June 8, 2018
MTE File No.: C40602-100

Mr. Ghazwan Yousif
City of Mississauga
300 City Centre Drive
Mississauga, ON L5B 3C1

Dear Mr. Yousif:

Re: Revised Stormwater Management Brief
Erinview Proposed Redevelopment Full Build-Out– 2132 Dundas Street West
City of Mississauga

In accordance with the City of Mississauga's SPA requirements, four (4) copies of the Existing Conditions and Removals Plan (MTE Drawing C1.1), Site Grading Plan – Phase 2 (MTE Drawing C3.1), Site Servicing Plan – Phase 2 (MTE Drawing C3.2), and Details and Notes Plan – Phase 2 (MTE Drawing C3.3) for the above development are enclosed for your review and approval.

BACKGROUND AND EXISTING CONDITIONS

MTE Consultants Inc. was retained by Sifton Properties Limited to prepare a Site Grading Plan and Stormwater Management (SWM) Brief for the proposed redevelopment of the Erin Mills Retirement Community Centre located at 2132 Dundas Street West in the City of Mississauga (herein referred to as 'the Site'). The proposed redevelopment includes the demolition of the existing retirement community centre and the construction of a new facility, to be completed in two stages.

The Site has a total area of approximately 1.02 ha and is bounded to the north by Dundas Street West, to the west by Christ Our King Lutheran Church, to the south by existing residential development, and to the east by Fifth Line West. For the exact location of the Site refer to the key plan located on the enclosed engineering drawings.

In the existing condition, runoff from the Site is collected in a series of on-site catchbasins and conveyed to the north corner of the property where it is discharged to the municipal storm sewer. There are no existing stormwater management quantity or quality controls on the Site.

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Kitchener, Ontario N2B 3X9
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The existing retirement facility will be demolished in two phases and a new retirement facility will be constructed in two phases. Phase 1, which is now underway, includes the demolition of a portion of the existing building parallel to the south east property line and the construction of a new building in its place, complete with a new driveway and small parking area. A new storm system will tie into the existing on-site storm system which currently outlets at the Dundas Street West and Fifth Line West intersection. Phase 2 will include the demolition of the remaining existing facility and the construction of a new building in its place, complete with parking areas. A new storm system will be constructed for Phase 2, including a new connection at the Dundas Street West and Fifth Line West intersection. The portion of storm system installed during Phase 1 will connect into the Phase 2 storm system.

STORMWATER MANAGEMENT

The Site is located east of Winston Churchill Blvd, in the Loyalist Creek Subwatershed which is governed by the Credit Valley Conservation Authority. The stormwater management design criteria for the subject Site, as established by the City of Mississauga, are as follows:

i) Provide attenuation of the post-development peak flows for the 10-year storm event to the pre-development (existing) peak flows; and

ii) Provide on-site retention of the first 5mm of runoff.

ATTENUATION

Per the City of Mississauga Transportation and Works Development Requirements Manual (September 2016), the maximum pre-development (existing condition) runoff co-efficient for a Site that has already been developed is 0.50. This equates to an imperviousness of approximately 43%. The following table summarizes the catchments used in the modeling of the Site. For the pre-development condition, the Site is modeled as one catchment (101). For the post-development condition of the full site build-out, the Site is divided into four catchments: Site (excluding building), Phase 1 building (302), Phase 2 building (303) and the link roof (304). Refer to the attached figures illustrating the pre development and post development catchment areas.

