November 15, 2024

Ripple Holdings Inc.
15 Lily Court
Richmond Hill, ON I4C 8X5

Attention: Mr. Sean French

Dear Mr. French,

Re: Servicing Letter
585 Laurelwood Drive
City of Waterloo

Introduction

Meritech Engineering was retained by Ripple Holding Inc. to prepare Site Servicing and Grading Plans and Servicing letter, for the proposed master plan 12-storey each of 4 towers development at 585 Laurelwood Drive (herein referred to as "the Site") in the City of Waterloo.

The purpose of this letter is to support the Site Plan Approval (SPA) application. This will be accomplished by reviewing the opportunities and constraints for the subject property with respect to servicing, grading, and stormwater management, describing the development concept, and demonstrating the functional serviceability of the property. Following approval of the Site Plan application, engineering approval will be sought and final drawings will be submitted to the City in support of future Building Permits.

Site Description

The site area is about 3 hectares, including an undevelopable portion. On the east side of the site, there is a 15m setback from the existing wetland and GRCA Regulation Limit. For more information, refer to the attached Master Site plan.

The site is currently vacant land and is zoned Residential Mixed Use (RMU-40). It is located in the northwest of the City of Waterloo, facing Laurelwood Drive. It is bounded by Laurelwood Drive to the north, GRCA regulated land with OS3 Zone, existing residential to the east, future development land (FD) to the south, and an existing retirement home to the west as shown in Figure 1 below and the site plan attached.

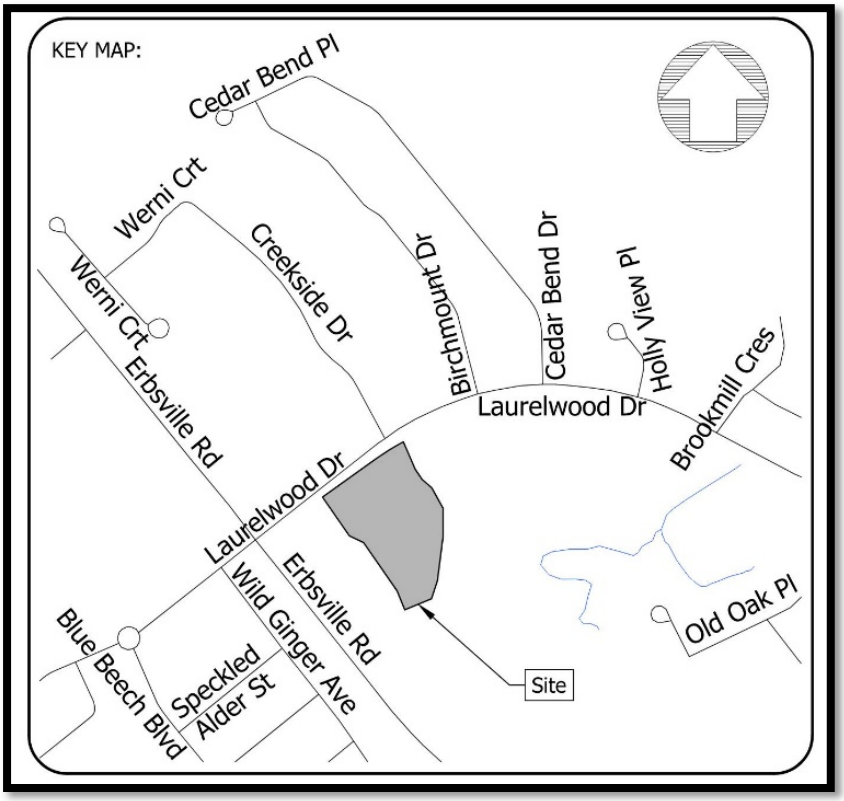


Figure 1: Site Location

Geotechnical Information

Chung & Vander Doelen Engineering Ltd. (CVD) carried out a geotechnical and hydrogeological investigation. The site consists of compacted fill over native clayey silt and sand layers. Borehole results indicate subsurface conditions suitable for the proposed 12-storey buildings with underground parking, supported by conventional footing foundations. Groundwater, encountered between ±6m and ±11m below grade, is manageable through conventional sump pumping. The report emphasizes that additional boreholes in each building footprint are advisable for finalizing foundation design and ensuring soil suitability.

Proposed Development

The proposed development includes four towers of residential buildings of 12-story each with a round-up driveway and two accesses to Laurelwood Drive. A service easement that varies in width from 7 to 10 meters exists along the frontage of the Site for existing storm, sanitary, and utility services from the adjacent retirement residential site to traverse the site directly ends to the open space on the east.

The proposed buildings on the site are planned to be developed in phases, allowing for a structured and efficient construction process. Each phase will be designed to integrate seamlessly with the existing infrastructure, ensuring that utility connections, access, and services are maintained throughout the development stages. This phased approach will also enable flexibility

in construction, allowing for adjustments to be made as needed to accommodate the needs of the project while still meeting all regulatory requirements and timelines. Refer to the attached Phase 1 Site plan.

A condominium ownership is expected for the development, with one common area designated for the road and shared services. The site will feature a single water and sanitary connection serving the entire property, which will be managed as part of the common elements. To meet the separate servicing requirements under the OBC and the Region of Waterloo (DGSSMS), each building within the development will be designed to ensure that all individual connections and services comply with regulatory standards. This approach will facilitate proper utility management and maintenance within the common areas while adhering to the applicable codes and guidelines.

Grading and Drainage

Existing Topography

The Site is currently comprised of an existing vacant land. In the existing condition, surface runoff from the Site drains in a northeasterly fashion toward an existing drainage feature to the north which comprises a temporary sediment basin with a Hickenbottom with riprap and a temporary ditch inlet catch basin (DICB). The elevation difference of about 11 m between the southwest and the existing drainage feature on the north. There is an elevation difference of about 3 m between the northeast and existing drainage features.

Refer to the attached Existing Conditions and Removals Plan for an illustration of the existing servicing.

Proposed Grading

The proposed master plan for the development will include 4 towers, with associated above-ground and underground parking spaces, internal roadways, landscaped areas, and central amenity space. Retaining walls are proposed adjacent to the east and west property lines to help make up the grade difference between the Site and adjacent existing properties. The proposed grading strategy will respect the existing grades along all property lines while maintaining the existing drainage paths to the existing storm servicing stub and the Laurelwood Drive right-of-way. Refer to the separately attached Site Grading Plan for more information on the proposed grading design for the Site.

The site features a varied topography, with the existing land gently sloping from the southwest boundary and the majority of the site toward the northeast, and from the northeast boundary toward the southwest. To accommodate the proposed phased development, significant grading will be required, involving a balanced approach of cut and fill to ensure that the finished grades are suitable for building construction and site functionality. Retaining walls are planned in specific areas along the east and west boundaries to manage the elevation changes and to create level building pads, providing stability and supporting the surrounding infrastructure.

The site currently slopes from both the northeast and southwest toward the existing temporary outlet on the north. The elevation difference on the southwest part of the site ranges from

approximately 370 meters above sea level (masl) along the site's property line and the retirement home, to 359 masl on the north toward the existing temporary drainage feature. The elevation difference on the northeast part of the site ranges from approximately 362 masl along the site's property line and the open space, to 359 masl on the north toward the existing temporary drainage feature.

The general drainage profile of the site is not proposed to be changed for the development. Local grading within the parking lot will convey drainage to the proposed catch basins, while the overland flow is graded to the parking lot south of the proposed building. Grading around the edge of the site has been matched to existing property line grades to ensure overland drainage is not increased to neighbouring properties. The landscaped area along the east boundary drains uncontrolled toward the Wetland.

Proposed Servicing

Water

There are two objectives regarding water servicing: provide domestic water supply as per Provincial, Regional, and City/Township requirements, and ensure that an adequate fire-fighting water supply is available as per the Ontario Building Code and other Regional requirements.

The existing watermain on Laurelwood Drive is a 300 mm diameter PVC main. An existing fire hydrant is located on Laurelwood Drive and approximately 82 m west of the intersection of Creekside Drive and Laurelwood Drive, directly in front of the proposed building A to the site. As this hydrant is out of the 90m coverage for the site and will not provide coverage to the furthest proposed building on the south, an additional private hydrant within the site is required.

The Region of Waterloo has provided pressure information for junction JCT_18731 located at the intersection of Laurelwood Drive and Creekside Drive. It shows that at this location, the main is able to provide a fire flow of 179 L/s. As the buildings will be sprinklered, the water distribution system and proposed internal water system are believed to be able to provide fire protection as per OBC and FUS guidelines. For more information, please refer to the attached water model prepared by the Region of Waterloo.

A 150 mm watermain is proposed to be extended toward the site from the existing 300 mm watermain in the right of way. This is sufficient to provide water servicing for the proposed buildings. The buildings will have fire sprinkler systems with Siamese connection for each building which will be designed by the mechanical engineer. The proposed fire hydrant will be located within 45m from the proposed Siamese connections for each building.

Sanitary

The primary objective with respect to sanitary servicing is that a sanitary sewer system servicing the site can be constructed as per MOE, Region of Waterloo (DGSSMS), and City of Waterloo standards. The development will outlet into existing infrastructure in the neighbouring development, so it will be necessary to demonstrate that the existing sewers have the capacity to support this development.

As shown on the record plan/profile by Preliminary Planning & Engineering Initiative Ltd. drawing number 5-2095, there is an existing 200 mm diameter sanitary sewer along Laurelwood Drive north of the site, with an existing 200 mm diameter sanitary service stub at an invert elevation of 358.54m and is approximately 3.48 m deep available for connection near the northeast corner of the site. The sanitary service is installed at a 0.55% slope, which results in a theoretical capacity of approximately 25.38 L/s.

In a meeting with the City of Waterloo on October 1, 2024, the City confirmed that they will run a model to assess the incremental flow due to the intensification of the site. This will confirm the capacity of the downstream receiving systems of the incremental sewage flows from the proposed site.

As shown on the as-built sanitary drainage plan by Stantec Consulting Ltd. drawing number 6-500A, for the southwest part of the Site with an area of about 0.70 ha, there is an allocation density of 250/2.5 = 100 people per hectare (p/ha). For the northeast part of the site at 585 Laurelwood Drive including the open space area with a total of 2.35 ha, there is an allocation density of 242/2.42 = 100 p/ha. The allocated population for the total site area including the open space is 3.05 ha x 100 p/ha = 305 People, while the allocated population for the developable area from the site is 2.19 ha x 100 p/ha = 219 people. For the sanitary design, the allocation for the total site area which includes the open space will be utilized.

Based on the proposed development, peak flows were determined by applying peaking factors to the average day demand of 275 L/capita/day as specified in the DGSSMS. The site is expected to have a density of 1.77 people per unit (PPU), with 497 total units.

Type of Flow	Density (ppu)	Total Units	Population	Peaked Flow (L/s)
Apartments	1.77	497	880	11.50

Table 1: Sanitary Flows

Table 1 shows that the development generates a peak flow, including infiltration, of 11.50 L/s. This peak flow represents about 20% of the capacity of the existing 200mm diameter sanitary service to be provided in Laurelwood Drive. The City will complete a sanitary flow modelling based on the proposed sanitary flow rate contributing from the development. Refer to the attached sanitary sewer design sheet for information about the proposed sanitary sewer on the site.

Refer to the attached engineering plans for an illustration of the proposed sanitary servicing.

Storm

The primary objective with respect to storm servicing is that a storm sewer system servicing the site can be constructed as per MOE, DGSSMS, and City of Waterloo standards.

As shown on the record plan/profile by Preliminary Planning & Engineering Initiative Ltd. drawing number 5-2095, there is an existing 675 mm storm service with an existing temporary DICB with an invert elevation of 358.69 m and is approximately 3.33 m deep, available for connection near

the northeast corner of the site. The storm service is installed at a 0.57% slope, producing a capacity of approximately 634.63 L/s.

As shown on the as-built storm drainage plan by Stantec Consulting Ltd. drawing number 6-500B, for both the southwest and northeast parts, not including the open space area, there is an AxC (area x runoff coefficient) storm allocation of 2.19 x 0.70 = 1.533. Under the proposed conditions, the calculated weighted runoff coefficient for the site is 0.685, which would result in an AxC of 2.19 x 0.685 = 1.502 which is less than the allocated storm. Therefore, the proposed storm design for the site is less than the allocated storm at the service connection. Refer to the attached storm sewer design sheet for information about the proposed storm sewer on-site.

Overland flow is directed toward the proposed right of way which will outlet to the public right of way through the proposed access driveway for the site.

Refer to the attached engineering plans for an illustration of the proposed storm servicing.

Stormwater Management

The site is tributary to the Cedar Bend Stormwater Management Wet Pond, located at 764 Cedar Bend Drive, which plays an important role in both stormwater quantity and quality control for the surrounding area. The Cedar Bend SWM Pond discharges directly to the Laurel Creek Reservoir, providing both quality and quantity control to manage stormwater effectively.

The calculated AxC of 1.502 for the proposed site at 585 Laurelwood Drive is less than the allocated AxC of 1.533, hence, no stormwater management is required based on the City of Waterloo's guidelines.

Sourcewater Protection

Reference to the MECP Source Water Protection Atlas, the site is classified as a Wellhead Protection Area (WHPA) Q1 and Q2 with low stress. The WHPA-Q1 is an area where activities that take water without returning it to the same source may be a threat. A WHPA-Q1 is delineated when the quantity of groundwater that supplies a municipal well is under stress due to water taking. The site is not anticipated to have an issue as no water taking is proposed.

A WHPA-Q2 is an area where activities that reduce recharge may be a threat to the quantity of groundwater that supplies a municipal well. The site is tributary to the Cedar Bend Stormwater Management Wet Pond, which plays an important role in both stormwater quantity and quality control for the site. No additional measures are anticipated as part of the proposed design for the site.

Erosion and Sediment Control (ESC)

Construction activities can cause erosion of native soils, and deposition of sediment on other properties or in receiving watercourses. To avoid these problems siltation control measures, such as silt ponds, silt fencing and construction staging are utilized.

