

# **Water Engineering Report**

## **For**

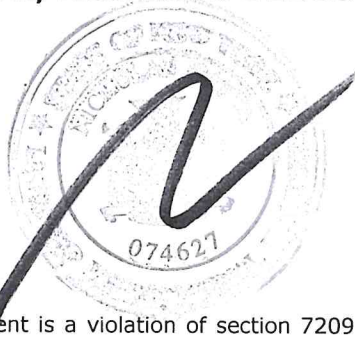
# **Town Center PDD**

580 Columbia Turnpike  
Town of  
East Greenbush, New York

**September 2020**  
***Revised January 2021***  
***Revised March 2021***

**Applicant:**                      **580 Columbia Turnpike, LLC**  
   **1 Parkview Drive**  
   **Rensselaer, New York 12144**  
   **Contact: Mr. Tyler Culberson**  
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## **INTRODUCTION**

The purpose of this report is to describe the existing water system conditions and proposed methods, which will be utilized to provide adequate domestic and fire flow water service for the proposed development 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 22,000 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.

There is an existing 16-inch DIP water main along Columbia Turnpike in front of the site. The 16-inch main is owned by the Town of East Greenbush. It is the intention of the project design to use this existing 16-inch water main to provide water service to the project.

## **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 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 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 our westerly boundary.

The proposed mixed use of commercial and residential uses is in conformance with the approved Planned Development District (PDD).

### **EXISTING UTILITIES**

**Water Supply:** - The Town of East Greenbush currently uses about 500,000,000 million gallons of water per year. The average daily use from both residential and commercial users is about 1.37 million gallons per day. Peak daily use averages about 4.2 MGD. Water is provided to the Town and The City of Rensselaer from the City of Troy under a purchase agreement with available supply up to 8.0 million gallons per day. The available storage capacity is 10 million gallons utilizing two 5 mg above ground storage tanks. The tanks are located off Rt 4 in the Town.

The City of Rensselaer and the Town of East Greenbush jointly own and operate the Cross Street pump station, the 36 inch transmission main and two above ground storage facilities. Both municipalities under a joint agreement purchase water from Troy. Together they consume about 1,000,000,000 gallons per year. The current agreement is under a 20 year contract period.

Water is pumped to the Town from a pump station (Cross Street PS) located in the City of Troy. Two pumps have a pumping capacity of 5,000 GPM each and a third pump at 500 GPM. Pumping is maintained by the City of Troy to keep storage tank at static levels equal to the daily demand. There is also an emergency backup pump at Cross Street rated at 5,000 GPM with emergency power, in the event there is a power supply grid failure.

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 about 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.



The existing 16 inch diameter water main along Columbia Turnpike will be utilized to provide water service for the proposed project. This 16" main is runs along the entire frontage of the proposed development. Existing fire hydrants are adequately spaced along this corridor.

Hydrant flow tests were conducted on July 22, 2020 by RBM Guardian Fire Protection Inc. on hydrants fed by the existing 16-inch main along Columbia Turnpike. The flow test indicated the following:

Hydrant #1 – Columbia Turnpike:

Flow Rate = 910 GPM

Static Pressure = 103 pounds per square inch (PSI)

Hydrant #2 – Columbia Turnpike:

Residual Pressure = 90 PSI

Calculated extrapolated flow rate at 20 PSI residual = 2,476 GPM

The test results and hydrant location map are shown in Appendix "D"

**Sanitary Sewer:** - A gravity sanitary manhole currently exists on the south 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).

**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 Fun Plex 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. A master meter and backflow protection will be provided at the connection point. 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 south 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.

