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TO:	Beals + Thomas 144 Turnpike Road Southborough, MA 01772  Professional Services Corporation, PC Ten Lincoln Road, Suite 201 Foxboro, MA 02035	DATE:	11/9/2022
FROM:	Howard Stein Hudson	HSH PROJECT NO.:	19227.01
SUBJECT:	20 Hancock Street – Wrentham, MA 02093		

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# Beals and Thomas

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## General Comments

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1. Chapter 390 – Article 7.2.F of the By-law requires a locus plan incorporating several elements at a scale of 1"=200'. We acknowledge the locus provided by the Applicant at a scale of 1"=160'. B+T takes no specific exception to the scale used; however, notes the inconstancy relative to the d By-law for the benefit of the Board.

*HSH: Concur*

**Current B+T Response: No further action required.**

*Current HSH: Acknowledged*

2. Chapter 390 – Article 7.3 of the By-law requires the site plan submission be depicted at a scale of 1"=40'. The Applicant has used a scale of 1"=20' in the current submission. B+T takes no specific exception to the scale used; however, notes the inconstancy relative to the d By-law for the benefit of the Board.

*HSH: Concur*

**Current B+T Response: No further action required.**

*Current HSH: Acknowledged*

3. Chapter 390 - Article 7.4 of the By-Law requires multiple elements be incorporated into the Site plan set. The Project documentation provided does not appear to be fully compliant with the requirements of the referenced By-Law. We note the following:



- a. Article 7.4A(3) of the By-Law require a suitable space to record the action the Planning Board and signatures of members on each sheet. We note that the existing conditions plans do not incorporate this requirement.

*HSH: A suitable space to record the action and signatures of the Planning Board Members has been added to the Existing Conditions Plans.*

**Current B+T Response: This comment has been adequately addressed by the Applicant. No further action is required.**

*Current HSH: Acknowledged*

- b. Article 7.4.A(5)(b) of the By-Law requires significant soil types be delineated.

*HSH: Soil delineation lines have not been shown on the watershed maps as there is only one type of soil being used.*

**Current B+T Response: We acknowledge the response provided the Applicant. We defer to the Board on the adequacy of this approach as the watershed maps will not be part of the construction documents.**

*Current HSH: Concur*

- c. Article 7.4.A(5)(c) of the By-Law requires that the 100-yr flood elevation be depicted.

*HSH: The property is not within a flood zone of any kind, no 100-year flood elevation is depicted.*

**Current B+T Response: This comment has been adequately addressed by the Applicant. No further action is required.**

*Current HSH: Acknowledged*

- d. Article 7.4.A(6) of the By-Law requires a locus map that includes principal buildings, zoning district limits, etc.

*HSH: The Locus Map, provided on Sheet C1.3, has been revised to include all principal buildings and Zoning District limits.*

**Current B+T Response: The referenced By-Law stipulates all buildings, etc., within 1,500 feet of the Project. Sheet C1.3 is not at a scale to depict the required coverage. We defer to the Board on the adequacy of the surrounding coverage depicted on Sheet C1.3.**

*Current HSH: A locus plan showing all structures within 1,500 feet and all other information presented in Section 7.4.A(6) of the bylaw can be seen on Sheet C1.4.*



- e. Article 7.4.A(8) of the By-Law requires plans prepared by a Registered Architect including building elevations, etc. We acknowledge the architectural plans provided by the Applicant; however, note they do not include the required endorsement.

*HSH: Revised Architectural Plans have been endorsed by a Registered Architect.*

**Current B+T Response: This comment has been adequately addressed by the Applicant. No further action is required.**

*Current HSH: Acknowledged*

- f. Article 7.4.A(9) of the By-Law requires plans prepared by a Registered Landscape Architect be provided relative to the landscaping design. We acknowledge the planting plans provided by the Applicant; however, note they do not include the required endorsement.

*HSH: Revised Landscape Plans have been endorsed by a Registered Landscape Architect.*

**Current B+T Response: This comment has been adequately addressed by the Applicant. No further action is required.**

*Current HSH: Acknowledged*

- g. Article 7.4.A(10) requires a table showing various site areas (building coverage, impervious area, etc.)

*HSH: The Zoning Requirements Table shown on the Cover Sheet of the plan set, as well as the Dimensional Requirements Table shown on page 3 of the Supplemental Data Report have been revised to include all required information per Article 7.4.A(10) of the Town of Wrentham Zoning Bylaws.*

**Current B+T Response: This comment has been adequately addressed by the Applicant. No further action is required.**

*Current HSH: Acknowledged*

We request that the Applicant address the noted requirements of the By-Law.

4. Chapter 390 – Article 13.5(D)(6) of the By-Law requires that permanent conservation restriction be placed on the open space associated with a SLC. We note this for the benefit of the Board when considering potential conditions of approval.

*HSH: Concur, the applicant is comfortable placing the area outside of the limit of work in a conservation restriction.*



**Current B+T Response: We acknowledge the response provided by the Applicant. Accordingly, we defer to the Board on the status of the pending deeded conversation restriction.**

*Current HSH: Concur*

- Chapter 390 – Article 13.5(D)(9) of the By-Law requires a 5-ft sidewalk be installed along one side of the roadway. As proposed, the Applicant has provided a meandering 6-ft wide walking path that will loop the perimeter of the developed portion of the property. We further note that the sidewalk is provided on the opposite side of the roadway from where the residential units are proposed. B+T does not necessarily take exception to the site conditions proposed; however, defers to the Board to determine if the intent of the referenced By-Law is being met.

*HSH: During the planning board process, the board requested that the sidewalk be constructed on the opposite side of the roadway and access driveways to remain continuous without driveway or vehicular interruptions. The walkway has also been designed, as requested by the Board, to meander from the edge of the pavement creating a more enjoyable walking experience for the residents of the development.*

**Current B+T Response: This comment has been adequately addressed by the Applicant. No further action is required.**

*Current HSH: Acknowledged*

- Chapter 390 – Article 13.5(D)(10) and 18 of the By-Law defines signage requirements. Project signage is not proposed at this time; however, the Applicant indicates that signage will likely be proposed at a later date. We note this for the benefit of the Board and defer review of the comprehensive signage package to the building permit review process.

*HSH: Concur*

**Current B+T Response: We reiterate the intent of our previous comment.**

*Current HSH: Acknowledged*

- Chapter 390 – Article 13.5(D)(11) of the By-Law requires that an SLC have an amenity structure to allow for a variety of passive and active recreational activities to support the residents of the community. As proposed, an amenity structure has not been proposed. However, Article 13.5(I)(3) allows the Board to waive the requirement with a super majority vote. Accordingly, we defer to the Board on the need for the Project to provide an amenity structure.



*HSH: A community shared pavilion structure has been provided within the common green area on the interior of the proposed units. The shared pavilion will be a roofed open-air structure with a level floor surface. This space will provide area for seating, tables, and could also be rearranged and be used for active activities as well. The common green area can also be utilized for a number of different activities and include an interconnected walking loop to each unit, as well as an open green space to be utilized as desired by the residents. The project is also serviced by a 6' wide meandering sidewalk with benches placed intermittently at the outside of the project allowing a longer, uninterrupted loop at the edge of the wetland and forested areas for the use of the residents.*

**Current B+T Response: This comment has been adequately addressed by the Applicant. No further action is required.**

*Current HSH: Acknowledged*

8. Chapter 390 – Article 13.5(E)(8) allows for multiple methods for the Project to provide for affordable housing. In the documentation provided it is unclear which method the Applicant will pursue. We note this for the benefit of the Board when considering potential conditions of approval.

*HSH: Response to be submitted by attorney under separate cover.*

**Current B+T Response: We reiterate the intent of our previous comment pending the submission of the reference response.**

*Current HSH: Howard Stein Hudson is actively working with the Board on this matter.*

9. Chapter 390 – Article 14 includes requirements relative to the earth removal special permit being requested by the Applicant. The documentation provided by the Applicant is unclear. It states that 124 CY of material will be excavated within the site; however, 32,965 CY of material will be transported from the site (cumulative for the Sheldon Meadow and Sheldon West Projects). Additionally, Article 14 also requires:

*HSH: Howard Stein Hudson has revised the application to more clearly depict the calculations. Each application has been provided with its own cut/fill numbers and are not cumulative for both projects. The initial analysis for Sheldon Meadow showed a cut of 21 CY and a fill of 35,640 CY of fill required to be brought onto the site. These number have been updated as the design has been revised. The updated cut/fill for Sheld Meadow is approximately a 20 CY cut and 38,060 CY of fill, with a net of 38,040 CY being brought onto the site.*



**Current B+T Response: We acknowledge the response provided by the Applicant. However, the revised earthwork calculations do not appear to have been documented in the revised submission. We request that the revised earthwork calculations be documented for the Administrative Record.**

*Current HSH: The revised earthwork calculations have been provided as a separate attachment as part of this submission.*

- a. Article 14.5(6) requires a minimum of two vertical benchmarks be included on the plans. Benchmarks do not appear to have been provided.

*HSH: Benchmarks will be set prior to the start of construction. Multiple benchmarks will be set throughout the project due to tree clearing and the lack of existing permanent structures on site. As development occurs, permanent benchmarks will be set.*

**Current B+T Response: We recommend that the incorporation of the required benchmarks be included as a potential condition of approval.**

*Current HSH: Concur. Howard Stein Hudson requests that this requirement be made a Condition of Approval.*

- b. Article 14.7(K) stipulates excavation cannot be conducted within 10-ft of the estimated seasonal high groundwater elevation. Several of the on-site test pits demonstrated shallow groundwater elevations.

*HSH: The proposed site, in general, is to be raised from the existing elevation. However, stormwater basins are allowed to be within 2' of groundwater and the septic system, 5-6' within groundwater. Excavation will be required within 10' of groundwater in order to install the septic system and stormwater basins.*

**Current B+T Response: Understanding the Site constraints, we recommend that the Applicant request a formal waiver from this section of the By-law.**

*Current HSH: Concur. The project has added this as a formal waiver request.*

- c. Article 14.9 includes submission of an Environmental Impact Statement. Reference in this document is made to the Site needing to be filled to mitigate shallow groundwater as opposed to the export reported in the applicant documents.

*HSH: The application was misread, and values were placed on incorrect lines. Updated values per the revised design will be reported to the Board.*



**Current B+T Response: This comment has been adequately addressed by the Applicant. No further action is required.**

*Current HSH: Acknowledged*

10. The Project proposes to utilize existing municipal water infrastructure in Hancock Street to serve the domestic and fire protection water demands. Notations on the existing conditions plan indicate the water main in Hancock Street is 4”; however, the proposed Project water main is 8”. The increase in size would be an atypical engineering design. We defer the Wrentham DPW personnel to review and approve the water connection.

*HSH: Concur*

**Current B+T Response: We reiterate the intent of our previous comment and continue to defer to the DPW staff relative to future connection to the municipal water distribution system.**

*Current HSH: Acknowledged*

11. We acknowledge the photometric plan provided by the Applicant; however, it depicts light trespass onto the abutting residential properties on Hancock Street. Also, a pole height does not appear to have been specified. We request that the Applicant clarify the design intent of the lighting design to not impact abutting parcels.

