



June 5, 2017

City of Ottawa
Development Review - Urban Services Branch
Planning and Growth Management Department
110 Laurier Avenue West, 4th Floor
Ottawa, ON, K1P 1J1

Attention: Steve Belan, Planner II

**Re Royal Thai Embassy, 180 Island Park Drive, Ottawa
Site Servicing Report, Rev. 1**

Dear Steve:

We provide the following Site Servicing Report in accordance with the City of Ottawa Site Plan Control Application requirements for the proposed Royal Thai Embassy at 180 Island Park Drive, Ottawa. The purpose of the report is to confirm that existing municipal and site services, including water, storm and sanitary, can support the increased demand from the proposed site re-development.

Reference documents

- Site Servicing, Grading and Drainage, Erosion and Sediment Control Plan by Jp2g Consultants Inc., March 6, 2013.
- Stormwater Management Report by Jp2g Consultants Inc., March 6, 2013.
- Topographical Survey by Fairhall Moffatt & Woodland Ltd, August 15, 2012, Ref No. 50-402(NP), tp302q.dwg.
- Geotechnical Investigation – Proposed Thai Embassy, 180 Island Park Drive, by Paterson Group Inc., dated September 9, 2012, Report No. PG2734-1.

Background

The proposed embassy development is to be located on the site of the existing two-storey Royal Thai Embassy on Island Park Drive, between the Sir John A Macdonald Parkway and Clearview Avenue, Ottawa. The total property area is approximately 0.14 ha. The proposed site development includes the demolition of the existing two-storey embassy and the construction of a new two-storey embassy, an underground parking garage and landscaped areas.

Site Servicing

1.1 Storm Sewer

The existing embassy does not have a connection to the municipal storm sewer system. There is an existing catch basin lead along Island Park Drive in front of the property, as well as an existing 375mm diameter storm sewer running northwest along Latchford Road, behind the property, west of Island Park Drive. The catch basin lead connects to the 375mm diameter storm sewer running north along Clearview Avenue and ultimately outlets directly into the Ottawa River approximately 900 meters northeast of the site. The storm sewer on Latchford Road also outlets directly into the Ottawa River approximately 900 meters northwest of the site.

Connecting a new storm sewer to the existing 375mm storm sewer on the south side of Island Park Drive would require significant road disturbance. Therefore, the proposed site storm drainage from the roof, walkways, and landscaped areas, will be collected by a storm sewer system, which will outlet to the municipal sewer on Latchford Road via a new 200mm diameter PVC storm sewer that will run northwest along an easement behind the property and discharge into the 375mm diameter storm sewer on Latchford Road.



Stormwater quantity control will be achieved using roof weirs and by installing a flow restrictor in the new monitoring storm manhole. Stormwater management calculations are included in the Stormwater Management Report, dated March 6, 2013, prepared by Jp2g.

1.2 Sanitary Sewer

Based on City drawings, the existing embassy sanitary sewer service appears to outlet to an existing 225mm diameter sanitary sewer running northwest along an easement behind the property and discharging into the 250mm diameter sanitary sewer on Latchford Road.

Based on hydraulic calculations prepared by CIMA for a Preliminary Design Concept Report (attached), the existing sanitary sewer service will be replaced by a new 150mm diameter sanitary sewer service that will be connected to the existing 225 mm diameter municipal sanitary sewer, flowing northwesterly, approximately 2m deep. The sanitary sewer service will outlet the building at a slope of 1%, and then connect to the existing municipal sanitary sewer in accordance with City of Ottawa Standard Detail S11.

Based on the City of Ottawa Design Guidelines, the peak sanitary flows for the site were calculated to be 0.48 l/s (Refer to Appendix A - Sanitary Sewer Design Sheet). The proposed 150mm diameter sanitary sewer service will have a full flow capacity of 15.2 l/s, which will be sufficient to handle the proposed site re-development.

1.3 Water

Based on City of Ottawa record drawings and discussions with City Staff– refer to Appendix B, the existing embassy water service appears to be fed by an existing 50mm diameter watermain, encased in a decommissioned 150mm diameter watermain, located along the easement behind the property which is connected to the existing 150mm diameter watermain on Latchford Road and the 200mm watermain on Clearview Avenue.