TABLE 1.1 - CATCHMENT PARAMETERS

#	Catchment	Area (ha)	% Impervious	Pervious CN	Impervious CN	Slope (%)	Flow Length (m)
Pre-Development Catchment Area							
101	Site	1.021	43	75	98	2.0	15
Post Development Catchment Areas (Full Build-out)							
301	Site (excluding bldgs)	0.599	55	75	98	4.0	10
302	Phase 1 Bldg	0.164	100	75	98	1.5	30
303	Phase 2 Bldg	0.177	100	75	98	1.5	30
304	Link Roof	0.082	50	75	98	2	15

In order to achieve the stormwater management requirements for the Site, runoff generated from catchment areas 302, and 303 will be controlled through the installation of FCRDs, with a maximum depth of ponding on the rooftop of 0.15 metres. With the addition of the FCRDs, the post development runoff for the full site build-out is controlled to 0.164 m^3/s. Table 1.3 summarizes the flows generated during the 10 year storm event in the post-development condition. No additional on-site controls are proposed.

TABLE 1.2 - SUMMARY OF FLOWS

Modeling Condition	10 year Storm Event (m^3/s)
Pre-Development	0.179
Phase 2 Development	0.164

There is existing external drainage directed onto the Site from neighbouring properties to the south and west. As their condition remains the same throughout the construction phases, this area was not taken into account in the pre and post runoff calculations. The external drainage area was considered when sizing the on-site storm sewer pipes.

RETENTION

The geotechnical report by Chung and Vander Doelen dated February 10, 2016 indicates that the soils are not suitable for a traditional infiltration gallery. Therefore, in order to retain the first 5 mm runoff three on-site low impact development strategies are proposed. Based on the site area of 1.21 ha, the retention target for the overall site is 51.1 m^3. Within the surface parking, hydroPAVERS™ are proposed for the parking stalls.

HydroPAVERS™ are paving stones made up of ceramic granules and bentonite clay that absorb up to 6 L/m^2 of water. Stormwater above the pavers' 6 L/m^2 retention capacity will infiltrate into the gravel bed below or will be directed to the storm system. A green roof on the link between the two towers is proposed to reduce the amount of impervious area on site and provide some retention. The proposed green roof is to be designed by LiveRoof® and will have a total retention capacity of 59 L/m^2. Finally, it is proposed that the landscaped areas along the west property line and the Dundas Street and Fifth Line West frontages have a thicker layer of topsoil to allow for retention. Having amended topsoil with a 450 mm thickness in these area will allow for greater retention of rainwater falling on the landscaped area by allowing water to be stored in the topsoil while slowly infiltrating into the subbase. By using this combination of LID techniques, the retention requirement of the site is met. See the enclosed calculation sheet for a breakdown of the retention volume achieved by each LID technique.

EROSION AND SEDIMENTATION CONTROL

In order to minimize the effects of erosion during the grading of the Site, sediment control fencing will be installed, as shown on the enclosed engineering drawings, around any stockpiles and around the catchbasins during construction. Any sediment that is tracked onto the roadway during the course of construction will be cleaned by the contractor. To help minimize the amount of mud being tracked onto the roadway, a mud mat will be installed at the primary construction entrance, off Fifth Line West.

CONCLUSIONS AND RECOMMENDATIONS

Based on the foregoing analysis, it is concluded that:

i) Utilizing FCRDs, the proposed stormwater management design provides adequate attenuation of the 10-year storm in the full build-out of the site;

ii) HydroPAVERS™, a green roof and topsoil amendment are proposed to achieve the 5mm of required retention; and

iii) Upon completion of construction, the Site will conform to the design criteria specified by the City of Mississauga.

It is recommended that:

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

ii) The proposed civil works be inspected by MTE Consultants Inc., during construction, and certified to the City of Mississauga upon completion.

We trust that this information is satisfactory. Please contact the undersigned if you have any questions.

Yours truly,

MTE CONSULTANTS INC.

Maisy Jefferson, E.I.T.
Designer

Rebecca Kerr, P.Eng.
Design Engineer

MMJ:dem
cc: Celeste Salvagna, MHBC
Sabrina Vastag, James Fryett Architect Inc.
Louise Sanford, MTE Consultants Inc.