*HSH: The photometric plan has been revised to eliminate any light trespass onto abutting residential properties. A mounting height of 18 feet for all pole lights and 3.5 feet for bollards has been added to the Lighting Plans (Sheets C9.1 and C9.2).*

**Current B+T Response: We acknowledge the revisions to the photometric plan; however, de minimis light trespass continues to be depicted over the property line. Accordingly, we reiterate the intent of our previous comment.**

*Current HSH: Additional landscape screening has been proposed along the northeast property line. The lighting software that is used does not consider landscape screening in the lighting output. With the newly proposed screening and existing screening along the property line, all de minimis light trespass will be eliminated from the abutting property.*

12. The Applicant has not provided a swept path vehicular turning movement analysis for larger emergency vehicles. Though access appears to be adequate, we defer to Wrentham Fire Department personnel relative to the adequacy of the emergency access provided.

*HSH: A swept path vehicular movement plans, showing large emergency vehicle access has been included as Appendix M of the Supplemental Data Report.*



**Current B+T Response: We acknowledge the swept path plan provided. We continue to defer to the Fire Department personnel relative to the adequacy of the access provided.**

*Current HSH: Acknowledged*

13. The Project proposes the use of an on-site sanitary waste disposal soil absorption system. We note the following:

- a. The existing on-site septic system (location not provided within the submission) will need to be decommissioned and abandoned.

*HSH: The location of the current septic system has been added to the Existing Condition Plans and notes have been added to the plan set regarding decommissioning and abandoning the system.*

**Current B+T Response: The location of the existing septic system does not appear to have been added to the existing conditions plan as noted. We continue to defer to the BOH review process.**

*Current HSH: The existing septic system has been added to the existing conditions plan.*

- b. Details of the proposed system have not been provided within this submission.

*HSH: The proposed system will be submitted to the Town of Wrentham Board of Health for permitting at a later date.*

**Current B+T Response: We continue to defer to the BOH review process.**

*Current HSH: Concur*

- c. The Project is within the Aquifer Protection district.

*HSH: The proposed system will be submitted to the Town of Wrentham Board of Health for permitting. The system has been designed in accordance with the requirements and limits within the Aquifer Protection District.*

**Current B+T Response: We continue to defer to the BOH review process.**

*Current HSH: Concur*

We note these items for the benefit of the Board and defer review and approval of the proposed system to the Wrentham Board of Health review process.

14. We request that the Applicant analyze if stop control (stop sign and stop bar) are required at the intersection of the Project access drive and Hancock Street.





*HSH: A stop bar and sign have been added to the revised Site Plan set.*

**Current B+T Response: This comment has been adequately addressed by the Applicant. No further action is required.**

*Current HSH: Acknowledged*

15. The Applicant does not appear to have provided a comprehensive inventory of site details. Details for the crosswalks, fences, retaining wall, benches, etc. do not appear to have been provided. Additionally, proposed retaining walls are at a height that would require fall protection be incorporated. We request that the Applicant clarify the design intent and provide all details necessary to execute the proposed site work.

*HSH: Details for the aforementioned items have been added to the Detail Sheets (Sheets C10.1 – C10.11) of the plan set.*

**Current B+T Response: This comment has been adequately addressed by the Applicant. No further action is required.**

*Current HSH: Acknowledged*

## Stormwater Management Comments

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16. Section 4.51.g and 5.212 of the Subdivision Regulations require that projects not cause an increase or decrease in either the total volume or runoff discharged offsite, or total rate of runoff offsite for the 2-inch, 2-yr, 10-yr, 50-yr and 100-yr frequency events. As proposed, we note the following relative to the noted regulation:

- a. AP1 has a net increase in discharge rate for the 2-inch event.

*HSH: The stormwater analysis has been revised with updated storm data and revised subcatchment areas based on changes to the grading. The outlet structure has also been removed from the infiltration basin which was the source of the increase in the previous design. There is no longer an increase to AP1 in any storm*

**Current B+T Response: This comment has been adequately addressed by the Applicant. No further action is required.**

*Current HSH: Acknowledged*

- b. AP3 has a net increase in volume for the 50-yr and 100-yr event.

*HSH: The subcatchment areas and routing for the area of AP3 has been revised in the pre and the post. The area of the depression in the abutters property is routed to AP3, which is now indicated as Hancock Street. The abutters depression, if it were to overflow would flow into Hancock St and continue to the headwall on the*



*south side of the road. The increase in AP3 in the revised design is due to the lack of drainage structures or curbing on Hancock Street, in order to connect the new access way to Hancock areas that are currently grass will need to be paved, and with lack of pitch in the road some of the pavement will flow down the side of Hancock and into the headwall which leads to the wetlands on the project site, also analyzed as AP1. The slight increase of CFS and volume will not cause any taxation on a town storm drain system and will enter back onto the project site causing no flooding due to its negligible amount. The depression on the abutter will take less runoff than in its existing condition. We understand that through the information provided from the abutter that they have not had any standing water on their property. In our analysis there would only be visible standing water on their property if a 50 or 100 year storm occurred and it would still be less than one foot of water, and given the soil it would draw down fairly quickly. Please see table below with elevation and storage amounts in the various storms for pre and post. The modeled bottom of the depression is 249.70 and a top of 250.60. The table below shows an improvement to the conditions of their property*

	<i>2-inch storm</i>	<i>2-year</i>	<i>10-year</i>	<i>50-year</i>	<i>100-year</i>
<i>Pre-Development</i>	<i>Vol=0 cf EL=249.70</i>	<i>7 cf 249.78</i>	<i>130 cf 250.07</i>	<i>606 cf 250.41</i>	<i>1,009 cf 250.58</i>
<i>Post Development</i>	<i>0 cf 249.70</i>	<i>0 cf 249.71</i>	<i>18 cf 249.84</i>	<i>183 cf 250.13</i>	<i>350 cf 250.27</i>

**Current B+T Response: This comment has been adequately addressed by the Applicant. No further action is required.**

*Current HSH: Acknowledged*

- c. AP1 and AP2 demonstrate significant volume decrease for all events.

*HSH: Concur. The design is retaining and infiltrating more water than in the existing conditions.*

**Current B+T Response: The referenced Subdivision Regulation does not allow for a significant volume decrease as the intent is to mimic existing conditions. Accordingly, we reiterate the intent of our comment.**

*Current HSH: This project is not considered a subdivision. All stormwater practices (Infiltration Basin and Subsurface Infiltration Systems) have been designed to fully infiltrate all storm events. If the emergency spillway/outlet devices were to be lowered, the post-*



*development conditions would no longer meet pre-development conditions for both rate and volume for all storm events.*

- d. AP2 demonstrates significant rate decreases for the 50-yr and 100-yr event.  
*HSH: Concur. The design is retaining and infiltrating more water than in the existing conditions.*

**Current B+T Response: The referenced Subdivision Regulation does not allow for a significant rate decrease as the intent is to mimic existing conditions. Accordingly, we reiterate the intent of our comment.**

*Current HSH: This project is not considered a subdivision. All stormwater practices (Infiltration Basin and Subsurface Infiltration Systems) have been designed to fully infiltrate all storm events. If the emergency spillway/outlet devices were to be lowered, the post-development conditions would no longer meet pre-development conditions for both rate and volume for all storm events.*

We request that the Applicant clarify the stormwater management design and document compliance with the referenced regulation.

17. Section 5.213 of the Subdivision Regulations require that rainfall event estimate be derived from Technical Paper No. 40 (TP-40). Though the rainfall events appear appropriate, we request that Applicant confirm the assumptions made. We request that the Applicant document compliance with the referenced regulation.

*HSH: All rainfall data has been updated in HydroCAD analysis to use data from NRCC, as agreed upon with the peer review engineers. The NRCC rainfall data is more recent and conservative (larger rainfall amounts) than TP-40 data.*

**Current B+T Response: This comment has been adequately addressed by the Applicant. No further action is required.**

*Current HSH: Acknowledged*

18. Section 5.225 of the Subdivision Regulations requires that stormwater basins greater than 500 cubic feet be screened from roadways by a greenbelt of trees. As designed, the Project does not provide the required subdivision screening requirements. Acknowledging the Project is not specifically a subdivision, we note this for the benefit of the Board when considering potential conditions of approval.

*HSH: The landscaping plan has been revised to provide proper screening.*



**Current B+T Response: This comment has been adequately addressed by the Applicant. No further action is required.**

*Current HSH: Acknowledged*

19. Section 5.232 of the Subdivision Regulations requires that all drainage pipe have a minimum diameter of 12-in. As designed, the stormwater management system does not comply with this regulation. We request that the Applicant clarify the design intent and document compliance with the noted regulation.

*HSH: All pipes leading from inlet structures in the roadway are a minimum of 12". Header and outlet pipes from the subsurface infiltration chambers are not, but are not intended to be, as this is an emergency outfall, if large pipes were used it would reduce the overall storage capacity of the system. The trench drain and pipe from area drain-1 leading to SIS1 is also not a 12" as it would be oversized for the small amount of water entering it. The other pipes that are less than 12" are roof drains enters SIS2, and they are sized appropriately for the amount of water entering them.*

**Current B+T Response: B+T does not take exception to the use of drainage pipe with a diameter of less than 12". However, we defer to the Board is strict compliance with the referenced section of the Subdivision Regulations is required.**

*Current HSH: Howard Stein Hudson has added this as a formal waiver request. The area drain and strip drain utilize a smaller diameter pipe size due to the lack of flow presented to the systems. A 12" diameter pipe is not necessary for these practices.*

20. Section 5.241 of the Subdivision Regulations requires that catch basins or equivalent structure, have a maximum spacing of 300-ft. As designed, the inlet spacing does not appear to comply with this requirement. We request that the Applicant clarify the design intent and document compliance with the referenced regulation.

*HSH: This project is not considered a Subdivision. However, the design has been revised and all stormwater inlets have been spaced appropriately to not exceed the maximum distance of 300-feet between high points to first structures and between in line structures down gradient.*

**Current B+T Response: B+T concurs that the Project is not a subdivision and the drainage structure spacing appears to be appropriate. We consider this comment to have been adequately addressed by the Applicant.**

*Current HSH: Acknowledged*



21. The modeling of the Pond IB1: Infiltration Basin #1 is unclear. The outlet control structure orifice, outlet invert, and basin bottom are all at the same elevation. This would appear to provide no initial storage of the “first flush” required by the Wrentham Stormwater Regulations. We request that the Applicant clarify the design intent of for this infrastructure and revise the documentation as applicable.

*HSH: The outlet control structure has been removed from Infiltration Basin #1.*

**Current B+T Response: Acknowledged. With the modifications to the stormwater management design, this comment is no longer applicable.**

*Current HSH: Acknowledged*

22. We request that the Applicant provide a fully executed MassDEP Checklist for Stormwater Report endorsed by a Professional Engineer (PE) registered in the Commonwealth of Massachusetts.

