December 24, 2018

Ms. Maren Toohill  
Town Planner  
Town of Littleton Planning Board  
Shattuck Street Municipal Building  
37 Shattuck Street, Room 303  
Littleton, MA 01460

Subject: Engineering Review Services of Site Plan/Special Permit Application for “King Street Senior Residential Development”  
Littleton Planning Department

Dear Ms. Toohill:

Pursuant to our agreement with the Town of Littleton, Green International Affiliates, Inc. (Green) is submitting this letter report of the findings from our peer review of the Site Plan and Special Permit Application Package for King Street Senior Residential Development, Littleton, MA.

This peer review investigates the documentation for compliance with Chapter 173, Zoning Bylaw, Chapter 38. This review included an examination of the following documents:

- Plans titled “Special Permit Plan – King Street Senior Residential Development, Littleton, MA” prepared by Ducharme & Dillis Civil Design Group, Inc., dated October 9, 2018 and containing ten (10) sheets;
- Report titled “Stormwater Report for Map U42, Parcel 9-2 Behind 80 King Street in Littleton, Massachusetts,” prepared by Ducharme & Dillis Civil Design Group, Inc., dated October 9, 2018;

Green offers the following comments resulting from our review of the above documents as they pertain to the cited regulations. Please note that this peer review is not a complete review of the project design and does not relieve the Applicant and Engineer of meeting all requirements of local, state and federal regulations. The highlighted items below are items that we have deferred to or made a recommendation to the Planning Board.

**Site Plan Review Comments:**

1. The Applicant should show the intersection of King Street and Mill Road on the plans. Per MassDOT’s Project Development & Design Guide, driveways with large volumes should be designed as intersections. Exhibit 6-34 specifies that an intersection spacing of 75-feet is required on King Street given the 40-mph speed limit and it appears that this requirement is not met. The Applicant will be
required to obtain a MassDOT Access Permit for the Senior Residential Development driveway. The Applicant should revise the entrance to meet the requirement for intersection spacing.

2. The Typical Road Cross-Section between Sta. 0+00 – Sta. 3+50 illustrates a superelevated roadway. Catch basins are proposed on both sides of the roadway. The catch basins on the right side of the roadway will not collect any water. The Applicant should review this location and confirm the need for superelevation and/or catch basins along the roadway.

3. At all crosswalk wheel chair ramps, the location of the detectable warning panel(s) is incorrect. Detectable warning panels are to be placed where the pedestrian enters the roadway. The Applicant should revise the location of the detectable warning panel to match MassDOT’s Construction Standard Details and meet ADA/MAAB Standards.

4. The Applicant should provide wheelchair ramps near Sta. 6+75 RT, Sta. 6+90 RT, Sta. 7+50 and at the parking stalls near Sta. 2+75 LT.

5. The Applicant should revise the plans to show the sidewalk traveling across the driveway entrances instead of the wheelchair ramps shown at each driveway. The Applicant should refer to MassDOT Standard Detail E107.7.0 and E107.8.0.

6. The crosswalks near Sta. 6+20 and Sta. 7+50 do not have a destination that is ADA compliant. The Applicant should provide wheelchair ramps and ADA complaint path on both sides of the crosswalks.

7. The Applicant should include a stop bar and stop sign near Sta. 9+75 RT. The Applicant should also include a stop bar near 0+10 LT.

8. Notes 1.1 and 1.2 under the Layout & Material Specifications Section note Sta. “X+XX”. The Applicant should provide the appropriate station numbers.

9. The Typical Road Cross Sections do not call out the Bituminous Cape Cod Berm. The Applicant should include call outs to the berm so that the appropriate detail can be referenced.

10. The Applicant should provide Bottom of Wall and Top of Wall elevations on all retaining walls. This is particularly important at the walls near the King Street intersection.

11. The improvements near the roadway entry off King Street should be better defined on the Layout Plan. Is the existing parking area going to be removed or reshaped? The eastern retaining wall is right on the property line. Is the retaining wall width drawn accurately? The detail shows a distance between the retaining wall and the sidewalk. A guard rail should be added to provide fall protection.

12. The contours shown along the eastern edge of the roadway show grades sloping towards the property line. With the offsite areas also sloping towards the same property line, a “ditch” is formed to intercept the runoff and direct it towards King Street where it becomes trapped along the retaining wall and the King Street Roadway Embankment and likely spreads onto the neighboring property. The Applicant should consider a culvert underneath the roadway at the intersection to carry water onto the property and better mimic existing conditions.

