

Chessia Consulting Services LLC



May 28, 2021

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

RE: Supplemental Engineering Review
40 Harborview Drive
Site Plan – Raze and Reconstruct Residential Dwelling

Dear Members of the Board:

In response to your request, Chessia Consulting Services, LLC has reviewed the site plan submittal for the above referenced project for compliance with the requirements of the Zoning Bylaw (ZBL) for projects submitted under an Application for Site Plan Approval. I also reviewed the submittal relative to general engineering design standards, DEP Stormwater Management Regulations/drainage design. The data reviewed included the following information:

- Plan entitled “Site Plan to Accompany Site Plan Review 40 Harbor View Drive” dated 4/6/21, revised 5-18-21 prepared by Cavanaro Consulting. (Plan)
- Report entitled “Site Plan Review Application and Stormwater Report Submitted to Town of Hingham Planning Board Proposed Residential Redevelopment Review 40 Harbor View Drive Hingham Massachusetts” revised May 18, 2021, prepared by Cavanaro Consulting. (Report)
- Supporting data including:
 - Application for Site Plan Approval in Association with Application for Building Permit dated April 8, 2021. *Not resubmitted*
 - Response to Review Comments letter prepared by Cavanaro Consulting dated May 18, 2021. (Response)

The site is located on the south side of Harbor View Drive at the cul de sac. The previously existing house has been razed and a new house has been constructed on the lot. The Application notes that the work in the yard changed from the initial building Permit Application to now require a Site Plan Review as more area with steep slopes has been altered.

Topographically the lot in 2019, prior to current construction, sloped to the west. The plan indicating conditions in 2021 has more of the site sloping north into Harbor View Drive and more sloping to the south toward the east side of the abutting lot. Based on site observations the fill on the lot has encroached on abutting properties. Some lot

stakes are apparent in the field but not in all locations. The topography plans also indicate this condition. The current conditions have a more level area behind the house and to the west side with a retaining wall roughly bisecting the rear yard and a smaller wall in the front between the driveway and front entrance.

Based on MassGIS mapping the locus is not in a FEMA flood hazard area, NHESP habitat, Zone II for public water supply wells or ACEC. No certified or potential vernal pools are mapped within 100 feet of proposed work. There are no wetlands identified near the site based on MassGIS. All of the abutting lots are developed.

Based on the test logs on the plans and published data, soils appear to be dense glacial till over the entire lot. The site is a glacial drumlin formation, which consist of soils that are typically very dense and with very slow permeability with a seasonally high groundwater table. Soil testing consisting of two test pits excavated in February of 2021 indicate that there is fill over the native glacial till material reported as silt loam. The seasonally high water table is reported as lower than published data and typical tests in the general area. It is common for snowmelt and rain to be restricted by the silt loam and the seasonal water table is typically at the interface of B (subsoil) and C (glacial till) layers. This site has been disturbed and the A (topsoil) and B layers have been removed, it is unclear if any of the underlying C layer has been removed during construction.

The project results in an increase in impervious area as a result of construction of a larger house and driveway. The site has already been cleared and regraded removing most of the vegetation from the site. It is unclear where the property line is in some locations, there are some stakes marked "lot line" but not on all lot lines.

I visited the site on April 27, 2021 to observe existing conditions. I revisited the site on May 25, 2021 as sediment controls had been installed based on the Response and this was confirmed in the field. Current comments are in *italic type* following my initial comments.

GENERAL PLAN REVIEW:

The following issues are considered the most significant for the Board to consider in review of the project:

Summary of Main Concerns:

- There are no sediment controls installed on the site at the limit of work except in very limited areas. There is evidence of sediment flow into Harbor View Drive and onto abutting properties. There should be sediment controls at the downgradient work limits and a silt sack installed in the catch basin at the end of the cul de sac immediately. The site plan should also indicate where sediment controls should be installed.

Sediment controls have been installed for all but a small section of the lot to the east of the recently installed retaining wall at the rear of the site. The mulch log

should be extended as there is fill and a slope created pitching to the south in this area.

- Soils on this site as in other sites in the area are very dense and generally not suitable for infiltration purposes. The Applicant may need to review the design relative to this aspect.

The design has been revised, refer to comments below.

- Drainage design, there are some issues to be addressed in relative to compliance with the Standards.

Refer to comments under Section 4 h. below.

- Landscape Design, no data on removal of existing trees, existing trees to remain or any proposed plantings has been provided. Based on the plan there was an area with overgrown vegetation to the south and west sides of the property and based on MassGIS orthophotos there were some larger trees in this area. At this time all vegetation except for a small strip along the rear (southeast side) appears to have been removed and fill placed over the cleared area.