*HSH: A fully executed MassDEP Checklist was previously submitted to the Town of Wrentham Conservation Commission. The checklist has been included as Appendix D of the Supplemental Data Report.*

**Current B+T Response: This comment has been adequately addressed by the Applicant. No further action is required.**

*Current HSH: Acknowledged*

23. Standard 3 of the MassDEP Regulations requires documentation of the on-site soil types. The Applicant indicates that the on-site soils are within the Hydrologic Soil Group (HSG) B; however, utilizes the most ideal HSG A infiltration rates for all the modeling analysis and drawdown calculations. We request that the Applicant clarify the noted inconsistency and revise the documentation as applicable.

*HSH: As part of the design process, a Hydrogeologist conducted testing that produced results characteristic of A soils. Although the USDA soil map previously used showed possible results of different soils, the testing was used since it was seen to be more accurate. Site soils have been revised to be consistent with the infiltration rates used within the infiltration practices, all associated with HSG A. A memo from the Hydrogeologist can be found in Appendix N of the Supplemental Data Report.*

**Current B+T Response: This comment has been adequately addressed by the Applicant. No further action is required.**

*Current HSH: Acknowledged*



24. Standard 3 of the MassDEP Regulations requires that the Estimated Seasonal High Groundwater Elevation (ESHGWE) be established for the Site. B+T acknowledges the test pit data provided and the 2-ft vertical separation provided between these elevations and the bottom of infiltrative stormwater Best Management Practices (BMPs). However, considering the bottom elevation of the BMPs is within 4-ft of the ESHGWE we request that the Applicant provide a mounding analysis for each BMP.

*HSH: 2 feet of separation from groundwater is met. Mounding calculations have been provided in Appendix I of the Supplemental Data Report.*

**Current B+T Response: This comment has been adequately addressed by the Applicant. No further action is required.**

*Current HSH: Acknowledged*

25. Standard 3 of the MassDEP Regulations requires drawdown calculations for all infiltrative BMPs. The storage volumes used do not appear to be consistent with the modeling. We request that the Applicant clarify the volumes used and revise the calculations accordingly.

*HSH: Drawdown calculations have been provided within the Supplemental Data Report. The volumes used for the calculations consist of the entirety of the volume associated with the BMP associated with that storm.*

**Current B+T Response: This comment has been adequately addressed by the Applicant. No further action is required.**

*Current HSH: Acknowledged*

26. Standard 4 of the MassDEP Regulations requires water quality treatment standards are met. We acknowledge the treatment train input provided. However, the TSS removal percentages utilized were derived from vendor correspondence. We request that the Applicant provide formal documentation that certifies the level of treatment provided by the proposed proprietary treatment units.

*HSH: Formal documentation has been provided as Appendix C of the Supplemental Data Report that certifies that level of treatment provided by the proprietary treatment units.*

**Current B+T Response: This comment has been adequately addressed by the Applicant. No further action is required.**

*Current HSH: Acknowledged*

27. Standard 8 of the MassDEP Regulations requires that Construction Period Pollution Prevention and Erosion and Sedimentation Controls be documented. The Project will be covered by the NPDES Construction General Permit. Accordingly, a Stormwater Pollution



Prevention Plan (SWPPP) will be required. A SWPPP has not been provided with the documentation provided by the Applicant. We request that the Applicant document compliance with the noted regulation.

*HSH: A draft of the SWPPP has been submitted to the Town of Wrentham for review. A final SWPPP will be completed prior to construction as part of the NPDES permitting.*

**Current B+T Response: B+T acknowledges the draft SWPPP provided. We recommend, as a potential condition of approval, that the final SWPPP be submitted prior to construction.**

*Current HSH: Concur*

28. Standard 10 of the MassDEP Regulations requires that the Applicant provided an executed Illicit Discharge Compliance Statement. The Applicant indicates that this documentation will be provided under separate cover. We note this for the benefit of the Board when considering potential conditions of approval. We recommend that the Applicant provide the referenced documentation prior to construction.

*HSH: A signed Illicit Discharge Compliance Statement has been provided within this submission.*

**Current B+T Response: This comment has been adequately addressed by the Applicant. No further action is required.**

*Current HSH: Acknowledged*

29. The modeling of the Pond EX: Existing Abutter Depression, in both the pre- and post-development analysis, is unclear. It assumes elevations and grades that are not depicted on the existing conditions plans. We request that the Applicant clarify how this area was modeled.

*HSH: The existing abutter depression was modeled using the existing surface provided by the surveyor. Several spot elevations were used to determine the exact nature of the depression. These spot elevations were removed for readability purposes. A blowup detail of the abutter depression has been included within the watershed maps with the spot shots and tenth-contours turned on.*

**Current B+T Response: This comment has been adequately addressed by the Applicant. No further action is required.**

*Current HSH: Acknowledged*

30. There appears to be an inconsistency with the design of Pond SIS2. The modeling indicated 45 chamber units will be included; however, the plans depict an additional row and 50



chamber units. We request that the Applicant clarify the noted inconsistency and revise the documentation accordingly.

*HSH: The system has been revised based on the new rainfall data and grading changes. The plans have been revised to match the modeling of SIS2 within the HydroCAD model.*

**Current B+T Response: This comment has been adequately addressed by the Applicant. No further action is required.**

*Current HSH: Acknowledged*

31. For several of the pond structures (drain manholes, catch basins, area drains) the pipe material and associated Manning's "n" values are inconsistent. Many are identified as HDPE on the plans; however, are modeled as RCP. We request that the Applicant clarify the design intent and revise the documentation accordingly.

*HSH: The hydrocad has been updated to have manning's values associated with HDPE.*

**Current B+T Response: This comment has been adequately addressed by the Applicant. No further action is required.**

*Current HSH: Acknowledged*

## Professional Services Corporation, PC

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### Comments on Acceptable Stormwater Management Plan Requirements

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The RSMR (item 1, page 2) requires the Applicant to "Capture and treat the "FIRST FLUSH" of storm, usually defined herein ... as the runoff from the first 2-inches of precipitation..."

The Applicant's stormwater report presents stormwater BMP calculations to address this for capture of 1-inch, but this analysis needs to be upgraded to 2-inches to meet this requirement. Also, we defer on final comment until other flaws in the submittal are corrected. See Comment 11 below.

*HSH: The water quality calculations have been revised to use a value of 2 inches instead of the previously used 1 inch.*

The RSMR (item 2, page 2) requires that the plan "Not cause an increase or decrease in either the total volume of runoff discharged offsite, or total rate of runoff discharged offsite, as compared with the respective discharge offsite prior to the development. Such condition shall be required for storms of 2-inch, 2- year, 10-year, 50-year, and 100-year frequency events." The proposed stormwater management design seeks to maintain peak flow and





volume of stormwater runoff to levels that currently run off the land. The Applicant proposes to do this by directing Site runoff to surface and subsurface infiltration basins. However, in one case (discharge point AP3) the volume is not controlled for the 50-year and 100-year storms; and it is not yet clear if peak flows and volumes in general will be controlled because the saturated hydraulic conductivity rate used to model the three infiltration systems is too high. The rate needs to be revised to a slower rate (2.41 inches per hour) which is a Rawls rate more appropriate for the soils class and soil test data provided:

1. The Applicant needs to revise the HydroCAD model and the design of the three infiltration areas based on using a saturated hydraulic conductivity rate of 2.41 inches per hour, which is appropriate given the “Loamy Sand” determination from test pit soil evaluations within the basin area.

*HSH: As part of the design process, a Hydrogeologist conducted testing that produced results characteristic of A soils. Although the USDA soil map previously used showed possible results of different soils, the testing was used since it was seen to be more accurate. Site soils have been revised to be consistent with the infiltration rates used within the infiltration practices, all associated with HSG A. A memo from the Hydrogeologist can be found in Appendix H of the Supplemental Data Report.*

**PSC: This comment has been addressed. We have reviewed the supplemental testing conducted by the Applicant’s Hydrogeologist (Appendix H) and concur with the findings in defense of the selected saturated hydraulic conductivity rate of 8.27 inches per hour.**

**HSH: Acknowledged**

2. Increase the CN value to 98 for the surface infiltration pond to account for 100% of direct pond rainwater being collected.

*HSH: The CN value of the surface infiltration pond has been revised to a value of 98.*

**PSC: This comment has been addressed.**

**HSH: Acknowledged**

3. The reported increase in stormwater volume that will be released to the abutting resident’s land on the east side of the entrance road is not acceptable and needs to be rectified. The Applicant’s summary of post-development stormflows notes that for the 50-year storm and 100-year storm, the volume of flow released to a low area on the adjacent resident’s lot increases by 77 cubic feet and 276 cubic feet respectively.

*HSH: Please see response to #16b of the B+T responses above.*



**PSC:** This comment has been partially addressed. We still question the reference to the possible overflow from the depression on the lot at 32 Hancock Street back to Hancock Street “overflow would flow into Hancock St and continue to the headwall on the south side of the road...” and “will flow down the side of Hancock and into the headwall which leads to the wetlands on the project site, also analyzed as AP1.” Unfortunately, this flow path and headwall location, and details for the headwall and pipe or swale to wetlands are not clear to us based on our review of the existing conditions plans and the existing and post-development tributary area plans. Please provide more detailed survey or detailed views, possibly with photos, to explain this.

*HSH: The drainage design has been adjusted to redirect all overflow from the depression within 32 Hancock Street to the area drain on the subject property, eliminating the runoff from entering Hancock Street. The maximum elevation of the existing depression is approximately 250.60. During the 100-year storm event in the post-development conditions, the maximum elevation within the depression would be approximately 250.27. According to the model, the stormwater would be completely contained within this depression. However, the drainage on site has been slightly revised to accept water from this depression instead of the flow being directed to Hancock Street if the depression were to ever overflow. The rim of the area drain has been lowered to an elevation of 250.50. If the depression were to ever overflow, the water would be directed towards the area drain prior to entering Hancock Street or extending further into the property of 32 Hancock Street. By revisiting this drainage path, runoff from this depression no longer enters Hancock Street, reducing the overall impact to Hancock Street and the existing headwall. The previous AP3 has been removed due to this revision.*

The RSMR (item 3, page 2) requires that the plan “Include source controls and design of BMPs including, but not limited to, Infiltration and Detention Structures, LID Techniques, Bioretention Areas, and Constructed Storm Water Wetlands in accordance with procedures acceptable to the Board of Health...”: The Applicant’s Site plans and stormwater report demonstrate adequate plans to address this requirement. However, we defer on final comment until the other flaws in the submittal are corrected.

