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PROPOSED CHURCH CONVERSION
260 HIGH PARK AVENUE
CITY OF TORONTO

FUNCTIONAL SERVICING REPORT

Prepared For:

TRAC DEVELOPMENTS INC.
c/o MCG CONSULTANTS INC.

February 10, 2016

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Note: This report should be read in conjunction with the Functional Servicing & Grading Plans prepared by The Odan/Detech Group Inc

1.0 INTRODUCTION

The property under study is a 0.487 ha site located on at 260 High Park Avenue, at the south-west corner of the intersection of High Park Avenue and Annette Street. Currently the site contains an existing church and a single family residential home. Site is also bound by existing residential home to the south and to the west.

It is proposed to construct a new low rise residential apartment complete with an underground parking structure. For further information regarding the proposed building/expansion layouts and location please refer to drawings prepared by the architect.

This report will evaluate the serviceability of the site with respect to sanitary, water and storm services and also evaluate the stormwater management (SWM) strategy that will be implemented to meet the City of Toronto's SWM requirements and Wet Weather Flow Management Guidelines (WWFMG).

For detailed topography of the existing site conditions, as of October 7 , 2015 refer to the topographic survey prepared by R. Avis Surveying Inc.

2.0 DESIGN CONSIDERATIONS

A) SANITARY WASTE WATER DISPOSAL

Existing Conditions

There is an existing sanitary sewer located on High Park Avenue. The sanitary sewer between Annette Street and Dundas Street West is a 750mm brick sewer which increases to an 825mm brick sanitary sewer between Annette Street and Humberside Avenue where it then connects to the sanitary trunk sewer.

The existing sanitary sewer is oversized for its current tributary area due to its conversation from a combined sewer to a sanitary only sewer. Plan H-235 shows that in 1973 a new storm sewer was constructed on High Park Avenue and bulkheads were constructed to divert flow from the old sewer to the new storm sewer. Furthermore, this plan makes reference to "for sanitary connections only" on the plan. An additional bulkhead was constructed at the intersection of High Park Avenue and Annette Street to separate flows. This can also be seen on the on the BMOG plan 24-B-51. Based on the above evidence we conclude that the sanitary sewer on High Park Avenue is not a combined sewer but a sanitary sewer serving as a local sewer for the homes on this street. Similarly, the sanitary sewer on High Park Avenue between Annette Street and Humberside Avenue also specifies "sanitary connections only". These existing plan and profiles can be found in the appendix for further reference.

There is an existing combined sewer on Annette Street that does not connect with the High Park sewer but continues westerly to the trunk sewer at the intersection of Annette Street and Quebec Avenue. It is not known if this sewer has been converted to a sanitary sewer.

All existing services for the site will be removed by City forces through the Municipal Services Application.

Proposed Conditions

It is proposed to connect the new development to the existing 825mm brick sewer on High Park Avenue with a 150mm service lateral.

The following Table 1 summarizes the uses and corresponding areas/units that will be proposed for the sanitary outlet for the site. These will be used to evaluate the expected population increase and peak sanitary flows for the site for each outlet.

TABLE 1 - Summary of Land Uses for Sanitary Flow Calculations

	Existing		Proposed	
Land Use	Site Area (ha)	Population	No. of Units	Population
Church	0.425	37	-	-
Residential	0.062	4	77	143

For calculating the population increases for the site the following city standards for population densities and flow rates were used.

- 1.4 persons/unit for 1 Bedroom Units
- 2.1 persons/unit for 2 Bedroom Units
- 3.1 persons/unit for 3 Bedroom Units
- 3.5 persons/unit for single family dwelling
- 86 persons/ha for churches / schools
- The per capita flow rate of 240 L/person/day for existing residential will be used.
- The per capita flow rate of 450 L/person/day for proposed residential will be used.

Given the above information, the peak sanitary flows to High Park Avenue were calculated as shown in the following Table 2 as per City of Toronto Sanitary Design Guidelines.

TABLE 2 - Summary of Sanitary Flows from the Site

Location of Outlet	Existing Peak Flow (l/s)	Proposed Peak Flow (l/s)
High Park Avenue	0.61	3.25

The tributary area for the High Park Avenue was analyzed to the trunk sewer on Humberside Avenue. The tributary area consists of existing single family homes on High Park Avenue from Dundas Street West to Humberside Avenue. Sewers south of Humberside Avenue continue to the south. The calculations show that the existing sanitary sewer has enough capacity to convey the extra sanitary flow from the proposed site to the trunk sewer.

TABLE 3 - Summary of Total Sanitary Flows versus Capacity

Scenario	Location of Outlet	Peak Flow (l/s)	High Park Sewer Capacity (l/s)
Existing	Humberside Ave Trunk Sewer	4.91	908
Proposed	Humberside Ave Trunk Sewer	7.55	908

* includes infiltration

B) WATER DISTRIBUTION

Existing Conditions

There is an existing 300mm watermain located on Annette Street, a 250mm watermain on High Park Avenue north of Annette Street and a 150mm watermain in High Park Avenue south of Annette Street. All of these watermain tie together with two separate "T" connections on Annette Street.

Fire Hydrants are located on the west side of High Park Avenue with one located right at the intersection of High Park Avenue and Annette Street.

All existing services for the site will be removed by City forces through the Municipal Services Application

Proposed Conditions

It is proposed to connect to the 300mm watermain located on Annette Street with a 200mm PVC service lateral since the proposed development is expected to have sprinklers. The lateral will then branch of to a 50mm service for domestic purposes. The proposed lateral will enter the building within a mechanical room which will be housed with all the necessary meters and backflow preventers for the relevant fire line and domestic lines.

The site will not require any additional hydrants for the site so the proposed siamese connection for the building will need to be located within 45m of the existing hydrant at the intersection as mentioned in the above paragraph.

The unit rate and peaking factors of water consumption, minimum pipe size and allowable pressure in line were established from the City Design Manual Standards. The fire flow water demand is calculated as per FUS 1999 manual.

The pressures and volumes must be sufficient for peak hour conditions and under fire conditions as established by the Ontario Building Code 2006. The minimal residual pressure under fire conditions is 140 kpa. (or 20.3 psi).

a)	Average Day domestic demand -	using 191L/cap/day (143 persons, from sanitary calculations)	0.32 L/sec
b)	Peak day demand -	1.3 x daily demand	0.42 L/sec
c)	Peak hour demand -	2.5 x daily demand	0.80 L/sec
d)	Fire flow (Ordinary Construction)		183 L/sec
e)	Fire flow (Fire Resistive)		100 L/sec

TABLE 4 – Total Water Demand for the Site

	L/sec	USGM
Peak Day Demand	0.42	7
Fire Flow Demand (ordinary Construction)	183.00	2,900
Total Water Demand	183.42	2.907
Actual Flow at 20 PSI Residual Pressure	TBD	TBD

The City of Toronto does not permitted hydrant testing in the winter months, therefore, a hydrant test will be completed in the spring to accompany this report. Due to the size of the adjacent watermains and their interconnected nature we feel, based on experience, that the fire flow demands for this site should be accomplished.

C) STORM WATER MANAGEMENT

Existing Conditions

There is a 1650mm concrete storm sewer located on Annette Street which flows easterly to High Park Avenue. The storm sewer then bends and flows southerly on High Park Avenue towards Humberside Drive. At the bend there is a connection to collect flows from the north and east.

All existing services for the site will be removed by City forces through the Municipal Services Application

Proposed Conditions

Storm water management for the proposed development will follow the storm water criteria as set out by the City of Toronto's Wet Weather Flow Management Guidelines for quantity control. The allowable post-development peak flow for the proposed development up to the 100 year storm event will be set to the 2-year pre-development flow rate using a rational runoff coefficient (C) of 0.5. Only the areas of redevelopment where the existing elevations are being altered will be considered for stormwater management. For this development, this includes areas where there is a new building footprint and where additional floors are being proposed above the existing roof top. A new storm outlet will be required onto Annette Street at the same capacity as the allowable from the site.

Design storm data for the City of Toronto 2 year and 100 year storms are shown below. Using Visual Otthymo 2.3.2 to perform stormwater runoff analysis, these storms will be used to show that the storm drainage and total storage volume up to the 100 year event will be accommodated on-site.

2 Year Storm:	$I_2 = 21.8 / (T)^{(0.780)}$	where: I = intensity (mm/hr)
100 Year Storm:	$I_{100} = 57.7 / (T)^{(0.800)}$	T= time of concentration (hours)

The above equations were modified to represent T in minutes as follows so they could be inputted in the computer modelling program Visual Otthymo.

$I_2 = ((21.8) \times (1/60)^{(-0.780)}) / (T)^{(0.780)}$
$I_2 = 531.9 / (T)^{(0.780)}$

$I_{100} = ((59.7) \times (1/60)^{(-0.800)}) / (T)^{(0.800)}$
$I_{100} = 1579.4 / (T)^{(0.800)}$

Allowable Flow:

Allowable discharge from the site will be determined by calculating the pre-development flow for the 2 year design storms using the rational method. The existing C value for the site is 0.90 however the WWFM guidelines states a C value no greater than 0.5 shall be used for redevelopment. The following table summarizes the allowable release rate for the site.

TABLE 5 – Allowable Flows

Location	Run-off Coefficient	Rainfall Intensity (mm/hr)	Area of Development (ha)	Site Allowable (l/s)
Annette Street	0.50	88.2	0.487	**60**

Post Development Flow Analysis:

In order to control the post development flows to the allowable flow rate, on-site storage will be required. Visual OTTHYMO 2.3.2. will be used to model and determine the detention volume required. For drainage areas with significant imperviousness the calculation of effective rainfall in Visual OTTHYMO is accomplished using the “Standhyd” method. This method is used in urban watersheds to simulate runoff by combining two parallel standard unit hydrographs resulting from the effective rainfall intensity over the pervious and impervious surfaces. For pervious surfaces, losses are calculated using the SCS modified CN method.

The following table summarizes the parameters used in Visual OTTHYMO to characterize the post development catchment areas.

