REPORT

Capital Region Resource Recovery Centre

Site Servicing Brief

Submitted to:

Taggart Miller Environmental Services

Submitted by:

Golder Associates Ltd.

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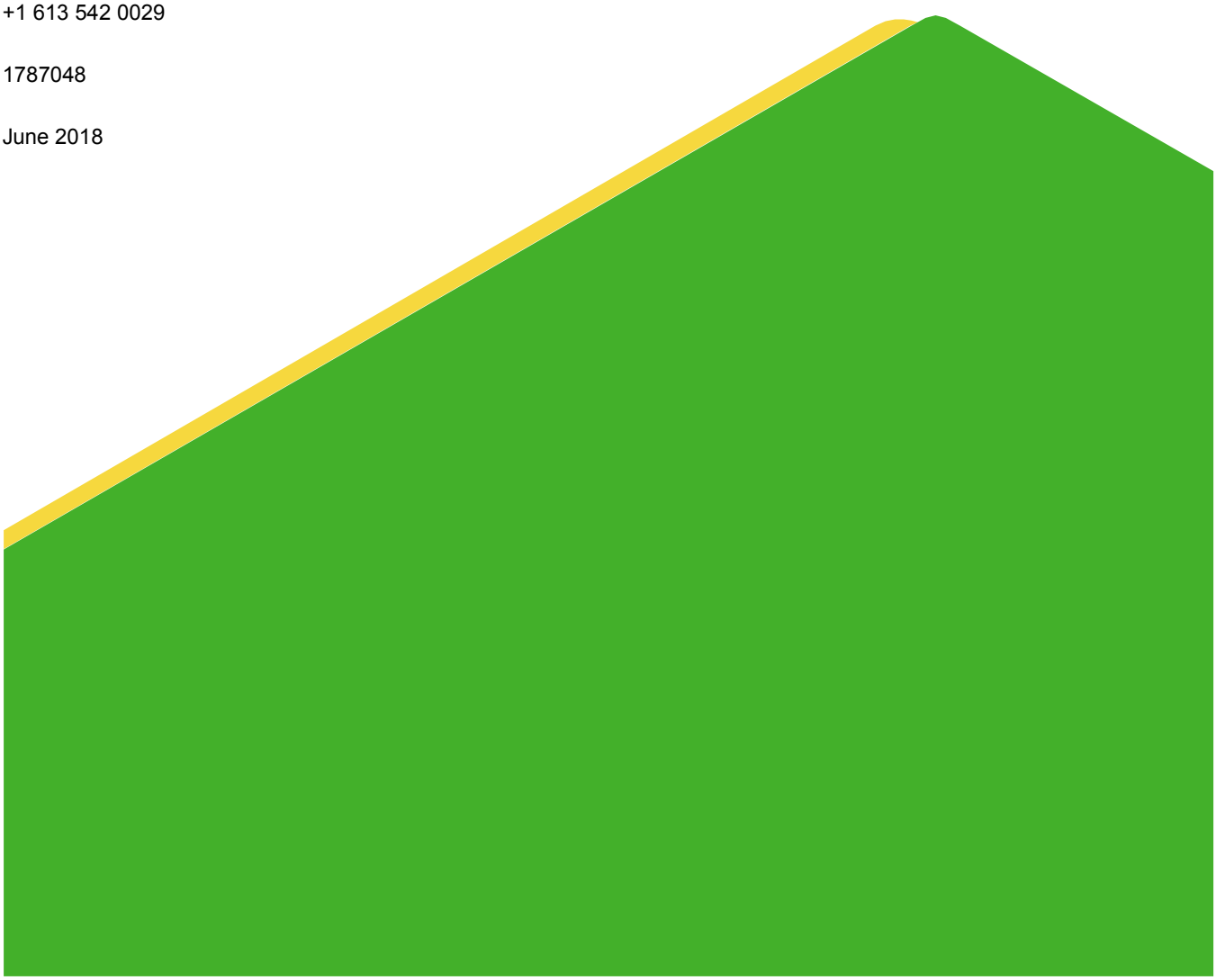
June 2018



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1.0 INTRODUCTION

A new integrated waste management facility, the Capital Region Resource Recovery Centre (CRRRC), is proposed for the Capital Region of eastern Ontario. The CRRRC will provide facilities and capacity for the recovery of resources and diversion of materials from wastes that are generated by Industrial, Commercial and Institutional (IC&I) and Construction and Demolition (C&D) sectors in Ottawa and eastern Ontario. It will also provide landfill disposal capacity on the same Site for post-diversion residuals and materials that are not diverted.

This report outlines the servicing for the proposed development: water, fire, sanitary and storm drainage. This report is being submitted in support of the Site Plan application to the City of Ottawa for the subject property and should be read in conjunction with the enclosed engineering drawings.

1.1 Site Location and Description

The proposed CRRRC Site (the Site) is located in the east part of the City of Ottawa just southeast of the Highway 417/ Boundary Road interchange. The property is located on the east side of Boundary Road, north of Devine Road and west of Frontier Road, and east of an existing industrial park, on Lots 22 to 25, Concession XI, former Township of Cumberland. See Figure 1 for the site location.

The Boundary Road Site (the Site), totalling approximately 192 hectares (ha), is located in the Bear Brook Subwatershed in the Lower Ottawa – South Nation Watershed. The area surrounding the Site primarily consists of rural and agricultural land, an industrial park, residential properties and open spaces. The Site is generally flat, and slopes from local high point elevations at the western side of the Site at Boundary Road, towards the lowest portion of the Site found along the eastern edge at Frontier Road.

The property is adjacent to an existing Industrial Park with few existing immediate neighbours. It is underlain by a surficial silty sand layer followed by a thick deposit of silty clay soil.

2.0 SITE SERVICING

The objective of the Site servicing report is to provide an overview of the proposed servicing for the development.

2.1 Water

The proposed development site is located along Boundary Road that does not currently have municipal water services. The Owner and the City have been working together to extend the Carlsbad Springs Trickle Feed Water System to service the Industrial Park area, including this Site. It is understood that the system expansion is presently being designed and is planned to be operational for the Fall of 2018. Based on pre-consultation with the City of Ottawa, the Site will be provided with 15 equivalent connections from the Trickle Feed Water System, which is equivalent to 2,700 L/day x 15 = 40,500 L/day (0.47 L/s).

The municipal water system would provide potable water to the proposed Site development. The fire system will utilize the on-Site Stormwater Management (SWM) Pond 5A, which is fed by stormwater runoff.

2.1.1 Domestic Water Demand

The maximum daily flow rate for water use at the Site has been calculated based on the occupancy of each building and the values from the Ontario Building Code (OBC), Table 8.2.1.3.B. These values are shown on the Overall Site Servicing Plans, Drawings SS1 and SS2, included in Appendix E. There are no proposed staff facilities, such as washrooms or sinks, in the PHC soil treatment, or the secondary digestor buildings. Staff working in these buildings or at the adjacent composting and organics processing areas will use facilities at the

leachate pre-treatment building or the organics pre-processing building. Therefore, water use information values for these areas are summarized in the leachate pre-treatment building and organics pre-processing building values. Flows shown for some of these facilities are based on a nominal use for washdown of areas.

An average day factor of 0.33 has been applied to these values to account for actual flow rates at the Site. This factor is consistent with actual average day water use at a similar material recovery facility that Miller Waste operates for the Region of York. A peaking factor of 2.5 above maximum daily rates has been assumed for peak hour flow rates. The maximum daily flow rates, average daily flow rates and peak hourly flow rates for each building are summarized in the following table:

Table 1: Domestic Water Requirements

Building	Maximum Daily Flow Rate (L/d)	Average Daily Flow Rate (L/d)	Peak Hourly Flow Rate (L/h)
Administration	1,950	644	203
In-Bound Scale	113	37	12
C&D Processing Facility	7,950	2,624	828
Materials Recovery Facility	11,700	3,861	1,219
Maintenance Garage	2,188	722	228
Secondary Digester	100*	33	1,140**
Organics Pre-Processing	1,500	495	156
Leachate Pre-Treatment	2,438	805	254
Secondary Scale	113	37	12
Total	**28,052**	**9,258**	**4,052**

*The maximum daily flow rate has been assumed at 100 L/d as there are no staff facilities within these buildings.
**The peak hourly flow rate has been assumed at 1,140 L/h (22.7 L/m or 5 USgpm) as there are no staff facilities within these buildings.

