



October 6, 2020

Landis Hershey, Conservation Agent
Town of Walpole – Conservation Commission
135 School Street
Walpole, MA 02081

Re: Proposed Multifamily Development – 55 Summer St Peer Review of Applicant’s September 2020 Submission.

Ms. Hershey:

BETA Group, Inc. (BETA) has reviewed the plans and other materials submitted to the Conservation Commission by the Applicant on September 14, 2020 for the proposed Multifamily Housing Development located at 55 Summer Street in Walpole, Massachusetts (the Site). The project is being concurrently reviewed by the Walpole Zoning Board of Appeals under the Comprehensive Permit review process.

Basis of Review

- *Notice of Intent*, dated May 14, 2020, prepared by Howard Stein Hudson.
- *Project Plans: “Site Plan for Proposed Multifamily Development,”* dated May 5, 2020, prepared by Howard Stein Hudson (86 Sheets).
- *Stormwater Management Report: “Proposed Multifamily Development”* dated May 2020, prepared by Howard Stein Hudson.
- *Abbreviated Notice of Resource Area Delineation*, dated November 20, 2019, prepared by Oxbow Associates, Inc.
- *Site Plan and RFA Narrative Revisions*, dated June 20, 2020, prepared by Howard Stein Hudson.
- *Comprehensive Permit (40B) Peer Review*, dated April 20, 2020, prepared by Tetra Tech.
- Massachusetts Stormwater Handbook
- Town of Walpole Wetland Protection By-Law, Chapter 561, Wetland Protection, Division 2 of the General Bylaw (as revised 5/07/201) and Regulations (the Bylaw).
- MACC Buffer Zone Guidebook, dated June 6, 2019,
- Massachusetts Wetlands Protection Act (M.G.L. Chapter 131 Section 40 - *the Act*),
- *Site Plan and Peer Review Response*, dated September 14, 2020, prepared by Howard Stein Hudson,
- Responses to BETA August 10, 2020 Peer Review Letter prepared by Howard Stein Hudson.

SITE AND PROJECT DESCRIPTION

The Site consists of three lots identified by the Walpole Assessor’s Office as Lots 52-78-1, 52-59, and 52-60. In total, the Site consists of 54.73± acre parcel and is located to the north of Summer Street. The existing Site is currently vacant and predominantly woodlands.

An internal wetland system is present throughout the Site. The Site is bounded to the north by Cedar Brook and Cedar Swamp, and the 200-foot Riverfront Area extends into the Site. Several vernal pools are located throughout these wetlands. Portions of the Site to the north and east are within a FEMA-

mapped 100-year flood zone (Zone A and Zone AE). The north end of the Site is also within a NHESP-mapped Priority Habitat of Rare Species. The resource area boundaries on the Site were confirmed by two Order of Resource Area Delineation decisions, both of which are still valid.

The project proposes to clear and grade most of the non-wetland areas to construct multi-family housing development. The development will include several larger apartment/townhouse buildings as well as a series of single-family homes. Associated Site improvements include paved parking areas, paved roadways, wetland crossings, and utilities (domestic water, fire service, sewer, gas, electric). Stormwater management is proposed through a network of catch basins, manholes, subsurface infiltration systems, and infiltration ponds.

The project will impact wetland resource areas, riverfront areas, and flood zones that are Subject to Protection under the local Bylaw and the Massachusetts Wetlands Protection Act. The Applicant has submitted a request for a Waiver from compliance with the local Wetlands Protection Bylaw and Regulations, as the Project is seeking approval for a Comprehensive Permit pursuant to M.G.L. Chapter 40B.

STORMWATER MANAGEMENT

The project is large, dense, and complex relative to stormwater management. The project proposes a closed drainage system consisting of deep-sump, hooded catch basins and drainage manholes to capture stormwater runoff from proposed paved areas. This system conveys runoff to either a subsurface infiltration system towards the northern side of the Site or one of several infiltration basins with sediment forebays. These BMPs include overflow outfalls or emergency spillways that discharge runoff into adjacent wetland buffer zones.

BETA was asked by the Conservation Commission to review the ZBA peer review consultants' letter. The scope of this review is the project's compliance with the Massachusetts Stormwater Handbook. This letter is not intended to be a comprehensive peer review of the stormwater management design.

PEER REVIEWER COMMENTS – STORMWATER MANAGEMENT

The project's stormwater design has been reviewed by Tetra Tech (TT) in their peer review letter dated April 10, 2020. BETA has reviewed these findings and is in general agreement with these comments. Howard Stein Hudson's (HSH) response to BETA's August 10, 2020 Comments are provided below. Additional clarification, comments and recommendations by BETA are included below *in Bold italics*.

MASSACHUSETTS STORMWATER STANDARDS

The following section details BETA's review of project compliance with the MassDEP Stormwater Standards and good engineering practices.

SW1. Provide copy of MassDEP Stormwater Report Checklist.

HSH: This was included in the submission, refer to the checklist for Stormwater Report stamped and signed by Katie Enright dated 5-19-20.

BETA: Comment resolved.

NO UNTREATED STORMWATER (STANDARD NUMBER 1): *No new stormwater conveyances (e.g., outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.* The proposed stormwater management system includes outfalls which discharge to wetland buffer zones. Prior to discharge, stormwater is treated by deep sump catch basins, sediment forebays, and infiltration ponds (or subsurface infiltration systems). Riprap aprons are proposed at each outfall to control erosion.

SW2. Provide calculations for sizing of riprap aprons to ensure that runoff will not cause erosion.

HSH: Standard riprap aprons lengths and quantities for flared end sections has been provided on detail sheet 1 of 18 based on standard drainage pipe sizes. See detail sheet 1 of 18 (sheet 69 of 86) from the plan set dated 5/1/20.

BETA: Provide calculations as requested to confirm.

DEVELOPMENT PEAK DISCHARGE RATES (STANDARD NUMBER 2): *Stormwater management systems must be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates.* The project proposes a significant change to ground cover which will greatly increase the discharge rate of stormwater runoff from the Site. This increase will be mitigated by infiltration ponds to capture, store, and infiltrate runoff. The provided calculations indicate a decrease in peak discharge rate and runoff volume for the 2, 10, 25, and 100-year storm events.

SW3. The Applicant is using an infiltration rate for "A" soil based on soil test data taken throughout the site and yet is using "B, C and D" soil in the hydrology model. If soils data indicates "A" soils revise pre and post development HydroCAD models, modeling all upland soils as "A" soils.

