

Chessia Consulting Services LLC



September 9, 2021

Planning Board
Town of Hingham
210 Central Street
Hingham, MA 02043

RE: Supplemental Engineering Review
220 Summer Street
Site Plan Review

Dear Members of the Board:

In response to your request, Chessia Consulting Services, LLC has reviewed the above referenced project under the Site Plan review procedures in the Zoning By-Law. The submittal was also reviewed for general engineering design standards, and DEP Stormwater Management Policy/drainage design. The data reviewed included the following information:

- Plans entitled:
“Site Plan Proposed Dwelling 220 Summer Street Hingham, MA 02043”
dated 3-15-21, last revised 08-23-21 prepared by James Engineering, Inc.
consisting of 8 sheets. (Plans)
- Supporting Documents (emailed 8-26 & 8-27, 2021 except as noted):
 - Drainage Calculations report last revised 08/23/21, partial data as HydroCAD files were not included prepared by James Engineering, Inc. (hand delivered on September 7, 2021)
 - Erosion Control Plan dated July 8, 2021, last revised 8/23/21 prepared by James Engineering, Inc.
 - Operation and Maintenance Plan dated January 24, 2019, last revised 08/23/21 prepared by James Engineering, Inc.
 - Response letter addressed to Christine Stickney, from James Engineering, Inc. dated August 26, 2021 (not emailed to this office, hand delivered September 7, 2021)
 - Revised Landscape Plan emailed on 9-8-21 not previously provided to this office.

The emails referenced a Response letter that has not been received by this office, but which would typically be helpful and expedite the review effort. A Response to some issues addressed to Christine Stickney was hand delivered on September 7, 2021.

The site is located on the North Side of Summer Street and the east side of Kilby Street. The property initially included an antique house and barn that has been divided to create a

new lot at the corner of Summer and Kilby Streets. The property is mostly cleared with recent earthwork in the southerly part of the site. Based on prior reviews of this project, the site area was previously mostly meadow and brush with a developed lawn around the existing antique house and barn. There was an existing cart path from Kilby Street to the existing house and barn that crosses the newly created lot.

Topographically the new lot is lower than the surrounding area with a gentle slope to the north. There was a channel that was flowing in sections at the time of my first site visit in January of 2019. The channel originated near Summer Street and flowed to a 6" culvert under the cart path. Based on observations and the presence of algae in the water the water source was assumed to be from groundwater. There is a stone retaining wall in the area that appears to be located within the Summer Street layout where water was observed and this section of Summer Street has a berm along the roadway to channel surface runoff in the street gutter. Below the cart path the channel was more defined and had more significant flow. Ultimately this flow discharges next to an existing catch basin in Kilby Street, but most of the flow bypasses the catch basin and flows to the north across the abutting driveway to a catch basin in Chief Justice Cushing Highway. Since my initial site visit for the initial project filing in 2019, there has been a cut to the berm behind the catch basin in Kilby Street to allow runoff to enter the basin. In addition to the groundwater flow there is a section of roadway at the corner of Summer and Kilby Streets where surface runoff flows into the lot from the roadway. At this location there is no berm or a minimal berm along the edge of pavement. There was evidence of scour between the pavement and the lower lot area noted in my 2019 site visit. Along Kilby Street north of Summer Street there is a very small berm that does not appear to be that effective as there was evidence of flow from the roadway across the shoulder, which is covered in wood chips, to the property along this area as well.

Since the prior submissions, the channel through the lot has been mostly filled and a 4" corrugated plastic pipe in crushed stone has been installed in the channel area. This appears to have limited effectiveness as the area near Summer Street has ponded water. I attached photographs taken at my prior site visit as part of my initial review of the refiled Application. There has also been fill and other site disturbance over most of the southern part of the lot. Some work was performed on the abutting lot to the north based on property line stakes placed in the field and part of the tracking pad at the access appears to be over the lot line. There is no or minimal vegetation in the disturbed part of the lot. The area of the previous channel is defined by a gray shaded area on the plans, but the pipe and stone were not clearly identified. At this time it is assumed that this system is no longer functioning properly as minimal flow has been observed at the outlet end of the system. There is also a French drain indicated on the plans that was previously installed along the west side of the lot parallel to Kilby Street. This drain previously discharged to the existing channel at the northerly end of the site. This drain is no longer visible and likely was disturbed by recent fill and other work on the site. It is unclear that this drain still functions due to the recent site disturbance.

I have visited the site several times over the past two years and have noted ponded water on the lot. In addition, there have been several photographs taken by Town Staff and

Officials of the site after rainfall events. It is evident from the photographs that the site currently floods during rainfall events of sufficient depth. Reportedly and in one case an overflow of the on-site berm has been reported. It appears that previously installed drainage systems including pipes surrounded by crushed stone, are not functioning to convey water from the south side of the site.

It is my understanding that the Conservation Commission determined that the site was not considered a wetland. The Drainage Calculations identify the area as a wet meadow based on soil conditions and model the runoff accordingly in the existing case with a higher runoff curve number typical of wetlands conditions used in the calculations.

