Final Design Brief

Proposed Residential Development 73/79 Sideroad 19

Township of Centre Wellington (Fergus), Ontario

Submitted to:
Wrighthaven Homes Ltd.
925 Gartshore St, Unit 1
Fergus, ON N1M 3V9

Submitted by:
GEI Consultants Canada Ltd.
650 Woodlawn Road W, Block C, Unit 2
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August 5, 2025
Project No. 2401073 / 122025

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Certification

PREPARED BY:
GEI Consultants Canada Ltd.

Parth Lad, E.I.T.
Technical Specialist

CHECKED BY:
GEI Consultants Canada Ltd.

Sarah Primmer, P.Eng.
Senior Project Manager

Record of Revisions

Identification	Date	Description of Issued and/or Revision
1	August 5, 2025	Issued for Site Plan Approval

1. Introduction

GEI Consultants Canada Ltd. have been retained by Wrighthaven Homes Ltd. to complete the detailed site servicing design for the proposed residential development involving properties 73 Sideroad 19 and 79 Sideroad 19 in the Town of Fergus in the Township of Centre Wellington, Ontario (hereafter referred to as the "Site"). The site location is shown on Figure 1 and the Site Plan prepared by GSP Group is included as Figure 2.

This Final Design Brief is accompanied by the Stormwater Management Design Report for 73/79 Sideroad 19 (GEI Consultants Canada Ltd).

1.1. Site Information

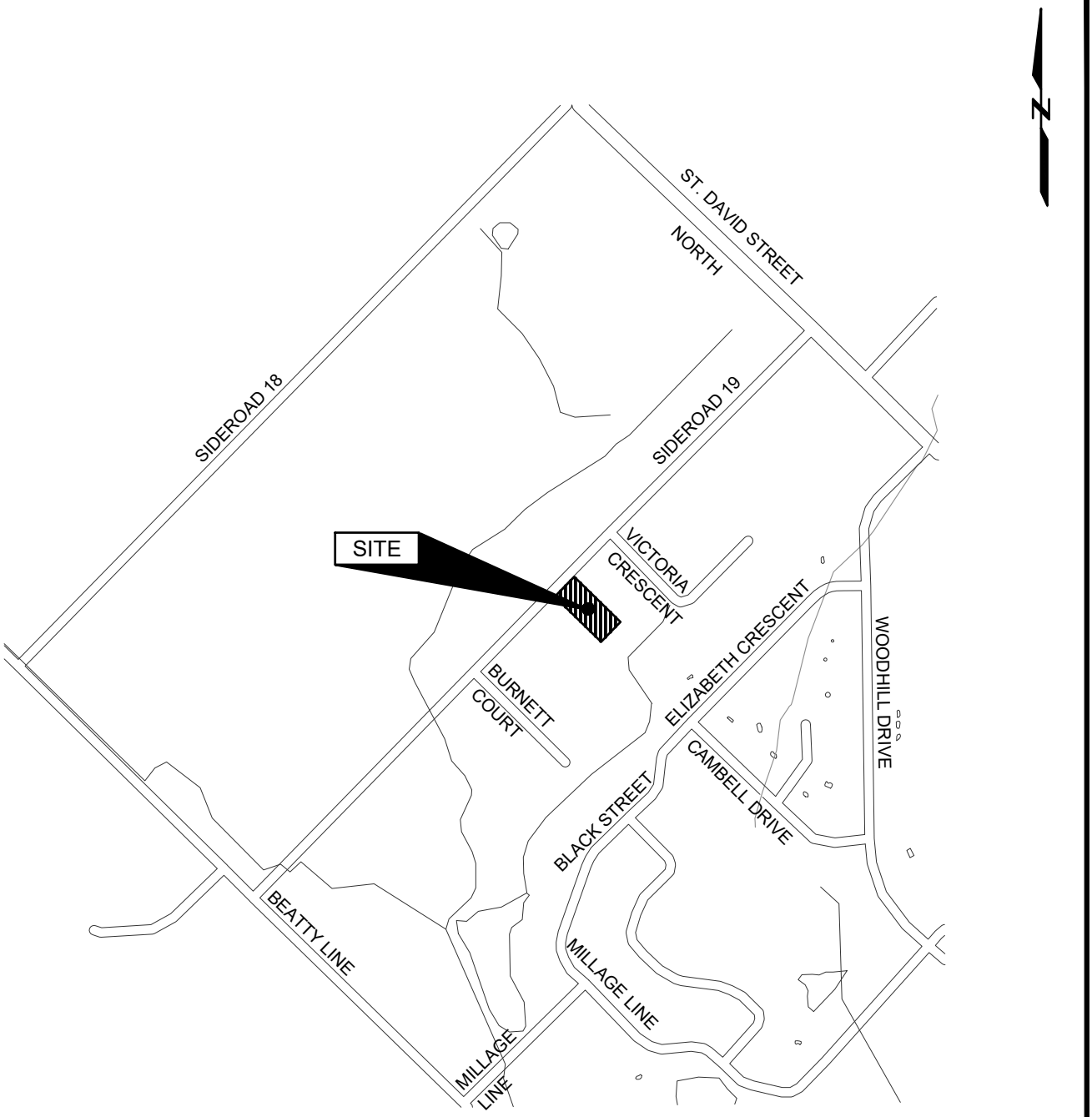
The 1.12-hectare (ha) site is located at 73 and 79 Sideroad 19 in the Town of Fergus in the Township of Centre Wellington. The property is rectangular in shape, with approximately 57m of frontage along Sideroad 19 and a depth of approximately 190m. For the purposes of this report, Sideroad 19 is considered to have a north-south orientation. The Site is bordered by existing residential properties to the north, an existing wetland and residential properties to the east, existing residential properties to the south, and Sideroad 19 to the west.

