UPPER CANADA CONSULTANTS
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File: 2090

FUNCTIONAL SERVICING REPORT

5558 Drummond Road, Niagara Falls

March 2023

INTRODUCTION

This report is to address the servicing needs and requirements for the 12 unit townhouse condominium in the zoning amendment process. The development is located on the east side of Drummond Road, north of North Street west of Portage Road and south of Prospect Street in the City of Niagara Falls. Historically the property has been occupied with a single detached residential dwelling, but more recently has been vacant land.

The development site is approximately 0.38 hectares and shall consist of 12 townhouse condominium units, and will include associated asphalt parking lot, concrete curbs, catch basins, storm sewers, sanitary service, and a water service.

The objectives of this study are as follows:

1. Identify domestic and fire protection water service needs for the site;
2. Identify sanitary servicing needs for the site; and,
3. Identify stormwater management needs for the site.

WATER SERVICING

There is an existing Regional 500mm diameter C.I. watermain located on Drummond Road as well as a City 150mm diameter C.I. watermain on the east side of Drummond Road. It is proposed to connect a 150mm diameter water service to the existing Municipal 150mm diameter watermain on Drummond Road to provide both domestic water supply and fire protection.

An existing hydrant relocated at the north/east corner of the site on Drummond Road, and a required private fire hydrant will be installed to provide adequate fire protection to the site. The location will be determined as part of the detailed engineering design.

Therefore, the existing water service on Drummond Road can provide sufficient water supply and fire protection for the site.

SANITARY SERVICING

There is an existing 300mm diameter concrete sanitary sewer on Drummond Road conveying flows northerly. It is proposed to connect the proposed site to the existing sanitary sewer on Drummond Road and extend within the site.

The proposed 0.38 hectares, 12 unit townhouse development will produce a peak sanitary outflow of approximately 0.69L/s, occupying 3.2% of the existing 300mm diameter sanitary sewer. It is expected that this will be an acceptable addition to the current capacity of the existing sanitary sewer. All sanitary calculations can be found in Appendix A.

STORMWATER MANAGEMENT

As part of the site development, the following is a summary of the stormwater management plan. The criteria provided by the City of Niagara Falls for this development includes the requirement to control stormwater flows from this site to allowable levels up to and including the 5 year design storm event, and provide stormwater quality controls to MECP Normal Protection (70% TSS removal) levels before discharging from the site.

The current stormwater flows from the site travel overland in a south to north direction, towards the adjacent residential properties on Prospect Street, and westerly to Drummond Road. There is an existing 675mm diameter storm sewer on the west side of Drummond Road that convey the stormwater northerly. It is proposed to outlet to the existing storm sewer system on Drummond Road. As the site has limited stormwater flow to the Drummond Road stormwater system, and the development of the site is increasing the imperviousness, stormwater quantity control will be required for the site stormwater system.

The site was included in the existing drainage area for Drummond Road storm sewer. As shown in Figure 1, 0.18 hectares was included at a Runoff Coefficient of 0.40. The proposed drainage areas and their associated Runoff Coefficients from the impervious areas are shown in Figure 2. The site stormwater system will collect a drainage area of 0.60 hectares, while the remaining 0.03 hectares will flow directly to Drummond Road through overland sheet flow.

The Modified Rational Method (MRM) was used to determine the peak flows and storage volume required for the 100 year storm event as shown in the Appendix B. From the MRM analysis the allowable outflow to Drummond Road stormwater sewer system is 28.3 L/s from A10, less the overland flow of 5.8 L/s from A21.

To control the outflow of 22.5 L/s, a stormwater storage of 62.4m^3 is required. In order to meet the allowable conditions for future stormwater flows, an outlet control, such as orifice and site

stormwater storage, will be implemented at the site. The stormwater storage will be through the use of underground superpipes, maintenance holes, and catch basins. It is estimated that 90.5m of 900mm diameter storm sewer will provide the required storage for the 100 year event.

To improve the quality of stormwater, an oil/grit separator will be utilized to remove Total Suspended Solids (TSS) as required for this type of development. It is estimated that a Hydroworks HD4 will provide 91% TSS removed for this development. The complete stormwater design for this development will be identified as part of the future detailed design.

CONCLUSIONS AND RECOMMENDATIONS

Therefore, based on the above comments and design calculations provided for this site, the following summarizes the servicing for this site.

1. The existing City 150mm diameter watermain will have sufficient capacity to provide both domestic and fire protection water supply.

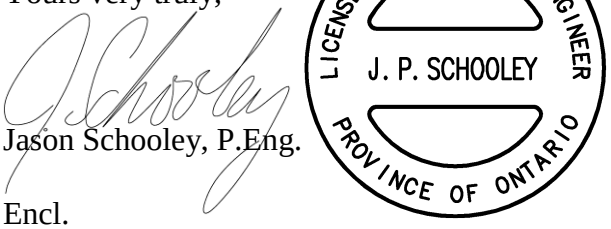
2. The existing 300mm diameter sanitary sewer on Drummond Road will have adequate capacity for the proposed residential development.

3. Stormwater quantity controls are being provided on site to the allowable capacity of the existing Drummond Road storm sewer.

4. Stormwater quality controls will be provided to MECP Normal Protection (70% TSS removal) levels prior to discharge from the site.

In conclusion, there exists adequate municipal infrastructure to service the proposed development. We trust the above comments and enclosed calculations are satisfactory for approval. If you have any questions or require additional information, please do not hesitate to contact our office.

Yours very truly,



Jason Schooley, P.Eng.

Encl.

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APPENDICES

UPPER CANADA CONSULTANTS
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APPENDIX A

Sanitary Sewer Design Sheet

UPPER CANADA CONSULTANTS
3-30 HANNOVER DRIVE
ST.CATHARINES, ONTARIO
L2W 1A3

DESIGN FLOWS

RESIDENTIAL: 320 LITRES/PERSON/DAY (AVERAGE DAILY FLOW)
INFILTRATION RATE: 0.286 L / s / ha (M.O.E FLOW ALLOWANCE IS BETWEEN 0.10 & 0.28 L / s / ha)
POPULATION DENSITY: 3.0 PERSONS / UNIT

SEWER DESIGN

PIPE ROUGHNESS: 0.013 FOR MANNING'S EQUATION
PIPE SIZES: 1.016 IMPERIAL EQUIVALENT FACTOR
PERCENT FULL: TOTAL PEAK FLOW / CAPACITY

MUNICIPALITY: CITY OF NIAGARA FALLS
PROJECT : 5558 Drummond Road
PROJECT NO: 2090

SANITARY SEWER DESIGN SHEET

Peaking Factor= $M = 1 + \frac{14}{4 + P^{0.5}}$ Where P = design population in thousands

LOCATION			AREA		POPULATION				ACCUMULATED PEAK FLOW				DESIGN FLOW					
Location and Description	**From M.H**	**To M.H.**	**Increment (hectares)**	**Accumulated (hectares)**	**Number of Units**	**Population Density (persons/unit)**	**Population Increment**	**Total Population Served**	**Peaking Factor**	**Flow (L/s)**	**Infiltration Flow L/s**	**Total Peak Flow (L/s)**	**Pipe Diameter (mm)**	**Pipe Length (m)**	**Pipe Slope (%)**	**Full Flow Velocity (m/s)**	**Full Flow Capacity (L/s)**	**Percent Full**
PROPOSED DEVELOPMENT	PROP	SEWER	0.38	0.38	12	3.0	36	36	4.34	0.58	0.11	0.69	200	22.0	0.40	0.67	21.64	3.2%
EX DRUMMOND ROAD												0.69	300	16.0	0.98	1.37	99.87	0.7%

