations. GEI offers the following:
  - a. The minimum centerline radius of a minor street must be 100 feet. The centerline radii of Drive "A" at Station  $\pm 5+00$  and Drive "B" at Station  $0+50$  are  $\pm 75$  feet. (SRR §4.1.3.2)
  - b. The tangent length at Station  $0+75\pm$  is less than 150 feet. (SRR §4.1.3.3)
  - c. The maximum centerline grade for streets must not exceed 4%. Approximately 400 feet of roadway is proposed with a grade of 7%. (SRR §4.1.5.2)
  - d. A minimum K-value of 28 must be used for crest curves and 35 for sag curves. The plans propose a crest K-value of 14 and a sag K-value of 33. (SRR §4.1.5.3)
  - e. Dead end streets may not be longer than 500 feet. The proposed roadways extend  $\pm 800$  feet into the site from an existing dead end street. (SRR §4.1.6.3)
  - f. Dead end streets must have a circular turnaround with a radius of 100 feet. (SRR §4.1.6.7)
6. On Sheet C5.05, the "Typical Roadway Section" construction detail needs to be revised to propose 2-3/4" of binder asphalt instead of 2". GEI understands that waiver requests for roadway material thicknesses are not typically approved. (SRR §5.2.2.2.b)
7. The outlet pipe from the subsurface detention system at the northwest corner of the site will create a concentrated stormwater discharge onto the abutter's property and toward a garage (the garage isn't shown on the plans) located on that property where no such concentrated discharge exists. An alternative discharge point needs to be chosen. Unless another discharge point is available, it may be warranted to connect to the drainage system in Church Street if this is acceptable to the Grafton Highway Department. (SRR §4.6.1)

### **Grafton Regulations Governing Stormwater Management**

8. GEI has no issues relative to compliance with the Grafton Stormwater Management Regulations except as noted in the following comment.
9. The 18" diameter outlet pipe (D-25) of Basin 1 is proposed too steep at a slope of 20.3%. The pipe slope needs to be revised (drop manholes may be needed) to limit the water velocity to ten feet per second. Likewise, the slopes of pipes D-13 and D-30 are too steep. (§6.B.3.d)

### **Grafton Wetland Regulations**

10. GEI has no issues relative to compliance with the Grafton Wetland Regulations except as noted in the following two comments.
11. Fences are not proposed at the open stormwater basins. (§V.B.5.(h)3)
12. The plans do not identify where proprietary stormwater treatment units are proposed. The Stormwater Management Report indicates that proprietary treatment units are proposed in the treatment trains containing infiltration BMPs. Eighty percent TSS removal must be achieved before stormwater enters the infiltration BMPs. (§V.B.5.(h)10)

### **Hydrology & MassDEP Stormwater Management Review**

13. GEI reviewed the hydrology computations and found them to be in order except as noted in the following five comments.
14. The time of concentration path for subcatchment EDA-101 has a length of 119 feet in the HydroCAD model but has a scaled length of 700 feet. The information must be consistent.
15. The HydroCAD model of Basin 1 includes a 10' wide weir at elevation 452.0, but the plans indicate the weir elevation is 452.6 with a scaled width of less than 10 feet. The information must be consistent. The weir information for Basin 2 is also inconsistent.
16. The outlet pipe of OCS-2 is identified as 449.90 on the construction detail, but it is modelled at elevation 452.0. The information must be consistent.
17. The HydroCAD model of Pond DB-4 includes an extra foot of drain stone over the top of the stone envelope of the StormTech chambers. It is not apparent that this extra stone is specified on the plans or construction details. It appears this layer of stone is necessary for containing the 100-year storm. The information must be consistent.
18. The HydroCAD model of Pond DB-4 includes three outlet orifices. There is only one outlet pipe shown from this system on the plans. The lowest outlet orifice is 0.5 feet below the bottom of the stone envelope. The information must be consistent.
19. Compliance with MassDEP Stormwater Handbook is reasonable.
20. The scale of the post-development hydrology plan is mislabeled as 1"=40' and should be corrected to 1"=100'.

21. The rim and invert elevations for structures DMH-11 and DMH-14 are not listed on the Structure Tables on profile Sheet C3.04, and their connecting pipes are also not listed. These structures and pipes must be listed, and it would be helpful if the plan viewports on the profiles could be expanded to include them.

### **General Engineering**

22. On the Erosion and Sediment Control Plan, there is an "ECB" note and leader south of the loam stockpile that don't point to any proposed ECBs; the note and leader should be moved or deleted.
23. The plans appear to show a proposed water connection at the intersection of West Street and Church Street, but this is not evident on the profile; proposed water utilities begin at Station 0+00 which is  $\pm 310$  feet from the intersection. The location of the water main connection needs to be clarified. Whereas the existing water main is only six-inch diameter, it would be prudent to upgrade to a larger diameter water main.
24. Top-of-wall and bottom-of-wall elevations should be provided for the retaining walls proposed in the eastern basin and west of Building 4.
25. Subsurface stormwater systems DB-4, INF-1 (A) and INF-1 (B) need to be labeled on Sheet C3.02.
26. Pipe invert elevations need to be provided on the plans for the stormwater basins' discharge pipes (i.e. FES-5, FES-6 and FES-7).
27. The drainage pipe is identified as HDPE on the profile sheets, but Utility Note 6 on the General Notes and Legend Sheet states that all drainage pipe must be RCP (reinforced concrete pipe). The information must be consistent.
28. Catch basin 5 must be shown on the profiles.
29. On Sheet C3.02, drafting of the proposed and former emergency spillway's riprap swale needs to be finalized. A leader note and breaks in the proposed topographic contours are associated with the former swale location.
30. The Planting Plan does not identify the trees labelled "QP" in the Plant Schedule.
31. The construction detail of the spillway specifies a channel width of "10' or 30'", but the scaled dimensions of the channels on the plans are  $\pm 5$  feet. The information must be consistent.
32. For durability, the two courses of bituminous pavement on the sidewalk construction detail should be increased from 1" to 1-1/2".
33. A construction detail was provided for a mortared fieldstone retaining wall. The location of this type of wall is not apparent on the plans; only CMU walls and a free-standing field stone wall are shown.

**General Comments**

34. A Traffic Study was included with this submission. GEI understands that this study will be reviewed by others.
35. There is only one fire hydrant proposed on site at the end of Drive "B" and one existing hydrant near the project entrance. It would be prudent to also propose a hydrant on Drive "A" near the intersection of Drive "B". GEI understands the Grafton Fire Department will review the plans relative to fire protection.
36. GEI understands that the Grafton Water District will review proposed water utilities and the Grafton Sewer Department will review proposed sewer utilities.

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: Wayne Belec; WDA Design Group