DEPARTMENT OF PUBLIC WORKS
TOWN OF WAYLAND

Entrusted To Manage The Public Infrastructure

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To: Geoff Larsen, Building Commissioner
Zoning Board of Appeals

From: Paul Brinkman, Town Engineer

CC: Tom Holder, Director DPW
Julia Junghanns, Director BoH
Linda Hansen, Conservation Administrator
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Date: August 15, 2018

Subject: 24 School Street – Windsor Place

The Department of Public Works (DPW) has reviewed information relative to the Comprehensive Permit filed for the aforementioned project. Revisions to the original Comprehensive Permit application were submitted to the Town between May and August 2018. The documents received that are in this review include:

- A Slug Test and Groundwater Mounding Analysis Report dated May 7, 2018.
- A letter from Creative Land & Water Consulting, LLC dated May 8, 2018.
- A Revised Hydrologic Analysis dated May 2018.
- A Plan Set consisting of an Existing Conditions Site Plan dated May 23, 2017 and a five-page Sheet Set (Proposed Layout, Proposed Grading, Proposed Site, and two Proposed Detail plans) with a revision date of April 20, 2018.
- A review of Mounding Calculations/Stormwater Review by Nover-Armstrong Associates, Inc. dated May 24, 2018.
- A response to the May 24, 2018 Nover-Armstrong comment letter from Creative Land & Water Engineering, LLC dated June 12, 2018.
- A Stormwater Report by MetroWest Engineering, Inc. dated June 2018.
- A Plan Set (5 sheets) with a revision date of July 5, 2018 consisting of Proposed Layout, Proposed Grading, Proposed Site, and two Proposed Details plans.
- A follow-up review by Nover-Armstrong, Inc. dated August 1, 2018.

The submittals were primarily provided to address previous analysis completed by the proponent on the mounding of stormwater and wastewater system discharges on the site. The mounding height of the discharges from the stormwater infiltration system and sub-surface wastewater disposal system required modifications to the systems to develop adequate separation between the groundwater and systems'

infiltration elevations. This resulted in significant modifications to the stormwater management systems. It also depicts modifications to accommodate access concerns raised by the Fire Department.

The proposed project involves the construction of 12 condominium style units in two separate structures. They are proposed in two rows, with a row along School Street composed of 5 units and the remaining 7 units are located along the west boundary of the property. The site address is 24 School Street, a parcel located at the intersection of School Street and East Plain Street with an approximate area of 38,000 square feet.

The project will require substantial modification to the existing parcel to construct the proposed development. Waivers of many of the local permitting requirements will be required to construct the project as proposed. The project as depicted will require the installation of water and fire services; wastewater collection and treatment and disposal systems; drainage collection, infiltration and discharge systems; as well as electrical, gas, and telecommunications facilities.

The project results in significant modification to the existing features with the demolition of all existing structures and the removal of a substantial portion of the existing natural cover. In order to create the proposed elevations, a significant amount of fill material will be required. The modifications result in a significant increase in impermeable/reduced permeable area. The project will also require modification to the Town's right of way with new water connections and the modification of existing curb cuts.

Water Connections

The plans depict four connections to the water system. Two pairs of domestic water service and fire service pipes are shown to service each of the two separate structures. One from School Street to service the 5-unit structure and the other from East Plain Street to service the 7-unit structure on the west side of the property. It is unclear as to the configuration for the distribution of water within the structures. Based upon previously reviewed architectural drawings, it is likely that interior plumbing will be required to distribute the water to each unit.

A permit from the DPW – Water Department will be required prior to connection to the Town's water system. The application will require details regarding the distribution of water on-site as well as meter locations and covenants in place to clearly define the responsibility for the private facilities constructed as part of the project.

Prior reviews of the project required additional information to be provided to ascertain that existing customers will not be impacted by the project. The proponent is to provide information as requested in the prior reviews.

Transportation

The revised plan set depicts two curb cuts to provide access to the property. One entrance, off of East Plain Street, is designated as emergency vehicles only. The controls proposed to manage vehicular traffic through this curb cut is three signs placed adjacent to the driveway. The entrance for residents and others requiring access to the proposed development is from School Street.

