140 Rue Lusk Street

Stormwater Management Report

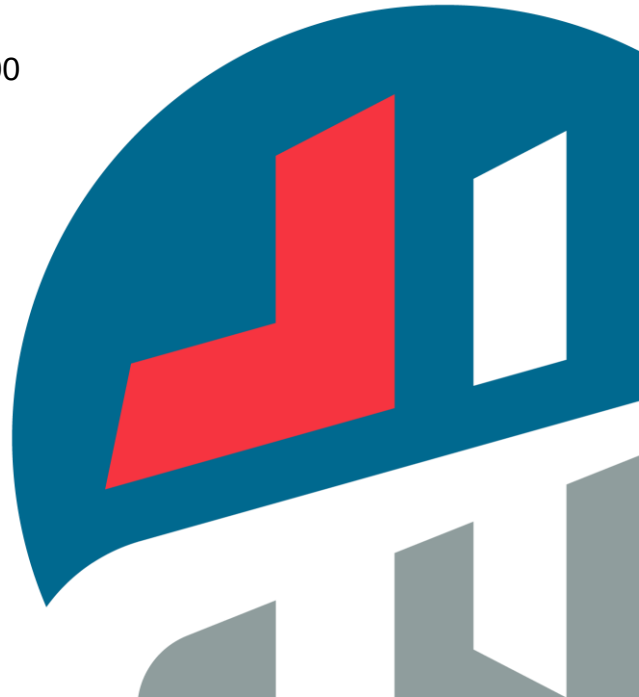
Project Location:
140 Rue Lusk Street
Ottawa, ON

Prepared for:
Troms Holdings Corp
601 Pamplona Private
Ottawa, ON K2J 5T3

Prepared by:
MTE Consultants
520 Bingemans Centre Drive
Kitchener, ON N2B 3X9

December 2, 2022

MTE File No.: 52222-100



Engineers, Scientists, Surveyors.

Contents

Figures

Tables

Appendices

Drawings

1.0 Introduction

MTE Consultants Inc. was retained by Troms Holdings Corp to complete the stormwater management design for the Holiday Inn Ottawa to be constructed at 140 Lusk Street in the City of Ottawa (herein referred to as the 'Site').

The Site is 0.52ha in size and referred to as Block 14, located within the O'Keefe Court – 416 Lands, the commercial development at the northeast quadrant of the intersection of Fallowfield Road and Strandherd Dive. The Site is bounded to the north by O'Keefe Court, to the west and to the east by future commercial development, to the south by a trail easement leading to Lusk Street and the turning circle of Lusk Street. For exact location of the site refer to the key plan located on the separately appended engineering drawings.

The proposed development for the site is the construction of a four-storey hotel building with associated driveway and at grade parking areas. The overall imperviousness of the proposed development is approximately 85.3% (C =0.80).

This report addresses the stormwater management (SWM) requirements set forth by the Design Brief for O'Keefe Court Business Park – 416 Lands Commercial Development, prepared by IBI Group, dated May 2018. The design requirements for the Site conforms to the criteria set forth by the City of Ottawa and the Jock River Reach One Subwatershed Study. The site grading, servicing and stormwater management details for the site are illustrated on the separately appended MTE Engineering Drawings C1.1, C2.1, C2.2, and C2.3.

2.0 Criteria

The stormwater management design criteria for the subject Site, as established by the Design Brief for the O'Keefe Court – 416 Lands Commercial Development, prepared by IBI Group, dated May 2018, and the City of Ottawa are as follows:

i) Attenuation of the post-development peak flows up to the 100-year storm event from the proposed development to maximum allowable release rate of 74L/s;

ii) Providing sufficient on-site storage, a minimum of 92.4m^3 as required in the O'Keefe Court – 416 Lands Commercial Development Design Brief (IBI Group, 2018), to ensure no overland flow for all storms up to and including the 100-year storm event; and

iii) Water quality control will be provided in the downstream stormwater management facility within the O'Keefe Court – 416 Lands Commercial Development.

3.0 Methodology

In order to successfully complete the stormwater management design for this site, the following specific tasks were undertaken:

i) Calculated the allowable runoff rates using MIDUSS NET;

ii) Determined the percent impervious of the site and catchment parameters for inclusion in MIDUSS modelling;

iii) Calculated post-development runoff hydrographs using MIDUSS NET; and,

iv) Revised the site grades to attain the required storage for runoff control.