Some landscaping has been added to the plans refer to comments below.

I have described my comments with reference to the specific section of the submittal requirements. My comments are as identified below:

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.
4. Submittal Requirements:
 - a. The Report includes a Locus Plan that appears to be a USGS plan not at a specified scale. The Applicant is APF Development Group, LLC. The property limits are indicated on the plans with descriptive data (metes and bounds). Topography has been indicated for part of the locus. There are two plans, one indicating existing conditions in 2019 prior to razing the pre-existing house and the other indicating existing conditions 2021. The plans should indicate structures within 100 feet of the locus as required. In particular, houses that are down gradient of the site and could be impacted by the work should be shown. There is what appears to be a MassGIS plan that indicates the houses in a general overview of the area but having them on the

site plan would be useful. Some additional topography should also be required to the east, south and west.

Nearby houses have been added to the plans. Some topography has been added on the east side of the lot and the edge of pavement added in Harborview Circle. I note that there is a very steep slope to the house at 4 Baker Hill Road.

- b. The plans are drawn to scale. Building plans have not been provided, the Board should determine if they will be required for a single family dwelling. I note that the house has been constructed and appears to be complete as far as exterior work.
- c. A single family house typically does not require a traffic analysis. There is typically little issue with sight distance at a cul de sac as speeds are low. The lot is at the end of a cul de sac on a residential street that likely does not have much traffic as there are only three houses on the circle. The driveway has already been constructed.
- d. The Application does not request any relief from zoning requirements. The site is in the Residence A zoning district. Typically, a table of Zoning requirements is listed on the Plan, but as there was a building permit issued for construction of the house and it has been built, this may not be required in this case. I recommend that building setback dimensions be indicated on the site plan.

A Zoning Table has been provided. Typically, the actual setbacks would be included on the plan and on the table together with the minimum required setbacks. Based on scaling the plans setbacks have been met. As the house has already been constructed this is likely not an issue.

- e. The plans do not indicate water, sewer or electric/cable utility service locations. It is likely that they have been installed at this time but typically it is required to indicate the location of these utilities. The plans include the location of the sewer main in the street and there is an easement across a portion of the lot for the sewer main. The sanitary sewer flows in this easement across the northwestern side of the lot from the cul de sac toward Fottler Road. There is a utility pole/light pole at the end of the cul de sac and a catch basin. There is a drainage easement indicated across the abutting property to the northwest of the site but no pipes have been indicated.

The water service has been added to the plans. No other utilities except the propane tank have been identified. I observed that there are overhead utilities connecting to the house at the northeast corner of the building.

The plans indicate a buried propane tank next to the driveway. There is a label "Propane Tanks (3)" by the rear of the garage but the actual location of the tanks is not shown on the plan. It is proposed to install two subsurface infiltration systems to the south side of the house. One would be on the upper area behind the house and east of the retaining wall. There would be another to the west side of the retaining wall southwest of the corner of the garage.

It appears that the above ground propane tanks have been removed and may have been temporary. The subsurface systems remain but have been revised.

No data on landscaping has been provided. The Board may request data on any proposed landscaping. No trees have been indicated on the plans.

The plans include three proposed trees and a wildlife seed mix on the lower slope to the west side of the lot, together with some general landscape beds. The trees are to be selected from a list on the plans. The Board should review the proposed landscaping.

As a single family house refuse storage and removal is generally not an issue with site plan review.

- f. The submittal includes a grading plan and stormwater runoff analysis. As noted, traffic is generally not an issue with single family projects on existing lots. Refer to comments under Stormwater Management Regulations below for drainage design. The grading does not clearly indicate the changes as there are two existing conditions plans and all of the grading has been done. Topography should be extended on the east to indicate the slope as it appears that there was excavation on this side with a steep slope to the easterly abutting property. Based on the two plans, the area to the east side of the lot was excavated and fill placed behind the retaining wall to create a level yard area. This altered the slope to pitch more south than west as was the case before recent house construction. Below the wall there is an excavated area next to the new house and then fill over the rest of the lot to the west. Runoff ultimately all flows to the west but the design may increase flow to the southerly and northwesterly abutters as well as flow into Harbor View Drive as the front yard has more pitch to the north into the street than the 2019 conditions indicate.

