

Sanitary Sewer Engineering Report
For
Town Center PDD

580 Columbia Turnpike
Town of
East Greenbush, New York

September 2020
Revised January 2021

Applicant: **580 Columbia Turnpike, LLC**
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INTRODUCTION

The purpose of this report is to describe the existing sanitary sewer system conditions and proposed methods, which will be utilized to provide municipal Sanitary Sewer Service to the subdivision of a parcel of land situated in the Town of East Greenbush (EG) owned by 580 Columbia Turnpike, LLC, 1 Parkview Drive, Rensselaer, New York 12144. The "Town Center" project consists of a mixed-use development situated on 35+/- acres of land. The project will consist of approximately 20,000 square feet of commercial space and 275 residential apartments. The project will be serviced with municipal water and sewer. The 35-acre project area is comprised of various portions of 5 different tax map parcels

- a portion of tax map # 166.-7-3.4
- tax map # 166.-7-3.5 in its entirety
- tax map # 166.-7-5 in its entirety
- tax map # 166.-7-6.51 in its entirety, and
- a portion of tax map# 166.-7-6.111

As shown on the attached site location map Appendix "A", the parcel of land is situated on the southwest side of US Route 9 & 20 (Columbia Turnpike) and to the west and north of the intersection of US Route 9 & 20 (Columbia Turnpike) and US Route 4 (Troy Road).

EXISTING CONDITIONS

Currently the parcel of land is a mix of asphalt, gravel and woods. The front portion of the parcel was previously developed as the former site of the Weathervane Restaurant. The middle portion was a parking lot for the former Club East Health Club and historically developed as the Auto vision Drive in Theatre. The rear portion of the site is a mix of a gravel mine, firewood processing operation, equipment and trailer storage, and partially wooded. Most of the rear of the site has been disturbed over the last several decades.

The majority of the site has a gradual slope. The southerly portion of the project boundaries does have steeper slopes and is where most of the wooded area is located. The westerly boundary is also wooded and borders the Woodland Park neighborhood. See the attached aerial map Appendix B for added detail.

The site is served by Town of East Greenbush water and sewer. Extensions of the water and sewer mains into our site will be required. The site falls within an existing water and sewer district.

The site currently drains via surface runoff. The northerly (front) 1/3 of the site drains in a northerly direction towards Columbia Turnpike, and the southerly (back) 2/3 of the site drains in a southerly fashion to the rear of the site.

SITE TOPOGRAPHY, VEGETATION AND EXISTING SOILS

Vegetative Cover

Much of the site is open with some areas of heavily wooded vegetation. There is a strip of wooded vegetation about 200 feet deep along much of the southwest side of the site. There are some additional wooded sections on the south side of the site. There is an existing pond in the southeast corner of the site.

Topography

The topography of the parcel can generally be described as gently sloping. The project site generally changes in grade from a low elevation of approximately 240 feet in the southeast corner of the site to a high elevation of approximately 320 feet in the north central area of the site. North Country Ecological Services has delineated the wetlands on the site and they are shown on the site plan set. No wetland disturbance is planned as part of this project.

Soils

According to the USDA Natural Resource Conservation Service (NRCS) Soil Report for Rensselaer County, the primary soils within the project site are defined as Riverhead fine sandy loams, Windsor loamy sand and Fluvaquent. The soils are classified as Hydrologic Soil Group A and are well drained. The typical soil profile consists of a 6-inch loamy topsoil layer, underlain with at least 50" of sand and gravelly loam. Depth to bedrock is greater than 80 inches.

Based on actual drilled test borings as performed by Terracon, the soils denoted above are more typical of the southerly portion of the site. Borings done at the front northerly half of the site consist of granular overburden to a depth of 36" and then a silty sand and clay later to a depth of approximately 25'. The more sandy material becomes apparent closer to the rear of the future pad site and building C, at a depth of approximately 12'.

Refer to Appendix "C" for additional soils information.

LAND USE AND ZONING

The 35 acre parcel is situated within two different zoning districts as shown on the town of East Greenbush Zoning Map. Along the project frontage on Columbia Turnpike is the B-1 General Business Mixed Use District. This district extends approximately 850 feet

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off of the highway. The back half of the parcel is in the R-B Residential-Buffer District. Lands contiguous to the proposed development parcel are zoned as follows:

B-1 General Business Mixed Use District – northerly, easterly and westerly along the highway

R-B southerly and in the rear of the project limits

R-2 In the rear portion of the site along the westerly boundary.