4.0 Stormwater Management

4.1 Catchment Parameters

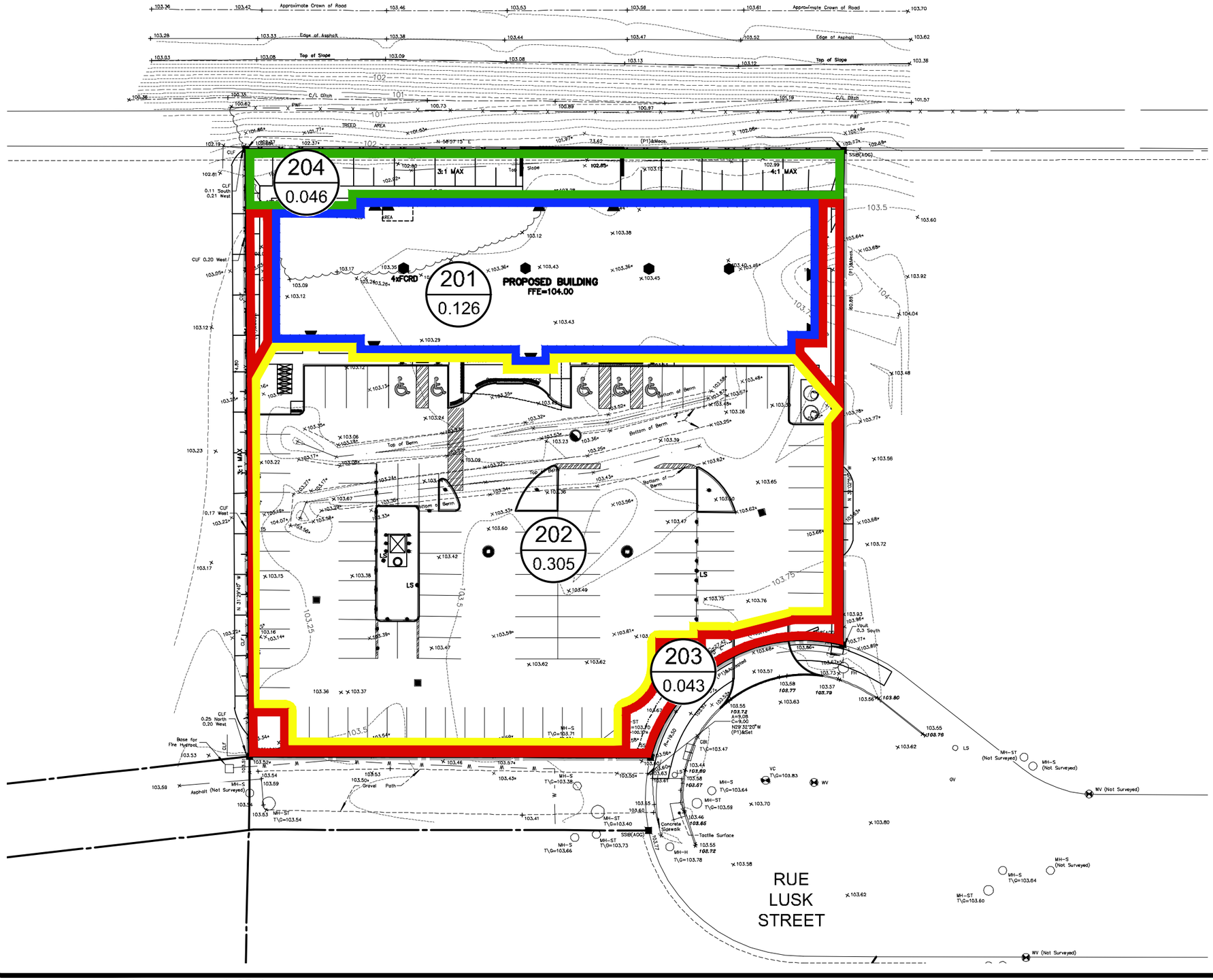
Per the Design Brief for the O'Keefe Court – 416 Lands Commercial Development, provided by IBI Group, dated May 2018, the allowable peak flow for the Site is 74L/s for all storm events up to and including the 100-year storm event. The required on-site stormwater storage is 92.4m^3. Refer to Appendix A for the 416 Lands Storm Drainage Area Plan, prepared by IBI Group, dated May 18, 2022, for more detail.

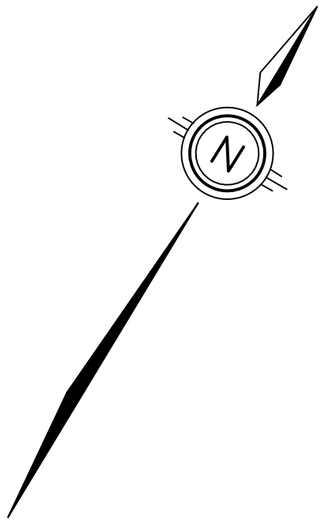
The following Table 4.1 summarizes the catchments used in the modelling of the site. The post-development condition was separated into four catchment areas. The building rooftop area, the controlled driveway and parking lot area, the uncontrolled area draining towards Lusk Street, and the uncontrolled area towards O'Keefe Court. Figure 1.0 illustrates the limits of the post-development catchment areas.

Table 4.1 – Catchment Parameters

#	Catchment	Area (ha)	% Impervious	Pervious CN	Impervious CN	Slope (%)	Flow Length (m)
Post-Development Catchment Areas							
201	Building Rooftop Area (to Lusk Street)	0.126	100.0	75	98	2.0	7.5
202	Controlled Area (to Lusk Street)	0.305	96.0	75	98	1.0	15.0
203	Uncontrolled Area draining (to Lusk Street ROW)	0.043	28.6	75	98	18.0	2.0
204	Uncontrolled Area draining to O'Keefe Court Street ROW	0.046	27.0	75	98	27.0	6.0

A geotechnical investigation was not available for this development at the time this report was published. Therefore, a conservative value of 75 was used for the pervious CN.





LEGEND

- SITE BOUNDARY
- CATCHMENT 201
- CATCHMENT 202
- CATCHMENT 203
- CATCHMENT 204

201 / 0.043 — SUB-CATCHMENT NUMBER / AREA (ha.)

F1

Date: NOV.30/2022
Scale: 1:500

POST-DEVELOPMENT CATCHMENT AREAS

MTE
Engineers, Scientists, Surveyors

Project No.: 52222-100

date — time — CADTAG

P: \P\52222\100\52222-100-F1.dwg

4.2 Water Quantity – Modelling Results

It is proposed that stormwater runoff from the proposed development to be directed to the existing 450mm diameter storm stub located at the southern property line of the Site, and ultimately draining to the 975mm diameter municipal storm sewer.

In order to achieve the stormwater management requirements for the site, runoff generated from the controlled driveway and parking areas will be captured by the on-site storm sewer system and will be conveyed to catchbasin-manhole (CBMH10), wherein the flow will be controlled with the installation of a 120mm diameter on-line orifice plate on the outlet pipe. Stormwater storage volume will be provided within the driveway and parking areas, on the building rooftop storage, and within the subsurface storm sewer system. The maximum depth of ponding permitted within the parking area by grading is 0.30m.

In addition, four flow control roof drains, single notch, are proposed to be installed on the roof of the proposed building. This will help to further reduce the post-development runoff from the site.

The flow equations for the orifice and the IDF parameters for the 5 and 100-year storm events are included in Appendix B. Refer to Appendix C for the MIDUSS NET output.

A combination of the surface storage, rooftop storage, and subsurface storage provides approximately 246.0m^3 of storage volume, which exceeds the required 92.4m^3 by the Design Brief for O'Keefe Commercial Development (IBI Group, 2018). The following table 4.2 illustrates the stage-storage-discharge relationship of the storm system.

