

July 6, 2017

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Weston Zoning Board of Appeals
c/o Mrs. Winifred I. Li
Zoning Board of Appeals, Chair
11 Town House Road
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RE A&M Project #2275-01
Stony Brook Weston 40B Development
104 Boston Post Road
Weston, MA 02493
**Response to Chessia Consulting Services
LLC memo dated June 14, 2017**

Dear Mrs. Li:

Allen & Major Associates, Inc. and Stantec, on behalf of 104 Stony Brook, LLC, respectfully submits a review response memo regarding the 104 Boston Post Road Multi-Family Development Project based on a peer review memo prepared by Chessia Consulting Services LLC dated June 14, 2017. The comments are based on the following submitted materials:

Plans Entitled:

- "Site Development Plans for Stony Brook Weston 104 Boston Post Road Weston, MA" dated March 28, 2017 consisting of 17 Sheets prepared by Allen & Major Associates, Inc. Sheet C-3A was revised 5-5-17 and Sheets C-3B and D-4 were last revised 5-16-17.
- "Stony Brook Weston 104 Boston Post Road Weston, MA" dated November 18, 2016, prepared by Allen & Major Associates, Inc. and SMOOK Architecture and Urban Design consisting of 17 sheets of plans.

Supporting Data:

- "40B Residential Housing Development 104 Boston Post Road Weston, MA Drainage Report" issued April 18, 2017, last revised May 5, 2017, prepared by Allen & Major Associates, Inc.
- Miscellaneous correspondence including:
 - Nitsch Engineering review letter dated May 15, 2017.
 - Memo to ZBA from Town of Weston Engineering Department.
 - City of Cambridge Supplemental Response to 104 Stony Brook LLC's G.L.c. 40B Comprehensive Permit Application for its Proposed Project at 104 Boston Post Road dated May 22, 2017.
 - Executive Summary for Proposed Wastewater Treatment and Evaporation Facilities 104 Stony Brook LLC Stony Brook Apartments 104 Boston Post Road Weston, Massachusetts 02439, prepared by Stantec Consulting Services, Inc.

- Comment letter from Karen Sebastian, LLC Landscape Architecture dated May 18, 2017.
- Allen & Major response letters dated May 16 and 18, 2017 to City of Cambridge Water Department and Weston Zoning Board of Appeals respectively, with attachments.

To assist in the review of this document, A&M has provided a response in ***bold Italics*** following each of the outstanding comments.

General Design Comments:

DEP Stormwater Management Regulations/Town of Weston Stormwater Regulations:

1. The Report asserts that the project would comply with both DEP Stormwater Standards and the Town of Weston Stormwater Bylaw and Stormwater Regulations (WSR). I have reviewed the data supplied by the Applicant for conformance with the DEP Stormwater Handbook, in particular Volumes 1 for general data on the Stormwater Standards and Volume 3 "Documenting Compliance with the Massachusetts Stormwater Standards". Specific BMP's were also reviewed in Volume 2 Chapter 2 for construction and maintenance requirements and Chapter 1 for systems to use in specific areas, specifically associated with Standard 6. I have used DEP's 10 Standards as the basis for review. If the DEP Standards do not apply due to work being performed outside of a jurisdictional area (Riverfront or Wetlands Buffer Zone) the Weston Regulations would also need to be waived for the project to proceed.

In summary, the proposed use is not an allowed use in a Zone A of a Public Surface Water Supply.

A&M Response: The Applicant has formally requested to waive the Town of Weston Stormwater Regulations. As such, the project is only subject to the National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems, also known as MS4 Regulations.

Part II of the Massachusetts small MS4 storm water management program, Section C. – “Public Drinking Water Supply Requirements” states that:

2. ***Discharges to public drinking water supply sources and their protection areas (Zones I, II, Wellhead Protection Areas, Zone A, B, and C as defined in 310 CMR 22.00) should provide pretreatment and spill control capabilities to the extent feasible.***

Minimum TSS removal and phosphorous removal is provided by the Jellyfish water quality unit filter. See the Jellyfish details as well as the TSS removal calculations, enclosed. Spill control capabilities (for refueling construction vehicles, etc.) are detailed in the Operations & Maintenance (O&M) Narrative in the Drainage Report.

It should be noted that no work is proposed within the 200-foot riverfront area, nor the 100' wetlands buffer area, and therefore the project is not subject to the Wetlands Protection Act (WPA). Although not subject to 310 CMR 10.00 (Massachusetts Stormwater Management Regulations) due to the waiving of the Weston Stormwater Regulations, the project will attempt to meet these design standards to the maximum extent practicable.

Wastewater Issues:

- Minimal data on wastewater disposal has been provided. As no municipal sewer service is available other means of disposal will be required. Based on submitted data, a Wastewater Treatment Plant with a combination of evaporators for air disposal of steam and undetermined off-site location for disposal of residual sludge and solids is proposed. Sludge and solids would be retained in on-site tankage for periodic pumping. I have listed appropriate data from Massachusetts regulations and guidance for wastewater treatment systems.

In summary, the proposed use is not an allowed use in a Zone A of a Public Surface Water Supply.

Stantec Response: The proposed Wastewater Treatment Facility (WWTF) will be located within the proposed apartment building, underneath the lower garage level. There will be no sewers or drains that will discharge outside the building, and periodic removal of solids will also be in a contained area to eliminate any possibility of contamination outside the building. Evaporators will evaporate the treated wastewater, so there will be no groundwater or surface water discharge.

