



# NEW ENGLAND CIVIL ENGINEERING CORP.

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April 26, 2019

Darlene Wynne  
Assistant Planning Director  
Beverly Planning Department  
191 Cabot Street  
Beverly, MA 01915

Re: City of Beverly, Peer Review RFP -  
Peer Review Services, Livingstone Avenue Definitive Subdivision Plan – 7 Porter Terrace, LLC

Dear Darlene:

We are pleased to support the Beverly Planning Board and Conservation Commission with peer review services for the above referenced project. We understand the project will be presented at the next ConCom meeting in May of 2019 and at the next Planning Board meeting in May of 2019, we have prepared this project status letter for your use at the meeting.

## Project Understanding:

- The Applicant (7 Porter Terrace, LLC) proposes a development between Porter Terrace and Livingstone Avenue. The project will involve extension of a private paved street and construction of three new buildings and related site work and utilities.
- The City of Beverly Planning Board requests an independent peer review of the proposed development plans and documentation including stormwater management, drainage, and utilities; and onsite engineering issues raised by other departments.
- The peer review shall consider relevant City Ordinances and Regulations, and review comments from Beverly Parking and Traffic Commission, Conservation Commission, Beverly Police and Fire Departments, and the City Engineer.
- Included in the peer review will be consideration of existing and proposed utilities, sewer separation and infiltration issues, water main capacity and water valve status, and adequacy of existing utilities to serve the project.
- Specific documents to be reviewed include a Stormwater Report (dated March 23, 2018 - 133 pages), a Subdivision Application (dated May 4, 2018 - 24 pages, and Design Drawings (dated March 8, 2018 - 8 sheets).
- The City of Beverly Conservation Commission may also request peer review in the future but additional review to address concerns of the Conservation Commission is not included in this peer review.
- We prepared a peer review letter dated August 31, 2018.

- We attended a Planning Board meeting on September 25, 2018 and presented the findings of the peer review.
- Applicant submitted a peer review response letter dated December 17, 2018 (5 pages) and submitted a substantially revised set of drawings dated December 17, 2018 (8 sheets) and a substantially revised and expanded stormwater management report dated December 17, 2018.
- Applicant submitted a revision to the 12/17/18 letter and submittal, including a revised peer review response letter dated December 27, 2018 (1 page) and submitted a revised set of drawings dated December 27, 2018 (4 sheets) and a revised stormwater management report dated December 27, 2018.
- Applicant submitted a second peer review response letter dated March 28, 2019 (2 pages) and submitted a substantially revised set of drawings dated March 28, 2019 (10 sheets) and a substantially revised and expanded stormwater management report dated March 28, 2019.

#### Review Comments

##### 1) Submittal Package

To date the following information has been provided for review:

- 03/ 08/ 18 set of design drawings (8 Sheets)
- 03/ 23/ 18 Stormwater Report (133 Pages)
- Subdivision Application (24 Pages)
- 12/17/ 18 set of design drawings (8 Sheets)
- 12/17/ 18 Stormwater Report
- 12/17/18 response letter (5 pages)
- 12/ 27/18 set of design drawings (4 Sheets)
- 12/27/18 Stormwater Report
- 12/27/18 response letter (1 page)
- 03/28/19 set of design drawings (10 Sheets)
- 03/28/19 Stormwater Report
- 3/28/19 response letter (2 pages)

##### 2) Conservation Restrictions

The 3/8/18 plans include a three lot subdivision on Livingstone Avenue. Proposed Lot #100 encroaches on both the 25-foot No Disturb Zone and the 50-foot No Build Zone parallel to the intermittent stream. The proposed building corner is 25-feet from the resource flags and proposed grading (fill) extends to within 10-feet from the resource flags. Applicant intends to request a waiver from these setback requirements.

We agree that a waiver will be required to site a residential building on proposed Lot #100, however it does not appear the design attempts to minimize the impact. For example, proposed grading surrounding building layout could be revised to reduce encroachment on NDZ, or building could be re-oriented and/or reduced in size without garage to avoid any encroachment on NDZ.

