

January 28, 2022

Leicester Planning Board
Town of Leicester
3 Washburn Square
Leicester, Massachusetts 01524

Re: Skyview Estates
Major Site Plan Review & Special Permit

To the Board:

We are in receipt of the following in association with the above referenced project:

- Plans entitled “DEFINITIVE SUBDIVISION PLANS FOR SKYVIEW ESTATES, MAIN STREET, LEICESTER, MA 01611”, 25 sheets, dated 9-17-21 with revision date of 12-14-21, by Allen & Major Associates, Inc. of Woburn, Massachusetts.
- Package entitled “Drainage Report, Skyview Estates, Leicester, MA”, issued 7-16-21 with revision date of 12-14-2021 prepared by Allen & Major Associates, Inc. of Woburn, Massachusetts.
- “*Site Plan Review & Special Permit Application*”, dated as received 21 Dec 20.
- Letter addressed to Alaa M Abusalah, Town Planner dated December 14, 2021 providing a narrative of the revised project.

Plans submitted represent a substantial reconfiguration of this project. Information received in relation to previous submissions is not considered.

Plans identify the following waiver requests, from Leicester Subdivision Regulations. Our comments on requested waivers follow:

1. Waive §V, A, 1, f to permit roadway centerline radius of curvature of 135 feet and 120 feet. Minimum radius of curvature is 200 feet.

On a local development road, curve radii of 120 feet and 135 feet can be negotiated by vehicles, and will not impede public safety vehicles, but

may be perceived as inconvenient for some drivers. We do not object to the requested waivers. See note below.

It is understood from the Applicant that Colonial Drive Extension will be deleted from the plans (see comment below). The radius of curvature of Skyview Drive from STA 11+29.41 to STA 11+50.18 is 120 feet. After Colonial Drive Extension has been eliminated, there will be more room to expand the radius of curvature in this area. Leicester Planning Board may wish to require the Engineer make reasonable efforts to minimize the relief requested, before considering a waiver.

2. Waive §V, A, 3, a, to permit a road slope of “less than 12%”. Maximum permitted road slope is 10%.

Skyview Drive has a maximum road slope of 11.65%. It is the opinion of this office that this road slope is within the limits of safe roadway design. If Leicester Planning Board grants this waiver, it is recommended that the waiver specify the proposed road slope of 11.65%.

3. Waive §VI, B, 1, a, to permit HDPE drain pipe. Reinforced concrete pipe (RCP) drains are required.

The use of HDPE pipe as drainage culvert has been permitted and even requested by Leicester Highway Department in the past. This product is long-lived and performs well, if correctly installed. We do not object to this requested waiver.

A waiver should specify double wall HDPE pipe, with smooth interior.

4. Waive §VI, C, 4 to permit flow velocities in drains of 11.92 and 14.0 feet per second. Required storm flow velocity is between 2 and 10 feet per second.

The primary concern with high-velocity flow is long-term erosive damage to drainage structures, however, on these plans the likelihood of damage to infrastructure is low. We do not object to this requested waiver.

5. Waive §VI, L to permit street trees on one side of the roadway. Street trees are required on both sides of the road.

We defer to Leicester Planning Board on this non-engineering related request. See Comment 13 below.

6. Waive §VI, G, 1 to permit sidewalks on one side of the roadway.
Sidewalks are required on both sides of the roadway.

We defer to Leicester Planning Board on this non-engineering related request.

Our comments on the plans are found below:

1. This site presents exceptional challenges for earthwork: steep slopes exist, wet conditions frequently prevail, and the native soils will be difficult to work with particularly under saturated conditions. It would be appropriate to execute site earthwork in phases, to limit the area of soil disruption and exposed soil surfaces at any one time. Each phase must have a plan for controlling runoff and groundwater, and stabilizing soils. Failure to implement an appropriate plan for managing earthwork risks enormous problems with soil instability, erosion and sediment transport and with runoff.
2. On Sheet C-100 project phases of the site development are identified. The Engineer must identify what each phase represents: if phasing is intended to permit building construction and seek occupancy of dwellings by phase, it must be clearly defined to Leicester Planning Board.
3. The submitted plans are found to be incomplete in relation to requirements for Site Plans. The following required plan information is not found:
 - a.) Porches or decks on each dwelling not shown. It is understood from applicant that porches or decks are planned for each unit. (REF: Site Plan Review Regulations, Section II, F, 2)
 - b.) Locations of sidewalks to dwellings not shown. (REF: Site Plan Review Regulations, Section II, F, 4)
 - c.) Proposed landscaping not shown. (REF: Site Plan Review Regulations, Section II, F, 6)
 - d.) Proposed water and sewer services to individual dwellings not found on plan; roof drywells from each dwelling not found on plan. (REF: Site Plan Review Regulations, Section II, F, 7)
 - e.) Plans do not identify the location where earth removal or filling will take place, nor the volume of material to be moved. (REF: Site Plan Review Regulations, Section II, F, 9)