Based on a review of MassGIS data, the property is not in an ACEC, Zone II or Zone A of public water supplies, nor are there any identified rare wildlife habitat or vernal pools in the vicinity of the parcel. The property is not located in the Accord Pond Watershed and Hingham Aquifer Protection District.

Some soil testing data is included on the plans. Tests were previously performed and two were witnessed by Chessia Consulting Services one was at the southerly end of the previously proposed infiltration basin. Additional testing was performed on 6-18-21. I have also reviewed Natural Resource Conservation Service (NRCS) published data available on line. The site primarily consists of Chatfield Rock Outcrop complex soils with Newfield soils to the north. Both Chatfield and Newfield soils are classified as Hydrologic Soil Group (HSG) B, which are of moderate permeability. Soils in the vicinity of the existing channel have been considered HSG D, typical of wetland soils, due to high groundwater conditions. Testing that has been performed indicates more permeable sands generally to the south east side of the site and in the area of the antique house and barn. These soils would be HSG A and have been assumed to be HSG A in the calculations. Recent testing indicated sand to the west of the barn extending to the north. Unsuitable soils were located closer to the previous channel area.

GENERAL PLAN REVIEW:

The proposed project would develop a new residential house on an ANR lot. The former cart path that accessed off of Kilby Street would be modified to a paved driveway to access the lot. The driveway opening is in the same general area of the cart path. The proposed garage has been changed to the rear of the house (north side). As noted some of this work has been performed but it appears to be reasonable to base the design on the preconstruction conditions.

A plan of current existing conditions has been provided as Sheet 5 of 8 as requested by the Interim Town Planner.

This lot would be served by an on-site septic system. Runoff would be collected from the roof of the new house, part of the new driveway and part of the existing barn, existing house and associated yard area for discharge to a new surface infiltration basin on the lot. Runoff from the front yard associated with Summer Street frontage would be collected in

a new flared end inlet which would now discharge at the north end of the lot into the existing channel. The prior submission had this connecting to the previously installed french drain to the west side of the lot. The current plan has one new 8 inch outlet approximately 20 feet from the property line versus approximately 40 feet from the extended 6 inch french drain outlet on the approved plans. As noted., the area of the drain has been disturbed by recent work and it appears that all of the existing drains have been damaged. Part of the westerly side of the lot would be sloped into Kilby Street. This is a change from the previously approved plan as more area is directed to the right of way than before. This aspect should be coordinated with the DPW as the agreement for the prior plan did not include adding this extent of area to the Town right of way. More of the proposed driveway than on the previously approved plan is also directed to Kilby Street. A new inlet and swale along Kilby Street are proposed as previously indicated on the approved plans to collect this runoff. The catch basin is proposed to connect to the existing catch basin further to the north on Kilby Street as previously approved.

The overall study area for runoff analysis has expanded to include more of the existing house, barn and associated area. More of this area would flow to the infiltration basin than in the previously approved plans. The total flow to the channel and catch basin in Kilby Street has not been assessed in any of the filings.

The water service is proposed to come off of Summer Street; there is no data on gas, electric or cable utilities. The project is subject to site plan review since there would be alteration of 20,000 square feet of land.

The following issues are considered the most significant for the Board to consider in review of the project, current comments are in underlined text following prior comments:

- Confirmation from the DPW of the proposed work in Kilby Street based on the new design.
The Response states that there is no change to the design, I recommend that the DPW confirm that they are satisfied.
It is unclear if the DPW has reviewed the revised plans.
- Soil testing for the proposed stormwater basin and general basin design given that the basin has been relocated further into the wet area with what appear to be less suitable soils.
Soil testing was performed on 6-18-2021. The data on the plans should be clarified as 4 tests were performed and only 3 tests are listed. The test pits are not labeled on the plans and do not include the elevation at the test, which should be provided. I had some different data in my logs as noted below.
Satisfied.
- Compliance with stormwater standards.
There remain some issues or documentation required to confirm compliance.
There are several recommended conditions listed under Stormwater Management Regulations.
- Condition and function of existing the French Drain and new 4” drain in the channel.

The Response indicates that the previously installed drains do not function and new drains are proposed. Data on what will be done to complete abandonment of the existing drains should be provided.

Partially addressed, it is proposed to connect the southerly portion of the existing subdrain to the proposed foundation subdrain. This pipe would connect to the proposed 6 inch surface drain collecting runoff from the low area at the southern end of the lot, then discharge this flow into the surface water collection system from the southern end of the lot at a proposed manhole at the northeast corner of the lot. I recommend that the plans indicate the location of the existing pipe and stone for the subdrain. The plans only state that the existing french drain is to be abandoned in place. I recommend that the ends be capped and plugged.

Current comments are in underlined type following prior comments in *italic type* which following my initial comment as applicable. I have identified recommended conditions for the current plan, if approved, in **highlighted type**.

