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September 27, 2018

Ms. Maren Toohill
Planning Administrator/Permit Coordinator
Town of Littleton Planning Board
37 Shattuck Street, Room 303
Littleton, MA 01460

**Subject: Engineering Review Services of
Definitive Subdivision Application for
"Highland Park"
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 Definitive Subdivision Plan Application Package for "Highland Park".

This peer review investigates the application package for compliance with the Code of the Town of Littleton, Massachusetts, Chapter 38, Article II - Stormwater Management and Erosion Control Bylaw, Chapter 173 - Zoning Bylaw and Chapter 249 - Subdivision of Land Regulations. Following our initial peer review letter, dated August 16, 2018, we received the following supplemental/revised documents from the Applicant:

- Plans titled "Definitive Subdivision Plan, An Open Space Development for Highland Park at 93 Foster Street, Littleton, Massachusetts" prepared by Stamski and McNary, Inc., dated May 23, 2018 and Revised August 17, 2018 and containing eleven (11) sheets;
- Letter titled "Definitive Subdivision Plan "The Homes at Croft Common" 93 Foster Street (Previously known as "Highland Park") with responses to comments, an updated traffic operations analysis, Development Statement, Definitive Development Impact Report, updated waiver list, construction management plan, and updated cost estimate;
- Revised Stormwater Operation and Maintenance Manual dated May 23, 2018 and revised August 17, 2018
- Revised Highland Park Stormwater Report of unknown dated May 23, 2018 and revised August 17, 2018.
- Drainage maps dated April 5, 2018 and revised August 17, 2018

Green offers the following comments resulting from our review of the above supplemental/revised documents as they pertain to the Code of the Town of Littleton, Massachusetts, Chapter 173, Zoning Bylaw and Chapter 249, Subdivision of Land 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 Record from meeting all requirements of local, state and federal regulations. **Please note that the highlighted items below either require action by the Applicant or are items that we have deferred to or made a recommendation to the Planning Board.**

Form C Comments:

1. Initial 08/16/2018 Comment: Item 3., The addresses listed for the Record Owners do not match the addresses on the Title Sheet. The Applicant should verify and revised, as required.

08/17/2018 Applicant Response: The Record Owner's address on the Title Sheet has been corrected to match Form C.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

9/27/2018 Comment

Definitive Plan Comments:

2. Initial 08/16/2018 Comment: Per §249-32. A and § 249-32. D, the Applicant shall provide Roadway Cross Sections. A waiver was not requested for this requirement and no cross sections were included in this submittal.

08/17/2018 Applicant Response: A "Street Cross Section, 1"=4'" detail has been added to sheet 7. Labels on this detail show at what stations the roadway side slopes differ from the 4:1 required.

09/27/2018 Comment: The cross sections are a requirement of the subdivision regulations; therefore, if the Applicant is required to provide them or request a waiver. We recommend the Board require cross sections at the locations where roadway sideslopes are steeper than 4:1 and recommend a waiver be requested for requirement for providing cross sections at 50-foot intervals.

3. Initial 08/16/2018 Comment: Per §249-32. B, the plan shall be at a scale of 1" = 20'. The proposed Definitive Plan is at a scale of 1" = 40' and the Applicant has requested a waiver for this scale to be approved by the board. See below for our recommendation for this waiver.

08/17/2018 Applicant Response: No response required.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

4. Initial 08/16/2018 Comment: Per §249-32.C , the Applicant should show the overlay district (Water Resource District) as well as the Residence District on the Definitive Plan.

08/17/2018 Applicant Response: Sheet 1 of the plan set shows the Zoning District as Residence and now includes the Water Resource District, which encompasses the entire neighborhood.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

5. Initial 08/16/2018 Comment: Per §249-32. C, a street name should be proposed by the Applicant and then shown on the plans. The plans indicate the roadway will be called "Road A".

08/17/2018 Applicant Response: A street name has been provided "Croft Circle" and shown on the plans.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

6. Initial 08/16/2018 Comment: Per §249-32. C, the Applicant shall provide space to record the action by the board, including space for the date, five signatures, and the Town Clerk's certification on each sheet. The Applicant is currently missing this space on Sheets 6, 7, and 10.

08/17/2018 Applicant Response: Space has now been provided to record the action by the board and Town Clerk's certification on each sheet.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

7. Initial 08/16/2018 Comment: Per §249-32. D, the plans should be at a scale of 1" = 20' and the profiles should be at a scale of 1" = 4', or the plans should be at a scale of 1" = 40' and the profiles should be at a scale of 1" = 8'. The Definitive Plan shows the roadway profile at a scale of 1" = 4'. A waiver has been requested by the Applicant. See below for our recommendation for this waiver.

08/17/2018 Applicant Response: No response required.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

8. Initial 08/16/2018 Comment: Per § 249-32. D, the Applicant shall show the location of the proposed lighting and electrical transformers. The Applicant should coordinate with the Littleton Electric Department and show all components of the electrical system on the Definitive Subdivision Plans. The locations should be coordinated with the sidewalk and other features to avoid conflicts during construction.

08/17/2018 Applicant Response: The location of the proposed electrical transformers is now shown on sheet 6.

09/27/2018 Comment: The Applicant has revised the plans to show junction boxes and transformers, as requested. However, the revised plans show a new location for the underground conduit and it conflicts with the proposed street trees throughout the subdivision. The Applicant should revise the plans to resolve this conflict.

9. Initial 08/16/2018 Comment: Per §249-32. E, the Applicant shall submit a water study and should demonstrate that each service connection (fire hydrant) will have a minimum residual pressure of 20 PSI. The Water Study states that the Littleton Water Department estimates 636 GPM; however, the Applicant should state if this equates to the required residual pressure. Additionally, the Applicant should provide a full water study or request a waiver for this requirement.

08/17/2018 Applicant Response: The applicant has scheduled a water study with the town to demonstrate a residual pressure of 20 PSI. The results will be forwarded once they are received.

09/27/2018 Comment: Green will review the results when available.

10. Initial 08/16/2018 Comment: Per §249-32. E, Public Works Costs have been provided by the Applicant but should be verified. Based on the information provided, the reviewer calculates \$3,285 per year.

08/17/2018 Applicant Response: No response required.

09/27/2018 Comment: The Applicant has stated that the public works cost is \$16,536 per mile of roadway and the Applicant proposes 0.19 miles of roadway and they also state the annual cost for this project is \$389. The Applicant did not revise the public works cost statement to reflect the actual amount of \$3,285. The Applicant should revise this statement in their Permit Application Package.

11. Initial 08/16/2018 Comment: Per §249-32. E, the Applicant shall provide Municipal Service Costs for review. Municipal Service Costs were not included as a part of the Definitive Subdivision submission.

08/17/2018 Applicant Response: Municipal Services Cost relative to schools has been added to the Development Impact Statement.

09/27/2018 Comment: The municipal services costs statement has been added; however, it does not indicate the anticipated revenue from taxes the Town will collect from the new housing stock. The Applicant should revise this paragraph to include this discussion.

