TOWN OF CALEDON
PLANNING
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FUNCTIONAL SERVICING AND STORMWATER MANAGEMENT REPORT

for

ART + WORK
13846 & 13940 AIRPORT ROAD

Report Prepared for:

AIRPORT KING INC.
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Brampton, Ontario
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Prepared by:

Calder Engineering Ltd.



February 2022

Reference: 19-216

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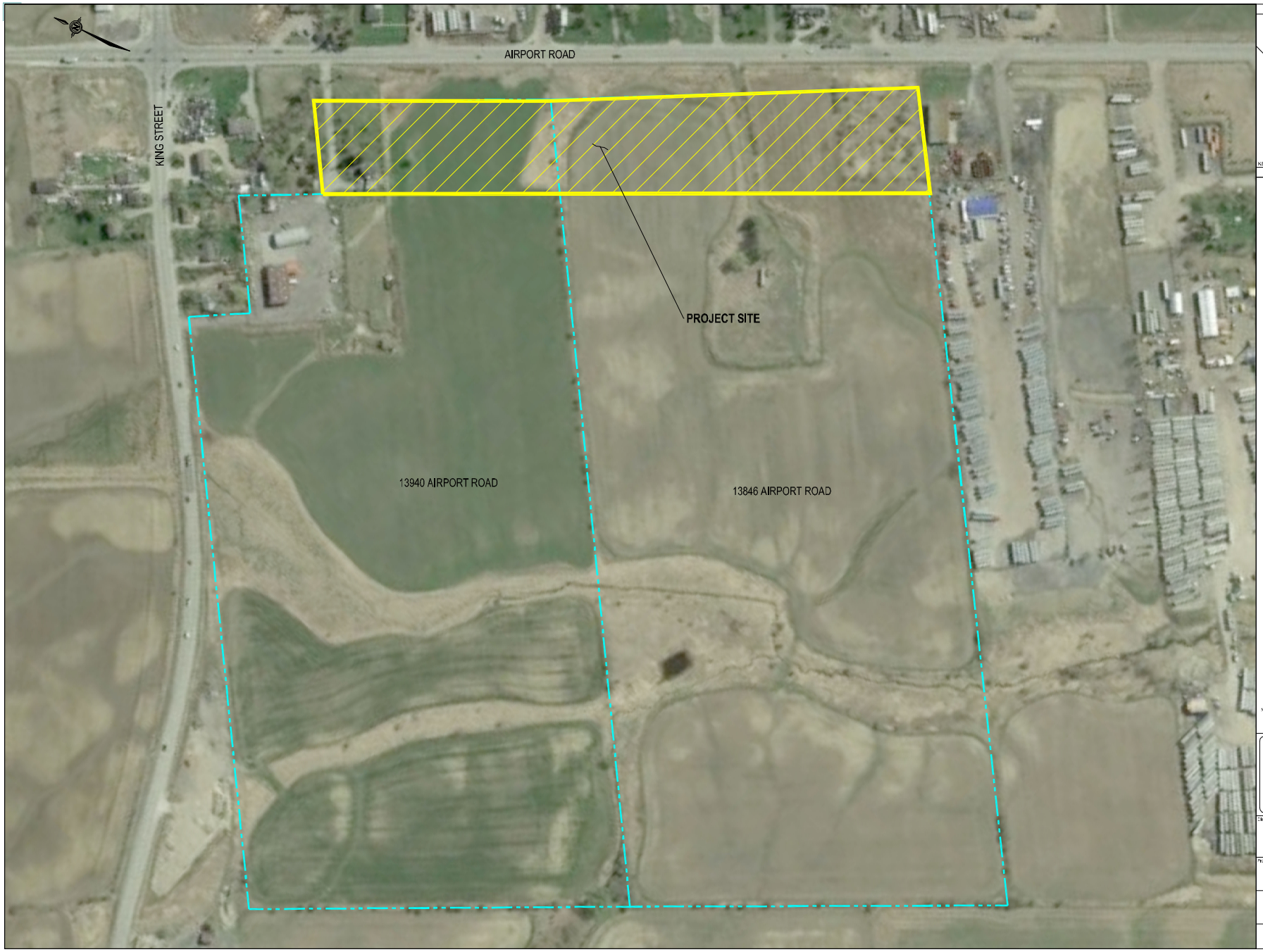
1.0 INTRODUCTION

Calder Engineering Ltd. has been retained by Airport King Inc. to complete a Functional Servicing and Stormwater Management Report for a proposed highway commercial/industrial development in the Sandhill Settlement Area of the Town of Caledon. The Functional Servicing and Stormwater Management Report is supporting documentation for the respective Site Plan application.

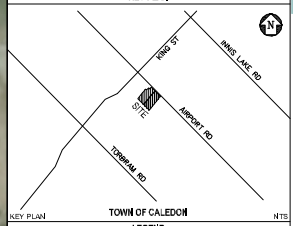
The site location is shown on Figure 1.1 and comprises approximately 3.82 hectares (ha). The subject site is located within the Sandhill Settlement in the Town of Caledon on the west side of Airport Road south of the intersection of Airport Road and King Street. The site comprises part of 13846 Airport Road and part of 13940 Airport Road. The legal description of the property is Part of Lot 27, Concession 6, East of Hurontario Street, formerly in the Township of Chinguacousy, Town of Caledon, Regional Municipality of Peel.

