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April 13, 2020

Susan Noyes, Administrator
Newbury Zoning Board of Appeals
12 Kent Way, Suite 200
Newbury, MA 01922

Re: The Villages at Cricket Lane
55R Pearson Drive
Peer Review

Dear Ms. Noyes:

I have received a 40B Comprehensive Permit plan set (sheets 1 -18 of 18, dated January 22, 2020 by Ranger Engineering Group, Inc.), Comprehensive Permit Application binder dated February, 2020, by Cricket Lane, LLC/Deschenes & Farrell, P.C., and a copy of 3D Architectural Renderings, all for The Villages at Cricket Lane. Also, on April 8th, I received a mailed copy of the Stormwater Management Report dated January 31, 2020. Further, on April 11th, I received a mailed copy of the Road Profile sheet, which had been missing from the plan package. I have reviewed the submitted material relate to the Town of Newbury Zoning Board of Appeals Comprehensive Permit Rules and Regulations, MassDEP Stormwater Management Standards, and common engineering practice. I offer the following:

Sheet 1 of 18, CS0001, Cover Sheet

The index of drawings lists sheet 10 of 18, CS3501, as Road Profile, but sheet 10 appears to incorrectly contain site details. It appears to be a duplicate of sheet 11. The engineer should provide the road profile sheet for review.

Sheet 1 of 1, CS9001, Open Space Plan

1. The plan labels an open space parcel, proposed to be deemed to the Commonwealth of Massachusetts Division of Fish and Game as 4.82 acres, but sheet 6 of 18 labels the area as 9.15 acres. The engineer should verify which number is correct.
2. It is not clear on this plan, but the division line between the two open space parcels appears to be the stone wall, based on what is presented on sheet 6 of 18.

Sheets 3 and 4 of 18, CS0201/0202, Existing Conditions Plan

1. It is worth noting that wetland flags C8-C11 are depicted across a rock outcrop. The engineer may want to review whether the depiction reflects actual field conditions.
2. Existing curb cuts and driveways should be depicted for lots 75 and 76 in order to determine their relation to the proposed roadway.
3. The pipe size and material are not provided for the existing water line in Pearson Drive. Typically, the water department/authority will have this information on file.
4. Approximately 22 test pits were conducted, primarily on the western side of the site, to a depth of 6-10 feet, presumably with a backhoe or excavator. The plan also depicts 6 “HP” test pits which, according to the legend on sheet 2, were “hand-dug” to a depth of only 26-36 inches. The method, and

resulting shallow analysis depth, is unusual , and does not provide adequate information on the depth of the C layer, or possible depth to ledge. The locations and number of these test pits may also not be suitable for the design of the Stormwater BMPs (Best Management Practices). This will be discussed further in the Stormwater section.

5. Existing treelines should be depicted on the plans, as would be typical.

Sheets 5 and 6 of 18, V0801/V0802, Roadway Layout and Property Line Plan

1. The plans are stamped by a registered professional engineer. Given that the plans present "property line" data, it would be appropriate to have a registered surveyor's stamp and signature on the plans.

2. Section 3.1(e) of the Comprehensive Rules and Regulations states "where a subdivision of land is involved, a definitive subdivision plan, conforming to all of the requirements of the Planning Board's Rules and Regulations for the Subdivision of Land" shall accompany the application. The right-of-way layout, width and cul-de-sac dimensions do not conform to the subdivision regulations. Of particular concern is the 100' radius provided at about station 2+00, where the engineer should demonstrate that the required 200' sight distance is provided.

3. The board may want the engineer to provide lot areas for the 24 individual lots proposed, as would be typical.

Sheet 7 of 18, CS1001, Layout and Materials Plan

1. As mentioned previously, the existing curb cuts and driveways for units 75 and 76 should be shown on the plan in order to determine their relation to the proposed roadway/sidewalk.

2. The proposed curb cut appears to include the roadway, but also a paved way onto lot 76. It scales about 8' wide, which would typically be too narrow for a driveway, and appears to connect to existing gravel or rock. In either case, it is not recommended to have an abutting entrance included in the proposed roadway. The board may want the engineer to explain why the layout shown is necessary.

