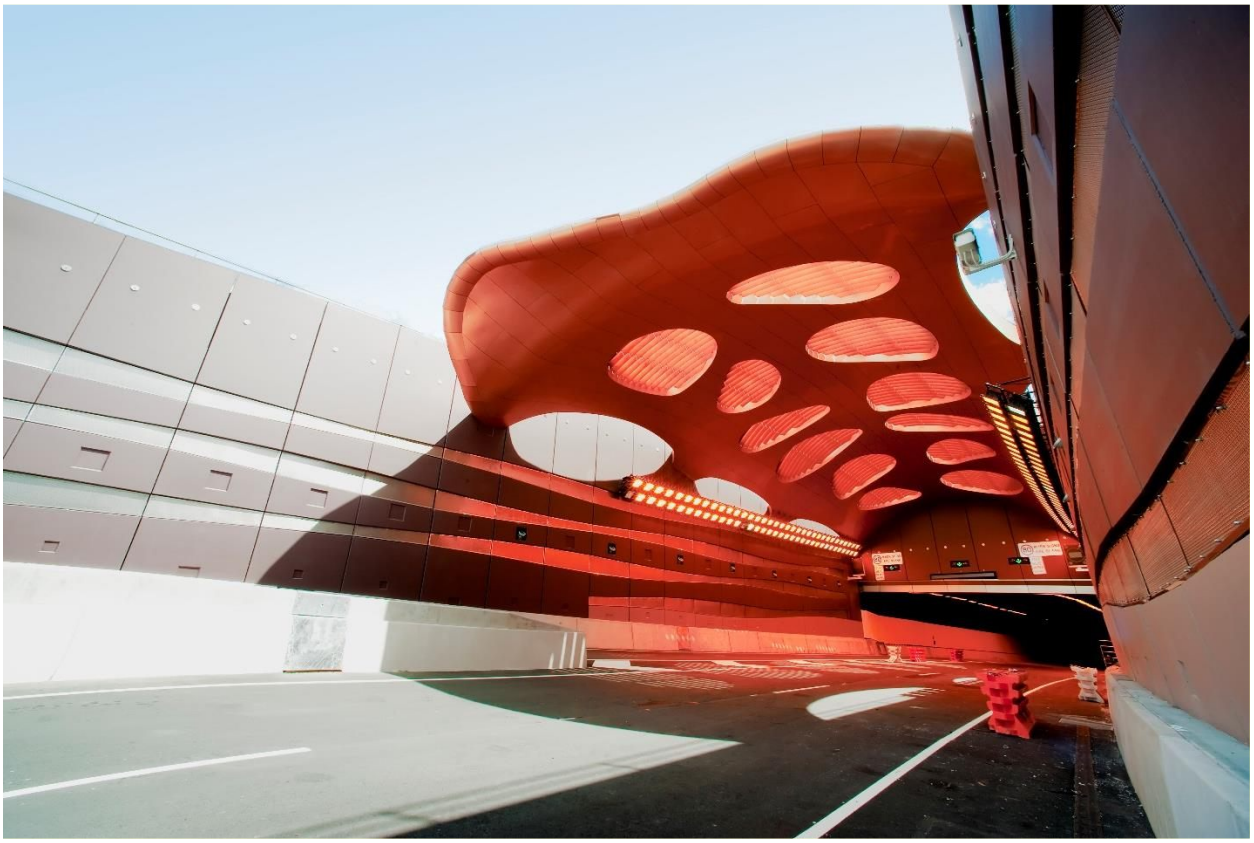
KERBEL GROUP INC.

WEST HOLLAND LANDING SOUTH RETAIL BLOCK

FUNCTIONAL SERVICING REPORT

MARCH 27, 2025

CONFIDENTIAL



SIGNATURES

PREPARED BY

Abilash Sriranganathan
Designer

Jonathan Framil
Designer

REVIEWED BY

Michael E. Oldham, P.Eng.
Vice-President
Land Development & Municipal Engineering Ontario

This report was prepared by WSP Canada Inc. (WSP) for the Client, KERBEL GROUP INC., in accordance with the professional services agreement. The disclosure of any information contained in this report is the sole responsibility of the intended recipient. The material in it reflects WSP's best judgement in light of the information available to it at the time of preparation. Any use which a third party, other than the Town of East Gwillimbury which can rely on this report, makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. WSP accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report. This limitations statement is considered part of this report.

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

1 INTRODUCTION

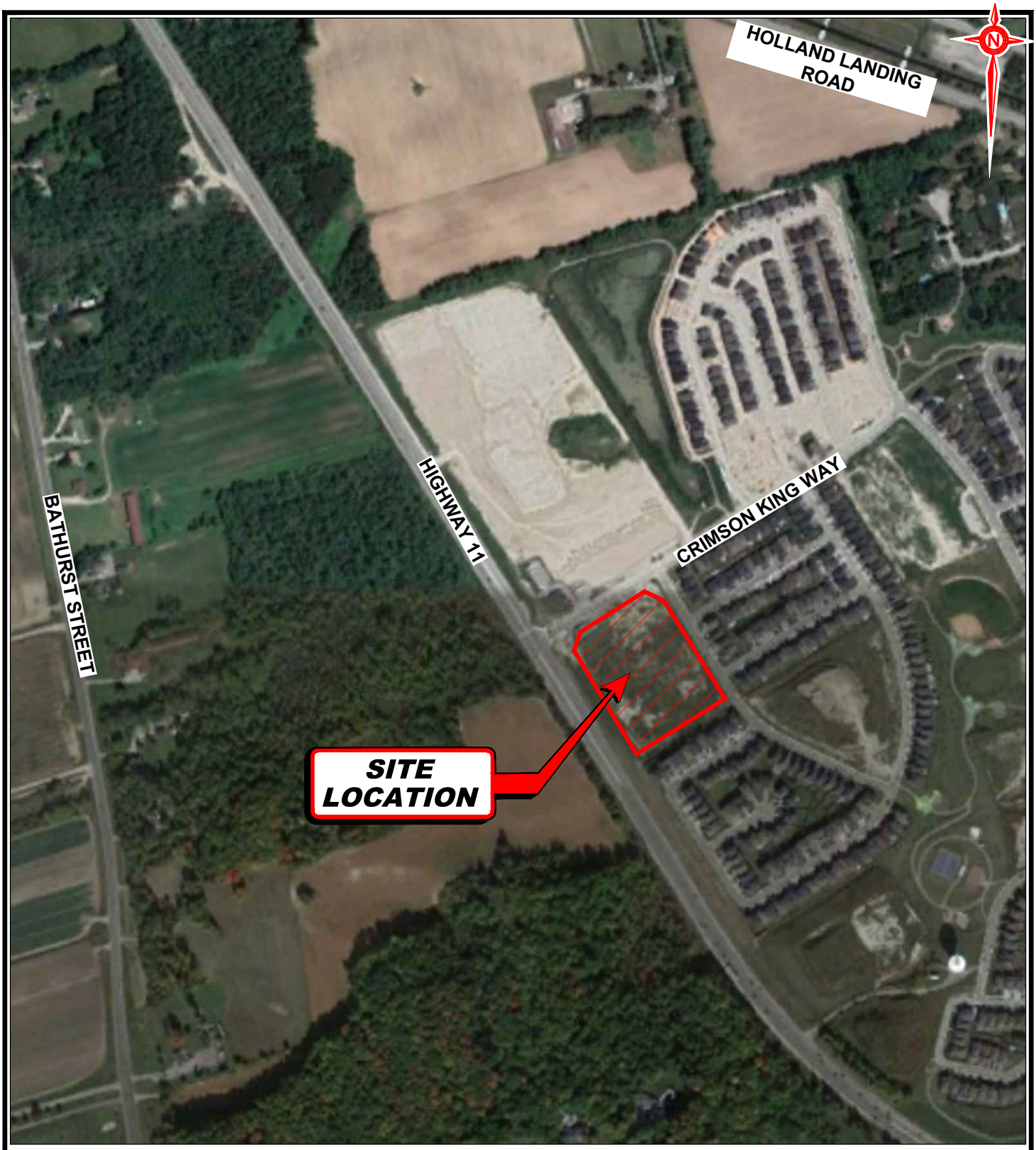
WSP Canada Inc. (WSP) has been retained to prepare a Functional Servicing Report in support of the Zoning By-law Amendment Application to assess the servicing requirements relating to the proposed West Holland Landing South Retail Block commercial development located at the southeast corner of Highway 11 and Crimson King Way in the Town of East Gwillimbury (hereinafter referred to as the "Site"). The subject Site is a partially developed parcel located in an area covered by the previously approved Master Servicing Plan Update (MMM Group Ltd., 2010). This report provides the conceptual framework for water distribution, sanitary sewage and storm drainage for the development of this site. A Stormwater Management (SWM) Report outlining the proposed quality and quantity controls for stormwater on this site has been prepared under a separate cover.

1.1 SITE DESCRIPTION

The Site is located at the southeast corner of Highway 11 and Crimson King Way in the Town of East Gwillimbury. The Site consists of a total of 2.68 ha of land for the commercial development. The Site is currently undeveloped and borders Crimson King Way to the north, Cloverridge Avenue to the east, an existing residential area to the south and Highway 11 to the west. The internal site topography generally slopes from the south to the north towards a temporary erosion and sediment control pond which ultimately discharges to Crimson King Way through an existing ditch-inlet catchbasin (DICB). Please refer to **Figure 1** for the Site Location Plan and **Figure 2** for the Existing Conditions Plan.

The proposed development is to be completed based on the site plan prepared by Baldassara Architects Inc. received November 21, 2024. The proposed Site will encompass an area of 2.68 ha and will include 6 buildings; a one-storey kiosk with a motor vehicle gas bar, a one-storey carwash, a one-storey convenience restaurant with an accompanying drive-through, and 3 (three) one-storey multi-unit employment use buildings, all with at-grade parking. Pedestrian and vehicular access will be provided to the Site from Highway 11 and Crimson King Way.

There is existing water, sanitary and storm lines running adjacent to the Site with existing connections to the property line. There is one existing 250mm diameter sanitary connection to the 250mm diameter sanitary sewer on Crimson King Way, one existing 825mm diameter storm connection to the 900mm diameter storm sewer on Crimson King Way, and an existing 'H' style water service connection with a 200mm diameter fire line and a 100mm diameter domestic line branching from the 300mm watermain on Crimson King Way. There is an existing 900mm/ 1200mm diameter storm sewer located within an existing easement along the western property limit which will be maintained during construction. There is also a 300mm diameter storm sewer along the northwestern portion of the Site which will be removed to accommodate the proposed development. Please refer to **Figure 3** for the Proposed Development Plan.



CLIENT

KERBEL GROUP INC.

TITLE

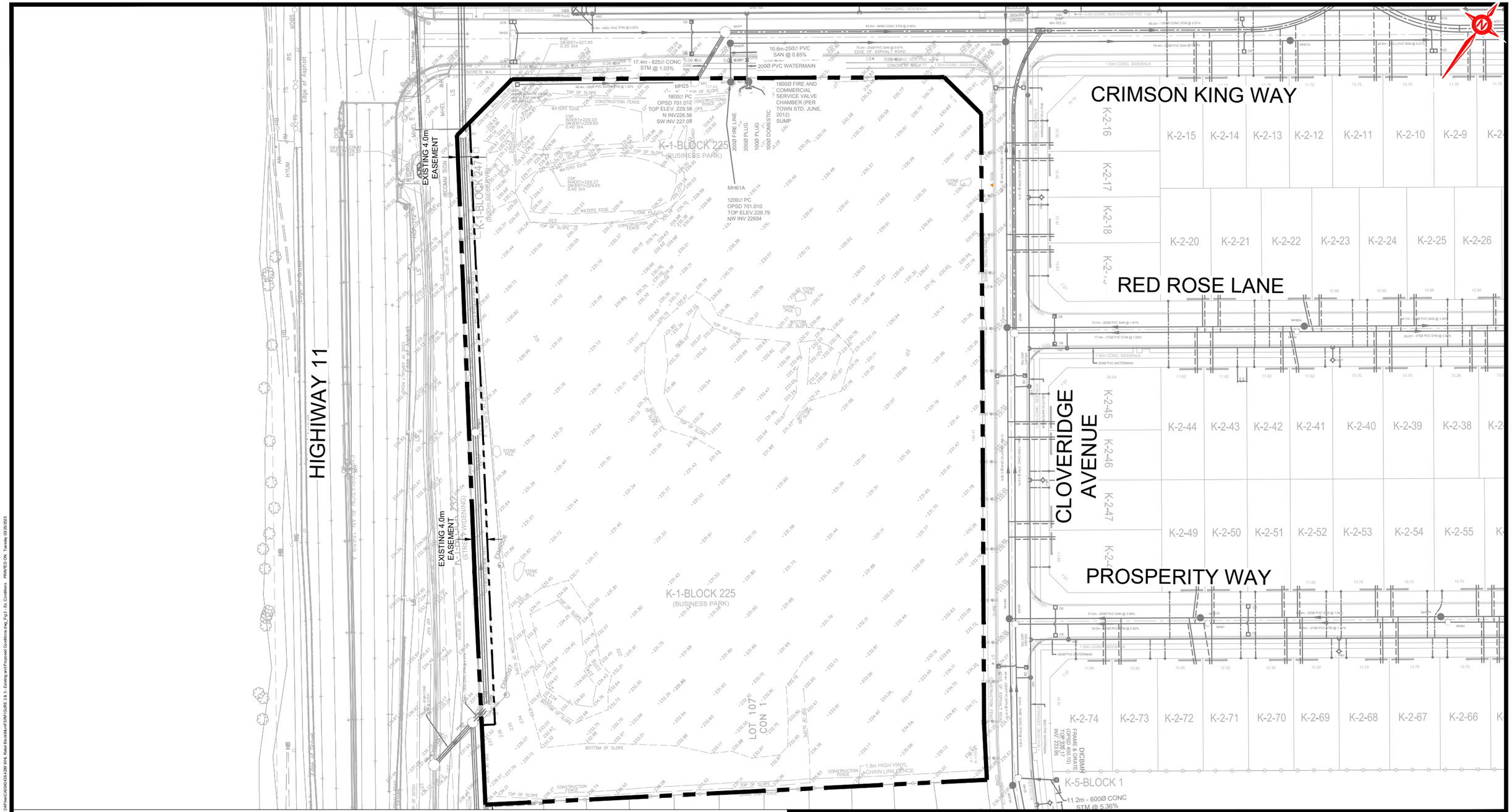
WHL SOUTH RETAIL BLOCK
EAST GWILLIMBURY, ON

SITE LOCATION

wsp
150 Commerce Valley Dr. West, Thornhill, ON Canada L3T 0A1
t: 905.882.1100 f: 905.882.0055 wsp.com

Checked A.S./M.E.O.	Drawn AutoCAD/J.E.F.	
Date MARCH 2025	Proj. No. CA0042438.4289	
Scale N.T.S.	Figure No. 1	Gr.No. 00

FIGURE 1 - Site Location.dwg Fig 1 C:\Users\CAAS077425\DC\ACCDocs\WSP Canada projects (AMER)\LDME ON 24\Files\CA0042438.4289 WHL Retail Block\Mun\FSR\ Mar 25, 2025 - 6:30pm



LEGEND

- PROPERTY LIMITS
- EASEMENT
- EX. WATERMAIN
- EX. SANITARY SEWER
- EX. HYDRANT
- EX. VALVE AND CHAMBER
- EX. SANITARY MANHOLE
- EX. STORM MANHOLE
- EX. STORM SEWER

CLIENT

KERBEL GROUP INC.