*HSH: Concur.*

The RSMR (item 7, page 4) requires: “Include hydrologic and hydraulic calculations and data to support the proposed design for the runoff drainage system. Both volume and flow



rate of runoff, before and after development, must be clearly stated and shall be in accordance with the specifications previously designated herein. Calculations shall be performed using the most recent procedures of the U.S.D.A. Soil Conservation Service such as are described in National Engineering handbook - Section 4- Hydrology (SCS 1985., TR-20 "Computer Program for Project Formulation-Hydrology (SCS 1983), and Technical Release No. 55 "Urban Hydrology for Small Watersheds" (SCS 1986). Structure design shall comply with the standards of USDA SCS Publication TR-60 for containments for detention and retention areas or other designated references. Rainfall event amounts shall be as derived from the latest Atlases of Precipitation as published by the Northeast Regional Climate Center, Cornell University, Ithaca, N.Y." The Applicant's submittals generally demonstrate compliance with these requirements. However, as noted earlier, the "hydrologic and hydraulic calculations and data to support the proposed design" are flawed and need to be corrected before we can offer final comment on compliance.

*HSH: Please see response #22 above. A memo from the Hydrogeologist can be found in Appendix N of the Supplemental Data Report.*

## Review per the RSMR Checklist of Design Regulations

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The Applicant's submittal does not include an evaluation of compliance with the Wrentham RSMR checklist of design regulations for stormwater and drainage designs. In our review, we have found the following items of non-compliance, and related items to be addressed.

*HSH: A Wrentham RSMR Checklist was included as part of the submission to the Town of Wrentham Board of Health. A Checklist has been included as Appendix E of the Supplemental Data Report.*

4. The Applicant also needs to submit a copy of the *MassDEP Checklist for Stormwater Report* that is stamped and dated by the Registered Professional Engineer for the Project.

*HSH: A MassDEP Checklist was included as part of the submission to the Town of Wrentham Board of Health. A checklist has been included as Appendix D of the Supplemental Data Report.*

**PSC: This comment has been addressed.**

*HSH: Acknowledged*

5. **Separate overlays shall be included of pre- and post- development watershed catchment areas, including the soil types, hydrologic categories, CN values of the NRSCS, and the Time of Concentration flow paths and design points delineated.**



The Applicant needs to clarify the pre- and post-development watershed plans with details (perhaps spot grades) to clearly define drainage patterns at the existing depression (elevation 250) on the abutting lot at 32 Hancock Street, east of the entrance road. This low area which will collect stormwater, is described in both the pre- and post-development models, but it is not clear how the stage-storage elevation data stated in the HydroCAD model is derived. Also, an overflow is included in HydroCAD pre-and post-development routing diagrams (modeled as a broad crested weir: 20' long, 15' breadth) but it is not clear how this has been derived. Does it in fact exist? Please explain and/or resolve these issues.

*HSH: All soils have been modeled as A, as previously discussed, so there are no soil delineation lines shown, the CN values can be referenced in the HydroCAD, and delineated on the plans by edge of pavement, roofs with hatching, and tree lines. The existing depression on the abutting lot has been enlarged on the pre- watershed map and spot shots and tenth-contours have been shown for the area modeled as the depression. The weir has been removed and the depression has been modeled for any overflow to routed to AP3 directly (Hancock Street). The TCs on the pre and post watershed maps has been delineated with hatched circles to indicate where each flow path or change of surface and slope occurs as modeled in hydrocad report. The time of concentration has also been added directly to the plans, and can also be seen in the node reports of the subcatchment in Appendix H. Please see response to #16b of the B+T responses above for more detail on the existing depression.*

**PSC: This comment has been addressed. However, see concerns raised in our reply to Comment 3 above.**

*HSH: Acknowledged*

6. Related to Comment 5 above, the infiltration rate assumed for HydroCAD modeling of the existing depression at Lot 32 Hancock Street is 2.410 inches per hour. Given that this is an existing condition, and not a constructed area, and that topsoil (loam) will be present as the most restrictive layer, the Rawls rate should be reduced to 0.52 inches per hour, that for Loam, HSG B soils.

*HSH: Please see response to #16b of the B+T responses above for more detail on the existing depression. We are assuming A soils, so we used an infiltration rate of 1.02 inches per hour for the existing depression, instead of 8.27 in/hr to be conservative. However overall we are reducing the amount of water and square footage running onto the abutting property, so if a different infiltration rate is used in the pre and post, the results of the post would still show lower discharge to the area and thus improving the existing condition.*

**PSC: This comment has been addressed.**

*HSH: Acknowledged*



7. There is a large flat area with undefined elevations at the intersection of the entrance road with the loop road bounded by a proposed 257 contour line, and this area needs spot grades to define the drainage patterns and to show that water will not stagnate in the area.

*HSH: Several spot grades have been added to this area. Flow path arrows have also been added to help depict the drainage pattern and direction of flow.*

**PSC: This comment has been addressed.**

*HSH: Acknowledged*

8. There is a large flat area at the south end of the loop road bounded by a proposed 251 contour line, and this area needs an additional proposed contour line and/or spot grades to define the drainage patterns to show that water will not stagnate in the area and will flow to the nearest curb-side inlet.

*HSH: Several spot grades have been added in the area to help depict the flow path to the Rain Guardian Foxhole(s) inlet.*

**PSC: This comment has been addressed.**

*HSH: Acknowledged*

9. At proposed CB-3, the overflow for the 45 Stormtech chamber system, the rim elevation is 253.5 and the upgradient contour is 254. The area downgradient of this overflow structure is not well defined and needs to be clarified with re-shaped contour lines and/or spot grades to ensure that overflow will be safely channeled by a swale toward the south end of the loop road, and away from abutting Units 7, 8, 9, 10, 11 & 12. Presently, it appears very likely that overflow will drain toward the rear of Units 7, 8 and 9 where water could flood near the foundations.

*HSH: Several spot grades and flow path arrows have been added to better depict the drainage pattern and direction of flow. Runoff will be directed towards one of the stormwater inlet devices and enter the infiltration basin in the rear of the site.*

**PSC: This comment appears to have been addressed. Nevertheless, we advise HSH that in our opinion, the owners of units 12, 9 and 8 could experience flooding near their foundations if finish grading is not completed with precision – there appears to be little room for error.**

*HSH: Acknowledged.*

10. Provide spot grades and additional detail for grading of the area that will capture water from the side slope on the east side of the entrance road, that will drain into an un-named Area



Drain with Rim elevation 250.75. More controlled grading is necessary to ensure that drainage to that area will not overflow or run on to the land of the abutter at 32 Hancock Street on the east side of the entrance road.

*HSH: More detailed grading has been done and spot shots, and flow arrows have been added to show the flow path. Some pavement will flow into Hancock Street, but the grading shows that it will flow towards the headwall on the south side of the street and flow back into the wetland series on the project site. This area was accounted for in our weighted TSS and adjusted recharge calculation and the design meets the stormwater standards.*

**PSC: This comment has been partially addressed. We question the following reference to grading that directs drainage to Hancock Street and away from the project: “Some pavement will flow into Hancock Street, but the grading shows that it will flow towards the headwall on the south side of the street and flow back into the wetland” As noted in our response at Comment 3 above, this flow path and headwall location, and details for the headwall and pipe or swale to wetlands are not clear to us based on our review of the existing conditions plans and the existing and post-development tributary area plans. Please provide more detailed survey or detailed views, possibly with photos, to explain this.**

*HSH: Please see response to the above Comment #3.*

11. **Best Management Practices shall be provided for removal of contaminants from the peak runoff from the 2-inch storm. Specific calculations shall be prepared.** The Applicant needs to submit revised Water Quality Volume calculations for proposed pre-treatment BMPs that are based on the 2-inch storm (instead of the 1-inch quantity that was used).

*HSH: Water Quality Volume calculations have been revised within the Supplemental Data Report to use a value of 2-inches compared to the previous 1-inch.*

**PSC: This comment has been addressed.**

*HSH: Acknowledged.*

**High groundwater determinations shall be made in the areas of any detention or infiltration basins based upon soil morphology or by use of an adjustment provided by or otherwise approved by the Board of Health based upon the methodology of Frimpter. The location of all test holes and monitor wells shall be shown, including elevation of top of monitor well, elevation of ground, date of water level readings (should usually be taken between the 22nd and 29th of the month), and groundwater adjustment used with**



**supporting data, where applicable.** The Applicant has provided adequate soil data and estimated seasonal high groundwater (ESHGW) data per on-site soil evaluations.

12. **Hydrographs shall be printed out and show data and a 2D graphical representation for pre- and post- development conditions.** The applicant needs to submit printed hydrographs, but in the interest of saving paper volume, we recommend that it would most useful if the hydrographs printed by the Applicant only be for the final design point discharges for pre- and post-development conditions for required design storm events. *HSH: Hydrographs have been added to Appendix H within the Supplemental Data Report.*  
**PSC: This comment has been addressed.**  
*HSH: Acknowledged.*

13. **20-scale Cross-Section view of basin showing detail of design features and underlying profiles of high groundwater, existing grade, proposed grade, soil strata, and impervious/bedrock layers. All test holes and borings also shown in appropriate perspective.** The Applicant has submitted cross sections of the proposed surface and subsurface infiltration areas, however more details are required for the cross-section views of the two proposed subsurface systems; and the cross-sections for all infiltration areas should be supplemented by the following:
- a. Show in the cross-sections of the surface basin and subsurface chambers logs of the test pit results (soil strata, in grey scale background), including elevations, for the relevant test pits, and including ESHGW designations for each. Also note the elevation of ESHGW from which the proposed 2-foot vertical setbacks are noted for each infiltration area.
  - b. For the surface basin overflow, add bedding material for the 12-inch rock riprap, and show the materials specifications and depths on the spillway details.
  - c. For the surface basin inflows and outflows, submit calculations to show that the proposed armoring is sufficient to prevent erosion and to withstand the entrance and exit velocities at the basin. [For example, the 100-year outflow currently projected is 8.69 cubic feet per second.] Such calculations should be prepared after the basin has been re-designed to account for a lower hydraulic conductivity rate, and any mounding analysis adjustments.
  - d. For the subsurface basins, submit calculations to show that the proposed catch basin grate outlet designs will be sufficient to prevent erosion and to withstand 100-year



exit velocities during overflows from the subsurface systems. Such calculations should be prepared after the subsurface basins have been re-designed to account for a lower hydraulic conductivity rate, and any mounding analysis adjustments.

- e. Each subsurface chamber system cross section should include the following:
  - i. Elevation of seasonal high groundwater below the system base stone
  - ii. Bottom of stone elevation
  - iii. Bottom and top of chamber elevations
  - iv. Top of stone elevation
  - v. Elevations, sizes, materials of inlet and outlet pipes (including header if any)
  - vi. Elevations, and details of any water level control weirs at the inlet and outlet
  - vii. Elevations of finished grades above the system.

*HSH: A cross-section view of the basin and underground chambers has been added to Detail Sheets 9 & 10 (Sheet C10.9 & C10.10) and all requested information is shown on either the cross-section or plan view on the same sheet.*

**PSC: This comment has been addressed.**

*HSH: Acknowledged.*

**Geometric Design follows both Board of Health requirements and DEP Stormwater Handbook. Note that 4:1 side slopes are required on basin interiors and a 10' safety bench are required. The width of the top of the containment berm must be at least 10' wide.** The Applicant's plans meet these requirements.