The trickle feed expansion will extend with a 100mm diameter main along Boundary Road from the north, and terminate just south of the proposed Site entrance. The Site service will include a meter chamber on private property, close to the connection at the watermain. The connection will include a flow restricting orifice such that the maximum flow from the trickle feed system to the Site will be restricted to 0.47 L/s. The meter chamber (1,200 mm x 3,300 mm) and meter will be per City of Ottawa standard W32 and is proposed adjacent to the entrance road to the Site at Boundary Road. A cistern will be constructed on-Site to provide water storage to accommodate the limited flow rate of the system supply.

The out-bound scale will be fed directly from the trickle feed system service to the Site, after the flow meter and prior to the on-Site cistern, and has therefore not been included in the above table. The out-bound scale has the same occupancy and flow rates as the in-bound scale listed above and will be equipped with a pressure tank to account for peak flow rates.

2.1.2 Domestic Water Service Sizing

The water service sizing was determined by J.L. Richards & Associates Limited, based on Part 7 of the OBC. The sizes are summarized in the technical memorandum dated March 26, 2018, included in Appendix A. The truck tire wash service has been deleted since that time, as it will not be required.

The calculations for the sizing of the on-Site water distribution system for peak hourly flow rates and water age are included in Appendix B. Tables 2 and 3 provide a summary of the results; refer to overall Site Servicing Drawings SS1 and SS2 for section numbering.

Table 2: Domestic Water System Design Summary

Watermain Section	Peak Flow Rate (m^3/h)	Pipe Diameter (m)	Friction Loss (m)	Friction Loss (ft)	Water Age (d)
W1	4.052	0.075	0.088	0.289	0.03
W2	3.849	0.075	0.099	0.325	0.05
W3	3.837	0.075	0.101	0.331	0.05
W4	3.825	0.075	0.123	0.404	0.07
W5	2.997	0.075	0.122	0.400	0.15
W6	1.778	0.050	0.283	0.928	0.16
W7	1.368	0.050	0.132	0.433	0.33
W8	0.410	0.050	0.019	0.062	0.26
W9	0.012	0.019	0.004	0.013	1.87

Table 3: Domestic Water Service Design Summary

Building Service	Peak Flow Rate (m^3/h)	Pipe Length (m)	Total Head (m)	Total Head (psi)	Total Water Age (d)*
Administration (W10)	0.203	53.0	32.03	47.6	6.19
In-Bound Scale (W11)	0.012	9.7	31.98	47.5	6.15
C&D Processing Facility (W12)	0.828	170.2	32.32	48.0	6.33
Materials Recovery Facility (W13)	1.219	187.8	32.53	48.3	6.45
Maintenance Garage (W14)	0.228	70.0	32.29	47.9	7.03
Secondary Digester (W15)	1.140	281.6	32.59	48.4	23.57
Organics Pre-Processing (W16)	0.156	24.0	32.68	48.5	6.87
Leachate Pre-Treatment (W17)	0.254	185.8	32.28	47.9	7.22
Secondary Scale (W18)	0.012	5.7	31.88	47.3	8.04

*Includes an estimate of the water age to the Site of 3 days and a duration of 3 days in the on-Site cistern.

The pressure differential across the Site during peak hour flow rates is approximately 1.2 psi. Therefore, if the most remote use (secondary scale) is kept at a minimum residual pressure of 40 psi, the closest building to the water distribution pump will have an approximate pressure of 41.2 psi. This is considered acceptable for a normal operating range of 40 to 60 psi.

The water distribution pump will need to be designed to provide a peak hourly flow rate of 4,052 L/h at a design head of 32.68 m. The pump will be equipped with a variable speed drive to allow lower flow rates during average daily flows. A pressure sensor on the water distribution system will control the pump operation.

An on-Site water cistern is proposed to account for peak hourly flow rates and maximum daily flow rates. The cistern is sized for 27,774 L of working capacity, which is the volume of 3 average day flows, and is just less than the maximum daily flow rate of 28,252 L/d. As stated above, the trickle feed system will provide a maximum daily flow of 40,500 L/d. A 40,000 L cistern is proposed to account for air space and minimum levels within the tank. The cistern will be equipped with a low level shut off float for the water distribution pump and a high level shut off float valve for the incoming water from the trickle feed system.

2.1.3 Domestic Water Age

The total water age shown above for each building service ranges from approximately 6.15 to 23.6 days. This is based on an assumption that the water is 3 days old when it arrives at the Site and then ages 3 days in the cistern, based on average day demand.

The secondary digester building will be equipped with signs indicating that the water is not potable, due to the higher total water age shown. The remainder of the buildings at the site have a total water age equal to, or less than, 8.04 days. This would be considered acceptable to maintain a minimum chloramine concentration for residual disinfection in the water supply. Additional injection of chloramine could be considered as the trickle feed service flow enters the cistern if the actual age to the site is longer than 3 days.

2.1.4 Fire Suppression

On-Site fire protection storage will be provided in SWM Pond 5A. SWM Pond 5A has a total permanent pool storage volume of 12,670 m^3. The stage storage characteristics for the permanent pool of SWM Pond 5A are shown in Table 4 below:

Table 4: Stage Storage of Permanent Pool for SWM Pond 5A

Height (m)	Area (m^2)	Storage (m^3)
0.00	-	-
0.10	4,455	263
0.20	4,698	721
0.30	4,943	1,203
0.40	5,188	1,709
0.50	5,435	2,240
0.60	5,682	2,796
0.70	5,931	3,376
0.80	6,180	3,982
0.90	6,431	4,612
1.00	6,683	5,268
1.10	6,935	5,949
1.20	7,189	6,655

Height (m)	Area (m^2)	Storage (m^3)
1.30	7,444	7,387
1.40	7,700	8,144
1.50	7,957	8,927
1.60	8,215	9,736
1.70	10,598	10,634
1.80	14,564	11,891
1.85	16,625	12,670

The ice thickness in SWM Pond 5A has been estimated based on Stefan's Equation from the MOECC SWM Planning and Design Manual (2003), Equation 4.1, as follows:

h = α (Df)^0.5

Where,

h = ice thickness in mm

α = coefficient of ice growth = 24 (maximum value for an average lake with snow)

Df = the sum of freezing degree days = 928 (Environment Canada - Ottawa MacDonald-Cartier Int'l Airport (1981 to 2010))

Therefore,

h = 24 * (928)^0.5

h = 731 mm

The storage volume available in SWM Pond 5A, excluding the 0.30 m below the pipe invert to the wet well/standpipe and the 0.731 m for the ice thickness, is 4,879 m^3.

The requirement for sprinkler systems and standpipes in the on-Site buildings was determined by J.L. Richards & Associates Limited. This information is presented in their technical memorandum, dated March 26, 2018, included in Appendix A. The C&D processing facility and the materials recovery facility will require sprinklers at flow rates of 1,500 USgpm, and the organics pre-processing and leachate pre-treatment buildings will require standpipes at flow rates of 1,250 USgpm. As per A.3.2.5.7 of the OBC, these flow rates will need to be maintained for a minimum duration of 30 minutes. This equates to a total required fire storage volume of approximately 624.5 m^3.

The C&D processing facility and the materials recovery facility will be serviced by a direct connection to the building for the sprinkler system. An additional fire hydrant will be provided within 45 m of the Siamese connection for each building.