#### **8/18/18 Comment:**

**Recommend Applicant revise layout to minimize impacts on conservation setbacks.**



**Status = Partially Resolved. Applicant has revised the plans to reduce the overall size of the proposed house #100 (house increased in size but garage deleted) to reduce footprint in the NBZ. Applicant has revised the plans and grading to eliminate any impacts (with exception of brush clearing) in the NDZ.**

3) Proposed Conditions -Grading

A drainage alteration permit required from Engineering Department and Conservation Commission. Grading change greater than 2-feet proposed in many areas, including in the NDZ. As stated by DPS and Engineering review, each home or property will also require an erosion control and drainage alteration permit. Applicant has not provided a drainage alteration permit for reference and review.

**Recommend Applicant submit a drainage alteration permit for review.**

**Status = Resolved. Applicant has confirmed that a drainage alteration permit, a NPDES construction general permit, and a stormwater pollution prevention plan (SWPPP) will be submit to the Beverly Engineering Dept.**

4) Proposed Conditions – Porter Terrace Drain

An existing drain on Porter Terrace serves the closed drainage on Porter Terrace and the intermittent stream between Livingstone and Ashton Street. The pre and post-development catchment areas tributary to this stream and drain pipe are not identified in the report.

**8/18/18 Comment:**

**Request Applicant submit an expanded drainage analysis to include the catchment area tributary to the Porter Terrace drain at the point of proposed connection from the project.**

**Status = Resolved. Applicant submitted a revise and expanded drainage analysis on 12/17/18 and a revised analysis on 12/27/18. The analysis confirmed the pre and post flows are not increased in Porter Terrace on 12/27/18 letter.**

**The design was revised in 3/28/19 submittal to eliminate the storage tank on the subject parcel and address downstream restrictions on Porter Terrace and Upland Road. Proposed flows increase to Porter Terrace but hydraulic model shows the improvements result in an improved drainage condition on Porter Terrace.**

5) Proposed Conditions – Porter Terrace Drain

A drainage system is proposed to collect runoff from the improved Livingstone Avenue and the three developed lots, and discharge it toward Porter Terrace with a new 8-inch drain pipe and manhole on Porter Terrace.

The stormwater report predicts reduced peak discharge rate and total volume of runoff toward Livingstone Avenue, and increased peak discharge rate and total volume toward Porter Terrace.

Without analysis of the peak discharge and time of concentration of the runoff being conveyed by the Porter Terrace drain, and capacity analysis of the Porter Terrace drainage system, it is not clear if the proposed increased discharge will pose any adverse impact on the downstream system.



**8/18/18 Comment:**

**Request Applicant submit an expanded drainage analysis to include the area tributary to the Porter Terrace drain at the point of proposed connection from the project, predict pre and post-development flows in the Porter Terrace drain at proposed point of connection, and demonstrate capacity based on minimum pipe slope downstream from point of discharge.**

**Status = Resolved, See Comment 4) Status.**

**6) Groundwater Recharge – Roof Leaders**

In effort to meet requirements for groundwater recharge (standard 3), Applicant proposes to install three dry wells, one for each building, to collect and infiltrate runoff from the rear of each building. As a result, the project requires gutters and roof leader connections to the drywells to be installed to meet the design requirements. Since gutters are often optional in building contracts, we recommend that the Planning Board incorporate a requirement to install gutters as a condition of approval.

**8/18/19 Comment:**

**Recommend condition of approval that Applicant submit final architectural plans to Planning Board for approval prior to issuance of building permit and/or submit confirmation that gutters and downspouts to drywells have been installed prior to issuance of certificate of occupancy.**

**Status = Ongoing, Recommend Condition of Approval.**

**7) Groundwater Recharge – Subsurface Conditions**

As stated above, plan incorporates dry wells to infiltrate the runoff from the rear half of the roofs for each building. The detail for the drywells require a minimum of 4.5-feet of depth to construct the drywells, and the drainage calculations require the bottom of the drywells to be dry and allow infiltration to meet the design intent.

The completed subsurface investigations identify ledge and/or high groundwater in proximity to each drywell (TPs-20, 19, 18, 16, and 4) identify depths to seasonal high groundwater and/or ledge that is above the projected bottom of the drywell systems, calling into question whether the calculations represent high groundwater conditions. Not clear if drawdown rate of 1.02 inches per hour is representative of each system with consideration for groundwater and ledge, may need to define ledge removal depths and/or relocate or reposition the systems to allow for predicted infiltration rates.