*HSH: Concur*

**Minimum of 12 inches of freeboard provided.** The Applicant's plans currently comply with this rule. However, this standard should be re-visited after the subsurface basin has been re-designed to account for a lower hydraulic conductivity rate, and any mounding analysis adjustments.

*HSH: A memo from the Hydrogeologist can be found in Appendix N of the Supplemental Data Report.*

**Maintenance access has been provided (for basins).** The Applicant's plans comply with this rule.

*HSH: Concur*

**Soil hydraulic conductivity shall be based upon field borehole permeability tests.** The Applicant has provided soil evaluations, which are an acceptable alternative to this rule.

*HSH: Concur*





**Complete Boring Logs and Details of Calculations shall be submitted.** This requirement is not applicable to the proposed design methodology.

*HSH: Concur*

**Elevation of high ground water, elevation of underlying impervious layer (ledge or clay), and saturated thickness of underlying aquifer has been determined.** The Applicant's test pits have adequately documented soils layers, and restrictive soil layers were not found. Not applicable.

*HSH: Concur*

14. **Mounding of Groundwater shall be considered in the design.** Because the vertical separation from the bottom of the proposed surface and subsurface infiltration basins is less than 4-feet from ESHGW and basins are used to control peak flows, per the Massachusetts SWH, the Applicant needs to submit mounding analyses for the proposed surface and subsurface infiltration basins.

*HSH: Mounding calculations have been completed and can be found in Appendix I of the Supplemental Data Report.*

**PSC: This comment has not been adequately addressed. Although a mounding analysis is provided, one for each of the three recharge areas, the design storm input is not noted and the derivation of the various input parameters is not clearly explained. Nine mounding analyses should be performed: One for each of the three recharge areas for the 2-year, 10-year and 100-year storm events (as reported in HydroCAD). Demonstrate that each of recharge area will be fully dewatered within 72 hours for the three storm events so the next storm can be stored for exfiltration. The mounding analysis must show that the groundwater mound under the recharge system will not break into the bottom of any of the recharge areas or above the land or water surface of a nearby wetland. Provide backup for Hantush equation input values, specifically:**

- A. Identify the specific inputs used for the calculated Application Rate for each of the recharge areas and associated storm event
- B. Defend the selected Horizontal Hydraulic Conductivity rate of 493 ft/day
- C. Provide the basis (or data source) for selecting an initial saturated thickness of 35 feet
- D. Provide the basis (or data source) for selecting the Fillable Porosity of 0.35



*HSH: A mounding analysis has been performed for the 2-year, 10-year, and 100-year storm events and have been submitted to the Town for review.*

- *Application Rate: Discarded Volume / wetted perimeter at peak elevation.*
- *Horizontal Hydraulic Conductivity: presented in the Hydrogeologic report generated by Northeast Geoscience, Inc. stating “The geometric mean hydraulic conductivity value was 493 ft/day.”*
- *Initial Saturated Thickness: Based upon the findings presented in the Hydrogeologic Report by Northeast Geoscience, Inc., “samples observed were similar across the sites and consisted of stratified deposits of fine to coarse sand and gravel to depths of up to 27 feet and contained a saturated thickness of over 15 feet.” A value of 27 feet was used in the mounding calculations.*
- *Fillable Porosity: Value is based on soil classifications within infiltration practice. Generally presented as 0.35 for most soils.*

15. **An infiltration structure for a 2-inch storm will have a minimum of 2 feet of vertical clearance (preferably 4 feet) to the high ground water with consideration of the groundwater mound.** The Applicant needs to demonstrate that this requirement is met for all infiltration systems after completing the work noted in Comment 14.

*HSH: Mounding calculations have been completed that demonstrates compliance with the above requirement. These calculations can be found in Appendix I of the Supplemental Data Report.*

**PSC: See our response under Comment 14.**

*HSH: Mounding calculations have been completed for the 2-year, 10-year, and 100-year storm events that show groundwater will not break through into the bottom of the systems.*

16. **Ten-year storm will empty (infiltrate) in 24 hours maximum.** The Applicant should submit calculations to demonstrate that this condition is met for all infiltration systems after revising the surface and subsurface basin designs based on a lower saturated hydraulic conductivity rate (see Comment 1).

*HSH: Calculations have been included within the Supplemental Data Report that show each infiltration system emptying within 24 hours regarding the 10-year storm event.*

**PSC: This comment has been addressed; however, double check this issue after completing the mounding analyses requested in Comment 14 above.**



*HSH: Mounding analyses have been submitted for each storm event. All calculations pertaining to the infiltration systems draining within the required time are still valid.*

17. **100-year storm will empty (infiltrate) in 72 hours maximum.** The Applicant should submit calculations to demonstrate that this condition is met by the proposed basin after revising the basin design based on a lower saturated hydraulic conductivity rate (see Comment 1).

*HSH: Calculations have been included within the Supplemental Data Report that show each infiltration system emptying within 72 hours regarding the 100-year storm event.*

**PSC: This comment has been addressed; however, double check this issue after completing the mounding analyses requested in Comment 14 above.**

*HSH: Mounding analyses have been submitted for each storm event. All calculations pertaining to the infiltration systems draining within the required time are still valid.*

18. **Underground Infiltration Facilities shall be preceded by an Innovative/Alternative stormwater quality enhancement system that has had its performance verified by the Massachusetts Strategic Envirotechnology Partnership (STEP). Such I/A systems shall be required for all underground infiltration facilities. Units shall be designed to accept the flow rate from a 2-inch NRCS Type 3 Rainfall without by-pass.** The Applicant should submit evidence that the Rain Guardian systems (“Bunkers” and “Foxhole” proposed as pre-treatment practices for storm flow have had their performance verified by the STEP program, and that they can accept the flow rate from a 2-inch NRCS Type 3 Rainfall without by-pass.

*HSH: Massachusetts STEP program was defunded in 2014. We have provided documents verifying the proprietary treatment units from third party testing, provided by the manufacturers of the BMPs. Please refer to Appendix C of the Supplemental Data Report.*

**PSC: This comment has been partially addressed. At the water quality calculations on pages 18 – 21 of the Supplemental Data Report, please explain derivation of  $q_u$  values that are selected for the individual proprietary device locations. We do not question overall calculation of equivalent water quality flow rate, however, please explain how the  $q_u$  values (unit peak discharge, csm/in) were identified for each location. The  $q_u$  values appear to be conservatively too large - possibly based on the NRCS (SCS) Type II rainfall distribution whereas a Type III storm is appropriate for the New England area.**



**HSH:** *The value of  $q_u$  is taken from the Massachusetts Department of Environmental Protection Wetlands Program Figure 4, which has been included as a standalone document. There is no data that corresponds to a 2-inch NRCS Type 3 Rainfall amount. Values are representative of the first 1-inch and first ½-inch of runoff, but for the first 2-inches of runoff, the data is not available. In an attempt to meet the 2-inch requirement given the information that is available, the  $q_u$  value is obtained from the time of concentration ( $T_c$ ) for the first 1-inch of runoff while substituting a  $Q$  value of 2-inches compared to 1-inch.*

19. **The stormwater management system shall have an operation and maintenance plan satisfactory to the Board of Health in accordance with Mass DEP guidelines and good engineering practice to ensure that systems function as designed. For stormwater facilities that are not publicly owned or maintained, the Board of Health shall require that an agreement shall be executed, subject to the approval of the Board of Health, for perpetual maintenance and operation of the stormwater system in order to guarantee the regular maintenance, repair, and replacement of any or all components as necessary.** Subject to some recommended additions, the Applicant has submitted a satisfactory Operation & Maintenance Plan for the proposed stormwater BMPs; however as noted, an agreement between the Board of Health and the Owner (and ultimately the Homeowner Association) will need to be executed. See Comments 41 and 44.

*HSH: Concur*

**PSC: This comment has been addressed. The Board should require as a Condition of Approval that the Applicant submit a copy of an executed agreement for the HOA to provide perpetual maintenance and operation of the stormwater system.**

*HSH: Acknowledged*

## Massachusetts Stormwater Management Standards

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The Applicant's Stormwater Management Report includes an evaluation of compliance with the Stormwater Management Standards as presented in the Massachusetts Stormwater Handbook (SWH). The Project's compliance with Stormwater Management Standards are addressed for each standard below:

**Standard 1: No New Untreated Discharges or Erosion to Wetlands.** Compliance with this standard has been partially demonstrated. However, our concerns regarding use of alternative curbside pretreatment, and use of an inappropriate saturated hydraulic conductivity rate for the



infiltration basin and the design revisions that may follow such revisions, need to be addressed prior confirmation of compliance with this standard. Also see additional comments under Standard 8 below.

*HSH: The proprietary treatment device information has been provided within Appendix C of the Supplemental Data Report. A memo from the Hydrogeologist discussing the results of the testing can be found within Appendix N of the Supplemental Data Report.*

**Standard 2: Peak Rate Attenuation.** Compliance with this standard has been partially demonstrated because the current design complies with Standard 2 and the current post-development peak flows do not exceed the pre-development runoff rates. However, we've raised concern on use of an inappropriate saturated hydraulic conductivity rate and the design revisions that may follow use of a revised rate, and mounding analyses results, must be addressed prior to confirmation of compliance with this standard.

*HSH: See Appendix N of the Supplemental Data Report.*

**Standard 3: Stormwater Recharge.** The intent of Standard 3 is to ensure that the infiltration volume of precipitation into the ground under post-development conditions is at least as much as the infiltration volume under pre-development conditions. Compliance with this standard has been generally demonstrated, but based on flawed infiltration input. The Applicant needs to address the issues discussed in Comments 1 and 14 above to demonstrate that the surface infiltration BMP is properly designed in compliance with MA SWH requirements.

20. The Applicant needs to submit calculations proving adequate drawdown times for the surface infiltration detention basin, factoring in the requested revised saturated hydraulic conductivity rate. See Comment 1 above.

*HSH: Calculations proving adequate drawdown times for surface infiltration detention basins has been provided within the Supplemental Data Report.*

**PSC: This comment has been addressed; however, double check this issue after completing the mounding analyses requested in Comment 14 above.**

*HSH: Mounding analyses have been submitted for each storm event. All calculations pertaining to the drawdown times are still valid.*

**Standard 4: Water Quality.** The Stormwater Report and design plans demonstrate that stormwater runoff from all paved areas will be collected and directed through pre-treatment and contained infiltration with the exceptions noted in Comments 11 and 18 which the Applicant must first address before this Standard can be stated as met. Also, address the following:



21. The Applicant must address the erosion control provisions noted under Standard 8 below before this Water Quality Standard can be stated as met.

*HSH: All comments associated with erosion and control provisions have been addressed within the attached revised materials.*

**PSC: This comment has been addressed.**

*HSH: Acknowledged.*

22. The Applicant must submit evidence that pretreatment performance for the Rain Guardian systems that are employed prior to discharge to the surface infiltration basin will comply with the Town’s required pretreatment of the first 2-inches of rainfall, (also see Comments 18).