The proposed development for the property comprises approximately 3.82 hectares of highway commercial land use fronting on Airport Road.

The objective of this report is to describe proposed site grading design, methods for site sanitary and water servicing, plan for drainage and stormwater management, and other proposed servicing infrastructure.



KEY PLAN



LEGEND

PROPERTY LINE

NOTES:
1. AIRPHOTO FROM GOOGLE EARTH DATED 2015. LOCATION AND SCALING IS APPROXIMATE.

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STUDY AREA

FIGURE 1.1

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2.0 STUDY AREA

2.1 General

The site is located within the Sandhill Settlement in the Town of Caledon and is bounded by Airport Road to the east and a mixture of commercial/institutional/residential land uses, commercial development to the north, agricultural land to the west, and industrial/commercial development to the south. The legal description of the property is Part of Lot 27, Concession 6, East of Hurontario Street, formerly in the Township of Chinguacousy, Town of Caledon, Regional Municipality of Peel.

The proposed development for the property comprises approximately 3.82 hectares of highway commercial/industrial land use fronting on Airport Road. Illustrated on Figure 2.1 is the proposed site plan. Access to and egress from the proposed development is proposed from Airport Road at three locations via one full movement entrance and two right-in/right-outs. It is anticipated the proposed development will also be able to be accessed in the future from King Street.

The subject lands are zoned Highway Commercial in the Town of Caledon Official Plan (2018) and are shown on Schedule T of the Official Plan (Sandhill Land Use Plan). The site is not located within the Southern Ontario Greenbelt or lands regulated by the Oak Ridges Moraine Conservation Plan.

2.2 Physiography and Landform

The property is located within the physiographic region referred to as the South Slope (Chapman and Putnam, 1984). The South Slope physiographic region is defined as the area along the southern edge of the Oak Ridges Moraine and extends along the moraine between Durham Region in the east and the Niagara Escarpment in the west. Landform of the South Slope is characterized by topography that gently slopes southwards towards Lake Ontario and consists of smooth, faintly drumlinized, clay till plain that contains deeply incised stream valleys (Toronto and Region Conservation Authority, 2008).

