



100 GROVE ST. | WORCESTER, MA 01605

T 508-856-0321

F 508-856-0357

gravesengineering.com

December 26, 2019

Shrewsbury Planning Board
100 Maple Avenue
Shrewsbury, MA 01545

**Subject: Edgemere Crossing at Flint Road
Site Plan Review**

Dear Planning Board Members:

We received the following documents in our office December 6, 2019:

- Plans entitled Site Plan for Edgemere Crossing at Flint Pond, 180-222 Hartford Turnpike dated June 19, 2019 and last revised November 25, 2019, prepared by R.J. O'Connell & Associates, Inc. for Route 20 Nominee Trust and Demoulas Super Markets, Inc. (61 sheets)
- Bound document entitled Stormwater Report, Edgemere Crossing at Flint Pond, Shrewsbury, Massachusetts, dated June 19, 2019 and updated November 25, 2019, prepared by R.J. O'Connell & Associates, Inc. for Route 20 Nominee Trust and Demoulas Super Markets, Inc.

Graves Engineering, Inc. has been requested to review the plans and supporting materials for compliance with the Rules and Regulations Governing Special Permits & Site Plan Review with amendments through September 7, 2017; Zoning Bylaw, Town of Shrewsbury, Massachusetts with amendments through October 22, 2018; Massachusetts Department of Environmental Protection (MassDEP) Stormwater Handbook and standard engineering practices.

This letter is a follow-up to our previous review letter dated July 23, 2019. 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.

Our comments follow:

Rules and Regulations Special Permit and Site Plan Review

1. *GEI has no issues relative to compliance with the Shrewsbury Rules and Regulations Governing Special Permits & Site Plan review except as noted in the two following comments. **GEI has no issues relative to compliance with the Shrewsbury Rules and Regulations Governing Special Permits & Site Plan.***
2. *On Sheet C-2B, the southernly set of two handicap parking spaces at the 24,250 square-foot retail building needs more information to show proper grading (2% maximum in any direction). (§IV.1.g.19)*
Acknowledged. Proposed spot elevations were provided at the handicap parking spaces; the grades are less than 2%. The 24,250 square-foot building and associated parking area were reconfigured; two smaller buildings are proposed. The design engineer should recheck the four proposed spot elevations at the handicap spaces nearest the 4,000 square-foot building. The spot elevations show a level area; a grade of approximately 1% should be provided for drainage.

x:\shared\projects\shrewsbury\edgemerecrossingatflintpond\docs\spb122619ecfp.ltr.docx

3. *There needs to be delineation for any areas to be used as un/loading spaces. (§IV.1.g.12 & ZBL §VII.F.3.c.2)*
Acknowledged. Loading spaces were identified on Sheets C-4A through C-4D.

Zoning Bylaw

4. *GEI has no issues relative to compliance with the Shrewsbury Zoning Bylaw except as noted in the two following comments.*
GEI has no issues relative to compliance with the Shrewsbury Zoning Bylaw.
5. *On Sheets L-1 and L-2B, there are two sections on the north side of the project between the two entrances that have a break in landscaping. The landscaping provided needs to be continuous along the edge of Route 20 or groupings with the equivalent of one canopy tree per 25 linear feet of frontage. (§VII.N.7.b)*
Acknowledged. The two breaks in landscaping were reduced in size and additional ornamental trees were provided.
6. *The 24,250 square-foot retail building needs to include outdoor amenities. (§VII.N.9.d)*
Acknowledged. The 24,250 square-foot building and associated parking area were reconfigured to two buildings and Sheet L-2B was revised to include an amenity area at the larger building.
7. *On Sheet C-4D, there may be a potential issue with reaching the rear side of Building 8A in the case of a fire. GEI defers to the Fire Department if there is adequate access for their emergency response needs. (§VII.F.3.c.7)*
No further comment.