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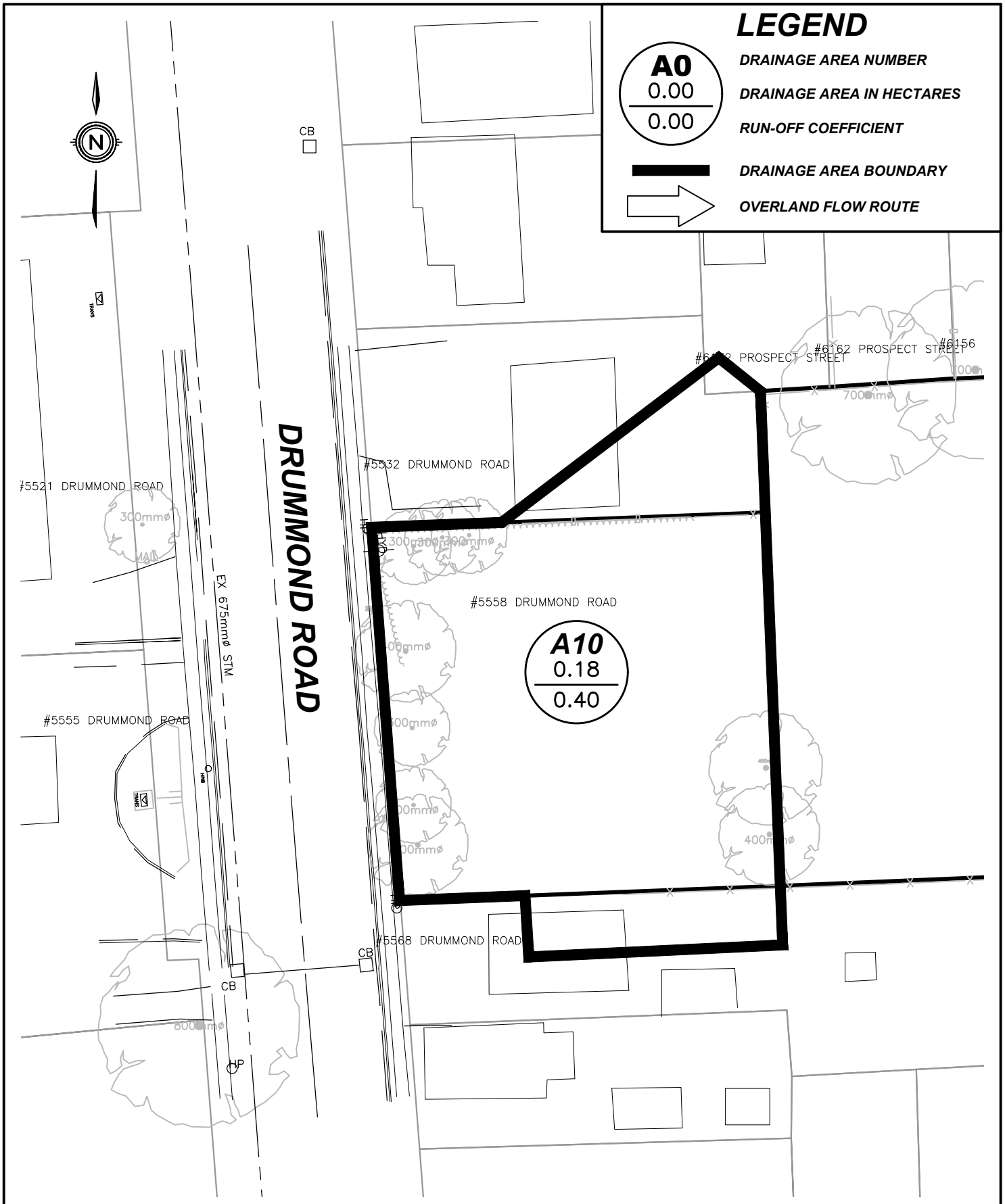
APPENDIX B

Existing Storm Drainage Plan
Proposed Storm Drainage Plan
Weighted Impervious Calculations
Modified Rational Method – Peak Stormwater Flows for 100 Year Storm Event
Hydroworks - HydroDome Simulation



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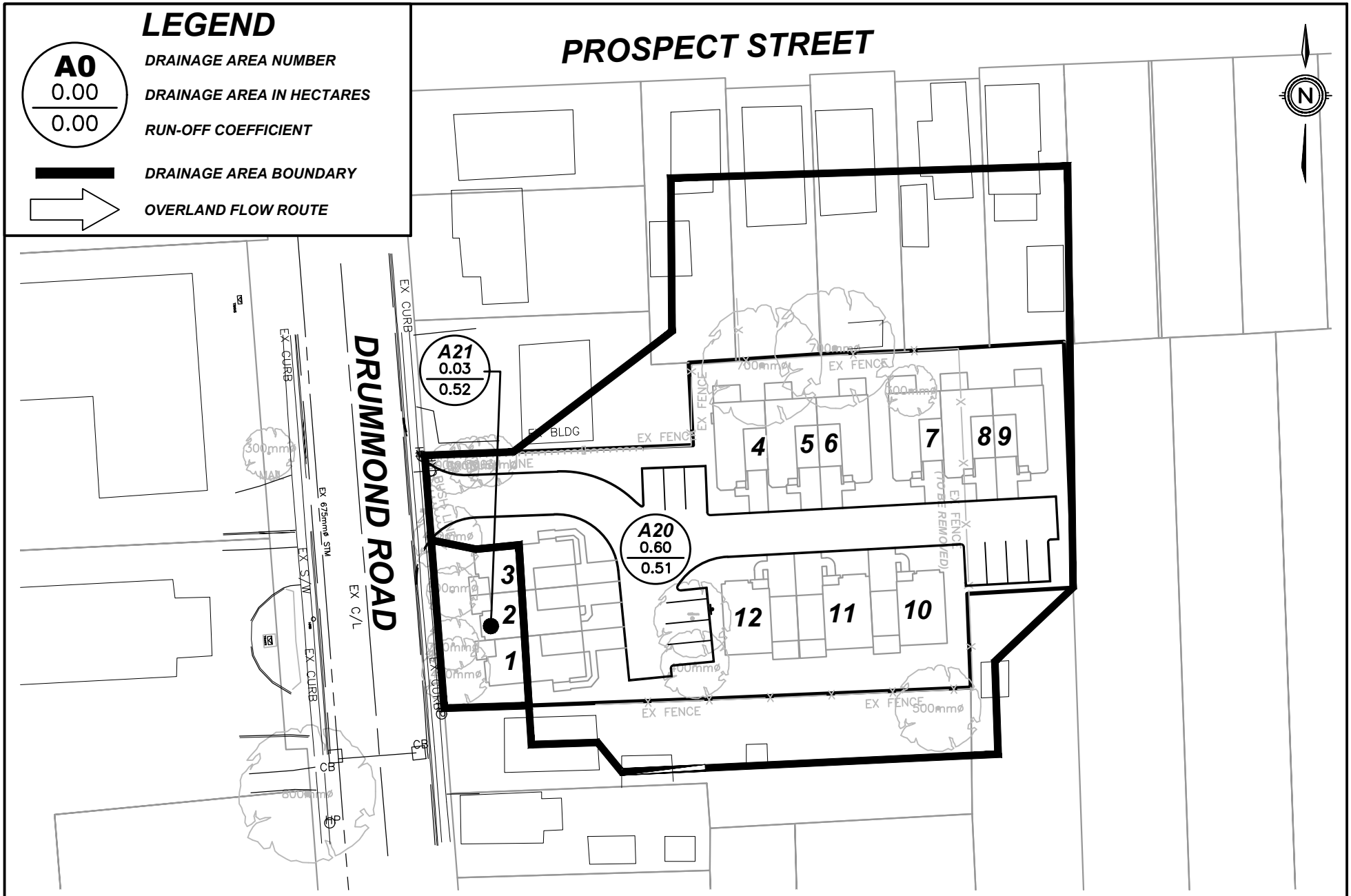
5558 DRUMMOND ROAD