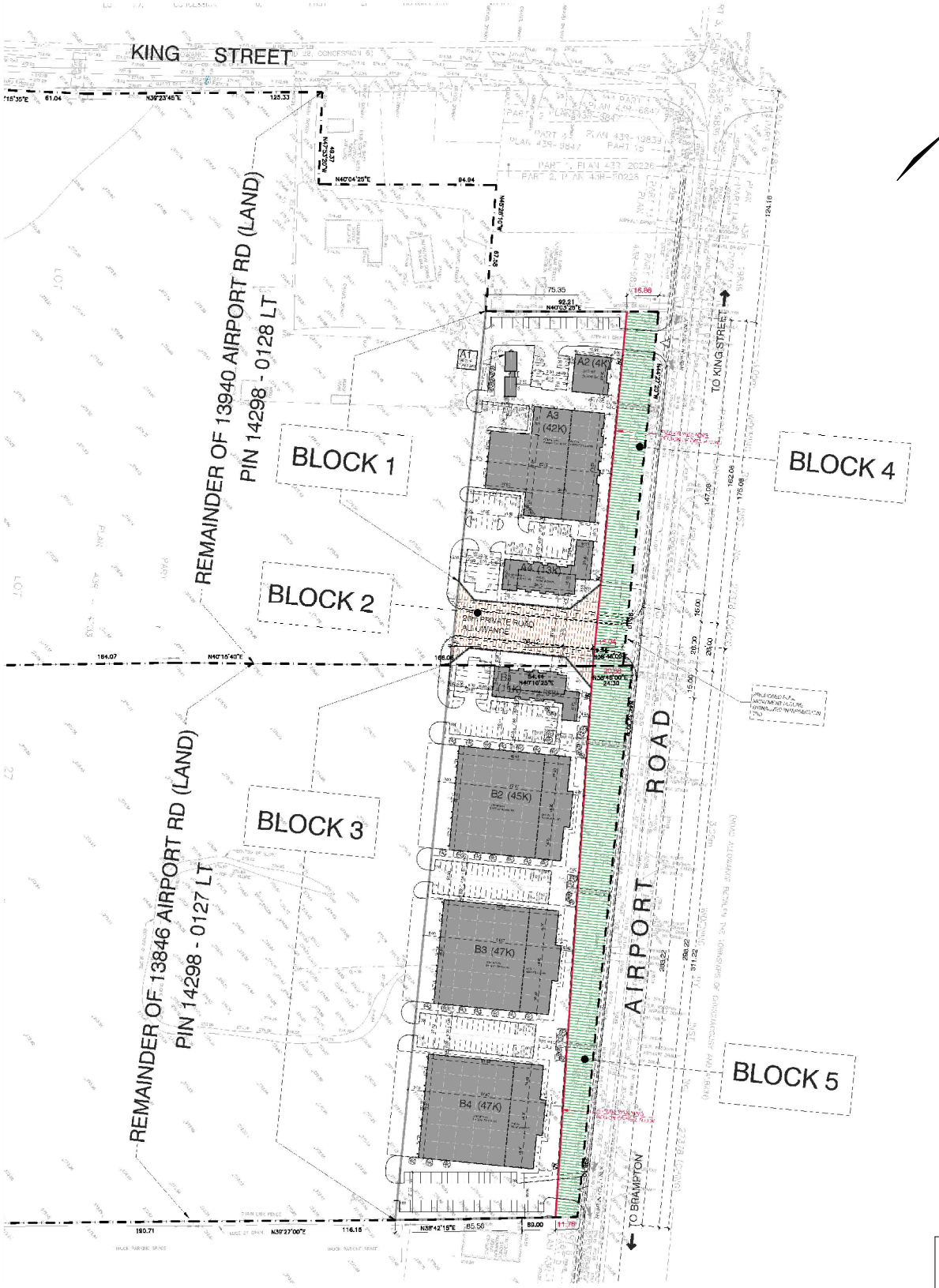
2.3 Topography

The site topography is smooth and gently sloping from north to south and west to east (towards Airport Road). The highest elevation on the site occurs in the middle along the west limit of the site (approximate elevation 275.0 metres) and the lowest elevation occurs in the southeast corner of the property (approximate elevation 269.7 metres). Topographic survey of both the 13846 Airport Road property and 13940 Airport Road property was completed by Mandarin Surveyors Limited in June 2017.

Topographic survey information for the site is provided on the engineering plans provided in Appendix C. Surveyed elevations are referenced to geodetic datum.

2.4 Pre-Development Land Uses and Drainage Patterns

The land was historically cleared and farmed. Currently, portions of the lands are planted with agricultural crops. There is one vacant building on 13940 Airport Road.



NOTES:
1. SITE PLAN PREPARED BY RG CONSULTING INC. DATED MARCH 202`. DRAWING SHEET SP1. FILENAME "AIRPORTROAD-KING-SP-MAR23-21-SPS.PDF.

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SITE PLAN

FIGURE 2.1

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The site is located within the West Humber River Subwatershed which is part of the Humber River Watershed. Currently, existing site drainage is conveyed by overland flow to an existing ditch along the west side of Airport Road. The existing ditch along the west side of Airport Road drains south to a tributary of Salt Creek. Salt Creek is a tributary of the West Humber River. The site falls within the jurisdiction of the Toronto and Region Conservation Authority (TRCA).

The pre-development drainage pattern of the site and local area is illustrated in Figure 2.2 and Figure 2.3. There is an external area immediately west of the proposed development area that will have to be accommodated in the drainage design. Summarized in Table 2.1 are pre-development sub-basin characteristics.

TABLE 2.1: SUMMARY OF PRE-DEVELOPMENT SUB-BASIN CHARACTERISTICS

Sub-basin	Drainage Area (ha)	Outlet	Receiver
A1	8.51	ditch on west side of Airport Road	Salt Creek Tributary, Humber River Watershed
Total:	8.51		

Note:
1. Units: ha – hectares.
2. Refer to Figure 2.2 and Figure 2.3 for pre-development drainage patterns and sub-basin delineation.
3. Salt Creek is a tributary of the West Humber River.

2.5 Flood Lines

Review of Toronto Region and Conservation Authority regulatory area information indicates there are no regulatory flood lines which impact the proposed development.