Some data has been added on the east side. The southerly side of the site has a small undisturbed section with some existing trees. Grading does alter the flow above the undisturbed area and near the retaining wall toward the south more than to the west. The sediment barrier is located over the lot line on the plans but has been installed within the lot based on lot line stakes in the field. There has clearly been work over the lot lines based on the field staking of the lot line and disturbed soil area. A noted there is a small increase in flow toward Harborview Drive from the front yard. The Response notes that this is minimal, which is likely the case but the DPW has been sensitive to any additional flow into the roadway on past projects.

- g. This item requires information to assess the impact of the development on soil, water supply, ways and services. As a replacement of an existing house the overall impacts are likely to be similar for water supply, ways and services. There is more impervious area proposed and runoff could be a concern. Refer to comments under Stormwater Management Regulations below.

Refer to comments under Stormwater Management Regulations below.

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

STORMWATER MANAGEMENT POLICY/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 be considered a redevelopment only for the portion of the site currently covered with impervious surfaces and for other parts full compliance is required. An overall increase in impervious area is proposed and has been constructed.

Standard 1 – Untreated Stormwater

This standard requires that the project not result in point sources of untreated runoff and that runoff not result in erosion or sedimentation.

There are two new outlets indicated on the plan associated with subsurface infiltration systems. The project proposes to direct runoff from the roof and a portion of the driveway into the subsurface systems, which would overflow to outlets approximately 8 and 5 feet from the southerly abutters property. I recommend that the outlets be directed to the west as the lot sloped prior to the current disturbance. I also recommend that an outlet similar to that used at 31 Harbor View be considered that would spread out the flow. Although the flow is minimal based on the calculations, it is typically not allowed to direct it to an abutter as proposed, in particular as there is a very steep slope below the outlets that has not been indicated on the plans and the house appears to be below at least one of the outlets.

Satisfied, the outlets now discharge to a 24" deep by 24" wide, 70 foot long energy dissipater trench similar to that used at 31 Harborview. This trench is located approximately 15 feet from the lot lines at the ends and 40 feet near the center of the trench. This should disperse flow over the proposed slope such that a concentrated discharge is not created.

A portion of the proposed driveway, walkway and patio area would not be treated (1,536 square feet). The area not treated in the 2019 plan includes 1,186 square feet of roof and 1,483 square feet of pavement, walks and patio for a total of 2,769. I note that it may be feasible to extend the stone infiltration trench along the driveway further toward Harbor View Drive to collect more of the impervious area.

Satisfied, the trench has been extended to collect all of the driveway.

I recommend that the design address the above issues.

This Standard would be met.

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. System designs should comply with the DEP Handbook for stormwater management systems.

General:

The site is located in an established subdivision and all surrounding lots are developed. There are no wetlands proximate to the site. Based on the plans and available aerial views of the property it appears that part of the rear yard and the west side of the site would have been either wooded or unmaintained. There was an established lawn around the house and to the street. At this time, it is difficult to confirm pre-construction conditions and all but a strip along the south east side has been disturbed and either filled or excavated. It is unclear if any of the top and subsoil exists under the fill but it no top or subsoil was noted in the two test pits excavated on the site.

Subarea plans should have contours and identify flow into the site where it would impact any proposed system. As currently surveyed, runoff from the easterly abutter would flow into the street or to the south and not impact proposed systems.

Contours have been added to the subarea plans.

Existing Conditions:

Runoff on the site generally would have flowed due west to the abutters at the bottom of the slope along Fottler Road.

Soils, based on the NRCS mapping are Hydrologic Soil Group (HSG) C. On-site testing indicate some fill, 15-20 inches deep at the locations tested with no top or subsoil present and silt loam under the fill. No water was identified in the tests, but mottles were observed at a depth of 60 inches at the bottom of the excavation. Soil mapping indicates seasonal high water typically at the surface of the dense till layer below top and subsoil (A & B) soil layers at a depth of 18 to 37 inches. My experience with these soils and this area is that the soils are generally not suitable for infiltration purposes although pockets of more permeable soils may exist it is not likely in this part of a glacial drumlin feature.

The Response states that a similar system to that proposed was used at 49 Harborview Drive with an infiltration rate of 0.27 in./hr. and that it is functioning properly. As I am unfamiliar with that site copies of any inspection reports that identify that the system drains as proposed would be useful to confirm conditions. If the system is working as designed then this system would likely function similarly if the existing soils have not been compacted or otherwise impacted by construction.

