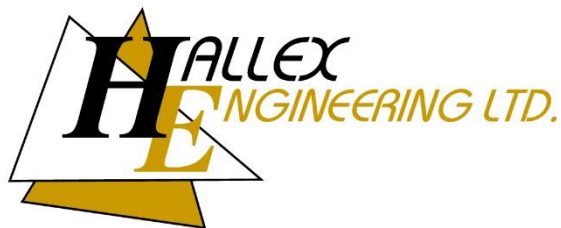

PROPOSED DEL DEGAN WINERY
17945 LOYALIST PARKWAY, PRINCE EDWARD COUNTY

FUNCTIONAL WATER SERVICING DESIGN BRIEF

REV 2 – November 16, 2023

PREPARED BY:



HALLEX PROJECT #220526

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1. INTRODUCTION

The proposed Del Degan Winery development consists of the construction of three new buildings, asphalt laneway & parking areas and grass areas. This development is located at 17945 Loyalist Parkway, which is south of the Greer Road and Loyalist Parkway intersection in the County of Prince Edward, ON.

The purpose of the service assessment is to determine the required domestic water supply flows to ensure it meets the recommended recommended pumping rates for Well #1, Well #2, Well #4 and Well #5 from the ground water aquifer as recommended in the Hydrogeological Assessment Report by Cambium Inc., reference #15435-002, dated November 08, 2023.

2. WATER DISTRIBUTION SYSTEM

The building development is currently in the concept phase; therefore, the following assumptions based on the architectural drawings are made in carrying out the calculations:

- The winery and residence plumbing fixtures and the number of plumbing fixtures indicated in Exhibit #1 are assumed and may not represent the final building plumbing design.
- The winery production flow rate assumes 12,000 cases of wine produced per year. Each case is assumed to contain 12-750mL bottles and requires 10L of water to produce a litre of wine. Assuming production is to occur 8 hours per day, 5 days per week, 26 weeks per year with a 50% safety factor, the peak flow rate required for production is 26.0 L/min.
- The total daily wastewater usage rate, also being representative of the total daily water consumption rate, is taken from the Septic System Design Brief by Hallex Engineering (Project #220526, Revision #2, dated August 03, 2023) as follows:
 - Warehouse / Basement / 2nd Floor Office – 6,505 L
 - Restaurant / Retail / 1st Floor Office / Potential Future Capacity – 14,633 L
 - Residence – 1,400 L

The peak probable domestic water demand for the proposed development is determined to be 203.0 L/min for the winery production, warehouse, basement and 2nd floor office, 249.3 L/min for the restaurant, retail and 1st floor office and 110.8 L/min for the residence. These calculations are based on the above assumptions and fixtures and fixture units shown in Exhibit #1 attached. Table 7.4.10.5 in the Ontario Building Code is used to determine water demands for the total fixture units.

The average domestic water demand for the proposed development, assuming the total daily water consumption rate is used over a 4-hour period, is determined to be 27.1 L/min for the warehouse, basement and 2nd floor office, 61.0 L/min for the restaurant, retail and 1st floor office and 5.8 L/min for the residence.

The hydraulic analysis conclusions from Hydrogeological Assessment Report by Cambium Inc. state "Based on hydraulic testing results, recommended pumping rates for the test wells are 90 L/min for TW1, 23 L/min for TW2, 10 L/min for TW4, and 14 L/min for TW5." Well 2 could provide the daily water consumption rate of 6,505 L warehouse, basement and 2nd floor office in 4.7 hours, Well 1 could provide the daily water consumption rate of 14,633 L for the restaurant, retail and 1st floor office in 2.7 hours and Well 5 could provide the daily water consumption rate of 1,400 L for the residence in 1.7 hours.

Given all the above peak flows exceed the well supply rate for each development area, a minimum cistern size would be required to ensure sufficient water supply for the development. A single 15-minute peak period would result in a required volume of 3,045 L for the winery production, warehouse, basement and 2nd floor office, 3,740 L/min for the restaurant, retail and 1st floor office and 1,662 L for the residence. If four peak periods were to occur daily, a required volume would be 12,180 L for the winery production, warehouse, basement and 2nd floor office, 14,960 L/min for the restaurant, retail and 1st floor office and 6,648 L for the residence.