12. Initial 08/16/2018 Comment: Per §249-32. F, the Applicant shall provide a typical street cross section that is to scale at 1" = 4'. The Applicant shall revise the scale of the typical street cross section shown on Sheet 8. Additionally, the typical section should also be revised to show a 2.0% cross slope with a crown at the centerline and a 1.5% (max) cross slope on the sidewalk. The roadway side slopes should be revised to be 4:1 or flatter per Figure 1. If sideslopes that are 3:1 or steeper are proposed, the Applicant should provide cross sections and show locations where guardrail is needed or demonstrate that guardrail is not required.

08/17/2018 Applicant Response: A "Street Cross Section, 1"=4'" detail has been added to sheet 7 and revised as requested. The area where the side slopes are steeper than 4:1 are in a cut situation, so guard rails are not required.

09/27/2018 Comment: We agree with the Applicant that guardrail will not be required in cut situations. The typical section indicates there is a 120-foot section of roadway where sideslopes will be 2:1, which will not provide sufficient snow storage. We recommend the Town DPW be consulted regarding the need for snow storage at this location.

13. Initial 08/16/2018 Comment: The Typical Section on Sheet 8 has a note that states unsuitable materials shall be excavated and replaced with MassDOT M1.02.0 Special Borrow. Special borrow is similar to sand borrow and may hold excess water in the roadway subbase if an underdrain is not installed. The Applicant should review the suitability of special borrow in these locations and propose underdrain or specify a substitute backfill material.

08/17/2018 Applicant Response: It is not anticipated that unsuitable material will be found beneath the proposed paved surface. "MassDOT spec. M1.03.0 Gravel Borrow" has been substituted in lieu of the "MassDOT M1.02.0 Special Borrow" in the unlikely scenario that unsuitable material is found beneath the proposed paved surface and would have to be removed and replaced. The "Street Cross Section" detail on sheet 7 has been updated to reflect this.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

14. Initial 08/16/2018 Comment: The Typical Section on Sheet 8 should depict the typical drain line and water line locations and depths of cover and the Applicant should make sure the locations of all proposed utilities in the typical section reflect the locations shown on the plans. The "If Applicable" note should be removed from the gas line as the Applicant proposes to install a gas main. The Applicant should clarify the intent of the 3' (min) dimension at the roadway centerline.

08/17/2018 Applicant Response: The "Street Cross Section" detail has been revised to show drain lines and water line locations and depths of cover.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

15. Initial 08/16/2018 Comment: Per §249-32. F, the Applicant shall submit a cost estimate including all the items required. The cost estimate should be based on MassDOT unit prices or other sources that reflect prevailing wage rates. The estimate provided is based on RS Means and some "Engineer Estimate" items appear low, such as the sediment basin. The Applicant should ensure all items are included in the estimate, including, but not limited to: infiltration basins, separate costs for gravel borrow and dense graded crushed stone, sidewalk materials, roadway binder and roadway top course thicknesses, roadway excavation and/or fill costs, all electrical system components such as transformers, water main costs, cleaning the drainage system before roadway acceptance, loam and seed with the right-of-way, street trees, line striping, signs, cement concrete wheelchair ramps and snow removal.

08/17/2018 Applicant Response: The cost estimate has been adjusted as requested to include mentioned items.

16. **09/27/2018 Comment:** The Applicant should confirm the number of handicap ramps included in the estimate. The estimate should also be updated to reflect the installation of hydrants, water gates and outlet control structures. Most of the unit prices are based from RS Means. We recommend the Board require the estimate be based on MassDOT unit prices, wherever applicable.

For example, the average price for 12" RCP based on MassDOT costs is \$80 per foot. RS Means unit pricing for this item is approximately \$49. This estimate will be utilized to determine the roadway bond and in the event the bond is utilized, the Town is required to pay prevailing wage rates, which are not included in RS Means pricing.

Additionally, we recommend a cost of \$7,000 be carried for snow removal, based on information provided by previous subdivision applicants.

17. Initial 08/16/2018 Comment: Per §249-43. A, dead-end streets shall not be allowed, except for lanes and, if approved, shall no be more than 750-feet long. The Applicant has demonstrated on the plans that no one point along the roadway is more than 750-feet from Foster Street and it is the reviewers understanding that the proposed layout was preferred by the Board during the Preliminary Plan phase. The Applicant should request a waiver for this requirement and we recommend the Board require review and approval from the Littleton Police and Fire Departments prior to granting the waiver. If a waiver is not granted, the Applicant should provide an approved second means of egress.

08/17/2018 Applicant Response: Per 249-43. A. (2) dead-end streets "shall be no more than seven hundred fifty (750) feet, measured from the end of the turnaround to the side line of the first intersecting street not a part of the dead-end street system." The proposed road meets this requirement; therefore, a waiver is not required.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

18. Initial 08/16/2018 Comment: Per §249-43. B, the Applicant meets the vertical curve requirements based on the K- Values, however, the MassDOT PD&DG requires vertical curve lengths to be three times the design speed. The Applicant should revise the curve at Sta. 8+00 to the greatest extent practicable.

08/17/2018 Applicant Response: The curve at Sta. 8+00 has been revised to have an increased vertical curve length of 63.75', greater than 3 times the design speed of 15 mph.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

19. Initial 08/16/2018 Comment: The Applicant shall revise the roadway profile where it meets Foster Street to comply with Exhibit 6-14 A. The 7.0% grade break at the Foster Street intersection does not comply with the MassDOT PD&DG and may result in vehicles bottoming out as they attempt to enter or exit the roadway. The applicant should also evaluate if a cross culvert is required at this location.

08/17/2018 Applicant Response: The intersection as shown in Exhibit 6-14A was evaluated for this proposed road but determined not to be feasible due to topography. A low point right before the intersection of the proposed road with Foster Street would require catch basins, and runoff could not be routed from this location to the proposed Infiltration Basin #3 given the 2' separation from bottom of basin to groundwater. The catch basins in the proposed road are as close to the Foster Street intersection as possible while still being able to connect to Infiltration Basin #3. Also, there is a grade break of 4.14% (9.14-5.0), which is less than the maximum grade break of 6% allowed per Table 249-43.3. A cross culvert is not necessary in a cut situation like this.

09/27/2018 Comment: The reviewer acknowledges that adding a low point at the bottom of Croft Circle would be infeasible due to the drainage concerns noted by the Applicant. However, we recommend the Applicant review the profile to reduce the 7.0% grade break at the intersection with Foster Street (5.0% on Croft Circle and 2.0% (assumed) on Foster Street). The current design will not provide a smooth transition from Foster Street to Croft Circle.

20. Initial 08/16/2018 Comment: It appears the Applicant designed the roadway to meet a 15 MPH design speed. Per §249-43. B, the horizontal curve radius of 46-feet at STA. 8+00 is sharp and does not meet the requirements specified in Exhibit 4-9 of the MassDOT PD&DG manual. The Applicant shall revise this radius to comply with the design manual and preferably provide a minimum centerline radius of 110' to be designed for a speed of 20 MPH.