HSH: The Hydrologic Soil Group is broken down into four groups based on the soil's runoff potential. Soils categorized as Group A generally have the smallest runoff potential and the highest infiltration rate, whereas Group D soils have the highest runoff potential and the lowest infiltration rate. This is specifically talking about how the land cover will react to a rainfall event, and how the water will travel over the ground surface. When designing an infiltration pond, testing needs to be performed within the soil layer which the infiltration will be occurring to determine the soil texture. For the design of each infiltration basins, test pits were performed, and the soil type and texture were obtained from the C horizon. Based on the information obtain from the test pit logs, it was determined that most of the test pits, within the C horizon, were loamy sand with some test pits yielding a texture class of sand. These correlate to infiltration rates of 2.41 in/hr and 8.27 in/hr respectively from the Massachusetts Stormwater Handbook Rawls Rate table 2.3.3. The following information was taken from the Massachusetts Stormwater Handbook to support the above design methodology: "Conduct tests at the point where recharge is proposed. The tests are a field evaluation conducted in the actual location and soil layer where stormwater infiltration is proposed (e.g., if the O, A and B horizons are proposed to be removed, the tests need to be conducted in the C soil layer below the bottom elevation of the proposed recharge system). The tests shall be conducted by a Competent Soils Professional." "when the static or simple dynamic method is proposed for sizing... in-situ tests for saturated hydraulic conductivity are not required for purposes of the stormwater standards and the saturated hydraulic conductivities listed by Rawls 1982 shall be used". "When Static or simple dynamic methods are used, the Rawls Table (table 2.3.3) must be used to establish the exfiltration rate associated with the soil textures determined at the actual location on site where infiltration is proposed."

BETA: BETA recommends updating the HydroCAD model to reflect test data soils rating and providing in-situ saturated hydraulic conductivity test to verify soils data as identified, see attachment for further explanation.

SW4. Revise model using a CN value of 98 (water surface) for all infiltration basins to avoid double counting infiltration.

HSH: HSH will change the Hydro Cad to test this extreme case. Applicant will update plans

accordingly and provide in final plan revision.

BETA: Calculations not revised – issue remains outstanding.

RECHARGE TO GROUNDWATER (STANDARD NUMBER 3): *Loss of annual recharge to groundwater should be minimized through the use of infiltration measures to maximum extent practicable.* NRCS soil maps indicate the presence of various soil groups predominantly including fine sandy loam. Hydrologic Soil Group (HSG) ratings are primarily B, C, and D. Infiltration ponds are proposed to provide the required recharge volume. Drawdown calculations have been provided showing the BMPs will drain within 72 hours.

SW5. *Due to the reliance on infiltration to provide mitigation for stormwater impacts and the fact that the design does not allow for flexibility (due to density) if infiltration rates do not match the assumed rates as well as the difference in assumed hydrologic group rating of soils from NRCS mapping, BETA recommends the Applicant provide two in-situ saturated conductivity tests for each of the proposed basins to confirm design.*

HSH: Sufficient testing has been done to comply with the stormwater handbook and regulations. According to the Massachusetts Stormwater Handbook, the Dynamic field method suggested above is the least conservative method of determining an infiltration rate. The method chosen is the most conservative method with the highest factor of safety built into the design.

BETA: BETA maintains the Applicant obtain in-situ hydraulic conductivity tests to verify infiltration rates since the stormwater design relies heavily on the basins, see attachment for further explanation.

SW6. *Recommend including a condition requiring observation of excavation for each infiltration basin/system by an agent of Town prior to installation of loam and seed.*

HSH: Agree as condition of approval.

BETA: Recommend including a condition.

SW7. *Provide provision to protect the infiltration basins during construction to ensure they operate as designed after construction is complete.*

HSH: Agree as condition of approval.

BETA: Include provisions in final SWPPP See SW12.

TOTAL SUSPENDED SOLIDS (STANDARD NUMBER 4): *For new development, stormwater management systems must be designed to remove 80% of the annual load of Total Suspended Solids.* The proposed design includes treatment trains consisting of deep sump catch basins, sediment forebays, and infiltration basins to provide both 44% pretreatment and 80% total treatment. One treatment train includes an isolator row and subsurface system to achieve a similar result. The infiltration BMPs have been designed to treat the 1" water quality volume. BETA defers to the peer review by Tetra Tech regarding the accuracy of water quality volume calculations.

HIGHER POTENTIAL POLLUTANT LOADS (STANDARD NUMBER 5): *Stormwater discharges from Land Uses with Higher Potential Pollutant Loads (LUHPPLs) require the use of specific stormwater management BMPs.* The project is not considered a LUHPPL – not applicable.

CRITICAL AREAS (STANDARD NUMBER 6): *Stormwater discharges to critical areas must utilize certain stormwater management BMPs approved for critical areas.* The project proposes discharges from Infiltration Pond #1 to several vernal pools which are defined as Class B Outstanding Resource Waters under 314 CMR 4.00 Section 4.06(2). Infiltration basins and sediment forebays are recommended BMPs for discharges to this critical area.

SW8. *Correct project narrative to indicate the presence of a critical area.*

HSH: HSH will correct narrative to recognize the critical area that is protected by stormwater design.

BETA: Correction not provided – issue remains outstanding.

SW9. *Provide source control and pollution prevention plan.*

HSH: Agree to provide as part of SWPPP prior to construction as a condition of approval.

BETA: See SW12.

SW10. *Setback stormwater BMPs at least 100' from vernal pool.*

HSH: Not applicable under the Wetlands Protection Act 10.57 regulation. “Vernal Pool Habitat” is only protected 100 feet from the pool if WITHIN AN AREA REGULATED UNDER THE ACT – Buffer Zone is not a resource area under the Act. Work near the other 2 pools (1, 2) is in Buffer Zone, but not resource area therefor this comment is not applicable.

BETA: Item 3 of Table CA 2, Stormwater Discharge Near or To Outstanding Resource Waters including Vernal Pools and Surface Water Sources for Public Water Systems, under Standard 6 of the Stormwater Handbook states: “BMPs must be set back 100' from a certified vernal pool and comply with 310 CMR 10.60[1]. Proponents must perform a habitat evaluation and demonstrate that the stormwater BMPs meet the performance standard of having no adverse impact on the habitat functions of a certified vernal pool.”

SW11. *Perform required habitat evaluation.*

HSH: Not applicable under the Wetlands Protection Act 10.57 regulation. “Vernal Pool Habitat” is only protected 100 feet from the pool if WITHIN AN AREA REGULATED UNDER THE ACT – Buffer Zone is not a resource area under the Act. Work near the other 2 pools (1, 2) is in Buffer Zone, but not resource area therefor this comment is not applicable.

BETA: see BETA’s reply comment to WS10 HSH response.

