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WASTEWATER ENGINEERING REPORT

For

Artis Senior Living of Tarrytown, LLC
Village of Tarrytown, New York

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Prepared By

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1.0 INTRODUCTION

Artis Senior Living of Tarrytown is proposing to construct a two story, 64 bed Alzheimer's and Dementia Care facility, with associated parking and other appurtenances at 153 White Plains Road. Access to the site is provided via the existing driveway servicing the adjoining 155 White Plains Road parcel. The proposed building is to be served by public water and public sewer.

The subject 4.6-acre property is in the OB Zone and is identified as Tax Map #1.201-121-5.12. The lot is currently vacant, except for a P-1, micropool extended detention pond. This pond was constructed under a previously approved project SWPPP for the porous pavement parking lot on the 155 White Plains Road parcel. The micropool extended detention pond and porous pavement parking lot (located on the 155 White Plains Road parcel) were constructed from 2014 to 2015.

The subject parcel is in the Tarrytown Sewer District. In 2007 a Site Plan Approval was issued for the construction of a 60,000 s.f. office building on the subject property. Assuming a hydraulic loading rate of 0.08 gpd/s.f. the previously approved office building anticipated a Design Maximum Daily Wastewater Flow Rate of 4,800 gpd.

2.0 PROJECT DESIGN MAXIMUM DAILY FLOW AND ANTICIPATED FLOW

The design maximum daily flow is a conservative design flow utilized in design. This value does not represent the average daily demand which is expected to be less.

The design maximum daily flow for the proposed project, will be calculating used two methods. The first is 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 2014).

The following table calculates the maximum daily domestic demand / flow rate in gallons per day (gpd) based on DEC 2014 hydraulic loading rates:

Table 1: Project Design Maximum Daily Flow Rate

Proposed Use	Hydraulic Loading Rate	Design Maximum Daily Domestic Flow (gpd)
64 – One Bedroom Apartments	110 gpd/dwelling	7,040
45 – Employees Per Day	12 gpd/employee	540
Total		**7,580**

[1] A 20% reduction for use of water saving fixture was applied to the cited demand of 15 gpd/employee

Utilizing the Design Maximum Daily Flow, 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*.

Peak Hourly Flow

7,580 gpd ÷ (16 hr/day) ÷ (60 min/hr) = 7.9 gallons per minute (gpm)

Peak Hourly Flow = 5.3 gpm x 4.1 = 32.4 gpm

Utilizing the American Water Works Association (AWWA) *Manual of Water Supply Practices M-22 (M-22),* a peak instantaneous demand of 60 gpm was calculated based upon a simultaneous probable fixture count of 898. In order to determine the peak instantaneous flow rate, the plumbing fixtures in the building are combined to determine a fixture unit count. The fixture unit count is then used to determine the probable demand, which is utilized as the peak instantaneous flow rate for design purposes. Refer to the project *Water Engineering Report* for the fixture unit calculations.

Average daily demand / flow is useful in understanding a project's impact to the receiving wastewater treatment facilities and regular demands on the municipal wastewater system. Wastewater treatment facilities utilize a 30-day average flow as opposed to peak flows in determining conformance with their SPDES permits. The average daily demand / flow was estimated from water use data obtained from two existing Artis Senior Living Facilities over a period of one year. The data illustrated an average daily demand per bed ranging from 89 to 104 gpd/bed for an average population of 42 beds and 63 beds respectively. This water use data while cited in gpd/bed, includes the total flow used at the site by both employees and visitors as well as irrigation. The irrigation demand can account for an excess of 25% of the metered flows. Based on removal of irrigation flows the actual per bed flow is estimated at 66 to 78 gpd / bed. The irrigation flow was removed in order to determine what will be tributary to the project's average daily wastewater demand. Based on actual flow data the project is anticipated to generate 4,224 to 4,992 gpd of domestic water demand / wastewater flow.

Although the anticipated average daily demand / flow for the project is 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.

The Village has provided a CCTV inspection of the existing sewer on Martling Avenue downstream of the site. The video was a pre-cleaning video. The Village is currently seeking to find more recent videos to ensure the downstream collection system can function based on the proposed increase in flows from the project. It is noted the subject property is an existing parcel within the sewer district and was previously approved with a 60,000 s.f. office building. As such, impacts associated with the proposed project on the sewer system are anticipated to be minimal when compared to the previously approved project.

3.0 PROPOSED SYSTEM COMPONENTS

An onsite gravity sewage collection and conveyance system consisting of 6 inch diameter PVC SDR 35 sewer mains and precast concrete manholes shall been installed. The sewage entering this collection and conveyance system will flow by gravity to the sewer line in Martling Avenue.

Two sewer service lines will exit the proposed building. One sewer service line will connect the kitchen waste to a grease interceptor designed in conformance with DEC 2014. The grease interceptor will discharge into an onsite sewer manhole to be constructed as part of this project. The second sewer service line will exit the building and connect with a proposed sewer manhole to be constructed onsite. All sewer service lines will be 6" diameter PVC SDR 35 sewer service connections. The service connection will be installed with a minimum slope of ¼" per foot meeting the requirements of DEC 2014. The sewer service line will connect into the Martling Avenue Sewer Main. A 6" PVC SDR 35 sewer line can convey 193 gpm at 50% full which exceeds the anticipated peak hourly flow of 60 gpm.

A grease interceptor is proposed to be installed on the sewer service line exiting the kitchen. Based on Table D-1 in DEC 2014 a 2,000-gallon grease interceptor will be provided which will be able to convey the entire project maximum daily design flow. A detail of the grease interceptor has been provided on project drawings.

All PVC SDR 35 pipe will contain rubber push on gaskets at the pipe connections. Sewer manholes will be installed onsite and uphill of the point of connection on Martling Avenue. All sewer manholes will have exterior asphalt coating and contain water tight connections at all pipe connections. Cleanouts will be provided on each sewer service connection just outside of the building. All sewer service lines will be pressure tested in accordance with the *Recommended Standards for Wastewater Treatment Works*.