13. § 1807.2.1 of Massachusetts State building Code (780 CMR) states, “Retaining walls that support an unbalanced height of retained material greater than six feet (1.83 m), and any retaining system or slope that could impact public safety or the stability of an adjacent structure shall be designed by a...
registered design professional.” While the proposed retaining walls at the entry are only 5 feet in height, they could impact the stability of the roadway at the intersection, therefore it’s Green’s recommendation that they be designed by a registered design professional. This could be easily accomplished by the manufacturer of the precast block wall system and can be completed during shop drawing review.

14. The Applicant should describe the design standards used for the tennis courts. If desired, Green can provide references to appropriate design and construction standards.

**Zoning Bylaw Comments:**

15. § 173-18-C of the Zoning Bylaw states that major topographic changes be minimized. The existing site topography mimics a depressional area with all surrounding offsite areas draining towards the property with no known outlet. The soils are indicated to be well draining therefore the site has not become a wetland area and is likely able to temporarily store and infiltrate the approximately 15.98-acre (onsite and offsite) watershed. The Applicant proposes to fill and raise the site by an average of 4 feet and direct runoff to the perimeter taking away the sites natural ability to store and infiltrate runoff. Subsurface infiltration areas are proposed, but hydrologic calculations should be provided to demonstrate their ability to manage major storm events. Additionally, it’s unclear why the site needed to be raised as much as it is as it results in retaining walls at several locations along the perimeter of the site. **We respectfully defer to the Board to determine whether further analysis of this item is required.**

16. § 173-18-C of the Zoning Bylaw also states that removal of existing trees be minimized. While not indicated on the Existing Conditions Plan provided, a visit to the site revealed that the majority of the site is densely vegetated with trees. The development will remove a large number of trees and the Applicant is not currently showing any new trees. Green recommends that, a minimum, the tree limits be shown on the plans and any individual trees that can be saved be clearly identified. **We respectfully defer to the Board to determine whether further analysis of this item is required.**

17. § 173-18-E indicates that adequate utility structures be provided. A new water line is shown to connect to the existing water main within King Street.

- The size of the water main should be added to the plans.
- Fire hydrants and water shutoff valves should be shown on the plans.
- As there is only one water connection to the main, there is no way to back feed the system. Therefore, if there is a break in the line at any point, the whole development would be without water. The Applicant should consider adding a new connection to the water main in King Street and adding additional valves to enable isolation of different parts of the system to ensure adequate fire protection is always available. This would require coordination with the Littleton Water Department.
- The Applicant should confirm that adequate water is available from the Town water main to service the proposed development both for regular operations and during a fire.
- The Applicant should confirm the water line can bend at the radius shown and add bends as required.
- The Applicant should confirm the tee junction of the water loop, the utility plan shows a water line stopping suddenly near Unit 1 without connection.
• The electric line ends without any connection near Unit 15. The applicant should confirm the connection and feasibility of the location of electric line.

• As electric lines are pulled through conduits and have specific bend requirements, the Applicant should provide handholes to accommodate.

• The gas line loops around the buildings and connects to the drain line. The Applicant should confirm the location of the gas line.

18. § 173-29 mentions the lot shape requirement, the area for the lot is mentioned as two different numbers in two different plans, 191,664 SF in the Layout Plan and 193,522 SF in Existing Conditions Plan. The applicant should confirm the right number for the lot area.

19. The Intensity of Use Schedule indicates an accessory structure setback requirement of 10 feet in a Residential District. A retaining wall which retains four (4) or more feet of unbalanced fill is listed in the definition of “Structure”. The wall at the entrance at 5 feet tall and would not meet the 10 foot setback requirement. **We respectfully defer to the Planning Board for an opinion on this item.**

Special Permit Submission Requirements Comments:

20. The Special Permit Application submitted is out of date. A new Permit Application form became effective May 3, 2018. The Applicant should submit the newer application and pay special attention to the Submission Requirements listed on Page 3.

Special Permit Senior Residential Development Bylaw Comments:

21. The Special Permit Application should be revised as needed to represent 17 units instead of 30.

22. Per § 173-148-A, maximum height of Principal and accessory structures is 32 feet. The Applicant should provide the height information for review.

23. Checking conformance with § 173-149-B requires review of architectural plans which is excluded from Green’s scope of work.

24. § 173-149-D requires that outdoor walkways be designed for universal access. The longitudinal slope on the walkway on the southern end of the property does not appear to be ADA/MAAB compliant, particularly at the proposed retaining wall where the slope is measured at 8%, which exceeds the maximum allowable of 5%.