Proposed Conditions:

It is proposed to collect roof runoff separately from the east and west sides of the house for discharge to one of two subsurface systems. The subsurface system at the lower (westerly) side of the lot would also collect runoff in a stone infiltration trench along the edge of part of the drive with a pipe connecting it to subsurface system 1P in the Report. I note that the pipe is indicated connecting this trench to the subsurface system but the pipe is not located in the trench itself based on the detail and no inverts are listed. I recommend that if this design is accepted that a section of perforated pipe be included in the trench to collect the water and protect the pipe from blockage by the stones.

The stone trench next to the driveway has been revised to include a pipe and has been extended to collect the entire driveway.

Testing is not at the higher part of the system and the systems provide just 2 feet of groundwater separation based on the test results. In the soils located on the site, groundwater is typically not at a specific elevation but follows the elevation of the silt loam soil layer. In addition, the design utilizes recharge in all storms and DEP requires either 4 feet of separation or a mounding analysis in this case. As noted, infiltration capacity of the soils are limited and it is questionable whether these systems will reliably function at this site.

The revised design provides 3.5 feet of separation according to the Response. As noted the DEP Handbook requires 4 feet or a mounding analysis. Alternatively the model could eliminate infiltration as an outlet in the 10 year or greater storm. The volume below the outlet would be captured and ultimately infiltrated, but this would not be a factor for rate control, or a mounding analysis could also be performed. In this case the infiltration rate is insignificant and it should not have a significant impact to eliminate infiltration in the larger storms. If approved the Board may require confirmation that the system functions as designed by requiring inspections of the system after completion and after rain events to confirm the system drains 72 hours after the storm.

System 1 has a 4 inch outlet pipe but is modeled as an orifice. The pipe should be modeled as a culvert. System 2 has a 3 inch outlet pipe listed on the detail and in the calculations but the pipe from the system to the outlet is listed as a 4 inch pipe. The model should be a culvert or two with different diameters. The plans should list all of the inverts associated with the pipes at each end.

The revised design has a perforated pipe, modeled as an orifice connecting to a solid pipe that is modeled as a pipe reach in the Report. This is likely to be equivalent to how the system flows would function in this case.

The infiltration calculation should not include the wetted area as the DEP Handbook requires use of bottom area only. As the discharge is so minimal to

the ground it is unlikely to alter the results significantly but it could be a condition if the project is approved to revise the calculations prior to final acceptance of the project.

Since it is proposed to collect roof runoff from the 100 year storm there should be calculations for gutter, downspout and pipe capacity in the 100 year storm.

Not addressed, in this case the building has been completed but roof drain connections have not been implemented. It may be necessary to alter the design of the roof gutters or downspouts depending upon what has been installed. It could be a condition to provide this data post approval.

It is questionable that the proposed design would meet this Standard, in particular due to soil conditions. Additional information is required to demonstrate compliance with this Standard.

As previously noted soils are difficult in this area and have minimal infiltration capacity. It appears that the Board has previously approved similar designs. It may be useful to have inspection reports on how these systems function after installation during various times of the year to guide the design of future projects. There are a few issues listed above that could be conditions if the Board deems it appropriate.

Standard 3 – Recharge to Groundwater

The design would result in an increase in impervious area. The difference in impervious area over the existing conditions should be infiltrated in accordance with the standard.

It is proposed to recharge most of the proposed impervious area in the two subsurface systems. It is unclear that this Standard could be met based on soils conditions reported and observed. For sites with HSG C soils that are not suitable for recharge it is required to recharge to the maximum extent practicable. I also note that although not specifically called out on the soil test logs, typical soils in this area are classified with a “d” qualifier for dense in place. I recommend that the Board discuss soil conditions on the site. The Applicant could request that recharge be allowed to the maximum extent practicable if soils are not suitable.

The Response indicates that the Board approved a similar project across the street from this site in 2018 and that it is functioning properly. As none of the testing was witnessed by Chessia Consulting Services and we did not review the other project, I cannot comment on the suitability of this specific site. My experience with soils in this area is that they are generally very dense and have very low permeability.

This submittal indicates that this Standard would be met. As noted, soils in my opinion are questionable relative to their suitability for recharge. The

Applicant could also consider requesting a waiver if they agree that soils are not suitable for recharge. The Board could require further soil evaluations. I recommend that any testing be witnessed by an agent of the Board.

The Board should determine if any additional soils information will be required. The calculations indicate that sufficient volume of runoff would be infiltrated to meet the requirements.

Standard 4 – 80% TSS Removal

This standard requires that runoff be treated to remove 80% of total suspended solids (TSS) prior to discharge. For a partial redevelopment it has to be demonstrated that there is some improvement over existing conditions.

