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April 25, 2018

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

**Re: Engineering Peer Review  
Comprehensive Permit Plan known as “River Stone”  
Viking Lane and Ward Street, Hingham MA  
Assessors Map 124, Lots 70-75 & Lot 26  
Applicant: River Stone, LLC**

Dear Ms. Wentworth:

This letter is in response to questions and comments in a review letter dated April 9, 2018 from Patrick G. Brennan, P.E. of Amory Engineers, P.C. and a letter dated April 3, 2018 from Jeffrey S. Dirk, P.E., PTOE, FITE of Vanasse & Associates, Inc. for the above referenced project.

Enclosed herewith are the following:

- Four (4) copies of the report entitled “Preliminary Hydrologic Analysis for Comprehensive Plan for River Stone” prepared by McKenzie Engineering Group, Inc., (MEG) with the latest revision date of April 25, 2018.
- Eight (8) sets Plans entitled “Comprehensive Permit Plan known as River Stone” prepared by McKenzie Engineering Group, Inc. (MEG) with the latest revision date of April 25, 2018.
- Letter by Ron Müller & Associates dated April 24, 2018 regarding Proposed Roadway Width.
- Letter by Geoscience dated April 24, 2018 regarding Title 5 – Nitrogen Sensitive Areas.

Responses by McKenzie Engineering Group, Inc. (MEG) correspond to the outline of the review letters and are in *italics*. Text in gray represents peer review comments.

### **Amory Engineers Comments**

#### Incomplete or Missing Information

1. The revised list of requested waivers, dated February 12, 2018 is not complete and needs to be revised to reflect the current plan. Again, we note that 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. We believe that it is extremely important to identify where the project will not comply with Planning Board Rules and Regulations (R&R) Section 4 – Design Standards and Section 5 – Specifications for Construction of Required Improvements. This is required to determine if the design complies with generally accepted public safety requirements and good engineering practice.

**MEG 4/25/18 response: A revised waiver list was submitted to Ms. Emily Wentworth on April 18, 2018.**

2. The Board asked for a photometric plan at the February 6, 2018 public hearing. No lighting plan has been received to date.

**MEG 4/25/18 response: Light posts will be provided at every house equipped with a photosensitive cell to operate dusk to dawn, therefore; an exterior lighting plan with photometrics should not be required. A Plan can be submitted prior to construction if the Board desires.**

3. Soil information/test pits at all proposed infiltration systems. MEG has stated that "additional location specific soil testing will be performed in conjunction with the development of final plans." We have maintained that testing at this point would be a safer course of action for the developer but the required testing could be included as a condition of approval should the Board approve the project. Our suggested condition would be:

*Prior to the submission of final site development plans, a minimum on one test pit shall be excavated at each proposed infiltration system to verify soil textural analysis and depth to seasonal high groundwater. Test pits shall be excavated to a minimum depth of four feet below the proposed bottom of each infiltration system and shall be witnessed by an agent of the Town. Test pit logs shall be submitted to the Zoning Board of Appeals. The following actions shall be required based on test pit results:*

- a. *If the test pit confirm assumed soil textural analysis and depth to seasonal high groundwater then no further action is required.*
- b. *If the test pits indicate more-restrictive soil texture, then the design of the infiltration system(s) shall be reevaluated. Results of the reevaluation shall be submitted to the ZBA for review.*
- c. *If the seasonal high groundwater is found to be less than four feet from the bottom of any infiltration system a mounding analysis shall be performed and results submitted to the ZBA for review.*
- d. *If the seasonal high groundwater is found to be less than two feet from the bottom of any infiltration system, the system shall be redesigned to provide a minimum of two feet of separation.*
- e. *Any modifications to an infiltration system design shall be submitted to the ZBA for review.*

**MEG 4/25/18 response: No response required.**

4. Documentation to demonstrate that adequate water supply is available for domestic use and fire protection. The revised plan shows only one proposed fire hydrant. Additional hydrants are needed and we suggest the Applicant consult with the Fire Department about the location and number of hydrants.