To minimize sediment migration and prevent erosion on the site during construction activities, a comprehensive ESC plan will be implemented. This plan will include a range of best management practices such as silt fences, sediment traps, erosion control blankets, and stabilized construction entrances to prevent soil displacement and control runoff. These measures are designed to capture sediment on-site, reduce the velocity of stormwater runoff, and prevent sediment-laden water from leaving the construction area.

Silt fences will be placed along the site's perimeter and near sensitive areas to capture sediment from surface runoff. Sediment traps will be installed in low-lying areas to temporarily hold runoff and allow sediment to settle before water is discharged. Erosion control blankets will be used on exposed slopes and disturbed soil areas to stabilize the ground and prevent soil erosion caused by wind and water. Additionally, stabilized construction entrances will be established to reduce the tracking of sediment onto adjacent roads.

Regular inspections of all sediment and erosion control measures will be conducted by the contractor throughout the construction activities. These inspections will occur periodically and after significant rainfall events to ensure that all control measures are functioning effectively and are properly maintained. Any damaged or ineffective controls will be required to promptly be repaired or replaced by the contractor. Detailed records of each inspection will be kept, documenting the condition of the control measures, any deficiencies observed, and the corrective actions taken. This proactive approach will help ensure that the site remains in compliance with municipal and environmental regulations, minimizing the impact on the surrounding environment and water bodies.

Typically, the following measures are recommended during construction for ESC:

- Erosion and sedimentation facilities are to be installed prior to any area grading operations;
- All erosion control measures are to be inspected and monitored by the contractor and repairs are to be completed as required;
- All materials and equipment used for Site preparation and project completion should be operated and stored in a manner that prevents any deleterious substance from leaving the Site;
- Stripping and strategic placement of topsoil stockpiles. Placement of sediment control fencing around all stockpile areas; and,
- Re-vegetation of completed areas as soon as possible after construction.

Utilities

The following utility companies are required to confirm their ability to service the development:

- Local Hydro Authority (Enova Power)
- Bell Canada,
- Rogers Cable,
- Union Gas.

Phasing, Construction & Servicing Considerations

The proposed site is planned to be constructed in multiple phases to ensure minimal disruption and efficient use of resources. Phase 1 will include the construction of Building A. This phase will also include the construction of the proposed services for the master plan, underground parking, and temporary access roads. Future phases will involve the construction of additional buildings including Building B, C, and D, as shown in the master site plan.

During the construction of phase 1, attention will be given to maintaining access to the site for construction vehicles while minimizing the impact on surrounding areas. Tree protection fencing will be installed around existing landscaped areas which will remain in place for the entire duration of the construction.

Grading for the site will be undertaken in accordance with the engineering grading plan design as mentioned in previous sections. The initial phase will involve grading to establish a level foundation for Building A and the surrounding areas, ensuring proper drainage flow away from structures. Cut-and-fill operations will be carefully balanced to minimize the amount of soil imported or exported from the site. As part of the interim grading design for the site, it is proposed to provide a temporary sediment basin with riprap and a Hickenbottom and ditch inlet catch basin (DICB) with a proper erosion and silt control to provide protection for the existing and proposed storm sewers.

The site has been designed to allow for Phase 2 future development without significant disruption to existing infrastructure. Areas designated for future construction will be temporarily graded and seeded to stabilize the soil and prevent erosion until they are needed. The phased approach ensures that the underground services are installed with provisions for easy connection during the construction of the future phase.

Refer to the attached phase 1 engineering plans for an illustration of the proposed grading and servicing.

Conclusions

It is our opinion that adequate services are available and can support the proposed development as described in this letter. Based on the foregoing analysis, it is concluded that:

- The proposed grading design will respect the existing grades along all property boundaries;
- Existing municipal infrastructure to the Site is adequate to service the proposed development; and,
- Stormwater Management is not required since the Site has an overall AxC less than the allocated amount in the existing Cedar Bend Stormwater Management Pond.

The proposed on-site 200mm and 100mm sanitary sewers can convey the Site's peak flows to the existing 200mm diameter sanitary sewer on Laurelwood Drive, which has an adequate theoretical capacity. In a meeting with the City of Waterloo on October 1, 2024, they confirmed that they will confirm the capacity of the downstream receiving system of the incremental sewage flows.

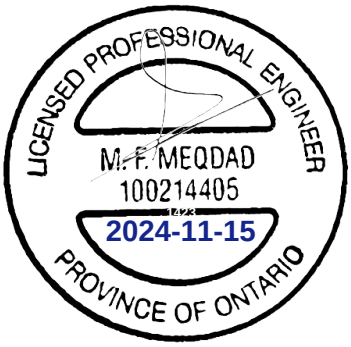
The provision of a 150mm diameter watermain into the site to an internal hydrant provides adequate flow and pressure as per MOE and City of Waterloo guidelines for firefighting supply; the domestic supply to the proposed buildings is via a separate 150mm diameter water service for each proposed building.

Recommendations

- Sanitary connections shall be provided to each building and connected to the proposed internal sanitary sewer which will connect to the existing sewer.
- The detailed water distribution design shall account for fire demand and sprinklers where appropriate.
- Storm connections shall be provided to each building and connect to the internal storm sewer discharging into the SWM facility, which then discharges to the existing sewer on Laurelwood Drive.
- Buildings shall have sump pumps to discharge runoff from the underground parking to the sanitary sewer.
- Buildings shall connect roof drains to the internal storm sewer system.
- Approval agencies shall review and approve this document as a suitable approach to a preliminary design configuration and re-zoning approval.

Yours very truly,

MERITECH ENGINEERING



Mohammad Meqdad, P.Eng., M.Eng., PMP
Sr. Project Engineer

MM/mf

Enclosures: Attachment 1 – Master Site Plan dated Nov 2024
Attachment 2 – Phase 1 Site Plan dated Nov 2024
Attachment 3 – Design drawings prepared by Meritech Engineering dated Nov 2024
Attachment 4 – Storm sewer design sheet prepared by Meritech Engineering dated Nov 2024
Attachment 5 – Sanitary sewer design sheet prepared by Meritech Engineering dated Nov 2024
Attachment 6 – Water model prepared by the Region of Waterloo dated Oct 2024

ATTACHMENT 1

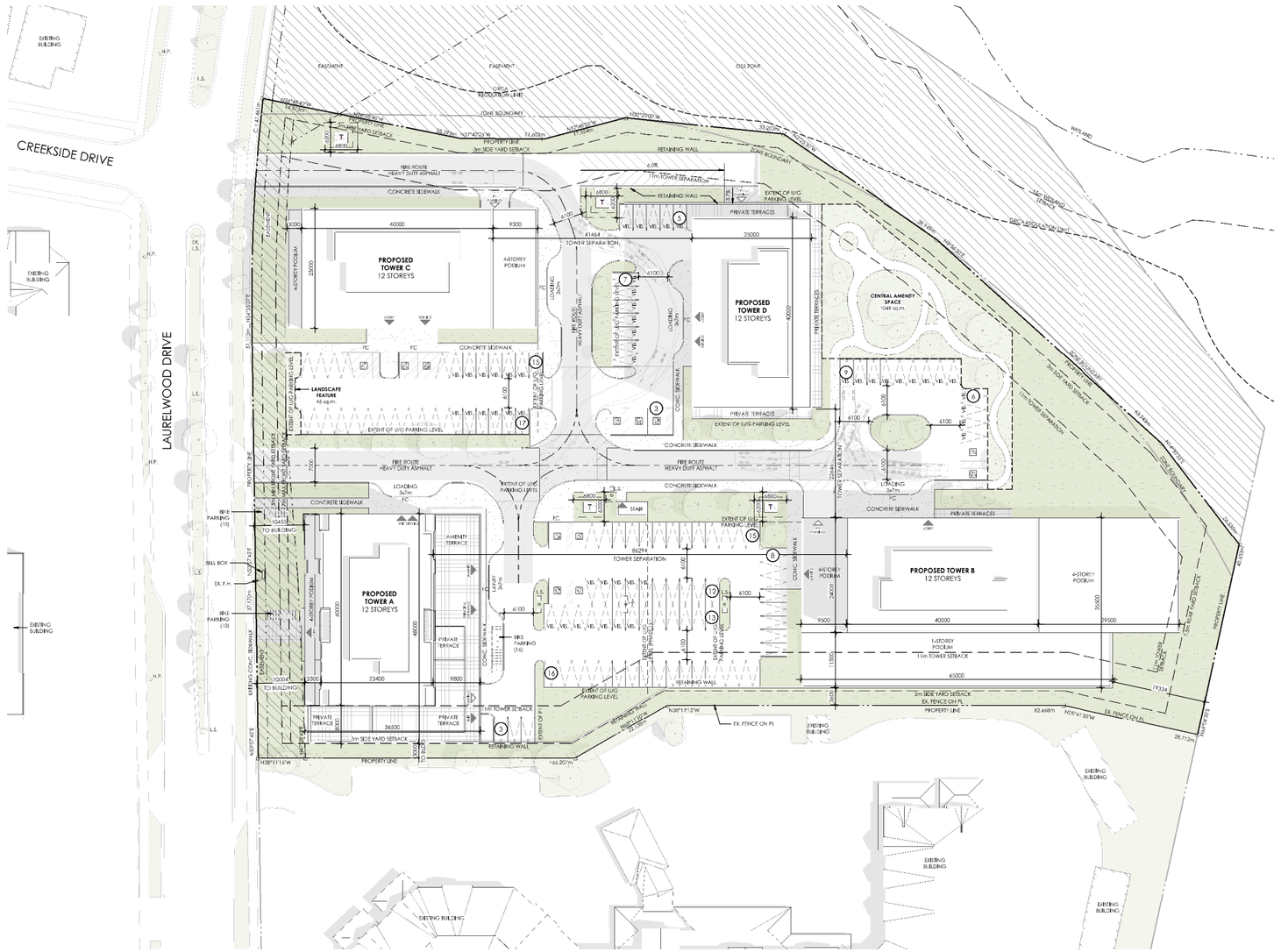
SITE PLAN LEGEND

- EXISTING HYDRO POLE
- EXISTING HYDRO POLE ANCHOR
- EXISTING SIGN
- EXISTING BELL BOX
- EXISTING STANDARD IRON BAR
- CATCH BASIN
- MANHOLE
- FIRE DEPARTMENT CONNECTION
- FIRE HYDRANT
- ENTRANCE/EXIT
- VEHICLE ENTRANCE/EXIT
- BARRIER FREE PARKING SPACE
- FLUSH CURBING (FC)
- CONCRETE CURB
- PROPERTY LINE
- PROPOSED FIRE ROUTE
- PROPOSED FENCE
- LANDSCAPED AREA
- CONCRETE AREA
- ACCESSIBLE PARKING SIGN RB-93 (30x45) cm SUPPORT: STEEL
- FIRE ROUTE SIGN S-5 (30x45) cm SUPPORT: STEEL
- VISITOR PARKING SIGN 30x45) cm SUPPORT: STEEL
- NO LEFT TURN SIGN RB-12 (60x60) cm SUPPORT: STEEL
- FIRE ROUTE SIGN S-5 (30x45) cm SUPPORT: STEEL
- BIKE RACK (##)
- TRANSFORMER c/w CONCRETE PAD AND GROUNDING RODS
- PARKING COUNT BUBBLE
- PROPOSED LIGHT FIXTURES (REFER TO SITE ELECTRICAL PLAN)
- PROPOSED ELECTRICAL VEHICLE PARKING (EV)
- PROPOSED CURB RAMP c/w TACTILE WARNING STRIP INDICATOR (TWSI)
- TACTILE WARNING STRIP INDICATOR (TWSI)

SITE PLAN NOTES

1. LEGAL DESCRIPTION: BLOCKS 1 AND 2, REGISTERED PLAN 58M-318
2. SITE INFORMATION TAKEN FROM BSR&D LTD.
3. FOR SITE GRADING, SERVICES & STORM WATER MANAGEMENT REFER TO DRAWINGS PREPARED BY MERITECH ENGINEERING
4. FOR LANDSCAPE WORK REFER TO DRAWINGS PREPARED BY MHBC
5. FOR SITE LIGHTING REFER TO DRAWINGS PREPARED BY MIGHTON ENGINEERING
6. ALL ROADS & ISLANDS SHALL HAVE 150mm CURBS UNLESS NOTED OTHERWISE.
7. CURB RADIUS = 1.20m UNLESS NOTED OTHERWISE DIMENSIONED.
8. STANDARD PARKING STALLS TO BE 2.8m x 5.5m, AND 3.0m x 5.5m WHEN ONE SIDE ABUTS A WALL OR COLUMN, AND 3.2m x 5.5m WHEN BOTH SIDES ABUT A WALL OR COLUMN. BARRIER FREE PARKING STALLS TO MEET CITY OF WATERLOO REQUIREMENTS FOR TYPE 'A' (3.7m x 5.5m) AND TYPE 'B', (2.4m x 5.5m) INCLUDING ALL APPLICABLE ACCESS AISLES (1.5m WIDE).
9. ALL OUTDOOR LIGHTING MUST BE FULL CUT-OFF AND HAVE NO GLARE.
10. TREE PROTECTION FENCING SHOULD BE ERECTED AROUND ALL EXISTING LANDSCAPED AREAS AND SHOULD REMAIN ON SITE FOR THE DURATION OF THE CONSTRUCTION.
11. ALL ROOF-TOP EQUIPMENT TO BE SCREENED AND/OR LOCATED SO THAT IT CANNOT BE VIEWED FROM THE STREET.
12. SIGNAGE (BUILDING, PYLON & OTHERWISE) NOT APPROVED VIA THE SITE PLAN APPROVAL PROCESS.
13. THERE WILL BE NO OUTDOOR STORAGE OF ANY ITEMS ON SITE.
14. LIGHT FIXTURES & BOLLARDS ARE NOT TO OBSTRUCT PEDESTRIAN MOVEMENT.
15. ANY MULTIPLE UNIT IDENTIFICATION SIGNAGE TO HAVE REFLECTIVE LETTERING.
16. EXCESS SNOW TO BE REMOVED FROM SITE.
17. LIGHTING IN PARKING GARAGE TO BE RECESSED AND MUST NOT SPILL OUT, SHOULD NOT "GLARE" OVER TO STREET OR PROPERTIES NOR SHOULD THE LIGHTING BE VISIBLE FROM THE STREET.
18. ALL STRUCTURED PARKING SPACES ARE "DESIGNATED ELECTRIC VEHICLE PARKING SPACE" PER SECTION 6.3.1.1 OF THE ZONING BY-LAW