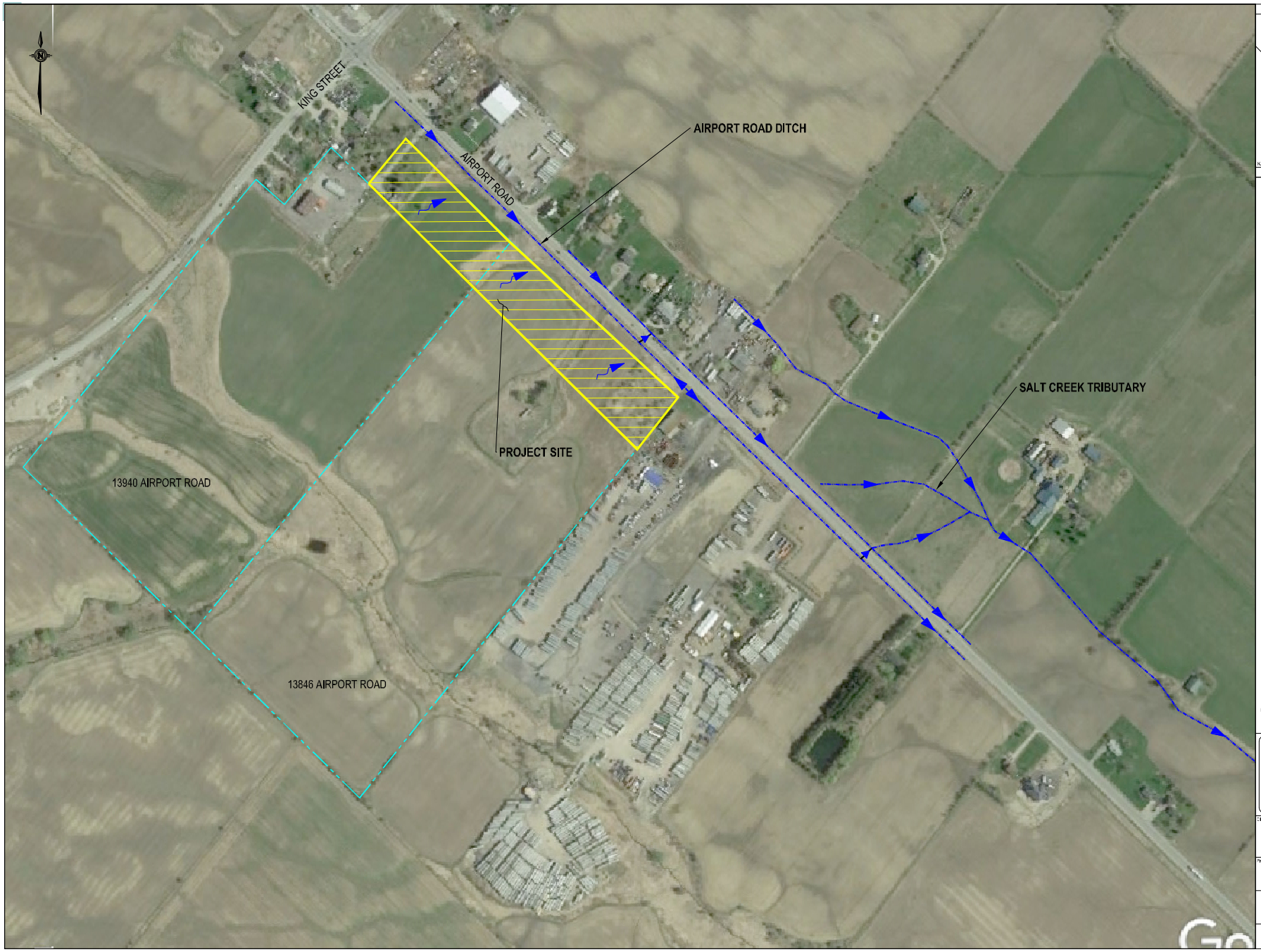
2.6 Surficial Soils

A geotechnical investigation was performed by HLV2K Engineering Limited (2019) in September 2019 comprising 13 boreholes extending to a depth of approximately 5.2 metres. Generally, the site consists of an approximately 100 to 200-millimetre layer of topsoil which overlays fill and/or disturbed native materials (silty clay to clayey silt) and native soils (silty clay till to clayey silt till). The depth of fill in the boreholes ranged from 0.3 to 0.6 metres below the existing ground surface.

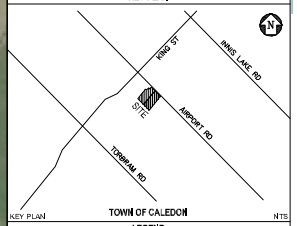
The surficial soils are identified in the Soil Survey of Peel County (Hoffman and Richards, 1953) as Chinguacousy clay loam (Chc). The natural drainage characteristics are described in the Soil Survey of Peel County as imperfect.

2.7 Geology

The surficial geology of the study area has been described by HLV2K Engineering Limited (2020). The surficial geology of the site is described as mainly Halton/Wildfield Till Formation dominated by low permeability dark grey silty clay loam, silty clay or clay till. The site is located within a glacial till plain that was deposited by the Late Wisconsinan glacier consisting of glaciolacustrine deposits, silty loam, silty clay loam or clay deposits (Toronto and Region Conservation Authority, 2008).



KEY PLAN



KEY PLAN — TOWN OF CALEDON — NTS

LEGEND

- PROPERTY LINE
- DITCH/WATERCOURSE
- SHEET FLOW
- EX. CULVERT

NOTES:
1. AIRPHOTO FROM GOOGLE EARTH DATED 2015. LOCATION AND SCALING IS APPROXIMATE.