08/17/2018 Applicant Response: The shape of the turnaround was confirmed in the Preliminary process and functions as a cul-de-sac. Per 249-43. A. (3), "Dead-end street shall be provided at the closed end with a turnaround having dimensions conforming to AASHTO Exhibit 5-8D. Only circular offset type is allowed." Although the cul-de-sac is shaped differently, their function is the same. The minimum outside pavement radius shown in AASHTO Exhibit 5-8D is 47'. The outside paved radius shown near STA 8+00 is 57' (centerline radius of 46')

09/27/2018 Comment: The Applicant has adequately addressed the comment.

21. Initial 08/16/2018 Comment: There appears to be tangents adjacent to the horizontal curves at Sta. 1+60 and at Sta. 9+60. The Applicant should consider revising the plans to remove these short tangents per the MassDOT PD&DG and AASHTO Green Book requirements.

08/17/2018 Applicant Response: Section 4.2 of MassDOT PD&DG says "broken back curvature (a short tangent between two curves in same direction) should be avoided because drivers do not expect to encounter this arrangement on typical highway geometry." The proposed road is a residential lane with a proposed speed limit of 15 mph.

09/27/2018 Comment: We recommend the broken back curve be removed unless there is an existing condition that requires an alternative roadway alignment infeasible or to avoid disturbing an existing feature on site. The MassDOT PD&DG applies to both highways and local roads. We recommend the Applicant comment on hardships that may result from a revised alignment.

22. Initial 08/16/2018 Comment: Per §249-43. D, the major roadway shall not have an approach grade of over 5.0% approaching the intersection. The "Road A" has a 9.14% grade between Sta 0+50 and 3+77.30. The Applicant should also consider potential sight distance issues at the "T" intersection at Sta. 3+50/10+49. The intersection is located on the steep side of the vertical curve with a k-value set to the minimum for 15-mph.

08/17/2018 Applicant Response: The approach grade is 5.0% for greater than 20' approaching the intersection as required. Also, the vertical curve near the intersection at Sta. 3+50 and 10+49 has been revised to have a greater k value. The k value for that vertical crest curve is now 8.44, much greater than the design k value of 3 based on Stopping Sight Distance for the proposed speed limit of 15 mph.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

23. Initial 08/16/2018 Comment: Per §249-43. D, the property lines should all have radii of at least 20 feet at any intersections. The Applicant shall provide this 20-foot radius at the intersection of the loop and the newly proposed road at the corner of the newly proposed park inside the loop.

08/17/2018 Applicant Response: The property line on the inside of the loop portion of the road near its intersection now has a minimum radius of 20'.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

24. Initial 08/16/2018 Comment: Per §249-43. D, the Applicant shall make the nearest line of any driveway not closer than 50' from the intersection of two streets. The driveway for Lot 8 is located within 50-feet of an intersection. The Applicant should revise the plans accordingly.

08/17/2018 Applicant Response: The waiver request letter has been revised to include Lot 8's driveway being within 50' of an intersection (if deemed applicable). We view this road as an expanded cul-de-sac, for one street, therefore a waiver is not required.

09/27/2018 Comment: An additional waiver has been requested.

25. Initial 08/16/2018 Comment: Per §249-43. E, the Applicant shall provide additional landscaping information, including a plant list indicating the species and caliper of the proposed trees and any other additional information to show that the proposed landscaping will meet the requirements.

08/17/2018 Applicant Response: A "Street Tree List" has been provided on sheet 6 that gives additional information on the trees proposed along the proposed road.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

26. Initial 08/16/2018 Comment: The proposed drainage easement for the drain line between Lots 3 and 4 should be centered on the drainage infrastructure. All drainage shall be located within an easement. There is a portion of a drain line located on Lot 3 without an associated easement.

08/17/2018 Applicant Response: The proposed drainage easement for the drain line between Lots 3 and 4 is now centered on the drainage infrastructure. The easement around Infiltration Basin #1 has been expanded along Lot 3's driveway for access. All drainage is now located in an easement.

09/27/2018 Comment: The drainage easements were revised so all drainage is within the easement; however, it easement is not centered on the drain lines. The easements need to be centered to provide adequate access for maintenance and repairs.

27. Initial 08/16/2018 Comment: The Applicant should clarify the purpose of the Access Easements that encompasses the roadway. Additionally, all easements shall be identified, and the purpose of those easements identified on the Record Plan 4 of 11.

08/17/2018 Applicant Response: The Access Easement that encompasses the roadway is to ensure enough space for proposed grading along the roadway or placement of utilities. The easement labels on sheet 4 have been revised to clarify their purpose.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

28. Initial 08/16/2018 Comment: The Applicant should verify all easement information is shown on the Record Plan. For example, curve information is missing from Easement D on Lots 3 and 5 and the length is missing from R=115' on Lot A.

08/17/2018 Applicant Response: The missing easement information is now shown on sheet 4.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

29. Initial 08/16/2018 Comment: Per §249-59. A, all wiring and appurtenances of electric power, telephone, cable and other utilities shall be placed underground within the limits of the street right-of-way. The Grading, Drainage, and Utility Plans indicate electric power will be placed underground. The Applicant should show all wired utilities placed underground along the same route as the underground electric, or spare conduits will be provided, per §249-59. B. The Applicant should also show all electrical transformers and confirm that they avoid conflicts with sidewalks, guardrails and other features within the subdivision.

08/17/2018 Applicant Response: The proposed electric line (linetype "E") has been changed to linetype "UGW" (underground wires) to show that all wired utilities will be placed underground along the same route.

09/27/2018 Comment: The Applicant has revised the plans to show junction boxes and transformers, as requested. However, the revised plans show a new location for the underground conduit and it is in conflict with the proposed street trees throughout the subdivision. The Applicant should revise the plans to resolve this conflict.

30. Initial 08/16/2018 Comment: Per §249-59. G, the Applicant shall provide construction management plans, including a traffic management plan, a truck route, and proposed hours of construction.

08/17/2018 Applicant Response: A Construction Management Plan is attached.

09/27/2018 Comment: Green reviewed the construction management plan. The Applicant should revise the Snow Removal section to state that snow removal will be performed by the Applicant until the roadway is accepted by the Town. Snow removal will be required between the time the lots are released and roadway acceptance.

31. Initial 08/16/2018 Comment: Per §249-66. D, 4-inches of dense graded crushed stone and 8-inches of gravel borrow shall be provided for roadway subbase material. The Typical Pavement Section detail should remove the reference to 4" Processed Gravel, as this may indicate approval of processed concrete. The dense graded crushed stone shall consist of natural, inert materials. The Applicant should revise Note 2. Reclaimed asphalt material is not an acceptable substitute for dense graded crushed stone.

08/17/2018 Applicant Response: The "Typical Pavement Section" detail on sheet 9 has been updated to remove the reference to 4" processed gravel and replaced with 4" compacted thickness of dense graded crushed stone. Also, note 2 on the detail has been removed.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

32. Initial 08/16/2018 Comment: Per §249-73, the Applicant shall provide MassDOT Granite Curb Type VA-4 for all proposed granite curbing on the site on both sides of the proposed road. The type of granite curb should be called out on the Typical Section on Sheet 8. The Applicant should confirm the need to the Sloped Granite Curbing Detail on Sheet 8. The reviewer does not see sloped granite curbing shown on the plans.

