

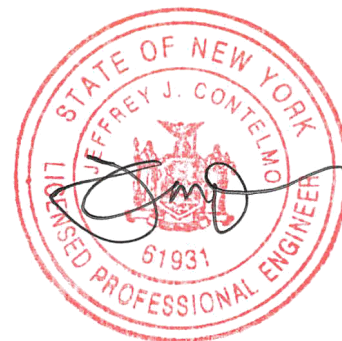


## **PRELIMINARY WATER & WASTEWATER ENGINEERING REPORT**

**For**

**Beacon Views  
City of Beacon, New York**

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## 1.0 INTRODUCTION

The Beacon Views project is located on a parcel adjacent to Conklin Street and Hastings Drive. The subject property is located in the City's RD-5 District and is identified as Tax Map No. 6055-03-331123. The applicant, Beacon Views, LLC wishes to construct nine buildings containing 42 townhomes.

The project is located in the City of Beacon Water and Sewer area. Water will be provided by an 8" diameter watermain extension off the adjacent 12" diameter main through the property, with proposed individual water service line connections to each proposed building. The proposed watermain will connect to the 12" diameter existing watermain located in the easement along the east side of the parcel.

Sewer will be provided with an 8" diameter gravity main through the site that will collect service connections from each unit. The 8" diameter gravity main will discharge to a proposed sewer pump station that will discharge to the existing city sewer system on Conklin Street.

## 2.0 PROJECT DESIGN FLOWS AND ANTICIPATED FLOWS

Design maximum daily wastewater flows for the proposed project, Beacon Views, are based on the hydraulic loading rates given in the New York State Department of Environmental Conservation (NYSDEC) publication *Design Standards for Intermediate Sized Wastewater Treatment Works – 2014* (DEC 14). The design maximum daily water use is a conservative design flow on which the water infrastructure will be designed. This value does not represent the average daily flow which is expected to be substantially less.

The following table calculates the hydraulic loading rates and the design flow rates (gallons per day or gpd) for the proposed project.

**Table 1: Beacon Views Project Design Maximum Daily Flow Rate**

Proposed Use	Hydraulic Loading Rate	Design Maximum Daily Flow (gpd)
42 –Three Bedroom Townhome	330 gpd/dwelling	13,860
<b>Total</b>		<b>13,860</b>

The anticipated design average daily flows for the project are expected to be significantly less than the design maximum daily design flow. The design maximum daily flows represent conservative flows to ensure that the proposed sewer infrastructure is designed with an ample factor of safety. The anticipated average daily flows are based on occupancy rates and measured data for water use. Statistical data (obtained from *Rutgers University, Center for Urban Policy Research, Residential Demographic Multipliers*, June 2006) for the average number of occupants in rental units (based on number of bedrooms) was used to calculate the expected number of residents anticipated for the project as shown in the table below. Data from the American Water Works Association (AWWA) shows that the average in home water use is 69 gpd per person. This number is reduced to 45 gpd per person when water saving fixtures are used, which is the case for this project.

**Table 2: Design Average Daily Flow**

Proposed Use	Occupancy Rate	Total Anticipated Residents	Water Use Per Resident (gpd)	Water Use (gpd)
42 –Three Bedroom Townhome	3.0 people/unit	126	45	5,670
<b>Total Anticipated Water Use (gpd)</b>				<b>5,670</b>

As demonstrated above, through the use of water saving fixtures as required by current building code, a design maximum flow of 13,860 gpd is proposed for the project, while the design average daily flows are anticipated to be substantially less 5,670 gpd.

The peak hourly flow is calculated using a peaking factor that is based on the population of the subject project. A peaking factor of four will be used for the project based on Figure 1 from *Recommended Standards for Wastewater Facilities* (RRWW).

Peak Hourly Domestic Flow

$$13,860 \text{ gpd} \div (24 \text{ hr/day}) \div (60 \text{ min/hr}) = 9.6 \text{ gallons per minute (gpm)}$$

$$\text{Peak Hourly Flow} = 9.6 \text{ gpm} \times 4 = 38.4 \text{ gpm}$$

Although the anticipated flows (design average daily flow) for the project are lower than the design maximum daily flows, the design maximum daily flows are used for the design of the system. This provides an additional factor of safety in the proposed design.

### **3.0 PROPOSED WATER CONNECTION TO THE CITY OF BEACON SYSTEM**

#### **3.1 System Characteristics**

Based on review of existing system with the City of Beacon Water and Sewer Department there is an existing 12" diameter water main located in the easement that runs along the northeast portion of the subject parcel. The dynamics of the system in the project area are not yet known and will be addressed as the project advances.

#### **3.2 Proposed Water Service Connection**

The existing watermain which the project proposes to connect to is located in existing easement which bounds the project site to the east. As previously discussed, based on available mapping subsequent discussions with the City of Beacon Water and Sewer Department the existing watermain is 12-inch diameter pipe. The project proposes one (1) 8" diameter DIP watermain extension from the existing 12" diameter watermain. The water service lines to the buildings will be sized for each of the residential building units.

Two (2) centrally located fire hydrants are proposed throughout the proposed development. All hydrants will be manufactured by Mueller as required by the City.

Restrained joint connections will be provided at all pipe bends. Upon completion of the water service installation pressure testing, disinfection, and flushing will be performed in accordance with AWWA standards.

RSWW recommends that the normal working pressure not be below 35 psi, and both the RSWW and the *American Water Works Association* (AWWA) M 31 recommend that a minimum of 20 psi be maintained at all points in the water distribution system during fire flows.

### **4.0 PROPOSED WASTEWATER CONNECTION TO THE CITY OF BEACON SYSTEM**

Sanitary sewer connection for the Beacon Views will be provided via force main connection to the gravity sewer system located east of the project site on Conklin Street.

An onsite sewer main will collect wastewater flows from each of the 42 townhomes and convey to an onsite sewer main, and then to an onsite pump station. A sewer service line will connect each building to the onsite sewer main. The proposed onsite gravity sewer main will be 8" PVC SDR 35. From the pump station, a sewer force main will convey the wastewater flows from the project site to the existing sewer manhole on the corner of Conklin Street and De Soto Avenue. Wastewater flow from each building will be conveyed by 4" diameter PVC SDR 35 sewer service lines. The service connections will be installed with a minimum slope of 1/4" per foot slope meeting the requirements of DEC14. A sewer force main will connect to the existing city sewer system on Conklin Street, east of the project site. All PVC pipe will contain rubber push on gaskets at pipe connections. Cleanouts will be provided on each sewer service connection just outside of each building. Upon installation of the sewer mains will be tested with low pressure air tests in conformance with ASTM F1417-92 and the sewer manholes shall be vacuum tested

in conformance with ASTM 1244-02, per the notes on the project plans. As stated above all sewer service lines will be 4" PVC SDR 35 at a minimum of 2% slope.