Section I-I Site Plan Review:

1. Purpose:
No comment required.
2. Procedures:
It is assumed that the appropriate information has been submitted to initiate the review process. The Board should review the project relative to the specific subsections of this section.
3. Pre-Application Submittal.
It is unknown if a pre-application submittal has been submitted or commented on by the Board. I note that this site has been previously approved with a follow up modification plan. There has not been a plan that complied with all of the approval conditions to the best of my knowledge as my files indicate some outstanding issues based on my review of the plans submitted after the Decision on the approved plans. This plan is a significant change as the lot design, basin design and location, etc. have all been modified from the prior plans.
No further comment.
4. Submittal Requirements:
Plans are stamped by a Professional Engineer.
 - a. The submittal includes a locus plan. The Owner/Applicant is listed as Ryan P. Sillery on the Plan. The lot area and boundary dimensions are indicated on the plans. The plans include setbacks from Summer Street, Kilby Street and the easterly lot line. The plans include the Zoning District (Residence C) where the lot is located, together with required zoning setbacks, area, etc. The plan also includes the zoning square. It appears that the proposed building would meet setbacks as shown on the plan. The plans indicate existing and proposed

contour elevations in the vicinity of the proposed work. Structures within 100 feet of the property line are indicated on the plans as required.

- b. The plans are drawn to scale (1" = 40' and 1" = 20') and indicate the proposed building footprint. The building dimensions are not listed on the plans as required. Building elevations and floor plans were not provided but may not be required for a residential dwelling.
- c. No data on traffic circulation has been provided. As a single family lot, it is not typically required to perform a traffic analysis. The Board may require a detail of the driveway cross section.
- d. The Application does not request any relief from zoning requirements. Since the site includes over 20,000 square feet of land disturbance a site plan review is required under Section IV-B 6 b.
- e. The plans indicate a proposed on-site septic system near the existing barn is proposed. It is my understanding that the Board of Health has approved the septic system but will be discussing the need for a variance for the foundation due to groundwater concerns. Water would be brought to the site from Summer Street. Electric/cable services are not indicated, it is unclear if these would be brought to the house via overhead wires or in underground conduits. No gas mains or a service connection is indicated on the plans. Utility purveyors should comment on the plans. A stormwater system consisting extension of the existing French drain, a new catch basin in the driveway, roof leaders and an open infiltration basin system is proposed. Refer to comments on the stormwater systems under h. below. There are no proposed trees or plantings indicated. There are some trees both along the Summer Street and Kilby Street frontage within the lot that could be impacted by grading, one is listed as to be removed. There are other large trees on the lot that would be impacted by grading or excavation, including a 48 inch maple that will likely need to be removed due to excavation for the septic system sewer pipe. The plans should identify trees to be removed or retained. A landscape plan has not been provided.

It is unclear if the Board of Health has approved the plans. No further information has been provided on electric, cable or gas utilities.

It is my understanding that a permit for the foundation drain will be required by the Board of Health. No further data on electric, cable or gas utilities has been provided. It is unclear if the Board will require underground services.

The drainage has been revised to install all new piping in alternative locations as it is assumed that existing pipes, etc. have been damaged by construction. The Plans should clearly label how drains will be removed or abandoned. Typically, pipes are exposed and the ends and plugged if abandoned in place. The infiltration basin has also been redesigned and moved to the east based on the results of soil testing in June of 2021.

I recommend that the plans indicate the location and limits of the existing subdrain pipe and stone that is to remain and how any other sections will be disposed of and/or plugged. I recommend that the existing french drain be plugged and capped at the ends and any other locations, as applicable, where

the drain would be impacted by proposed work. These issues could be conditioned if desired by the Board.

The Response indicates that there would be less pressure on trees along Kilby Street, but based on the grading, the entire area around the trees would be filled. Currently the grade slopes from Kilby Street into the site and it is proposed to fill the area around the trees based on the plans. This could damage the trees. The grading is incomplete on the Grading Sheet but the contour is indicated on the Proposed Watershed Plan as filling up to the stonewall at the property line and creating a swale in Kilby Street. The septic system force main has been revised to be further from the 48 inch Maple to the north of the existing house on the abutting lot. Two other trees would be removed to install the infiltration basin. There is no data on any new landscaping if proposed.

A review of the prior existing conditions and the current existing conditions indicates an inconsistency with the EL 39 contour and the limit of work based on the tree line indicated on the plans. Based on site observations on September 8, 2021 the shoulder of the roadway slopes into the lot and the proposed, and partially installed, fill will create a low area near the driveway. The plans include some unlabeled contours at the driveway that would appear to create a flow path across the driveway to the north. The contours should all be labeled and how flow in this area will discharge clarified. The runoff model could be impacted if flow is directed to the northerly abutter over the driveway. The Board could include conditions that these issues be addressed in a final plan to be submitted and approved prior to construction.