3. Proposed curb radii should be provided at the entrance, as would be typical.

4. A 5' sidewalk is proposed from the project onto Pearson drive, but no connection is shown to an existing sidewalk. The engineer should address whether the proposed sidewalk will connect to an existing walkway. The engineer should also address the need for an ADA ramp at the end of the sidewalk, as would be typical.

5. The engineer should address where mail/parcels will be delivered. Projects of this type will typically have a central mailbox stand, as dictated by the postmaster general for the area. Some projects locate the stand under a shelter.

6. It appears that 4 solar powered street lights are proposed along the roadway, within the project. No light appears to be provided at the intersection with Pearson Drive. The engineer should address how the intersection will be lit.

7. Individual driveway depths do not appear sufficient in some cases to park a vehicle in the driveway. The lot 7 driveway scales about 15', lot 2 scales about 18', and lot 7 scales about 13' to the back of sidewalk. The board may want the engineer to provide a suitable driveway depth, say 20', to ensure that residents can park vehicles.

8. The plan appears to depict a proposed treeline beyond the wetlands line at flags D14-D18, which is also beyond the erosion control line depicted on sheet 17. The engineer should comment on this.

9. A proposed wall appears to be depicted at lot 21-22, but it is not labeled.

10. The plan proposes a 5' bituminous concrete sidewalk with a sloped granite curb. It has been my experience that this combination results in a gap that forms where the curb meets the sidewalk. This allows water to get under the sidewalk and curb. The way to typically avoid this is to install vertical

granite curb with the bituminous sidewalk. The board may want to consider requiring vertical curb abutting the sidewalk, with sloped curb at all other locations.
11. The cul-de-sac island is 90' in diameter with a label that states "prop. hard packed grass area to be kept clear of snow". No curbing is depicted around the island, which will make it easy to use for parking. The engineer should comment on the lack of curbing, combined with a hard packed grass area.
12. There appear to be only 4 visitor parking spaces for the site. The lack of visitor parking, combined with a narrow roadway, could create traffic enforcement issues.

Sheet 8 of 18, CS1501, Grading and Drainage Plan
1. DMH1 and CB1 and CB2 cannot be constructed as shown, given the invert information and details provided. As designed, the top of pipe is only about 8" below the rim elevation. About 1.5-2' is required between the rim and top of pipe, given the frame, bricks, and slab top thicknesses. The engineer should revise the design accordingly.
2. The engineer should discuss what will be done to keep Pearson Drive runoff from entering the proposed roadway.
3. The 30-40 arrow leaders make the plan very busy and difficult to follow. It would be simple enough for the engineer to put the drainage structure information in a table on the plan. This would eliminate many of the leaders.
4. The proposed walking path depicted on sheet 7 should be shown on the grading plan. It appears that the proposed grades do not account for the walking path.
5. Top and bottom elevations should be provided for the retaining walls depicted.
6. The plans depict a "roof infiltrator" area for most, but not all, of the proposed dwellings. I cannot comment on the proposed size as I was not provided with a copy of the Stormwater Report, but they do appear too small (i.e. 5'X10') for a 1,600s.f. +/- roof area. Further, the detail on sheet 12 shows that the bottom of the infiltration system needs to be about 60" below grade. Typical groundwater throughout the site is about 18-48" below grade, based on the test pit data provided. Based on this, the engineer should verify that each system will be above groundwater.
7. The slopes around detention pond P3-2 are graded at 2:1, whereas 3:1 maximum slopes are typically required. The 2:1 is difficult to stabilize, mow, and likely poses a safety hazard given the proximity to the proposed dwellings. The board may want the engineer to propose a safer, more maintainable slope around the pond.
8. The large existing rock outcrop depicted on sheet 3 is not accounted for in the detention pond P3-2 grading. The engineer should address whether the outcrop is proposed to be removed entirely.
9. The closest test pit to detention pond P3-2, HP5, has groundwater at 18". The bottom of the pond is 6 feet below grade, likely 4-5 feet into the watertable. The engineer should address this issue.
10. The plan does not depict any decks or patios on the backs of the dwellings. The architectural renderings show a sliding door at the back of each house, so it would stand to reason that a deck or patio would be needed. These should be accounted for on the plan.
11. Based on the architectural renderings and grading scheme, it appears that all of the dwellings will have basements, some with walkouts perhaps. The dwellings with walkouts will need a deck above for the sliding door, and likely a set of stairs to come off the deck. All of these features should be depicted on the plan so that the board has a true sense of all the site features.
12. Dwelling 1 is located about 10 feet off a 6-8 foot retaining wall, dwelling 4 is about 3 feet off the sidewalk, dwelling 8 is about 1 foot off the sidewalk, and dwelling 21 is about 5 feet off a 6-8' retaining wall. The board may want the engineer to redesign the layout to provide more useable space around each dwelling.