The water demand for the proposed embassy was calculated based on Table 4.2 from the City of Ottawa Design Guidelines for Water Distribution. The calculations are based on the following criteria:

- Average daily sewage flow for office workers = 75 l/person/day
- Average occupancy for the building = 20 persons (staff and residents)

Average Daily Demand: $\frac{75 \text{ l/person/day} \times 20 \text{ persons}}{24 \text{ hrs/day} \times 3600 \text{ s/hr}} = 0.017 \text{ l/s}$

Maximum Daily Demand: $0.017 \text{ l/s} \times 1.5 = 0.026 \text{ l/s}$

Maximum Hour Demand: $0.017 \text{ l/s} \times 1.8 = 0.031 \text{ l/s}$

There is an existing fire hydrant at the northwest corner of the Island Park Drive and Clearview Avenue intersection which will provide fire protection to the site. The proposed building will be equipped with sprinklers and a Siamese connection located at the front of the building at the northeast entrance. Based on the Fire Underwriters Survey Method, the fire flow demand for the proposed embassy was calculated to be:

Fire Flow Demand: 66.7 l/s (Refer to Appendix C – Fire Flow Calculations).

Based on the boundary conditions provided by the City of Ottawa and additional correspondence – refer to Appendix D, it has been determined that the existing 50mm diameter watermain does not have sufficient flow to service the new building's proposed sprinkler system. Therefore, the following two solutions were analysed in an effort to overcome this obstacle. Option A is to upgrade between 75 and 165 metres of the existing municipal watermain extending to the property line at the Royal Thai Embassy. Option B is to provide a water storage tank on site for fire protection measures.



Option A

A proposed 150mm diameter watermain service lateral would replace the existing water service to the embassy, and connect to a new 150mm diameter municipal watermain in the easement behind the property. The proposed 150mm diameter water service will include a service valve at the property line. In addition, the watermain in the easement would be replaced from the Embassy's property to either Clearview Avenue or to Latchford Road. The considerations for this undertaking are as follows:

- It would be a shorter distance to replace the watermain to Clearview Avenue at approximately 75m, however replacing the watermain through the easement would have a significant impact on the adjacent homes' rear yards and mature trees.
- Based on discussions with the City, the 150mm dia. watermain on Latchford Road also does not have sufficient flow to service the Embassy's water requirements, therefore the Latchford watermain would have to be upgraded from the Embassy's property to Clearview Ave, a distance of approximately 165m.

Option B

The Embassy's firefighting requirements were calculated to be 2700 l/min using the Ontario Building Code method – refer to Appendix E. An 81,000L underground water storage tank would provide a sufficient water supply to the sprinklers for 30 minutes in accordance with the National Fire Protection Association (NFPA) and the City of Ottawa's Fire Service specific requirements. A storage tank with a capacity of 85,000L would measure approximately 12m in length by 3m in diameter – refer to Appendix E, and would be stored either in the rear yard of the property or in the underground garage.

End of Site Servicing Report

Please contact the undersigned should you require any clarification.

Yours truly,

Jp2g Consultants Inc.

ENGINEERS • PLANNERS • PROJECT MANAGERS



Roxanne Tubb, P.Eng.
Project Manager - Civil Engineer

cc Vladimir Popovic, Principal Architect, N45 Architecture Inc.



Appendix A - Sanitary Sewer Design Sheet

Appendix A - Sanitary Sewer Design Sheet



Project Name: Royal Thai Embassy, 180 Island Park Drive, Ottawa

Definitions
 Manning's Coefficient (n) = 0.013
Manning's Formula
 $Q = A \cdot R^{2/3} \cdot S^{1/2} / n$ (l/s), where
 A = Areas in Hectares (ha)
 R = Hydraulic Radius (m)
 S = Slope

Design Parameters (City of Ottawa Sewer Design Guidelines, Section 4)
 1) Institutional Flow = 50000 L/ha/day
 2) Institutional Peak Factor = 1.50
 3) Residential Peak Factor = 4.0
 4) Avg. daily flow = 350 l/person/day
 4) Extraneous Flow = 0.28L/s/ha

Designed RT
 Checked DN
 Dwg. Reference C1
 Jp2g project No 2111541A

A1.1 Pre-development

Location		Residential Flow				Infiltration		Commercial		Institutional		Industrial		Total	Sewer Data (estimated)				
From	To	Area (ha)	Pop. (pers.)	Peak Factor	Peak Flow (l/s)	Area (ha)	Inf. Flow (l/s)	Area (ha)	Com. flow (l/s)	Area (ha)	Inst. flow (l/s)	Area (ha)	Inst. flow (l/s)	Peak Flow (l/s)	Length (m)	Dia. (mm)	Slope (%)	Capacity (full) (l/s)	Velocity (full) (m/s)
private property	easement	0.00	6	4.0	0.10	0.14	0.04	0.00	0.00	0.14	0.12	0.00	0.00	0.26	20.0	150	2.0	21.5	1.2
easement	Latchford Road	0.00	0	4.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	73.0	225	0.5	31.7	0.8