We have met with the MassDEP and have submitted Conceptual Design Plans and a Preliminary Design Report for review. MassDEP has determined that the proposed wastewater treatment facility with effluent evaporation is not a prohibited use at this location. Although the facility will not require either a Groundwater Discharge Permit or a Surface Water Discharge Permit, the treatment plant will be constructed, operated and maintained in accordance with MassDEP requirements.

General Design Comments:

1. It is proposed to have a cut ledge face starting at the property line in several locations along the south west and southerly sides of the site. A construction easement or license from the abutting property owner (Book 1696 page 404, owned by the City of Cambridge according to the Plans) would be required to implement the plan or more likely locating the top of the ledge cut further into the site to provide construction space.

No information has been provided, to date, by the Applicant to document that the abutting property owner (the City of Cambridge or the municipal agency having custody and control) has agreed to provide such an easement or license.

Based on Natural Resource Conservation Service (NRCS) data soil could be from 12-65+ inches in depth. The plans only identify one area of exposed ledge at the westerly side of the Boston Post Road access drive to the existing building. The plans identify the survey as an "on-the-ground" survey so any other areas of exposed ledge would have been seen by the field crew and identified on the plans. The plans also indicate that the entire area proposed for the steep cut ledge face along the property line is wooded, which indicates the presence of soil over the ledge. During my visit to the periphery of the site I noted additional ledge that was not observed by the surveyor, but was obvious from the nearby street. This area

is east of the existing building and along the south side of the pavement for the access and parking areas.

No soil testing, as is standard engineering practice and a requirement of the Town of Weston Stormwater Regulations, has been performed. The ledge in the area below the soil may also be weathered and not suitable for a 4' vertical to 1' horizontal slope or other steep cut slopes proposed. Any existing soil over the ledge would not be stable at a 4' vertical to 1' horizontal slope, resulting in impacts over the property line. The data provided should document soil and ledge conditions at critical points based on on-site testing data. It is unclear how steep slopes would be protected as a high steep created cut slope as proposed would be a safety hazard if not properly fenced. There is no room for a fence as the cut slope is at the property line. The area visible from the street is mostly wooded, except around the existing building, some areas are newer growth but many large mature trees exist on the site. The size and extent of the trees and undergrowth observed is not typical of an area with no soil over ledge.

A&M Response: Once the project goes into the Construction Document phase A&M will coordinate with the Geotechnical Engineer on slope stability and ledge face design parameters.

Test pits have not yet been conducted but are anticipated to be performed once the project is established at its proposed subgrade. At that point, soil testing can be accomplished, and if found to meet or exceed the proposed rate, the infiltration system will be constructed as designed. Should the infiltration rate not satisfy the design standards, an alternate design will be proposed.

Three borings were performed on June 5, 2017, and generally indicate "competent gray granite" with "some fractures" approximately 2 feet below existing grade. The boring logs and associated Boring Plan have been previously submitted to the Zoning Board of Appeals.

Not all areas of existing ledge were surveyed, as the scope of work involves large amounts of cut within these areas. The existing bedrock outcrops are extraneous to the scope of work, except to indicate shallow bedrock on-site, as noted by the NRCS soils map. Test pits and additional borings are anticipated to be performed, in accordance with standard engineering practice, and should the assumed conditions not be met for stormwater and infiltration purposes, the drainage design will be revised as necessary.

2. Revised building plans and elevations based on the new footprint should be provided, including general plan and elevation views for the wastewater treatment plant and associated stacks, vents, etc. Although final design is not required at this stage, safety impacts from steam, odors, moisture and potential mold issues with a below grade wastewater treatment within a residential structure should be assessed, along with potential noise and vibration issues.

The building elevations should also address ventilation of the underground garage areas. It is unclear if there are openings at areas where grades are suitable. Collection of exhaust

fumes within the garage would be a health issue for building occupants, if the garage is not properly vented.

A&M Response: Revised Architectural plans and elevations for the most current building footprint have previously been submitted to the Zoning Board of Appeals.

3. Sheets C-3A and C-3B indicate a pipe labeled UD, identified as underdrain in the legend, around a portion of the building on the east, south and part of the west and north sides. Elevations of this pipe and the discharge location(s) should be identified together with quantification of the flow.

Underdrains collect groundwater and would typically flow for several months in late winter-through spring depending on snow melt and rainfall conditions. No detail of the underdrain has been included in the plans. The plans do not detail a connection for the underdrain to the stormwater system and the elevations would not be suitable for connection to the stormwater system in some locations based on proposed site grading. Any and all discharge location(s) should be indicated. The underdrain should not discharge to Sibley Road, as presently shown on the plans, because groundwater discharge to Sibley Road would result in safety concerns with ice forming in the roadway as well as potential erosion of the steep slope at the low point in the east corner of the building.

If it is proposed to discharge groundwater to the wastewater treatment plant the flow calculations would need to account for the flow if it could be permitted as part of the plan design. If it is proposed to discharge to the stormwater system that flow should also be quantified. As noted above, the proposed elevations do not appear suitable to connect to the stormwater system and pumping would be required.

A&M Response: Once a full geotechnical report with detailed recommendations is prepared and an MEP engineer is engaged means and methods to handle potential groundwater will be addressed during the construction document phase.