The organics pre-processing and leachate pre-treatment buildings will be serviced with fire hydrants within 45 m of the Siamese connection at each building.

A pump house is proposed adjacent to SWM Pond 5A to feed the hydrants and sprinkler systems for the C&D processing facility, materials recovery facility, organics pre-processing and leachate pre-treatment buildings. A wet well will be installed with a fire pump system capable of providing 5,500 USgpm at a total head of approximately 110.2 ft (33.58 m; refer to Appendix C). This allows for a residual pressure of 30 psi at the remote hydrants or building connections, which is greater than the minimum required pressure of 20.3 psi (140 kPa). Booster pumps will likely be required in the C&D processing facility and the materials recovery facility to feed the sprinkler systems.

The fire pump will likely require a diesel generator or other means of back-up power to ensure operation during power outages.

The fire distribution piping has been sized based on all four buildings requiring fire flows at the same time. The calculations are included in Appendix C. Tables 5 and 6 provide a summary of the results.

Table 5: Fire Distribution Piping Design Summary

Firemain Section	Flow Rate (USgpm)	Pipe Diameter (m)	Friction Loss (m)	Friction Loss (ft)
F1	1,500	0.250	4.41	14.47
F2	3,000	0.300	2.19	7.19
F3	5,500	0.375	0.72	2.36
F4	1,500	0.250	2.42	7.94
F5	1,250	0.250	1.43	4.69
F6	2,500	0.300	2.80	9.19
F7	1,250	0.150	2.25	7.38

Table 6: Fire Distribution System Pressure

Building	Total Head (m)	Total Head (ft)	Total Pressure (psi)
C&D Processing Facility	33.58	110.17	49.9
Materials Recovery Facility	31.59	103.64	46.9
Leachate Pre-Treatment	30.81	101.08	45.7
Organic Pre-Processing	31.63	103.77	47.0

The maintenance garage and PHC soil storage buildings are both over 600 m^2 in area and will also require on-Site storage for fire protection, as per A.3.2.5.7 of the OBC. A dry hydrant system within 90 m of the entrance to the building is proposed to service the maintenance garage from SWM Pond 5A. It was determined through pre-consultation with Ottawa Fire Services (OFS) that the PHC soil storage building would be serviced from the hydrant located adjacent to the leachate pre-treatment building and no additional measures are required.

The building classification and internal volume are being confirmed for the maintenance garage and PHC soil storage buildings; therefore, the required storage volumes have not been calculated at this time. However, given that there is over 4,000 m^3 remaining in SWM Pond 5A for fire protection, this is not a concern.

2.2 Sanitary Sewage

The proposed development site is not within the City of Ottawa sanitary service area. Due to the number of buildings and spatial separation across the Site, a holding tank approach to storage of wastewater was considered for this Site, instead of a collection/full treatment and disposal option. Each building on the Site requiring sanitary servicing is proposed to be equipped with a septic tank for primary settling and an effluent holding tank. The effluent holding tanks will be pumped on a regular basis by facility operations staff and the sanitary effluent taken by truck to the on-Site leachate pre-treatment facility.

The sewage system proposed for the Site includes primary treatment through the septic tank and additional treatment through the leachate pre-treatment facility. The effluent from the leachate pre-treatment facility will then be hauled to the City of Ottawa Robert O. Pickard Environmental Centre (ROPEC). Therefore, the system does not classify as a Class 4 or Class 5 sewage system under the OBC, as the raw sewage receives treatment on-Site, but the treated effluent is hauled for disposal off-Site. As the combined flow rate for the buildings on-Site is greater than 10,000 L/day, the system does not fall under the jurisdiction of the OBC and an approval under the OBC is not required. Since the leachate facility only provides pre-treatment and does not include a discharge of wastewater or effluent to the environment, it does not require a permit from the MOECC.

The average day demand of the system is calculated as per Table 7 below:

Table 7: Sanitary Sewage Design Flows

CRRRC Proposed Facilities	Sanitary Sewage Design Flows (L/day) [1]	No. 8 hr. shifts	No. Employees per shift	No. Administration Staff [2]	Occasional Users [3]
Material Recovery Facility (MRF)	11,700	2	45	3	-
Construction and Demolition (C&D)	7,950	2	30	3	-
Administration Building	1,950	1	-	6	50
In-Bound Scalehouse [4]	113	1.5	-	1	-
Out-Bound Scalehouse [4]	113	1.5	-	1	-
Secondary Scalehouse [4]	113	1.5	-	1	-
Maintenance Garage [5]	2,188	2.5	7	-	-
Truck Tire Wash Station [6]	-	-	-	-	-
Organics Pre-Processing Facility [7 8]	1,500	1.5	8	-	-
Leachate Pre-Treatment Facility [7 8]	2,438	1.5	13	-	-
Organics Processing Area [9]	-	-	-	-	-
Compost Processing Area [9]	-	-	-	-	-
Secondary Digester [9]	-	-	-	-	-

CRRRC Proposed Facilities	Sanitary Sewage Design Flows (L/day) [1]	No. 8 hr. shifts	No. Employees per shift	No. Administration Staff [2]	Occasional Users [3]
Sludge Dewatering Pad [9]	-	-	-	-	-
Soil Stockpile Area [9]	-	-	-	-	-
PHC Contaminated Soil Treatment Area [9]	-	-	-	-	-

Notes:
Ontario Building Code (Table 8.2.1.3B).

1. OBC: 125 L/day for Factory (excluding process or cleaning waters) with shower – per employee per 8 hour shift.
2. OBC: 75 L/day for Factory (excluding process or cleaning waters) without shower or for Office Building – per employee per 8 hour shift.
3. Per capita demand: 30 L/day.
4. Number of 8-hour shifts for Scalehouses is based on 1 x 12-hour shift for one staff per each scalehouse (3 staff for 3 scalehouses).
5. Number of 8-hour shifts for Maintenance Garage is based on a total of 2 x 10-hour shifts.
6. Most of the water utilized in the Truck Tire Wash Station will be recycled for reuse.
7. Number of 8-hour shifts for the entire Organics/Soil/Leachate Processing Facilities is based on 1 x 12-hour shift.
8. 1 employee per 8-hour shift for the Leachate Pre-Treatment Facility is included in the total 13 employees per shift.
9. Included in the Organics Pre-Processing and Leachate Pre-Treatment Facility calculations.

The septic tanks have been sized to provide three times the OBC daily design flow with an actual use reduction factor of 0.33. This actual use reduction factor is based on flow data from an existing resource recovery facility operated by Miller Waste in York Region. Flow data from that facility is provided in Appendix D. The storage tanks will be sized to provide storage for seven times the OBC daily design flow reduced by an actual use reduction factor of 0.33. The seven day storage volume was selected to simplify Site operations. The tank design is summarized in Table 8 below:

Table 8: Sewage System Tank Sizing

CRRRC Proposed Facilities	Max. Day Sewage Design Flows (L/day)	Average Sewage Design Flows (L/day)	Septic Tank Size (L)	Storage Tank Size (L)
Material Recovery Facility (MRF)	11,700	3,861	11,583	27,027
Construction and Demolition (C&D)	7,950	2,624	7,871	18,365
Administration Building	1,950	644	3,600*	4,505
In-Bound Scalehouse	113	37	3,600*	259
Out-Bound Scalehouse	113	37	3,600*	259
Secondary Scalehouse	113	37	3,600*	259

CRRRC Proposed Facilities	Max. Day Sewage Design Flows (L/day)	Average Sewage Design Flows (L/day)	Septic Tank Size (L)	Storage Tank Size (L)
Maintenance Garage	2,188	722	3,600*	5,054
Truck Tire Wash Station	-	-	-	-
Organics Pre-Processing Facility	1,500	495	3,600*	3,465
Leachate Pre-Treatment Facility	2,438	805	3,600*	5,635
Organics Processing Area**	-	-	-	-
Compost Processing Area**	-	-	-	-
Secondary Digester**	-	-	-	-
Sludge Dewatering Pad**	-	-	-	-
Soil Stockpile Area**	-	-	-	-
PHC Contaminated Soil Treatment Area**	-	-	-	-

*Minimum size of septic tank is 3,600 L as per 8.2.2.3.(1) of the OBC.
** Included in the Organics Pre-Processing and Leachate Pre-Treatment Facility calculations.

