FILE#: IWW 10619-18, WPL 10659-18

MEMORANDUM

TO: Westport Conservation Commission

FROM: Summit Saugatuck, LLC

DATE: August 24, 2018

RE: Response to July 11, 2018 Peer Review Memo of GHD

RECEIVED
AUG 24 2018
TOWN OF WESTPORT
CONSERVATION DEPARTMENT

GHD reviewed Summit Saugatuck's inland wetlands plan set dated May 7, 2018 and prepared a peer review comment memo. In the text below, GHD's comments and questions are in *italics*, and the applicant's responses are in **bold**. Divney Tung Schwalbe and Redniss & Mead have prepared the responses to Nos. 1 – 8, and William Kenny Associates and Shipman & Goodwin have responded to No. 9.

1. Background

A local development company, Summit Saugatuck, LLC, submitted an 8-30G application to the Westport Conservation Department (the Town) for a proposed affordable housing project consisting of a 187 unit apartment complex comprised of five individual structures and parking facility for 343 vehicles (the Project). The existing site includes 10 parcels with single-family homes that will be demolished to allow for construction of the apartment complex. The Project will include four 3-story buildings, one 4-story building, partial underground parking, and associated site work and utilities.

RESPONSE: The total parking count on the current site plan is 325 spaces, not 343.

2. Purpose of Technical Memorandum

The Town requested proposals for a third party review of the Project as described in the May 15, 2018 letter "RE: RFP – Third Party Review, Hiawatha Lane, Affordable Housing Project, Westport, CT". Specifically, the Town is interested in review of the potential impacts the Project may have on the wetlands, watercourses, and the flood plain, as well as reviewing the proposed stormwater management systems. The stormwater management systems will be reviewed with respect to water quality treatment and the potential impacts to surface water quality.

In this report, each item reviewed was assigned either "appears to be adequate", meaning there was sufficient information provided and the proposed work appears to be in conformance with the Town of Westport Drainage Design Manual, CT DEEP Water Quality Manual, and accepted

practice for civil engineering; or "appears to be inadequate", meaning there was not sufficient information provided, or the item does not appear to be in conformance with the Town of Westport Drainage Design Standards, CT DEEP Stormwater Quality Manual or accepted civil engineering practice.

3. *Documents Reviewed*

The following appendices submitted with the application were reviewed to assess the adequacy of the proposed work and identify the potential impacts to the wetlands and surface water quality:

1. *Plans entitled "The Village at Saugatuck, Westport, Connecticut Application for Inlands Wetland Regulated Activity Permit and Waterway Protection Line Ordinance Approval", dated May 7, 2018*
2. *Extreme precipitation tables*
3. *Stormwater calculations*
4. *Stormwater management report*
5. *Infiltration chambers*
6. *Operations and maintenance plans*
7. *Soil tests*
8. *Wetland delineation report*
9. *Wetland assessment*
10. *Wetland Function and Values*

4. *Engineered Plans*

The plans submitted with the application were reviewed for general conformance with Town of Westport Drainage Design Standards (and the November 1, 2015 update document) (Town standards), 2004 Connecticut Stormwater Quality Manual (State manual), and the typical standard of care for civil engineering practice. They include layout plans, existing conditions plans, grading and utility plans, landscape plans, erosion control plans, construction phasing plans, mechanical (wastewater) plans, profiles, and construction details.

Overall, the level of detail and comprehensiveness of the engineered plans submitted by the applicant were adequate for permit-level design drawings.

5. Runoff Calculations

The applicant used accepted civil engineering methods to perform runoff calculations, including "Urban Hydrology for Small Watersheds, Technical Release 55" to estimate peak runoff rates for Type III 24-hour storms and Bentley PondPack v10.1 to model the existing and proposed stormwater systems. The model inputs including drainage areas, curve numbers, and times of concentration, appear to be reasonable and adequate. Per the Town standards, the applicant used the current Extreme Precipitation Tables prepared by the Northeast Regional Climate Center.

Please note, not all calculations and models were re-calculated or re-computed during this review. It is the responsibility of the design engineer sealing the documents to perform calculations and the hydrologic and hydraulic modelling. To assess the adequacy of the proposed stormwater management systems, GHD randomly "spot-checked" various inputs and outputs of the model and calculations, paying close attention to the stormwater systems that may have a higher risk of adversely affecting the wetland or water quality.

Overall, the existing runoff calculations appear to be adequate and in general conformance with the Town standards and the State manual.

Although the proposed project increases impervious surfaces from 1.1 acres (pre-development) to 3.9 acres (post-development), there is a net decrease in runoff for the site. Storage and infiltration from the proposed stormwater management systems reduces peak flows generated during the 1, 2, 10, and 25-year storms to values less than the pre-development conditions. The proposed calculations appear to be adequate and in conformance with the Town standards; however, there is a lack of information regarding runoff generated during the 100-year event. The Town standards require the engineered stormwater managements systems to accommodate the 25-year type III design storm whereas the CT manual recommends peak runoff attenuation during the 100-year event.

GHD recommends that the applicant show the topography of the wetland (2' GIS contours) and perform runoff calculations for the 100-year event to quantify the impact to the wetland water surface elevation as well as the potential risk of flooding down-stream properties.

See below table for a summary of the existing and proposed runoff calculations.

Table 5.1 Summary of Runoff Calculations

Item	*Adequacy*	*Reason*	*Action Item*
Existing runoff calculations	*Appear to be adequate*	*Appear to conform to design guidelines*	*N/A*

Item	*Adequacy*	*Reason*	*Action Item*
Proposed runoff calculations	*Appear to be Inadequate*	*Does not include analysis for the 100-year storm, specifically related to offsite flooding and impact to water surface elevation of wetland*	*Show topography on plans to the south of the site (wetland) and summarize impacts of 100-year storm*

RESPONSE: **A further evaluation of potential impacts on surface elevation within the wetland south of the proposed redevelopment has been completed. This evaluation includes GIS topography with 1-foot contours and a PondPack modeling summary of existing and proposed conditions for the wetland area. Due to the proposed use of detention measures including below ground infiltration systems and infiltration basins, the total runoff volume decreases from existing to proposed conditions. This evaluation found that the project will not increase the peak water elevation within the wetland area for storms up to and including the 100-year storm, and therefore the redevelopment will have no impacts on the flooding of downstream properties. The peak water elevation decreases by approximately three-quarters of an inch for the 100-year storm.** ***See*** **Exhibit 1, Wetland Water Level Impact Evaluation for additional information.**

6. *Stormwater Management Systems*

The proposed site will utilize the following stormwater management system components to treat, store, and infiltrate runoff:

- *Catch basin inlet filters*
- *Stormwater infiltration basins*
- *Underground infiltration systems*
- *Rain gardens*
- *Footing Drains*
- *Level Spreaders*
- *Trench Drains*
- *Storm Sewer Piping*

6.1 Catch basins and Inlet Filters

The proposed site utilizes 15 catch basins to collect runoff, each are to be equipped with an AbTech Industries catch basin inlet filter to provide pretreatment. According to the manufacturer, the filters are capable of removing 80% total suspended solids (TSS) and 80% oil and gas for flows up to 500 gallons per minute (gpm). The filters are specified to contain additional media ("Smart Sponge") to help remove heavy metals and bacteria from the runoff. Due to the proprietary nature of inlet filters, there is little design guidance other than what each individual manufacturer recommends.

Overall, the inlet filters appear to be adequate however, for them to function properly they must be replaced every 1 to 3 years (according to the manufacturer.) The applicant has proposed, for the first year, to inspect and clean quarterly, and from the second year onward to inspect and clean twice per year.

The proposed catch basin structures have an internal diameter of 3-feet (ft) with a 2-ft deep sump. The State manual recommends a 4-ft internal diameter and a 4-ft deep sump from the invert of the outlet pipe to the bottom of the structure. The deep sump will aid in sediment and trash removal should the inlet filters become clogged or exceed their capacity of 500 gpm.

See below table for a summary of the proposed catch basins and inlet filters.

Table 6.1 Summary of Catch Basins and Inlet Filters

Item	*Adequacy*	*Reason*	*Action Item*
Inlet filters	*Appear to be adequate*	*Provide pre-treatment (TSS, oil, heavy metal removal)*	*N/A*
Catch basin structures	*Appear to be Inadequate*	• *2-ft sump is too small* • *3-ft internal diameter is too small*	*All structures have an internal diameter of 4-ft and a 4-ft deep sump*

RESPONSE: The proposed catch basins have been revised to include a 4-foot internal width and 4-foot minimum sump. *See* Detail #5 on Sheet SP-5.2 for additional information.

6.2 Infiltration Basins

The proposed site utilizes three at-grade, open stormwater infiltration basins to provide stage storage and infiltration of stormwater. The infiltration basins were designed to infiltrate the 1-inch water quality volume and provide storage for peak flows up to the 25-year storm with negligible overflow. Test pits indicate percolation rates greater than the minimum of 0.3 inches per hour (in/hr) for infiltration basins. Because infiltration rates are greater than 3 in/hr, pretreatment is required, which the applicant has included in the design. However, two test pits

(TP-7 and TP-8) exhibit percolation rates of 10.5 in/hr and 13.5 in/hr that is greater than 5.0 in/hr recommended by the State.

GHD recommends that the applicant provide a construction detail or specification for the infiltration basins. The proposed soil matrix used to construct the basin (bottom, sub-grade, and side slopes) should be designed such that it can impede infiltration velocity to 5.0 in/hr to provide the proper hydraulic residence time to allow sufficient time for treatment by improving water quality as it percolates through the subsurface.

See below table for a summary of the proposed infiltration basins.

Table 6.2 Summary of Infiltration Basins

Item	*Adequacy*	*Reason*	*Action Item*
Water quality volume (1")	*Appear to be adequate*	*Systems designed to infiltrate 1-inch water quality volume*	*N/A*
Peak rate attenuation (up to 25-year)	*Appear to be adequate*	*Systems can store 25-year storm with negligible overflow*	*NA*
Percolation rates	*Appear to be inadequate*	*Test pits TP-7 and TP- 8 (for systems BB-2 and BB-4) exceed the State recommended percolation rate of 5 in/hr and may not provide minimum residence time of 12 hours*	*Utilize engineered soil to provide a hydraulic residence time of 12 hours*
Construction details	*Appear to be inadequate*	*Plans do not provide information or show details for construction of infiltration basins*	*Provide typical section and construction detail showing dimensions, materials, surface treatment, etc.*

RESPONSE: An infiltration basin construction detail has been provided on Sheet SP-5.4, which includes the basin side slopes, bottom, sub-grade, and 6-inches of topsoil. SP-2.1 includes the required elevations and surface area for each infiltration basin. The basin seed mix, ERNMX-183, is shown on SP-3.1 and 3.2. The percolation rates provided are for subsoil only. The top soil percolation rate will likely be slower than the subsoil due to the presence of organic material. Testing of the topsoil will be conducted prior to construction and the topsoil amended if necessary to impede infiltration velocity to 5.0 inches per hour to provide the proper hydraulic residence times to allow sufficient time for treatment.

6.3 Underground Infiltration Systems

The proposed site utilizes three large underground infiltration systems (StormTech SC-740 chambers) to provide storage and infiltration of stormwater. The infiltration systems were designed to infiltrate the 1-inch water quality volume and provide storage for peak flows up to the 25-year storm, with negligible surcharge to a secondary component (rain garden or level spreader). As suggested in the State manual, the systems utilize catch basin inserts as pretreatment. Test pits indicate percolation rates greater than the minimum of 0.3 in/hr for underground infiltration systems. However, two test pits (TP-5 and TP-6) exhibit percolation rates of 8.25 in/hr and 10.5 in/hr that is greater than maximum of 5.0 in/hr recommended by the State.

GHD recommends that the applicant provide further information on the "basis of design" for the underground infiltration systems, specifically how the percolation rate will not adversely affect the wetland. If the applicant proposes to remove and replace the unsuitable material below the chambers with a slower draining material (to allow for increased hydraulic residence time), they must provide backup documentation.

In addition, the construction detail on sheet SP-5.3 entitled "Isolator Row and Inspection Port" refers to the installation of the inspection ports being optional; GHD recommends requiring at least one inspection port on all rows of chambers in the underground infiltration systems. Inspection ports allow the inspector to understand how much sediment or standing water is in the system, which helps determine system condition and whether or not it needs replacement or rehabilitation.

See below table for a summary of the underground infiltration systems.

Table 6.3 Summary of Underground Infiltration Systems

Item	*Adequacy*	*Reason*	*Action Item*
Water quality volume (1")	*Appear to be adequate*	*Systems designed to infiltrate 1-inch water quality volume*	*N/A*
Peak rate attenuation (up to 25-year)	*Appear to be adequate*	*Systems can store 25-year storm with negligible overflow*	*N/A*

Item	*Adequacy*	*Reason*	*Action Item*
Percolation rates	*Appear to be inadequate*	*Test pits TP-5 and TP- 6 (for systems BB-1 and BB-3) exceed the State recommended percolation rate of 5 in/hr and may not provide minimum residence time of 6 hours*	• *Provide information on how this will not adversely impact wetland* • *If engineered soil material is proposed to increase residence time, provide backup documentation*
Construction details	*Appear to be inadequate*	*Sheet SP-5.3 refers to the installation of inspection ports being optional*	*Provide at least one inspection port on each row of chambers in each system*

RESPONSE: **As to percolation rates, BB-1 is more than 40 feet from the wetland and receives runoff only from the roof. BB-3 is more than 270 feet from the wetland. Regarding construction details, Detail 5 on sheet SP-5.3 has been revised to require an inspection port on each row of chambers in each system. The isolator rows in the underground infiltration systems will capture incoming sediment, slowing the infiltration rate over time as the sediment restricts the flow rate of the filter fabric lining the bottom of the isolator row.**

6.4 Rain Gardens

The proposed site utilizes six small rain gardens, or bioretention facilities, to store and infiltrate stormwater from the green roof, parking lot, and overflow from other stormwater systems should they surcharge. The rain gardens appear to use a stone check dam to create a forebay within the raingarden to provide pretreatment in addition to treatment provided by the catch basin filters and the green roof. They appear to provide at least three feet of separation between the bottom of the rain garden and the water table as recommended in the State manual. The composition of the filter bed, although proprietary, appears to be adequate and consists of layers of mulch, amended soil, subbase, geotextile, a drainage course, and river stone. Some of the systems utilize an 8-inch PVC riser pipe to allow for a 6-inch ponding depth prior to discharge to other stormwater management systems.

See below table for a summary of the proposed rain gardens.

Table 6.4 Summary of Rain Gardens

Item	*Adequacy*	*Reason*	*Action Item*
Rain Garden	*Appear to be adequate*	*Systems appear to be adequately designed*	*N/A*

6.5 Footing Drains

The proposed design utilizes foundation footing drains that discharge to two different locations on site; one footing drain (for building E) connects directly to the existing storm sewer on Hiawatha Lane and the other footing drain (serving buildings A, B, C and D) drains through a drainage manhole and is routed to a level spreader. According to the Town standards, footing drains shall not be connected to the Town-owned storm sewer unless specifically allowed by the director of Public Works.

Unless permission to connect to the Town storm sewer has already been granted, GHD recommends that the applicant seek permission to do so. If permission has not yet been granted, a capacity analysis of the existing storm sewer should be performed to evaluate if the piping can accommodate the additional proposed flows.

Sheet SP-2.2 also refers to a "building sump pump" in the garage of Building A; The application provides little to no information regarding the routing, discharge capacity, or discharge location. GHD recommends that the applicant submit detailed information on this pumping system.

See below table for a summary of the proposed foundation footing drains.

Table 6.5 Summary of Footing Drains

Item	*Adequacy*	*Reason*	*Action Item*
Footing Drain (Building E)	*Appear to be inadequate*	*Proposed system is connected directly to Town-owned storm sewer*	*Applicant to seek permission to discharge to storm sewer and provide capacity analysis under existing and proposed conditions*

Item	*Adequacy*	*Reason*	*Action Item*
Sump Pumps	*Appear to be inadequate*	*Sheet SP-2.2 refers to a building sump pump in the garage of Building A. Routing of the discharge is unknown.*	• *Applicant to provide information on all building sump pump discharge locations.* • *If discharges connected to Town-owned storm sewer, provide analysis on pipe capacity with actual pump flow rates*

RESPONSE: **Exhibit 2 includes a sump pump detail and pump curves. The footing drain and sump pump for Building E will connect to a proposed catch basin on the project site, which will connect to an existing catch basin on Hiawatha Lane Extension. Hiawatha Lane Extension is a private street, which means town permission is not required for the connection. The 2-inch discharge pipe from the sump pump will connect to the proposed catch basin with a 12-inch diameter outlet pipe. The pump has a rating of 30 gpm, and the 12-inch pipe has a total capacity of 1,600 gpm, and an available capacity of 1,000 gpm during the 25-year storm. The flow from the sump pump and the remainder of the site is less than the pre-development flow and the existing flow and that currently enter the existing catch basin.**

The footing drain and sump pump for Buildings A-D will connect to a drainage manhole east of Building A, which will drain to a level spreader uphill of the wetland. This 3-inch discharge pipe will connect to a proposed manhole with a 15-inch diameter outlet pipe. The pump has a rating of 112 gpm, and the 15-inch pipe has a capacity of 2,050 gpm, and an available capacity of 1,060 gpm during the 25-year storm.