- f. The submittal includes a grading plan and stormwater runoff analysis. Traffic volume is unlikely to be a concern. Refer to comments under Stormwater Management Regulations below for drainage design. The grading plan proposes to fill the front and around the proposed house by 4-6 feet to create a pad for the house, driveway and yard. As noted the area has a very high water table, essentially at grade during high groundwater periods. The house would be constructed over the existing channel that passes through the lot. This channel has been filled and a stone trench with 4 inch corrugated pipe installed. I note that this drain was not on the prior approved plans. Based on my observations this pipe has limited function. I have included some photos of this area to help describe conditions. Plans should identify elevations at the top and base of the retaining wall along Summer Street. There are some elevations listed but more should be added. Much of this wall is indicated in the Public Way.

The detail for the foundation indicates to excavate to ledge and backfill with 3-5 inch stone. This would require removal of all of the existing material under the foundation and replacing with an unknow depth of stone. This is a modification from the initially submitted plan and would require significant earthwork. I note that there are no test pits at the proposed building location. The plans should include contours and with elevation labels together with spot grades as required in the proposed infiltration basin. There are contours but no labels in the forebay. The grading plan is generally the same except at the

revised infiltration basin, which proposes work on the abutting lot and should have a permanent grading easement to perform the work as the basin berm relies on the grading. There is also a contour that has been removed along Kilby Street that makes the area incomplete as noted under e. above. It is still proposed to fill the front yard and around the proposed house by 4-6 feet and to create a pad for the house with a cellar slab at EL 38.7.

The plan is the same. The only change is to add a 30 foot grading easement on Lot 1. I recommend that the Board require contours with labels be added to the plans as discussed previously, this could be a condition if the plans are approved. As noted above, clarification of the proposed grading at the proposed driveway and along Kilby Street is required.

A foundation drain would connect to the new 6 inch pipe that would convey water from the front of the site to the north end at the filled channel. The elevation of the drain is not listed, I recommend that the elevation be added to the detail. The plans indicate that the stone for the foundation drain would connect to the proposed stone associated with the stone fill under the slab and foundation. I note that the existing subdrain pipe that has been damaged was observed to be a 4 inch pipe not a 6 inch as listed on the plans, at least at the south end of the trench. The most recent plans indicate the start of the pipe near Summer Street but do not specifically label the pipe and trench. The Response letter notes that the existing drain that was previously installed is not functional. The plans should specify what is proposed for the existing non-functioning subdrain trench that passes through the proposed building. I recommend that this drain be abandoned and the means of abandonment be documented on the plans. The subdrain detail should be removed from the plans.

It is now proposed to connect the existing section of subdrain from Summer Street to the proposed foundation, into the foundation subdrain. As noted the entire foundation is proposed to be located on an unspecified depth of 3-5 inch stone fill. If approved the Board should require that the design be approved by the Building Commissioner and Board of Health. I recommend that the plans clearly identify where the pipe and stone for the subdrain will remain and how other portions would be capped and abandoned. I recommend that the elevation(s) of the drain be listed on the plans. These could be conditions if the Board approves the plan.

A note has been added stating that the existing retaining wall is coincident with street grades along part of Summer Street.

Sheet 3 has some extraneous lines at the driveway entrance on Kilby Street that should be removed.

Comment remains.

The revised plans should include more contour labels. There are two EL 39 contours at the driveway entrance. If this is what is proposed the drainage analysis would need to be modified as additional runoff would be directed to the northerly abutter as noted above.

Refer to comments under Stormwater Management Regulations below for comments on the drainage design.

- g. This item requires information to assess the impact of the development on soil, water supply, ways and services. There are several test pit logs included in the Application for this lot but none at the actual location of the proposed stormwater basin, which has been moved north and east of the previously approved location. Most of the testing appears to be for septic system design. Tests performed indicate refusal at ledge 6 feet or deeper in many of the tests. Soils below the top layers are reported as sand or loamy sand with percolation rates of all less than 2 min/in primarily on the easterly side of the site. The westerly side has less permeable soils. Groundwater is generally shallow and estimated either by redox features or weeping in the lower elevation areas. The results are consistent with site observations with EL 37 being approximately the seasonal high water table near Summer Street. This site has significant water issues as noted and control of groundwater and surface water flow through the site is a major issue. Recent work does not appear to have improved conditions as there is still ponding near Summer Street despite the new drain and water was observed on the surface of the recent fill material and in the channel where the 4 inch pipe and stone trench has been installed.

Testing has been performed at and adjacent to the proposed basin location. I witnessed four tests but they are not all indicated on the plans and the test pits are not labeled. There was suitable soil near the barn to the west side of the site, but the first test pit which was excavated closer to the filled in channel did not have suitable material. There is ledge below the sand in tests on the northerly end of the basin based on my estimation of the test locations from the field work. Test pits should be surveyed for location and elevation and the data added to the plans. Groundwater was high in some of the tests making the elevation of the surface at the test location an important factor in the design. Without this information is it not feasible for me to determine if the design complies with DEP Requirements. Refer to comments under Standard 3 below for additional comments on recent soil testing. As previously noted and documented by photos by others, the site is subject to high runoff and groundwater flows.