**MEG 4/25/18 response: A hydrant flow test is scheduled for Wednesday April 25, 2018 and the Aquarion Water Company has indicated that a Will Serve Application will provided after the flow test.**

**Two (2) proposed hydrants were shown on the plans. One at approximately Sta. 104+64 on Road B and the second one at approximately Sta. 201+39 on Road C. A Hydrant Location Plan will be provided to the Fire Department for their review and is included in the revised plan set, see Sheet C-2A).**

5. Septic system design information 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. MEG has stated that "full septic system design plans will be submitted in conjunction with the development of final construction plans." Without the full design we cannot determine where the project will not comply with state and local regulations.

**MEG 4/25/18 response: Wastewater calculations and a preliminary soils absorption system design have been provided in order to determine what waivers may be required under the Town of Hingham Board of Health Supplementary Rules and Regulations for the Disposal of Sanitary Sewage. The Project will fully comply with Title V (310 CMR 15.00). Full septic**

**system design plans will be submitted in conjunction with the development of final construction plans.**

6. Information to document that the proposed septic system components (tanks and the spoil absorption system) shown under proposed roadways are designed for loading as required by the Fire Department apparatus.

**MEG 4/25/18 response: The septic system will consist of 4-inch schedule 40 PVC pipe embedded in 2 feet by 2 feet crushed stone trenches with a minimum depth of cover of 2.5 feet. The attached calculations indicate that the system is designed to accommodate the loading of the Fire Department apparatus.**

7. Updated pipe sizing calculations should be provided to reflect the revised drainage design.

**MEG 4/25/18 response: Updated pipe sizing calculations are included in Appendix D of the Preliminary Hydrologic Analysis for Comprehensive Plan for River Stone.**

## Technical Comments

### General/Roadway Comments

1. The proposed retaining wall between Units 23-25 on the subject site and 64 Ward Street will be up to nineteen feet high (previously fifteen feet).
  - a. We question whether this wall can be constructed without disturbing the 64 Ward Street property.
  - b. A portion of Unit 23 is only two feet off the wall and there is a roof drain pipe shown between the unit and the wall. Access to the roof drain pipe for maintenance would be limited. Also, proximity of the wall would block natural light and essentially render Unit 23 undesirable.
  - c. The proposed decks/patios of Units 24 and 25 abut the wall. This will cause similar issues regarding natural light and visual impact.
  - d. A fence is proposed along the top of the wall but we have safety concerns with a wall of this height.

**MEG 4/25/18 response: We have been in contact with a representative from the wall supplier Redi-Rock, and they have represented that the wall can be built as shown on the plan without disturbing the 64 Ward Street property. A design provided by a Massachusetts Registered Structural Engineer will be provided prior to construction.**

**The grading behind the wall has been revised and the wall has been decreased in height to fifteen feet.**

2. There also appears to be a six foot high retaining wall behind units 13-17, at the sediment forebay, yet this is not labeled on the plan.

**MEG 4/25/18 response: The wall has been labeled on Sheet C-1.**

3. We concur with Mr. Dirk's comment that the roadway widths should be a minimum of 24-feet.

**MEG 4/25/18 response: Please refer to Ron Müller & Associates' letter dated April 24, 2018.**

4. In Mr. Dirk's April 3, 2018 letter to Ms. Wentworth, he notes that Road C has a grade of approximately 8 percent approaching Ward Street and recommends "a leveling area with a grade of 2 percent or less should be provided for a minimum distance of 50-feet approaching Ward Street." We agree that a leveling area should be provided and note that the R&R require a grade of not greater than three percent for a distance of 100 feet.

**MEG 4/25/18 response: The profile for Road C has been revised to provide a leveling area with a grade of less than 2 percent for a distance of 50-feet from the STOP-line.**

5. Roadway slopes are not shown on the Road C profile and between Sta. 2+00 and 3+00 on the Viking Lane profile (Sheet C-3).

**MEG 4/25/18 response: The profiles have been revised to show the roadway slopes.**

- The proposed trench drain at about Sta. 2+81 on Road C should be shown on the profile on Sheet C-3.

**MEG 4/25/18 response: The profile for Road C has been revised to show the proposed trench drain.**

- As noted in Mr. Dirk's April 3, 2018 letter, the sidewalk in front of Units 28 and 29 would be blocked if a vehicle were parked in either driveway.

