



PRELIMINARY WASTEWATER SYSTEM REPORT

For

RESTAURANT DEPOT

Town of Southeast, New York

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1.0 INTRODUCTION

The subject property contains 44± acres located in the SR-6 Zoning District on U.S. Route 6 in the Town of Southeast. The subject lot contains a mixture of woods and meadow, watercourses and two (2) Town-regulated wetlands. The meadow areas have been historically, and are currently, mowed for hay. There is an existing trail and stream crossing in the eastern portion of the site and a paved apron off of U.S. Route 6 near the meadow across from Joe's Hill Road. There are no other improvements to the subject property, except two drilled wells.

A 2-lot commercial subdivision was approved for the subject properties and the plat was filed with the Putnam County Clerk's Office on March 23, 2010. This application proposes a 3-Lot subdivision from the existing 2-Lot subdivision. Proposed Lots 1 & 3 shall remain vacant for future development. Lot 2 consisting of 11 acres ± proposes a Large Retail Establishment, as defined in the Southeast Zoning Code, consisting of 57,500 s.f. building, associated parking, lighting, landscaping, subsurface sewage treatment system, well, and stormwater management areas.

Access to the proposed development will be provided with a driveway entrance deriving access from U.S. Route 6. Water will be supplied by a drilled well that will serve as a non-community public water supply. Wastewater will be disposed of with a subsurface sewage treatment system (SSTS), located on the west portion of the property.

The wastewater system will be designed in accordance with all applicable codes and regulations, including the Putnam County Department of Health's *Bulletin CS-31, Program Review and Policies, Sewage Treatment and Water Supply Facilities for Commercial and Multifamily Residential Projects*, the New York State Department of Environmental Conservation (NYSDEC)'s *Design Standards for Intermediate Sized Wastewater Treatment Works – 2014 (DEC 14)*, and the *2004 Recommended Standards for Wastewater Facilities* (a.k.a. Ten-State Standards).

A single primary absorption SSTS area will be utilized for sewage treatment at the site. The primary SSTS area is located in the existing meadow on the western side of the project site and will be sized to treat 2,100 gpd from the proposed development. The expansion absorption SSTS area will be provided on a separate lot to the east of the project site. An easement is proposed from the project site, through the adjoining lot to the proposed expansion absorption area.

2.0 WASTEWATER DESIGN FLOW

The proposed use for the subject site includes a restaurant/supply warehouse. The owner has supplied water usage data from a regional store in Needham Massachusetts, which averaged 1,400 gallons per day over a 6-month duration. Using a factor of safety of 1.5, a design flow of 2,100 gallons per day (gpd) has been established for the for the proposed project. The existing facilities will be equipped with water saving plumbing fixtures, as required by the building code, and shall be implemented in the proposed project to provide similar water usage.

3.0 WASTEWATER COLLECTION SYSTEM

The proposed Restaurant Depot project consists of a 57,500 sf building. The building will contain a 6" diameter PVC SDR 35 sewer service connection discharging to a septic tank for primary treatment from which effluent will be discharged to an engineered pump station. Wastewater flow from the proposed building will be by gravity to the septic tank and pump station. From the precast concrete duplex pump station, a single 2" diameter PVC SDR 21 sewer force main will convey the effluent to the absorption trenches.

4.0 SEPTIC TANKS / GREASE TRAPS

A septic tank is proposed for the Restaurant Depot development. A capacity greater than or equal to 1.5 times the design flow will be provided for the septic tank. A summary of the design flow, required tank size, and provided septic tank size has been provided below:

Table 4.0 - Septic Tank Summary Table

Septic Tank ID	Total Design Flow (gpd)	Factor of Safety	Required Total Septic Tank Capacity (gallons)	Proposed Septic Tank Size (gallons)
ST-1	2,100	1.5	3,150	4,000

The septic tank will be reinforced concrete, per the detail on the project plans. The septic tank will be provided with inlet tees and access manhole covers. The septic tank shall comply to H-20 loading.

5.0 WASTEWATER PUMPING SYSTEMS

A precast concrete pump pit with duplex submersible effluent pumps, and controls is proposed. The electrical meter and service panel, breaker panel, pump controls transfer switch for auxiliary power, and an automatic standby emergency generator is proposed for the wastewater pump pit. A 2" diameter PVC SDR 21 forcemain will deliver the effluent from the pump pit to the junction box where the flow is distributed to the two SSTS area sections. Each section consists of eleven (11) primary absorption trenches. As previously stated in this report, the expansion absorption trenches are proposed to be on the adjoining lot to the east. A 2" diameter PVC SDR 21 forcemain is proposed to extend from the pump pit to the eastern property line for future connection to the expansion absorption area.

5.1 Pumps

Duplex submersible effluent pumps have been designed to convey the septic tank effluent generated from the proposed development. The pumps will be housed in a precast concrete pump pit. The submersible pumps will be controlled via floats that will turn the pumps on or off depending on the water level within the pump pit. A float will also be used to trigger the high-level alarm.