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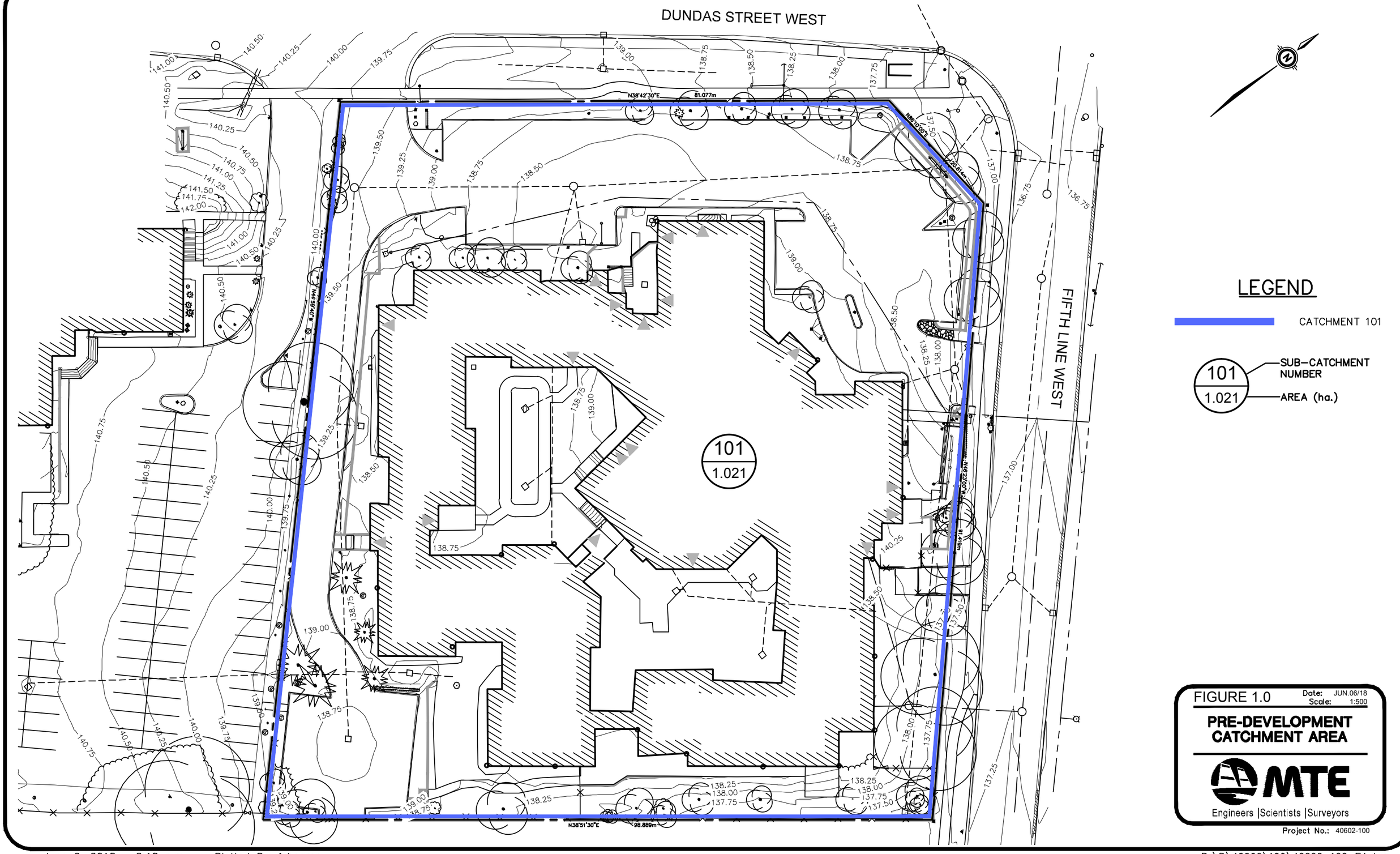

LEGEND

CATCHMENT 101

101 — SUB-CATCHMENT NUMBER

1.021 — AREA (ha.)