Additional hydraulic testing was completed on test wells TW1 and TW3 as summarized in the Additional Hydraulic Testing Report by Cambium Inc., reference #15435-002, dated November 08, 2023. This report concludes that "Test well TW1 can conservatively be pumped at a rate of 365L/min to meet and enhance the peak demand of the proposed development." The report further utilizes the above water demand calculations for the development and concludes the "Water Supply network and peak demand calculations indicate there is a shortage of about 9,300 L to meet the peak demand conditions. Therefore, one Water Storage Reservoir with a minimal capacity of 9,300 L is recommended to meet the peak demand conditions."

As such, domestic water supply using the wells for the development could be utilized provided a minimum 9,300 L Water Storage Reservoir complete with any required water treatment system(s) are constructed as part of the development.

3. CONCLUSION

The aforementioned calculations and recommendations for domestic water servicing are based on the current design for the site as of writing this report. A final sealed report, complete with updates to the recommendations made in this report, may be required based on the final site design.

We trust this report meets your approval. Please contact the undersigned should you have any questions or comments.

Yours truly,
HALLEX ENGINEERING LTD



Jim Halucha P.Eng
Civil/Structural Engineer

A handwritten signature in black ink, appearing to read "Jonathan Skinner".

Jonathan Skinner, C.E.T., B.Tech
Civil Technologist



Del Degan Winery
17945 Loyalist Parkway, Rosehall
Exhibit #1 - Water Demand

11/16/2023
 Job: 220526

DOMESTIC WATER SUPPLY

Fixture	# of Plumbing Fixtures	Fixture Units (Table 7.6.3.2.A.)	Total Water Fixture Units
Winery Basement			
Water closet w/ flush tank (private)	3 fixtures	3 FUs	9 FUs
Sink (domestic)	3 fixtures	2 FUs	6 FUs
Sink (service or mop basin)	1 fixture	3 FUs	3 FUs
Hose bibb (public, 19mm)	2 fixtures	6 FUs	12 FUs
Winery 1st Floor Warehouse			
Water closet w/ flush tank (private)	1 fixture	3 FUs	3 FUs
Sink (domestic)	1 fixture	2 FUs	2 FUs
Sink (service or mop basin)	1 fixture	3 FUs	3 FUs
Winery 2nd Floor			
Water closet w/ flush tank (private)	1 fixture	3 FUs	3 FUs
Sink (domestic)	1 fixture	2 FUs	2 FUs
Total =			43.0 FUs
Total Flow =			177.0 L/min

Therefore the maximum domestic water demand is determined to be 177 L/min for the warehouse and basement.

Winery 1st Floor Restaurant / Retail			
Water closet w/ flush tank (private)	2 fixtures	3 FUs	6 FUs
Water closet w/ flush tank (public)	8 fixtures	5 FUs	40 FUs
Sink (domestic)	11 fixtures	2 FUs	22 FUs
Sink (commercial, kitchen)	6 fixtures	4 FUs	24 FUs
Dishwasher (commercial)	2 fixtures	8 FUs	16 FUs
Dishwasher (domestic)	1 fixture	1.4 FUs	1.4 FUs
Total =			109.4 FUs
Total Flow =			249.3 L/min

Therefore the maximum domestic water demand is determined to be 249.3 L/min for the restaurant.

Residence			
Bathroom group with flush tank	3 fixtures	3.6 FUs	10.8 FUs
Sink (domestic)	1 fixture	2 FUs	2 FUs
Dishwasher (domestic)	1 fixture	1.4 FUs	1.4 FUs
Clothes washer (private, domestic)	1 fixture	1.4 FUs	1.4 FUs
Total =			15.6 FUs
Total Flow =			110.8 L/min

Therefore the maximum domestic water demand is determined to be 110.8 L/min for the residence.