08/17/2018 Applicant Response: The type of granite curb (Type VA-4) is now shown on the "Street Cross Section" detail on Sheet 7. The "Sloped Granite Curbing" detail has been replaced with the "Vertical Granite Curbing" detail (Type VA-4). A label on sheet 6 also calls out the curbs as vertical granite.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

33. Initial 08/16/2018 Comment: Per §249-81. A, cement concrete is required for all sidewalks unless a written waiver has been obtained by the Applicant. The Applicant has submitted a waiver to provide sidewalks constructed with Hot Mix Asphalt. The DPW director has requested cement concrete sidewalks be installed within the subdivision and on Foster Street. We defer to the Board on a determination of this item.

08/17/2018 Applicant Response: The details now reflect a cement concrete sidewalk.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

34. Initial 08/16/2018 Comment: The Applicant proposes a 3-foot grass strip and bituminous concrete sidewalk. There are two sidewalk details provided on Sheet 8 and Sheet 9. Neither detail depicts the grass strip and the thickness of the sidewalk varies between the two details. The Applicant should provide one detail with the elements shown as proposed. The detail should be updated to reflect cement concrete sidewalk.

08/17/2018 Applicant Response: The extraneous sidewalk detail has been removed and the 3' grass strip is now shown.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

35. Initial 08/16/2018 Comment: Per §249-85. A, the Applicant shall provide hydrants at intervals of no more than 500 feet and show them on the plans. The proposed roadway is 1050-feet in length; therefore, at least 2 fire hydrants shall be proposed. The locations of the hydrants shall be coordinate with the Water Department and Fire Department. Potential locations for the hydrants are at the roadway high points located at Sta 3+91 and 8+11.

08/17/2018 Applicant Response: Two fire hydrants are now proposed at the locations suggested, Sta 3+91 and 8+11.

09/27/2018 Comment: The Applicant has revised the hydrant locations shown on the Sheet 6; however, the hydrant locations were not updated on the profile on Sheet 7. The Applicant should update the profile.

36. Initial 08/16/2018 Comment: Per §249-85. B, the Applicant shall note where Class IV and Class V RCP will be used. For example, Drainage Manhole – 1 (DMH-1) for example does not meet the 18" cover requirement for Class III RCP on Table 249-85 and therefore shall be either Class IV or Class V RCP and be shown on the plans as such. It should be noted that the cover requirements in Table 249-85 are from the bottom of subgrade and not finished grade to account for construction loading.

08/17/2018 Applicant Response: The Class of RCP proposed is now shown on each pipe label on sheet 7.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

37. Initial 08/16/2018 Comment: Per §249-85. B, the Applicant shall provide catch basins and manholes that meet the specifications of the MassDOT construction details E 201.4.0 and E 202.4.0 respectively. The catch basin detail should be updated to reflect granite curbing and reinforced concrete pipe. The manhole detail should be updated to include bricked inverts.

08/17/2018 Applicant Response: The catch basin and drain manhole details now include a note that they shall conform to MassDOT construction details E 201.4.0 and E 202.4.0 respectively. The catch basin detail now reflects the vertical granite curbing and RCP. The manhole detail now includes bricked inverts.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

38. Initial 08/16/2018 Comment: Per §249-85. D, streetlights are not required; however, the Board reserves the right to require street lighting. We respectfully defer to the Board for a determination on this item. We recommend street lights be installed at the Foster Street intersection.

08/17/2018 Applicant Response: There is a streetlight currently on Utility Pole #35, which is proposed to be relocated about 9' to make way for the proposed sidewalk. This light should be sufficient for the area where the proposed road meets Foster Street.

09/27/2018 Comment: The relocated utility pole and light should provide sufficient light at the Foster Street intersection. We feel this lighting is adequate for the subdivision; however, we defer to the Board if street lights are required within the subdivision.

39. Initial 08/16/2018 Comment: Per §249-85. E, wherever the proposed water main runs parallel to the proposed storm drain, the Applicant shall provide a 5-foot offset between the pipes. The Applicant should show the closed drainage system on the Utility and Layout Plan so these locations can be identified. The Water and Sewer crossing detail on Sheet 9 should be updated to reflect these requirements.

08/17/2018 Applicant Response: The closed drainage system is now shown on the Layout & Utility Sheet (Sheet 6). The "Water and Sewer Crossing" detail on Sheet 9 has been updated to reflect the horizontal separation required for water and storm drain pipes.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

40. Initial 08/16/2018 Comment: Per §249-89.A and §249-32.C, the Applicant shall provide permanent monuments at all street intersections, at all points of change in direction or curvature of the street, at all lot and easement corners along the right of way, and at other points where, in the opinion of the board, permanent monuments are necessary. Semi-permanent monuments shall be set at all other lot and easement corners in the proposed subdivision. The Applicant shall show the proposed monuments on the plans.

08/17/2018 Applicant Response: Monuments are provided as requested and shown on sheet 4.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

41. Initial 08/16/2018 Comment: The Applicant should indicate on the plans if granite curbing is proposed on Foster Street where the sidewalk is proposed.

08/17/2018 Applicant Response: A "Proposed Vertical Granite Curb" label has been added to Sheet 6 for along the sidewalk on Foster Street.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

42. Initial 08/16/2018 Comment: The Applicant should show the location of the street name sign and any relevant regulatory and warning signs on the plans. Stop signs and stop bars have been shown.

08/17/2018 Applicant Response: The "Stop Sign" label on Sheet 6 has been updated to say "Proposed Stop & Sign Street Name Sign."

09/27/2018 Comment: The Applicant has adequately addressed the comment.

43. Initial 08/16/2018 Comment: The bottom of the roadway profile is cut off on Sheet 7. The applicant should revise accordingly.

08/17/2018 Applicant Response: The roadway profile has been shifted so that the entire profile is now shown on sheet 7.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

44. Initial 08/16/2018 Comment: The Layout and Utility Plan should show connections to the existing utility infrastructure on Foster Street, including the water line, gas main and utility poles. The Applicant should coordinate with the DPW Director regarding repairs to Foster Street and those requirements should be included on the Plans.

08/17/2018 Applicant Response: The connection of utilities in Foster Street is now shown on sheet 6. The underground wires (electric, cable, telephone) are shown as coming off relocated utility pole #35.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

Stormwater Report Comments:

45. Initial 08/16/2018 Comment: The curve number worksheets for the developed scenarios (starting on page 54 of 336) have "Present" incorrectly circled.

08/17/2018 Applicant Response: The curve number worksheets have been corrected with the "Developed" scenario.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

45. Initial 08/16/2018 Comment: The Applicant should indicate what smaller areas are included in the Subcatchment Areas for the post developed conditions. For example, Subcatchment #2 is made up of P2, P8, etc.

