

WILTON PUBLIC WORKS  
DEPARTMENT

(203) 563-0152



TOWN HALL ANNEX  
238 Danbury Road  
Wilton, Connecticut 06897

**MEMORANDUM**

**TO:** WPCA Commission

**FROM:** Frank Smeriglio, PE, - Director of Public Works/Town Engineer *FS*

**DATE:** October 31, 2022

**RE:** 19 Cannon Rd – Baywing LLC

---

This memo is written in regards to the review of Sanitary calculations dated September 1, 2022 for the 19 Cannon Road Proposed Development. Based on the review of the submitted information included in the application, we are not able to form an opinion to allow the proposed sewer connection into the existing sewer system at this time. The following items below shall be addressed for our continued review.

**Technical Sanitary Sewer Related Items**

1. A pump station is proposed on private property with a proposed private force main on Cannon Road (Town road) and on Danbury Road (State road -Route 7) to discharge into the existing sewer system.
  - a. Provide preliminary authorization from State DOT to allow a private force main across Route 7. Developer shall evaluate utilizing a gravity sewer line crossing Route 7 and conduct test pits to locate existing utilities to ensure that a gravity sewer line can be constructed.
  - b. The sewer force main on Cannon road and on Route 7 shall be private. After the forcemain is built, State Regulations (Call Before You Dig) requires that the force main is marked out by the owner within 3 days when a future potential contractor is proposing to work in the area on Cannon Road and on Danbury road (Route 7). Provide measures on how you plan to register with CBYD Clearing House and how you plan to be in compliance by marking out the force main within the allotted timeframe to prevent damage to the private force main.
  - c. Provide measures on how the property owner will maintain flow discharge in the event the proposed force main is potentially damaged as part of an independent contractor's work on Cannon road and on Route 7.

- d. Provide a draft agreement for our review for the maintenance of the forceman on Cannon Road.
2. Provide design plans of the pump station at 19 Cannon. Provide design plans of the force main including proposed restoration on Cannon Road and on Route 7. GIS layout with one line is not sufficient for our review. This information is needed to review and to evaluate the potential of combining two potential proposed forcemains into one.
3. Design Engineer shall obtain actual slopes of the existing 8" pipes on Route 7 to determine actual pipe capacity. Various slopes may be flatter than 0.005.
4. Please refer to items 1 through 6 of the Wright Pierce letter dated October 28, 2022.

**General Sanitary Sewer Related items**

5. Please note: The project will be subject to Sewer Capital Assessment as required by the WPCA. The Assesment would be levied after the project is completed.
6. Please note, any potential clogs in the lateral, forcemain and/or sewer main connection points shall be the responsibility of the property owner to unclog.
7. Please note, upon review of the development plans, property owner shall be responsible for maintainance of the force main from the property to gravity sewer line and the pump station on private property.
8. Please note, all proposed sewer lines shall be air tested prior to sign off of certificate of occupancy.
9. Please note, the project will be subject to the final technical review by the WPCA.

Based on the list of items above, these comments shall be considered preliminary and additional items may be required depending on responses to the above.

If you have any questions, please do not hesitate to call.

October 28, 2022

Frank Smeriglio, PE  
Director of Public works / Town Engineer  
238 Danbury Road  
Wilton, CT 06897

**SUBJECT: Wilton WPCA – Sewer Capacity Review  
Multi-Family Development at 19 Cannon Road**

Dear Frank,

Per your request, we reviewed the provided PDF entitled: “GENERAL STATUTES § 7-246a APPLICATION OF BAYWING L.L.C. FOR SEWER EXTENSION, ALLOCATION OF SEWER CAPACITY, AND APPROVAL TO CONNECT A MULTI-FAMILY DEVELOPMENT AT 19 CANNON ROAD, WILTON” dated September 1, 2022 (referred to as “Application”). Wright-Pierce previously reviewed the proposed flows for this site, regarding system capacity, as provided in the February 2022 submission.

This memorandum provides our review and comments on the capacity analysis and connection of the development.

