AMORY ENGINEERS, P.C.

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MEMORANDUM

Date: June 26, 2018

To: Ms. Emily Wentworth, Senior Planner/Zoning Administrator

From: Patrick G. Brennan, P.E.

Subject: River Stone – Comprehensive Permit

We understand that the Applicant disagrees with some of the conditions proposed by the Zoning Board of Appeals (Board). Based on our telephone conversation, this memo is to provide information to the Board related to some of the conditions the Applicant disagrees with, specifically the following:

- Condition C.1.h: The applicant believes that the proposed condition *"impermissibly grants post-approval review authority to the Board and its agents..."* The condition requires test pits/soil evaluations at each proposed infiltration system and lists actions to be taken based on the results of the test pits/soil evaluations. McKenzie Engineering Group, Inc. (MEG) agreed to additional soil testing in its February 2, 2018 response to comments letter. The statement in the letter reads: *"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 have stated in letters and the public hearing that we believed testing during the permitting process *"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."* The proposed condition requiring soil testing has been included in the last two comprehensive permit projects we have reviewed for the Board.

- Condition C.1.h.(i)3: *"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 Zoning Administrator for review."* The applicant's response is *"the Applicant does not agree to the proposed condition, analysis is not required if no credit for infiltration is given for over 10-year storm event."* The Post Development HydroCAD model does take credit for infiltration for the 25- and 100-year storm events. If the Applicant believes that infiltration is not needed for the 25- and 100-year storm events then the Post Development HydroCAD model will need to be revised. We believe that the revised model would show that infiltration is required in order to mitigate rates and volumes of runoff in the post development condition.

- Condition C.1.h(iv): *"Flared end sections shall be reinforced concrete. Plastic (HDPE) flared end sections are not allowed."* The Applicant's response reads "the Applicant does not agree to this subsection of the proposed condition because it would render the project uneconomic in the aggregate…" There are four flared end sections proposed on the project, three 12-inch and one 18-inch. The total difference in price between reinforced concrete and HDPE flared end sections for the project would be an increase of about $730 (see attached emails from Scituate Companies and Cape Cod Winwaterworks). Our experience is that HDPE flared end sections are not durable and are easily deformed when riprap stone is placed around them. Durability and deformation are not issues with reinforced concrete flared end sections.

- Condition D.15: *"As the Applicant has requested and the Board has granted a waiver of Section VI.22 of the Hingham Board of Health Supplementary Rules and Regulations for the Disposal of Sanitary Sewage, prior to commencement of any site work, the Applicant shall, in order to protect the soil from compaction, install fencing around the entire area where the soil absorption system is to be constructed and shall maintain such fencing until the soil absorption system is fully constructed."* Applicant Response: *"The Applicant does not agree to the proposed condition because it would render the project uneconomic in the aggregate, and it is not justified by a valid health, safety, environmental, design, open space, planning, or other local concern and proposed to install typical construction fencing as would be required by state guidance for similar projects."* Title 5, 310 CMR 15.246: Excavation and Flagging of Soil Absorption System specifies that care shall be taken to assure that the soil at the bottom of the excavation is not compacted or smeared (see attached page from Title 5). The intent of the construction fencing around the soil absorption system is to comply with this regulation and maintain the infiltration capacity of the soil beneath the system.

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Pat Brennan <pbrennan@amoryengineers.com>

HDPE Flared end cost

epsjostedt@winwaterworks.com <epsjostedt@winwaterworks.com> Tue, Jun 26, 2018 at 9:03 AM

To: Pat Brennan <pbrennan@amoryengineers.com>

Pat, contractor cost approx $170. for 12” and $190 for 18”

Sent from my iPhone
Ted Sjostedt / Cape Cod Winwaterworks
508-844-3580

[Quoted text hidden]

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Pat Brennan <pbrennan@amoryengineers.com>

Flared end cost

Chris Bonney <cbonney@scituatecompanies.com> Tue, Jun 26, 2018 at 8:43 AM
To: Pat Brennan <pbrennan@amoryengineers.com>

Pat,

A 12” Flared end is $335 + tax and a 18” Flared End is $425 + tax. Guaranteed not to distort. Feel free to contact me with any questions.

Regards,

Chris Bonney

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SCITUATE COMPANIES

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From: Pat Brennan [mailto:pbrennan@amoryengineers.com]
Sent: Tuesday, June 26, 2018 8:36 AM
To: Chris Bonney <cbonney@scituatecompanies.com>
Subject: Flared end cost

[Quoted text hidden]

15.245: Soil Absorption System Siting Requirements

(1) Systems serving new construction shall not be sited in areas with percolation rates slower than 60 minutes per inch.

(2) When recorded percolation rates are between those listed in 310 CMR 15.242, the next slower rate shall be used for design purposes.

(3) Surface and subsurface drainage shall be directed away from the soil absorption system.

(4) Approval of a soil absorption system in soils with a recorded percolation rate of between 60 and 90 minutes per inch may be granted only for upgrades of existing systems with no increase in design flow. In such cases, the soil absorption system design shall be based on a maximum effluent loading rate of 0.15 gpd/square foot.

15.246: Excavation and Flagging of Soil Absorption System

(1) Excavation for construction of a soil absorption system may be by mechanical means, provided care is taken to assure that the soil at the bottom of the excavation is not compacted or smeared. The bottom and sides of the excavation shall be level and scarified. Vehicular traffic and parking of vehicles or equipment in or on the area of the soil absorption system should be avoided at all times prior, during and after construction of the system.

(2) Prior to the installation of the soil absorption system and until receipt of a Certificate of Compliance from the Approving Authority in accordance with 310 CMR 15.021, the perimeter of the soil absorption system shall be staked and flagged to identify the location of the soil absorption system and prevent the use of such area for all activities which might damage the soil absorption system. Such flagging is not intended to preclude the final grading and landscaping of the area of the soil absorption system. Stockpiling of materials or equipment within the area is prohibited.

15.247: Aggregate

Aggregate shall be required for all soil absorption systems, unless otherwise approved in writing by the Department in accordance with 310 CMR 15.280 through 15.288, according to the following specifications:

(a) Base aggregate for leaching structures shall be provided from below the elevation of the crown of the distribution line(s) to the bottom elevation of the soil absorption system and shall consist of double washed stone ranging from ¾ to 1½ inches in diameter and shall be free of iron particles, fines and dust in place;

(b) A minimum of a two-inch layer of double washed stone ranging from ⅛ to ½ inch diameter and free of iron particles, fines and dust in place shall cover the base aggregate to prevent intrusion of fine textured soils to the system. Geotextile fabric may be substituted for the minimum two-inch layer of double washed stone.

15.248: Reserve Area

(1) Systems for new construction or increased flow designed and approved in accordance with 310 CMR 15.000 shall include a reserve area sufficient to replace the primary soil absorption system. The area required for the reserve area shall be calculated in accordance with 310 CMR 15.242 (effluent loading rates), based on the percolation rate in the reserve area.

(2) No permanent buildings or other structures shall be constructed on the reserve area.