RANGER ENGINEERING GROUP, INC.
13 Branch St., Suite 101
Methuen MA 01844
Tel: 978-208-1762
www.rangereng.com

August 18, 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:

Please see our responses to the peer review letter comments below which are bulleted, bold, italicized directly below Mr. Serwatka's bold comments. Please note that not all comments required a response.

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.

This issue has been addressed.

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.

A revised copy of the plan was not submitted, but the response states that the area labels have been corrected.

- ***A copy of this sheet has been included with the resubmittal***

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.

As noted above, a revised copy of the plan was not submitted, but the response states that the proposed property line has been added.

- ***A copy of this sheet has been included with the resubmittal***

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.

The plan has been revised to label the area 'rocks and boulders" rather than rock outcrop.

2. Existing curb cuts and driveways should be depicted for lots 75 and 76 in order to determine their relation to the proposed roadway.

The existing driveways have been depicted on the plan.

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.

The recommended information has been provided.

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.

The response states that "additional test pits have been done and have been added to the plan". The test pits appear to be labeled on the plan as TP20-1 through 10, but I am unable to find the test pit data on the plan, or in the stormwater report. The engineer should provide the test pit data.

- ***The soil testing data has been included with the submittal***

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

The plan has been revised.

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

It should be noted that none of the plans combine lots, or "exclusive use area", with house locations. I superimposed the property line plan over the grading plan, and it would appear that the dwellings on lots 2-4, at least, extend beyond their "use area". The engineer should address these issues.

- ***The exclusive use areas have been added to the Layout and Material plan (sheet 7) to demonstrate that the homes and decks are located within the exclusive use areas.***

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.

The engineer emailed copies of the plans, stamped and signed by a land surveyor, on July 16, 2020.

- ***The revised plans include the surveyor stamp***

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.

The response states that "a 200' site distance line has been added to the plan", but it has actually been added to sheet 7 of 18. The response states that "there are no obstructions above the line of site that interfere with this line". It would be important that no trees shrubs or walls are installed in this area that could interfere with sight lines. The board may want to make this a condition of any approvals.

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

The area of each "exclusive use area" has been added to the plans.

RANGER ENGINEERING GROUP, INC.
13 Branch St., Suite 101
Methuen MA 01844
Tel: 978-208-1762
www.rangereng.com

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.

The plan has been revised.

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.

The condition has been revised.

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

The engineer has added "pavement curb radii" to the plan.

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.

The plan has been revised to add as ADA ramp at the end of the proposed sidewalk. As noted, there are no existing sidewalks on Pearson Drive.

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.

The plan has been revised to show the mailboxes in the gazebo.

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.

An additional light has been added at the entrance.

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.

This issue does not appear to be entirely addressed. The driveway for dwelling 7 still scales only 15 feet in depth to the back of sidewalk.

- ***The plan has been revised so that the driveway for lot 7 is 20' long to the back of the sidewalk.***

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.

The tree line has been revised.

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

The wall has been 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.

The engineer appears to have missed my point relative to the two types of curbs, and the response states that "the curbing will be sloped granite".

- ***The proposal remains for sloped granite curb. With either curb installation there is a joint between the curb and the sidewalk. This condition will be maintained by the homeowners association.***

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.

The response states that the cul-de-sac island design is based on a request from the fire department.

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.

The response states that four additional spaces have been added in the cul-de-sac.

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.

The response states that the pipe elevations have been adjusted down, but there is still only 1.2-1.4' between the rim and top of pipe. The detail on sheet 12 allows for an 8" slab top, but does not provide dimensions for the grate height and bricks. The engineer should revise the detail to show that structure can be installed with as little as 1.2 feet from rim to top of pipe.

- ***There is 24" between the rim elevation and the pipe invert. The pipe is specified as being 8" ductile iron so there is 16" between the top of the pipe and the rim elevation. If a 4" frame and cover is used with one course of 2" brick and an 8" flat top, the total elevation required is 14", which is 2" less that what is designed.***

2. The engineer should discuss what will be done to keep Pearson Drive runoff from entering the proposed roadway.

The engineer has provided for a lip at the entrance to keep runoff flowing down Pearson Drive.

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.

The engineer has kept the leaders, but made the plan easier to read.

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.

The walking path has been added to the plan.

5. Top and bottom elevations should be provided for the retaining walls depicted.

Elevations have been provided which depict an 8' retaining wall. The wall plans will need to be stamped by a structural engineer. The board may want to make this a condition of any approvals.

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.

The response states that only some units will have roof infiltration systems. Based on the roof infiltration table on sheet 12, only units 5-9 and 22-24 will have roof units. The elevations provided in the table, however, do not work with the detail provided. As noted previously, the roof units are designed to be about 60" below grade, and the table only provides 3' between proposed grade and bottom of system. The engineer should make the necessary revisions.

- ***The roof infiltrator detail has been corrected to show the depth of the system as 36" from finished surface elevation to the bottom of the stone in the infiltrator. The offset to groundwater elevation has been based upon this design.***

The engineer should address whether the roof infiltration system for a dwelling should be on the same lot as the dwelling, or can be located on an adjacent lot.

- ***The roof infiltration systems, as well as the entire drainage system, will be inspected and maintained by the homeowners association. They do not need to be restricted to the exclusive use area for each unit.***

The proposed roof collection pipe for units 19-21 will not work as designed. The plan shows an 8" roof drain @ 1% to collect the roof runoff and direct it to DMH 5. Assuming an invert of about 66 feet at DMH 5, then running 240' to unit 21, the pipe would be at elevation 68.4 feet, which is higher than the garage and sill elevations. The engineer should revise the plan accordingly.