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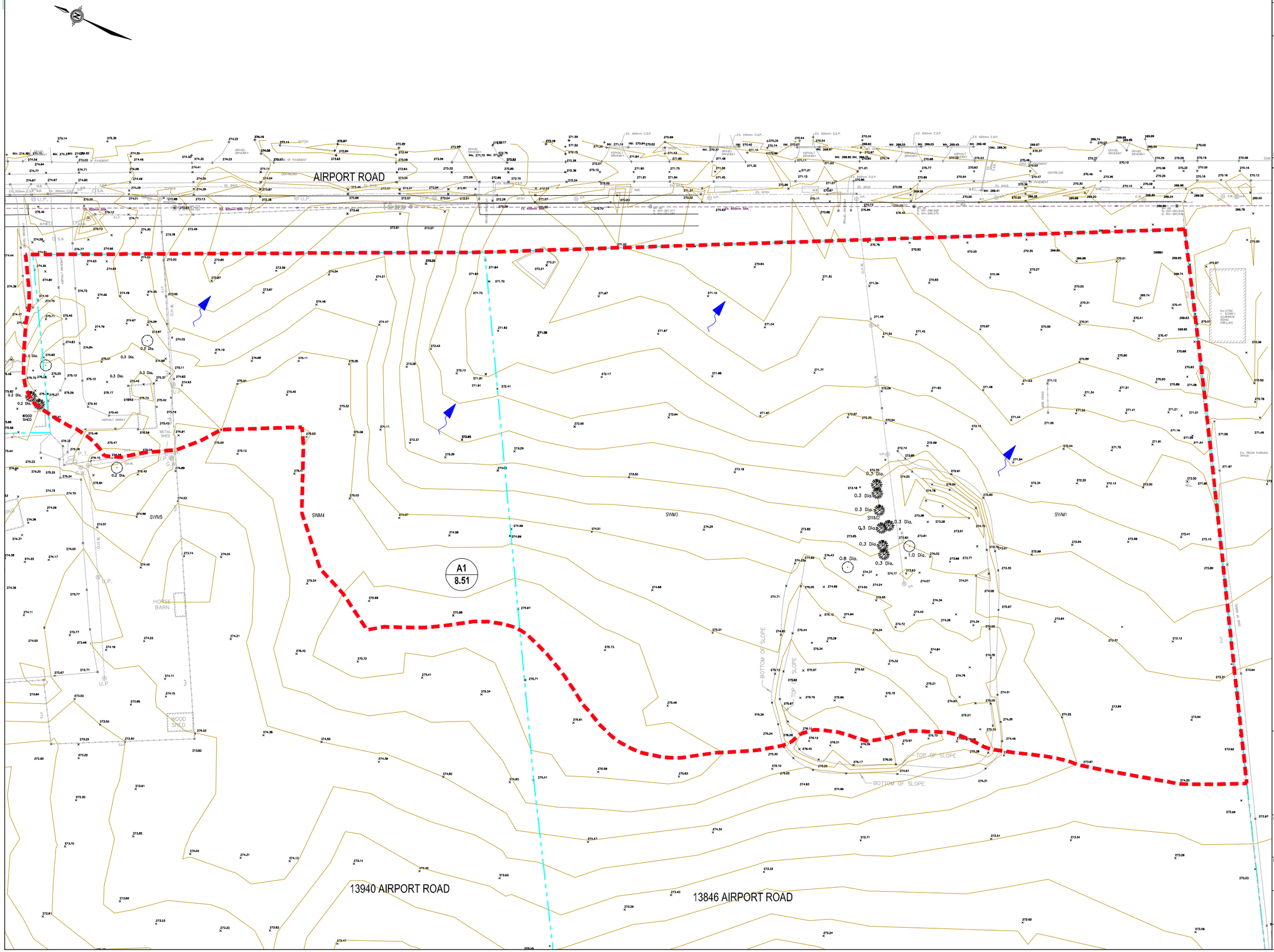
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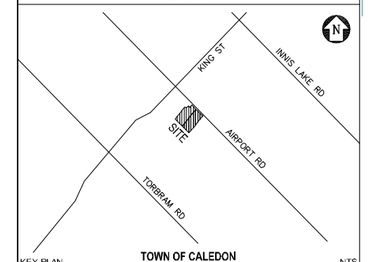
EXISTING DRAINAGE PATTERNS

FIGURE 2.2

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KEY PLAN



KEY PLAN — TOWN OF CALEDON — NTS

LEGEND

- PROPERTY LINE
- × 269.64 — EX. ELEVATION
- EX. CONTOUR LINES (0.5m INTERVALS)
- DRAINAGE BOUNDARY (APPROX.)
- A1 / 8.51 — BASIN ID / DRAINAGE AREA (HECTARES)
- SHEET FLOW

NOTES:
1. BASE SITE PLAN PREPARED BY RG CONSULTING INC., DATED MARCH 2021.

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DRAINAGE AREAS PRE-DEVELOPMENT CONDITIONS

FIGURE 2.3

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A detailed description of the quaternary geology of the study area is provided in the Quaternary Geology of the Bolton Area, Southern Ontario (White, 1975) and on accompanying Map 2275.

2.8 Groundwater Conditions

A hydrogeological investigation was completed by HLV2K Engineering Limited (2020) for the proposed development to characterize the existing hydrogeological conditions at and in vicinity of the site, evaluate potential impacts to the local groundwater regime, and identify appropriate mitigative measures, as warranted.

In addition to the 13 boreholes associated with the geotechnical investigation completed by HLV2K Engineering Limited (2019), three additional boreholes were drilled on March 11, 2020 and three groundwater monitoring wells installed (HLV2K Engineering Limited, 2020). These boreholes were drilled to a depth of 6.1 metres. One groundwater sample was collected and submitted for laboratory analyses.

It is reported by HLV2K Engineering Limited (2020) that regional groundwater flow in the area typically reflects the local topography and generally occurs from topographic highs to topographic lows. Based on the topography, the local groundwater flow direction was inferred to be from east to west toward Salt Creek. The regional groundwater flow direction in the watershed is from north to south and discharges into Lake Ontario.

Groundwater elevations were measured and recorded by HLV2K Engineering Limited on two occasions in March 2020 at three monitoring wells. The measured groundwater levels in the monitoring wells varied from -0.85 metres to 0.33 metres below the existing ground surface. The corresponding elevations for groundwater were from 271.03 metres to 273.35 metres. It was inferred that, given that the depth to water in the monitoring wells is higher than the ground level, the monitoring wells are drilled into a confined (pressurized) aquifer.

In-situ hydraulic conductivity testing was undertaken by HLV2K Engineering Limited (2020) with the results from three tests varying from 3.3×10^{-3} centimetres per second to 4.5×10^{-6} centimetres per second.