PROJECT NORTH



1 / SPA 1.0 MASTER SITE PLAN (AERIAL)

1 : 500

SITE DATA - LAURELWOOD DRIVE, WATERLOO					ZBL 2018-050: RMU-40
DENSITY	**Minimum**		**Maximum**		**Provided**
Beds / hectare	150 bph		600 bph		331.5
AREAS	**Metric**		**Imperial**		%
Site Area	2.19 ha		5.4 acre		
	21,898.2 sq m		**235,710.5** sq ft		**100%**
Building Footprint at grade	6,711.9 sq m		72,245.0 sq ft		31%
Asphalt Area	6,096.5 sq m		65,599.5 sq ft		28%
Concrete Curbs, retaining walls etc	896.1 sq m		8,709.6 sq ft		4%
Concrete Sidewalks	1,570.0 sq m		16,896.6 sq ft		7%
Total Impervious Area	**15,166.5** sq m		**163,213.7** sq ft		**69%**
Landscaped/Sodded Area	6,731.6 sq m		72,496.7 sq ft		31%
Total Permeable Area	**6,731.6** sq m		**72,496.7** sq ft		**31%**
SETBACKS	**Podium Building Face: Minimum**	**Maximum**	**Provided**		**Tower Building Face: Required**	**Provided**
Building A					
Front Yard Setback	4.0m	7.0m	10.0m		-	-
Rear Yard Setback	7.5m	0.0m	145.8m		-	-
Internal Side Yard Setback	3.0m	0.0m	3.0m		11m	11m
FRONTAGE	**Min Required**		**Provided**			
Lot Frontage	20.0 m		137.10 m			
LANDSCAPING	**Min Required**		**Provided**			
Landscaped Open Space (30 % of Site Area, excludes rooftop amenity Area)	6,569.5 sq m		8,310.97 sq m		38%	

BUILDING DATA						
BUILDING HEIGHT	*Height (m)*	*# of Floors*	**Metric**		**Imperial**	
Total Building Height - Building A (Max. 40m or 12 storeys)		12	**40.0** m		**131.0** ft	
Total Building Height - Building B (Max. 40m or 12 storeys)		12	**40.0** m		**131.0** ft	
Total Building Height - Building C (Max. 40m or 12 storeys)		12	**40.0** m		**131.0** ft	
Total Building Height - Building D (Max. 40m or 12 storeys)		12	**39.7** m		**130.0** ft	
RESIDENTIAL						
UNITS		*# of Floors*	**1 Bed**	**2 Bed**	**3 Bed**	**Units**	**Beds**
Building A							
Level 1 (Ground Floor)		1	3	1	2	6	11
Levels 2-4 (Podium)		3	6	2	2	10	16
Levels 5-12 (Tower)		8	6	4	0	10	14
Building A Total		12	**15**	**7**	**4**	**116**	**171**
Unit Mix			59%	34%	7%	100%	
Building B							
Level 1 (Ground Floor)		1	4	2		6	8
Levels 2-4 (Podium)		3	12	8		20	28
Level 5 (Terrace)		1	2	5		7	12
Levels 5-12 (Tower)		7	5	4		10	14
Building B Total		12	**84**	**59**	**0**	**143**	**202**
Unit Mix			59%	41%	0%	100%	
Building C							
Level 1 (Ground Floor/Joint Podium)		1	5	3	2	9	15
Levels 2-4 (Podium)		3	6	4	2	12	20
Level 5 (Terrace)		1	4	3	3	10	19
Levels 5-12 (Tower)		7	5	4		10	14
Building C Total		12	**67**	**46**	**11**	**124**	**192**
Unit Mix			54%	37%	9%	100%	
Building D							
Level 1 (Ground Floor)		1	1	3		4	7
Levels 2-12 (Tower)		11	6	4		10	14
Building D Total		12	**67**	**47**	**0**	**114**	**161**
Unit Mix			59%	41%	0%	100%	
Overall Total			**287**	**191**	**19**	**497**	**726**
Overall Unit Mix			58%	38%	4%	100%	
AMENITY			**Metric**			**Imperial**	
REQUIRED							
Building A (3 sq. m for 1st Bedroom and 2 sq. m for each additional Bedroom)			458 sq m			4,929.9 sq ft	
Building B (3 sq. m for 1st Bedroom and 2 sq. m for each additional bedroom)			547 sq m			5,887.9 sq ft	
Building C (3 sq. m for 1st Bedroom and 2 sq. m for each additional bedroom)			508 sq m			5,468.1 sq ft	
Building D (3 sq. m for 1st Bedroom and 2 sq. m for each additional bedroom)			436 sq m			4,693.1 sq ft	

Parking Data						Spaces
VEHICLES						
REQUIRED (Zoning/By-law Parking Requirements)						
Building A						
Residential Parking Required (1.0 space / Dwelling unit)						116
Visitor Parking Required (0.20 space / Dwelling unit)						12
Total Parking Required- Building A						**128**
Building B						
Residential Parking Required (1.0 space / unit)						143
Visitor Parking Required (0.20 space / Dwelling unit)						15
Total Parking Required- Building B						**158**
Building C						
Residential Parking Required (1.0 space / unit)						114
Visitor Parking Required (0.20 space / Dwelling unit)						12
Total Parking Required - Building C						**126**
Building D						
Residential Parking Required (1.0 space / unit)						114
Visitor Parking Required (0.20 space / Dwelling unit)						12
Total Parking Required - Building D						**126**
Total Parking Required (Overall)						**537**
PROVIDED	*# of Floors*	**Type A**	**Type B**	**Standard**	**Visitor**	**Total:**
Building A						
P1 (Underground)	1	1	1	79		81
Level 0 (A) (Lobby Entrance)	1			20		20
Surface Parking		2	2	5	12	67
Total Parking Provided		**3**	**3**	**104**	**12**	**168**
Building B						
P1 (Underground)	1			75	2	77
Level 1 (A) (Lobby Entrance)	1			44		44
Surface Parking		1	1	0	13	15
Total Parking Provided		**1**	**1**	**118**	**15**	**135**
Building C						
P2 (Underground)	1			44		44
P1 (Underground)	1			48		48
Surface Parking		2	1	17	12	32
Level 1 (Ground Floor)						0
Total Parking Provided		**2**	**1**	**113**	**12**	**128**
Building D						
P2 (Underground)	1			42		42
P1 (Underground)	1			42		42
Surface Parking		2	1		12	15
Total Parking Provided		**2**	**1**	**84**	**12**	**99**
Provided Parking Includes:						
Visitor Parking						0
Participation Requirement (Electric Vehicle Ready Parking Spaces "150% Structured Parking)						0
Total Parking Provided (Overall)						**530**
BICYCLES						
REQUIRED		**Type A**	**Type B**			**Total**
Building A (Type A: 0.3 / Dwelling Unit + Type B: 0.3/ Dwelling unit)		35	35			**70**
Building B (Type A: 0.3 / Dwelling Unit + Type B: 0.3/ Dwelling unit)		43	43			**86**
Building C (Type A: 0.3 / Dwelling Unit + Type B: 0.3/ Dwelling unit)		38	38			**76**
Building D (Type A: 0.3 / Dwelling Unit + Type B: 0.3/ Dwelling unit)		35	35			**70**

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THE CONTRACTOR MUST VERIFY ALL DIMENSIONS ON SITE AND REPORT ANY DISCREPANCIES TO THE ARCHITECT, BEFORE PROCEEDING WITH THE WORK.

DRAWINGS ARE NOT TO BE SCALED.

NO.	REVISIONS	DATE

SITE PLAN PRE-CON APPLICATION	2024.02.16
CHRONOLOGY	DATE

aba architects inc.
101 Frederick Street, Unit 8, Kitchener, ON, N2H 6R4 (519) 744-4135 | www.abaarchitects.ca

CLIENT
RIPPLE HOLDINGS INC.

PROJECT NAME
LAURELWOOD DEVELOPMENT
585 Laurelwood Dr, Waterloo, ON

DRAWING TITLE
MASTER SITE PLAN

SCALE 1:500
SHEET SIZE 24X36
PROJECT NUMBER 2023-118
DRAWING NUMBER SPA 1.0

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ATTACHMENT 2

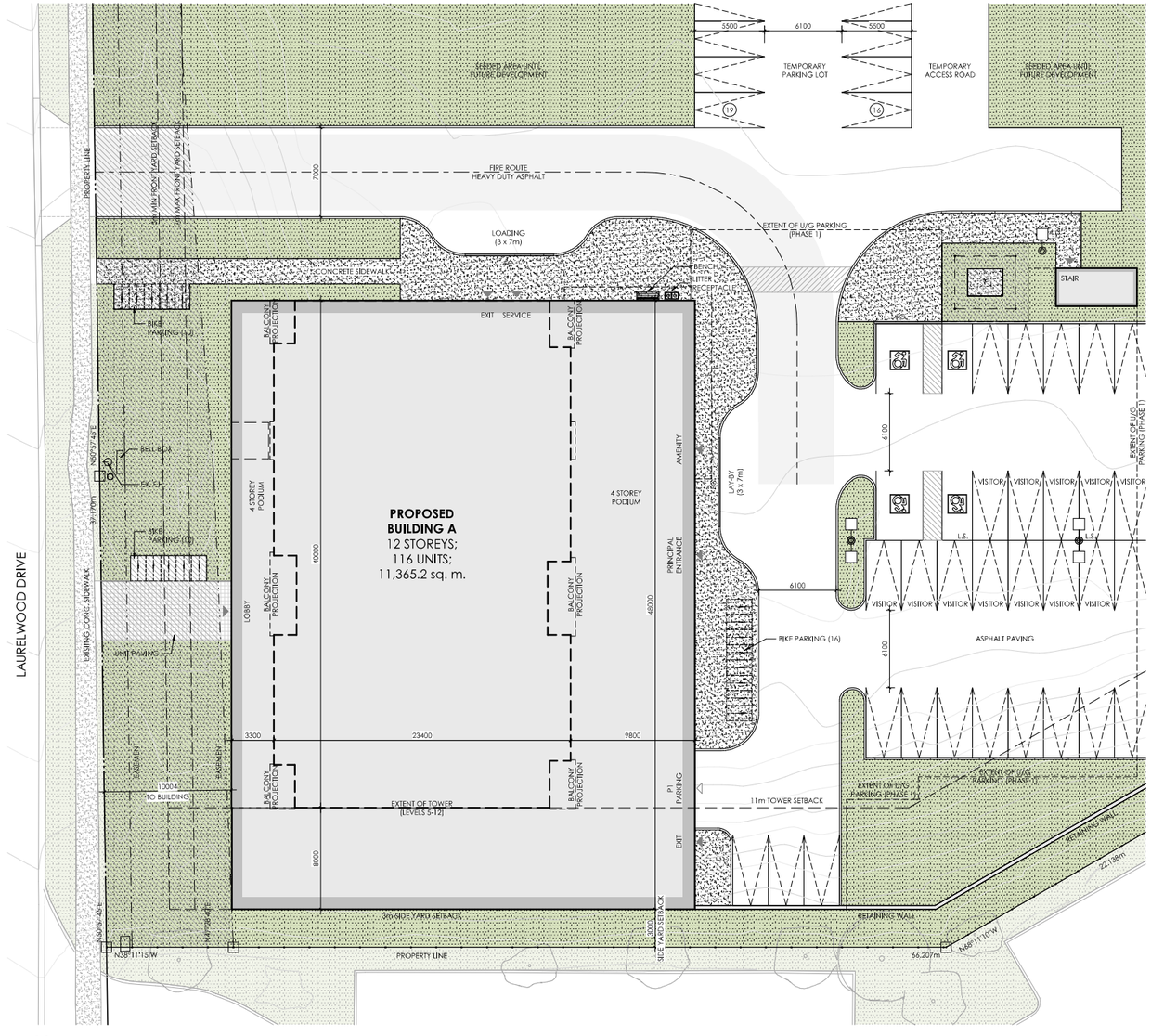
SITE PLAN LEGEND

- EXISTING HYDRO POLE
- EXISTING HYDRO POLE ANCHOR
- EXISTING SIGN
- EXISTING BELL BOX
- EXISTING STANDARD IRON BAR
- CATCH BASIN
- MANHOLE
- FIRE DEPARTMENT CONNECTION
- FIRE HYDRANT
- ENTRANCE/EXIT
- VEHICLE ENTRANCE/EXIT
- BARRIER FREE PARKING SPACE
- FLUSH CURBING (FC)
- CONCRETE CURB
- PROPERTY LINE
- PROPOSED FENCE
- LANDSCAPED AREA
- CONCRETE AREA
- ACCESSIBLE PARKING SIGN RB-93 (30x45) cm SUPPORT: STEEL
- FIRE ROUTE SIGN S-5 (30x45) cm SUPPORT: STEEL
- VISITOR PARKING SIGN 30x45) cm SUPPORT: STEEL
- NO LEFT TURN SIGN RB-12 (60x60) cm SUPPORT: STEEL
- FIRE ROUTE SIGN S-5 (30x45) cm SUPPORT: STEEL
- PEDESTAL BIKE RING (##)
- BIKE RING (##)
- VERTICAL BIKE RACK (##)
- TRANSFORMER c/w CONCRETE PAD AND GROUNDING RODS
- PARKING COUNT BUBBLE
- PROPOSED LIGHT FIXTURES (REFER TO SITE ELECTRICAL PLAN)
- PROPOSED ELECTRICAL VEHICLE PARKING (EV)
- PROPOSED CURB RAMP c/w TACTILE WARNING STRIP INDICATOR (TWSI)
- TACTILE WARNING STRIP INDICATOR (TWSI)