Topographic survey of the site was completed by Van Harten Surveying Inc., received on August 29, 2022, and March 18, 2024. Topographic survey of the wetland area was also completed by Van Harten Surveying Inc., received on May 23, 2025.

1.2. Report Objectives

The objectives of this report are as follows:

- Document all existing reports and standards within the study area;
- Summarize the proposed development conditions; and,
- Detail and summarize the proposed storm, sanitary and water servicing design.



73/79 SIDEROAD 19 RESIDENTIAL DEVELOPMENT TOWNSHIP OF CENTRE WELLINGTON (FERGUS)	GEI Consultants	LOCATION PLAN
WRIGHTHAVEN HOMES LTD.	Project 2401073	JUNE 2025 Figure No. 1

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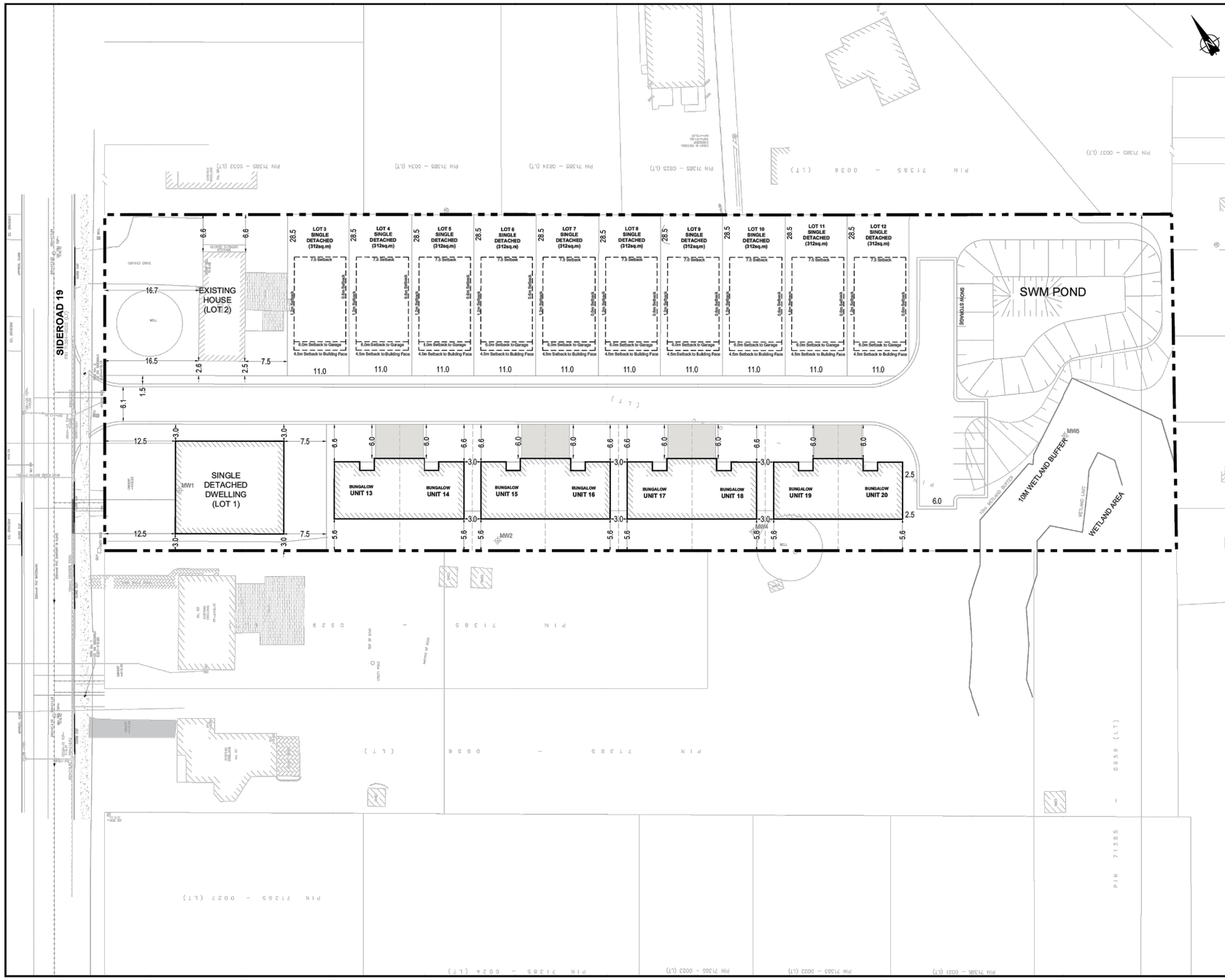
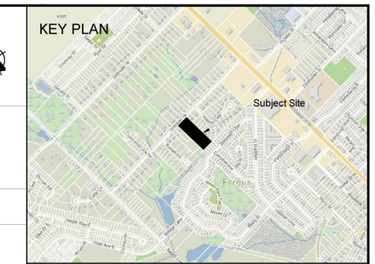




