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February 6, 2018

Ms. Emily Wentworth, Senior Planner/Zoning Administrator
Hingham Zoning Board of Appeals
210 Central Street
Hingham, MA 02043

Subject: **River Stone – Comprehensive Permit**

Dear Ms. Wentworth:

As a follow-up to our January 18, 2018 letter, this is to advise that we have reviewed the following supplemental documents related to the subject Comprehensive Permit Application:

- Comprehensive Permit Plan, River Stone (16 sheets), revised February 2, 2018, prepared by McKenzie Engineering Group, Inc. (MEG)
- Preliminary Hydrologic Analysis, revised February 2, 2018, prepared by MEG
- Response to comments letter, dated February 2, 2018, prepared by MEG

The documents have been prepared to address comments contained in our letters date January 9 and 18, 2018.

The following six comments from our January 9, 2018 letter are restated in plain text, followed by the current status of each in **bold text**:

1. The list of requested waivers in the application materials includes many 'general waivers' from various regulations. The waivers should explain the exact regulation from which relief is being requested so that the Board fully understands the implications of each requested waiver. **It is stated in the MEG response letter that *"a revised waiver list will be submitted at a later date."***

2. Updated plans to include the following:

    a. Grading and drainage plan – **Received.**
    b. Utilities plan – **Received.**
    c. Landscaping plan – **Received.**
    d. Construction details – **Received.**
    e. Exterior lighting plan with photometrics. **MEG response indicated that *"light posts will be provided at every house equipped with a photosentive cell to operate dusk to dawn, therefore; an exterior lighting plan with photometrics is not required. No lighting plan received to date."***

3. Stormwater management report and drainage calculations. **Received.**

4. Soil information including test pits logs. We note that some test pit logs and locations are included in the Preliminary Hydrologic Analysis received today. However, there are none located within the footprint of the detention basin and many of the subsurface infiltration systems shown on the plan set received today. **See technical comments below.**

5. Documentation to demonstrate that adequate water supply is available for domestic use and fire protection. We note that two fire hydrants are shown on the plan set received today and suggest the Applicant consult with the Fire Department about the location and number of hydrants. **Not addressed to date.**

6. Sizing calculations for the septic soil absorption system to demonstrate that there is sufficient area for the system and required reserve area. **Addressed – sizing calculations, dated January 23, 2018, for the soil absorption system have been submitted and sufficient area is provided.**

Technical Comments

The following comments from our January 18, 2018 letter are restated in plain text, followed by the current status of each in **bold text**:

General/Roadway Comments

1. There are proposed retaining walls shown on the plan which will be greater than four feet in height. Walls over four feet in height require a building permit and design by a registered structural engineer. Details of retaining wall design should be shown on the plans. A railing or an alternative protective barrier should be included on the top of the walls. A guardrail should be provided along the wall adjacent to Road B. **A modular block retaining wall detail has been added to Sheet C-5. The detail shows either a fence or guardrail on top of the wall and notes that wall design *"shall be by a professional civil structural engineer registered in the Commonwealth of Massachusetts."***

2. We note that the proposed retaining wall between Units 24-26 on the subject site and 64 Ward Street will be up to fifteen feet high and it is shown about five feet from the property line. The wall would retain the earth between the wall and the 64 Ward Street property line. We question whether this wall could be constructed without encroachment onto the 64 Ward Street property. We note that a wall of this height will present visual (on site) and safety (64 Ward Street) concerns. **As noted above, a modular block retaining wall detail has been added to Sheet C-5. However, our concerns related the visual impact, safety and constructability remain.**

3. Sidewalks are shown at four feet wide and are adjacent to the Cape Cod berm. To enhance public safety the sidewalks should be five-feet wide and they should be separated from the travel way with something more than a Cape Cod berm. We are in agreement with Mr. Jeffrey S. Dirk, P.E.[1] that a vertical curb or grass strip of sufficient width should be provided. **A two-foot wide grass strip, as suggested by Mr. Dirk, is now proposed between the back of the Cape Cod berm and the sidewalks. However, sidewalks are still shown to be four feet wide.**

4. We also agree with Mr. Dirk that a sidewalk should be provided along Viking Lane between Road B and Ward Street. **Addressed – a sidewalk is shown in this location.**

5. We concur with Mr. Dirk's comment that the roadway widths should be a minimum of 24-feet in accordance with MassDOT standards. **It is stated in the MEG response that they *"strongly believe that a 20-foot-wide roadway with 1-foot Cape Cod berms on either side can adequately accommodate the subdivision."* MEG has also included two truck turning plans *"which illustrate that the Hingham Fire Department (Ladder) truck and a Single Unit (SU) truck can adequately negotiate the site."* It appears that the turning plan for the Hingham Fire truck shows that some movements require the truck to exit the pavement. However, we defer comment to Mr. Dirk.**