SITE PLAN NOTES

1. LEGAL DESCRIPTION: BLOCKS 1 AND 2, REGISTERED PLAN 58M-318
2. SITE INFORMATION TAKEN FROM BSR&D LTD.
3. FOR SITE GRADING, SERVICES & STORM WATER MANAGEMENT REFER TO DRAWINGS PREPARED BY MERITECH ENGINEERING
4. FOR LANDSCAPE WORK REFER TO DRAWINGS PREPARED BY MHBC
5. FOR SITE LIGHTING REFER TO DRAWINGS PREPARED BY MIGHTON ENGINEERING
6. ALL ROADS & ISLANDS SHALL HAVE 150mm CURBS UNLESS NOTED OTHERWISE.
7. CURB RADIUS = 1.20m UNLESS OTHERWISE DIMENSIONED.
8. STANDARD PARKING STALLS TO BE 2.8m x 5.5m, AND 3.0m x 5.5m WHEN ONE SIDE ABUTS A WALL OR COLUMN, AND 3.2m x 5.5m WHEN BOTH SIDES ABUT A WALL OR COLUMN. BARRIER FREE PARKING STALLS TO MEET CITY OF WATERLOO REQUIREMENTS FOR TYPE 'A' (3.7m x 5.5m), AND TYPE 'B', (2.4m x 5.5m) INCLUDING ALL APPLICABLE ACCESS AISLES (1.5m WIDE).
9. ALL OUTDOOR LIGHTING MUST BE FULL CUT-OFF AND HAVE NO GLARE.
10. TREE PROTECTION FENCING SHOULD BE ERECTED AROUND ALL EXISTING LANDSCAPED AREAS AND SHOULD REMAIN ON SITE FOR THE DURATION OF THE CONSTRUCTION.
11. ALL ROOF-TOP EQUIPMENT TO BE SCREENED AND/OR LOCATED SO THAT IT CANNOT BE VIEWED FROM THE STREET.
12. SIGNAGE (BUILDING, PYLON & OTHERWISE) NOT APPROVED VIA THE SITE PLAN APPROVAL PROCESS.
13. THERE WILL BE NO OUTDOOR STORAGE OF ANY ITEMS ON SITE.
14. LIGHT FIXTURES & BOLLARDS ARE NOT TO OBSTRUCT PEDESTRIAN MOVEMENT.
15. ANY MULTIPLE UNIT IDENTIFICATION SIGNAGE TO HAVE REFLECTIVE LETTERING.
16. EXCESS SNOW TO BE REMOVED FROM SITE.
17. LIGHTING IN PARKING GARAGE TO BE RECESSED AND MUST NOT SPILL OUT, SHOULD NOT "GLARE" OVER TO STREET OR PROPERTIES NOR SHOULD THE LIGHTING BE VISIBLE FROM THE STREET.
18. ALL STRUCTURED PARKING SPACES ARE "DESIGNATED ELECTRIC VEHICLE PARKING SPACE" PER SECTION 6.3.1.1 OF THE ZONING BY-LAW

PROJECT NORTH

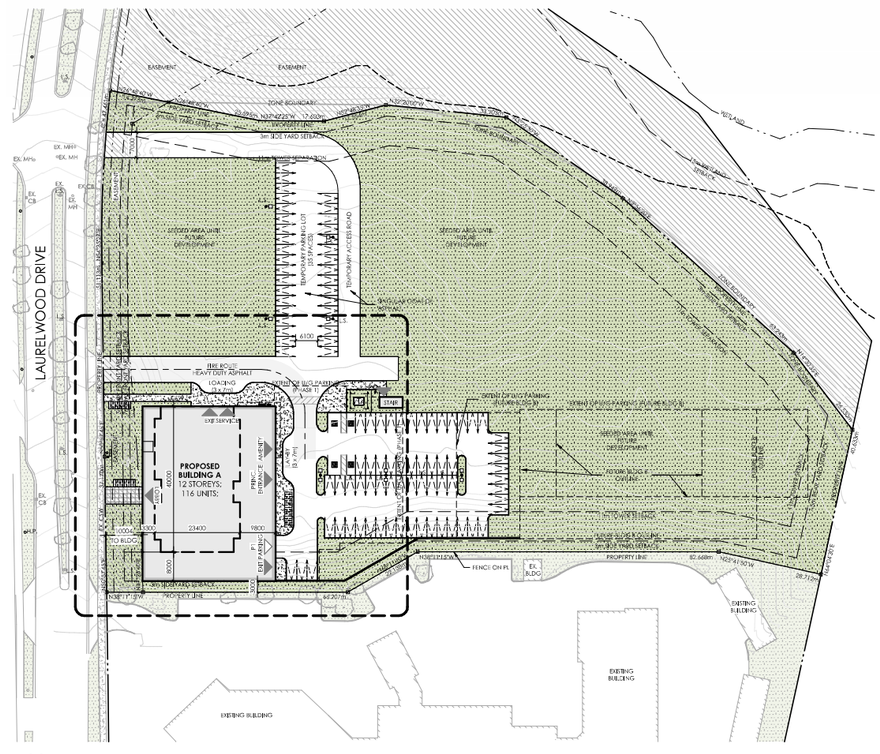


1 SPA 1.1 SITE PLAN - PHASE 1 (ENLARGED) 1 : 200

SITE DATA - LAURELWOOD DRIVE, WATERLOO							ZBL 2018-050: RMU-40
DENSITY		Minimum		Maximum			Provided
Beds / hectare		150 bph		600 bph			78.09
AREAS		Metric		Imperial			%
Site Area		2.19 ha		5.4 acre			-
		21,898.2 sq m		235,710.3 sq ft			100%
SETBACKS		Podium Building Face			Tower Building Face		
		Min Req'd	Max Req'd	Provided	Req'd	Provided	
Building A							
Front Yard Setback		5.0m	7.0m	10.0m	-	-	
Rear Yard Setback		7.5m	0.0m	141.6m	-	-	
Internal Side Yard Setback		3.0m	0.0m	3.0m	11m	11m	
BUILDING DATA							
BUILDING AREAS							
Building A	Area (sq.m.)	# of Floors	Metric			Imperial	
Below Grade							
P1 (Underground)	3287.5	1	3,287.5 sq m			35,387.9 sq ft	
Level 0 (Partially Below Grade)	1728.0	1	1,728.0 sq m			18,600.0 sq ft	
Gross Floor Area (Below Grade)			5,015.5 sq m			53,988.0 sq ft	
Above Grade							
Level 1 (Ground Floor/Street Level)	1035.8	1	1,035.8 sq m			11,149.3 sq ft	
Levels 2-4 (Podium)	930.2	3	2,985.6 sq m			32,136.7 sq ft	
Levels 5-12 (Tower)	879.1	8	7,032.8 sq m			75,700.5 sq ft	
Mechanical Penthouse	311.0		311.0 sq m			3,347.6 sq ft	
Gross Floor Area (Above Grade)		12	11,365.2 sq m			122,334.0 sq ft	
Total Gross Floor Area			16,380.7 sq m			176,320.9 sq ft	
BUILDING HEIGHT	Height (m)	# of Floors	Metric			Imperial	
Building A							
Average Grade Calculation		-	0.0 m			- ft	
Level 1 (Ground Floor/Street Level) (Min. height = 4m)	4	1	4.0 m			13.0 ft	
Levels 2-3 (Podium)	3.2	2	6.4 m			20.2 ft	
Level 4 (Podium) (Min. podium height = 10.5m; Max = 14.8m or 4 ST)	3.6	1	3.6 m			11.0 ft	
Levels 5-11 (Tower)	3.2	7	22.4 m			73.0 ft	
Level 12 (Penthouse)	3.6	1	3.6 m			11.0 ft	
Total Building Height - Building A (Max. 40m or 12 storeys)		12	40.0 m			131.0 ft	
Parapet (not included in Building Height Calculation since <1.2m)			1.2 m			3.0 ft	
Mechanical Penthouse (not included in Building Height Calculation if <8.0)			4.0 m			13.0 ft	
RESIDENTIAL							
UNITS	# of Floors	1 Bed	2 Bed	3 Bed	Units	Beds	
Building A							
Level 1 (Ground Floor)	1	3	1	2	6	11	
Levels 2-4 (Podium)	3	6	2	2	10	16	
Levels 5-12 (Tower)	8	6	4	0	10	14	
Building A Total	12	69	35	8	116	171	
Unit Mix		59%	34%	7%	100%		

STORAGE LOCKERS			Lockers
REQUIRED (Client)			
Building A (0.33 per unit)			38
PROVIDED			
Building A			-
P1 (Underground)			21
Level 0			21
Total			42
AMENITY	Metric		Imperial
REQUIRED			
Building A (3 sq. m for 1st Bedroom and 2 sq. m for each additional bedroom)	458 sq m		4,929.9 sq ft
PROVIDED			
Building A			
Interior Rooms (Fitness, Theatre, etc.)	411.5 sq m		4,429.4 sq ft
Terraces (Terrace/Green Roof)	319.4 sq m		3,384.6 sq m
Private Balconies/Terraces	1,117.5 sq m		12,029.2 sq ft
Total	1,753.0 sq m		18,847.1 sq ft

Parking Data						Spaces
VEHICLES						
REQUIRED (Zoning/By-law Parking Requirements)						
Building A						
Residential Parking Required (1.0 space / Dwelling unit)						116
Visitor Parking Required (0.10 space / Dwelling unit)						12
Total Parking Required- Building A						128
Loading (min 4 x 7 type A spaces for 76-300 Bedrooms)						1
Barrier Free Parking Required (for req'd parking spaces btwn 101-133, 2 Type A & 3 Type B)						5
Type A Required						2
Type B Required						3
PROVIDED	# of Floors	Type A	Type B	Standard	Visitor	Total:
Building A						
P1 (Underground)	1	1	1	79		81
Level 0 (A) (Lobby Entrance)	1	0	0	20		20
Surface Parking		2	2	51	12	67
Temporary Parking				35		35
Total Parking Provided		3	3	185	12	203
BICYCLES						
REQUIRED		Type A	Type B			Total
Building A (Type A: 0.3 / Dwelling Unit + Type B: 0.3/ Dwelling unit)		35	35			70
PROVIDED		Type A	Type B			Total
Building A						
P1 (Underground)		0	0			0
Level 0		40	16			56
Level 1 (Street Level)		0	20			20
Bike Parking Total (Building A)		40	36			76



2 SPA 1.1 SITE PLAN - PHASE 1 1 : 750

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DRAWINGS ARE NOT TO BE SCALED.

NO.	REVISIONS	DATE

SITE PLAN PRE-CON APPLICATION	2024.02.16
CHRONOLOGY	DATE

aba architects inc.
50 Hazelton Drive, Unit 8, Waterloo ON, N2L 6J3 519 886 2211 www.abarchitects.ca

CLIENT
RIPPLE HOLDINGS INC.

PROJECT NAME
LAURELWOOD DEVELOPMENT
585 Laurelwood Dr, Waterloo, ON

DRAWING TITLE
SITE PLAN PHASE 1

SCALE: As indicated
SHEET SIZE: 24X36
PROJECT NUMBER: 2023-118
DRAWING NUMBER: SPA 1.1

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ATTACHMENT 3

Servicing Legend

Ex=Existing	Pr=Proposed
Ex Sanitary/Storm Manhole/CB Manhole	Pr Sanitary/ Storm MH/CBMH/ WMN Chamber
Ex Sanitary Sewer (Flow Direction)	Pr Sanitary Sewer (Flow Direction)
Ex Storm Sewer (Flow Direction)	Pr Storm Sewer (Flow Direction)
Ex Water Valve/Curb Stop	Pr Water Valve/Curb Stop/Reducer
Ex Fire Hydrant & Valve Set	Pr Fire Hydrant & Valve Set
Ex 90°/45°/22.5°/11.25° Bends	Pr Siamese Connection
Ex Watermain with TEE	Pr 90°/45°/22.5°/11.25° Bends
	Pr Watermain with TEE

Grading Legend

123.45 — Original Ground Elevation	123 — Draft Plan/R-Plan Lot No.
123.45 / 123.45 — Proposed Ground Elevation / Original Ground Elevation	Block 23 — Block Number
TFE=123.45 / FFE=123.75 / BFE=121.10 — Top Of Foundation Elevation / First Floor Elevation / Basement Floor Elevation	#12 — Municipal Address
TC=123.45 — Top Of Casting Elevation	123.45 — Ground Elevation At Face Of Building
Retaining Wall	S.F. — Denotes Lot Contains Structural Fill
Armour Stone	N — Lot Subject To Noise and/or Vibration Measures
Overland Flow Direction	Infil — Infiltration Measures Required
2.0% — Pr Surface Drainage Direction/Slope	PRV — Pressure Reducing Valve Required
2.0% — Ex Surface Drainage Direction/Slope	A, B, C and/or D — Lot Grading Type, Per Municipality
Swale Direction at Lot Corner	High/Low Point
Swale Flow Direction	
D / D — Drainage Divide Line	

Utilities Legend

A/G H — Above Ground Hydro Lines	Utility Pole & Guy
U/G H — Below Ground Hydro Lines	Street Light/Light Pole
TEL — Above/Below Ground Telephone Lines	Hydro Transformer/vault
CATV — Above/Below Ground Cable TV Lines	Utility Pedestal
GAS — Gas Main	T — Telephone Manhole
UTI — Combined Utility Ducts (Hydro & Telecommunications)	H — Hydro Meter
U/G H / U/G N — Underground ducts	GV — Gas Valve
	G — Gas Meter

