S. LLEWELLYN & ASSOCIATES LIMITED
CONSULTING ENGINEERS

Technical Memorandum

To:	National Homes	**From:**	Luka Frankovich, BASc.Eng.
	Mr. Darren Huot	**Date:**	May 15, 2024
Project:	484 Plains Road East, Phase 2	**Pages:**	5 + Appendix
	City of Burlington	**Job #:**	22057
Re:	Phase 2 Storm Water Management		

1.0 INTRODUCTION

S. Llewellyn & Associates Limited has been retained by National Homes to provide consulting engineering services for the proposed development at 484 Plains Road East in the City of Burlington, Region of Halton (see Figure 1.0 for location plan). The subject site is bound by Plains Road East to the north, existing commercial lands to the northeast and southwest, and residential lands to the southeast. This memorandum will outline the storm servicing and stormwater management for Phase 2 of the proposed 484 Plains Road East development.



Figure 1.0 – Location Plan

2.0 STORM DRAINAGE AND STORMWATER MANAGEMENT

2.1 EXISTING CONDITIONS

Under existing conditions, the 0.93 ha Phase 2 segment of the site includes a commercial sales centre building complete with associated concrete and asphalt parking areas. The runoff from the site is captured internally and conveyed by a private storm system to an existing 525mmø storm sewer flowing south through a storm easement towards Nora Drive. See Table 1 below for pre-development site catchment areas and characteristics.

Table 1 – Existing Conditions Catchment Areas

Catchment ID	Description	Area (ha)	Percent Impervious	Runoff Coefficient
101	Uncontrolled Phase 1 drainage to the 525mmø Storm Sewer on Nora Drive	0.93	36%[1]	0.50[1]
102	Uncontrolled Phase 2 drainage to the 525mmø Storm Sewer on Nora Drive	0.74	36%[1]	0.50[1]
103	Uncontrolled drainage to 600mmø Storm Sewer on Plains Road East	0.16	36%[1]	0.50[1]
104	Rear yard drainage to 525mmø Storm Sewer outlet in existing easement	0.17	55%	0.60

[1] Maximum permissible % impervious and runoff coefficient is 36% and 0.50 respectively (As per City of Burlington Stormwater Management Guidelines). These values do not represent actual onsite conditions.

2.2 PROPOSED CONDITIONS

In the proposed condition, Phase 2 consists of constructing one (1) 9-storey mixed-use building with 166 units and two (2) 3-storey townhouse blocks with an additional 45 units. Discharge from the site will be captured and conveyed to the existing 525mmø storm sewer on Nora Drive via a private storm system.

Three (3) catchment areas have been identified in the proposed condition. Catchment 201 represents controlled drainage from the Phase 1 portion of the site to Nora Drive. It should be noted that Phase 1 has been previously approved and is currently undergoing construction. Catchment 202 represents the controlled drainage from the Phase 2 portion of the site to Nora Drive. Catchment 203 represents the uncontrolled drainage from the small, landscaped area around the southern portion of the site that is to remain unchanged due to tree protection zones. See Table 2 below and the Post-Development Drainage Area Plan in the Appendix for reference.

Table 2 – Proposed Condition Drainage Area Characteristics				
Catchment ID	Description	Area (ha)	% Imperviousness	Runoff Coefficient (C)
201	Phase 1 controlled drainage to 525mmø storm sewer on Nora Dr.	0.89	90%	0.85
202	Phase 2 controlled drainage to 525mmø storm sewer on Nora Dr.	0.90	88%	0.85
203	Phase 1 + 2 uncontrolled drainages to 525mmø storm sewer on Nora Dr.	0.04	0%	0.25

Water Quantity Control

It is proposed to apply quantity control measures to Phase 2 runoff from Catchment 202 by means of a 200mmø orifice pipe installed between the stormwater management tank and MH2 (Up-Flo Filter), to restrict discharge from the site to the 5-year pre-development discharge rate.

With installation of on-site quantity control for Catchment 202, it will be required to provide stormwater storage during storm events up to and including the 100-year event. To provide the required storage, a cast-in-place storage vault is proposed withing the underground parking structure with a volume of approximately 264m^3. Tank characteristics are provided in Tables 3 below and in the Appendix.

Table 3 – Proposed Condition Stage Storage Discharge		
Elevation (m)	Active Storage Volume (m^3)	Discharge (m^3/s)
93.81 (Orifice Invert/Bottom of Tank)	0	0.0000
94.31 (0.5m Deep)	76	0.0573
94.81 (1.0m Deep)	152	0.0868
95.31 (1.5m Deep)	228	0.1088
95.55 (Top of Tank)	264	0.1179

The maximum discharge rates for Catchments 201, 202 and 203 were calculated using SWMHYMO hydrologic modelling program developed by J.F. Sabourin & Associates for the 2-year to 100-year City of Burlington 6-hour Chicago Design Storm. The proposed discharge rates and storage volumes are summarized in Table 4 below and in the Appendix.

Table 4 – Propose Condition Stormwater Discharge to Nora Drive					
Storm Event	201 (Controlled) (m^3/s) [1]	202 (Controlled) (m^3/s) [1]	203 (Uncontrolled) (m^3/s) [1]	Total Discharge (m^3/s) [2]	Allowable Discharge (m^3/s) [3]
2-Year	0.083	0.069	0.002	**0.153**	0.262
5-Year	0.099	0.081	0.003	**0.183**	
10-Year	0.109	0.090	0.004	**0.202**	
25-Year	0.121	0.100	0.005	**0.225**	
50-Year	0.129	0.107	0.006	**0.241**	
100-Year	0.137	0.114	0.007	**0.256**	

[1] Based on SWMHYMO Output. Refer to Appendix A for details.
[2] Calculated using the SWMHYMO "ADDHYD" command.
[3] See *484 Plains Road East Phase 1 & Phase 2 Interim Condition Functional Servicing and Stormwater Management Report* completed by S. Llewellyn and Associates Ltd. (February 2024) Table 2.2.

Based on the information above and the SWMHYMO output, the calculated maximum required storage for Catchment 202 is **246m^3**, which can be accommodated within the 264m^3 cast-in-place storage tank.

Water Quality Control
The proposed overall development is required to achieve a "Enhanced" (80% TSS removal) level of water quality protection. To achieve this criterion, discharge from Catchment 201 and 202 will be treated using stainless steel mesh liners within area drains in addition to a Hydro International Up-Flo Filter before ultimately discharging to the 525mmø storm sewer on Nora Drive. The Up-Flo Filter has been previously approved during the Phase 1 design and is currently undergoing construction.

Water Balance
As per City of Burlington Guidelines, the minimum runoff retention is 5.0 mm depth across the site area. In using the 5.0 mm infiltration depth for the 0.93 ha area that encompasses Phase 2, the Runoff Volume Control Target (RVCT) is calculated to be 46.5 m^3, which can be accommodated by the irrigation cistern within the underground parking structure at the southwest corner of the site.

The analysis determined the following:

- A 200mmø orifice pipe to be installed as per the Site Servicing Plan prepared by S. Llewellyn and Associates Limited and this report to achieve effective stormwater quantity control for Phase 2.

- A cast-in-place storage vault to be installed within the underground parking of Phase 2 as per the Site Servicing Plan and this report to provide adequate stormwater storage.

- An Up-Flo Filter (or approved equivalent), to be installed as per the Site Servicing Plan and Phase 1 & Phase 2 Interim Condition Functional Servicing and Stormwater Management Report to provide adequate stormwater quality control.

We trust the information enclosed is satisfactory. Should you have any questions please do not hesitate to contact our office.

Prepared by:

S. LLEWELLYN & ASSOCIATES LIMITED



L. Frankovich, BASc. Eng.

J. Koch, P.Eng.

APPENDIX: STORMWATER MANAGEMENT DESIGN INFORMATION

S:_22057\WORKING\CURRENT_22057 - DAP.dwg

PLAINS ROAD EAST

GLEN ACRES COURT

ATKINS PLACE

202
0.90
88
0.85

201
0.89
90
0.85

203
0.04
0
0.25

EX-1
0.17
55
N/A

LEGEND

PERVIOUS AREA

201
0.39
11
0.32

DRAINAGE AREA I.D.
DRAINAGE AREA (ha)
PERCENT IMPERVIOUS
RUNOFF COEFFICENT

DIRECTION OF SHEET FLOW

FIGURE 2.0
POST-DEVELOPMENT STORM DRAINAGE AREA PLAN

SCALE: 1:750

PROJECT: 484 PLAINS ROAD EAST, BURLINGTON, ON
PROJECT No.: 22056

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4/30/2024 2:20:11 PM - Luka Frankovich

484 Plains Rd E
Burlington, Ontario

S. LLEWELLYN & ASSOCIATES LIMITED
CONSULTING ENGINEERS

STAGE-STORAGE-DISCHARGE CALCULATIONS

Catchment 202
Outlet Device No. 1 (Quantity)

Type:	Circular Orifice
Diameter (mm)	**200**
Area (m^2)	0.03142
Invert Elev. (m)	93.81
C/L Elev. (m)	93.91
Disch. Coeff. (C_d)	0.8
Discharge (Q) =	Refer to Rating Table Report
Number of Orifices:	1