CITY OF NIAGARA FALLS

EXISTING STORM DRAINAGE PLAN

DATE	2023–03–09
SCALE	1:500 m
REF No.	.
DWG No.	*FIGURE 1*

DRAWING FILE: F:\2090\2090–5558 DRUMMOND ROAD FSR.dwg PLOTTED: Mar 14, 2023 – 10:00am PLOTTED BY: roberto



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5558 DRUMMOND ROAD

CITY OF NIAGARA FALLS
PROPOSED STORM DRAINAGE PLAN

DATE	2023-02-23
SCALE	1:750 m
REF No.	.
DWG No.	FIGURE 2

DRAWING FILE: F:\2090\2090-5558 DRUMMOND ROAD FSR.dwg PLOTTED: Mar 14, 2023 - 9:57am PLOTTED BY: roberto

Weighted Percent Impervious Calculations

Project Name:	5558 Drummond Road, City of Niagara Falls
UCC Project Number:	2090
Date:	March 9, 2023

Proposed Conditions - Area A20

Area Type	Area (m^2)	% Impervious	Impervious Area (m^2)
Buildings, Asphalt and Concrete Surfaces	131	100%	131.2
Landscape, Greenspace, and Park	156	0%	0.0
		Total Catchment Impervious Area (m^2)	131
		Total Catchment Area (m^2)	287
		Weighted Percent Impervious (%)	45.7%
		Weighted Runoff Coefficent [c]	0.52

Proposed Conditions - Area A21

Area Type	Area (m^2)	% Impervious	Impervious Area (m^2)
Buildings, Asphalt and Concrete Surfaces	2,667	100%	2,667.0
Landscape, Greenspace, and Park	3,303	0%	0.0
		Total Catchment Impervious Area (m^2)	2,667
		Total Catchment Area (m^2)	5,970
		Weighted Percent Impervious (%)	44.7%
		Weighted Runoff Coefficent [c]	0.51

STORM SEWER DESIGN SHEET

PROJECT / SUBDIVISION: 5558 Drummond Road, City of Niagara Falls

LOCATION						TIME OF FLOW		STORMWATER ANALYSIS				
DESCRIPTION	**FROM M.H.**	**TO M.H.**	**PIPE LENGTH (m)**	**INCREMENT AREA (hectares)**	**TOTAL AREA (hectares)**	**TO UPPER END (min)**	**IN SECTION (min)**	**RUNOFF COEFF**	**SECTION A X R**	**ACCUMLD A x R**	**RAINFALL INTENSITY (mm/hr)**	**PEAK FLOW (L/s)**
PRE-DEVELOPMENT CONDITIONS												
A10	SITE	DRUMMOND ROAD		0.19	0.19	10.00	0.00	0.400	0.076	0.076	133.938	**28.3**
POST-DEVELOPMENT CONDITIONS												
A20	SITE	DRUMMOND ROAD		0.60	0.60	10.00	0.00	0.510	0.306	0.306	133.938	**113.8**
A21	SITE	DRUMMOND ROAD		0.03	0.03	10.00	0.00	0.520	0.016	0.016	133.938	**5.8**
						Allowable Structure Control Discharge to Drummond Road						**22.5**

DESIGN BY: **UPPER CANADA CONSULTANTS**
3-30 HANNOVER DRIVE
ST. CATHARINES, ON L2W 1A3
DESIGN BY: **Roberto Duarte, B. Eng.**
DATE: **March 9, 2023**

RAINFALL PARAMETERS:
Time to Upper End = 10 min.
City of Niagara Falls - 100 Year IDF Curve

a = 1264.60 mm/hr
b = 7.72 minutes
c = 0.78

Modified Rational Method (MRM) Required Storage Volume

Project:	5558 Drummond Road, City of Niagara Falls
Project No:	2090
Date:	2023-03-09
Design By:	Roberto Duarte, B. Eng.
Description:	*Stormwater Management Plan, Quantity Control Storage Volume Calculation*

Storm Event: **City of Niagara Falls - 100 Year IDF Curve**

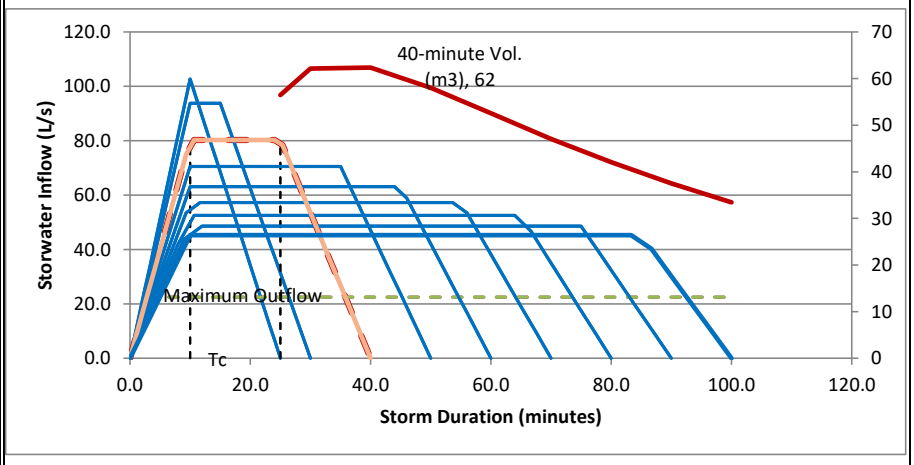
a =	1264.60	mm/hr
b =	7.72	minutes
c =	0.78	

Critical Storm Duration:	40.00	minutes	Tail Multiplier (x1-1.5) 1.5
Tc From Design:	10.00	minutes	
Storm Tail Time:	25.00	minutes	
Accumulated Area x R (Ha):	0.306		<-- Area x Runoff Coefficient (Sewer Design Sheet)
Peak Rainfall Intensity:	94.43	mm/hr	
Peak Inflow at Tc:	80.27	L/s	
Maximum Release Rate:	22.5		<-- Outlet Full Flow Capacity (Design Sheet)
Time When Outlet Exceeded:	2.80		

Time (min)	Intensity (mm/hr)	Inflow (L/s)	Outflow (L/s)	Interval Volume (m3)	Total Required Volume (m3)
0.0	0.00	0.00	22.47	-1.3	0.0
1.3	12.59	10.70	22.47	-0.7	0.0
2.7	25.18	21.41	22.47	-0.1	0.0
4.0	37.77	32.11	22.47	0.6	0.6
5.3	50.37	42.81	22.47	1.2	1.8
6.7	62.96	53.51	22.47	1.9	3.7
8.0	75.55	64.22	22.47	2.5	6.2
9.3	88.14	74.92	22.47	3.1	9.3
10.7	94.43	80.27	22.47	3.5	12.8
12.0	94.43	80.27	22.47	3.5	16.2
13.3	94.43	80.27	22.47	3.5	19.7
14.7	94.43	80.27	22.47	3.5	23.2
16.0	94.43	80.27	22.47	3.5	26.7
17.3	94.43	80.27	22.47	3.5	30.1
18.7	94.43	80.27	22.47	3.5	33.6
20.0	94.43	80.27	22.47	3.5	37.1
21.3	94.43	80.27	22.47	3.5	40.5
22.7	94.43	80.27	22.47	3.5	44.0
24.0	94.43	80.27	22.47	3.5	47.5
25.3	92.34	78.49	22.47	3.4	50.8
26.7	83.94	71.35	22.47	2.9	53.8
28.0	75.55	64.22	22.47	2.5	56.3
29.3	67.15	57.08	22.47	2.1	58.3
30.7	58.76	49.95	22.47	1.6	60.0
32.0	50.37	42.81	22.47	1.2	61.2
33.3	41.97	35.68	22.47	0.8	62.0
34.7	33.58	28.54	22.47	0.4	***62.4***
36.0	25.18	21.41	22.47	-0.1	62.3
37.3	16.79	14.27	22.47	-0.5	61.8
38.7	8.39	7.14	22.47	-0.9	60.9
40.0	0.00	0.00	22.47	-1.3	59.5