**MEG 4/25/18 response: The plans have been revised to provide a minimum of 21 feet from the far edge of the sidewalk to the front of the garage for Units 28 and 29.**

#### Drainage and Utilities

- The infiltration rate used for depression D-4 should be modeled in inches per hour (in/hr) to be consistent with the modeling of the other three depressions.

**MEG 4/25/18 response: The infiltration rates for depression D-4 have been re-modeled in inches per hour (in/hr.). A revised post HydroCAD analysis is provided in Appendix B of the Preliminary Hydrologic Analysis for Comprehensive Plan for River Stone" prepared by McKenzie Engineering Group, Inc., (MEG) with the latest revision date of April 25, 2018.**

- 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. In our February 6, 2018 letter to the Board we questioned how the outlet from the wetland was modeled and asked for MEG to verify the outlet configuration and that the increase in runoff volume will not impact adjacent properties. In the March 9, 2018 response letter, MEG states that "additional information will be forwarded under separate cover." The revised calculations model the outlet from the wetland differently but no information has been provided to verify the outlet modeling (i.e. topography around the entire wetland to clearly show the outlet(s).

**MEG 4/25/18 response: Upon review of the existing conditions information, there is insufficient topography to properly model the existing wetlands and to verify the outlet, therefore, Design Point 3 has been revised to be the limit of bordering vegetated wetlands (BVW). The pre/post HydroCAD analysis has been revised accordingly to remove the existing wetlands from the HydroCAD models.**

**The proposed detention basin has been increased in size and the outlet control structure has been revised, resulting in the volume of stormwater runoff less than pre-development conditions for all storm events. The revised pre/post HydroCAD analysis are provided in Appendix A and B of the Preliminary Hydrologic Analysis for Comprehensive Plan for River Stone" prepared by McKenzie Engineering Group, Inc., (MEG) with the latest revision date of April 25, 2018.**

#### Board of Health Letter dated March 6, 2018:

- The Board of Health (BOH) has indicated that the subject project is located within a nitrogen sensitive area (NSA) because there are three nearby private drinking water wells. The Applicant has not responded to the BOH's letter. We believe that the BOH's letter raises valid health concerns and a response from the applicant is required.

**MEG 4/25/18 response: Please refer to Geoscience's letter dated April 24, 2018.**

#### **Vanasse & Associates, Inc. Comments**

For reference, listed below are the comments that were raised in our February 6, 2018 review letter that required additional information or analysis followed by a summary of the response submitted on behalf of the Applicant, with additional comments indicated in **bolded** text for identification.

#### **COMPREHENSIVE PERMIT PLAN**

*Comment 1a: The Applicant should consult with the Hingham Fire Department to determine if the primary response will be from High Street or Ward Street. If the response will be from High Street, a turning analysis should be performed for a vehicle entering at the High Street/Autumn*

*Circle intersection and then proceeding to the Project site.*

*Response:* The Applicant's engineer provided a truck turning analysis for the Hingham Fire Department design vehicle (Hingham Tower Truck) entering from Ward Street and exiting to Autumn Circle. **This response route should be confirmed by the Fire Department. No further response required.**

*Comment 2a:* *Expand the analysis to include turning maneuvers to/from Ward Street for each design vehicle. The curblineline along both sides of Ward Street and the centerline pavement marking should be shown on the turning analysis.*

*Response:* The truck turning analysis has been expanded to illustrate the turning maneuvers from Ward Street with the curblineline and centerline shown. **A review of the turning analysis indicates that the fire truck will require the use of the full width of the Project site roadway when turning to/from Ward Street. As such, on-street parking would need to be prohibited (see comments regarding the school bus waiting area). No further response required.**

*Comment 3a:* *The fire truck turning analysis indicates that the bumper/ladder overhang will extend beyond the edge of the pavement in a number of locations. The Applicant should confirm that this is acceptable to the Fire Department and verify that no objects will be located in these areas that would inhibit fire truck maneuverability, including snow windrows.*

*Response:* **The revised fire truck turning analysis indicates that portions of the fire truck design vehicle continue to cross the sidewalk area and will extend into individual driveways in order to circulate within the Project site. Further, the presence of on-street parking, which is common in residential neighborhoods, would inhibit emergency vehicle circulation in specific areas within the Project site. These conditions are directly related to the width of the Project site roadways. Accordingly and as stated in our prior comment letters, the Project site roadways should be increased in width to 24-feet. The *Comprehensive Permit Plan* should be revised accordingly or it is suggested that this be included as a condition of any Decision that may be advanced for the Project.**