REDEVELOPMENT (STANDARD NUMBER 7): *Redevelopment of previously developed sites must meet the Stormwater Management Standards to the maximum extent practicable.* The project is not a redevelopment – **Not Applicable.**

EROSION AND SEDIMENT CONTROLS (STANDARD NUMBER 8): *Erosion and sediment controls must be implemented to prevent impacts during construction or land disturbance activities.* As the project proposes to disturb greater than one acre of land, it will be required to file a Notice of Intent with EPA

^[1] Wildlife Habitat – <http://www.mass.gov/eea/docs/dep/service/regulations/310cmr10a.pdf>

and develop a Stormwater Pollution Prevention Plan (SWPPP). The Applicant has provided limited erosion control notes and no SWPPP was included in the submittal. Plans indicate perimeter erosion controls and stabilized construction entrance. Given the size of the Site and significant impact to resource areas, additional information is required to show compliance with this standard.

SW12. Provide a draft SWPPP.

HSH: Agree to provide prior to construction as condition of approval.

BETA: Recommend including a condition.

SW13. Provide phasing plan that controls the area of the Site to be disturbed at any one time, recommended to be no greater than 5 acres.

HSH: Project will comply with the existing regulations.

BETA: See SW12.

SW14. Provide anticipated locations of proposed staging and stockpile areas.

HSH: Agree to provide as part of SWPPP prior to construction as a condition of approval.

BETA: See SW12.

SW15. Provide typical inspection and maintenance requirements for all erosion control BMPs.

HSH: Agree to provide as part of SWPPP prior to construction as a condition of approval.

BETA: See SW12.

SW16. Expand construction sequencing plan to include time of storm water system installation. Provide means of protecting stormwater BMPs during construction and restoring any damaged areas prior to the BMP coming online.

HSH: Agree to provide as part of SWPPP prior to construction as a condition of approval.

BETA: See SW12.

SW17. Provide specifications for temporary and final seeding.

HSH: Agree to provide as part of SWPPP prior to construction as a condition of approval.

BETA: See SW12.

SW18. Clarify if the "proposed erosion control" label on the plans is meant to indicate silt fence, compost filter tube, or both.

HSH: Sheet 9 of 86 from plan set dated 5/1/20 shows the type of erosion control as 10-12-inch compost sock with silt fence backing.

BETA: Comment resolved.

SW19. Revise erosion control plan to include perimeter controls at all limits of wetlands. Several areas do not depict erosion control measures.

HSH: Agreed. Change will be shown on next plan revision.

BETA: Plan to be revised – issue remains outstanding.

SW20. Recommend including a condition requiring submission of a copy of the final, signed SWPPP.

HSH: Agreed

BETA: See SW12.

OPERATIONS/MAINTENANCE PLAN (STANDARD NUMBER 9): A Long-Term Operation and Maintenance Plan shall be developed and implemented to ensure that stormwater management systems function as designed. A Stormwater Operation and Maintenance (O&M) Plan has been included in the submittal.

SW21. Update O&M to provide minimum required information, including:

- a. Stormwater System Owner (contact information)

HSH: TBD

BETA: Recommend a condition requiring O&M Plan to be updated with information requested in herein a-d as well as other comments below.

- b. Party(ies) responsible for operation and maintenance, including how future property owners will be notified of the need for maintenance.

HSH: TBD

BETA: See SW21a.

- c. Plan depicting the location of all stormwater BMPs including discharge points include vehicle access paths for stormwater basin/system maintenance.

HSH: Standalone plan will be included in SWPPP.

BETA: Provide in O&M Plan not SWPPP. See SW21a.

- d. Estimated operations and maintenance budget.

HSH: See attached budget.

BETA: Include in final O&M Plan. See SW21a.

SW22. Attach manufacturer maintenance recommendations for Stormtech system and isolator row.

HSH: O&M Plan will be updated accordingly and provided in future plan revision.

BETA: Include in final O&M Plan See SW21a.

SW23. Provide inspection and maintenance tasks for proposed outfalls and culverts.

HSH: O&M Plan will be updated accordingly and provided in future plan revision.

BETA: Include in final O&M Plan See SW21a.

ILLICIT DISCHARGES (STANDARD NUMBER 10): *All illicit discharges to the stormwater management system are prohibited.* The report narrative indicates that an illicit discharge compliance statement will be provided under separate cover.

SW24. *Recommend a condition to require providing a signed illicit discharge compliance statement.*

HSH: Applicant will provide signed form.

BETA: Recommend including a condition.

SW25. *Provide measures in the pollution prevention plan to prevent illicit discharges to the stormwater management system.*

HSH: Agree to provide as part of SWPPP prior to construction as a condition of approval.

BETA: See SW12.

Massachusetts Stormwater Handbook – BMP Design

The Massachusetts Stormwater Handbook provides guidance for design of stormwater BMPs. The following section details the project's conformance with these design standards. BETA defers to peer review by Tetra Tech regarding suitability of soil conditions.

SW26. *Provide alternative catch basin top detail for structures that are not adjacent to curbs.*

HSH: The catch basin detail depicted in detail sheet 3 of 18 (71 of 86) from plan set dated 5/1/20 is adequate to be used for scenarios with and without a curb present. When a curb is not present, the right-hand side of the frame and grate detail would be used around the full perimeter of the structure.

BETA: BETA defers to the design engineer.

SW27. *Revise infiltration basin detail to include outfall pipe and emergency spillway.*

HSH: Detail sheets 9, 10 and 11 of 18 (77, 78 & 79 of 86) from plan set dated 5/1/20 have been revised to depict the inflow pipe(s) to the infiltration ponds and outlet pipe exiting the infiltration ponds where applicable. The outlet pipes which are located within a Multi-Stage Discharge Outlet Structures have remained depicted within the corresponding outlet detail associated with each infiltration pond. The emergency spillway is labeled within the plan view for each detail and within the section view as "weir outlet" with a corresponding elevation. Please refer to detail sheets 9, 10, and 11 of 18 dated 9/14/20 attached to this response.

BETA: Plans not provided for review.

SW28. *Verify that infiltration basins/system meet setback to foundations (10 ft down gradient) and wetlands (50 ft) and access (15 ft) requirements. See also TT 19 & 29.*

HSH: Verified.

BETA: Comment resolved.

WETLAND AND ENVIRONMENTAL RESOURCE AREAS

BETA reviewed the Notice of Intent (NOI) submitted by the Applicant on May 14, 2020 and found it provided few construction details, limited wetland restoration procedures and design, and no information regarding construction activities within buffer zones (e.g. staging, dewatering, etc.). Temporary and permanent activities proposed within areas subject to jurisdiction under the Bylaw and the Act will need to be reviewed. This review focuses on the information provided in the May 14, 2020 NOI that is subject to the interests of the Bylaw and the Wetlands Protection Act. As part of the review, BETA conducted a site visit to observe existing conditions and areas of proposed impacts within and adjacent to resource areas on the site. The site is primarily wooded undeveloped land with numerous wetland resource areas separated by hilly topography with steep elevation changes. Puddingstone cobbles and boulders are scattered throughout the site and a unique cluster of large puddingstone erratic boulders were observed in the northeastern corner. The site provides significant wetland, vernal pools, and upland habitats for a number of wildlife species including terrestrial amphibians that spend the majority of their lives in the uplands and utilize the site's vernal pools during the breeding season. Dense shrub thickets throughout the site provide nesting habitat for bird species. During the visit BETA observed wood frogs within the northern forested uplands and a young red tail hawk in the tree canopy of the inner portion of the site.