The proposed mixed-use development is in conformance with the approved Planned Development District. (PDD)

EXISTING UTILITIES

Water: - Water is conveyed to the Town through 9 miles of 36-inch ductile iron pipe from the City of Troy to the Town. At the Town the 36-inch main feeds the two storage tanks and water to a 36 and 30 inch main to the eastern part of Town along Rt. 4 and via a 16-inch main on 3rd Ave. Pressure is reduced at 3rd Ave. to approximately 80 psi along 3rd Ave and to the west. The 16-inch main also provides water to the City of Rensselaer. From the intersection of Route 4 and 9 & 20 the 16" main continues westerly on 9 & 20 towards the City of Rensselaer. This 16" main is runs along the entire frontage of the proposed development.

Sanitary Sewer: - A gravity sanitary manhole currently exists on the southwest side of Columbia Turnpike at the intersection of the project entrance road. At this point the 8-inch gravity sewer crosses to the northeast side of Columbia Turnpike and then runs southeast along Columbia Turnpike approximately 1000 feet and then crosses back to the southwest side of the street and continues southeast increasing in size from 8-inch to 18-inch and connects to the 18-inch trunk sewer that runs towards the Corliss pumping station at the end of Corliss Avenue. After the Corliss Ave pumping Station force main, sewage is conveyed through a series of gravity sewers and ultimately discharges into the Town of East Greenbush Wastewater Treatment Plant (WWTP) for treatment prior to discharge into the Hudson River. The East Greenbush WWTP is located on Columbia Turnpike (Route 9 & 20).

The existing Sewer route from the Town Center Project to the town Waste Water Treatment Plant is shown in Appendix B. See Section "Impact on Downstream Sanitary Sewer Facilities" for added description on the existing sanitary sewer system.

Other Utilities: - Other Utilities: - The project owner is working with the utility companies to get required other utilities such as Electric, telephone, CATV and gas service to each building.

PROPOSED DEVELOPMENT

Roadway: A new road is being proposed that will start at Columbia Turnpike directly across from the current FunPlex entrance. The road will terminate with a cul-de-sac. Accommodations will be made on the cul-de-sac to allow for future connections to the south and east. An "Emergency Access Only" connection will be made near the mid-point of this new road, with Jefferson Avenue. Parking for all proposed commercial and residential units will be provided with separate private lots. The new road will be designed and constructed to Town standards and it is the intent to have this road dedicated to the Town following acceptance.

Proposed Utilities

Water Service: An existing 16" DIP water main exists along the southerly side of Columbia Turnpike. A new 8" PVC C900 water main is proposed to be connected to the existing 16" pipe, at the intersection of the proposed roadway and Columbia Turnpike. Approximately 2,500 linear feet of water main and related appurtenances will be required for this project. It is the intent to have the Water system designed and constructed to Town standards and to have the water system dedicated to the Town following acceptance.

Sanitary Sewer: As previously mentioned a gravity sanitary sewer manhole currently exists on the southwest side of Columbia Turnpike at the intersection of the project entrance road. It is the intention of the project design to connect the proposed site sewer to this gravity sanitary sewer manhole. All proposed new sewers will be gravity 8" PVC SDR 26 sewer. This project will require the installation of approximately 2700 lf of gravity sewer and 11 new sanitary manholes. The sanitary sewer system will be designed and constructed in accordance to Town standards and it is the intent to have the Sewer system dedicated to the Town following acceptance.

See Section "Wastewater Collection and Treatment" for added description on the sanitary sewer system.

DESIGN STANDARDS ESTIMATED SANITARY FLOW

The proposed Sanitary Sewer System components consisting of 8" PVC SDR 26 gravity sewer mains are designed to receive and convey the peak sanitary flows at velocities sufficient to prevent deposition of solids. The estimated sanitary sewer flows for the project is as follows:

Phase I would include:

19,000 SF commercial – which includes a 3,500 sf restaurant, plus 78 residential apartment units with a ratio of approximately (60% 2 BR and 40% 1 bedroom). Phase 1 will flow out to the existing manhole on Columbia Turnpike.

Estimated Sanitary Flow Phase I:

Apartment units to be connected to system:

2 bedroom apartments = 46

110 GPD/bedroom x 2 bedrooms per unit = 220 GPD/unit

220 GPD/unit x 46 = 10,120 gallons per day (GPD).

1 bedroom apartments = 32

110 GPD/bedroom x 1 bedrooms per unit = 110 GPD/home

110 GPD/home x 32 = 3,520 gallons per day (GPD)

**Based on actual flow data from a nearby apartment facility the average daily flow was calculated to be 45 GPD/unit.

Commercial space = 3,500 Sq. Ft. restaurant plus 15,500 Sq. Ft. general space.

3,500 SF Restaurant with 100 seats.

100 seats x 35 GPD/seat = 3,500 GPD.