Variable Storm Duration Storage Requirements

Duration	*Max Storage*	*Duration*	*Max Storage*	*Duration*	*Max Storage*
25 Min	56.5 m3	50 Min	58.0 m3	80 Min	42.0 m3
30 Min	62.2 m3	60 Min	52.5 m3	90 Min	37.5 m3
40 Min	**62.4 m3**	70 Min	47.1 m3	100 Min	33.4 m3



```
          ************************************************
          *      Storm Water Management Sizing Model     *
          *               Hydroworks, LLC                *
          *                Version 4.4                   *
          *                                              *
          *        Continuous Simulation Program         *
          *              Based on SWMM 4.4H              *
          *              Hydroworks, LLC                 *
          *               Graham Bryant                  *
          *                2003 - 2021                   *
          ************************************************
                           Developed by
          ************************************************
          *              Hydroworks, LLC                 *
          *            Metcalf & Eddy, Inc.              *
          *           University of Florida              *
          *       Water Resources Engineers, Inc.        *
          *      (Now Camp Dresser & McKee, Inc.)        *
          *              Modified SWMM 4.4               *
          ************************************************
                    Distributed and Maintained by
          ************************************************
          *                                              *
          *               Hydroworks, LLC                *
          *                888-290-7900                  *
          *              www.hydroworks.com              *
          *                                              *
          ************************************************
          ************************************************
          *     If any problems occur executing this     *
          *     model, contact Mr. Graham Bryant at      *
          *     Hydroworks, LLC by phone at 888-290-7900 *
          *     or by e-mail: support@hydroworks.com     *
          ************************************************
          ************************************************
          *     This model is based on EPA SWMM 4.4      *
          *  "Nature is full of infinite causes which    *
          *   have never occurred in experience" da Vinci *
          ************************************************
          ************************************************
          * Entry made to the Rain Block                 *
          * Created by the University of Florida - 1988  *
          * Updated by Oregon State University, March 2000 *
          ************************************************

              5558 Drummond Road
          City of Niagara Falls

          HydroDome Simulation

         ########################################
         #  Precipitation Block Input Commands  #
         ########################################

        Station Name.........................  St. Catherines A
        Station Location.....................  Ontario
        Station, ISTA........................    7287
        Beginning date, IYBEG (Yr/Mo/Dy).....  1971/ 1/ 1
        Ending date, IYEND (Yr/Mo/Dy).........  2005/12/31
        Minimum interevent time, MIT..........     1
        Number of ranked storms, NPTS.........    10
        NWS format, IFORM (See text)..........     1
        Print storm summary, ISUM (O-No 1-Yes)     0
        Print all rainfall, IYEAR (O-No 1-Yes)     0
        Save storm event data on NSCRAT(1)....     0
        (IFILE =0 -Do not save, =1 -Save data)
        IDECID 0 - Create interface file
               1 - Create file and analyze
               2 - Synoptic analysis..........     2
        Plotting position parameter, A........  0.40
        Storm event statistics, NOSTAT........  1100

        KODEA (from optional group B0).........     2
         = 0, Do not include NCDC cumulative values.
         = 1, Average NCDC cumulative values.
         = 2, Use NCDC cumulative value as inst. rain.

        KODEPR (from optional group B0).......     0
         Print NCDC special codes in event summary:
         = 0, only on days with events.
         = 1, on all days with codes present.
         Codes: A = accumulated value, I = incomplete value,
                M = missing value,     O = other code present

    ******************************************************
    *  Precipitation output created using the Rain block   *
    *  Number of precipitation stations...        1        *
    ******************************************************

    Location Station Number
    -------- --------------
           1.     7287

    STATION ID ON PRECIP. DATA INPUT FILE = 7287
    REQUESTED STATION ID =     7287  CHECK TO BE SURE THEY MATCH.
```

$$
Note, 15-min. data are being processed, but hourly
print-out, summaries, and statistics are based on
hourly totals only. Data placed on interface file
are at correct 15-min. intervals.
$$

##
Entry made to the Runoff Block, last updated by
Oregon State University, and Camp, Dresser and
McKee, Inc., March 2002.
##
"And wherever water goes, amoebae go along for
the ride"   Tom Robbins
##

Snowmelt parameter - ISNOW.....................   0
Number of rain gages - NRGAG...................   1
Horton infiltration equation used - INFILM.....   2
Maximum infiltration volume is limited to RMAXINF input on subcatchment lines.
Infiltration volume regenerates during non rainfall periods.
Quality is simulated - KWALTY..................   1
IVAP is negative. Evaporation will be set to zero
    during time steps with rainfall.
Read evaporation data on line(s) F1 (F2) - IVAP..   1
Hour of day at start of storm - NHR............   1
Minute of hour at start of storm - NMN.........   1
Time TZERO at start of storm (hours)...........   1.017
Use Metric units for I/O - METRIC..............   1
 ===> Ft-sec units used in all internal computations
Runoff input print control...   0
Runoff graph plot control....   1
Runoff output print control..   0
Print headers every 50 lines - NOHEAD (0=yes, 1=no)   0
Print land use load percentages -LANDUPR (0=no, 1=yes)   0
Limit number of groundwater convergence messages to 10000 (if simulated)
Month, day, year of start of storm is: 1/ 1/1971
Wet time step length (seconds).......   300.
Dry time step length (seconds).......   900.
Wet/Dry time step length (seconds)...   450.
Simulation length is.....   20051231.0 Yr/Mo/Dy
Percent of impervious area with zero detention depth   25.0
Horton infiltration model being used
Rate for regeneration of infiltration = REGEN * DECAY
DECAY is read in for each subcatchment
REGEN = ...   0.01000

****
*   Processed Precipitation will be read from file   *
****

  ##############################
  #   Data Group F1   #
  # Evaporation Rate (mm/day) #
  ##############################

 JAN. FEB. MAR. APR. MAY   JUN. JUL. AUG. SEP. OCT. NOV. DEC.
 ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ----
 0.00 0.00 0.00 2.54 2.54 3.81 3.81 3.81 2.54 2.54 0.00 0.00

****
*   C H A N N E L A N D P I P E D A T A   *
****

Input   NAMEG: Drains   Invert L Side   R Side Intial   Max Mann-   Full
equen Channel   to   Channel Width Length   Slope   Slope   Slope   Depth   Depth   ings   Flow
umber   ID #   NGTO: Type   (m)   (m)   (m/m)   (m/m)   (m/m)   (m)   (m)   "N"   (cms)
----- ---------- -------- ------ ------- ------- ------- -------- ------- ------- ------- ----- -----
  1   201   200   Dummy   0.0   0.0   0.0000   0.0000 0.0000   0.0   0.0 0.0000 0.00E+00

