
Date:	September 22, 2023	No. of Pages:	2
Project:	Pangli Estate Firefighting Water	Project No.:	TE-42529-23
Address:	5397 Wellington Road 125, Erin, ON		
Client:	Peter Pangli		
Distribution:	Peter Pangli	info@sssservices.ca	
	Nicola Augustin	Fryett Turner Architects	nicola@ftarchitects.ca

Background

Tacoma Engineers has been retained by Peter Pangli to calculate the required on-site water supply for firefighting purposes at the above noted project. The subject building is an existing agricultural building which the owner intends to change to a storage garage (F3 major occupancy). The building is subject to Change of Use and Renovation per Part 11 of the Ontario Building Code (OBC). Refer to the report "Change of Use of Existing Equestrian Facility" prepared by Fryett Turner Architects Inc. The subject property is not serviced with municipal water.

The calculation below is based on Div. B A-3.2.5.7. of the 2012 Ontario Building Code (OBC), in order to satisfy the OBC requirements of OBC Div. B 3.2.5.7.

The following design documents were provided for the basis of this calculation:

- Architectural Floor Plan and Elevations by Fryett Turner Architects, dated 2023/07/25
- Site Plan, A1.0 by Fryett Turner Architects., dated 2023/07/25
- Existing building drawings, titled "Civiero Riding Arena", prepared by R.J. Burnside & Associates Limited, dated Nov. 8, 2011
- Sketch Showing Topographic Features on 5397 Wellington Road 125, Town of Erin, County of Wellington by Van Harten Surveying Inc., dated Sept. 8, 2023

On-site Water Calculation

The water supply quantity formula [Div.B, A-3.2.5.7.3.(a)]:

$$Q = K \times V \times S_{tot}$$

- $K = 28$ from Table 1. The building will be a group F3 major occupancy of combustible construction with no proposed fire resistance ratings for the roof or supporting structure.
- $V = 13,304 \text{ m}^3$ based on the total building volume. The building volume was established from the Architectural drawings noted above. Estimated interior building volumes include:
 - Ground Floor = 8,643 m^3
 - Roof Space = 4,661 m^3
- $S_{tot} = 1.5$ from Figure 1. The south building face is 4.4m from the property line, providing an S value of 0.5. All other exposure distances exceed 10m, based on the Site Plan referenced above. Therefore, $S_{tot} = 1.0 + (0.5+0+0+0)$.

$$Q = 28 \times 13,304 \text{ m}^3 \times 1.5$$

$$Q = 558,789 \text{ litres} \quad \text{or} \quad 147,616 \text{ US gal}$$

Minimum Water Supply Flow Rate = **9,000 L/min** (per Table 2)

Additional Comments

Design of the water storage system must conform to the provisions outlined in OBC Div. B, A-3.2.5.7. Note that the specific design of the water storage system is by others. These additional comments are being provided for convenience.

Two common sources of water storage for firefighting purposes are underground tanks or ponds (natural or man-made). It is understood that the owner intends to use an existing pond for firefighting water storage.

- Underground Tank – see attached example of a precast concrete tank by Wilkinson Heavy Precast. Five (5) of these tanks would be required to have sufficient volume for the required water storage quantity.
- Pond – A natural or man-made pond may be used as the water source. Design requirements regarding the provisions for using a pond include:
 - The top 600mm of water is considered an allowance for ice depth and would not be included in the required water storage volume.
 - Make-up water supply needs to be provided so that the minimum required design volume is maintained during a drought.
 - Based on the survey provided, the calculated volume of the existing pond is $\pm 706,000$ L. With a reduction to allow for 600mm of ice depth, the remaining available water is $\pm 408,000$ L, which is less than required.
 - Based on the survey provided, consideration could be given to increasing the top of water elevation in the pond. An elevation increase of roughly 300mm would provide an adequate available water volume. The final top of water elevation should be coordinated with the civil engineer.

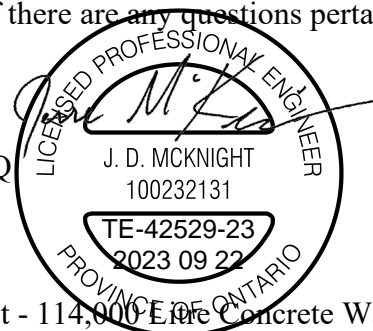
In addition to the volume requirements a draft pipe must be provided for the fire department's connection to the water source. The draft pipe must be located as per the 'hydrant' requirements in OBC 3.2.5., including being located not more than 90 meters from the principal building entrance, measured along the Fire Access Route [OBC 3.2.5.5.(2)(b) & 3.2.5.7.(2)].

Please feel free to contact the undersigned if there are any questions pertaining to this report.

Sincerely,

Per

Jesse McKnight, P.Eng., C.E.T., BCQ
Structural Engineer, Associate
Tacoma Engineers Inc.



Encl.

Reference – Wilkinson Heavy Precast - 114,000 L Pre Concrete Water Holding Tank
(1 page)

114,000 LITRE CONCRETE WATER HOLDING TANK MODEL H114S

CONSTRUCTION DETAILS:

Concrete: 35 MPa at 28 Days, 5 to 8% Air Entrainment.

Reinforcing: Designed for a maximum 1.5 metre burial over the top slab in firm soil.
Optional reinforcing for CHBDC vehicular loading available upon request.

