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February 15, 2023

Hopedale Planning Board
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**Subject: Hopedale Ridge
Overdale Parkway
Definitive Subdivision Plan Review**

Dear Planning Board Members:

We received the following document on January 12, 2023 via email and on January 24, 2023 in hard-copy format:

- Correspondence from Bernstein, Shur, Sawyer & Nelson, P.A. to Hopedale Planning Board dated January 12, 2023, RE: Request for Subdivision Waivers, Overdale Parkway – Hopedale Ridge, 81W Modification Application.

We received the following documents on January 24, 2023:

- Correspondence from Allen Engineering & Associates, Inc. to Hopedale Planning Board dated January 10, 2023, Re: Comment Response Letter, Hopedale Ridge – Definitive Subdivision, On Overdale Parkway, Hopedale, MA 01747, Black Brook Realty, Hopedale Select Board & Ricardo Lima – Owners/Applicants.
- Plans entitled Hopedale Ridge, A Definitive Subdivision Plan on Overdale Parkway in Hopedale, MA 01747 dated February 11, 2022 and revised January 10, 2023, prepared by Allen Engineering & Associates, Inc. for Black Brook Realty Corp., Ricardo Lima, and Hopedale Select Board. (8 sheets)
- Document entitled Drainage Analysis for “Hopedale Ridge”, 10 Lot Subdivision in Hopedale, MA 01747 dated February 11, 2022 and revised January 10, 2023, prepared by Allen Engineering & Associates, Inc. for Ricardo Lima, Black Brook Realty, and the Town of Hopedale.
- Bound document containing Form 11 - Soil Suitability Assessments.

Graves Engineering, Inc. (GEI) has been requested to review the plans and supporting materials for compliance with Sections 8 and 13 of the Zoning By-Laws, Town of Hopedale, Massachusetts, dated August 24, 2014, the Rules and Regulations Governing the Subdivision of Land, Planning Board, Hopedale, Massachusetts (SR&R) dated May 1976, the Massachusetts Department of Environmental Protection (MassDEP) Stormwater Handbook and standard engineering practices. As part of our initial review, GEI visited the site on June 7, 2022.

This letter is a follow-up to our previous review letter dated June 14, 2022. For clarity, comments from our previous letter are *italicized* and our comments to the design engineer’s responses are depicted in **bold**. Previous comment numbering has been maintained.

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WASTEWATER | STORMWATER | WATER | SITE DEVELOPMENT | SURVEYING

Our comments follow:

Zoning By-Law

1. *GEI has no issues relative to compliance with the Zoning By-Laws except as noted in the following comment.*

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

2. *The parking spaces for the proposed 12-space parking lot scale to 9 ft. x 18 ft (the dimensions are not currently specified). Per the by-law, the minimum standard dimensions are 9 ft. x 19 ft. (§8.1.a & §8.1.b)*

Acknowledged. The parking lot was revised to propose four parking spaces with the dimensions 9 ft. x 19 ft.

Subdivision Rules and Regulations

3. *The plans propose private septic systems for each lot instead of sanitary sewer lines in the public way. The results of percolation tests and water table information need to be provided. (§III.C.2.o)*

Acknowledged. The results of the percolation tests and water table information were included in this submission and the testing locations were added to Sheet G-1.

4. *The plans propose a roadway width of 20 feet instead of 30 feet. The existing roadway width in the vicinity of the project is approximately 20 feet. Considering the width of the existing roadway, GEI does not have an issue with the proposed width of 20 feet. GEI defers further consideration of the pavement width, if any, to the Planning Board. (§IV.A.2)*

The plans were revised to propose a roadway width of 24 feet. The design engineer responded that they discussed the roadway width with the Planning Board, and an amended waiver has been requested to allow this roadway width. GEI has no issue with the waiver request and understands that the Planning Board will address waiver requests.

5. *The plans propose overhead electrical wires as an extension of the existing overhead wires on Overdale Parkway instead of underground utilities. In GEI's opinion, it would be prudent to provide underground electrical and communications utilities rather than overhead utilities. GEI defers to the Planning Board regarding this matter. (§IV.F)*

Acknowledged. The plans were revised to propose underground electric utilities beginning at station 14+00.

6. *The plans do not currently propose fire hydrants or fire cisterns. It is GEI's understanding that Overdale Parkway does not currently have a water main or fire hydrants, and the Hopedale Fire Department has reviewed the plans and stated it has no issues regarding public safety. GEI defers further consideration of this matter, if any, to the Planning Board. (§IV.J)*

The plans were revised to propose a 20,000-gallon fire cistern adjacent to the parking lot. The waiver request was revised to request the allowance of a cistern compatible with Hopedale Fire Department's equipment and apparatus. GEI defers to the Planning Board and Fire Department regarding this waiver request.