		SWM Pond Volumes						Outlet No. 1		Total
	Elevation	Area	Tank Incremental Volume	Additional Incremental Pond Volume	Additional Incremental Surface	Cumulative Volume	Active Storage Volume	H	Discharge	
	m	m^2			m^3	m^3	m^3	m	m^3/s	m^3/s
Bottom of Upper Chamber/1st Stage Orifice Invert	93.81	152	0	0.0	0	0	0	0.000	0.0000	0.0000
0.25m Deep (Upper Chamber)	94.06	152	38	0.0	0	38	38	0.000	0.0330	0.0330
0.50m Deep (Upper Chamber)	94.31	152	38	0.0	0	76	76	0.400	0.0573	0.0573
0.75m Deep (Upper Chamber)	94.56	152	38	0.0	0	114	114	0.650	0.0735	0.0735
1.00m Deep (Upper Chamber)	94.81	152	38	0.0	0	152	152	0.650	0.0868	0.0868
1.25m Deep (Upper Chamber)	95.06	152	38	0.0	0	190	190	0.650	0.0984	0.0984
1.50m Deep (Upper Chamber)	95.31	152	38	0.0	0	228	228	0.650	0.1088	0.1088
Top of Tank	95.55	152	36	0.0	0	264	264	0.650	0.1179	0.1179

```
2     Metric units
*#************************************************************************|
*#  Project Name: 484 PLAINS ROAD EAST (PHASE 2)
*#                BURLINGTON, ONTARIO
*#  JOB NUMBER  : 22057
*#       Date   : AUGUST 2022
*#    Company   : S. LLEWELLYN AND ASSOCIATES LTD.
*#       File   : 22056.DAT
*#************************************************************************|
*
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[002]
                    BUR6_002.stm
*
READ STORM          STORM_FILENAME "STORM.001"
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*#
*#        PRE-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING (PHASE 1)
*#        ========================================================
*#
*#************************************************************************|
*# CATCHMENT 101 -  PRE-DEVELOPMENT DISCHARGE TO NORA DRIVE FROM PHASE 1
*
CALIB STANDHYD      ID=[1], NHYD=["101"], DT=[1](min), AREA=[0.93](ha),
                    XIMP=[0.36], TIMP=[0.36], DWF=[0](cms), LOSS=[2],
                    SCS curve number CN=[80],
                    Pervious   surfaces: IAper=[6.35](mm), SLPP=[2.0](%),
                                         LGP=[5](m), MNP=[0.250], SCP=[0](min),
                    Impervious surfaces: IAimp=[1.0](mm), SLPI=[2.2](%),
                                         LGI=[16](m), MNI=[0.013], SCI=[0](min),
                    RAINFALL=[ ,  ,  ,  , ](mm/hr) ,  END=-1
*%-----------------|-------------------------------------------------------|
*# CATCHMENT 102 -  PRE-DEVELOPMENT DISCHARGE TO NORA DRIVE FROM PHASE 2
*
CALIB STANDHYD      ID=[2], NHYD=["102"], DT=[1](min), AREA=[0.74](ha),
                    XIMP=[0.36], TIMP=[0.36], DWF=[0](cms), LOSS=[2],
                    SCS curve number CN=[80],
                    Pervious   surfaces: IAper=[6.35](mm), SLPP=[2.0](%),
                                         LGP=[5](m), MNP=[0.250], SCP=[0](min),
                    Impervious surfaces: IAimp=[1.0](mm), SLPI=[2.2](%),
                                         LGI=[16](m), MNI=[0.013], SCI=[0](min),
                    RAINFALL=[ ,  ,  ,  , ](mm/hr) ,  END=-1
*%-----------------|-------------------------------------------------------|
* ADD TOTAL EXISTING FLOWS DIRECTED SOUTH
ADD HYD             IDsum=[3], NHYD=["101+102"], IDs to add=[1,2]
*%-----------------|-------------------------------------------------------|
*# CATCHMENT 103 -  PRE-DEVELOPMENT DISCHARGE TO PLAINS ROAD EAST
*
CALIB STANDHYD      ID=[4], NHYD=["102"], DT=[1](min), AREA=[0.16](ha),
                    XIMP=[0.36], TIMP=[0.36], DWF=[0](cms), LOSS=[2],
                    SCS curve number CN=[80],
                    Pervious   surfaces: IAper=[6.35](mm), SLPP=[2.0](%),
                                         LGP=[5](m), MNP=[0.250], SCP=[0](min),
                    Impervious surfaces: IAimp=[1.0](mm), SLPI=[1.3](%),
                                         LGI=[14](m), MNI=[0.013], SCI=[0](min),
                    RAINFALL=[ ,  ,  ,  , ](mm/hr) ,  END=-1
*%-----------------|-------------------------------------------------------|
*#************************************************************************|
*#
*#        POST-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING (PHASE 1)
*#        =========================================================
```

```
*#
**#*************************************************************************|
*# CATCHMENT 201 - PHASE 1 CONTROLLED DISCHARGE TO NORA DRIVE
*
CALIB STANDHYD      ID=[1], NHYD=["201"], DT=[1](min), AREA=[0.89](ha),
                    XIMP=[0.90], TIMP=[0.90], DWF=[0](cms), LOSS=[2],
                    SCS curve number CN=[80],
                    Pervious   surfaces: IAper=[6.35](mm), SLPP=[2.0](%),
                                         LGP=[5](m), MNP=[0.250], SCP=[0](min),
                    Impervious surfaces: IAimp=[1.0](mm), SLPI=[1.9](%),
                                         LGI=[15](m), MNI=[0.013], SCI=[0](min),
                    RAINFALL=[ ,  ,  ,  , ](mm/hr) ,  END=-1
*%-----------------|-------------------------------------------------------|
*# ROUTE CATCHMENT 201 THROUGH ORIFICE PIPE AND TANK
*
ROUTE RESERVOIR     IDout=[2],  NHYD=["201 CONTROLED"],  IDin=[1],
                    RDT=[1](min),
                          TABLE of ( OUTFLOW-STORAGE ) values
                                     (cms) - (ha-m)
                                   0.0000   0.0000
                                   0.0273   0.0031
                                   0.0633   0.0066
                                   0.0854   0.0101
                                   0.1029   0.0136
                                   0.1179   0.0171
                                   0.1311   0.0206
                                   0.1463   0.0251
                                     -1  ,  -1    (max twenty pts)
                          IDovf=[3], NHYDovf=["201.OVF"]
*%-----------------|-------------------------------------------------------|
*# CATCHMENT 202 - PHASE 2 CONTROLLED DISCHARGE TO NORA DRIVE
*
CALIB STANDHYD      ID=[4], NHYD=["202"], DT=[1](min), AREA=[0.90](ha),
                    XIMP=[0.88], TIMP=[0.88], DWF=[0](cms), LOSS=[2],
                    SCS curve number CN=[80],
                    Pervious   surfaces: IAper=[6.35](mm), SLPP=[2.0](%),
                                         LGP=[5](m), MNP=[0.250], SCP=[0](min),
                    Impervious surfaces: IAimp=[1.0](mm), SLPI=[2.0](%),
                                         LGI=[15](m), MNI=[0.013], SCI=[0](min),
                    RAINFALL=[ ,  ,  ,  , ](mm/hr) ,  END=-1
*%-----------------|-------------------------------------------------------|
*# ROUTE CATCHMENT 202 THROUGH ORIFICE PIPE AND TANK
*
ROUTE RESERVOIR     IDout=[5],  NHYD=["202 CONTROLED"],  IDin=[4],
                    RDT=[1](min),
                          TABLE of ( OUTFLOW-STORAGE ) values
                                     (cms) - (ha-m)
                                   0.0000   0.0000
                                   0.0330   0.0038
                                   0.0573   0.0076
                                   0.0735   0.0114
                                   0.0868   0.0152
                                   0.0984   0.0190
                                   0.1088   0.0228
                                   0.1179   0.0264
                                     -1  ,  -1    (max twenty pts)
                          IDovf=[6], NHYDovf=["202.OVF"]
*%-----------------|-------------------------------------------------------|
*# CATCHMENT 203 - UNCONTROLLED DISCHARGE AROUND PERIMETER OF SITE
*
CALIB NASHYD        ID=[7], NHYD=["203"], DT=[1]min, AREA=[0.04](ha),
                    DWF=[0](cms),  CN/C=[80], IA=[6.35](mm),
```

```
                    N=[3], TP=[0.10]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
* ADD TOTAL FLOWS DIRECTED SOUTH
ADD HYD             IDsum=[8], NHYD=["201+202+203"], IDs to add=[2,3,5,6,7]
*%-----------------|-------------------------------------------------------------|
**#*****************************************************************************|
* RUN REMAINING DESIGN STORMS (CITY OF BURLINGTON 2 TO 100-YR)
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[005]
                    BUR6_005.stm
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[010]
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*
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*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[050]
                    BUR6_050.stm
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[100]
                    BUR6_100.stm
*%-----------------|-------------------------------------------------------------|
FINISH
```

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

   SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO        999    999    =========
   S      W W W  MM MM  H   H   Y Y   MM MM  O   O      9   9  9   9
   SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  9   9   Ver  4.05
       S  W W W  M   M  H   H    Y    M   M  O   O       9999   9999   Sept 2011
   SSSSS   W W   M   M  H   H    Y    M   M   OOO            9      9   =========
                                                          9   9  9   9   # 3902680
        StormWater Management HYdrologic Model            999    999    =========

 *************************************************************************
 ************************** SWMHYMO Ver/4.05  ****************************
 *********  A single event and continuous hydrologic simulation model  *********
 *********     based on the principles of HYMO and its successors      *********
 *********                  OTTHYMO-83 and OTTHYMO-89.                 *********
 *************************************************************************
 ********* Distributed by:  J.F. Sabourin and Associates Inc.          *********
 *********                  Ottawa,  Ontario: (613) 836-3884           *********
 *********                  Gatineau, Quebec: (819) 243-6858           *********
 *********                  E-Mail: swmhymo@jfsa.com                   *********
 *************************************************************************

 +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 +++++++++ Licensed user: S. Llewellyn & Associates Ltd                +++++++++
 +++++++++                in any City           SERIAL#:3902680       +++++++++
 +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

 *************************************************************************
 *********           ++++++ PROGRAM ARRAY DIMENSIONS ++++++             *********
 *********          Maximum value for ID numbers  :     10             *********
 *********          Max. number of rainfall points: 105408             *********
 *********          Max. number of flow points    : 105408             *********
 *************************************************************************


 *********************   D E T A I L E D   O U T P U T   *********************
 *************************************************************************
 *         DATE: 2024-04-17     TIME: 12:25:16     RUN COUNTER: 000103       *
 *************************************************************************
 * Input   filename: T:\projects\22057\SWMHYMO\22056_2.dat                   *
 * Output  filename: T:\projects\22057\SWMHYMO\22056_2.out                   *
 * Summary filename: T:\projects\22057\SWMHYMO\22056_2.sum                   *
 * User comments:                                                            *
 * 1:_____________________________________________________________________*
 * 2:_____________________________________________________________________*
 * 3:_____________________________________________________________________*
 *************************************************************************

-------------------------------------------------------------------------------
001:0001---------------------------------------------------------------------|
*#************************************************************************|
*#  Project Name: 484 PLAINS ROAD EAST (PHASE 2)
*#               BURLINGTON, ONTARIO
*#  JOB NUMBER  : 22057
*#       Date   : AUGUST 2022
*#    Company   : S. LLEWELLYN AND ASSOCIATES LTD.
*#       File   : 22056.DAT
*#************************************************************************|
*
*
  ** END OF RUN :   1

*************************************************************************




--------------------
| START            |  Project  dir.: T:\projects\22057\SWMHYMO\
--------------------  Rainfall dir.: T:\projects\22057\SWMHYMO\
    TZERO =   .00 hrs on      0
    METOUT=   2 (output = METRIC)
    NRUN  = 002
    NSTORM=   1
          #  1=BUR6_002.stm
-------------------------------------------------------------------------------
002:0002---------------------------------------------------------------------|
*#************************************************************************|
*#  Project Name: 484 PLAINS ROAD EAST (PHASE 2)
*#               BURLINGTON, ONTARIO
*#  JOB NUMBER  : 22057
*#       Date   : AUGUST 2022
*#    Company   : S. LLEWELLYN AND ASSOCIATES LTD.
*#       File   : 22056.DAT
*#************************************************************************|
*
*
-------------------------------------------------------------------------------
002:0002---------------------------------------------------------------------|
*
--------------------
| READ STORM       |    Filename: Burlington 2-yr 6hr CHICAGO  (A=681.52,
| Ptotal=  40.93 mm|    Comments: Burlington 2-yr 6hr CHICAGO  (A=681.52,
--------------------
            TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
             hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
             .17   1.715 |   1.67   8.325 |   3.17   4.467 |   4.67   2.213
             .33   1.858 |   1.83  19.646 |   3.33   3.978 |   4.83   2.105
             .50   2.032 |   2.00  78.391 |   3.50   3.595 |   5.00   2.008
             .67   2.247 |   2.17  25.776 |   3.67   3.286 |   5.17   1.920
             .83   2.522 |   2.33  13.777 |   3.83   3.030 |   5.33   1.841
            1.00   2.888 |   2.50   9.511 |   4.00   2.815 |   5.50   1.769
            1.17   3.399 |   2.67   7.331 |   4.17   2.632 |   5.67   1.703
            1.33   4.172 |   2.83   6.005 |   4.33   2.474 |   5.83   1.642
            1.50   5.492 |   3.00   5.111 |   4.50   2.335 |   6.00   1.586

-------------------------------------------------------------------------------
002:0003---------------------------------------------------------------------|
*
*#************************************************************************|
*#
*#        PRE-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING (PHASE 1)
*#        =======================================================
*#
*#************************************************************************|
*# CATCHMENT 101 -  PRE-DEVELOPMENT DISCHARGE TO NORA DRIVE FROM PHASE 1
*
----------------------
| CALIB STANDHYD     |   Area    (ha)=     .93
| 01:101    DT= 1.00 |   Total Imp(%)=   36.00   Dir. Conn.(%)=   36.00
----------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        .33          .60
     Dep. Storage     (mm)=       1.00         6.35
     Average Slope     (%)=       2.20         2.00
     Length            (m)=      16.00         5.00
     Mannings n            =       .013         .250

     Max.eff.Inten.(mm/hr)=      78.39        24.53
               over (min)        1.00         4.00
     Storage Coeff.  (min)=        .74 (ii)    4.30 (ii)
     Unit Hyd. Tpeak (min)=       1.00         4.00
     Unit Hyd. peak  (cms)=       1.26          .27
                                                          *TOTALS*
     PEAK FLOW       (cms)=        .07          .03          .100 (iii)
     TIME TO PEAK    (hrs)=       2.00         2.03         2.000
     RUNOFF VOLUME    (mm)=      39.93        12.19        22.179
     TOTAL RAINFALL   (mm)=      40.93        40.93        40.933
     RUNOFF COEFFICIENT   =        .98          .30          .542

       (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.

-------------------------------------------------------------------------------
002:0004---------------------------------------------------------------------
*# CATCHMENT 102 -  PRE-DEVELOPMENT DISCHARGE TO NORA DRIVE FROM PHASE 2
*
----------------------
| CALIB STANDHYD     |   Area    (ha)=     .74
| 02:102    DT= 1.00 |   Total Imp(%)=   36.00   Dir. Conn.(%)=   36.00
----------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        .27          .47
     Dep. Storage     (mm)=       1.00         6.35
     Average Slope     (%)=       2.20         2.00
     Length            (m)=      16.00         5.00
     Mannings n            =       .013         .250

     Max.eff.Inten.(mm/hr)=      78.39        24.53
               over (min)        1.00         4.00
     Storage Coeff.  (min)=        .74 (ii)    4.30 (ii)
     Unit Hyd. Tpeak (min)=       1.00         4.00
     Unit Hyd. peak  (cms)=       1.26          .27
                                                          *TOTALS*
     PEAK FLOW       (cms)=        .06          .02          .080 (iii)
     TIME TO PEAK    (hrs)=       2.00         2.03         2.000
     RUNOFF VOLUME    (mm)=      39.93        12.19        22.179
     TOTAL RAINFALL   (mm)=      40.93        40.93        40.933
     RUNOFF COEFFICIENT   =        .98          .30          .542

       (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.