6.6 Level Spreaders and Basin Overflows

The proposed design utilizes two 70-foot long level spreaders to distribute concentrated flows from day-lighted discharge pipes (end sections) prior to entering the wetland. Per the Town standards, the proposed level spreaders were designed to promote "overland flow" and maintain a maximum water depth of 1/2-inch for the 25-year storm. Basin overflows on BB-2 and BB-4 were also designed to maintain overland flow conditions by maintaining a maximum water depth of 1/2-inch for the 25-year storm.

Overall, the proposed level spreaders and basin overflows appear to be adequate. See below table for a summary.

Table 6.6 Summary of Level Spreaders and Basin Overflows

Item	*Adequacy*	*Reason*	*Action Item*
Level Spreaders and Basin Overflows	*Appear to be adequate*	*Proposed systems appear to promote overland flow by maintaining a maximum water depth of 1/2-inch for the 25-year storm.*	*N/A*

6.7 Storm sewer piping

The proposed alignment, routing, and depth of cover (2-feet) of the storm sewer piping appear to be acceptable. However, the pipe diameter and material are not provided for the storm sewer (mains).

Table 6.7 Summary of Storm Sewer Piping

Item	*Adequacy*	*Reason*	*Action Item*
Storm Sewer Piping	*Appear to be inadequate*	*Unable to locate pipe type or diameter of storm sewer mains.*	*Applicant to specify pipe type and diameter of storm sewer mains.*

RESPONSE: The proposed type and diameter of the storm sewer mains have been added to sheets SP-2.1 and SP-2.2, where not previously provided.

6.8 Trench Drains

The proposed site utilizes several trench drains to collect runoff (sheet flow) prior to entering the garage and Hiawatha Lane. Trench drains are acceptable but they must be inspected and cleaned frequently, as they are susceptible to clogging with sediment, leaves, and debris. The applicant should specify the trench drain inspection and maintenance schedule in the Operation and Maintenance Plan.

Table 6.8 Summary of Trench Drains

Item	*Adequacy*	*Reason*	*Action Item*
Trench Drains	*Appear to be inadequate*	*Unable to locate information on operation and maintenance for trench drains*	*Applicant to address trench drains in operation and maintenance plan.*

RESPONSE: Maintenance will include regular inspections and removal of accumulated sediment every 6 months. Full maintenance procedures have been added to the Operation and Maintenance Plan in Exhibit 3, and on the new full size plan sheet OM-1.

6.9 Green Roof

The proposed buildings utilize a green roof to incorporate low impact development (LID) into the design. The green roof serves as the first component of treatment for the rainfall that precipitates onto the buildings before it is routed to subsequent stormwater management components. For the green roof to function properly and provide suitable stormwater treatment, it must be regularly monitored and maintained. GHD was unable to identify engineering plans, details or notes for the green roof. In addition, the Operation and Maintenance plan did not include information regarding the green roof.

The applicant should specify the components of the green roof including drainage, membranes, substrates, vegetation, and irrigation. The applicant should provide construction details, plans, notes, and include detailed information in the Operation and Maintenance plan.

Table 6.8 Summary of Green Roof

Item	*Adequacy*	*Reason*	*Action Item*
Green Roof	*Appears to be inadequate*	*Unable to locate detailed information on green roof construction and operation and maintenance*	*Applicant to provide detailed information on green roof, including; plans, details, notes, and operation and maintenance plan.*

RESPONSE: A detail of the green roof is provided on Sheet SP-5.4 including drainage, membranes, substrates, and vegetation. Irrigation will come from building mounted hose bibs. The maintenance plan includes requirements for establishing and maintaining vegetative cover, clearing drainage outlets, and making structural repairs. Guidance for actions to be taken in all 4

seasons is provided in the Operation and Maintenance Plan and on Sheet OM-1.

7. Operation and Maintenance Plan

Overall, the operation and maintenance plan appears to be adequate (for the components identified). However, the applicant did not address the following items:

- *Trench drains*
- *Ensure that the rain gardens remain vegetated*
- *Plowing and road salt application*

As previously stated, trench drains are an acceptable means for collecting runoff, especially sheet flow, but must be maintained more frequently than catch basins. The grate size and long narrow shape of these structures make them susceptible to clogging thereby reducing inlet capacity. When these structures fail (due to clogging) the sheet flow they were intended to capture will travel past the grate and flow to Hiawatha Lane, the underground parking area, or other unplanned areas.

Per the Town standards (Item 5, Engineered Systems), the applicant must include a maintenance narrative explaining how the six proposed rain gardens will not become permanent wetlands overtime.

The operation and maintenance plan does not address snow plowing or deicing measures, specifically the application of road salt. GHD is concerned that salt-laden snow and any resulting runoff from snowmelt may negatively affect the wetland. GHD recommends that the applicant delineate, on the plans, "snow disposal areas" that are located as far from the wetland as possible. The applicant should also demonstrate how de-icing chemicals, excess sand, and road salt will not negatively impact the wetlands or stormwater management systems.

In addition, the operation and maintenance should include the proposed green roof and identify the frequency of inspections during vegetation establishment (minimum of 5 years), the acceptable level of plant mortality, removal of invasive plants and acceptable limits of bare ground. In addition, there should be a long term Operation and Maintenance Plan to ensure the green roof remains vegetated.

Table 7.1 Summary of Operation and Maintenance Plan

Item	*Adequacy*	*Reason*	*Action Item*
Trench Drains	*Appear to be inadequate*	*Unable to locate information on operation and maintenance for trench drains*	*Applicant to address trench drains in operation and maintenance plan.*
Rain Gardens	*Appear to be inadequate*	*Unable to locate information on methods to prevent rain garden from becoming permanent wetland*	*Applicant to address methods to prevent rain gardens from becoming permanent wetland*
Snow plowing and de-icing	*Appear to be inadequate*	*Unable to locate information on snow plowing and de-icing and how these activities will not adversely impact the wetlands or stormwater management systems*	*Applicant to address the following:* • *Provide snow disposal areas on plans* • *Document how sand and de-icing chemicals will not adversely impact the wetland or stormwater management systems*
Green Roof	*Appear to be inadequate*	*Unable to locate information on operation and maintenance for the green roof*	*Applicant to address methods to ensure the green roof is property established and maintained:* • *Inspection frequency during vegetation establishment* • *Acceptable level of plant mortality* • *Removal of invasive plants* • *Acceptable limits of bare ground. I* • *Long term plan to ensure the green roof remains vegetated*

RESPONSE: Maintenance procedures for the trench drains have been added to the Operation and Maintenance Plan. Maintenance procedures for the rain gardens have been expanded in the Operation and Maintenance Plan, which includes removal of accumulated sediment and invasive plants.

Snow disposal areas are located in corners of parking lots and have been noted on Sheets SP-1.1 and 1.2. Maintenance procedures for the green roof have been expanded and include requirements for establishing and maintaining vegetative cover as well as 4-season maintenance requirements. See the Operation and Maintenance Plan and sheet OM-1 *See* Exhibit 3 for more information.

8. Erosion and Sedimentation Controls

The applicant submitted a comprehensive erosion and sedimentation plan, construction details, construction notes, and a phasing plan. Proposed erosion control measures include catch basin inserts, double-row silt fence, contained soil stockpiles, inlet protection, construction entrances, coir logs, and sediment traps.

The narrative provided in the notes on sheet SP-4.1 summarizes the following goals for a comprehensive erosion and sedimentation control plan:

- *Trapping particles at source by promptly stabilizing disturbed areas*
- *Avoiding concentration of runoff*
- *Avoiding contamination of existing storm drains*
- *Weekly maintenance (and after storm events) of controls*

See below table for a summary of the proposed erosion and sedimentation control plan.

Table 8.1 Summary of Erosion and Sedimentation Controls

Item	*Adequacy*	*Reason*	*Action Item*
Erosion and Sedimentation Control Plans	*Appear to be adequate*	*Plans, notes, and details appear to be adequate*	*N/A*

9. Potential Impacts to Wetlands

GHD has reviewed the Application of Summit Saugatuck LLC for Regulated Activity Permit and Waterway Protection Line Ordinance Approval, Hiawatha Lane and Hiawatha Lane Extension, dated May 14, 2018, and the supporting technical reports and attachments. These documents discuss the existing regulated and non-regulated resources in and adjoining the Site and provide an analysis of potential impacts resulting from the proposed development. These documents also

discuss proposed mitigation measures incorporated into the project design to mitigate identified potential impacts to the wetlands and waterways on the Site.

Based on these documents:

- *The applicant is not proposing any direct impacts to wetlands or waterways on or adjoining the site.*
- *The applicant has identified that potential secondary impacts to wetlands and watercourse related to construction (short-term) and increased impervious surfaces and stormwater run-off (long-term) could occur, if unmitigated.*
- *The applicant has provided an analysis and discussion of proposed mitigation measures to address potential short-term and long-term adverse impacts on the wetlands and watercourses as a result of the project. The proposed mitigation measures include an erosion and sedimentation control plan to address potential short-term due to construction activities and a comprehensive stormwater management plan to address potential long-term adverse impacts to the wetlands and water courses.*

The stormwater management plan presented incorporates a variety of accepted best management practices to address stormwater quantity and stormwater quality generated by the project prior to its discharge to the wetland. GHD has reviewed the stormwater management plan and has identified items where additional information is required or where inadequacies exist in the design (see Item 6). If these inadequacies can be addressed to GHD's and the Towns satisfaction, the amended stormwater management plan will appear to be adequate to mitigate potential long-term adverse impacts to the wetlands and waterways.

As previously expresses in this memorandum (see Item 7), the stormwater management facilities designed for this facility must be properly inspected and maintained on a regular basis on order to perform their designed functions. GHD recommends that the applicant provide the Town with financial assurances for the inspection and maintenance of the stormwater system.

GHD believes the erosion and sedimentation control plan is adequate as presented and meets the Town and state standards for erosion and sedimentation control plans (see Item 8). The plan appears adequate to mitigate potential short term impacts resulting from construction.

GHD believes the applicant has adequately identified and characterized the wetland and watercourse resources on the Site. The applicant proposes to place 2.8 acres into a conservation easement that includes the wetlands and watercourses on the Site. The applicant also proposes to install permanent markers to delineate the easement boundary.

However, the applicant has not identified who will be the owner of the easement area that is responsible for the inspection; maintenance of the easement markers and protection of the easement; and funding for these actions.

GHD believes this easement and the proposed control of invasive species in the adjoining areas will benefit the wetland in the long term. GHD recommends the applicant provide a plan to address the maintenance of the easement area. The plan should include the removal of invasive plants and a schedule of proposed native plants; including the species, size and form of materials to be used. In addition, the plan should include proposed monitoring and performance standards where native planting and invasive species control will occur. At a minimum, all dead tree and shrub specimens will be replaced during the first three (3) years, subsequently, if greater than 10 percent mortality is observed. The inspection and maintenance program should be conducted by a qualified landscaper with the appropriate credentials.

RESPONSE: **Improvements and clarifications to the stormwater management plan (GHD comments 6.1 to 6.8) have been addressed as discussed above and on the site plan as revised to August 24, 2018. Stormwater operations and maintenance (GHD comment 7.1) are addressed above and on the revised site plan.**

The "owner" (grantee) of the proposed Conservation Easement is the Town of Westport's choice, and is presumably the Town of Westport and/or its Conservation Commission. The applicant will accept a condition of approval requiring that the Conservation Easement will include each of the maintenance obligations listed in GHD's comment above, and otherwise will accept a standard Conservation Easement used by the Town of Westport.

As to financial guarantees, the applicant will, of course, accept the financial guarantees in form and amount, for public improvements and erosion controls as required by the Connecticut General Statutes.

10. Summary of Recommendations

The following is a summary of the action items identified:

Item	*Action Item*
Proposed runoff calculations	*Show topography on plans to the south of the site (wetland) and summarize impacts of 100-year storm*
Catch basin structures	*All structures have an internal diameter of 4-ft and a 4-ft deep sump*
Infiltration basin percolation rates	*Utilize engineered soil to provide a hydraulic residence time of 12 hours*
Infiltration basin construction details	*Provide typical section and construction detail showing dimensions, materials, surface treatment, etc.*

Item	*Action Item*
Underground infiltration system percolation rates	*Provide information on how this will not adversely impact wetland* *If engineered soil material is proposed to increase residence time, provide backup documentation*
Underground infiltration system construction details	*Provide at least one inspection port on each row of chambers in each system*
Footing drain (Building E)	*Seek permission to discharge to storm sewer and provide capacity analysis under existing and proposed conditions*
Footing drain sump pumps	*Provide information on all building sump pump discharge locations* *If discharges are to be connected to Town-owned storm sewer, provide analysis on pipe capacity with actual pump flow rates*
Storm sewer piping	*Specify pipe type and diameter of storm sewer mains.*
Green Roof	*Applicant to provide detailed information on green roof, including; plans, details, notes, and operation and maintenance plan*
Operations and Maintenance Plan - trench drains	*Address trench drains in operation and maintenance plan.*
Operations and Maintenance Plan - rain gardens	*Address methods to prevent rain gardens from becoming permanent wetland*
Operations and Maintenance Plan - snow plowing and de-icing	*Provide snow disposal areas on plans* *Document how sand and de-icing chemicals will not adversely impact the wetland or stormwater management systems*
Operation and Maintenance Plan - financial assurance	*Provide the Town with financial assurances for the inspection and maintenance of the stormwater system*

Item	*Action Item*
Operations and Maintenance Plan - green roof	*Address methods to ensure the green roof is property established and maintained: inspection frequency, acceptable plant mortality levels, removal of invasive plants; acceptable limits of bare ground, and Long term plan to ensure the green roof remains vegetated*
Easement Area	*Identify the owner of the easement area* *Identify who is responsible for the maintenance and protection of the easement area and funding for these actions* *Provide an easement area maintenance plan that includes:* • *removal of invasive plants and a* • *schedule of proposed native plants; including the species, size and form of materials to be used. In addition, the plan should include* • *proposed monitoring and performance standards* • *Conducted by a qualified landscaper*

RESPONSE:

Action Item	***Response***
Show topography on plans to the south of the site (wetland) and summarize impacts of 100-year storm	**Wetland Impact Evaluation Completed, *see* Exhibit Exhibit 1**
All structures have an internal diameter of 4-ft and a 4-ft deep sump	**The proposed catch basins have been revised to include a 4-foot internal width and 4-foot minimum sump**
Utilize engineered soil to provide a hydraulic residence time of 12 hours	**Top soil to be used to provide hydraulic residence time**
Provide typical section and construction detail showing dimensions, materials, surface treatment, etc.	**Detail of Infiltration Basin added on Sheet SP-5.4**

Action Item	***Response***
Provide information on how this will not adversely impact wetland *If engineered soil material is proposed to increase residence time, provide backup documentation*	**Provided by William Kenny at July 18, 2018 hearing** **Top soil will be tested and amended as needed increase residence time.** Condition
Provide at least one inspection port on each row of chambers in each system	**Inspection ports added to detail**
Seek permission to discharge to storm sewer and provide capacity analysis under existing and proposed conditions	**Pipe capacity described above, private road does not require permission for connection**
Provide information on all building sump pump discharge locations *If discharges are to be connected to Town-owned storm sewer, provide analysis on pipe capacity with actual pump flow rates*	**Sump pump detail and pump curves provided in Exhibit 2** **Pipe capacity described above**
Specify pipe type and diameter of storm sewer mains.	**Pipe type and diameter shown on SP-2.1 and SP-2.2**
Applicant to provide detailed information on green roof, including; plans, details, notes, and operation and maintenance plan	**Green roof detail added to sheet SP-5.4 and operation and maintenance plan included in Exhibit 3**
Address trench drains in operation and maintenance plan.	**Trench drain operation and maintenance plan included in Exhibit 3**
Address methods to prevent rain gardens from becoming permanent wetland	**Rain Garden operation and maintenance plan included in Exhibit 3**
Provide snow disposal areas on plans *Document how sand and de-icing chemicals will not adversely impact the wetland or stormwater management systems*	**Snow disposal areas shown on SP-1.1 and SP-1.2** **NaCl will not be used for deicing; road and snow stockpiles drain to stormwater infiltration systems**
Provide the Town with financial assurances for the inspection and maintenance of the stormwater system	**Addressed in response to No. 10, above**