15,500 SF general commercial =

0.10 GPD/Sq. Ft. x 15,500 Sq. Ft. = 1,550 GPD

Design Average Daily Flow Total Phase I:

10,120 GPD + 3,520 GPD + 3,500 GPD + 1,550 GPD = 18,690 GPD

Design Peak hourly Flow Phase I:

Peak daily flows are estimated at approximately 4.0 times the average daily flow.

Average Daily Sewer Loading from above = 18,690 GPD = 13.0 gallons per minute (GPM) x 4 = 52.0 (GPM) peak

Phase II would include:

205 apartment units with a ratio of approximately (70% 2 BR and 30% 1 bedroom).

Phase II would flow southwest away from Columbia Turnpike and connect directly to the existing 18-inch gravity trunk sewer at the rear of the site.

Estimated Sanitary Flow Phase II:

Apartment units to be connected to system:

2 bedroom apartments = 144

110 GPD/bedroom x 2 bedrooms per unit = 220 GPD/unit

220 GPD/unit x 144 = 31,680 gallons per day (GPD).

1 bedroom apartments = 61

110 GPD/bedroom x 1 bedrooms per unit = 110 GPD/home

110 GPD/home x 61 = 6,710 gallons per day (GPD)

Design Average Daily Flow Total:

31,680 GPD + 6,710 GPD = 38,390 GPD/1,440 min. /day = 26.66
gallons per minute (GPM) average.

Design Peak hourly Flow:

Peak daily flows are estimated at approximately 4.0 times the average daily flow.

Average Daily Sewer Loading from above = 38,390 GPD = 26.66 gallons per minute (GPM) x 4 = 106.6 (GPM) peak

Total Project Peak flow = phase I 52.0 GPM + Phase II 106.6 GPM =158.6 GPM

WASTEWATER COLLECTION AND TREATMENT

The proposed sanitary sewer system for the project site will consist of 6-inch PVC sanitary sewer laterals and an 8-inch PVC gravity sewer main with 4-foot diameter manholes. As previously mentioned, a gravity sanitary sewer manhole currently exists on the southwest side of Columbia Turnpike at the intersection of the project entrance road. It is the intention of the project design to connect the proposed site sewer to this gravity sanitary sewer manhole. Approximately 2,700 LF of proposed 8" gravity sewer and 11 sanitary manholes will be installed as part of this project.

The proposed sewer main will be tested in accordance with ASTM Standards. The proposed work will be performed in accordance with the requirements and recommendations of the New York State Department of Environmental Conservation, Rensselaer County Health Department and the Town of East Greenbush.

Town Requirements

The Town of East Greenbush requirements with respect to construction of the proposed sewer mains are provided below.

- a. Underground mains will be 8" PVC SDR 26 pipe and have at least 5 feet of cover.
- b. The Town must be notified a minimum of two (2) days in advance of installation and testing of the sewer mains.

The proposed site development is shown on plans prepared by Hart Engineering and are included in Appendix "D".

Impact on Downstream Sanitary Sewer Facilities

The Sewer route from the Town Center Project to the town Waste Water Treatment Plant is shown in Appendix B. In general, the depicted route is as follows: As stated above a gravity sanitary manhole currently exists on the southwest side of Columbia Turnpike at the intersection of the project entrance road. At this point the 8-inch gravity sewer crosses to the northeast side of Columbia Turnpike and then runs southeast along Columbia Turnpike approximately 1000 feet and then crosses back to the southwest side of the street and continues southeast increasing in size from 8-inch to 10-inch to 12-inch to 16-inch and then to 18-inch and connects to the 18-inch trunk sewer line that runs in a north westerly direction behind Hannaford Plaza and makes it way to the Corliss Avenue pump station. The Corliss Avenue pump station has two force mains (12" and 14") which flow towards Route 20 and connect to a gravity manhole at Barber Drive. From here the sewage flows westerly through 20" and 24" trunk lines to the Town of East Greenbush Wastewater Treatment Plant (WWTP) for treatment prior to discharge into the Hudson River. The East Greenbush WWTP is located on Columbia Turnpike (Route 9 & 20). The WWTP currently has a capacity of 4.4 MGD. The average daily flow is 1.7 MGD and the maximum daily flow is 3.4 MGD.

Our analysis of the downstream infrastructure is broken into 3 segments:

1. Flow from our site to Columbia Turnpike, along Columbia Turnpike to the 18-inch trunk sewer behind Hannaford Plaza. (Phase I = 52.0 GPM)
2. Flow from our site south westerly directly to the 18-inch trunk sewer behind Hannaford Plaza. (Phase II = 106.6 GPM)
3. Flow from Corliss Avenue pump station to the Waste Water Treatment Plant

Segment 1: Project Site to Columbia Turnpike, along Columbia Turnpike to the 18-inch trunk sewer behind Hannaford Plaza.

