

Ms. Juliet T. H. Walker, AICP  
Planning Director  
Planning Department  
1 Junkins Avenue  
Portsmouth, NH 03801

June 5, 2019

Ref. T0884

Re: Cate Street Extension & West End Yards Site Stormwater Peer Review #2

Dear Ms. Walker:

On behalf of the City of Portsmouth, TEC, Inc. (TEC) has completed an engineering peer review of the revised Cate Street Extension and West End Yards site stormwater management system based on updated and supplemental material submitted by the Applicant and dated May 2019, including responses to peer review comments previously offered by TEC in a letter dated May 14, 2019. The following details the results of this stormwater review:

Reference Documents:

The following documents provided by the City of Portsmouth Planning Department were included as part of this review:

- *Cate Street Roadway Plans*, prepared by Fuss & O'Neill – dated May 2019
- *West End Yards Site Plans*, prepared by Fuss & O'Neill – dated May 2019
- *Stormwater Management Report - West End Yards*, by Fuss & O'Neill – dated May 20, 2019
- *Response to Cate Street Extension & West End Yards Site Stormwater Peer Review*, letter prepared by Fuss & O'Neill – dated May 20, 2019.

After review of the reference documents cited above, TEC offers the following comments and recommendations (in **BOLD**) to be addressed by the Applicant, at the discretion and direction of the City. The comment numbering system from the May 14, 2019 peer review has been utilized for consistency, with new comments added at the end:

Stormwater Management Review:

1. It is noted that the Site Plans and Stormwater Management Report cited under the Reference Documents section above are not yet complete/finalized and those documents shall be resubmitted by the Applicant for review/approval, when finalized, prior to project approval.

*Fuss & O'Neill Response:*

*Supporting information, such as Test-pits and Saturation Rates, necessary to appropriately size Sub-surface Infiltration Basins (SSIB's) have been obtained from the Wetland / Soils Scientists and Geotechnical Engineers. The revised plans and stormwater analysis are based on this information as well as revised site layout and grading that has been performed during the continued design of the project.*

**It is noted that stormwater design supporting information has been obtained and provided in the latest submittal, and the stormwater design has been updated to reflect this information. However, the plans and stormwater management system design are not considered final and ready for City approval until all peer review comments are adequately addressed, and any outstanding items not listed herein, but that have been discussed/coordinated with the City, are completed by the Applicant.**

2. It is understood that the Applicant is in the process of procuring a City Conditional Use Permit as required by the City of Portsmouth due to disturbance within the wetland buffer zone. Construction shall not commence before such permit is granted.

**Comment adequately addressed.**

3. The hydrologic analysis calculations shall be revised to utilize the design storm rainfall data published by the Northeast Regional Climate Center at Cornell University, with an additional 15% factor added, as required by the NHDES AOT Regulation ENV-Wq 1503.08 (I).

**Comment adequately addressed.**

4. The Executive Summary notes in Section 2.1 that test pits will be performed to confirm site geotechnical conditions, including Hydraulic Conductivity and ESHWT (Estimated Seasonal High Water Table). Test pits shall be performed by the Applicant at all proposed locations of stormwater management practices in order to complete the proposed stormwater management design and verify compliance with City of Portsmouth and NHDES standards.

*Fuss & O'Neill Response:*

*Test-pits have been performed and the Geotechnical Engineer has provided Hydraulic Conductivity calculations for a number of locations on the site. Some previously considered locations for SSIB's have been abandoned due to poor depth to ESHWT or poor Hydraulic Conductivity (Ksat). The Test-pit locations and logs and Hydraulic Conductivity Calculations have been provided as part of the revised Stormwater Management Report.*

**It is noted that test pits have been performed and results have been provided. Please label the ESHWT value on the drainage details on Sheets CD-511 to CD-513 as applicable. If the drainage structures are located within ESHWT, provide ballast calculations as necessary.**

5. Label all proposed stormwater infrastructure shown on the Grading, Drainage, & Erosion Control Plans, including subsurface infiltration basins (SSIBs), for clarity; and provide all dimensions and design details in the plan set for all proposed stormwater management practices.

*Fuss & O'Neill Response:*

*The Stormwater Management System has been revised extensively. Structures have been labelled on the plans. Design details for the SSIB's are in progress at the selected chamber producer in support of the design. These will be added to the plans when received. All other structures are detailed. Minor revisions will be ongoing and completed prior to submission to NHDES Land Resources Management Bureau for Alteration of Terrain permitting.*

**A number of labels for proposed stormwater design infrastructure are still missing from the plans (e.g. Bioretention curb openings, inlet structures, etc.)**

6. Subcatchments T9 and T10 appear to drain toward the storm drain system Pond AP2. However, the HydroCAD routing diagram appears to show subcatchments T9 and T10 draining toward Hodgson Brook, Pond AP1. The Applicant should review and revise the drainage design if necessary to confirm compliance with City of Portsmouth and NHDES standards.

**Comment adequately addressed.**

7. The Applicant shall confirm via a qualified hydrogeologist that the proposed drainage system additions do not result in any "adverse effect on other public or private groundwater sources", as required by the City of Portsmouth Site Plan Regulations, Section 7.2.4.

*Fuss & O'Neill Response:*

*The Geotechnical Engineer will submit the required confirmation. However the site and surrounding area is on City Water and Sewer. The area is also outside public and private well head protection areas.*

**Prior to Site Plan approval, the Applicant shall provide confirmation from a qualified hydrogeologist that the proposed drainage system additions do not result in any "adverse effect on other public or private groundwater sources", as required by the City of Portsmouth Site Plan Regulations, Section 7.2.4.**

8. The Applicant should review Tables 1.1 and 2.1 of the Executive Summary and revise as necessary. The Net Change in the 50-year AP1 and 10-year AP2 peak flows appear to be incorrect based on the Existing and Proposed Flows cited.