Table 4.2 – Stage-Storage-Discharge Information (taken From MIDUSS)

Elevation (m)	Head (m)	Orifice Flow (m^3/s)	Volume (m^3)	Remarks
101.012	0	0	0	120mm diameter Orifice invert
103.40	2.388	0.04795	8.60	Top of grate CB3
103.45	0.05	0.04846	10.24	Top of grate CB4 and CBMH1
103.50	0.05	0.04897	15.94	Top of grate CB5. 0.10m ponding
103.55	0.05	0.04948	34.71	Top of grate CB2. 0.15m ponding
103.60	0.05	0.04998	75.43	0.20m ponding
103.65	0.05	0.05048	146.77	0.25m ponding
103.70	0.05	0.05097	246.50	0.30m ponding. Overflow elevation.

With the addition of the 120mm diameter orifice plate, the post-development runoff from the controlled portion of the site for the 5- and 100-year storm events is controlled to 0.059m^3/s (or 59.0L/s) and 0.069m^3/s (or 69.0L/s), respectively. The following table summarizes the flows generated by the whole site.

Table 4.3 – Summary of Flows

Modelling Condition	2-Year Storm Event (m^3/s)	5-Year Storm Event (m^3/s)	100-Year Storm Event (m^3/s)
Allowable Release Rate	0.074	0.074	0.074
Post-Development	0.054	0.059	0.069

The maximum ponding elevation for the 5-year storm event is 103.509m. This represents 10.9cm of ponding depth within the parking area. For the 100-year storm event, the maximum ponding elevation is 103.579m. This represents 17.9cm of ponding depth within the parking area.

4.3 Water Quality Control

The Site is located within the Jock River Reach One Subwatershed, which requires Enhanced Level of Protection water quality control (80% TSS removal). Per the Design Report for the O'Keefe Court – 416 Lands Commercial Development (IBI Group, 2013), the end-of-pipe stormwater management facility within the O'keefe Court Commercial Business will provide water quality control. Therefore, no additional water quality control is required on-site.

4.4 Erosion & Sediment Control

In order to minimize the effects of erosion during the grading of the Site, the following measures are proposed during construction for erosion and sedimentation control:

i) Erosion and sedimentation facilities are to be installed prior to any area grading operations;

ii) All erosion control measures are to be inspected and monitored by the contractor and repairs are to be completed as required;

iii) All materials and equipment used for the purpose of site preparation and project completion should be operated and stored in a manner that prevents any deleterious substance from leaving the site;

iv) Re-vegetation of completed areas as soon as possible after construction, including those areas not slated for construction, within 60 days of rough grading; and,

v) To minimize the amount of mud being tracked onto the roadway, a mud mat should be installed at the primary construction entrance.

5.0 Conclusions and Recommendations

Based on the foregoing analysis, it is concluded that:

i) the proposed SWM design provides adequate storage volume and attenuation of the 5- and 100-year storm events to allowable release rate set by the Design Brief for O'Keefe Court Commercial Development (IBI Group, 2018); and,

ii) upon completion of construction, the site will conform to the design criteria specified by the City of Ottawa.

It is recommended that:

i) the site grading be undertaken according to the proposed elevations, details and erosion control measures shown on the separately appended engineering drawings;

ii) the stormwater management system be installed as detailed on the separately appended engineering drawings; and,

iii) the stormwater management facilities be inspected by MTE Consultants Inc. during construction and certified to the City of Ottawa upon completion.

All of which is respectfully submitted,

MTE Consultants Inc.

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JHN:dlb

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Appendix A

416 Lands Storm Drainage Area Plan (IBI Group, 2022)

REVIEWED BY
DEVELOPMENT REVIEW SERVICES BRANCH

Signed _____

Date _____ 2017

Plan Number _____

LEGEND :

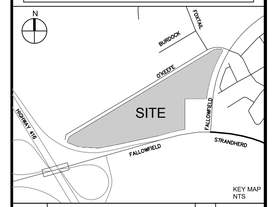
S168 / 2.01 | 0.80 — AREA NUMBER / RUNOFF COEFFICIENT / AREA IN HECTARES

⇨ EMERGENCY FLOW ROUTE

NOTE :

1. MINIMUM BUILDING OPENING TO BE CONFIRMED AT SITE PLAN STAGE.

SEE 010, 011, 012 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS



KEY MAP
NTS

No.	REVISIONS	By	Date
14			
13			
12			
11			
10			
9			
8			
7			
6			
5	REVISED PER CITY COMMENTS	DGY	18:05:22
4	REVISED PER CITY COMMENTS	DGY	18:04:06
3	REVISED PER CITY COMMENTS	DGY	18:01:10
2	REVISED PER CITY COMMENTS	DGY	17:09:26
1	ISSUED FOR CITY REVIEW	DGY	17:05:04

DCR/PHOENIX GROUP OF COMPANIES
18A BENTLEY AVE
OTTAWA ONT
K2E 6T8

IBI GROUP
400 – 333 Preston Street
Ottawa ON K1S 5N4 Canada
tel 613 225 1311 fax 613 225 9868
ibigroup.com

Project Title

416 LANDS

4401 FALLOWFIELD ROAD

LICENSED PROFESSIONAL ENGINEER
D. G. Yannoulopoulos
22/05/2018
PROVINCE OF ONTARIO

Drawing Title

STORM DRAINAGE AREA PLAN

Scale
1:1250

Design	Date
MB/RM	MARCH 2016
Drawn: EH	Checked: DGY
Project No.: 39744	Drawing No.: 500

CITY FILE No. D07-16-13-0013

CITY PLAN No. 17492

Appendix B

Calculations and IDF Parameters

CALCULATIONS

Orifice Equation (MIDUSS NET)

$$Q = C_c \, p/4 \, D5 \, \text{sqrt}(2g(H-2/3D))$$

where
- C_c coefficient of contraction
- H head relative to the invert of the orifice
- D orifice diameter
- g gravitational acceleration

IDF Parameters

IDF Parameters	2-Year Storm Event	5-Year Storm Event	100-Year Storm Event
A	732.951	998.071	1735.688
B	6.199	6.053	6.014
C	0.810	0.814	0.820