*HSH: Calculations showing compliance with the Town’s required 2-inches of runoff has been provided within the Supplemental Data Report.*

**PSC: This comment has been addressed.**

*HSH: Acknowledged.*

23. SWH Standard 4 requires submittal of a *Long Term Pollution Prevention Plan* (LTPPP) to fully comply with Standard 9. The Applicant has submitted a plan to meet the other Standard 9 requirement, which is a “Long-Term Operation and Maintenance Plan” (in Appendix A of the project “Supplemental Data Report”), but this is not a LTPPP. The Applicant should submit a LTPPP that include includes procedures for the following:

- a. good housekeeping;
- b. storing materials and waste products inside or under cover;
- c. vehicle washing;
- d. routine inspections and maintenance of stormwater BMPs;
- e. spill prevention and response;
- f. maintenance of lawns, gardens, and other landscaped areas;
- g. storage and use of fertilizers, herbicides, and pesticides;
- h. pet waste management;
- i. operation and management of septic systems; and
- j. proper management of deicing chemicals and snow

*HSH: A draft of the Long-Term Pollution Prevention Plan including the aforementioned items has been included as Appendix A of the Supplemental Data Report.*

**PSC: This comment has been addressed.**

*HSH: Acknowledged.*



**Standard 5: Land Uses with Higher Potential Pollutant Loads (LUHPPLs).** This standard is not applicable for the Project Site.

*HSH: Concur*

**Standard 6: Critical Areas.** The Project Site does not fall within a Critical Area and compliance with this standard is not required.

*HSH: Concur*

**Standard 7: Redevelopment Project.** This standard is not applicable for the Project Site.

*HSH: Concur*

**Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation**

**Controls:** The Applicant has provided plans and instructions for controlling erosion and sedimentation and is partially in compliance with this standard. However, the Applicant should review these and confirm (or revise to confirm) that the following comments are being addressed:

24. Because site contractors often seek to utilize proposed stormwater basin areas as temporary stormwater detention basins during construction, we recommend that the Applicant add a note to the Erosion Control Plan to specify procedures and temporary stormwater management controls to be followed during construction to ensure that the proposed surface and subsurface recharge basins will not be utilized for control of stormwater during construction. All runoff should be held entirely on the work site and the final basins shall not be used except for the completed project. If the Applicant finds that the aforementioned controls are not possible, then the need for utilizing the proposed surface and subsurface basins during construction must be discussed. As a minimum any check dam pools (say in the proposed swales) or at the surface detention basin used for temporary drainage during construction must not overflow to the wetland buffer zone, and final excavation of the stormwater basins to finished bottom grades should not be completed until all other site construction and land disturbance work is completed; and only then shall the basin bottom areas be exposed and graded, and any accumulated siltation within the basin areas must be removed along with the required excavation to the final bottom grades.

*HSH: Temporary sediment basins have been added to the Demolition and Erosion Control Plans (Sheets C3.1 and C3.2) of the plan set. Additional Erosion and Sedimentation Controls and narratives will be provided in preparation of the SWPPP and NPDES filing prior to construction.*



**PSC: This comment has been partially addressed. We recommend that a note be added to the plans (e.g., Grading & Drainage Plan) to specify the following or equivalent: “The surface detention/infiltration basin shall not be used for temporary drainage during construction; however, if erosion should occur affecting the basin bottom area, then any accumulated siltation within the basin area must be removed along with the required excavation or restoration to final basin bottom grade.”**

*HSH: Note #18 has been added to the “Grading and Drainage Notes” on Sheet C1.2 of the plan set.*

25. Although a basic “General Construction Sequence” is provided on Detail Sheet 1 of 7 (Sheet C10.1) and in Appendix B of the Supplemental Data Report, provide supplemental plan(s) and narrative to explain the proposed sequence of work to manage stormwater during the Site construction. Provide details and narrative to explain how stormwater will be directed and maintained within the Site disturbance limits during construction, for example through sequenced placement of temporary diversion swales, temporary sediment traps/basins, etc. Keeping stormwater as close as possible to the source of generation is the preferred approach, and allowing Site stormwater to accumulate at one collection point is not preferred.

*HSH: The management of stormwater during Site Construction will be developed with the selected site Contractor when completing the SWPPP and NPDES permit filing prior to construction. Howard Stein Hudson requests that this be made a condition prior to construction as items may differ dependent on the Contractor selected and the timing of the build out. The general sequence on Detail Sheet 1 has been updated to be more detailed.*

**PSC: This comment has been addressed; and we recommend that the Applicant be required to submit an updated SWPPP prior to construction as a Condition of Approval.**

*HSH: Concur*

26. Add a note to the Erosion Control Plan (Sheets C3.1, C3.2), and include discussion in the Appendix B narrative “Erosion Control and Sedimentation Control” to require that the Site Contractor: “Monitor and maintain the Stabilized Construction Entrance to ensure that it is cleaned and functioning correctly to prevent tracking of sediment by construction vehicles that exit the Site”.

*HSH: A note has been added to Sheet C1.2 stating the above.*

**PSC: This comment has been addressed.**





*HSH: Acknowledged.*

27. See note 10 on the Erosion Control Plan Notes (Sheet C1.2): We recommend replacing the word “mulch” and include the following: “a tarp or mulch can be used to cover stockpiles, and temporary seeding can also be applied”.

*HSH: The aforementioned note has been revised to include the requested language.*

**PSC: This comment has been addressed.**

*HSH: Acknowledged.*

28. Add some form of “Weekly Inspection and Maintenance Report Form” within “Appendix B, Erosion and Sediment Control Notes and General Construction Sequence”, and include inspection requirements for the following, at a minimum:

- a. Erosion Control Blanket Areas (e.g., for swale and basin side slope areas, and for any perimeter slope areas),
- b. Temporary Sediment Control Basin(s) and Swales;
- c. Temporary Stockpile areas,
- d. Stabilized Construction Entrance,
- e. Installations of “Compost Filter Socks”, and
- f. Sediment traps to protect all proposed curbside inlet areas
- g. Protection of the proposed 10-foot wide pervious parking shoulder areas.

*HSH: The operation and maintenance forms can be used for weekly inspections, there are no dates specified in the empty table. We have added some of the above items to the regular operation and maintenance appendix. The other items and scheduling of inspections will be included in the SWPPP and NPDES permit filing prior to construction. Howard Stein Hudson requests that this be made a condition prior to construction as items may differ dependent on the Contractor selected and the timing of the build out.*

**PSC: This comment has been addressed; and we recommend that the Applicant be required to submit an updated SWPPP prior to construction as a Condition of Approval.**

*HSH: A completed SWPPP has been submitted as part of this package.*

There are several other recommended revisions for the Erosion Control Plan Notes (Sheet C1.2) and the Erosion Control Plan (Sheets C3.1 & C3.2) to specify controls and procedures as follows:



29. Add notes for stabilizing any new exposed slope areas - such as the slopes and channel bottoms along the proposed drainage swales, slopes along the project perimeter, and slopes at the surface basin, with erosion control matting as soon as the grading is completed. It is preferable for the erosion control matting to include mulch, grass seed and fertilizer, and be organic so as to degrade over time without removal.

*HSH: Erosion Control Plan Note 18 on Sheet C1.2 has been revised to state “New, exposed slope areas, such as the slopes and channel bottoms along the proposed drainage swales, slopes along the project perimeter, and slopes at the surface basin must be stabilized with erosion control matting as soon as the grading is completed.”*

**PSC: This comment has been addressed.**

*HSH: Acknowledged.*

30. Provide a detail to explain the proposed method to protect the various Rain Guardian curbside inlets (Rain Guardian Bunkers, and Rain Guardian Foxhole) from erosion sediment during the construction period, since it does not appear feasible to install silt sacks such as those detailed on the plans. Also address requirements to protect the proposed 10-foot wide pervious parking shoulder areas from the impacts of stormwater sediment.

*HSH: All curbside inlets and pervious parking shoulders will be protected with the use of compost sock. These areas will be presented in more detail and shown on the final plan that will accompany the SWPPP which will be provided prior to the start of construction.*

**PSC: This comment has been addressed; and we recommend that the Applicant be required to submit an updated SWPPP prior to construction as a Condition of Approval.**

*HSH: A completed SWPPP has been submitted as part of this package.*

31. Remove any detail that calls for use of Haybales, and add a note that Haybale Silt Barriers are not allowed for catch basin protection.

*HSH: Haybales have been removed from the plan set and a note has been added to Sheet C1.2 stating that the use of haybales for catch basin protection is not allowed.*

**PSC: This comment has been addressed.**

*HSH: Acknowledged.*

32. Add notes to discuss procedures to protect the surface detention basin and the two subsurface chamber areas and prevent impacts during construction. Describe procedures to be followed during excavation and construction of these surface and subsurface basins, to remove unsuitable soils that may be encountered. Call for heavy equipment to avoid



unnecessary compaction of soils. Describe a work sequence that employs erosion control BMPs and prevents discharge of excavated materials and prevents erosion into excavation for these BMP areas.

*HSH: The surface infiltration basin and subsurface chamber areas will be protected with the use of construction fencing and compost socks during construction. The protection of these areas will be presented in more detail in the final SWPPP that will be submitted to the Town of Wrentham prior to the start of construction.*

**PSC: This comment has been addressed; and we recommend that the Applicant be required to submit an updated SWPPP prior to construction as a Condition of Approval.**

*HSH: A completed SWPPP has been submitted as part of this package.*

33. Prior to any excavation which may require removal of soil off site, the Applicant must apply for and obtain an Earth Removal Permit from the Planning Board in accordance with the Wrentham General Bylaw - Article 7.11.

*HSH: An Earth Removal Permit is currently before the Planning Board for review.*

**PSC: This comment has been addressed.**

*HSH: Acknowledged.*

34. Because the project will disturb over one acre, an eNOI must be filed with the USEPA and a Stormwater Pollution Prevention Plan (SWPPP) must be prepared by the Applicant. We recommend that a Draft SWPPP be submitted to the Town now for review and comment. As part of the SWPPP preparation, we recommend that the erosion control information already submitted be included in the SWPPP, and that erosion control notes and narrative should be upgraded, at a minimum, to describe how temporary measures, including construction phasing, are to occur, and be consistent with the *Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas* (1997, revised 2003) (hereinafter, MA E&S Guidelines), and be consistent with the methods noted in the E&S Guidelines starting at page 42. The erosion control narrative should also address restoration of temporary impacts that will occur due to construction (grading, retaining wall, etc.) within the 100-foot Buffer Zone.

*HSH: A draft of the SWPPP is included as Appendix B of the Supplemental Data Report.*

**PSC: This comment has been addressed.**

*HSH: Acknowledged.*



35. For the proposed stockpile area noted on the plan, describe what is to be stockpiled and reference a detail (to be placed on one of the detail sheets) of how the stockpile(s) will be protected (see item 38 below).