 ****
 *   S U B C A T C H M E N T D A T A   *
 ****

NOTE. SEE LATER TABLE FOR OPTIONAL SUBCATCHMENT PARAMETERS

      SUBCATCH- CHANNEL   WIDTH   AREA PERCENT   SLOPE   RESISTANCE FACTOR   DEPRES. STORAGE(MM) INFILTRATION   DECAY RATE GAGE MAXIMUM
       MENT NO. OR INLET   (M)   (HA) IMPERV.   (M/M)   IMPERV.   PERV.   IMPERV.   PERV.   RATE(MM/HR)   (1/SEC)   NO. VOLUME
                                                                                                            MAXIMUM MINIMUM   (MM)
 --- --------   -------- --------- -------- -----   ------- ------- -------- ------   ------   ----   ------- ------- ------ -------
  1   300   200   77.46   0.60 44.70   0.0200   0.015   0.250   0.510   5.080   63.50   10.16   0.00055   1 101.60000

TOTAL NUMBER OF SUBCATCHMENTS...   1
TOTAL TRIBUTARY AREA (HECTARES).   0.60
IMPERVIOUS AREA (HECTARES)......   0.27
PERVIOUS AREA (HECTARES)........   0.33
TOTAL WIDTH (METERS)............   77.46
PERCENT IMPERVIOUSNESS..........   44.70

****
*   G R O U N D W A T E R   I N P U T   D A T A   *
****

SUB-CATCH NUMBER	CHANNEL OR INLET	GROUND (M)	BOTTOM (M)	STAGE (M)	BC (M)	TW (M)	A1 (MM/HR-M^B1)	B1	A2 (MM/HR-M^B2)	B2	A3 (MM/HR-M^2)
0	602	3.05	0.00	0.00	0.61	0.61	3.484E-04	2.600	0.000E+00	1.000	0.00E+00

****
* G R O U N D W A T E R I N P U T D A T A (CONTINUED) *
****

S O I L P R O P E R T I E S

SUBCAT. NO.	POROSITY	SATURATED HYDRAULIC CONDUCTIVITY (mm/hr)	WILTING POINT	FIELD CAPACITY	INITIAL MOISTURE	MAX. DEEP PERCOLATION (mm/hr)	PERCOLATION PARAMETERS HCO	PCO	ET PARAMETERS DEPTH OF ET (m)	FRACTION OF ET TO UPPER ZONE
0	.4000	127.000	.1500	.3000	.3000	5.080E-02	10.00	4.57	4.27	0.350

****
* Arrangement of Subcatchments and Channel/Pipes *
****
* See second subcatchment output table for connectivity *
* of subcatchment to subcatchment flows.   *
****

Channel or Pipe
201 No Tributary Channel/Pipes
No Tributary Subareas.....

INLET
200 Tributary Channel/Pipes... 201
Tributary Subareas........ 300

****
* Hydrographs will be stored for the following 1 INLETS *
****
200

##
Quality Simulation
##
General Quality Control Data Groups
##

Description	Variable	Value	
Number of quality constituents.....	NQS.....	1	
Number of land uses.....	JLAND.....	1	
Standard catchbasin volume.....	CBVOL.....	1.22	cubic meters
Erosion is not simulated.....	IROS.....	0	
DRY DAYS PRIOR TO START OF STORM...	DRYDAY.....	3.00	DAYS
DRY DAYS REQUIRED TO RECHARGE CATCHBASIN CONCENTRATION TO INITIAL VALUES.....	DRYBSN.....	5.00	DAYS
DUST AND DIRT STREET SWEEPING EFFICIENCY.....	REFFDD.....	0.300	
DAY OF YEAR ON WHICH STREET SWEEPING BEGINS.....	KLNBGN.....	120	
DAY OF YEAR ON WHICH STREET SWEEPING ENDS.....	KLNEND.....	270	

##
Land use data on data group J2
##

LAND USE NAME	BUILDUP EQUATION TYPE (METHOD)	FUNCTIONAL DEPENDENCE OF BUILDUP PARAMETER(JACGUT)	LIMITING BUILDUP QUANTITY (DDLIM)	BUILDUP POWER (DDPOW)	BUILDUP COEFF. (DDFACT)	CLEANING INTERVAL IN DAYS (CLFREQ)	AVAIL. FACTOR FRACTION (AVSWP)	DAYS SINCE LAST SWEEPING (DSLCL)
Urban De	EXPONENTIAL(1)	AREA(1)	2.802E+01	0.500	67.250	30.000	0.300	30.000

##
Constituent data on data group J3
##

	Total Su
Constituent units.....	mg/l
Type of units.....	0
KALC.....	2
Type of buildup calc.....	EXPONENTIAL(2)
KWASH.....	0
Type of washoff calc.....	POWER EXPONEN.(0)
KACGUT.....	1
Dependence of buildup....	AREA(1)
LINKUP.....	0
Linkage to snowmelt.....	NO SNOW LINKAGE
Buildup param 1 (QFACT1).	28.020
Buildup param 2 (QFACT2).	0.500
Buildup param 3 (QFACT3).	67.250
Buildup param 4 (QFACT4).	0.000

```
Buildup param 5 (QFACT5).           0.000
Washoff power (WASHPO)...           1.100
Washoff coef. (RCOEF)....           0.086
Init catchb conc (CBFACT)         100.000
Precip. conc. (CONCRN)...           0.000
Street sweep effic (REFF)           0.300
Remove fraction (REMOVE).           0.000
1st order QDECAY, 1/day..           0.000
Land use number.........               1

************************************************
* Constant Groundwater Quality Concentration(s) *
************************************************

 Total Susp has a concentration of..    0.0000   mg/l

************************************************
* REMOVAL FRACTIONS FOR SELECTED CHANNEL/PIPES *
* FROM J7 LINES                                *
************************************************

  CHANNEL/   CONSTITUENT
     PIPE Total Susp
----------  --------
       201     0.000

*****************************************************
*     Subcatchment surface quality on data group L1 *
*****************************************************

                                Total   Number   Input
                          Land  Gutter     of    Loading
                Land      Use   Length   Catch-  load/ha
          No.  Usage     No.     Km     Basins   Total Su
        ------ --------  ----  -------- --------  -------
   1        300 Urban De  1        0.15     2.00  0.0E+00
   Totals (Loads in kg or other)    0.15     2.00  0.0E+00

    ***********************
    *    DATA GROUP M1    *
    ***********************

TOTAL NUMBER OF PRINTED GUTTERS/INLETS...NPRNT..        1
NUMBER OF TIME STEPS BETWEEN PRINTINGS..INTERV..        0
STARTING AND STOPPING PRINTOUT DATES............        0        0

    ***********************
    *    DATA GROUP M3    *
    ***********************

CHANNEL/INLET PRINT DATA GROUPS......       -200

          ****************************************
          * Rainfall from Nat. Weather Serv. file  *
          * in units of hundredths of an inch      *
          ****************************************

Rainfall Station    St. Catherines A
State/Province      Ontario
Rainfall Depth Summary (mm)
```