### **Sewer Capacity Analysis Review**

The sewer capacity provided as part of the application was performed by M. Bartos of Landtech and is dated August 29, 2022. The assumptions made as part of the analysis done by M. Bartos include, with commentary made by Wright-Pierce for some items (in italics):

- The analysis reviewed the capacity of the 8-inch sewer from Cannon Road to where the pipe becomes an 18-inch sewer just north of Catalpa Road
- A manning’s n of 0.015 was assumed for the 8” pipes of unknown material.
  - *This is a suitably conservative value.*
- A proposed flow of 80 gpm (pumped flow rate) from the development requesting connection at 19 Cannon Drive.
- An allowance of 80 gpm of pumped flow rate from the nearby Cannondale Village development site based on a previous application for capacity from that site.
- The 2019 Wilton Heights Report (what was not provided to Wright-Pierce as part of our review) was updated with the assumed flows from 19 Cannon Drive and Cannondale Village and was utilized as a basis to evaluate the flows and capacities within four pipe sections south of Catalpa Road down to the Norwalk Town Line.
- An estimated minimum slope of 0.005 ft/ft for the 8” pipes along Danbury Road north of Catalpa Road to avoid surveying the inverts.

- An existing metered peak flow of 115.3 gpm (from the Fall 2021 metering performed by EST Associates) was utilized for the existing flows within the 8-inch sewer north of Catalpa Road.
  - *This metering period contained no significant rainfall events.*
  - *No additional allowance for infiltration and info was included in the analysis of the 8-inch sewer north of Catalpa Road.*

The analysis performed by Landtech finds that there is sufficient capacity in the existing pipe segments, that were evaluated, to accommodate the proposed flow.

However, there are some items not taken into consideration as part of the evaluation outlined above that could reduce the stated ability of the existing system to handle the future flow, specifically in the existing 8-inch pipe. These items are expressed below.

#### **Item 1 - Insufficient Allowance for Infiltration and Inflow**

As noted in the assumptions listed above, the analysis by Landtech utilized metered flow during a relatively dry period when potential sources of excess rainfall or groundwater would not be significantly active. In addition, they did not include any allotments or assumptions for those flows likely not captured by the metering. These increased wet-weather flows are critical to include during a capacity analysis, as these flows take away from the ability for the sewer to convey sewage as designed.

This infiltration allowance is typically included utilizing a “normalized I/I” factor. This factor is often expressed in a rate of gallons per day per inch-mile of pipe. This “normalized I/I” rate could either be based on an I/I analysis, where the increase in flow during wet weather is tabulated and then averaged out over the area of the contributing sewer pipes, or an assumed value can be utilized.

“TR-16 - GUIDES FOR THE DESIGN OF WASTEWATER TREATMENT WORKS,” a document prepared by the New England Interstate Water Pollution Control Commission and typically regarded as the design standard for sewers in Connecticut calls for a typical allowance of between 250 to 500 gpd per inch diameter mile of pipe for typical pipes, with high values to be utilized if supporting documentation indicated higher infiltration rates during wet weather and high groundwater periods.

Whether a wet-weather metering period is used, or some form of infiltration and inflow allowance is added to the capacity analysis, these wet-weather flows should be included to ensure that capacity exists during these expected high-flow events.

For the purposes of our review, to be conservative knowing that Norwalk has requested that Wilton perform an I/I study, we will assume a higher infiltration allowance of approximately 2,000 gpd/in-mile. Utilizing that number, and assuming approximately 2,400 LF of 8 -inch pipe exists (located upstream of the increase to 18-inch sewer near Catalpa Road). This would account for an infiltration flow allowance of approximately 0.01 cfs that we utilized to account for I/I in this analysis. **However, the applicant should review this assumption and confirm this value or provide their own revised capacity analysis that accounts for I/I.**

### Item 2 - Confirmation of Proposed Pumping Station Capacity

The flows from the proposed development at 19 Cannon Road will be conveyed to a Town pumping station on School Road near the Cider Mill School. Although the upstream sewer pipe capacity has been reviewed, the current analysis does not present information about the ability of this pump station to accept the additional flows from the proposed development.