Misc Features Legend

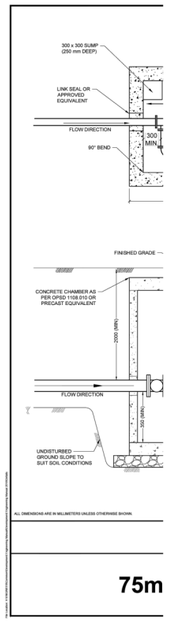
Ex Building	Ponding Areas
Pr Building	On-street Parking Locations Where Lot Frontage Is Less Than 14.0m. Semi-detached Lot Driveway Locations To Be Determined At Time Of Construction.
Site Boundary	
BM — Geodetic/Local Benchmark	Building Entrance (Man Door, Drive-In, Loading Dock)
Regulatory Floodline	Bike Rack
Community/Single Mailbox	Downspout Location
Borehole Locations (ID Number & Elevation)	Sump Pump Location, Outlet Direction
Test Pit (ID Number & Groundwater Elevation)	W — Well
Vegetation Line (Dripline or Bush/Shrub)	Specified Driveway Location Depressed Curb
Trees (Deciduous/Coniferous)	Signage (Misc & Railway)
Landscape Rock/Boulder	Railway Tracks
Truncated Dome Plates	Embankment
Fencelines - Chainlink - Post & Wire - Board on Board - Noise Fence/wall	Guardrail
	A — Section Arrow

ESC Legend

SF — Silt Fence	Rock/Straw Bale Check Dam
TPF — Tree Protection Fence	Ex/Pr RipRap
Topsoil/Material Stockpile Location	Silt Sack

Removals Legend

Concrete Pavement With Bituminous Surface To Be Removed	Area To Be Close Cut Cleared
Bituminous Pavement To Be Removed	Area To Be Cleared
Concrete Pavement To Be Removed	Area To Be Grubbed
Gravel Surface To Be Removed	Area To Be Cleared & Grubbed
	Items To Be Removed
	Tree removals



General Notes

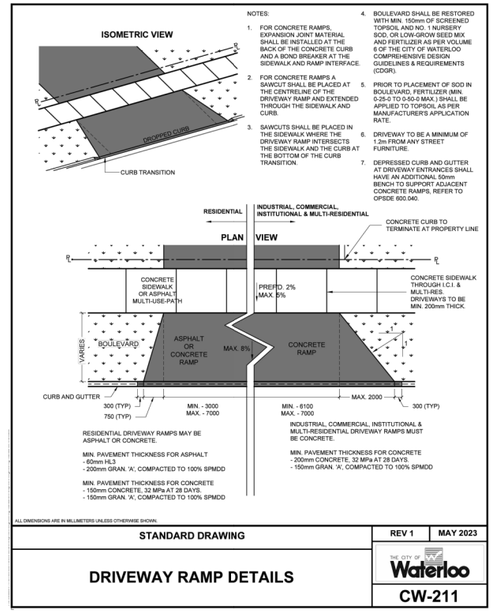
1. All dimensions are in metres unless otherwise noted. This drawing shall not be scaled.
2. All work shall be in accordance with the requirements of the local municipality, the DGSSMS, the latest relevant sections of the OPSS's, OPSD's, and the Ontario Building Code.
3. Soil Management Regulations: All import or export of soil related to this site is to be completed in conformance with Ontario Regulation 406/19: On-site and Excess Soil Management. Per the regulation, it is the responsibility of the owner to retain a Qualified Person (QP) to investigate and/or develop (or supervise the development of) a site-specific excess soil plan. The QP for this site is: To be confirmed
4. The Contractor shall obtain all necessary locates & permits prior to commencing work.
5. The Contractor shall notify the Engineer 24 hours prior to constructing any works in order to coordinate inspections.
6. The Contractor shall, at their own cost, install and maintain erosion control measures for the duration of construction, in accordance with local and provincial regulations or as directed by the Engineer.
7. Only drawings stamped "Issued for Construction" shall be used for construction.
8. Shop drawings shall be submitted to the Engineer for review and approval prior to construction of the following;
   a. Retaining walls
   b. SWM works
   c. Non-standard pre-cast concrete structures
8. Retaining walls to be designed and submitted for building permit by others, if required by the OBC or the municipality. Include fence or handrail, if required by the OBC.
9. All embankment slopes are at maximum 3:1, unless otherwise shown.
10. Elevations at curbs are asphalt grades unless otherwise shown.
11. Proposed grades are to match existing grades at the perimeter of the work site, unless otherwise shown.
12. Cap services 1m outside building face. All trenches into building shall have a clay seal before entering building. All storm service connections inside the building to be water tight to 1m above finished first floor elevation.

Specifications

CoW refers to City of Waterloo Municipal Standard Specifications and Drawings.
SSMS refers to Region of Waterloo and Area Supplemental Specifications for Municipal Services.
OPSS and OPSD refer to Ontario Provincial Standard Specifications and Drawings.

The following minimum specifications shall apply unless otherwise noted:

1. Excavation, Backfilling, Grading and Compaction:
   a. Work shall be completed in accordance with OPSS.MUNI 206, 401 and 501. (Method A); standard proctor maximum dry density (SPMDD) shall apply.
   b. Earth fill placed as "structural fill" shall be compacted to 98% SPMDD. Each lift shall be inspected and approved by the Geotechnical Engineer.
   c. Underground services shall have Granular 'A' embedment material compacted to 100% SPMDD and suitable native backfill compacted to 98% SPMDD.
   d. Road subgrade shall be compacted to 98% SPMDD; road subbase shall comprise granular material compacted to 100% SPMDD.
   e. Surplus topsoil and/or earth shall be stockpiled on the work site; all other material shall be removed from the Work site in accordance with OPSS 180.
2. Precast concrete structures shall be installed in accordance with OPSS 407, OPSD 704.010 to 704.012 and shall include frame and grate and other appurtenances:
   a. Maintenance holes and catchbasin maintenance holes:
      a.1. OPSD 701.010, 1200mm diameter
      a.2. 600mm sump in catchbasin maintenance holes
      a.3. Benching according to OPSD 701.021 and/or SSMS D.3.3.4.
      a.4. Safety platforms to be installed per OPSD 404.020, 404.021 and/or 404.022.
   b. Single catchbasins:
      b.1. OPSD 705.010, std 1680mm height or alt A/B/C/D as noted, min. 250mm diameter lead at 1.0% (max 20%), 600mm sump.
   c. Frames and grates:
      c.1. OPSD 400.100, catchbasin frame and grate
      c.2. OPSD 401.010, maintenance hole cover, type A "closed" (sanitary) & type B "open" (storm)
3. Sewers shall be installed in accordance with OPSS.MUNI 410, class "B" bedding:
   a. PVC pipe per OPSD 802.010 to 802.024 (Max 525mm diameter)
      a.1. <200mm diameter - DR28 per CSA B182.2
      a.2. ≥200mm diameter - DR35 per CSA B182.2
   b. HDPE pipe per OPSD 802.010 to 802.024 culverts and subdrain only
      b.1. 100 and 150mm diameter - CSA B182.6
      b.2. ≥200mm diameter - CSA B137.0 and B137.1
   c. Service connection per OPSD 1006.010:
      c.1. 150mm diameter sanitary at 2-8%, invert as shown in the servicing plans.
      c.2. 150mm diameter storm at 2-8%, invert @ 1.2m min below finished grade when possible at 1m away from building face.
   d. Subdrain per OPSD 216.021, 3m either side of all structures/in accordance with geotechnical recommendations:
      d.1. 150mm diameter perforated PVC/HDPE with knitted geotextile sock
4. Watermains shall be installed in accordance with OPSS.MUNI 441 and municipal requirements:
   a. Watermain clearances and crossings per section 7.3.5.7 of the 2012 OBC and section 15 of the Watermain Design Criteria for Future Alterations Authorized under a Drinking Water Works Permit (MOEE, June 2012):
      a.1. Minimum 2.5m clear horizontal from any sewer and/or adequate vertical clearance.
      a.2. Watermains shall cross over sewers with 0.5m clearance; or cross under sewers with 0.5m clearance, adequate support, and joints further than 2.44m from the sewer.
   b. Water services may be placed in the same trench with building drain or building sewer if the bottom of the service at all points is a minimum of 0.5m above the drain/sewer and placed on a shelf at one side of the common trench per OBC 7.3.5.7.2.
   c. Watermains and services to have 2.0m minimum cover from final grade.
   d. For pipes installed with less than 1.2m cover (finished ground to top of pipe), provide insulation cover in accordance with standards indicated, at the locations shown on the plan(s).
   e. Construct watermain in fill areas using restrained joints.
   f. Water systems 100mm diameter and larger shall be isolated from the municipal water supply with a certified backflow prevention device, per SSMS E2-17 during construction. All testing, sampling and commissioning activities shall be included in the scope of work by the Contractor and witnessed by the Owner's representative.
   g. Watermains and appurtenances shall be flushed and chlorinated in accordance with municipal standards.
   h. Cathodic protection shall be installed on each metallic component.
      h.1. Anode spacing per OPSS.MUNI 442.
      h.2. Shall be installed 1.0m horizontally from each metallic component and as deep as the bottom of each metal component in accordance with OPSD 1109.010 and 1109.011.
      h.3. Protective coating should be applied to all thermite wires.
      h.4. The anode lead shall be connected to copper services using a ground clamp. Ground clamps shall be attached to copper services in accordance with the manufacturer's instructions as per OPSS.MUNI.442.07.11
      h.5. The anode shall be placed on native soil, not in granular bedding material as per OPSS.MUNI.442.07.12
   i. Anti-corrosion wraps for watermain fittings shall conform to SSMS, Section C.2.12.
   j. Plastic pipe:
      j.1. 50mm diameter - HDPE or PEX
      j.2. 100-300mm diameter - DR18 per AWWA C900
   k. Valves shall be installed in accordance with OPSD 1101.020.
   l. Water commissioning and chlorine residual maintenance plans to be submitted, as required in accordance with municipal standards.
   m. Water service per OPSD 1104.010 or 1104.020 and shall include curb stop.
      m.1. 150mm diameter water at 0.5% minimum., invert @ 2.0m min below property line unless otherwise noted.
   n. Fire hydrants shall be installed in accordance with OPSD 1105.010.
      n.1. For mains <300mm diameter, hydrant shall have 1-100mm diameter nozzle with Storz connection, 2-65mm diameter nozzles, and 1-150mm mechanical joint outlet.
      n.2. Private fire hydrants shall be located within 5m of the private access road, no closer than 3m to any building and kept visible and accessible at all times. Storz connection shall face the access road.
      n.3. Drain plugs shall be plugged.
5. Concrete Compressive Strength per OBC section 9.3.1.6., shall be 32Mpa at 28 days, 5% to 8% air entrainment:
   a. Sidewalk shall be 125mm thick according to OPSD 310.010 and/or 310.020, 310.030, 310.031 310.033 installed in accordance with OPSS 351. Sidewalks shall be 150mm thick across residential driveways.
   b. Truncated dome detectable warning plates at barrier free pedestrian crossings per RMW Std Dwg 224 or OPSD 310.039.
   c. Curb and curb & gutter shall be installed in accordance with OPSS.MUNI 353 and the following:
      c.1. OPSD 600.110, concrete barrier curb
6. Roads and paved areas:
   a. Joints at existing pavement shall be sawcut and milled in accordance with RMW Std Dwg 207/municipal standards.
   b. Transition subgrade elevations shall utilize a 10:1 frost taper in the subbase layer from the lower elevation to the higher elevation.
   c. Pavement structure ;
      c.1. 40mm HL3 pavement, per OPSS.MUNI 310 by the QA method
      c.2. 60mm HL8 pavement, per OPSS.MUNI 310 by the QA method
      c.3. 150mm Granular 'A' road base, per OPSS.MUNI 206 and 314
      c.4. 400mm Granular 'B' road subbase, per OPSS.MUNI 206 and 314
   d. Line painting shall be in accordance with OPSS 710 and 1716 (no beads).
7. Miscellaneous:
   a. Chain link fencing, No.9 gauge, shall be installed in accordance with OPSS.MUNI 771 and/or OPSS.MUNI 772.
   b. Topsoil & sod shall be in accordance with OPSS.MUNI 802 & 803.
   c. Topsoil & seed shall be in accordance with OPSS.MUNI 802 & 804.



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T 519.623.1340 F 519.623.7334 www.meritech.ca

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PROFESSIONAL ENGINEER — ONTARIO — M. F. MEDDAD — 100214405 — 2024-11-15 — PROVINCE OF ONTARIO

No.	REVISION/ISSUE	DATE	BY
1.	Issued for Review and Approval	Nov 14, 2024	XCC

DRAWING: Legend, Details & Project Notes Plan
OWNER: Ripple Holding Inc.
LOCATION: City of Waterloo
PROJECT: 585 Laurelwood Drive 58M-318
DESIGNED BY: XCC | CHECKED BY: MM | CONTRACT:
DRAWN BY: XCC | DATE: Nov 14, 2024 | FILE NAME: 1423
DRAWING: 1423-1 SHEET: 1 of 6 | SCALE: Not to Scale

Filename: C:\M\Meritech Engineering\PRJ - DOCS\1423\CAD\Sheets\1423.dwg, 1423-1 -- Plotted: November 15, 2024 8:55 AM, Suslec

Block 36

Lot 1
No. 800

Block 5

Block 2

Block 1

Limit of Construction

Creekside Drive

Laurelwood Drive

No. 799-803 Block 50

Lot 29

No. 600 Lot 44

No. 585

No. 605
Existing 3-Storey Retirement Residence

Old Oak Park

Part Of Lot 43, German Company Tract

No. 520

GRCA Limit

2.00m Easement

7.00m Utility Easement

10.00m Utility Easement

BM #1

Install heavy duty silt fence 0.3m inside the entire perimeter of the site, per OPSD 219.130, prior to commencement of construction and maintain in good working condition for the duration of the construction period.

Remove and sawcut existing boulevard and full high curb. Install the new driveway in the same location and to the dimension shown on the Site Grading Plan (No. 1423-3).

Excavate, locate and replace existing DICB with CBMH. Install the proposed catchbasin manhole at the same location ,shown on Site Grading Plan (No.1423-4).

Excavate, locate and remove existing service stub. Install the proposed sanitary manhole at the same location, shown at (No.1423-4).

Install catchbasin protection per ESC notes on DWG 1423-2

Site hoarding to be provided as needed by the building contractor.