A1.2 Post-development

Location		Residential Flow				Infiltration		Commercial		Institutional		Industrial		Total	Sewer Data				
From	To	Area (ha)	Pop. (pers.)	Peak Factor	Peak Flow (l/s)	Area (ha)	Inf. Flow (l/s)	Area (ha)	Com. flow (l/s)	Area (ha)	Inst. flow (l/s)	Area (ha)	Inst. flow (l/s)	Peak Flow (l/s)	Length (m)	Dia. (mm)	Slope (%)	Capacity (full) (l/s)	Velocity (full) (m/s)
private property	SAMH-1	0.00	20	4.0	0.32	0.14	0.04	0.00	0.00	0.14	0.12	0.00	0.00	0.48	7.3	150	1.0	15.2	0.9
SAMH-1	easement	0.00	0	4.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.3	150	0.5	10.8	0.6
easement	Latchford Road	0.00	0	4.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	40.1	225	0.5	31.7	0.8



Appendix B - City of Ottawa Correspondence

From: [Roxanne Tubb](#)
To: [Sarah McLaughlin](#)
Subject: FW: Fire Flow - Royal Thai Embassy - 180 Island Park Drive
Date: Thursday, May 18, 2017 11:28:01 AM
Attachments: [image001.png](#)

From: Cole, Bruce [mailto:Bruce.Cole@ottawa.ca]
Sent: May 3, 2017 3:32 PM
To: roxannet@jp2g.com
Cc: Alting-Mees, Birgitte <birgitte.alting-mees@ottawa.ca>; Wu, John <john.wu@ottawa.ca>
Subject: Fire Flow - Royal Thai Embassy - 180 Island Park Drive

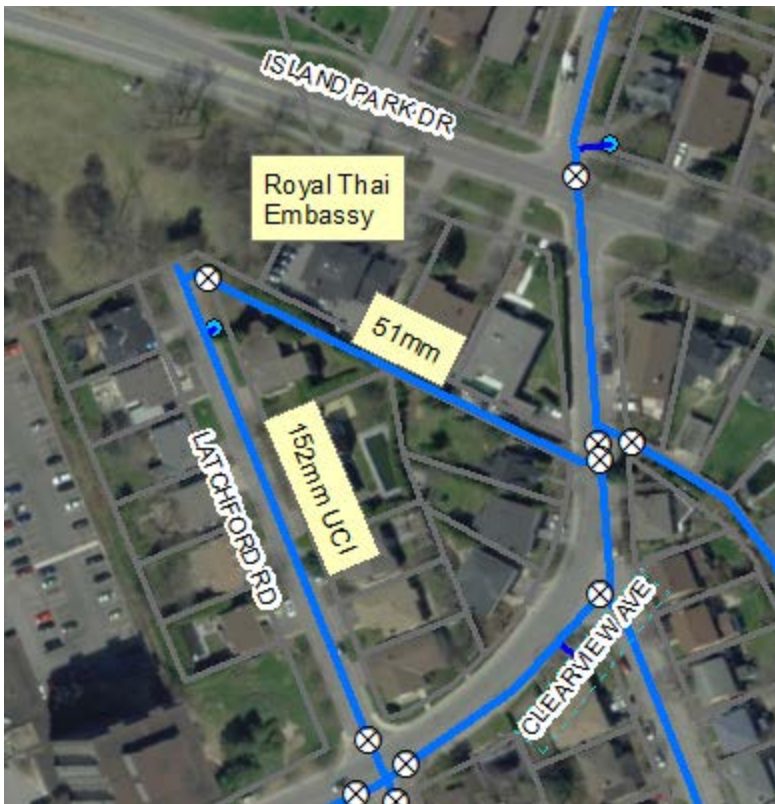
Hello

The Royal Thai Embassy located at 180 Island Park Drive will need approximately 67 L/s from the water distribution system to provide the needed fire protection.

The Royal Thai Embassy property faces Island Park Drive and is serviced from the rear of the property. The 51mm watermain in the lane behind the properties facing Island Park Drive is connected to the 152mm, UCI watermain at the north end of Latchford Rd. Both watermains connect to the 203mm watermain in Clearview Ave.