Hydrology & Stormwater Management Review

8. *GEI has reviewed the hydrology (HydroCAD) calculations and found them to be in order except as noted in the following three comments.*
Please see Comment 11.
9. *GEI disagrees with the use of "Woods, fair" ground cover for modeling the wooded areas. Per TR-55, "woods, fair" represents ground cover whereby the woods are grazed but not burned, and some forest litter covers the soil. Based upon aerial photography and GEI's understanding that the woods are currently not being used, the wooded areas appear to consist of "Woods, good" ground cover (the woods are protected from grazing, and litter and brush adequately cover the soil). Furthermore, Appendix C of MassDEP's Hydrology Handbook for Conservation Commissioners states "Most woods in Massachusetts have forest litter and brush covering the soil and should be considered in "good hydrologic condition". A few trails on the forest floor should not change this." In short, the woods should be modeled as having "good" ground cover.*
Acknowledged. The hydrology computations were revised to model the wooded areas as "Woods, good."
10. *On Sheet C-7, the table shows the orifice for OCS-1 to be thirty-six inches by four inches which differs from the HydroCAD model. The orifice was modeled to be thirty inches by three inches. This information needs to be consistent.*
Acknowledged. On-site Stormwater Basin 1 was eliminated.

11. *On Sheets C-2A – C-2E, the discharge culvert pipes' diameters and slopes for Basins 1 - 5 and Basin 7 are inconsistent with what was modeled in HydroCAD. This information needs to be consistent.*
The outlet pipe diameter for Infiltration Basin 4 is not consistent between the plans and hydrology computations. The Outlet Control Structure construction detail on Sheet C-7 needs to clarify that Infiltration Basin 5 has three outlet control structures.
12. *GEI has no issues with the pipe sizing calculations.*
GEI has no issues with the revised pipe sizing calculations except that on page 4 the computations need to include the flow from catch basins CB4-8 and CB-4-9 to flared end section FES4-1.
13. *GEI has no issues relative to compliance with the MassDEP Stormwater Standards and Handbook.*
No further comment necessary.
14. *On Page 12 of the Stormwater Report, the engineer has a table with drawdown calculations. GEI was unable to confirm the reported drawdown times using the other data provided in the table. Nevertheless, GEI's estimated drawdown times met the MassDEP standard of no more than 72 hours. For the record, the design engineer should recheck the calculated draw down times to confirm they are correct and give an example of how the drawdown times were calculated.*
Acknowledged. The Drawdown Calculations table was revised. GEI has no issues with the calculated drawdown times.
15. *References to the Cambridge Water Department need to be removed from Section 4 – Snow Management of the Stormwater Report. Also, relative to snow storage areas, Section 4 refers to a Site Layout Plan; the reference needs to be changed to the Snow Management Plan - Sheet SMP-1. GEI has no issues with the proposed snow storage locations (at parking areas) provided that stored snow is removed as necessary to maintain adequate parking for the retail and residential uses.*
Acknowledged. References to Cambridge Water Department in Section 4 - Snow Management of the Stormwater Report of the Operation and Maintenance Plan were deleted and Sheets C-4A through C-4E were revised to identify snow storage areas.

General Engineering Comments

16. *On Sheet C-1C, there are two leader notes pointing to the existing 12-inch CI Grafton State Hospital Water Main. One leader states "Protect existing waterline until ... inspected and made operational" while the other states, "435 linear feet to be removed." However, the length of the waterline enclosed by the "cloud" line-type is approximately 715 feet. The design engineer needs to clarify the length of the water main to be removed.*
Acknowledged. Sheet C-1C was revised to clearly show the work associated with the existing water main and that the work is to be coordinated with the DPW.
17. *On Sheets C-1A - C-1E, the infiltration basins will be utilized as as temporary sediment basins during construction. To preserve the intended infiltration rates, a note should be added to excavate the temporary sediment basins to one foot above the proposed infiltration basin bottom elevations and maintain those elevations until the tributary areas are permanently stabilized. Upon stabilization of the tributary areas, the bottoms of the basins can then be excavated to the proposed elevations and stabilized.*

Acknowledged. Sheets C-1A – C-1D were revised to include the above-referenced note.