Sheet 9 of 18, CS1701, Utility Plan

1. The plan labels an “8” Tapping Sleeve” in Pearson Drive, but a triple gate system is drawn, and the detail on sheet 15 shows a triple gate cut-out on the existing watermain. This should be corrected and, as noted previously, the existing pipe size and material should be provided.
2. At SMH 1-6 there will be about 2 feet of cover over the pipe, given the elevations shown. Sewer mains should have 4 or more feet of cover, or be insulated properly. The engineer should address this issue.
3. At SMH 1-1 about 3 feet of cover is provided. The engineer should review this and revise accordingly.
4. At SMH 1-2, the pipe in from SMH 2-2 is incorrectly labeled and the invert appears incorrect. The engineer should revise.
5. At SMH 2-2, the invert out to SMH 1-2 should be labeled correctly.
6. At SMH 2-3 about 3 feet of cover is provided. The engineer should look at revising the design.
7. Sewer pipe lengths and slopes should be provided on the plan, as this information is not shown on the road profile.
8. Two inch copper waterlines with blowoffs are proposed for the two dead end streets, but a blowoff detail does not appear to be provided. The engineer should address this.

Sheet 10 of 18, CS3501, Road Profile

1. The road profile starts off at one percent into the site from Pearson Drive. As mentioned previously, the engineer should discuss how runoff from Pearson Drive will be kept from flowing onto the proposed road.
2. The engineer may want to consider starting the road profile at plus one percent, rather than minus one percent. This would require the catchbasins to be relocated to station 0+00, but would increase the cover over the pipes. As mentioned previously, the current design has only about 8” of cover over the pipes.
3. Proposed sewer structures and piping are typically depicted in the roadway profile, as they are generally installed under the paved roadway. In this case, most of the structures/piping are located outside of the paved roadway, and are not depicted on the profile. It is still important to provide sewer profiles to the site contractor, so I would recommend that a sewer profile sheet be provided in the plan set.
4. Catchbasin grates should be set at a gutter grade which is 0.22 feet lower than the centerline, to account for the 11 feet of pavement sloping at 2 percent. Catchbasins 1 and 2 have grate elevations that are only 0.12 feet lower than centerline, or about 1 percent cross slope. The engineer should adjust these elevation, and verify the remaining catchbasin grates.
5. The cul-de-sac has a slope of 1.25 percent through the centerline. When the gutter grade is checked, which is the route that runoff will take, it comes out to only 0.8 percent from the high point to catchbasin 9. The engineer should adjust the profile so that a minimum gutter grade of one percent is provided.
6. It appears that the cul-de-sac pavement is proposed to be superelevated so that all runoff drains to the outside curb. The detail on sheet 10, however, depicts a typical crowned roadway. This should be adjusted to agree with the profile/grading.

Exhibit M, Stormwater Design Narrative

1. The “Subsurface Investigation” section of the narrative states that “sufficient soils were found beneath the proposed detention/infiltration basin to allow for infiltration at a rate of 1” per hour”. This is not accurate, in my opinion. The plans depict one hand-dug pit (HP6) in the area of Galley System P3-1, whereas the Policy require a minimum of three test pits. Further, the hand-dug pit exhibits only 6” of

C layer. The engineer should conduct the required number of test pits, with a machine, and submit the data for review.

