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March 8, 2019

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

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gravesengineering.com

EXHIBIT 16

RECEIVED

**Subject: The Ridings
Definitive Plan Review**

MAR - 8 2019

Dear Joe:

PLANNING BOARD
GRAFTON, MA

We received the following documents on November 9, 2018:

- Correspondence from Thompson-Liston Associates, Inc. to Grafton Planning Board dated November 7, 2018 re: Definitive Subdivision filing for Land at 88 Adams Road, Grafton, Massachusetts.
- Correspondence from Thompson-Liston Associates, Inc. to Grafton Planning Board dated November 9, 2018 re: Definitive Subdivision filing for Land at 88 Adams Road, Grafton, Massachusetts.
- Plans entitled The Ridings, Flexible Plan Preliminary Subdivision in Grafton, Massachusetts dated October 9, 2018, prepared by Thompson-Liston Associates, Inc. for Casa Builders & Developers Corp. (33 sheets)
- Plans entitled The Ridings, Predevelopment Drainage Area Plan in Grafton, Massachusetts dated October 9, 2018, prepared by Thompson-Liston Associates, Inc. for Steven Venincasa. (1 sheet)
- Plans entitled The Ridings, Postdevelopment Drainage Area Plan in Grafton, Massachusetts dated October 9, 2018, prepared by Thompson-Liston Associates, Inc. for Steven Venincasa. (1 sheet)
- Bound document entitled Drainage Report for The Ridings dated October 9, 2018, prepared by Thompson-Liston Associates, Inc., for Casa Builders & Developers Corp.
- Bound document entitled Traffic Impact Study; Proposed Residential Development, Grafton, MA and Westborough, MA dated February 2016, prepared by Conley Associates.

We also received the following documents on February 4, 2019:

- Bound document entitled USGS Web Soil Survey for 88 Adams Road, The Ridings.
- Bound document entitled Traffic Impact Study; Proposed Residential Development, Grafton, MA and Westborough, MA dated February 2016, prepared by Conley Associates with a supplemental traffic volume report dated December 6, 2018, prepared by Boston Traffic Data.

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- Document entitled Project Description for The Ridings dated January 31, 2019.
- Document entitled Environmental and Community Impact Analysis dated January 31, 2019 prepared by Thompson-Liston Associates, Inc.
- Correspondence from Thompson-Liston Associates, Inc. to Grafton Planning Board dated January 31, 2019 re: Definitive Subdivision filing for Land at 88 Adams Road, Grafton, Massachusetts. (Definitive Subdivision transmittal)
- Correspondence from Thompson-Liston Associates, Inc. to Grafton Planning Board dated January 31, 2019 re: Definitive Subdivision filing for Land at 88 Adams Road, Grafton, Massachusetts. (Application fee)
- Correspondence from Thompson-Liston Associates, Inc. to Grafton Planning Board dated January 31, 2019 re: Definitive Subdivision filing for Land at 88 Adams Road, Grafton, Massachusetts. (Revision comments)
- Correspondence from Thompson-Liston Associates, Inc. to Grafton Planning Board dated January 31, 2019 re: Definitive Subdivision filing for Land at 88 Adams Road, Grafton, Massachusetts. (Waiver requests)
- Plans entitled The Ridings, Flexible Plan Definitive Subdivision in Grafton, Massachusetts dated October 9, 2018 and revised December 6, 2018, prepared by Thompson-Liston Associates, Inc. for Casa Builders & Developers Corp. (35 sheets)
- Plan entitled The Ridings, Predevelopment Drainage Area Plan in Grafton, Massachusetts dated October 9, 2018 and revised December 6, 2018, prepared by Thompson-Liston Associates, Inc. for Steven Venincasa. (1 sheet)
- Plan entitled The Ridings, Postdevelopment Drainage Area Plan in Grafton, Massachusetts dated October 9, 2018 and revised December 6, 2018, prepared by Thompson-Liston Associates, Inc. for Steven Venincasa. (1 sheet)
- Bound document entitled Drainage Report for The Ridings dated October 9, 2018 and revised December 6, 2018, prepared by Thompson-Liston Associates, Inc., for Casa Builders & Developers Corp.

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 19, 2015; "Rules and Regulations Governing the Subdivision of Land, Grafton, Massachusetts" revised through April 27, 2009; Massachusetts Department of Environmental Protection (MassDEP) Stormwater Management Handbook and standard engineering practices. The comments below pertain to the latest version of the above-referenced documents.