The proposed site development plan is shown on site plans prepared by Hart Engineering and are attached in Appendix "E"

### **DESIGN STANDARDS ESTIMATED FLOW**

#### **Proposed Water Usage:**

The hydraulic loading is computed as follows:

Hydraulic Loading - Water Use – Domestic Flow

#### **Design Average Daily Flow:**

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 Hydraulic Loading 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/unit  
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 Hydraulic Loading from above = 18,690 GPD = 13.0 gallons per minute (GPM) x 4 = 52.0 (GPM) peak

#### **Estimated Hydraulic Loading Phase II:**

Phase II would include:

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

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:**

$31,680 \text{ GPD} + 6,710 \text{ GPD} = 38,390 \text{ GPD} / 1,440 \text{ min. /day} = \underline{26.66}$   
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 Hydraulic Loading from above = 38,390 GPD = 26.66 gallons per minute (GPM)  $\times 4 = \underline{106.6 \text{ (GPM) peak}}$

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

Total Estimated Average Yearly Flows = 57,080 gallons per day (GPD)  $\times 365$  days per year = 20.83 Million gallons per year.

In full build out of the Town Center the estimated average daily flow is 0.057 MGD, which represents 0.57% of the storage capacity in the storage tanks which holds 10 million gallons total. The town average daily flow is 1.37 MGD. The Town Center Subdivision represents 4.4% of the current flow from this tank. It is not anticipated that any improvements will be required on the existing water system to provide the water to the Project.

**Static Pressure for Proposed Development:**

The static pressure at the first floor elevation of the highest building is calculated as follows:

$322 \text{ feet (Highest Building First Floor Elevation)} - 257 \text{ feet (Elevation at hydrant used for static pressure reading, hydrant \#1)} = 65 \text{ feet} \times .433 \text{ psi/ft.} = 28.1 \text{ psi.}$

$103 \text{ PSI static at the hydrant \#1} - 28.1 \text{ psi} = \underline{74.9 \text{ PSI static}}$  at highest building first floor.

**Building Water Service lateral size:**

The buildings currently being proposed will be served by individual water services laterals connected to the proposed street mains. Each water service will be sized for domestic and fire flow needs of the individual buildings.

The pressure at the first floor of the proposed buildings will be a minimum of 74.9 PSI. If required, pressure reducing valves will be installed at each building to keep the static pressure below 90 PSI.

The plumbing within the building shall be designed so that the minimum flow rate and flow pressure provided to fixtures and appliances are in accordance with Table 604.3 of the 2015 International Plumbing Code.

**Fire Protection:**

Fire protection will be provided by proposed fire hydrants that are shown on the project drawings. Calculations showing extrapolation of available flows at 20 psi result in 2,476 GPM (See "Existing Utilities – Water Supply" section of this report).

**FINANCING**

Installation of the proposed water service improvements in connection with the proposed development will be performed by the project developer/owner at their expense.

**WATER SERVICE PERMITS**

The applicant/Developer and the project contractor will be responsible for completing the required applications for the new water service permits. The water system extension and improvements proposed for this project, as they relate to the Town's water system, will require approval by the Rensselaer County Health Department.

**USER COSTS:**

Appropriate user and connection fees will be calculated at time of building permit for each phase.

**CONCLUSION**

It is our opinion, based on the enclosed analysis, that the Town Center Development can be connected to the 16-inch DIP water main along Columbia Turnpike. The existing water main and water system have sufficient capacity and pressure to service the proposed project's domestic water demands.

The system will also have enough capacity to service the proposed project's fire flow water demands.

Respectfully submitted:

Advance Engineering & Surveying PLLC

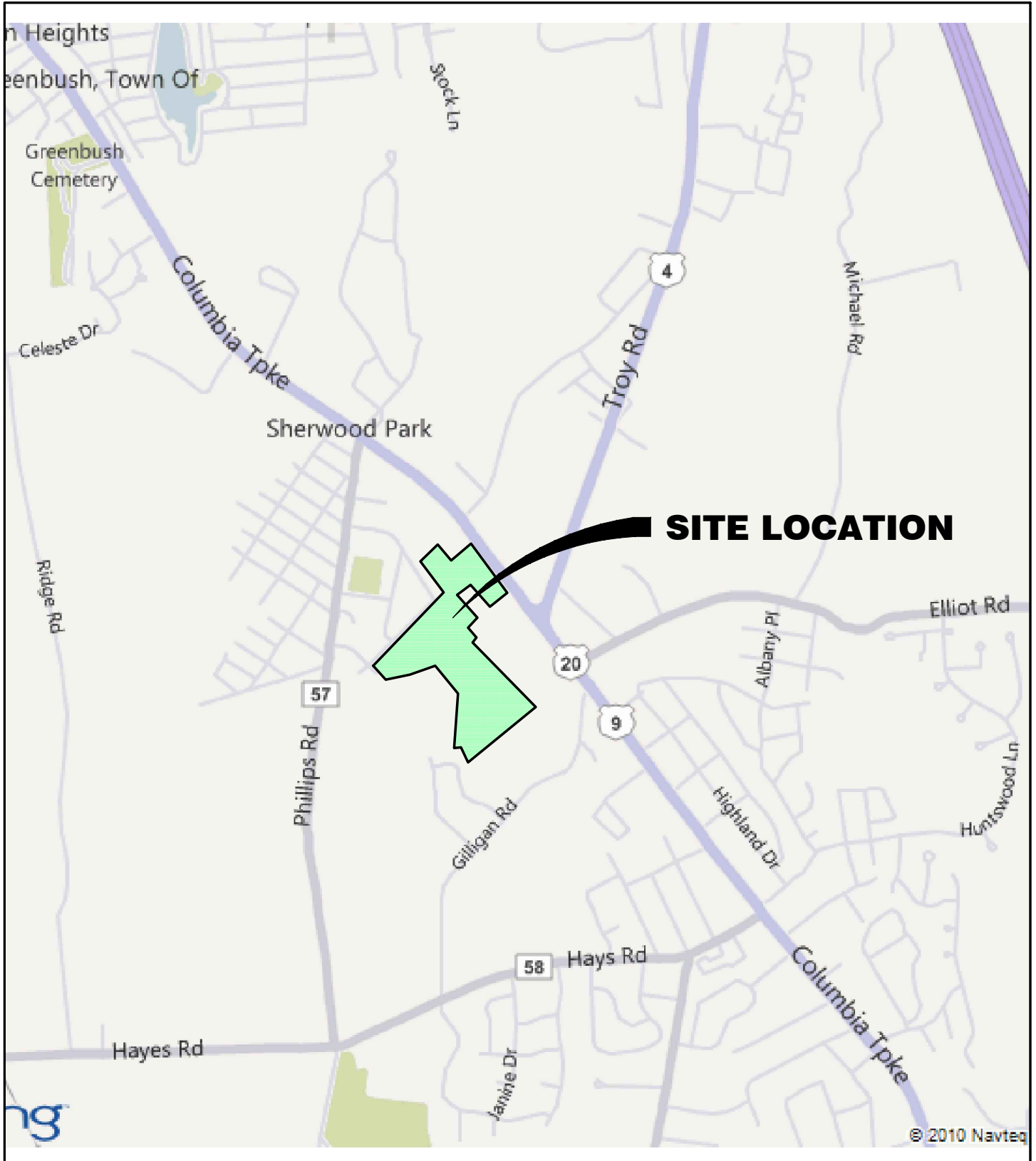
Nicholas Costa, PE



# **Appendix A**

## **Location Map**

Drawn By: <b>CHRIS BERTRAM PE</b>	Checked By: <b>STEVE HART PE</b>	Date Issued: <b>MAY 25, 2018</b>	SCALE: <b>1"= 1700'</b>	Drawing Number: <b>2</b>
Project Name: <b>TOWN CENTER PDD</b>	Drawing Title: <b>SITE LOCATION MAP</b>	File Name: <b>SITE LOCATION MAP.DWG</b>		