-------------------------------------------------------------------------------
002:0005---------------------------------------------------------------------
* ADD TOTAL EXISTING FLOWS DIRECTED SOUTH
------------------------
| ADD HYD (101+102   ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
------------------------                  (ha)     (cms)   (hrs)   (mm)   (cms)
                      ID1 01:101           .93      .100    2.00  22.18    .000
                     +ID2 02:102           .74      .080    2.00  22.18    .000
                      ==========================================================
                      SUM 03:101+102      1.67      .180    2.00  22.18    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
002:0006---------------------------------------------------------------------
*# CATCHMENT 103 -  PRE-DEVELOPMENT DISCHARGE TO PLAINS ROAD EAST
*
----------------------
| CALIB STANDHYD     |   Area    (ha)=     .16
| 04:102    DT= 1.00 |   Total Imp(%)=   36.00   Dir. Conn.(%)=   36.00
----------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        .06          .10
     Dep. Storage     (mm)=       1.00         6.35
     Average Slope     (%)=       1.30         2.00
     Length            (m)=      14.00         5.00
     Mannings n            =       .013         .250

     Max.eff.Inten.(mm/hr)=      78.39        24.53
               over (min)        1.00         4.00
     Storage Coeff.  (min)=        .80 (ii)    4.36 (ii)
     Unit Hyd. Tpeak (min)=       1.00         4.00
     Unit Hyd. peak  (cms)=       1.21          .27
                                                          *TOTALS*
     PEAK FLOW       (cms)=        .01          .01          .017 (iii)
     TIME TO PEAK    (hrs)=       2.00         2.03         2.000
     RUNOFF VOLUME    (mm)=      39.93        12.19        22.179
     TOTAL RAINFALL   (mm)=      40.93        40.93        40.933
     RUNOFF COEFFICIENT   =        .98          .30          .542

       (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.

-------------------------------------------------------------------------------
002:0007---------------------------------------------------------------------
*#************************************************************************|
*#
*#        POST-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING (PHASE 1)
*#        ========================================================
*#
**#***********************************************************************|
*# CATCHMENT 201 - PHASE 1 CONTROLLED DISCHARGE TO NORA DRIVE
*
----------------------
| CALIB STANDHYD     |   Area    (ha)=     .89
| 01:201    DT= 1.00 |   Total Imp(%)=   90.00   Dir. Conn.(%)=   90.00
----------------------
```

```
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        .80          .09
     Dep. Storage     (mm)=       1.00         6.35
     Average Slope     (%)=       1.90         2.00
     Length            (m)=      15.00         5.00
     Mannings n           =       .013         .250

     Max.eff.Inten.(mm/hr)=      78.39        24.53
               over (min)        1.00         4.00
     Storage Coeff.  (min)=        .74 (ii)    4.30 (ii)
     Unit Hyd. Tpeak (min)=       1.00         4.00
     Unit Hyd. peak  (cms)=       1.26          .27
                                                    *TOTALS*
     PEAK FLOW       (cms)=        .17          .00          .179 (iii)
     TIME TO PEAK    (hrs)=       2.00         2.03         2.000
     RUNOFF VOLUME    (mm)=      39.93        12.19        37.159
     TOTAL RAINFALL   (mm)=      40.93        40.93        40.933
     RUNOFF COEFFICIENT   =        .98          .30          .908

       (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.

-------------------------------------------------------------------------------
002:0008---------------------------------------------------------------------
*# ROUTE CATCHMENT 201 THROUGH ORIFICE PIPE AND TANK
*
--------------------
| ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
|  IN>01:(201   )   |
| OUT<02:(201 CO)   |    =========  OUTFLOW STORAGE TABLE  =========
--------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                          (cms)    (ha.m.)   |    (cms)    (ha.m.)
                           .000  .0000E+00   |     .103  .1360E-01
                           .027  .3100E-02   |     .118  .1710E-01
                           .063  .6600E-02   |     .131  .2060E-01
                           .085  .1010E-01   |     .146  .2510E-01

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     --------------------       (ha)     (cms)     (hrs)       (mm)
     INFLOW >01: (201   )        .89      .179     2.000     37.159
     OUTFLOW<02: (201 CO)        .89      .083     2.017     37.159
    OVERFLOW<03: (201.OV)        .00      .000      .000       .000

                    TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                    CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                    PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=   46.436
                    TIME SHIFT OF PEAK FLOW         (min)=     1.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=.9731E-02

-------------------------------------------------------------------------------
002:0009---------------------------------------------------------------------
*# CATCHMENT 202 - PHASE 2 CONTROLLED DISCHARGE TO NORA DRIVE
*
--------------------
| CALIB STANDHYD    |   Area    (ha)=     .90
| 04:202    DT= 1.00 |   Total Imp(%)=   88.00   Dir. Conn.(%)=   88.00
---------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        .79          .11
     Dep. Storage     (mm)=       1.00         6.35
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      15.00         5.00
     Mannings n           =       .013         .250

     Max.eff.Inten.(mm/hr)=      78.39        24.53
               over (min)        1.00         4.00
     Storage Coeff.  (min)=        .73 (ii)    4.29 (ii)
     Unit Hyd. Tpeak (min)=       1.00         4.00
     Unit Hyd. peak  (cms)=       1.27          .27
                                                    *TOTALS*
     PEAK FLOW       (cms)=        .17          .01          .177 (iii)
     TIME TO PEAK    (hrs)=       2.00         2.03         2.000
     RUNOFF VOLUME    (mm)=      39.93        12.19        36.604
     TOTAL RAINFALL   (mm)=      40.93        40.93        40.933
     RUNOFF COEFFICIENT   =        .98          .30          .894

       (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.

-------------------------------------------------------------------------------
002:0010---------------------------------------------------------------------
*# ROUTE CATCHMENT 202 THROUGH ORIFICE PIPE AND TANK
*
--------------------
| ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
|  IN>04:(202   )   |
| OUT<05:(202 CO)   |    =========  OUTFLOW STORAGE TABLE  =========
--------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                          (cms)    (ha.m.)   |    (cms)    (ha.m.)
                           .000  .0000E+00   |     .087  .1520E-01
                           .033  .3800E-02   |     .098  .1900E-01
                           .057  .7600E-02   |     .109  .2280E-01
                           .073  .1140E-01   |     .118  .2640E-01

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     --------------------       (ha)     (cms)     (hrs)       (mm)
     INFLOW >04: (202   )        .90      .177     2.000     36.604
     OUTFLOW<05: (202 CO)        .90      .069     2.033     36.604
    OVERFLOW<06: (202.OV)        .00      .000      .000       .000

                    TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                    CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                    PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=   38.684
                    TIME SHIFT OF PEAK FLOW         (min)=     2.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=.1026E-01

-------------------------------------------------------------------------------
002:0011---------------------------------------------------------------------
*# CATCHMENT 203 - UNCONTROLLED DISCHARGE AROUND PERIMETER OF SITE
*
---------------------
| CALIB NASHYD      |   Area    (ha)=     .04   Curve Number    (CN)=80.00
| 07:203    DT= 1.00 |   Ia      (mm)=   6.350   # of Linear Res.(N)= 3.00
---------------------   U.H. Tp(hrs)=    .100

     Unit Hyd Qpeak  (cms)=     .015

     PEAK FLOW       (cms)=     .002 (i)
     TIME TO PEAK    (hrs)=    2.067
     RUNOFF VOLUME    (mm)=   12.187
     TOTAL RAINFALL   (mm)=   40.933
     RUNOFF COEFFICIENT   =     .298

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
002:0012---------------------------------------------------------------------
* ADD TOTAL FLOWS DIRECTED SOUTH
-----------------------
| ADD HYD (201+202+20) | ID: NHYD          AREA     QPEAK   TPEAK   R.V.    DWF
-----------------------                    (ha)     (cms)   (hrs)   (mm)    (cms)
                      ID1 02:201 CONTRO      .89     .083    2.02  37.16    .000
                     +ID2 03:201.OVF         .00     .000     .00    .00    .000
                     +ID3 05:202 CONTRO      .90     .069    2.03  36.60    .000
                     +ID4 06:202.OVF         .00     .000     .00    .00    .000
                     +ID5 07:203             .04     .002    2.07  12.19    .000
                      ==========================================================
                      SUM 08:201+202+20     1.83     .153    2.03  36.34    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
002:0013---------------------------------------------------------------------
**#*****************************************************************************|
* RUN REMAINING DESIGN STORMS (CITY OF BURLINGTON 2 TO 100-YR)
*
  ** END OF RUN :   4

*******************************************************************************




--------------------
| START             |  Project  dir.: T:\projects\22057\SWMHYMO\
--------------------  Rainfall dir.: T:\projects\22057\SWMHYMO\
    TZERO =   .00 hrs on        0
    METOUT=   2 (output = METRIC)
    NRUN  = 005
    NSTORM=   1
           #  1=BUR6_005.stm
-------------------------------------------------------------------------------
005:0002---------------------------------------------------------------------
*#*****************************************************************************|
*#  Project Name: 484 PLAINS ROAD EAST (PHASE 2)
*#               BURLINGTON, ONTARIO
*#  JOB NUMBER  : 22057
*#       Date   : AUGUST 2022
*#    Company   : S. LLEWELLYN AND ASSOCIATES LTD.
*#       File   : 22056.DAT
*#*****************************************************************************|
*
*
-------------------------------------------------------------------------------
005:0002---------------------------------------------------------------------
*
--------------------
| READ STORM        |    Filename: Burlington 5-yr 6hr CHICAGO    (A=802.04
| Ptotal=  53.05 mm|    Comments: Burlington 5-yr 6hr CHICAGO    (A=802.04
--------------------
              TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
               hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
               .17   2.348 |   1.67  10.690 |   3.17   5.897 |   4.67   3.004
               .33   2.537 |   1.83  24.479 |   3.33   5.279 |   4.83   2.862
               .50   2.766 |   2.00 101.312 |   3.50   4.790 |   5.00   2.734
               .67   3.048 |   2.17  31.941 |   3.67   4.394 |   5.17   2.619
               .83   3.407 |   2.33  17.333 |   3.83   4.065 |   5.33   2.514
              1.00   3.881 |   2.50  12.145 |   4.00   3.788 |   5.50   2.419
              1.17   4.539 |   2.67   9.469 |   4.17   3.550 |   5.67   2.331
              1.33   5.523 |   2.83   7.826 |   4.33   3.344 |   5.83   2.251
              1.50   7.185 |   3.00   6.709 |   4.50   3.164 |   6.00   2.176

-------------------------------------------------------------------------------
005:0003---------------------------------------------------------------------
*
*#*****************************************************************************|
*#
*#        PRE-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING (PHASE 1)
*#        ========================================================
*#
*#*****************************************************************************|
*# CATCHMENT 101 -  PRE-DEVELOPMENT DISCHARGE TO NORA DRIVE FROM PHASE 1
*
---------------------
| CALIB STANDHYD    |   Area    (ha)=     .93
| 01:101    DT= 1.00 |   Total Imp(%)=   36.00   Dir. Conn.(%)=   36.00
---------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        .33          .60
     Dep. Storage     (mm)=       1.00         6.35
     Average Slope     (%)=       2.20         2.00
     Length            (m)=      16.00         5.00
     Mannings n           =       .013         .250

     Max.eff.Inten.(mm/hr)=     101.31        41.03
               over (min)        1.00         4.00
     Storage Coeff.  (min)=        .67 (ii)    3.56 (ii)
     Unit Hyd. Tpeak (min)=       1.00         4.00
     Unit Hyd. peak  (cms)=       1.32          .30
                                                    *TOTALS*
     PEAK FLOW       (cms)=        .09          .05          .146 (iii)
     TIME TO PEAK    (hrs)=       2.00         2.02         2.000
     RUNOFF VOLUME    (mm)=      52.05        19.79        31.406
     TOTAL RAINFALL   (mm)=      53.05        53.05        53.053
     RUNOFF COEFFICIENT   =        .98          .37          .592

       (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.

--------------------------------------------------------------------------------
005:0004----------------------------------------------------------------------
*# CATCHMENT 102 -  PRE-DEVELOPMENT DISCHARGE TO NORA DRIVE FROM PHASE 2
*
---------------------
| CALIB STANDHYD     |   Area    (ha)=     .74
| 02:102    DT= 1.00 |   Total Imp(%)=   36.00   Dir. Conn.(%)=   36.00
---------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       .27          .47
     Dep. Storage     (mm)=      1.00         6.35
     Average Slope     (%)=      2.20         2.00
     Length            (m)=     16.00         5.00
     Mannings n           =      .013         .250

     Max.eff.Inten.(mm/hr)=    101.31        41.03
               over (min)        1.00         4.00
     Storage Coeff.  (min)=       .67 (ii)    3.56 (ii)
     Unit Hyd. Tpeak (min)=      1.00         4.00
     Unit Hyd. peak  (cms)=      1.32          .30
                                                    *TOTALS*
     PEAK FLOW       (cms)=       .07          .04          .116 (iii)
     TIME TO PEAK    (hrs)=      2.00         2.02         2.000
     RUNOFF VOLUME    (mm)=     52.05        19.79        31.406
     TOTAL RAINFALL   (mm)=     53.05        53.05        53.053
     RUNOFF COEFFICIENT   =       .98          .37          .592

       (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.