The revised plan set also depicts limited information related to modifications to the right-of-way to accommodate the increased traffic volumes from the project. Arrow markings are depicted on the plans, but it is unclear if these are proposed to be added as part of the project. Additionally, minor sidewalk repairs are proposed to East Plain Street as a result to changes in curb cuts. There are likely other changes required to the right-of-way to allow the project to be completed, they include modifications to hedges and other greenspace along School Street, although this is not depicted.

Comments as they continue to pertain to the project from the prior review still remain relevant.

Proponent to provide details and analysis regarding the project's impacts on the Town's transportation system from the project. Proponent to provide information on the mitigation proposed to eliminate the impacts on the Town's transportation system.

Stormwater

The plan set represents a substantial revision from earlier submittals. The primary revisions include the addition of a "rain garden" to capture flow from the east side of the development, the addition of a level spreader and significant modifications to the infiltration system. The system as proposed, will discharge a higher volume of water to the adjacent wetlands located on Town owned land under storms greater than or equal to 2-year, 24-hour in intensity than the previous proposed design.

A revised hydrologic model was provided with the submittal. The calculations provided in the model indicate that the post development peak flowrates and total volumes will be less than those estimated for the existing site. A review of the submittal indicated a few areas of concern with regards to the management of stormwater on the property and the presentation of data.

- On page 2 of 8 of the summary information contained in the report states that "The proposed infiltration system is designed to completely contain and recharge runoff from storms up to the 10-year storm." The modeling indicates that the system will overflow under a 2-year storm condition.

- The post-development watershed delineation plan depicts a Design Point for Basin 3A that appears unrepresentative of the proposed topography. The discharge point is located on top of a proposed retaining wall. During the Conservation Commission meeting of August 8, 2018, the proponent indicated that water would sheet flow from the wall to the adjacent parcel. Basin 3A appears to direct the primary flow of stormwater down across the wastewater management system.

- The post-development peak flow rates are provided on page 7 of 8. The flows indicated for Design Point C under the 100-year condition are approximately 4 cubic feet per second. The majority of the stormwater will be transported to the level spreader through an 8-inch pipe. This will require a flow rate of greater than 8 feet per second, which based upon the slope of the proposed pipe is not possible.

- Chapter 5 includes a table (Table One) that identifies the reductions in peak runoff rates from existing conditions to proposed. The reduction in the 100-year storm appears to be incorrectly calculated.

- According to the model calculations the system will be fully utilized under the 100-year condition. The peak flow level elevation is equivalent to the top of the infiltration system.

The plans depict several stormwater management system components and pipes. Some concerns identified are as follows:

- Elevation and grade control. The onsite management of stormwater will require very refined elevation and grade control. Two areas of concern specifically are the emergency entrance from East Plain Street and the west side of the property, which is the discharge location of the majority of overland flow stormwater derived from the property under existing and proposed conditions. The East Plain entrance grading does not currently appear sufficient to contain stormwater derived from the parking area within the project. It will require more substantial

elevation contours to positively enable stormwater to be directed to the double catch basin #3.

The west side drainage control will require modification to ensure that it does not become a point source discharge. The configuration and construction should limit the future potential by residents of the project to modify elevations causing a negative impact on the Town's property and drainage system. As previously mentioned, a short discussion regarding the form of the retaining occurred at the Conservation Commission meeting of August 8, 2018. Both a cast-in-place and a pre-engineered block type wall was discussed. Project considerations for the final wall type and configuration should include reviewed to ensure that stormwater flows do not impact the Town's adjacent property.

- The plans depict a storm drain system identification leader with attributes adjacent to the Proposed SMH 4. The leader does not appear to be pointing at any specific proposed infrastructure. The plans should be updated as to the necessity of this information.
- Proposed invert elevations for the drain lines (from the Stormceptors® and bypass) discharging to the infiltration system will be operating under a surcharged/flooded condition. This may impact future operation of the system. The lines contain several fittings, which cannot readily be accessed. Proponent should consider modifications to alleviate these concerns.
- Inverts for the pipe between DMH 3 and DMH 3A appear to be have the pipe in a negative slope configuration. This will reduce the effectiveness of the Stormceptor® and reduce the amount of flow treated by the units.
- Elevations identified for the Stormceptors® as compared to the overflow inverts from the infiltration system will result in flooded/surcharged conditions within the Stormceptors® during operation. This may reduce the effectiveness of the units. Proponent shall provide information that this is an acceptable operating condition for the units.
- As mentioned earlier the discharge piping from the overflow of the infiltration system and rain garden appears to be inadequately sized to handle the peak flow generated from a 100-year event.
- A level spreader is proposed to manage overflows from the infiltration system and rain garden. The level spreader is proposed to be immediately adjacent to the proposed site retaining wall. The piping is located within 1-foot of the retaining wall. The detail for the level spreader does not show how the retaining wall will be constructed to interact with the level spreader. The detail also does not appear to be consistent with the site plan relative to the "cleanout" and "inspection port".