4. No soil testing as required in the Weston Stormwater Regulations (page 4 3. d. iii. 5.) has been performed and I recommend that this requirement not be waived because many of the design assumptions rely on certain soil conditions. If differing conditions exist, the assumptions would not be valid and the design would not function as proposed. Soil testing could also impact the existing runoff calculations if soils differ from that assumed. Soil testing is standard practice to develop site designs and should be required here. Determination of soil conditions for runoff, groundwater elevations and wastewater disposal in areas without access to a sanitary sewer system is typically a first step in evaluating the suitability of a site for development.

A&M Response: On site borings were performed which indicated shallow bedrock. The boring logs and associated Boring Plan have been previously submitted to the Zoning Board of Appeals.

5. It is proposed to install "NDS Tufftrack Grass Pavers" around the building to provide emergency access. The design has an 8.3% grade; the website data on the product specifies a 6% maximum grade for emergency vehicle use. The significance of this grade and the close proximity of the emergency access to the area should be evaluated by the Fire Department and the availability of equipment to fight a fire that occurs on the reservoir side of the building should be evaluated, both as to Town and mutual aid equipment. The Town may also want to have a professional fire expert provide a technical report on these issues.

A&M Response: The Weston Fire Department has reviewed the proposed access drive and has issued a letter of acceptance for the site design.

6. The depth of soil suitable for vegetation growth is only 1.5" and the website notes that full irrigation is required to maintain vegetation. As proposed, the design detail indicates crushed stone on compacted native soils. The native soils have not been determined except through published data. Depending on the soil used under the crushed stone at the slopes proposed, most rainfall will soak through the 1.5" of planting soil into the crushed stone and follow the compacted soils to the lowest point and then break out to the surface as a weep since the grading of this area is relatively steep and in most areas the grass pavers are confined between the ledge and building foundation. Creating a new point of water discharge would create soil stability issues on steep slopes or icing issues if discharge to a roadway area.

A&M Response: On site borings were performed which indicated shallow bedrock. The boring logs and associated a boring location plan have been previously submitted to the Zoning Board of Appeals. The access drive in question is proposed to be outfitted with a mechanical heating system, and catch basins are provided at the access drive intersection with Sibley Road, to capture runoff prior to discharge to Sibley Road.

7. The plans also specify Permeable Pavers for the upper garage access road and the lower access road leading to the perimeter grass paver system. The detail for these areas is **not** fully consistent with the DEP Handbook (Volume 2). The inconsistencies are: 1) choker course under sand bedding not reservoir course as indicated, 2) filter course (called subbase course) should be 12 inch minimum thickness and under choker course, 3) no filter blanket under filter course, 4) no reservoir course or subdrains under filter blanket. The reservoir course would be above the native materials. No soil testing to determine the suitability of the native materials has been performed.

It appears that the intent is to infiltrate runoff through the joints of the pavers to a crushed stone reservoir and then a filter layer of bank gravel and then to native materials. For the upper garage access native materials are likely to be ledge as this is the only area where some exposed ledge was surveyed. In addition, the upper access roadway is proposed to be in 7 to 9 feet of cut compared to existing grades. The lower access is in cuts of 0 to 3 feet. As designed the flow of runoff under the grass pave system would likely flow into the constructed subgrade of the pervious paver system and then weep out at Sibley Road. The DEP Handbook restricts use of this type of system in the Zone A for a surface water

supply, within 20 feet of a cellar foundation, within 10 feet of a property line, for slopes over 5% (easterly drive only), in areas with high bedrock and the bottom should be below the frost line and be a minimum of two feet above seasonal high ground water.

The combination of NDS Tufftrack Grass Pavers shown on Sheet D-2 and Permeable Precast Concrete Pavers shown on Sheet D-1 are not a viable design and could result in safety issues in Sibley Road due to water weeping into the street with icing in the winter.

A&M Response: The permeable pavers detail will be updated appropriately.

8. The proposed building would be as close as 3 feet from the right of way (property line) at Sibley Road. The top of the building would be EL 189 based on the first floor elevation and the building plans. The grades along Sibley Road at the street in front of the building vary from EL 92 at the east end of the building to EL 107 on the west side of the lower entrance. A mass of this height that close to the road, with the roadway on the north side of the building would have shading impacts to Sibley Road with increased icing as the building will block Sibley Road from the sun in winter. This would result in more deicing chemicals being required in the roadway which would impact the water supply.

A&M Response: The project proposes to utilize pervious pavers and grass pavers to promote infiltration on-site. Catch basins are proposed at one of the access points to the site to capture runoff flowing towards Sibley Road. Runoff from Sibley Road is captured by a catch basin and routed to a water quality unit before being discharged towards the Stony Brook all within the existing right-of-way.

9. Traffic will access the locus from Sibley Road and traffic on Sibley Road certainly will greatly increase as a result of the project and the location of the building will result in safety issues in this public way. Also, the impact of the steam generated at the locus by the proposed evaporation system should be evaluated to see if it will result in moisture falling on Sibley Road - and on Boston Post Road, creating dangerous (and often unexpected) icing on these ways in cold conditions, even if there is no precipitation, catching motorists (and any pedestrians outside of the building) off guard.

A&M Response: The project falls under the jurisdiction of MassDOT and will be permitted accordingly.

10. The plans do not indicate how garage runoff from melting snow and rainwater dripping or any wind-blown rain from open window areas or wall openings, would be collected and discharged. Discharge of flow from building floor drains is not allowed into an exterior separate storm sewer system under the plumbing code 248 CMR 10.00 10.15 e specifies that parking garages are part of the sanitary sewer system. The load from the parking garages should be factored into the wastewater treatment plant flow calculations.