We reviewed the nameplate information of the pump and contacted the manufacturer. The existing pumps are rated for 350 gpm at 106' TDH (350 gpm = approximately 0.78 cfs), when purchased in 1976. TR-16 defines the capacity of a pumping station as the ability of the station to convey flow while one pump is offline. Therefore, the proposed development, when the pumps are operational the 19 Cannon Road development would demand about 23% of the station's existing pumping capacity.

There is concern with pumping capacity of peak flows during high flows within the existing system. The local YMCA is connected to the system upstream of this station. As part of their routine maintenance, pool water is pumped to the sewers. This pumping must be coordinated at nighttime to avoid daytime flows; high-level alarms still occur during these low flow condition giving concern about the peak flow capacity at this station.

A review of the pump station run times since approximately March of 2022 indicate that the station runs approximately 5 to 8 hours per day on average. On an average daily basis, the station seems to have capacity to accept the proposed additional flows. However, as noted above, there are concerns that there is not adequate pumping capacity during peak flow conditions. **Based on this information it is recommended that the applicant reconsider the proposed pump station's design flow rate and reduce the requested pumping capacity to convey the proposed flow from the development to the Wilton system.**

### Item 3 - As-Built Pipe Minimum Slope

The analysis utilized a pipe slope of 0.005 ft/ft. However, TR-16 allows for a slope as little as 0.004 ft/ft in 8-inch pipe; the existing pipe could have been installed with less than the assumed slope, and still meet standard design guidelines. If the reduced slope is used in the capacity calculations, this could reduce the assumed full pipe flow capacity within the pipe from 0.75 cfs down to approximately 0.67 cfs. Without information on the actual as-built slope of the sewer pipe, **it is requested that the pipe inverts be surveyed to determine actual slopes so the capacity analysis can be revised with the surveyed information.**

### Item 4 – Existing Assisted Living Facility Connection Flows

There is an existing assisted living facility near the intersection of Route 7 and Olmstead Hill Road that connects to the existing sewer system. This facility consists of two separate buildings and were the impetus for the construction of the existing 8-inch sewer that 19 Cannon Road is requesting to connect to. These buildings were approved for 0.20 cfs and 0.20 cfs, for a total sewer flow of 0.40 cfs from the site. The metered flow used from the capacity analysis was less than this amount, generally. **Therefore, we request that the capacity analysis be revised to ensure that the allotted capacity of 0.40 cfs from the assisted living facility can be maintained in addition to the other existing flows as well as the proposed development flows.**

#### Item 5 - Proposed Pump Station Assumptions

Any revisions to the design flow rate associated with the pump station from the proposed development could have a direct impact to the assumptions utilized during the capacity analysis and should be considered.

The capacity analysis assumes that the pumping station is designed with a force main velocity of 2 ft/sec. A velocity of 2 ft/sec is the minimum rate typically utilized to design gravity sewers and is the target velocity for keeping solids in suspension and used for gravity sewers that have a steady flow of water or will drain to empty. However, in an infrequent pumping scenario the pipe remains full, the design velocity target is 3 ft/sec to re-suspend settled solids and prevent clogging. TR-16 states that a force main should be designed to maintain a velocity of 3 ft/sec for design average daily flow and a 4-inch minimum pipe size. These references are taken from Section 3.7.1 and 3.7.2 of TR-16 for Pumping Station designs.

If the design requirements of TR-16 for low pressure sewers or Grinder Pump stations (section 2.9.2 or 2.9.3 of TR-16) are followed, it mentions designing the force main piping for cleansing velocities and references following WEF's Manual of Practice FD-12 Alternative Sewer Systems, which the designer should consult to confirm the appropriate velocity. Wright-Pierce would elect a minimum velocity of 3 ft/sec to avoid long term impacts to the function of the force main.

If a 3 ft/sec pumping velocity is used within the 4-inch pipe, it would make the proposed 80-gpm pumping rate higher. A 4-inch pipe flowing at 3 ft/sec would be closer to 120-gpm, not 80-gpm. This increase from 80 to 120 gpm due to the change in design velocity would equate to approximately 0.09 cfs of additional flow capacity of the downstream pipe.