18. *On Sheet C-4A, it is unclear if a sidewalk is proposed along Hartford Turnpike between the two project entrances. GEI understands that off-site improvement plans are being prepared by another engineer. Nevertheless, considering the new residential and retail uses and the pedestrian traffic these uses will generate, consideration should be given to a sidewalk along Hartford Turnpike.*

Acknowledged. Sheet C-4A was revised to include the following note at the sidewalk location: “Mixed use path (see plans by others).”

19. *On Sheet C-4B, a sidewalk should be provided from the main access driveway to the 24,250 square-foot retail building.*

Acknowledged. The plans were revised to include a sidewalk system to the buildings in this reconfigured area.

20. *On Sheet C-7, the construction detail for the outlet control structure needs to provide the width and length of the structure.*

Acknowledged. The construction detail was revised to include the structures’ dimensions.

21. *On Sheet C-7, the construction detail for the drain manhole needs to include an invert channel.*
The drain manhole construction detail needs to be revised to address this comment.

22. *A schedule of parking signs needs to be provided on the plans (e.g. details for W11A-2, R5-1, R1-1).*

Acknowledged. Upon further review, a traffic control schedule was provided on Sheet C-4E. The table was updated during revision of the plans.

General Comments

23. *On Sheet OS-1, the north arrow is facing the wrong direction and needs to be revised.*

Acknowledged. The north arrow was reoriented.

24. *On Sheet OS-1, there is a typographical error for footnote 1. It refers to §VII.O.10.A for Mixed-Use Development and needs to be corrected to §VII.N.10.A.*

Acknowledged. The typographical error was corrected.

25. *On Sheet OS-1, there appears to be a typographical error in the zoning table. Under the open space section, it refers to footnote 4; no such footnote is on this sheet.*

Acknowledged. The typographical error was corrected.

26. *GEI understands that a separate stormwater design and permit package for the off-site basins will be prepared by VHB and submitted as part of the off-site roadway improvement package.*

No further comment necessary.

27. *GEI understands water and sewer utilities will be reviewed by Shrewsbury Water and Sewer Departments respectively.*

No further comment necessary.

28. *GEI understands a traffic consultant will review on-site traffic circulation and vehicle parking configurations.*

No further comment necessary.

29. *GEI understands the signs (other than traffic signs) will be reviewed by Shrewsbury Planning Board and/or Town Staff.*

No further comment necessary.

Additional Comments, December 26, 2019

30. **On Sheet C-7, the Outlet Control Structure construction detail needs to be revised to clearly identify that Infiltration Basin 5 will have three (3) outlet control structures, each with a 36" wide x 6" high orifice.**
31. **The flared end section invert elevations need to be labelled for the infiltration basins' outlet pipes.**
32. **The slope of the 24" diameter outlet pipe from OCS5-3 (Infiltration Basin 5) appears to be too steep and the slope of the 24" diameter outlet pipe from Infiltration Basin 7 is too steep; water velocities will be excessive. The slopes need to be revised.**
33. **On Sheets C-2A and C-2B the elevations are missing for the drain manhole between OCS5-3 and FES W2-3.**
34. **The drainage structures identified as CB4-8, CB4-9 and DMH4-4 in the Rational Method calculations need to be labelled on the plans.**
35. **On Sheet C-2C a catch basin south of the residential dwellings needs elevation information and a label.**
36. **On Sheet C-2D the pipe diameters need to be labeled for the drainage pipes between DMH5-23 and DMH5-25.**
37. **It is not clear what the purpose is for the 6" CPP drainage pipe system located west of the supermarket. The design engineer should explain.**
38. **Upon further review, the "V"-shaped swale in the "Drainage Channel" construction detail on Sheet C-7 should be revised to a flat-bottom or parabolic cross section to avoid the potential for scour/erosion that would occur at the invert of the "V" cross section.**

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