SITE PLAN

Part of Park Lot 10, Registered Plan 71
Township of Centre Wellington
Wellington County

73 & 79, Sideroad 19, Fergus

GSP group
PLANNING I URBAN DESIGN I LANDSCAPE ARCHITECTURE
gspgroup.ca

REVISIONS

Date: May 21, 2025	Drawn By: EF	Dwg. File Name: sp23030k.dwg
Scale: 1:300	Project No.: 23030	

73/79 SIDEROAD 19 RESIDENTIAL DEVELOPMENT
TOWNSHIP OF CENTRE WELLINGTON (FERGUS)

WRIGHTHAVEN HOMES LTD.

GEI Consultants

SITE PLAN

Project 2401073 | JULY 2025 | FIGURE No. 2

LAD, PARTH B:\Working\WRIGHTHAVEN HOMES\2401073 - 122025 079 Sideroad 19 Fergus\5 Work in Progress\Drafting\Figures\122025 Site Plan Figure.dwg - 7/9/2025

2. Reference Information

2.1. Reports and Standards

The proposed site servicing design is based on the following reports, standards, and information prepared by others:

Site Background Reports and Historical Drawings:

- **Geotechnical Investigation**, Proposed Residential Development, 79-87 Side Road 19, Township of Centre Wellington (Fergus), Ontario, Ref. No. G4670-22-12, April 2023, prepared by JLP Services Inc.
- **Reconstruction of Sideroad 19 –** Plan and Profile Sta. 3+530 to Sta. 3+710, prepared by Triton Engineering Services Limited, April 2009**.**
- **Reconstruction of Victoria Crescent –** Plan and Profile Sideroad 19 to Sta. 7+150, prepared by Triton Engineering Services Limited, June 2009**.**

Reference Standards:

- **Development Manual,** Centre Wellington, dated June 2024.

2.2. Soils

Soil Conditions

The soils for the Site are classified as follows:

- The predominant soil type on the Site is a combination of sandy silt, sand and silt (JLP Services, 2023).

The Geotechnical Investigation report by JLP Services Inc. is included in the Stormwater Management Design Report for 73/79 Sideroad 19 (GEI Consultants Canada Ltd).

Groundwater Levels

The groundwater levels observed on Site are as follows:

- Five monitoring wells were installed, resulting in a range of water levels between 414.64m to 417.34m across the Site, based on readings up to May 2025.

Groundwater elevations are shown in Figures 7a and 7b contained in the Hydrogeological Study Report for 73/79 Sideroad 19 (GEI Consultants Canada Ltd).

3. Proposed Development

The proposed site development will contain the following elements:

- A private road for site access, including parking spaces and a turnaround area at the end. The site access road features a 6.1m asphalt width, concrete curb and gutter along both sides and a 1.5m wide concrete sidewalk on one side.
- Ten (10) single-detached dwellings with associated yards and driveways fronting onto the north side of the site access road.
- Eight (8) bungalow units with associated yards and driveways fronting onto the south side of the site access road.
- One (1) single-detached dwelling with associated yard and driveway fronting onto Sideroad 19.
- Servicing and stormwater management infrastructure, including a stormwater management facility. The design of the stormwater management facility is presented in the Stormwater Management Design Report for 73/79 Sideroad 19 (GEI Consultants Canada Ltd).