*HSH: A note has been added to the Erosion Control Plan Notes specifying the types of materials that may be stockpiled with reference to a detail on a typical stockpile.*

**PSC: This comment has been addressed.**

*HSH: Acknowledged.*

36. The Site entrance from Hancock Street has a proposed construction vehicle *Stabilized Construction Entrance*. This entrance area should be divided into two parts clearly marked as either “entry or exit only.” There is no need to clean vehicles that are entering as vehicles entering an exit zone will degrade the exit zone by compaction. (Also see Comment 39 below.)

*HSH: The Demolition and Erosion Control Plan (Sheet C3.1) has been revised to show a separated construction entrance and exit. The detail on Detail Sheet 1 (Sheet C10.1) has also been revised.*

**PSC: This comment has been addressed.**

*HSH: Acknowledged.*

37. Upgrade the notes on the erosion control plans to be consistent with methods noted in the MA E&S Guidelines starting at page 42, and address phasing of the work such that clearing, grubbing, and stabilization should be done in discreet areas at different times. It appears that tree clearing will be required for grading along the east property line and in the south half of the Site, including areas near to the proposed surface stormwater basin, and in areas within the 100-foot buffer zone on the west side and south end of the Site. Therefore, the erosion control narrative should explain in more detail how tree removal will occur, how felled logs will be removed from the site (landing areas, etc.), how grubbing will occur, and how erosion from the grubbed site and any sloped areas will be prevented until such areas are stabilized. (Also see Comment 33 above.)

*HSH: The management of stormwater during Site Construction will be developed with the selected site Contractor when completing the SWPPP and NPDES permit filing prior to construction. Howard Stein Hudson requests that this be made a condition prior to construction as items may differ dependent on the Contractor selected and the timing of the build out. The general sequence on Detail Sheet 1 has been updated to be more detailed.*



**PSC: This comment has been addressed; and we recommend that the Applicant be required to submit an updated SWPPP prior to construction as a Condition of Approval.**

*HSH: A completed SWPPP has been submitted as part of this package.*

38. Add a detail for material stockpiles. Show how soil and other material stockpiles will be protected from wind and stormwater. This may be done with mulch, tarps, or annual seed mixes that are watered until growing, and ringed with a silt fence.

*HSH: A temporary stockpile detail has been added to Detail Sheet 2 (Sheet C10.2) of the plan set.*

**PSC: This comment has been partially addressed. We recommend that this detail on Sheet C10.2 include reference to the need for protecting stockpiles with mulch and/or tarps, or annual seed mixes that are watered until growing if long term soil storage.**

*HSH: A note has been added to the Temporary Stockpile detail on Sheet C10.2.*

39. Revise the Stabilized Construction Entrance detail (Sheet C10.1) to provide a stone pad zone that is slightly depressed and pitched in the center so as to drain off to one side into a limited drainage water catchment area. In addition to the detail revision, show this catchment area location on the Layout and Materials Plan (Sheet C4.1). The objective should be to clean the vehicles and have any drainage from the tracking pad captured off to one side so that silt and sediment are settled out and not re-tracked. In addition, add a note to call for personnel at the exit to supervise traffic direction and clean off vehicles with problems and ensure any material covers are in-place. One feature of the Town's IDDE Bylaw and eventual regulations will be a requirement to retain all drainage on-site. Failure to do so will result in fines and delays.

*HSH: A detail on Detail Sheet 1 (Sheet C10.1) has been revised to include an entrance and exit as well as a depression to drain off to the side.*

**PSC: This comment has been addressed.**

*HSH: Acknowledged.*

40. The SWPPP (to be prepared) and the erosion control plans should include the following additional procedural notes to help ensure that the Project contractor is informed of procedures that are important to the Town and so that construction activity minimizes erosion and associated impacts:



- a. The inspection of erosion control devices adjacent to the buffer zone and along downgradient areas will be done by the Applicant's Engineer, and once installation is determined to be accurate, the Engineer will send a letter to the Board of Health attesting to accuracy and describing any potential changes.
- b. The plan needs to state how often the Project Construction Supervisor will inspect the Site and the erosion controls. Also, the owner shall submit any changes to sequence or timing of construction or inspections to the Board of Health and Commission prior to implementation.
- c. To keep unauthorized grading machine traffic to a minimum, install a four-foot high, high-visibility limit-of-work (LOW) fence to enclose the work site and any non-active work areas.
- d. Catch basins and Rain Guardian devices on Site and any downgradient catch basin(s) in Hancock Street shall be covered until all surfaces in the watershed of the catch basin are stable and the stormwater management areas are fully constructed. If catch basins are required to be operational, these shall be protected by an approved method as detailed on the plans, and these shall be checked weekly and following any storm event, and cleaned sediment is captured.
- e. Stormwater must be managed in the work area and it must not be allowed to impact erosion control devices, nor be discharged outside of the Site work area.
- f. All grades or bare soil within the buffer zone, and any slopes or areas potentially draining near to a proposed infiltration practice or off site must be stabilized within 48 hours, and no discharge of sediment is to leave the Site.
- g. A stump grinder shall be used to make a mulch material that can be stockpiled and used throughout the Site for stabilization. Also, save leaves and other surface debris for similar use in stabilization of disturbed areas.
- h. The use of Haybales is not allowed on the Site. (The Applicant's submittals need to be revised to remove all references to Haybales). Only compost filter socks of minimum 8-inch height are to be employed, and these shall be backed by a silt fence and a high-visibility Limit-of-Work (LOW) fence. The Board of Health requires that the details for the filter mitt and wattle comply with the specifications of the Conservation Commission (see the Commission's web site).



- i. A LOW fence is required for abutting properties.
- j. No topsoil is to be imported to the Site unless required because of a shortage of topsoil gathered or stockpiled on the Site, and only if pre-approved by the Wrentham Conservation Agent.

*HSH: All aforementioned information will be provided in the final SWPPP that will be submitted to the Town of Wrentham prior to construction.*

**PSC: This comment has been addressed; and we recommend that the Applicant be required to submit an updated SWPPP prior to construction as a Condition of Approval.**

*HSH: A completed SWPPP has been submitted as part of this package.*

**Standard 9: Long Term Operation and Maintenance Plan and Long Term Pollution Prevention Plan.** An Operation and Maintenance Plan has been submitted as part of the stormwater report, however this plan does not fully comply with Standard 9. This O&M plan should be amended as follows:

41. The O&M plan could Include all relevant elements as required by Standard 9 for a Long Term Pollution Prevention Plan (LTPPP), or it may be preferable for the Applicant to submit a separate LTPPP document. The project Homeowners Association can utilize a LTPPP as a guide for property management. The LTPPP requirements are listed in Comment 23 above.

*HSH: A Long-Term Pollution Prevention Plan has been included as Appendix A in the Supplemental Data Report. This will be a “living” document that will be updated and revised as the SWPPP is prepared.*

**PSC: This comment has been addressed. However, because the LTPPP serves a long-term purpose, to be implemented by the HOA (after the SWPPP has been implemented during construction), the Board should require as a Condition of Approval that the final LTPPP be included with the related submittal referenced within Comment 19 above (i.e., the executed agreement for HOA to provide perpetual maintenance and operation of the stormwater system).**

*HSH: Acknowledged.*

42. To fully comply with Standard 9, the Applicant should revise and confirm that their Long-Term Operation and Maintenance Plan at a minimum includes all of the following:



- a. Stormwater management system owners;
- b. The party or parties responsible for operation and maintenance, including how future property owners will be notified of the presence of the stormwater management system and the requirement for proper operation and maintenance;
- c. A narrative description of the routine and non-routine stormwater system maintenance tasks to be undertaken by the Homeowner Association after construction is complete and a schedule for implementing those tasks;
- d. A plan that is drawn to scale and shows the location of all stormwater BMPs in each treatment train along with the discharge point;
- e. A description and delineation of public safety features; and
- f. An estimated Total Annual Operations and Maintenance Budget for all stormwater BMP systems combined.

*HSH: The Long-Term Pollution Prevention Plan has been included with the aforementioned items as Appendix A within the Supplemental Data Report.*

**PSC: This comment has been addressed.**

*HSH: Acknowledged.*

43. The O&M Plan for stormwater facilities should include recommendations, which should also be included on the maintenance and inspection forms, regarding the frequency of inspection of the Rain Guardian systems' equipment and filters, with emphasis on requiring increased frequency of inspections during seasons when leaves, debris and sand will stress these filter systems, especially since these do not have deep sumps or oil/water hoods.

*HSH: Proprietary maintenance and BMP information can be found in Appendix A and C of the Supplemental Data Report.*

**PSC: This comment has been addressed.**

*HSH: Acknowledged.*

44. The O&M Plan should include recommendations for maintenance, and inspection forms for the infiltration basin overflow and inflow receiving areas.

*HSH: The O&M Plan within the Long-Term Pollution Prevention Plan includes recommendations for the infiltration basin overflow and inflow areas.*

**PSC: This comment has been addressed.**





*HSH: Acknowledged.*

45. The O&M Plan should include recommendations for maintenance, and inspection forms for the 10-foot wide pervious parking shoulder areas.

*HSH: The O&M Plan within the Long-Term Pollution Prevention Plan includes recommendations for the pervious parking shoulders throughout the site.*

**PSC: This comment has been addressed.**

*HSH: Acknowledged.*

46. Although snow storage areas have been shown on the “Layout and Materials Plan” (sheets C4.1 and C4.2) of the project plans, the O&M Plan should include this snow storage plan to show operators where snow storage should occur during winter storms. In addition, the Applicant should submit calculations that document the amount of snow accumulation that will be gathered during a typical snowstorm event from paved areas, and demonstrate that the calculated amount of required storage will be provided by the recommended snow storage zones. The following are suggested guidelines for such calculations:

- a. Calculate snow accumulation to occur after paving the Site (say per inch of snow)
- b. Calculate the maximum storage capacity of the various areas noted on the project plans (plus any new areas). Assume a maximum storage height based on 1:1 side slope snow storage that will fit within the designated snow storage footprints.
- c. From a. and b. above, and allowing for compaction, determine how many inches of snow can be effectively stored on the project Site, and by default, the excess volume that will require haul-away to an appropriate disposal site.
- d. Also, provide a response (in the project narrative) to discuss how the Site will comply with MADEP Snow Storage Guidelines which can be found at:

<https://www.mass.gov/guides/snow-disposal-guidance#-snow-disposal-guidance->

*HSH: Snow storage calculations have been provided as Appendix K of the Supplemental Data Report and meets all standards set forth by the State.*

**PSC: This comment has been addressed.**

*HSH: Acknowledged.*



DEP guidance, in part states: “Avoid disposing of snow on top of storm drain catch basins or in stormwater drainage systems including detention basins, swales or ditches. Snow combined with sand and debris may block a stormwater drainage system, causing localized flooding. A high volume of sand, sediment, and litter released from melting snow also may be quickly transported through the system into surface water.”

**Standard 10: Prohibition of Illicit Discharges.** An Illicit Discharge Compliance Statement has not been submitted and therefore this standard has not been met.