## **Appendix B**

### **Aerial Map**



Drawn By:  
**CHRIS BERTRAM PE**

Checked By:  
**STEVE HART PE**

Date Issued:  
**MAY 25, 2018**

SCALE:  
**1" = 400'**

Drawing Number:  
**1**

Project Name:  
**TOWN CENTER PDD**

Drawing Title:  
**AERIAL MAPPING**

File Name:  
**AERIAL MAP.DWG**





# **Appendix C**

## **Soils Data**


# Custom Soil Resource Report Soil Map



## Custom Soil Resource Report

### MAP LEGEND

#### Area of Interest (AOI)

 Area of Interest (AOI)

#### Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

#### Special Point Features

 Blowout

 Borrow Pit

 Clay Spot


 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water


 Perennial Water

 Rock Outcrop

 Saline Spot

 Sandy Spot

 Severely Eroded Spot


 Sinkhole


 Slide or Slip


 Sodic Spot

 Spoil Area

 Stony Spot


 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

#### Water Features

 Streams and Canals


#### Transportation

 Rails


 Interstate Highways

 US Routes

 Major Roads

 Local Roads

#### Background

 Aerial Photography

### MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service  
Web Soil Survey URL:  
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Rensselaer County, New York  
Survey Area Data: Version 14, Oct 8, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 10, 2015—Mar 29, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CaA	Catden muck, 0 to 2 percent slopes	0.0	0.0%
FIA	Fluvaquents-Udifulvents complex, 0 to 3 percent slopes	10.0	17.3%
Pg	Pits, gravel	0.2	0.4%
RkB	Riverhead fine sandy loam, 3 to 8 percent slopes	21.7	37.5%
RkC	Riverhead fine sandy loam, rolling	8.5	14.7%
W	Water	1.3	2.3%
WnE	Windsor loamy sand, 25 to 35 percent slopes	16.1	27.9%
<b>Totals for Area of Interest</b>		<b>57.9</b>	<b>100.0%</b>

## Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor



components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

## Rensselaer County, New York

### CaA—Catden muck, 0 to 2 percent slopes

#### Map Unit Setting

*National map unit symbol:* 2t2qk  
*Elevation:* 0 to 1,430 feet  
*Mean annual precipitation:* 36 to 71 inches  
*Mean annual air temperature:* 39 to 55 degrees F  
*Frost-free period:* 140 to 240 days  
*Farmland classification:* Not prime farmland

#### Map Unit Composition

*Catden and similar soils:* 80 percent  
*Minor components:* 20 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Catden

##### Setting

*Landform:* Kettles, marshes, swamps, bogs, depressions, depressions, depressions, fens  
*Landform position (two-dimensional):* Toeslope  
*Landform position (three-dimensional):* Base slope, tread  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Parent material:* Highly decomposed herbaceous organic material and/or highly decomposed woody organic material

##### Typical profile

*Oa1 - 0 to 2 inches:* muck  
*Oa2 - 2 to 79 inches:* muck

##### Properties and qualities

*Slope:* 0 to 1 percent  
*Percent of area covered with surface fragments:* 0.0 percent  
*Depth to restrictive feature:* More than 80 inches  
*Natural drainage class:* Very poorly drained  
*Runoff class:* Negligible  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to high (0.14 to 14.17 in/hr)  
*Depth to water table:* About 0 to 6 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* Frequent  
*Available water storage in profile:* Very high (about 26.9 inches)

##### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 5w  
*Hydrologic Soil Group:* B/D  
*Hydric soil rating:* Yes