5.2 Pump Design Criteria

Based upon an average design flow rate of 2,100 gallons per day (gpd) and a peaking factor of 4.0, a peak design sewage inflow rate of 9-gallons per minute (gpm) was calculated. Since the proposed project is active only in the day and early evening, a 16-hour day was utilized in the peak flow calculation. Using the 2" diameter force main, a force main length of 265 feet, a static head of 30.0 feet, and losses associated with bends, entrance and exit losses and valves, a total dynamic head (TDH) of 39 feet was calculated at the design flow of 30 gpm using a Hazen-Williams "C" value of 120. These computations are attached.

Based upon a review of pump curves from various manufacturers a Goulds 3885 effluent pump, Model WEO5HH with a 0.5 horsepower (hp) motor, was selected for the pump station. The selected pump will pump 30 gpm at a TDH of 39 ft with a C value of 120 for the force main. The selected pump curve is attached.

5.3 Pump Controls

A Submersible Level Control system is proposed for the pump pit. This pump pit will include a float system to control and monitor the operation of the duplex pump station and provide lead-lag automatic alternation and high- and low-level alarms (Visual and Audible).

5.4 Pump Pit

One 3,000-gallon dual alternating pump pit that is H-20 rated with cast-iron frames and cover is proposed. The pump pit has been designed to provide the desired dose volume, which is 75%-85% of the absorption trench pipe volume for each of the SSTS area. The pump pit has two pumps, and the pumps will be set to alternate dosing to the SSTS area. For the SSTS Area 82% of the absorption trench volume equals 945 gallons (based upon 1,760 lf of trenches or 2 sections with 880 lf per section). The required dose volume for the SSTS area is present between the "both pumps off" and "lead pump enable" float settings.

5.5 Force Mains

The sewer forcemain for the system will consist of a single forcemain, which will be used to convey septic tank effluent from the sewer pump station to the SSTS area. The forcemain will be 2." diameter, PVC SDR 21 with bell and spigot joints and factory installed gaskets. The fittings and elbows will be glued SCH 80 fittings. The forcemain shall be provided with 3'-6" minimum ground cover.

5.6 Check Valves

Check valves will be provided on the pump discharge header. The proposed check valves will be swing type with a weight and lever. The check valves will have a pressure rating of 150 psi. Due to the small diameter and length of the force main, surge pressure (the effect of water hammer on the check valves resulting from the backwater in the force main) is estimated to be negligible.

5.7 Distribution Boxes

There are three (3) 10-way distribution boxes proposed for the SSTS area. The proposed boxes are precast concrete. Each distribution box will accept a dose from the pump station and distribute the flow to the associated absorption fields of that particular section.

6.0 SUBSURFACE SEWAGE TREATMENT SYSTEMS

6.1 Soil Testing

Soil testing was witnessed by Insite Engineering, Surveying & Landscape Architecture P.C., the Putnam County Department of Health (PCDOH), and the New York City Department of Environmental Conservation (NYCDEP) and was determined to be acceptable for the SSTS area. For the SSTS area, three (3) test pits were dug to depths greater than 7' – 0" and generally consisted of slightly compacted fine sand and silty sand. No bedrock was encountered in any of the holes and the three holes displayed groundwater at depths in excess of 80". One hole displayed evidence of mottling at 72". Three (3) percolation tests were also performed. The rates recorded ranged from 17 to 30 minutes per inch.

6.2 Absorption Trenches

The absorption fields consist of conventional 2' wide absorption trenches. The trenches will be divided into three sections. Each section includes a total trench length of 700 linear feet per section. The SSTS will consist of conventional 2' wide absorption trenches spaced 6' on center. The absorption trench design parameters are as follows:

Design Flow =	2,100 gpd
Soil Percolation Rate =	21 to 30 min/in
Application Rate (per percolation rate) =	0.6 gpd
Absorption Trench Width =	2'
Total length of absorption trenches required (L) =	$2,100 \text{ gpd} \div 0.6 \text{ gpd/sf} \div 2 \text{ sf/lf}$
L = 1,750 linear feet (lf) of primary absorption trenches required.	

The SSTS area is proposed to provide 1,760 lf (two sections containing 880 lf) of primary absorption trenches and 100% SSTS expansion area (1,760 lf). As previously stated, the expansion absorption area is proposed to be located on the adjoining lot to the east.

APPENDIX A
Pump Station Calculation



**OWTS for Restaurant Depot
Pump Pit Design Calculations**

Design Flow	2100 gal/day	
Peak Flow	14.6 gpm	Peak Flow = $\frac{(\text{Design Flow})(10)}{(24\text{hr/day})(60\text{min/hr})}$ Use 10x Daily Flow for Peak Flow
Static Head	20 ft	Vertical distance from bottom of pump pit to invert of distribution box
C	120	Roughness coefficient for smooth plastic pipe
d	2 in	Diameter of force main
L	265 ft	Length of force main
Q	33 gpm	Flow Rate
V	3.4 ft/s	Velocity
L _e	50 ft	Equivalent length to account for losses in valves and bends
L _t	315 ft	Total Length = L + L _e
HL	10 ft	HL = $\frac{10.44(L_t)(Q^{1.85})}{(C^{1.85})(d^{4.87})}$ = .0000438(L _t)(Q ^{1.85})
Total Dynamic Head	30 ft	TDH = HI + Static Head

Use one (1) Goulds Pump Model # 3885, Series WE05H (or approved equal).

These pumps will pump 33 gpm with a Total Dynamic Head of 30 feet.