2.2.1 Leachate Pre-Treatment Facility

Leachate from the landfill will be pumped to the proposed leachate pre-treatment facility. The facility will use sequencing batch reactor technology for pre-treatment of the leachate before it is hauled to ROPEC for final treatment prior to discharge to the Ottawa River. The Owner and the City are currently negotiating terms for a discharge agreement.

The generation of leachate will increase over time as the approved landfill footprint area increases in stages and then is expected to decrease in about 30 years when the landfill is expected to be at capacity. The pre-treatment system will be constructed in stages to meet actual leachate generation rates. The expected leachate generation rate is expected to be at a maximum of 230,000 m^3/year. In addition, the system capacity will be sized to treat about 10,000 m^3/year of liquor from the on-Site organics processing building and other wash-down water from the processing buildings and about 6,000 m^3/year of sanitary wastewater, as discussed above.

During periods of high inflow from the landfill that exceed the capacity of the facility, excess leachate will be stored outside in a storage pond. This stored leachate will then be pumped back into the facility when capacity is available. The raw leachate pond will have a capacity of about two months of storage based on the maximum yearly generation rate.

Treated effluent will also be stored outside in ponds. Currently three cells are shown with a combined capacity of about 15 days. It is anticipated that there will be quality verification requirements before the effluent is hauled to ROPEC; the three cells will allow the full cell to be sampled and then emptied while the other cells are being filled.

Sludge generated from the treatment process will be dewatered on-Site in Geotubes and the dewatered solids will be disposed of in the landfill.

2.3 Stormwater Management

The proposed Site will be serviced primarily by a ditch network with culverts at road crossings and with some storm sewers provided to collect runoff from the material recovery facility and C&D building roofs and from the compost processing pad. The ditches have been sized to convey water from the 1:100 year return period design storm on the landfill, and the 1:25 year event for the diversion processing area of the Site. Culverts have been sized to convey water from the 1:25 year return period design storm, and the storm sewers have been sized to convey water from the 1:2 year return period design storm. During larger storm events, flows may surcharge to the ground surface and be directed overland to ditches and stormwater management ponds.

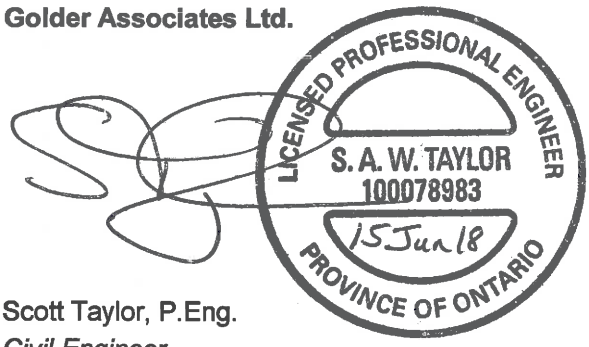
There will be five stormwater management ponds provided at the Site, designed to provide enhanced level water quality control (80% long-term TSS removal) and quantity control to limit post-development peak flows to pre-development levels. As well, stormwater from the composting area will discharge to a separate pond and normally be held for reuse in the curing processes.

The Stormwater Management Report dated June 15, 2015, prepared by Golder provides details of the proposed Stormwater management plan for the Site.

Signature Page

We trust that this report meets your current needs. If you have any questions, or if we may be of further assistance, please contact the undersigned.

Golder Associates Ltd.



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APPENDIX A

J.L. Richards & Associates Limited

Technical Memorandum dated March 26, 2018

TECHNICAL MEMORANDUM

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

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TO: CRRRC Team

DATE: Mar. 26, 2018

JOB NO.: 24230-0.11

FROM: Jason Chahal, P.Eng

RE: Water Distribution- Site Wide

CC: Sarah Gore, JLR

Fire Protection Service:

The flow rates for the fire service utilities will be based on *NFPA 13: Installation of Sprinkler Systems*, *NFPA 14: Installation of Standpipe and Hose Systems*, and the *Ontario Building Code Div. B, Part 3: Fire Protection, Occupant Safety and Accessibility*. Based on the previous JLR code review, of each building, the following systems were determined to be required. The C&D and MRF processing buildings will include a sprinkler system. The Leachate Treatment and Organics Pre-processing buildings will include a standpipe system. According to clause 7.10.1.3.1.1 in NFPA 14, the total water demand is based on the standpipe or the sprinkler system demand in the highest hazard classification, whichever is greater.

Flow Rates (Based on Mar 26, 2018 Layouts):

Building	Occupancy Zone	Hazard Classification[4]	Sprinkler Density[1] (gpm/ft^2)	Sprinkler Flow at 2500 ft² (gpm)	Standpipe Flow [2] (gpm)	Hose Allowance[3] (gpm)	Total Flow (gpm)
C&D Processing	Processing	Extra Hazard (Group 1)	0.4	1000	-	500	1,500
	Administration	Light Hazard	0.1	-	-	-	
MRF Processing	Processing	Extra Hazard (Group 1)	0.4	1000	-	500	1,500
	Administration	Light Hazard	0.1	-	-	-	
Leachate Treatment	All Areas	Extra Hazard (Group 1)	-	-	750	500	1,250
Organics Pre-Processing	All Areas	Extra Hazard (Group 1)	-	-	750	500	1,250

[1] Based on NFPA 13: Figure 11.2.3.1.1, based on a minimum area of 1500 ft² for Ordinary hazard and 2500 ft² for Extra Hazard. These values allow for a worst-case scenario for each hazard case.
[2] Based on NFPA 14: Clause 7.10.1.1.2: Horizontal Standpipe Flow Rates
[3] Based on NFPA 13: Table 11.2.3.1.1: Hose stream allowance.
[4] Based on NFPA 13: Chapter 5: Classification of Occupancies and Commodities. The proposed classifications are based on JLR's current knowledge of each space. Classifications, areas, and sprinkler densities are subject to change as the design develops. NFPA 13 defines Hazard Classifications as:

Light Hazard: quantity and/or combustibility if contents are low and fires with relatively low rates of heat release are expected.

Extra Hazard (Group 1): quantity and combustibility of contents are very high, dust, lint, or other materials are present, introducing the probability of rapidly developing fires with high rates of heat release but with little or no combustible liquids.

Domestic Water Service:

The domestic water service is based on the Ontario Building Code Div. B, Part 7. It is assumed the water pressure will be between 40-60 psi at building entry.

Building	Connection Size
Administration Building	2" Diameter
Scale Houses	3/4" Diameter
Maintenance Garage	2" Diameter
C&D Processing Facility	2" Diameter
Materials Recovery Facility	2" Diameter
Organics Processing Facility	2" Diameter
Leachate Treatment and Sludge Dewatering	2" Diameter
Truck Tire Wash	2" Diameter

Prepared by:

J.L. RICHARDS & ASSOCIATES LIMITED

Jason Chahal, P. Eng.

Reviewed by:

J.L. RICHARDS & ASSOCIATES LIMITED

Steve Parenteau, C.E. T.