TABLE 6 - Catchment Characteristics for the Post-Developed Site

Area	Area (ha)	Hydrograph Method	% impervious	imperviousness directly connected %	Loss Method for Pervious Area	CN for Pervious Area	Initial Abstraction for Pervious (mm)	Time to peak (T_p)
Roofs and Terraces	0.246	StandHyd	99	99	SCS	99	1	-
Landscape, Asphalt and Hard Surfaces	0.242	StandHyd	62	62	SCS	80	5	-

The following table is a summary of the total peak storm flows for the 2 and 100 year storm events. This table demonstrates that the post-development flow meets the allowable criteria.

TABLE 7 - Summary of Flows from Site

Storm Sewer System	**2 Yr. Storm** (l/s)	**100 Yr. Storm** (l/s)
Flow to Annette Street	28	54

The following table is a summary of the required volume to store the 2 and 100 year storm events due to the necessary controls to achieve the allowable flow rate.

TABLE 8 - Summary of Volumes for the Site for Quantity Control

Storm Sewer System	**2 Yr. Storm** (m^3)	**100 Yr. Storm** (m^3)
Volume Required	55	180

Volumes will be achieved through an underground storage chamber located within the underground parking structure. This chamber will also include the volume required for water balance. The water balance volume will be added to the above volume, water balance volume cannot be used as quantity control volume.

The tank will required an emergency overflow either to the surface or through pumps connected to a generator. The tanks will also required a vent to allow the tank to fill and drain properly.

Water Balance:

WQ1.1 - Erosion & Sediment Control

An erosion and sediment control plan has been prepared by The Odan/Detech Group for this site.

WQ 2.2 - Stormwater Retention & Reuse

The primary objective of the Water Balance Targets/Criteria is to capture and manage annual rainfall on the development site itself to preserve the pre-development hydrology (or "water balance", which typically consists of three components: runoff, infiltration, and evapotranspiration) through a combination of infiltration, evapotranspiration, landscaping, rainwater reuse and/or other low impact development practices.

WQ 2.2 Stormwater retention & reuse

Ensure that the maximum allowable annual runoff volume from the development site is no more than 50% of the total average annual rainfall depth

The water balance target volume is calculated based on the City of Toronto's Wet Weather Flow Management Guidelines for annual rainfall capture.

TABLE 7 - Water Balance Objective

Location I.D.	Site Area (m)	Total Annual Volume Required (m^3)
Site	4870	2045

The above criteria can be achieved via absorption/infiltration through the various surfaces along with stored storm water in a storage tanks for re-use purposes. Re-use water will consist of storm run-off from roof tops.

The site will require a $24m^3$ storage volume tank for re-use. This tank is generally combined with the quantity control tank with a baffle to separate the clean roof top water and the unclean surface run-off. A pump system will be designed by the mechanical engineer for the re-use tank.

Water Quality:

WQ 3.1 - Total Suspended Solids (TSS)

WQ 3.1 – Total Suspended Solids (TSS)

Remove 80% of total suspended solids (TSS) on an annual loading basis from all runoff leaving the site based on the post-development level of imperviousness

The site was divided according to surface conditions and the effective TSS for each surface condition was considered based on a number of criteria (i.e. drainage area surface characteristics, IA values, where the flows are directed, etc). The general basis of the effective TSS removal rates are as follows:

A city approved OGS (Jellyfish, MFS Filter) unit will be sized to treat the run-off for the surface areas, ie. parking, loading, etc... generally anywhere vehicles could drive.

The majority of this site is roof top which is considered clean water and will not require any further treatment.

3.0 CONCLUSIONS

From our investigation the site is serviceable utilizing existing sanitary, storm and watermain infrastructure within and adjacent to the site. Storm water management can be accommodated with on-site storage as described in this report.

The following table summarizes the SWM components of the proposed development.

TABLE 9 - Summary Information	
Existing Sanitary Flow (l/s)	0.61
Proposed Sanitary Flow (l/s)	3.25
Allowable release rate from site (l/s) (2 year storm)	60
Actual release rate from site (l/s) (100 year storm)	54
Total Storm Water Storage Required (m^3)	180
Total Storm Water Storage Provided (m^3)	180
Water Quality	OGS

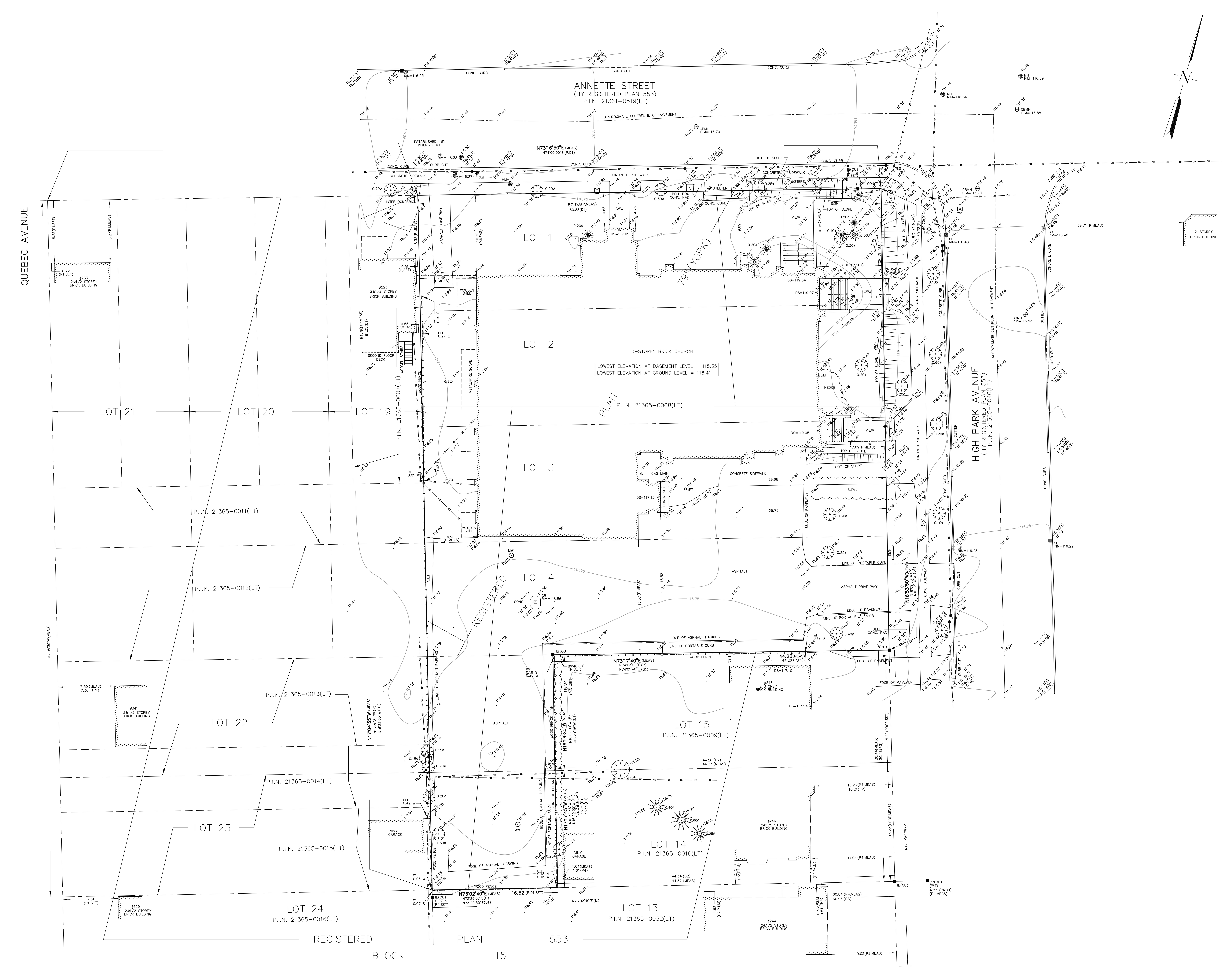
Respectfully Submitted;
The Odan Detech Group Inc.

Kate Logan, B.EngScty

John Krpan, M.S.C.E., P.Eng

APPENDIX A

Existing Condition Survey
Architectural Site Plan
Summary of Building Statistics



BOUNDARY AND TOPOGRAPHICAL SURVEY OF

LOTS 1 TO 4
REGISTERED PLAN 795(YORK)
AND
PART OF LOTS 14 AND 15
IN BLOCK 15
REGISTERED PLAN 553

CITY OF TORONTO

SCALE 1 : 200

5m 4 3 2 1 0 5 10 15m

R. AVIS SURVEYING INC.

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

NOTES AND LEGEND

BEARINGS SHOWN HEREON ARE GRID BEARINGS AND ARE DERIVED FROM HORIZONTAL CONTROL MONUMENTS No. 020680073 AND No. 022741470, ZONE 10, MTM COORDINATE SYSYEM CENTRAL MERIDIAN 79° 30' WEST LONGTITUDE.
(3° MODIFIED TRANSVERSE MERCATOR PROJECTION, NAD 83 (CSRS–1997)

HCM No. 020680073	HCM No. 022741470
N 4835780.552	N 4835959.167
E 307009.535	E 307500.938

ELEVATIONS SHOWN HEREON ARE GEODETIC AND ARE REFERRED TO CITY OF TORONTO BENCH MARK No. CT427, HAVING AN ELEVATION = 117.791metres.

DISTANCES SHOWN HEREON ARE ADJUSTED GROUND DISTANCES AND CAN BE CONVERTED TO GRID DISTANCES BY MULTIPLYING BY A COMBINED SCALE FACTOR OF 0.999887.