The submittal should include a TSS worksheet listing the various BMP's with percentages of removals. The Report lists driveway sweeping, but this is a discretionary credit that has typically not been allowed for these projects.

The Response states that a TSS worksheet has been provided but it was not found in the Report. Street sweeping is no longer proposed as a TSS removal credit.

The following treatment systems are proposed.

Gravel infiltration trench:

An infiltration trench is a listed BMP in the DEP Handbook for treatment. No soil testing has been performed at this location and as noted soils are questionable for infiltration on the site. An infiltration trench requires some means of pretreatment and none is proposed. The infiltration trench also has a pipe outlet and the infiltrated volume would be a function of the elevation of the pipe and the slope of the bottom as it is not proposed to be set at an even elevation at the bottom. This should be clarified on the plans and in the calculations.

Revised to be a collection trench. This is not a DEP listed BMP but likely would have some TSS removal.

Subsurface Infiltration system:

As noted soils are questionable for this application on this site. A subsurface system with a treatment row as used at other sites in Town could achieve the required TSS removal.

The revised design has an isolator row. A manhole for access to maintain the isolator row should be provided. As noted soils are questionable in my opinion but the Board previously approved a similar system.

Insufficient data have been provided to demonstrate that this Standard would be met.

This Standard could be met if the Board agrees that the soils are adequate to infiltrate at the rates proposed.

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

The site is not located in a critical area based on MassGIS.

Standard 7 – Redevelopment Projects

The site is a partial redevelopment project, new increased impervious areas would be subject to the Standards and some improvement over existing conditions is required.

Standard 8 – Erosion/Sediment Control

This Standard requires development of plans and narrative data to control erosion and sedimentation resulting from the removal of vegetation, etc. as a result of construction. In this case the work area would be less than the one acre of disturbance threshold and an EPA NPDES Permit and SWPPP would not be required.

In this case the majority of earthwork has been done except for installation of BMPs and loam and seed. There is evidence that some sediment controls were installed, but at this time most are either deteriorated, or buried under fill. The plans should indicate sediment control locations proposed with associated details. Typically, I would recommend a more detailed plan but the observed sediment leaving the site could most likely be controlled with a mulch sock. The catch basin in Harbor View Drive should have a silt sack there is evidence of sediment flowing to this structure. These measures should be installed immediately as this is an existing concern. The driveway is paved and the house is constructed so other than installation of stormwater management structures there is no other heavy site work required.
A mulch sock has been installed around all of the downgradient areas but the southeastern part of the lot.

I do recommend that competed areas be loamed and seeded as soon as possible as we are in the ideal growing period at this time.
It is likely that the spring growing season will be missed at this time, although portions of the lot that would not be altered by the proposed construction could and should be loamed and seeded as soon as possible.

The plans should be revised as noted above and controls should be installed immediately.

The mulch sock has been installed.

Standard 9 – Operation and Maintenance Plan

An Operation and Maintenance Plan (O&M) was provided on the Plan. For all projects a comprehensive O&M is required for the entire site.

The following BMPs are listed in the O&M

Subsurface infiltration system:

The O&M should advise the owner how to clean the system if debris or sediment is observed in the structures. I recommend that observation ports be located at each pipe connection and a cleanout be installed for the outlet pipe at the upstream end. Otherwise, the O&M meets requirements.

The plan should include a manhole for cleaning the isolator row and the manufacturer's manual for this system should be included for System 1. The other system does not have an isolator row and only receives roof runoff.

Roof drains:

The O&M meets requirements, cleaning of gutters downspouts and pipe is required twice annually as well as clearing snow and ice buildup if it occurs.

Infiltration Trench:

No data on the infiltration trench has been provided.

I recommend that there be inspection and maintenance for the collection trench and dissipator trench. Cleanouts for the pipe should also be provided and identified on the plans, this could be a condition if the project is approved.

The Board could require that the plans identify snow storage areas, although this may not be necessary for a single family house.

Additional data is required to comply with this Standard and the O&M may need to be revised depending on whether additional or different stormwater measures are required.

The above issues could be included as a condition.

Standard 10 Illicit Discharge

There is a general statement regarding illicit discharge connections. A signed statement from the Owner is required.

Providing a signed statement could be a condition if the project is approved.

- i. The plans do not indicate any existing or proposed lighting. Lighting is generally not an issue with a single family dwelling.

- j. It is unclear if the Board requires or requests and other materials not identified above regarding the project.

The Board should review the comments and determine if all of the information required under Section 6. 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