APPENDIX B

Site Water Distribution System Calculations

Table 9: Watermain Friction Loss Calculations

Pipe Section	Peak Flow Rate (m^3/h)	Flow Rate (m^3/s)	Pipe Diameter (m)	Hazen Williams Coefficient	Pipe Length (m)	Equivalent Length for Fittings (m)	Total Length (m)	Pipe Area (m^2)	Velocity (m/s)	Friction Loss (m)	Friction Loss (ft)
W1	4.052	0.001126	0.075	150	60.0	25.0	85.0	0.00442	0.25	0.088	0.289
W2	3.849	0.001069	0.075	150	95.4	10.0	105.4	0.00442	0.24	0.099	0.325
W3	3.837	0.001066	0.075	150	102.3	5.0	107.3	0.00442	0.24	0.101	0.331
W4	3.825	0.001063	0.075	150	127.5	5.0	132.5	0.00442	0.24	0.123	0.404
W5	2.997	0.000833	0.075	150	199.8	5.0	204.8	0.00442	0.19	0.122	0.400
W6	1.778	0.000494	0.050	150	168.5	5.0	173.5	0.00196	0.25	0.283	0.928
W7	1.368	0.000380	0.050	150	126.4	5.0	131.4	0.00196	0.19	0.132	0.433
W8	0.410	0.000114	0.050	150	170.2	5.0	175.2	0.00196	0.06	0.019	0.062
W9	0.012	0.000003	0.019	150	247.0	5.0	252.0	0.00028	0.01	0.004	0.013

Table 10: Water Service Total Head Calculations

Building	Pipe Section	Maximum Daily Flow Rate (L/d)	Peaking Factor	Peak Flow Rate (m^3/h)	Flow Rate (m^3/s)	Pipe Diameter (m)	Hazen Williams Coefficient	Pipe Length (m)	Equivalent Length for Fittings (m)	Total Length (m)	Pipe Area (m^2)	Velocity (m/s)	Friction Loss (m)	Elevation Head (m)	Residual Pressure of 40 psi (m)	Total Head (m)	Total Head (ft)	Total Head (psi)
Administration	W10	1,950	2.5	0.203	0.000056	0.050	150	53.0	5.0	58.0	0.00196	0.03	0.002	5.00	26.94	32.03	105.09	47.6
In-Bound Scale	W11	113	2.5	0.012	0.000003	0.019	150	9.7	5.0	14.7	0.00028	0.01	0.000	4.85	26.94	31.98	104.92	47.5
C&D Processing Facility	W12	7,950	2.5	0.828	0.000230	0.050	150	170.2	5.0	175.2	0.00196	0.12	0.069	4.90	26.94	32.32	106.04	48.0
Materials Recovery Facility	W13	11,700	2.5	1.219	0.000339	0.050	150	187.8	5.0	192.8	0.00196	0.17	0.157	4.90	26.94	32.53	106.73	48.3
Maintenance Garage	W14	2,188	2.5	0.228	0.000063	0.050	150	70.0	5.0	75.0	0.00196	0.03	0.003	4.40	26.94	32.29	105.94	47.9
Secondary Digester	W15			1.140	0.000317	0.050	150	281.6	5.0	286.6	0.00196	0.16	0.206	4.50	26.94	32.59	106.92	48.4

Building	Pipe Section	Maximum Daily Flow Rate (L/d)	Peaking Factor	Peak Flow Rate (m^3/h)	Flow Rate (m^3/s)	Pipe Diameter (m)	Hazen Williams Coefficient	Pipe Length (m)	Equivalent Length for Fittings (m)	Total Length (m)	Pipe Area (m^2)	Velocity (m/s)	Friction Loss (m)	Elevation Head (m)	Residual Pressure of 40 psi (m)	Total Head (m)	Total Head (ft)	Total Head (psi)
Organics Pre-Processing	W16	1,500	2.5	0.156	0.000043	0.050	150	24.0	5.0	29.0	0.00196	0.02	0.001	4.90	26.94	32.68	107.22	48.5
Leachate Pre-Treatment	W17	2,438	2.5	0.254	0.000071	0.050	150	185.8	5.0	190.8	0.00196	0.04	0.009	4.50	26.94	32.28	105.91	47.9
Secondary Scale	W18	113	2.5	0.012	0.000003	0.019	150	5.7	5.0	10.7	0.00028	0.01	0	4.65	26.94	31.88	104.59	47.3

Table 11: Watermain Water Age Calculations

Pipe Section	Daily Flow Rate (m^3/d)	Pipe Diameter (m)	Pipe Length (m)	Pipe Area (m^2)	Water Age (d)
W1	9.258	0.075	60.0	0.00442	0.03
W2	8.614	0.075	95.4	0.00442	0.05
W3	8.577	0.075	102.3	0.00442	0.05
W4	8.540	0.075	127.5	0.00442	0.07
W5	5.916	0.075	199.8	0.00442	0.15
W6	2.055	0.050	168.5	0.00196	0.16
W7	0.755	0.050	126.4	0.00196	0.33
W8	1.300	0.050	170.2	0.00196	0.26
W9	0.037	0.019	247.0	0.00028	1.87

Table 12: Water Service Total Age Calculations

Building	Pipe Section	Maximum Daily Flow Rate (L/d)	Average Daily Flow Rate (m^3/d)	Pipe Diameter (m)	Pipe Length (m)	Pipe Area (m^2)	Water Age (d)	Initial Water Age (d)	Time in Storage Tank (d)	Total Age (d)
Administration	W10	1,950	0.644	0.050	53.0	0.00196	0.16	3.00	3.00	6.19
In-Bound Scale	W11	113	0.037	0.019	9.7	0.00028	0.07	3.00	3.00	6.15

Building	Pipe Section	Maximum Daily Flow Rate (L/d)	Average Daily Flow Rate (m^3/d)	Pipe Diameter (m)	Pipe Length (m)	Pipe Area (m^2)	Water Age (d)	Initial Water Age (d)	Time in Storage Tank (d)	Total Age (d)
C&D Processing Facility	W12	7,950	2.624	0.050	170.2	0.00196	0.13	3.00	3.00	6.33
Materials Recovery Facility	W13	11,700	3.861	0.050	187.8	0.00196	0.10	3.00	3.00	6.45
Maintenance Garage	W14	2,188	0.722	0.050	70.0	0.00196	0.19	3.00	3.00	7.03
Secondary Digester	W15	100	0.033	0.050	281.6	0.00196	16.73	3.00	3.00	23.57
Organics Pre-Processing	W16	1,500	0.495	0.050	24.0	0.00196	0.10	3.00	3.00	6.87
Leachate Pre-Treatment	W17	2,438	0.805	0.050	185.8	0.00196	0.45	3.00	3.00	7.22
Secondary Scale	W18	113	0.037	0.019	5.7	0.00028	0.04	3.00	3.00	8.04

APPENDIX C

Site Fire Distribution System Calculations

Table 13: Fire Distribution Friction Loss Calculations

Pipe Section	Flow Rate (USgpm)	Flow Rate (m^3/s)	Pipe Diameter (m)	Hazen Williams Coefficient	Pipe Length (m)	Equivalent Length for Fittings (m)	Total Length (m)	Pipe Area (m^2)	Velocity (m/s)	Friction Loss (m)	Friction Loss (ft)
F1	1,500	0.095	0.250	150	374.0	30.0	404.0	0.049	1.94	4.41	14.47
F2	3,000	0.189	0.300	150	118.0	20.0	138.0	0.071	2.66	2.19	7.19
F3	5,500	0.347	0.375	150	3.0	40.0	43.0	0.110	3.15	0.72	2.36
F4	1,500	0.095	0.250	150	192.0	30.0	222.0	0.049	1.94	2.42	7.94
F5	1,250	0.079	0.250	150	164.0	20.0	184.0	0.049	1.61	1.43	4.69
F6	2,500	0.158	0.300	150	216.0	30.0	246.0	0.071	2.23	2.80	9.19
F7	1,250	0.079	0.150	150	5.0	20.0	25.0	0.018	4.39	2.25	7.38

Table 14: Fire Distribution Pressure Calculations

Building	Elevation Head (m)	Residual Pressure of 30 psi (m)	Total Head (m)	Total Head (ft)	Total Pressure (psi)
C&D Processing Facility	6.05	20.21	33.58	110.17	49.9
Materials Recovery Facility	6.05	20.21	31.59	103.64	46.9
Leachate Pre-Treatment	5.65	20.21	30.81	101.08	45.7
Organic Pre-Processing	5.65	20.21	31.63	103.77	47.0

APPENDIX D

York Region Facility Flow Data

Data from York Region Material Recovery Facility (MRF):

Design Flow [1] (L/day)	7,500

Notes:

1: Design flow per capita based on Ontario Building Code (OBC): 75 L/person/8 hour shift for Administration Staff and 125 L/person/8 hour shift for Facility Staff.