08/17/2018 Applicant Response: Hydrograph 29, starting on page 162, details the combined runoff that exits the property to the Northerly Lot Line. Included in this Hydrograph are inflow hydrographs 6, 18, 21, and 28. Those hydrographs include subcatchment P1 and the overflow from the infiltration trenches for P8, P9, and P11. All other subcatchments are independent.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

46. Initial 08/16/2018 Comment: The Applicant shall provide a plan showing how everything is connected in Hydraflow (e.g. P8 goes to Infiltration Trench 1 and gets added into P1).

08/17/2018 Applicant Response: The "Hydrograph Summary Report" starting on page 19 shows how everything is connected in Hydraflow. A table on the "Post development Drainage Map" has been added to detail the 5 analysis points and their respective areas as reflected in the Stormwater Management Narrative "Discharge Summary Tables."

09/27/2018 Comment: The Applicant has adequately addressed the comment.

47. Initial 08/16/2018 Comment: The Infiltration Basin #2 Hydrograph report for the 100-year storm shows a peak elevation of 322.12. According to the detail shown on the plans, the overflow elevation starts at elevation 322, therefore; the Nyoplast drain basin should be added to the model and the overflow runoff amount added to the Discharge summary table.

08/17/2018 Applicant Response: Infiltration Basin 2 has been slightly revised with more area to allow a greater volume of runoff to be stored. The 100-year storm elevation is now more than 0.1' below the emergency Nyoplast drain basin overflow (hydrograph 13).

09/27/2018 Comment: The Applicant has adequately addressed the comment.

48. Initial 08/16/2018 Comment: There is a constant Q amount of 0.06 cfs being removed from the inflow hydrograph for infiltration trenches P8 and P9 and 0.07 for P11. The Applicant should provide backup for this calculation.

08/17/2018 Applicant Response: Page 200 shows the infiltration trench calculations. The length, depth, and width of the trench is used to get a constant Infiltration flowrate. The subcatchments that drain to the infiltration trenches were then diverted, with the constant infiltration rate of the trench taken out and the rest as overflow.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

49. Initial 08/16/2018 Comment: In the Pond Report for Pond No. 2, the total storage available within the Stormtech SC-310 is 457 cubic feet. The 100-year hydrograph volume is 516 cubic feet. It is difficult for the reviewer to determine if the Pond Report represents the hydrograph being routed through the Stormtech Chambers and demonstrates that with the infiltration rate of 2.41 in/hr, they will not be above capacity during a 100-year storm. The Applicant should confirm that the chambers will be able to contain the 100-year storm. If not, an overflow may be needed, and the additional amount added to the total runoff from the site.

08/17/2018 Applicant Response: The Pond Report for Pond No.2 demonstrates that with the infiltration rate of 2.41 in/hr, the runoff will not be above capacity for the 100-year storm. The Hydraflow software takes the dead storage volume in addition to the exfiltration rate into account when routing the 100-year storm through the Stormtech chambers.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

50. Initial 08/16/2018 Comment: Some test pits are shown on the Post-development Drainage Plan, but not the Pre-development Drainage Plan (e.g., TP 6, TP 41, and TP 42). Please show on both.

08/17/2018 Applicant Response: The test pits that were missing from the Pre-development Drainage plan have been added.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

51. Initial 08/16/2018 Comment: The Infiltration Basin Details show the Estimated Seasonal High Water Table (E.S.H.W.T.) as determined by TP U 51, 58, and 62. However, the logs included in the report do not indicate an E.S.H.W.T. The Applicant should explain how the E.S.H.W.T. for these locations were calculated.

08/17/2018 Applicant Response: The E.S.H.W.T. was determined in TP U 51, 58, and 62. In the soil logs, in the table under Redoximorphic Features, the depth was noted. This depth should have been copied up to the "Estimated Depth to High Groundwater."

09/27/2018 Comment: The Applicant has adequately addressed the comment.

52. Initial 08/16/2018 Comment: The Roof Drywell detail numbers shown on Sheet 9 of 11 do not match the numbering shown on the drainage maps. Assuming 1, 4, 5, 6, 8 should actually be 1, 2, 3, 4, 5 instead and looking at the E.S.H.W.T. elevations listed in the table, it appears they don't match up with test pit information included in the report. The Applicant should review the test pit information nearest to the proposed drywells and ensure 2-feet of separation between the bottom of the infiltration structure and the seasonal high groundwater table as required under #3 of the Massachusetts Stormwater Standards.

08/17/2018 Applicant Response: The drywell labels on Sheet 5 have been updated to match Sheet 9. The table accompanying the Roof Drywell Details has been expanded to show the nearest test pit and depth to seasonal high ground water from existing grade. More accurate E.S.H.G.W. values have been provided, and all bottom of stone elevations are greater than or equal to 2' above seasonal high groundwater

09/27/2018 Comment: The Applicant has adequately addressed the comment.

53. Initial 08/16/2018 Comment: The Applicant should confirm that the infiltration trenches have 2-feet of separation between the bottom of stone and the E.S.H.W.T.

08/17/2018 Applicant Response: A table has been added to the "Infiltration Trench Detail" as well as the "Driveway Infiltration Trench Detail" that shows the nearest test pit to each infiltration trench, depth to groundwater, and estimated seasonal high groundwater to confirm the 2 feet of separation from bottom of stone to E.S.H.G.W.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

54. Initial 08/16/2018 Comment: Per §249-32. D, proposed labels (e.g. "CB-1") rims and inverts for the proposed drainage structures shall be added to the plans to confirm pipe calculations provided in the report and assist the Contractor. Rims and inverts are shown for some, but not all drainage structures.

08/17/2018 Applicant Response: The missing labels for the drainage structures have been added to the Plan View of Sheet 7.

09/27/2018 Comment: Labels are still missing for CB-4, CB-6 and CB-3. The Flared End Section inverts should also be added.

55. Initial 08/16/2018 Comment: Infiltration Basins 2 and 3 show spillway overflows onto roadways. Per Standard 2 of the Massachusetts Stormwater Standards, the applicant must evaluate the impact of peak discharges from the 100-year, 24-hour storm and that has been done. It is understood that the intent is for the infiltration basins to contain the 100-year storm within the basin and the overflow will not be utilized. However, we recommend the Applicant to comment on the severity or frequency of overflow events due to concerns with overflows directed onto the roadway.

08/17/2018 Applicant Response: Infiltration Basins 2 and 3 have been designed to hold and infiltrate all runoff up to and including the 100-year storm. It is not anticipated that the overflow would be utilized as the overflow elevation is above the 100-year elevation. The overflows are provided for emergency situations. An overflow event has a <1% chance of happening per year given that the overflow elevations area above the 100-year storm elevation. Level spreaders at the exit of the overflow pipe would disperse runoff and lessen the downstream impact.

09/27/2018 Comment: It is understood that the basins have been designed to contain the 100-year storm and have met the stormwater regulation requirements. However, we are recommending the Applicant comment on the approximate design frequency that a storm would overtop the basins for the Town's information since two of the basins discharge to the public way and not to a wooded area or wetland. The "100-year storm is based on rainfall amounts and intensity and the frequency of "100-year rainfall events" has increased in recent years.