Appendix C

MIDUSS Output

Post-Development

```
"                MIDUSS Output ----------------------------------------------->"
"                MIDUSS version                            Version 2.25  rev. 473"
"                MIDUSS created                          Sunday, February 7, 2010"
"           10   Units used:                                          ie METRIC"
"                Job folder:                                   Q:\52222\100\SWM"
"                Output filename:                             2 Year Post a.out"
"                Licensee name:                                               A"
"                Company                                                       "
"                Date & Time last used:                 11/30/2022 at 6:31:41 PM"
" 31          TIME PARAMETERS"
"        5.000   Time Step"
"      180.000   Max. Storm length"
"     1500.000   Max. Hydrograph"
" 32          STORM Chicago storm"
"            1   Chicago storm"
"      732.951   Coefficient A"
"        6.199   Constant B"
"        0.810   Exponent C"
"        0.400   Fraction R"
"      180.000   Duration"
"        1.000   Time step multiplier"
"             Maximum intensity           103.571    mm/hr"
"             Total depth                  31.880    mm"
"            6   002hyd   Hydrograph extension used in this file"
" 33          CATCHMENT 201"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          201   Building Rooftop"
"      100.000   % Impervious"
"        0.126   Total Area"
"        7.500   Flow length"
"        2.000   Overland Slope"
"        0.000   Pervious Area"
"        7.500   Pervious length"
"        2.000   Pervious slope"
"        0.126   Impervious Area"
"        7.500   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious SCS Curve No."
"        0.000   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        8.467   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.815   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                     0.028     0.000     0.000     0.000 c.m/sec"
```

```
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"             Time of concentration  12.484     0.987      0.987      minutes"
"             Time to Centroid       118.364    89.244     89.244     minutes"
"             Rainfall depth         31.880     31.880     31.880     mm"
"             Rainfall volume        0.00       40.17      40.17      c.m"
"             Rainfall losses        26.828     5.912      5.912      mm"
"             Runoff depth           5.052      25.968     25.968     mm"
"             Runoff volume          0.00       32.72      32.72      c.m"
"             Runoff coefficient     0.000      0.815      0.815      "
"             Maximum flow           0.000      0.028      0.028      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.028     0.028     0.000     0.000"
" 54          POND DESIGN"
"         0.028   Current peak flow    c.m/sec"
"         0.036   Target outflow    c.m/sec"
"          32.7   Hydrograph volume    c.m"
"           11.   Number of stages"
"         0.000   Minimum water level    metre"
"         0.150   Maximum water level    metre"
"         0.000   Starting water level    metre"
"             0   Keep Design Data: 1 = True; 0 = False"
"                   Level Discharge    Volume"
"                   0.000     0.000     0.000"
"                  0.01500   0.00090   0.04275"
"                  0.03000   0.00180    0.3420"
"                  0.04500   0.00270     1.154"
"                  0.06000   0.00360     2.736"
"                  0.07500   0.00450     5.344"
"                  0.09000   0.00540     9.234"
"                   0.1050   0.00630    14.663"
"                   0.1200   0.00720    21.888"
"                   0.1350   0.00810    31.165"
"                   0.1500   0.00900    42.750"
"            1.   ROOFTOP"
"                 Roof area  Store area  Area/drain  Drain flow  Roof slope"
"                   hectare     hectare    sq.metre  L/min/25mm      g H:1V"
"                     0.126       0.095     250.000      22.500      50.000"
"               Using 4 roofdrains on roofstorage area of 950. square metre"
"               Peak outflow                   0.006    c.m/sec"
"               Maximum level                  0.102    metre"
"               Maximum storage               13.647    c.m"
"               Centroidal lag                 1.879   hours"
"                    0.028     0.028     0.006     0.000 c.m/sec"
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"             6   Combine "
"             1   Node #"
"                 To Lusk Street"
"               Maximum flow                   0.006    c.m/sec"
```

```
"             Hydrograph volume            32.721    c.m"
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"            2   Start - New Tributary"
"                    0.028     0.000     0.006     0.006"
" 33          CATCHMENT 202"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          202   Controlled Parking/Driveway Area"
"       96.000   % Impervious"
"        0.305   Total Area"
"       15.000   Flow length"
"        1.000   Overland Slope"
"        0.012   Pervious Area"
"       15.000   Pervious length"
"        1.000   Pervious slope"
"        0.293   Impervious Area"
"       15.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious SCS Curve No."
"        0.159   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        8.467   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.833   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.061     0.000     0.006     0.006 c.m/sec"
"             Catchment 202          Pervious   Impervious Total Area "
"             Surface Area           0.012      0.293      0.305      hectare"
"             Time of concentration  23.296     1.841      2.010      minutes"
"             Time to Centroid       131.220    90.575     90.895     minutes"
"             Rainfall depth         31.880     31.880     31.880     mm"
"             Rainfall volume        3.89       93.34      97.23      c.m"
"             Rainfall losses        26.811     5.318      6.178      mm"
"             Runoff depth           5.069      26.562     25.702     mm"
"             Runoff volume          0.62       77.77      78.39      c.m"
"             Runoff coefficient     0.159      0.833      0.806      "
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"           8.   Number of stages"
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"                  Level Discharge    Volume"
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"                103.500   0.04897    15.940"
"                103.550   0.04948    34.710"
"                103.600   0.04998    75.430"
"                103.650   0.05048   146.770"
"                103.700   0.05097   246.500"
"           1.   ORIFICES"
"                Orifice   Orifice   Orifice Number of"
"                 invert coefficie  diameter  orifices"
"                101.012     0.630    0.1200     1.000"
"             Peak outflow                  0.048    c.m/sec"
"             Maximum level               103.426    metre"
"             Maximum storage               9.450    c.m"
"             Centroidal lag                1.566   hours"
"                  0.061     0.061     0.048     0.006 c.m/sec"
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"            6   Combine "
"            1   Node #"
"                To Lusk Street"
"             Maximum flow                  0.054    c.m/sec"
"             Hydrograph volume           110.871    c.m"
"                     0.061     0.061     0.048     0.054"
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"            2   Start - New Tributary"
"                     0.061     0.000     0.048     0.054"
" 33          CATCHMENT 203"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          203   Uncontrolled Area to Lusk Street"
"       28.600   % Impervious"
"        0.043   Total Area"
"        2.000   Flow length"
"       18.000   Overland Slope"
"        0.031   Pervious Area"
"        2.000   Pervious length"
"       18.000   Pervious slope"
"        0.012   Impervious Area"
"        2.000   Impervious length"
"       18.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious SCS Curve No."
"        0.156   Pervious Runoff coefficient"
```

```
"        0.100   Pervious Ia/S coefficient"
"        8.467   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.729   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                     0.003     0.000     0.048     0.054 c.m/sec"
"             Catchment 203          Pervious   Impervious Total Area "
"             Surface Area           0.031      0.012      0.043      hectare"
"             Time of concentration  2.922      0.231      1.167      minutes"
"             Time to Centroid       107.060    87.909     94.573     minutes"
"             Rainfall depth         31.880     31.880     31.880     mm"
"             Rainfall volume        9.79       3.92       13.71      c.m"
"             Rainfall losses        26.915     8.655      21.693     mm"