A&M Response: Per the State Building Code the internal drainage for the garage is to be routed to the sewer system via an oil-water separator. Once the architectural plans are advanced and an MEP Engineer is selected the means to capture and treat this stormwater will be addressed.

Stantec Response: Flow from melting snow and dripping rainwater within the garages will be captured and directed to a tight-tank for off-site removal.

DEP Stormwater Management Regulations/Town of Weston Stormwater Regulations:

The DEP Stormwater Management Regulations consist of ten standards. This section of the correspondence lists the standards and identifies whether the submittal complies, does not comply or if additional information is required to demonstrate compliance. The Weston Stormwater Regulations reference the DEP Regulations with specific variations that are identified within the DEP Standard where they vary. In addition, the WSR have specific data submittal requirements. Where data is incomplete under the WSR it is noted under the most appropriate DEP Standard. This project would require a Major Permit u under the WSR.

Critically, this entire site is located in the Zone A of a Surface Water Supply and under the DEP Handbook Volume 1 Table CA 2: Standard 6, no stormwater BMP's unless essential to operation of a public water supply system would be allowed on this site.

As a result, based upon DEP Handbook requirements, since the proposed project is not one that is essential to a public water supply system, the proposed building and its stormwater management systems should not be constructed at this location.

There are no allowed BMP's at the locus as it is in the Zone A and therefore there the proposed stormwater system would not be allowed.

The project has been reviewed below under each DEP standard for all issues, with emphasis where a particular BMP is listed as not allowed in the Zone A of a surface water supply. The WSR requires the Professional Engineer to certify that the Stormwater Management Plan conforms to the WSR. As the use proposed would not be allowed under the WSR because it does not conform to DEP requirements, a Professional Engineer could not provide the required Certification.

A&M Response: See A&M response to Comment #1.

Standard 1-Untreated Stormwater

In sufficient data to satisfy Standard 1 has been provided.

To demonstrate compliance with Standard 1, it is required that a project shall treat runoff from impervious areas prior to discharge and to demonstrate that the proposed outlets would be stable and diffuse flow such that erosion does not occur at the outlet.

One new outlet is proposed. Other areas would flow overland to either Boston Post Road or Sibley Road.

Although outlet protection sizing data was found in the Report, the proposed discharge is to a paved driveway with sections at over a 12% slope, which would concentrate runoff discharged from the pipe. This remnant section of driveway is located at the east side of the site and intersects with Sibley

Road approximately 20 feet west of the existing catch basin in Sibley Road. My site visit confirmed that sediment currently collects at the end of the driveway and a pipe outlet to this section of pavement would contribute to additional loading to the catch basin and treatment unit. This section of driveway serves no useful purpose but appears to be left to avoid work in the Riverfront. A detail of the outlet with complete grading, spot grades, etc. should be provided. This design would likely result in scour along the existing driveway, that is indicated to remain, and would impact the Town catch basin in Sibley Road.

The design should consider the requirements of the Weston Regulations relative to the Town's National Pollution Discharge Elimination System (NPDES) Municipal Separate Storm Sewer Permit (MS4) as discharge to the catch basin, and any increased sediment loading from erosion along the roadway could impact maintenance, etc. The catch basin in Sibley Road discharges to a surface water supply where water quality is critically important.

A&M Response: See A&M Response to Comment #1. Runoff collected by the catch basin within Sibley Road is treated by a water quality unit prior to discharge to critical areas.

Standard 2 - Post Development Peak Discharge Rates

Data submitted to demonstrate that Standard 2 would be satisfied is insufficient to demonstrate compliance.

Standard 2 requires an Applicant to demonstrate that the development does not result in an increase in the rate of runoff from the site and that the development will not result in flooding on or offsite. Evaluation of runoff is prepared for specific control points where runoff would concentrate or reach a specific resource area or existing stream or culvert. Under the WSR there are specific requirements for rainfall assumptions and a requirement to reduce both peak runoff rates and total runoff volume. Rainfall used in the stormwater model is consistent with Weston Regulations.

Existing Conditions:

It is unclear why in the existing case the flow to the existing Sibley Road catch basin is different than in the proposed case, in particular as the proposed case uses data reportedly prepared by the Town of Weston in 2014 and this condition would not have been altered in the pre-construction case. Other than the Sibley Road off site area there are a few inconsistencies with Subarea divides and the Time of Concentration may be underestimated in area E3. A longer hydraulic time would occur flowing southerly from the saddle between high points as the initial section is much flatter. Other than the above issues the calculations are reasonable subject to confirmation of soil conditions.

Proposed Conditions:

As noted under General Design Issues, no soil testing has been done, as is standard practice and required under the WSR and also under DEP requirements for specific Best Management Practices (BMP's) as described in Volume 2 of the Stormwater Handbook. This testing should be done.