Action Item	***Response***
Address methods to ensure the green roof is property established and maintained: inspection frequency, acceptable plant mortality levels, removal of invasive plants; acceptable limits of bare ground, and Long term plan to ensure the green roof remains vegetated	**Green roof operation and maintenance plan included in Exhibit 3**
Identify the owner of the easement area *Identify who is responsible for the maintenance and protection of the easement area and funding for these actions* *Provide an easement area maintenance plan that includes:* • *removal of invasive plants and a* • *schedule of proposed native plants; including the species, size and form of materials to be used. In addition, the plan should include* • *proposed monitoring and performance standards* • *Conducted by a qualified landscaper*	**Addressed in response to No. 10, above**

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FILE#: IWW 10619-18, WPL 10659-18

THE VILLAGE AT SAUGATUCK
WESTPORT, CONNECTICUT

RECEIVED
AUG 24 2018
TOWN OF WESTPORT
CONSERVATION DEPARTMENT

RESPONSE DOCUMENTS TO JULY 11, 2018 MEMO OF GHD

Prepared for:

Summit Saugatuck, LLC
55 Station Street
Southport, CT 06890

Prepared by:

Divney Tung Schwalbe, LLP
One North Broadway, Suite 1407
White Plains, NY 10601

July 30, 2018

EXHIBIT 1
WETLAND IMPACT EVALUATION

The south side of the site includes a wetland area adjacent to the MetroNorth Rail Road. The wetland extends along the railroad to the west and east beyond the project site. A culvert crosses under the railroad to drain the wetland. An evaluation of the watershed area tributary to the wetland was performed to evaluate the impact on the wetland area that is expected to occur as a result of the proposed project. See Figure No. W-1, Watershed Evaluation Area, for additional information

Existing Conditions

The watershed area was approximated using GIS from the Towns of Norwalk and Westport. The total watershed area is approximately 24 acres. The 9, 10, and 11-foot contours were used to model the wetland as a pond. See Figure No. W-2, Wetland GIS Topo for approximate grades within the wetland. The outlet of the pond was modeled as (4) 18-inch diameter pipes. This outlet was used because it best yielded the 100-year flood elevation of 11 feet as shown on the FEMA flood maps. The Existing Conditions PondPack model used in the Stormwater Management Report was revised to include both the wetland area and off-site areas not included in the original model. The 10, 25, 50, and 100-year storms were modeled and the maximum water elevations were calculated.

Proposed Conditions

The Proposed Conditions PondPack model, which includes the proposed infiltration systems and basins, was revised to evaluate the larger storm events and add the same wetland and off-site sub-watershed as used in the existing conditions model. Additionally, some of the pond dimensions were adjusted to avoid overtopping, compromising the runoff rates in the model. These adjustments were used to simulate runoff bypassing the stormwater management measures when they are filled.

Findings

The following table summarizes the changes from existing to proposed conditions.

	Existing	Proposed
DP 3[1] – Runoff Volume (ac-ft)	2.526	1.610
DP 3 – Peak Discharge (cfs)	24.07	27.40
Wetland High Water Elevation (ft)	11.05	10.99

The results of the model show that the effect on the wetland flood elevation from the project will be minimal, with a slight decrease in the peak elevation expected.

Some assumptions were made in defining the watershed boundaries and the pond outlets and the watersheds may vary as the capacities of the storm sewers and streams are exceeded. These assumptions and variances are consistent between the two models. The calculated high water elevation would change with varying inputs, but the conclusion that the proposed project will not have an adverse effect on the high water elevations and neighboring properties will not change.

Under current conditions for large storm events it is likely that water on the north side of the tracks crosses into adjacent watersheds. For example, water from the east in Indian Brook may back-up and enter the evaluated watershed. Since the high water elevation in the evaluated watershed will be less than current conditions, the development will not have an adverse effect on the adjacent watersheds as well.

[1] DP 3, Design Point 3 in the stormwater management is the combined flow from the project site entering the wetland.

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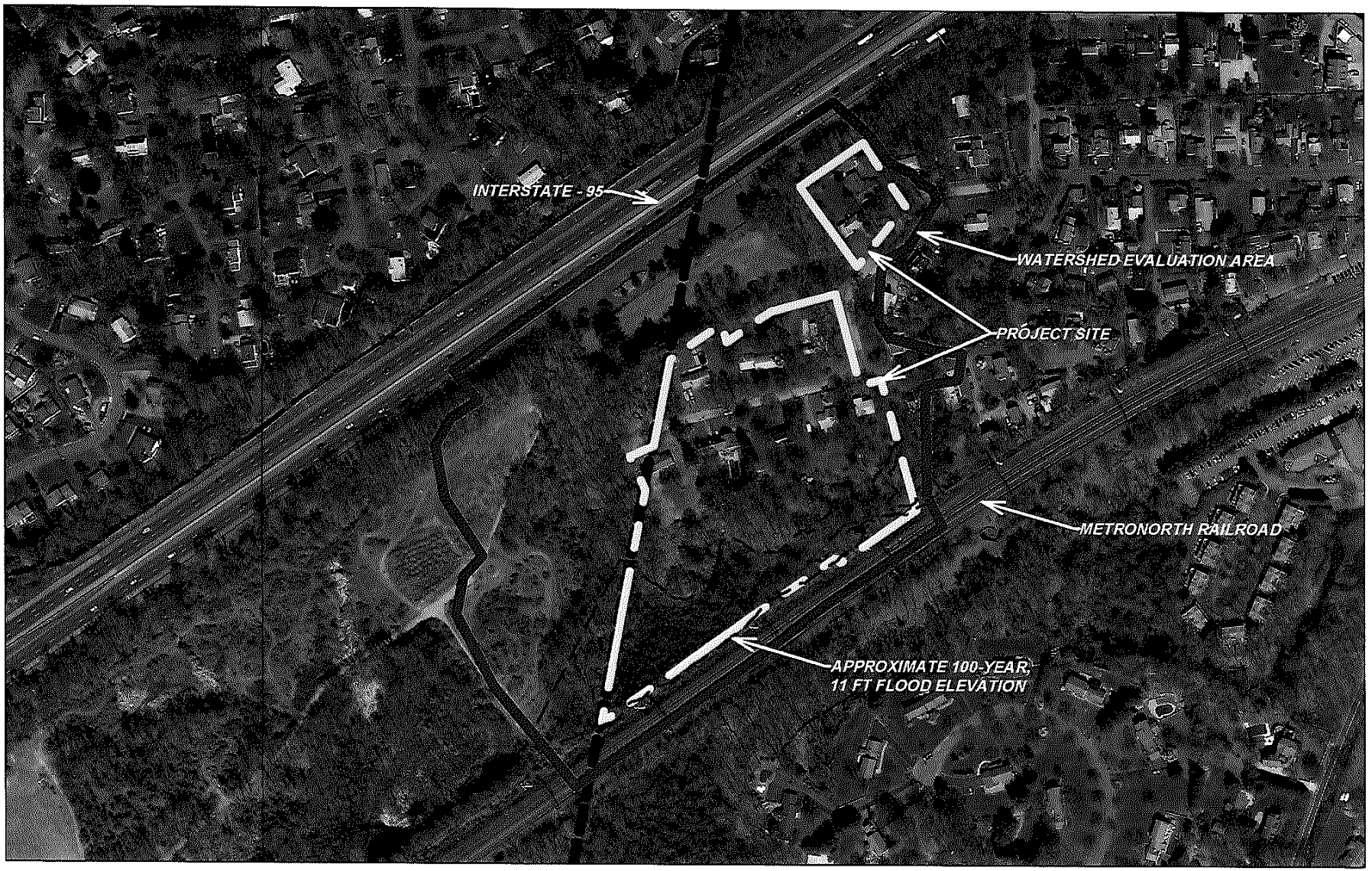

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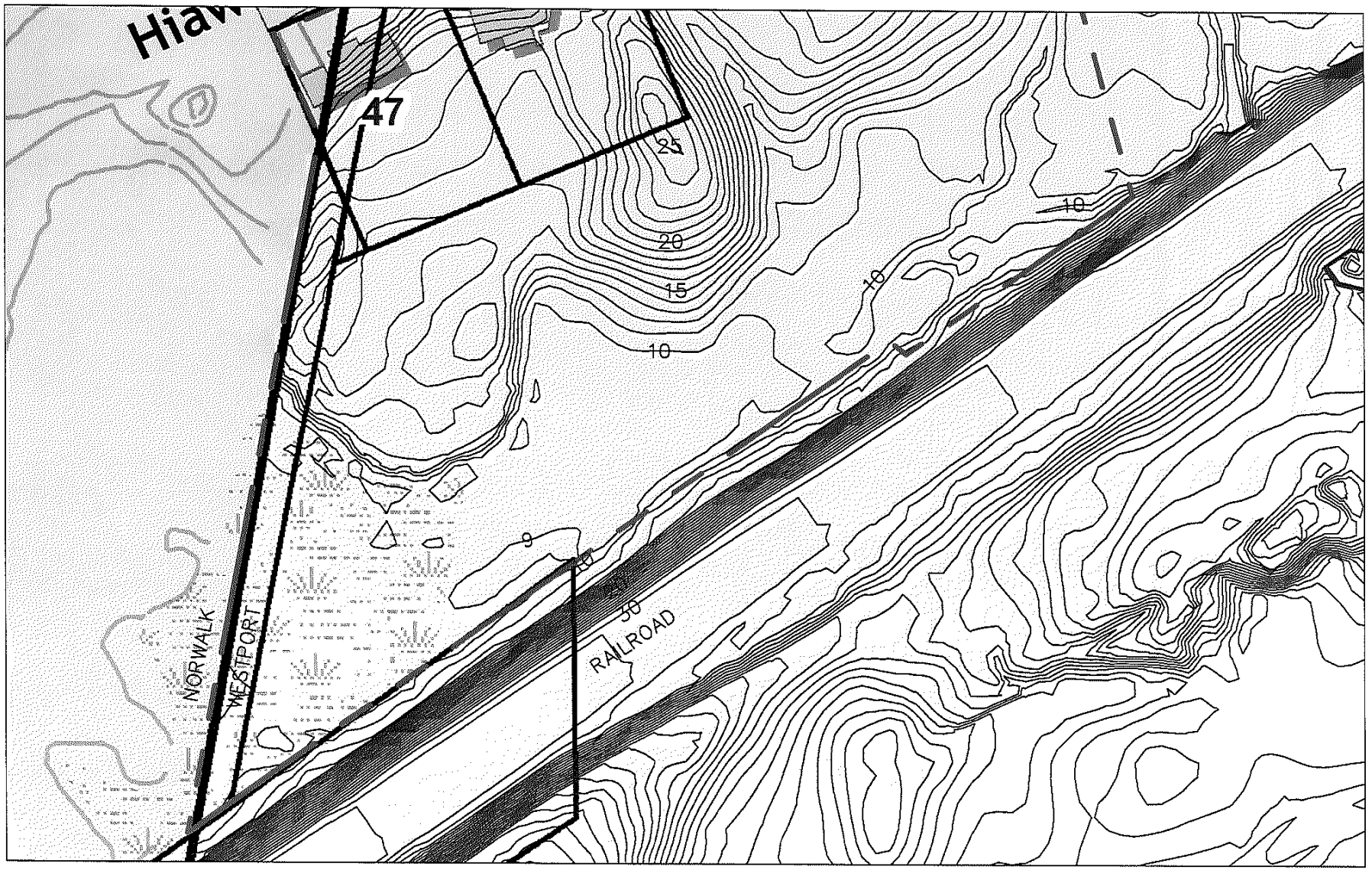
WATERSHED EVALUATION AREA

THE VILLAGE AT SAUGATUK
WESTPORT, CONNECTICUT

FIGURE NO. W-1

PLOTTED BY: DIVNEY TUNG SCHWALBE, LLP SHOGREN, MARK 7/30/2018 2:31 PM G:\CADD\644 HIAWATHA LANE - SUMMIT MISC\HIAWATHA LANE\DESIGN\644 AUTOCAD FILES\644 MJS GIS WATERSHED.DWG



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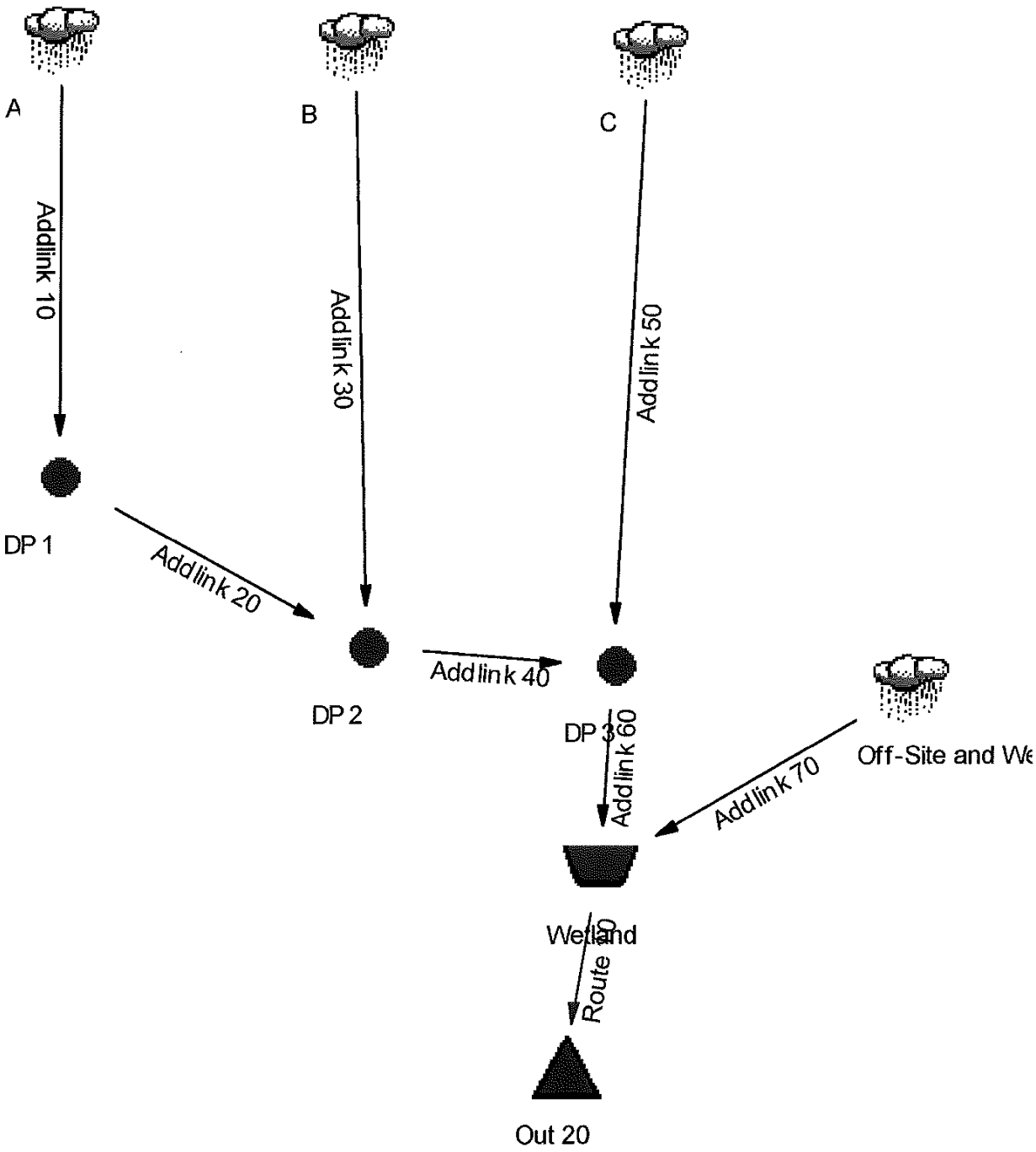
WETLAND GIS TOPO

THE VILLAGE AT SAUGATUK
WESTPORT, CONNECTICUT

FIGURE NO. W-2

Pond Pack Existing Conditions


A
B
C
Addlink 10
Addlink 30
Addlink 50
DP 1
Addlink 20
DP 2
Addlink 40
DP 3
Addlink 60
Off-Site and We
Addlink 70
Wetland
Route 10
Out 20