FIGURE 1.0

Date: JUN.06/18
Scale: 1:500

PRE-DEVELOPMENT CATCHMENT AREA

MTE
Engineers | Scientists | Surveyors

Project No.: 40602-100

June 6, 2018 2:18 p.m. Plotted By: jshearer

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DUNDAS STREET WEST

FIFTH LINE WEST

303
0.177

301
0.599

304
0.082

302
0.164

LEGEND

- CATCHMENT 301
- CATCHMENT 302
- CATCHMENT 303
- CATCHMENT 304

301 / 0.599 — SUB-CATCHMENT NUMBER; AREA (ha.)

FIGURE 2.0
Date: JUN.06/18
Scale: 1:500

FULL BUILD-OUT POST DEVELOPMENT CATCHMENT AREAS

MTE
Engineers | Scientists | Surveyors

Project No.: 40602-100

June 6, 2018 2:17 p.m. Plotted By: jshearer

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RETENTION CALCULATIONS

June 6, 2018

RETENTION REQUIRED

Site Area = 1.021 ha = 10,210 m^2
Retention Required = 10,210 m^2 *0.005 m = **51.1 m^3**

HYDROPAVERS:
Capacity = 6 L/m^2
Area of Pavers = 490 m^2
Retention Capacity Provided = 6 L/m^2 * 490m^2 = 2940 L **= 2.9 m^3**

GREEN ROOF
Capacity = 59 L/m^2
Area of Green Roof = 372 m^2
Retention Capacity Provided = 59 L/m^2 * 372 m^2 = 21,948 L **= 21.9 m^3** (Based on Capacity)
Area Directed to Green Roof = 815 m^2 (includes green roof area and peaked entrance roof)
Volume Directed to Green Roof = 815 m^2 * 0.03m = **24.5 m^3**
Note: Assuming 30mm storm event

Since the retention capacity of the green roof is lower than the volume directed it in the 30mm storm, the maximum retention volume is **21.9 m^3.**

AMENDED TOPSOIL
Capacity = 90 L/m^2
Note: Capacity based on 450mm thickness with void ratio of 0.2
Area of Amended Topsoil = 990 m^2
Retention Capacity Provided = 90 L/m^2 * 990 m^2 = 89,100 L **= 89.1 m^3**
Volume Directed to Amended Topsoil = 990 m^2 *0.03m **= 29.7 m^3**
Note : Assume 30mm storm event

Since the volume directed to the topsoil amended area is lower than its retention capacity, the maximum retention volume is **29.7 m^3.**