***MEG 4/25/18 response: We disagree that the portions of the fire truck design vehicle continue to cross the sidewalk area and extend into individual driveways in order to circulate within the Project site (see TT-1 & TT-2). In addition, on street parking will be prohibited throughout the site. In regards to the width of the project roadways, please refer to Ron Müller & Associates' letter dated April 24, 2018.***

*Comment 4a:* *The turning analysis for the turnaround area between Buildings 16 and 17 indicates that the fire truck design vehicle cannot maneuver within the area that is provided. The Applicant's engineer should redesign the turnaround to comply with the requirements of NFPA®*

*Response:* The subject turnaround area has been removed. **No further response required.**

*Comment 2:* *We disagree with the Applicant's engineer and refer to the engineering standards cited in our original comment pertaining to roadway width and our comments noted herein with regard to the truck turning analysis. The roadways within the Project site should be widened to 24-feet. The Applicant's engineer should also indicate if changes are proposed to the cul-de-sac where the connection to Autumn Circle is proposed, and if traffic control devices are planned at the connection.*

*Response:* The Applicant's engineer continues to assert that the roadway design complies with the standards for a low volume roadway. As we have stated in our prior comment letters, **we disagree with the Applicant's engineer and have cited the applicable roadway design standards that apply to the Project. We recommend that the Project site roadways provide a traveled-way of 24-feet in order to accommodate: i) the turning and maneuvering requirements of emergency vehicles; ii) occasional on-street parking, particularly in the vicinity of Ward Street where parents may park while waiting for the school bus; and iii) parking maneuvers to/from the visitor parking areas. The *Comprehensive Permit Plan* should be revised accordingly or it is suggested that this be included as a condition of any Decision that may be advanced for the Project.**

**MEG 4/25/18 response: Please refer to Ron Müller & Associates' letter dated April 24, 2018 regarding the roadway widths. The plans have been revised reflecting visitor parking lengthened 26 feet from the curb line to facilitate turning movements.**

The revised *Comprehensive Permit Plan* proposes to reconfigure the cul-de-sac at the end of Autumn Circle to a modern roundabout in order to provide traffic control within the former cul-de-sac area and to serve as a traffic calming device to moderate travel speeds and reduce the potential for cut-through traffic. **In addition to our prior comments requesting that the Applicant propose measures to address the Project's impact to Autumn Circle, the Applicant should discuss how access to the residential homes abutting the roundabout will be impacted.**

**MEG 4/25/18 response: The driveway to Parcel 124-13 Autumn Circle will need to be relocated as shown on the Comprehensive Permit Plan.**

*Comment 3: The Comprehensive Permit Plan indicates that sidewalks within the Project site will be 4-foot wide. The Public Rights-of-Way Accessibility Guidelines (PROWAG) requires that sidewalks that are less than 5-foot wide provide clear passing zones at intervals of 200-foot (maximum) that shall be 5-foot wide for a distance of 5-foot (R301.3.2). The Comprehensive Permit Plan should be revised to provide sidewalks that are a minimum of 5-foot wide or that comply with the PROWAG.*

*Response:* The revised *Comprehensive Permit Plan* now includes 5-foot wide sidewalks along one side of Viking Lane, "Road B" and "Road C", extending to Autumn Lane and Ward Street, with crosswalks and Americans with Disabilities Act (ADA) compliant wheelchair ramps provided at pedestrian crossing locations. The previously proposed 2-foot wide grass strip between the sidewalk and the edge of the traveled-way has been removed and sloped granite curbing is proposed.

Typically, vertical granite curb is used when a sidewalk is adjacent to the traveled-way; however, sloped granite curb may be used in low speed environments. We defer to the Department of Public Works and the Town Engineer as to their preference. A sidewalk should be added along at least one side of "Road D" (preferably along the north side) and a marked crosswalk with accompanying ADA compliant wheelchair ramps should be provided for crossing "Road C" at "Road D". The sidewalk and crosswalk should provide access to the proposed mail kiosk.