7. *GEI understands the proposed compacted 1" thickness of top course bituminous asphalt is per the regulations. Nevertheless, GEI recommends a minimum thickness of 1.25" for ease of construction and durability. (§V.B.5)*

Acknowledged. The “LID Roadway Cross Section” construction detail was revised to propose a top course thickness of 1.25”.

8. *The plans need to include proposed trees along the roadway. Trees can't be planted in the right-of-way where a roadside swale is proposed. Consideration could be given planting trees outside the right-of-way in the temporary construction easement wherever existing trees are removed. For example, Sheet G-1 shows earth cuts on Lots 3, 4, 5 and 6, and earth fills on Lots 9 and 10 that will require tree removal. (§V.G)*

Sheet P-1 was revised to depict native street trees on the proposed lots (two per lot), and Sheets P-1 and G-1 were revised to show White Pine Trees at 25 feet on center along the property line near #21 Overdale Parkway. The waiver request was revised to request the allowance of at least two Norway Maples, or a tree of similar quality and size, per house lot. GEI understands that the Planning Board will address this waiver request.

9. *The plans do not propose any street lighting. Consideration should be given to providing a streetlight at the cul-de-sac adjacent to the parking area. (§V.H.4)*

Acknowledged. Sheets P-1 and G-1 were revised to propose a streetlight at the parking lot.

Hydrology & Stormwater Management Review

10. *GEI reviewed the hydrology computations and found them to be in order except as noted in the two following comments.*

GEI reviewed the revised hydrology computations and found them to be in order except as noted in comment 28a.

11. *The modeling of Subcatchment 8S (shown as Subcatchment 9S on the Proposed Drainage Plan) needs to be reviewed by the design engineer. GEI estimated the total area of this subcatchment to be approximately 67,000 square feet but the subcatchment was modeled as having 42,282 square feet. Also, the Proposed Drainage Plan will have to be updated to be consistent with the hydrology model relative to Subcatchments 8 and 9.*

Acknowledged. The hydrology calculations for Subcatchments 8S and 9s were revised to model the overall area of each subcatchment and to correct the subcatchment labeling.

12. *The modeling of the infiltration basin's outlet control structure needs to be revised for the following reasons:*

- a. *The 8" diameter opening was modeled in the horizontal plane instead of the vertical plane.*

Acknowledged. The hydrology calculations were revised to model the opening in the vertical plane.

- b. *The grate at the top of the structure (at elevation 495.00) was modeled twice.*

Acknowledged. The hydrology calculations were revised to model the grate once.

- c. *The grate at the top of the structure was modeled in the vertical plan instead of the horizontal plane.*

Acknowledged. The hydrology calculations were revised to model the grate in the horizontal plane.

- d. The top of the outlet control structure is proposed to be elevation 495.00. The top slab of a drainage structure such as this is typically 8" thick, so the bottom of the top slab will be elevation 494.3+/- . Approximately half of the 12" diameter orifices proposed at elevation 493.75 will be blocked by the top slab.

Acknowledged. The 12-inch diameter orifices were replaced with 10-inch orifices proposed at elevation 493.4. This will leave 0.17 feet between the top of the orifices and the bottom of the slab.

13. Compliance with the MassDEP Stormwater Handbook is reasonable except as noted in the five following comments.

Compliance with the MassDEP Stormwater Handbook is reasonable.

14. In the infiltration basin, there needs to be at least one (1) foot of freeboard as measured from the 100-year peak water surface to the top of the impoundment. As modeled in the hydrology computations, there will only be 0.31 feet of freeboard.

Acknowledged. The infiltration basin was revised to have a top of impoundment elevation of 596.50, providing 1.01 feet of freeboard.

15. The infiltration basin needs to have an emergency spillway.

Acknowledged. The infiltration basin was revised to include a 12-foot-wide emergency spillway.

16. Information on Sheet G-1 of the plans shows the infiltration basin's outlet pipe to have a slope of 0.083 (although in the hydrology computations the pipe was modeled with a slope of 0.735). The pipe slope is too steep and will result in excessive water velocities. The slope of the pipe needs to be reduced such that the water velocity will not exceed 10 feet per second.

Acknowledged. The plans and hydrology computations were revised such that the slope of the pipe is 1.67%.

17. Access to the infiltration basin on Lot 10 is proposed along the side of a 3H:1V (33%) slope; the access is too steep and will not be usable by maintenance equipment. Grading on the access way needs to result in a cross slope no greater than 4%.

Acknowledged. The grading at the access path was revised so that access to the basin is outside the 3H:1V slope.