Actual Water Use:

Date	Water Meter Reading	Period (days)	Water Consumption (m^3)	Water Consumption (L/day)
06-Feb-15	7,290	-	-	-
03-Feb-16	8,182	362	892	2,464
03-Feb-17	9,099	366	917	2,505
			Average =	**2,485**

Based on Data from York Region Material Recovery Facility (MRF):

Actual Water Use [1] (L/day)	2,500
Design Flow (L/day)	7,500
Actual Use/Design Flow Ratio (%)	33%

Notes:

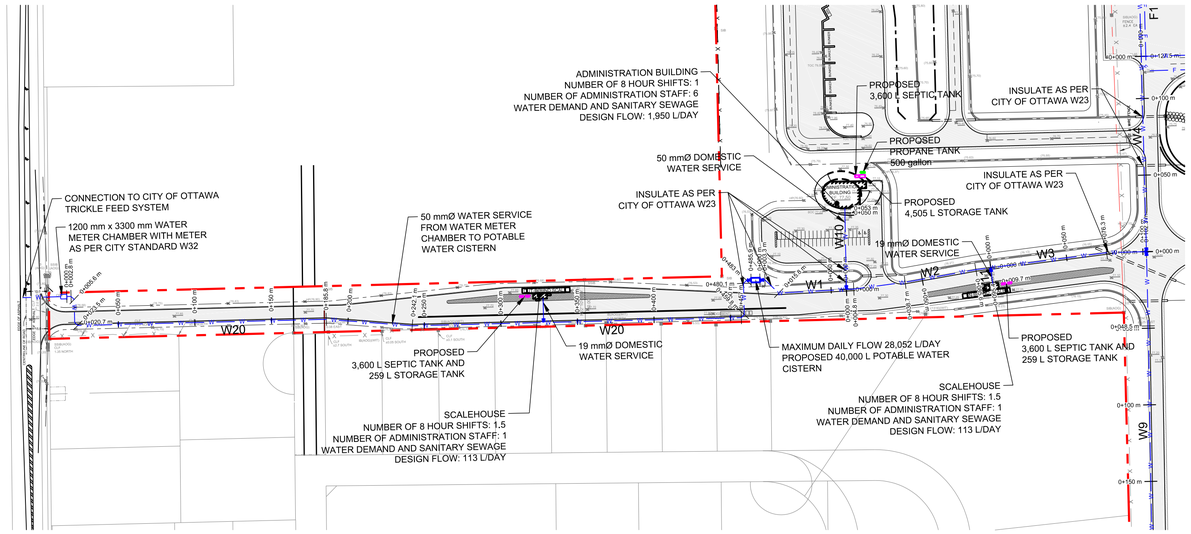
1: Based on average water reading of 2,485 L/day

APPENDIX E

Drawings

Overall Site Servicing Plan, SS1

Overall Site Servicing Plan, SS2



75 mm DIA. HDPE DR17 WATERMAIN FOR W1 TO W5 TABLE

WATERMAIN LINE	STATION	PROPOSED ELEVATION	PROPOSED TOP OF WATERMAIN / SERVICE	DESCRIPTION
W1	0+000	78.20	75.80	N/A
	0+003.3	78.20	75.80	45 DEG. HORZ. BEND
	0+015.8	77.20	74.80	45 DEG. HORZ. BEND
	0+050	77.15	74.75	N/A
	0+060	77.15	74.75	TEE CONNECTION AT W2 AND W10
W2	0+000	77.15	74.75	TEE CONNECTION AT W1 AND W10
	0+004.8	77.14	74.74	MINOR BEND
	0+038.7	77.11	74.71	MINOR BEND
	0+050	77.12	74.72	N/A
	0+085.6	77.14	74.74	MINOR BEND
	0+095.4	77.15	74.75	TEE CONNECTION AT W3 AND W11
W3	0+000	77.15	74.75	TEE CONNECTION AT W2 AND W11
	0+050	76.95	74.55	N/A
	0+076.3	76.90	74.50	MINOR BEND
	0+100	76.84	74.44	N/A
	0+102.3	76.85	74.45	TEE CONNECTION AT W4 AND W9
W4	0+000	76.85	74.45	TEE CONNECTION AT W3 AND W9
	0+050	76.75	74.35	N/A
	0+100	76.67	74.27	MINOE BEND
	0+127.5	76.80	74.40	TEE CONNECTION AT W5 AND W12
W5	0+000	76.80	74.40	TEE CONNECTION AT W4 AND W12
	0+050	76.60	74.20	N/A
	0+100	76.60	74.20	N/A
	0+150	76.60	74.20	N/A
	0+199.8	76.60	74.20	TEE CONNECTION AT W6 AND W13

50 mm DIA. HDPE DR17 WATERMAIN FOR W6 TO W8 TABLE

WATERMAIN LINE	STATION	PROPOSED ELEVATION	PROPOSED TOP OF WATERMAIN / SERVICE	DESCRIPTION
W6	0+000	76.60	74.20	TEE CONNECTION AT W5 AND W13
	0+050	76.60	74.20	N/A
	0+100	76.60	74.20	N/A
	0+150	76.60	74.20	N/A
	0+168.5	76.60	74.20	TEE CONNECTION AT W7 AND W8
W7	0+000	76.60	74.20	TEE CONNECTION AT W6 AND W8
	0+050	76.60	74.20	N/A
	0+100	76.60	74.20	N/A
	0+126.4	76.60	74.20	TEE CONNECTION AT W14 AND W15
W8	0+000	76.60	74.20	TEE CONNECTION AT W6 AND W7
	0+050	76.94	74.54	N/A
	0+083.6	76.50	74.10	45 DEG. HORZ. BEND
	0+091.9	76.50	74.10	45 DEG. HORZ. BEND
	0+100	77.45	75.05	N/A
	0+150	77.10	74.70	N/A
	0+170.2	77.15	74.75	TEE CONNECTION AT W16 AND W17

19 mm DIA. HDPE DR17 WATERMAIN FOR W9 TABLE

WATERMAIN LINE	STATION	PROPOSED ELEVATION	PROPOSED TOP OF WATERMAIN / SERVICE	DESCRIPTION
W9	0+000	76.85	74.45	TEE CONNECTION AT W3 AND W4
	0+048.5	77.10	74.70	MINOR BEND
	0+050	77.10	74.70	N/A
	0+100	76.90	74.50	N/A
	0+150	76.70	74.30	N/A
	0+200	76.50	74.10	N/A
	0+203.2	76.48	74.08	MINOR BEND
	0+204.8	76.48	74.08	MINOR BEND
	0+221.8	76.75	74.35	MINOR BEND
	0+247	76.90	74.50	W18

