

**STORMWATER MANAGEMENT BRIEF
DIAMOND DETAILING & AUTOMOTIVE
75 TORONTO ROAD
MUNICIPALITY OF PORT HOPE**

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Stormwater Design Brief

The subject property is located 75 Toronto Road in the Municipality of Port Hope. The property is presently vacant, with a total site area of 1,149 sq.m. The property will be developed by Diamond Detailing & Automotive, for 'detailing vehicles' and also selling vehicles.

Design Criteria:

1. ***IDF DATA, YARNELL'S EQUATION***

<i>Return Period</i>	<i>Regression constants</i>	
	<i>a</i>	<i>b</i>
2	1778	13
5	2464	16
10	2819	16
25	3886	18
50	4750	24
100	5588	28

$I=a/(T+b)$, Where T= time of concentration

2. The Stormwater Management Planning and Design Manual, March 2003, prepared by the Ministry of the Environment
3. Runoff Coefficient of 0.25 for open field and landscaped areas
Runoff Coefficient of 0.95 for paved surface, concrete and building roof
4. Rational Method $Q=CIA/360$
Where Q= peak flow (cms)
C= runoff coefficient
I= rainfall intensity (mm/hr)
A= area (hectares)
5. Airport Formula $T_c=3.26*(1.1-C)*(L^{0.5})/S^{1/3}$
Where T_c = time of concentration (min)
C= runoff coefficient
L= length (m)
S= Slope (%)
6. Low Impact Development Stormwater Planning And Design Guideline prepared by the Credit Valley Conservation Authority and The Toronto and Region Conservation Authority.

The peak runoff flows were calculated for the pre-development and post-development conditions for the 2-yr through the 100-yr storm events. IDF data for Yarnell's Equation and the Rational Method were used to calculate the runoff for each of the storms.

Existing/Historical Conditions

The site is presently vacant with surface runoff via sheet flow west towards Toronto Road, where it enters the municipal storm sewer system. Excess flow (Major Storm Event) will travel overland, south on Toronto Road. Historically (Gas Station) the site was entirely impervious, with asphalt and building on the entire lot. The decommissioning of the gas station included the building demolition and the removal of the underground gas tanks. The majority of the impervious surface was removed. In 2017, the west portion of the lot was impervious (estimated 440 sq.m paved) and the eastern portion was pervious (grass/dirt).

Further site clean-up was completed in 2022, leaving the site entirely covered with gravel. The peak runoff flows for the existing conditions and historical conditions are tabulated below for the various storm events.

Existing Conditions: Presently all gravel, with C=0.60
 Calculate runoff coefficient C

Calculate the Peak discharge Q (cms) for existing conditions

t=	10.00	C=	0.60	A=	0.115	
	2-yr		5-yr		10-yr	25-yr
I=	77.30	94.77	108.42	138.79	139.71	147.05
Q=	0.015	0.018	0.021	0.027	0.027	0.028

Historically the entire property was impervious. Use C=0.80. The peak discharge would have been as presented below.

t=	10.00	C=	0.80	A=	0.115	
	2-yr		5-yr		10-yr	25-yr
I=	77.30	94.77	108.42	138.79	139.71	147.05
Q=	0.020	0.024	0.028	0.036	0.036	0.038

The historical peak discharge would have been approximately 35% higher than the peak discharge under existing conditions.

Proposed Re-Development

Drawing 16-551-POST (Post Development Plan) illustrates the proposed development. A 3m landscaping strip along the north and south property line and a 5m landscaping strip along the east property line are proposed. The balance of the site will be impervious (building, asphalt, concrete walk).

The peak runoff flows for the proposed conditions are tabulated below for the various storm events.

Calculate the Runoff coefficient C

POST-DEV	Area	C	A x C
Grass	372	0.25	93
Building	187	0.95	177.65
Asphalt	590	0.95	560.5
Total	1149		831.2
Weighted C		0.72	

Calculate the peak discharge.

t=	10.00	C=	0.74	A=	0.115	
	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
I=	77.30	94.77	108.42	138.79	139.71	147.05
Q=	0.018	0.022	0.025	0.032	0.033	0.034

All surface runoff on the site will be directed towards the landscaped/grassed area in the SW corner of the site as noted. A subdrain will be installed under the landscaped areas on along the east and south property lines which will be connected to a new catchbasin near the SW corner of the site. The catchbasin will discharge into a quality control structure (Auquaswirl or approved equivalent) before entering the existing municipal storm sewer on Toronto Road.