Test pit data has been provided. Groundwater varies with test pits indicating seasonal high water at EL 33.5 and 33.9 within the basin. The test pit to south of the basin had seasonal high groundwater at EL 35.3 and the test pit to the west had seasonal high groundwater at EL 34.5. I note that in test pit 6-18-1 there was standing water at the surface of the pit as well.

- h. The regulations require compliance with DEP Stormwater Management Policy as discussed below:

STORMWATER MANAGEMENT REGULATIONS - EROSION AND SEDIMENT CONTROL:

The DEP Stormwater Management Regulations consist of ten standards. The standards were reviewed using the Massachusetts Stormwater Handbook Documenting Compliance (MSHDC) together with other sections of the Handbook as appropriate. This section of the correspondence lists the standards

and identifies whether the submittal complies, does not comply or if additional information is required to demonstrate compliance.

This project would not be considered a redevelopment as the lot is currently vacant.

The response indicates that there is an existing barn and a portion of a paved driveway on the lot. As there is an increase in impervious area the project would not be a redevelopment. Runoff from the barn and driveway would require some improvement but are not subject to full compliance with the Standards.

Standard 1 – Untreated Stormwater

This standard requires that no new untreated point source discharges are created and that point source or sheet flow discharges do not result in erosion into or scour of wetlands. This standard is required to be met for redevelopment projects.

The design includes three new surface discharge points although one is for the proposed foundation drain. There is an outlet from the basin on the northeast side of the lot and two outlets, including the foundation drain and the extension of the French drain proximate to the remainder of the channel on the lot. The plans do not indicate the existing 4" drain outlet which is also in the same general location. These outlets are approximately 30 feet from the property line. The basin low level drain also discharges at this point but would not have flow except to maintain the basin in the event soils become clogged. There is also a proposed new drop inlet with a connection to an existing catch basin in Kilby Street that would discharge through the existing outlet of the street system. Most of the discharge from impervious areas on the lot would be treated in the infiltration basin. Some would only be treated in the drop inlet proposed in Kilby Street.

The Response indicates that the drain and 6" pipe were on the modification plans filed in 2020. Upon further review there is a detail for an existing 6 inch subdrain and the outlet is labeled on the plans but not the sub drain itself, although it is shaded, there is no label or pipe indicated in this area on the plans. Based on field observations the pipe installed is 4" flexible HDPE pipe. In any case this drain has been damaged and a new foundation drain is proposed in the current plans. As recommend above this drain should be abandoned and the plans should clearly indicate what is proposed to be properly abandon this drain. Typically an abandoned drain would be capped at the ends and buried with sections in conflict with other utilities or structures removed. All drains proposed for the site are now all combined into one 8 inch outlet.

The current plan proposes reuse of a portion of the southern end of the subdrain and provides no data on capping or other abandonment of the northerly section. I recommend that the plans include capping sections of pipe and stone that

would remain to avoid settlement, water breakout, etc. in the future. The Board could include this as a condition if the plan is approved.

The submittal should include details, a plan and sizing calculations for scour protection as required.

Based on a review of sizing requirements in ASCE Manual and Report of Engineering Practice No.77 (a standard reference for this type of design), the outlet is undersized for length. The stone size and width are consistent with connection to the channel.

Not addressed, the Board could condition that appropriate sizing data for the outlet be provided and the detail modified accordingly.

To demonstrate compliance outlet protection data should be provided. Also refer to comments under other Standards.

Comment remains on the outlet dimensions, the length of the outlet protection should be increased.

The Board should include a condition that appropriate outlet protection sizing be provided as previously noted.

Standard 2 – Post Development Peak Discharge Rates

This standard requires that the peak rate of discharge does not exceed pre-development conditions and that the design would not result in off-site flooding during the 100 year storm. I note that it is not permitted to increase runoff or flooding to abutting properties without appropriate easements, etc.

I recommend that the subareas use the channel/trench drain as the divide not an arbitrary area on the slope. It is standard practice to use identifiable control points as a channel in this type of analysis. The time of concentration flow paths should extend to the control point at the property line at the end of the channel/trench or the catch basin in Kilby Street as applicable.

This data has been provided.

The condition of the existing French drain near Kilby Street should be assessed as if it has been damaged by recent construction it may need to be replaced.

This system is no longer used in the design and is to be abandoned. As noted plans should identify how the system will be capped, etc.

I recommend that if approved, that the Board require that the plans be modified to include capping sections of pipe and stone that would remain to avoid settlement, etc. in the future, and a detail be provided.

The model erroneously adds post watershed directly to the catch basin in Kilby Street in the post development condition, but the flow would have to cross the abutter to reach this point. This area should be added to the control point at the property line consistent with the existing conditions.

The model has been revised but the watershed plan provided with the July 10, 2021 plans and Report is not consistent with the design. It appears that the wrong plan was provided with the Report. I note that the most recently supplied

plan of the same date is cut off at Summer Street and does not include all of the area listings. Plans should have a revision date to be able to track which is the correct plan at a later date.

The Board could require that final watershed plans with a correct revision date be provided. I note that the current grading at the roadway entrance changes the watersheds and should be addressed either by modifying the contours or the runoff model.