HSH: This NOI is not subject to the interests of the Bylaw. No comment required as not applicable to the WPA.

BETA: ZBA will address the Project's compliance with the Bylaw.

It should be noted here that it is BETA's opinion that Applicant has not overcome the burden of proof that there is not practical alternative to siting the structural stormwater management measures within the outer Riverfront Area (RA). The Applicant needs to analyze the impacts of reducing the development footprint to avoid impacts to the RA altogether.

HSH: See revised plan. The use of the RFA for detention has fallen from 14% to approximately 8.8%. The reduction was accomplished by 1) reducing the number of multifamily buildings from four to three, two of which are connected in an L configuration and adding a 5 floor to each multifamily building and by creating approximately 30 additional underground parking spaces and 2) reducing by 4 the number of single family homes on the western portion of the site to move more of the detention out of the RFA. (Four additional rental town homes were added to the eastern portion of the site).

Pursuant to the Wetlands Protection Act, the standard for the alternatives analysis is whether there is a "practicable and substantially equivalent economic alternative." An alternative is defined by the Act as practicable and substantially economically equivalent if it is "available and capable of being done after taking into consideration: costs, and whether such costs are reasonable or prohibitive to the owner; existing technology; the proposed use; and logistics in light of overall project purposes."

As described in the June 30th alternatives analysis submission, 5 floor buildings cost roughly \$10,000 more per unit than 4 story buildings. However, by reducing the number of building from 4 to 3, one roof, one foundation and one fire stair will be eliminated from the project which will partially offset the additional per unit cost of adding a 5th floor in order to reduce the development footprint. Reducing the development footprint created more area for detention

outside the RFA and will reduce the amount of water that needs to be detained. The detention areas shown of the revised plan are estimates and will be finalized after the 9-23 hearing.

Any further reduction in the development footprint would require a diminution of the purpose of project as the number of units would need to be reduced. A reduction in the number of affordable and market *housing units would clearly not be a substantially equivalent economic alternative.*

Additionally, the RA boundary needs to be better depicted on the Grading and Drainage Plans to be able to determine what RA impacts are associated with the stormwater management measures and what is associated with site development activities.

There is no development activity in the RFA.

BETA: TBD (additional site visit to exam proposed activities within RA scheduled for October 3, 2020.)

BETA reviewed vernal pool boundaries and found the extent of Vernal Pool #3, in the southern portion of the site, larger than the area delineated in the field and shown on the site plans. Vernal pools size and shape vary from year to year based on environmental conditions and boundaries should be delineated to encompass all suitable areas within a wetland. Vernal Pool #3 is situated within contour 212', a large area with no defined slope change, which amphibians could utilize for breeding in any number of locations. Evidence of mean annual highwater was observable that indicated suitable breeding habitat beyond that shown on the site plans.

WE1. Vernal Pool#3 boundary and associated 100' buffer is larger than that currently shown on the site plans and should be enlarged based on detailed elevation or numerous breeding season surveys.

HSH: The Wetlands Protection Act Regulations define Vernal Pool Habitat at 310 CMR 10.04 (bold added):

“Vernal Pool Habitat means **confined basin depressions** which, at least in most years, hold water for a minimum of two continuous months during the spring and/or summer, and which are free of adult fish populations, as well as the **area within 100 feet of the mean annual boundaries of such depressions, to the extent that such habitat is within an Area Subject to Protection under M.G.L. c. 131, § 40** as specified in 310 CMR 10.02(1). These areas are essential breeding habitat, and provide other extremely important wildlife habitat functions during nonbreeding season as well, for a variety of amphibian species such as wood frog (*Rana sylvatica*) and the spotted salamander (*Ambystoma maculatum*), and are important habitat for other wildlife species.”

Vernal Pool #3 was scrutinized in May 2019 and subsequently in March, April, and May of 2020. The boundary of the feature, which is not a “confined basin depression”, but rather an area impounded by a farm road with the borrow used to construct a cart road at its current northward limit. A culvert beneath the cart road provides an outlet for part of the drainage from the palustrine forest to the south.

The boundary of the pool flagged in the field and indicated on the record plans was based on credible biological evidence of functional amphibian breeding within the depression that was historically excavated. The basin, as delineated provides adequate water depth to provide a relatively reliable hydroperiod to support metamorphosis by wood frogs and spotted salamanders in most years. Southward of the anthropogenically excavated basin feature is an

expanse of maple forest with pit and mound topography and clear indicators of the annual high-water elevation in the form of mossy tussocks and tree mounds with consistent water marks (Photo 1). Beyond the flagged pool limit water depths are inconsistent and typically less than six inches in depth. In that regard these backwaters provide unreliable localities for egg deposition by amphibians; localized biological selection has resulted in the deposition of eggs by progeny of previously successful amphibian adults, to the nearly fully insulated basin where larvae can undergo their entire development cycle in an environment providing structural habitat and cover, thermal diversity and a relatively persistent hydroperiod in most years.

Regardless of the true, biological functionality of “Vernal Pool #3”, we “chased” the limits of contiguous flooding and mapped same using a Trimble GEO XH GPS device. The criteria applied were far in excess of any tenable functional aquatic habitat for vernal pool vertebrates. Rather we chased all areas of even tenuously confluent seasonally high surface water, ignoring elevated peninsulas and other features separating seasonally flooded areas, and connected the outlying points of potentially confluent seasonal high-water areas.

The above should not be construed as a vernal pool; to define a vernal pool as such would undermine the legitimacy of the MDFW Certification process. However, we undertook this excessively conservative delineation in order to demonstrate that regardless of any intermediate boundary (between currently flagged and excessively exaggerated configuration as shown) **there is no regulatory effect upon the proposed build-out scenario (see site plan set)**. The vernal pool definition provided above clearly states the limits of regulatory jurisdiction as limited to 100 horizontal feet from the pool boundary – **only within a jurisdictional area regulated under the Act**.

To demonstrate that the dimensions of “Vernal Pool #” in even the most exaggerated configuration are inconsequential to review and permitting under MGL Ch. 131 §40, our delineated pool boundary is about 4,800 square feet. The exaggerated polygon flagged in the field is over 1000 percent greater (108,000 sq. ft.) than the actual, biologically functional basin previously observed, documented and defined in the field.