MASTER DESIGN STORM SUMMARY

Network Storm Collection: Westport 2016

Return Event	Total Depth in	Rainfall Type	RNF ID
10	5.1000	Synthetic Curve	TypeIII 24hr
25	6.4000	Synthetic Curve	TypeIII 24hr
50	7.5500	Synthetic Curve	TypeIII 24hr
100	8.9400	Synthetic Curve	TypeIII 24hr

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

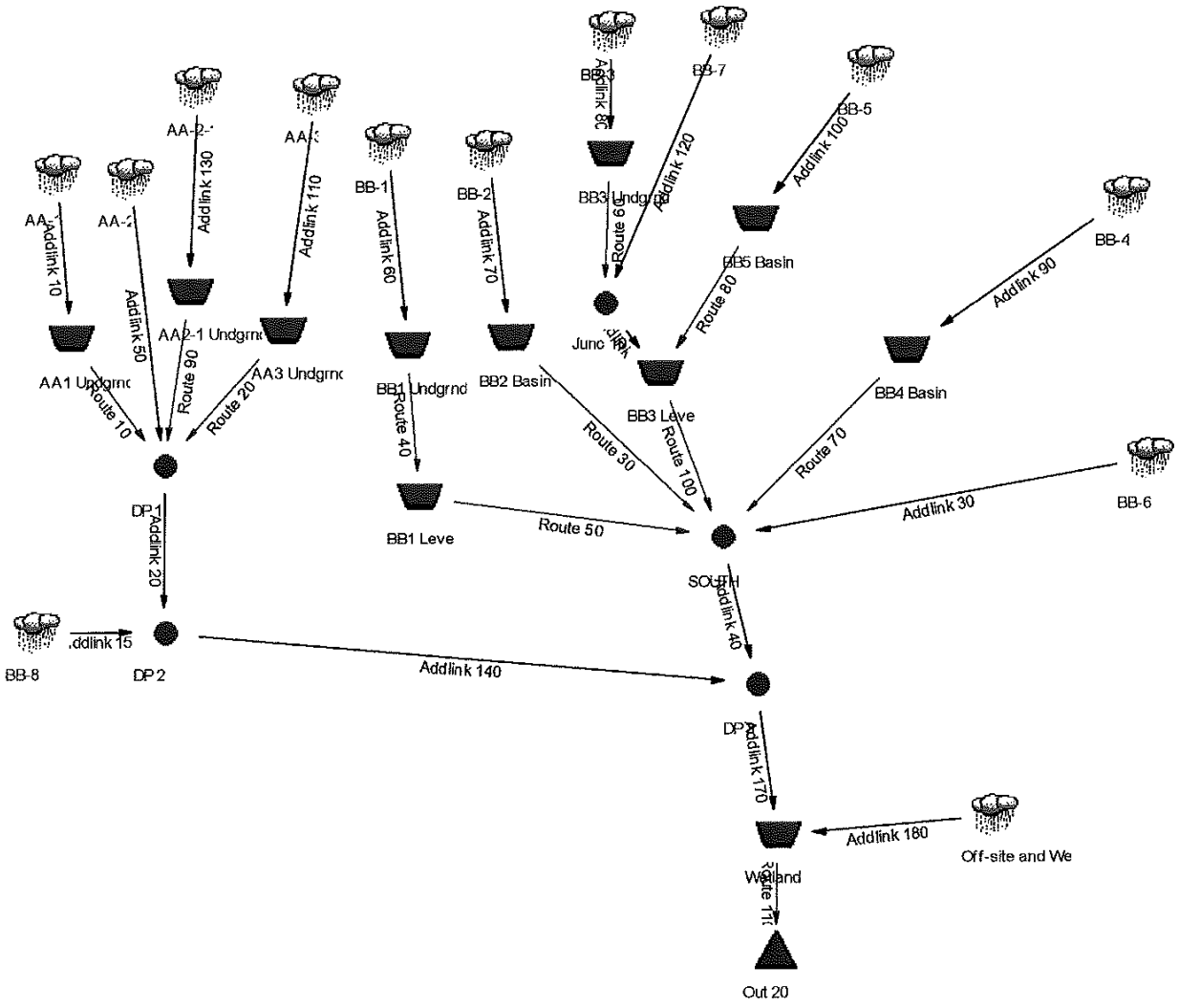
Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
A	AREA	10	.132		12.1500	1.41		
A	AREA	25	.195		12.1500	2.12		
A	AREA	50	.255		12.1500	2.77		
A	AREA	100	.330		12.1500	3.58		
B	AREA	10	.113		12.2000	1.15		
B	AREA	25	.169		12.2000	1.73		
B	AREA	50	.222		12.2000	2.27		
B	AREA	100	.288		12.2000	2.95		
C	AREA	10	.727		12.2500	6.61		
C	AREA	25	1.101		12.2500	10.23		
C	AREA	50	1.457		12.2500	13.61		
C	AREA	100	1.908		12.2500	17.85		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
DP 1	JCT	10	.132		12.1500	1.41		
DP 1	JCT	25	.195		12.1500	2.12		
DP 1	JCT	50	.255		12.1500	2.77		
DP 1	JCT	100	.330		12.1500	3.58		
DP 2	JCT	10	.245		12.1500	2.52		
DP 2	JCT	25	.364		12.1500	3.82		
DP 2	JCT	50	.477		12.1500	5.02		
DP 2	JCT	100	.618		12.1500	6.51		
DP 3	JCT	10	.973		12.2000	8.92		
DP 3	JCT	25	1.466		12.2000	13.79		
DP 3	JCT	50	1.933		12.2000	18.36		
DP 3	JCT	100	2.526		12.2000	24.07		
OFF-SITE AND WET AREA		10	3.193		12.2500	29.34		
OFF-SITE AND WET AREA		25	4.763		12.2500	44.41		
OFF-SITE AND WET AREA		50	6.244		12.2500	58.42		
OFF-SITE AND WET AREA		100	8.114		12.2500	75.84		
*OUT 20	JCT	10	4.165		12.6000	19.29		
*OUT 20	JCT	25	6.228		12.6000	28.65		
*OUT 20	JCT	50	8.177		12.6000	33.83		
*OUT 20	JCT	100	10.640		12.6500	38.74		
WETLAND IN	POND	10	4.166		12.2500	38.25		
WETLAND IN	POND	25	6.229		12.2500	58.03		
WETLAND IN	POND	50	8.177		12.2500	76.45		
WETLAND IN	POND	100	10.640		12.2000	99.56		
WETLAND OUT	POND	10	4.165		12.6000	19.29	10.19	.987
WETLAND OUT	POND	25	6.228		12.6000	28.65	10.48	1.561
WETLAND OUT	POND	50	8.177		12.6000	33.83	10.74	2.159
WETLAND OUT	POND	100	10.640		12.6500	38.74	11.05	3.020

Pond Pack Proposed Conditions



AA-1
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Route 100
Route 80
Route 70
Route 50
Route 60
Route 110
AA1 Undgrnd
AA2-1 Undgrnd
AA3 Undgrnd
BB1 Undgrnd
BB2 Basin
BB3 Undgrnd
BB5 Basin
BB3 Leve
BB4 Basin
BB1 Leve
DP1
DP2
SOUTH
Wetland
Off-site and We
Out 20

MASTER DESIGN STORM SUMMARY

Network Storm Collection: Westport 2016

Return Event	Total Depth in	Rainfall Type	RNF ID
10	5.1000	Synthetic Curve	TypeIII 24hr
25	6.4000	Synthetic Curve	TypeIII 24hr
50	7.5500	Synthetic Curve	TypeIII 24hr
100	8.9400	Synthetic Curve	TypeIII 24hr

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
AA-1	AREA	10	.169		12.1000	1.99		
AA-1	AREA	25	.223		12.1000	2.57		
AA-1	AREA	50	.271		12.1000	3.09		
AA-1	AREA	100	.329		12.1000	3.70		
AA-2	AREA	10	.037		12.1000	.23		
AA-2	AREA	25	.045		12.1000	.33		
AA-2	AREA	50	.053		12.1000	.42		
AA-2	AREA	100	.062		12.1000	.53		
AA-2-1	AREA	10	.005		12.0200	.06		
AA-2-1	AREA	25	.007		12.0300	.07		
AA-2-1	AREA	50	.008		12.0500	.09		
AA-2-1	AREA	100	.010		12.0400	.10		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
AA-3	AREA	10	.030		12.1000	.37		
AA-3	AREA	25	.042		12.1000	.52		
AA-3	AREA	50	.053		12.1000	.65		
AA-3	AREA	100	.067		12.1000	.81		
AA1 UNDGRND IN	POND	10	.169		12.1000	1.99		
AA1 UNDGRND IN	POND	25	.223		12.1000	2.57		
AA1 UNDGRND IN	POND	50	.271		12.1000	3.09		
AA1 UNDGRND IN	POND	100	.329		12.1000	3.70		
AA1 UNDGRND OUT	POND	10	.010		12.6300	.12	19.47	.071
AA1 UNDGRND OUT	POND	25	.045		12.3400	.88	19.85	.080
AA1 UNDGRND OUT	POND	50	.078		12.2000	1.71	20.13	.085
AA1 UNDGRND OUT	POND	100	.120		12.1500	2.92	20.49	.091
AA2-1 UNDGRNDIN	POND	10	.005		12.0200	.06		
AA2-1 UNDGRNDIN	POND	25	.007		12.0300	.07		
AA2-1 UNDGRNDIN	POND	50	.008		12.0500	.09		
AA2-1 UNDGRNDIN	POND	100	.010		12.0400	.10		
AA2-1 UNDGRNDOUT	POND	10	.001		12.1200	.05	20.01	.001
AA2-1 UNDGRNDOUT	POND	25	.001		12.0500	.07	20.02	.001
AA2-1 UNDGRNDOUT	POND	50	.002		12.0000	.10	20.02	.001
AA2-1 UNDGRNDOUT	POND	100	.003		12.0600	.10	20.02	.001
AA3 UNDGRND IN	POND	10	.030		12.1000	.37		
AA3 UNDGRND IN	POND	25	.042		12.1000	.52		
AA3 UNDGRND IN	POND	50	.053		12.1000	.65		
AA3 UNDGRND IN	POND	100	.067		12.1000	.81		
AA3 UNDGRND OUT	POND	10	.007		12.1000	.31	20.77	.002
AA3 UNDGRND OUT	POND	25	.013		12.1000	.45	20.80	.002
AA3 UNDGRND OUT	POND	50	.018		12.1000	.59	20.82	.002
AA3 UNDGRND OUT	POND	100	.026		12.1000	.75	20.84	.002

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
BB-1	AREA	10	.260		12.1000	3.02		
BB-1	AREA	25	.341		12.1000	3.89		
BB-1	AREA	50	.413		12.1000	4.66		
BB-1	AREA	100	.500		12.1000	5.58		
BB-2	AREA	10	.248		12.1000	2.86		
BB-2	AREA	25	.324		12.1000	3.67		
BB-2	AREA	50	.391		12.1000	4.38		
BB-2	AREA	100	.473		12.1000	5.23		
BB-3	AREA	10	.453		12.1000	5.32		
BB-3	AREA	25	.597		12.1000	6.89		
BB-3	AREA	50	.725		12.1000	8.26		
BB-3	AREA	100	.881		12.1000	9.92		
BB-4	AREA	10	.154		12.1000	1.86		
BB-4	AREA	25	.207		12.1000	2.44		
BB-4	AREA	50	.254		12.1000	2.96		
BB-4	AREA	100	.311		12.1000	3.57		
BB-5	AREA	10	.208		12.1000	2.46		
BB-5	AREA	25	.275		12.1000	3.20		
BB-5	AREA	50	.336		12.1000	3.86		
BB-5	AREA	100	.409		12.1000	4.64		
BB-6	AREA	10	.128		12.1600	1.33		
BB-6	AREA	25	.204		12.1500	2.22		
BB-6	AREA	50	.278		12.1500	3.07		
BB-6	AREA	100	.374		12.1500	4.17		
BB-7	AREA	10	.116	LR	12.1000	.49		
BB-7	AREA	25	.131	LR	12.1000	.68		
BB-7	AREA	50	.146	LR	12.1000	.86		
BB-7	AREA	100	.164	LR	12.1000	1.07		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID		Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
BB-8		AREA	10	.016		12.1000	.20		
BB-8		AREA	25	.023		12.1000	.29		
BB-8		AREA	50	.030		12.1000	.38		
BB-8		AREA	100	.039		12.1000	.49		
BB1 LEVEL	IN	POND	10	.028		12.4200	.71		
BB1 LEVEL	IN	POND	25	.076		12.2200	1.94		
BB1 LEVEL	IN	POND	50	.120		12.1600	3.27		
BB1 LEVEL	IN	POND	100	.178		12.1500	4.35		
BB1 LEVEL	OUT	POND	10	.028		12.4300	.72	14.61	.000
BB1 LEVEL	OUT	POND	25	.076		12.2300	1.94	14.64	.000
BB1 LEVEL	OUT	POND	50	.120		12.1700	3.26	14.66	.000
BB1 LEVEL	OUT	POND	100	.178		12.1600	4.34	14.67	.000
BB1 UNDGRND	IN	POND	10	.260		12.1000	3.02		
BB1 UNDGRND	IN	POND	25	.341		12.1000	3.89		
BB1 UNDGRND	IN	POND	50	.413		12.1000	4.66		
BB1 UNDGRND	IN	POND	100	.500		12.1000	5.58		
BB1 UNDGRND	OUT	POND	10	.028		12.4200	.71	17.04	.087
BB1 UNDGRND	OUT	POND	25	.076		12.2200	1.94	17.45	.095
BB1 UNDGRND	OUT	POND	50	.120		12.1600	3.27	17.87	.102
BB1 UNDGRND	OUT	POND	100	.178		12.1500	4.35	18.39	.111
BB2 BASIN	IN	POND	10	.248		12.1000	2.86		
BB2 BASIN	IN	POND	25	.324		12.1000	3.67		
BB2 BASIN	IN	POND	50	.391		12.1000	4.38		
BB2 BASIN	IN	POND	100	.473		12.1000	5.23		
BB2 BASIN	OUT	POND	10	.000		3.5200	.00	16.20	.099
BB2 BASIN	OUT	POND	25	.002		12.5400	.19	17.02	.133
BB2 BASIN	OUT	POND	50	.038		12.2600	1.56	17.15	.139
BB2 BASIN	OUT	POND	100	.084		12.1500	3.76	17.27	.145

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID		Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
BB3 LEVEL	IN	POND	10	.209	LR	12.1300	1.14		
BB3 LEVEL	IN	POND	25	.349	LR	12.4300	2.21		
BB3 LEVEL	IN	POND	50	.492	LR	12.2600	4.54		
BB3 LEVEL	IN	POND	100	.670	LR	12.1500	8.09		
BB3 LEVEL	OUT	POND	10	.209		12.1300	1.13	13.52	.000
BB3 LEVEL	OUT	POND	25	.349		12.4300	2.21	13.54	.000
BB3 LEVEL	OUT	POND	50	.491		12.2600	4.54	13.57	.000
BB3 LEVEL	OUT	POND	100	.670		12.1600	8.08	13.61	.000
BB3 UNDGRND	IN	POND	10	.453		12.1000	5.32		
BB3 UNDGRND	IN	POND	25	.597		12.1000	6.89		
BB3 UNDGRND	IN	POND	50	.725		12.1000	8.26		
BB3 UNDGRND	IN	POND	100	.881		12.1000	9.92		
BB3 UNDGRND	OUT	POND	10	.014		12.5100	.10	19.15	.163
BB3 UNDGRND	OUT	POND	25	.088		12.5100	1.04	20.12	.220
BB3 UNDGRND	OUT	POND	50	.170		12.3700	2.51	20.61	.242
BB3 UNDGRND	OUT	POND	100	.271		12.2800	4.01	21.20	.267
BB4 BASIN	IN	POND	10	.154		12.1000	1.86		
BB4 BASIN	IN	POND	25	.207		12.1000	2.44		
BB4 BASIN	IN	POND	50	.254		12.1000	2.96		
BB4 BASIN	IN	POND	100	.311		12.1000	3.57		
BB4 BASIN	OUT	POND	10	.000		5.4500	.00	13.01	.041
BB4 BASIN	OUT	POND	25	.010		12.2500	.61	13.29	.053
BB4 BASIN	OUT	POND	50	.029		12.1400	1.95	13.34	.055
BB4 BASIN	OUT	POND	100	.055		12.1200	2.92	13.37	.056
BB5 BASIN	IN	POND	10	.208		12.1000	2.46		
BB5 BASIN	IN	POND	25	.275		12.1000	3.20		
BB5 BASIN	IN	POND	50	.336		12.1000	3.86		
BB5 BASIN	IN	POND	100	.409		12.1000	4.64		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
BB5 BASIN OUT	POND	10	.080		12.3300	.79	15.45	.069
BB5 BASIN OUT	POND	25	.129		12.2300	1.59	15.83	.087
BB5 BASIN OUT	POND	50	.176		12.1400	3.14	15.93	.092
BB5 BASIN OUT	POND	100	.235		12.1200	4.30	16.00	.095
DP 1	JCT	10	.055		12.1100	.58		
DP 1	JCT	25	.104		12.3200	1.20		
DP 1	JCT	50	.151		12.1700	2.38		
DP 1	JCT	100	.210		12.1300	4.12		
DP 2	JCT	10	.070		12.1100	.78		
DP 2	JCT	25	.128		12.3200	1.33		
DP 2	JCT	50	.181		12.1600	2.66		
DP 2	JCT	100	.250		12.1300	4.58		
DP 3	JCT	10	.436		12.1300	3.17		
DP 3	JCT	25	.768		12.2300	7.74		
DP 3	JCT	50	1.139		12.1900	15.07		
DP 3	JCT	100	1.610		12.1500	27.40		
JUNC 10	JCT	10	.130	LR	12.1000	.49		
JUNC 10	JCT	25	.220	LR	12.5000	1.23		
JUNC 10	JCT	50	.316	LR	12.3500	2.86		
JUNC 10	JCT	100	.435	LR	12.2500	4.55		
OFF-SITE AND WET AREA		10	3.193		12.2400	29.34		
OFF-SITE AND WET AREA		25	4.762		12.2400	44.49		
OFF-SITE AND WET AREA		50	6.243		12.2400	58.58		
OFF-SITE AND WET AREA		100	8.112		12.2400	76.12		
*OUT 20	JCT	10	3.628		12.5900	16.82		
*OUT 20	JCT	25	5.530		12.6000	25.41		
*OUT 20	JCT	50	7.381		12.6000	32.60		
*OUT 20	JCT	100	9.722		12.6300	37.91		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