6. There are six, presumably visitor[2], parking spaces shown on the south side of Road B over the septic leaching area. The sidewalk passes through these spaces which would require a pedestrian to step into Road B if a vehicle is parked in any of those spaces. **Addressed – parking spaces have been adjusted and labeled accordingly.**

7. Roadway profiles are shown on Sheet C-3. However, the profiles show only the existing and proposed centerline grade of the roads. The profiles should show sewer, drain and water utilities (including sewer and drain structure rim and invert elevations). This information is required to verify that the proposed utilities may be installed without conflict. **Addressed – utilities and sewer and drain rim/invert elevations are shown on the roadway profiles.**

8. We note that the Applicant has request waivers from ZBL Section IV-A to reduce the required front, side and rear setbacks to fifteen feet. However, at the rear of each unit is what is labeled as a proposed 'deck or patio.' If these will be decks (structures) then the setback would be as little as eight feet on Units 2-4, 6-9 and 18-21. **As noted above, the MEG response letter indicates that *"a revised waiver list will be submitted at a later date."***

9. We note that the Applicant has requested a blanket waiver from ZBL Section IV-E.1.m, which requires roadways in multi-family developments to comply with the Planning Board Rules and Regulations Adopted Under the Subdivision Control Law (R&R). The

[1] See Vanasse & Associates, Inc. January 4, 2018 letter to Ms. Emily Wentworth.
[2] These spaces are not labeled with a 'V' as the other visitor spaces are.

Applicant has also requested a blanket waiver from the R&R. As noted above, waiver requests should identify each particular regulation for which the development will not comply. We believe that it is extremely important to identify where the project will not comply with Section 4 – Design Standards and Section 5 – Specifications for Construction of Required Improvements of the R&R. This is required to determine if the design complies with generally accepted public safety requirements and good engineering practice. **As noted above, the MEG response letter indicates that *"a revised waiver list will be submitted at a later date."***

Drainage and Utilities

1. Drainage pipe sizing calculations should be provided along with rim and invert elevations for manholes and catch basins. **Addressed – pipe sizing calculations have been provided.**

2. Figures 1-4 are missing from the Preliminary Hydrologic Analysis. **Addressed – Figures 1-4 are included in the revised Preliminary Hydrologic Analysis.**

3. Some test pit data has been provided. However, the information indicates varying seasonal high groundwater levels throughout the site. Because of the varying groundwater levels, additional test holes are required at each of the proposed infiltration systems to verify that adequate separation from groundwater will be provided and that soils are suitable for infiltration. Test holes should be witnessed by an agent of the Town. **It is stated in the MEG response that *"we believe there is sufficient soil data to support the design as proposed. Test pits have been excavated in close proximity to the subsurface infiltration systems and the highest observed groundwater elevation at those locations were used to establish the 4-foot separation to groundwater. Additional location specific soil testing will be performed in conjunction with the development of final construction plans."* We believe that testing at this point would be a safer course of action for the developer. However, the additional soil testing could be incorporated into a condition should the Board approve the project.**

4. Comparing proposed grading to the HydroCAD model in the Preliminary Hydrologic Analysis, portions of subsurface infiltration systems (SSI's) P5, P6 and P15 will be above ground. SSI's P3, P7, P11 and P16 would have very limited cover and SSI P11 is located under the hammerhead turnaround which will be subject to traffic loading. As noted above, test holes are required at each of the eighteen SSI's to verify seasonal high groundwater elevation. We suspect that many of the SSI's will need to be redesigned based on groundwater and cover constraints. **All systems are now shown to have adequate cover, except perhaps system P11, under the hammerhead turnaround, which may require additional cover depending on Hingham Fire apparatus loading (see Comment 15 below). Redesign of some systems may still be required based on additional soil testing.**

5. SSI P12 is modeled with 24 Cultec R-330XLHD chambers, yet only 22 chambers are shown on the plan. **Addressed – the number of chambers is consistent between the model and plans.**

6. Invert elevations should be shown for the roof drain piping, especially for the piping for Units 1-4, 6-9 and 25-28, to verify that there is adequate pitch to convey the roof runoff through the piping to the SSI's. **Invert elevations have been added to Sheet C-2, however, the invert at Unit 25 appears to be incorrect.**

7. The infiltration rates used for depressions D-3 and D-4 should be modeled in inches per hour (in/hr) and not cubic feet per second (cfs). We note that the infiltration rates used for depressions D-1 and D-2 are modeled in in/hr. **Addressed – infiltration rates are modeled consistently in inches per hour.**

8. All four of the depressions are modeled with a 24-foot long by 3-foot breadth broad-crested weir. These should be modeled with weirs that reflect the actual geometry of the depressions. **The model has been revised to eliminate the broad-crested weirs.**