4. Site Servicing

4.1. Sanitary Servicing

The existing site sanitary sewer servicing is as follows:

- The existing dwelling at 73 Sideroad 19 is serviced by a sewage leaching bed located in the rear yard, which is to be removed. There is also an existing 100mm diameter sanitary service stub from the existing 200mm diameter municipal sanitary sewer on Sideroad 19 to the property line, which is to be removed.
- The existing dwelling at 79 Sideroad 19 is serviced by a sewage leaching bed located in the rear yard, which is to be removed. There is also an existing 100mm diameter sanitary service stub from the existing 200mm diameter municipal sanitary sewer on Sideroad 19 to the property line.

The proposed site sanitary servicing is as follows:

- The extension of a new 100mm diameter sanitary service lateral from the existing 200mm diameter municipal sanitary sewer on Sideroad 19 to the existing dwelling at 73 Sideroad 19.
- The extension of the existing 100mm diameter sanitary service stub from the property line to the proposed dwelling at 79 Sideroad 19.
- The extension of a new 200mm diameter sanitary sewer through the Site from the existing 200mm diameter municipal sanitary sewer on Sideroad 19.
- Individual 100mm diameter sanitary service laterals to each unit from the new sewer. Services installed below groundwater to be furnished with clay cut-off collars or trench plugs at regular spacing.
- Waterproof wrapping applied to all proposed manhole joints where the pipe invert is greater than 0.3m below the seasonal high groundwater level.

Sanitary sewer catchment areas and sanitary sewer design calculations are included in Appendix A.

4.2. Water Servicing

The existing site water servicing is as follows:

- The existing dwelling at 73 Sideroad 19 is serviced by a private domestic water supply well located in the front yard, which is to be decommissioned by a licensed well driller in accordance with Ontario Regulation 903. There is also an existing 20mm diameter water service stub from the existing 200mm diameter municipal watermain on Sideroad 19 to the property line, which is to be removed.
- The existing dwelling at 79 Sideroad 19 is serviced by a private domestic water supply well located in the rear yard, which is to be decommissioned by a licensed well driller in accordance with Ontario Regulation 903. There is also an existing 20mm diameter water service stub from the existing 200mm diameter municipal watermain on Sideroad 19 to the property line.
- An existing fire hydrant is located to the west of the Site, within the western boulevard along Sideroad 19 municipal right-of-way.

The proposed site water servicing is as follows:

- The extension of a new 25mm diameter water service lateral from the existing 200mm diameter municipal watermain on Sideroad 19 to the existing dwelling at 73 Sideroad 19.
- The extension of the existing 20mm diameter water service stub from the property line to the proposed dwelling at 79 Sideroad 19.
- The extension of a new 150mm diameter watermain through the Site from the existing 200mm diameter municipal watermain on Sideroad 19.
- Individual 25mm diameter water services to each unit from the new watermain.
- Two new fire hydrants located along the internal site access road.

4.3. Storm Servicing

The existing site storm servicing is as follows:

- There is an existing storm service stub at 73 Sideroad 19 from the existing 450mm diameter municipal storm sewer on Sideroad 19 to the property line, which is to be removed.
- All on-site runoff, except for the front yard and driveway of the existing dwelling to remain, sheetflows in the easterly direction to the rear of the property towards the wetland. Runoff from the front yard and driveway of the existing dwelling sheetflow in a westerly direction towards the Sideroad 19 right-of-way.
- External drainage north of the Site (Victoria Crescent) flows through a 450mm diameter concrete pipe and ditch on-site that outlets to the wetland.

The proposed site storm servicing is as follows:

- The extension of a new 100mm diameter storm service lateral from the existing 450mm diameter municipal storm sewer on Sideroad 19 to the existing dwelling at 73 Sideroad 19.
- The extension of a new 100mm diameter storm service lateral from the existing 450mm diameter municipal storm sewer on Sideroad 19 to the proposed dwelling at 79 Sideroad 19.
- Lot swales designed to provide conveyance of runoff to the storm sewer system on-site or directly to the wetland.
- New storm sewer and catch basins designed to capture and convey runoff to the proposed stormwater management facility, ultimately discharging from the outlet to the wetland.
- Individual 100mm storm service laterals for sump pump discharge. Services installed below groundwater to be furnished with clay cut-off collars or trench plugs at regular spacing.
- Extending the existing 450mm diameter Victoria Crescent sewer within a 3.0m to 5.0m wide easement located along the north and east limits of the Site, discharging to the existing wetland.
- Waterproof wrapping applied to all proposed manhole joints where the pipe invert is greater than 0.3m below the seasonal high groundwater level.