"             Runoff depth           4.965      23.225     10.187     mm"
"             Runoff volume          1.52       2.86       4.38       c.m"
"             Runoff coefficient     0.156      0.729      0.320      "
"             Maximum flow           0.001      0.003      0.003      c.m/sec"
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"            4   Add Runoff "
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" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                     0.003     0.003     0.003     0.054"
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"            6   Combine "
"            1   Node #"
"                To Lusk Street"
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"             Hydrograph volume           115.251    c.m"
"                     0.003     0.003     0.003     0.056"
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"            2   Start - New Tributary"
"                     0.003     0.000     0.003     0.056"
" 33          CATCHMENT 204"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          204   Uncontrolled Area to O'Keefe Court"
"       27.000   % Impervious"
"        0.046   Total Area"
"        6.000   Flow length"
"       20.000   Overland Slope"
"        0.034   Pervious Area"
"        6.000   Pervious length"
"       20.000   Pervious slope"
"        0.012   Impervious Area"
"        6.000   Impervious length"
"       20.000   Impervious slope"
```

```
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious SCS Curve No."
"        0.158   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        8.467   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.756   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                     0.003     0.000     0.003     0.056 c.m/sec"
"             Catchment 204          Pervious   Impervious Total Area "
"             Surface Area           0.034      0.012      0.046      hectare"
"             Time of concentration  5.473      0.433      2.254      minutes"
"             Time to Centroid       110.034    89.119     96.676     minutes"
"             Rainfall depth         31.880     31.880     31.880     mm"
"             Rainfall volume        10.71      3.96       14.66      c.m"
"             Rainfall losses        26.839     7.789      21.695     mm"
"             Runoff depth           5.041      24.090     10.184     mm"
"             Runoff volume          1.69       2.99       4.68       c.m"
"             Runoff coefficient     0.158      0.756      0.319      "
"             Maximum flow           0.001      0.003      0.003      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.003     0.003     0.003     0.056"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                     0.003     0.003     0.003     0.056"
" 40          HYDROGRAPH   Combine    2"
"            6   Combine "
"            2   Node #"
"                To O'Keefe Court"
"             Maximum flow                  0.003    c.m/sec"
"             Hydrograph volume             4.685    c.m"
"                     0.003     0.003     0.003     0.003"
" 38          START/RE-START TOTALS 204"
"            3   Runoff Totals on EXIT"
"             Total Catchment area                      0.520    hectare"
"             Total Impervious area                     0.444    hectare"
"             Total % impervious                       85.292"
" 19          EXIT"
```

```
"                MIDUSS Output ----------------------------------------------->"
"                MIDUSS version                            Version 2.25  rev. 473"
"                MIDUSS created                          Sunday, February 7, 2010"
"           10   Units used:                                          ie METRIC"
"                Job folder:                                    Q:\52222\100\SWM"
"                Output filename:                              5 Year Post a.out"
"                Licensee name:                                               A"
"                Company                                                       "
"                Date & Time last used:                 11/30/2022 at 1:31:20 PM"
" 31          TIME PARAMETERS"
"        5.000   Time Step"
"      180.000   Max. Storm length"
"     1500.000   Max. Hydrograph"
" 32          STORM Chicago storm"
"            1   Chicago storm"
"      998.071   Coefficient A"
"        6.053   Constant B"
"        0.814   Exponent C"
"        0.400   Fraction R"
"      180.000   Duration"
"        1.000   Time step multiplier"
"             Maximum intensity           141.178    mm/hr"
"             Total depth                  42.540    mm"
"            6   005hyd   Hydrograph extension used in this file"
" 33          CATCHMENT 201"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          201   Building Rooftop"
"      100.000   % Impervious"
"        0.126   Total Area"
"        7.500   Flow length"
"        2.000   Overland Slope"
"        0.000   Pervious Area"
"        7.500   Pervious length"
"        2.000   Pervious slope"
"        0.126   Impervious Area"
"        7.500   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious SCS Curve No."
"        0.000   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        8.467   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.840   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                     0.040     0.000     0.000     0.000 c.m/sec"
```

```
"             Catchment 201          Pervious   Impervious Total Area "
"             Surface Area           0.000      0.126      0.126      hectare"
"             Time of concentration  8.798      0.860      0.860      minutes"
"             Time to Centroid       111.618    88.094     88.094     minutes"
"             Rainfall depth         42.540     42.540     42.540     mm"
"             Rainfall volume        0.00       53.60      53.60      c.m"
"             Rainfall losses        32.802     6.803      6.803      mm"
"             Runoff depth           9.738      35.737     35.737     mm"
"             Runoff volume          0.00       45.03      45.03      c.m"
"             Runoff coefficient     0.000      0.840      0.840      "
"             Maximum flow           0.000      0.040      0.040      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.040     0.040     0.000     0.000"
" 54          POND DESIGN"
"         0.040   Current peak flow    c.m/sec"
"         0.036   Target outflow    c.m/sec"
"          45.0   Hydrograph volume    c.m"
"           11.   Number of stages"
"         0.000   Minimum water level    metre"
"         0.150   Maximum water level    metre"
"         0.000   Starting water level    metre"
"             0   Keep Design Data: 1 = True; 0 = False"
"                   Level Discharge    Volume"
"                   0.000     0.000     0.000"
"                 0.01500   0.00090   0.04275"
"                 0.03000   0.00180    0.3420"
"                 0.04500   0.00270     1.154"
"                 0.06000   0.00360     2.736"
"                 0.07500   0.00450     5.344"
"                 0.09000   0.00540     9.234"
"                  0.1050   0.00630    14.663"
"                  0.1200   0.00720    21.888"
"                  0.1350   0.00810    31.165"
"                  0.1500   0.00900    42.750"
"            1.   ROOFTOP"
"                 Roof area  Store area  Area/drain  Drain flow  Roof slope"
"                   hectare     hectare    sq.metre  L/min/25mm      g H:1V"
"                     0.126       0.095     250.000      22.500      50.000"
"               Using 4 roofdrains on roofstorage area of 950. square metre"
"               Peak outflow                   0.007    c.m/sec"
"               Maximum level                  0.117    metre"
"               Maximum storage               20.657    c.m"
"               Centroidal lag                 2.000   hours"
"                    0.040     0.040     0.007     0.000 c.m/sec"
" 40          HYDROGRAPH   Combine    1"
"             6   Combine "
"             1   Node #"
"                 To Lusk Street"
"               Maximum flow                   0.007    c.m/sec"
```

```
"             Hydrograph volume            45.126    c.m"
"                    0.040     0.040     0.007     0.007"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.040     0.000     0.007     0.007"
" 33          CATCHMENT 202"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          202   Controlled Parking/Driveway Area"
"       96.000   % Impervious"
"        0.305   Total Area"
"       15.000   Flow length"
"        1.000   Overland Slope"
"        0.012   Pervious Area"
"       15.000   Pervious length"
"        1.000   Pervious slope"
"        0.293   Impervious Area"
"       15.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious SCS Curve No."
"        0.229   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        8.467   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.866   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.088     0.000     0.007     0.007 c.m/sec"
"             Catchment 202          Pervious   Impervious Total Area "