**Comment adequately addressed. The peak flows have been corrected.**

9. 4" perforated underdrain pipe is proposed in the Bioretention System details. NHDES Stormwater Manual Volume II requires  $\geq 6$ " pipe.

*Fuss & O'Neill Response:*

*The 4" perforated pipe underdrain has been replaced with a 6" perforated pipe underdrain.*

**It is noted that 6" underdrain pipes are now proposed. Please show underdrain in the Bioretention detail on Sheet CD-511.**

10. Deep sump catch basins are proposed throughout the design. The Applicant shall confirm that each deep sump catch basin has a contributing impervious drainage area of  $\leq 0.25$  acres, as parametrized by NHDES Stormwater Manual Volume II.

*Fuss & O'Neill Response:*

*Subcatchment Areas contributing to the catch basins will be reviewed. Whether the catch basins should be considered for deep sumps or additional catch basins should be added will be evaluated.*

**Ensure that all catch basins are specified with deep sumps, and that each catch basin inlet contributing area is  $\leq 0.25$  acres, as parametrized by NHDES Stormwater Manual Volume II (specifically, review CB #26).**

11. There appears to be a slight ( $\pm 3$  SF) discrepancy in total area between the pre/post HydroCAD conditions. Please consider revising.

**Comment adequately addressed.**

12. Groundwater Recharge Volume Calculations, BMP worksheets and calculations, Infiltration Feasibility Report, UIC Registration, and I&M Manual are noted as "pending" items. "Pending" items have not been reviewed by TEC and shall be completed prior to final approval.

*Fuss & O'Neill Response:*

*Groundwater Recharge Volume (GRV) Calculations have been performed, however, please note due to the reduction in impervious cover within the project area, there will be a negative required GRV without any infiltration. The design and implementation of infiltration will serve to expand this negative value, essentially a "credit". This is a good thing for the watershed in general. BMP worksheets have been prepared and provided.*

*Infiltration Feasibility Report information has been prepared and provided. UIC Registration will be prepared prior to submission to NHDES for AoT permitting.*

**Appendix J, UIC Registrations for infiltration to Groundwater, and Appendix K, Inspection and Maintenance Manual, are still pending and should be included with the final Site Plan submittal.**

13. Consider revising the location of proposed catch basins 5 & 6. Catch basins should be located at the low point (Station 2+78).

*Fuss & O'Neill Response:*

*All catch basin locations have been reviewed and revised to be in the low spots in their subcatchments.*

**Please verify that CB #7 and CB #8 are located at the gutter line low points (the profile low point is at Station 3+73.15); consider adding spot grade labels at gutter line low points throughout the project. Storm water drainage system layout/modifications at Bartlett Street appear to be incomplete. Catch basins should also be provided on Bartlett Street at the profile low point at Station 21+34.**

14. Consider revising catch basin locations throughout Cate Street / Cate Street Extension to provide a minimum spacing of 300'.

*Fuss & O'Neill Response:*

*Traditionally the 300-ft maximum separation between catch basins / drainage structures has to do with pipe cleaning and ensuring the jet trucks have adequate hose length to clean the lines. None of the drainage pipes employed in the design exceed 300-ft in length.*

*All but one set of catch basins are no more than 300-ft from another catch basin or a high spot. CB 12 and CB13 are 357-ft from the high spot at the intersection with the existing Cate Street as it heads toward the bridge over Hodgson Brook. The subcatchments to these two catch basins are small and will allow for them to receive deep sump credit.*

**The spacing between CB #44 (10+30 RT) and CB #26 (13+90 RT) is 360-feet and CB #26 also appears to collect contributing area from the Site parking area drive at Station 10+60 RT. Please study the inlet capacity of this drainage area (Subcatchment 10) and consider adding an additional CB.**

15. Show and label proposed curb openings to bioretention basins on the applicable plan sheets. The detail shows a curb opening to the BMP but the plans do not shown such information.

*Fuss & O'Neill Response:*

*Curb openings have been labelled on the plans.*

**This comment does not appear to have been addressed; please label curb openings on the plans. Seasonal maintenance will be critical to ensure that the curb inlets function effectively, as they could easily be blocked by snow or ice; consider an alternative inlet/grate to mitigate this issue.**

16. Adjust existing catch basin #1346 at the southeast corner of the US Route 1 Bypass / Cate Street Extension intersection to proposed final grade. Currently this catch basin is raised above the existing pavement and is not currently proposed to be adjusted.

*Fuss & O'Neill Response:*

*Existing catch basin #1346, has been reviewed appropriate adjustments will be called for.*

**The Applicant added a proposed note to "Adjust Rim Elevation". Further suggest to revise note to "Adjust Rim Elevation to Finished Grade" or provide proposed grate elevation.**

### **Additional Plan Review Comments**

The following comments were also included in the Cate Street Extension Peer Review #2 dated June 4, 2019, but pertain to stormwater and are provided again here:

17. Sheet CG-101

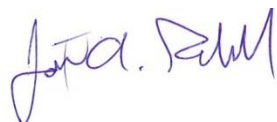
CB #5 at U-Haul drive appears to be in the wrong location. It should be either on the pavement side of the curb or further into the grass area within a depressed/swale area for the inlet.

18. Sheet CG-104

Provide complete drainage design and analysis for the Cate Street and Bartlett Street intersection.

Upon the receipt of additional, revised, and/or new documentation for the project, TEC reserves the right to provide additional comments as needed. Please do not hesitate to contact us directly at 978-794-1792 if you should have any questions concerning this peer review. Thank you for your consideration.

Sincerely,  
TEC, Inc.  
"The **E**ngineering **C**orporation"



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