1280 Dundas Street West
Town of Oakville

Delmanor West Oak Development

Functional Servicing Study

FINAL

December 17, 2021

arva

CANADA'S BEST MANAGED COMPANIES Platinum member

Prepared for: Delmanor West Oak Inc.

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1.0 INTRODUCTION

Delmanor West Oak Inc. (the Owner) is proposing the development of a seniors' living facility located at 1280 Dundas Street West in the Town of Oakville (the Site) known as the Delmanor West Oak development.

R.V. Anderson Associates Limited (RVA) has been retained by the Owner to prepare a Functional Servicing Study (FSS) in support of a Zoning By-Law Amendment (ZBA) application for the proposed site development.

The scope of this report specifically includes:

- A summary of the existing property and the proposed development;
- Identification and review of existing Municipal storm, sanitary and water infrastructure available to service the Site;
- Identification of the Town of Oakville and/or Halton Region criteria with respect to sanitary, water and storm servicing for the redevelopment of the Site;
- Calculation of water, sanitary and storm demands that will result from the redevelopment;
- A review of the capacity of the existing municipal water supply system and sewer collection system;
- Provide a summary of proposed servicing of the site with water, sanitary and storm services;
- Identification of any proposed Municipal infrastructure upgrades to support the development; and
- Provide a summary of the stormwater management approach for the proposed development.

2.0 BACKGROUND

2.1 Existing Conditions

The proposed Site is located on a property comprised of the St. Volodymyr Cultural Centre (SVCC) and the St. Volodymyr cemetery, located south of Dundas Street West immediately west of Sixteen Mile Creek, with the municipal address 1280 Dundas Street West in the Town of Oakville. Specifically, the Site is located within a vacant/ undeveloped portion of the St. Volodymyr property located to the north of the cemetery

and east of SVCC. The subject Site will be formed through a severance of the St. Volodymyr property.

The subject of this report is the proposed severed block of land to be developed as a seniors' living centre. The Site is approximately 4.6 hectares in size based on the proposed severance line.

As a result, the location of the Site can be described as being bound by Fourth Line along its north and east limits, with Sixteen Mile Creek located further to the east of Fourth Line, roughly parallel to the east side of the Site. A naturalized environmental area defined as the West Valley Feature has been identified and is located south of the Site which is under the jurisdiction of Conservation Halton. Finally, an existing private driveway located on the SVCC property leading from Fourth Line through to the cemetery defines the limit of the west side of the site.

The Site is comprised primarily of open grass field used for miscellaneous storage of equipment associated with SVCC.

Refer to Figure 2-1 below for the Site location.

Figure 2-1 – Site Location

2.2 Proposed Redevelopment

The proposed seniors' living facility will be comprised of one Main Senior's Building located along the north and east limits of the Site with four ancillary buildings (blocks) housing Independent Living Units (ILUs) positioned generally along the western limit of the Site. The Main Senior's Building's built form will consist of two eight-storey towers, with a 3-storey high podium with a roof-top amenity terrace between them. Each ILU Block will be one storey with multiple units per building.

Vehicular access into the Site will be from a driveway located generally at the northwest corner of the Site from Fourth Line. This driveway will continue into the Site as a private roadway and fire route generally in a north-south configuration. This roadway will be located along the frontage of the four (4) ILU Blocks providing vehicular access to these units. A second private roadway and fire route will provide vehicular access to the Main

Senior's Building and wrapping around a central parking lot in an inverted "U" configuration.

As mentioned in Section 2.1, there is an existing environmental feature that projects into the south side of the site. This environmental feature, herein referred to as the West Valley Feature (WVF), is regulated by Conservation Halton, and effectively establishes the south limit of the site and the limits of disturbance to the existing natural features. The proposed site plan illustrates the setbacks from the top of banks and environmental features (refer to drawings in Appendix A).

These setbacks, which include Long Term Stable Top of Slope (LTSTS) setbacks and tree protection zones (TPZ) effectively establish the limit of impact as a result of the Development. This impacted limit is roughly 3.3ha and will be the subject of this Functional Servicing Study.

2.3 Background and Resource Information

In preparation of this report, the following information has been obtained and reviewed:

- Regional Municipality of Halton Design Guidelines & Manuals (April 2019 Version 4.0);
- The Regional Municipality of Halton By-Law No. 71-19;
- The Regional Municipality of Halton By-Law No. 184-95;
- Town of Oakville Development Engineering Procedures and Guidelines (downloaded June 2020);
- Record Drawings:
    - Dundas Street West – Drawing O-19034 (dated September 2012)
    - Dundas Street West – Drawing O-19233-19235 (dated December 2012)
    - Dundas Street West – Drawing O-19056-19057 (dated January 2009)
    - Dundas Street West – Drawing O-19255 & O-19260 (dated December 2012)
    - Wooden Hill Circle – Drawing No. 5, 8 & 9 - Regional File No. DO-517 (dated August 2013)
- Topographic Survey of Part of 1280 Dundas Street West Town of Oakville Regional Municipality of Halton prepared by J.D. Barnes Limited dated June 26th, 2020;
- Site plan and project statistics prepared by Icke Brochu Architects Inc. dated December 17th, 2021;

- Hydrant flow testing data provided by Lozzi Aqua Check dated June 26th, 2020;
- Site visit undertaken in June 2020. The site visit included a general examination of the existing site to observe surface features that are representative of the underground servicing, current surface drainage, and to gather additional relevant information. Photos were taken of the entire site and the perimeter in order to document the pre-development conditions; and
- Sub-surface utility engineering investigation completed by Telecon Design dated January 29th, 2020.

3.0 WATER SERVICING

3.1 Water Servicing Criteria

The Regional Municipality of Halton's Water and Wastewater Linear Design Manual (Version 5 – October 2019) was used to estimate the water demand from the proposed development. The Region's criteria are generally summarized as follows:

- Water supply systems should be designed to satisfy the greater of maximum day demand plus fire flow or peak hour demand;
- Average domestic water demands of 0.275 m^3 per capita per day; and
- Maximum day and peak hour factors for residential are 2.25 and 4.00, respectively.

3.2 Existing Water Servicing

Based on the Region's records, there are no existing local distribution watermains along the municipal frontage of the Site. Based on Region's record drawings, there is a 1200 mm Ø concrete pressure pipe located along the north boulevard of Dundas Street West.

With respect to the nearby residential subdivision located west of the SVCC site, a 200 mm Ø watermain network services the subdivision, which includes the nearby Glenayr Gate and Wooden Hill Circle roadways. A 150 mm diameter watermain services the residential subdivision located south of the natural environmental area south of the Site.

Although there are no local distribution watermains located along Fourth Line and Dundas Street West along the frontage of the Site, records provided by the SVCC property owner indicate that the existing SVCC building is serviced off of the 200 mm diameter distribution watermain located on Glenayr Gate onto which it has frontage.

There are no existing fire hydrants present within the vicinity of the Site.

3.3 Proposed Water Servicing

3.3.1 Domestic Water Demand Analysis

The total estimated daily flow rates, maximum day and peak hour demand rates required for the proposed development were calculated in accordance with the Region of Halton Water and Wastewater Linear Design Manual (October 2019, Version 5).

As mentioned, the proposed site will be comprised of an eight-storey Main Senior's Building and four (4) ancillary buildings housing Independent Living Units (ILUs). The estimated equivalent population from the proposed development was calculated based on population densities, as per Table 2-1 of the Region's Linear Design Manual. A population density of 285 and 135 persons per hectare of ground floor area was used to calculate the population for the apartment building and the ILU blocks, respectively.

The proposed water demands are summarized in Table 3-1 below.

Table 3-1 – Proposed Water Demand

	Average Day Demand (L/s)	Maximum Day Demand (L/s)	Peak Hour Demand (L/s)
TOTAL	**2.9**	**6.4**	**11.5**

Refer to Appendix B for water demand calculations.

3.3.2 Fire Flow Analysis

As per the Region's Linear Design Manual, fire flows were calculated based on the *Water Supply for Public Fire Protection Fire Underwriters Survey (FUS)*. Calculations using FUS indicate a maximum governing fire flow of 333.3 L/s (19,998 L/min). Table 3-2 below summarizes the fire demands from the proposed buildings on the Site.

Table 3-2 – Estimated Fire Demands

	Estimated Fire Demand (L/s)
Apartment Building*	**333.3**
ILU – Block 1**	**150.0**
ILU – Block 2**	**200.0**
ILU – Block 3**	**133.3**
ILU – Block 4**	**150.0**
GOVERNING FIRE FLOW	**333.3**

**Based on non-combustible construction type and a sprinkler system conforming to NFPA standards*

***Based on ordinary construction type*

Refer to Appendix B for fire flow analysis calculations.

Fire flows were calculated separately for the Apartment building, and each of the four buildings housing independent living units. As described in Section 3.1, the water supply system should be designed to satisfy the greater of peak hour demand or maximum day demand plus fire flow. Therefore, the maximum day demand plus fire flow rate (i.e., 6.4 L/s + 333.3 L/s = 339.8 L/s (20,387 L/min)) is the governing requirement.

3.3.3 Proposed Watermain Service Connections

As mentioned in Section 3.2, there are no local distribution watermains available to service the Site. As such, discussions with the Region and the Town were initiated in November 2019 to discuss potential water servicing options. In summary, three preliminary water servicing options were discussed with the Region and the Town which included:

Option 1 – Private watermain installed through the SVCC property on easement and connected to the 200 mm Ø watermain located on Glenayr Gate;

Option 2 – Proposed Regional local distribution watermain installed along Fourth Line and directly connected to the 1200 mm Ø transmission main located on Dundas Street West; and

Option 3 – Proposed watermain (or water service) installed south through the Natural Environmental Lands and connecting to the local distribution watermain located within the residential subdivision located on Fourth Line.

Refer to Figure #1 located in Appendix A for an illustration of Servicing Options #1 – #3.

In summary, Options 1 and 3 were rejected by the Region. With respect to Option 2, the Region advised that a new distribution watermain would have to be looped in order to mitigate stagnant water. Consequently, the proposed layout for the new watermain would connect to the existing 1200 mm Ø transmission main, opposite the site, crossing Dundas Street West to Fourth Line where it would then run west along Fourth Line and Dundas Street West, ultimately connecting to the existing 200 mm Ø watermain located on Wooden Hill Circle.

With respect to the proposed connection to the 1200 mm Ø transmission main, the Sixteen Mile Creek Final Environmental Implementation Report and Functional Servicing Study for Graydon Banning and Martillac Estates Inc., North Oakville, dated March 1, 2020 (prepared by Stoneybrook Consulting Inc., Bird and Hale Limited, R.J. Burnside & Associates Limited, Aqualogic and Stantec Consulting Ltd.) indicates a required interconnection to the transmission main generally located at the Fourth Line and Dundas Street intersection. Consequently, it is proposed to incorporate that contemplated interconnection into the design.

As per Region Standards, a proposed fire line will service the Site from the new Regional watermain located on Fourth Line. A domestic service will tee off the fire line and enter the Site separately from the fire line. Both the fire and domestic service will enter into the Main Senior's Building where there will be a mechanical room that will house the water meter and associated fire detector assembly. The fire service will exit the main apartment building, where it will service fire hydrants spaced around the Site to provide fire protection in accordance with OBC requirements. Two remotely located fire department connections (siamese connections) will be provided for the main apartment building located within 45 m of a fire hydrant in accordance with NFPA standards. The domestic line will also exit the main Senior's Building after passing through the water meter where it will then service the ancillary ILU blocks.

The domestic and fire services will be sized and detail designed at the Site Plan Approval stage of the project. Please refer to the *Conceptual General Site Servicing Drawing* and Plan and Profile drawings (PP1 and PP2) in Appendix D for conceptual/preliminary details of the proposed water servicing.

3.3.4 Capacity of Existing Watermain System

Hydrant flow tests were performed by Lozzi Aqua Check on June 26th, 2020. The test hydrant locations are as follows:

1. Existing hydrant connected to the existing 200 mm Ø distribution watermain located on Wooden Hill Circle adjacent to property 2457 Wooden Hill Circle; and
2. Existing hydrant connected to the existing 1200 mm Ø transmission watermain located at the northeast corner of the Dundas Street West and Proudfoot Trail intersection.

The results of the hydrant flow tests are summarized in Table 3-3 below:

Table 3-3 – Hydrant Flow Test Results

Hydrant Location	Theoretical Flow at 20 PSI (L/s)
Wooden Hill Circle	**288.4**
Dundas Street West	**551.0**

The hydrant test on Dundas Street West is greater than the maximum day demand plus fire flow demand from the Site.

Refer to Appendix B for the hydrant flow test results.

A watermain network analysis will be undertaken for the proposed watermain, which will be submitted to the Region for review in conjunction with detailed design drawings to support the hydraulic design of the proposed Regional watermain in accordance with Region of Halton Design Standards.

4.0 SANITARY SERVICING

4.1 Sanitary Servicing Criteria

The Regional Municipality of Halton's Water and Wastewater Linear Design Manual (Version 5 – October 2019) was used to analyze the sanitary demand from the proposed development. The Region's criteria are generally summarized as follows:

- Average domestic residential sewage flows of 0.275 m^3pcd (275 litres per capita per day);
- The peak domestic sewage flow to be calculated by utilizing a calculated Modified Harmon Peaking Factor of [$M = K_{av} * (1 + 14 / (4+(P+P_e)^{0.5})$], where minimum permissible value of M is 2.0; and
- For drainage areas that do not include existing developed areas, the inflow/infiltration allowance shall be 0.286 x 10^{-3} m^3/ha/s for all types of land use.

4.2 Existing Sanitary Servicing

Based on the Region's records, there are no existing local sanitary sewers located along the municipal and regional frontage of the Site. Based on Region record drawings, there are twin 750 mm Ø sanitary force mains located on Dundas Street West along the frontage of the site. The twin force mains convey sewage in a westward direction where it discharges into a sanitary chamber east of the Dundas Street West and Proudfoot Trail intersection. Sewage is then conveyed via a 1200 mm Ø trunk sewer in a westward direction. There is an existing 450mm Ø sanitary "stub" sewer located approximately 270 m west of the development site that is connected perpendicular to the 1200 mm Ø trunk sewer. This stub was installed to collect sanitary drainage from the development lands on the north side of Dundas Street.

Although there are no local sanitary sewers along Fourth Line and Dundas Street West within the frontage of the Site, records provided by the SVCC property owner indicate that the existing SVCC building is serviced from the 200 mm Ø sanitary sewer located on Glenayr Gate onto which it has frontage.

4.3 Proposed Sanitary Servicing

4.3.1 Sanitary Demand Analysis

The total estimated dry weather flows, infiltration allowance, and peak sanitary flows for the proposed development were calculated in accordance with the Region of Halton Water and Wastewater Linear Design Manual (October 2019, Version 5).

The estimated equivalent population from the proposed development was calculated based on population densities as per Table 3-1 of the Region's Linear Design Manual. A population density of 285 and 135 persons per hectare of ground floor area was used to calculate the population for the apartment building and the ILU blocks, respectively.

Based on a per capita demand of 0.275 m^3/capita/day, the proposed development will result in an estimated total peak sanitary flow rate of 10.97 L/s. This represents an estimated increase of approximately 9.65 L/s over the existing estimated infiltration allowance from the Site in the existing (pre-development) condition.

The estimated breakdown of peak sanitary discharge from the redevelopment is summarized in Table 4-1.

Table 4-1 – Proposed Sanitary Demand

	Peak Flow (L/s)
Residential	10.97
Infiltration Allowance	1.32
TOTAL	**12.29**

Refer to Appendix C for sanitary demand calculations.

4.3.2 Proposed Sanitary Service Connection

4.3.2.1 Review of Alternatives

As mentioned in Section 4.2, there are no local sanitary sewers available to service the Site. Similar to water servicing, discussions with the Region and the Town were initiated in November 2019 to discuss a potential sanitary servicing approach to service the development. In summary, three preliminary servicing options were discussed with the Region and the Town which included:

Option 1 – Private force main installed through the SVCC property on easement and connected to the Regional sanitary sewer located on Glenayr Gate;

Option 2 – Proposed gravity sewer installed along both Fourth Line and Dundas Street West right-of-ways (ROWs) to discharge into the existing maintenance hole (MH) chamber (roughly 270 m west of Dundas Street West/Fourth Line intersection); and

Option 3 – Proposed force main installed south through the Natural Environmental Lands and connecting to the Regional sanitary sewer located within the residential subdivision located on Fourth Line.

The Region was not in favour of Options 1 and 3 for similar reasons as mentioned in the Water Servicing section. Consequently, Option 2 was concluded to be the most suitable approach to service the site.

4.3.2.2 External Servicing

The challenge associated with a gravity sewer is the required slope of the pipe to physically achieve a connection to the existing gravity sewer on Dundas Street West. The proposed 200 mm Ø Regional sewer is required to be installed at 0.32%. The upstream terminus of the sewer will be within Dundas Street West on the south half of the roadway. The sewer will continue to the west within Dundas Street West (south of and parallel to the existing twin 750 mm Ø force mains) where it will then cross Dundas Street by crossing below the existing twin 750mm Ø force mains. The sewer will continue in a westward direction parallel to the force mains, where it will then discharge into an existing segment of 450 mm Ø sanitary sewer. This 450 mm Ø sanitary sewer discharges into the same sanitary chamber in which the twin 750 mm Ø force mains outlet into. This sanitary chamber establishes the upstream limit of the existing 1200 mm Ø trunk sewer which accepts the flows from the twin force mains and the existing segment of 450 mm Ø sanitary sewer. This connection location is approximately 150 m east of Proudfoot Trail. The length of the proposed new sanitary sewer within the Municipal ROW is approximately 385 m.

A single sanitary service connection will extend from the upstream terminus of the new sanitary sewer to the Fourth Line property line of the Site. As Fourth Line is lower in elevation than Dundas Street West, the cover of the service connection at the property line is limited to a minimum 1.2 m frost cover. This minimum depth of service connection is, in fact, the basis of setting the gradient of the entire new sewer. It is, however, noted that the relatively shallow depth of cover is only associated with the service connection itself, and not the proposed sewer within Dundas Street West.

The proposed 200 mm Ø sanitary sewer will have sufficient capacity to convey the estimated total sanitary flow from the site of 12.29 L/s at a velocity of 0.63 m/s.

Please refer to Plan and Profile Drawings PP1 and PP2 in Appendix E for details of the proposed municipal sanitary sewer.

4.3.2.3 Internal Servicing

In accordance with The Region of Halton requirements, a new sanitary service is required for each property. Since the proposed development will be comprised of a single ownership, a single sanitary service connection is proposed to service the Site. The sanitary service will be connected to the proposed 1200 mm Ø Municipal MH on Fourth Line. A "control" or inspection MH placed near the property line will be the terminus of the service connection, as per Region of Halton requirements.

As mentioned in the previous section, the proposed service connection will be relatively shallow, only having 1.2 m of frost cover. As a result, it will not be possible to achieve a gravity connection to the buildings within the proposed development. Consequently, a private pumping station will be constructed on the site. Private sanitary building sewers will convey sanitary sewerage from the Main Senior's Building and the four (4) ILU Blocks to this pumping station. The pumping station and associated private force main will then lift the sewage to the sanitary control MH and service connection at the property line.

The proposed regional 200 mm Ø sanitary sewer @ 0.32% has an 80% full conveyance capacity of approximately 15 L/s. Hence, the pumping station will be designed to convey the flows to be less than 15 L/s to conform with the Region of Halton requirements.

The pumping station will be detailed designed at the site plan stage of the project.

4.3.3 Capacity of Existing Sanitary System

In relation to the proposed development, there was communication with the Region in May 2020 for the purpose of understanding any capacity-related constraints related to the new proposed sanitary sewer. In consideration that the downstream outlet for the proposed sanitary sewer is a recently designed trunk sewer and the contributing flows from the proposed development are relatively small, it is not anticipated that there should be any capacity concerns. Therefore, at this stage in the design process, it is our understanding that the Region is to advise of any further concerns with downstream capacity.

5.0 STORM SERVICING

5.1 Storm Servicing Criteria

Storm servicing criteria are to meet the standards set by Town of Oakville Development Engineering Procedures & Guidelines Manual. The criteria are generally summarized as follows:

- Storm runoff shall be controlled to local constraints of receiving systems, established watershed study, MTO guidelines, existing sewer capacity, pre to post where capacity unknown or history of flooding or erosion;
- Where practical, sites shall be designed with a sewer network capable of capturing the 5-year event. If sewers are not possible, surface drainage reaches shall be limited to 50 m;
- Sites shall be self contained unless part of a previous master drainage scheme. Major overland flow relief to a right-of-way shall be reviewed for impacts;
- Storm water can be detained by the following storage methods; landscape ponds, oversized pipes, underground tanks, roof tops, and some hard surface areas;
- Frequent events up to the 5-year level shall not be stored on paved surfaces; this nuisance ponding interferes with operation of site access;
- Quality treatment of storm water is required. The level of treatment is to be determined per the receiving system. Wet ponds, oil grit separators and landscape filter strips are acceptable methods;
- All storm sewer structures are to comply with OPSD specifications and adhere to the requirements of the Ontario Building Code;
- Quality and Quantity control devices shall be located at the property line for municipal access; if not possible, easements may be required (these private facilities shall be operated and maintained by the property owner); and
- Existing external drainage shall be accommodated without impacts to upstream lands.

Furthermore, consultation with Conservation Halton will also be required to establish Site specific stormwater management criteria at the Site Plan stage of the Development.

5.2 Existing Storm Servicing

5.2.1 Existing Storm Sewer Systems

Based on the Region's records, there are existing storm sewers in the vicinity of the site. They are summarized as follows:

- Municipal storm sewers located within Fourth Line, which convey drainage from the St. Volodymyr's Parking Lot and the Fourth Line ROW. This storm sewer discharges to a 600 mm Ø sewer located on Dundas Street West which discharges to Sixteen Mile Creek;

- A 525 mm and 675 mm Ø Storm Sewer on Dundas Street West, which discharges to the Sixteen Mile Creek; and
- A 450 mm Ø Storm Sewer along Glenayr Gate, which collects drainage from the Wooden Hill Circle subdivision and discharges to Sixteen Mile Creek Tributary.

A sub-surface utility engineering (SUE) investigation completed in November 2019 revealed additional storm sewers located along Fourth Line, east of the proposed site. These were found to convey drainage collected by a ditch inlet catchbasin on the west side of Fourth Line. These storm sewers converge with the storm sewers located on Fourth Line along the north side of the Site and ultimately discharge to the 600 mm Ø storm sewer located on Dundas Street West. Records of these additional storm sewers were unable to be obtained from either the Town or the Region.

5.2.2 Pre-Development Storm Drainage

As discussed previously in the report, the Site has an overall impacted limit which can be generally described as the greater of the limit of either the property line, 7.5m Long Term Stable Top of Slope (LTSTS) Buffer or the Tree Protection Zone (TPZ) fence line. As such, the area within this limit has been considered as the limit of impact with respect to stormwater management. Following the development of the Site, areas outside of this impacted limit but still inside the overall legal property line will remained untouched and, inherently, the post-development hydrology will match the pre-development hydrology. Therefore, these areas are not considered in the overall SWM Plan. Please refer to drawing *Pre-Development STM Drainage Area Plan* Drawing No. *PRE-STM*.

The existing Site drainage can generally be divided into four (4) drainage catchment areas and three drainage outlets. These are generally described as follows:

- Outlet A: Drainage overland (minor and major events) which outlets to the West Valley Feature (WVF) located along the south limits of the Site. The West Valley Feature protrudes into the Site as a drainage draw and has been identified as an environmental feature. This drainage feature continues generally in a South direction where it conveys drainage to Glenayr Creek which is a tributary to Sixteen Mile Creek.
- Outlet B: Drainage overland (minor and major events) towards an existing pond located at the north end of the site adjacent to the Fourth Line ROW. Based on the findings of the Project Environmental Consultant, the existing pond was presumed to be an on-line pond in the past, within a larger drainage catchment that extended further north of Dundas Street West. With the urbanization of Dundas Street West and the Fourth Line adjacent to the pond, it no longer serves as a basin that

captures runoff from an upstream catchment and, as such, it has not been identified as an environmental feature to remain.

Furthermore, an SUE investigation revealed that a 400 mm Ø steel culvert from the Pond to the West Valley Feature exists, however, roughly halfway between the Pond and WVF, this pipe was observed to be abandoned/plugged, concluding that no significant minor drainage, beyond a very low flow, discharges from the Pond Basin to the WVF.

Lastly, a review was undertaken that concluded the Pond Basin has enough depression storage capacity to accept the volume from major storm events up to the 100-yr design storm. Therefore, the pond basin catchment was not considered to contribute appreciable surface runoff to the WVF even during major storm events.

- Outlet C: Drainage overland (minor and major events) which outlets to the South West Valley (SWV) located at the southwest corner of the Site. Runoff down this valley flows into Glenayr Creek and ultimately continues in an easterly direction converging with drainage from the West Valley Feature downstream where it ultimately discharges to Sixteen Mile Creek.
- Outlet D: Drainage overland (minor and major events) with drainage conveyed towards Fourth Line along the eastern permitter of the Site.

The following table defines the characteristics and flows generated from the 2-year to 100-year Town of Oakville IDF curves based on a 24-hour Chicago distribution.

Table 5-1 – Existing 2-Yr to 100-Yr Peak Flows

ID	Outlet	Area (ha)	Runoff 'C'	2-Yr (L/s)	5-Yr (L/s)	10-Yr (L/s)	25-Yr (L/s)	50-Yr (L/s)	100-Yr (L/s)
A1	WVF	1.72	0.25	57	98	130	172	203	238
C1	SWV	0.06	0.25	3	5	7	9	11	13
D1	Fourth Line	0.40	0.25	19	32	43	57	68	81

Note: *Catchment ID B1 was excluded because it does not contribute flows up to the 100-yr storm event to the three surface runoff outlets of the existing Site*

Furthermore, there are external drainage areas that drain into the Subject Site. These areas can be summarized as follows:

- Catchment A2: East perimeter of the adjacent St. Volodymyr's property which includes a portion of the paved North/South vehicular driveway and some

miscellaneous landscaped areas which drains into catchment A1 and ultimately outlets to the WVF;

- Catchment B2: Strip of the south boulevard within the Fourth Line R.O.W which drains to the existing pond basin (Catchment ID B1);
- Catchment B3: East perimeter of the adjacent St. Volodymyr's property which includes a portion of the paved North/South vehicular driveway which drains to the existing pond basing (Catchment ID B1);
- Catchment C2: Minor pervious area that drains overland into Catchment C1 and ultimately outlets to the South Valley;

5.3 Post-Development Storm Drainage

5.3.1 Proposed Storm Outlet

The site plan concept envisions a relatively urbanized site with a central parking lot and private roadway to provide access to the ILU buildings. From a drainage perspective, this type of redevelopment is best suited for a storm drainage system with a minor system consisting of catchbasins and on-site storm sewer pipes to collect drainage, as opposed to conveying all storm drainage at the ground surface. Therefore, a storm sewer outlet would be required for this purpose.

The existing storm sewer systems in the vicinity of the Site currently do not collect a significant quantity of runoff from the Site other than some minor perimeter drainage from existing Catchment D which outlets to the existing municipal ditch inlet catchbasin located within the road-side ditch on the west side of the Fourth Line ROW. Beyond this minor contribution of drainage, these sewers were not designed to capture runoff from the entire Site catchment area. Therefore, the municipal minor storm sewer system located within the Fourth Line ROW is not a suitable storm drainage outlet for the entirety of the Site.

As indicated previously, the existing drainage from the majority of the site currently drains overland to the WVF located at the south end of the site. Consequently, the existing drainage draw (WVF) represents the reasonable storm outlet for the site. As a result, it is proposed to utilize the existing pipe outlet into this draw or a reconstructed pipe outfall at the same location and depth if the existing pipe is found to be in a condition that isn't suitable for reuse.

The implementation of a storm sewer outlet into the WVF, either using the existing pipe or a reconstructed pipe, will require measures to mitigate the impact of the urbanization of the site. The following section discusses the types of measures that could be employed as part of a stormwater management plan for the proposed site development.

5.3.2 Proposed Stormwater Management Plan

5.3.2.1 Stormwater Management Criteria

In addition to the general criteria summarized in Section 5.1 of this report, specific criteria and targets will have to be developed through consultation with Conservation Halton to mitigate the impacts of the Site redevelopment on the receiving waters. These targets and criteria will include the following:

Rate Control

Since the Site redevelopment will result in an increase in impervious surface area, storm water detention will have to be employed to facilitate a controlled discharge rate. It is anticipated that the rate control criteria and targets will, at a minimum, be based on controlling post-development peak discharge rates to pre-development peak discharge rates for storm events up to the 100-year storm.

Erosion Control

Stormwater measures to mitigate erosion will be required. These measures may take the form of extended detention of frequent rainfall events and/or retention of rainfall depths such as the first 5 mm.

Water Balance

Stormwater measures to address water balance and the impact of the increase in impervious ground cover will be required.

Water Quality

Measures to address the quality of the runoff from the redevelopment will be required. Typically, these measures target Total Suspended Solids (TSS) removal on an average annual basis.

5.3.2.2 Conceptual Stormwater Management Plan

A detailed Stormwater Management (SWM) Plan will be developed at the Site Plan Approval Stage of the project. This Plan will be developed with input from the Town, Conservation Halton, and the Environmental Consultant for the project, using the SWM criteria and targets established through that consultation.

The following description outlines a general proposed conceptual approach to this plan. Please also refer to drawing *Conceptual General Site Servicing* Drawing No. C-1 for additional details.

The proposed Site drainage can generally be described as maintaining the existing three stormwater outlets which include:

Outlet P1: West Valley Feature (WVF) – Majority of the proposed site drainage discharge to this location resembling the pre-development drainage conditions;

Outlet P2: Fourth Line – Minor perimeter strip of area located along the eastern portion of the site behind the Main Senior's Building; and

Outlet P3: South West Valley – Minor South-Western limit of the Site behind ILU Blocks #3 and #4.

Please refer to drawing *Conceptual Post-Development STM Drainage Area Plan* Drawing No. *PST-STM*.

Outlet P1:

Runoff from the majority of the Site will be captured by catchbasins and an on-site storm sewer system. Catchbasins would be fitted with goss traps or other devices such as CB Shields^{TM} for the purpose of capturing/trapping larger sediment particles and floatables that can be removed through catchbasin maintenance/cleanout programs. The on-site storm sewer system would be routed through an array of sub-surface modular stormwater tanks, which would provide both detention storage volume and retention volume. In that regard, a depth of volume within the bottom portion of this stormwater storage facility would be set below the onsite storm sewer system so that it would not drain out by gravity and instead, be allowed to infiltrate into the ground to mimic the pre-development hydrology. The remaining upper portion of the stormwater storage facility would provide active storage volume that would drain down through the on-site storm sewer system. This entire on-site storm system would be controlled by a downstream orifice sized to meet the peak discharge rate targets for various storm events and erosion control if applicable. This configuration would result in the required detention storage not just being provided within the buried stormwater tanks, but within all of the storm sewer pipes, MHs and catchbasins (CBs) upstream of the orifice. Furthermore, the proposed site grading will be designed to accommodate surface ponding within the main centralized parking lot outside of the fire route and select landscaped surfaces. The required detention storage will be designed to accommodate storage of runoff within the buried tanks and storm sewer up to the five (5) year storm event, whereas for larger events, the depression storage on the surface will be utilized.

To accommodate the tree preservation zone along the western property line between ILU Blocks #3 and #4, the proposed grading will match the drip line of these trees, which is at a lower elevation than the main centralized parking lot. As such, the adjacent ILU Block #3 and #4 and the fire route fronting these Blocks will also relate to the lower elevation of

this tree preservation zone. It is proposed to incorporate a second orifice control and buried stormwater detention tank to provide rate control for this sub-catchment. This will be done to ensure that the hydraulic grade line of the main stormwater detention tank (below the centralized parking lot) can fill up and utilize the surface depression storage in the main parking lot without spilling out the catchbasins that relate to the lower elevation located in the north-south fire route in front of ILU Blocks #3 and #4.

Outlets P2 and P3:

Generally, these catchment areas are primarily comprised of landscaped surfaces. For these areas, storm drainage using surface swales and low impact development (LID) measures would be employed with the goal to eliminate the need for a piped outfall. Hard surfaces, such as pathways or small patio areas, within these areas would sheet drain to pervious landscaped surfaces and swales. In some cases, culverts may be needed to allow drainage swales to pass under a pathway but, buried on-site sewers would be avoided for these areas. Swales would be directed toward the proposed LID infrastructure such as bio-retention swales and/or soakaway pits. Grading design to allow runoff to discharge as sheet overland drainage to the existing Fourth Line and South West Valley outlets in a more natural overland manner will be investigated during the detailed design Site Plan Approval Stage of the project.

External Drainage

Provision will be made for external drainage from both Fourth Line and the adjacent St. Volodymyr property to be conveyed through the Site and outlet to the WVF in a manner similar to pre-development conditions. It is noted that the external drainage areas that were conveyed to the existing pond (Catchments B-2 and B-3) in the pre-development scenario will be re-routed to discharge to the WVF outlet in the post-development condition. In that regard, the runoff from these external drainage areas in the post-development scenario (Catchments E-1, E-2, and E-3) will be accounted for in the overall detention storage of the on-site SWM facilities.

With respect to the external drainage area that was conveyed through the Site and discharged to the WVF in the pre-development condition (Catchment A-3), provision will be made for conveyance of this catchment to continue to drain through the Site and outlet to the WFV in the post-development condition. Since this external drainage area will remain unimpacted, the rate and quantity of runoff from this catchment which outlets to the WVF, will inherently match pre-development conditions. Therefore, the SWM facility will not be purposefully designed to account for detention storage of this external drainage area.

5.3.3 Rate Control and Preliminary Detention Storage Volumes

As mentioned in Section 5.3.2, an orifice control and buried stormwater tanks will serve to meet the discharge criteria provided through consultation with the Town and Conservation Halton. The Table below summarizes the preliminary detention volumes to facilitate the controlled release rate to match the pre-development peak flows for each storm event up to the 100-year. It is noted that the estimated detention storage values in Table 5-2 below are subject to change based on the established discharge criteria.

Table 5-2 – Outlet P1 - Preliminary Detention Storage Volumes and Peak Flows to the West Valley Feature

Storm Event	Pre-Development Peak Flows (L/s)	Post-Development Allowable Peak Flows (L/s)	Total Storage Required (m^3)	Total Storage Provided* (m^3)
2-Year	57	57	±500	1350
5-Year	98	98	±700	1350
10-Year	130	130	±800	1350
25-Year	172	172	±1000	1350
50-Year	203	203	±1200	1350
100-Year	238	238	±1300	1350

**Includes ±500m^3 surface detention storage*

With respect to the drainage outlets to Fourth Line (P2) and the South West Valley (P3), post-development flows will, at a minimum, match pre-development flows. This will be achieved through designing the site grading so that the catchment area discharging to these outlets will not exceed the pre-development flows to the same drainage outlets. Through further consultation with Conservation Halton, LIDs will be considered at the Site Plan Approval detailed design stage to reduce the runoff volume and promote rainwater retention/infiltration up to select return period storm events (i.e., the 2-year to 5-year design storms) prior to discharge off-site.

5.3.4 Erosion Control

As mentioned in Section 5.3.2.1, the erosion control criteria will be developed at a later stage through consultation with Conservation Halton and the Project Geomorphologist. At this stage, it is assumed at a minimum, 5 mm of rainfall depth (above initial abstraction values) will be required to be captured and retained on site. Provision has been made to account for 5mm of rainfall runoff volume retention across the impacted limits of the Site.

Based on an impacted area of approximately 3.3 ha, 5 mm of stormwater runoff retention equates to roughly 165 m^3. This volume will be provided within the bottom portions of the SWM facilities which will be located below the system outlet. The on-site buried SWM tanks will be open bottom to allow for infiltration into the native subgrade below the main parking lot.

Based on the infiltration testing performed by the Project Hydrogeologist, *Infiltration Rate Assessment Report 1280 Dundas Street West, Oakville, Ontario* prepared by BIG Consulting dated October 18th, 2021, an average infiltration rate below the main parking lot has been determined to be 6.8 mm/hour. Based on this infiltration rate, it would require a footprint of approximately 500 m^2 to infiltrate 165 m^3 (5 mm retention over the impacted limits of the Site) over 48 hours. The preliminary SWM tank layout in the main parking lot has a footprint of approximately 800 m^2 which exceeds the required footprint to infiltrate the 5 mm retention volume over 48 hours.

Furthermore, the Project Hydrogeologist has reported the seasonally high groundwater elevations at the Site location. Within the main parking lot area, the seasonally high groundwater table was reported to be roughly between elevations 146.5 m – 147.5 m. The proposed underside of the SWM facility retention/detention tanks will be set an elevation at least 1.0m above these seasonally high groundwater elevations in accordance with MECP Guidelines. Please refer to *Groundwater Contour Map* prepared by B.I.G. Consulting Inc. for the subject Site.

Lastly, since storms of more frequent return periods have a greater influence on a downstream stormwater channel's erosion, the 25mm storm event will also be considered with respect to peak flows. The orifice control and stormwater detention will be designed to control the post-development 25mm storm event peak flows to not exceed the pre-development peak flows during the same 25mm event.

5.3.5 Water Balance

As per Conservation Halton Guidelines for Stormwater Management (May 2021 – Draft Version 1.0), the objective of the water balance criteria is to:

- *Replicate as closely as possible existing hydrologic conditions by maintain a balance between infiltration, runoff and evapotranspiration;*
- *To maintain as closely as possible groundwater and base flow regimes; and*
- *To ensure long-term sustainability of hydrological/ecological form and function of natural features.*

This assessment will evaluate the impact of the proposed development on the Site's water balance by calculating the groundwater recharge (or infiltration) volume in both the existing and proposed condition. If the infiltrated volume in the post-development scenario is lesser than the pre-development condition, additional water balance strategies will be required to maintain the Site's groundwater recharge characteristics. It is noted that this assessment is solely focused on the pervious areas of the Site, in which groundwater recharge can be realized to maximum potential.

5.3.5.1 Groundwater Levels and Infiltration Rates

An Infiltration Rate Testing program was initiated by BIG Consulting Inc. (BIG) in September 2021 to study the existing depth of groundwater levels and to review the on-site soil infiltration rates. Results of this study are published in the BIG report *Infiltration Rate Assessment Report 1280 Dundas Street West, Oakville, Ontario* dated *October 18th,* 2021.

Based on the results of this study, the groundwater elevation was measured generally between 145m to 149m within the Site boundary. BIG has advised that these groundwater level measurements are representative of the seasonally high groundwater levels. Based on the Groundwater Contour Map prepared by BIG, the flow of groundwater is generally in a south direction ultimately towards the west valley feature. The soil stratigraphy at the infiltration test locations was reported to consist of topsoil underlain by native clayey silt to silty clay. Infiltration testing was conducted on September 8th, 2021, at locations that can generally be described as the central portion of the Site (at the proposed main parking lot location) and the northeast (east of the main building) and southeast (adjacent to ILU Block #4) limits of the Site. The percolation rates were reported to be between 10.8 to 20.8 mm/hour. The design infiltration rate reported by BIG is between 4.3 to 8.3 mm/hour, with a safety factor of 2.5.

5.3.5.2 Groundwater Levels and Infiltration Rates

In this exercise, a water balance calculation was completed using the Thornthwaite and Mather (1955) method. This calculation will solely focus on pervious areas of the Site, where groundwater recharge can be realized to maximum potential.

Input data for this calculation was extracted from the MECP SWM Planning & Design Manual Table 3.1, which includes precipitation and evapotranspiration values.

The basic water balance for a region can be expressed as:

$$P = RO + ET + RE + \Delta S \qquad \text{[Equation 1]}$$

Where, P = Precipitation

RO = Runoff

ET = Evapotranspiration

RE = Recharge (Infiltration) [1]

ΔS = Change in Storage (assumed to be zero under steady state conditions)

[1] As per *Hydrogeological Assessment Submission – Conservation Authority Guidelines for Development Applications (2013)*, the terms 'infiltration' and 'recharge' are commonly used interchangeably in development application supporting documents.

Precipitation (P) and evapotranspiration (ET) are site specific values extracted from the Table 3.1 of the MECP SWM Planning & Design Manual. Recharge (RE) and Runoff (RO) are calculated based on P and ET, where the difference between P and ET is the water surplus (WS) available for Infiltration (I) and Recharge (RE):

$$WS = P - ET \quad \text{[Equation 2]}$$

Where WS is used to calculate I after applying an infiltration factor.

$$I = WS \times IF \quad \text{[Equation 3]}$$

An infiltration factor was estimated based on the topography, soil, and ground cover attributes of the site, and summarized in Table 5-3 and 5-4 below.

Table 5-3 – Pre-Development Infiltration Factor

	Pre-development Pervious Areas	
	Attribute	**Component Value [1]**
Topography Factor	Hilly Land	0.10
Soil Factor	Clayey Silt / Silty Clay	0.15
Ground Cover Factor	Urban lawns/Woodland	0.10
Infiltration Factor (IF)		0.35

[1] Component values for southern Ontario basins as found in Table 3.1 on page 3-4 of the Stormwater Management Planning and Design Manual (MOE, 2003)

Table 5-4 – Post-Development Infiltration Factor

	Post-development Pervious Areas	
	Attribute	**Component Value [1]**
Topography Factor	Hilly Land	0.10
Soil Factor	Clayey Silt / Silty Clay	0.15

	Post-development Pervious Areas	
	Attribute	**Component Value [1]**
Ground Cover Factor	Urban lawns/Woodland	0.10
Infiltration Factor (IF)		0.35

[1] Component values for southern Ontario basins as found in Table 3.1 on page 3-4 of the Stormwater Management Planning and Design Manual (MOE, 2003)

The results of the water balance calculations are summarized in Table 5-5 below.

Table 5-5 – Water Balance Calculation (Pervious Areas)

	Pre-development	Post-development	Net Difference
Precipitation (m^3/yr) [1]	30,440	13,622	-16,818
Evapotranspiration (m^3/yr) [1]	17,001	7,608	-9,393
Infiltration (m^3/yr) [2]	4,704	2,105	-2,599
Pervious Areas (m^2) [3]	36,396	17,666	-17,892

[1] Precipitation (P) and Evapotranspiration (ET) values in mm/yr extracted from Table 3.1 on page 3-4 of the Stormwater Management Planning and Design Manual (MOE, 2003) multiplied by pervious area.
[2] Infiltration (I) values calculated using equation 2 & 3.
[3] Pervious areas are extracted from topo survey for pre-development condition, and conceptual site plan for post-development condition. The site plan features roughly 40% pervious areas at this stage of the project.

5.3.5.3 Groundwater Levels and Infiltration Rates

As demonstrated by the water balance calculation, due to overall increase of impervious areas and the decrease in pervious areas on the Site, an infiltration reduction of approximately 2,600 m^3/year is anticipated.

Since the annual groundwater recharge volume of the Site will be decreased due to a greater impervious surface coverage, the proposed development will have to implement SWM measures including infiltration through LIDs to match pre-development conditions in accordance with Conservation Halton requirements.

It is noted that the proposed erosion control target of capturing up to 5 mm of daily rain in and above the initial abstraction would more than make up the 2,600 m^3.

5.3.6 Water Quality

At the Site Plan stage, stormwater quality objectives will be determined through consultation with the Town, Conservation Halton and the project Environmental Consultant. It is anticipated that water quality measures will target Total Suspended Solids (TSS) removal on an average annual basis.

The approach to satisfying the water quality objectives may include measures such as:

- Maximizing landscape surfaces;
- Implementing a treatment train approach such as vegetated filter strips, bio-retention swales, permeable pavers, goss traps/CB Shields^{TM};
- Pre-treatment prior to discharge to the retention portion of the SWM facility including oil grit separators;
- Treatment unit prior to discharge to the natural environment.

6.0 CONCLUSION

With respect to the proposed seniors' living development at 1280 Dundas Street West, the site can be serviced with respect to water, sanitary and storm as follows:

Water: A new municipal distribution main constructed along a portion of the Fourth Line frontage of the site and continuing westerly along the south side of Dundas Street West can provide the required domestic and fire service for the site. This new watermain will have terminating interconnections at the existing 1200 mm Ø Regional transmission located on the north side of Dundas Street West opposite of the site and the existing 200 mm Ø distribution watermain located on Wooden Hill Circle west of the site. The location of the proposed interconnection with the transmission main coincides with the proposed interconnection proposed to service the development lands on the north side of Dundas Street West.

Sanitary: A new 200 mm Ø municipal sanitary sewer constructed from the Site westerly within the Dundas Street West ROW and discharging into the existing 1200 mm Ø sanitary trunk sewer at a location approximately 150 m east of the Proudfoot Trail intersection, will provide sanitary servicing for the site. The resultant service connection to the site will be relatively shallow (1.2 m frost cover) and, as a result, sanitary drainage from within the Site will drain by gravity to a private pumping station with a force main that discharges to a control MH and service connection located near the Fourth Line property line.

Storm: The existing site generally drains to the south into a defined environmental feature which is also a drainage draw. Adjacent storm sewers on Dundas Street West and Fourth Line were not designed to accept drainage from the Site.

It is proposed to reuse or reconstruct an existing outlet pipe into the drainage draw. To mitigate the impacts of the development, a stormwater management (SWM) plan will be implemented to provide discharge rate control, erosion control, water balance and quality control for discharge from the developed site. Prior to detailed design, criteria and target parameters for these measures will be confirmed through consultation with Conservation Halton. A concept SWM plan approach presented in section 5.3.2 of this report demonstrates how such a SWM plan could be employed for the proposed development.

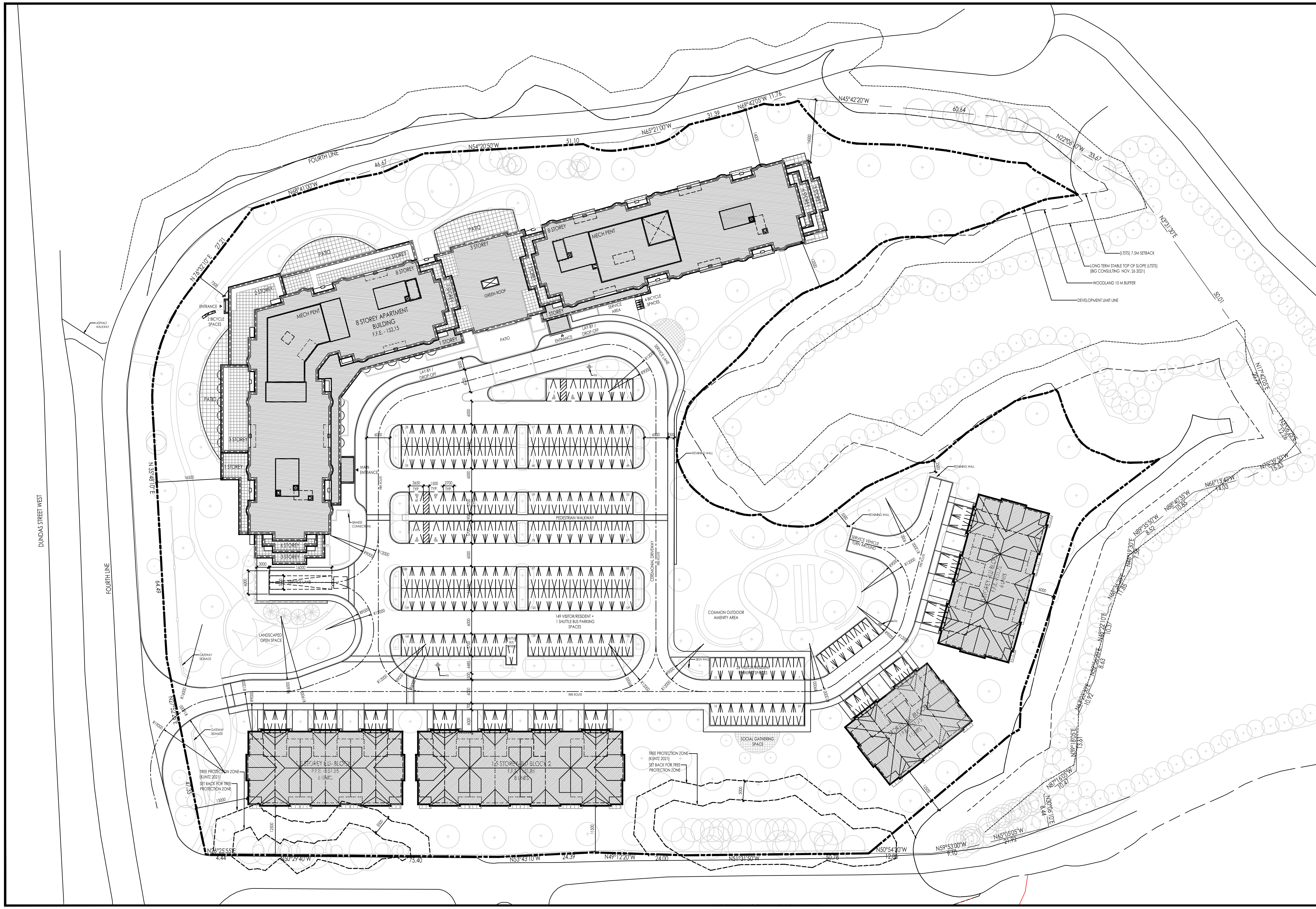
Mufaddal Shabbir

Report prepared by:
Mufaddal Shabbir

Report reviewed by:
David Stafford, P.Eng.

APPENDIX A

Architectural Plans and Background Information



KEY PLAN

SURVEY INFORMATION

PLAN OF SURVEY	PART OF LOT 23 CONCESSION 1 SOUTH OF DUNDAS STREET (GEOGRAPHIC TOWNSHIP OF TRAFALGAR) TOWN OF OAKVILLE REGIONAL MUNICIPALITY OF HALTON
NOTES	BEARINGS ARE UTM GRID, DERIVED FROM OBSERVED REFERENCE POINTS A AND B, BY REAL TIME NETWORK (RTN) OBSERVATIONS, UTM ZONE 17, NAD 83 (CSRS) (2010.0). DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999708.
ADDITIONAL NOTES	DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048
SURVEYOR CONTACT INFORMATION	J.D. BARNES LIMITED 401 WHEELABRATOR WAY, SUITE A MILTON, ON, L9T 3C1 TEL: (905) 875-9955 FAX: (905) 875-9956 www.jdbarnes.com

SITE PLAN LEGEND NTS

- MAIN ENTRANCE
- SECONDARY ENTRANCE
- EXISTING GRADE DATUM
- 000.000 FFE — FINISH FLOOR ELEVATION
- 000.000 EST GR — ESTABLISHED GRADE
- 000.000 — PROPOSED GRADE DATUM
- AIR CONDITIONING UNIT (REFER TO MECH DWGS)
- GAS METER (REFER TO MECH DWGS)
- HYDRO METER (REFER TO ELEC DWGS)
- RECEPTACLE (REFER TO ELEC DWGS)
- MB — MAILBOXES

PARKING/BICYCLE LEGEND NTS

- BICYCLE PARKING SPACE 600W x 1800L (mm)
- VISITOR/RESIDENT PARKING SPACE 2700W x 5700L (mm) SURFACE PARKING
- BARRIER-FREE PARKING SPACE TYPE 'A' 3650W x 5700L (mm) SURFACE PARKING + 1500mm AISLE
- BARRIER-FREE PARKING SPACE TYPE 'B' 2700W x 5700L (mm) SURFACE PARKING +1500mm AISLE
- PARALLEL VISITOR PARKING SPACE 2700W x 7000L (mm) SURFACE PARKING
- LOADING SPACE 3500W x 12000L x 4200H (mm)

CONSULTANT SYMBOLS NTS

- EXISTING HYDRANT (REFER TO SURVEY)
- PROPOSED HYDRANT (REFER TO CIVIL DWGS)
- SIAMESE CONNECTION (REFER TO MECH/CIVIL DWGS)
- MH — SANITARY MANHOLE (REFER TO CIVIL DWGS)
- MH — STORM SEWER MANHOLE (REFER TO CIVIL DWGS)
- CB MH — CATCHBASIN MANHOLE (REFER TO CIVIL DWGS)
- CB — CATCHBASIN (REFER TO CIVIL DWGS)
- LS — EXISTING STREET LIGHT (REFER TO SURVEY/ELEC)
- PROPOSED STREET LIGHT (REFER TO ELEC DWGS)
- TX — TRANSFORMER (REFER TO ELEC DWGS)

GENERAL NOTES

1. ALL GROUND LEVEL VENTILATION GRATES WILL HAVE A POROSITY OF LESS THAN 2 cm x 2 cm.

2. FOR GRADING AND SITE SERVICING INFORMATION, REFER TO DRAWINGS PREPARED BY ; R. V. ANDERSON ASSOCIATES LIMITED - 2001 SHEPPARD AVENUE EAST, SUITE 300, TORONTO, ON, M2J 4Z8 (416) 497-8600

3. FOR LANDSCAPE INFORMATION, REFER TO DRAWINGS PREPARED BY ; COSBURN NAUBORIS LTD. - 20 CROWN STEEL DR, SUITE 2, MARKHAM, ON, L3R 9X9 (905) 940 4443

4. FOR TRASPORTATION STUDY INFORMATION, REFER TO DRAWINGS PREPARED BY; LEA CONSULTING LTD. - 625 COCHRANE DRIVE, 8TH FLOOR, MARKHAM ON, L3R 9R9 (905) 470-0015

5. FOR ECOLOGICAL INFORMATION, REFER TO DRAWINGS PREPARED BY; SLR CONSULTING LTD. - 55 UNIVERSITY AVE., #501, TORONTO, ON, M5J 2H7 (905) 415-7248

6. A TRAINED ON-SITE STAFF MEMBER WILL BE AVAILABLE TO MANOEUVRE BINS FOR THE COLLECTION DRIVER AND ACT AS A FLAGMAN WHEN THE TRUCK IS REVERSING.

7. THE SITE CONTRACTOR IS TO PROVIDE A RISK MANAGEMENT PLAN TO ADDRESS PROTOCOL IN THE EVENT OF AN OIL OR GAS SPILL DURING CONSTRUCTION. THE RISK MANAGEMENT PLAN IS TO BE DISCUSSED WITH ALL PARTIES AT THE PRE-CONSTRUCTION MEETING.

1. ZONING

ZONING BY-LAW 2014-014

EXISTING ZONING: OPEN SPACE ZONE " O2 "

2. SITE AREA

	SQ. FEET (FT²)	SQ. METER (M²)	ACRES (AC)	HECTARES (HA)
OVERALL SITE AREA	497,685 FT²	46,233 M²	11.42 AC	4.62 HA
NET DEVELOPABLE SITE AREA	380,257 FT²	35,327 M²	8.73 AC	3.53 HA
NATURAL HERITAGE LAND AREA	117,428 FT²	10,906 M²	2.69 AC	1.09 HA

3. FLOOR AREA (FA)

"MEANS THE AGGREGATE AREA OF A BUILDING WITHIN THE EXTERIOR AREA OF A BUILDING CONTAINED WITHIN THE EXTERIOR WALLS , BUT DOES NOT INCLUDE ATTIC OR BASEMENT SPACE UNLESS OTHERWISE SPECIFIED ".

SENIORS RESIDENCE	NO. FLS x SQ METER (M²)	SQ METER (M²)	SQ FEET (FT²)
GROUND FLOOR		4,750 M²	51,128 FT²
2ND FLOOR		4,096 M²	44,088 FT²
3RD FLOOR		4,015 M²	43,217 FT²
4TH FLOOR		3,181 M²	34,240 FT²
5TH & 6TH FLOOR	2 FLOORS x 3,181 M²	6,362 M²	68,480 FT²
7TH FLOOR		3,101 M²	33,379 FT²
8TH FLOOR		2,983 M²	32,109 FT²
SUB TOTAL		28,488M²	306,642 FT²
INDEPENDENT LIVING UNITS (ILU)		SQ METER (M²)	SQ FEET (FT²)
GROUND FLOOR/ LOFT		3,472 M²	37,372 FT²
TOTAL		31,960 M²	344,014 FT²

4. NET FLOOR AREA (NFA)

"MEANS THE TOTAL AREA OF ALL FLOORS OF A BUILDING MEASURED FROM THE INTERIOR FACES OF THE EXTERIOR WALLS OR DEMISING WALLS, BUT DOES NOT INCLUDE THE AREA OF STAIR WELLS, ELEVATORS, ESCALATORS, VENTILATING SHAFTS, ATTICS, CONCOURSES, WASHROOMS, ATTACHED ENCLOSED AND COVERED LOADING DOCKS AND RELATED ENCLOSED CORRIDORS USED FOR LOADING PURPOSES, ABOVE AND BELOW GRADE PARKING STRUCTURES, STORAGE ROOMS, ROOMS FOR GARBAGE CONTAINMENT, AND MECHANICAL ROOMS."

SENIORS RESIDENCE	NO. FLS x SQ METER (M²)	SQ METER (M²)	SQ FEET (FT²)
GROUND FLOOR		4,340 M²	46,716 FT²
2ND FLOOR		3,998 M²	43,034 FT²
3RD FLOOR		3,919 M²	42,184 FT²
4TH FLOOR		3,100 M²	33,368 FT²
5TH & 6TH FLOOR	2 FLOORS x 3,100 M²	6,200 M²	66,736 FT²
7TH FLOOR		3,020 M²	32,507 FT²
8TH FLOOR		2,902 M²	31,237 FT²
SUB TOTAL		27,479 M²	295,782 FT²
INDEPENDENT LIVING UNITS (ILU)		SQ METER (M²)	SQ FEET (FT²)
GROUND FLOOR/ LOFT		2,928 M²	31,517 FT²
TOTAL		30,407 M²	327,299 FT²

5. UNITS

SENIORS RESIDENCE	ASSISTED LIVING (AL)	MEMORY CARE (MC)	INDEPENDENT SUPPORTIVE LIV. (ISL)	INDEPENDENT LIVING SUITES (IL)	TOTAL
GROUND	-	-	-	13	13
2ND FLOOR	34	-	-	16	50
3RD FLOOR	-	34	-	16	50
4TH FLOOR	-	-	24	18	42
5TH FLOOR	-	-	24	18	42
6TH FLOOR	-	-	24	18	42
7TH FLOOR	-	-	23	16	39
8TH FLOOR	-	-	21	16	37
SUBTOTAL	34	34	116	131	315 UNITS
INDEPENDENT LIVING UNITS (ILU)					
GROUND FLOOR/LOFT	24				24 UNITS
TOTAL					339 UNITS

6. DENSITY

UNITS PER HECTARE/ACRE

TOTAL UNITS / DEVELOPABLE SITE AREA (AC)	339 UNITS / 8.73 AC	39 UAC
TOTAL UNITS / DEVELOPABLE SITE AREA (HA)	339 UNITS / 3.53 HA	96 UHA

7. FLOOR SPACE INDEX (FSI)

"MEANS THE NET FLOOR AREA OF ALL BUILDINGS ON A LOT DIVIDED BY THE LOT AREA"

NET FLOOR AREA/DEVELOPABLE SITE AREA	30,407 / 35,327 M²	0.86 FSI

8. BUILDING HEIGHT

'HEIGHT SHALL BE MEASURED FROM THE GROUND FINISHED FLOOR ELEVATION TO THE HIGHEST POINT OF A STRUCTURE OF THE BUILDING, PER SITE SPECIFIC BY-LAW."

ZONING BY-LAW 2014-014: PART 12.3	SENIORS RESIDENCE	SENIORS FRIENDLY IND. LIVING UNITS (SFIL)
MAX PERMITTED	14M	14M
PROPOSED	29.5M (8 STOREY)	6M (1.5 STOREY)

9. COVERAGE

	SQ. METER (M²)	SQ. FEET (FT²)	%
BUILDING	7,514 M²	80,800 FT²	21.3% (25% MAX PERMITTED)
PAVED AREAS (DRIVE AISLES & PARKING AREAS)	7,873 M²	84,744 FT²	22.3%
LANDSCAPED AREAS (HARD/SOFT)	19,940 M²	214,713 FT²	56.4%
TOTAL	35,327 M²	380,257 FT²	100%

10. SETBACKS

ZONING BY-LAW 2014-014: PART 12.3

	FRONT YARD (FOURTH LINE)	FLANKAGE YARD	INTERIOR SIDE YARD	REAR YARD
REQUIRED	12 M	12 M	12 M	12 M
PROPOSED	7.3 M	14 M	11.5 M	6M

11. LOADING AREA

	SENIORS RESIDENCE	INDEPENDENT LIVING UNITS (ILU)
LOADING AREAS	1	N/A

12. PARKING

	MINIMUM REQUIRED	PROVIDED
RETIREMENT HOME SUITES (0.33 PER ASST/D LIVING UNIT & DWELLING UNIT (DU))	104 RESIDENT/VISITOR SPACES	161 RESIDENT/VISITOR SPACES
IL UNITS (2/ DU + .25 OF DU FOR VISITORS)	48 RESIDENT & 6 VISITOR SPACES = 54	48 RESIDENT & 6 VISITOR SPACES = 54
*ACCESSIBLE PARKING SPACES	5	6
RESIDENT'S SHUTTLE BUS PARKING	-	1
TOTAL PROVIDED	163	222

* (2 PLUS 2% OF THE TOTAL NUMBER OF PARKING SPACES IN THE PARKING AREA-MINIMUM)

13. BICYCLE SPACES

MIN. BICYCLES REQUIRED	"LESSER OF 5 OR 0.25 PER ASSISTED LIVING UNIT OR DWELLING UNIT"
TOTAL PROVIDED	6

NO.	DATE	ISSUE	BY
2.	MAR. 02, 2022	RE-ISSUED FOR RE-ZONING APPLICATION	PI
1.	SEPT. 22, 2020	ISSUED FOR RE-ZONING APPLICATION	PI

Issued

ICKE | BROCHU ARCHITECTS INC.

517 Wellington St W., Suite 201, Toronto, Ontario, M5V 1G1

ONTARIO ASSOCIATION OF ARCHITECTS — LICENCE 5395

APPLICANT NAME: DELMANOR WEST OAK INC.

DELMANOR West Oak
Inspired Retirement Living™

1280 DUNDAS STREET W. — OAKVILLE, ONTARIO

Drawing title:

SITE PLAN & STATISTICS

Date	SEP 10, 2021	Drawn By	PY
Scale	1:400	Reviewed By	PI
Project No.	17.23	Drawing No.	A101
Plot Date	March 02, 2022		

TOPOGRAPHICAL SKETCH OF
PART OF
1280 DUNDAS STREET WEST
TOWN OF OAKVILLE
REGIONAL MUNICIPALITY OF HALTON

SCALE 1 : 500

J.D. BARNES LIMITED

METRIC DISTANCES AND/OR COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

NOTES:
BEFORE DIGGING, UNDERGROUND SERVICES SHOULD BE LOCATED ON SITE BY THE RESPECTIVE AGENCIES.

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THAT LOCAL BENCHMARKS HAVE NOT BEEN ALTERED OR DISTURBED AND THAT THE RELATIVE ELEVATIONS AGREE WITH THE INFORMATION SHOWN ON THIS PLAN.

PRIMARY CONTOURS ARE SET AT 1.00m INTERVALS
SECONDARY CONTOURS ARE SET AT 0.25m INTERVALS

ELEVATION NOTE
ELEVATIONS SHOWN ON THIS PLAN ARE RELATED TO GEODETIC DATUM AND WERE DERIVED FROM THE TOWN OF OAKVILLE BENCH MARK No. 264.
ELEVATION = 149.535

LOCAL BENCHMARK No. 1
PK NAIL IN ASPHALT SIDEWALK AT FOURTH LINE TURN AROUND AND NORTHEAST TRAIL ENTRANCE.
ELEVATION = 149.453m

LOCAL BENCHMARK No. 2
CUT CROSS ON CURB ON NORTHWEST SIDE OF FOURTH LINE.
ELEVATION = 151.941m

CAUTION:
THIS IS NOT A PLAN OF SURVEY AND SHALL NOT BE USED FOR TRANSACTION OR MORTGAGE PURPOSES.

LOCAL BENCHMARK No. 1
ELEVATION = 149.453

LIMIT BETWEEN LOTS 22 AND 23, CONCESSION 1, SOUTH OF DUNDAS STREET

PART 3 PLAN 20R-16495
PART 2 PLAN 20R-16495
PART 1 PLAN 20R-16495
PART 1 PLAN 20R-8277
PART 1 PLAN 20R-12519
PART 2 PLAN 20R-12519
PART 6 PLAN 20R-16278
PART 7 PLAN 20R-16278
PART 7 PLAN 20R-2184 (REMAINDER)
PART 35 PLAN 20R-15191

DEPOSITED PLAN 880

KNOWN AS FOURTH LINE ROAD TRAVELLED ROAD

LOT 23

CONCESSION 1

SOUTH OF DUNDAS STREET

DUNDAS STREET WEST REGIONAL ROAD No. 5

LOCAL BENCHMARK No. 2
ELEVATION = 151.941

BLOCK 132
BLOCK 131
PLAN 20M-869
LOT 18
LOT 17
LOT 16
REGISTERED

DETAIL "A"

LEGEND

CB	DENOTES CATCHBASIN
SICB	DENOTES SIDE INLET CATCHBASIN
MH	DENOTES MANHOLE
TMH	DENOTES TELEPHONE MANHOLE
SAN MH	DENOTES SANITARY MANHOLE
STM MH	DENOTES STORM MANHOLE
WMH	DENOTES WATER MANHOLE
IB	DENOTES IRON BAR
RIB	DENOTES ROUND IRON BAR
SIB	DENOTES STANDARD IRON BAR
HP	DENOTES HYDRO POLE
LS	DENOTES LIGHT STANDARD
TSC	DENOTES TRAFFIC SIGNAL CONTROL
TL	DENOTES TRAFFIC SIGNAL
TJB	DENOTES TELEPHONE JUNCTION BOX
H	DENOTES FIRE HYDRANT
WK	DENOTES WATER KEY
WV	DENOTES WATER VALVE
SP	DENOTES GAS STAND PIPE
—E—	DENOTES OVERHEAD HYDRO WIRES
PED	DENOTES TELEPHONE PEDESTAL
HP	DENOTES HYDRO POLE WITH ANCHOR WIRE
CA	DENOTES CENTRELINE
	DENOTES DECIDUOUS TREE
	DENOTES COMIFEROUS TREE
CSP	DENOTES CORRUGATED STEEL PIPE

TAG# (#XXX ON PLAN)	ELEVATION (meters) (BASE OF TREE)
#137	151.84
#138	151.67
#139	151.71
#140	DID NOT FIND
#141	DID NOT FIND
#142	151.78
#143	151.71
#144	151.44
#145	151.88
#146	151.77
#147	151.73
#148	151.59
#149	151.80
#150	151.84
#151	151.71
#152	151.76
#153	151.87
#154	151.32
#155	151.25
#156	151.18
#157	151.03
#158	151.04
#159	150.87
#160	151.83
#161	150.82
#162	150.33
#163	150.33
#164	150.23
#165	149.74
#166	151.18
#167	150.19
#168	150.30
#169	150.63
#170	151.71
#171	150.83
#172	151.09
#173	150.56
#174	150.44
#175	DID NOT FIND
#176	150.23
#177	150.20
#178	150.08
#179	150.30
#180	150.83
#181	149.57
#182	149.57
#183	149.19
#184	149.23
#185	149.77
#186	149.72

TAG# (#XXX ON PLAN)	ELEVATION (meters) (BASE OF TREE)
#187	149.54
#188	149.28
#189	149.54
#190	149.33
#191	149.35
#192	149.26
#193	149.93
#194	149.83
#195	150.20
#196	150.14
#197	150.50
#198	150.34
#199	150.37
#200	149.86
#201	150.41
#202	149.83
#203	150.65
#204	DID NOT FIND
#205	150.44
#206	151.31
#207	151.58
#208	152.03
#209	152.03
#210	151.44
#211	151.72
#212	151.26
#213	151.40
#214	151.28
#215	151.42
#216	151.37
#217	151.41
#218	151.38
#219	151.40
#220	151.57
#221	151.68
#222	151.88
#223	152.14
#224	151.97
#225	151.90
#226	151.90
#227	151.68
#228	151.55
#229	151.84
#230	151.84
#231	151.83
#232	151.90
#233	152.16
#234	151.97
#235	152.11
#236	151.82

TAG# (#XXX ON PLAN)	ELEVATION (meters) (BASE OF TREE)
#237	151.89
#238	151.81
#239	151.76
#240	151.72
#241	151.48
#242	151.17
#243	150.80
#244	150.44
#245	151.06
#246	150.66
#247	150.66
#248	150.88
#249	150.81
#250	150.87
#251	150.48
#252	150.98
#253	151.08
#254	151.52
#255	151.32
#256	151.07
#257	150.89
#258	151.09
#259	151.17
#260	151.33
#261	151.34
#262	151.46
#263	151.49
#264	151.41
#265	151.52
#266	151.40
#267	151.39
#268	151.37
#269	151.26
#270	151.26
#271	151.15
#272	151.09
#273	150.97
#274	150.87
#275	150.90
#276	150.51
#277	150.28
#278	150.67
#279	149.99
#280	150.12
#281	150.66
#282	150.68
#283	150.22
#284	150.92
#285	150.88
#286	151.09

TAG# (#XXX ON PLAN)	ELEVATION (meters) (BASE OF TREE)
#287	151.09
#288	151.60
#289	151.87
#290	151.71
#291	152.05
#292	151.46
#293	151.34
#294	151.53
#295	151.35
#296	151.35
#297	151.30
#298	151.31
#299	151.34
#300	DID NOT FIND
#301	151.26
#302	DID NOT FIND
#303	DID NOT FIND
#304	DID NOT FIND
#305	151.41
#306	151.37
#307	151.40
#308	151.26
#309	151.11
#310	151.00
#311	151.45
#312	151.38
#313	150.62
#314	150.27
#315	150.38
#316	149.93
#317	149.81
#318	150.11
#319	150.03
#320	150.21
#321	150.15
#322	150.29
#323	150.18
#324	150.51
#325	150.22
#326	150.51
#327	150.67
#328	150.66
#329	150.22
#330	150.53
#331	150.61
#332	150.70
#333	150.37
#334	150.55
#335	150.71
#336	150.64

TAG# (#XXX ON PLAN)	ELEVATION (meters) (BASE OF TREE)
#337	150.70
#338	150.34
#339	150.40
#340	150.29
#341	150.30
#342	151.05
#343	151.10
#344	150.89
#345	150.68
#346	150.68
#347	150.51
#348	150.64
#349	150.75
#350	150.96
#351	151.01
#352	149.92
#353	149.77
#354	150.39
#355	150.32
#356	150.98
#357	150.90
#358	150.79
#359	151.00
#360	151.21
#361	151.28
#362	151.39
#363	151.54
#364	151.59
#365	151.70
#366	151.72
#367	152.03
#368	151.97
#369	152.13
#370	151.99
#371	151.98
#372	152.13
#373	152.11
#374	152.14
#375	152.17
#376	151.98
#377	152.08
#378	152.05
#379	152.11
#380	151.76
#381	151.63
#382	151.61
#383	151.57
#384	151.75
#385	151.45
#386	151.44

TAG# (#XXX ON PLAN)	ELEVATION (meters) (BASE OF TREE)
#387	151.58
#388	151.38
#389	151.38
#390	151.55
#391	151.36
#392	151.22
#393	151.13
#394	151.06
#395	151.56

MANHOLE TYPE AND NUMBER (ON FACE OF PLAN)	RIM ELEVATION (METRES)
STORM MH 1	150.36
STORM MH 2	151.40
STORM MH 3	152.15
STORM MH 4	152.18
STORM MH 5	151.98
STORM MH 6	152.26
STORM MH 7	152.24
STORM MH 8	152.49
STORM MH 9	153.32
STORM MH 10	154.61
STORM MH 11	154.64
STORM MH 12	154.51
STORM MH 13	156.21
STORM MH 14	156.22
STORM MH 15	156.70
STORM MH 16	157.02
STORM MH 17	156.28
STORM MH 18	155.75
SANITARY MH 1	153.41
SANITARY MH 2	154.66
SANITARY MH 3	154.49
SANITARY MH 4	155.80
SANITARY MH 5	155.90
TELEPHONE MH 1	152.37
TELEPHONE MH 2	154.94
WATER MH 1	152.55
WATER MH 2	156.29
WATER MH 3	156.83
WATER MH 4	156.62
MH 1	152.36
MH 2	152.45
MH 3	152.46
MH 4	152.46
MH 5	153.74
MH 6	153.68
MH 7	153.66
MH 8	153.82
MH 9	153.82
MH 10	153.84

MANHOLE TYPE AND NUMBER (ON FACE OF PLAN)	RIM ELEVATION (METRES)
MH 11	153.88
MH 12	154.04
MH 13	154.50
MH 14	154.52
MH 15	154.55
MH 16	155.08
MH 17	155.09
MH 18	155.23
MH 19	156.69
MH 20	156.81
MH 21	156.85
MH 22	156.71
MH 23	156.66
MH 24	156.56
MH 25	156.22
MH 26	156.36
MH 27	156.07
MH 28	156.73
MH 29	156.73
MH 30	156.76
MH 31	157.19
MH 32	156.96
MH 33	156.95
MH 34	156.93
MH 35	156.73
MH 36	156.40
MH 37	156.46
MH 38	156.18
MH 39	155.97
MH 40	154.87
MH 41	154.46
MH 42	154.25
MH 43	154.24
MH 44	154.23
MH 45	153.76
MH 46	153.23
MH 47	153.24
MH 48	152.74
MH 49	152.36

CATCH BASIN TYPE AND NUMBER (ON FACE OF PLAN)	RIM ELEVATION (METRES)
OPEN CB 1	152.06
OPEN CB 2	152.07
OPEN CB 3	151.84
OPEN CB 4	151.58
OPEN CB 5	151.59
OPEN CB 6	151.33
OPEN CB 7	151.33
OPEN CB 8	151.33
OPEN CB 9	151.24
OPEN CB 10	152.79
OPEN CB 11	151.68
OPEN CB 12	151.72
OPEN CB 13	153.21
OPEN CB 14	151.59
OPEN CB 15	152.46
OPEN CB 16	152.72
OPEN CB 17	154.03
OPEN CB 18	154.47
OPEN CB 19	153.80
OPEN CB 20	154.47
OPEN CB 21	154.88
SIDE INLET CB 22	155.18
SIDE INLET CB 23	155.83

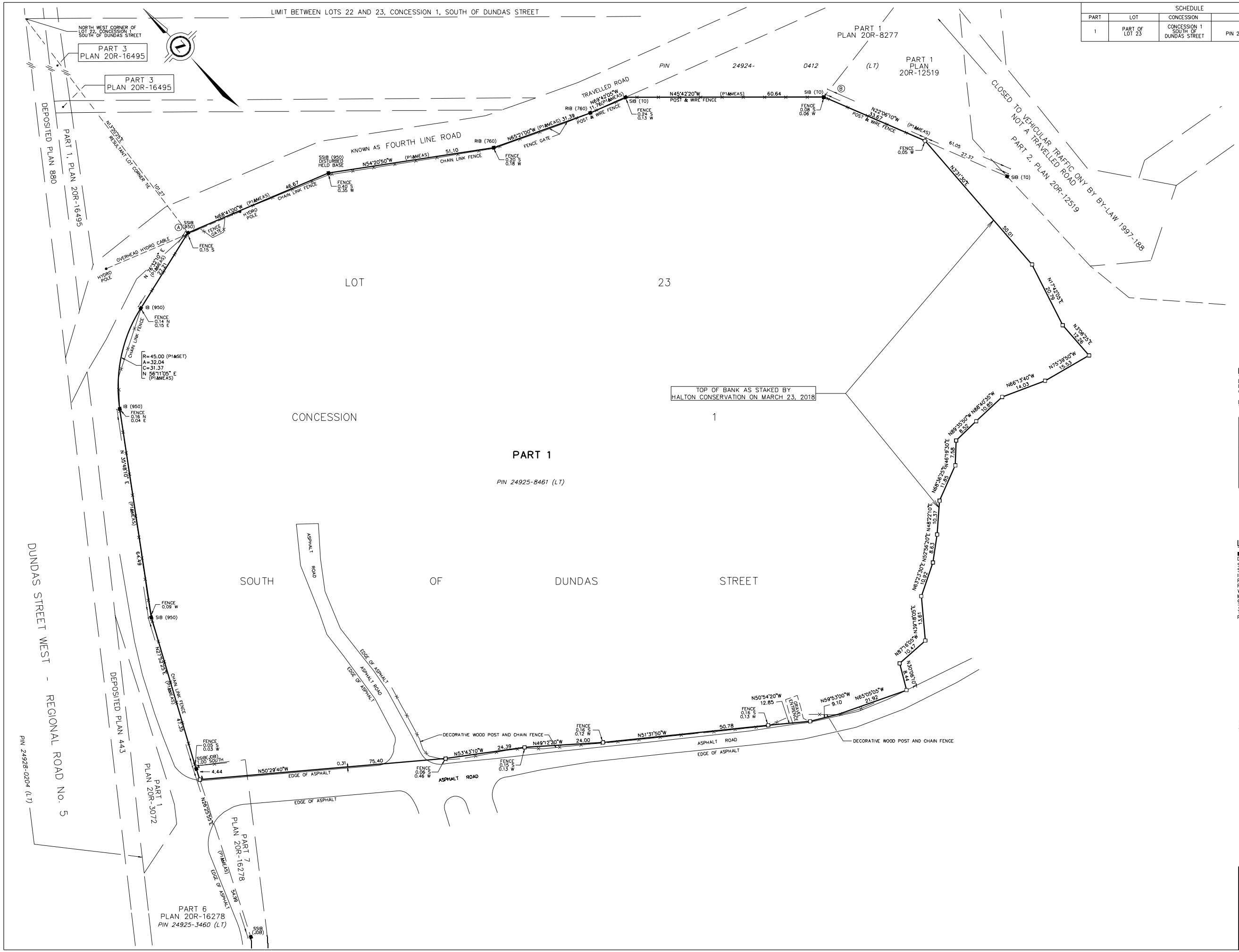
CATCH BASIN TYPE AND NUMBER (ON FACE OF PLAN)	RIM ELEVATION (METRES)
OPEN CB 24	156.08
OPEN CB 25	156.32
OPEN CB 26	155.91
OPEN CB 27	155.95
OPEN CB 28	156.05
OPEN CB 29	156.02
OPEN CB 30	156.64
OPEN CB 31	156.72
SIDE INLET CB 32	156.09
SIDE INLET CB 33	155.81
SIDE INLET CB 34	155.65
SIDE INLET CB 35	155.43
SIDE INLET CB 36	155.15
SIDE INLET CB 37	154.82
OPEN CB 38	154.02
SIDE INLET CB 39	153.50
SIDE INLET CB 40	153.07
SIDE INLET CB 41	152.74
SIDE INLET CB 42	152.73
OPEN CB 43	152.40
OPEN CB 44	152.39
OPEN CB 45	152.08
OPEN CB 46	152.07

FIELD WORK WAS COMPLETED ON JUNE 19th, 2020

J.D.BARNES LIMITED
SURVEYING MAPPING GIS
LAND INFORMATION SPECIALISTS
401 WEBER ARBITRATOR WAY, SUITE A, MILTON, ON L9T 5C1
T: (905) 875-4610 F: (905) 875-4676 www.jdbarnes.com

DRAWN BY:	CHECKED BY:	REFERENCE NO.:
JM / ML / ARP	KK	17-30-187-00-TOPO

FILE: Q:\17-30-187\DWG\Drawing\17-30-187-AddDetailSketch.dwg DATED: JUNE 26, 2020
PLOTTED: 6/26/2020



SCHEDULE			
PART	LOT	CONCESSION	PIN
1	PART OF LOT 23	CONCESSION 1 SOUTH OF DUNDAS STREET	PART OF PIN 24925-8461 (LT)

PLAN OF SURVEY OF

PART OF LOT 23
CONCESSION 1
SOUTH OF DUNDAS STREET

(GEOGRAPHIC TOWNSHIP OF TRAFALGAR)

TOWN OF OAKVILLE

REGIONAL MUNICIPALITY OF HALTON

SCALE 1 : 500

10 0 10 20 30 metres

THE INTENDED PLOT SIZE OF THIS PLAN IS 915mm IN WIDTH BY 609mm IN HEIGHT WHEN PLOTTED AT A SCALE OF 1:500

J.D. BARNES LIMITED

METRIC DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

NOTES

BEARINGS ARE UTM GRID, DERIVED FROM OBSERVED REFERENCE POINTS A AND B, BY REAL TIME NETWORK (RTN) OBSERVATIONS, UTM ZONE 17, NAD83 (CSRS) (2010.0).

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999708.

INTEGRATION DATA		
OBSERVED REFERENCE POINTS (ORPs): UTM ZONE 17, NAD83 (CSRS) (2010.0).		
COORDINATES TO URBAN ACCURACY PER SECTION 14 (2) OF O.REG 216/10.		
POINT ID	EASTING	NORTHING
ORP (A)	600 992.81	4 812 435.15
ORP (B)	601 160.74	4 812 328.90
COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.		

THE RESULTANT TIE BETWEEN ORP (A) AND ORP (B) IS 198.78 N 57°40'40" E

LEGEND

■	DENOTES	SURVEY MONUMENT SET
□	DENOTES	ROUND IRON BAR
SIB	DENOTES	STANDARD IRON BAR
SSIB	DENOTES	SHORT STANDARD IRON BAR
IB	DENOTES	IRON BAR
PB	DENOTES	PLASTIC BAR
RIB	DENOTES	ROUND IRON BAR
WIT	DENOTES	WITNESS
MEAS	DENOTES	MEASURED
950	DENOTES	F.G. CUNNINGHAM INC., O.L.S.
760	DENOTES	K. H. McCONNELL, OLS
TO	DENOTES	TOWN OF OAKVILLE SURVEY SECTION
P1	DENOTES	SURVEYOR'S REAL PROPERTY REPORT BY J.D. BARNES LTD., DATED JANUARY 10TH, 2018, (REF. No. 17-30-187-00-SRPR)

ALL SET SSIB AND PB MONUMENTS WERE USED DUE TO LACK OF OVERBURDEN AND/OR PROXIMITY OF UNDERGROUND UTILITIES IN ACCORDANCE WITH SECTION 11 (4) OF O.REG. 525/91.

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON 2020.

DATE

R. S. QUERUBIN
ONTARIO LAND SURVEYOR

THIS PLAN OF SURVEY RELATES TO AOLS PLAN SUBMISSION FORM NUMBER XXXXXXX

J.D.BARNES LIMITED
SURVEYING MAPPING GIS
LAND INFORMATION SPECIALISTS
401 WHEELABRATOR WAY, SUITE A, MILTON, ON L9T 3C1
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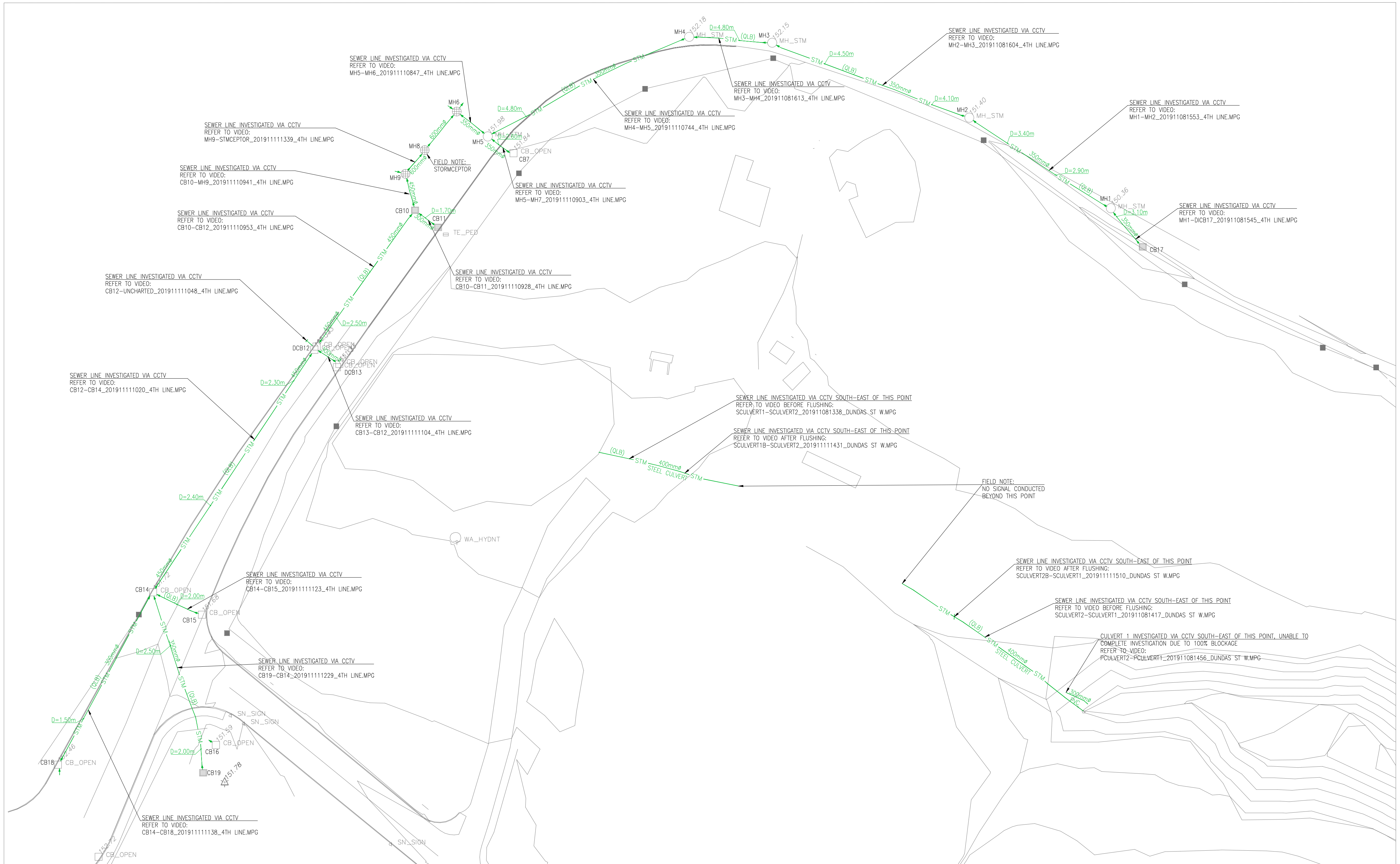
DRAWN BY:	CHECKED BY:	REFERENCE NO.:
AA	AB/RSQ	17-30-187-03-A
FILE: G:\17-30-187\03\Drawing\17-30-187-03-A.dgn	DATED: AUGUST 28, 2019	

PLOTTED: 6/26/2020



TD-UES SEWER INVERT TABLE – 1280 DUNDAS ST WEST, OAKVILLE, ONTARIO

MH/CB #	Type of sewer	Grade Elevation (m)	Direction	Materials	Depth Inv (m)	Depth Obv (m)	Size (mm)	Flows to	Elevation Invert (m)	Elevation Obvert (m)	Remarks
MH1	Storm	150.36	N	Plastic	2.65	2.30	350	N	147.71	148.06	
		150.36	SW	Plastic	2.60	2.25	350		147.76	148.11	
MH2	Storm	151.40	N	Plastic	3.85	3.50	350	N	147.55	147.90	
		151.40	S	Plastic	3.80	3.45	350		147.60	147.95	
MH3	Storm	152.15	W	Plastic	4.80	4.45	350	N	147.35	147.70	
		152.15	SE	Plastic	4.74	4.39	350		147.41	147.76	
MH4	Storm	152.18	SW	Plastic	4.87	4.52	350	SW	147.31	147.66	
		152.18	SE	Plastic	4.84	4.49	350		147.34	147.69	
MH5	Storm	151.98	NW	Plastic	4.84	4.49	350	NW	147.14	147.49	
		151.98	SE	Plastic	2.46	2.11	350		149.52	149.87	
		151.98	NE	Plastic	4.80	4.45	350		147.18	147.53	
MH6	Storm	152.56	NE	N/A	N/A	N/A	N/A	NE	N/A	N/A	Recessed*
		152.56	NW	N/A	N/A	N/A	N/A		N/A	N/A	
		152.56	SE	N/A	N/A	N/A	N/A		N/A	N/A	
		152.56	SW	N/A	N/A	N/A	N/A		N/A	N/A	
CB7	Storm	151.84	NW	Plastic	2.10	1.75	350	NW	149.74	150.09	Recessed*
MH8	Storm	152.47	NE	Concrete	4.60	4.00	600	NE	147.87	148.47	Recessed*, only one lead visible, stormceptor
		152.47	SW	N/A	N/A	N/A	N/A		N/A	N/A	
MH9	Storm	152.50	NE	Concrete	4.36	3.76	600	NE	148.14	148.74	
		152.50	SE	Plastic	4.08	3.63	450		148.42	148.87	
		152.50	NW	N/A	N/A	N/A	N/A		N/A	N/A	
CB10	Storm	151.59	NE	Plastic	3.10	2.65	450	NE	148.49	148.94	
		151.59	SW	Plastic	3.06	2.61	450		148.53	148.98	
		151.59	SE	Plastic	1.74	1.44	300		149.85	150.15	
CB11	Storm	151.63	NW	Plastic	1.77	1.47	300	NW	149.86	150.16	
DCB12	Storm	151.34	NE	Plastic	2.41	1.96	450	NE	148.93	149.38	
		151.34	SW	Plastic	2.39	1.94	450		148.95	149.40	
		151.34	NW	Plastic	2.23	1.93	300		149.11	149.41	Capped lead
		151.34	SE	Plastic	1.73	1.43	300		149.61	149.91	Recessed*
DCB13	Storm	151.33	NW	Plastic	1.46	1.16	300	NW	149.87	150.17	
CB14	Storm	151.72	NE	Plastic	2.13	1.68	450	NE	149.59	150.04	
		151.72	SW	N/A	N/A	N/A	N/A		N/A	N/A	Recessed*
		151.72	SE	Plastic	1.80	1.50	300		149.92	150.22	
		151.72	S	Plastic	2.06	1.71	350		149.66	150.01	
CB15	Storm	151.68	NW	Plastic	1.68	1.38	300	NW	150.00	150.30	
CB16	Storm	151.59	NW	Plastic	1.45	1.15	300	NW	150.14	150.44	
CB17	Storm	149.52	N	Plastic	1.49	1.14	350	N	148.03	148.38	Unable to open, measured with tape through the grate
CB18	Storm	152.46	NE	Plastic	1.70	1.30	300	NE	150.76	151.06	
		152.46	S	N/A	N/A	N/A	N/A		N/A	N/A	
CB19	Storm	151.64	NW	Plastic	1.60	1.25	350	NW	150.04	150.39	
		151.64	SW	N/A	N/A	N/A	N/A		N/A	N/A	

Notes & Legend:

* Where one or more leads are recessed, measurements for invert and obvert are approximate. Confined Space Entry required in order to obtain accurate measurements.

** MH/CB or pipe opening contains debris. May require flushing or cleaning prior to obtaining measurements.

LEGEND:

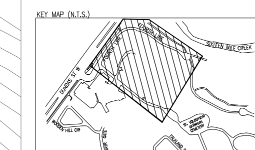
GAS MAIN, GAS SERVICE, FUEL PIPE, HYDRO, HYDRO SERVICE, ELECTRICAL, STREET LIGHT, WATERMAIN, WATER SERVICE, CHEMICAL

COMMUNICATION BELL, COMMUNICATION ROGERS, COMMUNICATION COGECO, COMMUNICATION ALLSTREAM, COMMUNICATION TELUS, COMMUNICATION GT, FIBER OPTIC CABLE, TRAFFIC SIGNAL, OVERHEAD WIRES

SANITARY SEWER, STORM SEWER, COMBINED SEWER, UNKNOWN UTILITY, END CAP (APPROXIMATE LOCATION), FLOW DIRECTION, DROP LEAD, TEST PIT LOCATION, CHANGE OF SUE QUALITY LEVEL, APPROXIMATE DEPTH MEASUREMENT FROM LOCATE EQUIPMENT

SURVEY NOTE:
THE GEODETIC ELEVATION LAYER IS TURNED OFF FOR PRESENTATION PURPOSES ONLY. ALL RELATIVE UTILITY ELEVATIONS ARE SHOWN IN THE AUTOCAD DIGITAL FILE (.DWG).

KEY MAP (N.T.S.)



GENERAL NOTES:
- THE SUE FIELD INVESTIGATION WAS COMPLETED IN NOVEMBER, 2019 BY TELECON DESIGN INC. (TD-UES).
- THE FIELD VERIFICATION OF UTILITIES WAS COMPLETED USING A COMBINATION OF ELECTROMAGNETIC PIPE AND CABLE LOCATE EQUIPMENT.
- TELECON USED AVAILABLE MEANS IN AN ATTEMPT TO DETERMINE THE LOCATION OF UNDOCUMENTED UTILITIES. TELECON IS NOT RESPONSIBLE FOR INDICATING ALL UNDOCUMENTED UTILITIES UNLESS PROVIDED, SHOWN AND/OR AVAILABLE AND RECEIVED DIGITALLY OR BY HARDCOPY.
- THE TOPOGRAPHIC BASE PLAN PROVIDED BY OTHERS, AND IS NOT A PART OF THIS SUE INVESTIGATION COMPLETED BY TD-UES.
- UTILITY, MATERIAL, SIZE AND FLOW DIRECTION SHOWN ON THIS DRAWING ARE BASED ON RECORDS, PROFESSIONAL JUDGEMENT AND FIELD INVESTIGATIONS.

SUBSURFACE UTILITY ENGINEERING QUALITY LEVELS

☒ LEVEL D
INFORMATION DERIVED FROM EXISTING RECORDS OR VERBAL RECOLLECTIONS.
Line Style (Level D)

☒ LEVEL C
INFORMATION ACQUIRED BY SURVEYING AND PLOTTING VISIBLE ABOVE GROUND UTILITY FEATURES AND BY USING PROFESSIONAL JUDGEMENT IN CORRELATING THIS INFORMATION TO THE QUALITY Level "D".
Line Style (Level C)

☒ LEVEL B
INFORMATION ACQUIRED THROUGH THE APPLICATION OF APPROPRIATE SURFACE GEOPHYSICAL UTILITY LOCATING METHODS TO DETERMINE THE EXISTENCE AND APPROXIMATE HORIZONTAL POSITION OF THE SUBSURFACE UTILITIES WHICH IS THEN GEODETICALLY SURVEYED.
Line Style (Level B)

☐ LEVEL A
PRECISE HORIZONTAL AND VERTICAL LOCATION OF UTILITIES OBTAINED BY THE ACTUAL EXPOSURE AND SUBSEQUENT MEASUREMENT AND/OR SURVEY OF SUBSURFACE UTILITIES.
Line Style (Level A)

REVISIONS

REV	DATE	DRAWN BY	APPROVED BY

LICENSED PROFESSIONAL ENGINEER W. P. SHAMON 100034593 Jan.29, 2020 PROVINCE OF ONTARIO

P.ENG STAMP HERE

telecon design MEMBER OF TELECON GROUP

UNDERGROUND ENGINEERING SERVICES
7777 WESTON ROAD, 5th FLOOR,
VAUGHAN (ONTARIO) L4L 0G9.
OFFICE: 905 – 569 – 2882
WWW.TELECON.CA

THE ENGINEERS SEAL HEREON IS TO CERTIFY THAT THE UTILITIES SHOWN HAVE BEEN INVESTIGATED IN ACCORDANCE WITH STANDARD SUE INDUSTRY PRACTICES. ALL OTHER INFORMATION HEREON HAS BEEN PROVIDED BY OTHERS AND IS NOT A PART OF THIS CERTIFICATION.

TELECON CLIENT

DELMANOR OAKVILLE LIMITED
R.V. ANDERSON ASSOCIATES LIMITED

SUE PROJECT

1280 DUNDAS STREET WEST, OAKVILLE, ONTARIO

PROJECT/ JDE #: 76540

DISCLAIMER
- THIS DOCUMENT HAS BEEN PREPARED FOR THE NOTED TELECON CLIENT(S) REFERENCE AND USE, AND WHEN REQUIRED BY LAW, APPROPRIATE GOVERNMENT REVIEWING AGENCIES. THE DRAWING HAS BEEN PREPARED FOR THE USE OF TELECON'S CLIENT AND MAY NOT BE USED, REPRODUCED OR RELIED UPON BY THIRD PARTIES, UNLESS WRITTEN CONSENT HAS BEEN GRANTED.
- NOT TO BE USED FOR EXCAVATION PURPOSES
- CONTACT ONTARIO ONE CALL 1-800-400-2255 AND THE APPROPRIATE UTILITIES FOR EXCAVATION LOCATES.

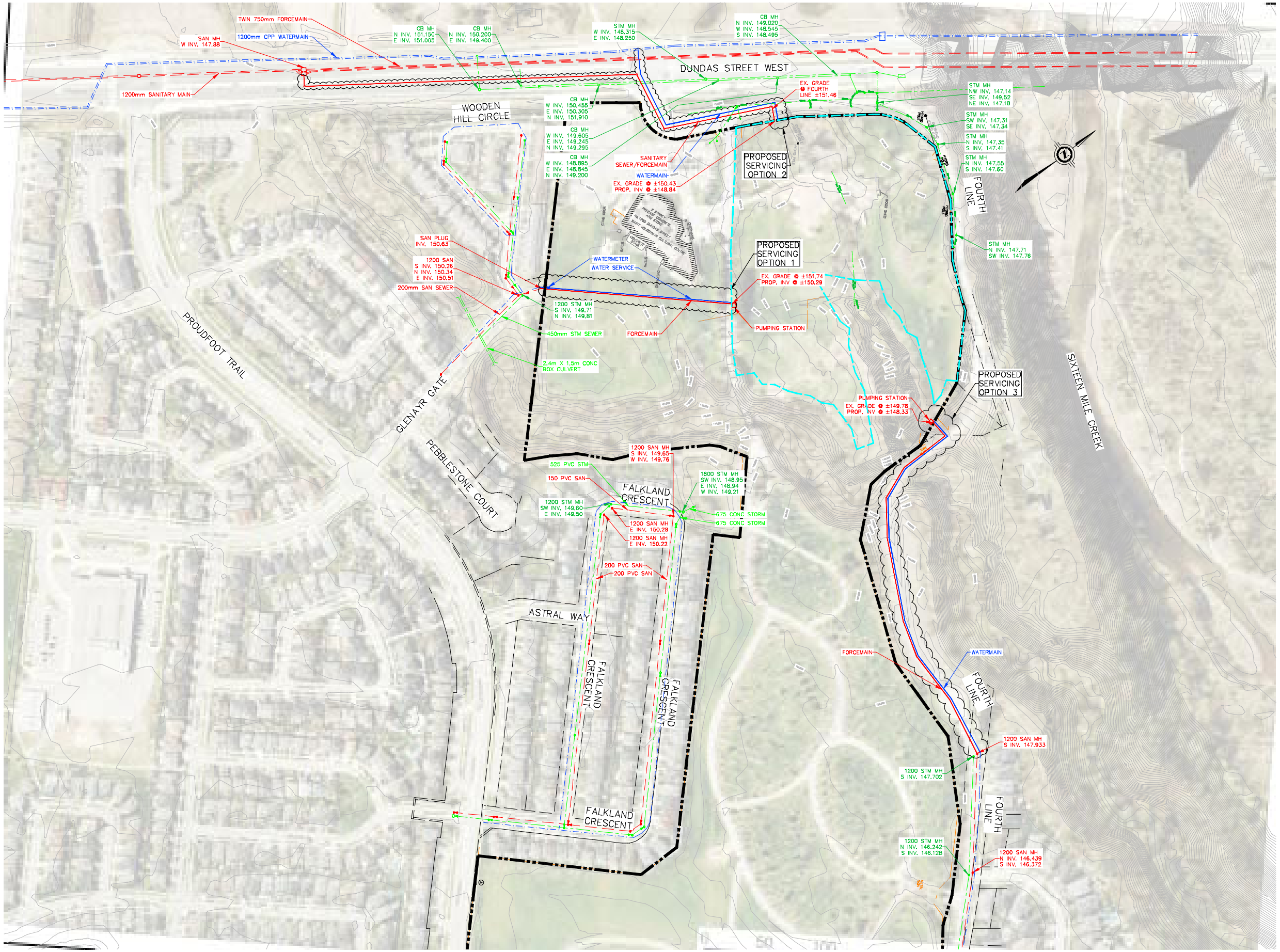
SURVEYED BY: B.MORIN DATE:NOV.13.2019

DRAWN BY: M.MALGAPO DATE:JAN.15.2020

CHECKED BY: S.SUBACH DATE:JAN.17.2020

APPROVED BY: W.SHAMON DATE:JAN.29.2020

DRAWING SCALE:	DRAWING NUMBER:
1:500	UG-1



KEY PLAN
N.T.S.

No.	Revision	Comments

LEGEND

- EXISTING STORM
- EXISTING SANITARY
- EXISTING WATER
- PROPOSED STORM
- PROPOSED SAN
- PROPOSED WATER
- EXISTING PROPERTY LINE
- APPROXIMATE EXTENTS OF SUBDIVIDED PROPERTY LINE

Drawing Prepared By:

arva
R.V. Anderson Associates Limited
engineering ♦ environment ♦ infrastructure

Client:
DELMANOR OAKVILLE LIMITED

Project Name:
1280 DUNDAS STREET W WATER AND SANITARY SERVICING FEASIBILITY

Drawing Title:
CONCEPTUAL SERVICING OPTIONS

Drawn:	Design:	Date:
M.S	###	2019-11-12
Checked:	Approved:	Scale:
D.A.S	###	1:1500
CADD File: 20191118-SERVICING CONCEPT.dwg		Dwg. No.: 01
Project No.: 195028		

R:\2019\195028 - Delmanor Oakville\0 CADD - Urban\03 Design\A. Archive

APPENDIX B

Water Demand Calculations

TABLE B1 - PROPOSED PEAK DOMESTIC WATER DEMAND CALCULATIONS

			TOTAL
1.1	Total Units (Seniors Residence + Independent Living Units)*	units	339
1.2	Total Seniors Residence apartment building Ground Floor Area (GFA)*	ha	2.75
1.3	Total Seniors Residence Apartment Building population based on 285 persons/hectare**	persons	783
1.4	Total Seniors Friendly Independent Living Units (SFIL) Ground Floor Area (GFA)*	ha	0.32
1.5	Total Seniors Friendly Independent Living Units (SFIL) population based on 135 persons/hectare**	persons	43
1.6	Total Residential Population (Seniors Residence + Independent Living Units)	persons	827
1.7	Total Population Used for Calculation Purposes***	persons	900.0
1.8	Per Capita Demand @ 275 L/person/day**	L/day	247,500
1.9	Equivalent Population Demand	L/s	2.9
2.0	Peak Hour Peaking Factor**		4.0
2.1	**Peak Hour Design Demand Rate**	**L/s**	**11.5**
2.2	Maximum Day Peaking Factor**		2.25
2.3	**Maximum Day Design Demand Rate**	**L/s**	**6.4**

*Based on Architectural Stats received from Icke Brochu Architects Inc. dated October 2021

** as per Halton Region Water and Wastewater Linear Design Manual October 2019 Version 5

*** The population was rounded up to provide a conservative figure for demand calculations

TABLE B2.1 - FIRE DEMAND CALCULATIONS - SENIORS RESIDENCE APARTMENT BUILDING
BASED ON F.U.S. GUIDELINES

			TOTAL
1.1	Coefficient for type of construction		0.80*
1.2	Height in Stories**		8
1.3	Total GFA (excluding basement more than 50% below grade)**	m^2	27,479
1.4	Fire Flow Required***	L/min	30,000
1.5	15% Reduction for Occupancy Charge - low fire hazard***	L/min	-4,500
1.6	Fire Flow Required	L/min	25,500
1.7	30% Reduction for Automatic Sprinklers	L/min	-7,650
1.8	Charge for Building Separation		
	North: Nearest Building	-	0%
	West: Nearest Building	42m	5%
	South: Nearest Building	350m	0%
	East: Nearest Building	-	0%
1.9	Charge for Building Separation	L/min	1,275
2.0	Fire Flow Required	L/min	20,000
2.1	Fire Flow Required	L/s	333.3

*Based on Architect recommendation for proposed construction type

**Based on Architectural Stats received from Icke Brochu Architects Inc. dated October 2021

***Based on FUS Guidelines

TABLE B2.2 - FIRE DEMAND CALCULATIONS - ILU BLOCK #1
BASED ON F.U.S. GUIDELINES

			TOTAL
1.1	Coefficient for type of construction		1.00*
1.2	Height in Stories**		1.5
1.3	Total GFA (excluding basement more than 50% below grade)**	m^2	1,278
1.4	Fire Flow Required***	L/min	8,000
1.5	15% Reduction for Occupancy Charge - low fire hazard; limited combustible***	L/min	-1,200
1.6	Fire Flow Required***	L/min	6,800
1.7	No Reduction for Automatic Sprinklers**	L/min	0
1.8	Charge for Building Separation		
	North: Nearest Building	>45m	0%
	West: Nearest Building	>45m	0%
	South: Nearest Building	3m	25%
	East: Nearest Building	40m	5%
1.9	Charge for Building Separation	L/min	2,040
2.0	Fire Flow Required	L/min	9,000
2.1	Fire Flow Required	L/s	150.0

*Based on Architect recommendation for proposed construction type

**Based on Architectural Stats received from Icke Brochu Architects Inc. dated October 2021

***Based on FUS Guidelines (1999)

TABLE B2.3 - FIRE DEMAND CALCULATIONS - ILU BLOCK #2 BASED ON F.U.S. GUIDELINES

			TOTAL
1.1	Coefficient for type of construction		1.00*
1.2	Height in Stories**		1.5
1.3	Total GFA (excluding basement more than 50% below grade)**	m^2	1,693
1.4	Fire Flow Required***	L/min	10,000
1.5	15% Reduction for Occupancy Charge - low fire hazard; limited combustible***	L/min	-1,500
1.6	Fire Flow Required***	L/min	8,500
1.7	No Reduction for Automatic Sprinklers**	L/min	0
1.8	Charge for Building Separation		
	North: Nearest Building	3m	25%
	West: Nearest Building	45m	5%
	South: Nearest Building	>45m	0%
	East: Nearest Building	>45m	0%
1.9	Charge for Building Separation	L/min	2,550
2.0	Fire Flow Required	L/min	12,000
2.1	Fire Flow Required	L/s	200.0

*Based on Architect recommendation for proposed construction type

**Based on Architectural Stats received from Icke Brochu Architects Inc. dated October 2021

***Based on FUS Guidelines (1999)

TABLE B2.4 - FIRE DEMAND CALCULATIONS - ILU BLOCK #3 BASED ON F.U.S. GUIDELINES

			TOTAL
1.1	Coefficient for type of construction		1.00*
1.2	Height in Stories**		1.5
1.3	Total GFA (excluding basement more than 50% below grade)**	m^2	864
1.4	Fire Flow Required***	L/min	7,000
1.5	15% Reduction for Occupancy Charge - low fire hazard; limited combustible***	L/min	-1,050
1.6	Fire Flow Required***	L/min	5,950
1.7	No Reduction for Automatic Sprinklers**	L/min	0
1.8	Charge for Building Separation		
	North: Nearest Building	>45m	0%
	West: Nearest Building	>45m	0%
	South: Nearest Building	3m	25%
	East: Nearest Building	>45m	0%
1.9	Charge for Building Separation	L/min	1,488
2.0	Fire Flow Required	L/min	8,000
2.1	Fire Flow Required	L/s	133.3

*Based on Architect recommendation for proposed construction type

**Based on Architectural Stats received from Icke Brochu Architects Inc. dated October 2021

***Based on FUS Guidelines (1999)

TABLE B2.5 - FIRE DEMAND CALCULATIONS - ILU BLOCK #4
BASED ON F.U.S. GUIDELINES

			TOTAL
1.1	Coefficient for type of construction		1.00*
1.2	Height in Stories**		1.5
1.3	Total GFA (excluding basement more than 50% below grade)**	m^2	1,278
1.4	Fire Flow Required***	L/min	8,000
1.5	15% Reduction for Occupancy Charge - low fire hazard; limited combustible***	L/min	-1,200
1.6	Fire Flow Required***	L/min	6,800
1.7	No Reduction for Automatic Sprinklers**	L/min	0
1.8	Charge for Building Separation		
	North: Nearest Building	3m	25%
	West: Nearest Building	>45m	0%
	South: Nearest Building	>45m	0%
	East: Nearest Building	>45m	0%
1.9	Charge for Building Separation	L/min	1,700
2.0	Fire Flow Required	L/min	9,000
2.1	Fire Flow Required	L/s	150.0

*Based on Architect recommendation for proposed construction type

**Based on Architectural Stats received from Icke Brochu Architects Inc. dated October 2021

***Based on FUS Guidelines (1999)

TABLE B2.6 - Summary of Fire Flows

		TOTAL
1.0 Apartment Building	L/s	333.33
2.0 SFIL Block 1	L/s	150.00
3.0 SFIL Block 2	L/s	200.00
4.0 SFIL Block 3	L/s	133.33
5.0 SFIL Block 4	L/s	150.00
6.0 Controlling Fire Flow	L/s	333.33

TABLE B3 - PROPOSED REDEVELOPMENT TOTAL WATER DEMAND

PER REGION OF HALTON DESIGN CRITERIA AND MECP DESIGN GUIDELINES, WATER SUPPLY SYSTEMS SHOULD BE DESIGNED TO SATISFY THE GREATER OF EITHER OF THE FOLLOWING DEMANDS:

-MAXIMUM DAY DOMESTIC DEMAND PLUS FIRE FLOW

-PEAK HOUR DOMESTIC DEMAND

MAX DAY & FIRE FLOWS

Max Day Residential	6.4	L/s
Fire Flow*	333.3	L/s
Total Max Day & Fire Flow	**339.8**	**L/s**

PEAK HOUR DOMESTIC DEMAND

Peak Rate Residential	11.5	L/s
Total Peak Rate	**11.5**	**L/s**

THEREFORE, MAX DAY + FIRE FLOW IS GOVERNING REQUIREMENT

WATER DEMAND

Max Day	6.4	L/s	387	L/min
Fire Flow*	333.3	L/s	20000	L/min
Total Max Day & Fire Flow	**339.8**	**L/s**	**20,387**	**L/min**

*Max fire flow as per Table B2.6

Lozzi Aqua Check

4820 18th Sideroad

Schomberg, Ontario

L0G-1T0

Massimo Lozzi Cell: 416 990-2131

E-mail: lozziaquacheck@gmail.com

Hydrant Flow Test Form

Job Location: 1280 Dundas St W,Mississauga Date: June 26,2020

Test Date

Time of Test: 1:30 pm

Location of Hydrant: hydrant in front of 2457 Wooden Hill Circle.

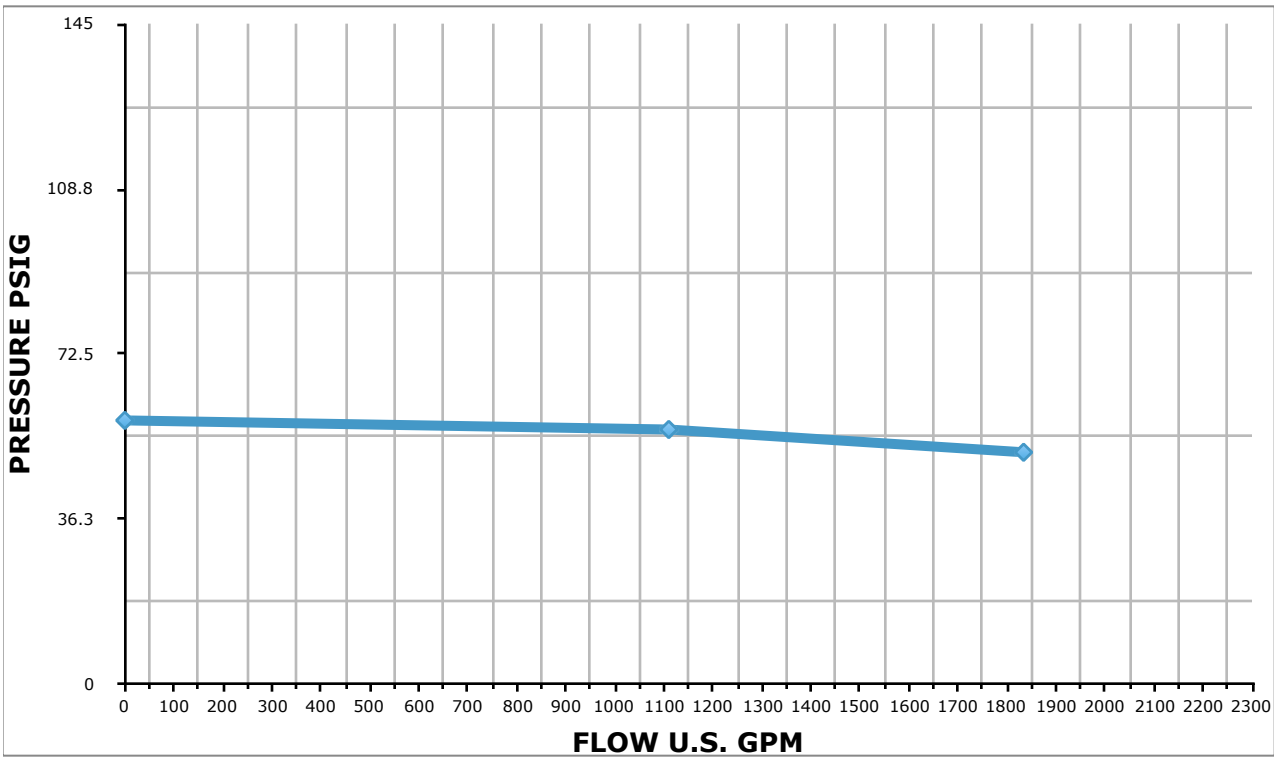
Residual hydrant: at 2465 Wooden Hill Circle.

Main Size: 200 mm Static Pressure: 58 psi

Theoretical GPM at 20 psi - 4572 gpm

	Number of Outlets & Orifice Size	Pitot Pressure (psi)	Flow (U.S. G.P.M.)	Residual Pressure (psi)
1.	Static	0	0	58
2.	1 x 2 ½	44	1110	56
3.	2 x 2 ½	30	1834	54

Note :Flow test conducted in accordance with NFPA Std 291



Lozzi Aqua Check

4820 18th Sideroad

Schomberg, Ontario

L0G-1T0

Massimo Lozzi Cell: 416 990-2131

E-mail: lozziaquacheck@gmail.com

Hydrant Flow Test Form

Job Location: 1280 Dundas St W,Mississauga Date: June 26,2020

Test Date

Time of Test: 1:00 pm

Location of Hydrant: hydrant at Dundas St W and Proudfoot Trail

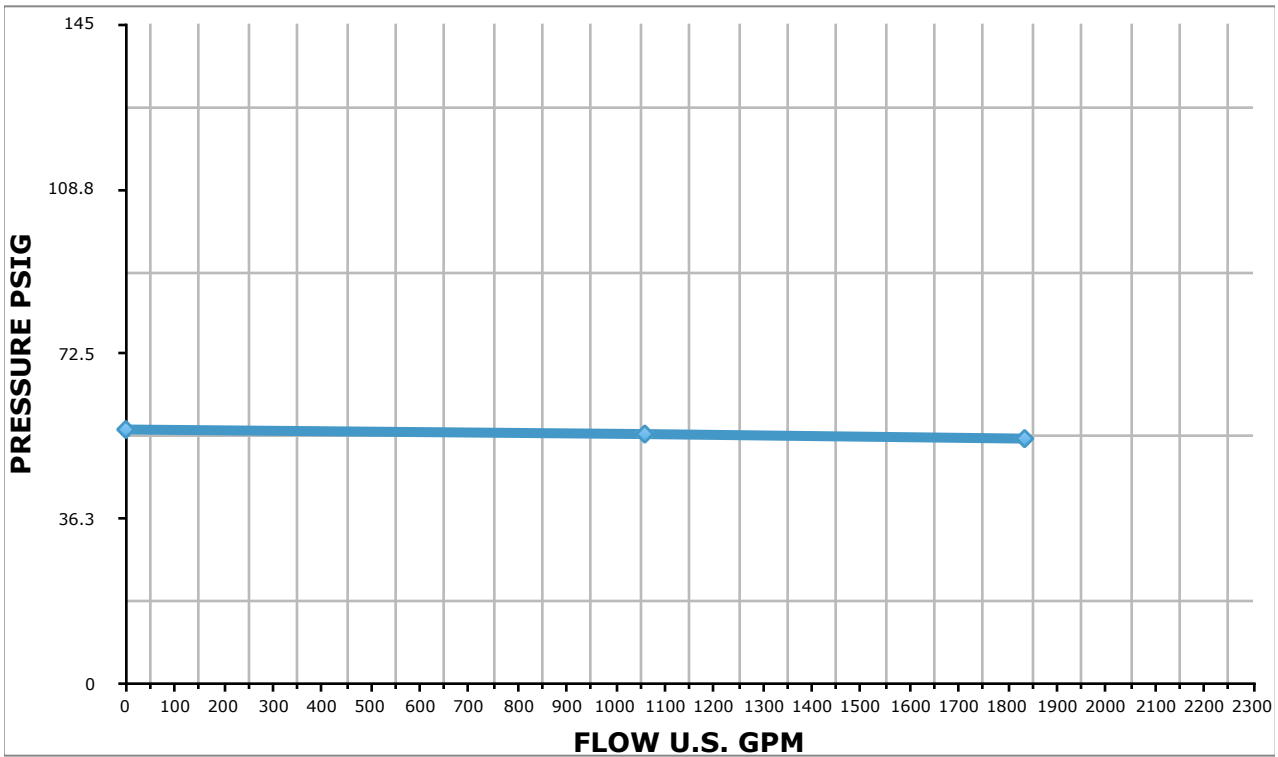
Residual hydrant: at Dashwood Dr and Proudfoot Trail

Main Size:1200 mm Static Pressure: 56 psi

Theoretical GPM at 20 psi - 8734 gpm

	Number of Outlets & Orifice Size	Pitot Pressure (psi)	Flow (U.S. G.P.M.)	Residual Pressure (psi)
1.	Static	0	0	56
2.	1 x 2 ½	40	1059	55
3.	2 x 2 ½	30	1834	54

Note :Flow test conducted in accordance with NFPA Std 291



APPENDIX C

Sanitary Demand Calculations

TABLE C1 - PROPOSED SANITARY FLOW ESTIMATE (275 L/c/d)

			TOTAL
1.1	Total Units (Seniors Residence + Independent Living Units)*	units	339
1.2	Total Seniors Residence apartment building Ground Floor Area (GFA)*	ha	2.75
1.3	Total Seniors Residence apartment building population based on 285 persons/hectare**	persons	783
1.4	Total Seniors Friendly Independent Living Units (SFIL) Ground Floor Area (GFA)*	ha	0.32
1.5	Total Seniors Friendly Independent Living Units (SFIL) population based on 135 persons/hectare**	persons	43
1.6	Total Residential Population (Seniors Residence + Independent Living Units)	persons	827
1.7	Total Population Used for Calculation Purposes***	persons	900.0
1.8	Total Residential Flow @ 275 L/person/day**	L/day	247500
1.9	Total Residential Flow	L/s	2.86
2.0	Peaking Factor****		3.83
2.01	**Total Residential Dry Weather Flow**	**L/s**	**10.97**

*Based on Architectural Stats received from Icke Brochu Architects Inc. dated October 2021

**as per Halton Region Water and Wastewater Linear Design Manual October 2019 Version 5

*** The population was rounded up to provide a conservative figure for demand calculations.

**** Peaking Factor calculated by using modified Harmon's Formula (Kav * (1+ 14/(4 + P^0.5)). K_{av} = 1

TABLE C2 - PROPOSED SANITARY FLOW ESTIMATE - INFILTRATION

1.0	Site Area*	m^2	46233
1.1	Site Area	ha	4.6233
1.2	Infiltration Allowance**	L/ha/s	0.286
1.3	**Total Infiltration Flow**	L/s	**1.32**

*From Topographic Plan and Architectural Stats dated October 12th 2021

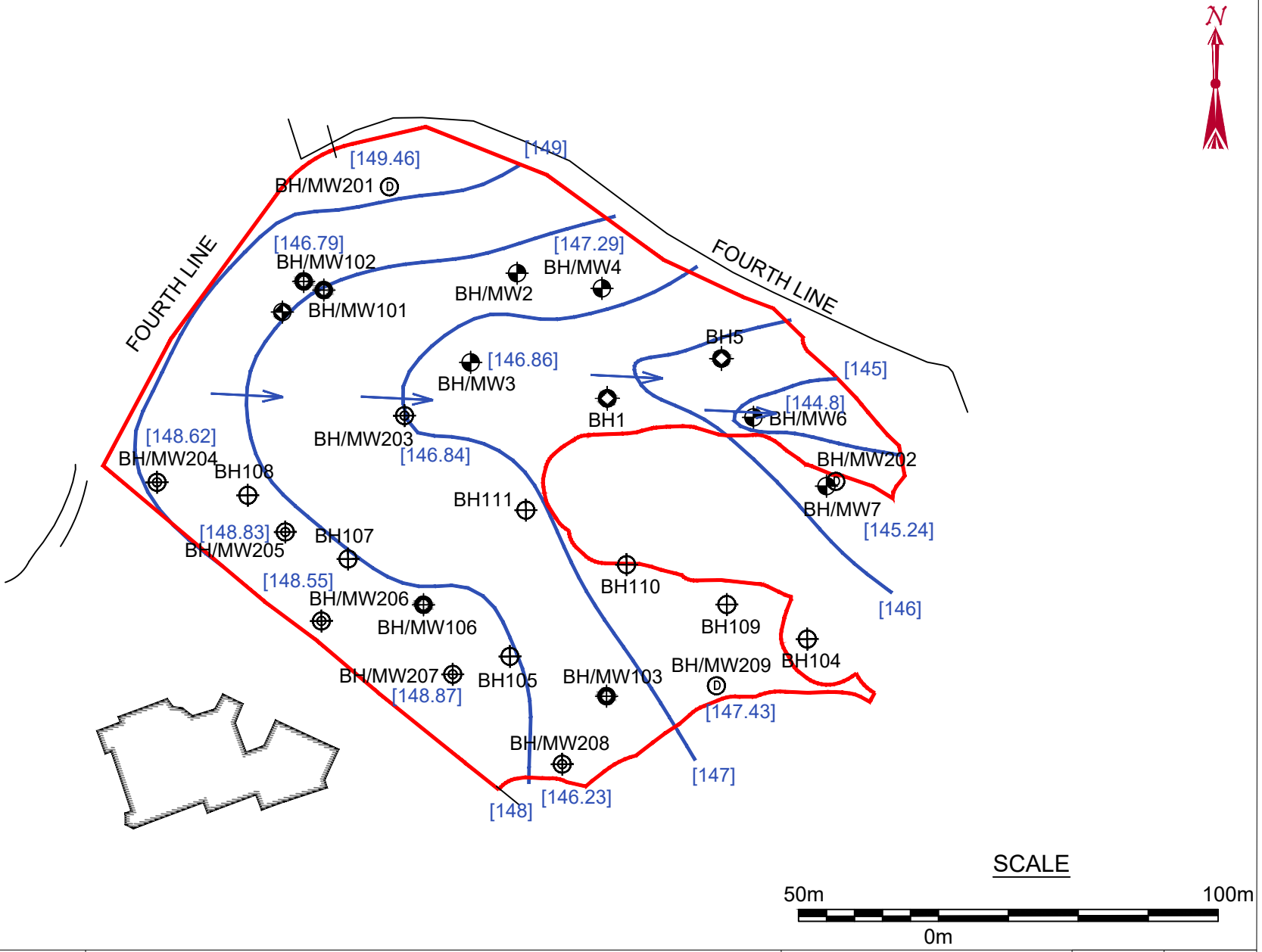
** as per Halton Region Water and Wastewater Linear Design Manual April 2019 Version 4.0

TABLE C3 - PROPOSED TOTAL SANITARY FLOW ESTIMATE

			TOTAL
3.1	Total Residential Dry Weather Flow	L/s	10.97
3.2	Total Infiltration Flow	L/s	1.32
3.3	**Total Sanitary Peak Flow**	**L/s**	**12.29**

APPENDIX D

Hydrogeological Information



B.I.G. CONSULTING INC.

t: (416) 214 - 4880 f: (416) 551 - 2633
12-5500 Tomken Rd.
Misissauga, ON L4W 2Z4
Canada

bigconsultinginc.com

LEGEND

- UPDATED SITE BOUNDARY
- EXISTING BUILDING
- APPROXIMATE BOREHOLE LOCATION (BIG, 2018)
- APPROXIMATE BOREHOLE/MONITORING WELL LOCATION (BIG, 2018)
- APPROXIMATE BOREHOLE LOCATION (BIG, 2019)
- APPROXIMATE BOREHOLE/MONITORING WELL LOCATION (BIG, 2019)
- APPROXIMATE BOREHOLE/MONITORING WELL LOCATION AT 6 MBGS (BIG, 2021)
- APPROXIMATE BOREHOLE/MONITORING WELL LOCATION AT 20 MBGS (BIG, 2021)
- [152] GROUNDWATER ELEVATION (MASL)
- INTERPRETED DIRECTION OF GROUNDWATER FLOW
- GROUNDWATER CONTOUR
- [XXX.XX] WATERLEVEL MEASUREMENT (September 30, 2021)

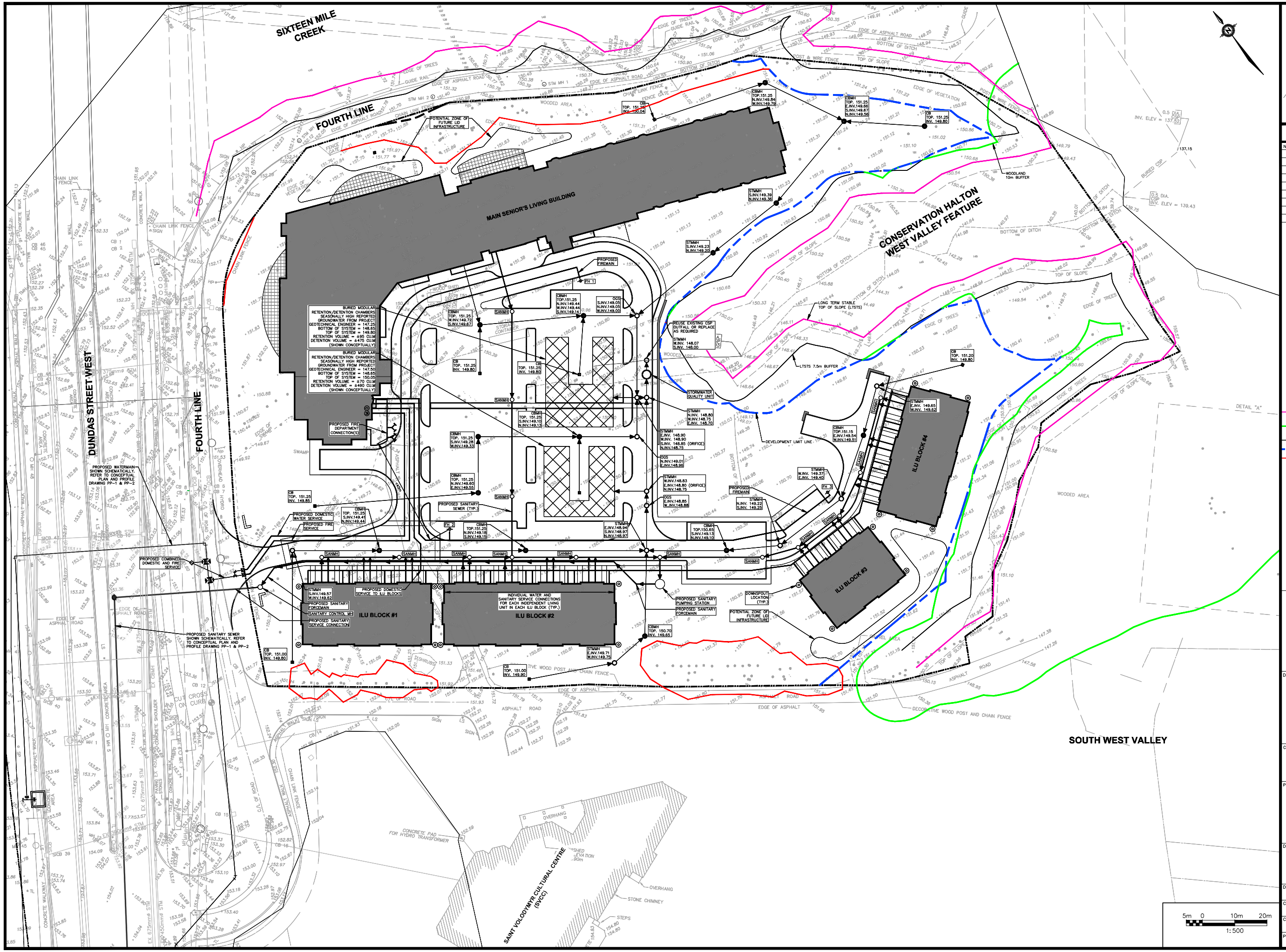
TITLE AND LOCATION

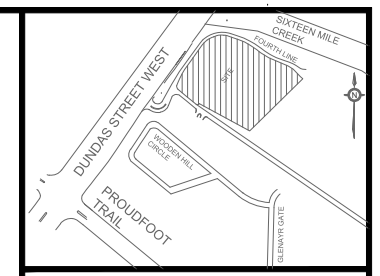
GROUNDWATER CONTOUR MAP
HYDROGEOLOGICAL INVESTIGATION
1260-1280 DUNDAS STREET WEST, OAKVILLE, ONTARIO

PROJECT NO.	DWN.
BIGC-GEO-185E	L.C.K.
SCALE	CK.
AS NOTED	E.L.
DATE	FIG NO.
OCTOBER 2021	1

APPENDIX E

Civil Drawings





KEY PLAN
N.T.S.

No.	Date	Comments
2	2021/12/17	RE-ISSUED FOR ZBA APPROVAL
1	2020/09/18	ISSUED FOR ZBA APPROVAL

THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL OTHER RVA DRAWINGS

LEGEND

- PROPERTY LINE
- CATCHBASIN WITH GOSS TRAP
- MH
- SANITARY SEWER AND FORCEMAIN
- WATERMAIN
- STORM SEWER
- VALVE
- FIRE DEPARTMENT CONNECTION (SIAMESE)
- FIRE HYDRANT
- M+B WATER METER
- D DETECTOR ASSEMBLY
- LONG TERM STABLE TOP OF SLOPE (LTSTS)
- WOODLAND 10m BUFFER LINE
- LTSTS 7.5m BUFFER LINE
- DEVELOPMENT LIMIT
- TREE PROTECTION ZONE

NOTE:
THE INFORMATION DENOTED IN BOXES [ ] WITHIN THE DRAWING DETAILS ON THIS SHEET ARE CONSIDERED TO BE PROPOSED DESIGN/SPECIFICATIONS. ALL OTHER INFORMATION IS SHOWN FOR CONTEXT ONLY. REFER TO THE APPROPRIATE DRAWINGS BY THE ARCHITECT, LANDSCAPE ARCHITECT, STRUCTURAL ENGINEER, AND MECHANICAL ENGINEER FOR DETAIL DESIGN AND SPECIFICATION OF OTHER DESIGN ELEMENTS.

Drawing Prepared By:

arva
R.V. Anderson Associates Limited
engineering • environment • infrastructure

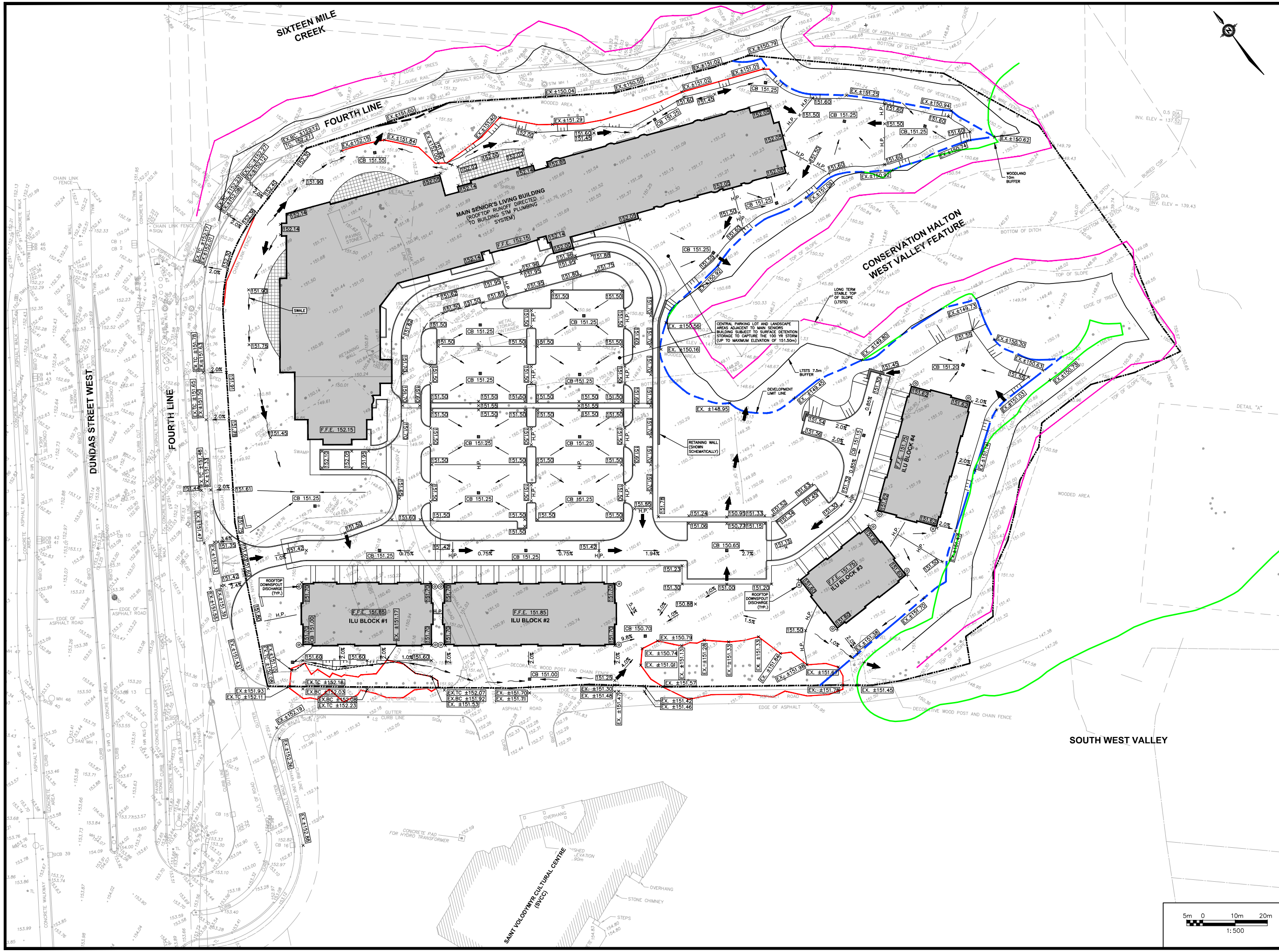
Client:
DELMANOR WEST OAK INC.

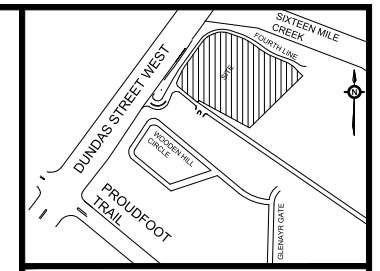
Project Name:
1280 DUNDAS STREET WEST REDEVELOPMENT DELMANOR WEST OAK

Drawing Title:
CONCEPTUAL GENERAL SERVICING PLAN

Drawn: M.S	Design: D.A.S	Date: JULY 2020
Checked: D.A.S	Approved: A.S.T	Scale: 1:500
CADD File: 195028-S-Servicing.dwg		Dwg. No.: C-1
Project No.: 195028		

R:\2019\195028 - Delmanor Oakville\Q CADD - Urban\04 Sheets





KEY PLAN
N.T.S.

No.	Date	Comments
2	2021/12/17	RE-ISSUED FOR ZBA APPROVAL
1	2020/09/18	ISSUED FOR ZBA APPROVAL

THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL OTHER RVA DRAWINGS

LEGEND

- PROPERTY LINE
- CATCHBASIN
- STORM AND SANITARY MANHOLE
- 151.50 PROPOSED ELEVATION
- EX.±151.49 EXISTING ELEVATION
- 1.0% PROPOSED SLOPE
- PROPOSED OVERLAND FLOW ROUTE
- PROPOSED SWALE
- HP HIGH POINT
- CUT/FILL SLOPES (MAX 3:1)
- DOWNSPOUT
- LONG TERM STABLE TOP OF SLOPE (LTSTS)
- WOODLAND 10m BUFFER LINE
- LTSTS 7.5m BUFFER LINE
- DEVELOPMENT LIMIT
- TREE PROTECTION ZONE

NOTE:
THE INFORMATION DENOTED IN BOXES [ ] WITHIN THE DRAWING DETAILS ON THIS SHEET ARE CONSIDERED TO BE PROPOSED DESIGN/SPECIFICATIONS. ALL OTHER INFORMATION IS SHOWN FOR CONTEXT ONLY. REFER TO THE APPROPRIATE DRAWINGS BY THE ARCHITECT, LANDSCAPE ARCHITECT, STRUCTURAL ENGINEER, AND MECHANICAL ENGINEER FOR DETAIL DESIGN AND SPECIFICATION OF OTHER DESIGN ELEMENTS.

Drawing Prepared By:

R.V. Anderson Associates Limited
engineering • environment • infrastructure

Client:
DELMANOR WEST OAK INC.

Project Name:
1280 DUNDAS STREET WEST REDEVELOPMENT DELMANOR WEST OAK

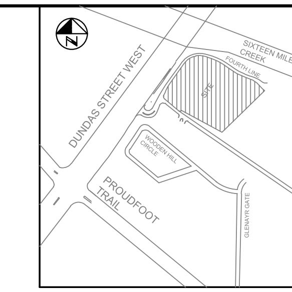
Drawing Title:
CONCEPTUAL GENERAL GRADING PLAN

Drawn:	Design:	Date:
M.S	D.A.S	JULY 2020
Checked:	Approved:	Scale:
D.A.S	A.S.T	1:500
CADD File: 195028-S-Grading.dwg		Dwg. No.: C-2
Project No.: 195028		

R:\2019\195028 - Delmanor Oakville\Q CADD - Urban\04 Sheets

CONCEPTUAL PLAN AND PROFILE SKETCH

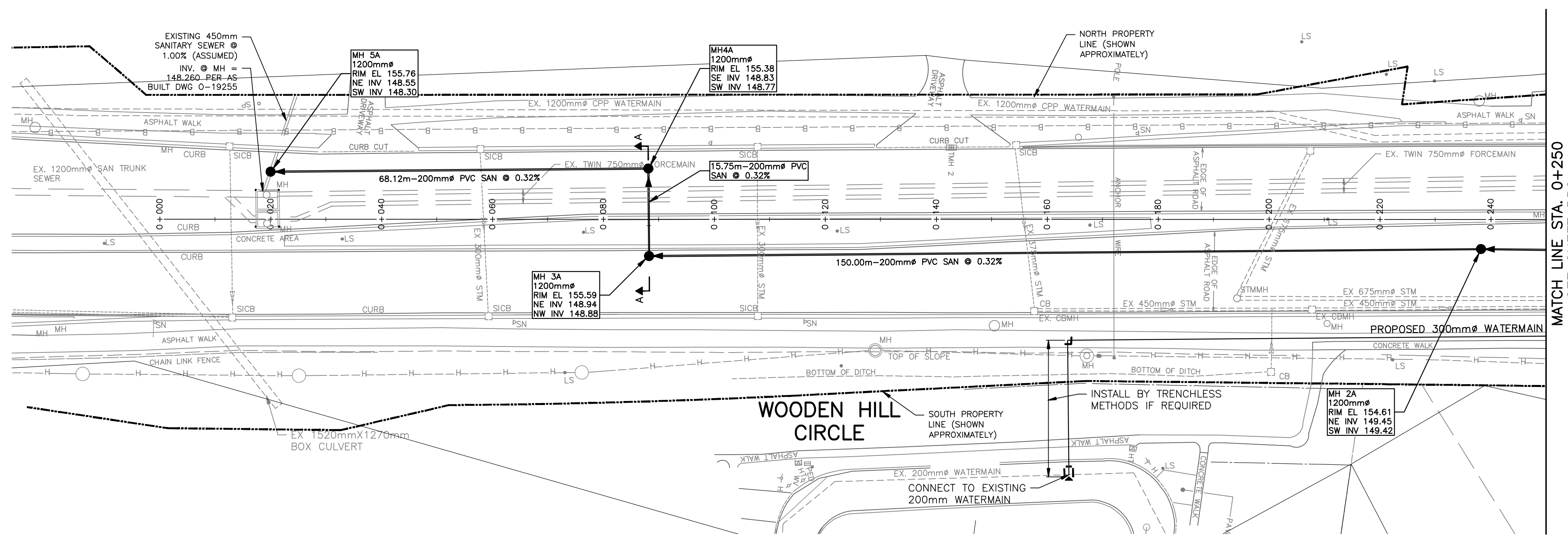
PROPOSED ALIGNMENT OF WATERMAIN AND SANITARY SEWER SHOWN SCHEMATICALLY FOR DISCUSSION PURPOSES TO SUPPORT 1280 DUNDAS STREET WEST ZBA APPLICATION



KEY PLAN
N.T.S.

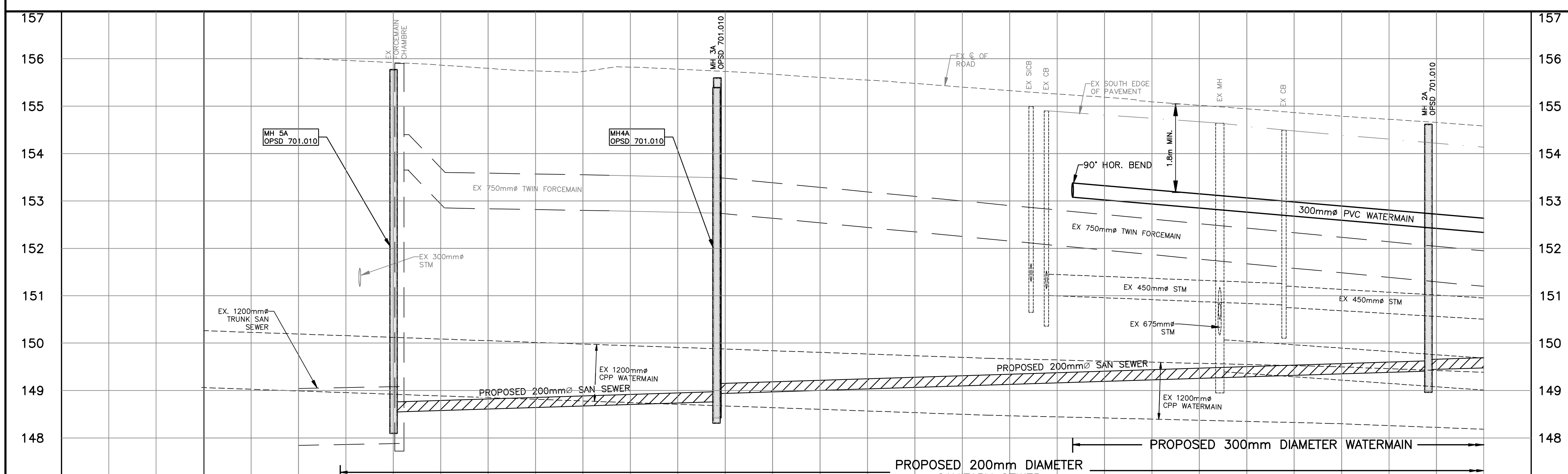
LEGEND

- LS — EX LIGHT STANDARD
- MH — EX MANHOLE
- DSICB — EX DOUBLE SIDE INLET CATCHBASIN
- SICB — EX SIDE INLET CATCHBASIN
- CB — EX CATCHBASIN
- EX STORM SEWER
- EX SANITARY FORCEMAIN
- EX WATER
- B — EX BELL CANADA CONDUIT
- H — EX HYDRO CABLE
- G — EX GAS MAIN
- PLUG
- PROP WATERMAIN
- PROP SANITARY SEWER
- PROP MANHOLE
- PROP HYDRANT AND VALVE
- PROP WATERMAIN TEE



THE LOCATION OF UTILITIES IS APPROXIMATE ONLY. THE CONTRACTOR SHALL PROVE THE LOCATION OF UTILITIES AND SHALL BE RESPONSIBLE FOR ADEQUATE PROTECTION FROM DAMAGE

DUNDAS STREET WEST (REG RD 5)



℄ ELEVATIONS	156.01 156.014	155.92 155.919	155.80 155.796	155.73 155.730	155.78 155.779	155.67 155.672	155.55 155.548	155.40 155.401	155.26 155.255	155.09 155.088	154.94 154.942	154.79 154.786	154.66 154.656
WATERMAIN INVERTS	300mmø PVC WATERMAIN												
SANITARY INVERTS	NE 148.55; 68.1m – 200mmø PVC SAN @ 0.32%				NE 148.94 NW 148.88; 15.8m – 200mmø PVC SAN @ 0.32%		150.0m – 200mmø PVC SAN @ 0.32%						NE 149.45 SW 149.42
CHAINAGE	0+000	0+020	0+040	0+060	0+080	0+100	0+120	0+140	0+160	0+180	0+200	0+220	0+240

NO.	DATE	BY	REVISIONS	MANU	CAD
2	21/12/17	M.S.	RE-ISSUED FOR ZBA APPROVAL		X
1	20/09/18	M.S.	ISSUED FOR ZBA APPROVAL		X

DESIGN M.S. CH'KD D.A.S. DATE 2020-07-06
DRAWN C.C. CH'KD
SCALE 1:500 HORIZ. 1:50 VERT.
REFERENCES
REGIONAL
FIELD NOTES
STAMP

SEE COVER SHEET FOR REGIONAL ACCEPTANCE

arva R.V. Anderson Associates Limited
engineering • environment • infrastructure

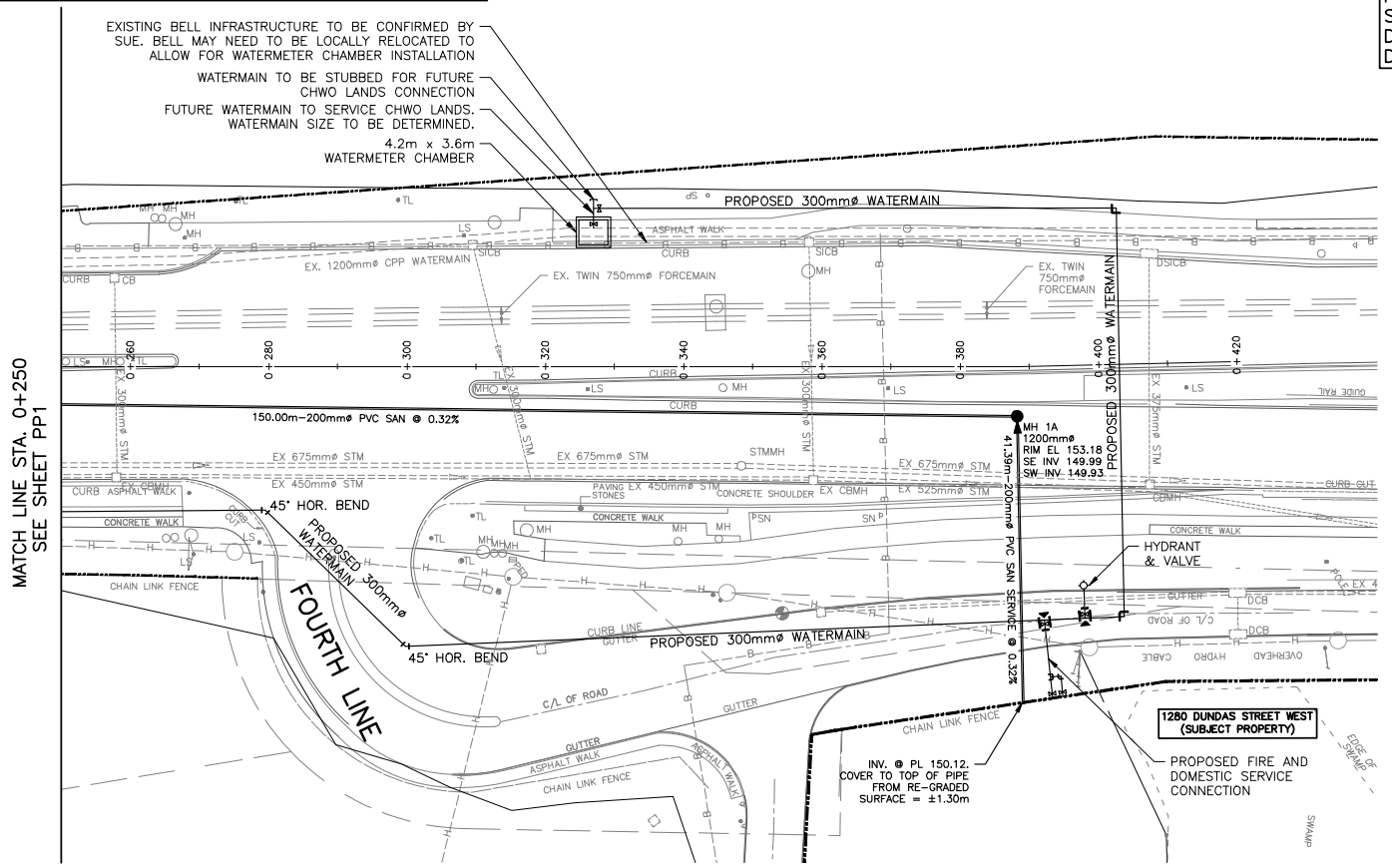
Halton REGION

PROPOSED 300mm WATERMAIN AND 200mm SANITARY ON
DUNDAS STREET WEST (REG. RD. 5)
FROM 130m EAST OF PROUDFOOT TRAIL TO 35m WEST OF FOURTH LINE
STA 0+000 TO STA 0+250
IN THE TOWN OF OAKVILLE

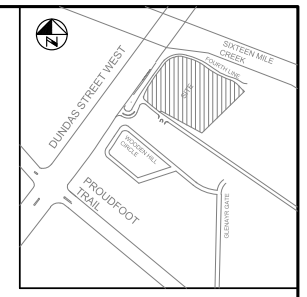
CONSULTANT FILE NO. 195028
REGIONAL DRAWING NO.
CONTRACT NO. X-XXXX-XX
DRAWING NO. SHEET PP1 OF PP2

Drawing: R:\2019\195028 - DELMANOR OAKVILLE\Q CADD - URBAN\04 SHEETS\195028-S-PP1.DWG
Layout Tab: PP1
Date: 12/16/2021 Time: 05:07:38 PM

CONCEPTUAL PLAN AND PROFILE SKETCH



PROPOSED ALIGNMENT OF WATERMAIN AND SANITARY SEWER SHOWN SCHEMATICALLY FOR DISCUSSION PURPOSES TO SUPPORT 1280 DUNDAS STREET WEST ZBA APPLICATION



KEY PLAN
N.T.S.

LEGEND

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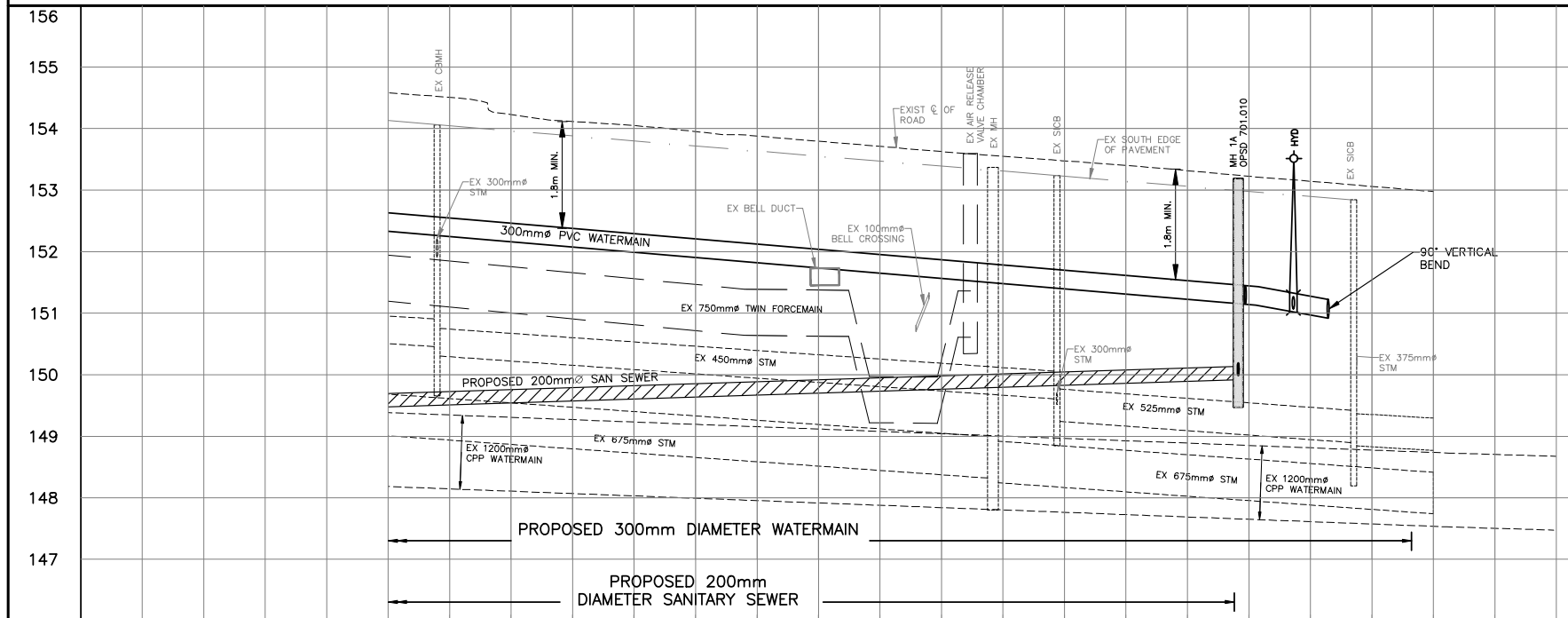
- PROP MANHOLE
- PROP HYDRANT AND VALVE
- PROP WATERMAIN TEE

THE LOCATION OF UTILITIES IS APPROXIMATE ONLY. THE CONTRACTOR SHALL PROVE THE LOCATION OF UTILITIES AND SHALL BE RESPONSIBLE FOR ADEQUATE PROTECTION FROM DAMAGE

DUNDAS STREET WEST (REG RD 5)



℄ ELEVATIONS	154.51 154.508	154.12 154.116	153.95 153.952	153.80 153.796	153.63 153.627	153.48 153.477	153.32 153.317	153.14 153.145	152.98 152.976
WATERMAIN INVERTS	300mmø PVC WATERMAIN								
SANITARY INVERTS	150.0m – 200mmø PVC SAN @ 0.32%								
CHAINAGE	0+260	0+280	0+300	0+320	0+340	0+360	0+380	0+400	0+420

NO.	DATE	BY	REVISIONS	MANU	CAD
2	21/12/17	M.S.	RE-ISSUED FOR ZBA APPROVAL		X
1	20/09/18	M.S.	ISSUED FOR ZBA APPROVAL		X

DESIGN	M.S.	CH'KD	D.A.S.	DATE 2020-07-06
DRAWN	C.C.	CH'KD		

SCALE 1:500 HORIZ. 0 5 10 20
1:50 VERT. 0 0.5 1 2

REFERENCES

REGIONAL

FIELD NOTES

STAMP

SEE COVER SHEET FOR REGIONAL ACCEPTANCE

arva R.V. Anderson Associates Limited engineering • environment • infrastructure

Halton REGION

PROPOSED 300mm WATERMAIN AND 200mm SANITARY ON
DUNDAS STREET WEST (REG. RD. 5)
FROM 35m WEST OF FOURTH LINE TO 65m EAST OF FOURTH LINE
STA 0+250 TO STA 0+420
IN THE TOWN OF OAKVILLE

CONSULTANT FILE NO.	REGIONAL DRAWING NO.
195028	
CONTRACT NO. X-XXXX-XX	DRAWING NO. SHEET PP2 OF PP2

PR-XXXX-XX XX OF XX

Drawing: R:\2019\195028 - DELMANOR OAKVILLE\Q CADD - URBAN\04 SHEETS\195028-S-PP1.DWG
Layout: PP2
Date: 12/16/2021 Time: 05:08:46 PM

SWM DEVELOPABLE LIMIT TO BE REFINED AT SITE PLAN WHEN TREE PROTECTION ZONES (TPZ) AND DEVELOPABLE LIMIT IS FINALIZED

PROPERTY LINE (TYP.)

SIXTEEN MILE CREEK

FOURTH LINE

DUNDAS STREET WEST

CONCESSION 1

LOT 23

SOUTH OF DUNDAS STREET

CONSERVATION HALTON WEST VALLEY FEATURE

SOUTH WEST VALLEY

SAINT VOLODYMYR CULTURAL CENTRE (SVCC)

PART 1 PLAN 20R-8277

PART 1 PLAN 20R-12519

PART 2 PLAN 20R-12519

PART 35 PLAN 20R-15191

PART 6 PLAN 20R-16278

BLOCK 131

BLOCK 132

LOT 18

STM-D1
0.40 | 0.25

STM-B2
0.10 | 0.25

STM-B1
1.13 | 0.28

STM-A1
1.72 | 0.25

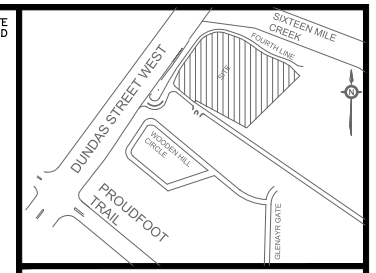
STM-A2
0.34 | 0.46

STM-B3
0.09 | 0.75

STM-C1
0.06 | 0.25

STM-C2
<0.01 | 0.25

5m 0 10m 20m
1:500



KEY PLAN
N.T.S.

No.	Date	Comments
2	2021/12/17	RE-ISSUED FOR ZBA APPROVAL
1	2020/09/18	ISSUED FOR ZBA APPROVAL

THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL OTHER RVA DRAWINGS

LEGEND

- PROPERTY LINE
- CATCHMENT AREA
- CATCHMENT DRAINAGE OUTLET
- STM-A1 — CATCHMENT ID; 1.85 | 0.25 — AREA (HA); RUNOFF COEFFICIENT 'C'
- EXTERNAL DRAINAGE CATCHMENT: PRE-DEV = POST-DEV
- UNIMPACTED AREAS: PRE-DEVELOPMENT = POST-DEVELOPMENT
- DEVELOPABLE LIMIT OF SITE (I.E. GREATER OF LTSTS BUFFER OR TREE PROTECTION)

This Drawing Is Not To Be Used For Construction Until Signed By The Engineer.

NOTE:
THE INFORMATION DENOTED IN BOXES WITHIN THE DRAWING DETAILS ON THIS SHEET ARE CONSIDERED TO BE PROPOSED DESIGN/SPECIFICATIONS. ALL OTHER INFORMATION IS SHOWN FOR CONTEXT ONLY. REFER TO THE APPROPRIATE DRAWINGS BY THE ARCHITECT, LANDSCAPE ARCHITECT, STRUCTURAL ENGINEER, AND MECHANICAL ENGINEER FOR DETAIL DESIGN AND SPECIFICATION OF OTHER DESIGN ELEMENTS.

Drawing Prepared By:

R.V. Anderson Associates Limited
engineering • environment • infrastructure

Client:
DELMANOR WEST OAK INC.

Project Name:
1280 DUNDAS STREET WEST REDEVELOPMENT DELMANOR WEST OAK

Drawing Title:
PRE-DEVELOPMENT STORM DRAINAGE PLAN

Drawn: M.S	Design: D.A.S	Date: JULY 2020
Checked: D.A.S	Approved: A.S.T	Scale: 1:500
CADD File: 195028-S-Storm Catchment.dwg		Dwg. No.: PRE-STM
Project No.: 195028		

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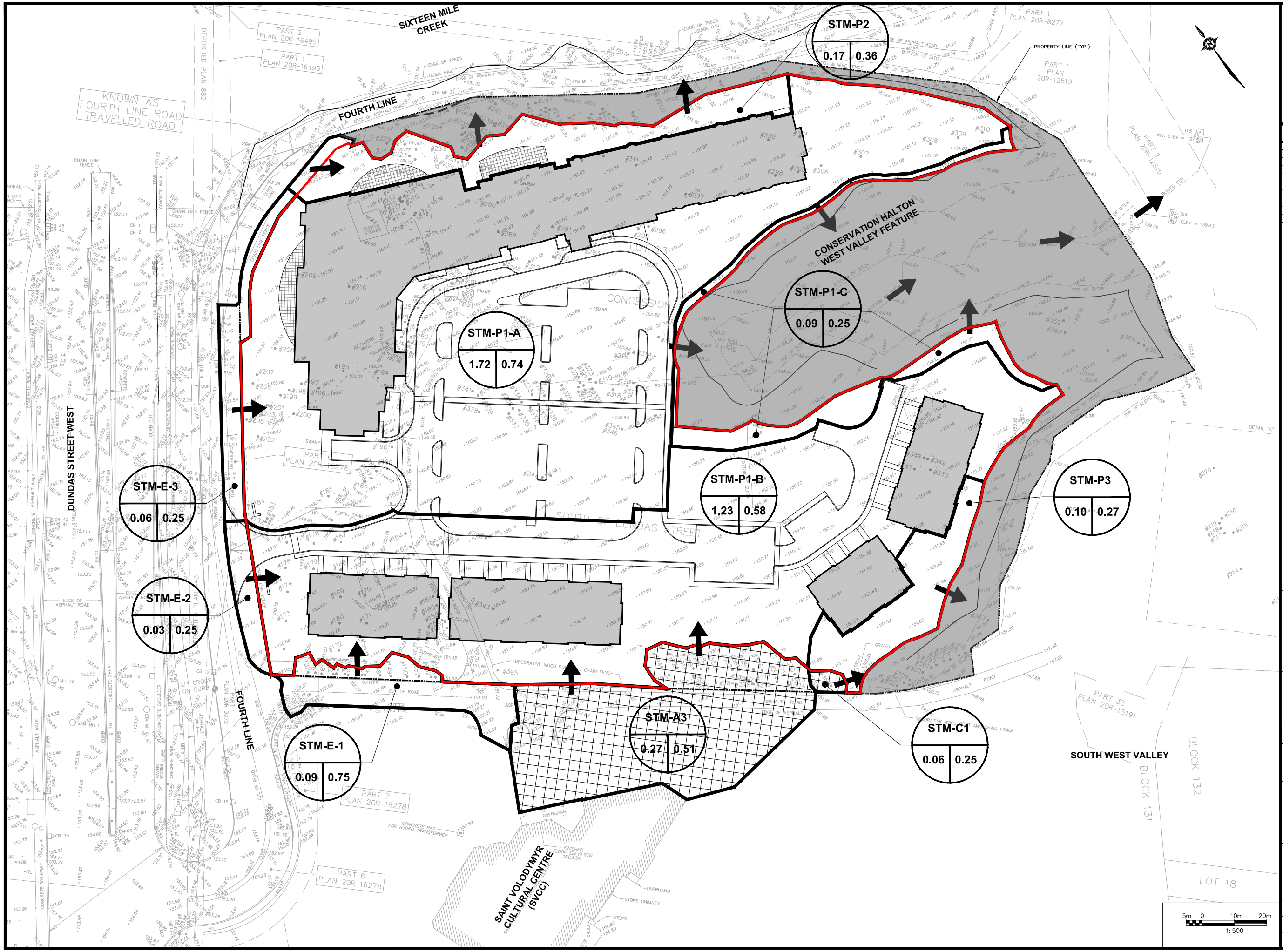

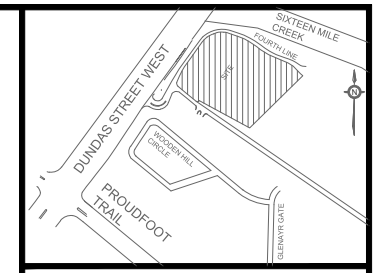

KEY PLAN
N.T.S.

No.	Date	Comments
2	2021/12/17	RE-ISSUED FOR ZBA APPROVAL
1	2020/09/18	ISSUED FOR ZBA APPROVAL

THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL OTHER RVA DRAWINGS

LEGEND

- PROPERTY LINE
- CATCHMENT AREA
- CATCHMENT DRAINAGE OUTLET
- STM-P2 (CATCHMENT ID); 1.85 (AREA (HA)); 0.25 (RUNOFF COEFFICIENT 'C')
- EXTERNAL DRAINAGE CATCHMENT: PRE-DEV = POST-DEV
- UNIMPACTED AREAS: PRE-DEVELOPMENT = POST-DEVELOPMENT
- DEVELOPABLE LIMIT OF SITE (I.E. GREATER OF LTSTS BUFFER OR TREE PROTECTION)

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Drawing Prepared By:

R.V. Anderson Associates Limited
engineering • environment • infrastructure

Client:
DELMANOR WEST OAK INC.

Project Name:
1280 DUNDAS STREET WEST REDEVELOPMENT
DELMANOR WEST OAK

Drawing Title:
CONCEPTUAL POST-DEVELOPMENT STORM DRAINAGE PLAN

Drawn: M.S	Design: D.A.S	Date: JULY 2020
Checked: D.A.S	Approved: A.S.T	Scale: 1:500
CADD File: 195028-S-Storm Catchment.dwg		Dwg. No.: PST-STM
Project No.: 195028		

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