Storm sewer catchment areas and storm sewer design calculations are included in Appendix B.

5. Site Grading

The site layout for the stormwater management areas and the internal roads is shown on the engineering plans by GEI Consultants Canada Ltd.

The proposed site grading is designed to match the existing elevations along the property limits and to maintain the existing drainage patterns.

Generally, the grade and elevation of the internal streets and proposed lots is governed by the major overland flow routes and the elevation of storm sewers which outlet to the stormwater management facility, which is governed by the available outlet at the wetland.

6. Utilities

The hydro servicing design, including streetlight and transformer locations, will be completed by others. The approximate location of the site lighting (poles and fixtures) has been indicated on the engineering plans by GEI Consultants Canada Ltd.

The detailed site lighting / photometric plan will be provided at a later stage. The site lighting will be designed to ensure zero light trespass over the property line and compliance with Township standards.

The other utilities (communications, cable and gas) will be notified of the development and will complete their designs in conjunction with the hydro servicing design and provider (Hydro One).

7. Conclusions

In summary, the features of the site servicing design for 73/79 Sideroad 19 are as follows:

- Water supply for the proposed development will be provided via a new watermain connected to the existing municipal watermain on Sideroad 19. Two fire hydrants will be provided along the new watermain.
- Sanitary service will be provided via a new sanitary sewer discharging to the existing municipal sanitary sewer on Sideroad 19.
- The storm sewer network has been designed to convey runoff from the 5-year design storm event to the on-site stormwater management facility, ultimately discharging to the wetland.
- Major overland flow from the development will be conveyed via swales and the site access road to the on-site stormwater management facility.
- Utilities design will be completed by others.

Based on the above works, we trust that this is the information required at this time to support approval of the proposed residential development.

Appendix A Sanitary Sewer Design Calculations and Catchment Areas

q = average daily per capita flow (350 L/cap.d)
I = unit of peak extraneous flow (0.15 L/ha/s)
A = Tributary area in gross hectares
M = Peaking factor
Q(p) = peak population flow (L/s)
Q(i) = peak extraneous flow (L/s)
Q(d) = peak design flow

SANITARY SEWER DESIGN

TOWN OF CENTRE WELLINGTON (FERGUS)

73 / 79 Side Road 19 - Residential Development

$M = 1 + \frac{14}{4 + (P)^{1/2}}$ where P is population in 1000's

$Q(p) = \frac{PqM}{86.4}$ (L/s)

Q(i) = IA

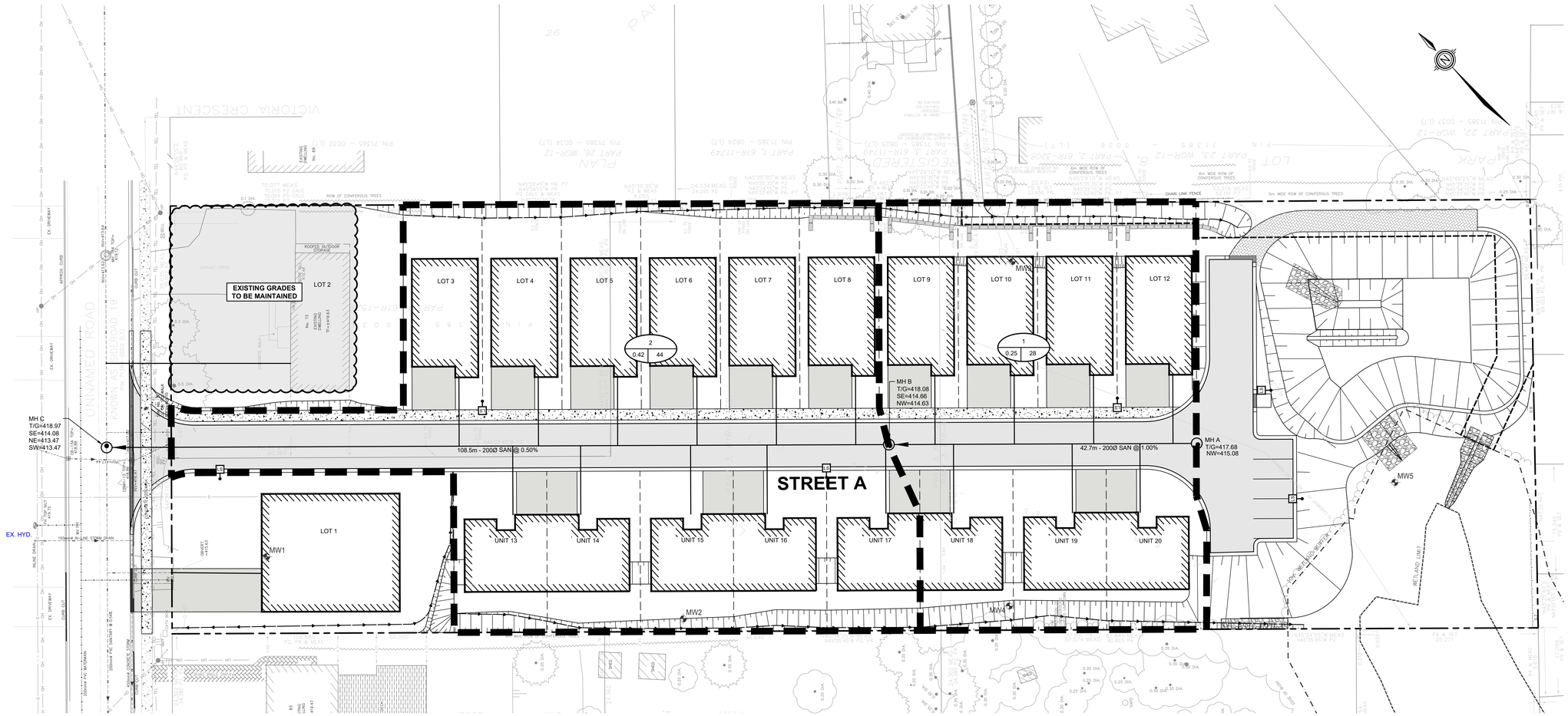
Q(d) = Q(p) + Q(i) (L/s)