"             Surface Area           0.012      0.293      0.305      hectare"
"             Time of concentration  16.418     1.606      1.767      minutes"
"             Time to Centroid       121.454    89.190     89.542     minutes"
"             Rainfall depth         42.540     42.540     42.540     mm"
"             Rainfall volume        5.19       124.56     129.75     c.m"
"             Rainfall losses        32.789     5.697      6.781      mm"
"             Runoff depth           9.751      36.843     35.759     mm"
"             Runoff volume          1.19       107.88     109.07     c.m"
"             Runoff coefficient     0.229      0.866      0.841      "
"             Maximum flow           0.000      0.088      0.088      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.088     0.088     0.007     0.007"
" 54          POND DESIGN"
"        0.088   Current peak flow    c.m/sec"
"        0.036   Target outflow    c.m/sec"
"        109.1   Hydrograph volume    c.m"
"           8.   Number of stages"
```

```
"      101.012   Minimum water level    metre"
"      103.700   Maximum water level    metre"
"      101.012   Starting water level    metre"
"            0   Keep Design Data: 1 = True; 0 = False"
"                  Level Discharge    Volume"
"                101.012     0.000     0.000"
"                103.400   0.04795     8.600"
"                103.450   0.04846    10.240"
"                103.500   0.04897    15.940"
"                103.550   0.04948    34.710"
"                103.600   0.04998    75.430"
"                103.650   0.05048   146.770"
"                103.700   0.05097   246.500"
"           1.   ORIFICES"
"                Orifice   Orifice   Orifice Number of"
"                 invert coefficie  diameter  orifices"
"                101.012     0.630    0.1200     1.000"
"             Peak outflow                  0.049    c.m/sec"
"             Maximum level               103.509    metre"
"             Maximum storage              19.500    c.m"
"             Centroidal lag                1.560   hours"
"                  0.088     0.088     0.049     0.007 c.m/sec"
" 40           HYDROGRAPH   Combine    1"
"             6   Combine "
"             1   Node #"
"                 To Lusk Street"
"             Maximum flow                  0.056    c.m/sec"
"             Hydrograph volume           154.406    c.m"
"                      0.088     0.088     0.049     0.056"
" 40           HYDROGRAPH Start - New Tributary"
"             2   Start - New Tributary"
"                      0.088     0.000     0.049     0.056"
" 33           CATCHMENT 203"
"             1   Triangular SCS"
"             1   Equal length"
"             1   SCS method"
"           203   Uncontrolled Area to Lusk Street"
"        28.600   % Impervious"
"         0.043   Total Area"
"         2.000   Flow length"
"        18.000   Overland Slope"
"         0.031   Pervious Area"
"         2.000   Pervious length"
"        18.000   Pervious slope"
"         0.012   Impervious Area"
"         2.000   Impervious length"
"        18.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        75.000   Pervious SCS Curve No."
"         0.227   Pervious Runoff coefficient"
```

```
"        0.100   Pervious Ia/S coefficient"
"        8.467   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.757   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                     0.005     0.000     0.049     0.056 c.m/sec"
"             Catchment 203          Pervious   Impervious Total Area "
"             Surface Area           0.031      0.012      0.043      hectare"
"             Time of concentration  2.059      0.201      0.996      minutes"
"             Time to Centroid       102.812    86.627     93.550     minutes"
"             Rainfall depth         42.540     42.540     42.540     mm"
"             Rainfall volume        13.06      5.23       18.29      c.m"
"             Rainfall losses        32.894     10.323     26.439     mm"
"             Runoff depth           9.646      32.217     16.101     mm"
"             Runoff volume          2.96       3.96       6.92       c.m"
"             Runoff coefficient     0.227      0.757      0.378      "
"             Maximum flow           0.002      0.004      0.005      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.005     0.005     0.049     0.056"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                     0.005     0.005     0.005     0.056"
" 40          HYDROGRAPH   Combine    1"
"            6   Combine "
"            1   Node #"
"                To Lusk Street"
"             Maximum flow                  0.059    c.m/sec"
"             Hydrograph volume           161.329    c.m"
"                     0.005     0.005     0.005     0.059"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                     0.005     0.000     0.005     0.059"
" 33          CATCHMENT 204"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          204   Uncontrolled Area to O'Keefe Court"
"       27.000   % Impervious"
"        0.046   Total Area"
"        6.000   Flow length"
"       20.000   Overland Slope"
"        0.034   Pervious Area"
"        6.000   Pervious length"
"       20.000   Pervious slope"
"        0.012   Impervious Area"
"        6.000   Impervious length"
"       20.000   Impervious slope"
```

```
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious SCS Curve No."
"        0.226   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        8.467   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.778   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                     0.005     0.000     0.005     0.059 c.m/sec"
"             Catchment 204          Pervious   Impervious Total Area "
"             Surface Area           0.034      0.012      0.046      hectare"
"             Time of concentration  3.857      0.377      1.908      minutes"
"             Time to Centroid       105.483    87.866     95.614     minutes"
"             Rainfall depth         42.540     42.540     42.540     mm"
"             Rainfall volume        14.28      5.28       19.57      c.m"
"             Rainfall losses        32.928     9.436      26.585     mm"
"             Runoff depth           9.612      33.104     15.955     mm"
"             Runoff volume          3.23       4.11       7.34       c.m"
"             Runoff coefficient     0.226      0.778      0.375      "
"             Maximum flow           0.002      0.004      0.005      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.005     0.005     0.005     0.059"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                     0.005     0.005     0.005     0.059"
" 40          HYDROGRAPH   Combine    2"
"            6   Combine "
"            2   Node #"
"                To O'Keefe Court"
"             Maximum flow                  0.005    c.m/sec"
"             Hydrograph volume             7.339    c.m"
"                     0.005     0.005     0.005     0.005"
" 38          START/RE-START TOTALS 204"
"            3   Runoff Totals on EXIT"
"             Total Catchment area                      0.520    hectare"
"             Total Impervious area                     0.444    hectare"
"             Total % impervious                       85.292"
" 19          EXIT"
```

```
"                MIDUSS Output ----------------------------------------------->"
"                MIDUSS version                            Version 2.25  rev. 473"
"                MIDUSS created                          Sunday, February 7, 2010"
"           10   Units used:                                          ie METRIC"
"                Job folder:                                  Q:\52222\100\SWM"
"                Output filename:                          100 Year Post a.out"
"                Licensee name:                                               A"
"                Company                                                       "
"                Date & Time last used:                 11/30/2022 at 1:33:39 PM"
" 31          TIME PARAMETERS"
"        5.000   Time Step"
"      180.000   Max. Storm length"
"     1500.000   Max. Hydrograph"
" 32          STORM Chicago storm"
"            1   Chicago storm"
"     1735.688   Coefficient A"
"        6.014   Constant B"
"        0.820   Exponent C"
"        0.400   Fraction R"
"      180.000   Duration"
"        1.000   Time step multiplier"
"             Maximum intensity           242.704    mm/hr"
"             Total depth                  71.708    mm"
"            6   100hyd   Hydrograph extension used in this file"
" 33          CATCHMENT 201"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          201   Building Rooftop"
"      100.000   % Impervious"
"        0.126   Total Area"
"        7.500   Flow length"
"        2.000   Overland Slope"
"        0.000   Pervious Area"
"        7.500   Pervious length"
"        2.000   Pervious slope"
"        0.126   Impervious Area"
"        7.500   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious SCS Curve No."