The definition, or physical limits of the boundary of the potential vernal pool, with the exception of the north, self-evident, road-impounded limit (Flags 1-3 through 1-7) indicated on the submittal plans is of no regulatory consequence to the regulatory review of the project.

The project will develop approximately 75% of the site’s uplands as well as grade and clear large areas adjacent to vernal pools. Terrestrial amphibians that use vernal pools for breeding depend on adjacent upland habitat most of their life. Although the project maintains a 100’ buffer around each vernal pool, most of this buffer area is covered by wetlands and provide little upland habitat.

BETA: Revised boundary to the Vernal Pool will be reviewed in the field.

WE2. The project should provide more undisturbed upland areas contiguous to vernal pools to protect Vernal Pools 1, 2 and 3. Development of the upland buffers between the vernal pool complex will eliminate safe migration of vernal pool species between pools.

HSH: This is not a requirement of the WPA and the project, as proposed complies with all applicable standards for vernal pools provided by the WPA. There is no alteration of resource area within 100 horizontal feet, and within regulated resource area within the entire development. Vernal Pool #2 and Vernal Pool# 3 we will have an intact corridor between them

by way of an over-sized, bottomless culvert exceeding the “Openness” standards and the revised plan has eliminated development activity between VP # 1 and VP# 2.

BETA: *Given the amount of lost upland habitat the Applicant should provide as much connectivity of wetlands to Riverfront Area and uplands as possible. The current design has further isolated Wetland C from natural areas. A wildlife crossing tunnel under the road at the northern end of Wetland C, between the proposed basins, would allow wildlife movement between the wetland, Cedar Swamp, and Riverfront Area. This would be considered mitigation for impacts in Areas Subject to Jurisdiction including the 100 foot Buffer Zone.*

WE3. *The Applicant should provide additional assessments on how the proposed impacts to habitat meet applicable performance criteria and adequately protect vernal pool upland habitats as well as the capacity of the RA to provide important wildlife habitat functions in the locations of the proposed alterations.*

HSH: **BVW/Bank:** The project meets the performance standards (regulation 10.58) in the riverfront area. A 100-foot (inner riparian zone) intact corridor is provided and only obligatory stormwater components are proposed within the outer riparian zone. The facilities proposed in the outer riparian zone will be without fences or other barriers to wildlife and so compliant with 310 CMR 10.58 (4) 3. (d) a. and b. **Riverfront Area:** Two, Habitat Assessments were provided examining wildlife habitat values and features of the two proposed crossings which in aggregate belie 5,000 square feet of impact to regulated areas. Please consult these Appendixes B for regulatory compliance.

BETA: *Item 3 of Table CA 2 “Stormwater Discharge Near or To Outstanding Resource Waters including Vernal Pools and Surface Water Sources for Public Water Systems”, under Standard 6 of the Stormwater Handbook states: “BMPs must be set back 100’ from a certified vernal pool and comply with 310 CMR 10.60[1]. Proponents must perform a habitat evaluation and demonstrate that the stormwater BMPs meet the performance standard of having no adverse impact on the habitat functions of a certified vernal pool.”*

WE4. *The Wildlife Habitat Evaluation provided with the NOI should provide more assessment of the overall connectivity of the wetland and vernal pools systems to the Cedar Swamp Brook. Upon site development, the wetland systems will be the only migration pathway from Vernal Pool #1 to the RA and river system. Vernal Pool #2 will be completely cut off.*

HSH: No Appendix B Habitat Assessment is required pursuant to 310 CMR 10.60 because no regulatory threshold for Riverfront Area is exceeded. Similarly, there is no impact proposed within 100 horizontal feet of actual or potential vernal pool(s) and within the limits of a resource area regulated under the Act.

BETA: *See BETA’s reply to HSH’s response to Item WE3 above.*

^[1] Wildlife Habitat – <http://www.mass.gov/eea/docs/dep/service/regulations/310cmr10a.pdf>

The proposed project includes two stream and wetland crossings that will result in impacts to banks of intermittent streams, vegetated wetlands, the 25' No Disturbance Zone¹, and the 100' buffer zone. The impacts are necessary to gain access to the site and mitigation has been provided at a 1:1.5 ratio as shown in the plan details at each crossing.

WE5. A Wetland Restoration Plan developed in accordance with the Massachusetts Inland Wetland Replication Guidelines and Checklist should be provided (Section 1.5.2 of the Bylaw). Restoration area details, such as existing and proposed contours and cross-sections, should be provided with the Site Plans.

HSH: The Applicant has attached plan detailing the restoration areas as well as cross sectional plans dated 9/14/20.

BETA: Avoid clearing mature trees associated with constructing Mitigation Areas by conducting a tree survey within proposed mitigation areas and either redesign the areas around the trees or move the mitigation sites to more appropriate locations. For instance, consider moving the proposed mitigation areas located on the west side of the wetlands, at the stream crossings, to the east side of the wetlands. Reduce or eliminate sharp corners of the mitigation design to provide more natural transition to existing contours.

WE6. Given the amount of impacts and loss of upland habitat resulting from the project the Applicant should provide wetland restoration at a 2:1 ratio or provide greater buffer zone protection.

HSH: The Applicant has exceeded the replication requirements for BVW by 50%. A replication ratio of unity is required (310 CMR 10.55 (4) (b) 1.) and has provided a replication ratio of 1.5:1 to assure a greater-than-required replication is provided. Additionally, the replication areas, as provided in the accompanying site plans, do or will upon completion, meet the additional criteria for BVW replication at, 310 CMR 10.55 (4) (b) 2., through 7.).

BETA: Comment resolved.

WE7. The Wetland Restoration Plan should include a designated minimum 25' No Disturbed Zone of native vegetation and the area should be indicated on the plans.

HSH: **This is not a requirement of the WPA** or Regulations for replication of BVW. The project proposes a 25' No Disturbed Zone around all resource areas except for three unavoidable impact areas.

BETA: See BETA's reply to HSH Response to Comment WE5, redesign Restoration Areas may provide additional 25' No Disturbed buffer. Further, although not a specific stated requirement, the Commission has the regulatory authority to require a vegetated buffer between the developed area and the constructed wetland if they feel a 25 foot vegetated buffer is necessary to protect the interests provided by the newly formed wetland.²

¹ According to the Walpole Bylaw Regulations Section 1.4.1 The Commission shall require the Applicant to maintain a twenty-five (25) foot wide contiguous, undisturbed vegetative buffer measured from, and parallel to, the wetland resource boundary, as a minimum.