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1971.	31.	0.	0.	0.	0.	0.	126.	93.	52.	60.	29.	0.	391.
1972.	0.	0.	0.	47.	65.	100.	39.	115.	63.	90.	1.	0.	521.
1973.	0.	0.	0.	103.	77.	71.	53.	29.	63.	139.	0.	0.	534.
1974.	0.	0.	0.	67.	105.	62.	50.	31.	74.	37.	110.	0.	536.
1975.	0.	0.	0.	0.	0.	94.	78.	76.	73.	56.	59.	6.	442.
1976.	0.	0.	0.	119.	136.	87.	101.	60.	72.	73.	13.	1.	662.
1977.	0.	0.	0.	94.	29.	69.	57.	150.	230.	71.	0.	1.	701.
1978.	0.	0.	0.	72.	43.	72.	43.	86.	156.	95.	0.	0.	567.
1979.	0.	0.	0.	84.	92.	33.	91.	88.	84.	129.	71.	0.	673.
1980.	0.	0.	0.	81.	39.	122.	60.	32.	79.	96.	45.	0.	554.
1981.	0.	0.	0.	91.	71.	106.	122.	61.	123.	91.	84.	0.	749.
1982.	0.	0.	0.	28.	65.	97.	36.	66.	82.	25.	143.	0.	544.
1983.	0.	0.	0.	78.	100.	65.	55.	106.	75.	122.	92.	0.	694.
1984.	0.	0.	0.	31.	113.	136.	19.	51.	144.	24.	44.	0.	562.
1985.	0.	0.	67.	32.	52.	64.	40.	94.	42.	109.	0.	1.	501.
1986.	0.	0.	0.	93.	113.	60.	85.	83.	98.	80.	43.	65.	719.
1987.	0.	2.	11.	77.	42.	80.	122.	97.	99.	71.	94.	34.	730.
1988.	0.	0.	41.	71.	42.	21.	110.	82.	70.	68.	75.	5.	585.
1989.	0.	0.	13.	63.	137.	108.	36.	45.	89.	73.	84.	0.	647.
1990.	0.	2.	38.	99.	124.	44.	68.	95.	56.	112.	96.	0.	735.
1991.	0.	0.	86.	124.	67.	31.	85.	57.	79.	64.	61.	28.	682.
1992.	0.	0.	29.	127.	56.	92.	185.	116.	77.	47.	103.	38.	869.
1993.	3.	0.	7.	83.	56.	86.	32.	61.	71.	92.	80.	38.	610.
1994.	0.	0.	44.	88.	105.	124.	48.	77.	117.	15.	0.	15.	633.
1995.	112.	23.	16.	48.	37.	60.	123.	66.	8.	137.	94.	0.	724.
1998.	0.	0.	0.	0.	51.	54.	64.	29.	9.	0.	1.	0.	207.
1999.	0.	0.	0.	79.	59.	35.	61.	58.	116.	78.	0.	0.	487.
2000.	0.	0.	0.	123.	134.	216.	51.	0.	0.	0.	10.	0.	534.
2001.	0.	0.	0.	56.	88.	45.	25.	30.	81.	129.	0.	0.	454.
2002.	0.	0.	0.	73.	104.	64.	53.	49.	52.	65.	8.	0.	468.
2003.	0.	0.	0.	10.	163.	77.	81.	64.	67.	73.	2.	0.	537.
2004.	0.	0.	0.	131.	126.	99.	115.	40.	88.	17.	0.	0.	616.
2005.	0.	0.	0.	38.	42.	78.	53.	120.	112.	0.	0.	0.	443.

```
Total Rainfall Depth for Simulation Period    19310. (mm)
```

Rainfall Intensity Analysis (mm/hr)

(mm/hr)	(#)	(%)	(mm)	(%)
2.50	21481	74.6	6454.	33.4
5.00	3585	12.4	3088.	16.0
7.50	1973	6.8	2886.	14.9
10.00	575	2.0	1233.	6.4
12.50	389	1.4	1070.	5.5
15.00	194	0.7	660.	3.4
17.50	210	0.7	846.	4.4
20.00	66	0.2	306.	1.6
22.50	92	0.3	487.	2.5
25.00	39	0.1	232.	1.2
27.50	37	0.1	246.	1.3
30.00	34	0.1	245.	1.3
32.50	29	0.1	228.	1.2
35.00	5	0.0	42.	0.2
37.50	10	0.0	90.	0.5
40.00	10	0.0	97.	0.5
42.50	12	0.0	124.	0.6
45.00	9	0.0	99.	0.5
47.50	1	0.0	12.	0.1
50.00	3	0.0	37.	0.2
>50.00	49	0.2	829.	4.3

Total # of Intensities 28803

Daily Rainfall Depth Analysis (mm)

(mm)	(#)	(%)	(mm)	(%)
2.50	1077	38.9	1247.	6.5
5.00	507	18.3	1850.	9.6
7.50	326	11.8	2006.	10.4
10.00	226	8.2	1958.	10.1
12.50	150	5.4	1672.	8.7
15.00	111	4.0	1495.	7.7
17.50	100	3.6	1620.	8.4
20.00	67	2.4	1260.	6.5
22.50	45	1.6	958.	5.0
25.00	37	1.3	881.	4.6
27.50	23	0.8	609.	3.2
30.00	20	0.7	575.	3.0
32.50	20	0.7	631.	3.3
35.00	12	0.4	405.	2.1
37.50	8	0.3	290.	1.5
40.00	9	0.3	350.	1.8
42.50	4	0.1	165.	0.9
45.00	4	0.1	173.	0.9
47.50	2	0.1	91.	0.5
50.00	4	0.1	192.	1.0
>50.00	15	0.5	882.	4.6

Total # Days with Rain 2767

****
* End of time step DO-loop in Runoff *
****

Final Date (Mo/Day/Year) = 1/ 1/2006
Total number of time steps = 2056313
Final Julian Date = 2006001
Final time of day = 1. seconds.
Final time of day = 0.00 hours.
Final running time = 306816.0000 hours.
Final running time = 12784.0000 days.

****
* Extrapolation Summary for Watersheds *
* # Steps ==> Total Number of Extrapolated Steps *
* # Calls ==> Total Number of OVERLND Calls *
****

Subcatch	# Steps	# Calls	Subcatch	# Steps	# Calls	Subcatch	# Steps	# Calls
300	6136625	1552403						

****
* Extrapolation Summary for Channel/Pipes *
* # Steps ==> Total Number of Extrapolated Steps *
* # Calls ==> Total Number of GUTNR Calls *
****

Chan/Pipe	# Steps	# Calls	Chan/Pipe	# Steps	# Calls	Chan/Pipe	# Steps	# Calls
201	0	0						

****
* Continuity Check for Surface Water *
****

	cubic meters	Millimeters over Total Basin
Total Precipitation (Rain plus Snow)	115574.	19263.
Total Infiltration	63658.	10610.
Total Evaporation	5010.	835.
Surface Runoff from Watersheds	47513.	7919.
Total Water remaining in Surface Storage	0.	0.
Infiltration over the Pervious Area...	63658.	19186.

Infiltration + Evaporation +
Surface Runoff + Snow removal +

```
Water remaining in Surface Storage +
Water remaining in Snow Cover.........                    116181.     19364.
Total Precipitation + Initial Storage.                    115574.     19263.

The error in continuity is calculated as
****************************************
* Precipitation + Initial Snow Cover  *
*      - Infiltration -               *
*Evaporation - Snow removal -         *
*Surface Runoff from Watersheds -     *
*Water in Surface Storage -           *
*Water remaining in Snow Cover        *
*-------------------------------------*
* Precipitation + Initial Snow Cover  *
****************************************
Error.................................       -0.525 Percent

*********************************************
*       Continuity Check for Channel/Pipes   *
*********************************************
                                                          Millimeters over
                                                cubic meters  Total Basin
Initial Channel/Pipe Storage.................                0.         0.
Final Channel/Pipe Storage...................                0.         0.
Surface Runoff from Watersheds...............               47513.      7919.
Baseflow.....................................                0.
Groundwater Subsurface Inflow................                0.         0.
Evaporation Loss from Channels...............                0.         0.
Channel/Pipe/Inlet Outflow...................               47513.      7919.
Initial Storage + Inflow.....................               47513.      7919.
Final Storage + Outflow......................               47513.      7919.
*********************************************
* Final Storage + Outflow + Evaporation  - *
* Watershed Runoff - Groundwater Inflow  - *
*     Initial Channel/Pipe Storage         *
*     ----------------------------------   *
*  Final Storage + Outflow  + Evaporation  *
*********************************************
Error.........................................      0.000 Percent

*************************************************
*     Continuity Check for Subsurface Water       *
*************************************************
                                                          Millimeters over
                                              cubic meters  Subsurface Basin

Total Infiltration                                           0.         0.
Total Upper Zone ET                                          0.         0.
Total Lower Zone ET                                          0.         0.
Total Groundwater flow                                       0.         0.
Total Deep percolation                                       0.         0.
Initial Subsurface Storage                                5486.       914.
Final Subsurface Storage                                  5486.       914.
Upper Zone ET over Pervious Area                             0.         0.
Lower Zone ET over Pervious Area                             0.         0.

****************************************
* Infiltration + Initial Storage - Final *
* Storage - Upper and Lower Zone ET -    *
* Groundwater Flow - Deep Percolation    *
* -------------------------------------- *
*     Infiltration + Initial Storage     *
****************************************
Error ........................................     0.000 Percent
```