Remove and sawcut existing boulevard and full high curb. Install the new driveway in the same location and to the dimension shown on the grading plan.

Install heavy duty silt fence 0.3m inside the entire perimeter of the site, per OPSD 219.130, prior to commencement of construction and maintain in good working condition for the duration of the construction period.

Install mud mat at construction entrance, as shown and maintain for the duration of the construction period. Any material tracked onto the street is the responsibility of the contractor, and is to be removed immediately. Maintain min 1.5m coverage on existing storm sewer at the access road.

Limit of Construction

Install catchbasin protection per ESC notes on DWG 1423-2

Install heavy duty silt fence 0.3m inside the entire perimeter of the site, per OPSD 219.130, prior to commencement of construction and maintain in good working condition for the duration of the construction period.

N26°48'40"W 14.373
N26°48'40"W 25.595
N37°42'25"W 17.603
N32°48'35"W 17.554
N32°20'00"W 30.203
N5°25'30"W 38.849
N35°24'E 63.243
N13°30'35"E 40.633
N64°04'30"E 28.712
N25°41'50"W 82.668
N68°11'10"W 66.207
N38°11'15"W 22.138
N38°11'15"W 37.170
N5°45'27"E 51.113
N5°45'27"E 73.867
N5°35'27"E 4.497

Property Line

Construction Site

5m-150mm Angular rip rap or recycled concrete*

10m-50mm Angular rip rap or recycled concrete*

Public Road

Stone pad shall be a minimum 300mm thick (450mm recommended) and shall be underlain with a geotextile or graded aggregate filter, and shall be a minimum of 5.0m wide and 15.0m long.

Additional measures such as wheel washing systems may be required to ensure sediment from a construction site will not be transported off-site via exiting vehicles.

* No reinforcement materials

Ex 300mmø Stm pipe below Mudmat

Construction Entrance (Mud Mat) Detail

Not to Scale

Attach erosion control filter cloth/silt sack firmly to the underside of the catchbasin lid to ensure adequate filtering of sediments.

Existing asphalt area

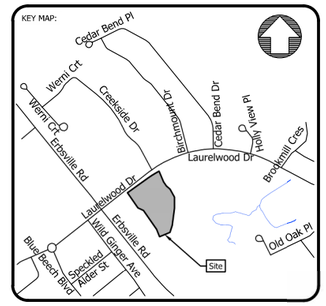
Catchbasin frame & grate

OPSD Precast catchbasin or OPSD Precast manhole

Catchbasin Protection in Paved Area

Not to Scale

KEY MAP:



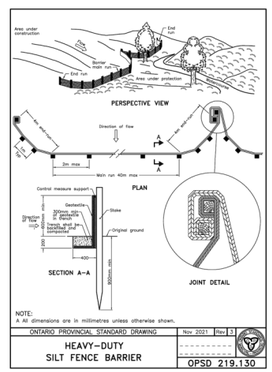
Project Notes

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   a. Site Plan by ABA Architects Inc., dated Nov 2024.
   b. Architectural Plans by ABA Architects Inc., dated Sep 2023.
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Existing slopes and inverts denoted with "±" are approximate and taken from plan/profile from City of Waterloo Drawing No.5-2092 sheet 13. All information shown for existing services to be confirmed on-site prior to construction.

Erosion and Sediment Control Notes:

1. All work is subject to City of Waterloo inspection requirements. Please contact Rob Nolan at 519-747-8517 for private site work and for works in the City right of way.
2. All works to be done in accordance with OPSS 805.
3. All silt fence to be installed prior to commencement of any area grading, excavating or demolition, per OPSD 219.130, unless noted otherwise.
4. Erosion control protection to be provided around all storm catchbasins per the details shown.
5. The Engineer shall monitor the site development to ensure all erosion controls are installed and maintained to the municipal requirements, and any damage repaired immediately. Contractor to comply with the Engineer's instructions to install, modify, or maintain erosion control works. Sediments to be removed when accumulations reach a maximum of one third (1/3) the height of the silt fence.
6. All erosion control structures to remain in place until all disturbed ground surfaces have been re-stabilized either by paving or restoration of vegetative ground cover.
7. All erosion control measures are to be inspected by the General Contractor before and after all rainfall and significant snowmelt events.
8. No alternate methods of erosion control protection shall be permitted unless approved by the Engineer and the municipality.
9. Mud mat to be provided on site at all locations where construction vehicles exit the site. Contractor to ensure all vehicles leave the site via the construction access and that the sediment trap is maintained in a manner to maximize its effectiveness at all times.
10. Areas affected by grading activities shall be topsoiled (125mm minimum thickness) and seeded within 30 days of site activity ceasing.
11. Excess fill material shall not be disposed of within environmentally sensitive areas, including wetlands, woodlots, regulated areas, or adjacent properties.
12. The property owner is responsible for restoration of all damaged and/or disturbed property within the municipal right-of-way to the municipal standards.
13. If, for unforeseen reasons the Owner and/or his representative must encroach onto private lands to undertake any works, he/she must obtain written permission from the adjacent property owners prior to entering upon the private property to perform any works. Copies of these letters of consent must be submitted to the municipality, prior to any work being performed. Failure to comply with the above is at the owners own risk.
14. Any material tracked onto the street is the responsibility of the contractor. Street sweeping and dust control to be conducted daily.
15. Site property line is to be identified prior to clearing the site and construction fencing to be installed around the site prior to construction start and replaced at the entrance to the site at the end of each working day.
16. Sediment and erosion control measures shall be in place, inspected and certified by the consultant prior to the inspection/acceptance by the City staff.
17. Construction hoarding or fencing around the site is to comply with the Occupational Health and Safety Regulations for Construction Projects, O. Reg 213/91 s.65.
18. Construction access is to be used for emergency access. Contractor must maintain access free and clear of any obstacle.
19. Existing sidewalk is not to be removed until contractor is ready to replace sidewalks. Sidewalks and bike paths are to be maintained and safe pedestrian access is provided for the duration of the construction period.
20. All work and equipment to be maintained within the site. Boulevard and City right-of-way is not to be used for any construction purposes.
21. Contractor is responsible for restoring all affected properties to original condition. Contractor to minimize disturbance to adjacent properties.
22. All work within the City's right of way is regulated by the Road Occupancy Permit By-law #2014-054. No construction work is authorized within the City's right of way and is prohibited until such time as formal written authorization from the City's Public Works Transportation Division is obtained. The developer should apply for a permit at least seven (7) days prior to any work being commenced in the right of way. Make applicable traffic control arrangements with Helga Bowman at 519-886-2310 ext. 30270.
23. Tree removals shall be as approved on Vegetation Management Plan.
24. Where silt fence and tree protection fence (TPF) location coincide, silt fence should be installed directly on the TPF. Avoid keying the silt fence where no other excavation grade cuts will occur.



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T 519.621.1146 F 519.621.7334 www.meritech.ca

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PROFESSIONAL ENGINEER PROVINCE OF ONTARIO LICENSED M. F. MEDDAD 100214405 2024-11-15

No.	DATE	BY
1.	Nov 14, 2024	XCC
	Issued for Review and Approval	REVISION/ISSUE

OWNER: Ripple Holding Inc.

LOCATION: City of Waterloo

CONTRACT:

PROJECT: 585 Laurelwood Drive 58M-318

FILE NAME: 1423

DRAWING: Original Conditions and Removals & Erosion & Sedimentation Control Plan

DESIGNED BY: XCC

CHECKED BY: MM

DRAWN BY: XCC

DATE: Nov 14, 2024

SCALE: 1:400

DRAWING: 1423-2

SHEET: 2 of 6

0 4 8 12 16 1:400

Filename: C:\M\Meritech Engineering\PRJ - DOCS\1423\CAD\Sheets\1423.dwg, 1423-2 - Plotted: November 15, 2024 8:55 AM, Susiec

Project Notes

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   a. Site Plan by ABA Architects Inc., dated Nov 2024.
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PROFESSIONAL ENGINEER PROVINCE OF ONTARIO — M. F. MEDDAD — 100214405 — 2024-11-15

No.	REVISION/ISSUE	DATE	BY
1.	Issued for Review and Approval	Nov 14, 2024	XCC

OWNER: Ripple Holding Inc.

LOCATION: City of Waterloo

PROJECT: 585 Laurelwood Drive 58M-318

CONTRACT:

FILE NAME: 1423

DRAWING: Master Site Grading Plan

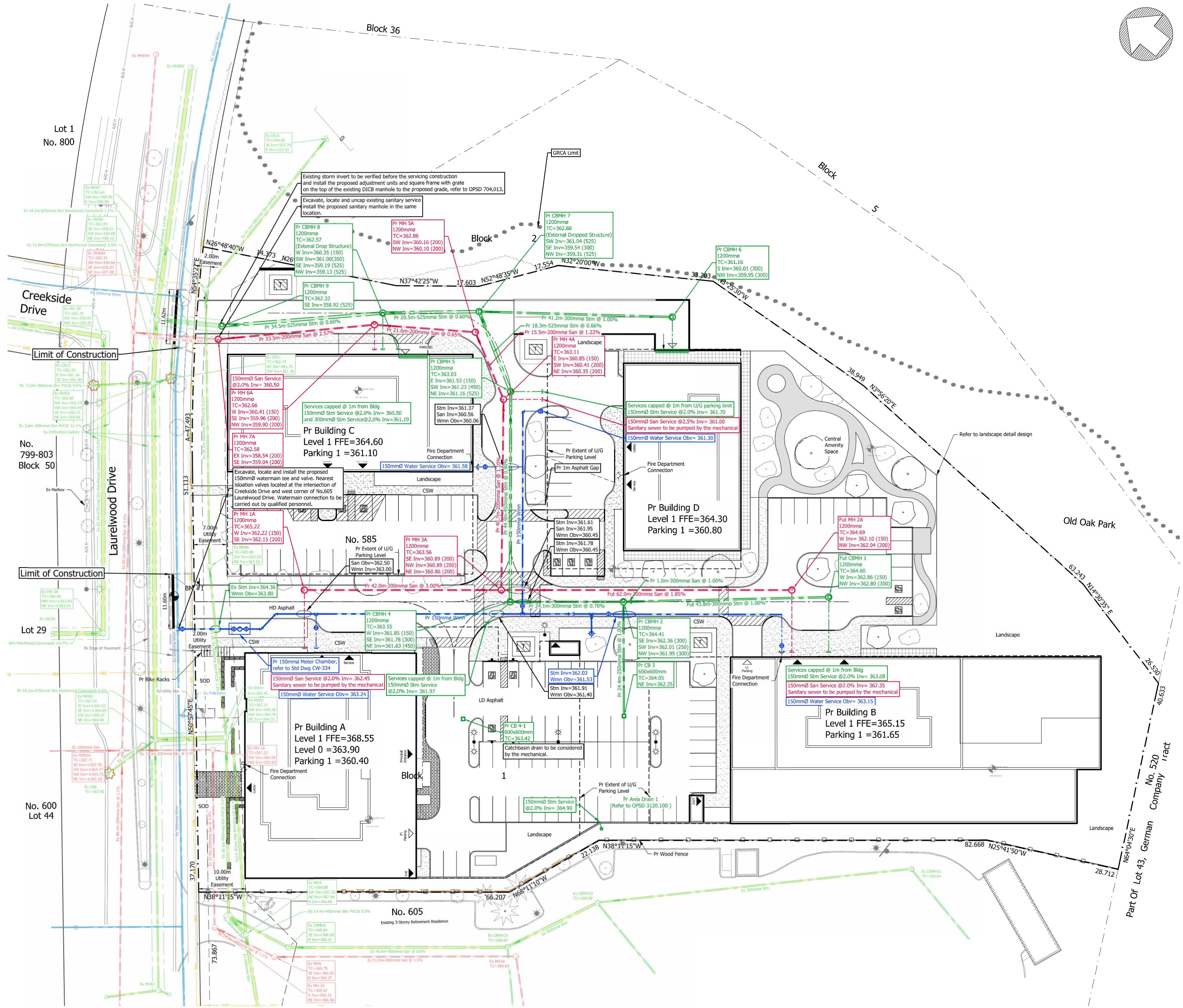
DESIGNED BY: XCC | CHECKED BY: MM

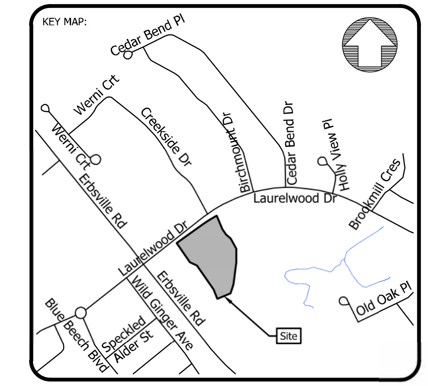
DRAWN BY: XCC | DATE: Nov 14, 2024

SCALE: 1:400 | DRAWING: 1423-3 | SHEET: 3 of 6

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Filename: C:\M\Meritech Engineering\PRJ - DOCS\1423\CAD\Sheets\1423.dwg, 1423-3 -- Plotted: November 15, 2024 8:55 AM, Suseic





Project Notes

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Assumed utility duct will be constructed 0.9m below proposed road elevation, refer to utility plan for more details.

Pr fire department connections will be provided and designed by others.

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LICENSED PROFESSIONAL ENGINEER
M. F. MEODAD
100214405
2024-11-15
PROVINCE OF ONTARIO

No.	REVISION/ISSUE	DATE	BY
1.	Issued for Review and Approval	Nov 14, 2024	XCC

OWNER: Ripple Holding Inc.