■	DENOTES SURVEY MONUMENT FOUND
□	DENOTES SURVEY MONUMENT PLANTED
SIB	DENOTES STANDARD IRON BAR
SSIB	DENOTES SHORT STANDARD IRON BAR
IB	DENOTES IRON BAR
CC	DENOTES CUT CROSS
WIT	DENOTES WITNESS
MEAS	DENOTES MEASURED
N,S,E,W	DENOTES NORTH, SOUTH, EAST, WEST
IP	DENOTES IRON PIPE
P	DENOTES PLAN OF SURVEY BY J. S.M. HWANG, O.L.S. DATED APRIL 6, 1976
P1	DENOTES NOTES BY THE CITY OF TORONTO SURVEY DATED JANUARY 27 TO FEBRUARY 4, 1982
P2	DENOTES TOPOGRAPHICAL SURVEY BY McSKIMMING AND PAUL SURVEYING LTD., O.L.S. DATED NOVEMBER 13, 2015
P3	DENOTES REGISTERED PLAN 553
P4	DENOTES SURVEYOR'S PROPERTY REPORT BY GREATER TORONTO ACRES SURVEYING INC., O.L.S. DATED JUNE 3, 2014
D1	DENOTES INST. CA129444
D2	DENOTES INST. CA544210
CB	DENOTES CATCH BASIN
FH	DENOTES FIRE HYDRANT
HLP	DENOTES HYDRO LIGHT POLE
HP	DENOTES HYDRO POLE
LS	DENOTES LIGHT STANDARD
BP	DENOTES BELL POLE
MH	DENOTES MANHOLE
WIF	DENOTES WROUGHT IRON FENCE
CLF	DENOTES CHAIN LINK FENCE
DS	DENOTES DOOR SILL
BB	DENOTES BELL BOX
CBMH	DENOTES CATCH BASIN MANHOLE
TLS	DENOTES TRAFFIC LIGHT SIGNAL
WV	DENOTES WATER VALVE
BO	DENOTES BOLLARD
MW	DENOTES MONITORING WELL
HR	DENOTES HAND RAIL
BM	DENOTES BENCH MARK
OH	DENOTES OVERHEAD WIRE
HMH	DENOTES HYDRO MANHOLE
CONC.	DENOTES CONCRETE
CWW	DENOTES CONCRETE WALKWAY
(T)	DENOTES TOP OF CURB
(B)	DENOTES BOTTOM OF CURB
(G)	DENOTES GUTTER ELEVATION
0.10ø	DENOTES CONIFEROUS TREE WITH TRUNK DIAMETER 0.10 metres
0.10ø	DENOTES DECIDUOUS TREE WITH TRUNK DIAMETER 0.10 metres
000.00	DENOTES SPOT ELEVATION

NOTE :
UPDATED ON OCTOBER 8,, 2015 TO SHOW ADDITIONAL TOPOGRAPHICAL FEATURES.
THE SURVEY WAS COMPLETED ON THE 7th DAY OF OCTOBER 2015.

AREA : 4198.2 sq. m.

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 THE 20th DAY OF SEPTEMBER, 2015.

SEPTEMBER 29, 2015
DATE

PIRATHEEPAN RAMACHANDRAN
Ontario Land Surveyor

R. AVIS SURVEYING INC.
SUITE 203
235 YORKLAND BOULEVARD
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CHECKED BY : P.R., O.L.S.	
CALCULATED BY : PR/JB	PROJECT No. : 2945–0
DRAWN BY : BL/JB	DRAWING No. : 2945–0T.DWG

ENTRY LEGEND

- PRIMARY RESIDENTIAL ENTRY
- SECONDARY RESIDENTIAL ENTRY
- ENTRY FOR EMERGENCY SERVICES

Toronto Green Standard Version 2.0 Statistics Template

For New Mid to High-Rise Residential and All Non-Residential Development

City Planning Division

The Toronto Green Standard StatisticsTemplate is submitted with Site Plan Control Applications and stand alone Zoning Bylaw Amendment applications. Complete this table and copy it directly onto the Site Plan submitted as part of the application. Complete General Project Description and Section 1 for Zoning Bylaw Amendment applications. Complete General Project Description, Section 1 and Section 2 for Site Plan Control applications. Refer to the full Toronto Green Standard for Mid to High-Rise Residential and All Non-Residential Development for the complete set of standards and detailed specifications. (www.toronto.ca/greendevelopment)

Toronto Green Standard Statistics

General Project Description		Proposed
Total Gross Floor Area		9,950 m2
Breakdown of project components:		
	Residential	9,950 m2
	Retail	0
	Commercial	0
	Industrial	0
	Institutional/Other	0
Total number residential units (residential only)		77

Section 1: For Stand Alone Zoning Bylaw Amendment Applications and Site Plan Control Applications

Automobile Infrastructure	Required	Proposed	%
Number of parking spaces	89	90	-
Number of parking spaces with physical provision for future EV charging (residential)	-	9	-
Number of parking spaces dedicated for priority parking (carsh-share/commercial)	-	-	-
Cycling Infrastructure	**Required**	**Proposed**	**%**
Number of long-term bicycle parking spaces (residential)	70	70	-
Number of long-term bicycle parking spaces (all other uses)	0	0	-
Number of long-term bicycle parking (residential and all other uses) located on:			
(a) first storey of building	N/A	0	-
(b) second storey of building	N/A	N/A	-
(c) first level below-ground (also includes ¾ of net area of level occupied by bicycle parking)	N/A	70	3.4%
(d) second level below-ground (also includes ¾ of net area of level occupied by bicycle parking)	N/A	0	-
(e) other levels below-ground (also includes ¾ of net area of level occupied by bicycle parking)	N/A	0	-
Number of short-term bicycle parking spaces (residential only)	8	8	-
Number of short-term bicycle parking spaces (all other uses)	0	0	-
Number of short-term bicycle parking spaces (residential and all other uses) at grade or on first level below grade	8	8	-
Number of male shower and change facilities (non-residential only)	0	0	-
Number of female shower and change facilities (non-residential only)	0	0	-
Storage and Collection of Recyclable and Organic Waste	**Required**	**Proposed**	**%**
Waste storage room area (residential only) (m²)	42	74	-

Section 2: For Site Plan Control Applications

Urban Heat Island Reduction: All Roofs	Required	Proposed	%
Total non-roof hardscape area (m²)	-	917.6	-
Total non-roof hardscape area treated for Urban Heat Island **(minimum 50%)** (m²) and (%)	458.8	-	-
Percentage (of non-roof hardscape treated with:			
(a) high-albedo surface material	-	917.6	100%
(b) open-grid pavement	-	-	-
(c) shade from tree canopy	-	-	-
(d) shade from structures covered by solar panels	-	-	-
Number of surface car parking spaces	-	-	-
Percentage of parking spaces under cover (non-residential only)	-	-	-
Urban Heat Island Reduction: Roof	**Required**	**Proposed**	**%**
Available Roof Space (m²)	-	839.5	-
Available Roof Space provided as Green Roof (m²) and (%)	-	335.7	40%
Available Roof Space provided as Cool Roof (m²) and (%)	-	-	-
Water Efficiency	**Required**	**Proposed**	**%**
Total landscaped site area (m²)	-	724.1	-
Landscaped site area provided with drought-tolerant plants **(minimum 50%)** (m²) and (%)	362.1	488.6	67%
Urban Forest - Increase Tree Canopy	**Required**	**Proposed**	**%**
Total site area (m²)	-	4872.9	-
Total number of trees planted **(site area x 40% = 66)**	30	56	-
Number of surface parking spaces	-	-	-
Number of interior shade trees in surface parking area **(minimum 1 tree for 5 parking spaces)**	-	-	-
Natural Heritage: Bird	**Required**	**Proposed**	**%**
Total number of species planted	-	17	-
Total number of native species planted and % of total species planted **(minimum 50%)**	-	9	53%
Bird Friendly Glazing*			**%**
Total area of glazing of all elevations within 12m above grade (including glass balcony railings)	-	274.6	-
Total area of treated glazing (m2 and %) of total area of glazing within 12m above grade)	-	233.0	85%
Percentage of glazing treated with: **(minimum 85%)**	-	-	-
a) Low reflectance opaque materials	-	87.8	32%
b) Visual markers	-	145.2	53%
c) Shading	-	0	0%
Storage and Collection of Recycling and Organic Waste	**Required**	**Proposed**	**%**
Waste storage area for bulky items and other (residential only)	10	10	-

*Areas and percentages for Bird Friendly Glazing are based on the bird friendly diagrams along the street and included on sheet RZ 12.

No.	Date:	Issued/Revision:	By
2	2016-02-08	ISSUED FOR REZONING AND SPA	RM
1	2015-10-16	SUBMITTED FOR PPR	RM

TURNER FLEISCHER

TURNER FLEISCHER ARCHITECTS INC.
67 Lesmill Road Toronto ON Canada M3B 2T8
Telephone (416) 425-2222 Facsimile (416) 425-6757
turnerfleischer.com

Client :

TRAC DEVELOPMENTS INC.

Project :

No. 260 HIGH PARK
CHURCH LOFTS AND RESIDENCES

260 HIGH PARK AVENUE
TORONTO, ONTARIO

Drawing Name :

SITE PLAN

Proj no.: 15.281	Date : 2015-10-16
Drawn by : AA	Scale : As indicated
Checked by : RM	Drawing No : RZ 10

SCALE 1:150

0 5 10 m

E:\15.281 - 260 High Park_asems.rvt

15.281 - 260 HIGH PARK

TORONTO, ONTARIO

STATISTICS

REVISED 2-Feb-16

SITE AREA	**4,873**	**m^2**
TOTAL GFA	**9,850**	**m^2**
F.S.I.	**2.02 x SITE AREA**	

GFA & FSI SUMMARY - AS PER CITY OF TORONTO ZONING BY-LAW 569-2013

USE	TFA		GFA		UNITS	F.S.I.
	m^2	ft^2	m^2	ft^2	#	#
RESIDENTIAL	9,701	104,423	9,701	104,423	77	1.99
AMENITY (IN EXCESS OF MIN. REQ.)	303	3,262	149	1,604		0.03
TOTAL	**10,004**	**107,685**	**9,850**	**106,027**	**77**	**2.02**

City of Toronto Zoning By-Law NO. 569-2013 Gross Floor Area (GFA) - Apartment Building:

Means the sum of the total area of each floor level of a building, above and below the ground, measured from the exterior of the main wall of each floor level.In the Residential Zone category, the gross floor area of an apartment building is reduced by the area in the building used for:

(A) parking, loading and bicycle parking below established grade;
(B) required loading spaces and required bicycle parking spaces at or above established grade;
(C) storage rooms, washrooms, electrical, utility, mechanical and ventilation rooms in the basement;
(D) shower and change facilities required by this By-law for required bicycle parking spaces
(E) amenity space required by this By-law;
(F) elevator shafts;
(G) garbage shafts;
(H) mechanical penthouse; and
(I) exit stairwells in the building.

