MarksEngineering

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Engineer's Report

STAR CIDER – NEW RESEARCH AND TASTING FACILITY:

July 24th, 2018

Marks Engineering, P.C. (Marks Engineering) has prepared this Engineer's Report for the new facility noted above located:

3365 East Lake Road
Town of Canandaigua
Ontario County
New York

Project Description/intent:

The subject property(s) will be developed with Commercial – General Business use(s) being proposed. The project will include the construction of a 4500 square foot single story, wood-framed structure on the site mentioned above.

The new building will be used by Star Cider (single occupant) which is an existing hard cider manufacturing company that is currently operating out of an existing facility in the Town of Seneca, NY. The intended use of this building is to promote their products, host students for research and education from the neighboring Finger Lakes Community College (FLCC) and provide tasting opportunities for the general public. Star Cider has partnered with FLCC and been accepted into the START-UP NY Program. A small portion of their cider production will be performed at this facility. Star Cider will continue manufacturing a majority of their product at the existing facility in the Town of Seneca. Star Cider will be hauling in apple juice to make cider and apple processing and pressing will take place off-site.

The new facility will be used for Assembly & packaging of product, production, food preparation, and general business. There will be a large area used for assembly of people for tasting and seating. This assembly will be considered A-2, with un-fixed seating and the serving of alcoholic beverages. There will be a portion of the building will be used for production of product. This area will be defined as F-1 use. There will be a small area for the organization of prepared food provided by a catering company. There will be a general business area for the sale of products and public facilities. In is anticipated that the **maximum occupancy of the building is 299**.

In addition to the building construction the site developments will include improvements to provide new parking lots, sidewalks and large covered patio/seating areas. The parking lots provide 37 new parking spaces. The parking lot will be lit with new pole lighting and landscaping will be provided. This Project will also include modifications to an existing commercial entrance off NYS Route 364. It is intended that overflow parking will use the neighboring FLCC parking lot with over 300 spaces.

The new building will have an "at grade" loading dock at the side nearest Marvin Sands Drive which will provide access for 30' single axle box trucks. The loading dock area will also host a dumpster for general refuse. The loading dock area will be surrounded by a six foot high fence and landscaping. It is intended there will be approximately 4 commercial truck deliveries per week.

Upon approvals, Star Cider will be entering into a long term property lease with the owner and constructing the building/improvements. In order to effectively lease the parcel the owner will be subdividing the parent parcel into two lots.

The project will be completed in a single phase that is expected to take 6 months.

Approvals and Permits:

- Mixed Use Re-zoning - Complete
- SEQR Review – Completed under preliminary site plan approval.

- The Project will require final subdivision approval from the Town of Canandaigua.
- The Project will require Final Site Plan Approval from the Town of Canandaigua.
- The Project will include a permit to connect to the Canandaigua Lake County Sewer System
- The Project will require a permit to connect to the Town Water System
- The Project will require a backflow prevention permit from the NYS Health Department.

Existing Conditions:

Currently the site is vacant. The site formerly hosted a residential/commercial restaurant with parking. The building has since been removed and site was restored to open space. The site does occupy a Federal wetland on northern portion of the site which will be over 307 feet for the disturbed area. This project will not disturb areas within the protected wetland.

Water Supply:

A 6" water service lateral will connected to the existing **8"** water main on Route 364. The service will be backflow protected by a new backflow preventer installed within the building.

Demand Information:
Based on NYSDEC's "Design Standards for Wastewater Treatment Works" and other available resources we can estimate the peak demand for the proposed facility:

- 4500 sf, and 3,000 gallons of cider produced annually
- 35 gallons per day (gpd) per seat (assume 100 seats) = 100 seats x 35 gpd/seat = 3500 gpd
- Process water for cider production = 20 gpd max (see usage information provided by Star Cider attached)
- Total = 3,520 gpd
- Based on a 12 hour demand period, average day demand will be 4.8 gpm
- Using Peak factor of 9, brewery/restaurant will require **44 gpm peak demand**

Flow information/calculations have been derived from the following hydrant flow information provided by (the Town Water Department):

Existing Hydrant Flow Data:
Hydrant #**xxx**: Residual Pressure: **xx** PSI
Static Pressure: <**100** PSI Hydrant Flow: **xx** GPM

The building will also include a wet sprinkler wet heads for 4500 FT^2. It is anticipated this building will be considered light hazard per NFPA 13 w/ a fire flow demand of 0.10 GPM/FT^2 totaling 450 GPM fire flows required. Calculation (attached) indicate the following flows with a residual 20 PSI at the new hydrant and sprinkler system under fire fighting conditions:

New Hydrant -
Fire Flow: <1000 GPM
W/ residual 20 PSI

Sanitary Sewers:

The sewer from the proposed building will be piped to the sanitary sewer on Marvin Sands Drive with a 6" lateral. Flows from production/process areas and process fixtures will be directed to a 1,000 gallon pretreatment/equalization tank installed beneath the loading/parking area. A control manhole will be located at the discharge point from the pretreatment tank. Flows from the restrooms and general hand sinks will be directly piped to the sewer system.

The anticipated wastewater characteristics after pre-treatment are as follows:

Total sewer flows – 3,520gpd
Average Annual - General Occupancy – 3500GPD
Average Annual - Cider Process Wastewater – 20 GPD
Average Daily Peak Process Wastewater Flows – 180 GPD (Peak), 1.5 GPM (peak), Non-seasonal
Average concentrations of nutrients (before pre-treatment)(estimated from published sources):
- BOD5- 2.0 kg/l
- TSS – 0.3 kg/l
- NH4 – 10 mg/l
- Temperature - >120 deg F
- pH – 4-10

Average concentrations of nutrients (after pre-treatment)(estimated from published sources):
- BOD5- 275 mg/l
- TSS – 250 mg/l
- NH4 – 4 mg/l
- Temperature - >80 deg F
- pH – 6-9

Estimated time and duration of discharge – 2:00PM – 4:00PM wash down time ~ 2 hours.

The making of cider is very different than the brewery process and very similar to wine making. Washing of equipment only takes place when “racking” of product takes place. The product is transferred from only fermenter to another leaving behind the precipitates. Racking is completed once every couple months with a total of 3 times per batch and they will have up to four fermenters at this location. The precipitates also known as “lees” is disposed of on agricultural fields and not washed down the drain. Some residual solids and organics in the tanks will be washed out during the wash-down process. The wastewater this process contains two main chemicals for cleaning & sterilizing tanks and equipment.

Caustic – 1.25% sodium Hydroxide
Acid Sanitizer – 0.02% ammonium Chloride

A 1000 gallon pretreatment tank will allow for the settling of solids, neutralizing of chemicals and cooling of waters prior to discharge. The chemicals noted above will neutralize to a pH within acceptable limits when diluted and combined. The pre-treatment tank will allow for up to xx hours of detention/contact time before discharge (See calculations below).

Process wastewater: 20 GPD * 9 (Peaking Factor) / 2 hrs. (Assumed process time) = 90 Gal/Hr. = 1.5 gpm
Contact/detention time = 1000 gallons / 1.5 gpm = 666.7 minutes = 11 hours

The solids level in the tank will be monitored weekly until a pumping schedule can be established. Future provisions have been installed to connect the pretreatment tank to the electrical room to implement an aerobic treatment process if required.

Food prep sinks will have an individual grease trap installed under the sink.

Stormwater:

See attached Stormwater pollution prevention plan.