SUMMARY STATISTICS FOR SUBCATCHMENTS

SUBCATCHMENT NO.	GUTTER OR INLET NO.	AREA (HA)	PERCENT IMPER.	PERVIOUS AREA: TOTAL SIMULATED RAINFALL DEPTH (MM)	PERVIOUS AREA: TOTAL RUNOFF LOSSES (MM)	PERVIOUS AREA: PEAK RUNOFF RATE (CMS)	IMPERVIOUS AREA: RUNOFF DEPTH (MM)	IMPERVIOUS AREA: PEAK RUNOFF RATE (CMS)	TOTAL SUBCATCHMENT AREA: RUNOFF DEPTH (MM)	TOTAL SUBCATCHMENT AREA: PEAK RUNOFF RATE (CMS)	TOTAL SUBCATCHMENT AREA: PEAK UNIT RUNOFF (MM/HR)
300	200	0.60	44.71	9262.47	75.29********	0.08117	621.418	0.146	7918.411	0.227	137.556

*** NOTE *** IMPERVIOUS AREA STATISTICS AGGREGATE IMPERVIOUS AREAS WITH AND WITHOUT DEPRESSION STORAGE

SUMMARY STATISTICS FOR CHANNEL/PIPES

CHANNEL NUMBER	FULL FLOW (CMS)	FULL VELOCITY (M/S)	FULL DEPTH (M)	MAXIMUM COMPUTED INFLOW (CMS)	MAXIMUM COMPUTED OUTFLOW (CMS)	MAXIMUM COMPUTED DEPTH (M)	MAXIMUM COMPUTED VELOCITY (M/S)	TIME OF OCCURRENCE DAY	TIME OF OCCURRENCE HR.	LENGTH OF SURCHARGE (HOUR)	MAXIMUM SURCHARGE VOLUME (CU-M)	RATIO OF MAX. TO FULL FLOW	RATIO OF MAX. DEPTH TO FULL DEPTH
201				0.00				1/ 0/1900	0.00				
200				0.23				8/14/1972	14.25				

TOTAL NUMBER OF CHANNELS/PIPES = 2

*** NOTE *** THE MAXIMUM FLOWS AND DEPTHS ARE CALCULATED AT THE END OF THE TIME INTERVAL

```
 ######################################################
 #             Runoff Quality Summary Page            #
 # If NDIM = 0 Units for:   loads    mass rates      #
 #             METRIC = 1    lb        lb/sec        #
 #             METRIC = 2    kg        kg/sec        #
 # If NDIM = 1 Loads are in units of quantity        #
 #             and mass rates are quantity/sec       #
 # If NDIM = 2 loads are in units of concentration   #
 #             times volume and mass rates have units#
 #             of concentration times volume/second  #
 ######################################################

Total Su NDIM =  0
METRIC =  2
```

	Total Su
Inputs	
1. INITIAL SURFACE LOAD.....	13.
2. TOTAL SURFACE BUILDUP.....	8206.
3. INITIAL CATCHBASIN LOAD.....	0.
4. TOTAL CATCHBASIN LOAD.....	0.
5. TOTAL CATCHBASIN AND SURFACE BUILDUP (2+4).....	8206.
Remaining Loads	
6. LOAD REMAINING ON SURFACE...	7.
7. REMAINING IN CATCHBASINS....	0.
8. REMAINING IN CHANNEL/PIPES..	0.
Removals	
9. STREET SWEEPING REMOVAL.....	919.
10. NET SURFACE BUILDUP (2-9)...	7288.
11. SURFACE WASHOFF.....	7280.
12. CATCHBASIN WASHOFF.....	0.
13. TOTAL WASHOFF (11+12).....	7280.
14. LOAD FROM OTHER CONSTITUENTS	0.
15. PRECIPITATION LOAD.....	0.
15a.SUM SURFACE LOAD (13+14+15).	7280.
16. TOTAL GROUNDWATER LOAD.....	0.
16a.TOTAL I/I LOAD.....	0.
17. NET SUBCATCHMENT LOAD (15a-15b-15c-15d+16+16a)....	7280.
>>Removal in channel/pipes (17a, 17b):	
17a.REMOVE BY BMP FRACTION.....	0.
17b.REMOVE BY 1st ORDER DECAY...	0.
18. TOTAL LOAD TO INLETS.....	7280.
19. FLOW WT'D AVE.CONCENTRATION mg/l (INLET LOAD/TOTAL FLOW).....	153.
Percentages	
20. STREET SWEEPING (9/2).....	11.
21. SURFACE WASHOFF (11/2).....	89.
22. NET SURFACE WASHOFF(11/10)..	100.
23. WASHOFF/SUBCAT LOAD(11/17)..	100.
24. SURFACE WASHOFF/INLET LOAD (11/18).....	100.
25. CATCHBASIN WASHOFF/ SUBCATCHMENT LOAD (12/17)...	0.
26. CATCHBASIN WASHOFF/ INLET LOAD (12/18).....	0.
27. OTHER CONSTITUENT LOAD/ SUBCATCHMENT LOAD (14/17)...	0.
28. INSOLUBLE FRACTION/ INLET LOAD (14/18).....	0.
29. PRECIPITATION/ SUBCATCHMENT LOAD (15/17)...	0.
30. PRECIPITATION/ INLET LOAD (15/18).....	0.
31. GROUNDWATER LOAD/ SUBCATCHMENT LOAD (16/17)...	0.
32. GROUNDWATER LOAD/ INLET LOAD (16/18).....	0.
32a.INFILTRATION/INFLOW LOAD/ SUBCATCHMENT LOAD (16a/17)..	0.
32b.INFILTRATION/INFLOW LOAD/ INLET LOAD (16a/18).....	0.
32c.CH/PIPE BMP FRACTION REMOVAL/ SUBCATCHMENT LOAD (17a/17)..	0.
32d.CH/PIPE 1st ORDER DECAY REMOVAL/ SUBCATCHMENT LOAD (17b/17)..	0.
33. INLET LOAD SUMMATION ERROR (18+8+6a+17a+17b-17)/17.....	0.

CAUTION. Due to method of quality routing (Users Manual, Appendix IX)
quality routing through channel/pipes is sensitive to the time step.
Large "Inlet Load Summation Errors" may result.
These can be reduced by adjusting the time step(s).
Note: surface accumulation during dry time steps at end of simulation is
not included in totals. Buildup is only performed at beginning of
wet steps or for street cleaning.