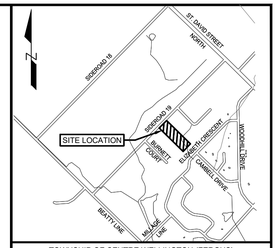
July 10, 2025

Designed By: BL

Checked By:

Location															
From	To	Individual Population	Cumulative Population	Individual Area (ha)	Cumulative Area	Peaking Factor (M)	Pop. Flow Q(p) (L/s)	Peak Extraneous Flow Q(i) (L/s)	Peak Design Flow Q(d) (m3/s)	Pipe Size (mm)	Type of Pipe	Grade %	Capacity (m^3/s)	Full Flow Velocity (m/s)	Actual velocity at Q(d)
Catchment 1	Side Road 19 Ex. Sanitary	28	28	0.25	0.25	4.359	0.49	0.038	0.0005	200	0.013	1.00	0.033	1.044	0.050
Catchment 1	Side Road 19 Ex. Sanitary	44	72	0.42	0.67	4.280	1.25	0.101	0.0013	200	0.013	0.50	0.023	0.738	0.384





TOWNSHIP OF CENTRE WELLINGTON (FERGUS)
N.T.S.

NOTES:

1. TOPOGRAPHIC AND EXISTING FEATURES SURVEY ON-SITE COMPLETED BY VAN HARTEN SURVEYING INC., RECEIVED 2022-08-29 AND 2024-03-18. TOPOGRAPHIC SURVEY OF THE WETLAND AREA WAS ALSO COMPLETED BY VAN HARTEN SURVEYING INC., RECEIVED 2025-05-23.
2. SITE PLAN PREPARED BY GSP GROUP, DATED 2025-05-21.
3. BEARINGS ARE GRID BEARINGS AND ARE DERIVED FROM GPS OBSERVATIONS AND ARE REFERRED TO THE UTM PROJECTION, ZONE 17, NAD 83 (CSRS-2010) ADJUSTMENT (PROVIDED BY VAN HARTEN SURVEYING INC.)
4. DISTANCES SHOWN ON THIS PLAN ARE ADJUSTED GROUND DISTANCES AND CAN BE CONVERTED TO GRID DISTANCES BY MULTIPLYING BY AN AVERAGED COMBINED SCALE FACTOR OF 0.999575. (PROVIDED BY VAN HARTEN SURVEYING INC.)
5. COORDINATES ON THIS PLAN ARE UTM, ZONE 17, NAD83 (CSRS-2010) ADJUSTMENT AND ARE BASED ON GPS OBSERVATIONS FROM A NETWORK OF PERMANENT GPS REFERENCE STATIONS. (PROVIDED BY VAN HARTEN SURVEYING INC.)
6. PROPOSED STREETLIGHT LOCATIONS PER STREET LIGHTING DRAWING PREPARED BY MIGHTON ENGINEERING (PROJECT No. 45173)