The proposed basin would be an infiltration basin by design, although the calculations do not credit exfiltration during a storm it is assumed to infiltrate between storms to have all of the volume available for the next storm. The Board should require additional soil testing to confirm conditions are suitable for infiltration. The basin has been moved to the north and recent field observations question the suitability of the soils on this side of the site. There were suitable soils under fill at the south end of the previous basin but the test is 50 feet away from the closest point in the bottom of the basin.

Soil testing has been performed but the data on the plans is incomplete. There were 4 tests performed and witnessed by Chessia Consulting Services, but only 3 logs are included and the plans do not label the tests or identify the elevation at the grade of the test to determine groundwater and ledge elevations. This data is to complete the review. Without the data I cannot confirm whether the design complies with DEP Requirements for groundwater separation. My logs indicate that test 6-18-3 on the plans is 6-18-4 in my logs and 6-18-3 has not been included. My log had redox at 20 inches in 6-18-2 and weeping at 28 inches, the log lists redox at 28 inches the same as the weeping observed. It is likely that 6-18-2 would control the elevation of the bottom of the system depending on the location of the test.

Data has been provided as requested. Test pits 6-18-1 and 6-18-2 are just outside of the basin and forebay.

The revised design ties the foundation drain into the surface drain but does not include the flow from the foundation drain. This could be substantial during certain periods. The foundation drain is approximately 12 inches below the proposed inlet for the low area near Summer Street so would likely be flowing much of the time during wet periods. In addition, the model for the outlet from the infiltration basin uses a free discharge to the downstream manhole, which may not be the case as there would be both flow from the foundation drain, which is not included, and the front of the site, which would result in some water level in the pipe that should be included in the calculations. This could affect the outflow rate from the basin as well as flood elevation in the basin and is necessary to complete my review of project impacts.

The invert from the basin is above the 100 year flood height in the manhole, although as noted this does not include any flow in the foundation drain. It appears that there would be sufficient elevation difference in the manhole such that this should not be an issue.

It is my understanding that the abutting property that was divided from this lot has a building permit for an expansion of the dwelling. A resubmitted watershed plan, delivered 8-3-21 without a revision date, has the addition

indicated but it was not on the prior plan revised submitted with the Report dated July 10, 2-21. It is unclear which footprint was used. This won't change the results much as it would also be added to the existing condition and appears only a small percentage larger than the portion of the house that was removed but it should be clarified as plans and calculations should be consistent.
Not addressed in the response, but not likely a significant issue.

Additional data is required under this Standard to demonstrate compliance.
Additional data is required under this Standard to demonstrate compliance.
I recommend that if the project is approved, the above recommendations be included as conditions.

Standard 3 – Recharge to Groundwater

This standard requires that designs provide on-site recharge to mimic pre-development conditions. Calculations to demonstrate compliance are based on soil conditions, and certain methodology as outlined in the MSHDC.

No site specific testing has been performed at the location of the proposed basin to determine if any suitable soils exist at the proposed location of the basin. It is proposed to raise the bottom of the basin approximately 2 feet above existing grades at the low end. I note that based on a discussion with DEP staff on a different project, removal of less permeable soils in the C layer to expose more permeable soils is not consistent with DEP requirements. This issue was not known at the time of the initial review of the project.

Refer to comments on soil testing under Standard 2. The design may meet this requirement but more data on groundwater elevations and test pit elevations and locations is required to confirm compliance with DEP requirements for groundwater separation.

Satisfied, the revised data includes all of the test pit logs and they include the elevation at the ground.

The submittal should include time to drain calculations and an adjustment for the portion of the driveway that is not tributary. Calculations use 0.5 inches of runoff as the recharge volume. This is conservative as some of the soil is HSG D (.1 inch recharge required) and the west side is primarily HSG B (.35 inch recharge required). HSG A soils require 0.6 inches of recharge but there does not appear to be any new impervious area in the HSG A soils.

No further comment required, the project would exceed recharge requirements and includes the barn and driveway in the recharge calculations subject to adequate groundwater separation being demonstrated at the basin.

Satisfied.

Additional data is required under this Standard to demonstrate compliance.
Subject to satisfactory documentation of the groundwater elevations and test pit data and elevations this Standard could be met, but I cannot confirm compliance at this time.

This Standard would be met.

Standard 4 – 80% TSS Removal

This standard requires runoff be treated to remove suspended solids (TSS) to at least 80% removal. For areas with rapidly draining soil pretreatment of 44% prior to an infiltration system is required. In this case soils are mixed with more permeable soils on the east side of the site.

It is proposed to direct runoff from the driveway into a catch basin prior to discharge to the infiltration basin. A portion of the driveway would flow to the new inlet in Kilby Street. Roof and patio flow would be collected in a pipe system and discharge directly to the basin. Roof runoff does not require pretreatment.

The revised design includes an oil/grit separator in addition to the catch basin and a forebay has also been added to the basin design.

Details of proposed catch basins, manholes, trenches, etc. should be included on the plans.