Stormwater runoff design is based on data from published soils reports and on-site testing. Published soil reports have been prepared using both mapping and excavation of test pits approximately 5 feet deep over the entire state. This data is used to classify soils into Hydrologic Soil Groups (HSG). HSG A soils are the most rapidly draining, typically sands, and HSG D soils are of very low permeability, typically dense silts and clay or wetland areas that are normally inundated with water. Soils are assigned a runoff curve number (CN) based on several factors including underlying soils capacity to absorb water (i.e. HSG A soils have a lower CN than HSG D other factors being the same) vegetative cover and the condition of the vegetation. A forest for example absorbs more rainfall than a maintained lawn. In this case the proposed design proposes to excavate nearly all native soil with the exception of the area within the Riverfront and small areas adjacent to Boston Post Road and Sibley Road. By removing all of the pervious soil, as proposed, to the underlying ledge which is considered nearly impervious, the HSG would be changed and the (CN) would be higher in the proposed reconstructed vegetated areas. A higher runoff coefficient means a higher runoff rate and greater runoff volume for a given area than that with a lower runoff coefficient. More runoff directed to the stormwater detention system and outlet pipe than assumed in the model would result in more outflow and potentially non-compliance with this standard. An increase in the CN would increase the runoff and the system should be designed to reflect the proposed conditions to demonstrate no increase in runoff. As presented this has not been demonstrated.

The design of the permeable pavers would allow runoff to flow in the stone layers and bypass the catch basins. This flow would weep out at the interface of the pavers with Sibley Road pavement. The runoff model assumes all of the flow from these pavers will enter the catch basins.

As noted above under General Design Comments, in most frequently observed storms of less than one-two inches of rainfall, rain will soak into the stone under the grass paver units and follow along the stone interface between the stone and compacted fill, or ledge, to a point where it would weep out to the surface. In very small storms some may soak into the compacted soils and into the trench for the subsurface storm system or along the foundation for the building. Melting snow and frost would also soak into the stone area and follow along the interface between stone and compacted fill or ledge and weep out at the joint between pavement in Sibley road and the pavers.

Depending on the back fill used for the subsurface system and storm sewer pipes, groundwater would follow the bottom of the pipe trench and breakout at the discharge point creating a new spring in the slope at the outlet pipe discharge. The National Corrugated Steel Pipe Association Installation Manual specifies permeable granular backfill under the pipe, in particular when placed in ledge, which would provide a conduit for water to follow. The proposed subsurface pipe detention system should be specified as leak proof, tested and certified as leak proof, or the volume of infiltration of ground water included in the calculations.

Groundwater that collects along the foundation would collect in the underdrain if located at sufficient depth to collect this water. The blasting required to install the foundation for the building would create a tub to hold groundwater and the discharge location for this groundwater should be accounted for in the analysis. Discharge to Sibley Road would result in icing with associated serious safety concerns, to motorists.

The proposed design relies on a subsurface corrugated metal pipe system with various connections from the roof area and two catch basins and a trench at the access driveways into the parking garages. It is unclear how the roof of the building, which is the major path of the runoff for the system, would connect to the underground pipe on the northerly side and part of the east and west sides of the building. No connections are located in these areas. It appears that the roof is pitched with a ridge at some locations. Design and sizing of this system is critical to the function of the system, as bypass of the roof system would flow directly into Sibley road excepting any runoff that may flow into the trench drain or catch basins. These structures are not sized for flow from the roof. Runoff that bypasses the system would not be controlled and would result in more flow to Sibley Road than listed in the Report.

The proposed grading plan is incomplete and, at places, internally inconsistent. In particular, grades along the southeast side of the site at the edge of the emergency access way are incomplete; and, in the northwest corner, grading and subareas do not coincide.

A&M Response: The Existing Watershed plan will be updated accordingly. See A&M response to Comment #4 regarding the status of test pits. See also revised Grading and Drainage Plans. Locations of roof drains are not yet shown on Architectural drawings, but will be incorporated into the Civil design plans once available.

Standard 3-Recharge to Groundwater

Standard 3 is not satisfied.

Standard 3 requires recharge of runoff to compensate for the increase in impervious area.

No infiltration is proposed. The Report claims that it is not feasible to confirm groundwater and infiltration rates until after the site is regraded due to the proposed changes in topography. The design should be based on the conditions that exist on the site now. Soil testing to confirm groundwater and ledge levels as well as soil classifications for infiltration purposes is a basic element of project design. If there are suitable soils on-site for infiltration, these areas should be protected for that use.

As emphasized above, none of these systems would be allowed in the Zone A of a surface water supply.

A&M Response: The entire drainage system including the outfall area have been significantly revised. The drainage system has been revised from a detention system to an infiltration system. Furthermore, the system footprint has been expanded to include an overblast area with stone and blasted ledge below the crushed stone bedding for significant stone storage. This will also reduce post-development peak volumes below pre-development peak volumes, and allow for infiltration into the underlying native materials. Stormwater infiltration for the project is proposed at an assumed rate of 0.045 in/hr, in order to meet the 72-hour drawdown calculations. Once the project is established at its proposed subgrade, soil testing can be accomplished, and if found to meet or exceed the proposed rate, the infiltration system will be constructed as designed. Should the infiltration rate not satisfy the design standards, an alternate design will be proposed.

The outfall area has been completely redesigned to incorporate a level spreader and velocity dissipating Gabion wall, with Gabion mattresses and rip-rap linings. As currently proposed, the runoff from the

infiltration system will outlet to a control structure, designed with various outlets at differing elevations to meet pre/post peak flows for all design storms (2-, 10-, 25- and 100-year storm events.) The effluent is proposed to be conveyed to a 12" diameter perforated PVC pipe set within a Gabion wall, with Gabion mattresses below and in front of the outlet area. Runoff will trickle through the perforated pipe, through the Gabions, and fill up the rip-rap lined concrete level spreader. Once the runoff reaches the crest of the level spreader, it will overtop onto the rip-rap velocity dissipater apron below, and runoff through the wooded hillside, down to the Stony Brook and Stony Brook Reservoir. The outlet has been designed to reduce scouring and erosion to the maximum extent practicable for the application, and is a significant improvement over the existing conditions, which allow for unmitigated and untreated flow to the Stony Brook and Reservoir areas, with high potential for scouring and erosion.