56. Initial 08/16/2018 Comment: The bottom of Infiltration Basin #3 is 5-feet higher than Foster Street. The water infiltrating into the basin may bleed out the embankment and onto the roadway. The Applicant should provide additional details for the design of this basin and ensure water infiltrates and does not bleed out of the embankment. The Applicant should also provide more details on the retaining wall that is designed in the infiltration basin.

08/17/2018 Applicant Response: A detail for the retaining wall within Infiltration Basin #3 has been added to sheet 9. An anti-seep collar is proposed within the berm so that water does not bleed out of the embankment, which is shown in the "Infiltration Basin #3" detail.

09/27/2018 Comment: The retaining wall detail reference by the Applicant cannot be located on the plans. The anti-seep collar proposed will only be installed around the outlet pipe and does not address the issue of water bleeding from the retaining wall onto Foster Street.

57. Initial 08/16/2018 Comment: A modular block retaining wall detail is shown on Sheet 8. The location(s) of the retaining wall shall be called out on the plans. We recommend using a linetype that differentiates retaining walls from stone walls. All retaining walls that retain private property shall be placed outside the right-of-way. Retaining walls retaining the roadway shall be within the right-of-way or be within an easement.

08/17/2018 Applicant Response: The location of the retaining walls is now called out on sheet 5 (behind Unit 6).

09/27/2018 Comment: The Applicant has adequately addressed the comment.

58. Initial 08/16/2018 Comment: The Curb Cut Detail shown on Sheet 8 does not apply for all proposed wheelchair ramps. The Applicant shall provide details for all wheelchair ramp designs.

08/17/2018 Applicant Response: An additional wheelchair ramp detail has been added to sheet 8.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

59. Initial 08/16/2018 Comment: The Trench for Drain Pipe Detail indicates that pavement should be removed and patched to install the new drainage. All drainage within the subdivisions should be installed prior to paving the roadway. The Applicant should revise the detail accordingly.

08/17/2018 Applicant Response: The "Trench for Drain Pipe" detail on sheet 9 has been revised to say that all drainage within the subdivision should be installed prior to paving the roadway.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

60. Initial 08/16/2018 Comment: A pipe trench detail is shown on Sheet 8 and a Water Main trench detail is shown on Sheet 9. Both details cover the water main installation. The Applicant should consolidate the details.

08/17/2018 Applicant Response: The extraneous pipe trench detail on sheet 8 has been removed.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

61. Initial 08/16/2018 Comment: Note 2 on the Water Main Trench Detail on Sheet 9 should be updated to reference the Littleton Water Department.

08/17/2018 Applicant Response: Note 2 on the "Water Main Trench" detail has been revised to reference the Littleton Water Department.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

62. Initial 08/16/2018 Comment: The detail on Sheet 9 should be revised to read "Detectable Warning Panel and Wheelchair Ramp Detail". Note 3 of the detail should be revised to indicate that the wheelchair ramps are installed based on the location shown on the plans. Detachable warning panels will not be permitted.

08/17/2018 Applicant Response: The "Detectable Warning Panel and Wheelchair Ramp" detail title has been corrected. Note 3 has been revised to say all ramps to be installed based on the location shown on the plans.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

63. Initial 08/16/2018 Comment: The sidewalk proposed on Foster Street should be carried across existing driveways to ensure ADA compliance for the length of the sidewalk. Detectable warning panels are not required at the driveways. Cement concrete sidewalk should be extended across the driveways. The Applicant should also identify any all utility poles, hydrants, signs and other infrastructure that will need to be relocated to facilitate the new sidewalk. A 5-foot minimum clear path should be provided to facilitate the Town's sidewalk plow.

08/17/2018 Applicant Response: The sidewalk along Foster Street is now shown extending across the driveways. The warning panels at the driveways have been removed. The utility poles that are to be relocated (UP 34, 35, & 36) are now labeled on sheet 5.

09/27/2018 Comment: It is our understanding that the existing stone retaining wall along Foster Street between Croft Circle and Mill Road is to be retained. It does not appear the proposed sidewalk alignment accounts for the retaining wall between UP 33 and Mill Road. The Applicant should review and revise the plans accordingly.

64. Initial 08/16/2018 Comment: The Applicant should confirm that all water line materials (pipe, gates, service boxes, hydrants, etc.) meet Littleton Water Department standards. Many of the manufacturer's specified to not meet LWD standards.

08/17/2018 Applicant Response: The water main and service details have been updated to meet LWD standards.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

66. Initial 08/16/2018 Comment: Cleanouts shall be provided on both sides (or more if recommended by the manufacturer) of the roof drywell units or a manhole and isolator row should be provided per the manufacturer's recommendations for proper inspection and maintenance of the systems.

08/17/2018 Applicant Response: The roof drywell details have been revised to show cleanouts on both sides of the unit.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

67. Initial 08/16/2018 Comment: The Applicant has designed some of the stormwater infrastructure, including infiltration basins to be located within Open Space parcels. Stormwater infrastructure within the Open Space precludes that area from being used for any other uses. We respectfully defer to the Board for a determination on this item.

08/17/2018 Applicant Response: Infiltration Basins were shown in the Open Space on the Preliminary Plan and its location was approved by the Board.

09/27/2018 Comment: The Preliminary Subdivision plans do show Infiltration Basin 1 within the Open Space Definitive Subdivision Plans do not propose a significant change from the Preliminary Subdivision Plans.

Stormwater Management and Erosion Control Bylaw Comments:

68. Initial 08/16/2018 Comment: Per Page 8 of the "Checklist for Stormwater Report", the Applicant plans to submit a SWPPP before land disturbance begins. We recommend the Board require the submission of a SWPPP to the Town prior to the start of construction as a condition of approval.

08/17/2018 Applicant Response: No response required.

09/27/2018 Comment: We continue to recommend this requirement be a condition of approval.

69. Initial 08/16/2018 Comment: If the Applicant intends to use the proposed infiltration basins as temporary sediment basins during construction and the Planning Board and Conservation Commission decide to allow this condition, we recommend that the following conditions be included in any approval:

- a. To minimize impact on the infiltration capacity of the final infiltration basin, temporary sediment basins should be excavated to no deeper than 12" above the final bottom of infiltration basin elevation.

08/17/2018 Applicant Response: No response required.

09/27/2018 Comment: We continue to recommend this requirement be a condition of approval.

70. Initial 08/16/2018 Comment: A detail for the proposed temporary sediment basins and inlet protection should be provided.

08/17/2018 Applicant Response: A detail for the proposed temporary sediment basin and inlet protection has been provided on sheet 11.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

71. Initial 08/16/2018 Comment: Per §38-16.C.1, ensure the wetland boundary and 100' buffer line is shown on the Stormwater Pollution Prevention Plan.