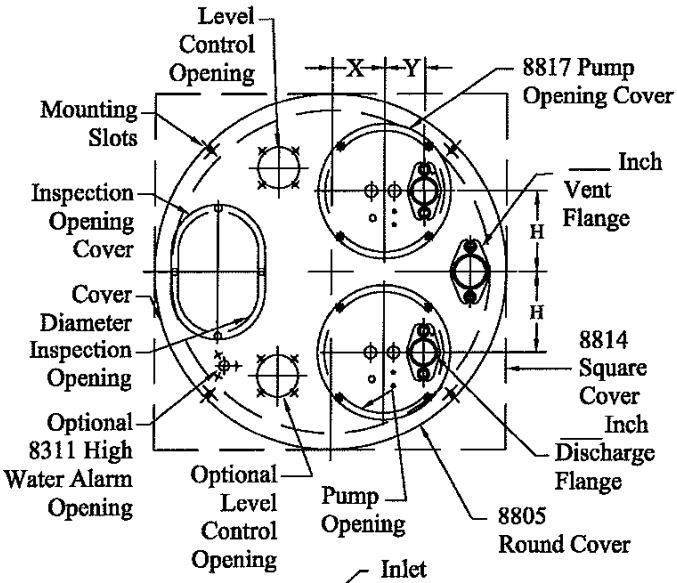
(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

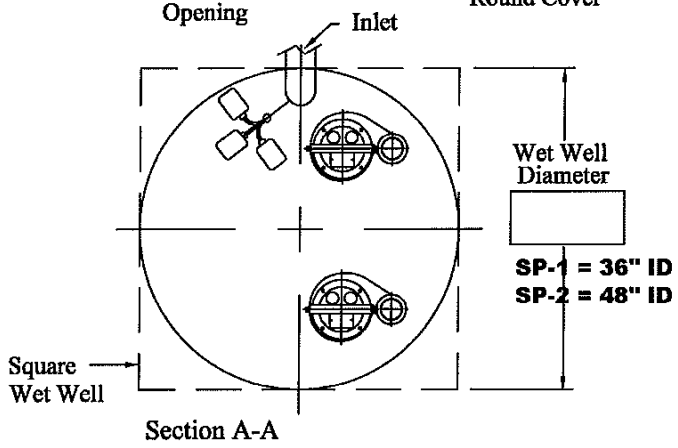
Node ID		Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
SOUTH		JCT	10	.365		12.3700	2.59		
SOUTH		JCT	25	.641		12.2300	6.56		
SOUTH		JCT	50	.957		12.2200	12.54		
SOUTH		JCT	100	1.360		12.1500	22.94		
WETLAND	IN	POND	10	3.628		12.2400	32.01		
WETLAND	IN	POND	25	5.530		12.2400	52.22		
WETLAND	IN	POND	50	7.381		12.2300	73.42		
WETLAND	IN	POND	100	9.723		12.2000	99.65		
WETLAND	OUT	POND	10	3.628		12.5900	16.82	10.10	.837
WETLAND	OUT	POND	25	5.530		12.6000	25.41	10.40	1.384
WETLAND	OUT	POND	50	7.381		12.6000	32.60	10.67	1.983
WETLAND	OUT	POND	100	9.722		12.6300	37.91	10.99	2.855

EXHIBIT 2
SUMP PUMP CUT SHEETS

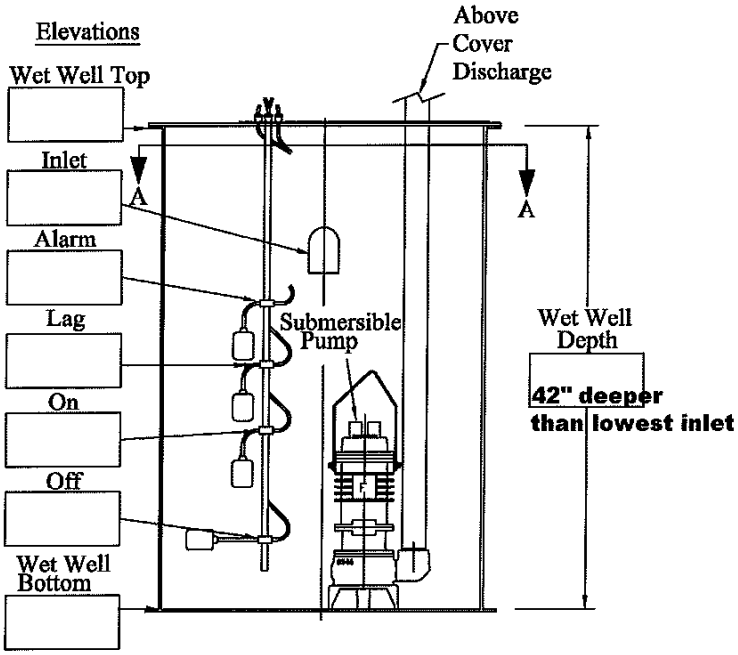
WEIL Duplex Submersible Pump S-9002

Floor Mount - Discharge Above Cover





Section A-A



Date: 7-27-18

Project: Hiawatha Housing

Item: Foundation Sump SP-1 or SP-2

Spec Reference: _____

Contractor: SP-1 = Weil 1601 / SP-2 = Weil 2545

Engineer: DJM

- Pump: 1601 or 2545 Qty: 2
  - GPM: 30 or 120 Head: 25'
  - HP: 3/4 or 2 RPM: 1750
  - PH: 3 Hz: 60 Volts: _____
  - Solid Size: _____
  - Pump Discharge Size: 2" or 3"
- Wet Well: Fiberglass w/ Antifloat
  - Diameter: _____
  - Depth: _____
  - Minimum Water Level: 9"
- Wet Well Cover: Steel
  - Diameter: _____
  - Pump Opening Diameter: _____
  - X _____ from Cover 8805 or 8814
  - H _____ from Cover 8805 or 8814
  - Y _____ from Cover 8817
- Control Panel: NEMA-1 Lead (Exercisor) Lag Alarm
- Level Control System: Tethered

Notes:

1. Minimum Wet Well Diameter

	8812	8805/8814
2 inch Discharge	- 30 inch	30 inch
3 inch Discharge	- 36 inch	42 inch
4 inch Discharge		
7 inch Pump Case	- 36 inch	42 inch
9 inch Pump Case	- 54 inch	54 inch
12 inch Pump Case	- 60 inch	60 inch

2. 10 Starts per hour maximum.
3. Minimum water level 1 inch above pump case.
4. Installation of this equipment to conform to local and/or national codes and ordinances and is the responsibility of the installer.
5. Pump openings with doors on cover:
   2 and 3 inch Discharge - 1
   4 inch Discharge - 2
6. Not to be used for construction purposes unless certified.

BUILDING E

WEIL 2-Inch Submersible Wastewater Pump 1601

SWPA MEMBER

Heavy duty pump for commercial and industrial applications.
Pump clear water and gray water with solids up to 1/2 inch diameter.

Disch. Size	2 Inch
Disch. Type	NPT
Solids Max.	1/2 Inch
Mounting Style	Floor

Pump
- Case - Cast Iron
- Impeller - Cast Iron
- Strainer - 304 Stainless Steel
- Stainless Steel Hardware

Motor

Double Seal - Tandem
- Upper - Carbon against Ceramic
- Lower - Silicon Carbide against Silicon Carbide

Air-Filled Hermetically Sealed
Shaft - Stainless Steel Series 300
Motor Shell - Cast Iron
Insulation - Class F
Ball Bearings - 2 - Double Sealed
Power Cable Length - 25 ft
Three-phase motor
- 1150 and 1750 RPM
- 60 Hz, 208-230 or 460 volts

Single-phase capacitor start motor
- 1150 and 1750 RPM
- 60 Hz, 115 or 208-230 volts
- Automatic reset thermal and overload protection

Options SP-1
- Bronze Impeller
- UL Explosion Proof Motor
- Moisture Sensor and Temperature Limiter
- Additional Power Cable Lengths SP-1
- Stainless Steel Lifting Cable

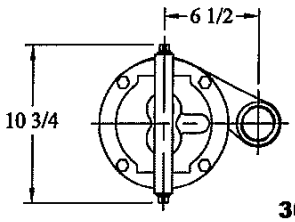
Capacities - Wet Wells

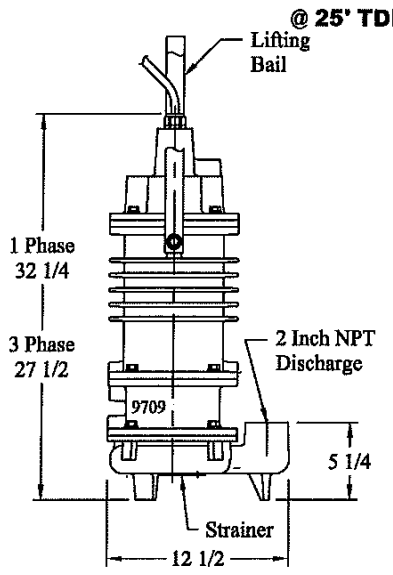
Dia or Side Inches	Gallons per Foot of Depth	
	Round	Square
18	13	17
24	24	30
30	37	47
36	53	67
48	94	120
60	147	187
72	212	269

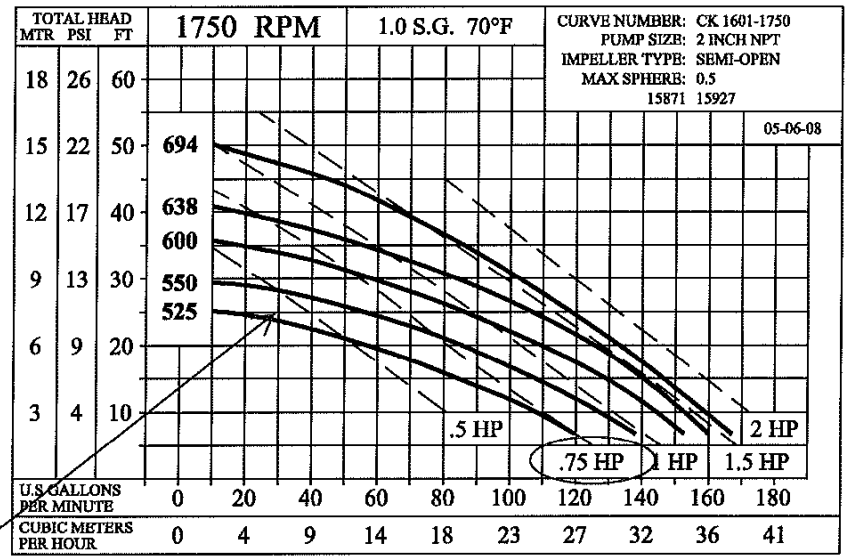
Flow - To prevent solids from settling out

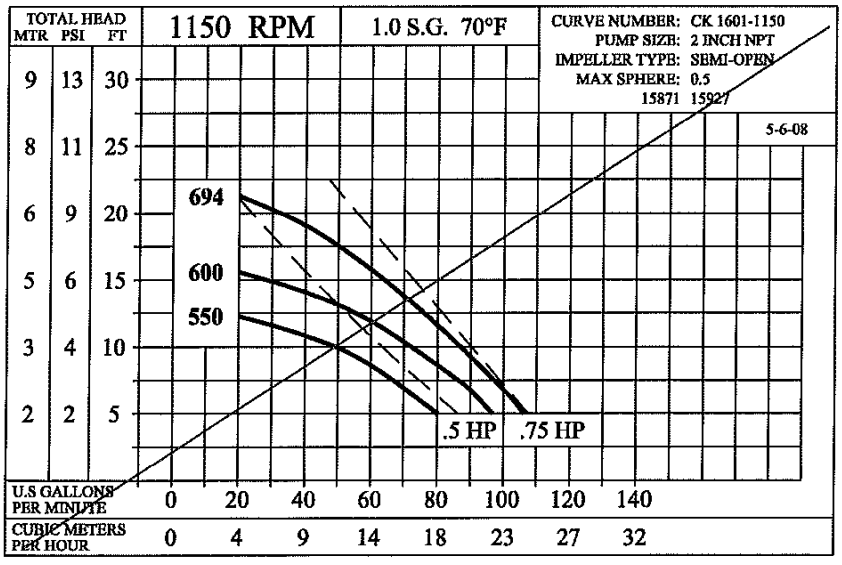
Discharge Pipe Size Dia Inches	Minimum Flow GPM
1 1/2	15
2	25
3	50

Good wet well design
Maximum 10 starts per hour.
Minimum run time - 1 1/2 minutes.









BUILDING A

WEIL 3-Inch Submersible Wastewater Pump 2545

SWPA MEMBER

Heavy duty pump for commercial and industrial applications.
Pump clear water, gray water, effluent and wastewater with solids up to 2 1/4 inch diameter.