TOTAL RETENTION VOLUME PROVIDED = 2.9 m^3 + 21.9 m^3 + 29.7 m^3 = 54.5 m^3
RETENTION REQUIRED = 51.1 m^3

RETENTION PROVIDED > RETENTION REQUIRED

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"             Time of concentration  10.987     1.195      4.122      minutes"
"             Time to Centroid       114.766    88.724     96.509     minutes"
"             Rainfall depth         51.735     51.735     51.735     mm"
"             Rainfall volume        301.08     227.13     528.21     c.m"
"             Rainfall losses        37.135     6.350      23.897     mm"
"             Runoff depth           14.600     45.385     27.837     mm"
"             Runoff volume          84.97      199.25     284.22     c.m"
"             Runoff coefficient     0.282      0.877      0.538      "
"             Maximum flow           0.036      0.170      0.179      c.m/sec"
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"            1   Chicago storm"
"     1010.000   Coefficient A"
"        4.600   Constant B"
"        0.780   Exponent C"
"        0.400   Fraction R"
"      180.000   Duration"
"        1.000   Time step multiplier"
"             Maximum intensity           173.041    mm/hr"
"             Total depth                  51.735    mm"
"            6   010hyd   Hydrograph extension used in this file"
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"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          302   Phase 1 Bldg"
"      100.000   % Impervious"
"        0.164   Total Area"
"       30.000   Flow length"
"        1.500   Overland Slope"
"        0.000   Pervious Area"
"       30.000   Pervious length"
"        1.500   Pervious slope"
"        0.164   Impervious Area"
"       30.000   Impervious length"
"        1.500   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."
"        0.887   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
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"             Surface Area           0.000      0.164      0.164      hectare"
"             Time of concentration  18.154     1.974      1.974      minutes"
"             Time to Centroid       124.369    89.954     89.954     minutes"
"             Rainfall depth         51.735     51.735     51.735     mm"
"             Rainfall volume        0.00       84.84      84.84      c.m"
"             Rainfall losses        37.121     5.860      5.861      mm"
"             Runoff depth           14.614     45.874     45.874     mm"
"             Runoff volume          0.00       75.23      75.23      c.m"
"             Runoff coefficient     0.000      0.887      0.887      "
"             Maximum flow           0.000      0.059      0.059      c.m/sec"
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"         11.   Number of stages"
"       0.000   Minimum water level    metre"
"       0.400   Maximum water level    metre"
"       0.000   Starting water level    metre"
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"                 Level Discharge    Volume"
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"                0.2800   0.04200   277.030"
"                0.3200   0.04800   326.230"
"                0.3600   0.05400   375.430"
"                0.4000   0.06000   424.630"
"          1.   ROOFTOP"
"               Roof area  Store area  Area/drain  Drain flow  Roof slope"
"                 hectare     hectare    sq.metre  L/min/25mm      g H:1V"
"                   0.164       0.123     120.000      22.500      66.667"
"            Using 10 roofdrains on roofstorage area of 1230. square metre"
"            Peak outflow                   0.012    c.m/sec"
"            Maximum level                  0.083    metre"
"            Maximum storage               34.431    c.m"
"            Centroidal lag                 2.030   hours"
"                 0.059     0.059     0.012     0.000 c.m/sec"
" 40          HYDROGRAPH   Combine    1"
"           6   Combine "
"           1   Node #"
"               Roof & Site"
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"           1   Equal length"
"           1   SCS method"
"         303   Phase 2 Bldg"
"      100.000  % Impervious"
"       0.177   Total Area"
"      30.000   Flow length"
"       1.500   Overland Slope"
"       0.000   Pervious Area"
"      30.000   Pervious length"
"       1.500   Pervious slope"
"       0.177   Impervious Area"
"      30.000   Impervious length"
"       1.500   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'"
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"       98.000   Impervious SCS Curve No."
"        0.887   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                  0.064     0.000     0.012     0.012 c.m/sec"
"             Catchment 303          Pervious   Impervious Total Area "
"             Surface Area           0.000      0.177      0.177      hectare"
"             Time of concentration  18.154     1.974      1.974      minutes"
"             Time to Centroid       124.369    89.954     89.954     minutes"
"             Rainfall depth         51.735     51.735     51.735     mm"
"             Rainfall volume        0.00       91.57      91.57      c.m"
"             Rainfall losses        37.121     5.860      5.861      mm"
"             Runoff depth           14.614     45.874     45.874     mm"
"             Runoff volume          0.00       81.20      81.20      c.m"
"             Runoff coefficient     0.000      0.887      0.887      "
"             Maximum flow           0.000      0.064      0.064      c.m/sec"
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"          11.   Number of stages"
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"        0.400   Maximum water level    metre"
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"                  0.2800   0.03780   370.442"
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"                  0.4000   0.05400   582.842"
"           1.   ROOFTOP"
"                Roof area  Store area  Area/drain  Drain flow  Roof slope"
"                  hectare     hectare    sq.metre  L/min/25mm      g H:1V"
"                    0.177       0.177     200.000      22.500      66.667"
"             Using 9 roofdrains on roofstorage area of 1770. square metre"
"             Peak outflow                   0.012    c.m/sec"
"             Maximum level                  0.088    metre"
"             Maximum storage               38.587    c.m"
"             Centroidal lag                 2.107   hours"
"                  0.064     0.064     0.012     0.012 c.m/sec"
" 40          HYDROGRAPH   Combine    1"
"            6   Combine "
"            1   Node #"
"                Roof & Site"
"             Maximum flow                   0.024    c.m/sec"
"             Hydrograph volume            156.422    c.m"
"                  0.064     0.064     0.012     0.024"
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" 33          CATCHMENT 304"
"            1   Triangular SCS"
"            1   Equal length"
```