08/17/2018 Applicant Response: The plan view on sheet 10 has been shifted to show the wetland boundary and 100' buffer zone.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

72. Initial 08/16/2018 Comment: 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.

08/17/2018 Applicant Response: Sheet 10 has been updated to show the limit of work (the siltation barrier in most areas), and now includes a chart with the square feet of disturbed land.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

73. Initial 08/16/2018 Comment: Per §38-17.C.3, the existing contours should be shown on the Post-Developed Drainage Map to show proposed contours are matching into existing.

08/17/2018 Applicant Response: The existing contours are shown on the Postdevelopment Drainage Map.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

74. Initial 08/16/2018 Comment: Per §38-18.C of the Stormwater Management and Erosion Control By-law, the Applicant shall include a mechanism for implementing and enforcing the Operations and Maintenance Plan in the case of stormwater BMPs that are serving more than one lot. The O&M provided names a responsible party for all O&M being the "condominium association", however it is assumed that the Town will be accepting the O&M of the above ground infiltration basins. It is also assumed that the dry wells and infiltration trenches will be the responsibility of the individual owners and not a condominium association. The Applicant should revise the Operations and Maintenance Manual to reflect the two scenarios.

08/17/2018 Applicant Response: The O&M has been revised to say that the individual homeowners shall be responsible for the inspection and maintenance of the infiltration trenches and drywells on their lots. The developer will be responsible for the inspection and maintenance of the infiltration basins and sediment forebays, street sweeping, snow removal, catch basins, and drainage manholes until street acceptance.

09/27/2018 Comment: We take no exception to the Applicant's response and defer to the Planning Board for acceptance of the requirements outlined in the Operation and Maintenance Manual assuming the Town accepts the infiltration basins and the streets.

75. Initial 08/16/2018 Comment: Also, per §38-18.C, the Applicant shall provide a copy of the legal instrument that establishes the terms of and legal responsibility for the operation and maintenance of stormwater BMP's. We recommend the Planning Board include this as a condition of the approval.

08/17/2018 Applicant Response: No response required.

09/27/2018 Comment: We continue to recommend this requirement be a condition of approval.

76. Initial 08/16/2018 Comment: The Town of Littleton has expressed concerns regarding the maintenance of subsurface infiltration chambers. As it is assumed the subsurface infiltration chambers (roof drywells) proposed for this project are to be maintained by the property owner, we take no exceptions to their installation.

08/17/2018 Applicant Response: No response required.

09/27/2018 Comment: The Applicant has confirmed that all roof drywells are to be maintained by the property owner; therefore, we take not exceptions. The Town DPW has indicated that they take no exceptions to privately maintained subsurface chambers.

Special Permit Application:

77. Initial 08/16/2018 Comment: The special permit applications were reviewed; however, we have no comments on the applications.

08/17/2018 Applicant Response: No response required.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

Chapter 173, Zoning Bylaws:

78. Initial 08/16/2018 Comment: The Applicant has indicated that a Notice of Intent is not required for this project. Per §173-96.C, an Request for Determination shall be submitted to the Conservation Commission.

08/17/2018 Applicant Response: A Request for Determination of Applicability shall be submitted to the Conservation Commission.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

79. Initial 08/16/2018 Comment: A Development Statement in accordance with §173-98.A shall be submitted.

08/17/2018 Applicant Response: A Development Statement has been added to the Definitive Development Impact Report.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

80. Initial 08/16/2018 Comment: Per §173-98.A, no building shall be erected within 40 feet of the boundary lines of the open space. This requirement shall be shown on Record Plan Sheet 4 of 11.

08/17/2018 Applicant Response: The requirement for no building to be erected within 40' of the boundary lines of the open space is now shown on sheet 4.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

81. Initial 08/16/2018 Comment: The Lot Shape calculation for each lot shall be shown for each lot on Record Plan Sheet 4 of 11.

08/17/2018 Applicant Response: The Lot Shape calculation is now shown for each lot on sheet 4.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

82. Initial 08/16/2018 Comment: A Development Statement in accordance with §173-98.A shall be submitted.

08/17/2018 Applicant Response: See #79 above.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

Traffic Impact and Access Study Comments:

83. Initial 08/16/2018 Comment: We reviewed the Traffic Impact and Access Study. The peak hour average trips meet the requirements for Minor Projects.

08/17/2018 Applicant Response: No response required.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

84. Initial 08/16/2018 Comment: Per §249-32.E(2)(a), the Applicant should provide a discussion on expected operating condition of the roadway (i.e. Level of Service).

08/17/2018 Applicant Response: See attached letter from Vanasse & Associates, Inc. on the traffic operations analysis.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

85. Initial 08/16/2018 Comment: The Intersection Sight Distance Assessment that was previously reviewed by Green indicated that 240-feet of intersection sight distance is provided. The Traffic Impact and Access Study indicates 230-feet is provided. Green previously agreed with the 240-foot value. The Applicant should revise the assessment, as required.

08/17/2018 Applicant Response: The Intersection Sight Distance in the Traffic Impact and Access Study has been revised to match the previous assessment of 240'.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

86. Initial 08/16/2018 Comment: Green's review of the intersection sight distance recommended a Combination Horizontal Alignment/Intersection sign (W1-10 Series) be installed for northbound traffic on Foster Street. The applicant should show this sign on the plans.

08/17/2018 Applicant Response: A label for the Combination Horizontal Alignment/Intersection sign (W1-10 Series) is now shown on sheet 6.

09/27/2018 Comment: The Applicant should revise the location of the W1-10 sign. The intention of the sign is to warn eastbound motorists of both Croft Circle and Mill Road. The sign should be installed west of Croft Circle and at a distance that is in compliance with MUTCD.

Comments Received from Chris Stoddard, DPW Director via email on 8/16/18:

87. Initial 08/16/2018 Comment: The Highway department will be installing sidewalks along Foster Street in the coming years. The sidewalks along Foster Street will have granite curb and concrete. The Planning board should NOT grant the waiver to the developer for bituminous concrete berm and sidewalks along any portion of the proposed project. If the developer is allowed to place bituminous concrete sidewalks instead of concrete sidewalks along Foster Street, the Town will be forced to use tax payer money to remove the bituminous concrete and replace it with granite curb and concrete.

08/17/2018 Applicant Response: Concrete sidewalks and granite curbs are now proposed throughout the development and on Foster Street.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

88. Initial 08/16/2018 Comment: The applicant is proposing to use the inside of the cul-de-sac for an open space park, the planning board should require an association be set up to maintain the park, as well as any appropriate easements to be set up. The Highway department does not have the budget or staff to maintain additional parks.

08/17/2018 Applicant Response: A Homeowner's Associates can be created should they not accept the park proposed inside the cul-de-sac.

09/27/2018 Comment: We recommend the Board require the Applicant to create a Homeowner's Association that will be responsible for maintaining the park; however, it should be clear the park is considered Open Space and can be used by the public at-large.

89. Initial 08/16/2018 Comment: The plan does not show where the location of the proposed mailbox is going to be. The mailbox should be placed outside the ROW layout, if the mailbox is within the layout and gets damaged the Highway department will not be liable to repair/replace the structure.

08/17/2018 Applicant Response: A proposed mailbox is now shown and labeled on sheet 6, outside the ROW layout.