--------------------------------------------------------------------------------
005:0005----------------------------------------------------------------------
* ADD TOTAL EXISTING FLOWS DIRECTED SOUTH
------------------------
| ADD HYD (101+102   ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
------------------------                  (ha)     (cms)   (hrs)   (mm)   (cms)
                      ID1 01:101           .93      .146    2.00  31.41    .000
                     +ID2 02:102           .74      .116    2.00  31.41    .000
                      ============================================================
                      SUM 03:101+102       1.67     .262    2.00  31.41    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
005:0006----------------------------------------------------------------------
*# CATCHMENT 103 -  PRE-DEVELOPMENT DISCHARGE TO PLAINS ROAD EAST
*
---------------------
| CALIB STANDHYD     |   Area    (ha)=     .16
| 04:102    DT= 1.00 |   Total Imp(%)=   36.00   Dir. Conn.(%)=   36.00
---------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       .06          .10
     Dep. Storage     (mm)=      1.00         6.35
     Average Slope     (%)=      1.30         2.00
     Length            (m)=     14.00         5.00
     Mannings n           =      .013         .250

     Max.eff.Inten.(mm/hr)=    101.31        41.03
               over (min)        1.00         4.00
     Storage Coeff.  (min)=       .72 (ii)    3.62 (ii)
     Unit Hyd. Tpeak (min)=      1.00         4.00
     Unit Hyd. peak  (cms)=      1.27          .30
                                                    *TOTALS*
     PEAK FLOW       (cms)=       .02          .01          .025 (iii)
     TIME TO PEAK    (hrs)=      1.98         2.02         2.000
     RUNOFF VOLUME    (mm)=     52.05        19.79        31.406
     TOTAL RAINFALL   (mm)=     53.05        53.05        53.053
     RUNOFF COEFFICIENT   =       .98          .37          .592

       (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.

--------------------------------------------------------------------------------
005:0007----------------------------------------------------------------------
*#*****************************************************************************|
*#
*#        POST-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING (PHASE 1)
*#        ========================================================
*#
**#*****************************************************************************|
*# CATCHMENT 201 - PHASE 1 CONTROLLED DISCHARGE TO NORA DRIVE
*
---------------------
| CALIB STANDHYD     |   Area    (ha)=     .89
| 01:201    DT= 1.00 |   Total Imp(%)=   90.00   Dir. Conn.(%)=   90.00
---------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       .80          .09
     Dep. Storage     (mm)=      1.00         6.35
     Average Slope     (%)=      1.90         2.00
     Length            (m)=     15.00         5.00
     Mannings n           =      .013         .250

     Max.eff.Inten.(mm/hr)=    101.31        41.03
               over (min)        1.00         4.00
     Storage Coeff.  (min)=       .67 (ii)    3.57 (ii)
     Unit Hyd. Tpeak (min)=      1.00         4.00
     Unit Hyd. peak  (cms)=      1.32          .30
                                                    *TOTALS*
     PEAK FLOW       (cms)=       .23          .01          .233 (iii)
     TIME TO PEAK    (hrs)=      2.00         2.02         2.000
     RUNOFF VOLUME    (mm)=     52.05        19.79        48.827
     TOTAL RAINFALL   (mm)=     53.05        53.05        53.053
     RUNOFF COEFFICIENT   =       .98          .37          .920

       (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.

--------------------------------------------------------------------------------
005:0008----------------------------------------------------------------------
*# ROUTE CATCHMENT 201 THROUGH ORIFICE PIPE AND TANK
*
---------------------
| ROUTE RESERVOIR    |    Requested routing time step =  1.0 min.
|  IN>01:(201   )    |
| OUT<02:(201 CO)    |    =========  OUTLFOW STORAGE TABLE  =========
---------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)     (ha.m.)   |    (cms)    (ha.m.)
                           .000  .0000E+00     |     .103  .1360E-01
                           .027  .3100E-02     |     .118  .1710E-01
                           .063  .6600E-02     |     .131  .2060E-01
                           .085  .1010E-01     |     .146  .2510E-01

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     -------------------        (ha)     (cms)     (hrs)        (mm)
     INFLOW >01: (201   )        .89      .233     2.000      48.827
     OUTFLOW<02: (201 CO)        .89      .099     2.033      48.827
    OVERFLOW<03: (201.OV)        .00      .000      .000       .000

                    TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                    CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                    PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=   42.519
                    TIME SHIFT OF PEAK FLOW          (min)=     2.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=.1288E-01

--------------------------------------------------------------------------------
005:0009----------------------------------------------------------------------
*# CATCHMENT 202 - PHASE 2 CONTROLLED DISCHARGE TO NORA DRIVE
*
---------------------
| CALIB STANDHYD     |   Area    (ha)=     .90
| 04:202    DT= 1.00 |   Total Imp(%)=   88.00   Dir. Conn.(%)=   88.00
---------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       .79          .11
     Dep. Storage     (mm)=      1.00         6.35
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     15.00         5.00
     Mannings n           =      .013         .250

     Max.eff.Inten.(mm/hr)=    101.31        41.03
               over (min)        1.00         4.00
     Storage Coeff.  (min)=       .66 (ii)    3.56 (ii)
     Unit Hyd. Tpeak (min)=      1.00         4.00
     Unit Hyd. peak  (cms)=      1.32          .30
                                                    *TOTALS*
     PEAK FLOW       (cms)=       .22          .01          .232 (iii)
     TIME TO PEAK    (hrs)=      2.00         2.02         2.000
     RUNOFF VOLUME    (mm)=     52.05        19.79        48.182
     TOTAL RAINFALL   (mm)=     53.05        53.05        53.053
     RUNOFF COEFFICIENT   =       .98          .37          .908

       (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.

--------------------------------------------------------------------------------
005:0010----------------------------------------------------------------------
*# ROUTE CATCHMENT 202 THROUGH ORIFICE PIPE AND TANK
*
---------------------
| ROUTE RESERVOIR    |    Requested routing time step =  1.0 min.
|  IN>04:(202   )    |
| OUT<05:(202 CO)    |    =========  OUTLFOW STORAGE TABLE  =========
---------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)     (ha.m.)   |    (cms)    (ha.m.)
                           .000  .0000E+00     |     .087  .1520E-01
                           .033  .3800E-02     |     .098  .1900E-01
                           .057  .7600E-02     |     .109  .2280E-01
                           .073  .1140E-01     |     .118  .2640E-01

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     -------------------        (ha)     (cms)     (hrs)        (mm)
     INFLOW >04: (202   )        .90      .232     2.000      48.182
     OUTFLOW<05: (202 CO)        .90      .081     2.050      48.182
    OVERFLOW<06: (202.OV)        .00      .000      .000       .000

                    TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                    CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                    PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=   35.075
                    TIME SHIFT OF PEAK FLOW          (min)=     3.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=.1367E-01

--------------------------------------------------------------------------------
005:0011----------------------------------------------------------------------
*# CATCHMENT 203 - UNCONTROLLED DISCHARGE AROUND PERIMETER OF SITE
*
---------------------
| CALIB NASHYD       |   Area    (ha)=     .04   Curve Number   (CN)=80.00
| 07:203    DT= 1.00 |   Ia      (mm)=   6.350   # of Linear Res.(N)= 3.00
---------------------  U.H. Tp(hrs)=    .100

     Unit Hyd Qpeak  (cms)=     .015

     PEAK FLOW       (cms)=     .003 (i)
     TIME TO PEAK    (hrs)=    2.067
     RUNOFF VOLUME    (mm)=   19.787
     TOTAL RAINFALL   (mm)=   53.053
     RUNOFF COEFFICIENT   =     .373

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
005:0012----------------------------------------------------------------------
* ADD TOTAL FLOWS DIRECTED SOUTH
------------------------
| ADD HYD (201+202+20) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
```

```
------------------------                    (ha)     (cms)   (hrs)   (mm)    (cms)
                    ID1 02:201 CONTRO       .89      .099    2.03  48.83    .000
                   +ID2 03:201.OVF          .00      .000     .00    .00    .000
                   +ID3 05:202 CONTRO       .90      .081    2.05  48.18    .000
                   +ID4 06:202.OVF          .00      .000     .00    .00    .000
                   +ID5 07:203              .04      .003    2.07  19.79    .000
                    ============================================================
                    SUM 08:201+202+20      1.83      .183    2.03  47.87    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
005:0013----------------------------------------------------------------------
**#*************************************************************************|
* RUN REMAINING DESIGN STORMS (CITY OF BURLINGTON 2 TO 100-YR)
*
------------------------------------------------------------------------------
005:0002----------------------------------------------------------------------
*
  ** END OF RUN :   9

********************************************************************************




--------------------
| START            |  Project  dir.: T:\projects\22057\SWMHYMO\
--------------------  Rainfall dir.: T:\projects\22057\SWMHYMO\
    TZERO =   .00 hrs on        0
    METOUT=   2 (output = METRIC)
    NRUN  = 010
    NSTORM=   1
          #  1=BUR6_010.stm
------------------------------------------------------------------------------
010:0002----------------------------------------------------------------------
*#*************************************************************************|
*#  Project Name: 484 PLAINS ROAD EAST (PHASE 2)
*#               BURLINGTON, ONTARIO
*#  JOB NUMBER  : 22057
*#       Date   : AUGUST 2022
*#    Company   : S. LLEWELLYN AND ASSOCIATES LTD.
*#       File   : 22056.DAT
*#*************************************************************************|
*
*
------------------------------------------------------------------------------
010:0002----------------------------------------------------------------------
*
--------------------
| READ STORM       |    Filename: Burlington 10-yr 6hr CHICAGO      (A=918.
| Ptotal=  61.10 mm|    Comments: Burlington 10-yr 6hr CHICAGO      (A=918.
--------------------
             TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
              hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
              .17   2.714 |   1.67  12.326 |   3.17   6.808 |   4.67   3.472
              .33   2.933 |   1.83  28.176 |   3.33   6.095 |   4.83   3.308
              .50   3.197 |   2.00 116.310 |   3.50   5.532 |   5.00   3.161
              .67   3.523 |   2.17  36.748 |   3.67   5.075 |   5.17   3.027
              .83   3.937 |   2.33  19.967 |   3.83   4.696 |   5.33   2.907
             1.00   4.483 |   2.50  14.001 |   4.00   4.376 |   5.50   2.796
             1.17   5.242 |   2.67  10.921 |   4.17   4.102 |   5.67   2.695
             1.33   6.377 |   2.83   9.030 |   4.33   3.864 |   5.83   2.602
             1.50   8.291 |   3.00   7.743 |   4.50   3.656 |   6.00   2.516

------------------------------------------------------------------------------
010:0003----------------------------------------------------------------------
*
*#*************************************************************************|
*#
*#        PRE-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING (PHASE 1)
*#        ========================================================
*#
*#*************************************************************************|
*# CATCHMENT 101 -  PRE-DEVELOPMENT DISCHARGE TO NORA DRIVE FROM PHASE 1
*
----------------------
| CALIB STANDHYD     |   Area    (ha)=     .93
| 01:101    DT= 1.00 |   Total Imp(%)=   36.00   Dir. Conn.(%)=   36.00
----------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       .33          .60
     Dep. Storage     (mm)=      1.00         6.35
     Average Slope     (%)=      2.20         2.00
     Length            (m)=     16.00         5.00
     Mannings n           =      .013         .250

     Max.eff.Inten.(mm/hr)=    116.31        54.51
               over (min)        1.00         3.00
     Storage Coeff.  (min)=      .63 (ii)     3.22 (ii)
     Unit Hyd. Tpeak (min)=      1.00         3.00
     Unit Hyd. peak  (cms)=      1.35          .36
                                                    *TOTALS*
     PEAK FLOW       (cms)=       .11          .07          .182 (iii)
     TIME TO PEAK    (hrs)=      1.98         2.02         2.000
     RUNOFF VOLUME    (mm)=     60.10        25.35        37.861
     TOTAL RAINFALL   (mm)=     61.10        61.10        61.101
     RUNOFF COEFFICIENT   =       .98          .41          .620

       (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.