CATCHMENT BOUNDARY

200 — CATCHMENT NUMBER
0.75 | 25 — POPULATION
CATCHMENT AREA IN HECTARES

SITE PLAN INFORMATION	SURVEYOR INFORMATION
GSP GROUP 72 VICTORIA STREET SOUTH, SUITE 201 KITCHENER, ON N2G 4Y9 PHONE: (519) 569-8883 WEBSITE: www.gspgroup.ca	VAN HARTEN SURVEYING INC. 2106 GORDON STREET GUELPH, ON, N1L 1G6 PHONE: (519) 821-2763 WEBSITE: www.vanharten.com

BENCHMARKS (PROVIDED BY VAN HARTEN SURVEYING INC.) :

SITE BENCHMARK #1
CUT CROSS ON SIDEWALK NEAR NORTHWEST CORNER OF SUBJECT PROPERTY HAVING AN ELEVATION OF 418.60m.

SITE BENCHMARK #2
CUT CROSS ON SIDEWALK NEAR NORTHEAST CORNER OF SUBJECT PROPERTY HAVING AN ELEVATION OF 419.10m.

No.	DATE	ISSUE/REVISION	INTIAL
3	2025-08-05	ISSUED FOR SITE PLAN APPROVAL	S.P.
2	2024-10-01	ISSUED FOR APPROVAL	A.E.K.
1	2024-09-05	ISSUED FOR REVIEW	A.E.K.

LICENSED PROFESSIONAL ENGINEER
Aug. 5, 2025
S.J. PRIMMER
100141776
PROVINCE OF ONTARIO

TOWNSHIP OF CENTRE WELLINGTON

WRIGHTHAVEN HOMES
079 SIDEROAD 19 RESIDENTIAL DEVELOPMENT
FERGUS, ONTARIO

SANITARY SEWER CATCHMENT AREAS

GEI Consultants Canada

DESIGNED BY: BL/PL	DATE: AUGUST 2025	CHECKED BY: SP
DRAWN BY: BL	PROJECT No. 2401073	DRAWING No. SAN-1
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Appendix B Storm Sewer Design Calculations and Catchment Areas

STORM SEWER DESIGN

5 Year Design

TOWNSHIP OF CENTRE WELLINGTON (FERGUS)

73 / 79 Side Road 19 - Residential Development

Fergus Shand Dam IDF Curves

A = 1459.072

B = 13.69

C= 0.85

Intensity = A / (t + B)^C

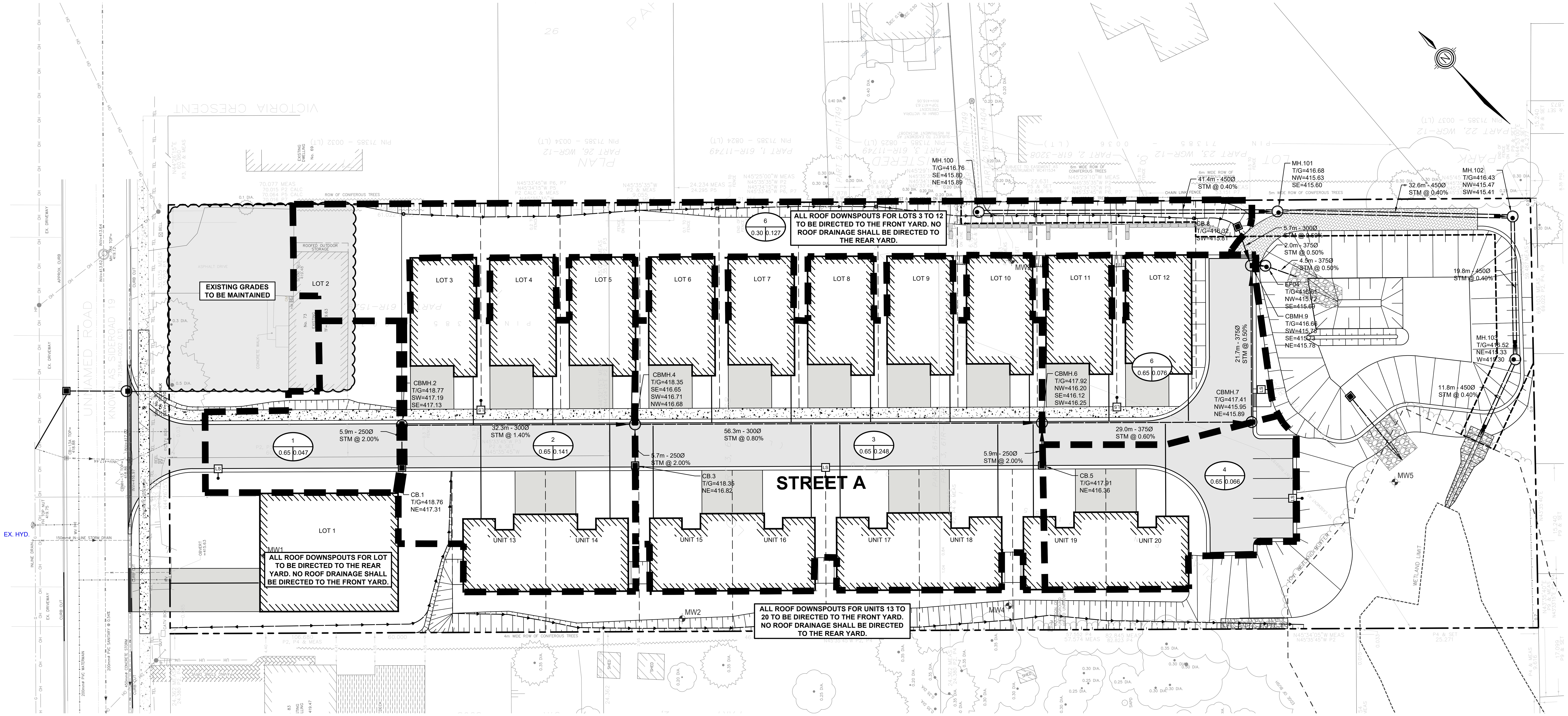
Q = CiA (m^3/s)