#### Minor Components

##### Timakwa

*Percent of map unit:* 5 percent



## Custom Soil Resource Report

*Landform:* Swamps

*Landform position (two-dimensional):* Toeslope

*Landform position (three-dimensional):* Base slope, tread

*Down-slope shape:* Linear, concave

*Across-slope shape:* Linear, concave

*Hydric soil rating:* Yes

### **Natchaug**

*Percent of map unit:* 5 percent

*Landform:* Depressions, depressions

*Landform position (two-dimensional):* Toeslope

*Landform position (three-dimensional):* Base slope, tread

*Down-slope shape:* Concave

*Across-slope shape:* Concave

*Hydric soil rating:* Yes

### **Canandaigua**

*Percent of map unit:* 5 percent

*Landform:* Depressions

*Landform position (two-dimensional):* Toeslope

*Landform position (three-dimensional):* Base slope, tread

*Down-slope shape:* Concave

*Across-slope shape:* Concave

*Hydric soil rating:* Yes

### **Alden**

*Percent of map unit:* 5 percent

*Landform:* Depressions

*Landform position (two-dimensional):* Toeslope

*Landform position (three-dimensional):* Base slope, tread

*Down-slope shape:* Concave

*Across-slope shape:* Concave

*Hydric soil rating:* Yes

## **FIA—Fluvaquents-Udifluvents complex, 0 to 3 percent slopes**

### **Map Unit Setting**

*National map unit symbol:* 9v1t

*Elevation:* 100 to 3,000 feet

*Mean annual precipitation:* 36 to 44 inches

*Mean annual air temperature:* 45 to 48 degrees F

*Frost-free period:* 115 to 195 days

*Farmland classification:* Not prime farmland

### **Map Unit Composition**

*Fluvaquents and similar soils:* 45 percent

*Udifluvents and similar soils:* 35 percent

*Minor components:* 20 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

## Description of Fluvaquents

### Setting

*Landform:* Flood plains  
*Landform position (two-dimensional):* Toeslope  
*Landform position (three-dimensional):* Dip  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Parent material:* Alluvium with highly variable texture

### Typical profile

*H1 - 0 to 6 inches:* silt loam  
*H2 - 6 to 60 inches:* gravelly silt loam

### Properties and qualities

*Slope:* 0 to 3 percent  
*Depth to restrictive feature:* More than 80 inches  
*Natural drainage class:* Poorly drained  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to high (0.06 to 5.95 in/hr)  
*Depth to water table:* About 0 inches  
*Frequency of flooding:* Frequent  
*Frequency of ponding:* Frequent  
*Calcium carbonate, maximum in profile:* 5 percent  
*Available water storage in profile:* Moderate (about 6.6 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 5w  
*Hydrologic Soil Group:* A/D  
*Hydric soil rating:* Yes

## Description of Udifluvents

### Setting

*Landform:* Flood plains  
*Landform position (two-dimensional):* Summit  
*Landform position (three-dimensional):* Talf  
*Down-slope shape:* Concave  
*Across-slope shape:* Convex  
*Parent material:* Alluvium with a wide range of texture

### Typical profile

*H1 - 0 to 9 inches:* gravelly fine sandy loam  
*H2 - 9 to 60 inches:* gravelly sandy loam

### Properties and qualities

*Slope:* 0 to 3 percent  
*Depth to restrictive feature:* More than 80 inches  
*Natural drainage class:* Moderately well drained  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to very high (0.06 to 19.98 in/hr)  
*Depth to water table:* About 36 to 72 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Available water storage in profile:* Low (about 5.9 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 5w

*Hydrologic Soil Group:* A

*Hydric soil rating:* No

**Minor Components**

**Saprists**

*Percent of map unit:* 5 percent

*Landform:* Marshes, swamps

*Hydric soil rating:* Yes

**Limerick**

*Percent of map unit:* 5 percent

*Landform:* Flood plains

*Hydric soil rating:* Yes

**Teel**

*Percent of map unit:* 5 percent

*Hydric soil rating:* No

**Fredon**

*Percent of map unit:* 3 percent

*Hydric soil rating:* No

**Unnamed soils, moderately deep**

*Percent of map unit:* 2 percent

*Hydric soil rating:* Unranked

**Pg—Pits, gravel**

**Map Unit Setting**

*National map unit symbol:* 9v2r

*Mean annual precipitation:* 36 to 44 inches

*Mean annual air temperature:* 45 to 48 degrees F

*Frost-free period:* 115 to 195 days

*Farmland classification:* Not prime farmland

**Map Unit Composition**

*Pits, gravel:* 90 percent

*Minor components:* 10 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Pits, Gravel**