² 310 CMR 10.53(1): For work in the Buffer Zone subject to review under 310 CMR 10.02(2)(b)3., the Issuing Authority shall impose conditions to protect the interests of the Act identified in the adjacent Resource Area. The

WE8. *The 25' No Disturbed Zone should be maintained as a native vegetated and natural buffer between site wetlands and the development. This Zone should not be mowed, fertilized, or maintained as lawn. The Development's Operation and Maintenance Plan should include specific language on the proper maintenance of the No Disturbed Zone as a natural buffer.*

HSH: Areas designated as "No Disturb" and are outside of the limit of work will not be mowed or maintained.

BETA: Comment resolved.

WE9. *An Invasive Species Control Plan should be included in the NOI application to ensure areas within 100 feet of resources will not be affected by invasive species that typically spread to disturbed areas as a result of construction activities.*

HSH: The site, an historic piggery is infested with varying degrees of invasive vegetation, much of it within jurisdictional wetlands. The Applicant is not required to manage, eliminate, or mitigate exotic vegetation that is pre-existing on the site and widely distributed in the local vicinity.

BETA: Much of the Site will be excavated or cleared and an Invasive Species Control Plan is critical to the protection of remaining habitat and areas Subject to Protection on-site and off-site. The Commission has jurisdiction over all activities proposed in areas Subject to Jurisdiction including the 100 foot Buffer Zone. If they feel that control and management of invasive species is required to protect the adjacent Resource Areas and the interest they protect, then they are within their regulatory authority to require the applicant to provide and implement an ISCP. An ISCP is required by other permitting authorities and on all MassDOT transportation and infrastructure projects.

Clearing and grading associated with the Project will significantly permanently alter 100-Foot buffer zone Bylaw resource area. The 100-foot buffer zone (or Bordering Land) on the Site is presumed to protect the important functions and values of the wetland resource areas. According to the Bylaw Regulations, scientific research and the Commission's own experience in reviewing a wide variety of projects, clearly demonstrates that alteration and construction activities within Bordering Lands (i.e. 100 foot buffer zone) consistently results in destructive and cumulative impacts on wetland resource areas. Bordering Land plays a significant role in wildlife habitat protection. Many studies document that amphibians, reptiles, birds and mammals regularly use upland buffer zones for nesting, feeding, overwintering and reproducing.³ Removing the natural features of the 100-foot buffer zone, as currently proposed, will remove wildlife cover resulting in a permanent adverse impact to wildlife escape and migration pathways, nesting, and forage. The Bylaw Regulations protect the wildlife habitat interest of the Buffer Zone, presuming that a 25-foot vegetated buffer is the minimum buffer necessary to protect the important functions and values of the resource areas.

HSH: **This NOI is not subject to the interests of the Bylaw** and the Bylaw Regulations are non-scope. The Project, as designed and throughout its extent complies with applicable provisions at

Issuing Authority may require....the preservation of natural vegetation adjacent to the Resource Area and/or other measures commensurate with the scope and location of the work within the Buffer Zone to protect the interests of M.G.L. c. 131 section 30. The purpose of the preconstruction review of work in the Buffer Zone is to ensure the adjacent Resource Areas are not adversely affected during or after completion of the work.

³ MACC Buffer Zone Guidebook, dated June 6, 2019

310 CMR 10.53(1). The Project further complies with the Department's Stormwater Management Standards within and beyond the extent of the buffer zone and is therefore compliant with applicable performance standards conferred to the various applicable resource areas extant on the site.

BETA: The Applicant shall comply with Stormwater Standards as well, see BETA's reply to HSH response to Comment WE3.

Buffer zone width is one of the most important variables for water quality protection, especially when a Project will result in intense use of the adjacent land. Since the current Project will result in a high-density residential neighborhood, migration of nutrients and sediment are likely, therefore a minimum of a 50-foot undisturbed buffer is recommended.

HSH: This NOI is not subject to the interests of the Bylaw and the Bylaw Regulations are non-scope. There is no such standard provided for, nor recommended in the Wetlands Protection Act or corresponding Regulations.

BETA: The Commission has the authority to regulate and condition work in the Buffer Zone that may affect a Resource Area.⁴ The Applicant has the burden of proof to demonstrate compliance with Buffer Zone regulatory criteria listed in 310 CMR 10.24(1)⁵ and 10.53(1)⁶.

Provide language in the Development's O & M Plan prohibiting the use of chemicals or lawn fertilizers within 100 feet of wetlands, post signs in strategic locations as reminders of the "Protected Wetland Areas" and implement dog curbing rules to further reduce nutrient overload within wetlands. At completion of construction consider installing a wooden post and rail fence system, or similar, for a barrier between wetland resource areas and the development.

In addition to providing wildlife habitat, upland buffer zones help control the rate at which water enters and leaves a wetland system and regulates stream base flows during dry times. The Site's steep topography and varied subsurface soil conditions are features that provide and maintain the hydrology required to support the wetland system and the potential vernal pool habitat. The Project will result in significant changes to the current watershed to the BVW, vernal pools and stream system. Therefore, a reduction in local recharge upgradient and cross-gradient of the wetland system may have a significant adverse effect on water budgets.

WE10. The Applicant should provide the Commission with a specific graphic that illustrates both current and proposed watersheds to the on-site resource areas and describe the changes in groundwater recharge within 100 feet of the boundaries to the resource areas.

HSH: Project meets or exceeds all applicable stormwater performance standards; so, doing also assures compliance with the standards of the Wetlands Protection Act and corresponding Regulations.

⁴ MACC Buffer Zone Guidebook, dated June 6, 2019

⁵ 310 CMR 10.24(1) states "if the issuing authority determines that a resource area is significant to an interest identified in M.G.L. c. 131, § 40 for which no presumption is stated in the Preamble to the applicable section, the issuing authority shall impose such conditions as are necessary to contribute to the protection of such interest."

⁶ 310 CMR 10.53(1) further states "For work in the Buffer Zone subject to review under 310 CMR 10.02(2)(b)3., the Issuing Authority shall impose conditions to protect the interests of the Act identified for the adjacent Resource Area."

BETA: Maintaining hydrology is critical to the site's vegetated wetlands, stream systems and vernal pools to remain viable and BETA maintains the Applicant provide the Commission with a graphic of current and proposed watersheds to the on-site resource areas and describe the changes in groundwater recharge within 100 feet of the boundaries of the resources areas. Further, a pre and post watershed map is required to adequately design the stormwater management system to comply with the Standards. Therefore, this graphic is immediately available and should be provided in a separate submission to the Commission that describes any changes in watersheds to the Resource Areas or Vernal Pools.

At this time the Applicant has not provided sufficient information to describe the site, the work, or the effects of the work on the interests protected by the Site's resource areas and vernal pools. The Applicant has not overcome the burden of proof that they have no practical alternatives to the significant impacts resulting from construction of stormwater management structures and site development activities in the RA. Therefore, the Commission should not issue an Order of Conditions approving the project.