**8/18/18 Comment:**

**Request clarification in the detail on the depth below drywells that ledge removal will be required, and confirmation that the bottom of the drywell systems are all above seasonal high groundwater.**

**Status = Resolved. 3/28/19 Redesign eliminates the drywell for #112, relocates the drywell for #106 and #100 to vicinity of test pit (TP-4) where sufficient depth to ledge is shown to exist. To compensate for elimination of drywell for #112, redesign adds additional source of recharge with rain garden on Livingstone Ave.**



8) Groundwater Recharge - #15 Porter Terrace Concerns

As stated above, plan incorporates dry wells to infiltrate the runoff from the rear half of the roofs for each building. An abutter at #15 Porter Terrace has expressed concerns with groundwater infiltration into the basement under existing conditions. Proposed drywell is to be located in toward the rear of the property, upgradient from #15 Porter. To reduce abutter concerns, recommend the location of the proposed drywell be adjusted to provide more separation from rear abutters.

**8/18/19 Comment:**

**Request Applicant consider revised locations for drywell for #112 to alleviate abutter concerns.**

**Status = Resolved. 3/28/19 Redesign eliminates the drywell for #112, relocates the drywell for #106, and adds additional source of recharge with rain garden on Livingstone Ave. Changes address concerns about increasing recharge in vicinity of #15 Porter Terrace.**

9) Pre and Post-Runoff

In effort to meet requirements for peak runoff rate attenuation (standard 2), Applicant proposes to install a sub-surface detention system in the front yard of proposed #106 Livingstone. The system consists of a series of connected 24-inch diameter drain pipes, surrounded by crushed stone, and wrapped in waterproof membrane.

The entire system is positioned below seasonal high groundwater which requires the system to be completely water-tight at time of construction and into the future to function, or the system could fill up to groundwater level and provide no storage for the detention that is required to meet the intent of the drainage design. If system leaks but does not fill entirely and drains out of low level 4-inch drain, the resulting flows would add to flows reaching the Porter Terrace drain but not be accounted for in the model, raising possibility of adverse impacts. The system is positioned in a front yard at shallow depth (approx. 2-feet) and is therefore susceptible to damage from homeowner excavation (planting a tree, installing a fence, etc.).

**8/18/19 Comment:**

**Request Applicant provide additional details on the proposed detention system, including:**

- Buoyancy calculations to confirm system will not "float" when empty.**
- Testing methods of construction to confirm system is watertight during construction (vacuum test for example)**
- Protective barrier above shallow system to reduce likelihood of homeowner or private contractor encounter and damage.**
- Information on use restriction to be placed on the front yard of #106 to reduce likelihood of homeowner or private contractor encounter and damage (No build zone, no plant zone, etc.).**
- Consideration of alternatives to proposed system, construction materials, or location that will address concerns listed above.**

**Status = Resolved. The 12/17/18 redesign relocated the subsurface tank from the private property to the roadway. The 3/28/19 redesign eliminated the subsurface tank altogether and instead increased capacity of downstream drainage in a location that is subject to coastal storm flowage where peak flows need not be mitigated if drainage has adequate capacity.**



10) Details – Outlet Control Structure

The 12-inch pipe inlet to the outlet control structure on Sheet C-7 is listed at elevation 46.5-feet, while the outlet pipe from WQS #1 on Sheet C-3 is listed at elevation 45.7-feet, lower than inlet.

**8/18/19 Comment:**

**Request Applicant clarify pipe elevations.**

**Status = Resolved. The 3/28/19 redesign eliminated the outlet control structure.**

11) Details – Detention Field

The Drainage report identifies the primary modeled outlet from the detention field as an 8-inch round culvert (pipe), while the details on Sheet C-7 identify the outlet at a 12-inch diameter pipe.

**8/18/19 Comment:**

**Request Applicant clarify pipe size and confirm drainage model is based on correct pipe outlet size.**

**Status = Resolved. The 3/28/19 redesign eliminated the outlet control structure.**

12) Sanitary Sewer

Existing sewer on Porter Terrace is identified as an 8" sewer with greater than minimum pipe slope. Sewer capacity should not be a concern.