In general, the statement is made by HLV2K Engineering Limited that the native soil in the area is dense with low hydraulic conductivity and the infiltration is expected to be low.

2.9 Airport Road Environmental Assessment

The Region of Peel (2015) has completed a Schedule C Municipal Class Environmental Assessment (EA) for improvements to Airport Road between Mayfield Road and King Street. Recommendations from the Class EA include re-alignment of Airport Road and drainage improvements in vicinity of the project site. The respective improvements will require acquisition of property by the Region of Peel along the frontage of 13846 Airport Road property and 13940 Airport Road. At the time of this report, the Airport Road improvements were in the detailed design stage. For this project, coordination was undertaken with staff of the Region of Peel and the proposed design reflects both improvements to Airport Road and property acquisition. Refinement of the detailed design for this project will require further consultation and coordination with the Region of Peel.

3.0 STORMWATER MANAGEMENT

3.1 Stormwater Management Criteria

The proposed development is situated in jurisdictions of the Town of Caledon, Regional Municipality of Peel, and the Toronto and Region Conservation Authority (TRCA). In this regard, stormwater management planning will be required to be conducted consistent current municipal and Conservation Authority criteria and guidelines.

Per the Town of Caledon Development Standards, Policies, and Guidelines (2019), the following stormwater management criteria are specified:

- Quantity Control – peak flows are controlled to pre-development levels;
- Quality Control – water quality treatment in conformance with Provincial requirements as outlined in the Stormwater Management Planning and Design Manual (Ministry of the Environment, 2003); and
- Erosion Control – erosion protection be provided in accordance with the policies of the Toronto and Region Conservation Authority.

In addition, applicable Toronto and Region Conservation Authority stormwater management criteria are as follows:

- Quantity Control – control of 2 to 100-year post-development peak flows to pre-development peak flows based on applicable Unit Flow Equations
- Quality Control – enhanced level of treatment (Level 1)
- Erosion Control – as a minimum retention of storm runoff from the first 5 mm of rainfall on the site, and where stormwater management ponds are proposed storm runoff from a 25-millimetre design storm be detained and released over a 48-hour period
- Water Balance – retention of storm runoff from the first 5 mm of rainfall on the site through infiltration, evapotranspiration, and/or reuse

In addition, Region Municipality of Peel stormwater management criteria for areas where drainage is intercepted by a Regional Road (i.e., Airport Road) is that post-development flows must not exceed pre-development flows.

3.2 Stormwater Management Strategy

The proposed stormwater management strategy comprises a “treatment train” approach utilizing a combination of lot level controls, Low Impact Development (LID) practices, and standard stormwater management measures to minimize potential increases in peak flows and volume of runoff. Measures are proposed to be undertaken at the source, and conveyance and end of pipe locations, and are as follows:

- maximize the use of building roof top storage to retain storm water and release it at a maximum rate of 42 litres per second per hectare;

- use of permeable pavers in four proposed Art Pod areas and select low volume parking areas to collect, filter, and slowly release storm water;

- use of raised planters in pedestrian areas to create localized rain gardens;

- use of oil/grit separators to provide pre-treatment of road drainage prior to discharge to bioretention areas and the ditch along Airport Road; and

- use of localized bioretention areas to temporarily detain and slowly release storm water to meet applicable stormwater management criteria.

There are five proposed bioretention areas located to the west of the proposed development.

3.3 Stormwater Management Assessment – Quantity Control

3.3.1 Hydrologic Modelling Approach

A hydrologic modelling approach was used to determine and evaluate measures for quantity (peak flow) control. A hydrologic model (SWMHYMO Version 4.07 dated July 1999) was set up to reflect the existing (pre-development) condition shown in Figure 2.2 and post-development condition shown in Figure 3.1. Available soils, land use, and topographic information was used to calculate SWMHYMO parameters, including curve number (CN), time to peak (tp), and catchment slope. The time to peak was calculated using the Airport method. The Atmospheric Environment Service (AES) 6-hour and 12-hour duration storms were applied to determine the critical storm duration. Based on this analysis, the AES 6-hour duration storm was determined to be the critical design storm and applied to estimate peak flows.

Summarized in Table 3.1 are post-development sub-basin characteristics.

TABLE 3.1: SUMMARY OF POST-DEVELOPMENT SUB-BASIN CHARACTERISTICS

Sub-basin	Drainage Area (ha)	Outlet	Receiver
B1	1.98	ditch on west side of Airport Road	Salt Creek Tributary, Humber River Watershed
B2	1.38	ditch on west side of Airport Road	Salt Creek Tributary, Humber River Watershed
B3	1.67	ditch on west side of Airport Road	Salt Creek Tributary, Humber River Watershed
B4	0.98	ditch on west side of Airport Road	Salt Creek Tributary, Humber River Watershed
B5	0.83	ditch on west side of Airport Road	Salt Creek Tributary, Humber River Watershed
B6	0.40	ditch on west side of Airport Road	Salt Creek Tributary, Humber River Watershed
B7	0.28	ditch on west side of Airport Road	Salt Creek Tributary, Humber River Watershed
C[3]	1.51	ditch on west side of Airport Road	Salt Creek Tributary, Humber River Watershed
Total:	9.03		

Note:
1. Units: ha – hectares.
2. Refer to Figure 3.1 for post-development sub-basin delineation.
3. "C" represents sub-basins C1, C2, C3, C4, C5, C6, and C7 shown on Figure 3.1.