GROSS FLOOR AREA (GFA) CALCULATIONS

4 STOREY RESIDENTIAL BUILDING

	FLOOR	TOTAL FLOOR AREA (NO EXCLUSIONS)		GROSS FLOOR AREA (W/ EXCLUSIONS)		GROSS FLOOR AREA BREAKDOWN						INDOOR AMENITY (EXCLUDED FROM GFA)		UNITS	OUTDOOR AMENITY		GREEN ROOF	
						RESIDENTIAL SALEABLE		RESIDENTIAL NON-SALEABLE		RESIDENTIAL								
		m^2	ft^2	m^2	ft^2	m^2	ft^2	m^2	ft^2	m^2	ft^2	m^2	ft^2	#	m^2	ft^2	m^2	ft^2
4 STOREY RESIDENTIAL BUILDING	U/G 2	1,807.7	19,458	45.2	487			45	487	45	487							
	U/G 1	3,547.7	38,188	481.7	5,185	406	4,374	76	814	482	5,185							
	1	2,612.7	28,123	2,273.1	24,468	1,949	20,976	324	3,492	2,273	24,468	303	3,262	21	212	2,277		
	2	2,502.4	26,936	2,465.9	26,543	2,262	24,348	204	2,195	2,466	26,543			24				
	3	2,331.6	25,097	2,295.1	24,704	2,095	22,548	200	2,156	2,295	24,704			20				
	4	1,886.6	20,308	1,817.4	19,563	1,647	17,733	170	1,829	1,817	19,563			12				
	MECH. PH	524.7	5,647	322.7	3,473	228	2,456	95	1,018	323	3,473				175	1,882		
	ROOF																243	2,614
	TOTAL	15,213	163,757	9,701	104,423	8,587	92,435	1,114	11,990	9,701	104,423	303	3,262	77	386	4,159	243	2,614

No.	Date:	Issued/Revision:	By
2	2016-02-08	ISSUED FOR REZONING AND SPA	RM
1	2015-10-16	SUBMITTED FOR PPR	RM

TURNER FLEISCHER

TURNER FLEISCHER ARCHITECTS INC.
67 Lesmill Road Toronto ON Canada M3B 2T8
Telephone (416) 425-2222 *Facsimile* (416) 425-6717
turnerfleischer.com

Client :

TRAC DEVELOPMENTS INC.

Project :

No. 260 HIGH PARK
CHURCH LOFTS AND RESIDENCES

260 HIGH PARK AVENUE
TORONTO, ONTARIO

Drawing Name :

STATISTICS

Proj no. : 15.281	Date : 2015-10-16
Drawn by : AA	Scale :
Checked by : RM	Drawing No : RZ 01

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UNIT BREAKDOWN

FLOOR	UNIT TYPE						SUB-TOTAL	BARRIER FREE UNITS
	1B	1B+D	2B	2B+D	3B	3B+D		
1		14		7			21	TBD
2		14		9		1	24	TBD
3		7		9		4	20	TBD
4		6		1		5	12	TBD
TOTAL	0	41	0	26	0	10	77	0
	41		26		10			
UNIT MIX	53.2%		33.8%		13.0%			0.0%

AMENITY AREAS - REQUIRED & PROVIDED

** AMENITY REQUIREMENTS AS PER CITY OF CITY OF TORONTO ZONING BY-LAW 569-2013*

	TYPE	REQUIRED			PROVIDED	
		RATIO	m2	ft2	m2	ft2
4 STOREY RESIDENTIAL BUILDING	INDOOR AMENITY	2.0 m2 / UNIT	154	1,658	303	3,262
	OUTDOOR AMENITY	TOTAL AMENITY REQUIRED MINUS THE INDOOR AMENITY PROVIDED (NO LESS THAN 40m2)			386	4,159
	TOTAL AMENITY REQ. (IN AND OUTDOOR)	4.0 m2 / UNIT	308	3,315	689	7,421

LOCKERS PROVIDED

FLOOR	LOCKERS PROVIDED
U/G PARKING LEVEL 1	77
U/G PARKING LEVEL 2	0
TOTAL	77

VEHICULAR PARKING - REQUIRED & PROVIDED

** BICYCLE PARKING RATIOS AS PER CITY OF CITY OF TORONTO ZONING BY-LAW 569-2013*

	USE	RATIO	UNITS / GFA (m²)	SPACES
VEHICULAR PARKING REQUIRED		MINIMUM		MINIMUM
	VISITOR	0.2 / UNIT	77	15
	1B & 1B+D UNITS	0.9 / UNIT	41	36
	2B & 2B+D UNITS	1.0 / UNIT	26	26
	3B & 3B+D UNITS	1.2 / UNIT	10	12
	TOTAL			89

	LEVEL	USE		TOTAL
		RESIDENT	VISITOR	
VEHICULAR PARKING PROVIDED	SURFACE	0	0	0
	PARKING LEVEL 1	37	15	52
	PARKING LEVEL 2	38	0	38
	SUBTOTAL	75	15	90
	TANDEM	17	0	
	GRAND TOTAL	92	15	107

BICYCLE PARKING - REQUIRED & PROVIDED

** BICYCLE PARKING RATIOS AS PER CITY OF CITY OF TORONTO ZONING BY-LAW 569-2013*

	USE	LONG TERM		SHORT TERM		SPACES
		RATIO	SPACES	RATIO	SPACES	
BICYCLE PARKING REQUIRED	RESIDENTIAL	0.9 / UNIT	70	0.1 / UNIT	8	78
	TOTAL	70		8		78

	LEVEL	SURFACE		PARKING LEVEL 1		TOTAL
		HORIZONTAL	VERTICAL	HORIZONTAL	VERTICAL	
BICYCLE PARKING PROVIDED	RES - SHORT TERM		8			8
	RES - LONG TERM			35	35	70
	TOTAL	0	8	35	35	78
		8		70		

No.	Date:	Issued/Revision:	By
2	2016-02-08	ISSUED FOR REZONING AND SPA	RM
1	2015-10-16	SUBMITTED FOR PPR	RM

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Client :

TRAC DEVELOPMENTS INC.

Project :

No. 260 HIGH PARK
CHURCH LOFTS AND RESIDENCES

260 HIGH PARK AVENUE
TORONTO, ONTARIO

Drawing Name :

STATISTICS

Proj no. : 15.281	Date : 2015-10-16
Drawn by : AA	Scale :
Checked by : RM	

Drawing No :

RZ 02

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APPENDIX B

Sanitary Flow Calculations
Sanitary Sewer Design Sheet
Sanitary Tributary Plan
Existing Plan & Profiles

ODAN/DETECH GROUP

EXISTING SANITARY FLOW CALCULATIONS

This program calculates the sanitary discharge from various land use — EXISTING SITE

As per the City of Toronto Guidelines

TOTAL SITE AREA (ha) = 0.487

LAND USE	NUMBER OF UNITS	SITE AREA, (ha)	GROSS FLOOR AREA, m2	TOTAL POPULATION	TOTAL DAILY FLOW (LITERS)	AVERAGE DAILY FLOW l/sec	PEAKING FACTOR, M	TOTAL FLOW FROM LAND USE, l/sec
RESIDENTIAL Density 1, using 86 person/site area				0				
RESIDENTIAL Density 2, using 170 persons/site area				0				
RESIDENTIAL Density 3, using 270 persons/site area				0				
CHURCH Density 4, using 86person/site area				0				
RESIDENTIAL Density 6, using 3.5 persons/unit	1			4				
RESIDENTIAL Density 6, using 3.5 persons/unit				0				
Total Existing Residential				4	875	0.01	4.45	0.05
CHURCH Density 4, using 86person/site area		0.425		37				
COMMERCIAL, Using 1.1 persons/100 m2				0				
INSTITUTIONAL, Using 3.3 persons/100 m2				0				
OFFICES, Using, 3.3 persons/100m2				0				
Total Existing ICI				37	8772	0.10	4.34	0.44
Total Infiltration								0.13
TOTAL FLOW								**0.61**

where :

P is population
q = 250 L/cap/day (Residential)
q = 240 L/cap/day (ICI)

i = 0.26 L/sec/ha (infiltration rate)
Q = (MqP/86400) + A * I (L/sec)
Peaking Factor M = 1 + [14 / (4 + (P/1000,1/2))]

ODAN/DETECH GROUP

PROPOSED SANITARY FLOW CALCULATIONS

This program calculates the sanitary discharge from various land use — PROPOSED SITE

As per the City of Toronto Guidelines

TOTAL SITE AREA (ha) = 0.487

LAND USE	NUMBER OF UNITS	SITE AREA, (ha)	GROSS FLOOR AREA, m2	TOTAL POPULATION	TOTAL DAILY FLOW (LITERS)	AVERAGE DAILY FLOW l/sec	PEAKING FACTOR, M	TOTAL FLOW FROM LAND USE, l/sec
RESIDENTIAL Density 1, using 86 person/site area				0				
RESIDENTIAL Density 2, using 170 persons/site area				0				
RESIDENTIAL Density 3, using 270 persons/site area				0				
CHURCH Density 4, using 86person/site area				0				
RESIDENTIAL Density 6, using 3.5 persons/unit				0				
RESIDENTIAL Density 6, using 3.5 persons/unit				0				
Total Existing Residential				0	0	0.00	4.50	0.00
1 BEDROOM Density 2, using 1.4 persons/unit	41			57				
2 BEDROOM Density 3, using 2.1 persons/unit	26			55				
3 BEDROOM Density 3, using 3.1 persons/unit	10			31				
Total Proposed Residential	77			143	64350	0.74	4.20	3.13
CHURCH Density 4, using 86person/site area				0				
COMMERCIAL, Using 1.1 persons/100 m2				0				
INSTITUTIONAL, Using 3.3 persons/100 m2				0				
OFFICES, Using, 3.3 persons/100m2				0				
Total Existing ICI				0	0	0.00	4.50	0.00
Total Infiltration								0.13
TOTAL FLOW								**3.25**

where :