25. In § 173-152-2-c, reducing the volume of cut or fill is discussed. This is similar to § 173-18-C. See comment #14. The Applicant should demonstrate that they are taking necessary measures to comply with the bylaw. **We respectfully defer to the Board to determine whether further analysis of this item is required.**

26. In § 173-152-2-d, reducing the number of trees six inches trunk diameter and larger proposed to be removed is discussed. This is similar to § 173-18-C. See comment #15. The Applicant should demonstrate that they are taking necessary measures to comply with the bylaw. **We respectfully defer to the Board to determine whether further analysis of this item is required.**

Aquifer and Water Resource District Special Permit Comments:

27. Per § 173-62.D.5, an analysis by a qualified engineer experienced in groundwater evaluation and/or geohydrology shall be provided when applying for a special permit. The Applicant should submit the analysis with the required information.
28. Per § 173-63.E, monitoring wells shall be constructed onsite; a monitoring schedule will be determined by the Planning Board in consultation with the Littleton Water Department. We recommend that the number and location of these monitoring wells be coordinated with the Town of Littleton Water Department.

Stormwater Report:

29. Per Vol. 2, Ch. 2 of the Massachusetts Stormwater Handbook, infiltration BMPs require a minimum of two feet of separation to seasonal high groundwater elevation. Test pits are required where the infiltration BMPs are proposed to demonstrate the minimum separation is provided. No test pit information is provided in the report for any of the subsurface infiltration areas. The Applicant should provide the test pit and permeability test information.

30. Per Massachusetts Stormwater Standard No. 2, the post-development peak discharge rates should not exceed pre-development. The Applicant has indicated compliance with this requirement in appendix D and E, but the appendices don’t contain any calculations. The Applicant should include the relevant calculations for all storm events listed.

31. A fairly large, 3-foot-deep depressional area is being created along the northern property line with about 3.88 acres tributary. The overflow route would direct water to the adjacent property before combining runoff with the ditch described above. The Applicant should provide Hydrologic calculations to demonstrate which storm event this depressional area would manage and consider the effects of the 100-year storm event.

32. An infiltration rate of 8.27 in/hr is used to calculate the 72-hour drawdown based on NRCS soil type A and texture sand. But the NRCS map unit 254B within the site is described as “Merrimac fine sandy loam”. The Applicant should revise infiltration rate calculation or provide reasoning for using sand instead of loamy sand.

33. The stormwater recharge calculation has three infiltration areas and one infiltration basin. The drainage plan shows four infiltration areas, no infiltration basin. The Applicant should confirm the information on the plan and drainage report are accurate.

34. Per Massachusetts Stormwater Standard No. 4, infiltration requires a minimum of 44% TSS removal prior to discharge. The Applicant has indicated that deep sump catch basin with a sediment forebay are designed for pre-treatment. The drainage plan doesn’t delineate any sediment forebay. The Applicant should identify the sediment forebay selected for use on this project.

Stormwater Management and Erosion Control Bylaw Comments:

35. On the south side of the site, there is a proposed erosion control barrier shown on the adjacent property.

36. Per § 38-16.C.5 of the Littleton Stormwater Management and Erosion Control Bylaws, the plans should show a delineation and number of square feet of the land area to be disturbed. The Applicant should revise the plans to indicate this amount.

37. Per § 38-16.C.7, the Applicant should show the location of material stockpiling on the plan.

38. Per § 38-17.C.5, estimated seasonal high groundwater elevation should be mentioned in the areas to be used for stormwater infiltration. The Applicant should include the information on the plan.
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39. The Town of Littleton has expressed concerns regarding the maintenance of subsurface infiltration chambers. As it is assumed the subsurface infiltration chambers proposed for this project are to be maintained by the property owner, we take no exceptions to their installation.

Exclusions:
As indicated in the Scope of Services, this peer review does not include the following:

- Review of the Application Package for compliance with other Local, State or Federal codes, ordinances or laws not mandated by the Code of the Town of Littleton, Massachusetts, Chapter 173, Zoning Bylaw;
- Review of any previously approved plans, reports or applications for compliance with Local, State or Federal codes, ordinances or laws;
- Confirmation of any delineated resource areas;
- Review of landscape planting and site lighting photometrics;
- Review of septic system design;
- Review of nitrogen loading calculations;
- Review of the project during construction;
- Review of architectural plans;
- Structural review of retaining walls

Some of the above comments include recommendations for the provision of additional drawing and document information. The updated information may result in the generation of additional comments once received and reviewed. Should you have any questions regarding this peer review please do not hesitate to contact us.

Sincerely,

Green International Affiliates, Inc.

Courtney Semlow, P.E.  
Project Manager

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