**Status = Resolved.**

13) Water

Proposed connection to City water line on Porter Terrace includes a new tee and triple gate connection. The proposed private 6-inch water line extends through private property to the private Livingstone Avenue where a valve and hydrant will be located. Engineering Department review stated that the hydrant location shall be coordinated with the Fire Dept., not clear if this has been done.

**Request Applicant confirm fire hydrant location has been coordinated with Fire Dept.**

**Status = Resolved. Applicant has stated that the Fire Dept. approved hydrant location on 12/17/19.**

14) Proposed Roadway Improvements and Maintenance

Limits of roadway reconstruction are not identified on the site plans, but assumed to be represented by the improved/unimproved road limits shown on Sheet C-2. Paving and curbing limits and proposed spot grades not identified. O&M Plan identifies street sweeping as an O&M activity to be completed by a homeowners association, it is not clear which properties will be included in the association and where the limits of the street sweeping will be defined.

**8/18/19 Comment:**

**Request Applicant provide additional information on the limits of roadway reconstruction and provide spot grades for roadway center and gutter lines to facilitate review of runoff projections.**



**Request Applicant provide additional information on the proposed homeowners association who will maintain and sweep the roadway, and where the limits of their responsibility will be defined.**

**Status = Resolved, Applicant has revised the O&M Plan to identify the limits of roadway/common driveway that the homeowners association will be responsible for.**

15) Proposed Utility Operations and Maintenance

Existing Lot #7 Porter, and proposed Lot #106 Livingstone have defined utility easements. The easements will encompass common utilities (water, sewer, and drain) as well as private utilities (sewer and water services). Information is not provided to explain the rights and intents of the easements, it is not clear if the easements allow access for individual lot owners, association representatives, City of Beverly, or some combination).

The O&M Plan states "Drainage structures will be maintained by individual lot owners". The drainage structures for this development include the three drywells, two catch basins, a water quality structure, a subsurface detention field, drain manholes and piping. It is not clear what is intent of the O&M, if individual owners would be responsible for the infrastructure on their individual property, or if there would be an association that would be responsible. Some drainage infrastructure (catch basins and water treatment device) are located on common property, while other infrastructure (sub-surface tanks and outlet control device) are located on property of #106).

Similar comment for other utilities, the fire hydrant and valve are on common property and the sewer pipe and sewer manholes are on property of #106. It is not clear which parties will be responsible for O&M of proposed common water and sewer utilities including the fire hydrant in paper street.

**8/18/19 Comment:**

**Request Applicant provide additional detail on the proposed ownership and O&M for the drainage infrastructure (and other utilities) on common land in the improved roadway, as well as the proposed utility easements to clarify division of responsibility moving forward.**

**Status = Resolved. Applicant has reduced the easement associated with the deleted subsurface tank, and has defined the limits of the responsibility between the HOA and the individual lot owners.**

16) Livingstone Drain Bypass

The revised and expanded drainage analysis identified additional flow contributions to the Livingstone/Porter catchment area and predicts the runoff will crest the banks of the intermittent stream and travel overland to lower Livingstone Avenue in the 25-year and 100-year design storms. The model predicts that grading changes for the roadway and proposed buildings will prevent the overland flow and increase flows to the Porter Street drain. prevented the overland flow and  
The 12/17/18 (and subsequent redesigns) have included a high level 18-inch bypass drain pipe on Livingstone Avenue from the intermittent stream to lower Livingstone Avenue to approximate Station 2+50, where it will discharge and continue to flow overland in similar patter to existing conditions.



**Request Applicant provide additional detail, topography, or spot grades to identify pre and post runoff patterns downstream of the proposed bypass pipe discharge point location at Station 2+50 on extended Livingstone Avenue.**

We appreciate the opportunity to work with the City of Beverly on this peer review project and look forward to continuing our working relationship on the future. If you have any questions or require additional information, feel free to reach me any time at my Salem office at 978-741-7401.

Sincerely,



William M. Ross, P.E.  
Project Manager/Principal Engineer  
New England Civil Engineering Corp.