**MEG 4/25/18 response: The plans have been revised to include a 5-foot wide sidewalk along the north side of Road "D" and an ADA compliant wheelchair ramp has been provided for crossing Road "C" at Road "D".**

*Comment 7: Sight triangle areas should be shown on the Site Plans along with a note to indicate: "Signs, landscaping and other features located within sight triangle areas shall be designed, installed and maintained so as not to exceed 2.5-feet in height. Snow windrows located within sight triangle areas that exceed 3.5-feet in height or that would otherwise inhibit sight lines shall be promptly removed."*

*Response:* The sight triangle areas and requested note have been added to the revised *Comprehensive Permit Plan*. **No further response required.**

*Comment 8: A note should be added to the Site Plans stating: "All Signs and pavement markings to be installed within the Project site shall conform to the applicable specifications of the Manual on Uniform Traffic Control Devices (MUTCD)."*

*Response:* The requested note has been added to the revised *Comprehensive Permit Plan*. **No further response required.**

*Comment 10: Driveways to individual units should be a minimum of 21-foot long measured between the garage door and the far edge of the sidewalk (edge closest to the residence) where a sidewalk is provided, and 23-foot measured between the garage door and the edge of the traveled-way in locations without a sidewalk.*

*Response:* The Applicant's engineer previously stated that the driveways will meet the indicated dimensions and typical driveway dimensions continue to be shown on the revised *Comprehensive Permit Plan*; however, **the driveways to the units along "Road D" and**

those serving Units 28 and 29 do not meet the stated criteria and should be revised accordingly and with consideration of the installation of a sidewalk along "Road D".

**MEG 4/25/18 response: The plans have been revised to provide a minimum of 21 feet from the far edge of the sidewalk to the front of the garage for Units 16-21 and Units 28 and 29.**

*Comment 11:* A school bus waiting area should be provided at an appropriate location defined in consultation with the Town of Hingham School Department.

*Response:* The Applicant's engineer indicated that a 5-foot wide sidewalk has been provided to Ward Street. **To the extent that the Project site roadway is widened to 24-feet as requested, the additional roadway width combined with an ADA accessible sidewalk to Ward Street is appropriate for a bus waiting area. No further response required pending confirmation from the Applicant that the Project site roadways will be increased in width to 24-feet.**

**MEG 4/25/18 response: Please refer to Ron Müller & Associates' letter dated April 24, 2018 regarding the roadway widths. Ultimately the Hingham School Department will decide on the location for a school bus waiting area.**

*Comment 12:* MUTCD compliant warning signs should be installed at and in advance of the "speed table" and should be added to the *Comprehensive Permit Plan*.

**MEG 4/25/18 response: The plans have been revised to provide MUTCD compliant warning signs at and in advance of the "speed table".**

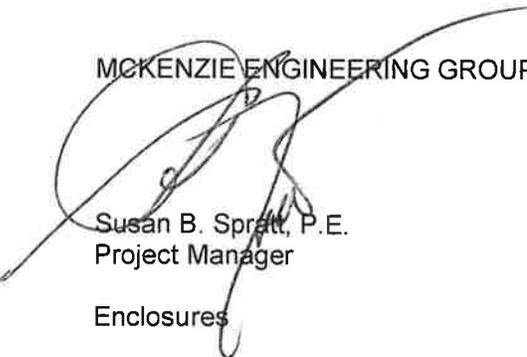
*Comment 13:* The grade of "Road C" approaching Ward Street is approximately 8 percent. A leveling area with a grade of 2 percent or less should be provided for a minimum distance of 50-feet approaching Ward Street (measured from the STOP-line).

**MEG 4/25/18 response: The profile for Road C has been revised to provide a leveling area with a grade of less than 2 percent for a distance of 50-feet from the STOP-line.**

We believe that the revisions to the plans and the additional information as noted above adequately address the comments from Amory Engineers, P.C. and Vanasse & Associates, Inc.

Please contact me at your convenience if you have any questions or require additional information.

MCKENZIE ENGINEERING GROUP, INC.

  
Susan B. Spratt, P.E.  
Project Manager

Enclosures

cc: River Stone, LLC

  
Bradley C. McKenzie, P.E.  
President