------------------------------------------------------------------------------
010:0004----------------------------------------------------------------------
*# CATCHMENT 102 -  PRE-DEVELOPMENT DISCHARGE TO NORA DRIVE FROM PHASE 2
*
----------------------
| CALIB STANDHYD     |   Area    (ha)=     .74
| 02:102    DT= 1.00 |   Total Imp(%)=   36.00   Dir. Conn.(%)=   36.00
----------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       .27          .47
     Dep. Storage     (mm)=      1.00         6.35
     Average Slope     (%)=      2.20         2.00
     Length            (m)=     16.00         5.00
     Mannings n           =      .013         .250

     Max.eff.Inten.(mm/hr)=    116.31        54.51
               over (min)        1.00         3.00
     Storage Coeff.  (min)=      .63 (ii)     3.22 (ii)
     Unit Hyd. Tpeak (min)=      1.00         3.00
     Unit Hyd. peak  (cms)=      1.35          .36
                                                    *TOTALS*
     PEAK FLOW       (cms)=       .09          .06          .145 (iii)
     TIME TO PEAK    (hrs)=      1.98         2.02         2.000
     RUNOFF VOLUME    (mm)=     60.10        25.35        37.861
     TOTAL RAINFALL   (mm)=     61.10        61.10        61.101
     RUNOFF COEFFICIENT   =       .98          .41          .620

       (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.

------------------------------------------------------------------------------
010:0005----------------------------------------------------------------------
* ADD TOTAL EXISTING FLOWS DIRECTED SOUTH
----------------------
| ADD HYD (101+102   ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
------------------------                  (ha)     (cms)   (hrs)   (mm)    (cms)
                    ID1 01:101             .93      .182    2.00  37.86    .000
                   +ID2 02:102             .74      .145    2.00  37.86    .000
                    ============================================================
                    SUM 03:101+102        1.67      .326    2.00  37.86    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
010:0006----------------------------------------------------------------------
*# CATCHMENT 103 -  PRE-DEVELOPMENT DISCHARGE TO PLAINS ROAD EAST
*
----------------------
| CALIB STANDHYD     |   Area    (ha)=     .16
| 04:102    DT= 1.00 |   Total Imp(%)=   36.00   Dir. Conn.(%)=   36.00
----------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       .06          .10
     Dep. Storage     (mm)=      1.00         6.35
     Average Slope     (%)=      1.30         2.00
     Length            (m)=     14.00         5.00
     Mannings n           =      .013         .250

     Max.eff.Inten.(mm/hr)=    116.31        54.51
               over (min)        1.00         3.00
     Storage Coeff.  (min)=      .68 (ii)     3.27 (ii)
     Unit Hyd. Tpeak (min)=      1.00         3.00
     Unit Hyd. peak  (cms)=      1.31          .35
                                                    *TOTALS*
     PEAK FLOW       (cms)=       .02          .01          .031 (iii)
     TIME TO PEAK    (hrs)=      1.98         2.02         2.000
     RUNOFF VOLUME    (mm)=     60.10        25.35        37.861
     TOTAL RAINFALL   (mm)=     61.10        61.10        61.101
     RUNOFF COEFFICIENT   =       .98          .41          .620

       (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.

------------------------------------------------------------------------------
010:0007----------------------------------------------------------------------
*#*************************************************************************|
*#
*#        POST-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING (PHASE 1)
*#        =========================================================
*#
**#************************************************************************|
*# CATCHMENT 201 - PHASE 1 CONTROLLED DISCHARGE TO NORA DRIVE
*
----------------------
| CALIB STANDHYD     |   Area    (ha)=     .89
| 01:201    DT= 1.00 |   Total Imp(%)=   90.00   Dir. Conn.(%)=   90.00
----------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       .80          .09
     Dep. Storage     (mm)=      1.00         6.35
     Average Slope     (%)=      1.90         2.00
     Length            (m)=     15.00         5.00
     Mannings n           =      .013         .250

     Max.eff.Inten.(mm/hr)=    116.31        54.51
               over (min)        1.00         3.00
     Storage Coeff.  (min)=      .64 (ii)     3.22 (ii)
     Unit Hyd. Tpeak (min)=      1.00         3.00
     Unit Hyd. peak  (cms)=      1.35          .36
                                                    *TOTALS*
     PEAK FLOW       (cms)=       .26          .01          .270 (iii)
     TIME TO PEAK    (hrs)=      2.00         2.02         2.000
     RUNOFF VOLUME    (mm)=     60.10        25.35        56.626
     TOTAL RAINFALL   (mm)=     61.10        61.10        61.101
     RUNOFF COEFFICIENT   =       .98          .41          .927

       (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.

------------------------------------------------------------------------------
010:0008----------------------------------------------------------------------
*# ROUTE CATCHMENT 201 THROUGH ORIFICE PIPE AND TANK
*
----------------------
| ROUTE RESERVOIR    |    Requested routing time step =  1.0 min.
|  IN>01:(201   )    |
| OUT<02:(201 CO)    |    =========  OUTLFOW STORAGE TABLE  =========
---------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)     (ha.m.)   |    (cms)    (ha.m.)
                            .000  .0000E+00    |     .103  .1360E-01
                            .027  .3100E-02    |     .118  .1710E-01
                            .063  .6600E-02    |     .131  .2060E-01
                            .085  .1010E-01    |     .146  .2510E-01

     ROUTING RESULTS             AREA     QPEAK     TPEAK       R.V.
```

```
     -------------------       (ha)      (cms)     (hrs)       (mm)
     INFLOW >01: (201   )        .89      .270     2.000     56.626
     OUTFLOW<02: (201 CO)        .89      .109     2.033     56.626
    OVERFLOW<03: (201.OV)        .00      .000      .000       .000

                    TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                    CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                    PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=   40.479
                    TIME SHIFT OF PEAK FLOW         (min)=    2.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=.1510E-01

------------------------------------------------------------------------------
010:0009--------------------------------------------------------------------
*# CATCHMENT 202 - PHASE 2 CONTROLLED DISCHARGE TO NORA DRIVE
*
--------------------
| CALIB STANDHYD     |   Area    (ha)=     .90
| 04:202    DT= 1.00 |   Total Imp(%)=   88.00   Dir. Conn.(%)=   88.00
---------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       .79          .11
     Dep. Storage     (mm)=      1.00         6.35
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     15.00         5.00
     Mannings n           =      .013         .250

     Max.eff.Inten.(mm/hr)=    116.31        54.51
               over (min)        1.00         3.00
     Storage Coeff.  (min)=      .63 (ii)    3.21 (ii)
     Unit Hyd. Tpeak (min)=      1.00         3.00
     Unit Hyd. peak  (cms)=      1.36          .36
                                                    *TOTALS*
     PEAK FLOW       (cms)=       .26          .01          .269 (iii)
     TIME TO PEAK    (hrs)=      2.00         2.02         2.000
     RUNOFF VOLUME    (mm)=     60.10        25.35        55.931
     TOTAL RAINFALL   (mm)=     61.10        61.10        61.101
     RUNOFF COEFFICIENT   =       .98          .41          .915

       (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.

------------------------------------------------------------------------------
010:0010--------------------------------------------------------------------
*# ROUTE CATCHMENT 202 THROUGH ORIFICE PIPE AND TANK
*
--------------------
| ROUTE RESERVOIR    |    Requested routing time step =  1.0 min.
|  IN>04:(202   )    |
| OUT<05:(202 CO)    |    =========  OUTLFOW STORAGE TABLE  =========
---------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)     (ha.m.)   |    (cms)    (ha.m.)
                           .000  .0000E+00   |     .087  .1520E-01
                           .033  .3800E-02   |     .098  .1900E-01
                           .057  .7600E-02   |     .109  .2280E-01
                           .073  .1140E-01   |     .118  .2640E-01

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     -------------------        (ha)     (cms)     (hrs)       (mm)
     INFLOW >04: (202   )        .90      .269     2.000     55.931
     OUTFLOW<05: (202 CO)        .90      .090     2.083     55.931
    OVERFLOW<06: (202.OV)        .00      .000      .000       .000

                    TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                    CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                    PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=   33.285
                    TIME SHIFT OF PEAK FLOW         (min)=    5.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=.1612E-01

------------------------------------------------------------------------------
010:0011--------------------------------------------------------------------
*# CATCHMENT 203 - UNCONTROLLED DISCHARGE AROUND PERIMETER OF SITE
*
---------------------
| CALIB NASHYD       |   Area    (ha)=     .04   Curve Number   (CN)=80.00
| 07:203    DT= 1.00 |   Ia      (mm)=   6.350   # of Linear Res.(N)= 3.00
---------------------  U.H. Tp(hrs)=    .100

     Unit Hyd Qpeak  (cms)=     .015

     PEAK FLOW       (cms)=     .004 (i)
     TIME TO PEAK    (hrs)=    2.050
     RUNOFF VOLUME    (mm)=   25.345
     TOTAL RAINFALL   (mm)=   61.101
     RUNOFF COEFFICIENT   =     .415

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

------------------------------------------------------------------------------
010:0012--------------------------------------------------------------------
* ADD TOTAL FLOWS DIRECTED SOUTH
------------------------
| ADD HYD (201+202+20) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
------------------------                  (ha)     (cms)   (hrs)   (mm)    (cms)
                    ID1 02:201 CONTRO      .89     .109    2.03  56.63    .000
                   +ID2 03:201.OVF         .00     .000     .00    .00    .000
                   +ID3 05:202 CONTRO      .90     .090    2.08  55.93    .000
                   +ID4 06:202.OVF         .00     .000     .00    .00    .000
                   +ID5 07:203             .04     .004    2.05  25.35    .000
                    ================================================
                    SUM 08:201+202+20     1.83     .202    2.03  55.60    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
010:0013--------------------------------------------------------------------
**#*****************************************************************|
* RUN REMAINING DESIGN STORMS (CITY OF BURLINGTON 2 TO 100-YR)
*
------------------------------------------------------------------------------
010:0002--------------------------------------------------------------------
*
------------------------------------------------------------------------------
010:0002--------------------------------------------------------------------
*
  ** END OF RUN :  24

********************************************************************************




--------------------
| START            |  Project  dir.: T:\projects\22057\SWMHYMO\
-------------------  Rainfall dir.: T:\projects\22057\SWMHYMO\
    TZERO =   .00 hrs on        0
    METOUT=   2 (output = METRIC)
    NRUN  = 025
    NSTORM=   1
           #  1=BUR6_025.stm
------------------------------------------------------------------------------
025:0002--------------------------------------------------------------------
*#*****************************************************************|
*#  Project Name: 484 PLAINS ROAD EAST (PHASE 2)
*#               BURLINGTON, ONTARIO
*#  JOB NUMBER  : 22057
*#       Date   : AUGUST 2022
*#    Company   : S. LLEWELLYN AND ASSOCIATES LTD.
*#       File   : 22056.DAT
*#*****************************************************************|
*
*
------------------------------------------------------------------------------
025:0002--------------------------------------------------------------------
*
--------------------
| READ STORM       |    Filename: Burlington 25-yr 6hr CHICAGO      (A=106
| Ptotal=  71.35 mm|    Comments: Burlington 25-yr 6hr CHICAGO      (A=106
--------------------
             TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
              hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
              .17   3.182 |   1.67  14.410 |   3.17   7.968 |   4.67   4.068
              .33   3.437 |   1.83  32.881 |   3.33   7.135 |   4.83   3.876
              .50   3.746 |   2.00 135.380 |   3.50   6.477 |   5.00   3.704
              .67   4.128 |   2.17  42.866 |   3.67   5.943 |   5.17   3.548
              .83   4.612 |   2.33  23.321 |   3.83   5.499 |   5.33   3.407
             1.00   5.251 |   2.50  16.365 |   4.00   5.125 |   5.50   3.278
             1.17   6.138 |   2.67  12.771 |   4.17   4.805 |   5.67   3.160
             1.33   7.465 |   2.83  10.563 |   4.33   4.527 |   5.83   3.051
             1.50   9.700 |   3.00   9.061 |   4.50   4.284 |   6.00   2.950

------------------------------------------------------------------------------
025:0003--------------------------------------------------------------------
*
*#*****************************************************************|
*#
*#        PRE-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING (PHASE 1)
*#        ======================================================
*#
*#*****************************************************************|
*# CATCHMENT 101 -  PRE-DEVELOPMENT DISCHARGE TO NORA DRIVE FROM PHASE 1
*
---------------------
| CALIB STANDHYD     |   Area    (ha)=     .93
| 01:101    DT= 1.00 |   Total Imp(%)=   36.00   Dir. Conn.(%)=   36.00
---------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       .33          .60
     Dep. Storage     (mm)=      1.00         6.35
     Average Slope     (%)=      2.20         2.00
     Length            (m)=     16.00         5.00
     Mannings n           =      .013         .250

     Max.eff.Inten.(mm/hr)=    135.38        71.01
               over (min)        1.00         3.00
     Storage Coeff.  (min)=      .59 (ii)    2.92 (ii)
     Unit Hyd. Tpeak (min)=      1.00         3.00
     Unit Hyd. peak  (cms)=      1.38          .38
                                                    *TOTALS*
     PEAK FLOW       (cms)=       .13          .10          .226 (iii)
     TIME TO PEAK    (hrs)=      1.98         2.00         2.000
     RUNOFF VOLUME    (mm)=     70.35        32.88        46.366
     TOTAL RAINFALL   (mm)=     71.35        71.35        71.347
     RUNOFF COEFFICIENT   =       .99          .46          .650

       (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.