P is population
q = 250 L/cap/day (Existing Residential)
q = 450 L/cap/day (Proposed Residential)
q = 240 L/cap/day (ICI)

i = 0.26 L/sec/ha (infiltration rate)
Q = (MqP/86400) + A * I (L/sec)
Peaking Factor M = 1 + [14 / (4 + (P/1000,1/2))]

ODAN/DETECH GROUP

EXISTING SANITARY FLOW CALCULATIONS

This program calculates the sanitary discharge from various land use

EXISTING SAN TRIBUTARY

As per the City of Toronto Guidelines

TOTAL SITE AREA (ha) = 5.96

LAND USE	NUMBER OF UNITS	SITE AREA, (ha)	GROSS FLOOR AREA, m2	TOTAL POPULATION	TOTAL DAILY FLOW (LITERS)	AVERAGE DAILY FLOW l/sec	PEAKING FACTOR, M	TOTAL FLOW FROM LAND USE, l/sec
RESIDENTIAL Density 1, using 86 person/site area				0				
RESIDENTIAL Density 2, using 170 persons/site area				0				
RESIDENTIAL Density 3, using 270 persons/site area				0				
CHURCH Density 4, using 86person/site area				0				
RESIDENTIAL Density 6, using 3.5 persons/unit	1			4				
RESIDENTIAL Density 6, using 3.5 persons/unit	34			119				
RESIDENTIAL Density 6, using 3.5 persons/unit	35			123				
Total Existing Residential				245	61250	0.71	4.11	2.92
CHURCH Density 4, using 86person/site area		0.425		37				
COMMERCIAL, Using 1.1 persons/100 m2				0				
INSTITUTIONAL, Using 3.3 persons/100 m2				0				
OFFICES, Using, 3.3 persons/100m2				0				
Total Existing ICI				37	8772	0.10	4.34	0.44
Total Infiltration								1.55
TOTAL FLOW								**4.91**

where :

P is population
q = 250 L/cap/day (Residential)
q = 240 L/cap/day (ICI)

i = 0.26 L/sec/ha (infiltration rate)
Q = (MqP/86400) + A * I (L/sec)
Peaking Factor M = 1 + [14 / (4 + (P/1000,1/2))]

ODAN/DETECH GROUP

PROPOSED SANITARY FLOW CALCULATIONS

This program calculates the sanitary discharge from various land use — PROPOSED SAN TRIBUTARY

As per the City of Toronto Guidelines

TOTAL SITE AREA (ha) = 5.96

LAND USE	NUMBER OF UNITS	SITE AREA, (ha)	GROSS FLOOR AREA, m2	TOTAL POPULATION	TOTAL DAILY FLOW (LITERS)	AVERAGE DAILY FLOW l/sec	PEAKING FACTOR, M	TOTAL FLOW FROM LAND USE, l/sec
RESIDENTIAL Density 1, using 86 person/site area				0				
RESIDENTIAL Density 2, using 170 persons/site area				0				
RESIDENTIAL Density 3, using 270 persons/site area				0				
CHURCH Density 4, using 86person/site area				0				
RESIDENTIAL Density 6, using 3.5 persons/unit	34			119				
RESIDENTIAL Density 6, using 3.5 persons/unit	35			123				
Total Existing Residential				242	60375	0.70	4.12	2.88
1 BEDROOM Density 2, using 1.4 persons/unit	41			57				
2 BEDROOM Density 3, using 2.1 persons/unit	26			55				
3 BEDROOM Density 3, using 3.1 persons/unit	10			31				
Total Proposed Residential				143	64350	0.74	4.20	3.13
CHURCH Density 4, using 86person/site area				0				
COMMERCIAL, Using 1.1 persons/100 m2				0				
INSTITUTIONAL, Using 3.3 persons/100 m2				0				
OFFICES, Using, 3.3 persons/100m2				0				
Total Existing ICI				0	0	0.00	4.50	0.00
Total Infiltration								1.55
TOTAL FLOW								**7.55**

where :

P is population
q = 250 L/cap/day (Existing Residential)
q = 450 L/cap/day (Proposed Residential)
q = 240 L/cap/day (ICI)

i = 0.26 L/sec/ha (infiltration rate)
Q = (MqP/86400) + A * I (L/sec)
Peaking Factor M = 1 + [14 / (4 + (P/1000,1/2))]

ODAN/DETECH GROUP

EXISTING SANITARY SEWER DESIGN

Development Details Basis

STREET / AREA	MAINTENANCE HOLE FROM	MAINTENANCE HOLE TO	DWELL UNITS	DENSITY P.P.U.	POP. (P)	POP. (ACC)	M PEAKING FACTOR	Q_P (L/S)	AREA (ha)	AREA (ACC) (ha)	Q_i (L/S)	Q_{tot} (L/S)	D (mm)	S (%)	Q FULL (L/S)	V FULL (m/s)
HIGH PARK	100A	101A	REFER TO DESIGN SHEET								0.00	4.91	825	0.40	907.85	1.70
HIGH PARK	101A	102A	REFER TO DESIGN SHEET								0.00	4.91	825	0.40	907.85	1.70
HIGH PARK	102A	TRUNK	REFER TO DESIGN SHEET								0.00	4.91	825	0.40	907.85	1.70

DATE: February 10, 2016 CALCULATED BY: Kevin Osinga, C.E.T. CHECKED BY: John Krpan, P.Eng

n > 0.013

ODAN/DETECH GROUP

PROPOSED SANITARY SEWER DESIGN

Development Details Basis

STREET / AREA	MAINTENANCE HOLE FROM	MAINTENANCE HOLE TO	DWELL UNITS	DENSITY P.P.U.	POP. (P)	POP. (ACC)	M PEAKING FACTOR	Q_P (L/S)	AREA (ha)	AREA (ACC) (ha)	Q_i (L/S)	Q_{tot} (L/S)	D (mm)	S (%)	Q FULL (L/S)	V FULL (m/s)
HIGH PARK	100A	101A	REFER TO DESIGN SHEET								0.00	7.55	825	0.40	907.85	1.70
HIGH PARK	101A	102A	REFER TO DESIGN SHEET								0.00	7.55	825	0.40	907.85	1.70
HIGH PARK	102A	TRUNK	REFER TO DESIGN SHEET								0.00	7.55	825	0.40	907.85	1.70

DATE: February 10, 2016 CALCULATED BY: Kevin Osinga, C.E.T. CHECKED BY: John Krpan, P.Eng

n > 0.013

	PROJECT NO : 15263	ODAN·DETECH CONSULTING ENGINEERS
SANITARY TRIBUTARY PLAN	260 HIGH PARK	The Odan/Detech Group Inc. P: (905) 632-3811 F: (905) 632-3363 5230 SOUTH SERVICE ROAD, BURLINGTON, ONTARIO, L7L 5K2
SCALE: N.T.S.	DATE: NOVEMBER 2015	

RESIDENTIAL SINGLE FAMILY (3.5 PERSONS/UNIT)

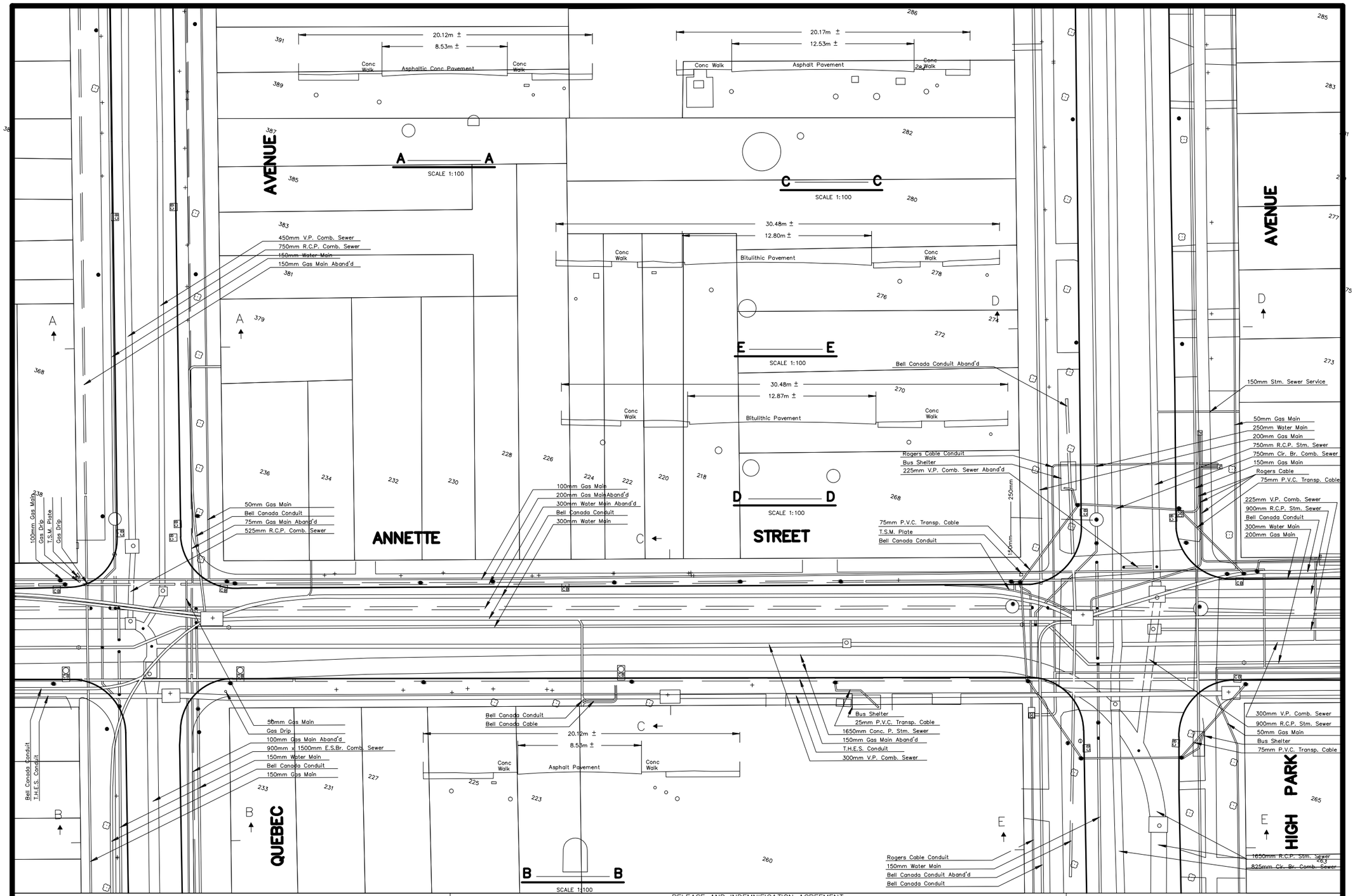
565 POPULATION
56 No. OF UNITS
3.02 SITE AREA (m2)