**Interpretive groups**

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 8s

*Hydric soil rating:* No

### Minor Components

#### Udorthents, loamy and clayey

*Percent of map unit:* 10 percent

*Hydric soil rating:* No

## RkB—Riverhead fine sandy loam, 3 to 8 percent slopes

### Map Unit Setting

*National map unit symbol:* 9v30

*Mean annual precipitation:* 36 to 44 inches

*Mean annual air temperature:* 45 to 48 degrees F

*Frost-free period:* 115 to 195 days

*Farmland classification:* All areas are prime farmland

### Map Unit Composition

*Riverhead and similar soils:* 80 percent

*Minor components:* 20 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Riverhead

#### Setting

*Landform:* Deltas, terraces

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Parent material:* Loamy glaciofluvial deposits overlying stratified sand and gravel

#### Typical profile

*H1 - 0 to 6 inches:* fine sandy loam

*H2 - 6 to 35 inches:* sandy loam

*H3 - 35 to 50 inches:* gravelly loamy sand

#### Properties and qualities

*Slope:* 3 to 8 percent

*Depth to restrictive feature:* More than 80 inches

*Natural drainage class:* Well drained

*Capacity of the most limiting layer to transmit water (Ksat):* High (1.98 to 5.95 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water storage in profile:* Low (about 4.7 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 2s

*Hydrologic Soil Group:* A

*Hydric soil rating:* No

#### **Minor Components**

##### **Riverhead, shallow substratum**

*Percent of map unit:* 5 percent

*Hydric soil rating:* No

##### **Haven**

*Percent of map unit:* 5 percent

*Hydric soil rating:* No

##### **Chenango**

*Percent of map unit:* 5 percent

*Hydric soil rating:* No

##### **Hoosic**

*Percent of map unit:* 5 percent

*Hydric soil rating:* No

### **RkC—Riverhead fine sandy loam, rolling**

#### **Map Unit Setting**

*National map unit symbol:* 9v31

*Mean annual precipitation:* 36 to 44 inches

*Mean annual air temperature:* 45 to 48 degrees F

*Frost-free period:* 115 to 195 days

*Farmland classification:* Farmland of statewide importance

#### **Map Unit Composition**

*Riverhead and similar soils:* 75 percent

*Minor components:* 25 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### **Description of Riverhead**

##### **Setting**

*Landform:* Terraces, deltas

*Landform position (two-dimensional):* Shoulder

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Parent material:* Loamy glaciofluvial deposits overlying stratified sand and gravel

##### **Typical profile**

*H1 - 0 to 6 inches:* fine sandy loam

*H2 - 6 to 35 inches:* sandy loam

*H3 - 35 to 50 inches:* gravelly loamy sand

##### **Properties and qualities**

*Slope:* 8 to 15 percent

*Depth to restrictive feature:* More than 80 inches

## Custom Soil Resource Report

*Natural drainage class:* Well drained

*Capacity of the most limiting layer to transmit water (Ksat):* High (1.98 to 5.95 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water storage in profile:* Low (about 4.7 inches)