Site Utilities/Facilities

A review of the utilities on the site was performed to check for conditions that might result in a failure of a system or systems that would result in negative impacts to the down gradient Town property and the Town drainage system.

Wastewater System. The project proposes to utilize a treatment system and sub-surface disposal system to manage wastewater generated from the project. The wastewater is proposed to be collected from the units from sewers that are placed parallel to the units within grassed areas. Observations/concerns are as follows:

- The wastewater collection system piping and manholes is configured inconsistently between the east and west side. A manhole is placed at the top end of the system on the School Street side, but not on the west side portion. Access to the lines is important to ensure that back-ups and overflows do not occur as a result of blockages in the system.

- The collection system passes under the drainage system in front of Unit 7B. There is approximately a 3-foot difference in the elevation of the two pipes. Positive measures should be used to ensure that groundwater flow between the two pipe systems is minimized.

- The locations proposed for the wastewater collection system are in the rear of the buildings and largely within grassed areas. There is very limited room to conduct maintenance activities on this system. In some locations less than 5-feet is available to access this important infrastructure.

- The collection system is also located in a manner that may increase the likelihood of freezing. Typically, the minimum bury depth for wastewater collection system and treatment infrastructure is 4-feet. There are areas where the piping is less. Additionally, on the west side, they piping is located approximately 4-feet from the retaining wall and above the base of the wall, which makes the piping potentially exposed to freezing conditions from two directions.

- Manholes for the collection system are primarily located within the grassed areas. They appear to be set flush to grade. After construction there is a tendency to "cover" the manholes with grass, which will make them susceptible to inflow from stormwater. Inflow could result in a failure of the wastewater treatment system and an overflow. It is recommended changes be made to ensure that inflow is not an issue for the system.

- The treatment system is located behind/below a retaining wall. There does not appear to be a formal means by which personnel can access the treatment system and equipment. Access to the system will be difficult and maintenance activities that require equipment larger than that which can be carried will be difficult.

Stormwater System. The project proposes to utilize a combination of deep sump catch basins, Stormceptors®, infiltration, raingarden and a level spreader to manage the stormwater flows from the project.

- The project proposes to collect roof drainage from the front side of the buildings into the management system (the rear of the buildings will be directed to the ground). Roof leader locations and the associated drainage piping have not been depicted on the plans. There are a number of other utilities which will be required for the project. These should be depicted to ensure that there is adequate room on the site.

- The level spreader is located on the southwest corner of the retaining wall. There is very limited access for the proponent to access the level spreader for operation and maintenance activities.

Retaining Wall. Two retaining walls are proposed for the project in order to develop adequate elevations for the appropriate management of wastewater and stormwater relative to the existing groundwater elevations.

- The retaining wall configuration and format have not been defined in the plans. The west side retaining wall is considerable in height and is immediately adjacent to the Town land. Proponent should provide information on the format and configuration, as well as provide

details as to how the system will be constructed to ensure that the Town land is not disturbed or impacted by the work.

- The west retaining wall is proposed with a fence. Given the height of wall and location immediately adjacent to the Town parcel (and wetlands), consideration for ensuring that activities from the top of the wall including, lawn maintenance, gardening, and recreational activities are kept on the parcel. Disposal of debris "over the wall" and repeated encroachment by residents on the Town land may result in damage to the wetlands.

- The retaining wall around the parking area, immediately to the east of the wastewater treatment system appears to be 4-feet in height, which may require the installation of a fence for fall protection.

Of general note, given the scale of the drawings 1"=20', it will be challenging to construct the systems required to service the project. Much of the infrastructure relies on precise elevation control. There is also little room for adjustments to the location of the infrastructure as it relates to the project.