See also response to Comment #1 pertaining to the allowed use within a Zone A of a surface water supply.

Standard 4-80% TSS Removal

Standard 4 is not satisfied.

Standard 4 requires that runoff be treated to 80% removal of TSS prior to discharge. This entire site is in the Zone A of a surface water supply and is considered a Critical Area and an Outstanding Resource Water (ORW). With the specific exception of stormwater discharges essential to the operation of a public water supply, no discharges are allowed.

A listing of the treatment BMP's proposed and their removal rating follows.

Deep sump catch basins: Deep sump catch basins are credited with 25% removal subject to proper design and sizing. To meet the standard, catch basins should collect no more than 10,890 square feet (1/4 acre) of impervious area. Although roof runoff is considered clean, if the roof discharges directly to pavement that portion should be included in the tributary impervious area calculations. Based on the pavement area alone surface flow to the catch basins would be under the maximum 1/4 acre of impervious. Provided the roof does not flow over pavement to the catch basins these would comply with 25% TSS removal credit.

Proprietary treatment unit: The Report indicates that a "Stormceptor 450i" treatment unit is proposed. More recent correspondence indicates that other options are being considered to remove phosphorus as the types of treatment proposed provide no filtration or phosphorus removal. Based on a DEP review of proprietary treatment units "Regulatory Review of Non Rated Stormwater Treatment Practices" published in 2013 by DEP, the proposed unit should only be credited between 30% and 75%. It is required to document the effectiveness of the unit with appropriate testing. In this case part of the flow is from the trench drain which provides no TSS removal and the Stormceptor would be the only treatment unit. The DEP Water Quality Volume (WQV) to Flow Rate conversion calculations should be provided for this unit. Subject to proper sizing and details I recommend that the Stormceptor receive a credit of 30% removal based on DEP publications. The allowable removal for proprietary units is at the Commission's discretion. Proprietary units are for pre-treatment; in this case it appears to be the main treatment device. The proposed use of the Stormceptor would not comply with DEP requirements.

The calculations use 1" to determine Water Quality Volume as required both under WSR and for a Critical Area.

In this case there are two treatment trains one has catch basins then the proprietary unit, the other is just the proprietary unit and the proposed design would not meet the standard.

A&M Response: Stormwater runoff captured by the roof is proposed to be discharged directly to the infiltration system, by use of roof drains. The drainage design plans have been revised to use a Jellyfish JF4-1-1 water quality unit to treat all surface runoff directed to the proposed infiltration system. A revised drainage plan and drainage report which includes the Jellyfish WQU design calculations, provided by the manufacturer.

Standard 5 – Higher Potential Pollutant Loads

Standard 5 is not satisfied.

Standard 5 specifies uses that are considered a Land Use with Higher Potential Pollution Loads (LUHPPL). The project would be considered a Land Use with Higher Potential Pollution Loads (LUHPPL) as a wastewater treatment facility is proposed at the site. In addition, storage of sludge, etc. is listed in the wastewater treatment process description as part of the process. Storage of sludge is also considered a LUHPPL. A wastewater treatment plant is not allowed in the Zone A of a Surface Water Supply.

The project definitely is an LUHPPL and the Report erroneously states that the project is not a LUHPPL.

This Standard has not been met by the project and is not allowed in this location due to DEP requirements for protection of Public Surface Water Supplies.

A&M Response: Source controls and pollution prevention measures to minimize or eliminate the exposure of any LUHPPLs to rain, snow, snow melt, and runoff are identified in the Long-Term Pollution Prevention Plan. The proposed WQU will meet TSS pre-removal requirements, see attached TSS removal calculations. The 1" rule has appropriately been utilized for sizing water quality units and recharge and water quality values.

Stantec Response: As stated previously, the WWTF will be contained within the apartment building, no sewers or drains from the WWTF will discharge outside the building, and periodic removal of solids will also be in a contained area to eliminate any possibility of contamination outside the building. Evaporators will evaporate the treated wastewater, so there will be no groundwater or surface water discharge. Since there will be no possibility of exposing wastewater or wastewater solids to rain, snow, snow melt or runoff, the WWTF is not an LUHPPL.

Standard 6 - Protection of Critical Areas

Standard 6 is not satisfied.

Standard 6 requires specific protections and uses of specific BMP's in Critical Areas.

Based on a review of MassGIS data and information in the submittal and other supplied information, the entire locus is in a critical area, the Zone A of a Surface Water Supply. The Report erroneously states that the project does not discharge near a critical area.

DEP has determined that several of the proposed uses, a wastewater treatment plant and stormwater BMP's and stormwater discharges in particular, are prohibited in the Zone A of a Surface Water Supply. Under these criteria, approval of the project would be subject to appeal by the City of Cambridge, the owner of the water supply and adjacent land for impacts to the Zone A. DEP requires that Public Surface Water Suppliers shall protect the Zone A of their systems.

The entire project is in a critical area, the Zone A is located a distance of 400 feet from the surface water supply, which is identified by the State as both the reservoir and Stony Brook. The proposed discharge is clearly within 400 feet of the Stony Brook and the Reservoir.

Standard 6 requires that **no stormwater BMP's** can be located in the Zone A.