"        0.000   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        8.467   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.868   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                     0.072     0.000     0.000     0.000 c.m/sec"
```

```
"             Catchment 201          Pervious   Impervious Total Area "
"             Surface Area           0.000      0.126      0.126      hectare"
"             Time of concentration  5.470      0.684      0.684      minutes"
"             Time to Centroid       103.771    86.695     86.695     minutes"
"             Rainfall depth         71.708     71.708     71.708     mm"
"             Rainfall volume        0.00       90.35      90.35      c.m"
"             Rainfall losses        44.863     9.485      9.485      mm"
"             Runoff depth           26.845     62.223     62.223     mm"
"             Runoff volume          0.00       78.40      78.40      c.m"
"             Runoff coefficient     0.000      0.868      0.868      "
"             Maximum flow           0.000      0.072      0.072      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.072     0.072     0.000     0.000"
" 54          POND DESIGN"
"         0.072   Current peak flow    c.m/sec"
"         0.036   Target outflow    c.m/sec"
"          78.4   Hydrograph volume    c.m"
"           11.   Number of stages"
"         0.000   Minimum water level    metre"
"         0.150   Maximum water level    metre"
"         0.000   Starting water level    metre"
"             0   Keep Design Data: 1 = True; 0 = False"
"                   Level Discharge    Volume"
"                   0.000     0.000     0.000"
"                 0.01500   0.00090   0.04275"
"                 0.03000   0.00180    0.3420"
"                 0.04500   0.00270     1.154"
"                 0.06000   0.00360     2.736"
"                 0.07500   0.00450     5.344"
"                 0.09000   0.00540     9.234"
"                  0.1050   0.00630    14.663"
"                  0.1200   0.00720    21.888"
"                  0.1350   0.00810    31.165"
"                  0.1500   0.00900    42.750"
"            1.   ROOFTOP"
"                 Roof area  Store area  Area/drain  Drain flow  Roof slope"
"                   hectare     hectare    sq.metre  L/min/25mm      g H:1V"
"                     0.126       0.095     250.000      22.500      50.000"
"               Using 4 roofdrains on roofstorage area of 950. square metre"
"               Peak outflow                   0.009    c.m/sec"
"               Maximum level                  0.148    metre"
"               Maximum storage               41.083    c.m"
"               Centroidal lag                 2.301   hours"
"                    0.072     0.072     0.009     0.000 c.m/sec"
" 40          HYDROGRAPH   Combine    1"
"            6   Combine "
"            1   Node #"
"                To Lusk Street"
"             Maximum flow                   0.009    c.m/sec"
```

```
"             Hydrograph volume            78.387    c.m"
"                    0.072     0.072     0.009     0.009"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.072     0.000     0.009     0.009"
" 33          CATCHMENT 202"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          202   Controlled Parking/Driveway Area"
"       96.000   % Impervious"
"        0.305   Total Area"
"       15.000   Flow length"
"        1.000   Overland Slope"
"        0.012   Pervious Area"
"       15.000   Pervious length"
"        1.000   Pervious slope"
"        0.293   Impervious Area"
"       15.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious SCS Curve No."
"        0.375   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        8.467   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.907   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.162     0.000     0.009     0.009 c.m/sec"
"             Catchment 202          Pervious   Impervious Total Area "
"             Surface Area           0.012      0.293      0.305      hectare"
"             Time of concentration  10.207     1.276      1.427      minutes"
"             Time to Centroid       110.254    87.347     87.735     minutes"
"             Rainfall depth         71.708     71.708     71.708     mm"
"             Rainfall volume        8.75       209.96     218.71     c.m"
"             Rainfall losses        44.837     6.696      8.222      mm"
"             Runoff depth           26.871     65.011     63.486     mm"
"             Runoff volume          3.28       190.35     193.63     c.m"
"             Runoff coefficient     0.375      0.907      0.885      "
"             Maximum flow           0.002      0.162      0.162      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.162     0.162     0.009     0.009"
" 54          POND DESIGN"
"        0.162   Current peak flow    c.m/sec"
"        0.036   Target outflow    c.m/sec"
"        193.6   Hydrograph volume    c.m"
"           8.   Number of stages"
```

```
"      101.012   Minimum water level    metre"
"      103.700   Maximum water level    metre"
"      101.012   Starting water level    metre"
"            0   Keep Design Data: 1 = True; 0 = False"
"                  Level Discharge    Volume"
"                101.012     0.000     0.000"
"                103.400   0.04795     8.600"
"                103.450   0.04846    10.240"
"                103.500   0.04897    15.940"
"                103.550   0.04948    34.710"
"                103.600   0.04998    75.430"
"                103.650   0.05048   146.770"
"                103.700   0.05097   246.500"
"           1.   ORIFICES"
"                Orifice   Orifice   Orifice Number of"
"                 invert coefficie  diameter  orifices"
"                101.012     0.630    0.1200     1.000"
"             Peak outflow                  0.050    c.m/sec"
"             Maximum level               103.579    metre"
"             Maximum storage              58.313    c.m"
"             Centroidal lag                1.628   hours"
"                  0.162     0.162     0.050     0.009 c.m/sec"
" 40          HYDROGRAPH   Combine    1"
"            6   Combine "
"            1   Node #"
"                To Lusk Street"
"             Maximum flow                  0.059    c.m/sec"
"             Hydrograph volume           272.449    c.m"
"                     0.162     0.162     0.050     0.059"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                     0.162     0.000     0.050     0.059"
" 33          CATCHMENT 203"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          203   Uncontrolled Area to Lusk Street"
"       28.600   % Impervious"
"        0.043   Total Area"
"        2.000   Flow length"
"       18.000   Overland Slope"
"        0.031   Pervious Area"
"        2.000   Pervious length"
"       18.000   Pervious slope"
"        0.012   Impervious Area"
"        2.000   Impervious length"
"       18.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious SCS Curve No."
"        0.369   Pervious Runoff coefficient"
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"        0.100   Pervious Ia/S coefficient"
"        8.467   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.796   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                     0.013     0.000     0.050     0.059 c.m/sec"
"             Catchment 203          Pervious   Impervious Total Area "
"             Surface Area           0.031      0.012      0.043      hectare"
"             Time of concentration  1.280      0.160      0.761      minutes"
"             Time to Centroid       97.778     84.828     91.771     minutes"
"             Rainfall depth         71.708     71.708     71.708     mm"
"             Rainfall volume        22.02      8.82       30.83      c.m"
"             Rainfall losses        45.270     14.607     36.500     mm"
"             Runoff depth           26.438     57.100     35.208     mm"
"             Runoff volume          8.12       7.02       15.14      c.m"
"             Runoff coefficient     0.369      0.796      0.491      "
"             Maximum flow           0.006      0.007      0.013      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.013     0.013     0.050     0.059"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                     0.013     0.013     0.013     0.059"
" 40          HYDROGRAPH   Combine    1"
"            6   Combine "
"            1   Node #"
"                To Lusk Street"
"             Maximum flow                  0.069    c.m/sec"
"             Hydrograph volume           287.588    c.m"
"                     0.013     0.013     0.013     0.069"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                     0.013     0.000     0.013     0.069"
" 33          CATCHMENT 204"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          204   Uncontrolled Area to O'Keefe Court"
"       27.000   % Impervious"
"        0.046   Total Area"
"        6.000   Flow length"
"       20.000   Overland Slope"
"        0.034   Pervious Area"
"        6.000   Pervious length"
"       20.000   Pervious slope"
"        0.012   Impervious Area"
"        6.000   Impervious length"
"       20.000   Impervious slope"
```