The 8-inch gravity sewer crosses to the northeast side of Columbia Turnpike and then runs southeast along Columbia Turnpike approximately 1000 feet and then crosses back to the southwest side of the street and continues southeast increasing in size from 8-inch to 10-inch to 12-inch to 16-inch and then to 18-inch and

connects to the 18-inch trunk sewer line that runs in a north westerly direction behind Hannaford Plaza and makes it way to the Corliss Avenue pump station.

Pipe Capacities at minimum allowable slope are as follows:

8-inch = 0.76 CFS = 171 GPM (at -0.1% slope)

10-inch = 1.16 CFS = 521 GPM

12-inch = 1.67 CFS = 750 GPM

16-inch = 2.50 CFS = 1123 GPM

18-inch = 3.64 CFS = 1634 GPM

The 18" trunk sewer main behind Hannaford Plaza is further described in segment 2

Segment 2: Our site south westerly directly to the 18-inch trunk sewer behind Hannaford Plaza.

As the sewer continues to travel westerly towards the Corliss Ave pump station it increases in size to 18" main behind Hannaford Plaza. The 18" pipe has a pipe capacity of 1634 GPM at minimum slope of 0.12 %.

Previous studies for the balance of the sewer conveyance system from the 18" trunk line down to the WWTP have been conducted by Hank Labarba, PE. The study is titled, Engineering Report Town of East Greenbush Sanitary Sewer System Capacity Status Luther Road Pump Station to the Town's Waste Water Treatment Plant. This report is dated March 21, 2019 and last revised April 29, 2019.

As noted in Table 2 of the Report, attached herein appendix "E", the 18" Trunk Sewer to the Corliss Avenue Pump Station has available capacity of at least 1237 GPM.

Segment 3: Corliss Avenue Pumping Station to the Waste Water Treatment Plant

The Corliss Avenue pump station has 3 – 100 HP pumps. Pump capacities with one pump running is 1950 GPM and with two pumps running is 2350 GPM. Based on flow data gathered between August and October of 2019 the average waste water flow was recorded as ranging between 465 GPM and 582 GPM. The maximum waste water flow was recorded as ranging between 1681 GPM and 2000 GPM. The maximum wastewater flows were noted on rainy days which would indicate issues with inflow and infiltration. The town is currently working on upgrades to the Corliss Ave pumping station including new pumps, controls, valves, and utilization of the equalization tank.

The discharge from the Corliss Avenue pump station then runs in a northerly direction to Routes 9 & 20 and then westerly along the highway to the WWTP. The

capacities of the sewer lines from the pump station to gravity MH 50 near Barber Drive and then continuing down to the WWTP are noted in Table 1A of the Labarba Report and are attached herein. Capacity in the lines have a minimum *available* capacity of over 3100 GPM.

The present Treatment Capacity of the treatment plant is 4.4 MGD (with SPDES Permit # NY – 0026034. According to the towns 2018 flow records, the average daily flow and maximum daily flow are 1.7MGD and 3.4 MGD respectively.

REGULATORY APPROVALS

The proposed project will require the following regulatory approvals prior to construction:

- Rensselaer County Health Department
 - Approvals of: Subdivision Plans
 - Sanitary Sewer and Water Systems
- Town of East Greenbush
 - Site Plan Approval; Water & Sanitary Sewer Permits

FINANCING

Installation of the proposed sanitary sewer improvements in connection with “Town Center” project will be performed by the project developer/owners at their expense. Once the system is installed, tested and certified it will be turned over to the Town of East Greenbush for ownership, operation and maintenance.

SEWER DISTRICT EXTENSION

The Town Center project located at 580 Columbia Turnpike East Greenbush, New York is located within the boundaries of the East Greenbush General Sewer District and the provisions of sanitary sewer service to the project will not require a sewer district extension. The town of East Greenbush will own, operate and maintain the proposed wastewater facilities.

USER COSTS AND CONNECTION FEES

Appropriate user and Connection Fees will be calculated at time of Subdivision Approval and building permit for each phase as applicable.

CONCLUSION

It is our opinion, based on the enclosed analysis that the Town Center project can be connected to the existing gravity manhole on Columbia Turnpike in front of the project site owned by the Town of East Greenbush via the proposed on-site gravity sewer system described above. The proposed Town Center Project and associated gravity sewer collection system will not result in any adverse impacts to the existing downstream infrastructure.

Respectfully submitted:
Advance Engineering & Surveying PLLC

Nicholas Costa, PE

Appendix A

Project Location Map

Appendix B

Aerial Map And Route of Sanitary Sewer Map

Appendix C

NRCS SOILS REPORT

Appendix D

Subdivision Plans

Appendix E

Existing Sewers Capacity Report by Hank Labarba, PE