------------------------------------------------------------------------------
025:0004--------------------------------------------------------------------
*# CATCHMENT 102 -  PRE-DEVELOPMENT DISCHARGE TO NORA DRIVE FROM PHASE 2
*
---------------------
| CALIB STANDHYD     |   Area    (ha)=     .74
| 02:102    DT= 1.00 |   Total Imp(%)=   36.00   Dir. Conn.(%)=   36.00
---------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       .27          .47
     Dep. Storage     (mm)=      1.00         6.35
     Average Slope     (%)=      2.20         2.00
     Length            (m)=     16.00         5.00
     Mannings n           =      .013         .250

     Max.eff.Inten.(mm/hr)=    135.38        71.01
               over (min)        1.00         3.00
     Storage Coeff.  (min)=      .59 (ii)    2.92 (ii)
     Unit Hyd. Tpeak (min)=      1.00         3.00
     Unit Hyd. peak  (cms)=      1.38          .38
                                                    *TOTALS*
     PEAK FLOW       (cms)=       .10          .08          .179 (iii)
     TIME TO PEAK    (hrs)=      1.98         2.00         2.000
     RUNOFF VOLUME    (mm)=     70.35        32.88        46.366
     TOTAL RAINFALL   (mm)=     71.35        71.35        71.347
     RUNOFF COEFFICIENT   =       .99          .46          .650

       (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.

--------------------------------------------------------------------------------
025:0005--------------------------------------------------------------------------
* ADD TOTAL EXISTING FLOWS DIRECTED SOUTH
------------------------
| ADD HYD (101+102   ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
-----------------------                   (ha)     (cms)   (hrs)   (mm)   (cms)
                      ID1 01:101           .93     .226    2.00  46.37    .000
                     +ID2 02:102           .74     .179    2.00  46.37    .000
                      ========================================================
                      SUM 03:101+102       1.67     .405    2.00  46.37    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
025:0006--------------------------------------------------------------------------
*# CATCHMENT 103 -  PRE-DEVELOPMENT DISCHARGE TO PLAINS ROAD EAST
*
----------------------
| CALIB STANDHYD     |   Area    (ha)=     .16
| 04:102    DT= 1.00 |   Total Imp(%)=   36.00   Dir. Conn.(%)=   36.00
----------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       .06          .10
     Dep. Storage     (mm)=      1.00         6.35
     Average Slope     (%)=      1.30         2.00
     Length            (m)=     14.00         5.00
     Mannings n           =      .013         .250

     Max.eff.Inten.(mm/hr)=    135.38        71.01
               over (min)        1.00         3.00
     Storage Coeff.  (min)=     .64 (ii)    2.97 (ii)
     Unit Hyd. Tpeak (min)=      1.00         3.00
     Unit Hyd. peak  (cms)=      1.34          .38
                                                    *TOTALS*
     PEAK FLOW       (cms)=       .02          .02          .039 (iii)
     TIME TO PEAK    (hrs)=      1.98         2.00         2.000
     RUNOFF VOLUME    (mm)=     70.35        32.88        46.366
     TOTAL RAINFALL   (mm)=     71.35        71.35        71.347
     RUNOFF COEFFICIENT   =       .99          .46          .650

       (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.

--------------------------------------------------------------------------------
025:0007--------------------------------------------------------------------------
*#*************************************************************************|
*#
*#        POST-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING (PHASE 1)
*#        ========================================================
*#
**#*************************************************************************|
*# CATCHMENT 201 - PHASE 1 CONTROLLED DISCHARGE TO NORA DRIVE
*
----------------------
| CALIB STANDHYD     |   Area    (ha)=     .89
| 01:201    DT= 1.00 |   Total Imp(%)=   90.00   Dir. Conn.(%)=   90.00
----------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       .80          .09
     Dep. Storage     (mm)=      1.00         6.35
     Average Slope     (%)=      1.90         2.00
     Length            (m)=     15.00         5.00
     Mannings n           =      .013         .250

     Max.eff.Inten.(mm/hr)=    135.38        71.01
               over (min)        1.00         3.00
     Storage Coeff.  (min)=      .60 (ii)    2.92 (ii)
     Unit Hyd. Tpeak (min)=      1.00         3.00
     Unit Hyd. peak  (cms)=      1.38          .38
                                                    *TOTALS*
     PEAK FLOW       (cms)=       .30          .01          .316 (iii)
     TIME TO PEAK    (hrs)=      2.00         2.00         2.000
     RUNOFF VOLUME    (mm)=     70.35        32.88        66.600
     TOTAL RAINFALL   (mm)=     71.35        71.35        71.347
     RUNOFF COEFFICIENT   =       .99          .46          .933

       (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.

--------------------------------------------------------------------------------
025:0008--------------------------------------------------------------------------
*# ROUTE CATCHMENT 201 THROUGH ORIFICE PIPE AND TANK
*
----------------------
| ROUTE RESERVOIR    |    Requested routing time step =  1.0 min.
|  IN>01:(201   )    |
| OUT<02:(201 CO)    |    =========  OUTLFOW STORAGE TABLE  =========
----------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                            (cms)     (ha.m.)   |    (cms)    (ha.m.)
                            .000  .0000E+00   |     .103  .1360E-01
                            .027  .3100E-02   |     .118  .1710E-01
                            .063  .6600E-02   |     .131  .2060E-01
                            .085  .1010E-01   |     .146  .2510E-01

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     --------------------       (ha)     (cms)     (hrs)       (mm)
     INFLOW >01: (201   )        .89      .316     2.000     66.600
     OUTFLOW<02: (201 CO)        .89      .121     2.033     66.600
    OVERFLOW<03: (201.OV)        .00      .000      .000       .000

                   TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                   CUMULATIVE TIME OF OVERFLOWS  (hours)=       .00
                   PERCENTAGE OF TIME OVERFLOWING    (%)=       .00


                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=   38.309
                   TIME SHIFT OF PEAK FLOW          (min)=     2.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=.1796E-01

--------------------------------------------------------------------------------
025:0009--------------------------------------------------------------------------
*# CATCHMENT 202 - PHASE 2 CONTROLLED DISCHARGE TO NORA DRIVE
*
----------------------
| CALIB STANDHYD     |   Area    (ha)=     .90
| 04:202    DT= 1.00 |   Total Imp(%)=   88.00   Dir. Conn.(%)=   88.00
----------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       .79          .11
     Dep. Storage     (mm)=      1.00         6.35
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     15.00         5.00
     Mannings n           =      .013         .250

     Max.eff.Inten.(mm/hr)=    135.38        71.01
               over (min)        1.00         3.00
     Storage Coeff.  (min)=      .59 (ii)    2.91 (ii)
     Unit Hyd. Tpeak (min)=      1.00         3.00
     Unit Hyd. peak  (cms)=      1.39          .38
                                                    *TOTALS*
     PEAK FLOW       (cms)=       .30          .02          .316 (iii)
     TIME TO PEAK    (hrs)=      1.98         2.00         2.000
     RUNOFF VOLUME    (mm)=     70.35        32.88        65.850
     TOTAL RAINFALL   (mm)=     71.35        71.35        71.347
     RUNOFF COEFFICIENT   =       .99          .46          .923

       (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.

--------------------------------------------------------------------------------
025:0010--------------------------------------------------------------------------
*# ROUTE CATCHMENT 202 THROUGH ORIFICE PIPE AND TANK
*
----------------------
| ROUTE RESERVOIR    |    Requested routing time step =  1.0 min.
|  IN>04:(202   )    |
| OUT<05:(202 CO)    |    =========  OUTLFOW STORAGE TABLE  =========
----------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                            (cms)     (ha.m.)   |    (cms)    (ha.m.)
                            .000  .0000E+00   |     .087  .1520E-01
                            .033  .3800E-02   |     .098  .1900E-01
                            .057  .7600E-02   |     .109  .2280E-01
                            .073  .1140E-01   |     .118  .2640E-01

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     --------------------       (ha)     (cms)     (hrs)       (mm)
     INFLOW >04: (202   )        .90      .316     2.000     65.850
     OUTFLOW<05: (202 CO)        .90      .100     2.167     65.850
    OVERFLOW<06: (202.OV)        .00      .000      .000       .000

                   TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                   CUMULATIVE TIME OF OVERFLOWS  (hours)=       .00
                   PERCENTAGE OF TIME OVERFLOWING    (%)=       .00


                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=   31.554
                   TIME SHIFT OF PEAK FLOW          (min)=    10.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=.1948E-01

--------------------------------------------------------------------------------
025:0011--------------------------------------------------------------------------
*# CATCHMENT 203 - UNCONTROLLED DISCHARGE AROUND PERIMETER OF SITE
*
----------------------
| CALIB NASHYD       |   Area    (ha)=     .04   Curve Number   (CN)=80.00
| 07:203    DT= 1.00 |   Ia      (mm)=   6.350   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .100

     Unit Hyd Qpeak  (cms)=     .015

     PEAK FLOW       (cms)=     .005 (i)
     TIME TO PEAK    (hrs)=    2.050
     RUNOFF VOLUME    (mm)=   32.872
     TOTAL RAINFALL   (mm)=   71.347
     RUNOFF COEFFICIENT   =     .461

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
025:0012--------------------------------------------------------------------------
* ADD TOTAL FLOWS DIRECTED SOUTH
------------------------
| ADD HYD (201+202+20) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
-----------------------                   (ha)     (cms)   (hrs)   (mm)   (cms)
                       ID1 02:201 CONTRO     .89     .121    2.03  66.60    .000
                      +ID2 03:201.OVF        .00     .000     .00    .00    .000
                      +ID3 05:202 CONTRO     .90     .100    2.17  65.85    .000
                      +ID4 06:202.OVF        .00     .000     .00    .00    .000
                      +ID5 07:203            .04     .005    2.05  32.87    .000
                       ========================================================
                       SUM 08:201+202+20     1.83     .225    2.05  65.49    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
025:0013--------------------------------------------------------------------------
**#*************************************************************************|
* RUN REMAINING DESIGN STORMS (CITY OF BURLINGTON 2 TO 100-YR)
*
--------------------------------------------------------------------------------
025:0002--------------------------------------------------------------------------
*
--------------------------------------------------------------------------------
025:0002--------------------------------------------------------------------------
*
--------------------------------------------------------------------------------
025:0002--------------------------------------------------------------------------
*
  ** END OF RUN :  49

********************************************************************************



----------------------
| START              |  Project  dir.: T:\projects\22057\SWMHYMO\
```

```
------------------  Rainfall dir.: T:\projects\22057\SWMHYMO\
    TZERO =   .00 hrs on      0
    METOUT=   2 (output = METRIC)
    NRUN  = 050
    NSTORM=   1
           #  1=BUR6_050.stm
--------------------------------------------------------------------------------
050:0002----------------------------------------------------------------------
*#*********************************************************************|
*#  Project Name: 484 PLAINS ROAD EAST (PHASE 2)
*#               BURLINGTON, ONTARIO
*#  JOB NUMBER  : 22057
*#       Date   : AUGUST 2022
*#    Company   : S. LLEWELLYN AND ASSOCIATES LTD.
*#       File   : 22056.DAT
*#*********************************************************************|
*
*
--------------------------------------------------------------------------------
050:0002----------------------------------------------------------------------
*
--------------------
| READ STORM       |    Filename: Burlington 50-yr 6hr CHICAGO     (A=1172
| Ptotal=  78.93 mm|    Comments: Burlington 50-yr 6hr CHICAGO     (A=1172
--------------------
              TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
               hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
               .17   3.533 |   1.67  15.961 |   3.17   8.836 |   4.67   4.516
               .33   3.817 |   1.83  36.356 |   3.33   7.913 |   4.83   4.304
               .50   4.160 |   2.00 149.296 |   3.50   7.185 |   5.00   4.113
               .67   4.582 |   2.17  47.374 |   3.67   6.593 |   5.17   3.940
               .83   5.119 |   2.33  25.806 |   3.83   6.102 |   5.33   3.783
              1.00   5.827 |   2.50  18.121 |   4.00   5.688 |   5.50   3.640
              1.17   6.809 |   2.67  14.149 |   4.17   5.333 |   5.67   3.509
              1.33   8.278 |   2.83  11.707 |   4.33   5.025 |   5.83   3.388
              1.50  10.753 |   3.00  10.045 |   4.50   4.755 |   6.00   3.277

--------------------------------------------------------------------------------
050:0003----------------------------------------------------------------------
*
*#*********************************************************************|
*#
*#        PRE-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING (PHASE 1)
*#        ========================================================
*#
*#*********************************************************************|
*# CATCHMENT 101 -  PRE-DEVELOPMENT DISCHARGE TO NORA DRIVE FROM PHASE 1
*
----------------------
| CALIB STANDHYD     |   Area    (ha)=     .93
| 01:101    DT= 1.00 |   Total Imp(%)=   36.00   Dir. Conn.(%)=   36.00
----------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       .33          .60
     Dep. Storage     (mm)=      1.00         6.35
     Average Slope     (%)=      2.20         2.00
     Length            (m)=     16.00         5.00
     Mannings n           =      .013         .250

     Max.eff.Inten.(mm/hr)=    149.30        83.65
               over (min)        1.00         3.00
     Storage Coeff.  (min)=       .57 (ii)    2.75 (ii)
     Unit Hyd. Tpeak (min)=      1.00         3.00
     Unit Hyd. peak  (cms)=      1.40          .40
                                                    *TOTALS*
     PEAK FLOW       (cms)=       .14          .12          .259 (iii)
     TIME TO PEAK    (hrs)=      1.98         2.00         2.000
     RUNOFF VOLUME    (mm)=     77.93        38.71        52.832
     TOTAL RAINFALL   (mm)=     78.93        78.93        78.932
     RUNOFF COEFFICIENT   =       .99          .49          .669

       (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.