Disch. Size	3 Inch
Disch. Type	NPT
Solids Max.	2 1/4 Inch
Mounting Style	Floor

Pump
- Case - Cast Iron
- Impeller - ~~Cast Iron~~
- Stainless Steel Hardware

Motor
- **Double Seal - Tandem**
  - Upper - Carbon against Ceramic
  - Lower - Silicon Carbide against Silicon Carbide
- **Air-Filled Hermetically Sealed**
- **Shaft - Stainless Steel Series 300**
- Motor Shell - Cast Iron
- Insulation - Class F
- Ball Bearings - 2 - Double Sealed
- Power Cable Length - 25 ft
- Three-phase motor
  - 1150 and 1750 RPM
  - 60 Hz, 208-230 or 460 volts
- Single-phase capacitor start motor
  - 1150 and 1750 RPM
  - 60 Hz, 115 or 208-230 volts
  - Automatic reset thermal and overload protection

Options
- Bronze Impeller
- UL Explosion Proof Motor
- Moisture Sensor and Temperature Limiter
- Additional Power Cable Lengths
- Stainless Steel Lifting Cable

SP-2

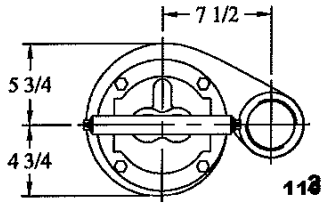
Capacities - Wet Wells

Dia or Side Inches	Gallons per Foot of Depth	
	Round	Square
18	13	17
24	24	30
30	37	47
36	53	67
48	94	120
60	147	187
72	212	269

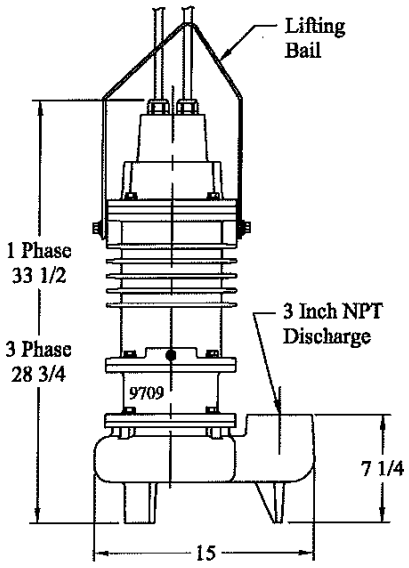
Flow - To prevent solids from settling out

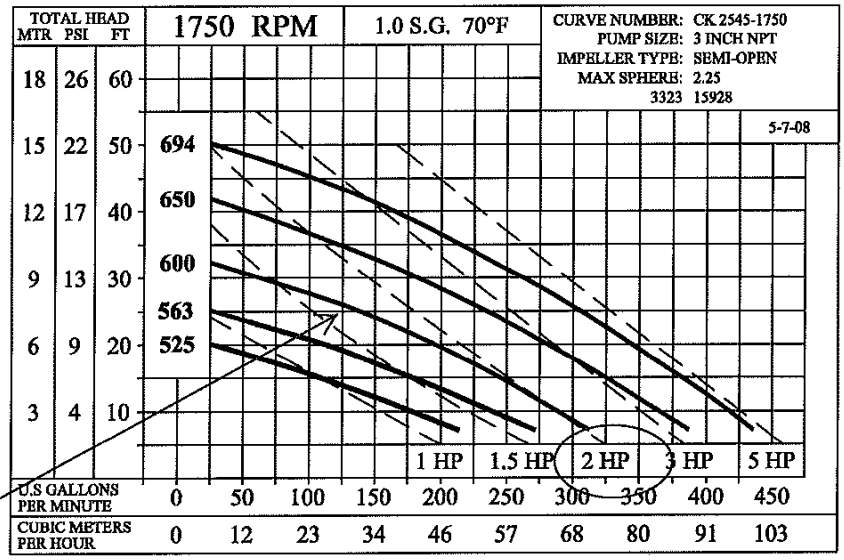
Discharge Pipe Size Dia Inches	Minimum Flow GPM
2	25
3	50
4	90

Good wet well design
Maximum 10 starts per hour.
Minimum run time - 1 1/2 minutes.



11⅜ GPM @ 25' TDH





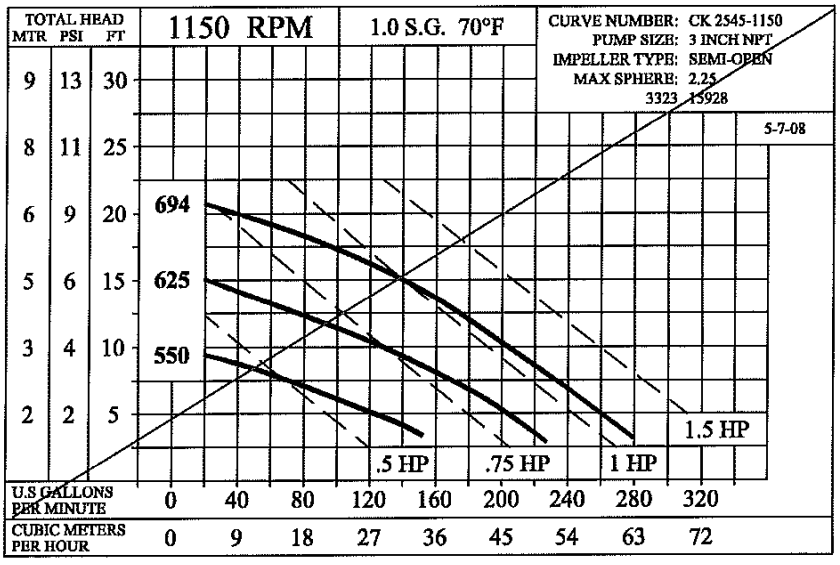


EXHIBIT 3
OPERATIONS AND MAINTENANCE PLAN

Operations and Maintenance Plan

The Village at Saugatuck
August 17, 2018

Scope:

The purpose of the Operations and Maintenance Plan is to ensure that the proposed stormwater components installed at *The Village at Saugatuck* are maintained in operational condition throughout the life of the project. The service procedures associated with this plan shall be performed as required by the parties legally responsible for their maintenance.

Recommended Frequency of Service:

As further defined below, all stormwater components should be checked on a periodic basis and kept in full working order. Ultimately, the required frequency of inspection and service will depend on runoff quantities, pollutant loading, and clogging due to debris. At a minimum, we recommend that all stormwater components be inspected and serviced twice per year, once before winter begins and once during spring cleanup. Inspector shall utilize and complete the Maintenance Inspection Checklist from Appendix E of the 2004 Connecticut Stormwater Quality Manual or a comparable inspection form. Changes to the inspection/maintenance procedures could be recommended by the inspector to be implemented going forward.

Qualified Inspector:

The inspections must be completed by an individual experienced in the construction and maintenance of stormwater drainage systems. Once every five years the inspections must be completed by a professional engineer.

Service Procedures:

1. Catch Basins, Drainage Inlets and Trench Drains:

    a. Catch basins, drainage inlets, and trench drains shall be completely cleaned of accumulated debris and sediments at the completion of construction. Oil absorbent pillows shall be removed and replaced as needed.
    b. For the first year, catch basins, drainage inlets, and trench drains shall be inspected on a quarterly basis.
    c. Any accumulated debris within the structures shall be removed and any repairs as required.
    d. From the second year onward, visual inspections shall occur twice per year, once in the spring and once in the fall, after fall cleanup of leaves has occurred.
    e. Accumulated debris within the structures shall be removed and repairs made as required.
    f. Accumulated sediments in catch basins and drainage inlets shall be removed at which time they are within 12 inches of the invert of the outlet pipe.
    g. Accumulated sediment in trench drains shall be removed semi-annually.

g. Any additional maintenance required per the manufacturer's specifications shall also be completed.

2. Storm Drainage Piping and Manholes:

a. All storm drainage piping shall be completely flushed of debris and accumulated sediment at the completion of construction.
b. Manholes shall be inspected and repaired on an annual basis.
c. Unless system performance indicates degradation of piping, comprehensive video inspection of storm drainage piping shall occur once every ten years.
d. Any additional maintenance required per the manufacturer's specifications shall also be completed.

3. Stormwater Control Structures:

a. All control structures (orifice, weir, etc.) shall be completely cleaned of accumulated debris and sediments at the completion of construction. Any repairs shall be performed.
b. For the first year, control structures (orifice, weir, etc.) shall be inspected on a quarterly basis.
c. Any accumulated debris shall be removed and any repairs made to the control structures (orifice, weir, etc.) as required.
d. From the second year onward, visual inspections shall occur twice per year, once in the spring and once in the fall, after fall cleanup of leaves has occurred.
e. Accumulated debris shall be removed and repairs made as required.
f. Any additional maintenance required per the manufacturer's specifications shall also be completed.

4. Infiltration Systems (Including Isolator Rows):

a. All infiltrators shall be completely cleaned of accumulated debris and sediments upon the completion of construction.
b. For the first year, the infiltrators shall be inspected on a quarterly basis.
c. Any accumulated debris within the infiltrators shall be removed and any repairs made to the units as required
d. From the second year onward, visual inspection shall occur twice per year, once in the spring and once in the fall, after fall cleanup of leaves has occurred.
e. Accumulated debris within the units shall be removed and repairs made as required.
f. Any additional maintenance required per the manufacturer's specifications shall also be completed.

5. Infiltration Basins and Rain Gardens:

a. All infiltration basins and rain gardens shall be completely cleaned of accumulated debris and sediments upon the completion of construction.
b. For the first year, they shall be inspected on a quarterly basis.

c. Any accumulated sediment and debris shall be removed and any repairs made as required
d. From the second year onward, visual inspection shall occur twice per year, once in the spring and once in the fall, after fall cleanup of leaves has occurred.
e. Accumulated sediment and debris shall be removed and repairs made as required.
f. Dead plants shall be replaced annually.
h. Invasive plants shall be removed annually.
i. All infiltration basins and rain gardens shall drain within 48 hours. If longer ponding occurs, remove and replace soil in the effected areas.

6. Green Roof:

a. Clear drainage outlets upon the completion of construction.
b. Inspect new green roof monthly from April through October during the first year of vegetation establishment. Replace dying plants as required. Maintain 90% minimum vegetated cover. Consult landscape architect for substituting plant types if mortality exceeds 50%.
c. Seasonal maintenance:
Summer: Make necessary structural repairs. Improve growing medium as needed. Clear drains. Irrigate as needed.
Fall: Replant exposed soil and dead plants. Remove sediment and debris from drains. Provide erosions control for bare soil if needed.
Winter: Clear drains as required
Spring: Replant exposed soil and dead plants. Remove sediment and debris from drains.

7. Roof Gutters:
a. Remove accumulated debris and inspect for damage. Any damage should be repaired as required.

8. Snow Removal and de-icing:
a. The use of road salt (NaCl) shall be avoided for de-icing pavement. Snow removal without the use of de-icing should be the typical operation. When additional de-icing is required, Calcium Magnesium Acetate, CMA, or other none sodium based product should be used.
b. Snow shall be plowed from paved surfaces to the corners of each parking bay. Snow shall not be stockpiled above the parking garage.

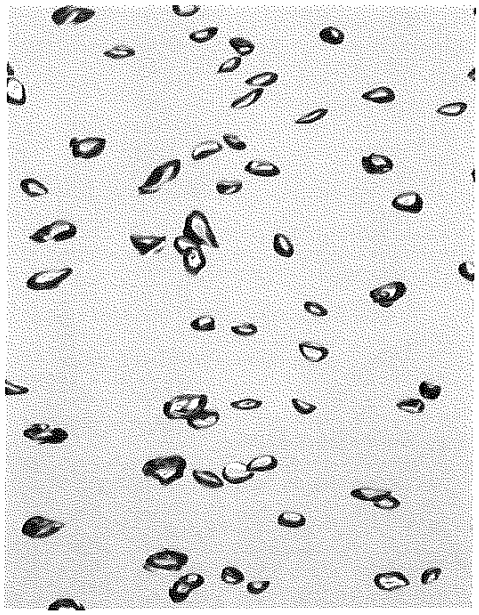
Disposal of Debris and Sediment:

All debris and sediment removed from the stormwater system shall be disposed of legally. There shall be no dumping of silt or debris into or in proximity to any inland or tidal wetlands.

Maintenance Records:

The Owners(s) must maintain all records (logs, invoices, reports, data, etc.) and have them readily available for inspection at all times.

Appendix E
Maintenance Inspection Checklist



Stormwater Ponds and Wetlands

Project/Location: _____

"As Built" Plans Available? _____

Date/Time: _____

Days Since Previous Rainfall and Rainfall Amount: _____

Inspector: _____

Maintenance Item	Satisfactory	Unsatisfactory	Comments
1. Embankment and Emergency Spillway			
o Vegetation and ground cover adequate			
o Embankment erosion			
o Animal burrows			
o Unauthorized planting			
o Cracking, bulging, or sliding of embankment/dam			
a. Upstream face			
b. Downstream face			
c. At or beyond toe			
d. Emergency spillway			
o Pond, toe & chimney drains clear and functioning			
o Seeps/leaks on downstream face			
o Slope protection or riprap failure			
o Vertical/horizontal alignment of top of dam "As-Built"			
o Emergency spillway clear of obstructions and debris			
o Other (specify)			
2. Riser and Principal Spillway			
o Low flow orifice obstructed			
o Low flow trash rack obstructed with debris			
o Weir trash rack obstructed with debris			
o Excessive sediment accumulation inside riser			
o Concrete/masonry condition riser and barrels			
a. Cracks or displacement			
b. Minor spalling (<1")			
c. Major spalling (rebars exposed)			
d. Joint failures			
e. Water tightness			
o Metal pipe condition			

Maintenance Item	Satisfactory	Unsatisfactory	Comments
o Control valve			
a. Operational/exercised			
b. Chained and locked			
o Pond drain valve			
a. Operational/exercised			
b. Chained and locked			
o Outfall channels functioning			
o Other (specify)			
3. Permanent Pool (Wet Ponds)			
o Undesirable vegetative growth			
o Floating or floatable debris removal required			
o Visible pollution			
o Shoreline problem			
o Other (specify)			
4. Sediment Forebay			
o Sedimentation noted			
o Greater than 50% of storage volume remaining			
5. Dry Pond Areas			
o Vegetation coverage adequate			
o Undesirable vegetative growth			
o Undesirable woody vegetation			
o Low flow channels clear of obstructions			
o Standing water or wet spots			
o Sediment and/or trash accumulation			
o Other (specify)			
6. Condition of Outfalls			
o Riprap failures			
o Slope erosion			
o Storm drain pipes			
o Endwalls/Headwalls			
o Other (specify)			
7. Other			
o Complaints from residents (odors, insects, other)			
o Aesthetics (graffiti, algae, other)			
o Conditions of maintenance access routes			
o Signs of hydrocarbon build-up			
o Any public hazards (specify)			

Maintenance Item	Satisfactory	Unsatisfactory	Comments
8. Wetland Vegetation			
o Vegetation healthy and growing			
o Wetland maintaining 50% surface area coverage of wetland plants after the second growing season. (If unsatisfactory, reinforcement plantings needed)			
o Survival of desired wetland plant species distribution according to landscaping plan?			
o Evidence of invasive species			
o Maintenance of adequate water depths for desired wetland plant species.			
o Harvesting of emergent plantings needed			
o Have sediment accumulations reduced pool volume significantly or are plants choked with sediment?			
o Other (specify)			
Actions to Be Taken:			
To Be Completed By (Date):			

Source: Adapted from Watershed Management Institute, Inc. 1997. *Operation, Maintenance, and Management of Stormwater Management Systems*, in cooperation with U.S. Environmental Protection Agency, Office of Water. Washington, D.C.

Infiltration Basins and Trenches

Project/Location: _____

"As Built" Plans Available? _____

Date/Time: _____

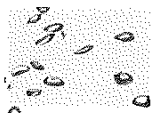
Days Since Previous Rainfall and Rainfall Amount: _____

Inspector: _____

Maintenance Item	Satisfactory	Unsatisfactory	Comments
1. Debris Cleanout			
o Basin bottom or trench surface clear of debris			
o Inlet/Inflow pipes clear of debris			
o Overflow spillway clear of debris			
o Outlet clear of debris			
2. Sediment Traps or Forebays			
o Sedimentation noted			
o Greater than 50% of storage volume remaining			
3. Vegetation (Basins)			
o Mowing performed as necessary			
o No evidence of erosion			
4. Dewatering			
o Basin/Trench dewaters between storms			
o Drawdown time does not exceed 36 to 48 hours			
5. Sediment Accumulation			
o Approximate depth of accumulated sediment			
6. Inlets			
o Good condition			
o No evidence of erosion			
7. Outlet/Overflow Spillway			
o Good condition, no need for repair			
o No evidence of erosion			
8. Aggregate Repairs (Trench)			
o Surface of aggregate clean			
o Top layer of stone does not need replacement			
o Trench does not need rehabilitation			

Maintenance Item	Satisfactory	Unsatisfactory	Comments
9. Structural Repairs			
o Embankment in good repair			
o Site slopes are stable			
o No evidence of erosion			
10. Fences/Access Repairs			
o Fences in good condition			
o No damage which would allow undesired entry			
o Access point in good condition			
o Locks and gate function property			
Actions to Be Taken:			
To Be Completed By (Date):			

Source: Adapted from Watershed Management Institute, Inc. 1997. Operation, Maintenance, and Management of Stormwater Management System,. in cooperation with U.S. Environmental Protection Agency, Office of Water. Washington, D.C.



Filtering Practices – Sand and Organic Filters

Project/Location: _____

"As Built" Plans Available? _____

Date/Time: _____

Days Since Previous Rainfall and Rainfall Amount: _____

Inspector: _____

Maintenance Item	Satisfactory	Unsatisfactory	Comments
1. Debris Cleanout			
o Filtration facility clean of debris			
o Inlet and outlets clear of debris			
2. Oil and Grease			
o No evidence of filter surface clogging			
o Activities in drainage area minimize oil and grease entry			
3. Vegetation			
o Contributing drainage area stabilized			
o No evidence of erosion			
o Area mowed and clipping removed			
4. Water Retention			
o Water holding chambers at normal pool			
o Filter chamber dewaters between storms			
o No evidence of leakage			
5. Sediment Accumulation			
o Approximate depth of accumulated sediment			
o Depth of sediment in forebay or sump should not be more than 12 inches or 10 percent of the pretreatment volume			
o Sediment accumulation on filter bed does not exceed 1" or drawdown time does not exceed 36 to 48 hours			
6. Structural Components			
o No evidence of structural deterioration			
o Grates are in good condition			
o No evidence of spalling or cracking of structural parts			
7. Outlet/Overflow Spillway			
o Good condition, no need for repairs			
o No evidence of erosion (if draining into a natural channel)			

Maintenance Item	Satisfactory	Unsatisfactory	Comments
8. Overall Function of Facility			
o No evidence of flow bypassing facility			
o No noticeable odors outside facility			
Actions to Be Taken:			
To Be Completed By (Date):			

Source: Adapted from Watershed Management Institute, Inc. 1997. Operation, Maintenance, and Management of Stormwater Management Systems, in cooperation with U.S. Environmental Protection Agency, Office of Water. Washington, D.C.