### **Interpretive groups**

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 3e

*Hydrologic Soil Group:* A

*Hydric soil rating:* No

### **Minor Components**

#### **Haven**

*Percent of map unit:* 5 percent

*Hydric soil rating:* No

#### **Chenango**

*Percent of map unit:* 5 percent

*Hydric soil rating:* No

#### **Hoosic**

*Percent of map unit:* 5 percent

*Hydric soil rating:* No

#### **Windsor**

*Percent of map unit:* 5 percent

*Hydric soil rating:* No

#### **Riverhead, shallow substratum**

*Percent of map unit:* 5 percent

*Hydric soil rating:* No

## **W—Water**

### **Map Unit Setting**

*National map unit symbol:* 9v3k

*Mean annual precipitation:* 36 to 44 inches

*Mean annual air temperature:* 45 to 48 degrees F

*Frost-free period:* 115 to 195 days

*Farmland classification:* Not prime farmland

### **Map Unit Composition**

*Water:* 100 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*



## **WnE—Windsor loamy sand, 25 to 35 percent slopes**

### **Map Unit Setting**

*National map unit symbol:* 2svl7  
*Elevation:* 10 to 1,110 feet  
*Mean annual precipitation:* 36 to 71 inches  
*Mean annual air temperature:* 39 to 55 degrees F  
*Frost-free period:* 140 to 240 days  
*Farmland classification:* Not prime farmland

### **Map Unit Composition**

*Windsor and similar soils:* 90 percent  
*Minor components:* 10 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Windsor**

#### **Setting**

*Landform:* Dunes, outwash plains, outwash terraces, deltas  
*Landform position (three-dimensional):* Tread, riser  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Convex, linear  
*Parent material:* Loose sandy glaciofluvial deposits derived from granite and/or loose sandy glaciofluvial deposits derived from schist and/or loose sandy glaciofluvial deposits derived from gneiss

#### **Typical profile**

*Oe - 0 to 1 inches:* moderately decomposed plant material  
*A - 1 to 3 inches:* loamy sand  
*Bw - 3 to 25 inches:* loamy sand  
*C - 25 to 65 inches:* sand

#### **Properties and qualities**

*Slope:* 25 to 35 percent  
*Depth to restrictive feature:* More than 80 inches  
*Natural drainage class:* Excessively drained  
*Runoff class:* Low  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to very high (1.42 to 99.90 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Salinity, maximum in profile:* Nonsaline (0.0 to 1.9 mmhos/cm)  
*Available water storage in profile:* Low (about 4.5 inches)

#### **Interpretive groups**

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 4e  
*Hydrologic Soil Group:* A  
*Hydric soil rating:* No

**Minor Components**

**Hinckley**

*Percent of map unit:* 10 percent

*Landform:* Outwash plains, deltas, eskers, kames

*Landform position (two-dimensional):* Summit, shoulder, backslope

*Landform position (three-dimensional):* Nose slope, side slope, crest, head slope, rise

*Down-slope shape:* Convex

*Across-slope shape:* Linear, convex

*Hydric soil rating:* No

## **Appendix D**

### **Hydrant Flow Test Results and Hydrant Location Map**

# RBM GUARDIAN FIRE PROTECTION, INC.

8 Enterprise Drive Albany, New York 12204 P # 518-463-4340 F# 518-463-4378  
Email: [rbm@rbmguardian.com](mailto:rbm@rbmguardian.com)

## FLOW TEST SUMMARY SHEET FOR HYDRANT TESTING

DATE: July 22, 2020  
TO: Hart Engineering  
ATTN: Steven Hart  
FROM: Matthew Wilms  
JOB NAME/LOCATION: 580 Columbia Turnpike, North Greenbush

Please find the results of the Hydrant Flow Tests that were conducted by  
RBM Guardian Fire Protection, Inc., North Greenbush Water Department and  
Hart Engineering:

1. Date of Flow: July 22, 2020
2. Time: 09:00 am
3. Size of Main: 16"
4. Street Names(s): Next to Farmer's Market
5. ~~Circulating~~ or Dead End Main

Static 103 PSI

2 " Little Hosemonster 34 pitot 910 GPM @ 90 PSI

Remarks:

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



Drawn By:  
**CHRIS BERTRAM PE**

Checked By:  
**STEVE HART PE**

Date Issued:  
**MAY 25, 2018**

SCALE:  
**1"= 400'**

Drawing Number:  
**1**

Project Name:  
**TOWN CENTER PDD**

Drawing Title:  
**AERIAL MAPPING**

File Name:  
**AERIAL MAP-HYDRANT LOCATION.DWG**



# **Appendix E**

## **Project Drawings**