TITLE

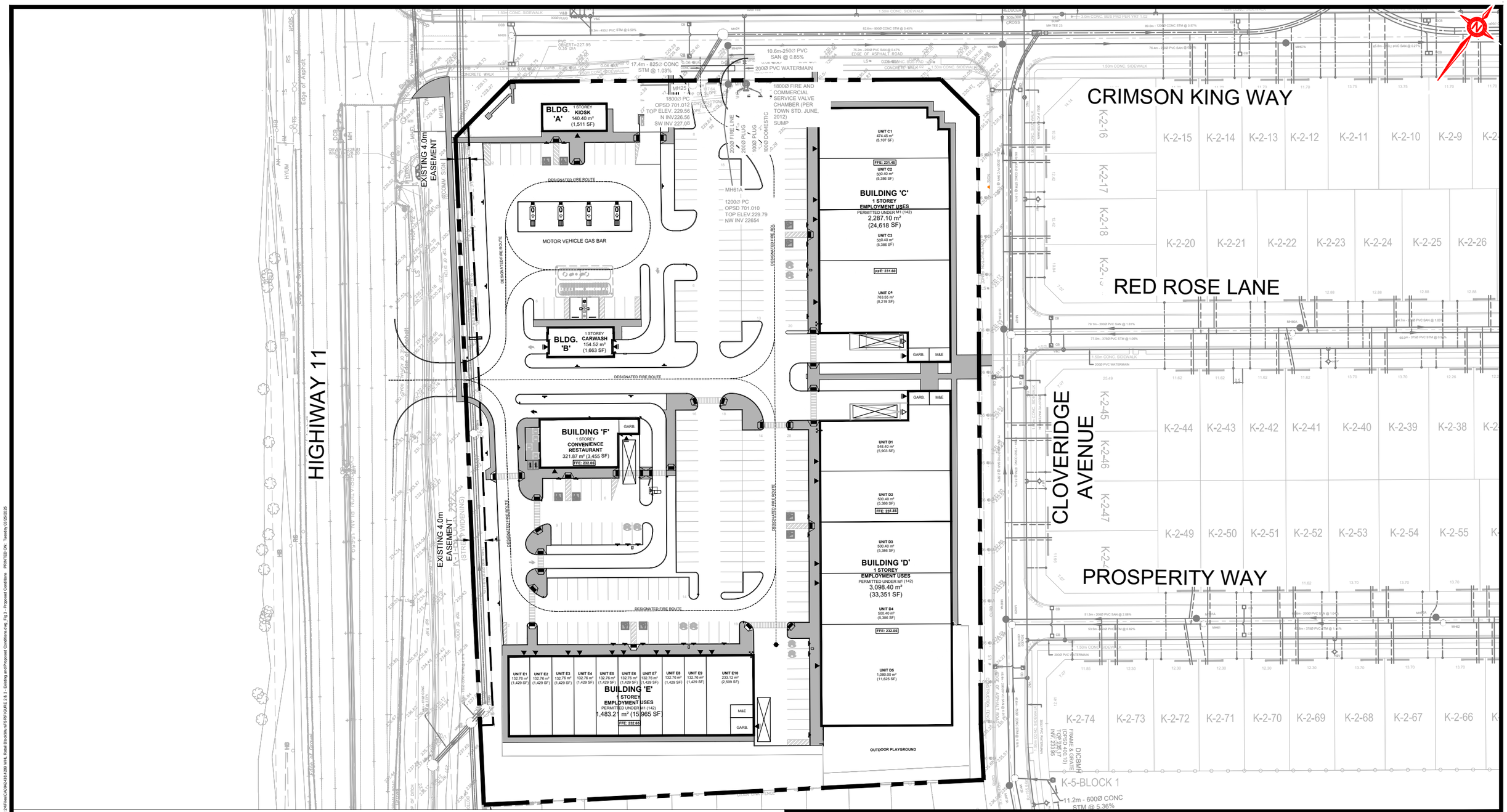
WEST HOLLAND LANDING SOUTH RETAIL BLOCK

EXISTING CONDITIONS

wsp

Checked A.S./M.E.O.	Drawn J.E.F.
Date MARCH 2025	Proj. No. CA0042438.4289
Scale 1:1000	Figure No. 2

FILE NAME: C:\Users\CA0077405\DC\ACCDocs\WSP Canada projects (AMER)\LIOME ON 24Files\CA0042438.4289 WHL Retail Block\Mun\FIGURE 2 & 3 - Existing and Proposed Conditions.dwg, Fig 2 - Ex. Conditions PRINTED ON: Tuesday, 03/25/2025



LEGEND

- PROPERTY LIMITS
- EASEMENT
- EX. WATERMAIN
- EX. SANITARY SEWER
- EX. HYDRANT
- EX. VALVE AND CHAMBER
- EX. SANITARY MANHOLE
- EX. STORM MANHOLE
- EX. STORM SEWER

CLIENT: KERBEL GROUP INC.

TITLE: WEST HOLLAND LANDING SOUTH RETAIL BLOCK

PROPOSED CONDITIONS

Checked: A.S./M.E.O.	Drawn: J.E.F.
Date: MARCH 2025	Proj. No.: CA0042438.4289
Scale: 1:1000	Figure No.: 3

FILE NAME: C:\Users\CA\577420\DOCS\CD\xxx\WSP Canada projects (AMER)\LDN\E ON 24F\ent\CA0042438.4289 WHL Retail Block\Mxd\FIRST\FIGURE 2 & 3 - Existing and Proposed Conditions.dwg, Fig 3 - Proposed Conditions PRINTED ON: Tuesday 03/25/2025

1.2 DESIGN GUIDELINES AND BACKGROUND DOCUMENTATION

The following documents were consulted, and the guidelines therein followed in the preparation of this report:

- Town of East Gwillimbury Engineering Standards and Design Criteria (September 2012);
- Stormwater Management Report – Holland Green Subdivision by Valdor Engineering Inc. dated August 2016;
- Various record drawings over neighbouring developed lands provided by Valdor Engineering Inc;
- West Holland Landing Residential Subdivision As-Constructed Drawings prepared by WSP dated January 2017; and,
- West Holland Landing Kerbel and LRT As-Constructed Storm & Sanitary Sewer Design Sheets prepared by WSP dated Nov 23, 2020.

2 WATER SUPPLY

2.1 EXISTING CONDITIONS

Water supply for the proposed development is available from the Town's existing water distribution system.

The following list shows all the existing watermains available near the project Site:

- 300mm diameter watermain on Crimson King Way; and
- 300mm diameter watermain on Clover Ridge Avenue.

There is an existing 200mm fire and 100mm domestic service connection to the Site which connects to the existing 300mm watermain on Crimson King Way. The existing water service connections are complete with an existing 1800mm diameter fire and commercial service valve chamber.

2.2 POST DEVELOPMENT – DOMESTIC WATER DEMANDS

The domestic water demand for the proposed development has been evaluated using two methodologies. Methodology #1 calculates the proposed domestic water demand for each of the buildings within the Site based on the design criteria specified in the *Town of East Gwillimbury Engineering Standards and Design Criteria* (September 2012). Methodology #2 calculates the proposed domestic water demand for each of the buildings within the Site by taking into account each building's specific use. Past projects and neighbouring municipality standards have been used to obtain the required building-use specific design criteria.

2.2.1 METHODOLOGY #1 – TOWN OF EAST GWILLIMBURY DESIGN CRITERIA WATER DEMANDS

The domestic water demand for the proposed development for Methodology #1 has been evaluated using the *Town of East Gwillimbury Engineering Standards and Design Criteria* (September 2012). The following design parameters have been used to determine the water requirements for this project:

- Average Day Demand of 28,000 L/ha/day for commercial;
- Maximum Day Demand is 2.0 times the Average Day Demand;
- Peak Hour Demand is 2.75 times the Average Day Demand; and
- Equivalent Population Density of 50 persons per hectare of GFA for commercial developments;

The estimated domestic water demands for each building using Methodology #1 are summarized in **Table 2-1**.

Table 2-1: Methodology #1 - Town of East Gwillimbury Design Criteria Water Demands

	Total Industrial/ Commercial Area (m^2)	Total Population	Average Day Water Demand (L/s)	Maximum Day Demand (L/s)	Peak Hour Demand (L/s)
Building A - Motor Vehicle Gas Bar - Kiosk	140.4	1	0.005	0.01	0.01
Building B – Car Wash	154.5	1	0.01	0.01	0.01
Building C – Multi-unit Employment Uses	2287.1	12	0.07	0.15	0.20
Building D – Multi-unit Employment Uses	3098.4	16	0.10	0.20	0.28
Building E – Multi-unit Employment Uses	1483.2	8	0.05	0.10	0.13
Building F – Convenience Restaurant	321.9	2	0.01	0.02	0.03
Total	**7485.5**	**40**	**0.24**	**0.49**	**0.67**

As seen in **Table 2-1**, the estimated average demand for the Site using the Town of East Gwillimbury Criteria is 0.24 L/s, the maximum day demand is 0.49 L/s and the peak hour demand is 0.67 L/s. The detailed domestic demand calculations are included in **Appendix A**.

2.2.2 METHODOLOGY #2 – BUILDING-USE SPECIFIC WATER DEMANDS

The domestic water demand for the proposed development for Methodology #2 has been evaluated using the *Town of East Gwillimbury Engineering Standards and Design Criteria* (September 2012), design rates obtained from previous projects as well as *the Town of Whitchurch-Stouffville Water and Wastewater Master Plan Study* (March 2023). The following design parameters have been used to determine the water requirements for this project:

- Average Day Demand of 28,000 L/ha/day for commercial (Buildings A, C, D & E);
- Maximum Day Demand is 2.0 times the Average Day Demand (All buildings);
- Peak Hour Demand is 2.75 times the Average Day Demand (All buildings);
- Equivalent Population Density of 50 persons per hectare of GFA for commercial developments (All buildings);
- Average Day Demand of 726,990 L/ha/day for the car wash (Building B) – Obtained from previous projects; and
- Average Day Demand of 60L/m^2/day for the convenience restaurant (Building F) – Obtained from the *Town of Whitchurch-Stouffville Water and Wastewater Master Plan Study* (March 2023);

The estimated domestic water demands for each building using Methodology #2 are summarized in **Table 2-2**.

Table 2-2: Methodology #2 - Building-Use Specific Water Demands

	Total Industrial/ Commercial Area (m^2)	Total Population	Average Day Water Demand (L/s)	Maximum Day Demand (L/s)	Peak Hour Demand (L/s)
Building A - Motor Vehicle Gas Bar - Kiosk	140.4	1	0.005	0.01	0.01
Building B – Car Wash	154.5	1	0.13	0.26	0.36
Building C – Multi-unit Employment Uses	2287.1	12	0.07	0.15	0.20
Building D – Multi-unit Employment Uses	3098.4	16	0.10	0.20	0.28
Building E – Multi-unit Employment Uses	1483.2	8	0.05	0.10	0.13
Building F – Convenience Restaurant	321.9	2	0.22	0.45	0.61
Total	**7485.5**	**40**	**0.58**	**1.16**	**1.61**

As seen in **Table 2-2**, the estimated average demand for the Site taking into account each building's specific use is 0.58 L/s, the maximum day demand is 1.16 L/s and the peak hour demand is 1.61 L/. The detailed domestic demand calculations are included in **Appendix A**.

The estimated water demands using Methodology #2 results in higher values than the estimated water demands using Methodology #1. Additionally, Methodology #2 takes into account each building's specific use, therefore resulting in a more realistic estimate. As such, the water demands calculate using Methodology #2 governs the domestic water demand for the Site.

2.2.3 FIRE FLOWS

A detailed fire flow calculation has been prepared for each building using the recommendations of the Water Supply for Public Fire Protection, 1999 – Fire Underwriters Survey (FUS). The fire flow calculations are based on the proposed buildings being fire resistive with vertical opening and exterior vertical communications being adequately protected (one hour fire rating), buildings C, D, and E, exclusively having automatic sprinkler protection (meeting NFPA 13 and other NFPA sprinkler standards), building separation distance, and factoring each building's respective occupancy fire hazard rating. The calculations consider the total floor area of the building. A summary of the fire flow calculations can be found in **Table 2-3**.

Table 2-3: Fire Flow Summary

	Total Commercial Area (m^2)	Occupancy Fire Hazard Rating	Fire Flow Demand (L/m)
Building A - Motor Vehicle Gas Bar - Kiosk	140.4	Rapid Burning (+25%)	3000
Building B – Car Wash	154.5	Free Burning (+15%)	3000
Building C – Multi-unit Employment Uses	2287.1	Combustible (+0%)	6000
Building D – Multi-unit Employment Uses	3098.4	Combustible (+0%)	**9000**
Building E – Multi-unit Employment Uses	1483.2	Combustible (+0%)	5000
Building F – Convenience Restaurant	321.9	Free Burning (+15%)	3000

Note: The fire flow demand for the proposed development area was computed using the Fire Flow Calculation Procedure per Water Supply for Public Fire Protection, 1999 by Fire Underwriter Survey, p 20.

As seen in **Table 2-3**, The fire flow calculations indicate that the maximum recommended fire flow is governed by Building D , which requires a flow of 2,377.55 USGPM (9,000 L/min). This considers the worst-case scenario and generates a flow rate less than the Town of East Gwillimbury's fire flow demand of 12,000 L/min (200 L/s) for employment developments. Therefore, the demand calculated using the FUS is not the governing fire flow, and the flow of 12,000 L/min (200 L/s) is required based off Section H of The Town of East Gwillimbury Engineering Standards and Design Criteria (September 2012) . The fire flow calculations are included in **Appendix A**.

2.3 WATERMAIN APPURTENANCES

The proposed development area will be serviced by the existing H-style 200mm diameter fire and 100mm diameter domestic service connections from the 300mm diameter watermain on Crimson King Way. There is an existing 1800mm diameter fire and commercial service valve chamber per Town Standards at the existing watermain connection for the site. A 200mm diameter fire line and a 100mm diameter domestic line is proposed to service the development area, which will tie into the aforementioned existing H-style 100mm diameter domestic and 200mm diameter fire service connections.

A separate domestic and fire service connection is proposed for each building. The water service locations for each building will be connected through the building's designated mechanical room. Water service connections to the proposed buildings will be in accordance with the Town of East Gwillimbury's engineering standards. A separate water meter is to be proposed for each building , with backflow preventers and double check valve assemblies to be provided within the mechanical room for the domestic water service, in accordance with Town standards.

Fire hydrants will be proposed along the parking lots with a maximum spacing of 90m as per the Town's requirements for commercial areas. There are two existing hydrants on Crimson King Way and two existing hydrants on Cloverridge Avenue adjacent to the Site which will be utilized to provide the required coverage for the proposed development. Building code requirements stipulate that each building is to be serviced by a fire hydrant which is located no more than 45 m away from the building's siamese connection. The proposed and existing hydrants will be located within 45 m of the

buildings proposed siamese connection. The location and size of the proposed watermain network is shown on the **Site Servicing Plan (Drawing SS1)** included in **Appendix B.**

2.4 HYDRANT FLOW TEST

A hydrant flow test was completed on June 3, 2022, indicating an available flow rate of 2500 USGPM (158 L/s) at 20psi. The Town's criteria indicates that the under normal conditions of maximum day and fire flow demands, the pressure should not drop below 275 kPa (40 psi).

As discussed in **Section 2.2.3** and **Section 2.2.2**, the FUS fire flow rate for the site was calculated to be 2,377.56 GPM (150 L/s) and the maximum day flow for the site is 1.16 L/s, however since the calculated FUS fire flow rate falls below the minimum FUS flow rate of 200 L/s (12,000 L/m) for employment areas, a value of 200 L/s must be used. Therefore, the maximum day flow plus fire flow demand for the proposed development is 201.16 L/s. As such, pressure booster systems will be provided internal to the proposed buildings to ensure adequate water pressure is provided under the fire flow condition to meet OBC requirements. The pressure booster system will be coordinated with the Mechanical Consultant to meet OBC. Based on the proposed design, there is sufficient water pressure within the existing water distribution network in the West Holland Landing residential subdivision to support the proposed development. It is recommended to complete an updated hydrant flow test to reflect current flows and pressure conditions. Detailed results are included in **Appendix C**.

3 SANITARY SEWAGE SYSTEM

3.1 EXISTING CONDITIONS

The following list shows all the existing sanitary sewers available near the project site:

- 250mm diameter sanitary sewer on Crimson King Way; and
- 200mm diameter sanitary sewer on Clover Ridge Avenue.