****
* TSS Particle Size Distribution *
****

Diameter (um)	%	Specific Gravity	Settling Velocity (m/s)	Critical Peclet Number
20.	20.0	2.65	0.000267	0.080977
60.	20.0	2.65	0.002319	0.160673
150.	20.0	2.65	0.012234	0.284537
400.	20.0	2.65	0.047806	0.524584
2000.	20.0	2.65	0.180097	1.431405

****
*
* Summary of TSS Removal *
*
****

TSS Removal based on Lab Performance Curve

Model #	Low Q Treated (cms)	High Q Treated (cms)	Runoff Treated (%)	TSS Removed (%)
Unavailabl	0.114	0.114	99.9	85.1
HD 4	0.114	0.114	99.9	90.8
HD 5	0.114	0.114	99.9	94.0
HD 6	0.114	0.114	99.9	96.0
Unavailabl	0.114	0.114	99.9	97.4
HD 8	0.114	0.114	99.9	98.2
HD 10	0.114	0.114	99.9	99.1
HD 12	0.114	0.114	99.9	99.6

****
*
* Summary of Annual Flow Treatmnet & TSS Removal *
*
****

Unavailabl

Year	Flow Vol (m3)	Flow Treated (m3)	TSS In (kg)	TSS Rem (kg)	TSS Out (kg)	TSS Byp (kg)	Flow Treated (%)	TSS Removal (%)
1971.	5092.	5092.	145.	117.	29.	0.	100.0	80.3
1972.	6543.	6207.	191.	157.	33.	4.	94.9	80.8
1973.	6319.	6319.	201.	173.	28.	0.	100.0	86.1
1974.	6460.	6460.	212.	188.	24.	0.	100.0	88.5
1975.	5480.	5480.	184.	152.	32.	0.	100.0	82.6
1976.	8154.	8154.	237.	201.	36.	0.	100.0	84.7
1977.	8753.	8753.	239.	188.	51.	0.	100.0	78.5
1978.	6955.	6955.	218.	183.	35.	0.	100.0	83.8
1979.	8347.	8347.	253.	216.	36.	0.	100.0	85.6
1980.	6713.	6713.	226.	191.	34.	0.	100.0	84.8
1981.	9273.	9273.	262.	229.	33.	0.	100.0	87.4
1982.	6520.	6520.	207.	182.	25.	0.	100.0	87.9
1983.	8596.	8596.	267.	230.	37.	0.	100.0	86.0
1984.	6928.	6928.	210.	178.	32.	0.	100.0	84.7
1985.	6048.	6048.	200.	174.	26.	0.	100.0	86.8
1986.	8809.	8809.	277.	241.	36.	0.	100.0	87.1
1987.	9117.	9117.	283.	242.	40.	0.	100.0	85.7
1988.	7348.	7348.	233.	205.	28.	0.	100.0	87.9
1989.	8028.	8028.	233.	202.	31.	0.	100.0	86.9
1990.	9089.	9089.	286.	253.	33.	0.	100.0	88.4
1991.	8518.	8518.	269.	232.	37.	0.	100.0	86.4
1992.	10828.	10828.	323.	273.	49.	0.	100.0	84.7
1993.	7376.	7376.	254.	229.	25.	0.	100.0	90.0
1994.	7956.	7956.	224.	182.	43.	0.	100.0	81.0
1995.	9149.	9149.	267.	219.	47.	0.	100.0	82.3
1998.	2395.	2395.	93.	78.	15.	0.	100.0	83.5
1999.	5837.	5837.	196.	165.	31.	0.	100.0	84.3
2000.	6683.	6683.	184.	151.	34.	0.	100.0	81.8
2001.	5310.	5310.	161.	145.	16.	0.	100.0	90.1
2002.	5546.	5546.	185.	162.	23.	0.	100.0	87.4
2003.	6308.	6308.	195.	163.	32.	0.	100.0	83.5
2004.	7575.	7575.	208.	176.	32.	0.	100.0	84.5
2005.	5500.	5500.	158.	121.	37.	0.	100.0	76.7

HD 4

Year	Flow Vol (m3)	Flow Treated (m3)	TSS In (kg)	TSS Rem (kg)	TSS Out (kg)	TSS Byp (kg)	Flow Treated (%)	TSS Removal (%)
1971.	5092.	5092.	145.	124.	21.	0.	100.0	85.6
1972.	6543.	6207.	191.	171.	20.	4.	94.9	87.8
1973.	6319.	6319.	201.	185.	16.	0.	100.0	92.2
1974.	6460.	6460.	212.	198.	15.	0.	100.0	93.1
1975.	5480.	5480.	184.	166.	18.	0.	100.0	90.1
1976.	8154.	8154.	237.	215.	22.	0.	100.0	90.5
1977.	8753.	8753.	239.	208.	32.	0.	100.0	86.7
1978.	6955.	6955.	218.	193.	25.	0.	100.0	88.7
1979.	8347.	8347.	253.	227.	26.	0.	100.0	89.7
1980.	6713.	6713.	226.	206.	20.	0.	100.0	91.1
1981.	9273.	9273.	262.	243.	19.	0.	100.0	92.8
1982.	6520.	6520.	207.	194.	13.	0.	100.0	93.5
1983.	8596.	8596.	267.	243.	24.	0.	100.0	90.9
1984.	6928.	6928.	210.	189.	22.	0.	100.0	89.8
1985.	6048.	6048.	200.	183.	17.	0.	100.0	91.6
1986.	8809.	8809.	277.	257.	20.	0.	100.0	92.7
1987.	9117.	9117.	283.	257.	26.	0.	100.0	90.8

1988.	7348.	7348.	233.	215.	18.	0.	100.0	92.4
1989.	8028.	8028.	233.	216.	16.	0.	100.0	93.1
1990.	9089.	9089.	286.	269.	16.	0.	100.0	94.3
1991.	8518.	8518.	269.	248.	21.	0.	100.0	92.3
1992.	10828.	10828.	323.	293.	30.	0.	100.0	90.6
1993.	7376.	7376.	254.	237.	17.	0.	100.0	93.5
1994.	7956.	7956.	224.	196.	28.	0.	100.0	87.5
1995.	9149.	9149.	267.	241.	25.	0.	100.0	90.4
1998.	2395.	2395.	93.	84.	9.	0.	100.0	90.2
1999.	5837.	5837.	196.	177.	19.	0.	100.0	90.4
2000.	6683.	6683.	184.	159.	25.	0.	100.0	86.2
2001.	5310.	5310.	161.	152.	9.	0.	100.0	94.7
2002.	5546.	5546.	185.	172.	14.	0.	100.0	92.6
2003.	6308.	6308.	195.	176.	20.	0.	100.0	90.0
2004.	7575.	7575.	208.	189.	19.	0.	100.0	90.7
2005.	5500.	5500.	158.	134.	24.	0.	100.0	85.0

```
**************************************************
*  Summary of Quantity and Quality Results at      *
*  Location        200  INFlow in cms.             *
*  Values are instantaneous at indicated time step *
**************************************************
```

5558 Drummond Road
City of Niagara Falls

Date Mo/Da/Year	Time Hr:Min	Flow cum/s	Total Su mg/l
Flow wtd means.....		0.000	153.
Flow wtd std devs..		0.001	58.
Maximum value.....		0.227	292.
Minimum value.....		0.000	0.
Total loads.....		47508.	7284.
		Cub-Met	KILOGRAM

===> Runoff simulation ended normally.

===> SWMM 4.4 simulation ended normally.
Always check output file for possible warning messages.

```
**********************************************************
*       SWMM 4.4    Simulation Date and Time Summary     *
**********************************************************
* Starting Date... March      16, 2023                   *
*          Time...         15: 4:42.423                  *
*   Ending Date... March      16, 2023                   *
*          Time...         15: 4:45.947                  *
*  Elapsed Time...               0.059 minutes.          *
*  Elapsed Time...               3.524 seconds.          *
**********************************************************
```