Filtering Practices - Bioretention

Project/Location: _____

"As Built" Plans Available? _____

Date/Time: _____

Days Since Previous Rainfall and Rainfall Amount: _____

Inspector: _____

Maintenance Item	Satisfactory	Unsatisfactory	Comments
1. Debris Cleanout			
o Bioretention and contributing areas clean of debris			
o No dumping of yard wastes into practice			
o Litter (branches, etc.) has been removed			
2. Vegetation			
o Plant height not less than design water depth			
o Fertilized per specifications			
o Plant composition according to approved plans			
o No placement of inappropriate plants			
o Grass height not greater than 6 inches			
o No evidence of erosion			
3. Check Dams/Energy Dissipaters/Sumps			
o No evidence of sediment buildup			
o No evidence of erosion at downstream toe of drop structure			
4. Dewatering			
o Dewaters between storms			
o No evidence of standing water			
5. Sediment Accumulation			
o Approximate depth of accumulated sediment			
o Depth of sediment in forebay or sump should not be more than 12 inches or 10 percent of the pretreatment volume			
o Sediment accumulation on filter bed does not exceed 1" or drawdown time does not exceed 36 to 48 hours			

Maintenance Item	Satisfactory	Unsatisfactory	Comments
6. Outlet/Overflow Spillway			
o Good condition, no need for repair			
o No evidence of erosion			
o No evidence of any blockages			
7. Integrity of Filter Bed			
o Filter bed has not been blocked or filled inappropriately			

Actions to Be Taken:

To Be Completed By (Date):

Source: Adapted from Watershed Management Institute, Inc. 1997. *Operation, Maintenance, and Management of Stormwater Management Systems,* in cooperation with U.S. Environmental Protection Agency, Office of Water. Washington, D.C.

Water Quality Swales

Project/Location: _____

"As Built" Plans Available? _____

Date/Time: _____

Days Since Previous Rainfall and Rainfall Amount: _____

Inspector: _____

Maintenance Item	Satisfactory	Unsatisfactory	Comments
1. Debris Cleanout			
o No excessive trash and debris in contributing areas, forebay, or channel			
2. Check Dams or Energy Dissipators			
o No evidence of flow going around structures			
o No evidence of erosion at downstream toe			
3. Vegetation			
o Mowing performed as necessary (to maintain grass height of 4 to 6 inches during growing season)			
o No evidence of erosion (channel bottom or side slopes)			
o Fertilized per specification			
4. Dewatering			
o Dewaters between storms (dry swales)			
5. Sediment Accumulation			
o Approximate depth of accumulated sediment			
o Sediment accumulation is less than 25% of forebay or channel capacity (cleaning recommended otherwise)			
6. Outlet/Overflow Spillway			
o Good condition, no need for repairs			
o No evidence of erosion			

Actions to Be Taken:

To Be Completed By (Date):

Source: Adapted from Watershed Management Institute, Inc. 1997. Operation, Maintenance, and Management of Stormwater Management Systems, in cooperation with U.S. Environmental Protection Agency, Office of Water. Washington, D.C.

FILE COPY

MEMORANDUM

RECEIVED
SEP - 7 2018
TOWN OF WESTPORT
CONSERVATION DEPARTMENT

TO: Westport Conservation Commission
Alicia Mozian, Conservation Director

FROM: Summit Saugatuck LLC
William Kenny Associates LLC
Divney Tung Schwalbe
Redniss & Mead, Inc.
Shipman & Goodwin LLP

DATE: September 7, 2018

RE: Regulated Activity Permit, Hiawatha Lane and Hiawatha Lane Extension; Response to A. Mozian Questions

---

In the text below, the comments / questions by Conservation Director Alicia Mozian are in *italics*, and the applicant's responses are in **bold**.

1. What is the fuel source for the buildings? I believe you said natural gas but wanted to confirm.

RESPONSE: Natural gas, extended from Saugatuck Avenue or as determined by Southern Connecticut Gas Company, as indicated in the Utility Report.

2. Please clarify the estimated cubic yards of fill to be removed from the site.

RESPONSE: There is an estimated 25,725 cubic yards of soil to be removed from the site and 871 cubic yards of concrete and asphalt, as shown in Appendix H of the Stormwater Management Report.

3. At the next meeting, please plan on spending some time explaining the details of Sheet Sp-4.2 the "Erosion Control Phasing Plan." The Commission had asked that a more detailed construction phasing plan be submitted.

RESPONSE: Sheet SP-4.2 shows the sequence of the construction including site preparation, demolition, excavation, building foundations, building construction, paving, and landscaping. We will explain the Construction Phasing Plan and Erosion Control Plan in additional detail at the September 12, 2018 meeting.

4. Do you plan on registering the site with the State of CT an erosion and sediment/stormwater management plan?

RESPONSE: Yes, because the total disturbance area is greater than five acres a Construction General Permit is required prior to the start of construction.

5. Consideration of moving or reducing the size of the proposed stockpile location in the southwest corner of the property.

RESPONSE: Stockpile is located outside of the 30 foot wetland review area, and will be seeded and surrounded by double row silt fence. It is intended to remove excess material immediately from the site, minimizing all soil stockpiles.

6. Consideration of where snow will be stockpiled and what type of de-icing measures will be used to treat the roadways within the complex.

RESPONSE: Snow stockpile areas are shown on Sheets SP-1.1 and SP-1.2. When de-icing is required, Calcium Magnesium Acetate (CMA) or other non-sodium based product shall be used, as indicated in the Operations and Maintenance Plan.

7. Submission of response to GHD's recommendations listed in their July 11, 2018 report. This includes, but is not limited to, a detail of the green roof including an operation and maintenance plan and a maintenance plan for the Conservation Easement area where the wetland restoration work is proposed.

RESPONSE: The response included Drawing No. SP-5.4 with a detail of the green roof and an updated Operations and Maintenance Plan.

8. What is the applicant's plan for ensuring long-term maintenance of the stormwater treatment system components?

RESPONSE: The property owner will be responsible for the long-term maintenance of the site and stormwater infrastructure as shown in the Operations and Maintenance Plan.

9. Has a Phase I site assessment been completed? If so, may we have a copy?

RESPONSE: Because the subject property consists of single-family homes or vacant lots, there has been no reason to obtain Phase I environmental studies. Above

ground oil storage tanks on six lots have been removed years ago, with removal reported to the Town.

10. The Commission had asked that the corner of the buildings, parking lots and wetland be staked prior to the next site walk. Given the dense vegetation growth this time of year, perhaps the 30 ft. upland review area line could be staked instead of the wetland boundary.

RESPONSE: The pavement corners, building corners, and portions of the 30 foot upland review area line are being staked for the September 7, 2018 site walk.

Submitted into record 9/25/18

The Village at Saugatuck
Hiawatha Lane
Westport, Connecticut

CONSERVATION EASEMENT & ECOLOGICAL ENHANCEMENT ZONE MANAGEMENT PLAN

Objectives: Remove surficial debris, control the growth of invasive vegetation and foster the growth of native plant species in a manner that beneficially affects the conservation easement area, ecological enhancement zone and adjacent stormwater infiltration basins that are shown on the attached site plan.

Management Methods:

1. All management activities will be under the direction of a professional wetland scientist.
2. The upland boundary of the ecological enhancements zone will be permanently marked with demarcation signs to minimize the potential for future intrusions. The signs will be maintained in perpetuity unless reviewed and approved otherwise by the Westport Inland Wetlands and Watercourses Agency.
3. Loose surficial debris and litter will be removed from the ecological enhancements zone and easement. Embedded or buried debris that requires earthwork and other forms of major disturbance will not be removed.
4. Maintain unaltered water flow and drainage patterns due to blockage from debris and other onsite material.
5. Invasive vegetation will be controlled within the ecological enhancement zone, via cutting, herbicide applications and the establishment and management of native vegetation.
    a. Cutting of target invasives (i.e. invasive vines and other aggressive species such as Japanese knotweed, multiflora rose, burning bush) will be completed via the use of hand tools or low-impact brush clearing machinery. Vines smothering vegetation should be cut at breast height and at ground level and apply an herbicide to the cut stump.
    b. Controlled applications of herbicides are proposed to ensure that the invasive control plan objectives are achieved while the potential for environmental impacts are minimized. The growth characteristics of the target invasives are very robust and aggressive. Without the controlled use of herbicides, significant soil disturbance would be required and the duration to achieve project success would be significantly longer; likely unending. To ensure that the potential for environmental impacts from the controlled use of herbicides will be minimized, herbicides will be used in accordance with label requirements and in a manner that minimizes potential non-target effects based on the best available science. Moreover, due to the proximity of the wetland to the proposed application area, only herbicides designed for both terrestrial and aquatic weed control, such as GlyphoMate 41, will be used. The herbicides will also be non-persistent and will not bioaccumulate. Where feasible, the herbicides will be selective. Only properly trained and licensed personnel will apply the herbicides. The herbicides will be securely stored, handled and disposed of in a manner consistent with all federal, state and local requirements.
    c. Native plants will be installed and maintained to compete with the invasive plants and reduce the potential for the invasive plants to thrive. In the short-term, meadow

plants are proposed to provide a dense groundcover growth, which will reduce the potential for the seeds of invasive plants to reach the soil surface and germinate. In the long-term, the proposed tree plantings will increase shading and thereby reduce the growth and abundance of invasive plants, which do less well in shade.

i. The upland wildflower seed mix should be applied on clean, bare soil by mechanical spreader or by hand. Lightly rake or roll to ensure proper seed to soil contact. Best results are obtained with a spring or late fall dormant seeding. If seeding occurs in late spring or summer, a light mulching of clean, weed-free straw will be applied to conserve moisture. If conditions are drier than usual, watering may be required. If seeding occurs in late fall or winter, the seeding rate will be increased by 50 percent. Fertilization is not required unless the soils are particularly infertile. The soil surface will be free of weeds at the time of seeding.

6. Monitoring
   a. Invasive species control activities will be monitored and documented. Invasive vegetation within the enhancement zone and stormwater basins will be considered 'controlled' if invasive vegetation is not dominant. Dominant species are defined as the most abundant species that, when ranked in descending order of abundance and cumulatively totaled, immediately exceed 50 percent of the total dominance measure, plus any additional species comprising 20 percent or more of the total dominance measure.
   b. Meadow areas and other groundcover vegetation shall have at least 80 percent aerial cover and planted trees and shrubs shall have at least 80 percent survival. The aerial coverage excludes open water areas and invasive plants.
   c. The easement and enhancement zone will be inspected to determine the presence and abundance of debris and other waste material. The presence of the demarcation signs will also be reviewed.
   d. The easement and enhancement zone will be inspected for debris and other material that has the potential to obstruct water flow patterns. In addition, if blockage material is present within the culverts that extend below the Metro North railroad, the issue will be reported to Metro North so that they may clear the material and allow unimpeded surface water flow.
   e. Annual reports will be submitted to the Westport Conservation Department at the end of each of the three monitoring years indicating the measures that were taken to control the invasive plant species and outlining the current dominant plant species.

Management Sequence:

1. Year One
   a. Obtain review and flagging by wetland scientist of vegetation to remain and be protected.

b. Control target invasives within the ecological enhancements zone, conservation easement and stormwater basins.
c. During the first growing season after sowing the meadow seed, cut the wetland and upland meadows to prevent weeds from exceeding the height of desired seeded meadow plants.

2. Year One Through Three
   a. Annually monitor and prepare and submit written reports to the Westport Conservation Department.
   b. Annually remove loose surficial debris and other waste from the easement and enhancement zone as needed.
   c. Annually replace missing or damaged demarcation signs.
3. Long-Term Maintenance Beyond Year Three
   a. Mow meadow areas to prevent the establishment of woody vegetation. Mowing shall occur no more than once annually in March. Annually inventory the habitat enhancement area to determine existence and prevalence of invasive vines and other invasive plants via cutting and herbicide treatments in accordance with local, state and federal laws.
   b. Annually remove loose surficial debris and other waste from the easement and enhancement zone as needed.
   c. Annually replace missing or damaged demarcation signs.

NTOUR
ONTOUR
OUNDARY
ON EASEMENT AREA
AND
ENHANCEMENT ZONE
R INFILTRATION BASIN

NOTES

- ECOLOGICAL COMMUNITIES INFORMATION PROVIDED BY WILLIAM KENNY ASSOC. OTHER INFORMATION TAKEN FROM A SURVEY PREPARED BY DIVNEY, TUNG & SCHWALBE, LLP.

CONSERVAT
ECOLOGICA
ZONE MANA

THE VILLAGE
HIAWATHA LA
WESTPORT, C

SCALE: 1"
DATE: SEPTEMBE

DIVNEY • TUNG • SCHWALBE
Intelligent Land Use

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Andrew V. Tung, ASLA, Esq., LEED AP
Gerhard M. Schwalbe, P.E.

William J. Carey, Jr.
Mark S. Gratz, P.E.
Maria Coplit Alfaro, P.E.
Donna M. Maiello, ASLA, RLA

Cosimo Reale, CPESC
Mark J. Shogren, P.E.
Matthew N. Steinberg, AICP

RECEIVED
OCT 01 2018
TOWN OF WESTPORT
CONSERVATION DEPARTMENT

FILE COPY

MEMORANDUM

TO: Alicia Mozian

DATE: September 28, 2018

FROM: Mark J. Shogren, P.E.

RE: Hiawatha Lane Development
IWW 10619-18, WPL 10659-18

In response to the September 7, 2018 Memorandum from Amrik Matharu to Alicia Mozian. The following documents have been revised:

Stormwater Management Report, 9/27/18
SP-1.1 Layout Plan (North)
SP-1.2 Layout Plan (South)
SP-2.1 Grading and Utility Plan (North)
SP-2.2 Grading and Utility Plan (South)
SP-3.1 Landscape Plan (North)
SP-3.2 Landscape Plan (South)
SP-5.4 Site Details

In the text below, the comments / questions by Amrik Matharu are in *italics*, and the applicant's responses are in **bold**.

1. **Comment:** *Drainage. Impervious total for BB-3 on table No. 2 does not add up correctly.*
   Response: **This row did not add up on the table due to rounding to the nearest 0.01 acre. The table has been adjusted.**

2. **Comment:** *Drainage. Notes #6/#7 on Table No. 2 and notes #2/#3 on Table No. 3 state that flow rates of 0.01 cfs and 0.04 cfs are used for footing drain calculations. Based on the revisions, this flow rate shall be updated.*
   Response: **The constant underdrain drain flow for Buildings A, B, C, and D has been modeled at 140 gpm, 0.31 cfs, the estimated pump rate of the sump pump. The constant underdrain drain flow for Building E has been modeled at 0.01 cfs. A sump pump is not proposed for this building. The tables and Pond Pack model have been updated.**

3. Comment: *Drainage. It does not appear gutters are proposed for half of the building E. The infiltration trench practice is not a permitted practice in areas such as this. A significant amount of additional stormwater may enter the system from the adjacent overland flows not computed as part of this drainage analysis.*

Response: All buildings will have gutters around the entire perimeter. Additional labels have been added to drawings SP-2.1 and 2.2 to clarify. A low retaining wall and diversion swale have been added to the west side of Building E to keep the off-site overland flow out of the infiltration system.

4. Comment: *Drainage. Additional deep hole test is required for Infiltration AA-1. As depicted, it is 18" (El. 17) lower than the restrictive layer of 54" (El 18.5) observed in TP#2 (Ground El. 23). Systems are required to be set 1' above seasonal high groundwater.*

Response: The closest test pit was TP#3, which went down to an elevation of 18.2 without encountering a restrictive layer. The proposed infiltration area is currently inaccessible for test pits. Prior to construction, a test pit and infiltration test will be conducted. At that time the infiltration may be modified.

5. Comment: *Drainage. Infiltration BB-3 does not appear to be set 1' above the observed restrictive layer in TP#5.*

Response: BB-3 has a bottom elevation of 17.0 feet with a restrictive layer of 15.9 feet.