SCHOOL/CHURCH (86 PERSONS/ha)

4 POPULATION
0.38 AREA (ha)

RESIDENTIAL APARTMENTS (BASED ON PROPOSED UNITS)

4 POPULATION
0.38 AREA (ha)



DIGITAL MAP OWNERS GROUP OF TORONTO

MEMBERS

BELL CANADA
CITY OF TORONTO
ENBRIDGE GAS DISTRIBUTION INC.
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HYDRO ONE NETWORKS INC.
TORONTO TRANSIT COMMISSION
TORONTO HYDRO ELECTRIC SYSTEM LIMITED

SCALE RATIO 1:200

METRE 5 0 10 METRES

RELEASE AND INDEMNIFICATION AGREEMENT
FOR THE USE OF DIGITAL MAP OWNERS GROUP ("DMOG") MAPS OF THE CITY OF TORONTO

1 The DMOG Map(s) of the City of Toronto provided is/are a product Digital Map Owners Group ("DMOG"), a joint undertaking of the City of Toronto and certain Utilities, being Bell Canada, Toronto Hydro Electric System Limited, Enbridge Gas Distribution Inc., Rogers Cable Communications Inc., the Toronto Transit Commission, and Hydro One Networks Inc (jointly the "Utilities"). The party purchasing and/or using these maps (the "User") assumes all risks associated with the use of the DMOG maps(s).

2 The User is to use the DMOG Map(s) for planning and preliminary design purposes only. The User agrees not to use the DMOG Map(s) for construction work or any work, which involves interference with or the breaking of the surface of any highway or geographic area prescribed by the DMOG Map(s).

3 The User acknowledges that neither the City nor DMOG represent the DMOG Map(s) to be complete, absolute, or accurate as to the extent. The User will, from time to time hereafter well and truly save, defend, save harmless and fully indemnify the City, DMOG and each Utility from and against all actions, suites, claims and demands which may be brought against or made upon the City, DMOG and each Utility and against all liability, loss, costs, charges, damages or expenses which may be sustained or incurred by the City, DMOG or each Utility resulting from or arising out of the provision of the DMOG Map(s) to the User.

4 The User undertakes not to use the DMOG Map(s) for "Locates". The User agrees to always contact the appropriate affected Utility to obtain a physical locate of the underground plant.

5 The DMOG Map(s) provided is/are for the sole use of the User and the User agrees not to provide the DMOG Map(s) to any other party, by any measure, other than to a member of DMOG, unless that other party has signed this Agreement.

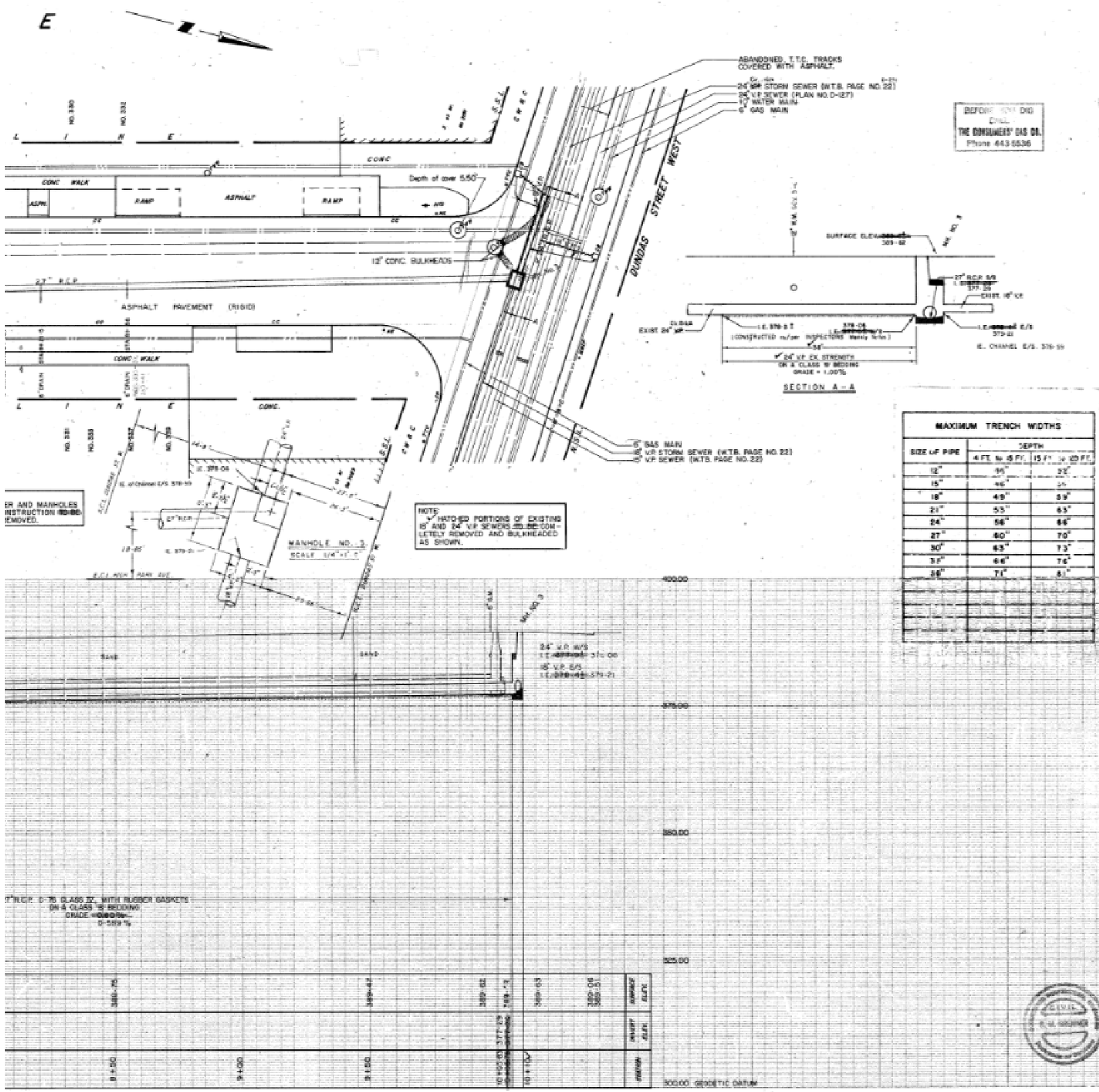
6 The User hereby releases, remises and forever discharges the City, DMOG and each Utility and each of their officers, employees or agents from any and all manner of actions, causes of actions, debts, claims and demands whatsoever which against the City, DMOG and each Utility the User ever had or which the User's heirs, executors, administrators or assigns or any of the hereinafter can, shall or may have for or by reasons of the use or otherwise of the above noted DMOG Map(s) which have been provided by the City, DMOG and each Utility.

SHEET No. 24-B-51

KEY MAP

24-B-44	24-B-45	24-B-46
24-B-50	24-B-51	24-B-52
24-B-56	24-B-57	24-B-58

FACET No.02447J15



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CALL
THE CONSUMERS' GAS CO.
Phone 443-5536

MAXIMUM TRENCH WIDTHS		
SIZE OF PIPE	DEPTH	
	4 FT. to 15 FT.	15 FT. to 25 FT.
12"	44"	52"
15"	46"	54"
18"	49"	59"
21"	53"	63"
24"	56"	66"
27"	60"	70"
30"	63"	73"
33"	66"	76"
36"	71"	81"

WORK COMMENCED MAY 13, 1974
WORK COMPLETED JULY 26, 1974
FINAL MEASUREMENT BOOK Lt. Nmbr 4065 PAGE — DATE JULY 12, 1974
INSPECTOR N. PARSON
LAYOUT W. HALL
SUPERVISING ENGINEER R. WALLACE

GEODETIC BENCH MARK NO. 426, ELEV. 391-627
" " " " 427 " 387-043 ✓
SEE LOOSE LEAF NOTES NOS. 3507 and 3529

457-152

3-1354-73-006
Dec 28, 1973

CITY OF TORONTO
DEPARTMENT OF PUBLIC WORKS

ROAD STORM SEWER

HIGH PARK AVENUE

FROM ANNETTE STREET TO DUNDAS STREET WEST

DRAWING NO. H-235	SCALES HORIZ. 1"=20'-0", VERT. 1"=10'-0"
SENIOR DESIGN ENG.	DESIGN BY
SENIOR PROJECT ENG.	DRAWN BY A. LANNING and D. HAMMONS
DIRECTOR	CONTRACT NO. 58560
COMMISSIONER	DATE NOVEMBER 1973

2" x 8" = 16 sq. ft.