--------------------------------------------------------------------------------
050:0004----------------------------------------------------------------------
*# CATCHMENT 102 -  PRE-DEVELOPMENT DISCHARGE TO NORA DRIVE FROM PHASE 2
*
----------------------
| CALIB STANDHYD     |   Area    (ha)=     .74
| 02:102    DT= 1.00 |   Total Imp(%)=   36.00   Dir. Conn.(%)=   36.00
----------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       .27          .47
     Dep. Storage     (mm)=      1.00         6.35
     Average Slope     (%)=      2.20         2.00
     Length            (m)=     16.00         5.00
     Mannings n           =      .013         .250

     Max.eff.Inten.(mm/hr)=    149.30        83.65
               over (min)        1.00         3.00
     Storage Coeff.  (min)=       .57 (ii)    2.75 (ii)
     Unit Hyd. Tpeak (min)=      1.00         3.00
     Unit Hyd. peak  (cms)=      1.40          .40
                                                    *TOTALS*
     PEAK FLOW       (cms)=       .11          .10          .206 (iii)
     TIME TO PEAK    (hrs)=      1.98         2.00         2.000
     RUNOFF VOLUME    (mm)=     77.93        38.71        52.832
     TOTAL RAINFALL   (mm)=     78.93        78.93        78.932
     RUNOFF COEFFICIENT   =       .99          .49          .669

       (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.

--------------------------------------------------------------------------------
050:0005----------------------------------------------------------------------
* ADD TOTAL EXISTING FLOWS DIRECTED SOUTH
------------------------
| ADD HYD (101+102   ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
------------------------                  (ha)     (cms)   (hrs)   (mm)   (cms)
                      ID1 01:101           .93      .259    2.00  52.83    .000
                     +ID2 02:102           .74      .206    2.00  52.83    .000
                      ======================================================
                      SUM 03:101+102       1.67     .465    2.00  52.83    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
050:0006----------------------------------------------------------------------
*# CATCHMENT 103 -  PRE-DEVELOPMENT DISCHARGE TO PLAINS ROAD EAST
*
----------------------
| CALIB STANDHYD     |   Area    (ha)=     .16
| 04:102    DT= 1.00 |   Total Imp(%)=   36.00   Dir. Conn.(%)=   36.00
----------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       .06          .10
     Dep. Storage     (mm)=      1.00         6.35
     Average Slope     (%)=      1.30         2.00
     Length            (m)=     14.00         5.00
     Mannings n           =      .013         .250

     Max.eff.Inten.(mm/hr)=    149.30        83.65
               over (min)        1.00         3.00
     Storage Coeff.  (min)=       .62 (ii)    2.80 (ii)
     Unit Hyd. Tpeak (min)=      1.00         3.00
     Unit Hyd. peak  (cms)=      1.36          .39
                                                    *TOTALS*
     PEAK FLOW       (cms)=       .02          .02          .044 (iii)
     TIME TO PEAK    (hrs)=      1.97         2.00         2.000
     RUNOFF VOLUME    (mm)=     77.93        38.71        52.832
     TOTAL RAINFALL   (mm)=     78.93        78.93        78.932
     RUNOFF COEFFICIENT   =       .99          .49          .669

       (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.

--------------------------------------------------------------------------------
050:0007----------------------------------------------------------------------
*#*********************************************************************|
*#
*#        POST-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING (PHASE 1)
*#        =========================================================
*#
**#*********************************************************************|
*# CATCHMENT 201 - PHASE 1 CONTROLLED DISCHARGE TO NORA DRIVE
*
----------------------
| CALIB STANDHYD     |   Area    (ha)=     .89
| 01:201    DT= 1.00 |   Total Imp(%)=   90.00   Dir. Conn.(%)=   90.00
----------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       .80          .09
     Dep. Storage     (mm)=      1.00         6.35
     Average Slope     (%)=      1.90         2.00
     Length            (m)=     15.00         5.00
     Mannings n           =      .013         .250

     Max.eff.Inten.(mm/hr)=    149.30        83.65
               over (min)        1.00         3.00
     Storage Coeff.  (min)=       .58 (ii)    2.75 (ii)
     Unit Hyd. Tpeak (min)=      1.00         3.00
     Unit Hyd. peak  (cms)=      1.40          .40
                                                    *TOTALS*
     PEAK FLOW       (cms)=       .33          .02          .350 (iii)
     TIME TO PEAK    (hrs)=      1.98         2.00         2.000
     RUNOFF VOLUME    (mm)=     77.93        38.71        74.010
     TOTAL RAINFALL   (mm)=     78.93        78.93        78.932
     RUNOFF COEFFICIENT   =       .99          .49          .938

       (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.

--------------------------------------------------------------------------------
050:0008----------------------------------------------------------------------
*# ROUTE CATCHMENT 201 THROUGH ORIFICE PIPE AND TANK
*
----------------------
| ROUTE RESERVOIR    |    Requested routing time step =  1.0 min.
|  IN>01:(201   )    |
| OUT<02:(201 CO)    |    =========  OUTLFOW STORAGE TABLE  =========
---------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)     (ha.m.)   |    (cms)     (ha.m.)
                            .000  .0000E+00    |     .103  .1360E-01
                            .027  .3100E-02    |     .118  .1710E-01
                            .063  .6600E-02    |     .131  .2060E-01
                            .085  .1010E-01    |     .146  .2510E-01

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     -------------------        (ha)     (cms)     (hrs)       (mm)
     INFLOW >01: (201   )         .89      .350     2.000     74.010
     OUTFLOW<02: (201 CO)         .89      .129     2.033     74.010
    OVERFLOW<03: (201.OV)         .00      .000      .000       .000

                   TOTAL NUMBER OF SIMULATED OVERFLOWS  =         0
                   CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                   PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=   36.915
                   TIME SHIFT OF PEAK FLOW         (min)=     2.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=.2011E-01

--------------------------------------------------------------------------------
050:0009----------------------------------------------------------------------
*# CATCHMENT 202 - PHASE 2 CONTROLLED DISCHARGE TO NORA DRIVE
*
----------------------
| CALIB STANDHYD     |   Area    (ha)=     .90
| 04:202    DT= 1.00 |   Total Imp(%)=   88.00   Dir. Conn.(%)=   88.00
----------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       .79          .11
     Dep. Storage     (mm)=      1.00         6.35
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     15.00         5.00
     Mannings n           =      .013         .250
```

```
     Max.eff.Inten.(mm/hr)=     149.30        83.65
               over (min)         1.00         3.00
     Storage Coeff.  (min)=        .57 (ii)    2.74 (ii)
     Unit Hyd. Tpeak (min)=       1.00         3.00
     Unit Hyd. peak  (cms)=       1.41          .40
                                                    *TOTALS*
     PEAK FLOW       (cms)=        .33          .02          .350 (iii)
     TIME TO PEAK    (hrs)=       1.98         2.00         2.000
     RUNOFF VOLUME    (mm)=      77.93        38.71        73.226
     TOTAL RAINFALL   (mm)=      78.93        78.93        78.932
     RUNOFF COEFFICIENT   =        .99          .49          .928

       (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.

------------------------------------------------------------------------------
050:0010------------------------------------------------------------------------
*# ROUTE CATCHMENT 202 THROUGH ORIFICE PIPE AND TANK
*
--------------------
| ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
|  IN>04:(202   )   |
| OUT<05:(202 CO)   |    =========  OUTLFOW STORAGE TABLE  =========
--------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                          (cms)     (ha.m.)   |    (cms)     (ha.m.)
                           .000  .0000E+00    |     .087  .1520E-01
                           .033  .3800E-02    |     .098  .1900E-01
                           .057  .7600E-02    |     .109  .2280E-01
                           .073  .1140E-01    |     .118  .2640E-01

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     --------------------       (ha)     (cms)     (hrs)       (mm)
     INFLOW >04: (202   )        .90      .350     2.000     73.226
     OUTFLOW<05: (202 CO)        .90      .107     2.167     73.226
    OVERFLOW<06: (202.OV)        .00      .000      .000       .000

                   TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                   CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                   PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=   30.469
                   TIME SHIFT OF PEAK FLOW          (min)=    10.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=.2206E-01

------------------------------------------------------------------------------
050:0011------------------------------------------------------------------------
*# CATCHMENT 203 - UNCONTROLLED DISCHARGE AROUND PERIMETER OF SITE
*
----------------------
| CALIB NASHYD       |   Area    (ha)=     .04   Curve Number   (CN)=80.00
| 07:203    DT= 1.00 |   Ia      (mm)=   6.350   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .100

     Unit Hyd Qpeak  (cms)=     .015

     PEAK FLOW       (cms)=     .006 (i)
     TIME TO PEAK    (hrs)=    2.050
     RUNOFF VOLUME    (mm)=   38.707
     TOTAL RAINFALL   (mm)=   78.932
     RUNOFF COEFFICIENT   =     .490

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

------------------------------------------------------------------------------
050:0012------------------------------------------------------------------------
* ADD TOTAL FLOWS DIRECTED SOUTH
------------------------
| ADD HYD (201+202+20) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
------------------------                   (ha)     (cms)   (hrs)   (mm)    (cms)
                     ID1 02:201 CONTRO      .89      .129    2.03  74.01    .000
                    +ID2 03:201.OVF         .00      .000     .00    .00    .000
                    +ID3 05:202 CONTRO      .90      .107    2.17  73.23    .000
                    +ID4 06:202.OVF         .00      .000     .00    .00    .000
                    +ID5 07:203             .04      .006    2.05  38.71    .000
                     ==========================================================
                     SUM 08:201+202+20     1.83      .241    2.05  72.85    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
050:0013------------------------------------------------------------------------
**#*************************************************************************|
* RUN REMAINING DESIGN STORMS (CITY OF BURLINGTON 2 TO 100-YR)
*
------------------------------------------------------------------------------
050:0002------------------------------------------------------------------------
*
------------------------------------------------------------------------------
050:0002------------------------------------------------------------------------
*
------------------------------------------------------------------------------
050:0002------------------------------------------------------------------------
*
------------------------------------------------------------------------------
050:0002------------------------------------------------------------------------
*
  ** END OF RUN :  99

****************************************************************************




--------------------
| START            |  Project  dir.: T:\projects\22057\SWMHYMO\
--------------------  Rainfall dir.: T:\projects\22057\SWMHYMO\
    TZERO =   .00 hrs on        0
    METOUT=   2 (output = METRIC)
    NRUN  = 100
    NSTORM=   1
          #  1=BUR6_100.stm
------------------------------------------------------------------------------
100:0002------------------------------------------------------------------------
*#*************************************************************************|
*#  Project Name: 484 PLAINS ROAD EAST (PHASE 2)
*#                BURLINGTON, ONTARIO
*#  JOB NUMBER  : 22057
*#       Date   : AUGUST 2022
*#    Company   : S. LLEWELLYN AND ASSOCIATES LTD.
*#       File   : 22056.DAT
*#*************************************************************************|
*
*
------------------------------------------------------------------------------
100:0002------------------------------------------------------------------------
*
--------------------
| READ STORM       |    Filename: Burlington 100-yr 6hr CHICAGO         (A=
| Ptotal=  86.27 mm|    Comments: Burlington 100-yr 6hr CHICAGO         (A=
--------------------
              TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
               hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
               .17   3.862 |   1.67  17.445 |   3.17   9.657 |   4.67   4.936
               .33   4.172 |   1.83  39.736 |   3.33   8.649 |   4.83   4.704
               .50   4.546 |   2.00 163.177 |   3.50   7.853 |   5.00   4.495
               .67   5.008 |   2.17  51.779 |   3.67   7.206 |   5.17   4.306
               .83   5.595 |   2.33  28.205 |   3.83   6.670 |   5.33   4.135
              1.00   6.369 |   2.50  19.806 |   4.00   6.217 |   5.50   3.979
              1.17   7.443 |   2.67  15.465 |   4.17   5.829 |   5.67   3.835
              1.33   9.048 |   2.83  12.795 |   4.33   5.492 |   5.83   3.703
              1.50  11.752 |   3.00  10.979 |   4.50   5.197 |   6.00   3.581