09/27/2018 Comment: The Applicant has shown a proposed mailbox outside the ROW; however, the final location may need to be coordinated with the Postal Service.

90. Initial 08/16/2018 Comment: Should the grading vary from the submitted plans based on final septic system design, the applicant should be required to come back to the board for further review from all applicable departments. This is an issue that came up on the Durkee farm project, where the septic systems needed to be raised which caused grading to occur within the ROW. This has now caused the Town to lose all the snow storage with in the ROW in this area.

08/17/2018 Applicant Response: It is not anticipated that the septic grading will change based on final septic system design. The grading shown is based on soil testing conducted on site.

09/27/2018 Comment: The Applicant has adequately addressed the comment.

New 09/27/2018 Comments:

91. There are two proposed water lines shown on the plans. This appears to be an error. The Applicant should revise the plans.
92. The drain line between DMH-1 and DMH-2 may appears to be in conflict with the water main given the pipe inverts and the water profile drawn. The Applicant should review and show how the water will cross the drain line at this location and other drain crossings.

93. There are two pipes shown entering the Flared End Section within Infiltration Basin 2. Flared End Sections can only accommodate one pipe. The Applicant should consider providing a manhole structure upstream of the FES, an additional FES, or a headwall structure that will accommodate both pipes.
94. The Applicant revised the plans to depict the sidewalk crossing the driveways on Foster Street; however, the cement concrete sidewalk should also be carried across the driveways within the subdivision. The Applicant should revise the plans accordingly.

Requested Waivers:

- §249-32 B. The plan shall be at the scale of one (1) inch equals twenty (20) feet or other scale approved by the Planning Board to accept to show details clearly and adequately and shall be identified as a Definitive Plan. **The proposed Definitive Plan is at a scale of one (1) inch equals forty (40) feet.**

Green's Comment: We take no exception to this waiver request and respectfully defer to the Board for a final determination on this item.

- §249-32 D. Site Plans and Profiles. For every street, there shall be a separate plan at 1"=20' and profiles at 1"=4' (Vertical), which is preferred, or plans at 1"=40' and profiles at 1"=8' (Vertical), showing the following data. **A profile of the proposed road is provided at 1"=40' and 1"=4' (Vertical).**

Green's Comment: We take no exception to this waiver request and respectfully defer to the Board for a final determination on this item.

- §249-43 A (3). Dead end street shall be provided at the closed end with a turnaround having dimensions conforming to AASHTO Exhibit 5-8D. Only circular offset type is allowed. **A loop turnaround is provided per preliminary plan approval with an open space parcel in lieu of the cul-de-sac island for use as a park.**

Green's Comment: The proposed loop turnaround should provide adequate access for emergency vehicles. We take no exception to this particular waiver request; however, we recommend the Applicant resolve other comments related to the length of roadway and a second means of egress prior to the Board approving this waiver.

§249-43 D (10). Street intersections on all Collector and Arterial Streets, including but not limited to Great Road, King Street, Newtown Road, Shaker Lane, Goldsmith Street, Tahattawan Road, Harvard Road, Harwood Avenue, Foster Street, Taylor Street, and Whitcomb Avenue, shall be spaced not less than four hundred (400) feet apart.

The proposed road intersects with Foster Street and is only three hundred twenty-three (323) +/- feet as previously approved in the preliminary decision from the intersection of Mill Road and Foster Street.

Green's Comment: Green reviewed the intersection spacing during the Preliminary Plan phase. While the proposed design does not meet §249-43 D (10)., the design does meet the requirements of the MassDOT PD&DG. It is Green's understanding that this was previously approved and we take no exception to the waiver request.

§249-43 D (12). The nearest line of any driveway shall not be closer than fifty (50) feet from the intersection of any two (2) streets.

The nearest line of the proposed intersection of the proposed road and Foster Street is forty-four (44) +/- feet from the nearest line of the nearest abutting driveway.

Green's Comment: The Waiver requested appears to be for the driveway for 105 Foster Street; however, the Waiver request should also include the driveways for 96 Foster Street and possibly 92 Foster Street. There is also a driveway within the subdivision that is within 50-feet of an intersection. Based on the spacing of existing driveways on Foster Street, it may be infeasible for the Applicant to meet this requirement. Green respectfully defers the Board for a determination on this item.

§249-43 E (1). Cul-de-sac center islands shall be landscaped. Eight (8) feet width of gravel is required on the perimeter of the cul-de-sac, inside the curb. Low-maintenance groundcover shall be planted with topsoil and bark mulch, with trees screening any transformers or electrical equipment. Do not obstruct access.

The cul-de-sac center island, Open Space Parcel B, is proposed as a park. Trees shall be clustered in a manner to provide open space for park use.

Green's Comment: We take no exception to this waiver request and respectfully defer to the Board for a final determination on this item.

§249-51 H. The maintenance berm shall be flat and at least fifteen (15) feet in width. The pipe inlets discharging into the basin shall be at or above the 25-year storm event ponding elevation. A minimum thirty (30) foot setback as measured from the top of the inside slope to all property lines is required. **The proposed maintenance berms are a minimum of (6) six feet in width. The pipe inlets discharging into the basin are below the 25-year storm event ponding elevation. A portion of the proposed infiltration basins are to be constructed within 30' of property lines.**

Green's Comment: We recommend the Applicant provide additional information to support their waiver request. We respectfully defer to the Board for a final determination on this item.

09/27/2018 Comment: We continue to recommend the Applicant provide additional information to support the waiver request.

§259-59 C. Written Approvals. No Definitive Plan will be approved unless the developer submits written certification of approval of the design by all utilities which are to provide services within the subdivision.
A waiver is requested for written certification of approval of the design by all utilities which are to provide services within the subdivision.

Green's Comment: We recommend the Board require the certification for all utilities designed by the Applicant (i.e. storm drainage and domestic water); however, we respectfully defer to the Board for a final determination on this item.

§249-81 A. Concrete shall be placed to a depth of at least four (4) inches. At driveways, concrete shall be placed to a depth of at least six (6) inches. **The proposed sidewalk shall be made of hot mix asphalt as shown on the Hot Mix Asphalt Sidewalk Detail. All proposed wheelchair ramps shall be made of concrete.**

Green's Comment: The DPW Director has requested cement concrete sidewalk be constructed on Foster Street and within the Subdivision. Cement concrete sidewalk is more durable than bituminous concrete sidewalk. We defer to the Board for a determination of this item.

09/27/2018 Comment: The Applicant should withdraw this waiver request, as the Applicant now proposes cement concrete sidewalks.

Exclusions:

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

- Review of the Definitive Subdivision 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 38, Article II - Stormwater Management and Erosion Control Bylaw, Chapter 173 - Zoning Bylaw and Chapter 249 - Subdivision of Land Regulations;
- 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 septic system design;
- Review of the project during construction.

Ms. Maren Toohill
September 27, 2018

Several 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.

Thomas Bigelow

Thomas Bigelow, P.E. (NH)
Project Manager

Courtney Semlow

Courtney Semlow, P.E., CFM, ENV SP
Project Manager

TPB/cs

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