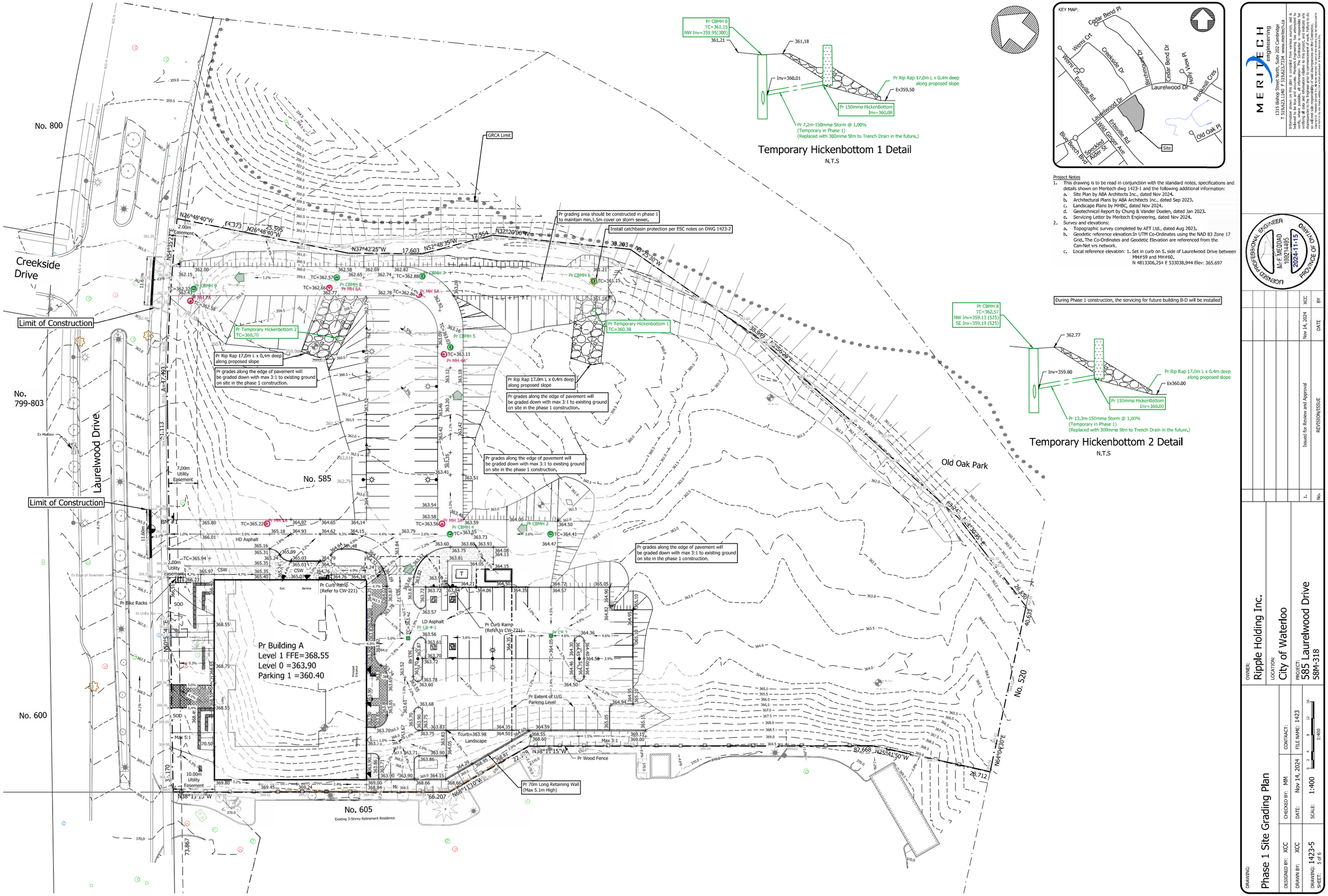
LOCATION: City of Waterloo

PROJECT: 585 Laurelwood Drive 58M-318

DRAWING: Master Site Servicing Plan

DESIGNED BY: XCC	CHECKED BY: MM	CONTRACT:
DRAWN BY: XCC	DATE: Nov 14, 2024	FILE NAME: 1423
DRAWING: 1423-4 SHEET: 4 of 6	SCALE: 1:400	0 2 4 8 12 16 1:400

Filename: C:\M\Meritech Engineering\PRJ - DOCS\1423\CAD\Sheets\1423.dwg, 1423-4 -- Plotted: November 15, 2024 8:56 AM, Susiec



Project Notes

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   a. Site Plan by ABA Architects Inc., dated Nov 2024.
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PROFESSIONAL ENGINEER — M. F. MEDDAD — 100214105 — 2024-11-15 — PROVINCE OF ONTARIO

No.	Issued for	DATE	BY
1.	Review and Approval	Nov 14, 2024	XCC

DRAWING: Phase 1 Site Grading Plan

OWNER: Ripple Holding Inc.

LOCATION: City of Waterloo

DESIGNED BY:	XCC	CHECKED BY:	MM
DRAWN BY:	XCC	DATE:	Nov 14, 2024
DRAWING:	1423-5	SCALE:	1:400
SHEET:	5 of 6		

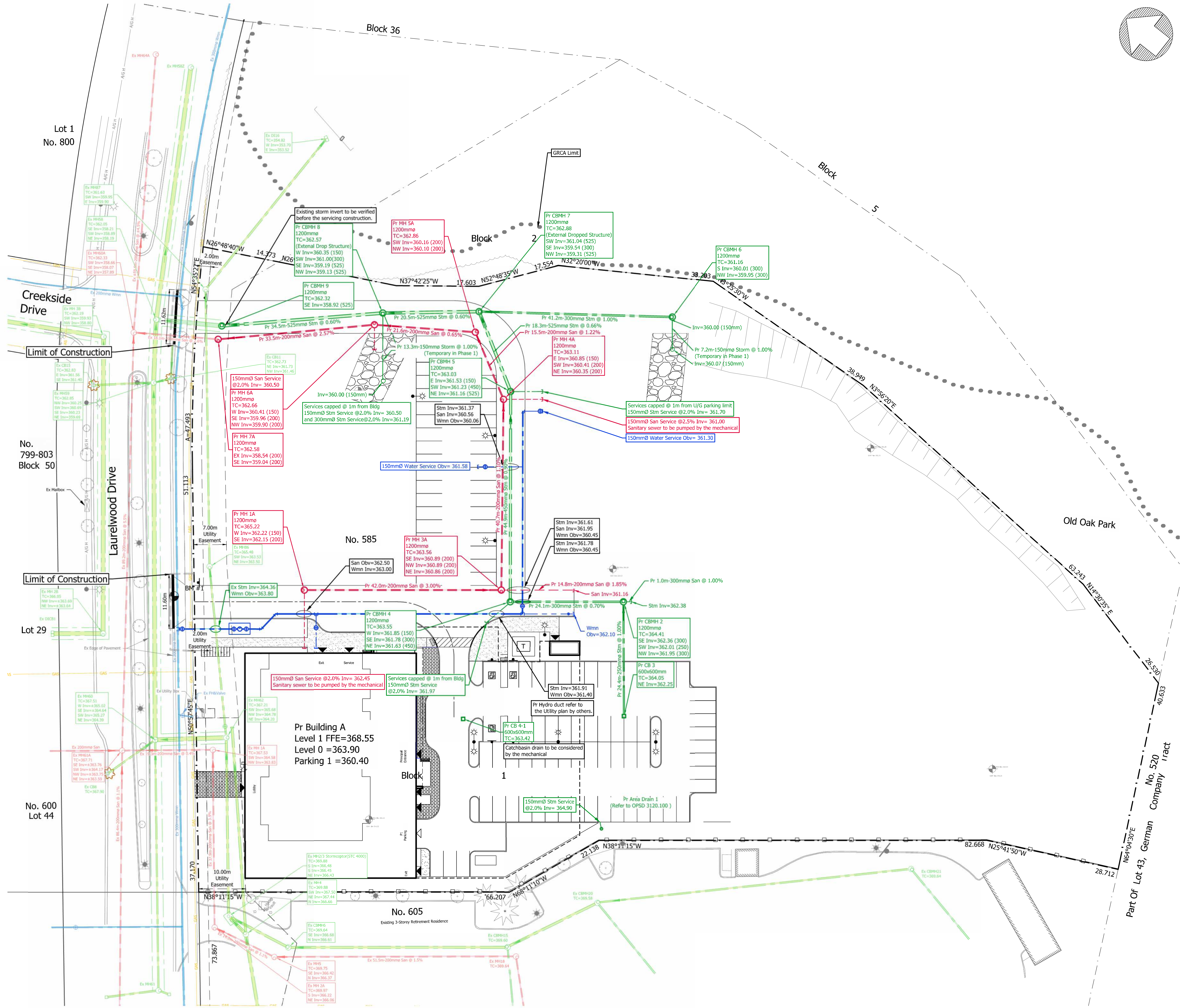
CONTRACT:

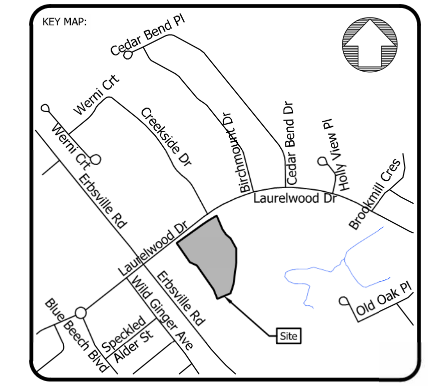
PROJECT: 585 Laurelwood Drive 58M-318

FILE NAME: 1423

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Filename: C:\MI\Meritech Engineering\PRJ - DOCS\1423\CAD\Sheets\1423.dwg, 1423-5 -- Plotted: November 15, 2024 8:56 AM, Susiec





Project Notes

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During Phase 1 construction, the servicing pipes for future building B-D will be constructed after underground parking start.

Pr fire department connections will be provided and designed by others.

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100214405
2024-11-15
PROVINCE OF ONTARIO

No.	REVISION/ISSUE	DATE	BY
1.	Issued for Review and Approval	Nov 14, 2024	XCC

DRAWING:
Phase 1 Site Servicing Plan

OWNER: Ripple Holding Inc.
LOCATION: City of Waterloo
PROJECT: 585 Laurelwood Drive
58M-318

DESIGNED BY: XCC	CHECKED BY: MM	CONTRACT:	
DRAWN BY: XCC	DATE: Nov 14, 2024	FILE NAME: 1423	
DRAWING: 1423-6 SHEET: 6 of 6	SCALE: 1:400	0 2 4 8 12 16 1:400	

Filename: C:\M\Meritech Engineering\PRJ - DOCS\1423\CAD\Sheets\1423.dwg, 1423-6 -- Plotted: November 15, 2024 8:56 AM, Susiec

MERITECH

Storm Sewer Hydraulic Design Sheet

for

The City of Waterloo

Ref # MOE Ref Num

Project: Laurelwood Drive
File: 1423
Calc'd by: xcc
Date: 4-Nov-24
Chk'd by: LQ
Date: 13-Nov-24

I=A/(Tc+B)^C
A= 1755
B= 12.347
C= 0.895
Tc= 10

Pipe Velocities: 0.6 m/s min.
6.0 m/s max.
n= 0.024 CSP
n= 0.013 Conc./PVC/HDPE

5 Year Design Storm

Rational Formula: Q =CIA/0.36
Where: Q : peak flow (L/s)
C : runoff coefficient
I : rainfall intensity (mm/hr)
A : area (ha)

Concentration time: tc = ti + tf (minute)
Where: ti: inlet time before pipe (minute)
tf: time of flow in pipe (minute)
tf = L/60V
ti = 10

Manning Equation:
Qcap.=(D/1000)^2.667*(S/100)^0.5/(3.211*n)*1000 (L/s)
D: pipe size (mm)
S: slope (grade) of pipe (%)
n: roughness coefficient

Location		Runoff									Pipe								
From	To	Area ID	Area A (ha)	"C"	Section "AC" (ha)	Accum. "AC" (ha)	ti (Min.)	tc (Min.)	"I" (mm/hr)	Peak Flow Q (L/s)	Length L (m)	N.D. D (mm)	Pipe Mat'l	Slope S (%)	Qcap. (full) (L/s)	V (full) (m/s)	tf (Min.)	Q/Qcap.	Actual Velocity (m/s)
Site																			
CB3	CBMH2	1	0.14	0.69	0.096	0.096	10.00	10.34	108.824	28.990	24.4	250	PVC	1.00%	59.468	1.211	0.34	49%	1.199
CBMH1	CBMH2	2	0.40	0.69	0.276	0.276	10.00	10.53	108.824	83.432	43.8	300	PVC	1.00%	96.701	1.368	0.53	86%	1.553
CBMH6	CBMH7	5-1	0.03	0.60	0.020	0.020	10.00	10.50	108.824	5.985	41.2	300	PVC	1.00%	96.701	1.368	0.50	6%	0.711
CB3	CBMH2					0.096		10.34											
CBMH1	CBMH2					0.276		10.53											
CBMH1	CBMH2	3	0.02	0.69	0.014	0.110	10.53	11.07	106.550	32.468	43.8	300	PVC	1.00%	96.701	1.368	0.53	34%	1.211
CBMH2	CBMH4	4	0.04	0.69	0.025	0.135	11.07	11.42	104.374	39.007	24.1	300	PVC	0.70%	80.906	1.145	0.35	48%	1.133
CBMH4	CBMH5	5	0.85	0.69	0.587	0.721	11.42	11.86	102.994	206.285	44.9	450	PVC	0.90%	270.475	1.701	0.44	76%	1.888
CBMH4	CBMH5					0.721		11.86											
CBMH6	CBMH7					0.020		10.50											
CBMH5	CBMH7	6	0.02	0.69	0.015	0.736	11.86	12.05	101.316	207.197	18.3	525	PVC	0.66%	349.384	1.614	0.19	59%	1.679
CBMH7	CBMH8	7	0.08	0.69	0.055	0.791	12.05	12.27	100.614	221.188	20.5	525	PVC	0.60%	333.125	1.539	0.22	66%	1.654
CBMH8	CBMH9	8	0.13	0.69	0.090	0.881	12.27	12.64	99.801	244.268	34.5	525	PVC	0.60%	333.125	1.539	0.37	73%	1.693