------------------------------------------------------------------------------
100:0003------------------------------------------------------------------------
*
*#*************************************************************************|
*#
*#        PRE-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING (PHASE 1)
*#        ======================================================
*#
*#*************************************************************************|
*# CATCHMENT 101 -  PRE-DEVELOPMENT DISCHARGE TO NORA DRIVE FROM PHASE 1
*
----------------------
| CALIB STANDHYD     |   Area    (ha)=     .93
| 01:101    DT= 1.00 |   Total Imp(%)=   36.00   Dir. Conn.(%)=   36.00
----------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       .33          .60
     Dep. Storage     (mm)=      1.00         6.35
     Average Slope     (%)=      2.20         2.00
     Length            (m)=     16.00         5.00
     Mannings n           =      .013         .250

     Max.eff.Inten.(mm/hr)=    163.18        96.51
               over (min)        1.00         3.00
     Storage Coeff.  (min)=       .55 (ii)    2.61 (ii)
     Unit Hyd. Tpeak (min)=       1.00         3.00
     Unit Hyd. peak  (cms)=       1.42          .41
                                                    *TOTALS*
     PEAK FLOW       (cms)=        .15          .14          .293 (iii)
     TIME TO PEAK    (hrs)=       1.98         2.00         2.000
     RUNOFF VOLUME    (mm)=      85.27        44.54        59.200
     TOTAL RAINFALL   (mm)=      86.27        86.27        86.271
     RUNOFF COEFFICIENT   =        .99          .52          .686

       (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.

------------------------------------------------------------------------------
100:0004------------------------------------------------------------------------
*# CATCHMENT 102 -  PRE-DEVELOPMENT DISCHARGE TO NORA DRIVE FROM PHASE 2
*
----------------------
| CALIB STANDHYD     |   Area    (ha)=     .74
| 02:102    DT= 1.00 |   Total Imp(%)=   36.00   Dir. Conn.(%)=   36.00
----------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       .27          .47
     Dep. Storage     (mm)=      1.00         6.35
     Average Slope     (%)=      2.20         2.00
     Length            (m)=     16.00         5.00
     Mannings n           =      .013         .250

     Max.eff.Inten.(mm/hr)=    163.18        96.51
               over (min)        1.00         3.00
     Storage Coeff.  (min)=       .55 (ii)    2.61 (ii)
     Unit Hyd. Tpeak (min)=       1.00         3.00
     Unit Hyd. peak  (cms)=       1.42          .41
                                                    *TOTALS*
     PEAK FLOW       (cms)=        .12          .11          .233 (iii)
     TIME TO PEAK    (hrs)=       1.97         2.00         2.000
     RUNOFF VOLUME    (mm)=      85.27        44.54        59.200
     TOTAL RAINFALL   (mm)=      86.27        86.27        86.271
     RUNOFF COEFFICIENT   =        .99          .52          .686

       (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.

------------------------------------------------------------------------------
100:0005------------------------------------------------------------------------
* ADD TOTAL EXISTING FLOWS DIRECTED SOUTH
------------------------
| ADD HYD (101+102   ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
------------------------                   (ha)     (cms)   (hrs)   (mm)    (cms)
                     ID1 01:101             .93      .293    2.00  59.20    .000
                    +ID2 02:102             .74      .233    2.00  59.20    .000
                     ==========================================================
                     SUM 03:101+102        1.67      .525    2.00  59.20    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
100:0006------------------------------------------------------------------------
*# CATCHMENT 103 -  PRE-DEVELOPMENT DISCHARGE TO PLAINS ROAD EAST
*
----------------------
| CALIB STANDHYD     |   Area    (ha)=     .16
| 04:102    DT= 1.00 |   Total Imp(%)=   36.00   Dir. Conn.(%)=   36.00
```

```
---------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       .06          .10
     Dep. Storage     (mm)=      1.00         6.35
     Average Slope     (%)=      1.30         2.00
     Length            (m)=     14.00         5.00
     Mannings n           =      .013         .250

     Max.eff.Inten.(mm/hr)=    163.18        96.51
               over (min)        1.00         3.00
     Storage Coeff.  (min)=       .60 (ii)    2.65 (ii)
     Unit Hyd. Tpeak (min)=      1.00         3.00
     Unit Hyd. peak  (cms)=      1.38          .41
                                                    *TOTALS*
     PEAK FLOW       (cms)=       .03          .02          .050 (iii)
     TIME TO PEAK    (hrs)=      1.97         2.00         2.000
     RUNOFF VOLUME    (mm)=     85.27        44.54        59.200
     TOTAL RAINFALL   (mm)=     86.27        86.27        86.271
     RUNOFF COEFFICIENT   =       .99          .52          .686

       (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.

------------------------------------------------------------------------------
100:0007------------------------------------------------------------------------
*#*************************************************************************|
*#
*#        POST-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING (PHASE 1)
*#        ========================================================
*#
**#*************************************************************************|
*# CATCHMENT 201 - PHASE 1 CONTROLLED DISCHARGE TO NORA DRIVE
*
---------------------
| CALIB STANDHYD     |   Area     (ha)=     .89
| 01:201    DT= 1.00 |   Total Imp(%)=   90.00   Dir. Conn.(%)=   90.00
---------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       .80          .09
     Dep. Storage     (mm)=      1.00         6.35
     Average Slope     (%)=      1.90         2.00
     Length            (m)=     15.00         5.00
     Mannings n           =      .013         .250

     Max.eff.Inten.(mm/hr)=    163.18        96.51
               over (min)        1.00         3.00
     Storage Coeff.  (min)=       .56 (ii)    2.61 (ii)
     Unit Hyd. Tpeak (min)=      1.00         3.00
     Unit Hyd. peak  (cms)=      1.42          .41
                                                    *TOTALS*
     PEAK FLOW       (cms)=       .36          .02          .384 (iii)
     TIME TO PEAK    (hrs)=      1.98         2.00         2.000
     RUNOFF VOLUME    (mm)=     85.27        44.54        81.198
     TOTAL RAINFALL   (mm)=     86.27        86.27        86.271
     RUNOFF COEFFICIENT   =       .99          .52          .941

       (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.

------------------------------------------------------------------------------
100:0008------------------------------------------------------------------------
*# ROUTE CATCHMENT 201 THROUGH ORIFICE PIPE AND TANK
*
---------------------
| ROUTE RESERVOIR    |    Requested routing time step =  1.0 min.
|  IN>01:(201   )    |
| OUT<02:(201 CO)    |    =========  OUTLFOW STORAGE TABLE  =========
---------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)    (ha.m.)   |    (cms)    (ha.m.)
                           .000  .0000E+00    |     .103  .1360E-01
                           .027  .3100E-02    |     .118  .1710E-01
                           .063  .6600E-02    |     .131  .2060E-01
                           .085  .1010E-01    |     .146  .2510E-01

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     -------------------        (ha)     (cms)     (hrs)       (mm)
     INFLOW >01: (201   )        .89      .384     2.000     81.198
     OUTFLOW<02: (201 CO)        .89      .137     2.033     81.198
    OVERFLOW<03: (201.OV)        .00      .000      .000       .000

                  TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                  CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                  PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=   35.605
                  TIME SHIFT OF PEAK FLOW         (min)=     2.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=.2229E-01

------------------------------------------------------------------------------
100:0009------------------------------------------------------------------------
*# CATCHMENT 202 - PHASE 2 CONTROLLED DISCHARGE TO NORA DRIVE
*
---------------------
| CALIB STANDHYD     |   Area     (ha)=     .90
| 04:202    DT= 1.00 |   Total Imp(%)=   88.00   Dir. Conn.(%)=   88.00
---------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       .79          .11
     Dep. Storage     (mm)=      1.00         6.35
     Average Slope     (%)=      2.00         2.00
     Length            (m)=     15.00         5.00
     Mannings n           =      .013         .250

     Max.eff.Inten.(mm/hr)=    163.18        96.51
               over (min)        1.00         3.00
     Storage Coeff.  (min)=       .55 (ii)    2.60 (ii)
     Unit Hyd. Tpeak (min)=      1.00         3.00
     Unit Hyd. peak  (cms)=      1.43          .41
                                                    *TOTALS*
     PEAK FLOW       (cms)=       .36          .03          .385 (iii)
     TIME TO PEAK    (hrs)=      1.98         2.00         2.000
     RUNOFF VOLUME    (mm)=     85.27        44.54        80.383
     TOTAL RAINFALL   (mm)=     86.27        86.27        86.271
     RUNOFF COEFFICIENT   =       .99          .52          .932

       (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.

------------------------------------------------------------------------------
100:0010------------------------------------------------------------------------
*# ROUTE CATCHMENT 202 THROUGH ORIFICE PIPE AND TANK
*
---------------------
| ROUTE RESERVOIR    |    Requested routing time step =  1.0 min.
|  IN>04:(202   )    |
| OUT<05:(202 CO)    |    =========  OUTLFOW STORAGE TABLE  =========
---------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)    (ha.m.)   |    (cms)    (ha.m.)
                           .000  .0000E+00    |     .087  .1520E-01
                           .033  .3800E-02    |     .098  .1900E-01
                           .057  .7600E-02    |     .109  .2280E-01
                           .073  .1140E-01    |     .118  .2640E-01

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     -------------------        (ha)     (cms)     (hrs)       (mm)
     INFLOW >04: (202   )        .90      .385     2.000     80.383
     OUTFLOW<05: (202 CO)        .90      .114     2.167     80.383
    OVERFLOW<06: (202.OV)        .00      .000      .000       .000

                  TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                  CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                  PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=   29.522
                  TIME SHIFT OF PEAK FLOW         (min)=    10.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=.2464E-01

------------------------------------------------------------------------------
100:0011------------------------------------------------------------------------
*# CATCHMENT 203 - UNCONTROLLED DISCHARGE AROUND PERIMETER OF SITE
*
---------------------
| CALIB NASHYD       |   Area    (ha)=     .04   Curve Number   (CN)=80.00
| 07:203    DT= 1.00 |   Ia      (mm)=    6.350  # of Linear Res.(N)= 3.00
---------------------  U.H. Tp(hrs)=    .100

     Unit Hyd Qpeak  (cms)=     .015

     PEAK FLOW       (cms)=     .007 (i)
     TIME TO PEAK    (hrs)=    2.050
     RUNOFF VOLUME    (mm)=   44.531
     TOTAL RAINFALL   (mm)=   86.271
     RUNOFF COEFFICIENT   =     .516

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

------------------------------------------------------------------------------
100:0012------------------------------------------------------------------------
* ADD TOTAL FLOWS DIRECTED SOUTH
------------------------
| ADD HYD (201+202+20) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
------------------------                  (ha)     (cms)   (hrs)   (mm)   (cms)
                        ID1 02:201 CONTRO     .89     .137    2.03  81.20    .000
                       +ID2 03:201.OVF        .00     .000     .00    .00    .000
                       +ID3 05:202 CONTRO     .90     .114    2.17  80.38    .000
                       +ID4 06:202.OVF        .00     .000     .00    .00    .000
                       +ID5 07:203            .04     .007    2.05  44.53    .000
                        ==========================================================
                        SUM 08:201+202+20    1.83     .256    2.07  80.00    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
100:0013------------------------------------------------------------------------
**#*************************************************************************|
* RUN REMAINING DESIGN STORMS (CITY OF BURLINGTON 2 TO 100-YR)
*
------------------------------------------------------------------------------
100:0002------------------------------------------------------------------------
*
------------------------------------------------------------------------------
100:0002------------------------------------------------------------------------
*
------------------------------------------------------------------------------
100:0002------------------------------------------------------------------------
*
------------------------------------------------------------------------------
100:0002------------------------------------------------------------------------
*
------------------------------------------------------------------------------
100:0002------------------------------------------------------------------------
      FINISH
------------------------------------------------------------------------------
*******************************************************************************
     WARNINGS / ERRORS / NOTES
     -------------------------
   Simulation ended on 2024-04-17     at 12:25:17
===============================================================================
```