2. The narrative states that Detention Pond P1-1 is a “detention pond with a pocket wetland”. The detail on sheet 13 does not appear to match Policy requirements for a pocket wetland. Sheet “14 of 17” is referred to for “pocket wetland details”, but sheet 14 has no details. The engineer should address these issues.

3. The narrative and detail sheet 14 refer to “treatment galley row(s)” associated with buried detention basin P3-1. Neither the plans, nor the details, appear to depict any treatment rows. The engineer should address this issue.

Stormwater Management Report

1. Section X, Stormwater management standards, states that “detention ponds 1-2 and 3-2 have been designed as dry detention basins to control flow”. The policy states that the bottom of the basin should not intercept groundwater. Pond 1-2 is at, or slightly above, groundwater based on the soil testing provided, and basin 3-2 is several feet into the groundwater based on the minimal testing provided. The engineer should address these issues.

2. Relative to “dry detention basin” 3-2, the Policy requires side slopes to be no steeper than 3:1. He subdivision regulations also call for slopes no steeper than 3:1. The engineer has provided 3:1 inside the basin itself, but the slopes above and around the basin are graded at 2:1.

3. The engineer states that Standard 4 is met by using “the impervious paved area”, but the Policy dictates that “total impervious area” be used. The engineer should adjust the Standard 4 calculations accordingly.

4. The LID Measures section of the Checklist for Stormwater Report lists only ‘constructed Stormwater wetlands” as an LID measure used on the site. The local stormwater regulations states that “Low Impact Development (LID) measures are to be used”. The Subdivision Regulations sates that “drainage systems relying on gutters, catch basins and underground piping will be allowed only where country drainage is not feasible”. The board may want the engineer to address how additional LID measures can be incorporated into the site drainage system.

5. The Standard 3: Recharge section of the checklist states that soil analysis has been provided. As stated previously, only one hand-dug test pit, demonstrating only 6” of C Layer, has been depicted in the area of the galley infiltration system. The engineer should provide the minimum 3 test pits required in the infiltration area. Further, sufficient information has not been provided relative to the proposed roof infiltration systems. The engineer should provide additional soil testing for the roof infiltration systems and provide system elevations relative to groundwater.

6. The report assumes that all 24 dwellings have roof infiltration systems, but the plans do not depict systems for dwellings 4 and 9. The engineer should address this.

7. The post development watershed plan shows roof runoff shedding in 2 to 3 different directions on some dwelling. With the roof infiltration system, however, the entire roof area is collected in gutters and directed to the system. Any runoff not capable of being stored in the infiltration system would still overflow into the same subcatchment area as the system. The engineer should revise the watershed plan accordingly.

Town Memos

Fire Department (9/23/19)

1. The fire department suggested “a minimum of twenty (20) feet of space between buildings due to exposure issues in the event of fire”. The submitted plans do not comply, and provide a minimum 15’ between buildings instead.
2. The fire department suggested that the dead-end sections be reconfigured or eliminated. It appears that the dead-ends have not been adjusted to comply.

Planning Board (9/29/19)

1. The cul-de-sac length exceeds the maximum allowed without a waiver by 345 feet. This is listed as a waiver.
2. A sidewalk is provided on the proposed street, but there are no sidewalks in Pearson Drive. The board may want the engineer to address whether a sidewalk could be constructed along Pearson Drive.
3. As mentioned previously, each unit has a sliding door on the back of the house, likely leading to a deck and/or patio. These should be depicted on the plans, and accounted for in the proposed grading.
4. The project has not addressed what LID alternatives were considered for the site.

Board of Selectmen (9/23/19)

1. Concerns are raised relative to cul-de-sac length, dead-end sections, and separation between dwellings.

Should you have any questions concerning this letter, please contact me at your convenience.

Sincerely,

Joseph J. Serwatka, P.E.