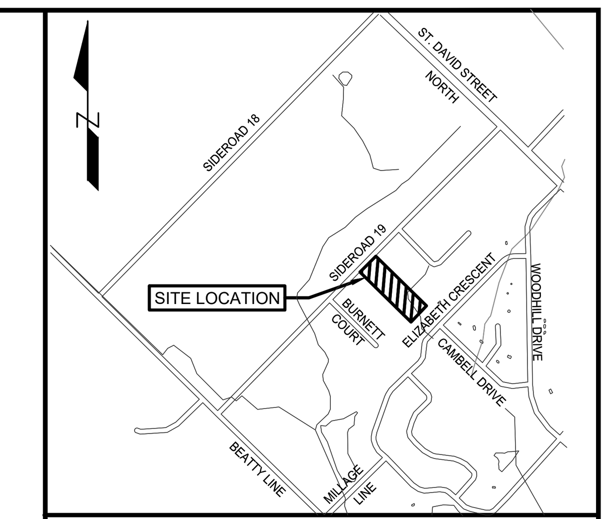
August 2, 2025

Designed By: BL

Checked By: PL

Location			Area (ha)	Runoff Coefficient	A x C	Cumulative A x C	Time of Conc. (min.)	Intensity (mm/hr)	Flow (m^3/s)	Proposed Sewer						
Catchment Area	From	To								Length (m)	Pipe Size (mm)	Type of Pipe	Grade %	Capacity (m^3/s)	Full Flow Velocity (m/s)	Time of Flow (min.)
1	CBMH.2	CBMH.4	0.047	0.65	0.03	0.03	10.00	99.01	0.008	32.3	300	0.013	1.40	0.11	1.62	0.33
2	CBMH.4	CBMH.6	0.141	0.65	0.09	0.12	10.33	97.85	0.033	56.3	300	0.013	0.80	0.09	1.22	0.77
3	CBMH.6	CBMH.7	0.248	0.65	0.16	0.28	11.10	95.27	0.075	29.0	375	0.013	0.60	0.14	1.23	0.39
4	CBMH.7	CBMH.9	0.066	0.65	0.04	0.33	11.49	94.00	0.085	21.7	375	0.013	0.50	0.12	1.12	0.32
5	CB.8	CBMH.9	0.127	0.30	0.04	0.04	10.00	99.01	0.010	5.4	300	0.013	0.50	0.07	0.97	0.09
6	CBMH.9	EFO4	0.076	0.65	0.05	0.41	11.81	92.99	0.107	2.0	375	0.013	0.50	0.12	1.12	0.03
NA	EFO4	SWM Pond	0.000	0.00	0.00	0.41	11.84	92.90	0.107	4.5	375	0.013	0.50	0.12	1.12	0.07





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0.45 — RUN-OFF CO-EFFICENT

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WRIGHTHAVEN HOMES
079 SIDEROAD 19 RESIDENTIAL DEVELOPMENT
FERGUS, ONTARIO

STORM SEWER CATCHMENT AREAS

GEI Consultants Canada

DESIGNED BY: BL/PL	DATE: AUGUST 2025	CHECKED BY: SP
DRAWN BY: BL	PROJECT No. 2401073	DRAWING No. STM-1
SCALE: 1:300		

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