AIRPORT ROAD

C7 0.04
C6 0.29
C5 0.08
C4 0.34
B6 0.40
C3 0.34
C2 0.35
C1 0.35
B7 0.28
B5 0.83
B4 0.98
B3 1.67
B2 1.38
B1 1.98

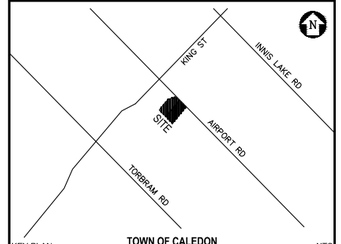
SWM5
SWM4
SWM3
SWM2
SWM1

PROP. TOP OF SLOPE

13940 AIRPORT ROAD

13946 AIRPORT ROAD

KEY PLAN



KEY PLAN — TOWN OF CALEDON — NTS

LEGEND

- PROPERTY LINE
- EX. CONTOUR LINES (0.5m INTERVALS)
- DRAINAGE BOUNDARY (APPROX.)
- SHEET FLOW
- B1 / 1.98 — BASIN ID / DRAINAGE AREA (HECTARES)
- C1 / 0.35 — ROOF BASIN ID / DRAINAGE AREA (HECTARES)
- ROOF AREA WITH CONTROLLED RELEASE RATE
- PROPOSED SITE DISCHARGE LOCATIONS
  ROOF CONTROL DISHARGE LOCATIONS TO BE DETERMINED

NOTES:
1. BASE SITE PLAN PREPARED BY RG CONSULTING INC., DATED SEPTEMBER 2021.

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DRAINAGE AREAS POST-DEVELOPMENT CONDITIONS

FIGURE 3.1

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Pre-development peal flows were computed using two approaches: (i) standard hydrologic modelling approach and (ii) based on the TRCA Humber River unit flow rate equations.

The flow rates for the site used as target flow rates to be managed under post-development conditions for peak flow control were based on the TRCA Humber River unit flow rate equations. The unit flow rates were calculated using Equation F for Sub-basin 36 from Table E.1: Summary of Unit Flow Relationships, Humber River Watershed, Appendix A of the Toronto and Region Conservation document entitled Stormwater Management Criteria (2012).

Computed pre-development peak flows are summarized in Table 3.2. As shown in Table 3.2, return period peak flow are substantially lower, typically by a factor of 2, than those computed using a standard hydrologic approach.

Five bioretention areas and two underground tanks are proposed for peak flow control. The locations are shown in Figure 3.1. The bioretention areas are designated as SWM1, SWM2, SWM3, SWM4, and SWM5, and are associated with sub-basin B1, B2, B3, B4, and B5, respectively. The discharge from bioretention areas is directed by storm sewers to the ditch on the west side of Airport Road. The ditch drains south along Airport Road to a tributary of Salt Creek.

The drainage from Sub-basin B6 and Sub-basin B7 is proposed to be each directed to an underground tank and then to the ditch on the west side of Airport Road.

Sub-basin C represents the total roof top storage area used to retain storm water and released at a maximum rate of 42 liters per second per hectare. This sub-basin will discharge to the ditch on the west side of Airport Road.

Summarized in Table 3.2 are both pre-development peak flow rates and post-development flow rates for the 2-year through 100-year design events. As shown in Table 3.2, the proposed stormwater management strategy provides the target level of peak flow control.

TABLE 3.2: SUMMARY OF ESTIMATED PEAK FLOWS FROM THE SITE

Return Period	Pre-Development Unit Flow (cms)	"Standard" Pre-Development Peak Flow (cms)	Post-Development Peak Flow (cms)
2-Year	0.070	0.119	0.044
5-Year	0.108	0.236	0.095
10-Year	0.132	0.327	0.117
25-Year	0.166	0.452	0.137
50-Year	0.195	0.551	0.151
100-Year	0.220	0.654	0.165

Note:
1. Units: cms – cubic metres per second.

3.3.2 Bioretention Areas

The bioretention areas have been designed in general conformance with guidelines provided in the Low Impact Development Stormwater Management Planning and Design Guide (Credit Valley Conservation and Toronto and Region Conservation, 2010). Key design characteristics of the bioretention areas are as follows:

- designed to provide filtration of storm water;
- pre-treatment of storm water provided by oil/grit separators;
- provision of a filter bed surface with a mixture of sand, fines, and organic material;
- provision of a subdrain in the filter bed media;
- shallow depth of flooding (e.g., 0.10 to 0.20 metres) to contain and slowly release storm water during and following small rainfall events via filtration and evapotranspiration; and
- naturalized landscaping.

Summarized in Table 3.3 are characteristics of the bioretention areas. As previously noted, pre-treatment of storm water runoff from driveway and parking areas prior to discharge to the bioretention area would be achieved with oil/grit separators. In regards to the above and for sizing of the bioretention areas, the volumetric contribution associated with 50 percent of the soil media has not been taken into account.