With the current watermain configuration only 40 l/s of flow is available from the water distribution system at the north end of Latchford Rd with a residual pressure of 20 Psi. The Asset Management Branch is not planning to renew or rehabilitate these watermains.

A hydrant flow test is not recommended. The flow information from this test would unlikely be representative of the flow available from the water distribution system. The results from the hydrant test would be for a point in time and could be affected by constraints in the water distribution system.



Bruce Cole
Infrastructure Assessment Engineer - Watermains
Planning, Infrastructure & Economic Development Department
City of Ottawa
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Appendix C - Fire Flow Demand

Appendix B - Fire Flow Demand

Project Name: Royal Thai Embassy, 180 Island Park Drive, Ottawa Ontario

C.1 - Fire Flow Demand Requirements (Fire Underwriters Survey (FUS Guidelines))

Design Parameters*

Estimated Fire Flow Formula: $F=220 \cdot C \cdot A^{-1/2}$ (L/min)

F = Required fire flow (L/min)

C = Coefficient related to the type of construction

C_{1.5} = 1.5 for wood frame construction (structure essentially all combustible)

C_{1.0} = 1.0 for ordinary construction (brick or other masonry walls, combustible floor and interior)

C_{0.8} = 0.8 for non-combustible construction (unprotected metal structural components, masonry or metal walls)

C_{0.6} = 0.6 for fire-resistive construction (fully protected frame, floors, roof)

A = Total floor area in square metres

Adjustments to the calculated fire flow are based on: reduction low fire hazard occupancy (school), reduction for automatic sprinkler protection, and an increase for exposures for residences within 45 metres on two sides of the school. The table below summarizes the adjustments made to the basic fire flow.

Building Construction	Floor Area	C	1	2	3	4	Final Adjusted Fire Flow	Final Adjusted Fire Flow			
			Fire Flow (F)	Occupancy	Sprinkler	Exposure					
	(m ²)		(L/min)	%	Adjusted Fire Flow(s) (L/min)	%	Adjusted Fire Flow(s) (L/min)	(L/min)	(L/s)		
non-combustible construction	1120	0.8	6000	-25.0	4500	-50.0	-2250	35.0	1575.0	4000	66.7

*Water Supply for Public Protection (Fire Underwriters Survey, 1999).



Appendix D - Water Boundary Conditions

From: [Roxanne Tubb](mailto:Roxanne.Tubb)
To: [Sarah McLaughlin](mailto:Sarah.McLaughlin)
Subject: FW: 180 Island Park Drive - Boundary Conditions
Date: Thursday, May 18, 2017 8:06:36 AM
Attachments: [image003.png](#)

From: Wu, John [mailto:John.Wu@ottawa.ca]
Sent: January 30, 2017 10:37 AM
To: Roxanne Tubb <roxannet@jp2g.com>
Subject: RE: 180 Island Park Drive - Boundary Conditions

Hi, Roxanne:

Here is the result:

Here you go. I assumed that part of the 51mm watermain would be replaced. You still won't have a lot of available flow

******The following information may be passed on to the consultant, but do NOT forward this e-mail directly.******

The following are boundary conditions, HGL, for hydraulic analysis at 180 Island Park (zone 1W) assumed to be connected to a future 152mm PVC watermain behind 180 Island Park (see attached PDF for location).

Minimum HGL = 108.2m

Maximum HGL = 117.9m; the maximum pressure is estimated to be close to 80 psi. A pressure check at completion of construction is recommended to determine if pressure control is required.

Available flow = 40 L/s assuming a residual of 20 psi and a ground elevation of 58.0m

These are for current conditions and are based on computer model simulation.

Disclaimer: The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation.

The available fire flow is not enough.

John.

From: Roxanne Tubb [mailto:roxannet@jp2g.com]
Sent: Friday, January 20, 2017 11:52 AM
To: Wu, John
Subject: 180 Island Park Drive - Boundary Conditions

Hi John,

I hope things are well with you.

Could you please provide hydraulic boundary conditions for the Royal Thai Embassy project at 180 Island Park Drive.

1. Type of Development: New two storey embassy
2. Pressure Zone: 1W
3. Address: 180 Island Park Drive
4. Average Daily: 0.017 L/s, see attached calculations.
5. Maximum Day: 0.026 l/s, see attached calculations.
6. Maximum Hourly: 0.031 L/s, see attached calculations.
7. Fire Flow: 66.7 L/s based on the Fire Underwriters Survey formula, see attached calculations.

We've included a plan showing the location of the water connection.