Standard 6 cannot be met by the project due to risks of contamination to the Public Surface Water Supply, which will include stormwater contaminants and wastewater contaminants.

A&M Response: See A&M response to Comment #1.

Standard 7-Redevelopment Projects

Standard 7 is not applicable.

The site is not a redevelopment project. In order to be a redevelopment project there can be no increase in impervious area. This site has a substantial increase in impervious area. The site is also not a partial redevelopment project as no components of the existing development are proposed to remain except a small area of pavement from the proposed stormwater discharge to Sibley Road. This pavement should be removed as it will exacerbate erosion from the stormwater outlet. This pavement appears to remain not for any useful purpose but to avoid having to file with the Conservation Commission by staying out of the riverfront area. Although the overall project cannot meet DEP requirements, removal of pavement in the riverfront alone could be permitted as a restoration project.

A&M Response: The drainage system outlet has been revised to reduce runoff velocities as indicated in the submitted drainage report. The pavement within the 200-foot riverfront area will remain.

Standard 8-Erosion/Sediment Control

Standard 8 is not satisfied. WSR 5.0 C. 3. f. is not satisfied.

Standard 8 requires that an Erosion and Sedimentation Control plan shall be developed for the site.

In this case a NPDES SWPPP will be required, a draft SWPPP has not been submitted. The plans include a plan labeled "Demolition and Erosion Control Plan". This plan may be a demolition plan and does indicate a row of silt fence and straw bales around the perimeter of the site but the plan does not meet the requirements under the DEP Handbook or of the WSR. Of particular importance is that temporary runoff controls are not indicated. As the site is directly tributary to a surface water supply, this is a critical aspect of the design.

The WSR also requires indication of locations where stormwater would discharge during construction. As much of the site naturally slopes to the Public Water Supply Reservoir, sediment discharged during construction would impact the catch basin in Sibley road and any excess sediment would flow to the reservoir. Any unforeseen circumstances, such as a hydraulic fluid leak, fuel spill, etc. would also potentially discharge to the reservoir.

A&M Response: A NPDES SWPPP will be submitted prior to the start of construction as coordinated with the Cambridge Water Department.

Temporary runoff controls will be included in the revised Demolition and Erosion Control Plan during the construction document and SWPPP preparation phase of the project.

Standard 9 - Operation and Maintenance Plan

Standard 9 would be satisfied if the use was allowed in a Zone A.

Standard 9 requires a plan for long term Operation and Maintenance (O&M) of stormwater BMP's.

An Operation and Maintenance Plan (O&M) was provided in the Report. The O&M is generally consistent with DEP requirements for long term maintenance; however, the stormwater system itself is not allowed in the Zone A, as emphasized above.

A&M Response: See A&M response to Comment #1.

Standard 10 Illicit Discharge

Standard 10 is not satisfied.

Standard 10 requires a signed illicit discharge statement. An illicit discharge statement is included in the Report, but it has not been signed as required.

A&M Response: The required illicit discharge statement will be provided.

Wastewater Issues:

There is no public sewer system accessible to the site. 248 CMR · 10.00 the Massachusetts Plumbing Code, which applies to all building construction including this project protects health and safety relative

to sanitary waste disposal and potable water supply. The proposed wastewater treatment plant would not be allowed in a Zone A under current permitting requirements. There is no provision for an evaporative effluent disposal system so it would not be allowed at this time.

The project proposes a unique effluent discharge system, which would consist of using multiple gas fired evaporators to boil off the fluid portion of the effluent generated (up to 25,000 gallons per day at peak flows) and then discharge the fluid that results to the air as steam and collect remaining solids in tanks that then would be truck from the locus to a licensed disposal location. The wastewater would be treated prior to discharge by a Membrane Bioreactor (MBR) wastewater treatment plant. Under Definitions in 310 CMR 12.00 "Operation, Maintenance and Pretreatment Standards for Wastewater Treatment Works and Indirect Discharges" this would be a "Wastewater Treatment Plant".

As noted in the Stantec "Conceptual Design Executive Summary for Proposed Wastewater Treatment and Evaporation Facilities dated May 12, 2017, the DEP "Guidelines for the Design, Construction, Operation and Maintenance of Small Sewage Treatment Facilities with land Disposal" (Guidelines) is the accepted guidance for construction of treatment plants of the size and type proposed for this project. Although the final effluent disposal is different than land disposal, the treatment plant should be constructed in compliance with the same criteria as a plant with land disposal of effluent.

Under 310 CMR 22.20B no new treatment or disposal works permitted under 310 CMR 3.00 Surface Water Discharge Program or 310 CMR 5.00 Groundwater Discharge Program will be allowed in the Zone A of a Public Surface Water Supply, so the proposed treatment system is not allowed.

The proposed disposal system is a 'treatment works.' The proposed system does not appear to be permitted under either program specifically, but if it were allowed, then certainly the standard location and setback requirements for the Treatment Works aspect of the design should apply and they are not satisfied by the proposed system.

A Treatment Works system may not be located in a Zone A as there is risk of contamination of the public water supply. In addition, there are potential health hazards to the occupants of the building to having a wastewater treatment plant inside of a residential building.

Under the Guidelines a minimum 50 foot separation is required between a dwelling unit and the treatment plant. There would not be 50 foot of separation from a dwelling unit based on the plans provided. This should be 50 feet of horizontal separation, not vertical separation, but the project would not meet vertical separation either. There is also a required setback of 50 feet from a property line. As the location of the system is not indicated on any plans it is unclear if the treatment plant can meet this setback. The proposed building is closer than 50 feet to the property line, so that requirement cannot be satisfied.