6. Comment: *Drainage. Provide details for flow splitters and outlet control structures utilized in the design.*

Response: Details of the flow splitter and outlet control structure manholes have been added to drawing SP-5.4 Site Details.

7. Comment: *Drainage. It is not clear whether interior drains are proposed for the garage areas. If internal floor drains are proposed, they shall be directed to an oil/grit separator and discharge into the sanitary sewer system.*

Response: All interior drains will go to the sanitary sewer. Oil/grit separators will be used as required by the building code.

8. Comment: *Drainage. Infiltration Basin BB-5 does not appear to be set 1' above the observed restrictive layer in TP#9.*

Response: BB-5 has a bottom elevation of 13.6 feet with a restrictive layer of

12.6 feet.

9. **Comment:** *Drainage. Composite Curve Number calculations were not submitted as part of the drainage report.*
Response: The composite curve numbers were calculated on Table No. 2. Note #3 shows the curve numbers used based on land use.

10. **Comment:** *Drainage. It appears that the flow rate for sump pump in Building A will be closer to 175 gpm (gallons per minute), not the 112 called out on the cut sheet.*
Response: The Pond Pack model has revised to use a pump rate of 140 gpm.

11. **Comment:** *Drainage. It appears that the footing drain from Building A will be pumped and discharged as surface water. This practice is in conflict with Planning & Zoning Regulation 32-8.3.10.*
Response: The underdrains from buildings A through D will now be pumped to the underground infiltration system BB-1 as shown on SP-2.2.

12. **Comment:** *Drainage. It appears that the footing drain from Building E will be pumped to the private drainage network and discharged as surface water before entering the wetlands. This practice is in conflict with Planning & Zoning Regulation 32-8.3.10.*
Response: The underdrain from Building E will now be conveyed via gravity drain to the on-site catch basin as shown on SP-2.1.

13. **Comment:** *Drainage. It is not clear whether Buildings B, C, and D will have a footing drain and sump pump system.*
Response: The footing drains for A, B, C, and D will be interconnected, and will be pumped to infiltration system BB-1 as shown on SP-2.2

14. **Comment:** *Drainage. It appears that Infiltration Basin BB-2 is not set 1' above the observed restrictive layer in TP#7.*
Response: BB-2 has a bottom elevation of 12.0 feet with a restrictive layer of 11.0 feet.

15. **Comment:** *Grading. Grading on the west side of BLDG E is steeper than 1:5 (V:H).*
Response: A low retaining wall and diversion swale have been added to the west side of Building E to minimize the grading.

Mozian, Alicia

From: Shogren, Mark J. <mshogren@divneytungschwalbe.com>
Sent: Wednesday, October 03, 2018 8:08 AM
To: Mozian, Alicia
Cc: Stuart.Manley@ghd.com; Hollister, Timothy; Matharu, Amrik
Subject: RE: Hiawatha

Alicia,
In the event of a power outage or failure of the 2 pumps, there is an overflow pipe that will drain to Infiltration Basin BB-4. This pipe is shown on SP-2.2.

Mark J. Shogren, P.E.
mshogren@divneytungschwalbe.com

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From: Mozian, Alicia <AMOZIAN@westportct.gov>
Sent: Tuesday, October 2, 2018 12:07 PM
To: Shogren, Mark J. <mshogren@divneytungschwalbe.com>
Cc: Stuart.Manley@ghd.com; Hollister, Timothy <THollister@goodwin.com>; Matharu, Amrik <amatharu@westportct.gov>
Subject: RE: Hiawatha

Hi Mark,

I haven't had a chance to review the plans yet so apologies if they answer my question..

At the meeting last week one of my commission members questioned what would happen if the sump pump in the garage(s) failed and the cars got flooded. Can you address that question at or before our next meeting?

Thanks,

Alicia

From: Shogren, Mark J. <mshogren@divneytungschwalbe.com>
Sent: Tuesday, October 02, 2018 8:03 AM
To: Stuart.Manley@ghd.com; Mozian, Alicia <AMOZIAN@westportct.gov>
Cc: Matharu, Amrik <amatharu@westportct.gov>; Wilberg, Keith <KWILBERG@westportct.gov>; Ratkiewich, Peter <Pratkiewich@westportct.gov>
Subject: RE: Hiawatha

All - Attached are PDFs of the documents that were submitted yesterday.

Mozian, Alicia

From: Shogren, Mark J. <mshogren@divneytungschwalbe.com>
Sent: Wednesday, October 10, 2018 4:32 PM
To: Stuart.Manley@ghd.com
Cc: Mozian, Alicia; Matharu, Amrik
Subject: RE: Hiawatha

Stuart,
If the restrictive layer is higher than assumed on our plans, the entire infiltration system could be shifted to the north raising the bottom elevation by up to 12". If additional raising is necessary, we could switch to a smaller chamber, say the SC-310, which could allow us to raise the bottom by up to an additional 14". The footprint for the shallower chamber system would increase. Based on the 2 nearby test pit results, the ability to raise the infiltration system if needed, and the available space within the parking lot; potential modifications to the system should be feasible.

Mark J. Shogren, P.E.
mshogren@divneytungschwalbe.com

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www.divneytungschwalbe.com

From: Stuart.Manley@ghd.com <Stuart.Manley@ghd.com>
Sent: Tuesday, October 9, 2018 3:16 PM
To: Shogren, Mark J. <mshogren@divneytungschwalbe.com>
Cc: Mozian, Alicia <AMOZIAN@westportct.gov>; Matharu, Amrik <amatharu@westportct.gov>
Subject: RE: Hiawatha

Hi Mark,
Our only new comment pertains to Amrick's Comment 4 regarding an additional deep hole test for Infiltration AA-1. Assuming the Town agrees, we think it would be prudent to include an alternate option in case the soils are found unsuitable.
Thanks
Stuart

Stuart Manley, LEP, LSP, CHMM
Associate

GHD
Direct: +1 860 747 8548 | Office: +1 860 747 1800 | Mobile: +1 203 767 6482 | Email: stuart.manley@ghd.com
45 Farmington Valley Drive Plainville CT 06062 USA | www.ghd.com

WATER | ENERGY & RESOURCES | ENVIRONMENT | PROPERTY & BUILDINGS | TRANSPORTATION

Please consider our environment before printing this email

From: Shogren, Mark J. <mshogren@divneytungschwalbe.com>
Sent: Tuesday, October 09, 2018 1:36 PM
To: Stuart Manley <Stuart.Manley@ghd.com>
Subject: Hiawatha

Stuart,
Checking to see if you have had a chance to review the revised drawings and Stormwater Report or if there are any remaining issues to address before the 10/17 Conservation Commission meeting.

Thank you,

Mark J. Shogren, P.E.
mshogren@divneytungschwalbe.com

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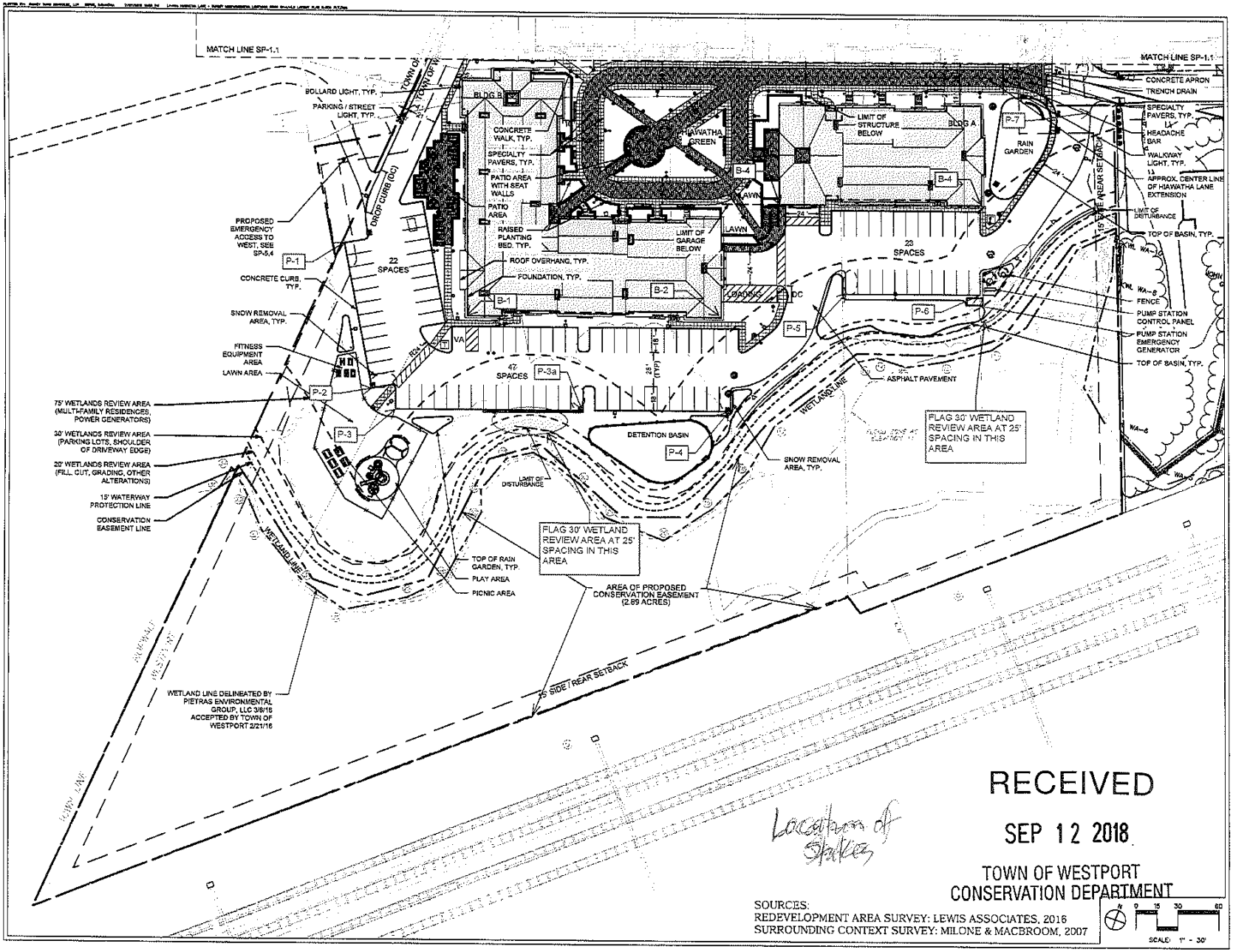


SOURCES:
REDEVELOPMENT AREA SURVEY: LEWIS ASSOCIATES, 2016
SURROUNDING CONTEXT SURVEY: MILONE & MACBROOM, 2007

SCALE: 1" = 30'

RECEIVED
SEP 12 2018
TOWN OF WESTPORT
CONSERVATION DEPARTMENT

Location of Stakes

THE VILLAGE AT SAUGATUCK

HIAWATHA LANE
TOWN OF WESTPORT,
CONNECTICUT

SUMMIT SAUGATUCK LLC
55 Station Street
Southport, CT 06880

PLANNER, CIVIL ENGINEER, LANDSCAPE ARCHITECT:
DIVNEY • TUNG • SCHWALBE
Intelligent Land Use

ARCHITECT:
THE MONROE PARTNERSHIP, LLC
8 Knight Street, Suite 204
Norwalk, CT 06851

SURVEYOR:
LEWIS ASSOCIATES
260 Main Street
Monroe, CT 06468

SANITARY ENGINEER:
REDNISS & MEAD
22 First Street
Stamford, CT 06905

ATTORNEY:
SHIPMAN & GOODWIN LLP
One Constitution Plaza
Hartford, CT 06103

WETLAND CONSULTANT:
WILLIAM KENNY ASSOCIATES LLC
195 Tunxis Hill Road
Fairfield, CT 06825

NOT FOR CONSTRUCTION

REVISIONS
NO. DATE ISSUE
1 07/31/18 REVISED PER THIRD PARTY REVIEW COMMENTS

LAYOUT PLAN (SOUTH)

DRAWN BY: SBK CHECKED:
PROJECT NO. 564 DATE: 06/

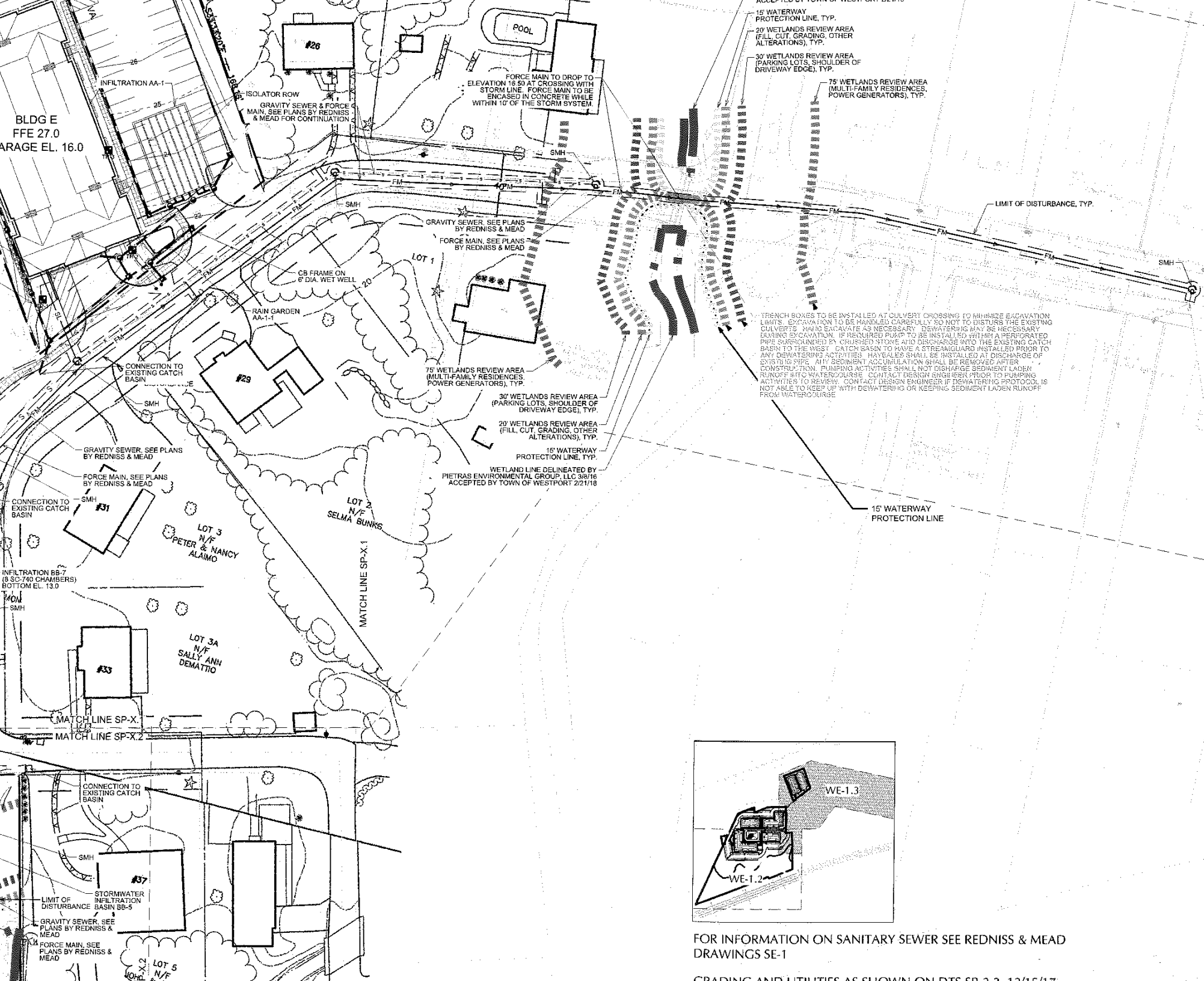
SP-1

Submitted at Public Hearing
10/17/18

APPLICATION OF SUMMIT SAUGATUCK LLC TO WESTPORT CONSERVATION COMMISSION AND FLOOD AND EROSION CONTROL BOARD FOR REGULATED ACTIVITY PERMIT AND WATERWAY PROTECTION LINE ORDINANCE APPROVAL, HIAWATHA LANE AND HIAWATHA LANE EXTENSION

PROPOSED CONDITION OF APPROVAL

The applicant agrees, prior to the issuance of building permits, to examine the condition of the culvert at the intersection of Davenport Avenue and Hiawatha Lane, including its load-bearing capacity for trucks hauling excess earth materials; and to obtain any permits necessary to repair or replace the culvert prior to the start of residential construction.



FOR INFORMATION ON SANITARY SEWER SEE REDNISS & MEAD DRAWINGS SE-1

GRADING AND UTILITIES AS SHOWN ON DTS SP-2.2, 12/15/17