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"        0.250   Pervious Manning 'n'"
"       75.000   Pervious SCS Curve No."
"        0.372   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        8.467   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.809   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                     0.012     0.000     0.013     0.069 c.m/sec"
"             Catchment 204          Pervious   Impervious Total Area "
"             Surface Area           0.034      0.012      0.046      hectare"
"             Time of concentration  2.398      0.300      1.462      minutes"
"             Time to Centroid       99.506     85.952     93.463     minutes"
"             Rainfall depth         71.708     71.708     71.708     mm"
"             Rainfall volume        24.08      8.91       32.99      c.m"
"             Rainfall losses        45.047     13.721     36.589     mm"
"             Runoff depth           26.661     57.987     35.119     mm"
"             Runoff volume          8.95       7.20       16.15      c.m"
"             Runoff coefficient     0.372      0.809      0.490      "
"             Maximum flow           0.006      0.007      0.012      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.012     0.012     0.013     0.069"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                     0.012     0.012     0.012     0.069"
" 40          HYDROGRAPH   Combine    2"
"            6   Combine "
"            2   Node #"
"                To O'Keefe Court"
"             Maximum flow                  0.012    c.m/sec"
"             Hydrograph volume            16.155    c.m"
"                     0.012     0.012     0.012     0.012"
" 38          START/RE-START TOTALS 204"
"            3   Runoff Totals on EXIT"
"             Total Catchment area                      0.520    hectare"
"             Total Impervious area                     0.444    hectare"
"             Total % impervious                       85.292"
" 19          EXIT"
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