Roxanne Tubb, P.Eng.
Project Manager - Civil Engineer
Gestionnaire de projet - ingénieur civil
Jp2g Consultants Inc.

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Appendix E - Underground Water Storage Tank Design

Royal Thai Embassy Re-Zoning
 Fire Flow Calculation as per OBC 2012 (Appendix 3.2.5.7)

$Q = KVStot$

- Q Minimum Supply of Water in Litres
- K Water Supply Coefficient
- Stot Total of Psatial Coefficient values from property line exposure on all sides as obtained from formula
 $Stot = 1.0 + [S_{side1} + S_{side2} + S_{side3} + \dots \text{ etc}]$

Type of Construction	Building Classification	Water Supply Coefficient	
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Non-Combustible with Fire Resistance Ratings	A-2, B-1, B-2, B-3, C, D		10.00
----------------------------------------------	--------------------------	--	-------

K

Floor Location	Floor Area (m2)	Floor Height (m)	Total Building Volume (m3)
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Basement	780	3.2	2496
Ground	560	4.4	2464
Second	560	4.4	2464

7,424.00

V

Building Façade	Exposure Distance (m)	Spatial Coefficient	
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North	7.5		0.4
East	4.5		0.5
South	16.5		0
West	1.5		0.5

1.40

Stot

103,936.00

Q

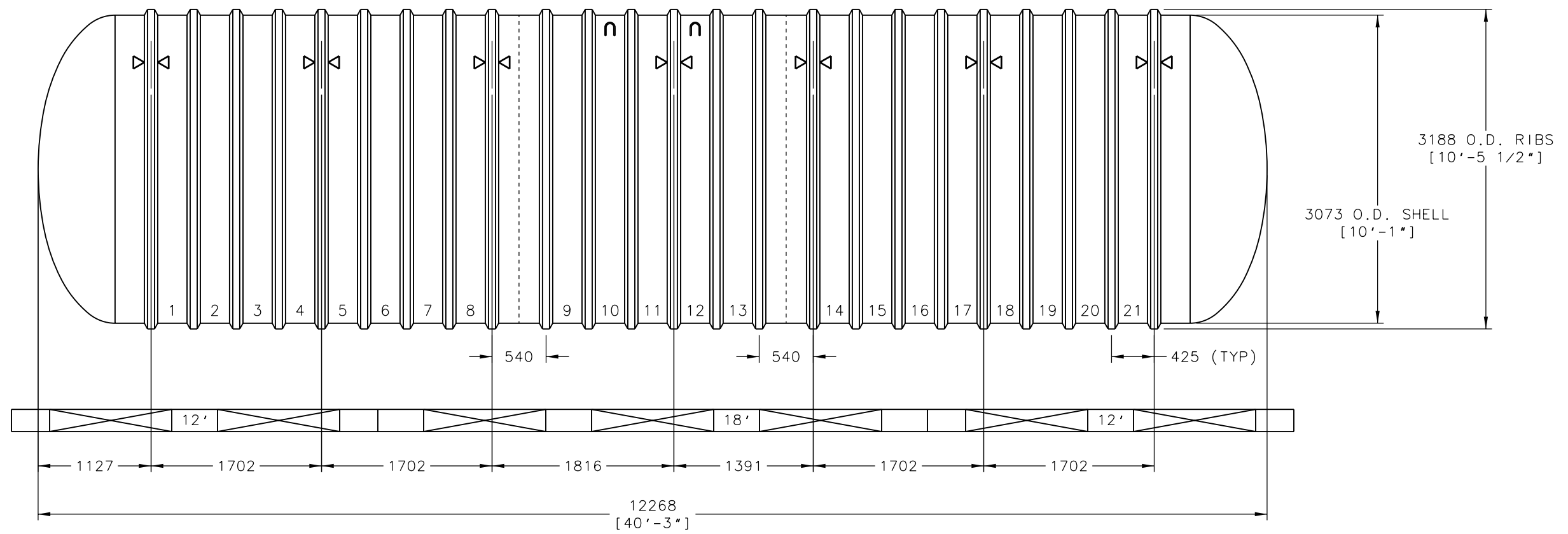
As per Table 2 of Appendix A (3.2.5.7) total water supply flow rate (L/min)

2,700.00

Water Syupply required for 30min (L)

81,000.00

Size of Underground Tank Required



Optional prefabricated engineered concrete deadmen shown.

ZCL COMPOSITES INC.	
TITLE Z100SW CAP. 85,000 LITRES 23,000 U.S. GALLONS	
DATE 6-12	DR. NO. Z10-031.01