Please evaluate proposing a different size forcemain that can provide both cleaning velocities and a reduced flow rate.

Although the applicant proposes that maintaining that force main is the property owner's responsibility, the concern would be that the final design ends up calling for a higher velocity and potentially a larger pumping rate than currently estimated in the capacity analysis, which could make the provided analysis obsolete.

**Confirming the designer's confidence with a design velocity of 2 ft/sec within the force main, and therefore the proposed pumping rate, is an important consideration for approval of the capacity analysis as presented. In conjunction with Item #2 above, consideration must be given to reducing the pumping rate for the proposed pumping station.**

#### Item 6 - Capacity for Additional Future Development

In the applicant's analysis, there appears to be no allowance for any reserved capacity for additional future connections in the area besides the proposed development and the previously proposed and approved Cannondale Villages. The 80-gpm allowance for Cannondale Villages utilized in the analysis does act as a reserve capacity for any other future developments in the area, but was part of an approved development, and may not be available for other future connections. **If the existing slopes within the applicant's analysis are correct, pending the other items noted in this letter, there may not exist much if any additional capacity for**

future flows beyond this proposed development. Wilton should consider an allowance for additional development, sewer growth from the Town's Plan for Conservation and Development and reserved capacity for this area that could connect to this section of sewer.

#### Summary of Action Items and Review:

Based on our review comments above, the following items need to be performed and the information used in an amended capacity analysis of the existing sewer in this area for Wilton to continue their review:

- Item 1 – Insufficient Allowance for Infiltration and Inflow
  - Applicant to review and accept estimated allowance in this letter or provide alternate method to account for Infiltration and Inflow in the capacity analysis.
- Item 2 – Confirmation of Pumping Station Capacity
  - Applicant should reconsider the proposed pump station's design flow rate and reduce the requested pumping capacity to convey the proposed flow from the development.
- Item 3 – As-built Pipe Minimum Slope
  - Applicant shall survey the pipe inverts to determine actual slopes and revise the analysis utilizing the surveyed information.
- Item 4 – Existing Assisted Living Facility Connection Flows
  - Applicant will revise the capacity analysis to provide and ensure the existing approved capacity of 0.40 cfs from the assisted living facility.
- Item 5 – Proposed Pump Station Assumptions
  - In conjunction with the comment from Item #2 above, applicant's designer shall also evaluate changing the size of the force main to both provide cleansing velocities and reduce the flow rates.
- Item 6 – Capacity for Additional Future Development
  - Wilton should consider any additional development that would connect to this sewer section to provide for growth and identified reserve capacity for sewer in accordance with Wilton's Plan for Conservation and Development.

Based on our review of the analysis provided by the applicant for 19 Cannon Road, the pipe would be nearly at capacity (over 90% of full pipe capacity at the peak condition) or over capacity if the pipe slopes utilized are correct and all three of the Assisted Living Facility, the 19 Cannon Road proposed development, and the Cannondale Villages development were built and utilized their entire 'allotment' as approved and as proposed and presented in the analysis. The presented analysis does not account for any reductions in available capacity due to the items noted within this letter. As the applicant's analysis stands, the Cannondale Villages allotment would be basically the remaining capacity in this line for future development without some form of upgrade to the capacity of the 8-inch line, or the installation of an alternate sewer route for some of the flows.

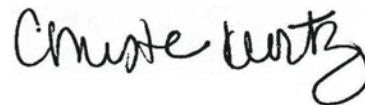
Applicant should address the action items above and amend their capacity analysis and re-submit their revised findings to the Town of Wilton.

We are prepared to meet to further discuss the concerns outlined above, or to answer any questions you or your staff may have.

Sincerely,  
**WRIGHT-PIERCE**



Joe Hausmann, PE  
Lead Project Engineer  
[joe.hausmann@wright-pierce.com](mailto:joe.hausmann@wright-pierce.com)



Christine Kurtz, PE  
Project Manager  
[christine.kurtz@wright-pierce.com](mailto:christine.kurtz@wright-pierce.com)