Our comments follow:

Subdivision Rules & Regulations

1. The north point needs to be specified if it is true, magnetic or grid. (§3.3.3.6)

2. Bounds were only proposed along the rights-of-way. The plans must be revised to also include bounds at all angle points along the easements, access routes and open space areas and at points where easement lines and property lines intersect. These bounds must be granite and a construction detail should also be added. (§3.3.3.10 & §4.8.1)
3. Unless approved otherwise by the Planning Board, GEI understands that each plan sheet must be sequentially numbered (i.e. 1 of 35, 2 of 35, etc.). (§3.3.3.3)
4. Each plan sheet must have space for Planning Board action. (§3.3.3.3)
5. GEI understands the Planning Board will address waiver requests. Nevertheless, relative to the waiver request to allow sloped granite edging, the town typically requires vertical granite curb at intersection radii. (§4.2.1)
6. Except for the hydrology calculations, no documentation was submitted to demonstrate compliance with the MassDEP Stormwater Handbook and Stormwater Standards. (§4.7.8)
7. Rational Method pipe sizing calculations need to be submitted. (§4.7.8.1)
8. The plans need to be revised such that catch basins (granite inlet stones are required) are not located at or adjacent to driveway openings. For example, catch basins conflict with the driveways of Lot 9 and Lot 25. (§4.7.8.3)
9. On Sheet D-1, the specifications or manufacturer/model number of the catch basin frames/grates and the manhole rims/covers need to be coordinated with GEI or the Grafton Highway Department. (§5.4.1.1)
10. All pipes must be reinforced concrete pipes (RCP). The 12"-diameter HDPE pipes proposed for the outlet of the stormwater basin on Lot 21 need to be revised to be RCP. (§5.4.2.1)

Zoning By-Law

11. The open space access easement across Lot 20 is only twenty (20) feet wide. The plans show a proposed trail that runs through this easement; all trail easements must be twenty-five (25) feet wide unless in the opinion of the Planning Board sufficient buffering is provided. (§4.10.2)
12. GEI has no issues relative to compliance with Grafton Zoning By-Laws except as noted below in the following comment.
13. Grading for the development of Lots 23 and 24 extends into the Common Land adjacent to Lots 23 and 24. GEI defers to the Planning Board whether grading for lot development can occur on adjacent Common Land. (§5.3.11.b)
14. The site is listed on Sheet E1 as being located in the R4 zoning district, this is assumed to be a typographical error and should be corrected to R40.

Hydrology & MassDEP Stormwater Management

15. GEI reviewed the hydrology computations and found them to be in order except as noted in the following three comments.
16. The hydrology computations need to evaluate pre- versus post-development peak runoff rates for the flow path to the northwest from Lots 35 – 39.
17. The lines between subcatchment 16 and 23 need to be delineated. There are two red lines between lots 18 through 20 and the swale that have a different linetype than the other subcatchment boundaries.
18. The slope of the sheet flow for subcatchment 16 is approximately 6% opposed to the modeled 3%. Furthermore, no path for Tc was displayed on the post-development drainage area plan.
19. As noted in Comment #6, except for the hydrology calculations, no documentation was submitted to demonstrate compliance with the MassDEP Stormwater Handbook and Stormwater Standards.
20. Proposed grading of the drainage easement on Lots 21 and 22 needs to allow for unimpeded access to the stormwater basin that complies with the MassDEP Stormwater Handbook. The steep slope in the easement will impede access.
21. The proposed detention basin off Olive Circle should be listed as an infiltration basin. Exfiltration is utilized as an outlet device in the basin within the HydroCAD calculations which makes the basin an infiltration basin in terms of MassDEP Stormwater Handbook.

General Engineering

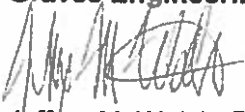
22. To better channelize passenger vehicle movements and to minimize the potential for drivers to encroach into the opposing lane during turning maneuvers, the intersection curb radii within the project should be no greater than 30 feet. Curb radii of approximately 45 feet were proposed.
23. On Sheet D-1, the "Precast Catchbasin" construction detail needs to include a hood at the catch basin's outlet and the depth of the sump needs to be revised from three feet to four feet.
24. Sheet D-1 includes a "Typical Drop Manhole" construction detail that is typically used for sanitary sewer but not drainage. The wye, elbow and vertical "down pipe" are not necessary for a drainage system; the construction detail should be deleted.
25. Pertinent elevations need to be provided for the open-bottom box culvert.
26. On Sheet P-1, DMH 9+90 is shown as having an invert out at an elevation of 433.30, which is believed to be a typographical error. This needs to be rechecked.
27. The scale on pre and post-development drainage needs to be corrected; the scale of 1" = 120' is incorrect.

General Comments

28. Sheet G-1 shows the proposed tree line going through the stormwater basin off Randolph Circle and across the basin's berm. This needs to be revised to go around the basin.
29. Sheet G-1 contains a typographical error regarding the inlet invert elevations of the 15" HDPE outlet pipes; the pipes are referred to as 12" instead of 15".
30. Whereas a Notice of Intent has not been filed yet with the Conservation Commission, GEI has not reviewed the project for compliance with the Grafton Stormwater Regulations or the Grafton Wetland Regulations.

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: James Tetreault, P.E., Thompson-Liston Associates, Inc.