50 mm DIA. HDPE DR17 WATER SERVICE FOR W10, W12 TO W17 TABLE

WATERMAIN LINE	STATION	PROPOSED ELEVATION	PROPOSED TOP OF WATERMAIN / SERVICE	DESCRIPTION
W10	0+000	78.15	75.75	TEE CONNECTION AT W1 AND W2
	0+050	77.33	74.93	N/A
	0+053	77.48	75.08	CONNECTION AT BUILDING
W12	0+000	76.80	74.40	TEE CONNECTION AT W4 AND W5
	0+050	77.35	74.95	N/A
	0+100	77.35	74.95	N/A
	0+134.1	77.35	74.95	45 DEG. HORZ. BEND
	0+136.9	77.25	74.85	45 DEG. HORZ. BEND
	0+150	77.25	74.85	TEE CONNECTION AT W3 AND W11
	0+170.2	77.27	74.87	CONNECTION AT BUILDING
W13	0+000	76.60	74.20	TEE CONNECTION AT W5 AND W6
	0+050	77.00	74.60	N/A
	0+100	77.30	74.90	N/A
	0+134.1	77.08	74.68	45 DEG. HORZ. BEND
	0+136.9	77.05	74.65	45 DEG. HORZ. BEND
	0+150	77.05	74.65	N/A
	0+187.8	77.05	74.65	CONNECTION AT BUILDING
W14	0+000	76.60	74.20	TEE CONNECTION AT W7 AND W15
	0+050	76.85	74.45	N/A
	0+064.6	76.85	74.45	45 DEG. HORZ. BEND
	0+067.4	76.85	74.45	45 DEG. HORZ. BEND
	0+070	76.90	74.50	CONNECTION AT BUILDING
W15	0+000	76.60	74.20	TEE CONNECTION AT W7 AND W14
	0+050	76.55	74.15	N/A
	0+100	76.45	74.05	N/A
	0+122.7	76.55	74.15	45 DEG. HORZ. BEND
	0+125.5	76.55	74.15	45 DEG. HORZ. BEND
	0+150	76.65	74.25	N/A
	0+200	76.70	74.30	N/A
	0+237.1	76.65	74.25	45 DEG. HORZ. BEND
	0+239.9	76.35	73.95	45 DEG. HORZ. BEND
	0+250	76.50	74.10	N/A
	0+281.6	77.00	74.60	CONNECTION AT BUILDING
W16	0+000	77.15	74.75	TEE CONNECTION AT W8 AND W17
	0+024	77.40	75.00	CONNECTION AT BUILDING
W17	0+000	77.15	74.75	TEE CONNECTION AT W8 AND W16
	0+050	77.15	74.75	N/A
	0+100	77.15	74.75	N/A
	0+150	76.77	74.37	N/A
	0+151.8	73.77	71.37	45 DEG. HORZ. BEND
	0+180.8	76.77	74.37	45 DEG. HORZ. BEND
	0+185.8	76.80	74.40	CONNECTION AT BUILDING
W20	0+000	77.70	75.30	CONNECTION AT WATER METER CHAMBER
	0+002.8	77.70	75.30	45 DEG. HORZ. BEND
	0+005.6	77.70	75.30	45 DEG. HORZ. BEND
	0+020.7	77.70	75.30	45 DEG. HORZ. BEND
	0+023.5	77.70	75.30	45 DEG. HORZ. BEND
	0+050	77.70	75.30	N/A
	0+100	77.75	75.35	N/A
	0+150	77.65	75.25	46 DEG. HORZ. BEND
	0+185.8	77.60	75.20	MINOR BEND
	0+200	77.60	75.20	N/A
	0+242.1	77.60	75.20	MINOR BEND
	0+250	77.60	75.20	N/A
	0+300	77.60	75.20	N/A
	0+350	77.55	75.15	N/A
	0+400	77.45	75.05	N/A
	0+457	77.40	75.00	45 DEG. HORZ. BEND
	0+459.8	77.40	75.00	45 DEG. HORZ. BEND
	0+480.1	78.20	75.80	45 DEG. HORZ. BEND
	0+483	78.20	75.80	45 DEG. HORZ. BEND
	0+485.9	78.20	75.80	CONNECTION AT CISTERN

19 mm DIA. HDPE DR 17 WATER SERVICE FOR W11 AND W18 TABLE

WATERMAIN LINE	STATION	PROPOSED ELEVATION	PROPOSED TOP OF WATERMAIN / SERVICE	DESCRIPTION
W11	0+000	77.15	74.75	TEE CONNECTION AT W2 AND W3
	0+009.7	77.35	74.95	CONNECTION AT BUILDING
W18	0+000	76.90	74.50	W9
	0+005.7	77.15	74.75	CONNECTION AT BUILDING

PIPE REFERENCE TABLE FOR F1 TO F7

F1	374.0 m - 250 mm DIA. HDPE DR17 PIPE
F2	118.0 m - 300 mm DIA. HDPE DR17 PIPE
F3	3.0 m - 375 mm DIA. HDPE DR17 PIPE
F4	192.0 m - 250 mm DIA. HDPE DR17 PIPE
F5	164.0 m - 250 mm DIA. HDPE DR17 PIPE
F6	216.0 m - 300 mm DIA. HDPE DR17 PIPE
F7	5.0 m - 150 mm DIA. HDPE DR17 PIPE

LEGEND

- PROPERTY BOUNDARY
- EXISTING CONTOUR (0.25 m INTERVAL)
- TERRACING (SLOPE AS INDICATED)
- RIP-RAP 200 mmØ, 300 M THICK (NOMINAL) AS PER OPSD 810.010 TYPE 'B
- DITCH
- 600 mmØ CULVERT OR AS NOTED
- EXISTING CULVERT AS NOTED
- PROPOSED FIRE PROTECTION
- PROPOSED WATERMAIN
- PROPOSED WATERMAIN VALVE
- CATCH BASIN (OPSD 705.010 C/W 600 mm SUMP)
- MAINTENANCE HOLE (OPSD 707.020)
- STORM SEWER LOCATION
- PROPOSED SIAMESE CONNECTION
- PROPOSED FIRE HYDRANT
- PROPOSED DRY HYDRANT

WATERMAIN AND FIRE SERVICE

1) CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY STANDARDS AND SPECIFICATIONS AND ONTARIO PROVINCIAL STANDARD DRAWINGS AND SPECIFICATIONS WHERE APPLICABLE. ONTARIO PROVINCIAL STANDARDS SHALL APPLY WHERE NO CITY STANDARDS ARE AVAILABLE. ALL DRAWINGS TO BE CHECKED FOR CONFIRMATION WITH APPLICABLE BUILDING CODES. NO ALTERATION OR GRADING OF SITE IS TO OCCUR PRIOR TO APPROVAL BY CITY.

2) THE CONTRACTOR IS RESPONSIBLE FOR ALL REMOVALS NECESSARY TO SATISFY ENGINEERING AND LANDSCAPE WORKS. CONTRACTOR TO OBTAIN PERMIT FOR CONNECTING TO SEWERS AND CONNECTION TO WATERMAIN. CONTRACTOR TO VISIT SITE PRIOR TO TENDERING AND CONFIRM SITE CONDITIONS. CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED AND BEAR COST OF SAME.

3) LOCATION OF SERVICES ARE NOT ALL SHOWN. LOCATION OF UTILITIES AND UNDERGROUND WORKS THAT ARE SHOWN ARE APPROXIMATE. CONTRACTOR TO VERIFY LOCATION AND ELEVATION OF ALL SERVICES, UTILITIES AND UNDERGROUND STRUCTURES PRIOR TO ANY CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR PROTECTION AND REINSTATEMENT.

4) THE CONTRACTOR SHALL CONSTRUCT WATER SERVICE, CONNECTION, AND APPURTENANCES AS PER THE CITY SPECIFICATIONS AND SHALL COORDINATE AND PAY ALL RELATED COSTS INCLUDING THE COST OF CONNECTION, INSPECTION, DISINFECTION AND WATER METER SUPPLY AND INSTALLATION BY CITY PERSONNEL. SERVICE CONNECTION SHALL BE INSTALLED A MINIMUM 2400 mm FROM ANY CATCH BASIN, MANHOLE OR OBJECT THAT MAY CONTRIBUTE TO FREEZING. THERMAL INSULATION SHALL ONLY BE INSTALLED WHERE SHOWN ON THE DRAWING OR OTHERWISE APPROVED BY THE CITY AS PER THE CITY SPECIFICATIONS W21, W22 AND W23. (WATER METER AND APPURTENANCES AS PER W-30, 31 AND 32)

5) ALL DISTURBED AREAS TO BE REINSTATED TO EQUAL OR BETTER CONDITION. PAVEMENT REINSTATEMENT FOR UTILITY CUTS SHALL BE IN ACCORDANCE WITH R10. ALL NEW WORK SHALL BLEND INTO EXISTING (TO BE APPROVED BY CONSULTANT).

6) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED. DRAWINGS SHOULD NOT BE SCALED BY THE CONTRACTOR. ANY MISSING OR QUESTIONABLE DIMENSIONS ARE TO BE CONFIRMED WITH THE CONSULTANT IN WRITING.

7) SITE WORKS CONTRACTOR IS RESPONSIBLE FOR ALL WORKS, UTILITY AND SERVICE CONNECTIONS TO THE BUILDING. CONNECTIONS TO BE COORDINATED WITH BUILDING CONTRACTOR.

8) THE CONTRACTOR SHOULD ENSURE THAT THESE DRAWINGS ARE SUPPLEMENTED FOR ARCHITECTURAL, AND STRUCTURAL HEATING/AIR CONDITIONING, AND ELECTRICAL, REQUIREMENTS TO SUIT MUNICIPAL, AND PROVINCIAL REQUIREMENTS.

9) SIDE SLOPE OF EXCAVATIONS SHOULD BE SLOPED IN ACCORDANCE WITH THE REQUIREMENTS OF ONT. REG. 213/91 UNDER THE OCCUPATIONAL HEALTH AND SAFETY ACT. REFER TO GEOTECHNICAL REPORT FOR CONSTRUCTION DETAILS.

0 100 200
1:2,000 METRES

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
1	2018-06-15	ISSUED FOR FOR SITE PLAN APPROVAL	SWT	MLF	DVK	DVK

SEAL

CLIENT
TAGGART MILLER ENVIRONMENTAL SERVICES

CONSULTANT
GOLDER

GOLDER ASSOCIATES LTD.
1931 ROBERSON ROAD
OTTAWA, ONTARIO
CANADA
[+1] (613) 592 9600
www.golder.com

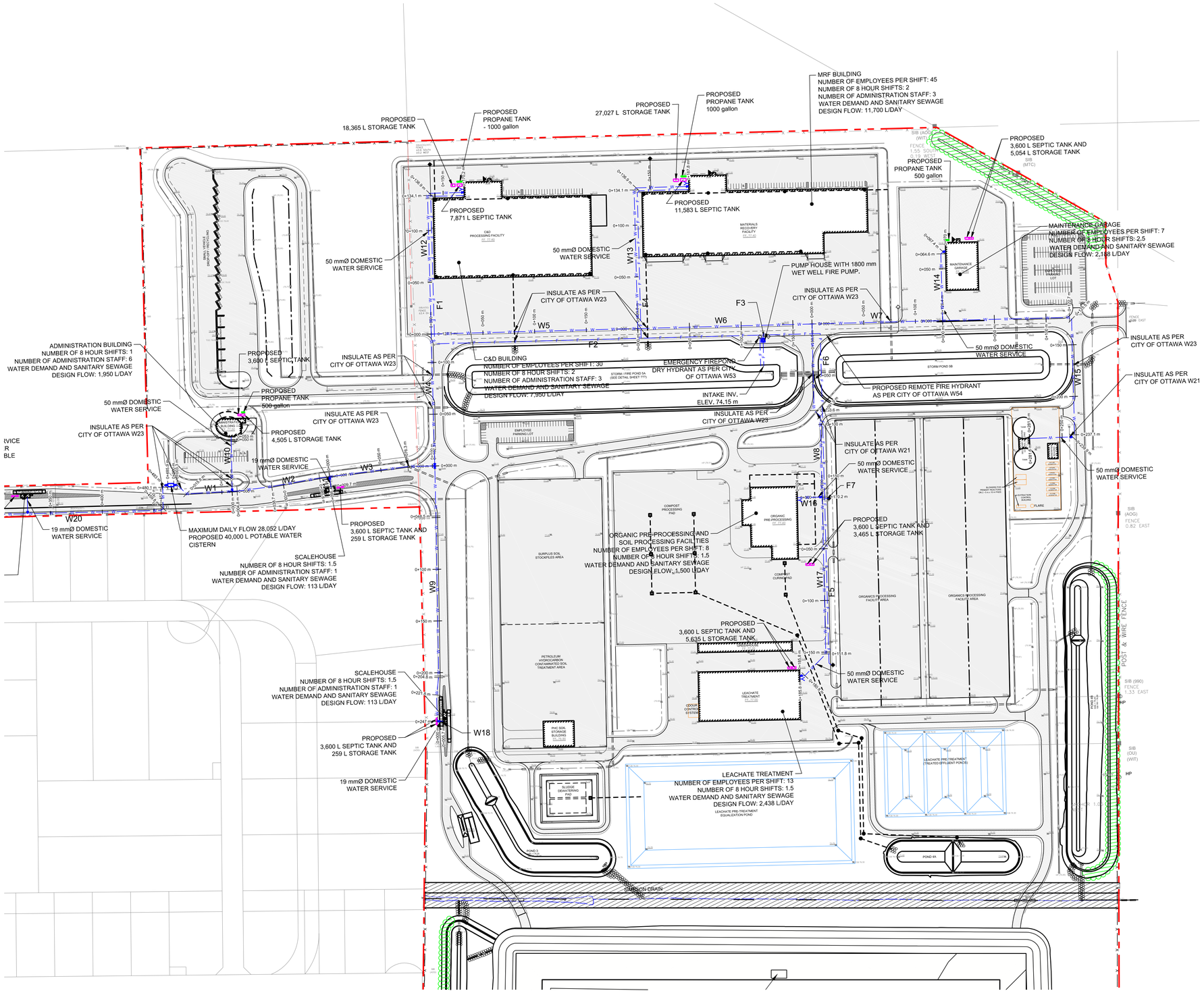
PROJECT
CAPITAL REGION RESOURCE RECOVERY CENTRE

TITLE
OVERALL SITE SERVICING PLAN

PROJECT NO.	CONTROL	REV.	of	DRAWING
1787048	0007	1		SS1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI D

25 mm
0



LEGEND

- PROPERTY BOUNDARY
- EXISTING CONTOUR (0.25 m INTERVAL)
- TERRACING (SLOPE AS INDICATED)
- RIP-RAP 200 mmØ, 300 M THICK (NOMINAL) AS PER OPSD 810.010 TYPE 'B
- DITCH
- 600 mmØ CULVERT OR AS NOTED
- EXISTING CULVERT AS NOTED
- PROPOSED FIRE PROTECTION
- PROPOSED WATERMAIN
- PROPOSED WATERMAIN VALVE
- CATCH BASIN (OPSD 705.010 C/W 600 mm SUMP)
- MAINTENANCE HOLE (OPSD 707.020)
- STORM SEWER LOCATION
- PROPOSED SIAMESE CONNECTION
- PROPOSED FIRE HYDRANT
- PROPOSED DRY HYDRANT

0 100 200
1:2,000 METRES

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
1	2018-06-15	ISSUED FOR FOR SITE PLAN APPROVAL	SWT	MLF	DVK	DVK

SEAL

LICENSED PROFESSIONAL ENGINEER
S. A. W. TAYLOR
100078983
15 Jun 18
PROVINCE OF ONTARIO

CLIENT
TAGGART MILLER ENVIRONMENTAL SERVICES

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PROJECT
CAPITAL REGION RESOURCE RECOVERY CENTRE

TITLE
OVERALL SITE SERVICING PLAN

PROJECT NO.	CONTROL	REV.	of	DRAWING
1787048	0007	1		SS2

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI D

0 25 mm

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