HSH: See revised plan. The use of the RFA for detention has fallen from 14% to approximately 8.8%. The reduction was accomplished by 1) reducing the number of multi family buildings from four to three, two of which are connected in an L configuration and adding a 5 floor to each multifamily building and by creating approximately 30 additional underground parking spaces and 2) reducing by 4 the number of single family homes on the western portion of the site to move more of the detention out of the RFA. (Four additional rental town homes were added to the eastern portion of the site).

Pursuant to the Wetlands Protection Act, the standard for the alternatives analysis is whether there is a "practicable and substantially equivalent economic alternative." An alternative is defined by the Act as practicable and substantially economically equivalent if it is "available and capable of being done after taking into consideration: costs, and whether such costs are reasonable or prohibitive to the owner; existing technology; the proposed use; and logistics in light of overall project purposes."

As described in the June 30th alternatives analysis submission, 5 floor buildings cost roughly \$10,000 more per unit than 4 story buildings. However, by reducing the number of building from 4 to 3, one roof, one foundation and one fire stair will be eliminated from the project which will partially offset the additional per unit cost of adding a 5th floor in order to reduce the development footprint. Reducing the development footprint created more area for detention outside the RFA and will reduce the amount of water that needs to be detained. The detention areas shown on the revised plan are estimates and will be finalized after the 9-23 hearing.

Any further reduction in the development footprint would require a diminution of the purpose of project as the number of units would need to be reduced. A reduction in the number of affordable and market housing units would clearly not be a substantially equivalent economic alternative.

BETA: The Applicant's Alternative Analysis does not provide the Commission with adequate information to confirm that the an alternative that is practicable and substantially equivalent economically if it is available and capable of being done after taking into consideration costs, existing technology, proposed use, and logistics, in light of the overall project purposes per 310 CMR 10.58(4)(c).

Recommendations

The Applicant has not provided sufficient information describing the effects of the work on the Site's Resource Areas and Certified Vernal Pools or compliance with DEP's Stormwater Regulations and Stormwater Standards. Therefore, the Commission cannot issue an Order of Conditions approving the project at this time.

Thank you. If you have any questions, please contact us at your convenience.

Very truly yours,
BETA Group, Inc.



Julia Stearns
Project Scientist



Philip F Paradis, Jr., PE
Associate



Marta J. Nover
Vice President

Attachment: Stormwater Memorandum

Job No: 7217

Date: September 29, 2020 DEP File No.: 315-1227
To: Landis Hershey, Conservation Agent, and Walpole Conservation Commission
Cc: Howard Stein Hudson 55 Summer Street
From: Philip Paradis, Jr., PE, LEED AP, CPSWQ *PPR*
Subject: 55 Summer St 40B - Stormwater Peer Review Update

BASIS OF REVIEW

BETA received the following documents for review:

- Cover letter to the Walpole Conservation Commission dated September 16, 2020 fro, 55 SS LLC, Westford MA
- Marked-up PDF dated September 14, 2020 providing written responses to BETA's August 10, 2020 Peer review letter.
- Plan entitled: **Proposed Subdivision/Overall Plan, Proposed MultiFamily Development Summer Street Walpole, MA** dated January 10, 2020 revised September 14, 2020 prepared by Howard Stein Hudson, Chelmsford, MA
- Plan entitled: **Presentation Plan, Proposed MultiFamily Development Summer Street Walpole, MA** dated January 10, 2020 revised September 14, 2020 prepared by Howard Stein Hudson,

COMMENTS AND RECOMMENDATIONS

Most of the responses indicate that documentation/clarification is to be provided in a future submission. The following outline BETA's position on two responses that we were not in agreement (SW3 & SW%).

Typically, a site is evaluated for runoff during extreme rainfall events based on surface type and hydrologic soil group rating. Higher infiltration produces less runoff. NRCS (Natural Resources Conservation Service) provides maps that provide hydrologic soil group (HSG) ratings – see NRCS's descriptions below.

Description – Hydrologic Soil Group

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

NRCS Hydrologic Soil Group Rating Description

NRCS maps for this site indicate a variety of soils with different HSG ratings which is typical where wetlands are present. The Applicant has conducted 31 tests scattered throughout the site for potential BMP locations. This data is provided on sheet 5 of the plan set. BETA has copied a portion of the sheet showing the soils data and added the NRCS HSG rating where the test pit is located.

The test data provided indicates soils are very similar throughout the site. Each has a topsoil layer – loam (L) that has little impact on rating. Below that is layers if sandy loam (SL), loamy sand (LS) and/or sand (S). These soils are consistent with “A” and “B” rated soils with high or moderate infiltration rates.

Table 2.3.3. 1982 Rawls Rates

Texture Class	NRCS Hydrologic Soil Group (HSG)	Infiltration Rate Inches/Hour
Sand	A	8.27
Loamy Sand	A	2.41
Sandy Loam	B	1.02
Loam	B	0.52
Silt Loam	C	0.27
Sandy Clay Loam	C	0.17
Clay Loam	D	0.09
Silty Clay Loam	D	0.06
Sandy Clay	D	0.05
Silty Clay	D	0.04
Clay	D	0.02

From the MassDEP Stormwater Handbook

The Applicant is taking credit for the high infiltration rate in the infiltration basins for the proposed BMPs, which may be appropriate based on the soil tests. However, the applicant has not adjusted the HSG rating for the HydroCAD model. Modeling a “D” soil generates higher runoff rates and volumes than an “A” or “B” soil. This may be overestimating the runoff in the existing conditions. If the design uses that threshold mitigation measures may be undersized, and the project may adversely impact down gradient properties and resources. If the soil tests are not accurate then the BMPs may be undersized. Due to these possible discrepancies,

BETA recommends updating the HydroCAD model to reflect HSG rating based on test data and provide in-situ saturated hydraulic conductivity test to verify soils data as identified in comments SW3 & SW5.