MERITECH

Sanitary Sewer Design Sheet

Project: projname
File: 1423
Calc'd by: XCC
Date: 24-Nov-14
Chk'd by: MFM
Date: 24-Nov-14

for

The City of Waterloo

Ref# MOE ref num

Pipe Velocities:	0.60	m/s min. (pipe full)	*(MECP CLI-ECA design criteria)*
	3.00	m/s max. (actual flow)	*(MECP CLI-ECA design criteria)*
n=	0.013	all pipe material	
Residential average daily flow (q):	275	L/cap/d	*(B.3.1.2.1 from SSMS)*
Unit extraneous flow (E):	0.25	L/s/ha	*(B.3.1.2.6 from SSMS)*

q = average daily per capita flow (L/cap/d)
I = Unit of peak extraneous flow (L/s/ha)
Q(p) = peak population flow (L/s)
Q(I) = peak extraneous flow (L/s)
Q(d) = peak design flow (L/s)

Peaking Factor:
M = 1 + 14/(4+(P/1000)^0.5)
Q(p) = (P/1000)qM/86.4 (L/s)
Q(I) = IA (L/s) ; where A = Area in hectares
Q(d) = Q(p) + Q(I) (L/s)

Manning Equation:
Qcap. = (D/1000)^2.667*(S/100)^0.5/(3.211*n)*1000 (L/s)
D: pipe size (mm)
S: slope (grade) of pipe (%)
n: roughness coeffiecient

Location		Unit Count (ppu)		Residential 0.0032 (L/s/cap)						Infiltration 0.25				Pipe							
				Individual		Accumulative															
From	To	1.77 Single Semi	2.44 Town	P (person)	Area (ha)	P (person)	Area (ha)	Peak Factor M	Pop. Q(p) (L/s)	Total Area	Accum Total Area	Extran. Q(I) (L/s)	Design Q(d) (L/s)	Length L (m)	Size D (mm)	Pipe Mat'l	Slope S (%)	Capacity Qcap. (L/s)	Velocity V (m/s)	Q(d)/Qcap	Actual Velocity (m/s)
Streetname																					
site		497	0	880	3.05	880	3.05	3.835	10.742	3.050	3.050	0.763	11.504	33.5	200	PVC	0.65%	27.590	0.851	41.7%	0.829
Receiving Sewer						880	3.05	3.835	10.742		3.050	0.763	11.504	18.1	200	PVC	2.60%	55.180	1.701	20.8%	1.395

ATTACHMENT 6

Region of Waterloo

ENGINEERING AND ENVIRONMENTAL SERVICES
Water and Wastewater Services
150 Frederick Street 7th Floor
Kitchener Ontario N2G 4J3 Canada
Telephone: 519-575-4400; TTY: 519-575-4608
Email: waterservices@regionofwaterloo.ca
www.regionofwaterloo.ca/water

Chris Togeretz, P.Eng.
Meritech Engineering
1315 Bishop St N, Suite 202
Cambridge, ON N1R 6Z2
T: 519-623-1140

Date: August 11, 2023

Dear: Chris Togeretz

Re: Unaddressed Laurelwood Drive, Waterloo

Please find the results of the modeling simulations for boundary conditions requested on July 28th, 2023. The results include a figure showing the location of the node from the Region's model. Attached are a series of spreadsheets containing results for Average Day, Maximum Day demands and available fire flows for node JCT_18731 located at the intersection of Creekside Dr and Laurelwood Dr. The diurnal 24-hour demand distribution accounts for the minimum hour and peak hour peaking factors. The maximum pressure on the average day represents the minimum hour, and the minimum pressure on the maximum day represents the peak hour.

Table 1 – Modeling Results

Node	Elevation (mASL)	Demand		Fire Flow Results	
		Ave Day (L/s)	Max Day (L/s)	Design Flow (L/s)	Design Pressure (m)
JCT_18731	362.00	3.5	5.1	179.0	14.0

A fire flow analysis shows the maximum flow available at a node with an associated design pressure during the maximum day scenario while maintaining the minimum design pressure of 14 m (140 kPa) at all nodes within the pressure zone.

If you have any questions, please contact me

Kevin Dolishny P.Eng.
Senior Engineer, Water Services
c. 226.751.4551
e. kdolishny@regionofwaterloo.ca

WAT 5

JCT_18731 Average Day 24 Hour Simulation

Time	Demand (L/s)	Head (m)	Pressure (m)
00:00 hrs	3.53	403.63	41.63
01:00 hrs	3.53	403.77	41.77
02:00 hrs	3.53	403.77	41.77
03:00 hrs	3.53	403.77	41.77
04:00 hrs	3.53	403.84	41.84
05:00 hrs	3.52	403.92	41.92
06:00 hrs	3.54	403.76	41.76
07:00 hrs	3.58	403.09	41.09
08:00 hrs	3.60	402.70	40.70
09:00 hrs	3.58	402.93	40.93
10:00 hrs	3.58	402.94	40.94
11:00 hrs	3.57	402.96	40.96
12:00 hrs	3.57	403.02	41.02
13:00 hrs	3.57	403.08	41.08
14:00 hrs	3.56	403.15	41.15
15:00 hrs	3.56	403.23	41.23
16:00 hrs	3.56	403.18	41.18
17:00 hrs	3.56	403.12	41.12
18:00 hrs	3.57	402.96	40.96
19:00 hrs	3.58	402.84	40.84
20:00 hrs	3.58	402.84	40.84
21:00 hrs	3.58	402.93	40.93
22:00 hrs	3.57	403.08	41.08
23:00 hrs	3.55	403.46	41.46
Average Day HGL:		403.25	
Minimum Hour:		403.92	

JCT_18731 Maximum Day 24 Hour Simulation

Time	Demand (L/s)	Head (m)	Pressure (m)
00:00 hrs	5.13	403.59	41.59
01:00 hrs	5.12	403.77	41.77
02:00 hrs	5.13	403.78	41.78
03:00 hrs	5.13	403.61	41.61
04:00 hrs	5.13	403.64	41.64
05:00 hrs	5.12	403.72	41.72
06:00 hrs	5.14	403.38	41.38
07:00 hrs	5.19	402.48	40.48
08:00 hrs	5.21	402.09	40.09
09:00 hrs	5.18	402.60	40.60
10:00 hrs	5.16	403.08	41.08
11:00 hrs	5.16	403.15	41.15
12:00 hrs	5.15	403.25	41.25
13:00 hrs	5.16	403.11	41.11
14:00 hrs	5.18	402.90	40.90
15:00 hrs	5.17	403.07	41.07
16:00 hrs	5.19	402.72	40.72
17:00 hrs	5.20	402.64	40.64
18:00 hrs	5.21	402.28	40.28
19:00 hrs	5.22	402.04	40.04
20:00 hrs	5.22	402.01	40.01
21:00 hrs	5.21	402.23	40.23
22:00 hrs	5.17	402.83	40.83
23:00 hrs	5.15	403.18	41.18
Maximum Day HGL:		402.96	
Peak Hour:		402.01	

Available Flow (L/s)	Residual Pressure (m)
0.0	42.5
20.0	41.9
40.0	40.7
60.0	38.8
80.0	36.5
100.0	33.6
120.0	30.3
140.0	26.4
160.0	22.1
179.0	14.0

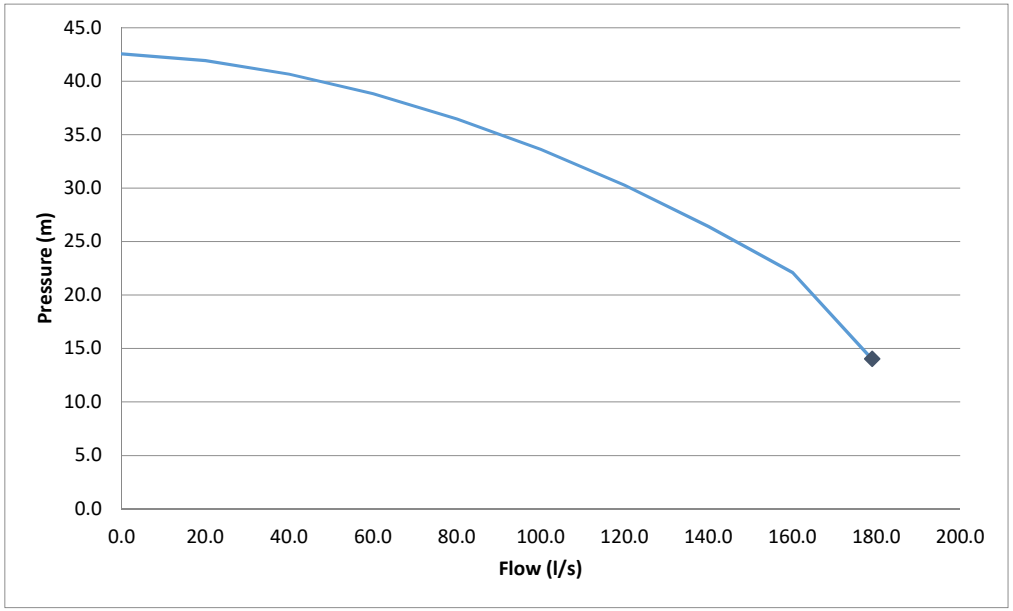
Fire Flow Analysis

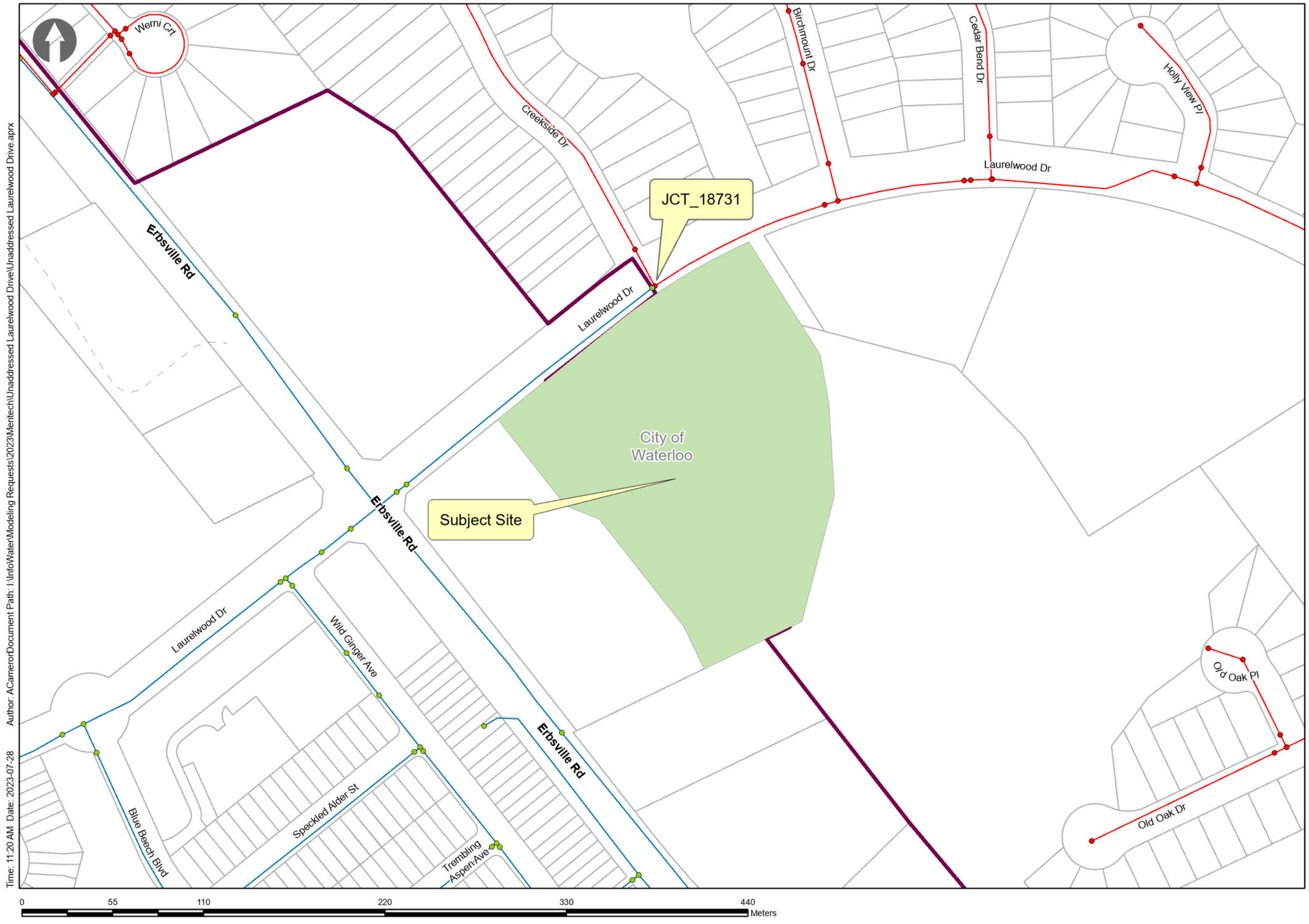
Fire Flow Node:	JCT_18731
Design Flow (L/s):	179.0
Design Pressure (m):	14.0

Design Flow: *The final adjusted flow at the node to maintain the minimum desigr pressure (14m (140 kPa)) at ALL locations within the pressure zone.*

Design Pressure: *The lowest allowable pressure at the node to maintain the minimum desigr pressure (14m (140 kPa)) at ALL locations within the pressure zone.*

Critical Node ID: *The constraining node within the pressure zone that drops to the minimum design pressure of (14m (140 kPa)) during the design flow.*





Region of Waterloo

ENGINEERING AND ENVIRONMENTAL SERVICES

Water and Wastewater Services

150 Frederick Street
Kitchener ON Canada N2G 4J3
Telephone: (519) 575-4426
Fax: (519) 575-4452
www.regionofwaterloo.ca

Type
- Active
- Domain

Type
- Active
- Domain
- Subject Site

Roads
- Arterial/Collector
- Local
- Private
- Pressure Zone
- Assessment Parcels (MPAC)
- Regional Municipal Boundaries

Unaddressed: Laurelwood Dr, Waterloo

Author: ACameronDocument Path: I:\InfoWater\Modeling Requests\2023\Meritech\Unaddressed Laurelwood Drive\Unaddressed Laurelwood Drive.aprx
Date: 2023-07-28
Time: 11:20 AM