Details have been included, I recommend the following be added to the plans:

- *Detail of the forebay and include the stone check dam*
- *Contours and labels within basin and forebay*

Not addressed, the Board could condition that this data be submitted and approved prior to issuance of a building permit.

A small area of the new driveway (694 square feet) is proposed to discharge to a new catch basin. This catch basin could meet requirements for 25% TSS removal if it is designed appropriately in accordance with DEP requirements as it would receive less than ¼ acre of impervious surface flow. This is the only treatment for a portion of the new driveway. This would not comply with requirement for 80% TSS removal. It may be “de minimus” based on DEP Regulations but the submittal should demonstrate that is the case.

This issue has been addressed.

The majority of the driveway would be collected in a new catch basin in the driveway. As noted no details have been provided so it cannot be determined if the catch basin would receive treatment credit. The tributary impervious area is less than ¼ acre so a standard deep sump catch basin with hood could meet requirement for 25% TSS removal.

A detail has been provided, I recommend that the 8 inch outlet also have a “T” to keep floatables out of the system.

Not addressed, I recommend that if approved, the Board require a “T” on the 8 inch outlet.

The final BMP in the treatment train is an infiltration basin. Depending upon soil conditions this system could meet requirements. If soils are highly permeable a higher level of pretreatment is required. The recharge volume

calculations use the runoff criteria for water quality volume and indicate that the system is sized adequately. As noted under other Standards additional testing should be performed to confirm soil conditions.

The design now has highly permeable soils requiring 44% pretreatment for the driveway. This is met by the design. In addition, there is a forebay that collects both runoff from the driveway and the roof. The forebay sizing calculations should be provided to demonstrate compliance with DEP Regulations.

Satisfied.

Additional data is required to demonstrate compliance with this Standard.

Subject to providing forebay sizing calculations and detail(s), this Standard could be met, without the data I cannot confirm compliance.

I recommend that if the project is approved, the above recommendations be included as conditions.

Standard 5 – Higher Potential Pollutant Loads

The project is not considered a source of higher pollutant loads, this standard is not applicable.

Standard 6 – Protection of Critical Areas

Based on a review of Mass GIS mapping the site is not located in a critical area.

Standard 7 – Redevelopment Projects

The project would not be considered a redevelopment

Standard 8 – Erosion/Sediment Control

This standard requires construction phase erosion controls. Although the work area is less than one acre and a SWPPP under EPA requirements would not be required, the data should include all of the information required in the DEP Handbook. As noted work has commenced without final approvals. I recommend that the Board require a separate Erosion and Sedimentation Control plan with all of the data required in the DEP Checklist. The site is subject to a high water table and depending on the season of construction this could be an issue.

A separate Erosion Control Plan has been provided.

A hard copy has not been provided. The only changes to the plan are the addition of notes regarding inspection of erosion and sediment control measures and an inspection log form.

This Standard requires the following data. I reference the Stormwater Report Checklist.

- *Narrative – There is Construction Sequence on the Plan that describes general construction steps. As work has started initial erosion and*

sediment controls for the site have been installed. It is unclear how construction phase runoff will be addressed to avoid impacts to the downgradient abutter. The plan should indicate the location of the temporary subdrain listed in the construction sequence together with the time to remove this drain. The revised plans add a lot of excavation in the previously filled building footprint. It is proposed to excavate to ledge, the depth of which is not determined as there are no tests at the location of the house. The entire house footprint would be filled with 2-5 inch stone.

Not addressed, I recommend that the Board consider requiring that the plans address construction phase runoff and identify the proposed location of the temporary subdrain. This could be a condition if the plans are approved.

- *Construction Period Operation and Maintenance Plan – the Construction O&M has been provided refer to comments under Standard 9.*
- *Names of Persons or Entity Responsible for Plan Compliance – Satisfied in the O&M although not specific to the Construction Phase.*
- *Construction Period Pollution Prevention Measures The plans indicate a mulch log at the lower limits of the property and a tracking pad. I recommend an alternative to haybales be provided as Hingham typically does not allow the use of haybales. There is a haybale check dam proposed. How runoff will be managed until the site is completed, stabilized and stormwater features functional should be described. It may be required to install silt sacks in off-site catch basins if acceptable to the DPW.*

Not addressed, I recommend that the Board consider requiring that the plans address construction phase runoff and remove reference to haybales. This could be a condition if the plans are approved.

- *Erosion and Sediment Control Drawings – A plan has been provided. The plan should include contours. The mulch sock should be moved off the abutting property unless documentation of permission is provided. This includes Summer Street and 87 Chief Justice Cushing Highway. The plan discusses installation of a temporary subdrain from Summer Street around the foundation but it is not shown on the latest plans. More detail on this aspect and when the drain would be removed should be included.*

Work on the abutting Summer Street property has been allowed by easement according to the plans. Other aspects as highlighted above could be conditioned by the Board if the plans are approved.