- f.) Plans do not identify proposed lighting at driveways. (REF: Site Plan Review Regulations, Section II, F, 5)
4. The Engineer must document the status of this project in relation to the Watershed Protection Overlay District (WPOD) bylaw. §7.1.04, (2), *Special Permit Uses* states that uses which render impervious more than 15% or 2500 square feet of any lot, but not greater than 30% are subject to Special Permit.
 5. The Engineer should document the status of this project in relation to §5.16, Earth Filling & Removal.
 6. The plan cover sheet identifies the project as “Definitive Subdivision” however, subdividing the property is not part of the development.
 7. The submission package states in many locations that 49 duplex units are proposed, but the number of duplex houses depicted does not equal 49. In a meeting on January 11, 2022, it was understood from the applicant that frontage lots on Main Street would not be included as part of the site development. As this application stands currently, however, those frontage lots are included as part of the Special Permit and Site Plan Review applications. Among the references to the number of dwellings or buildings:
 - Special Permit Application identifies 49 duplex units
 - Plan Sheet C-101 identifies Lots 2, 3 and 4 as part of the Site Plan.
 - Plan Sheet C-102 identifies “98 Units”, presumed to mean 98 dwelling units.
 - The Zoning Table on Sheet C-101 identifies Lots 1, 2, 3, 4 and 5
 - The narrative identifies 49 duplex units, page 1 of 10.
 - The narrative identifies 49 duplex units, and provides a summary table with Lots 1, 2, 3, 4 and 5.
 8. In a meeting on January 11, 2022, the applicant indicated that Colonial Drive extension would be deleted from plans, as an Emergency Access Road. This office does not object to eliminating Colonial Drive Extension as an Emergency Access road, due to the severe slopes and difficulties for fire apparatus to negotiate the existing section of Colonial Drive. It is anticipated that future plan revisions will reflect the elimination of Colonial Drive Extension.

9. “Trash Enclosures” are identified in three locations on Plan Sheets C-101, C-101A and C-101B. The Applicant’s proposal package should identify how solid waste removal will be handled.
10. Subdrains should be clearly identified on utility plans on both sides of **all roadways** onsite, to control groundwater in the road base. The entire site is located in earthwork cut areas.
11. Given the likelihood of high groundwater tables in the area, test pits should be conducted on all proposed roads in locations of cuts.
12. On Sheets C-101A, C-101B, C-101C plan notes which provide elevations on Catch Basins, Drain Manholes and Sewer Manholes are overlaid over other information, resulting in many unreadable notes.
13. Virtually the entire development area will be subject to earthwork cuts. As a result, preserving trees or vegetation will be impossible in these areas. Leicester Planning Board may wish to require a revegetation plan, inclusive of street trees, to reestablish trees and growth onsite.
14. In lieu of street lights, the Applicant has proposed to install lights at the ends of individual driveways. Before Leicester Planning Board considers this request, it is recommended that information be provided on the luminaire and post as well as a photometric plan, which documents the intensity of the proposed lighting.
15. No details for construction of the Emergency Access Road are found. Details defining the width, asphalt pavement surface and gravel base must be provided for the Emergency Access Road.
16. Regarding parking, Leicester Planning Board may wish the Applicant address guest parking onsite.
17. It is understood that dwellings will have a porch or deck on the rear of each unit. There are four buildings on the west side of the site (Skyview Drive, STA 21+50 – STA 24+50 left) in which the rear of the home is at rear-yard setback. Absent zoning relief, these units cannot have a porch or deck.
18. If wetland flags 47 – 54 and B1 – B11 delineate wetlands jurisdictional under the Massachusetts Wetland Protection Act, a Notice of Intent must be filed with Leicester Conservation Commission.
19. In cut areas, side slopes of 2:1 are proposed. Concerns exist for slope stability as well as surface erosion. In locations of deep cuts, it must be

anticipated that soils may be saturated at times, and that groundwater will express from sideslopes, contributing to destabilizing forces. Detail 2 on Sheet C-501 must be specified to pertain to all slopes 3:1 or steeper, and does not address soil stability, only erosion protection.