18. For adequate total suspended solids (TSS) removal, the Concrete Drop Inlet construction detail on Sheet D-1 needs to be revised to provide a four-foot-deep sump instead of a two-foot deep sump.

Acknowledged. The Concrete Drop Inlet construction detail was revised to provide a minimum of a four-foot-deep sump.

General Engineering Comments

19. GEI understands the proposed 12-space parking lot will serve as public parking for visitors to the adjacent Hopedale Parklands. If so, the parking lot requires accessible parking in accordance with the Massachusetts Architectural Access Board.

Acknowledged. The parking lot was revised to include four parking spaces, one of which will be ADA compliant.

20. On Sheet G-1, the pipe information (slope, length) for the proposed drainage system should be included.

Acknowledged. Sheet G-1 was revised to include the required pipe information.

21. *A construction detail for the surface treatment and gravel base of the proposed 12-space parking lot needs to be included in the plans.*

Acknowledged. Sheet D-1 was revised to include a construction detail for the parking lot pavement cross section.

22. *A construction detail for the proposed concrete headwalls needs to be included in the plans.*

Acknowledged. Upon further review, the headwall construction detail is included on Sheet D-1.

23. *On Sheet G-1, the proposed limit of clearing currently passes through the proposed infiltration basin and needs to be revised.*

Acknowledged. Sheet G-1 was revised to depict the limit of clearing following the edge of the infiltration basin.

General Comments

24. *On Sheet L-1, the professional land surveyor's statement needs to reference the Town of Hopedale instead of the Town of Upton.*

Acknowledged. The professional land surveyor's statement was revised to reference the Town of Hopedale.

25. *Sheet G-1 shows the infiltration basin extending onto Lot 9. Sheet L-1 needs to be revised to include the proposed grading, drainage, and access easement on Lot 9.*

Acknowledged. Sheet L-1 was revised to include the easement on Lot 9.

Additional Comments, February 15, 2023

26. **The plans need to show proposed work in black line-type instead of greyed-back. Sheet G-1 now shows the proposed roadway grading and infiltration basins greyed-back, which makes these features difficult to distinguish from existing features.**

27. **Relative to the waiver request pertaining to extending the Town's sewer utility to the Hopedale Ridge subdivision, please also refer to GEI's letter to the Planning Board dated November 2, 2022. Beyond GEI's November 2, 2022 letter, GEI would like to provide the following responses/comments to points made in correspondence from Bernstein, Shur, Sawyer & Nelson, P.A. to Hopedale Planning Board dated January 12, 2023:**

- a. **Section IV.H of the SR&R does not specify that distances from each individual lot within a subdivision to the existing sanitary sewer be considered. The distance is measured to the subdivision's boundary. The number of lots within 2,000 feet of the existing sanitary sewer holds little relevance.**
- b. **Septic systems would discharge wastewater to the soil overburden and private wells would draw water from deeper bedrock located under the soil overburden. Depending upon the hydrologic interaction between overburden soils and underlying bedrock, any balance of potable water withdrawal and wastewater disposal may not be realized on a lot-by-lot basis or even a subdivision basis.**

- c. To reiterate a point in my November 2, 2022 letter, the area's topography indicates that a sewer pump station is likely not needed; a gravity connection appears to be feasible.
28. On February 8, 2023, GEI received concerns/comments raised by one of the conservation commissioners and communicated to the Planning Board on or about January 31, 2023. GEI offers the following comments pertaining to those issues:
- a. The hydrologic/hydraulic modeling of Culvert 8R needs to be re-analyzed and the plans possibly revised. Culvert 8R is connected to and downstream of a drop inlet. Culvert 8R was modeled as a "reach," as opposed to modeling the culvert and drop inlet as a "pond." The hydrology computations show that the culvert does not have adequate capacity during the peak flows of a 100-year storm event - the calculations showed 19.81 cfs flowing to the culvert but only 15.69 cfs flowing out of the culvert. The flow to the culvert that exceeds the culvert's hydraulic capacity would fill and then bypass the drop inlet. GEI recognizes that the water level buildup within the drop inlet would increase the culvert's capacity because the culvert would then operate under pressure-flow conditions, a situation not addressed when the culvert is modeled as a reach.
 - b. The Long-Term Operation and Maintenance (O&M) Plan has the minimum maintenance criteria. The O&M Plan should be expanded to include all stormwater features (e.g., the driveway culverts) and detailed maintenance thereof, and blank stormwater management documents such as checklists that could be copied and filled-out by the system operator. GEI also recommends that the O&M Plan be a stand-alone document so that it can be used during operation and maintenance activities.

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: Mark E. Allen, P.E.; Allen Engineering & Associates, Inc.