APPENDIX C

FUS Calculation Sheet
Fire Hydrant Pressure/Flow Test Results

ODAN/DETECH
THE ODAN/DETECH GROUP - CONSULTING ENGINEERS

FIRE FLOW CALCULATOR

WATER SUPPLY FOR PUBLIC FIRE PROTECTION , FIRE UNDERWRITERS SURVEY
GUIDE FOR DETERMINATION OF REQUIRED FIRE FLOWS

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

Where:
F = required fire flow in liters per minute
C= Coefficient related to the type of construction
A = the total floor area in square meters (excluding basements) in the building considered

LOCATION:	High Park & Annette	**PROJECT:** 260 High Park
OBC OCCUPANCY:	Residential	**PROJECT No:** 15263
BUILDING FOOT PRINT (m2):	3080	
# OF STOREYS	4	

Contents	Charge
Non-Combustible	-25%
limited Combustible	-15%
Combustible	0%
Free Burning	15%
Rapid Burning	25%

CONSTRUCTION CLASS: Ordinary

AUTOMATED SPRINKLER PROTECTION

		Credit	Total
NFPA 13 sprinkler standard	yes	30%	50%
Standard Water Supply	yes	10%	
Fully Supervised System	yes	10%	
		50%	

CONTENTS FACTOR: Limited-Combustible CHARGE: -15%

EXPOSURE 1 (south)	Distance to Exposure Building (m)	6	0%
Residential	Length - Height		
EXPOSURE 2 (east)	Distance to Exposure Building (m)	>45	0%
Residential	Length - Height		
EXPOSURE 3 (west)	Distance to Exposure Building (m)	8	0%
Residential	Length - Height		
EXPOSURE 4 (north)	Distance to Exposure Building (m)	25	0%
Residential	Length - Height		
		Total:	0%

no more than 75%

Seperation	Charge
0-3 m	25%
3.1 -10 m	20%
10.1 - 20 m	15%
20.1 - 30 m	10%
30.1 - 45	5%
> 45 m	0%

ARE BUILDINGS CONTIGUOUS:

FIRE RESISTANT BUILDING Are vertical openings and exterior vertical communications protected with a minimum one (1) hr rating

CALCULATIONS

	C =	1.2		Ordinary
	A =	9682	m2	
	F =	25977	L/min	
Round to Nearest 1000 L/min	F =	26000	L/min	must be > 2000 L/min

STOREY AREAS m2
2676
2548
2396
2062

CORRECTION FACTORS:

OCCUPANCY	-3900	L/min
FIRE FLOW ADJUSTED FOR OCCUPANCY	22100	L/min
REDUCTION FOR SPRINKLER	-11050	L/min
EXPOSURE CHARGE	0	L/min

REQUIRED FIRE FLOW

	F =	11050	L/min	
Round to Nearest 1000 L/min	**F =**	11000	L/min	2906 usgm
	F =	183	L/sec	

ODAN/DETECH
THE ODAN/DETECH GROUP - CONSULTING ENGINEERS

FIRE FLOW CALCULATOR

WATER SUPPLY FOR PUBLIC FIRE PROTECTION , FIRE UNDERWRITERS SURVEY
GUIDE FOR DETERMINATION OF REQUIRED FIRE FLOWS

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

Where:
F = required fire flow in liters per minute
C= Coefficient related to the type of construction
A = the total floor area in square meters (excluding basements) in the building considered

LOCATION:	High Park & Annette	**PROJECT:** 260 High Park
OBC OCCUPANCY:	Residential	**PROJECT No:** 15263
BUILDING FOOT PRINT (m2):	3080	
# OF STOREYS	4	

Contents	Charge
Non-Combustible	-25%
limited Combustible	-15%
Combustible	0%
Free Burning	15%
Rapid Burning	25%

CONSTRUCTION CLASS: Fire Resistive

AUTOMATED SPRINKLER PROTECTION

		Credit	Total
NFPA 13 sprinkler standard	yes	30%	50%
Standard Water Supply	yes	10%	
Fully Supervised System	yes	10%	
		50%	

CONTENTS FACTOR: Limited-Combustible — CHARGE: -15%

EXPOSURE 1 (south)	Distance to Exposure Building (m)	6	0%
Residential	Length - Height		
EXPOSURE 2 (east)	Distance to Exposure Building (m)	>45	0%
Residential	Length - Height		
EXPOSURE 3 (west)	Distance to Exposure Building (m)	8	0%
Residential	Length - Height		
EXPOSURE 4 (north)	Distance to Exposure Building (m)	25	0%
Residential	Length - Height		
		Total:	0%

no more than 75%

Seperation	Charge
0-3 m	25%
3.1 -10 m	20%
10.1 - 20 m	15%
20.1 - 30 m	10%
30.1 - 45	5%
> 45 m	0%

ARE BUILDINGS CONTIGUOUS:

FIRE RESISTANT BUILDING Are vertical openings and exterior vertical communications protected with a minimum one (1) hr rating

CALCULATIONS

	C =	0.6		Fire Resistive
	A =	9682	m2	
	F =	12988	L/min	
Round to Nearest 1000 L/min	F =	13000	L/min	must be > 2000 L/min

STOREY AREAS m2
2676
2548
2396
2062

CORRECTION FACTORS:

OCCUPANCY	-1950	L/min
FIRE FLOW ADJUSTED FOR OCCUPANCY	11050	L/min
REDUCTION FOR SPRINKLER	-5525	L/min
EXPOSURE CHARGE	0	L/min

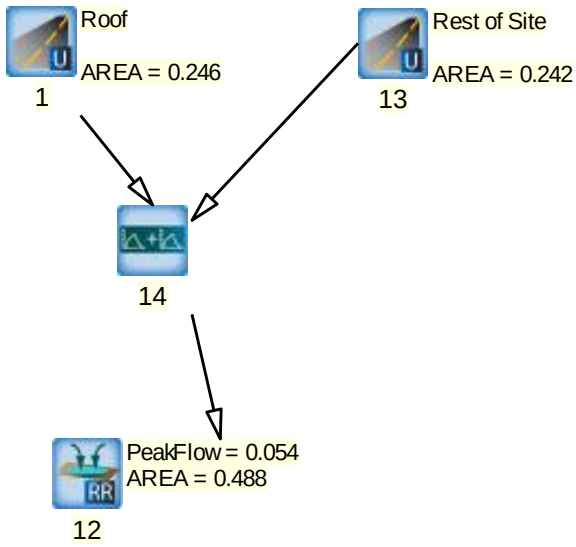
REQUIRED FIRE FLOW

	F =	5525	L/min	
Round to Nearest 1000 L/min	**F =**	6000	L/min	1585 usgm
	F =	100	L/sec	