WEIGHT: Top Section - 48,000 kg
Bottom Section - 48,000 kg

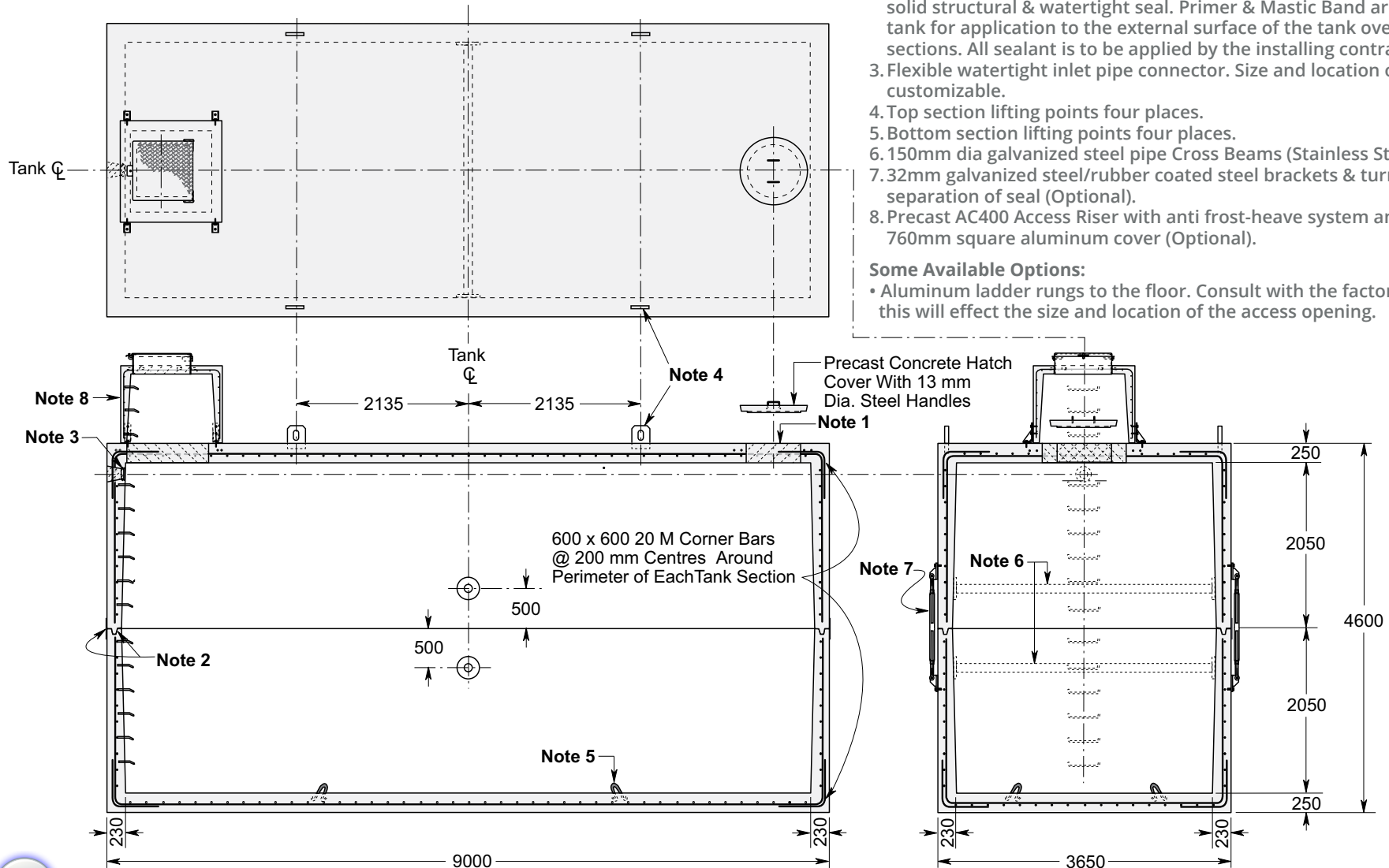
CAPACITY: Per Vertical Metre - 27,832 Litres
To Underside of Roof Slab - 114,110 Litres

NOTES:

1. Large 685 mm diameter roof access openings facilitate tank maintenance. Unless otherwise specified when ordered this tank will be shipped with 840mm diameter concrete roof access cover only. Please see [Access Riser](#) section for available riser & hatch options.
2. Close tolerance of tongue & groove joint and fibrous mastic sealant ensures a solid structural & watertight seal. Primer & Mastic Band are supplied with each tank for application to the external surface of the tank over the joint between sections. All sealant is to be applied by the installing contractor.
3. Flexible watertight inlet pipe connector. Size and location of connections are customizable.
4. Top section lifting points four places.
5. Bottom section lifting points four places.
6. 150mm dia galvanized steel pipe Cross Beams (Stainless Steel Optional).
7. 32mm galvanized steel/rubber coated steel brackets & turnbuckles to prevent separation of seal (Optional).
8. Precast AC400 Access Riser with anti frost-heave system and integrally cast 760mm square aluminum cover (Optional).

Some Available Options:

- Aluminum ladder rungs to the floor. Consult with the factory as to how this will effect the size and location of the access opening.



Dimensions in mm
N.T.S.

*Product designed for a **Maximum 1.5 Metre** burial over the top slab in firm soil away from any area of vehicular traffic.

For recommended installation procedures refer to Wilkinson [Installation Guidelines](#).

WARNING! IMPROPER INSTALLATION ESPECIALLY IN UNSTABLE SOIL CAN RESULT IN THE STRUCTURAL FAILURE OF THIS PRODUCT

March 27, 2019