

# **DESIGN REPORT FOR SEPTIC SYSTEM**

For:

**NORTH AMHERST FIRE HALL  
2200 Tonawanda Creek Road  
Amherst, New York 14228  
T3 Job # 26-020**

July, 2026

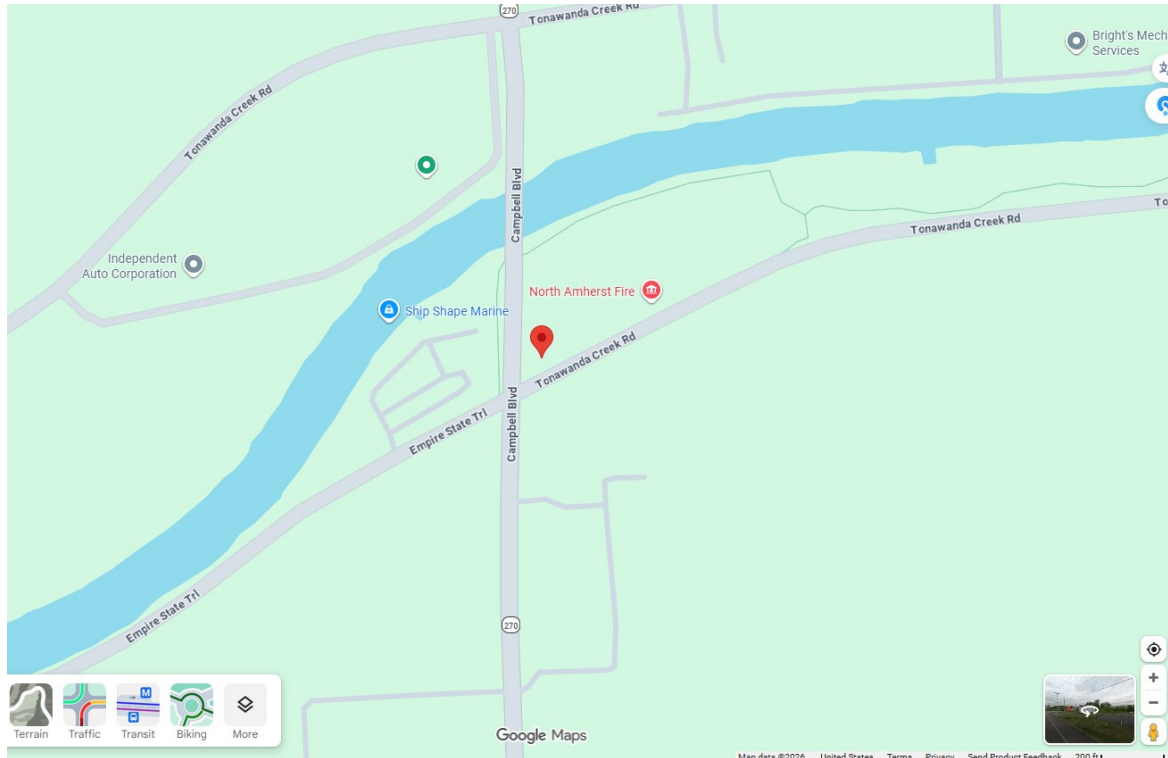


## **studio T3**

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**Proposed Development:**

The proposed development is a new one-story 4,800-square-foot fire apparatus storage building for accessory use adjacent to the existing fire hall (North Amherst). Adjacent driveway and parking lot construction, site re-grading, utility connections, drainage structures, landscaping, and temporary and permanent erosion control devices shall also be added. The 10.49-acre parcel is zoned "CF" (Community Facilities) and is located at the northeastern corner of the intersection of Tonawanda Creek Road and Campbell Boulevard in the Town of Amherst, New York (see Site Location Map below). This design report is intended to be submitted with Site Plan drawings entitled "North Amherst Fire Hall" as prepared by Studio T3 Engineering, PLLC.



Due to the absence of public sanitary sewers in the vicinity of the site, an on-site sewage and wastewater treatment (septic) system shall be used. The slope of the site shall be approximately 2% on average. The native soil on the site within the area of the proposed septic system is Canadaigua Silt Loam (Cc) soil rated Type C. The soil ratings (A, B, C, or D) are based on the classification system of the U.S.D.A. Natural Resources Conservation Service. Soil samples in the Geotechnical Engineer's Report show bedrock layers approximately 50 feet below the existing ground surface. No appreciable amounts of groundwater were encountered at the test borings during or at the completion of drilling operations. However based on moisture content of recovered soil samples, the seasonal high groundwater table is projected to be approximately 15 feet below the existing ground surface (see Geotechnical Report by Empire). There are no wetlands present within the area of disturbance within the project parcel as determined review of state and national wetland maps.

Based on the soil sample testing, a 67 minute per inch (0.9 inches per hour) percolation rate was measured. Therefore an intermittent sand filter with a mound-type leach field shall be used for discharge of the treated wastewater.

**Septic System:**

The new building shall be serviced by a new 4" diameter PVC sanitary sewer lateral. The new lateral shall convey wastewater from the interior restrooms into a new septic tank for settling and

pre-treatment of the wastewater. Wastewater effluent from the septic tank shall be conveyed to a buried intermittent sand filter. Filtered effluent shall then be discharged to an absorption mound system, which shall be dosed with a pumps.