The existing sanitary service connection to the site drains to an existing 250 mm diameter sanitary sewer within Crimson King Way. The existing 250mm sanitary sewer flows east along Crimson King Way and drains north to Holland Landing Road and continues north to Bradford Street and then east to the existing pumping station.

3.2 POST DEVELOPMENT - SANITARY DESIGN FLOWS

Similar to the water demand, the sanitary design flows for the proposed development have been evaluated using two methodologies. Methodology #1 calculates the proposed sanitary design flows for each of the buildings within the Site based on the design criteria specified in the *Town of East Gwillimbury Engineering Standards and Design Criteria* (September 2012). Methodology #2 calculates the proposed sanitary design flow for each of the buildings within the Site by taking into account each building's specific use. Past projects and the Ontario Building Code (OBC) have been used to obtain the required building-use specific design criteria.

3.2.1 METHODOLOGY #1 – TOWN OF EAST GWILLIMBURY DESIGN CRITERIA SANITARY DESIGN FLOWS

The sanitary design flows for the proposed development for Methodology #1 has been evaluated using the *Town of East Gwillimbury Engineering Standards and Design Criteria* (September 2012). The following design parameters have been used to determine the water requirements for this project:

- Sanitary generation rate of 28,000 L/ha/day for commercial;
- Equivalent Population Density of 50 persons per hectare of GFA for employment areas; and
- Infiltration flow rate of 0.286 L/s/ha;

The estimated sanitary design flows for each of the buildings using Methodology #1 are summarized in **Table 3-1**.

.

Table 3-1: Methodology #1 - Town of East Gwillimbury Design Criteria Sanitary Design Flows

	Total Commercial Area (m^2)	Total Population	Average Demand (L/s)	Infiltration Allowance (L/s)	Site Design Flow (L/s)
Building A - Motor Vehicle Gas Bar - Kiosk	140.4	1	0.005	-	0.005
Building B – Car Wash	154.5	1	0.005	-	0.005
Building C – Multi-unit Employment Uses	2287.1	12	0.074	-	0.074
Building D – Multi-unit Employment Uses	3098.4	16	0.100	-	0.100
Building E – Multi-unit Employment Uses	1483.2	8	0.048	-	0.048
Building F – Convenience Restaurant	321.9	2	0.010	-	0.010
Site Area (ha)	2.68			0.77	0.77
Total	**7,485.5**	**40**	**0.25**	**0.77**	**1.02**

As seen in **Table 3-1**, the estimated sanitary design flow for the Site using the Town of East Gwillimbury Criteria is 1.02 L/s. The detailed sanitary design flow calculations are included in **Appendix D**.

3.2.2 METHODOLOGY #2 – BUILDING-USE SPECIFIC SANITARY DESIGN FLOWS

The sanitary design flows for the proposed development for Methodology #2 has been evaluated using the *Town of East Gwillimbury Engineering Standards and Design Criteria* (September 2012), design rates obtained from previous projects as well as design rates specified in the Ontario Building Code (OBC). The following design parameters have been used to determine the water requirements for this project:

- Sanitary generation rate of 28,000 L/ha/day for commercial (Buildings C, D, E);
- Equivalent Population Density of 50 persons per hectare of GFA for employment areas (All buildings);
- Infiltration flow rate of 0.286 L/s/ha;
- Sanitary generation rate of 950 L/day/ water closet for the kiosk (Building A) – Obtained from the Ontario Building Code (OBC)
- Sanitary generation rate of 560 L/day/ fuel outlet for the kiosk (Building A) – Obtained from the Ontario Building Code (OBC)
- Sanitary generation rate of 726,990 L/ha/day for the car wash (Building B) – Obtained from previous projects; and
- Sanitary generation rate of 190 L/m^2/day for the convenience restaurant (Building F) – Obtained from previous projects;

The estimated sanitary design flows for each of the buildings using Methodology #2 are summarized in **Table 3-2.**

Table 3-2: Methodology #2 - Building-Use Specific Sanitary Design Flows

	Total Commercial Area (m^2)	Total Population	Average Demand (L/s)	Infiltration Allowance (L/s)	Site Design Flow (L/s)
Building A - Motor Vehicle Gas Bar - Kiosk	140.4	1	0.074	-	0.074
Building B – Car Wash	154.5	1	0.130	-	0.130
Building C – Multi-unit Employment Uses	2287.1	12	0.074	-	0.074
Building D – Multi-unit Employment Uses	3098.4	16	0.100	-	0.100
Building E – Multi-unit Employment Uses	1483.2	8	0.048	-	0.048
Building F – Convenience Restaurant	321.9	2	0.708	-	0.708
Site Area (ha)	2.68			0.77	0.77
Total	**7,485.5**	**40**	**1.14**	**0.77**	**1.91**

As seen in **Table 3-2**, the estimated sanitary design flow for the Site taking into account each building's specific use is 1.91 L/s. The detailed sanitary design flow calculations are included in **Appendix D**. The estimated sanitary design flows using Methodology #2 results in higher values than the estimated sanitary design flows using Methodology #1. Additionally, Methodology #2 takes into account each building's specific use, therefore resulting in a more realistic estimate. As such, the sanitary design flows calculated using Methodology #2 governs the sanitary design flows for the Site.

A sanitary sewer analysis was completed by WSP Canada as part of the approved West Holland Landing Residential Subdivision to assess the impact of the subdivision development on the downstream existing West Holland Landing Road trunk sewer. Based on the approved Sanitary Drainage Plan for the West Holland Landing Residential Subdivision prepared by WSP Canada dated January 2017, the Site falls within the sanitary drainage area for the West Holland Landing Road trunk sewer. The approved sanitary sewer analysis accounted for a total sanitary flow of 5.77 L/s from the Site. The approved Sanitary Drainage Plan is included in **Appendix E**.

The proposed development is expected is generate lower sanitary flows than the original flow accounted for the Site. The sanitary design flow for the proposed development is 1.91 L/s. As such, the original sanitary sewer analysis (as part of the subdivision design) estimated flows that are 3.86 L/s greater than the sanitary design flow for the Site. Therefore, there is downstream capacity to support to the proposed development.

3.3 PROPOSED SANITARY SERVICE CONNECTIONS

The internal sanitary network will generally flow from the south to the north and will follow the north driveway of the Site with a minimum pipe size of 200mm. Flows from the Site will connect into the existing sanitary manhole on the property line along Crimson King Way and will flow east along the sewer Crimson King Way. All flows are ultimately conveyed to the existing sanitary sewer on Holland Landing Road, which ends up at the existing pumping station on Bradford Street. The existing sanitary manhole along the property line will be maintained and will be used to service the proposed

development. Refer to the **Site Servicing Plan (Drawing SS1)** in **Appendix B** for the Site Servicing Plan.

A separate sanitary service connection is proposed for each building. Proposed sanitary sewage piping within the buildings will be designed by the site mechanical consultant to meet Ontario Plumbing Code Standards. All local sanitary sewers and service connections into the buildings will be per the Town of East Gwillimbury's standards.

4 STORM SEWAGE SYSTEM

A Stormwater Management Report for this development has been prepared by WSP under separate cover. It identifies the stormwater quantity and quality controls under which this site will operate to comply with the above noted guidelines.

4.1 EXISTING CONDITIONS

The following list shows all the existing storm sewers available near the project site:

- 450mm/ 900mm/ 1200 mm diameter storm sewer on Crimson King Way;
- 750mm / 825mm diameter storm sewer on Clover Ridge Avenue;
- 900mm/ 1500mm diameter storm sewer within an easement along the southwestern limits of the Site; and
- 300mm diameter storm sewer within the northwestern limits of the Site.

Under existing conditions, the site is currently undeveloped and generally slopes from the south to the north towards a temporary ECS pond which ultimately discharges to Crimson King Way through an existing DICB. Overland flow is directed towards Crimson King Way and ultimately outlets to the stormwater management pond northeast of the site. Based on the approved Storm Drainage Plan for the West Holland Landing Residential Subdivision prepared by WSP Canada dated January 2017, the drainage boundary with an area of 2.96ha encompasses the Site and includes a small portion of external area from the resident subdivision to the southeast. As stated in the approved Storm Drainage Plan, the 100-yr runoff will be controlled to the 5-yr design rate of 0.779 m^3/s. The approved Storm Drainage Plan is included in **Appendix F**.

4.2 PROPOSED STORM SERVICING

As mentioned in **Section 1.1**, the Site will consist of 8 proposed buildings including private driveways and at-grade parking. Quantity control will be provided though roof top controls and roof top storage within Buildings C, D and E to reduce peak flows entering the storm sewers. The roof top control and roof top storage will be coordinated with the mechanical consultant. Further quantity control will be provided through the proposed SWM chamber fronting Building C prior to outletting to the storm sewers on Crimson King Way. Water balance requirements will be achieved by collecting clean roof runoff from Buildings D, E and F and directing them to the proposed subsurface infiltration chamber fronting Building E. Runoff from all at-grade areas will be collected through catchbasins, double catchbasins and ditch-inlet catchbasins throughout the Site and will be directed to the proposed water quality unit prior to outletting into the proposed SWM chamber. Flows from the site ultimately discharge to the existing stormwater management pond northeast of the Site, through the storm sewers on Crimson King Way. The existing pond provides phosphorous removal, erosion control and water quality treatment for the proposed development as part of the previously approved design.

For future details regarding the proposed storm servicing, refer to the Stormwater Management Report prepared by WSP under a separate cover. It is proposed to have a storm sewer within the private roads to service the buildings and private roads. The storm sewer within the private roads will be constructed to Town of East Gwillimbury standards. Refer to the **Site Servicing Plan (Drawing SS1)** in **Appendix B** for the layout of the Site Servicing Plan.

4.3 MINOR/MAJOR STORM DRAINAGE SYSTEM

All storm flows will be collected by on site by roof service connections, catchbasins/ double catchbasins, catchbasin/ double catchbasin manholes and trench drains and directed to the proposed SWM chamber. The proposed SWM Chamber will attenuate the 100-yr flows to the 5-yr flows as dictated by the previously approved design. The Site's internal storm sewers are sized to convey storms up to the 100-year storm event. For storm events in excess of the storm sewers (100 year event), the grading design is prepared such that the surface (i.e. roads, and landscape area) will direct surface drainage away from the proposed and existing buildings to the driveway entrance to Crimson King Way, which ultimately outlet to the existing stormwater management pond.

Refer to **Site Servicing Plan (Drawing SS1)** in **Appendix B** for the Site Servicing Plan for the storm sewer layout and refer to the Stormwater Management Report prepared by WSP under a separate cover.

5 ROADS AND SITE GRADING

5.1 ROAD LAYOUT

As shown on the **Site Grading Plan (Drawing SG1)** in **Appendix G,** the proposed development is serviced by private driveways roads. Access to the site is provided from via Crimson King Way to the northwest and from Highway 11 from the southwest.

The pavement design of the commercial laneways follows a reverse “crowned” cross-section.

5.2 GRADING

The grading design will comply with Town of East Gwillimbury Standards and will be designed to achieve the following:

- Maintain existing overland flow routes through the site;
- Maintain perimeter grades;
- Optimize earthworks i.e. minimize the quantity of surplus materials to be exported;
- Minimize impact on building construction;
- Provide adequate cover for underground services;
- Accommodate stormwater management requirements;

The proposed grading for the site will, where possible, generally follow the existing grades to maintain drainage patterns. Minor storm drainage (5 year to 100-year storm event) is to be conveyed towards catch basins and catch basin manholes which conveys flows to the proposed SWM Chamber.

Major storm drainage (greater than the 100-year storm event) is provided to direct drainage away from proposed and existing structures to approved outlet points. Private roads will be designed with a minimum longitudinal grade of 0.5% and a maximum grade of 5.0%. Refer to the **Site Grading Plan (Drawing SG1)** included in **Appendix B.**

During detail design, further coordination with the stormwater management consultant, landscape consultant and mechanical engineer will be necessary to ensure grading initiatives support stormwater management and landscape objectives and provide sufficient cover for the sewers within the private’s roads.

6 CONCLUSION

6.1 WATER DISTRIBUTION

The proposed development will be serviced from the Town's existing watermain on Crimson King Way. The estimated maximum day demand is calculated to be approximately 1.16 L/s, the peak hour demand is calculated to be approximately 1.61 L/s and the fire flow for the site is calculated to be approximately 12,000 L/min (200 L/s). Domestic and FUS fire flow calculations for the proposed development has been completed and is included in **Appendix A**. A new local 200mm fire line and 100mm domestic line are proposed within the private driveways and which will tie into the existing H-style connection from the 300mm diameter watermain on Crimson King Way. Sizing and location of the proposed water services to the proposed building will be coordinated with the mechanical consultant.

6.2 SANITARY SEWAGE

New local 200mm sanitary sewers are proposed within the private driveways. These new sewers will service the proposed buildings and will outlet to the existing 250mm sanitary sewer within Crimson King Way. The flows will flow east along Crimson King Way to the 200mm sanitary sewer on Holland Landing Road. The estimated post-development peak sanitary flow is calculated to be approximately 1.91 L/s (refer to **Appendix C** for sanitary design flow calculations). Based on the approved sanitary sewer analysis completed for the West Holland Landing Residential Subdivision and the sanitary design flow study demonstrate that the proposed development has minimal impact to downstream sanitary sewer.

6.3 STORM SEWAGE

Storm drainage 100-year storm event or smaller will be collected on-site via storm sewers and will be conveyed to the proposed SWM Chamber to attenuate the flows to the 5-year storm event. Emergency storm flows will be directed away from proposed buildings and overland to Crimson King Way and ultimately to the stormwater management pond. Roof top storage, roof control and subsurface infiltration chambers are proposed as part of the site servicing. The existing stormwater management pond fulfils the phosphorous removal, erosion control and water quality requirements for the Site as part of the previously approved stormwater management pond design. Refer to the stormwater management report prepared for the Site by WSP under separate cover.

6.4 ROADS AND SITE GRADING

The grading design of the proposed development will generally follow existing drainage patterns. Minor storm drainage is to be conveyed towards roof service connections, catchbasins/ double catchbasins, catchbasin/ double catchbasin manholes and trench drains. Major storm drainage (greater than the 100-year storm event) is provided to direct drainage away from proposed and existing structures towards Crimson King Way which ultimately outlets to the stormwater management pond.

APPENDIX A

PROPOSED DOMESTIC WATER DEMAND

Project: **West Holland Landing South Retail Block**
Job No.: **CA0042438.4289**

Development Statistics

Building	Commercial (m^2)[1]	(Pop.)[2]	Total Population
Building A - Motor Vehicle Gas Bar - Kiosk	140.4	1	1
Building B - Car Wash	154.5	1	1
Building C - Multi-unit Employment Uses	2287.1	12	12
Building D - Multi-unit Employment Uses	3098.4	16	16
Building E - Multi-unit Employment Uses	1483.2	8	8
Building F - Convenience Restaurant	321.9	2	2
TOTAL	**7,485.5**	**40**	**40**

Proposed Development Water Demands

Methodology #1 - Town of East Gwillimbury Design Criteria Water Demands

Building	Population (see above)	Area (m^2)[1]	Demand Flow[3] (L/ha/d)	Average Daily Demand (L/s)	Max Day Peaking Factor[3]	Maximum Day Demand (L/s)	Peak Hour Peaking Factor[3]	Peak Hour Demand (L/s)
Building A - Motor Vehicle Gas Bar - Kiosk	1	140.4	28000	0.005	2	0.01	2.75	0.01
Building B - Car Wash	1	154.5	28000	0.01	2	0.01	2.75	0.01
Building C - Multi-unit Employment Uses	12	2287.1	28000	0.07	2	0.15	2.75	0.20
Building D - Multi-unit Employment Uses	16	3098.4	28000	0.10	2	0.20	2.75	0.28
Building E - Multi-unit Employment Uses	8	1483.2	28000	0.05	2	0.10	2.75	0.13
Building F - Convenience Restaurant	2	321.9	28000	0.01	2	0.02	2.75	0.03
TOTAL	**40**			**0.24**		**0.49**		**0.67**

Notes:

1) Unit count and floor areas per site plan prepared by Baldassarra Architects Inc. received Nov 21, 2024
2) Retail population densities of 50 persons per hectre of GFA for employment as per the Town of East Gwillimbury Engineering Standards and Design Criteria.
3) Average day demands, maximum day and peak hour factor as per the Town of East Gwillimbury Engineering Standards and Design Criteria.

Methodology #2 - Building-Use Specific Average Daily Flow Rates Water Demands

Building	Population (see above)	Area (m^2)[1]	Demand Flow[3] (L/ha/d) - General Commercial	Demand Flow[4] (L/ha/d) - Car Wash	Demand Flow[5] ($L/m^2/d$) - Convenience Restaurant	Average Daily Demand (L/s)	Max Day Peaking Factor[3]	Maximum Day Demand (L/s)	Peak Hour Peaking Factor[3]	Peak Hour Demand (L/s)
Building A - Motor Vehicle Gas Bar - Kiosk	1	140.4	28000			0.005	2	0.01	2.75	0.01
Building B - Car Wash	1	154.5		726990		0.13	2	0.26	2.75	0.36
Building C - Multi-unit Employment Uses	12	2287.1	28000			0.07	2	0.15	2.75	0.20
Building D - Multi-unit Employment Uses	16	3098.4	28000			0.10	2	0.20	2.75	0.28
Building E - Multi-unit Employment Uses	8	1483.2	28000			0.05	2	0.10	2.75	0.13
Building F - Convenience Restaurant	2	321.9			60	0.22	2	0.45	2.75	0.61
TOTAL	**40**					**0.58**		**1.16**		**1.60**

Notes:

1) Unit count and floor areas per site plan prepared by Baldassarra Architects Inc. received Nov 21, 2024
2) Retail population densities of 50 persons per hectre of GFA for employment as per the Town of East Gwillimbury Engineering Standards and Design Criteria, dated September 2012.
3) Average day demands, maximum day and peak hour factor as per the Town of East Gwillimbury Engineering Standards and Design Criteria, dated September 2012.
4) Average demand of 726,990 L/ha/day is used for the car wash based on previous projects
5) Average demand of 60 L/m2/day is used based on the Town of Whitchurch-Stoufville Water and Wastewater Master Plan Study dated March 2023

APPENDIX A

FIRE FLOW CALCULATIONS - BUILDING A (MOTOR VEHICLE GAS BAR - KIOSK)

Project: **West Holland Landing South Retail Block**
Job No.: **CA0042438.4289**

Fire Flow Calculation Procedure per Water Supply for Public Fire Protection, 1999 by Fire Underwriter Survey, p 20.

$$F = 220\ C\sqrt{A}$$

where

F = Fire flow in Litres per minute (Lpm)
C = coefficient related to the type of construction
A = total floor area in square metres

A. **Determine Type of Construction**
=> Fire-resistive construction (fully protected frame, floors, roof)
Therefore C = 0.6

B. **Determine Ground Floor Area**
=> Fire-resistive building with vertical openings and exterior vertical communications properly protected
Therefore A = Ground Floor Area
A^1 = 140 m2

C. **Determine Height in Storeys**
=> Building A: 1 Storeys

D. **Determined the Fire Flow**
F = 220 x 0.6 x √140.4
F = 2,000 Lpm

E. **Determine Increase or Decrease for Occupancy**
=> Increase for Rapid Burning Occupancies (Gas Station)
Therefore 25% increase
25% increase of 2000 Lpm = 500 Lpm
2000 + 500 = 2,500 Lpm

F. **Determine Decrease for Automatic Sprinkler Protection**
=> No Automatic Sprinkler Protection (Per NFPA 13 Standards)
Therefore 0% reduction
0% reduction of 2500 Lpm = - Lpm

G. **Determine the Total Increase For Exposures**

Face	Distance (m)	Charge
West Side		0%
East Side	57.84	0%
North Side	49.19	0%
South Side	53.32	0%
	Total	0% of 2,500 = 0 Lpm

H. **Req'd Fire Flow = E - F + G**
F = 2,500 Lpm
F = 3,000 Lpm (2,000 Lpm < F < 45,000 Lpm; OK)
F = 792 US GPM

Notes

1) Unit count and floor areas per site plan prepared by Baldassarra Architects Inc. received November 21, 2024

APPENDIX A

FIRE FLOW CALCULATIONS - BUILDING B (CAR WASH)

Project: **West Holland Landing South Retail Block**
Job No.: **CA0042438.4289**

Fire Flow Calculation Procedure per Water Supply for Public Fire Protection, 1999 by Fire Underwriter Survey, p 20.

$$F = 220\ C\sqrt{A}$$

where

F = Fire flow in Litres per minute (Lpm)
C = coefficient related to the type of construction
A = total floor area in square metres

A. **Determine Type of Construction**
=> Fire-resistive construction (fully protected frame, floors, roof)
Therefore C = 0.6

B. **Determine Ground Floor Area**
=> Fire-resistive building with vertical openings and exterior vertical communications properly protected
Therefore A = Ground Floor Area
A^{1} = 155 m2

C. **Determine Height in Storeys**
=> Building B: 1 Storeys

D. **Determined the Fire Flow**
F = 220 x 0.6 x √154.52
F = 2,000 Lpm

E. **Determine Increase or Decrease for Occupancy**
=> Increase for Free Burning Occupancies
Therefore 15% Increase

15% Increase of 2000 Lpm =	300	Lpm
2000 + 300 =	2,300	Lpm

F. **Determine Decrease for Automatic Sprinkler Protection**
=> No Automatic Sprinkler Protection (Per NFPA 13 Standards)
Therefore 0% reduction

0% reduction of 2300 Lpm =	-	Lpm

G. **Determine the Total Increase For Exposures**

Face	Distance (m)	Charge
West Side		0%
East Side	55.58	0%
North Side	53.32	0%
South Side	16.46	15%

Total 15% of 2,300 = 345 Lpm

H. **Req'd Fire Flow = E - F + G**
F = 2,645 Lpm
F = 3,000 Lpm (2,000 Lpm < F < 45,000 Lpm; OK)
F = 792 US GPM

Notes

1) Unit count and floor areas per site plan prepared by Baldassarra Architects Inc. received November 21, 2024

APPENDIX A

FIRE FLOW CALCULATIONS - BUILDING C (MULTI-UNIT EMPLOYMENT USES)

Project: **West Holland Landing South Retail Block**
Job No.: **CA0042438.4289**

Fire Flow Calculation Procedure per Water Supply for Public Fire Protection, 1999 by Fire Underwriter Survey, p 20.

$$F = 220\ C\ \sqrt{A}$$

where

F = Fire flow in Litres per minute (Lpm)
C = coefficient related to the type of construction
A = total floor area in square metres

A. **Determine Type of Construction**
=> Fire-resistive construction (fully protected frame, floors, roof)
Therefore C = 0.6

B. **Determine Ground Floor Area**
=> Fire-resistive building with vertical openings and exterior vertical communications properly protected
Therefore A = Ground Floor Area
A^{1} = 2,287 m2

C. **Determine Height in Storeys**
=> Building C: 1 Storeys

D. **Determined the Fire Flow**
F = 220 x 0.6 x √2287.1
F = 6,000 Lpm

E. **Determine Increase or Decrease for Occupancy**
=> No Charge for Occupancy
Therefore 0% reduction
0% reduction of 6000 Lpm = - Lpm
6000 - 0 = 6,000 Lpm

F. **Determine Decrease for Automatic Sprinkler Protection**
=> Has Automatic Sprinkler Protection (Per NFPA 13 Standards)
Therefore 30% reduction
30% reduction of 6000 Lpm = 1,800 Lpm

G. **Determine the Total Increase For Exposures**

Face	Distance (m)	Charge
West Side	55.58	0%
East Side	28.56	10%
North Side	50.80	0%
South Side	7.48	20%

Total 30% of 6,000 = 1,800 Lpm

H. **Req'd Fire Flow = E - F + G**
F = 6,000 Lpm
F = 6,000 Lpm (2,000 Lpm < F < 45,000 Lpm; OK)
F = 1,583 US GPM

Notes

1) Unit count and floor areas per site plan prepared by Baldassarra Architects Inc. received November 21, 2024

APPENDIX A

FIRE FLOW CALCULATIONS - BUILDING D (MULTI-UNIT EMPLOYMENT USES)

Project: **West Holland Landing South Retail Block**
Job No.: **CA0042438.4289**

Fire Flow Calculation Procedure per Water Supply for Public Fire Protection, 1999 by Fire Underwriter Survey, p 20.

$$F = 220\ C\ \sqrt{A}$$

where

F = Fire flow in Litres per minute (Lpm)
C = coefficient related to the type of construction
A = total floor area in square metres

A. **Determine Type of Construction**
=> Fire-resistive construction (fully protected frame, floors, roof)
Therefore C = 0.6

B. **Determine Ground Floor Area**
=> Fire-resistive building with vertical openings and exterior vertical communications properly protected
Therefore A = Ground Floor Area
A^{1} = 3,098 m2

C. **Determine Height in Storeys**
=> Building D: 1 Storeys

D. **Determined the Fire Flow**
F = 220 x 0.6 x √3098.4
F = 7,000 Lpm

E. **Determine Increase or Decrease for Occupancy**
=> No Reduction for Occupancies
Therefore 0% reduction
0% reduction of 7000 Lpm = - Lpm
7000 - 0 = 7,000 Lpm

F. **Determine Decrease for Automatic Sprinkler Protection**
=> Has Automatic Sprinkler Protection (Per NFPA 13 Standards)
Therefore 30% reduction
30% reduction of 7000 Lpm = 2,100 Lpm

G. **Determine the Total Increase For Exposures**

Face	Distance (m)	Charge				
West Side	18.00	15%				
East Side	28.48	10%				
North Side	7.48	20%				
South Side	21.87	10%				
	Total	55%	of	7,000	=	3,850 Lpm

H. **Req'd Fire Flow = E - F + G**
F = 8,750 Lpm
F = 9,000 Lpm (2,000 Lpm < F < 45,000 Lpm; OK)
F = 2,375 US GPM

Notes

1) Unit count and floor areas per site plan prepared by Baldassarra Architects Inc. received Novmeber 21, 2024

APPENDIX A

FIRE FLOW CALCULATIONS - BUILDING E (MULTI-UNIT EMPLOYMENT USES)

Project: **West Holland Landing South Retail Block**
Job No.: **CA0042438.4289**

Fire Flow Calculation Procedure per Water Supply for Public Fire Protection, 1999 by Fire Underwriter Survey, p 20.

$$F = 220\ C\ \sqrt{A}$$

where

F = Fire flow in Litres per minute (Lpm)
C = coefficient related to the type of construction
A = total floor area in square metres

A. **Determine Type of Construction**
=> Fire-resistive construction (fully protected frame, floors, roof)
Therefore C = 0.6

B. **Determine Ground Floor Area**
=> Fire-resistive building with vertical openings and exterior vertical communications properly protected
Therefore A = Ground Floor Area
A^{1} = 1,483 m2

C. **Determine Height in Storeys**
=> Building E: 1 Storeys

D. **Determined the Fire Flow**
F = 220 x 0.6 x √1483.21
F = 5,000 Lpm

E. **Determine Increase or Decrease for Occupancy**
=> No Reduction for Non-Combustible Occupancies
Therefore 0% reduction
0% reduction of 5000 Lpm = - Lpm
5000 - 0 = 5,000 Lpm

F. **Determine Decrease for Automatic Sprinkler Protection**
=> Has Automatic Sprinkler Protection (Per NFPA 13 Standards)
Therefore 30% reduction
30% reduction of 5000 Lpm = 1,500 Lpm

G. **Determine the Total Increase For Exposures**

Face	Distance (m)	Charge				
West Side		0%				
East Side	18.00	15%				
North Side	50.88	0%				
South Side	22.38	10%				
	Total	25%	of	5,000	=	1,500 Lpm

H. **Req'd Fire Flow = E - F + G**
F = 5,000 Lpm
F = 5,000 Lpm (2,000 Lpm < F < 45,000 Lpm; OK)
F = 1,319 US GPM

Notes

1) Unit count and floor areas per site plan prepared by Baldassarra Architects Inc. received Novmeber 21, 2024

APPENDIX A

FIRE FLOW CALCULATIONS - BUILDING F (CONVENIENCE Restaurant)

Project: **West Holland Landing South Retail Block**
Job No.: **CA0042438.4289**

Fire Flow Calculation Procedure per Water Supply for Public Fire Protection, 1999 by Fire Underwriter Survey, p 20.

$$F = 220\ C\sqrt{A}$$

where

F = Fire flow in Litres per minute (Lpm)
C = coefficient related to the type of construction
A = total floor area in square metres

A. **Determine Type of Construction**
=> Fire-resistive construction (fully protected frame, floors, roof)
Therefore C = 0.6

B. **Determine Ground Floor Area**
=> Fire-resistive building with vertical openings and exterior vertical communications properly protected
Therefore A = Ground Floor Area
A^1 = 2 m2

C. **Determine Height in Storeys**
=> Building E: 1 Storeys

D. **Determined the Fire Flow**
F = 220 x 0.6 x √2
F = 0 Lpm

E. **Determine Increase or Decrease for Occupancy**
=> Increase for Free Burning Occupancies
Therefore 15% increase
15% of 0 Lpm = - Lpm
0 +0 = - Lpm

F. **Determine Decrease for Automatic Sprinkler Protection**
=> No Automatic Sprinkler Protection (Per NFPA 13 Standards)
Therefore 0% reduction
0% reduction of 0 Lpm = - Lpm

G. **Determine the Total Increase For Exposures**

Face	Distance (m)	Charge
West Side		0%
East Side	51.01	0%
North Side	16.46	15%
South Side	50.88	0%

Total 15% of 0 = 0 Lpm

H. **Req'd Fire Flow = E - F + G**
F = 0 Lpm
F = 0 Lpm (2,000 Lpm < F < 45,000 Lpm; OK)
F = 0 US GPM

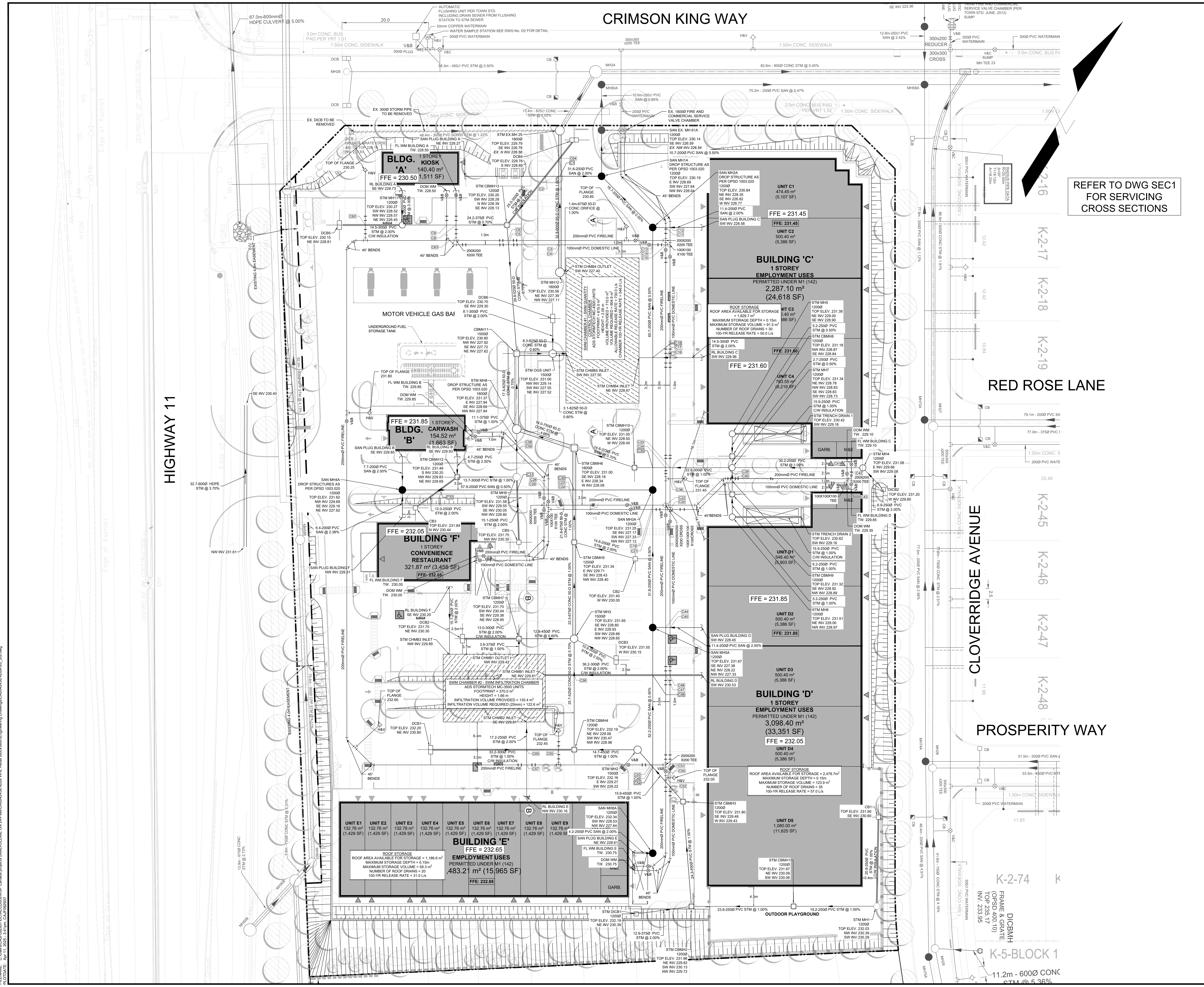
Notes

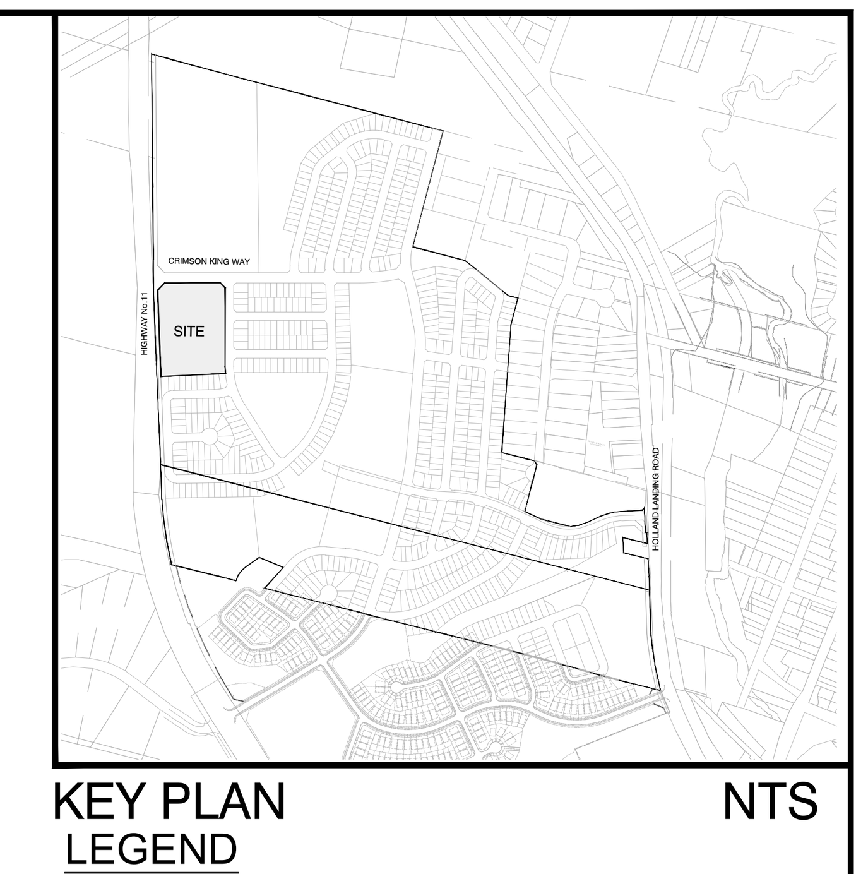
1) Unit count and floor areas per site plan prepared by Baldassarra Architects Inc. received November 21, 2024

APPENDIX

B

ENGINEERING DRAWINGS





KEY PLAN NTS

LEGEND

- PROPERTY LINE
- PROPOSED CONCRETE STORM SEWER
- PROPOSED PVC STORM SEWER
- PROPOSED PVC SANITARY SEWER
- PROPOSED FIRE LINE
- PROPOSED DOMESTIC LINE
- PROPOSED FIRE LINE WITH VERTICAL BENDS
- PROPOSED DOMESTIC LINE WITH VERTICAL BENDS
- C/W PIPE INSULATION
- PROPOSED STORM MANHOLE
- PROPOSED SANITARY MANHOLE
- PROP. CATCHBASIN / CATCHBASIN MANHOLE WITH SUBDRAIN
- PROP. DOUBLE CATCHBASIN / DOUBLE CATCHBASIN MANHOLE WITH SUBDRAIN
- PROPOSED DEPRESSED CURB
- PROPOSED RETAINING WALL
- MAX 3:1 SLOPE
- BUILDING ENTRANCES

No.	REVISIONS TO DRAWING	BY	DATE	APPR.
1	ISSUED FOR 1ST ZBA SUBMISSION	M.E.O	2025-04-11	M.E.O

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

CLIENT
KERBEL GROUP INC.

MUNICIPALITY
Town of East Gwillimbury

PROJECT TITLE
WEST HOLLAND LANDING SOUTH RETAIL BLOCK

SHEET TITLE
SITE SERVICING PLAN

CONSULTANT
WSP
150 Commerce Valley Dr. West, Thornhill, ON Canada L3T 7Z3
t: 905.882.1100 f: 905.882.0055 www.wsp.com

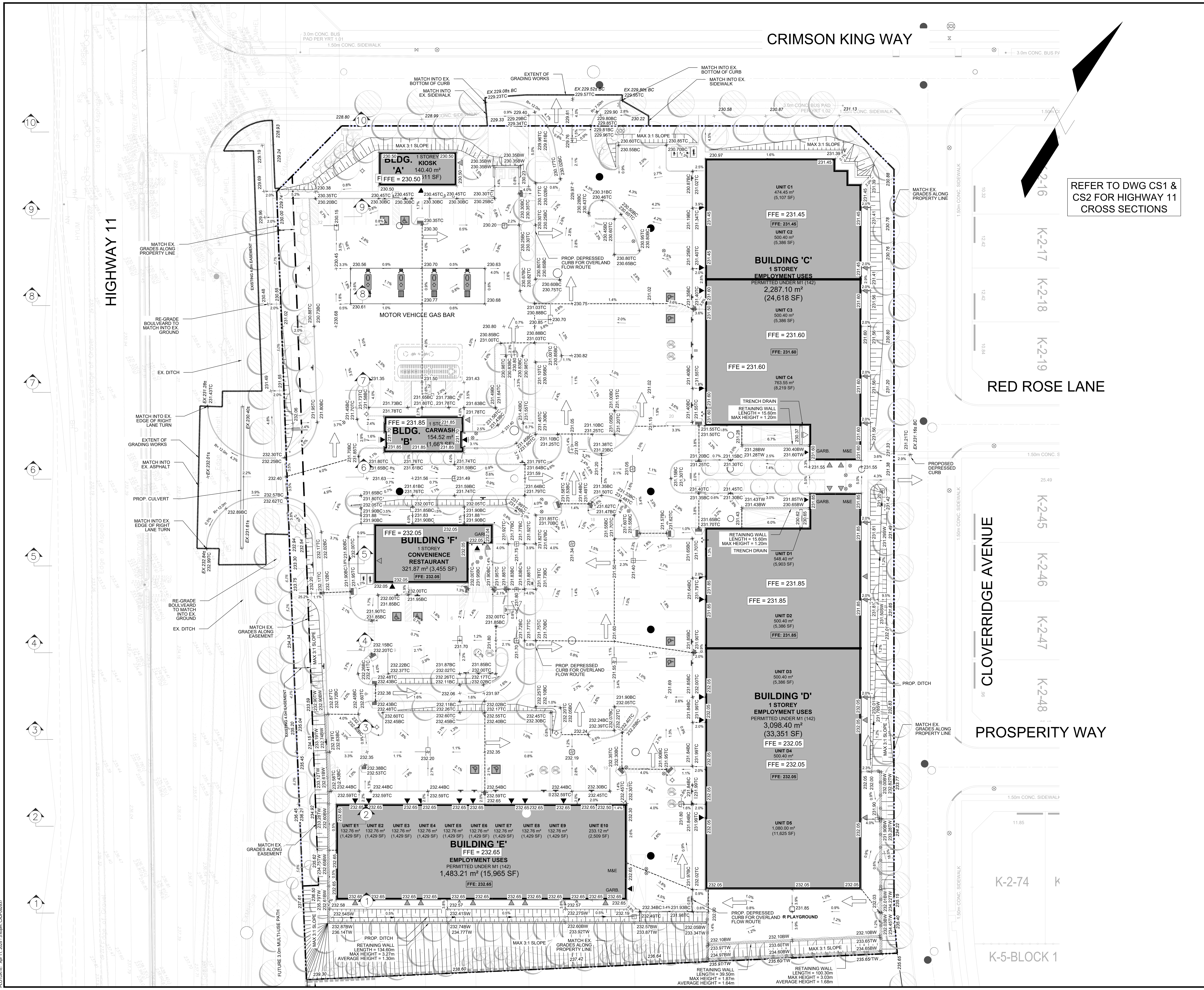
STAMP

APPROVAL

DESIGNED	DRAWN	CHECKED
A.S / S.V.S	10/12 CAD	M.E.O.

SCALE	DATE
1:400	APRIL 2025

PROJECT NUMBER	DWG. NUMBER
CA0042438.4289	SS1



KEY PLAN NTS

LEGEND

	PROPERTY LINE
162.00	PROPOSED ELEVATION
162.00 TC/BC	TOP/ BOTTOM OF CURB ELEVATION
162.00 TW/BW	TOP/ BOTTOM OF WALL ELEVATION
161.00	EXISTING ELEVATION
FFE=162.00	PROPOSED FLOOR ELEVATION
	DRAINAGE DIRECTION
	OVERLAND FLOW DIRECTION
	PROP. CATCHBASIN / MANHOLE
	PROPOSED DEPRESSED CURB
	PROPOSED RETAINING WALL
	STEEP SLOPE
	HIGH POINT
▼	BUILDING ENTRANCES

No.	REVISIONS TO DRAWING	BY	DATE	APPR.
1	ISSUED FOR 1ST ZBA SUBMISSION	M.E.O	2025-04-11	M.E.O

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

CLIENT
KERBEL GROUP INC.

MUNICIPALITY
Town of East Gwillimbury

PROJECT TITLE
WEST HOLLAND LANDING SOUTH RETAIL BLOCK

SHEET TITLE
SITE GRADING PLAN

CONSULTANT
WSP
150 Commerce Valley Dr. West, Thornhill, ON Canada L3T 7Z3
t: 905.882.1100 f: 905.882.0055 www.wsp.com

STAMP

APPROVAL

DESIGNED	DRAWN	CHECKED
A.S / S.V.S	10/12 CAD	M.E.O.

SCALE	DATE
1:400	APRIL 2025

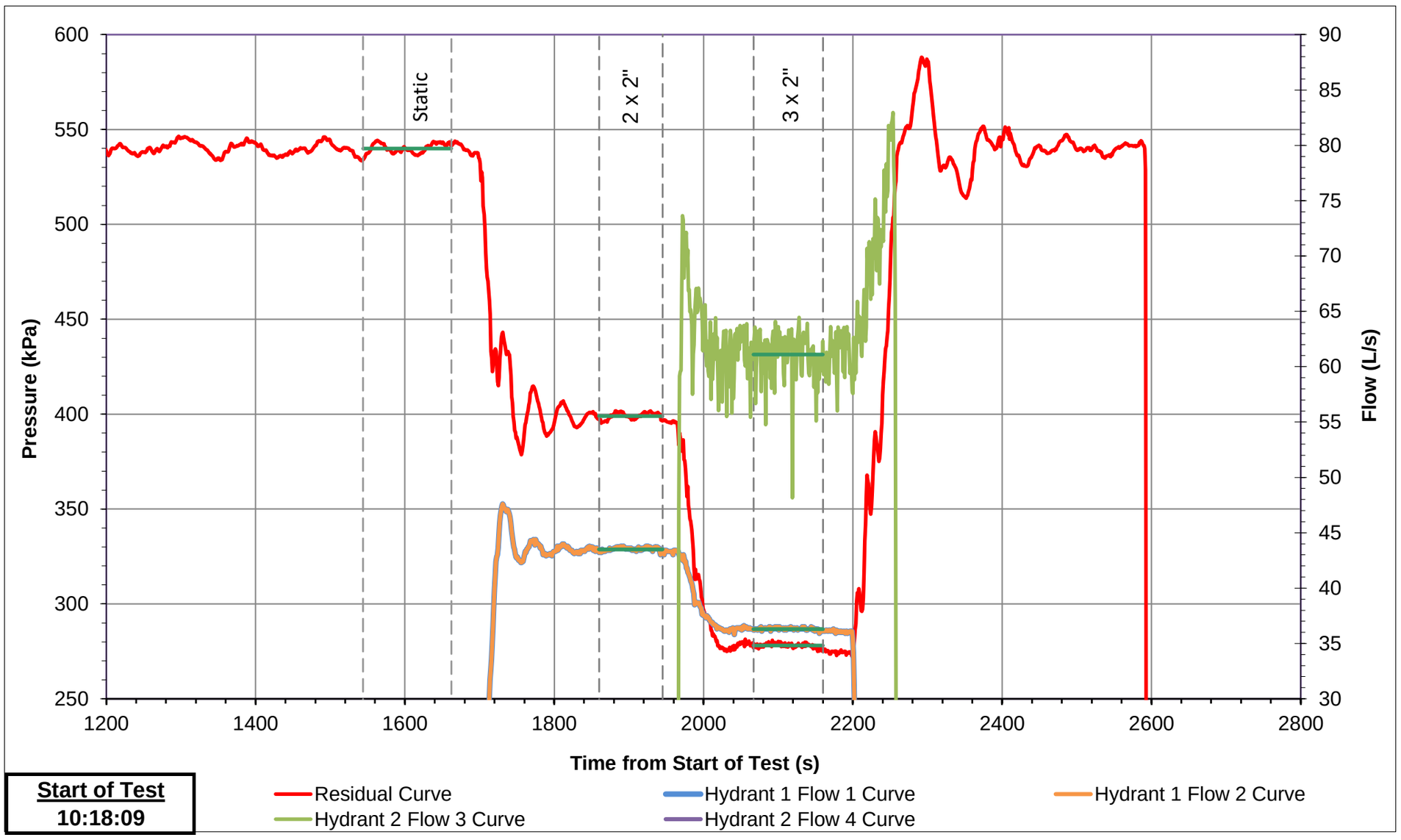
PROJECT NUMBER	DWG. NUMBER
CA0042438.4289	SG1

APPENDIX

C

HYDRANT FLOW TEST RESULTS

Test 1 - HWY 11 & Crimson King Way



Subject Watermain Details

Diameter:	300 mm	**Material:**	PVC
Area:	0.071 m2		

Subject Hydrant & Valve Details

Residual Hydrant:	
Flow Hydrant 1:	
Flow Hydrant 2:	

TABLE A: TESTED PRESSURES AND FLOWS

Point	Time		Residual Hydrant		Flow Hydrant 1				Flow Hydrant 2				Total Flow		Velocity
			Residual (S1)		Flow 1 (S2)		Flow 2 (S3)		Flow 3 (S4)		Flow 4 (S5)				
	Start	Finish	(kPa)	(psi)	(L/s)	(GPM)	(L/s)	(GPM)	(L/s)	(GPM)	(L/s)	(GPM)	(L/s)	(GPM)	(m/s)
Static	1544	1662	540	78.3	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
1 x 2"			0	0.0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2 x 2"	1860	1945	399	57.9	43.5	689	43.5	689	0.0	0	0.0	0	87.0	1379	1.2
3 x 2"	2067	2160	278	40.3	36.3	575	36.3	575	61.1	968	0.0	0	133.7	2119	1.9
4 x 2"			0	0.0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

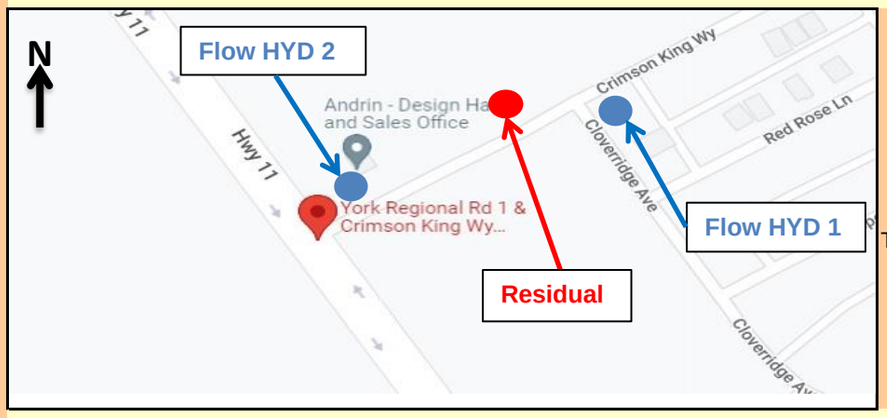
HWY 11 & Crimson King Way

HYDRANT FLOW TEST RESULTS

Date: 03-Jun-22 Time: 10:18 (hh/mm) Municipality: East Gwillimbury

Operator:

Tested By: Sen, Jack Test No: 1



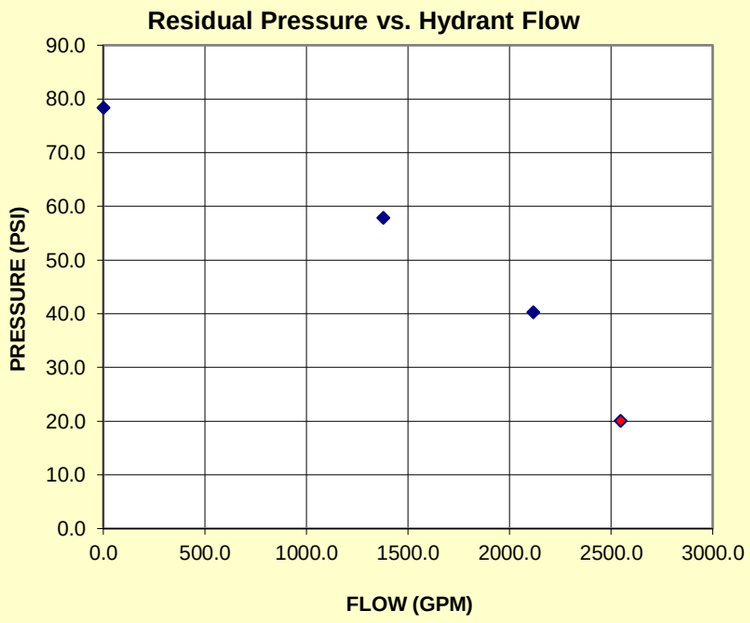
Conditions before Test (STATIC)

Residual Hydrant:	78.3 psi	540 kPa
Hydrant that will Flow:	78.3 psi	540 kPa
Δ pressure:	0.0 psi	0 kPa
Elevation Difference: (Flow El. - Residual El.)	0.0 ft	0.0 m

Test Notes:

TEST		TEST FLOW		RESIDUAL PRESSURE (psi)		Minimum Residual P_r (psi)	Fire Flow at Minimum Residual, Q_r (USGPM)	Fire Flow at Minimum Residual, Q_r (L/s)	10% Pressure Drop Achieved?
Port Size (in)	Nozzle Pressure (psi)	(USGPM)	(L/s)	Monitoring Hydrant	Flow Hydrant (Corrected) *				
STATIC	n/a	0	0	78.3	78.3				
Single Hydrant Test									
1 x 2"									
2 x 2"	19.5	1378.0	87.0	57.9	57.9	20	2429	153	YES
3 x 2"									
Hydrant 1	13.6	1150.0	72.6	40.3	40.3	20	2668	168	YES
Hydrant 2	33.5	968.0	61.1						
4 x 2"									
Hydrant 1									
Hydrant 2									

* Pressure correction is equal to the elevation difference. Column 2 (and Table A) show the nozzle pressure while flowing.



Results			
Static Pressure		Flow at 20 psi (140kPa)*	
(psi)	(kPa)	(gpm)	(L/s)
78.3	540	2500	158

* Results carried to nearest 50 gpm or 100 gpm if over 1000 gpm

Hydrant Classification as per NFPA 291			
Class	AA	Color	BLUE

Water Discharged During Test:	30100 L

Rounded up to closest 100L

APPENDIX

D

THEORETICAL SANITARY SEWAGE FLOWS

APPENDIX D

PROPOSED SANITARY FLOW GENERATION

Project: **West Holland Landing South Retail Block**
Job No.: **CA0042438.4289**

Proposed Development Sanitary Design Flows
Development Statistics

Building	Commercial (m^2)[1]	(Pop.)[2]	Total Population
Building A - Motor Vehicle Gas Bar - Kiosk	140.4	1	1
Building B - Car Wash	154.5	1	1
Building C - Multi-unit Employment Uses	2287.1	12	12
Building D - Multi-unit Employment Uses	3098.4	16	16
Building E - Multi-unit Employment Uses	1483.2	8	8
Building F - Convenience Restaurant	321.9	2	2
TOTAL	**7485.5**	**40**	**40**

Methodology #1 - Town of East Gwillimbury Engineering Standards and Design Criteria

Building	Population (see above)	Area (m^2)[1]	Average Commercial Daily Flow (L/ha/d)[3]	Average Flow (L/s)	Peaking Factor[4]	Peak Population Flow (L/s)
Building A - Motor Vehicle Gas Bar - Kiosk	1	140.4	28000	0.005	1	0.005
Building B - Car Wash	1	154.5	28000	0.005	1	0.005
Building C - Multi-unit Employment Uses	12	2287.1	28000	0.074	1	0.074
Building D - Multi-unit Employment Uses	16	3098.4	28000	0.100	1	0.100
Building E - Multi-unit Employment Uses	8	1483.2	28000	0.048	1	0.048
Building F - Convenience Restaurant	2	321.9	28000	0.010	1	0.010
Total	**40**	**7485.5**		**0.25**		**0.25**

Site Area = 2.68 ha
I/I = 0.77 L/s (0.286 L/s/ha)
Design Flow = 1.02 L/s

Total Site Design Flow = 1.02 L/s

Notes:
1) Unit count and floor areas per site plan prepared by Baldassarra Architects Inc. received November 21, 2024
2) Retail population densities of 50 persons per hectre for employment as per the Town of East Gwillimbury Engineering Standards and Design Criteria.
3) Average Commercial Daily Flow as per the Town of East Gwillimbury Engineering Standards and Design Criteria.
4) It is assumed that the peaking factor is included in the commerical average daily flow.

Methodology #2 - Building-Use Specific Average Daily Flow Rates

		Population (see above)	Area (m^2)[1]	# of Water Closets	# of Fuel Outlets	Average Commercial Daily Flow (L/ha/d)[3]	Average Daily Flow - Kiosk (L/d/ water closet)[5]	Average Daily Flow - Kiosk (L/d/ fuel outlet)[5]	Average Daily Flow - Car Wash (L/ha/d)[6]	Average Daily Flow - Convenience Restaurant (L/m2/d)[7]	Average Flow (L/s)	Peaking Factor[4]	Peak Population Flow (L/s)
Building A - Motor Vehicle Gas Bar - Kiosk	Water Closets	1	140.4	2		-	950				0.022	1	0.022
	Fuel Outlets				8	-	560				0.052	1	0.052
Building B - Car Wash		1	154.5			-			726990		0.130	1	0.130
Building C - Multi-unit Employment Uses		12	2287.1			28000					0.074	1	0.074
Building D - Multi-unit Employment Uses		16	3098.4			28000					0.100	1	0.100
Building E - Multi-unit Employment Uses		8	1483.2			28000					0.048	1	0.048
Building F - Convenience Restaurant		2	321.9			-				190	0.708	1	0.708
Total		**40**	**7485.5**								**1.14**		**1.14**

Site Area = 2.68 ha
I/I = 0.77 L/s (0.286 L/s/ha)
Design Flow = 1.91 L/s

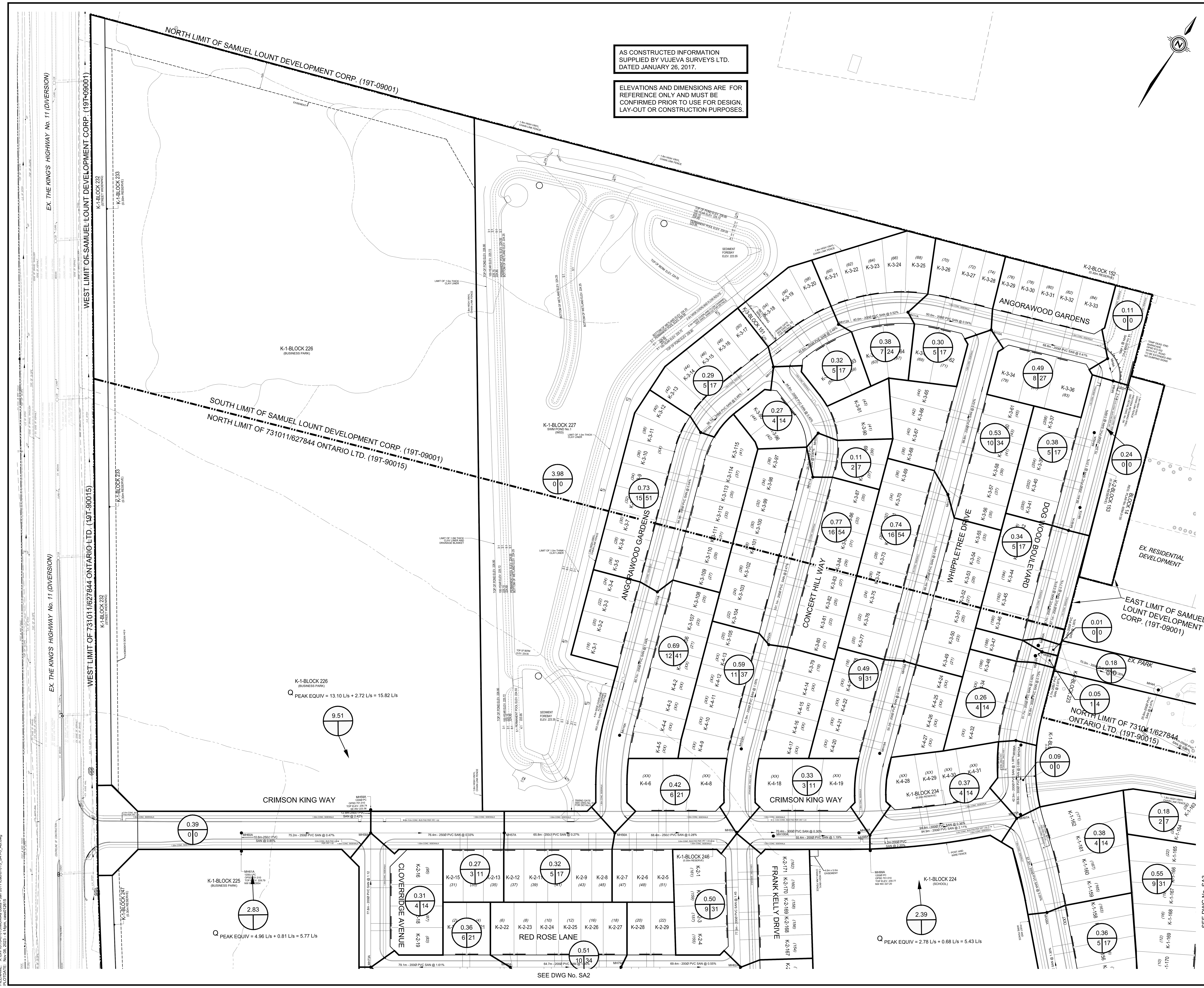
Total Site Design Flow = 1.91 L/s

Notes:
1) Unit count and floor areas per site plan prepared by Baldassarra Architects Inc. received November 21, 2024
2) Retail population densities of 50 persons per hectre for employment as per the Town of East Gwillimbury Engineering Standards and Design Criteria, dated September 2012.
3) Average Commercial Daily Flow as per the Town of East Gwillimbury Engineering Standards and Design Criteria, dated September 2012.
4) It is assumed that the peaking factor is included in the commerical average daily flow.
5) Average daily flow of 950 L/day per water closet and 560 L/day per fuel outlet obtained from the Ontario Building Code (OBC)
6) Average demand of 726,990 L/ha/day is used for the car wash based on previous projects
7) Average daily flow of 190 L/m2/day is used for the convenienve Restaurant based on previous projects

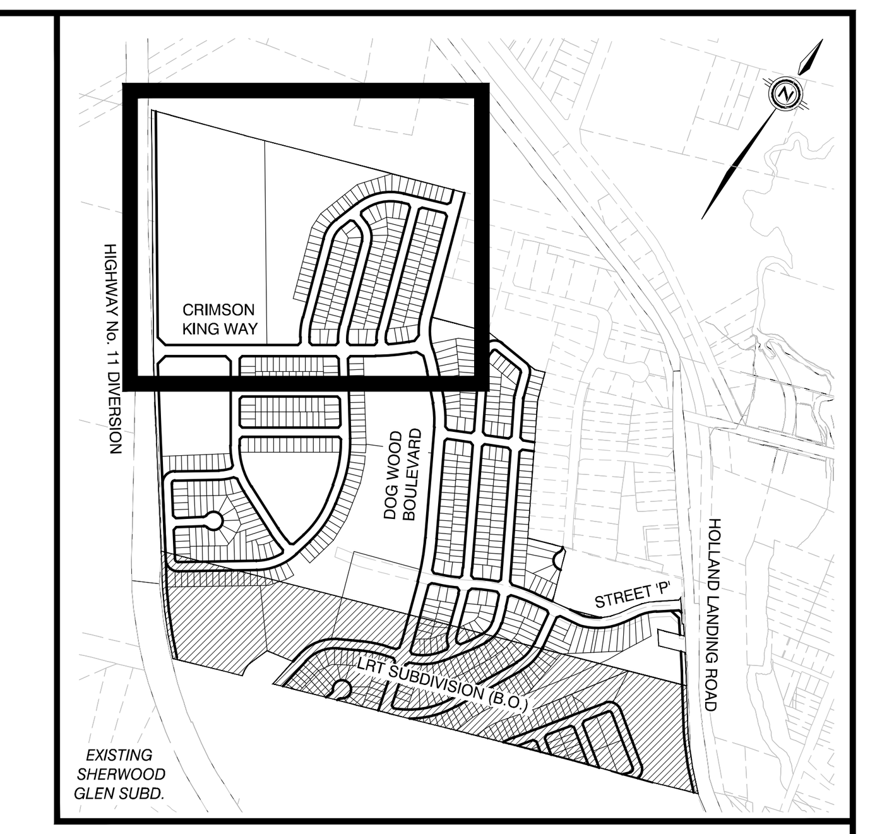
APPENDIX

E

APPROVED SANITARY DRAIAGE PLANS



AS CONSTRUCTED INFORMATION SUPPLIED BY VUJEVA SURVEYS LTD. DATED JANUARY 26, 2017.
ELEVATIONS AND DIMENSIONS ARE FOR REFERENCE ONLY AND MUST BE CONFIRMED PRIOR TO USE FOR DESIGN, LAY-OUT OR CONSTRUCTION PURPOSES.
NORTH LIMIT OF SAMUEL LOUNT DEVELOPMENT CORP. (19T-09001)
WEST LIMIT OF SAMUEL LOUNT DEVELOPMENT CORP. (19T-09001)
SOUTH LIMIT OF SAMUEL LOUNT DEVELOPMENT CORP. (19T-09001)
NORTH LIMIT OF 731011/627844 ONTARIO LTD. (19T-90015)
WEST LIMIT OF 731011/627844 ONTARIO LTD. (19T-90015)
EX. THE KING'S HIGHWAY No. 11 (DIVERSION)
K-1-BLOCK 226 (BUSINESS PARK)
K-1-BLOCK 227 SWM POND No. 1
Q PEAK EQUIV = 13.10 L/s + 2.72 L/s = 15.82 L/s
ANGORAWOOD GARDENS
CONCERT HILL WAY
WHIPPLETREE DRIVE
DOGWOOD BOULEVARD
CRIMSON KING WAY
CLOVERRIDGE AVENUE
RED ROSE LANE
FRANK KELLY DRIVE
EAST LIMIT OF SAMUEL LOUNT DEVELOPMENT CORP. (19T-09001)
EX. RESIDENTIAL DEVELOPMENT
EX. PARK
K-1-BLOCK 225 (BUSINESS PARK)
Q PEAK EQUIV = 4.96 L/s + 0.81 L/s = 5.77 L/s
K-1-BLOCK 224 (SCHOOL)
Q PEAK EQUIV = 2.78 L/s + 0.68 L/s = 5.43 L/s
SEE DWG No. SA2
SEE DWG No. SA3



KEY PLAN N.T.S.

LEGEND

- SANITARY DRAINAGE AREA (ha.) / POPULATION / UNITS
- SANITARY DRAINAGE AREA BOUNDARY
- EXTERNAL SANITARY DRAINAGE AREA BOUNDARY
- SANITARY MANHOLE
- EXTERNAL SANITARY DRAINAGE AREA (ha.) / POPULATION / UNITS
- LIMIT OF SUBDIVISION
- FUTURE PHASE BY LRT TECHNOLOGIES INC.

RESIDENTIAL = 350 L/c/d
COMMERCIAL = 0.32 L/s/ha
PARK = 0.21 L/s/ha
INSTITUTIONAL = 0.21 L/s/ha
INFILTRATION = 0.286 L/s/ha

No.	REVISIONS TO DRAWING	BY	DATE	APPR.
10	AS CONSTRUCTED	ADR	NOV 2023	
9	AS CONSTRUCTED	B.T.B.	JAN 2017	
8	REVISED PER ROY COMMENTS	MEO	JUN 15/16	
7	REVISED PER ROY COMMENTS	MEO	MAY 13/16	
6	APPROVED BY TOWN	MEO	MAR 20/15	
5	FINAL SUBMISSION	MEO	MAR 19/15	
4	FOURTH SUBMISSION	MEO	NOV 7/14	
3	THIRD SUBMISSION	MEO	SEP 17/14	
2	SECOND SUBMISSION	MEO	MAY 9/14	
1	FIRST SUBMISSION	MEO	FEB 5/14	

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

CLIENT
KERBEL GROUP INC.

MUNICIPALITY
Town of East Gwillimbury

PROJECT TITLE
WEST HOLLAND LANDING
Residential Subdivision

SHEET TITLE
SANITARY DRAINAGE PLAN

MMM GROUP
100 Commerce Valley Dr. West, Thornhill, ON Canada L3T 0A1
t: 905.882.1100 f: 905.882.0055 www.mmm.ca

REVIEWED BY TOWN OF EAST GWILLIMBURY

Originally Stamped and Signed by M. E. Oldham, P. Eng. on February 17, 2016

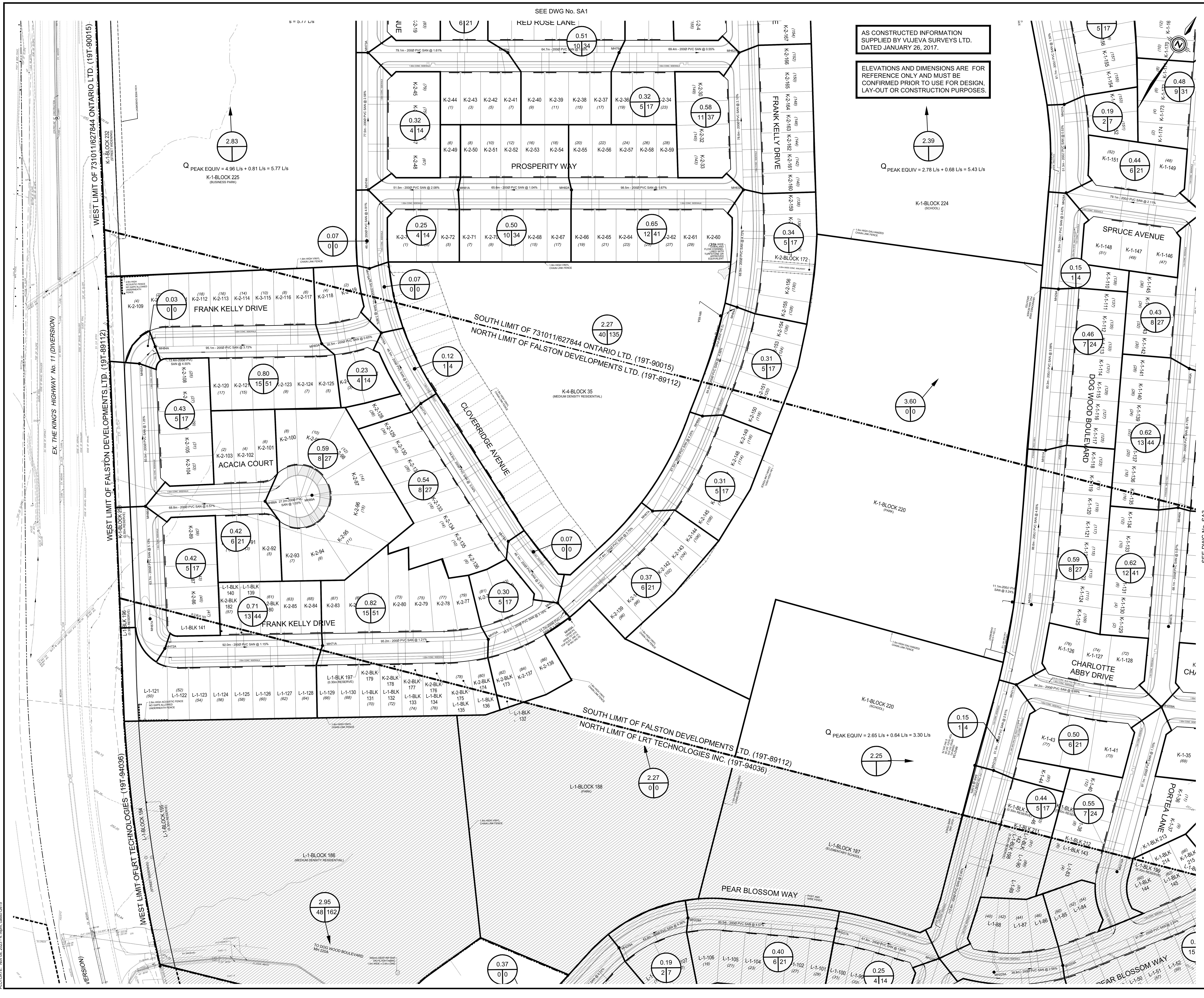
DATE:

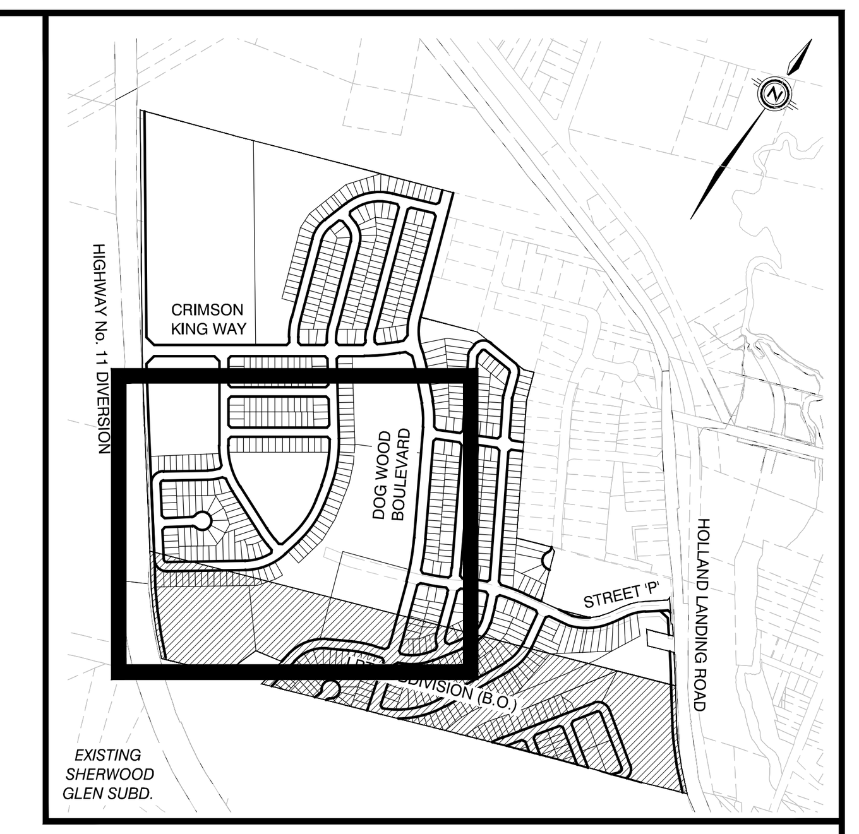
DESIGNED	DRAWN	CHECKED
K.L.	10/12 CAD	M.E.O.

SCALE	DATE
1:1000	JANUARY 2014

PROJECT NUMBER	DWG. NUMBER
10-07013	SA1

19T-09001/19T-90015/19T-89112





KEY PLAN N.T.S.

LEGEND

- 0.44 / 4 | 14 — SANITARY DRAINAGE AREA (ha.), POPULATION, UNITS
- SANITARY DRAINAGE AREA BOUNDARY
- EXTERNAL SANITARY DRAINAGE AREA BOUNDARY
- SANITARY MANHOLE
- 0.44 / 4 | 14 (dashed) — EXTERNAL SANITARY DRAINAGE AREA (ha.), POPULATION, UNITS
- LIMIT OF SUBDIVISION
- FUTURE PHASE BY LRT TECHNOLOGIES INC.

RESIDENTIAL = 350 L/c/d
COMMERCIAL = 0.32 L/s/ha
PARK = 0.21 L/s/ha
INSTITUTIONAL = 0.21 L/s/ha
INFILTRATION = 0.286 L/s/ha

No.	REVISIONS TO DRAWING	BY	DATE	APPR.
10	AS CONSTRUCTED	ADR	NOV 2023	
9	AS CONSTRUCTED	B.T.B.	JAN 2017	
8	REVISED PER ROY COMMENTS	MEO	JUN 15/16	
7	REVISED PER ROY COMMENTS	MEO	MAY 13/16	
6	APPROVED BY TOWN	MEO	MAR 20/15	
5	FINAL SUBMISSION	MEO	MAR 19/15	
4	FOURTH SUBMISSION	MEO	NOV 7/14	
3	THIRD SUBMISSION	MEO	SEP 17/14	
2	SECOND SUBMISSION	MEO	MAY 9/14	
1	FIRST SUBMISSION	MEO	FEB 5/14	

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

CLIENT
KERBEL GROUP INC.

MUNICIPALITY
East Gwillimbury

PROJECT TITLE
WEST HOLLAND LANDING
Residential Subdivision

SHEET TITLE
SANITARY DRAINAGE PLAN

MMM GROUP
100 Commerce Valley Dr. West, Thornhill, ON Canada L3T 0A1
t: 905.882.1100 f: 905.882.0055 www.mmm.ca

REVIEWED BY TOWN OF EAST GWILLIMBURY

DATE:

Originally Stamped and Signed by M. E. Oldham, P. Eng. on February 17, 2016

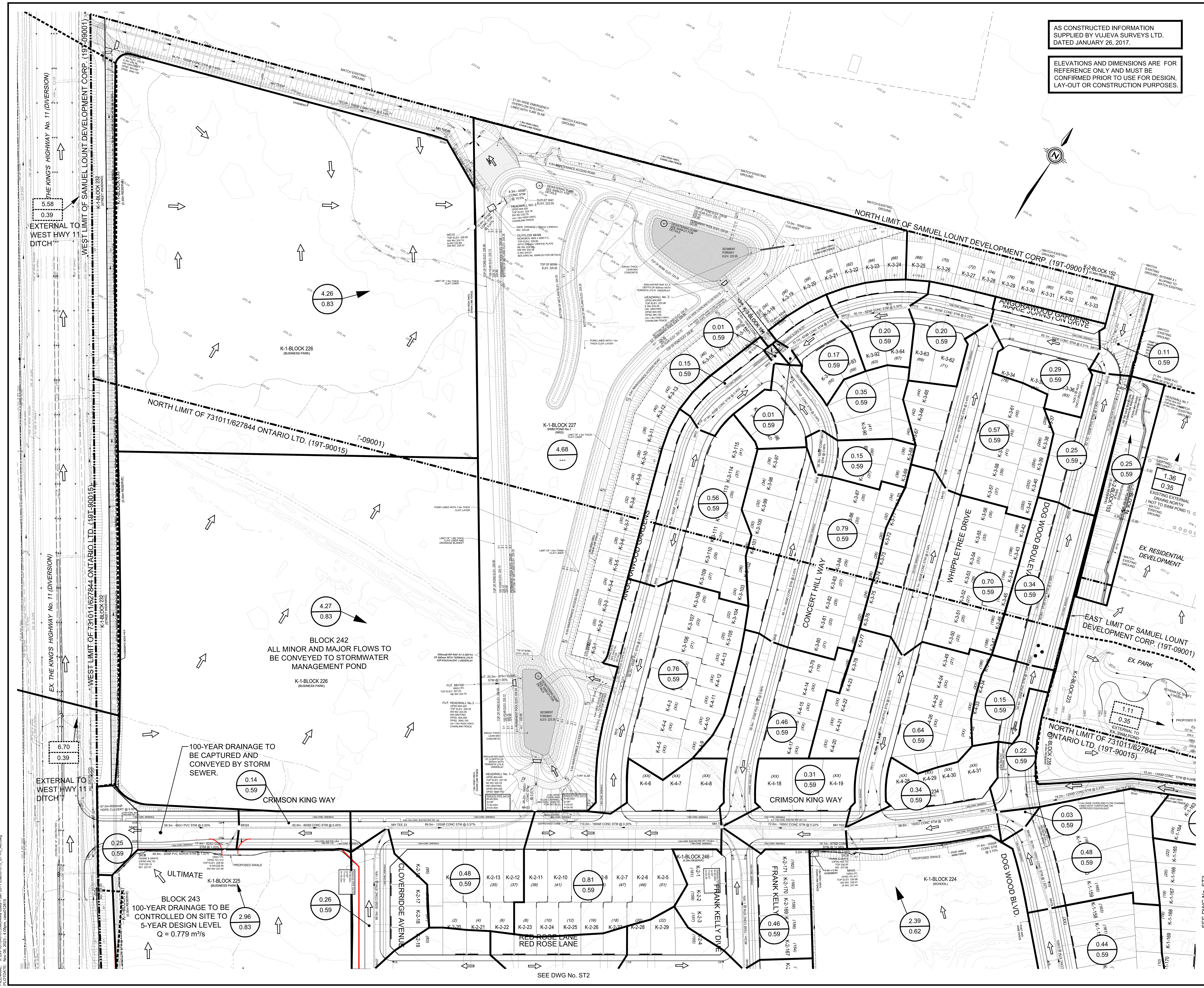
DESIGNED	DRAWN	CHECKED
K.L.	10/12 CAD	M.E.O.
SCALE 1:1000	DATE JANUARY 2014	
PROJECT NUMBER 10-07013	DWG. NUMBER SA2	

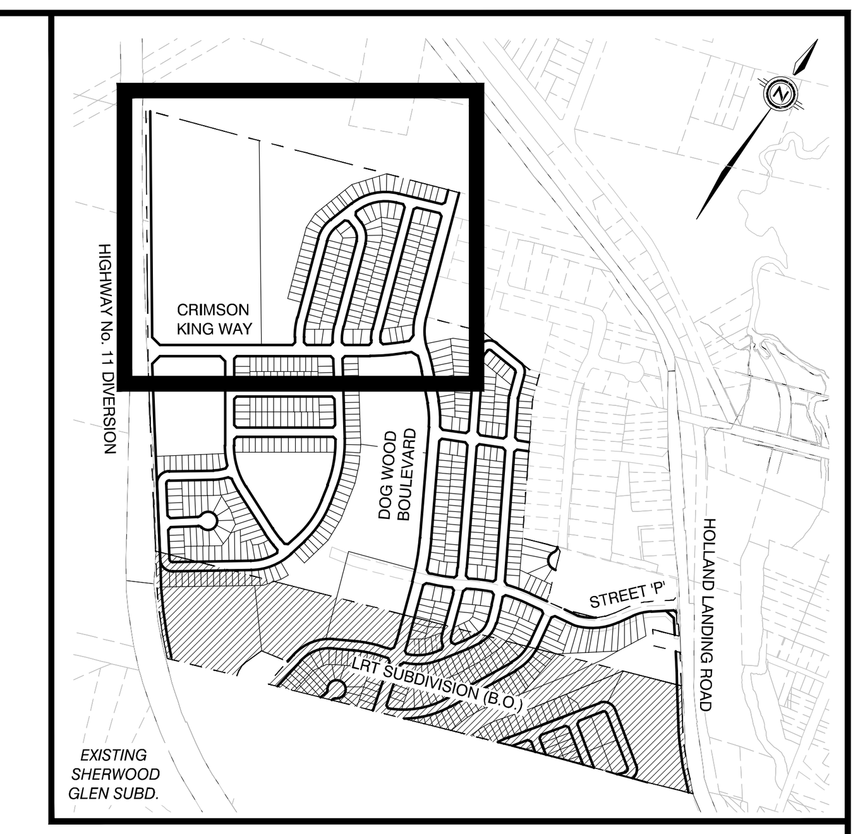
19T-09001/19T-90015/19T-89112

APPENDIX

F

APPROVED STORM DRAINAGE PLANS





KEY PLAN N.T.S.

LEGEND

- STORM DRAINAGE AREA (ha.) / RUN-OFF COEFFICIENT (0.20 / 0.59)
- EXTERNAL DRAINAGE AREA (ha.) / RUN-OFF COEFFICIENT (0.14 / 0.59)
- STORM DRAINAGE AREA BOUNDARY
- EXTERNAL STORM DRAINAGE AREA BOUNDARY
- STORM MANHOLE
- ORIGINAL GROUND CONTOUR (255)
- OVERLAND FLOW
- CATCHBASIN
- DOUBLE CATCHBASIN
- CATCHBASIN WITH INLET CONTROL RELEASE RATE = 28.3 L/S
- LIMIT OF SUBDIVISION
- FUTURE PHASE BY LRT TECHNOLOGIES INC.

No.	REVISIONS TO DRAWING	BY	DATE	APPR.
10	AS CONSTRUCTED	ADR	NOV 2023	
9	AS CONSTRUCTED	B.T.B.	JAN 2017	
8	REVISED PER ROY COMMENTS	MEO	JUN 15/16	
7	REVISED PER ROY COMMENTS	MEO	MAY 13/16	
6	APPROVED BY TOWN	MEO	MAR 20/15	
5	FINAL SUBMISSION	MEO	MAR 19/15	
4	FOURTH SUBMISSION	MEO	NOV 7/14	
3	THIRD SUBMISSION	MEO	SEP 17/14	
2	SECOND SUBMISSION	MEO	MAY 9/14	
1	FIRST SUBMISSION	MEO	FEB 5/14	

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

CLIENT

KERBEL GROUP INC.

MUNICIPALITY

Town of East Gwillimbury

PROJECT TITLE

WEST HOLLAND LANDING
Residential Subdivision

SHEET TITLE

STORM DRAINAGE PLAN

MMM GROUP

100 Commerce Valley Dr. West, Thornhill, ON Canada L3T 0A1
t: 905.882.1100 f: 905.882.0055
www.mmm.ca

REVIEWED BY TOWN OF EAST GWILLIMBURY

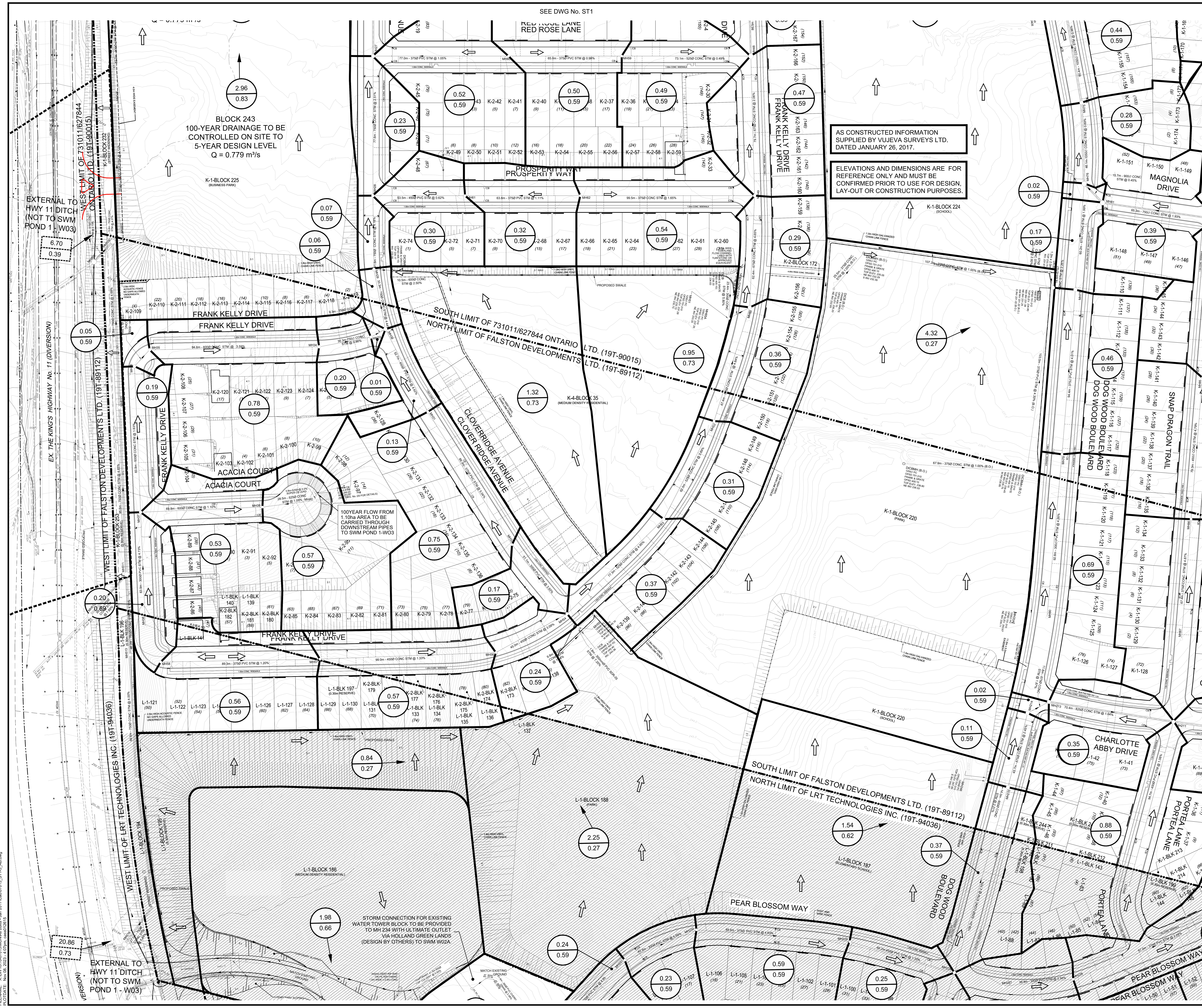
Originally Stamped and Signed by M. E. Oldham, P. Eng. on February 17, 2016

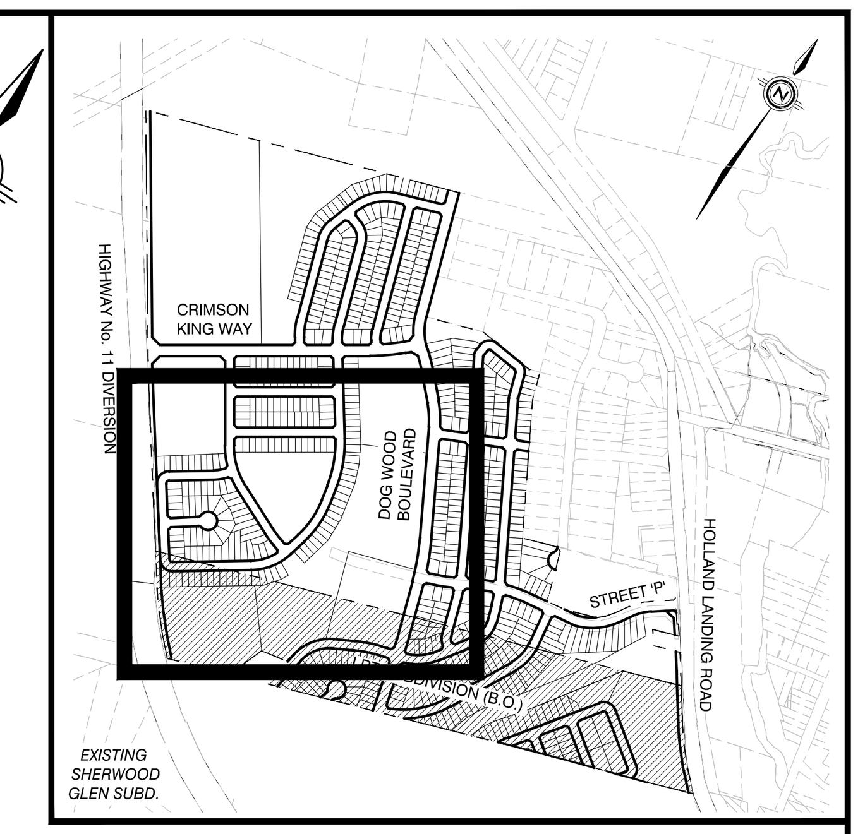
DATE:

DESIGNED	DRAWN	CHECKED
K.L.	10/12 CAD	M.E.O.
SCALE 1:1000	DATE JANUARY 2014	
PROJECT NUMBER 10-07013	DWG. NUMBER ST1	

19T-09001/19T-90015/19T-89112

FILENAME: X:\2010\10-07013\MUNs-builts - Jan 2017\Cad\07013_ST1-6_AB.dwg PLOTDATE: Nov 08, 2023 - 4:05pm, cased12615


SEE DWG No. ST1
RED ROSE LANE
PROSPERITY WAY
FRANK KELLY DRIVE
ACACIA COURT
CLOVERRIDGE AVENUE
DOG WOOD BOULEVARD
SNAP DRAGON TRAIL
MAGNOLIA DRIVE
CHARLOTTE ABBY DRIVE
PORTEA LANE
PEAR BLOSSOM WAY
SEE DWG No. ST3
BLOCK 243
100-YEAR DRAINAGE TO BE CONTROLLED ON SITE TO 5-YEAR DESIGN LEVEL
Q = 0.779 m³/s
EXTERNAL TO HWY 11 DITCH (NOT TO SWM POND 1 - W03)
WEST LIMIT OF 731011/627844 ONTARIO LTD. (19T-90015)
SOUTH LIMIT OF 731011/627844 ONTARIO LTD. (19T-90015)
NORTH LIMIT OF FALSTON DEVELOPMENTS LTD. (19T-89112)
WEST LIMIT OF FALSTON DEVELOPMENTS LTD. (19T-89112)
SOUTH LIMIT OF FALSTON DEVELOPMENTS LTD. (19T-89112)
NORTH LIMIT OF LRT TECHNOLOGIES INC. (19T-94036)
WEST LIMIT OF LRT TECHNOLOGIES INC. (19T-94036)
EX. THE KING'S HIGHWAY No. 11 (DIVERSION)
AS CONSTRUCTED INFORMATION SUPPLIED BY VUJEVA SURVEYS LTD. DATED JANUARY 26, 2017.
ELEVATIONS AND DIMENSIONS ARE FOR REFERENCE ONLY AND MUST BE CONFIRMED PRIOR TO USE FOR DESIGN, LAY-OUT OR CONSTRUCTION PURPOSES.
100YEAR FLOW FROM 1.10ha AREA TO BE CARRIED THROUGH DOWNSTREAM PIPES TO SWM POND 1-WO3
STORM CONNECTION FOR EXISTING WATER TOWER BLOCK TO BE PROVIDED TO MH 234 WITH ULTIMATE OUTLET VIA HOLLAND GREEN LANDS (DESIGN BY OTHERS) TO SWM W02A.
K-1-BLOCK 225
K-1-BLOCK 224
K-4-BLOCK 35
K-1-BLOCK 220
L-1-BLOCK 188
L-1-BLOCK 186
L-1-BLOCK 187



KEY PLAN N.T.S.

LEGEND

- 0.20 / 0.59 — STORM DRAINAGE AREA (ha.) / RUN-OFF COEFFICIENT
- 0.14 / 0.59 — EXTERNAL DRAINAGE AREA (ha.) / RUN-OFF COEFFICIENT
- STORM DRAINAGE AREA BOUNDARY
- EXTERNAL STORM DRAINAGE AREA BOUNDARY
- STORM MANHOLE
- 255 — ORIGINAL GROUND CONTOUR
- OVERLAND FLOW
- CATCHBASIN
- DOUBLE CATCHBASIN
- CATCHBASIN WITH INLET CONTROL RELEASE RATE = 28.3 L/S
- LIMIT OF SUBDIVISION
- FUTURE PHASE BY LRT TECHNOLOGIES INC.

No.	REVISIONS TO DRAWING	BY	DATE	APPR.
10	AS CONSTRUCTED	ADR	NOV 2023	
9	AS CONSTRUCTED	B.T.B.	JAN 2017	
8	REVISED PER ROY COMMENTS	MEO	JUN 15/16	
7	REVISED PER ROY COMMENTS	MEO	MAY 13/16	
6	APPROVED BY TOWN	MEO	MAR 20/15	
5	FINAL SUBMISSION	MEO	MAR 19/15	
4	FOURTH SUBMISSION	MEO	NOV 7/14	
3	THIRD SUBMISSION	MEO	SEP 17/14	
2	SECOND SUBMISSION	MEO	MAY 9/14	
1	FIRST SUBMISSION	MEO	FEB 5/14	

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

CLIENT
KERBEL GROUP INC.

MUNICIPALITY
Town of East Gwillimbury

PROJECT TITLE
WEST HOLLAND LANDING
Residential Subdivision

SHEET TITLE
STORM DRAINAGE PLAN

MMM GROUP
100 Commerce Valley Dr. West, Thornhill, ON Canada L3T 0A1
t: 905.882.1100 f: 905.882.0055 www.mmm.ca

Originally Stamped and Signed by M. E. Oldham, P. Eng. on February 17, 2016

REVIEWED BY TOWN OF EAST GWILLIMBURY

DATE:

DESIGNED	DRAWN	CHECKED
K.L.	10/12 CAD	M.E.O.

SCALE	DATE
1:1000	JANUARY 2014

PROJECT NUMBER	DWG. NUMBER
10-07013	ST2

19T-09001/19T-90015/19T-89112