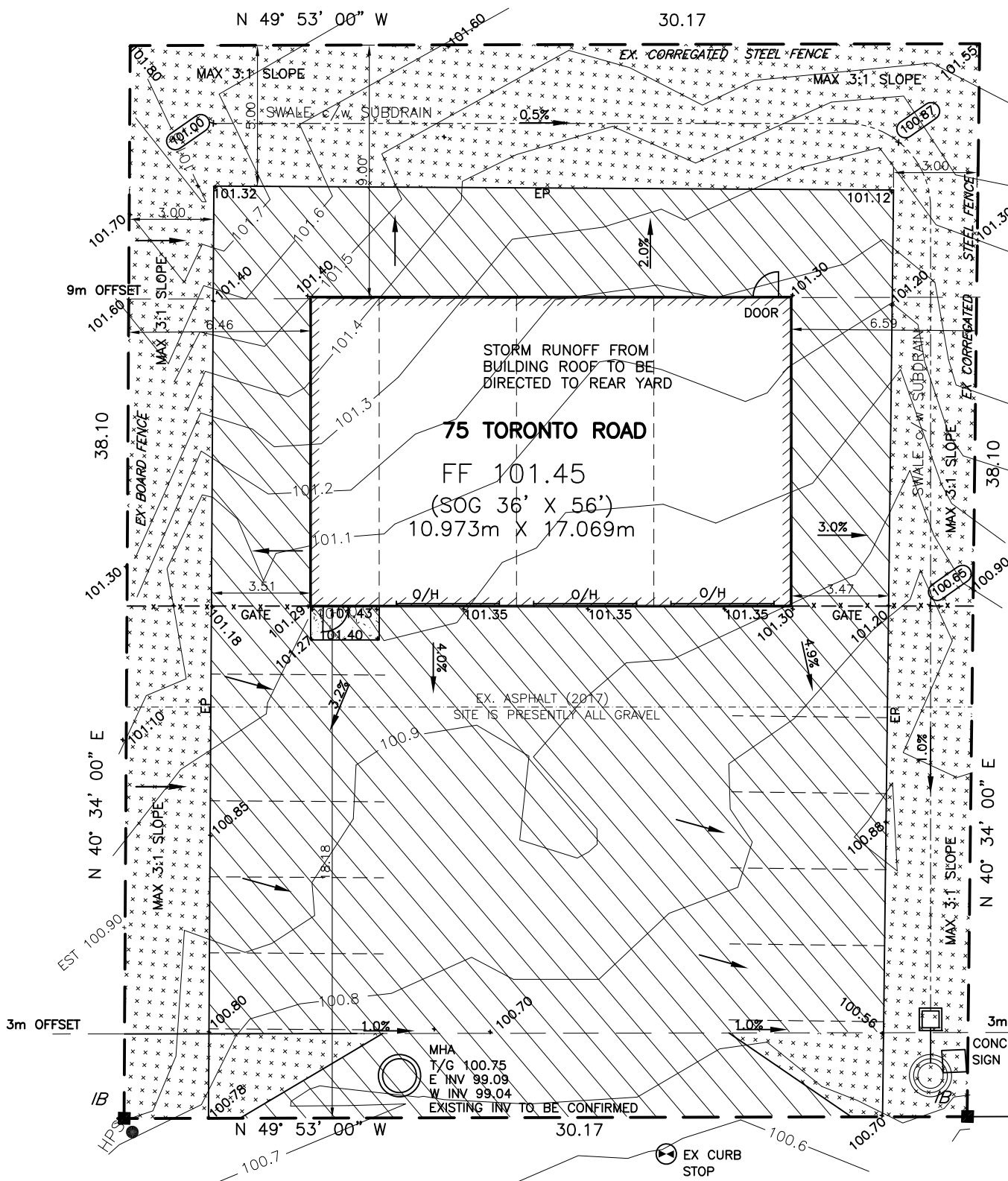
With respect to stormwater quantity controls, the proposed landscaped areas will reduce the historical impervious surface area, and subsequently reduce the peak discharge from the site. The peak flow will be reduced by approximately 10%. Since the peak flow will be less than historical peak flows, Stormwater quantity controls are not be required.

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APPENDIX



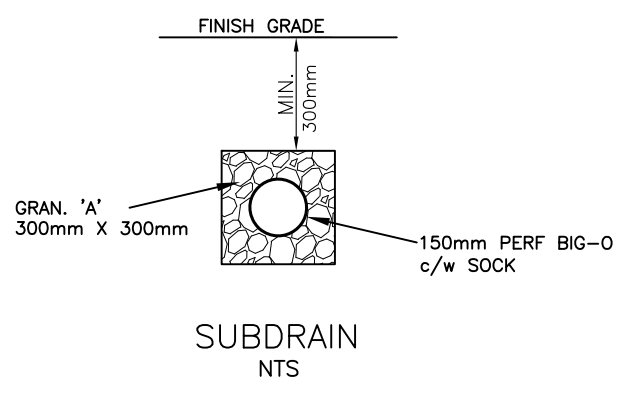
HISTORICALLY, THE SITE WAS USED AS A GAS STATION. PRIOR TO DECOMMISSIONING AND REMOVING THE UNDERGROUND GAS TANKS THE SURFACE OF THE ENTIRE PROPERTY WAS IMPERVIOUS (BUILDING/ASPHALT/CONCRETE). THE SITE CLEAN UP LEFT THE REAR OF THE LOT AS A DIRT/GRASS COVER AREA.

SURFACE AREA SUMMARY

BUILDING	187 sq.m
ASPHALT	590 sq.m
LANDSCAPING	372 sq.m
TOTAL SITE	1,149 sq.m

LEGEND:

- CONTOUR
- + 100.80 PROPOSED GRADE
- [Cross-hatched box] GRASSED/LANDSCAPING
- [Dotted box] CONCRETE SIDEWALK
- [Diagonal lines box] ASPHALT



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