The proposed septic system was designed, and shall be installed, in conformance with:

- Ten-State and Erie County Sewer District design standards
- Town of Amherst Engineering Department specifications
- New York State Department of Health and Erie County Health Department design codes
- New York State Department of Environmental Conservation design standards

Design calculations are as follows:

#### Gravity Sanitary Sewers

- Average sewer load for the new building =  $(0.1 \text{ GPD} / \text{square foot}) \times (4,800 \text{ square feet}) = \underline{480 \text{ GPD} = 0.3 \text{ GPM}}$
- Max. capacity of new 4" PVC sewer lateral @ 2.00% slope = **20,600 GPD = 14.3 GPM**

#### Septic Tanks

Based on the N.Y.S.D.E.C. formula for septic tank sizing –

- Average sewer load = 480 GPD
- Minimum septic tank volume = (average daily flow) x (minimum req'd septic tank residence time) =  $(480 \text{ GPD}) \times (1.5 \text{ days}) = \underline{720 \text{ gallons}}$
- **Use 1,000-Gallon Kistner ST-1000-T-N-0 traffic-rated septic tank, or approved equal**

#### Sand Filter

Based on the A-75, the native soil percolation rate is within the 61–120 min/in range, requiring a basal loading rate of **0.20 gpd/ft<sup>2</sup>**

- Average sewer load = 480 GPD
- Minimum required sand filter area = (average sewer load) / (minimum required sand filter application rate) =  $(480 \text{ GPD}) / (1.15 \text{ GPD} / \text{square ft.}) = \underline{417 \text{ square feet sand filter}}$
- Proposed sand filter area =  $28' \times 15' = \underline{420 \text{ square feet sand filter}}$
- Total distribution line length for each separate alternating sand filter =  $5 \text{ lines} \times 28 \text{ feet per line} = \underline{140 \text{ linear feet}}$
- Cross-sectional area of 4" diameter distribution line =  $\pi R^2 = \pi \times (2" / 12")^2 = \underline{0.09 \text{ square feet per linear foot}}$
- Therefore total distribution line volume =  $(140 \text{ linear feet}) \times (0.09 \text{ square feet per linear foot}) = \underline{12.6 \text{ cubic feet} = 94 \text{ gallons}}$
- Minimum dosing volume =  $75\% \times 94 \text{ gallons} = \underline{71 \text{ gallons (use 80 gallons per dose, or 10.7 cubic feet per dose)}}$
- Doses per day =  $480 \text{ GPD} / 10.7 \text{ gal/dose} = \underline{45 \text{ doses per day}}$

#### Mound discharge

Based on the within the 61–120 min/in per range, the required basal loading rate = **0.20 gpd/ft<sup>2</sup>**

- Total average sewer load for entire development = 480 GPD
- Minimum required mound area = (average sewer load) / (minimum required mound application rate) =  $(480 \text{ GPD}) / (0.2 \text{ GPD} / \text{square ft.}) = \underline{2,400 \text{ square feet mound base area}}$
- Proposed mound area =  $60' \times 40' = \underline{2,400 \text{ square feet mound base area.}}$
- Total distribution line length =  $4 \text{ lines} \times 39 \text{ feet per line} = \underline{156 \text{ linear feet}}$
- Cross-sectional area of 2" diameter distribution line =  $\pi R^2 = \pi \times (1" / 12")^2 = \underline{0.02 \text{ square feet per linear foot}}$

- Therefore total distribution line volume = (156 linear feet) x (0.02 square feet per linear foot) = 3.12 cubic feet = 23 gallons
- Minimum dosing volume = 75% x 23 gallons = 17 gallons (use 20 gallons per dose, or 2.7 cubic feet per dose)
- Doses per day = 480 GPD / 20 gal/dose = 24 doses per day
- Dosing tank cross sectional area = 212 gallons per foot depth (use Kistner 6' diameter dosing tank)
- Assume emergency storage in dosing tank = 8 hours at average daily flow = (480 GPD) x (24 hrs/day / 8 hours) = 160 gallons
- Distance between alarm float and invert of inflow pipe = 160 gallons / 212 gallons per foot = 0.75 feet
- Therefore elevation of alarm float = 570.17 – 0.75 = 569.42
- Distance between “off” and “on” floats and between “on” and alarm floats = 20 gallons per dose / 212 gallons per foot = 0.09 feet
- Therefore elevation of “on” float = 569.42 – 0.09 = 569.33
- Therefore elevation of “off” float = 569.33 – 0.09 = 569.24
- Minimum distance from “off” float to bottom of tank = 6”, therefore elevation = 569.24 – 0.50 = 588.74

The new septic system and all its components shall be privately owned and maintained. The Town of Amherst Engineering Department and Erie County Health Department shall review and approve all plans and the above calculations for permit. The contractor/plumber shall obtain all necessary permits from these agencies prior to the start of installation or construction for specific instructions and procedures regarding permit applications and fees. Both the field staff of the Erie County Health Department and a certified licensed Professional Engineer from the State of New York will conduct final inspections of the septic system during construction. This inspection will check all components of the system. The contractor should contact the District Office and the designated inspector 1-2 days before the inspection is needed. For this final inspection the contractor should leave uncovered the inlet and outlet sides of the septic tank, distribution boxes, headers, top of the sand filter, and ends of each tile line. The Health Department's final approval will be based on this field inspection.