APPENDIX D

Visual Otthymo Model
Visual Otthymo Input & Output
Water Balance Calculations

VISUAL OTTHYMO MODEL



```
================================================================================
==============================

       V    V   I    SSSSS  U   U    A    L
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO

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                  *****  D E T A I L E D   O U T P U T *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 2.3.3\voin.dat
  Output  filename: P:\2015\15263\SWM\FSR\SET B\OTTHYMO\Post Development.out
  Summary filename: P:\2015\15263\SWM\FSR\SET B\OTTHYMO\Post Development.sum


DATE: 2016-01-18                          TIME: 3:19:41 PM

USER:


COMMENTS: _____________________________________________________

--------------------------------------------------------------------------------
------------------------------
  ****************************
  ** SIMULATION NUMBER:   1 **
  ****************************

--------------------
| CHICAGO STORM    |    IDF curve parameters: A= 531.900
| Ptotal= 29.59 mm |                          B=    .000
--------------------                          C=    .780
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  4.00 hrs
                       Storm time step    = 10.00 min
                       Time to peak ratio =   .33

                TIME    RAIN |  TIME    RAIN |  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |   hrs   mm/hr |   hrs   mm/hr
                 .17    1.84 |  1.17   10.49 |  2.17    3.94 |  3.17    2.16
                 .33    2.08 |  1.33   88.27 |  2.33    3.43 |  3.33    2.02
                 .50    2.42 |  1.50   13.15 |  2.50    3.05 |  3.50    1.90
                 .67    2.90 |  1.67    7.84 |  2.67    2.75 |  3.67    1.79
                 .83    3.68 |  1.83    5.80 |  2.83    2.52 |  3.83    1.70
                1.00    5.23 |  2.00    4.67 |  3.00    2.32 |  4.00    1.62

--------------------------------------------------------------------------------
--
--------------------
| CALIB            |
| STANDHYD  (0013) |   Area    (ha)=    .24
|ID= 1 DT= 3.0 min |   Total Imp(%)=  62.00   Dir. Conn.(%)=  62.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        .15          .09
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      40.20        40.00
     Mannings n            =       .013         .250

         NOTE:  RAINFALL WAS TRANSFORMED TO   3.0 MIN. TIME STEP.

                          ---- TRANSFORMED HYETOGRAPH ----
                TIME    RAIN |  TIME    RAIN |  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |   hrs   mm/hr |   hrs   mm/hr
                .050    1.84 | 1.050   10.49 | 2.050    3.94 |  3.05    2.16
                .100    1.84 | 1.100   10.49 | 2.100    3.94 |  3.10    2.16
                .150    1.84 | 1.150   10.49 | 2.150    3.94 |  3.15    2.16
                .200    2.00 | 1.200   62.35 | 2.200    3.60 |  3.20    2.06
                .250    2.08 | 1.250   88.27 | 2.250    3.43 |  3.25    2.02
                .300    2.08 | 1.300   88.27 | 2.300    3.43 |  3.30    2.02
                .350    2.20 | 1.350   63.23 | 2.350    3.30 |  3.35    1.98
                .400    2.42 | 1.400   13.15 | 2.400    3.05 |  3.40    1.90
                .450    2.42 | 1.450   13.15 | 2.450    3.05 |  3.45    1.90
                .500    2.42 | 1.500   13.15 | 2.500    3.05 |  3.50    1.90
                .550    2.90 | 1.550    7.84 | 2.550    2.75 |  3.55    1.79
                .600    2.90 | 1.600    7.84 | 2.600    2.75 |  3.60    1.79
                .650    2.90 | 1.650    7.84 | 2.650    2.75 |  3.65    1.79
                .700    3.42 | 1.700    6.48 | 2.700    2.60 |  3.70    1.73
                .750    3.68 | 1.750    5.80 | 2.750    2.52 |  3.75    1.70
                .800    3.68 | 1.800    5.80 | 2.800    2.52 |  3.80    1.70
                .850    4.20 | 1.850    5.42 | 2.850    2.45 |  3.85    1.67
                .900    5.23 | 1.900    4.67 | 2.900    2.32 |  3.90    1.62
                .950    5.23 | 1.950    4.67 | 2.950    2.32 |  3.95    1.62
               1.000    5.23 | 2.000    4.67 | 3.000    2.32 |  4.00    1.62

     Max.Eff.Inten.(mm/hr)=      88.27        14.41
               over (min)         6.00         9.00
     Storage Coeff.  (min)=       1.55 (ii)    7.65 (ii)
     Unit Hyd. Tpeak (min)=       6.00         9.00
     Unit Hyd. peak  (cms)=        .34          .14
                                                      *TOTALS*
     PEAK FLOW       (cms)=        .04          .00       .036 (iii)
     TIME TO PEAK    (hrs)=       1.30         1.40       1.30
     RUNOFF VOLUME    (mm)=      28.59         6.87      20.32
     TOTAL RAINFALL   (mm)=      29.59        29.59      29.59
     RUNOFF COEFFICIENT   =        .97          .23        .69

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  80.0    Ia = Dep. Storage  (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--
--------------------
| CALIB            |
| STANDHYD  (0001) |   Area    (ha)=    .25
|ID= 1 DT= 3.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        .24          .00
     Dep. Storage     (mm)=       1.00         1.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      40.50        40.00
     Mannings n            =       .013         .250

     Max.Eff.Inten.(mm/hr)=      88.27       136.85
               over (min)         6.00         3.00
     Storage Coeff.  (min)=       1.56 (ii)    2.74 (ii)
     Unit Hyd. Tpeak (min)=       6.00         3.00
     Unit Hyd. peak  (cms)=        .34          .38
                                                      *TOTALS*
     PEAK FLOW       (cms)=        .06          .00       .058 (iii)
     TIME TO PEAK    (hrs)=       1.30         1.30       1.30
     RUNOFF VOLUME    (mm)=      28.59        26.24      28.57
     TOTAL RAINFALL   (mm)=      29.59        29.59      29.59
     RUNOFF COEFFICIENT   =        .97          .89        .97

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  99.0    Ia = Dep. Storage  (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--
--------------------
| ADD HYD   (0014) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0013):       .24     .036     1.30    20.32
       + ID2= 2 (0001):       .25     .058     1.30    28.57
         ==========================================================
         ID = 3 (0014):       .49     .094     1.30    24.48

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--
--------------------
| RESERVOIR (0012) |
| IN= 2---> OUT= 1 |
| DT=  3.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          .0000      .0000    |    .0460      .0135
                          .0250      .0045    |    .0540      .0180
                          .0370      .0090    |    .0000      .0000

                              AREA      QPEAK       TPEAK       R.V.
                               (ha)      (cms)       (hrs)       (mm)
     INFLOW : ID= 2 (0014)     .488       .094        1.30       24.48
     OUTFLOW: ID= 1 (0012)     .488       .028        1.45       24.39

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 29.23
                  TIME SHIFT OF PEAK FLOW         (min)=  9.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=   .0055

--------------------------------------------------------------------------------
--
  ****************************
  ** SIMULATION NUMBER:   2 **
  ****************************

--------------------
| CHICAGO STORM    |    IDF curve parameters: A=1579.400
| Ptotal= 78.75 mm |                          B=    .000
--------------------                          C=    .800
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  4.00 hrs
                       Storm time step    = 10.00 min
                       Time to peak ratio =   .33

                TIME    RAIN |  TIME    RAIN |  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |   hrs   mm/hr |   hrs   mm/hr
                 .17    4.47 |  1.17   26.65 |  2.17    9.75 |  3.17    5.26
                 .33    5.08 |  1.33  250.32 |  2.33    8.46 |  3.33    4.91
                 .50    5.91 |  1.50   33.57 |  2.50    7.50 |  3.50    4.61
                 .67    7.12 |  1.67   19.76 |  2.67    6.75 |  3.67    4.34
                 .83    9.10 |  1.83   14.49 |  2.83    6.16 |  3.83    4.11
                1.00   13.03 |  2.00   11.60 |  3.00    5.67 |  4.00    3.91

--------------------------------------------------------------------------------
--
--------------------
| CALIB            |
| STANDHYD  (0013) |   Area    (ha)=    .24
|ID= 1 DT= 3.0 min |   Total Imp(%)=  62.00   Dir. Conn.(%)=  62.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        .15          .09
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
```

```
     Length            (m)=      40.20        40.00
     Mannings n          =       .013         .250

         NOTE:  RAINFALL WAS TRANSFORMED TO   3.0 MIN. TIME STEP.


                          ---- TRANSFORMED HYETOGRAPH ----
               TIME    RAIN |  TIME    RAIN |  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |   hrs   mm/hr |   hrs   mm/hr
               .050    4.47 | 1.050   26.65 | 2.050    9.75 |  3.05    5.26
               .100    4.47 | 1.100   26.65 | 2.100    9.75 |  3.10    5.26
               .150    4.47 | 1.150   26.65 | 2.150    9.75 |  3.15    5.26
               .200    4.87 | 1.200  175.76 | 2.200    8.89 |  3.20    5.02
               .250    5.08 | 1.250  250.32 | 2.250    8.46 |  3.25    4.91
               .300    5.08 | 1.300  250.32 | 2.300    8.46 |  3.30    4.91
               .350    5.35 | 1.350  178.07 | 2.350    8.14 |  3.35    4.81
               .400    5.91 | 1.400   33.57 | 2.400    7.50 |  3.40    4.61
               .450    5.91 | 1.450   33.57 | 2.450    7.50 |  3.45    4.61
               .500    5.91 | 1.500   33.57 | 2.500    7.50 |  3.50    4.61
               .550    7.12 | 1.550   19.76 | 2.550    6.75 |  3.55    4.34
               .600    7.12 | 1.600   19.76 | 2.600    6.75 |  3.60    4.34
               .650    7.12 | 1.650   19.76 | 2.650    6.75 |  3.65    4.34
               .700    8.44 | 1.700   16.24 | 2.700    6.36 |  3.70    4.19
               .750    9.10 | 1.750   14.49 | 2.750    6.16 |  3.75    4.11
               .800    9.10 | 1.800   14.49 | 2.800    6.16 |  3.80    4.11
               .850   10.41 | 1.850   13.52 | 2.850    5.99 |  3.85    4.05
               .900   13.03 | 1.900   11.60 | 2.900    5.67 |  3.90    3.91
               .950   13.03 | 1.950   11.60 | 2.950    5.67 |  3.95    3.91
              1.000   13.03 | 2.000   11.60 | 3.000    5.67 |  4.00    3.91

     Max.Eff.Inten.(mm/hr)=     250.32       104.32
               over (min)        6.00         6.00
     Storage Coeff.  (min)=      1.02 (ii)    5.04 (ii)
     Unit Hyd. Tpeak (min)=      6.00         6.00
     Unit Hyd. peak  (cms)=       .36          .21
                                                    *TOTALS*
     PEAK FLOW       (cms)=       .10          .03          .123 (iii)
     TIME TO PEAK    (hrs)=      1.30         1.35         1.30
     RUNOFF VOLUME    (mm)=     77.75        39.63        63.26
     TOTAL RAINFALL   (mm)=     78.75        78.75        78.75
     RUNOFF COEFFICIENT   =       .99          .50          .80

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  80.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--
--------------------
| CALIB            |
| STANDHYD  (0001) |   Area    (ha)=    .25
|ID= 1 DT= 3.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       .24          .00
     Dep. Storage     (mm)=      1.00         1.00
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     40.50        40.00
     Mannings n          =       .013         .250

     Max.Eff.Inten.(mm/hr)=     250.32       991.06
               over (min)        6.00         3.00
     Storage Coeff.  (min)=      1.03 (ii)    1.81 (ii)
     Unit Hyd. Tpeak (min)=      6.00         3.00
     Unit Hyd. peak  (cms)=       .36          .46
                                                    *TOTALS*
     PEAK FLOW       (cms)=       .17          .00          .169 (iii)
     TIME TO PEAK    (hrs)=      1.30         1.30         1.30
     RUNOFF VOLUME    (mm)=     77.75        75.27        77.72
     TOTAL RAINFALL   (mm)=     78.75        78.75        78.75
     RUNOFF COEFFICIENT   =       .99          .96          .99

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  99.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--
--------------------
| ADD HYD   (0014) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0013):      .24     .123     1.30    63.26
        + ID2= 2 (0001):      .25     .169     1.30    77.72
          ================================================
          ID = 3 (0014):      .49     .292     1.30    70.55

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--
--------------------
| RESERVOIR (0012) |
| IN= 2---> OUT= 1 |
| DT=  3.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------       (cms)     (ha.m.)   |    (cms)     (ha.m.)
                           .0000      .0000    |    .0460       .0135
                           .0250      .0045    |    .0540       .0180
                           .0370      .0090    |    .0000       .0000

                                AREA      QPEAK       TPEAK       R.V.
                                (ha)      (cms)       (hrs)       (mm)
     INFLOW : ID= 2 (0014)       .488       .292        1.30       70.55
     OUTFLOW: ID= 1 (0012)       .488       .054        1.45       70.46

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)= 18.47
                    TIME SHIFT OF PEAK FLOW          (min)=  9.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=   .0180

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 FINISH
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WATER BALANCE CALCULATION SHEET

SITE AREA **4870 m**
0.487 ha

WATER BALANCE

SURFACE TYPE	RECHARGE METHOD	SURFACE CAPTURE (mm)	AREA (m^2)	% OF SITE AREA	ANNUAL VOLUME CAPTURE (%)	ANNUAL VOLUME CAPTURE (m^3)
Landscaped Areas	Infiltration	5	1250	25.7	48.0	504.0
Hard Surfaces	Infiltration	1	920	18.9	9.0	69.6
Roof Top (Green)	Infiltration	5	240	4.9	48.0	96.8
Roof Top	Re-Use	10	2460	50.5	69.0	1425.8
TOTAL			**4870**	**100.0**		**2096.1**

TOTAL ANNUAL AVERAGE RAINFALL **840 mm**

CAPTURED VOLUME TARGET
(50% of Total Average Annual Rainfall Volume)
(Total Area x Total Annual Average Rainfall x 50%) **2045.4 m^3**

ANNUAL CAPTURED VOLUME (%) **51%**

STORAGE TANK SIZE (m3) **24.6 m^3**
- Minus Pipe Storage 0.6 m^3
ACTUAL TANK SIZE (m3) **24.0 m^3**