47. The Applicant should submit a signed Illicit Discharge Compliance Statement as discussed in the Massachusetts SWH.

*HSH: A signed Illicit Discharge Compliance Statement has been provided.*

**PSC: This comment has been addressed.**

*HSH: Acknowledged.*

## Other Comments on the Project Submittals

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48. Three (3) retaining walls are proposed: one along the southwest side (near to and/or touching the 200-foot outer riparian zone), one along the west side (near the 50-foot no disturb zone), and one on north side of the Site (near two abutters with frontage on Hancock Street). The wall heights on the southwest will vary from 1-foot to 4-feet, heights on the west wall will vary from 1-foot to 6-feet, and heights on the north wall will vary from 0.5-feet to 5-feet. These retaining walls need to be designed by a Massachusetts registered Structural Engineer. Calculations for factor of safety against Massachusetts registered Structural Engineer. Calculations for factor of safety against overturning, sliding and bearing capacity are required for any section over 4-feet in height, and the proximity of wetlands and possible high groundwater should be factored into the design. If the structural plans are provided by a wall manufacturer then the Board should require that the plans be based on site specific geotechnical information and the Board should not accept plans that are qualified by requiring further determination of geotechnical conditions after issuance of the signed and sealed structural drawings.

*HSH: All design and calculations associated with the retaining wall on site will be completed by a Massachusetts registered Structural Engineer and will be provided prior to construction. Howard Stein Hudson requests that the conditions of approval specify that the wall construction and impacts are not any closer to the resource areas than depicted in the plans currently under review.*



**PSC: This comment has been addressed; and we recommend that the Applicant be required to submit a Structural Engineer’s design for the retaining walls prior to construction as a Condition of Approval.**

*HSH: Concur. Designs for the retaining walls from a certified Structural Engineer will be submitted at a later date.*

49. Explain how construction of the three (3) retaining walls – one in close proximity to the 200-foot outer riparian zone on the southwest, one near the 50-foot no touch zone on the west, and one near to abutting properties on the north - will be possible without temporary disruption of these buffer zones or neighbors’ land, and please designate an appropriate “temporary disturbance limit of work” line on the Grading and Drainage Plans (Sheet C5.2), and provide reasonable estimates of the area (in square feet) of temporary disturbance that will be required for access to, and construction of these retaining walls, and provide a restoration plan for the disturbances.

*HSH: The walls and grading have been revised. Please see plans for distances to the critical design limits. The proposed Versa-lok wall system construction guidance requires a 2’ wide trench for the installation of the base of the wall. The wall will then be battered away from the limit of work. No temporary disturbance will be necessary for installation of the wall. Howard Stein Hudson requests that the conditions of approval specify that the wall construction and impacts are not any closer to the resource areas than depicted in the plans currently under review.*

**PSC: This comment has been addressed; and concur**

*HSH: Acknowledged.*

50. Show the proposed downspout locations for all homesite roof drainage systems and check to be sure that the sub-catchment areas limits are not affected by roof leader locations.

*HSH: Proposed downspout locations for the homesite roof drainage system has been provided as Appendix L of the Supplemental Data Report.*

**PSC: This comment has been addressed.**

*HSH: Acknowledged.*

51. Provide details for the proposed post & rail guard rails to be used on site.

*HSH: A detail of the proposed post and rail fence around the site has been added to Detail Sheet 2 (Sheet C10.2) of the plan set.*

**PSC: This comment has been addressed.**

*HSH: Acknowledged.*



52. The entrance road catch basin CB-1 will be critical to preventing stormflow from draining into Hancock Street, and even if catch basin CB-1 is effective, the lack of grading detail at the entrance road intersection with Hancock Street could still lead to water shedding into Hancock Street. Therefore, we have the following two recommendations:
- a. Provide calculations to show that the single grate catch basin CB-1 will be adequate to capture storm flow from the 4 storm events that have been analyzed without overflow/bypass into Hancock Street; and
  - b. Provide a modest berm or rise in grade at the Site entrance, detailed with spot grades, to ensure that all sheet and gutter flow draining from the entrance road to Hancock Street will be directed to, and captured by CB-1. And conversely, such a berm or rise in grade must help prevent Hancock Street drainage from entering CB-1, (which should not enter CB-1 since the connected subsurface infiltration chamber system is not designed to accept such extra flow).

*HSH: Flow from Hancock Street will not enter CB-1, the storm flows can be seen in the hydrocad analysis entering CB-1. More detail grading and flow paths have been added to the plan. If the grade in Hancock Street were to change, the overflow from the chambers or the overflow in Hancock Street would both lead to the wetland area to the north of the entrance road and enter into the larger wetland system on the subject property. During large storms in the existing conditions, the water flows into the headwall on the southern side of Hancock Street, as it is the only drainage structure on Hancock Street.*

**PSC: This comment has been partially addressed. We question the reference to grading in Hancock Street that directs drainage to a headwall on the south side of Hancock Street and away from the Project. As noted in our response at Comment 3 above, this flow path and headwall location and details for the headwall and pipe or swale to wetlands are not clear to us based on our review of the existing conditions plans and the existing and post-development tributary area plans. Please provide more detailed survey or detailed views, possibly with photos, to explain this.**

*HSH: Please see response to the above Comment #3.*

53. Provide calculations to show that the following curbside catch basins will adequately capture storm flow from the 4 storm events that have been analyzed without resulting in overflow/bypass: CB-2, CB-5 and CB-6.



*HSH: Catch basin 2 is mainly an emergency overflow, fine grading has been done to ensure that it is not the main flow path for stormwater through open area, but if the catch basin were to discharge water, it would flow southerly through the green area inside the interior walkway and discharge into the foxholes at the low point in the road. The inlet catch basins have been designed per Massachusetts stormwater recommendations of less than a quarter acre of impervious area. Within the hydrocad, there is no surging in the outlet pipes, providing calculated analysis that the catch basins can capture the four storm events analyzed.*

**PSC: This response is not complete. We are no longer questioning CB-5 and CB-6, other than to note that CB-5 and the downstream connecting drain manhole should have an identifying label on Sheet C5. The unlabeled catch basin on Sheet C5.1 presumed to be CB-2 (based on HydroCAD model) is located at road station 5.0. It is clearly not an emergency overflow. The HydroCAD model lists 0.82-acres contributing flow to CB-2. Because the road is superelevated with a single (not paired) catch basin this can result in significant gutter flow to the catch basin. Therefore, it is reasonable to check the grate capacity and “flow spread” in the upstream gutter at this catch basin, especially for the 100-year storm. The HydroCAD model does not analyze gutter flow to catch basins and drainage spread within the road, therefore the Applicant will need another method to check conditions of flow entering CB-2.**

*HSH: The HydroCAD models shows a total of 23,870 sf being directed to CB2. However, flow spread calculations as well as depth of water along the curb line have been completed and included as Appendix L In the Supplemental Data Report.*

54. The drain manhole upgradient of DMH-6 should probably be labeled DMH-5. Please confirm and relabel it as appropriate.

*HSH: The manholes have been re-labeled appropriately.*

**PSC: This response is not complete. Drain manhole DMH-6 noted on the original plans at about road station 12+50 does not have a designation or label on the most recent submittal. Also, the drain manhole that is upgradient at road station 13+50 is also unlabeled. Also, as noted earlier, catch basins CB-5 and CB-2 are unlabeled.**

*HSH: All drainage structures have been labeled on Sheets C5.1 as well as Sheet C5.2.*

55. During the 100-year event, the HydroCAD model indicates that there will be some flooding over the headwall (top elevation 254) area near DMH-5 which could potentially impact Unit



5. Please redesign the headwall area and/or connecting pipe at the headwall to eliminate this condition.

*HSH: The road is super imposed with the low side being the outside. The peak elevation in a 100-year storm is 253.93. If this were to overflow over the headwall, the water would continue down the curb line to the next catch basin. There is no potential damage to unit 5 as it is upgradient to the road.*

**PSC: This comment has been addressed.**

*HSH: Acknowledged*

56. Two (2) Area Drains are proposed: One at the toe of slope area east of the entrance road, and one in the yard area between Units 14 & 15. First, identify these Area Drains with numbers, and second, we recommend that standard 4-foot deep sump hooded catch basins be provided at these two locations instead of the small 6-inch diameter Nyloplast-ADS structures noted on details Sheet C10.5. These structures are transferring on-site flow to off-site locations, and these could potentially be classified as not complying with Standard 1 of the MA SWH. Please justify. [Also, if the use of these small Nyloplast-ADS structures is critically important for some reason, please explain and submit calculations to justify the capacity of these lesser alternatives for capturing and managing flows from the anticipated 4 storm events that are evaluated.]

*HSH: Yard drains between units have been removed. The only remaining area drain along the entrance road is taking a small area, consisting of only grass, and is directed to enter SIS1, thus complying with standard 1. The area drain is modeled in hydrocad, and accepts all four storm events, an equivalent structure may also be used with sign off from the engineer prior to construction.*

**PSC: This comment has been addressed; however we still recommend use of a shallow catch basin (such as detailed on Sheet 10.5) instead of the Nyloplast-ADS yard drain.**

*HSH: Acknowledged*

57. Update the HydroCAD model to include the following:

- a. Drainage flow through the proposed strip drain (located below the east side of the loop road next to the retaining wall) should be modeled appropriately, say as a trench pond with no exfiltration, relieved by a perforated collection/outlet pipe, and then routed through a solid pipe reach to the west side of the Site based on the pipe sizes and types as identified on Sheet C5.1



*HSH: Infiltration strip drain has been removed and replaced with an ADS slot drain, that will collect water and transport through a 6" PVC pipe to SIS1. This is modeled in hydrocad with flows and max elevations in the 4 storm events and is of adequate size for the small amount of area flowing into it.*

**PSC: We have concerns about the proposed change to a “slot drain” and question the stormwater capture efficiency for the small 1.75” slot drain proposed along the grassy side slope, especially if debris, grass cuttings and/or leaves block flow to this proposed slot drain. In our opinion, the original design (dated April 11, 2022) which called for a gravel topped strip drain that was much wider (2’ at top, 1.5’ within collection trench) and backed by a retaining wall, would better capture runoff and protect the abutter. We ask the Applicant to reconsider using the original strip drain design, and direct flow from the lined trench to the SIS1 recharge area, and model the strip drain as a collection device within HydroCAD as originally requested.**

*HSH: The slot drain has been removed and replaced with a strip drain similar to the original design submitted on April 11, 2022. The detail on sheet C10.3 has also been revised.*

- b. Drainage flow from the area between Units 14 & 15 should be routed through a catch basin pond (see Comment 56 above) that flows through a reach to the outlet based on the pipe sizes and types as identified on Sheet C5.1

*HSH: Elevations of the units have been revised as well as the grading to eliminate the need for a yard drain and allow water to flow into the street and through treatment BMPs and infiltration structures.*

**PSC: This comment has been addressed.**

*HSH: Acknowledged*