- *Detail Drawings and specifications for erosion control BMPs, including sizing calculations. – The only details are for a tracking pad, mulch log, haybale check dam and catch basin silt sack. No sizing calculations are provided but there are no measures proposed that would have sizing calculations. If a temporary stormwater basin is proposed it should be*

sized appropriately. It is unclear how construction phase runoff will be controlled.

No further comment required.

- *Vegetation Planning* – Typically planting periods for successful growth should be included. There is no Landscape plan and other plans do not include planting details or planting periods for establishing vegetation. I recommend that the infiltration basin be completed and stabilized with vegetation prior to receiving and stormwater runoff from the collection system.

A Landscape Plan has been provided but is not specific relative to details or planting periods. The plan also lists the infiltration basin as a rain garden with many shrubs and perennials proposed. It is unclear that this is compatible with the O&M plan. The Board should review this aspect.

- *Site Development Plan* – This requirement would be satisfied with the Plans.
- *Construction Sequencing Plan* – There is a construction sequence on the Erosion Control Plan. The plan includes installation of a dewatering trench but does not specify the location. The sequence should discuss removal of this trench and timing of how the process would work for installation of the foundation, etc.

Not addressed, I recommend that the Board consider requiring that the plans identify the proposed location of the temporary subdrain and discuss disposition of portions that are not proposed to remain. This could be a condition if the plans are approved.

- *Sequencing of Erosion and Sediment Controls* – The erosion controls have been installed.
- *Operation and Maintenance of Erosion and Sediment Controls* – The submittal should include requirements for maintenance and repair of erosion and sediment controls in a Construction O&M.

Satisfied.

- *Inspection Schedule* – A schedule for inspection of various erosion and sediment controls is not included on the plans.
- *Maintenance Schedule* - A schedule for maintenance of the erosion and sediment controls is partially included on the plans. The tracking pad specifies “to be maintained” without further description and the catch basin silt sack requires removal of sediment when half full.

Satisfied.

- *Inspection and Maintenance Log Form* – A construction phase log form was not included with the submittal.

Satisfied.

Additional data is required to demonstrate compliance with this Standard.

Additional data is required to demonstrate compliance with this Standard.

I recommend that if the project is approved, the above recommendations be included as conditions.

Standard 9 – Operation and Maintenance Plan

This standard requires long term maintenance of non-structural and structural BMP's and requires a specific inspection schedule, etc.

The Report states that the O&M manual is attached but it was not included in the data provided.

The O&M has been provided.

Catch basin – The O&M meets DEP requirements.

Oil/Grit Separator – The DEP Handbook requires monthly inspections not quarterly as proposed. For one catch basin this may be excessive but would comply with DEP requirements.

Satisfied.

Infiltration Basin – I recommend that the plans indicate the access route for basin maintenance with contours. The design should be revised to have a straight outlet pipe. The plans should detail the low level maintenance drain and the shut off valve. I recommend that the valve be accessible whether the basin is flooded or dry. I recommend that the emergency spillway have a level concrete sill. Typically the emergency spillway would be rip rap to prevent erosion if the system overflows. Maintenance is otherwise acceptable.

Not addressed, I recommend that the Board consider including that above as conditions if the project is approved.

Additional data is required to demonstrate compliance with this Standard.

I recommend that the above listed issues be addressed on the plans.

I recommend that if the project is approved, the above recommendations be included as conditions.

Standard 10 – Illicit Discharge

An unsigned Certification Statement has been provided. Providing a signed Certification should be a condition if the project is approved.

The Response states that the copy given to the Board was signed.

- i. It does not appear that any lighting is proposed.
- j. *Refer to comments under Stormwater Management Regulations - Erosion and Sediment Control Standards 8 and 9.*
- k. It is unclear if the Board requires or requests and other materials not identified above regarding the project.
The latest plans do not provide any data on the current site status as requested by the Interim Town Planner at a public hearing. The site has had much work performed since the initial filing and there has been fill placed, existing

drainage systems have been impacted on the lot, etc. The Board should review this aspect of the submittal and determine if more information is required.

The revised plans include a sheet (Sheet 5 of 8) with current contours on the property as a screened existing condition.

It is evident that the site in its current condition is subject to flooding based on my observations and photos and observations reported by others. It is not known if the Board of Health has approved the plans and the Building Commissioner issued a stop work order on the site. This is a complex site given the above issues and the Board may want to consider the requirements of other Town agencies relative to data provided and conditions should the project be approved.

I defer this issue to the Board.

The Board should review the comments and determine if all of the information required under Section 7. Review Standards and Approval have been addressed by the Applicant prior to arriving at a decision.

I appreciate the opportunity to assist the Planning Board on this project and hope that this information is sufficient for your needs. This report is for the Hingham Planning Board and associated Hingham land use agencies only and provides no engineering, planning or other advice that may be relied upon by any party or agency other than the Town of Hingham. I would be pleased to meet with the Board or the design engineer to discuss this project at your convenience. If you have any questions please do not hesitate to contact me.

Very truly yours,
Chessia Consulting Services, LLC

John C. Chessia, P.E.
JCC/jcc