PRELIMINARY DEEP HOLE TESTING
12-4-19 THROUGH 12-6-19
SOIL EVALUATOR: KASEY FERREIRA
WITNESSED BY: CHRIS JOHNSON

STEEL GUARDRAIL DETAIL
NOT TO SCALE

<p>IP1 EL= 204.8 0"-13" A O 10YR 3/3 13"-23" B C SL 10YR 6/8 23"-120" C LS 2.5Y 6/4 ESHW: 24" MOTTLES: 24"</p>	<p>IP7 EL= 202.5 0"-7" A L/O 10YR 3/3 7"-122" C C LS 2.5Y 6/4 ESHW: 40" WEEPING: 103" MOTTLES: 40"</p>	<p>IP12 EL= 194.4 0"-13" A O 10YR 3/3 13"-28" B A SL 10YR 6/8 28"-135" C LS 2.5Y 6/4 ESHW: None Encountered</p>	<p>IP17 EL= 191.2 0"-13" A O 10YR 3/3 13"-23" B A SL 10YR 6/8 23"-120" C LS 2.5Y 6/4 ESHW: None Encountered</p>	<p>IP22 EL= 203.5 0"-6" A L 10YR 3/3 6"-23" B D SL 10YR 6/8 23"-66" C LS 2.5Y 6/4 ESHW: 32" MOTTLES: 32"</p>	<p>IP27 EL= 198.4 0"-8" A L 10YR 3/3 8"-25" B D SL 10YR 6/8 25"-48" C₁ LS 2.5Y 6/4 48"-110" C₂ LS 2.5Y 6/4 ESHW: 30" MOTTLES: 30" WEEPING: 54" STANDING: 100"</p>
<p>IP2 EL= 202.4 0"-7" A LS 10YR 3/3 7"-23" B C LS 10YR 5/6 23"-132" C S 2.5Y 6/3 ESHW: None Encountered</p>	<p>IP8 EL= 200.0 0"-7" A L 10YR 3/3 7"-18" B C SL 10YR 5/6 18"-139" C LS 2.5Y 6/3 ESHW: 44" WEEPING: 125" STANDING: 130" MOTTLES: 44"</p>	<p>IP13 EL= 203.7 0"-13" A L 10YR 3/3 13"-28" B SL 10YR 5/6 28"-135" C LS 2.5Y 6/3 ESHW: 43" WEEPING: 115" D MOTTLES: 43"</p>	<p>IP18 EL= 190.8 0"-7" A LS 10YR 3/3 7"-23" B A LS 10YR 5/6 23"-132" C S 2.5Y 6/3 ESHW: None Encountered</p>	<p>IP23 EL= 202.4 0"-12" A L 10YR 3/3 12"-24" B D LS 10YR 6/8 24"-118" C S 2.5Y 6/4 ESHW: 36" MOTTLES: 36" STANDING: 96"</p>	<p>IP28 EL= 199.8 0"-6" A L 10YR 3/3 6"-24" B D SL 10YR 5/6 24"-99" C LS 2.5Y 6/3 ESHW: 32" MOTTLES: 32" WEEPING: 65" STANDING: 90"</p>
<p>IP3 EL= 202.8 0"-10" A LS 10YR 3/3 10"-20" B C LS 10YR 6/8 20"-120" C S 2.5Y 6/4 ESHW: None Encountered</p>	<p>IP9 EL= 197.0 0"-10" A LS 10YR 3/3 10"-20" B A LS 10YR 6/8 20"-120" C S 2.5Y 6/4 ESHW: None Encountered</p>	<p>IP14 EL= 208.0 0"-7" A L 10YR 3/3 7"-13" B LS 10YR 6/8 13"-95" C₁ B S 2.5Y 6/4 95"-120" C₂ G ESHW: 95" MOTTLES: 95" STANDING: 104"</p>	<p>IP19 EL= 205.0 0"-8" A L 10YR 3/3 8"-20" B D SL 10YR 6/8 20"-120" C LS 2.5Y 6/4 ESHW: 50" MOTTLES: 50"</p>	<p>IP24 EL= 198.1 0"-11" A L 10YR 3/3 11"-24" B D LS 10YR 5/6 24"-102" C S 2.5Y 6/3 ESHW: 39" MOTTLES: 39" WEEPING: 100" REFUSAL: 102"</p>	<p>IP29 EL= 199.8 0"-13" A L 10YR 3/3 13"-18" B A SL 10YR 6/8 18"-132" C LS 2.5Y 6/4 ESHW: 43" MOTTLES: 43"</p>
<p>IP4 EL= 201.2 0"-8" A LS 10YR 3/3 8"-18" B C LS 10YR 6/8 18"-108" C S 2.5Y 6/4 ESHW: None Encountered</p>	<p>IP10 EL= 197.8 0"-8" A LS 10YR 3/3 8"-18" B A LS 10YR 6/8 18"-108" C S 2.5Y 6/4 ESHW: None Encountered</p>	<p>IP15 EL= 191.8 0"-5" A L 10YR 3/3 5"-22" B B SL 10YR 6/8 22"-120" C LS 2.5Y 6/4 ESHW: 30" WEEPING: 30"</p>	<p>IP20 EL= 206.8 0"-7" A L 10YR 3/3 7"-24" B D SL 10YR 6/8 24"-103" C LS 2.5Y 6/4 ESHW: 48" MOTTLES: 48"</p>	<p>IP25 EL= 201.8 0"-10" A L 10YR 3/3 10"-20" B D LS 10YR 6/8 20"-69" C S 2.5Y 6/4 ESHW: 41" MOTTLES: 41" REFUSAL: 69"</p>	<p>IP30 EL= 212.0 0"-12" A L/O 10YR 3/3 12"-30" B L 10YR 6/8 30"-128" C D LS 2.5Y 6/4 ESHW: 36" MOTTLES: 36" WEEPING: 102"</p>
<p>IP5 EL= 201.0 0"-7" A LS 10YR 3/3 7"-22" B C LS 10YR 6/8 22"-120" C S 2.5Y 6/4 ESHW: None Encountered</p>	<p>IP11 EL= 195.9 0"-7" A LS 10YR 3/3 7"-22" B A LS 10YR 6/8 22"-120" C S 2.5Y 6/4 ESHW: None Encountered</p>	<p>IP16 EL= 194.5 0"-5" A L 10YR 3/3 5"-20" B B SL 10YR 6/8 20"-120" C LS 2.5Y 6/4 ESHW: 36" MOTTLES: 36" STANDING: 96"</p>	<p>IP21 EL= 203.3 0"-9" A L 10YR 3/3 9"-24" B D LS 10YR 6/8 24"-102" C S 2.5Y 6/4 ESHW: 43" MOTTLES: 43"</p>	<p>IP26 EL= 203.5 0"-10" A L 10YR 3/3 10"-18" B SL 10YR 6/8 18"-75" C LS 2.5Y 6/4 ESHW: 49" MOTTLES: 49" REFUSAL: 75"</p>	<p>IP31 EL= 221.2 0"-32" FILL LS 10YR 3/3 32"-96" C GLS 10YR 6/8 ESHW: 42" MOTTLES: 42"</p>
<p>IP6 EL= 201.0 0"-7" A LS 10YR 3/3 7"-22" B C LS 10YR 6/8 22"-120" C S 2.5Y 6/4 ESHW: None Encountered</p>					

- Test Pit Data from Plan entitled: **Detail Sheet 5 of 18 Proposed MultiFamily Development Summer Street Walpole, MA** dated January 10, 2020 revised May 1, 2020 prepared by Howard Stein Hudson, Chelmsford, MA
- BETA has added NRCS HSG ratings (in red) where test pits are located