```
"            1   SCS method"
"          304   Link Roof"
"       50.000   % Impervious"
"        0.082   Total Area"
"      156.000   Flow length"
"        2.000   Overland Slope"
"        0.041   Pervious Area"
"      156.000   Pervious length"
"        2.000   Pervious slope"
"        0.041   Impervious Area"
"      156.000   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious SCS Curve No."
"        0.283   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."
"        0.894   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.014     0.000     0.012     0.024 c.m/sec"
"             Catchment 304          Pervious   Impervious Total Area "
"             Surface Area           0.041      0.041      0.082      hectare"
"             Time of concentration  44.780     4.870      14.458     minutes"
"             Time to Centroid       160.049    94.521     110.263    minutes"
"             Rainfall depth         51.735     51.735     51.735     mm"
"             Rainfall volume        21.21      21.21      42.42      c.m"
"             Rainfall losses        37.105     5.468      21.286     mm"
"             Runoff depth           14.630     46.267     30.448     mm"
"             Runoff volume          6.00       18.97      24.97      c.m"
"             Runoff coefficient     0.283      0.894      0.589      "
"             Maximum flow           0.001      0.014      0.014      c.m/sec"
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"            4   Add Runoff "
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" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.014     0.014     0.014     0.024"
" 40          HYDROGRAPH   Combine    1"
"            6   Combine "
"            1   Node #"
"                Roof & Site"
"             Maximum flow                  0.036    c.m/sec"
"             Hydrograph volume           181.390    c.m"
"                    0.014     0.014     0.014     0.036"
" 40          HYDROGRAPH   Confluence    1"
"            7   Confluence "
"            1   Node #"
"                Roof & Site"
"             Maximum flow                  0.036    c.m/sec"
"             Hydrograph volume           181.390    c.m"
"                    0.014     0.036     0.014     0.000"
" 33          CATCHMENT 301"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          301   Remainder of Site"
"       55.000   % Impervious"
"        0.599   Total Area"
"       10.000   Flow length"
"        4.000   Overland Slope"
```

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"        0.270   Pervious Area"
"       10.000   Pervious length"
"        4.000   Pervious slope"
"        0.329   Impervious Area"
"       10.000   Impervious length"
"        4.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious SCS Curve No."
"        0.281   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."
"        0.853   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.137     0.036     0.014     0.000 c.m/sec"
"             Catchment 301          Pervious   Impervious Total Area "
"             Surface Area           0.270      0.329      0.599      hectare"
"             Time of concentration  6.997      0.761      2.083      minutes"
"             Time to Centroid       109.560    88.258     92.775     minutes"
"             Rainfall depth         51.735     51.735     51.735     mm"
"             Rainfall volume        139.45     170.44     309.89     c.m"
"             Rainfall losses        37.217     7.602      20.929     mm"
"             Runoff depth           14.517     44.133     30.806     mm"
"             Runoff volume          39.13      145.40     184.53     c.m"
"             Runoff coefficient     0.281      0.853      0.595      "
"             Maximum flow           0.021      0.131      0.137      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.137     0.164     0.014     0.000"
" 38          START/RE-START TOTALS 301"
"            3   Runoff Totals on EXIT"
"             Total Catchment area                    1.022    hectare"
"             Total Impervious area                   0.711    hectare"
"             Total % impervious                     69.613"
" 19          EXIT"
```