- ***The grading and elevation of units 20-23 have been revised. Unit 21 now has its own roof infiltration system.***

It also appears that roof runoff from units 1-4 will be directed to pond P1-1, but a collection pipe is not shown. The engineer should address this issue.

- ***Roof drains have been added for units 1-4.***

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.

Grading has been revised.

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.

The label has been revised to "rocks and boulders" rather than "bedrock".

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.

The response states that "additional test pits were performed and included on the plans", but I am unable to locate test pit data on the plans or in the Stormwater report. The engineer should provide this information.

- ***Test pit information is enclosed***

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.

It appears that 10' by 10' decks/patios have been depicted on the dwellings, some with stairs as needed. As noted above, however, it appears that some of the dwellings/decks may extend past their "exclusive use area". The engineer should address this, and it would be helpful to depict the dwellings and lots on one plan.

- ***The decks and the exclusive use areas have been shown on sheet 7 of the revised plans***

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.

As noted above, decks, patios and stairs have been added to the plan.

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.

The response states that several buildings have been shifted to provide more usable yard space, but, as noted above, some dwellings/decks appear to extend beyond the "exclusive use area".

- ***See response to 10 above***

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.

The plan has been revised.

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.

The response states that the septic system plan has been revised to indicate insulation shall be provided, but those plans are not included in this submittal. I would recommend that this plan set contain adequate information to construct the entire gravity sewer system up to the first septic tank. The engineer should provide sewer manhole, trench, insulation details as necessary.

- ***The sewer profile sheet has been added to the plan.***

3. At SMH 1-1 about 3 feet of cover is provided. The engineer should review this and revise accordingly.
See comment above.
- ***See profile sheet for the sewer***

4. At SMH 1-2, the pipe in from SMH 2-2 is incorrectly labeled and the invert appears incorrect. The engineer should revise.
The invert has been revised.

5. At SMH 2-2, the invert out to SMH 1-2 should be labeled correctly.
The invert has been revised.

6. At SMH 2-3 about 3 feet of cover is provided. The engineer should look at revising the design.
No comment has been provided.
- ***See detail on sewer profile sheet***

7. Sewer pipe lengths and slopes should be provided on the plan, as this information is not shown on the road profile.
See comment above relative to providing adequate information in this plan set to construct the gravity sewer system up to the first septic tank.
- ***See the sewer profile sheet which has been added to the plan.***

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.
A detail has been provided.

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.
The engineer has provided a "lip" detail to maintain runoff flow in Pearson Drive.

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.
The engineer claims that relocating the catchbasins would be contrary to comment 1 above. As noted previously, there still appears to be an issue with constructing the first structures with the designed amount of cover.
- ***See response to item 1 for sheet 8 of 18***

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.

The response states that the sewer profiles are part of the septic system design plans. As noted previously, I would recommend that this plan set contain adequate information, including sewer profiles, to construct the gravity sewer system up to the first septic tank.

- ***See sewer profile sheets which have been added to the plans.***

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.

The elevations have been adjusted.

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.

The profile has been revised.

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.

An additional detail has been provided.

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.

The response states that additional test pits were performed and added to the plans, but I am unable to locate the test pit data on the plans or in the Stormwater report. The engineer should provide this data.

- ***Test pit data is attached***

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.

Details have been provided on sheet 15.

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.

This issue appears to be addressed.

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.

As mentioned previously, the results of the new test pits should be submitted for review.

- **Test pit results are attached**

2. Relative to "dry detention basin" 3-2, the Policy requires side slopes to be no steeper than 3:1. The 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.

The engineer has addressed the Policy requirements, but has not discussed how the slopes do not comply with local subdivision regulations.

- ***The slope above the pond is 2:1, a Waiver will be requested.***

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.

The calculations have been revised.

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.

The response simply states that "the drainage design for the project is in compliance with the Massachusetts Stormwater Management Standards".

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.

As noted previously, the new test pit data was not included in the submittal. Also, there are issues that need to be addressed with the roof infiltration systems. See previous comments.

- ***Test pit information has been included.***

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.

The revised plans have 13 of 24 dwellings being routed to roof infiltration systems. Previous comments have raised issues relative to the design.

7. The post development watershed plan shows roof runoff shedding in 2 to 3 different directions on some dwellings. 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.

The response states that the map and calculations have been revised, but post-development watershed map CS9301 was not included in the submittal. A copy should be provided.

- ***The drainage plans have been included with this submittal***

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.

The response simply states that "with cement fiberboard siding the building code allows a separation of 5'".

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.

The response claims that "the dead ends are in compliance with NFPA which require a minimum 16' wide fire lane. Dead end fire lanes are allowed but can be no longer than 300'".

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.

The response states that no response is required.

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.

The response states that sidewalks will only be provided in the new development.

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.

The plans have been revised.

4. The project has not addressed what LID alternatives were considered for the site.

The response states that LID alternatives have not been considered.

Board of Selectmen (9/23/19)

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

The response states that "the dead end street is in compliance with NFPA maximum of 100 units on a single entrance dean end".

We will be available to discuss these comments at the first available zoning board meeting.

RANGER ENGINEERING GROUP, INC.
13 Branch St., Suite 101
Methuen MA 01844
Tel: 978-208-1762
www.rangereng.com

Regards,

Benjamin C. Osgood, PE
Sr. Engineer

CC: