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YMCA Barrie - 535 Bayview Drive

FUNCTIONAL SERVICING REPORT

YMCA of Simcoe/Muskoka

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1 Introduction

Tatham Engineering Limited (Tatham) has been retained by YMCA of Simcoe/Muskoka to prepare a Functional Servicing Report (FSR) in support of a Site Plan Approval (SPA) application for the proposed YMCA facility located at 535 Bayview Drive (site) in the City of Barrie (City).

1.1 OBJECTIVES

This report was prepared to demonstrate the feasibility of the proposed development with respect to servicing including water supply and distribution, sewage collection and treatment, drainage, site grading, and utility distribution.

1.2 GUIDELINES AND BACKGROUND REPORTS

This report is prepared in consideration of the following municipal, provincial and agency guideline documents:

- The Ministry of the Environment, Conservation, and Parks (MECP, formerly known as Ministry of Environment), *Stormwater Management Practices Planning and Design Manual* (March 2003);
- The MECP, *Design Guidelines for Drinking-Water Systems*, (2016);
- Lake Simcoe Region Conservation Authority (LSRCA), *Technical Guidelines for Stormwater Management Submissions* (April 2022);
- City of Barrie, *Stormwater Infrastructure Design Standard* (June 2023);
- City of Barrie, *Sanitary Infrastructure Design Standard* (April 2023); and
- City of Barrie, *Drinking Water Infrastructure Design Standard* (January 2024).

This report is prepared in consideration of the following City of Barrie reports and publications:

- City of Barrie, *Wastewater Collection Master Plan Update* (prepared by Cole Engineering Group Ltd.) (2019);
- City of Barrie, *Wastewater Treatment Master Plan* (prepared by WSP Canada Inc.) (2019);
- City of Barrie, *Water Storage and Distribution Master Plan Update* (prepared by WSP Canada Inc.) (2019); and
- City of Barrie, *Water Supply Master Plan Update* (prepared by WSP Canada Inc.) (2019).

This report is also prepared in consideration of the following site-specific reports:



- Sabourin Kimble & Associates Ltd., *Stormwater Management Design Brief Park Place Development – Phase 1 City of Barrie* (2008);
- GEMTEC Consulting Engineers and Scientists Limited (GEMTEC), *Preliminary Geotechnical Investigation: Proposed YMCA* (September 2023);
- Tatham Engineering Limited, *Hydrogeological Assessment* (January 2024); and
- Tatham Engineering Limited, *Stormwater Management Report* (April 2024).

1.3 PROPOSED DEVELOPMENT

The development consists of a YMCA facility with a building footprint of 4,225 m², including recreational and community spaces, and a parking lot. The area to be developed is situated in the northeast corner of the existing parking lot of Sadlon Arena. The site will be accessed from Bayview Drive.

The site plan (prepared by Martin Simmons Sweers Architects, dated April 2, 2024) is provided in Appendix A.



2 Site Description

The site is an approximately 3 ha parcel, which consists of an existing parking lot which is mainly utilized for the Sadlon Arena building to the south. The site is bounded by existing commercial/industrial lands to the north, Bayview Drive to the west, the existing SWM Pond LV49 to the east, and the Sadlon Arena building and parking lots to the south. The proposed YMCA facility is to be located within the leased lands (currently parking lots) to the east/northeast boundary of the site adjacent to SWM Pond LV49, as shown in Figure 1: Site Location Plan.

A legal survey of the property was completed by Rudy Mak Surveying Ltd. in December 2023. The site is legally described as:

*Part of Lots 8 and 9
Concession 12
Geographic Township of Innisfil
City of Barrie
County of Simcoe*

The site re-development area is located within the Lake Simcoe Region Conservation Authority (LSRCA) watershed and is partially located within the LSRCA regulated area as a tributary of Lovers Creek bisects the north and south portions of the site. However, the limit of re-development on site is not located within the regulated area.

The site is designated as 'Community Hub' based on the City's current Official Plan, and 'Major Institutional' based on the City's Zoning By-law.

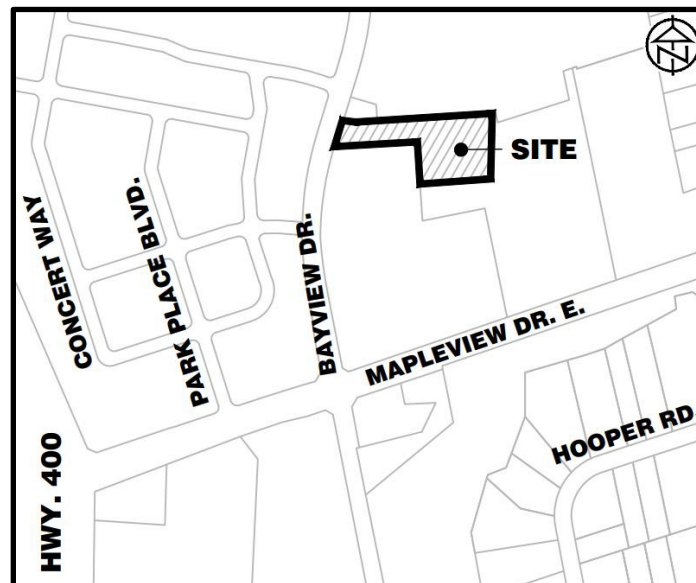


Figure 1: Site Location Plan



2.1 TOPOGRAPHY

Information relating to existing topography, ground cover, and drainage patterns was obtained through a review of relevant background studies, available plans, base mapping, and topographic surveys.

Detailed topographic surveys of the site were completed by Tatham on June 29, 2023 and November 27, 2023. The topographic survey base plan was also compiled by Tatham. This survey has been reviewed and compared to other available contour mapping and is sufficient for preliminary design. If required, additional topographic survey will be completed during the detailed design stage. A legal survey will be required prior to the detailed design stage.

The site is gently sloping (1.8-2.5%) from west to east towards the existing SWM Pond LV49 which receives all existing site drainage.

2.2 GEOTECHNICAL SETTING

Based on the *Soil Survey of Simcoe County, Ontario: Report No. 29 of the Ontario Soil Survey*, the existing soils are comprised of Tioga sandy loam (Tisl) towards the north bounds of the site which is classified as Hydrologic Soil Group (HSG) A, and Tioga loamy sand and Vasey sand loam (Tis-Vasl) towards the south bounds of the site which is classified as HSG AB. The soil classifications are consistent with the findings of the *Preliminary Geotechnical Investigation* report.

Per the *Preliminary Geotechnical Investigation*, the subsurface conditions generally consist of a layer of fill (beneath the existing asphalt) with depths ranging from 1.4 to 2.4 mbgs underlain by sand and silty sand. Refer to the original report under separate cover for additional information with respect to suitability of native soils for building construction/foundation design, pavement structure recommendations and servicing construction.

2.3 HYDROGEOLOGICAL SETTING

The *Hydrogeological Assessment* completed by Tatham was prepared to characterize the hydrogeological conditions on-site and assesses the potential impacts the groundwater regime may have on the proposed development. Monitoring wells were installed in three boreholes to facilitate stabilized groundwater level measurements. Groundwater was not encountered in the three monitoring wells, indicating that groundwater levels are below the borehole depth of exploration of 6.0 m below existing grade. It is anticipated that groundwater levels will fluctuate with seasonal changes and may be higher during wet periods of the year such as the early spring or following periods of heavy precipitation.



3 Water Supply & Distribution

3.1 EXISTING WATER SYSTEM

The site is located within an area of the City serviced by the municipal water distribution system. Specifically, the site is located within Pressure Zone 3S, supplied by the City's surface water system, as per the *Water Storage and Distribution Master Plan Update* (WSDMP) by WSP. The City's Surface Water Treatment Plant (SWTP) is located on the southern shore of Kempenfelt Bay at 20 Royal Parkside Drive and draws water supply from Lake Simcoe.

3.1.1 Existing Infrastructure

There is an existing 400 mm dia. distribution watermain fronting the site on Bayview Drive with an existing fire hydrant located on the west side of Bayview Drive opposite the north driveway entrance to the site, approximately 175 m from the proposed building. There are also 300 mm and 500 mm dia. transmission mains fronting the site on Bayview Drive.

3.1.2 Municipal Water Supply

Per Table 6-4 of the WSDMP, the City's SWTP (which supplies Pressure Zones 2S and 3S) has a firm capacity of 60 ML/day (60,000 m³/day). Per Table 6-5 of the WSDMP, the firm capacity of Zone 3S under existing conditions increases to 64.8 ML/day (64,800 m³/day) when accounting for the boosting capacities of the Harvie Road Reservoir and Big Bay Point Road Booster Pumping Stations.

Per Table 4-1 of the WSDMP, the maximum average day demand (ADD) for Zone 3S between 2011 and 2017 was 9,468 m³/day and the highest maximum day demand (MDD) was 14,612 m³/day, resulting in significant residual capacity within the existing supply system.

Per Table 3-2 of the WSDMP, the estimated ADD and MDD based on projected growth within Pressure Zone 3S (i.e. an area of the City supplied via the SWTP) are summarized in Table 1.



Table 1: Municipal Water Supply – Projected Zone 3S Demands

SCENARIO	AVERAGE DAY DEMAND (m ³ /DAY)	MAXIMUM DAY DEMAND (m ³ /DAY)	RESIDUAL (m ³ /DAY)
2021	11,458	20,624	39,376
2026	13,708	24,675	35,325
2031	15,849	28,528	31,472
2036	17,545	31,580	28,420
2041	20,099	36,178	23,822

Therefore, there is sufficient water supply to service additional development within Pressure Zone 3S.

The MDD of Pressure Zone 2S accounts for most of the residual capacity in Table 1 resulting in deficiencies based on the 2036 growth projection. However, future improvements (in two phases) are proposed by the City to increase the SWTP firm capacity to support population growth projections beyond 2036, as per Figure 5-1 of the *Water Supply Master Plan Update* (WSMP) by WSP.

3.1.3 Municipal Water Storage

Water storage for Pressure Zone 3S is provided by the Maplevue Drive Elevated Storage Tank (located at 65 Maplevue Drive West), supplied with surplus water from Zone 2S. Under existing conditions, there is a local deficit of storage within the Zone 3S system; however, some of the storage surplus in adjacent Zone 2S can be assigned to Zone 3S via the Harvie Road Reservoir to offset this deficit. As a result, there is a total net storage surplus of 3.05 ML for the City's surface water supplied zones (Zones 2S and 3S) (all as per Table 6-3 of the WSDMP). Therefore, there is sufficient water storage within the existing municipal system to service additional development in the area.

Under growth projections to 2041 there is a storage surplus of 1.20 ML within the surface water supplied zones (per Table 6-7 of the WSDMP).

3.2 PROPOSED WATER SYSTEM

The proposed building will be serviced with a 150 mm dia. domestic service and a 250 mm dia. fire service both connected to the existing 400 mm dia. distribution main on Bayview Drive, all in accordance with City standards. A new fire hydrant is also proposed which is within 45 m of the buildings fire department connection.



Refer to the Site Servicing Plan (Drawing SS-1; dated April 3, 2024) in the engineering drawing package for additional information.

3.2.1 Domestic Water Demands

Water demands for the proposed development have been estimated by applying the City's design guidelines.

- Total Development Area (building and immediately surrounding area) = 1.25 ha
- Institutional Consumption Rate = 28 m³/ha/day

Therefore, the Average Day Demand (ADD) was calculated to be 35 m³/day or 0.41 L/s. This is consistent with historical water consumption data from other similar YMCA sites.

Maximum Day Demand (MDD) and peak hour demand (PHD) factors have been applied in accordance with Table 3-1 of the MECP Design Guidelines for Drinking-Water Systems (2016).

- MDD factor = 2.75
- PHD factor = 4.13

Table 2: Domestic Water Demands

SCENARIO	DEMAND (m ³)	DEMAND (L/s)
Average Day	35.00	0.41
Maximum Day	96.25	1.11
Peak Hour	-	1.67

3.2.2 Domestic Water Service Design

The WSDMP includes figures which show modelled pressures at key junctions under ADD and MDD scenarios for growth projections between 2021 and 2041. These figures include a junction fronting the site with pressures ranging between 80 and 90 psi (550 to 620 kPa) under ADD scenarios and between 80 and 102 psi (550 to 700 kPa) under MDD scenarios. These available pressures are approximately equivalent to the City's preferred operating pressure of 80 psi (550 kPa).

In addition, a fire hydrant flow test was completed on the 400 mm dia. watermain in Bayview Drive (see results in Appendix B). The static pressure in the main at the time of the test was noted to be 79 psi. Therefore, the municipal system is expected to deliver sufficient flows and pressures to provide domestic service to the site.



As per the attached watermain design calculations in Appendix B, a 150 mm dia. domestic service will provide water service to the building. Under peak hour conditions, the pressure in the 150 mm dia. domestic service at the FFE of the proposed building is estimated to be 81.09 psi. Refer to Appendix B for additional calculations.

3.2.3 Fire Protection

FUS Calculations

Firefighting water demands have been estimated for the site using Water Supply Public Fire Protection (2020) prepared by the Fire Underwriters Survey (FUS). The required fire flow for the proposed facility was calculated to be 167 L/s (refer to calculation sheet in Appendix B).

Based on City guidelines the minimum fire flow for an institutional development shall be the greater of the value as calculated per the FUS Fire Flow Calculations or 200 L/s. Therefore, the required fire flow is 200 L/s.

Hydrant Flow Testing and Available Fire Flow

Hydrant flow testing was completed by Vipond Inc. on October 30, 2023 on two existing hydrants in Bayview Drive, fronting the site. The static pressure was measured to be 79 psi. The estimated available fire flow (as calculated using City of Barrie design guidelines) is greater than 300 L/s at a residual pressure of 20 psi. This is greater than the required fire flow of 200 L/s.

Refer to Appendix B for additional calculations.

Fire Service Design

As per the attached watermain design calculations in Appendix B, the 250 mm dia. fire service can provide the required fire flow of 200 L/s at a velocity of 4.08 m/s, which is less than the City maximum of 5.00 m/s. The pressure in the 250 mm dia. fire service at the FFE of the proposed building is estimated to be 58.66 psi. Refer to Appendix B for additional calculations.



4 Sanitary Sewage System

4.1 EXISTING SANITARY SYSTEM

The site is located in an area of the City serviced with a municipal sanitary sewer collection system that conveys flows to the Barrie Wastewater Treatment Facility (WWTF) located at 249 Bradford Street at the west end of Kempenfelt Bay on Lake Simcoe.

There is an existing 250 mm dia. local sanitary sewer located within the parking lot approximately 90 m west of the proposed building. This local sewer connects to an existing 750 mm dia. trunk sewer approximately 75 m south of the proposed building. The trunk sewer flows via gravity in an easterly direction, ultimately discharging to the WWTF. The downstream trunk sewers do not contribute to any sanitary pumping stations before reaching the WWTF.

4.1.1 WWTF Capacity

As per the Wastewater Treatment Master Plan, the Barrie WWTF has a rated average daily flow (ADF) capacity of 76,000 m³/day, and a peak flow capacity of 156,000 m³/day. Based on historical flow data, the WWTF has received between 48,000 m³/day to 50,700 m³/day between 2014 and 2017. Based on population growth projections the ADF estimated in 2021 is 60,019 m³/day. Therefore, under existing conditions there is an estimated residual capacity of 16,000 m³/day.

The WWTF is expected to reach its current rated capacity of 76,000 m³/day in 2031. Future improvements are proposed (with some already underway) to increase the capacity of the plant to support population growth projections beyond 2031.

4.2 PROPOSED SANITARY SYSTEM

4.2.1 Service Connection

The proposed building will be serviced with one 250 mm dia. sanitary service, connecting to the existing 750 mm dia. trunk sewer south of the site.

Refer to the Site Servicing Plan (Drawing SS-1; dated April 3, 2024) in the engineering drawing package for additional information.

4.2.2 Sanitary Flows

Preliminary sanitary flows that will be generated from the proposed development have been estimated by applying the City's design guidelines.

- Total Development Area (building and immediately surrounding area) = 1.25 ha



- Institutional Average Daily Flow = 28 m³/ha/day
- Extraneous Flows = 0.1 L/s/ha
- Peak Flow Factor = 2.00

Therefore, the Average Day Flow (ADF) is estimated to be 35.0 m³/day (0.41 L/s) and the peak instantaneous flow (for the purpose of sewer sizing) is estimated to be 0.94 L/s.

Based on as-built information, the full flow capacity of the existing sanitary trunk sewer south of the building is 787.21 L/s (based on a slope of 0.5%). Therefore, the flows from the proposed development represent approximately 0.10% of the full flow capacity of the sewer. As such, it is expected the downstream trunk sewers will have sufficient capacity to accept the sewage flow from the development.

4.2.3 Peak Flow (WWTF Capacity)

Peak day flow (PDF) with respect to capacity within the WWTF has been calculated utilizing peaking factors which consider the entirety of the population contributing to the WWTF. Based on the Wastewater Treatment Master Plan a peaking factor of 2.05 is to be utilized when assessing plant capacity. This results in a total PDF of 71.75 m³/day. As mentioned above, the existing WWTF is understood to have sufficient capacity to service addition development, with an estimated residual capacity of 16,000 m³/day. Therefore, the WWTF has sufficient capacity to service the subject development under average day and peak flow scenarios.



5 Drainage & Stormwater Management

A *Stormwater Management Report* has been prepared under separate cover and should be read in conjunction with this report. The report demonstrates that the proposed development will not result in negative impacts with respect to stormwater and has been prepared in accordance with City, LSRCA, and MECP design guidelines.

The following summarizes the findings of the report:

- Water quantity and quality controls for the site will be provided downstream via the existing SWM Pond LV49 located to the east of the site. This existing pond was designed to provide water quantity and quality controls for the existing site. Since the level of imperviousness is decreased under proposed conditions, peak flows will not increase. Therefore, SWM Pond LV49 will continue to provide sufficient water quantity and quality controls for the site.
- Due to the reduction in impervious area under proposed conditions, water balance and volume control requirements are not required and therefore will not be provided for the site. Furthermore, implementation of green space will encourage infiltration which is expected to improve groundwater recharge rates under proposed conditions.
- Phosphorus loading rates will not increase between existing and proposed conditions since the level of imperviousness does not increase under proposed conditions. In addition, due to the reduction in parking lot area and implementation of green space, the proposed site is expected to decrease phosphorus loading rates. Therefore, phosphorus mitigation measures are not required on-site.

The overall proposed drainage design for this site is intended to match existing drainage patterns. A proposed piped network ranging in diameter from 375 mm to 525 mm collects runoff generated on site, ultimately conveying flows to the existing stormwater management pond LV49, located east of the proposed building. The internal storm network has been designed in accordance with City of Barrie standards for the 5-year event. Refer to Drawing STM-1; dated April 3, 2024 for further detail.

Supporting details, drawings, and calculations are provided in the accompanying *Stormwater Management Report*. Existing and proposed conditions catchments information is depicted on Drawings DP-1 and DP-2; dated April 3, 2024 in the *Stormwater Management Report*.



6 Grading & Landscaping

The proposed grading design matches into the existing grading along the parking lot and existing edges of asphalt at the limit of the parking area. Site grading generally follows the existing conditions drainage pattern.

Grading on the site is generally in the range of 1% to 5%, with minor deviations where necessary. Accessibility standards (AODA) have been adhered to with ramping, depressed curbs, tactile plates and gentle slopes where achievable throughout the site.

Refer to the Site Grading Plan (Drawing SG-1; dated April 3, 2024) in the engineering drawing package for additional information.

6.1 EXCESS SOILS

It is anticipated the proposed site works will generate excess soils to be disposed off-site. As such, a Qualified Persons (QP) will be required to oversee the handling and disposal of excess soils in accordance with O.Reg.406/19 throughout design and construction.



7 Erosion & Sediment Control

Erosion and sediment control measures will be implemented for all construction activities within the development site including removals, vegetation clearing, topsoil stripping, grading, servicing, road construction and site development. The basic principles considered to minimize erosion and sedimentation transport include:

- All erosion control measures will be designed in accordance with relevant City, LSRCA and OPSD standards;
- Silt fences to be constructed prior to commencement of any grading operations;
- Designated construction vehicle entrance(s) with stone mud mat;
- Temporary swales, silt ponds, and check dams will be constructed to control runoff during construction by reducing velocities and promoting settlement of particulates;
- Storm inlet structures will be provided with filter screens during construction;
- Long term siltation and erosion control will be enhanced with a re-vegetation strategy for disturbed areas; and
- Confine refueling and servicing of equipment sufficiently away from existing drainage systems.

Regular inspection of control measures will be completed through a monitoring and mitigation plan, with regular repairs made as necessary. Refer to the Erosion & Sediment Control Plans (Drawings ESC-1 and ESC-2; dated April 3, 2024) in the Engineering Drawing Set.



8 Utilities

The following utility agencies provide services to the proposed development:

- Alectra;
- Enbridge Inc.;
- Bell Canada; and
- Rogers Communication Inc.

All utilities (electrical, gas, telecommunications) are expected to be available from the Bayview Drive right-of-way to service the proposed building. Utility coordination will be completed by the building electrical engineer.



9 Conclusions

9.1 WATER SUPPLY & DISTRIBUTION

The site will be serviced by individual domestic and fire protection water services connected to the existing 400 mm dia. distribution watermain located on Bayview Drive. A new fire hydrant is also proposed on site. The City's water supply and distribution system has sufficient capacity to service the proposed development with domestic water. Additional study will be required to confirm the City's infrastructure will provide sufficient fire fighting flows for the site.

9.2 SANITARY SEWAGE COLLECTION

The site will be serviced by a proposed sanitary sewer connection to the existing 750 mm dia. trunk sewer located south of the proposed building. There is expected to be sufficient capacity in the existing sanitary trunk sewer to accommodate the additional flow. The Barrie WWTF has sufficient capacity to service the proposed development.

9.3 DRAINAGE & STORMWATER MANAGEMENT

As the proposed development will reduce impervious area in comparison to existing conditions, on-site water quality, quantity or infiltration controls are not required.

Site generated runoff will continue to drain to existing City SWM Pond LV49 as per existing conditions.

9.4 GRADING

The grading of the proposed development will match to the existing grades along the limits of the development to achieve the objectives of the stormwater management plan.

9.5 UTILITIES

All utilities (electrical, gas, telecommunications) are expected to be available from the Bayview Drive.



Appendix A: Site Plan

GENERAL NOTES:

1. SITE AREA AND SURVEY INFORMATION SHOWN HAS BEEN TAKEN FROM THE PLAN OF SURVEY PREPARED BY RILEY WAX SURVEYING LTD., ONTARIO LAND SURVEYORS, DATED 12 DECEMBER 2023 (FILE REF: 19803).
2. THIS SITE PLAN IS PART OF THE CONTRACT DOCUMENTS AND MUST BE READ IN CONJUNCTION WITH ALL OTHER DOCUMENTS COMPRISING THE CONTRACT DOCUMENTS, INCLUDING BUT NOT LIMITED TO CIVIL, LANDSCAPE, AND SITE LIGHTING DOCUMENTS.
3. VERIFY ALL DIMENSIONS ON SITE AND PROMPTLY REPORT IN WRITING ANY DISCREPANCIES TO THE CONSULTANT MARTIN SIMMONS SWEERS ARCHITECTS (INC.).
4. ALL GEODEIC INFORMATION ON THIS SITE PLAN IS FOR REFERENCE ONLY. REFER TO SITE SURVEY, CIVIL, AND LANDSCAPE DOCUMENTS FOR EXISTING AND PROPOSED GRADING INFORMATION.
5. ALL LANDSCAPE INFORMATION ON THIS SITE PLAN IS FOR REFERENCE ONLY. REFER TO LANDSCAPE DOCUMENTS FOR EXISTING AND LANDSCAPE INFORMATION, INCLUDING TREE REMOVALS AND TREE PRESERVATION PLANS.
6. ALL BELOW-GRADE STORM, SANITARY, WATER, AND FIREMAN SITE SERVICES INFORMATION ON THIS SITE PLAN IS FOR REFERENCE ONLY. REFER TO CIVIL DOCUMENTS FOR EXTENT OF BELOW-GRADE STORM, SANITARY, WATER, AND FIREMAN SITE SERVICES TO REMAIN ALONG WITH ASSOCIATED SITE SERVICES TO BE DEMOLISHED, AND PROPOSED STORM, SANITARY, WATER, AND FIREMAN SITE SERVICES.
7. ANY EXISTING GRASS TO REMAIN WHICH IS DAMAGED DURING THE DURATION OF THE WORK IS TO BE REPLACED WITH NEW SOG.

ABBREVIATIONS

PHASING

- (A) DENOTES ABANDONED
(P) DENOTES PROPOSED (ALL WORK UNLESS NOTED)
(EX) DENOTES EXISTING
(DC) DENOTES WORK BY OTHERS

APR	DENOTES ACCESSIBLE PARKING	HP	DENOTES HYDRO POLE
BL	DENOTES BOLLARD	GV	DENOTES GAS VALVE
BLI	DENOTES BOLLARD WITH INTEGRATED LUMINAIRE	LS	DENOTES LIGHT STANDARD
BP	DENOTES BARBER FREE PARKING SPACE	MAS	DENOTES MUNICIPAL ADDRESS SIGNAGE
CB	DENOTES CATCH BASIN	MH	DENOTES MAINTENANCE HOLE COVER
CBMH	DENOTES CATCH BASIN MAINTENANCE HOLE COVER	OHW	DENOTES OVERHEAD WIRE
DCR	DENOTES DOUBLE CATCH BASIN	BP	DENOTES BARRIERSIDE LEADER SPREADING
DC	DENOTES CLEAFOOT	TS	DENOTES TRENCH DRAIN
DC	DENOTES DEPRESSURED CURB	TS	TRAFFIC SIGN
DW	DENOTES DEPRESSURED WATER CONNECTION	AD	DENOTES AREA DRAIN
EV	DENOTES CHARGE STATION	WM	DENOTES WATERMAIN ENTRY
FDC	DENOTES FIRE DEPARTMENT CONNECTION	WV	DENOTES WATER VALVE
FW	DENOTES FIRE HYDRANT	OWT	DENOTES ONE WAY TRAFFIC
FW	DENOTES FIRE SUPPRESSION WATER CONNECTION	DNE	DENOTES DO NOT ENTER
		BP	BELL PEDESTAL
FRM	DENOTES FIRE ROUTE SIGNAGE, REFER TO FIRE ROUTE SIGN DIAGRAM FOR TYPE	NP	DENOTES NO PARKING
HLP	DENOTES HYDRO LIGHT POLE		
HSP	DENOTES HYDRO GUY POLE		
			NO PARKING

DRAWING NOTES:

- (C) CURBS, REFER TO CIVIL DWGS.
- (H) HEAVY DUTY ASPHALT
- (C) CONCRETE BOLLARD, REFER TO LANDSCAPE DRAWINGS
- (L) LINE OF ROOF ABOVE
- (O) OUTDOOR CHILDREAN PLAY AREA
- (B) BICYCLE RACK, REFER TO LANDSCAPE DWGS.
- (P) PAINTED LINE MARKINGS AND GRAPHICS, REFER TO TRAFFIC PAVEMENT MARKING & SIGNAGE PLAN AS APPLICABLE
- (M) TACTILE WARNING SURFACE INDICATOR C/W ACCESSIBLE DROPPED CURB RAMP
- (D) DROP-OFF AREA
- (L) LINE OF BUILDING ABOVE
- (B) BENCH, REFER TO LANDSCAPE DRAWINGS
- (T) TRANSFORMER, CONCRETE PAD AND BOLLARDS - REFER TO ELECTRICAL DWGS.
- (A) ACCESS TO STORM WATER POND
- (B) BICYCLE REPAIR STATION, REFER TO LANDSCAPE DRAWINGS
- (S) SPORTS COURT, REFER TO LANDSCAPE DRAWINGS
- (H) HANDSCAPED AREA (PATH, CONCRETE, UNIT PAVEMENT, ETC.) REFER TO LANDSCAPE DWGS.
- (L) LANDSCAPE AREA (SOG, PLANTING BED, ETC.) REFER TO LANDSCAPE DWGS.
- (M) METAL TREE GUARD, REFER TO LANDSCAPE DRAWINGS
- (C) CROPPED CONCRETE CURB, REFER TO CIVIL DWGS.
- (T) TIE CONCRETE CURB / SIDEWALK INTO EXISTING, REFER TO CIVIL DRAWINGS
- (R) RETAINING WALL, REFER TO CIVIL DRAWINGS
- (T) TIE INTO EXISTING ASPHALT TRAIL
- (L) LEVEL ELECTRICAL VEHICLE CHARGER C/W CONCRETE PAD AND BOLLARDS
- (6m) 6m WIDE FIRE ROUTE
- (S) SNOW STORAGE AREA
- (M) MEDIUM DUTY ASPHALT PEDESTRIAN PATH

SITE PLAN LEGEND:

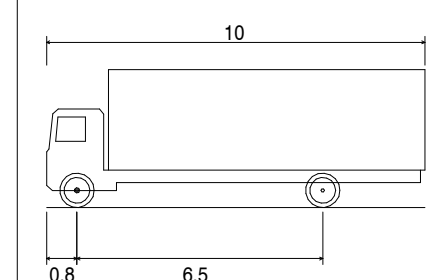
SITE AND ACCESS	
---	PRIORITY LINE
---	SETBACK
---	PART 2 SUBJECT TO EASEMENT SC039103
---	ROW RIGHT-OF-WAY / EASEMENT
---	WOOD POST FENCE
---	METAL POST FENCE
---	THREE PROTECTIVE FENCING
---	OVERHEAD HYDRO WIRE
---	C/L CENTERLINE OF ROAD
---	DENOTES FIRE ROUTE MIN. 4.0m WIDE WITH MIN. 12.0m CONTINUOUS WIDING
---	BUILDING EXIT
---	BP BARBER FREE
---	FP FIRE FIGHTER
---	PRINCIPAL ENTRANCE
---	GRADE LEVEL OVERHEAD DOOR
---	DRIVE AISLE DIRECTION
---	TRAFFIC SIGN, REFER TO ABBREVIATIONS FOR SIGN TYPE
---	FIRE DEPARTMENT CONNECTION
---	LIGHT STANDARD
---	FIRE HYDRANT
---	BICYCLE RACK
---	WATER VALVE
---	MANHOLE
---	HANDWELL
---	BELL PEDESTAL
---	CATCH BASIN
---	ACCESSIBLE PARKING
---	ELECTRICAL VEHICLE CHARGING STATION
LANDSCAPE AND SURFACING	
---	DENOTES EXISTING PAVING TO BE DEMOLISHED
---	DENOTES NEW LANDSCAPE PLANTING AREA
---	DENOTES NEW / REINSTATED SOG
---	DENOTES NEW LANDSCAPE PAVERS
---	DENOTES NEW C/P CONCRETE PAVING
---	HEAVY DUTY ASPHALT PAVING
---	MEDIUM DUTY ASPHALT PAVING

1 OVERALL SITE PLAN

A102 1:500

SADLON ARENA

TRUCK TURNING LEGEND



MSU - MEDIUM SINGLE UNIT TRUCK
OVERALL LENGTH: 10.00m
OVERALL WIDTH: 2.50m
OVERALL BODY HEIGHT: 3.60m
MIN BODY GROUND CLEARANCE: 1.40m
TRUCK WIDTH: 2.60m
LOOK TO LOCK TIME: 4.0m
CURB TO CURB TURNING RADIUS: 7.07m

SITE PLAN DATA CHART

MUNICIPAL ADDRESS	535 BAYVIEW DRIVE, BARRIE, ONTARIO	
LEGAL DESCRIPTION	PART OF LOTS 8 AND 9 CONCESSION 12 GEOGRAPHIC TOWNSHIP OF KENNEDY CITY OF BARRIE COUNTY OF SIMCOE	
ZONING	I40 (MAJOR INSTITUTIONAL)	
DATA	REQUIRED	PROVIDED
SITE AREA	5,900 m ²	34,181.40 m ²
LOT FRONTAGE	48.00 m	119.14 m
MIN. REAR YARD	7.0 m	7.91 m
MIN. FRONT YARD	9.0 m	156.53 m
MIN. SIDE YARD	9.0 m	NORTH: 6.37 m SOUTH: 7.07 m
MAX. LOT COVERAGE	35%	13%
MIN. LANDSCAPE OPEN SPACE	35%	35%
BUILDING HEIGHT	N/A	14.00 m
OFF-STREET PARKING	N/A	72 SPACES (INCLUDING B.P. SPACES)
BARBER FREE PARKING	TYPE 'A' SPACE	N/A
TYPE 'B' SPACE	N/A	4 SPACES
OFF-STREET LOADING	N/A	1 SPACE

2 ENLARGED SITE PLAN

A102 1:250

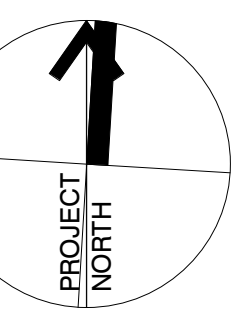
1 19/01/24 ISSUED FOR SPA

DATE ISSUE

MARTIN
SIMMONS
SWEERS

220 113 Breithaupt Street
Kitchener, ON N2H 5G9
T: 519.745.4734 F: 519.745.0001

DO NOT SCALE THESE DRAWINGS. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND REPORT ANY ERRORS AND/OR OMISSIONS TO THE ARCHITECT IMMEDIATELY UPON COMMENCEMENT OF THE WORK.
THESE DRAWINGS ARE THE PROPERTY OF THE ARCHITECT / CONSULTANT AND ARE NOT TO BE REPRODUCED OR DISTRIBUTED WITHOUT CONSENT FROM THE ARCHITECT / CONSULTANT.



PROJECT
BARRIE YMCA

535 BAYVIEW DRIVE, BARRIE, ONTARIO

DRAWING

SITE PLAN -
PROPOSED

DRAWN BY
MB/ML

CHECKED BY
JM

DATE
MARCH 2024


SCALE
AS NOTED

DRAWING NO

PROJECT NO
23017

A102

Appendix B: Water Calculations

	Project: YMCA Barrie, 535 Bayview Drive	Date: March 21, 2024
	File No.: 423449	Designed: JLM
	Subject: FUS Fire Flow Calculations	Checked: NM
	Revisions:	

Fire Underwriters Survey Fire Flow Calculations

Calculation Based on 2020 Publication "Water Supply for Public Fire Protection" by Fire Underwriters Survey (FUS).

Step	Description	Term	Options	Multiplier Associated with Option	Choose	Value used	Unit	Total Fire Flow (L/min)		
1	Frame Use for Construction of Unit	Coefficient related to type of construction (C)	Framing Material			Ordinary Construction	1.0	%	N/A	
			Type V - Wood Frame Construction	1.5						
			Type IVA - Mass Timber Construction	0.8						
			Type IVB - Mass Timber Construction	0.9						
			Type IVC - Mass Timber Construction	1.0						
			Type IVD - Mass Timber Construction	1.5						
			Ordinary Construction	1.0						
			Non-combustible Construction	0.8						
			Fire Resistive Construction	0.6						
2	Total Effective Area	Largest Floor Area					4225	m ²	N/A	
		Percentage of the Total Area of the Other Floors for Coefficient 1.0 to 1.5				100%	1920			
		Percentage of the Total Area of the Other Floors for Coefficient below 1.0:								
		a) If any vertical opening in the building are unprotected, consider the two largest adjoining floor areas plus 50% of all floors immediately above them up to a maximum of eight, or				50%				
		b) If all vertical openings and exterior vertical communications are properly protected in accordance with the National Building Code, consider only the single largest Floor Area plus 25% of each of the two immediately adjoining floors.				25%				
		Total Effective Area					6145			
3	Required Fire Flow without Reductions or Increases	Required Fire Flows without Reductions or Increases per FUS): (RFF= 220 x C x A ^{0.5})						17,000		
4	Factors Affecting Burning	Reductions / Increases Due to Factors Affecting Burning								
4.1	Combustibility of Building Contents	Occupancy content hazard reduction or surcharge	Non-combustible	-0.25	Limited combustible	-0.15	%	(2,550)	14,450	
			Limited combustible	-0.15						
			Combustible	0.00						
			Free burning	0.15						
			Rapid burning	0.25						
4.2	Reduction Due to Presence of Sprinklers	Sprinkler reduction	For a fully supervised system the conditions a), b) and c) below must be met.			-0.3	%	(4,335)	10,115	
			a) Automatic sprinkler protection designed and installed in accordance with NFPA 13	-0.3	Yes					
			b) Water supply is standard for both the system and the Fire Department hose lines	-0.1	No					
			c) Fully supervised system	-0.1	No					
		None	0.0	No						
4.3	Separation Distance Between Units (Use 10% for 2 hour Fire Separation between adjacent units)	Exposure distance between units	North Side	Greater than 30.0 m	0.00	0	%	-	10,115	
			East Side	Greater than 30.0 m	0.00					
			South Side	Greater than 30.0 m	0.00					
			West Side	Greater than 30.0 m	0.00					
4.4	Combustibility of Wood Shingle or Shake Roof Material	Surcharge for potential to spread fire	Non-combustible roofing material	0	Non-combustible roofing material	0	L/min	0	10,115	
			Low risk of fire spread	2000						
			Moderate risk of fire spread	3000						
			High risk of fire spread	4000						
Total Required Fire Flow, rounded to nearest 1000 L/min, with max/min limits applied:									10,000	
5	Required Fire Flow, Duration and Volume	Total Required Fire Flow (above) in L/s:							167	
		Required Duration of Fire Flow of 10,000 L/min (hrs):					2			
		Required volume for Fire Flow of 10,000 L/min (m³):					1,200			

FLOW TEST RESULTS

DATE : OCTOBER 30, 2023

LOCATION : 535 BAYVIEW DRIVE

BARRIE

ONTARIO

TEST BY : LEN K. — T.H.



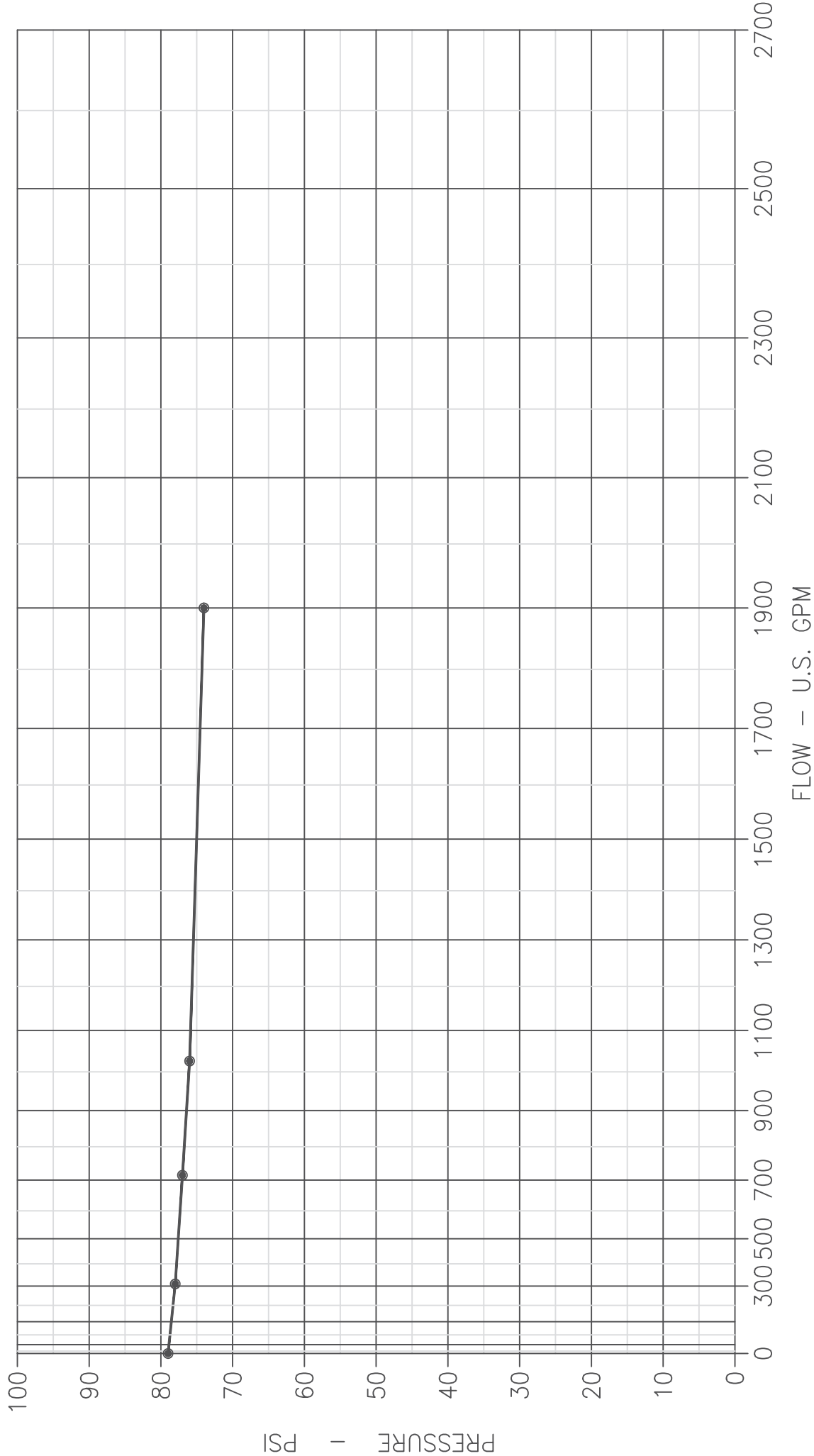
STATIC PRESSURE : 79 PSI

TEST NO.	NO. OF NOZZLES	NOZZLE DIAMETER (INCHES)	DISCHARGE CO-EFFICIENT	RESIDUAL PRESSURE (PSI)	PITOT PRESSURE (PSI)	DISCHARGE (U.S.GPM)
1	1	1-1/8	0.97	78	75	317
2	1	1-3/4	0.97	77	65	718
3	1	2-1/2	0.90	76	37	1026
4	2	2-1/2	0.90	74	32	1908



535 BAYVIEW DRIVE		BY : LEN K. – T.H.
BARRIE		OFFICE : BARRIE
ONTARIO		TEST BY : VIPOND & PUC
		DATE : OCTOBER 30, 2023

STATIC:	RESIDUAL:	FLOW:
79 <u>PSI</u>	TEST#1 78 <u>PSI</u>	@ 317 <u>GPM</u>
	TEST#2 77 <u>PSI</u>	@ 718 <u>GPM</u>
	TEST#3 76 <u>PSI</u>	@ 1026 <u>GPM</u>
	TEST#3 74 <u>PSI</u>	@ 1908 <u>GPM</u>



PROJECT	YMCA Barrie, 535 Bayview Drive	FILE	423449	
		DATE	2023-12-07	
SUBJECT	Available Fire Flow from Hydrant Flow Test Results	NAME	NM	
		PAGE	1	OF 1

$$Q_R = Q_F \left(\frac{h_r}{h_f} \right)^{0.54}$$

Test Completed By: Vipond Inc.
Date of Test: Oct. 30, 2023
Test Location: 535 Bayview Drive, Barrie
Static Pressure: 79 psi

TEST 1 Hydrant test: One 1 1/8" Nozzle

Values

Where Q_R = Flow at 20 psi

Q_F = Flow at Test (i.e. Discharge)

h_r = Pressure Drop Available (Static - 20)

h_f = Pressure Drop at Test (Static - Residual)

$$Q_F = 317 \text{ US gpm}$$

$$h_r = 79 - 20 = 59 \text{ psi}$$

$$h_f = 79 - 78 = 1 \text{ psi}$$

$$Q_R = 2,866 \text{ US gpm}$$

$$= 180.58 \text{ L/s}$$

TEST 3 Hydrant test: One 2 1/2" Nozzle

Values

Where Q_R = Flow at 20 psi

Q_F = Flow at Test (i.e. Discharge)

h_r = Pressure Drop Available (Static - 20)

h_f = Pressure Drop at Test (Static - Residual)

$$Q_F = 1026 \text{ US gpm}$$

$$h_r = 79 - 20 = 59 \text{ psi}$$

$$h_f = 79 - 76 = 3 \text{ psi}$$

$$Q_R = 5,126 \text{ US gpm}$$

$$= 322.93 \text{ L/s}$$

TEST 4 Hydrant test: Two 2 1/2" Nozzles

Values

Where Q_R = Flow at 20 psi

Q_F = Flow at Test (i.e. Discharge)

h_r = Pressure Drop Available (Static - 20)

h_f = Pressure Drop at Test (Static - Residual)

$$Q_F = 1908 \text{ US gpm}$$

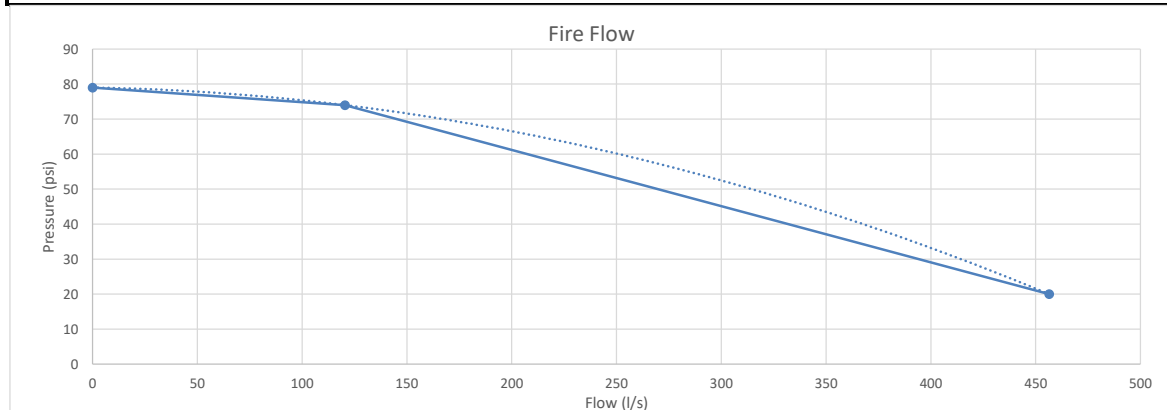
$$h_r = 79 - 20 = 59 \text{ psi}$$

$$h_f = 79 - 74 = 5 \text{ psi}$$

$$Q_R = 7,234 \text{ US gpm}$$

$$= 455.76 \text{ L/s}$$

Fire Flow Test (W501 v1.1)		
City of Barrie		
3-Apr-2024		
Hydrant Number (Residual and Static Pressure)	Residual Pressure H3870	
Hydrant Number(s) (Flow)	Pitot Pressure H3869	
Hydrant Street / Address (Residual and Static Pressure)	Bayview Drive (4th hydrant south of Churchill Drive)	
Hydrant Street / Address (Flow)	Bayview Drive (2nd hydrant north of South Village Way)	
Hydrant Locations Figure (Residual/Static and Flow)	Please refer to Vipond's "Flow Test Results"	
Date of Test (DD/MM/YYYY)	30-10-2023	
Time (HH:MM AM or PM)	Unknown	
Time (HH:MM AM or PM)	Unknown	
Company Name	Vipond Inc.	
Employee Name(s)	Len K. - T.H.	
City of Barrie Employee Name(s)	Unknown	
Static Pressure	79	psi
Residual Pressure	74	psi
Hydrant Elevation (Residual and Static Pressure)	289	m
Hydrant Elevation (Flow)	289	m
Elevation Difference (m)	0	m
Pitot Pressure - Outlet 1	32	psi
Pitot Pressure - Outlet 2	0	psi
Outlet Size	2.5	inch
Outlet Coefficient	0.9	
Pressure Drop Check (NFPA 291)	6.33	% Minimum pressure drop of 25% is recommended, please consider opening other outlets or flowing additional hydrants
Pressure Drop Check (AWWA M17)	5.00	psi Minimum pressure drop of 10 psi is recommended, please consider opening other outlets or flowing additional hydrants
Q Hydrant Flow - Outlet 1	1908.00	US gpm
Q Hydrant Flow - Outlet 2	0.00	US gpm
Q Total Flow	120.38	l/s
Pressure at Desired Fire Flow	20.00	psi
Q Outlet 1 _R	7234.27	US gpm
Q Outlet 2 _R	0.00	US gpm
Q Total _R	7234.27	US gpm
Q Total _R	456.41	l/s
Have any Cell formulas been changed? (Yes/No)	Yes	C28 (Q hydrant flow) was revised to measured value instead of theoretical calculation. Measured value is more conservative of actual flow scenario.
Hydrant Colour:	Blue	
Boundary Conditions (ET, Reservoir, BPS, PRV, Wells etc): Unknown		
Other Considerations (flushing, fire, operational issues, outlet coefficient etc): Entered data for Flow Test #4. Estimated hydrant elevations from ground elevations from Barrie OpenData GIS mapping.		



PROJECT	Barrie YMCA, 535 Bayview Drive	FILE	423449
		DATE	21-Mar-2024
SUBJECT	Water Supply Calculations	NAME	NM CHECK DB
		PAGE	1 OF 2

SITE DESCRIPTION

Proposed Barrie YMCA Building

DAILY DEMAND DESIGN PARAMATERS

Site Area	1.25	ha	Max Day Factor	2.75
Domestic	28	m ³ /ha/day	Peak Hour Factor	4.13
Fire Flow	200	L/s		

Design Demand			Total	
			L/day	L/s
Average Daily			35,000	0.41
Maximum Day			96,250	1.11
Peak Hour			144,550	1.67

WATERMAIN SERVICE SIZING AND FRICTION LOSS

Service/Scenario	D (mm)	Q (L/s)	A (m ²)	V (m/s)	C	L (m)	Friction Loss		
							(m)	psi	kPa
Domestic (M. Day)	150	1.11	0.0177	0.07	100	205.0	0.015	0.022	0.16
Domestic (Peak)	150	1.67	0.0177	0.10	100	205.0	0.032	0.046	0.32
Fire Line	250	200.00	0.0491	4.08	110	205.0	15.806	22.476	154.97

D - Pipe Diameter
 Q - Demand Flow
 A - Pipe Flow Area
 V - Flow Velocity
 C - Pipe Coefficient
 L - Pipe Length

Notes:

- $A = (\pi D^2)/4$; where D is converted to m.
- $V = Q/A$; where Q is converted to m³/s.
- $h_f = L \times \left(\frac{Q}{0.278 \times C \times D^{2.63}} \right)^{1/0.54}$; where Q is converted to m³/s.

PROJECT	Barrie YMCA, 535 Bayview Drive	FILE	423449
		DATE	21-Mar-2024
SUBJECT	Water Supply Calculations	NAME	NM CHECK DB
		PAGE	2 OF 2

STATIC HEAD LOSS

	Road C/L Elev (m)	Depth to W/M (m)	Finished Floor (m)		Total Head Loss		
					(m)	(psi)	(kPa)
Static Head Loss	288.70	1.80	285.40		-1.50	-2.133	-14.71

Note - static head loss calculated at FFE and does not consider height of building

TOTAL LOSSES

Service Type	Static Pressure		Static Loss (kPa)	Friction Loss (kPa)		Total Loss (kPa)	Service Pressure	
	(psi)	(kPa)					(kPa)	(psi)
Domestic (Peak)	79.00	544.69	-14.71	0.32		-14.39	559.08	81.09
Fire Line	79.00	544.69	-14.71	154.97		140.26	404.43	58.66

Note - The pressure loss between the residual hydrant and the connection point of the proposed 250 mm dia. fire service has been estimated assuming the static pressure in the Bayview main is 79 psi. These results also do not account for the MDD demand in the Bayview watermain, however a sensitivity analysis determined the impacts of MDD to be negligible.

SUMMARY

- the estimated pressure available in the 150 mm dia. domestic water service at the proposed building FFE is 81.09 psi under peak hour conditions
- the 250 mm dia. fire service can provide the required fire flow of 200 L/s to the building with a maximum velocity of 4.08 m/s. The estimated pressure in the fire service at the proposed building FFE is 59.54 psi

Appendix C: Sanitary Calculations

PROJECT	YMCA Barrie, 535 Bayview Drive	FILE	423449		
		DATE	July 19, 2023		
SUBJECT	Preliminary Sanitary Flow Calculations	NAME	JLM		
		PAGE	1	OF	1

1.1 Proposed Development

Design Criteria as per City of Barrie's *Sanitary Infrastructure Design Standard*

Area of Proposed Development = 1.25 ha

Institutional Average Daily Flow = 28 m³/ha/day = 28,000 L/ha/day

1.2 Design Sewage Flows

Design Criteria as per City of Barrie's *Sanitary Infrastructure Design Standard*

Peak Factor (Institutional) = 2.00

Average Day Flow (ADF) = 28,000 L/ha/day x 1.25 ha = 35,000 L/day
 = 35 m³/day = 0.41 L/s

Peak Flow (PF) = 35,000 L/ha/day x 2.00 = 70,000 L/day
 = 70 m³/day = 0.81 L/s

YMCA Barrie, 535 Bayview Drive	423449
--------------------------------	--------

N/A	
-----	--

Dan Brito	April 03-24
-----------	-------------

Nick Millington	April 03-24
-----------------	-------------

City of Barrie

Capita per Unit	Low	Medium	High
	3.13	2.34	1.67

Infiltration (L/s/ha)	0.1
-----------------------	-----

Pipe Material	Value
Concrete	0.013
PVC	0.013
Applied	0.013

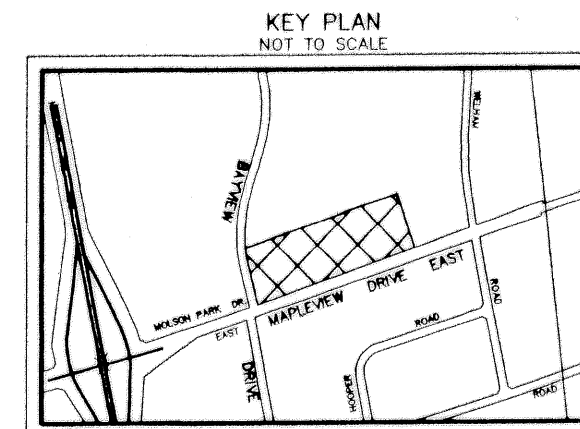
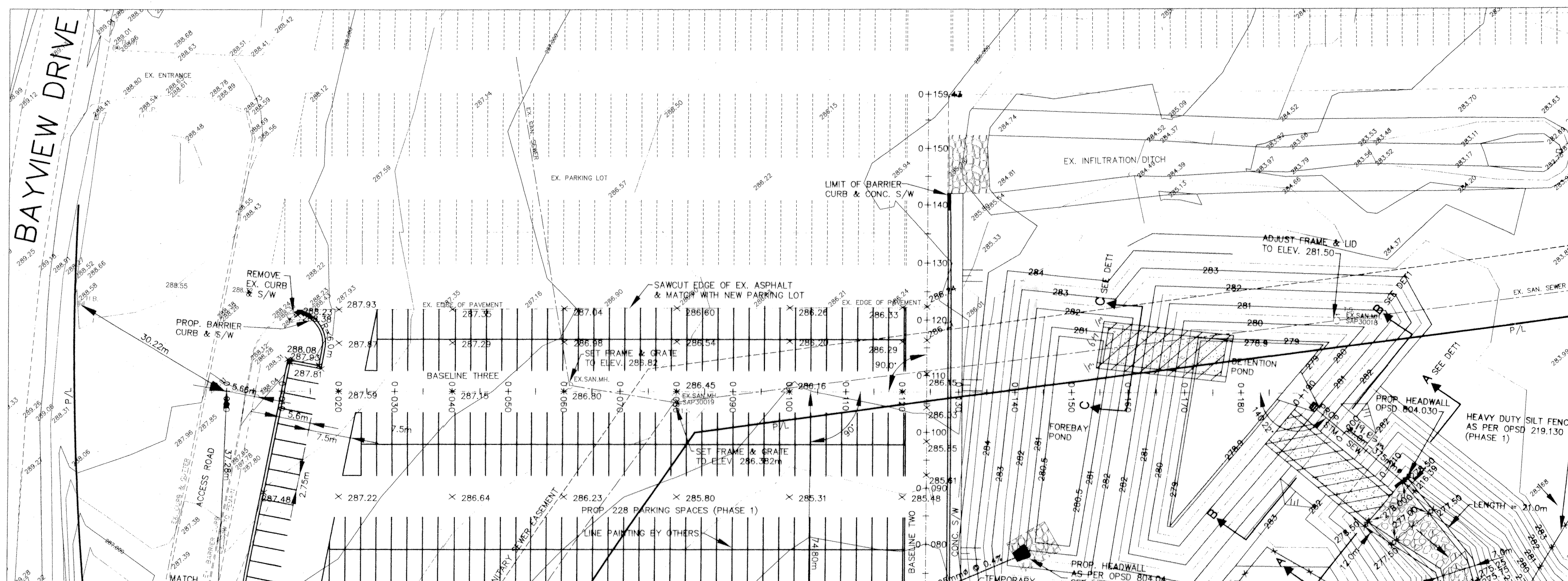
Development Type	Average (L/cap/day)	Peaking Factor
Residential	225	Harmful
Development Type	Average (L/ha/day)	Peaking Factor
Institution	28,000	2
Commercial	28,000	2
Industrial (High)	55,000	-
Industrial (Low)	50,000	-

1)

Version Number:

I:\2023 Projects\423449 - YMCA 555 Bayview Drive - Barrie\Design\Sanitary\01 - SPA 1st Submission\423449 - Sanitary Sewer Design Sheet.xlsx

Appendix D: As-Built Drawings



GENERAL NOTES

1. ALL MEASUREMENTS ARE IN METRES, PIPE SIZES IN MILLIMETRES, UNLESS OTHERWISE NOTED.
2. THE ONTARIO PROVINCIAL STANDARDS AND SPECIFICATIONS AND THE ONTARIO PROVINCIAL DRAWINGS & BARRIER STANDARDS SHALL APPLY TO THIS CONTRACT.
3. MANHOLE SAFETY PLATFORMS SHALL CONFORM TO OPSD #404.02.
4. RIGID PIPE BEDDING SHALL BE AS PER OPSD #402.03, TYPE 3 AND OPSD #402.034 WITH GRANULAR 'A' BEDDING MATERIAL AND GRANULAR 'A' COVER MATERIAL. FLEXIBLE PIPE BEDDING SHALL BE AS PER OPSD #402.010, TYPE 3 AND OPSD #402.014 WITH GRANULAR BEDDING AND GRANULAR COVER MATERIAL.
5. HOLLOW ALUMINUM LADDER RUNGS AS PER OPSD #405.010.
6. MANHOLE BENCHING SHALL BE FULL HEIGHT FOR SEWER AND AS PER OPSD #701.021.
7. ALL TOPSOIL OR DEBRIS IN THE SUBGRADE TO BE REMOVED.
8. ALL EXISTING UTILITIES AND SERVICES TO BE LOCATED ON SITE BY THE CONTRACTOR PRIOR TO CONSTRUCTION.
9. ORDER OF PRECEDENCE OF STANDARD DRAWINGS IS FIRSTLY CITY OF BARRIE STANDARD DRAWINGS (SDS), SECONDLY ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD).
10. LOCATIONS OF EXISTING SERVICES ARE NOT GUARANTEED. CONFIRM EXISTING UTILITY LOCATIONS AND ELEVATIONS PRIOR TO CONSTRUCTION. THE CONTRACTOR IS REQUIRED TO NOTIFY THE VARIOUS UTILITY COMPANIES 48 HOURS PRIOR TO THE COMMENCEMENT OF ANY WORK.
11. A ROAD OCCUPANCY PERMIT IS REQUIRED FROM THE MUNICIPAL WORKS DEPARTMENT PRIOR TO THE COMMENCEMENT OF WORK WITHIN ANY CITY RIGHT-OF-WAY.
12. NATIVE MATERIAL SUITABLE FOR BACKFILL SHALL BE COMPACTED TO 95% STANDARD PROCTOR MAXIMUM DRY DENSITY.
13. MATERIAL USED FOR FILL SHALL BE PLACED IN LAYERS 200mm IN DEPTH MAXIMUM AND COMPACTED TO 95% STANDARD PROCTOR MAXIMUM DRY DENSITY.
14. ALL DISTURBED AREAS ARE TO BE REINSTATED TO THEIR ORIGINAL CONDITION OR BETTER AS DETERMINED BY THE CITY MUNICIPAL WORKS DEPARTMENT.
15. ALL SILT CONTROL AND EROSION PROTECTION DEVICES ARE TO BE IN PLACE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION AND SHALL REMAIN IN PLACE AND BE MAINTAINED BY THE CONTRACTOR UNTIL CONSTRUCTION IS COMPLETE AND THE GRASS HAS ESTABLISHED GROWTH. SUBJECT TO APPROVAL BY THE DIRECTOR OF MUNICIPAL WORKS DEPARTMENT.
16. UTILITY CROSSING, WHERE REQUIRED SHALL BE SUPPORTED AS PER OPSD #1007.01.
17. PARKING LOT DESIGN SHALL CONSIST OF 85mm H.L.A., 150mm GRAN 'A' AND 300mm GRAN 'B'. GRANULARS TO BE COMPACTED TO 95% S.P.M.D.D. ASPHALT TO BE COMPACTED TO A MINIMUM 97% MARSHALL BULK DENSITY.

LEGEND

- X 280.12 PROPOSED ELEVATION
- EX. ELEVATION
- TREE REMOVAL
- PROPOSED CONTOUR
- EXISTING CONTOUR

BENCH MARKS

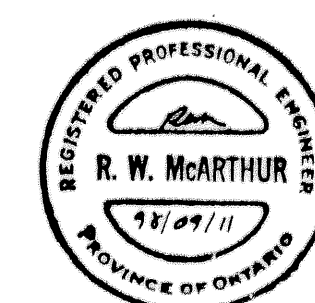
ELEV. 301.731 (VM-8)
D.H.O. PRECISE B.M. 95-68 CONCRETE BRIDGE CARRYING HWY. 400 OVER MOLSON PARK DRIVE. TABLET IS SET HORIZONTALLY IN EAST FACE OF NORTH CONCRETE ABUTMENT 4.70m SOUTH OF NORTH-EAST CORNER, 18cm BELOW COPING AND 7.3m EAST OF CENTERLINE OF HWY. 400 NORTHBOUND LANE.

ELEV. 267.497 (VM-12)
THE MONUMENT IS LOCATED ON THE NORTH SIDE OF MAPLEVIEW DRIVE, EAST AND EAST OF CANADIAN NATIONAL RAILWAY WEST OF HURONIA RD.

NO.	REVISIONS	DATE	APPROVED

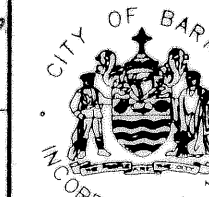
CITY OF BARRIE
APPROVED

DATE: 01/07/11
R. V. McARTHUR, JR.
DIRECTOR OF MUNICIPAL WORKS



BARRIE MOLSON CENTRE ADDITIONAL PARKING LOT

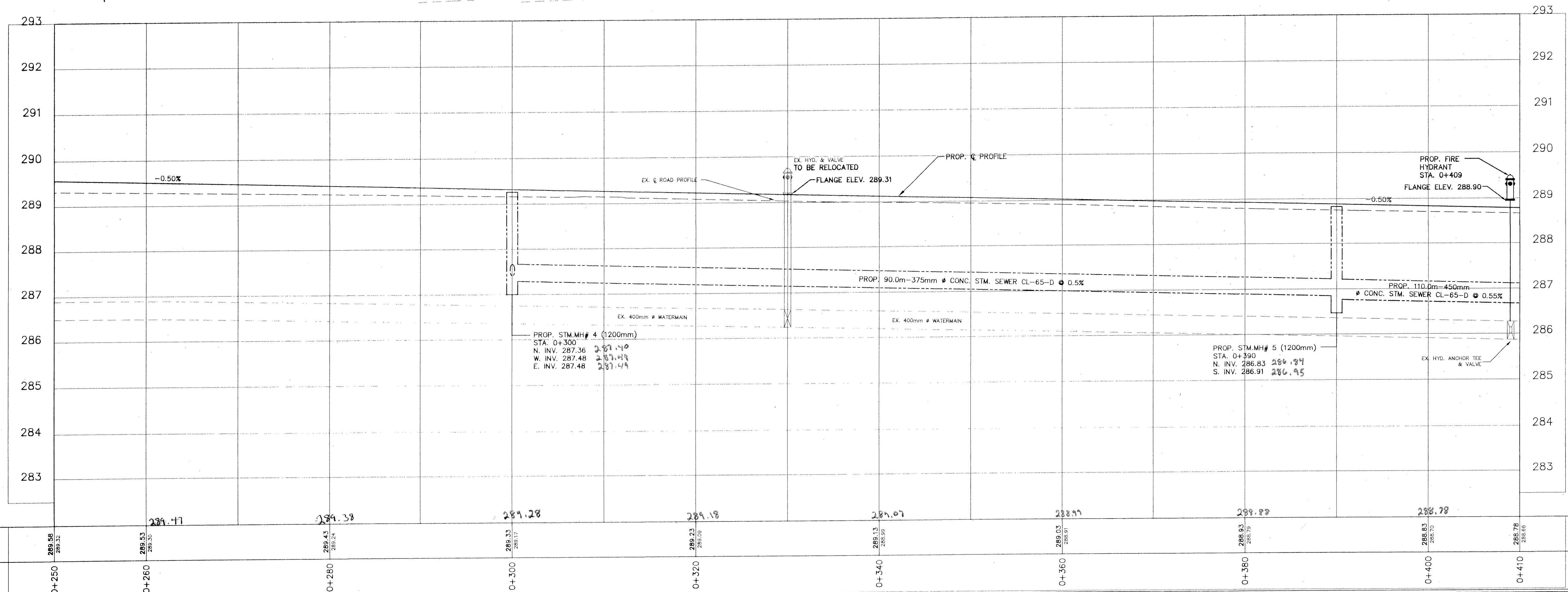
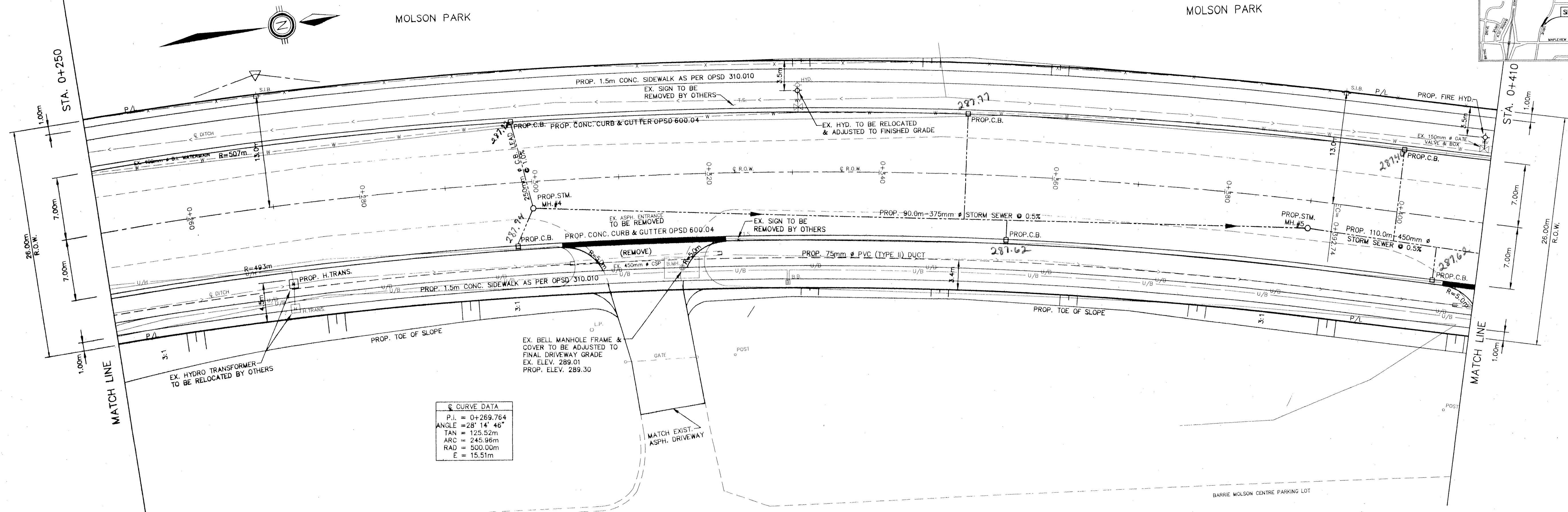
BASELINE THREE
STA. 0+000 TO 0+240



CITY OF BARRIE
MUNICIPAL WORKS DEPARTMENT
PARKS & REC. DEPARTMENT

SCALE: HOR. 1:500	VERT. 1:50	DRAWING NO. 98-20
DESIGN R.M./C.L.M.	DRAWN C.L.M.	SHEET NO. PP3
REVIEWED R.W.M.	DATE 08.08.10	

1998-020-006



FINISHED GRADE ● C/L	EXISTING GRADE ● C/L
----------------------------	----------------------------

CHAINAGE

GENERAL NOTES

REFER TO CURRENT CITY OF BARRIE STANDARDS FOR APPLICABLE GENERAL NOTES.

ELEV. 5073.51 NORTH BEARING HPY 40-00
 CONCRETE BRIDGE CARRYING HWY 40
 OVER WILSON POND MAP. TABLE 5 SET HORIZONTALLY IN EAST
 FACE OF NORTH CANTERL ABUTMENT 4.71M SOUTH OF NORTH-FAST
 CORNER, 16.0M BELOW CORNER AND 7.3m EAST OF CENTERLINE OF
 HWY 40 NORTH
 ELEV. 241.802 NORTH BEARING VTD0506544
 CONCRETE BRIDGE CARRYING MAINTENANCE ROAD EAST OVER LOWERS CREEK, 0.65m EAST OF
 CENTERLINE OF NORTH CANTERL ABUTMENT IN THE NORTH FACE, 5.40m NORTH OF CENTERLINE
 OF ROAD, 28.0m WEST OF THE NORTHEAST END OF BRIDGE, 16.0m BELOW TOP OF COPING.
 BEARING NOTE
 BEARINGS W/IN UTM GRID BEARINGS ARE REFERRED TO THE CENTRAL
 MERIDIAN IN DEGREE (17) AND ARE DERIVED FROM OBSERVATIONS
 ON UNK. STATION MONUMENTS 1700000000 (HANOI) 1700000000 (S) 1700000000 (S)
 MONUMENT 015065000 (D) 1700000000 (D) 1700000000 (D)
 DISTANCES SHOWN HEREIN ARE GROUND DISTANCES AND CAN BE
 CONVERTED TO GRID DISTANCES BY MULTIPLYING BY THE COMBINED
 SCALE FACTOR OF 1.000000000

NO.	REVISIONS	DATE	APPROVED
	<p>"This Record Drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the City does not warrant the accuracy of this information, and shall not be held responsible for damages arising from the use of the Record Drawing." The user hereby releases and discharges the City, its employees or agents from any claims, losses or damages and agrees to indemnify and save harmless, the City, from any claims, losses, or damages arising from the use of the Record Drawing."</p>		

CITY OF BARRIE
APPROVED
DATE: *Aug. 27, 1989.*
R. W. McArthur, P. Eng.
for DIRECTOR OF MUNICIPAL WORKS



BAYVIEW DRIVE RECONSTRUCTION

BAYVIEW DRIVE
STA. 0+250 TO 0+410

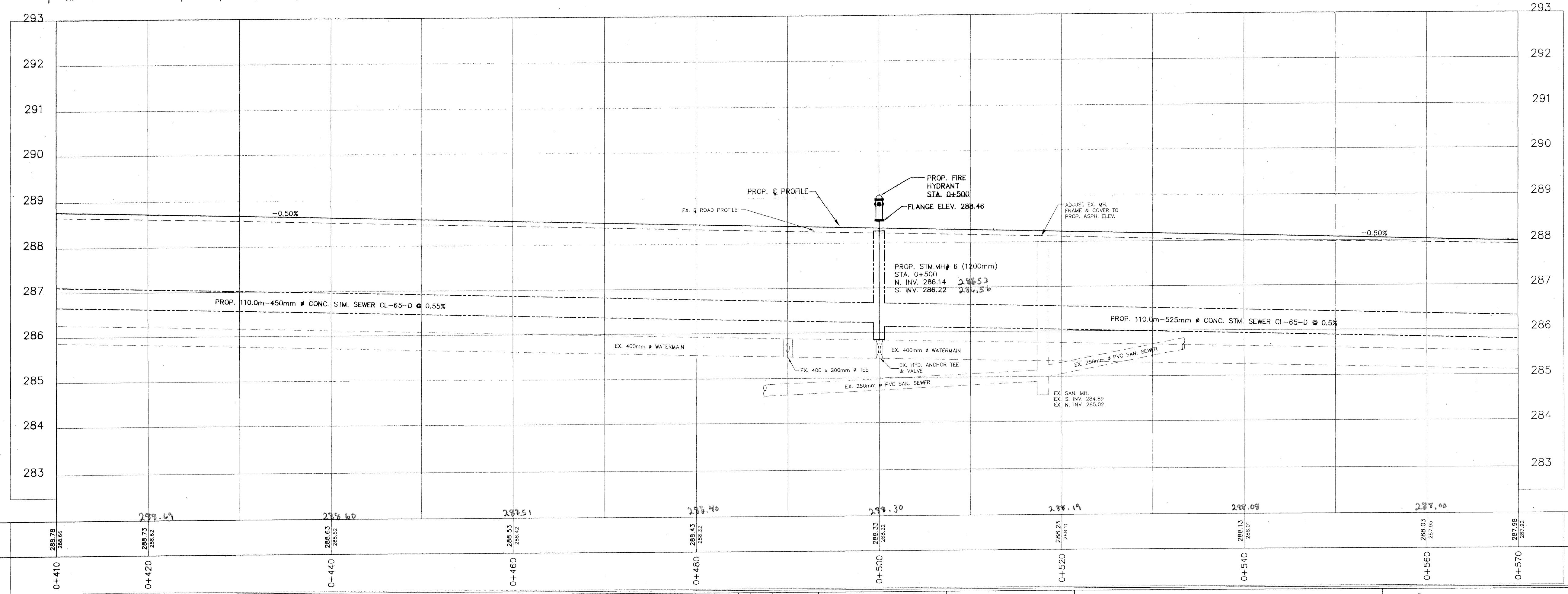
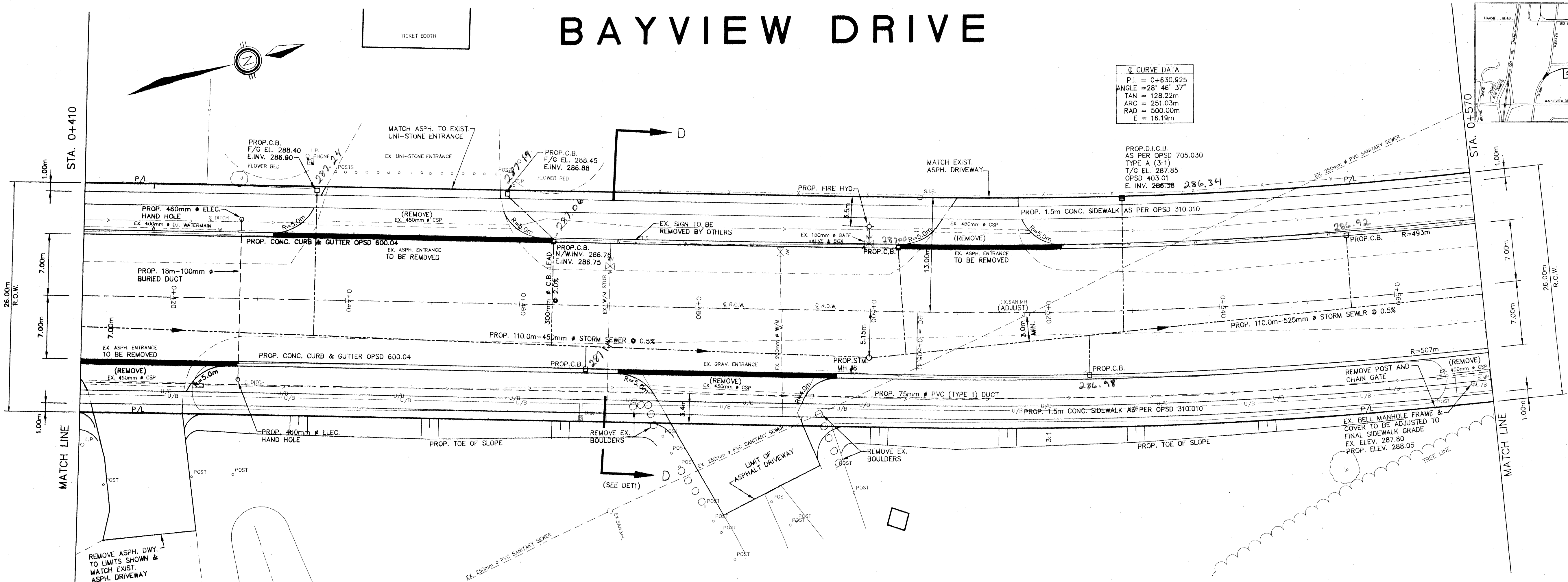


CITY of BARRIE

MUNICIPAL WORKS DEPARTMENT

VERT. 1:50 DRAWN J.R.C.	DRAWING NO. 99-20 SHEET NO. PP3
DATE 99.10.08	

BAYVIEW DRIVE



GENERAL NOTES

REFER TO CURRENT CITY OF BARRIE STANDARDS FOR APPLICABLE GENERAL NOTES.

BEARINGS ARE UTM GRID BEARINGS AND ARE REFERRED TO THE CENTRAL MERIDIAN IN ZONE 17 (87) AND ARE DERIVED FROM OBSERVATIONS ON MAP CONTROL MONUMENTS 031570003 (N4606023.375, E806327.205) MONUMENT 031570008 (N4611246.828, E806351.888)

BEARING NOTE:
BEARINGS ARE UTM GRID BEARINGS AND ARE REFERRED TO THE CENTRAL MERIDIAN IN ZONE 17 (87) AND ARE DERIVED FROM OBSERVATIONS ON MAP CONTROL MONUMENTS 031570003 (N4606023.375, E806327.205) MONUMENT 031570008 (N4611246.828, E806351.888)

DISTANCE NOTE:
DISTANCES SHOWN HEREON ARE GROUND DISTANCES AND CAN BE CONVERTED TO GRID DISTANCES BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.9999922

NO.	REVISIONS	DATE	APPROVED
1	"This Record Drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the City does not warrant the accuracy of this information, and shall not be held responsible for damages arising from the use of the Record Drawing. The user hereby releases and discharges the City, its employees or agents from any claims, losses or damages and agrees to indemnify and save harmless the City, from any claims, losses, or damages arising from the use of the Record Drawing."		

CITY OF BARRIE APPROVED

DATE: May 27, 1999

R. V. McArthur, Esq.
DIRECTOR OF MUNICIPAL WORKS

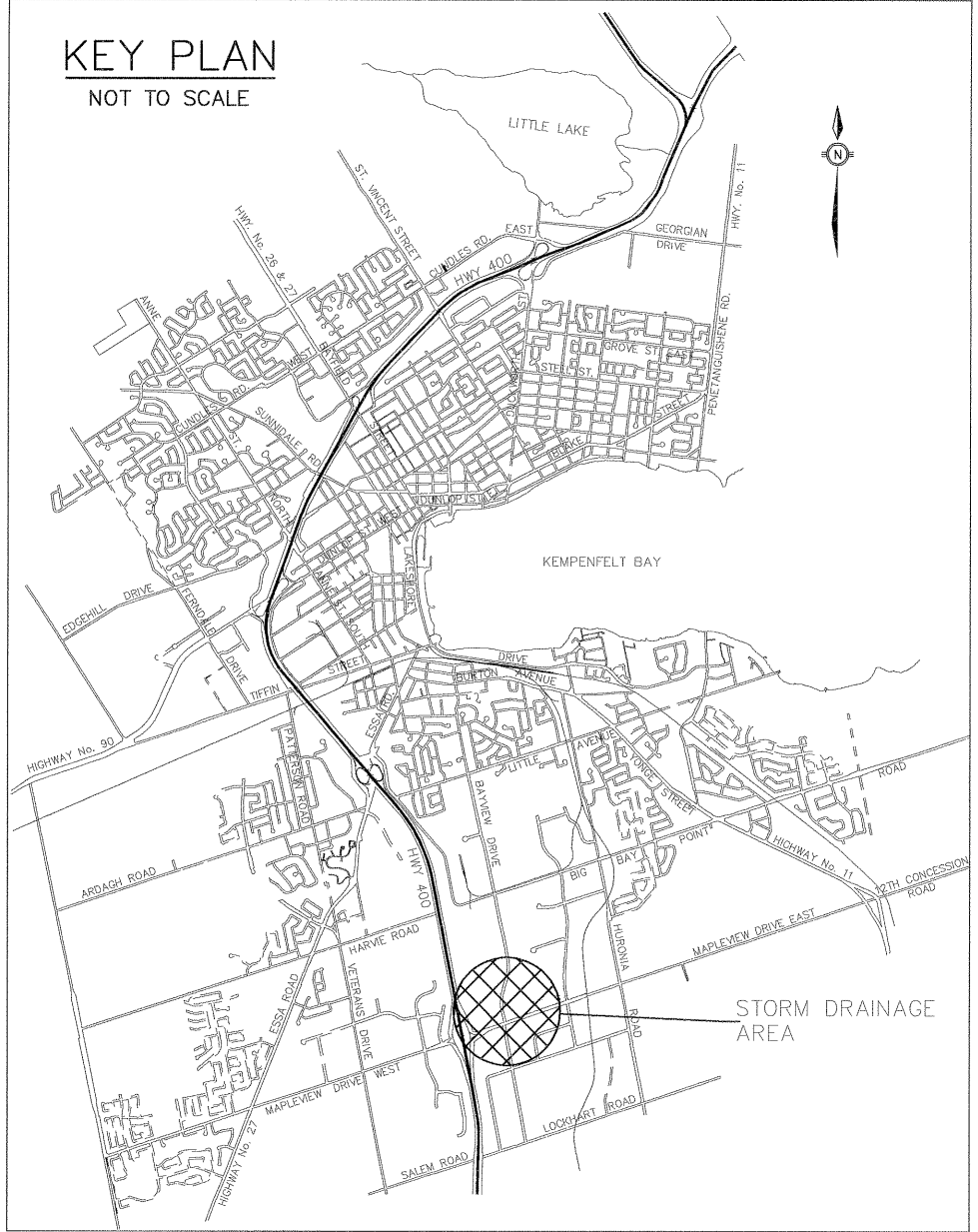
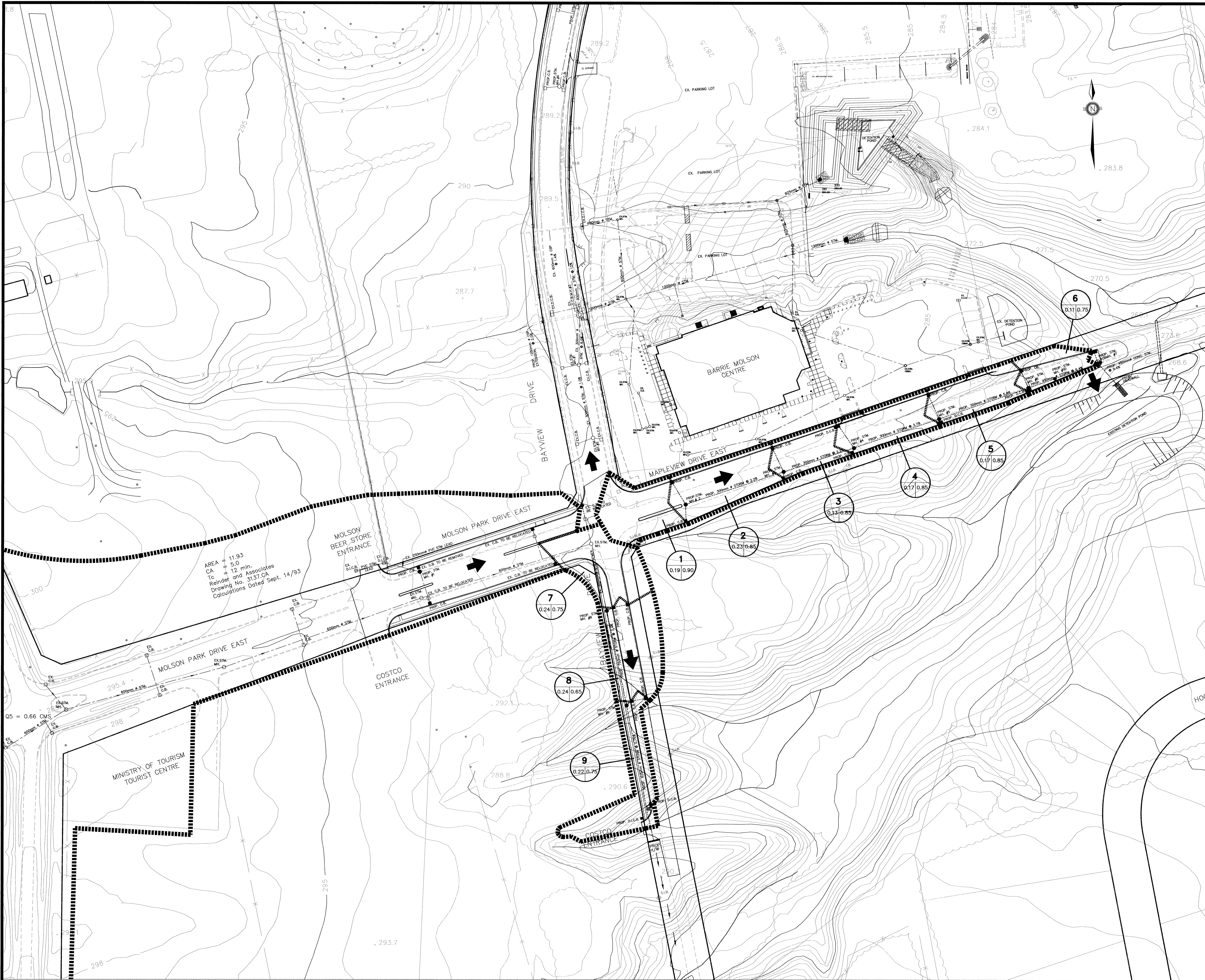


BAYVIEW DRIVE RECONSTRUCTION

BAYVIEW DRIVE
STA. 0+410 TO 0+570

CITY of BARRIE
MUNICIPAL WORKS DEPARTMENT

SCALE HOR.	1:250	VERT.	1:50	DRAWING NO.	99-20
DESIGN	R.M./A&A	DRAWN	J.R.C.	SHEET NO.	PP4
REVIEWED	R.W.M.	DATE	99.10.08		



STORM LEGEND

- CATCHMENT BOUNDARY
- SUB-CATCHMENT BOUNDARY
- MAJOR SYSTEM FLOW
- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- EXISTING STORM MAINTENANCE HOLE
- EXISTING CATCH BASIN
- PROPOSED STORM MAINTENANCE HOLE
- PROPOSED CATCH BASIN
- SUBCATCHMENT
- AREA (ha) 0.19 0.75
- RUNOFF COEFFICIENT

GENERAL NOTES

ELEV. 241.882 BENCH MARK # V01085454
CONCRETE BRIDGE CARRYING MAPLEVUE DR. EAST OVER LOVERS CREEK, 0.65km EAST OF HURON RD. TABLET IS SET HORIZONTALLY IN THE NORTH FACE, 5.45m NORTH OF CENTERLINE OF ROAD, 25m WEST OF THE NORTHEAST END OF BRIDGE, 10m BELOW TOP OF CURBING.
BEARING NOTE:
BEARINGS ARE UTM GRID BEARINGS AND ARE REFERRED TO THE CENTRAL MERIDIAN IN ZONE 17 (81°) AND ARE DERIVED FROM OBSERVATIONS ON MARK CONTROL MONUMENTS 031917003 (N490923.375, E605327.205) MONUMENT 031950006 (N491346.928, E605151.699)
DISTANCE NOTE:
DISTANCES SHOWN HEREON ARE GROUND DISTANCES AND CAN BE CONVERTED TO GRID DISTANCES BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.99999520

NO.	REVISIONS	DATE	APPROVED
1	ADDITION OF STORMCEPTOR STC 4000 MH 08 01 00	R.J.F.	

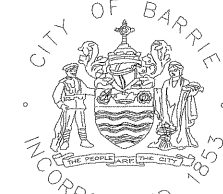
CITY OF BARRIE
APPROVED

DATE: Aug. 2, 2000
R. J. FORWARD
DIRECTOR OF MUNICIPAL WORKS



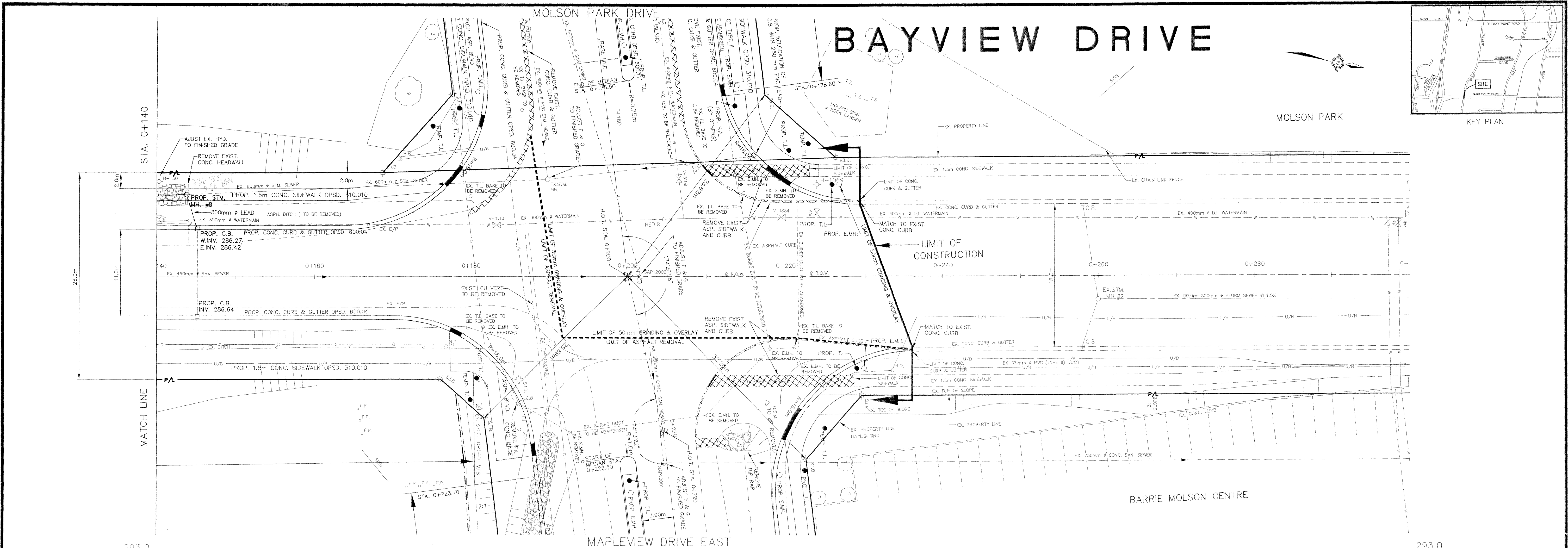
MOLSON PARK DRIVE/
MAPLEVUE DRIVE EAST &
BAYVIEW DRIVE
INTERSECTION IMPROVEMENTS

STORM DRAINAGE PLAN

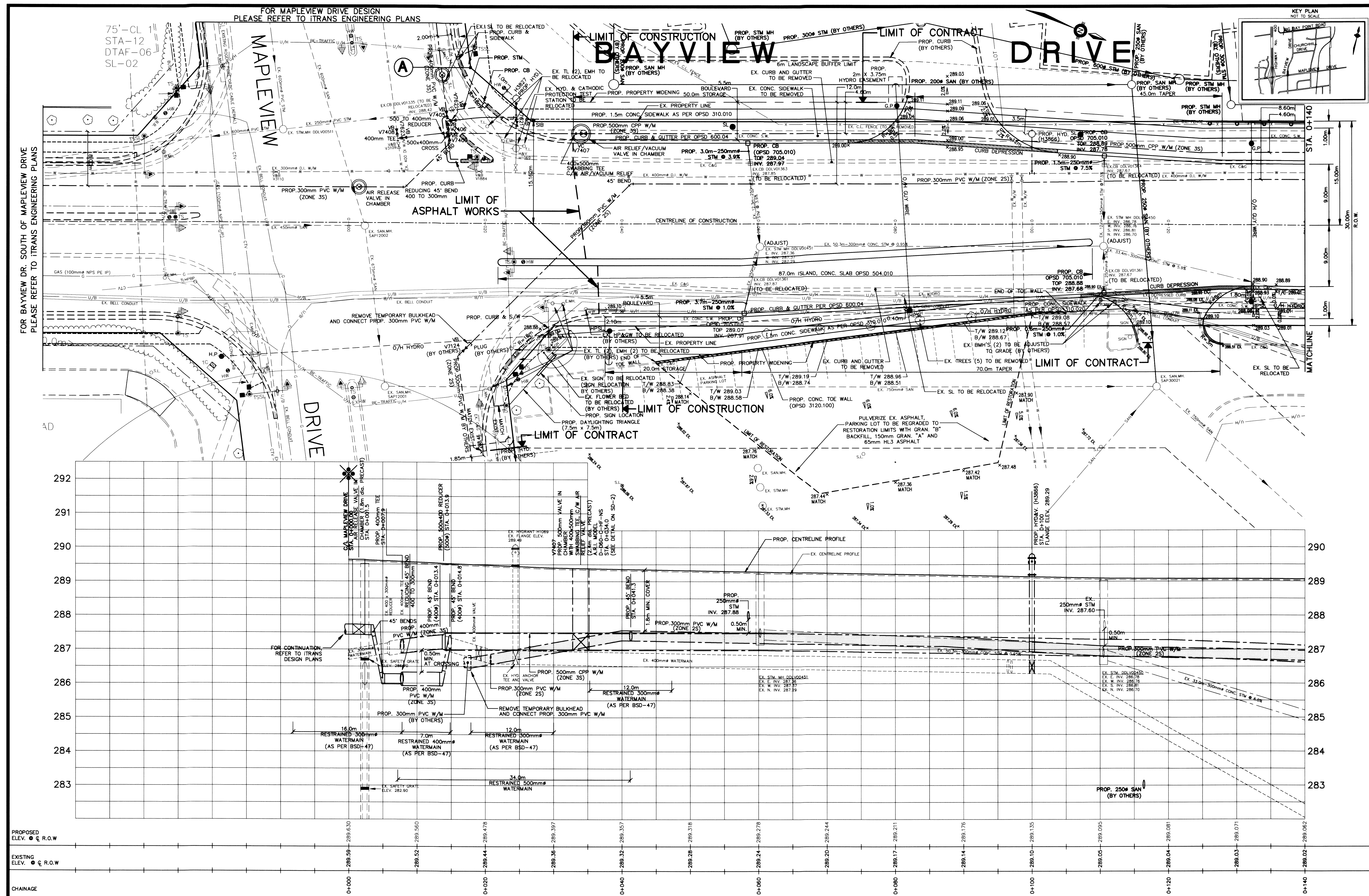


CITY of BARRIE
MUNICIPAL WORKS DEPARTMENT

SCALE HOR. 1:1250	VERT. 1:1250	DRAWING NO. 2000-03
DESIGN R.M.	DRAWN J.R.C.	SHEET NO. STM1
REVIEWED R.J.F.	DATE 00.06.28	



GENERAL NOTES		REVISIONS		APPROVED		CITY OF BARRIE		CITY of BARRIE			
<p>1. ELEV. 241.882 BENCH MARK # V010865424</p> <p>2. CONCRETE BRIDGE CARRYING MAPLEVIEW DR. EAST OVER LOVING CREEK, 0.65m EAST OF HURONIA RD. TABLET IS SET HORIZONTALLY IN THE NORTH FACE, 5.45m NORTH OF CENTERLINE OF ROAD, 28m WEST OF THE NORTHEAST END OF BRIDGE, 19m BELOW TOP OF CORNER.</p> <p>3. BEARING NOTE: BEARINGS ARE UTM GRID BEARINGS AND ARE REFERRED TO THE CENTRAL MERIDIAN IN ZONE 17 (81) AND ARE DERIVED FROM OBSERVATIONS ON MNR CONTROL MONUMENTS 031970023 (N4909923.375, E605327.205) MONUMENT 031950008 (N491346.525, E50051.698)</p> <p>4. DISTANCE NOTE: DISTANCES SHOWN HEREIN ARE GROUND DISTANCES AND CAN BE CONVERTED TO GRID DISTANCES BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.9999920</p>		<p>NO.</p> <p>1</p> <p>2</p> <p>3</p> <p>4</p> <p>5</p> <p>6</p> <p>7</p> <p>8</p> <p>9</p> <p>10</p> <p>11</p> <p>12</p> <p>13</p> <p>14</p> <p>15</p> <p>16</p> <p>17</p> <p>18</p> <p>19</p> <p>20</p> <p>21</p> <p>22</p> <p>23</p> <p>24</p> <p>25</p> <p>26</p> <p>27</p> <p>28</p> <p>29</p> <p>30</p> <p>31</p> <p>32</p> <p>33</p> <p>34</p> <p>35</p> <p>36</p> <p>37</p> <p>38</p> <p>39</p> <p>40</p> <p>41</p> <p>42</p> <p>43</p> <p>44</p> <p>45</p> <p>46</p> <p>47</p> <p>48</p> <p>49</p> <p>50</p> <p>51</p> <p>52</p> <p>53</p> <p>54</p> <p>55</p> <p>56</p> <p>57</p> <p>58</p> <p>59</p> <p>60</p> <p>61</p> <p>62</p> <p>63</p> <p>64</p> <p>65</p> <p>66</p> <p>67</p> <p>68</p> <p>69</p> <p>70</p> <p>71</p> <p>72</p> <p>73</p> <p>74</p> <p>75</p> <p>76</p> <p>77</p> <p>78</p> <p>79</p> <p>80</p> <p>81</p> <p>82</p> <p>83</p> <p>84</p> <p>85</p> <p>86</p> <p>87</p> <p>88</p> <p>89</p> <p>90</p> <p>91</p> <p>92</p> <p>93</p> <p>94</p> <p>95</p> <p>96</p> <p>97</p> <p>98</p> <p>99</p> <p>100</p>		<p>DATE</p> <p>APPROVED</p> <p>DATE: July 17, 2000</p> <p>R. J. Forward</p> <p>DIRECTOR OF MUNICIPAL WORKS</p>		<p>CITY OF BARRIE</p> <p>APPROVED</p> <p>DATE: July 17, 2000</p> <p>R. J. Forward</p> <p>DIRECTOR OF MUNICIPAL WORKS</p>		<p>CITY of BARRIE</p> <p>MUNICIPAL WORKS DEPARTMENT</p> <p>MOLSON PARK DRIVE/ MAPLEVIEW DRIVE EAST & BAYVIEW DRIVE INTERSECTION IMPROVEMENTS</p> <p>BAYVIEW DRIVE STA. 0+140 TO 0+300</p>		<p>SCALE HOR. 1:250 VERT. 1:50</p> <p>DESIGN R.M. DRAWN J.K.F./J.R.C.</p> <p>REVIEWED R.J.F. DATE 00.06.28</p> <p>DRAWING NO. 2000-03 SHEET NO. PP6</p> <p>2000-003-008</p>	



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10 Checkley Street, Barrie, Ontario, Canada L4N 1W1
T705.721.9222 F705.734.0764

BENCH MARKS

REFER TO GN-1 FOR VERTICAL AND HORIZONTAL
CITY OF BARRIE CONTROL MONUMENTS

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NO.	REVISIONS	DATE	APPROVED
6	FOR REVIEW	DEC/08	DT
7	FOR TRUNK WATERMAIN REVIEW ONLY	MAY 5/09	DT
8	FOR ROADWORKS AND WATERMAIN REVIEW	NOV/09	DT
9	ISSUED FOR CITY APPROVAL	JUNE11/10	DT
5	ISSUED FOR TENDER	SEP.09/10.	DT
6	ISSUED FOR CONSTRUCTION	DEC.17/10.	DT

CITY OF BARRIE
APPROVED

DATE. Jan 5, 2011
Rust / Rust
C DIRECTOR OF ENGINEERING



**BAYVIEW DRIVE
RECONSTRUCTION
(MAPLEVIEW DRIVE TO BIG BAY POINT RD)**

BAYVIEW DRIVE
STA. 0+000 TO 0+140



CITY of BARRIE
ENGINEERING DEPARTMENT

SCALE HOR. 1:250	VERT. 1:50	SITE PLAN NO. D11-1405
DESIGN D.T./K.S.	DRAWN K.S.	
REVIEWED D.T.	DATE 07-03-08	SHEET NO. PP1

2010-300-008



PROJECT NO.	02138	SKA PROJECT NO.	02:999
WG. NO.	SS-2		

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