9. The storage in depression D-2 does not appear to be correct as there is an El. 57 contour shown on the plan and the storage in the model starts at El. 58. **Addressed – the storage has been corrected.**

10. The outlets for depression D-4 are modeled at the wrong elevations. **Addressed – elevations have been corrected.**

11. A detail should be provided for the existing (or proposed) outlet control structure for the detention basin so that we may verify that it is modeled correctly. **A detail has been provided for the proposed outlet control structure. However, the structure is not modeled correctly in the HydroCAD model. Either the model or the detail needs to be revised to correctly model the outlet.**

12. The Detention Basin Section on Sheet C-6 shows a sediment forebay. However, there is no sediment forebay defined on the grading plan, Sheet C-2. **Addressed – sediment forebays are now shown on the grading plan, Sheet C-2.**

13. To more clearly show that a foot of freeboard will be provided in the detention basin during a 100-year storm event, the El. 62 contour should wrap around the north and east sides of the basin. **Addressed – the grading has been revised accordingly.**

14. All flared end sections and headwalls should be equipped with trash racks. **Addressed – a note has been added to Sheet C-6 specifying trash racks.**

15. Components of the proposed septic system, including tanks and the soil absorption system are shown under proposed roadways. Information should be provided to document that the components are designed for loading as required by the Fire

Department apparatus. **It is stated in the MEG response that the piping in the soil absorption system is designed for H-20 loading. However, we understand that the Hingham Fire Department's heaviest apparatus weighs 82,000 pounds. MEG should verify that all septic components under roadways are designed for this loading.**

16. Full septic system design information will be required to verify compliance with Title 5 (310 CMR 15) and to determine where the project will not comply with the Hingham Board of Health Supplementary Rules and Regulations for the Disposal of Sanitary Sewage. **It is stated in the MEG response that *"full septic system design plans will be submitted in conjunction with the development of final construction plans."* Again, without the full design we cannot determine where the project will not comply with state and local regulations.**

17. Erosion controls are detailed on Sheet C-10. The locations of erosion control barriers and the construction entrance should also be shown in plan. **Addressed – erosion control locations are shown on Sheet C-2.**

18. The Hydrant Detail on Sheet C-9 specifies C-900 PVC pipe. Ductile iron pipe should be specified as noted elsewhere on the plans. **Addressed – ductile iron pipe is specified.**

19. All water supply references to the Hingham Water Department or DPW should be changed to the Aquarion Water Company. **Addressed – all references have been changed to Aquarion.**

The comments below are based on review of the latest information received and are in addition to comments identified in our earlier letters.

1. The revised roadway profiles and grading show that the low point in the vicinity of the Viking Lane/Autumn Circle interface will now be on the Autumn Circle properties at Sta. 7+13.81, which is 94 feet beyond and about 1.5 feet below the rims of the last set of catch basins on Viking Lane. The previous editions of the plans showed the low point on the proponent's property at the catch basins, which is where it should be to protect the Autumn Circle properties from adverse stormwater impacts.

2. As noted under Drainage & Utilities comment 11 above, the proposed outlet control structure is not modeled correctly in the post development HydroCAD calculations. The 100-year flood elevation of the basin should also be clarified because it is shown to be El. 60.76 in the HydroCAD calculations and listed as El. 61.43 on Sheet C-3.

3. The post development HydroCAD results show that volume of stormwater runoff will be increased to the wetland area at the east side of the development. The calculations show that the rate of runoff will be decreased and the level of flooding in the wetland will not be increased. However, we question the modeling of the outlet from the wetland as a

120-foot long by 10-foot breadth broad-crested weir. MEG should verify the outlet configuration and that the increase in runoff volume will not impact adjacent properties.

4. In order to adequately convey the design storm, catch basins 8 and 11 should be equipped with double grates.

5. The Hingham online GIS shows that there is a private well at 38 Ward Street (Well No 796). Depending on the location of this well the proposed soil absorption system for this development may need to be moved to provide for the required 100-foot setback in accordance with Title 5. We also note that the Hingham Board of Health Supplementary Rules and Regulations for the Disposal of Sanitary Sewage require a setback of 250 feet from a private potable well and 100 feet from a non-potable well. The GIS does not specify the type of well. The type of well should be identified and it should be located and shown on the plans.

6. As we discussed in the January 25th public hearing, the wetland line on the current plans is different from the wetland line shown on Sheet 3 of 7, Subdivision Grading Plan, Definitive Subdivision of Viking Lane at Ward Street in Hingham, MA, revised June 4, 2002, prepared by R.H. Cole Associates and Daylor Consulting Group, Inc. We recommend that the Applicant have the wetland line verified by the Conservation Commission.

Please give us a call should you have any question.

Very truly yours,

AMORY ENGINEERS, P.C.

By:

Patrick G. Brennan, P.E.

PGB