Pertaining to drainage design:

20. The HydroCAD report indicates that post-development flow rates into the existing swale located on the northwest side of the site (modeled as Reach R-02) will be increased substantially over the pre-development rates (37.51 cfs pre-development vs 58.90 cfs post-development). Any increase in flow into this swale risks overflowing to the rear of properties on Main Street. Any design which creates an increase in stormwater flowing into this swale is unacceptable.
21. Drains from Detention Structures DS-1A and DS-1B both connect into existing catch basins in Main Street. Drains must connect into drain manholes, not catch basins.
22. Detention systems are proposed in three locations on plan, which utilize “Retain-It” underground chambers. Engineer must provide buoyancy calculations, documenting that the chambers are stable against flotation under high groundwater conditions, while empty.
23. Swales along the sides of Skyline Drive, beginning at Station 0+00 extending upgrade are steep, and may carry flow at erosive velocities. Engineer must determine velocities of flow in the swales and design appropriate protections to withstand velocity.
24. Engineer must document that Catch Basins CB-03 and CB-09 on Skyline Drive, have sufficient “grate capacity” to admit design flow. Catch basins must be designed to capture storm flow at design velocity.
25. Hydrology calculations indicate that 10 large dry wells will be installed onsite. Dry well locations not found on plan. Plans must specify:
 - a.) Dry well locations.
 - b.) Drains to convey the roof runoff from the building to the dry well
 - c.) A note requiring that each building must have roof gutters and downspouts to collect roof runoff
26. A note on plan Sheet C-102A states that dry wells will be installed for each structure. This note must be corrected when the drywell design is finalized.

27. Per Massachusetts DEP Stormwater Management Policy, field test pit evaluations of soils must be conducted at all dry well locations to determine soil suitability and compliance with groundwater separation requirements.
28. In the hydrologic analysis, under the 100-year storm, Detention Basin 1 discharges water over the Emergency Spillway. Water should not discharge over the Emergency Spillway under any design storm.
29. Detail 8, on plan sheet C-506 the detail for Outlet Control Structure should be identified as OCS-04.
30. No detail is found for Outlet Control Structure OCS-05.
31. On Detail 1, plan sheet C-504, the length specified (12") should be the length of each gabion structure (250 feet and 80 feet).
32. The HydroCAD report page 170, indicates that in the gabion outlet structure downstream of OCS-04, the HDPE distribution lines will have 80 – 2" diameter orifices drilled for each row, but the plan indicates that orifices will be drilled 24" on center, for a total of 40 orifices. The plan should be corrected to reflect the analysis.
33. Engineer must document that the drywell design meets the volumetric standard for recharge under the Massachusetts Stormwater Management Policy.
34. A drain manhole and 15-inch drain from Detention Structure DS-1A are proposed on a parcel of land which will be divided from Skyview Estates, to become private property. An easement must be provided for this drainage to be located on private property.
35. A utility pole exists at the intersection of Skyview Drive and Main Street, and must be relocated.
36. Engineer indicates that Contech proprietary stormwater treatment units will be used for removal of sediment from stormwater. Plans do not identify treatment units' locations, nor model of Contech treatment unit. The appropriate model of treatment unit must be specified at each location, to accommodate the flow characteristics at each.
37. Plan Sheet C-102B identifies the outlet from OCS-02 as 18-inch diameter culvert, however on page 162, the HydroCAD report modeled the outlet

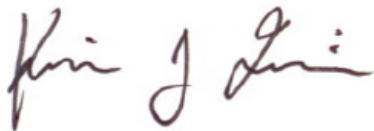
from OCS-02 as 24-inch diameter. The plans must be revised to reflect the model.

38. Detention Structure DS-1B is designed beneath the Emergency Access Road. The Retain-It structure must be specified to sustain HS-20 wheel loading.
39. Parts of Detention Structure DS-1A are exceptionally deep underground. The south west corner of the chambers will have approximately 26 feet of fill over the top of it; constructing this structure will require excavating to a depth approximately 37 feet below the existing grade over the southwest corner. From a practicality standpoint, it would be appropriate to revise the design to reduce the depth of the structure.
40. If Detention Structure DS-1A is not redesigned, the manufacturer must provide certification that the structure will sustain this exceptional soil loading.
41. The HydroCAD analysis indicates that the 30-inch diameter culvert which flows into Detention Basin #1 discharges stormwater at rates of up to 54.64 cfs. This exceptionally high-velocity flow will erode and disrupt the floor of the basin, and any vegetation growing. An energy dissipator must be designed at the outlet, to break up and disperse the flow at safe velocities.

Due to the large scale of these plans, and the extensive number of comments, this review cannot be considered complete or comprehensive. It must be expected that reviews of future submissions will be subject to additional and new comments.

Please contact this office should you have questions.

Sincerely,
QUINN ENGINEERING, INC.

A handwritten signature in dark ink, appearing to read "Kevin J. Quinn". The signature is fluid and cursive, with the first name "Kevin" and last name "Quinn" clearly distinguishable.

Kevin J. Quinn, P.E.
President