The Guidelines also contain specific requirements for the treatment plant building itself including ventilation, chemical storage if necessary, floor drains, etc. It is my understanding that the proposed system would be below grade under the lower level parking area. The plans should identify preliminary features including chimneys for discharge of steam from the evaporators, ventilation, etc. Wastewater treatment plants frequently are a source of odors that should be a consideration in the design.

Even if the subterranean treatment plant were to be allowed (despite the fact that it does not satisfy the above itemized requirements), then the Town still should evaluate the impact of the proposed system on public safety generally. The Town should evaluate the following public safety impacts, which are separate and apart from whether the system could obtain a permit to allow it:

Stantec Response: We have met with the MassDEP and have submitted Conceptual Design Plans and a Preliminary Design Report for review. Since the facility will not require either a Groundwater Discharge Permit or a Surface Water Discharge Permit, the MassDEP has determined that the proposed wastewater treatment facility with effluent evaporation is not a prohibited use at this location.

The treatment plant equipment will be installed within the basement of the apartment building and will maintain a 50' setback to the property lines. Although the treatment plant will not be constructed more than 50 feet from the apartment building (as outlined in the Guidelines for the Design, Construction, Operation and Maintenance of Small Wastewater Treatment Plants with Groundwater Disposal), the design will incorporate ventilation, odor, noise and vibration controls to protect the residents and prevent nuisance conditions. This is NOT the first wastewater treatment plant constructed in Massachusetts within the basement of a residential building.

- What noise and vibrations would be generated by the treatment plant and how would they impact occupants of the building, including not just the plan itself, but the venting system, whether internal to the building or attached to the outside of the building?

Encon Evaporators Response: Noise from the evaporator system is limited to the blowers used to exhaust flue gas and water vapor to the atmosphere. These blowers typically use 10-15 HP motors that operate in the range of 2200-2400 RPM. Blower motor housings and inlet and outlet silencers will be selected to minimize noise and ensure that the sound levels local to the evaporator does not exceed 85 dba (OSHA guideline).

Stantec Response: The WWTF design, including the ventilation system and treatment system blowers, will incorporate measures to keep noise to an acceptable level. Vibration should not be an issue with the treatment plant equipment.

- What type and level of odors would generated by the treatment plant, both within and outside of the building, and how would the odors impact the occupants of the building and occupants of nearby buildings?

Stantec Response: The majority of the treatment units will be covered to contain odors. The air above each covered unit, plus the entire treatment area, will pass through an odor control system.

- How would the steam generated by the treatment plant impact public safety? The impact on the following elements should be evaluated:
 - Locus sidewalks.
 - Locus access points
 - Sibley Road.

- Boston Post Road vehicular conditions.
- Boston Post Road sidewalk conditions (in front of and on either side of 133 Boston Post Road).
- The sidewalks and paving internal to the office park at 133 Boston Post Road
- The gas station and convenience store located on Boston Post Road.
- All area driveways.
- The Route 95 interchange that connects to Boston Post Road.
- Route 95.

Encon Evaporators Response: The evaporation system will be designed to minimize the likelihood of a vapor cloud impacting the local vicinity or moisture condensing into the local vicinity and causing safety conditions such as icing. The design will incorporate the following installation features:

a.) the exhaust stack will be well insulated to minimize the condensation of droplets in the stack. This will allow vapor phase steam to exhaust into the atmosphere as opposed to droplets of water.

b.) The stack run will be as straight as possible with no 90 degree bends and will exhaust vertically at a point approximately 5 feet above the highest nearby building peak.

c.) The blower motors will be connected to variable frequency drives that allow adjustment of motor speed to optimize the stack velocity to maximize the height of the discharged vapor above the stack outlet

- What level of moisture, if any, will be generated by the treatment plant within the building for the occupants of the building?

Stantec Response: The majority of the treatment units will be covered, so the humidity level should not be elevated. The WWTF will be equipped with an odor control and ventilation system that will monitor and control humidity.

Encon Evaporators Response: Any humidity from the evaporator is substantially contained in the vicinity of the evaporator. There is a negative pressure created by the exhaust blowers which will draw water vapor (humidity) out of the evaporator vessel and discharge it into the atmosphere through the stack outlet.

The evaporator system is designed as standard to keep blowers running at water temperatures above 150F to prevent moisture from escaping the evaporator tank and entering the surrounding room. This temperature can be adjusted lower by the operators, as necessary.

- If there will be vents for the treatment plant that will run through the building, what level of heat will the vents generate and what impact will that heat have on the residential units during the cooling season, both comfort -wise and financially?

Stantec Response: The wastewater treatment units will not generate a significant amount of heat.

Encon Evaporators Response: The evaporator tank is well insulated on all 6 sides so the escape of heat from the tank is minimized. There are exhaust blower motors (10-15HP) running on each system as well as 2 small blowers (1/3rd – 1/2 HP) that provide makeup air for combustion on the burners of each evaporator. These motors will generate heat that will be absorbed by the surrounding area.

If you have any questions or comments, please do not hesitate to contact me at (781)-935-6889. We look forward to further discussing the project with the ZBA at the hearing scheduled for Monday, July 10, 2017.

Very truly yours,

ALLEN & MAJOR ASSOCIATES, INC.



Timothy J. Williams P.E.
Principal

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