TABLE 3.3: SUMMARY OF BIORETENTION AREA CHARACTERISTICS

Bioretention Area	Storage Volume Required for 100-Year Peak Flow Control (cu.m)	Storage Volume Provided in Bioretention Area (cu.m)	Filter Bed Footprint (sq.m)	Typical Operating Depth (m)	Maximum Operating Depth (m)
SWM1	792	1,022	600	<0.15	0.75
SWM2	588	1,022	600	<0.12	0.56
SWM3	716	1,022	600	<0.25	0.69
SWM4	455	1,022	600	<0.20	0.44
SWM5	398	1,022	600	<0.20	0.42

Note:
1. Units: cu.m - cubic meters; sq.m – square metres; m – metres.
2. Storage volume provided is maximum available storage in bioretention area for water quantity/quality control and includes 120 cubic meters of effective storage in the underlying soil media.
3. Maximum operating depth is under the 100-year design event.

The outlet works for the proposed bioretention areas will comprise the following:

- perforated pipe outlet set in a perforated corrugated steel pipe (CSP) riser encased with clear stone;
- 100 mm diameter orifice on the pipe outlet; and
- an emergency spillway.

3.4 Stormwater Management Assessment – Quality Control

3.4.1 Total Suspended Solids Removal Assessment

The stormwater management criteria for quality control is to achieve an enhanced level of treatment (Level 1) consistent with the Stormwater Management Planning and Design Manual (Ministry of the Environment, 2003). Typically, Total Suspended Solids (TSS) is used as the parameter to evaluate water quality and the long-term average removal rate to achieve an enhanced level of treatment (Level 1) is 80%.

A "desk-top" accounting approach was used to calculate a nominal average annual TSS removal over the site. This approach was used to account for the various "treatment train" elements. The site was partitioned according to surface condition and an effective average annual TSS removal rate assumed for each surface condition based on flow path and "treatment train" component(s). The effective average annual TSS removal rate was assumed based on information provided in the Low Impact Development Stormwater Management Planning and Design Guide (Credit Valley Conservation and Toronto and Region Conservation, 2010) and Wet Weather Flow Management Guidelines (City of Toronto, 2006). With this approach, each TSS removal value is multiplied by respective percent of site total area to determine the TSS removal rate for each surface condition. The sum of all TSS removal rates for each surface condition is equal to the TSS removal over the site.

Summarized in Table 3.4 are the various treatment train components and assumed average annual TSS removal rate. Provided in Table 3.5 are computations for the site average annual TSS removal. For instance, Sub-basin B1a would include treatment train components 1 and 2 per Table 3.4 resulting in an effective TSS removal of 80.0%. Based on this approach, the calculated average annual TSS removal rate for the site is 86.0%. This indicates an enhanced level of treatment can be achieved with the proposed stormwater management approach.

TABLE 3.4: SUMMARY OF TREATMENT TRAIN COMPONENTS AND ASSUMED AVERAGE ANNUAL TSS REMOVAL RATE

Treatment Train Component	Treatment Train Type No.	Average Annual TSS Removal Rate[2]
Oil/Grit Separator	1	50%
Bioretention Areas	2	60%
Grassed Areas	3	85%
Roof	4	90%

Note:
1. TSS – Total Suspended Solids.

2. For assumed average annual TSS removal rates, refer to Table 5 in the Wet Weather Flow Management Guidelines (City of Toronto, 2006).

TABLE 3.5: ESTIMATION OF SITE AVERAGE ANNUAL TSS REMOVAL

Sub-basin	Treatment Train Components	Drainage Area (ha)	Percent of Site Area	Effective TSS Removal	Overall TSS Removal
B1a	1,2	0.27	3.0%	80%	2.4%
B1b	3,2	0.39	4.3%	94%	4.1%
B1c	3,2	1.32	14.6%	94%	13.7%
B2a	1,2	0.26	2.9%	98%	2.8%
B2b	3,2	0.35	3.8%	94%	3.6%
B2c	3,2	0.77	8.6%	94%	8.1%
B3a	1,2	0.27	3.0%	80%	2.4%
B3b	3,2	0.48	5.3%	94%	5.0%
B3c	3,2	0.92	10.2%	94%	9.6%
B4a	1,2	0.28	3.1%	80%	2.5%
B4b	3,2	0.33	3.6%	94%	3.4%
B4c	3,2	0.38	4.2%	94%	3.9%
B5a	1,2	0.24	2.6%	80%	2.1%
B5b	3,2	0.38	4.2%	94%	4.0%
B5c	3,2	0.21	2.3%	94%	2.2%
B6	-	0.40	4.4%	0%	0%
B7a	2	0.23	2.5%	50%	1.3%
B7b	-	0.05	0.6%	0%	0%
C	4	1.51	16.7%	90%	15.0%
Totals:	-	9.03	100%	-	86.0%

Note:
1. Units: ha – hectares.
2. TSS – Total Suspended Solids.

3.5 Stormwater Management Assessment – Water Balance

The water balance related stormwater management criterion is retention of storm runoff from the first 5 millimetres (mm) of rainfall on the site through infiltration/filtration, evapotranspiration, and/or reuse. This is proposed to be achieved through the use of granular media in the base of the bioretention areas and use of permeable pavers.

The estimated impervious area of the site is 46,829 square metres. This represents the surfaces of the parking areas, driveways, and roofs. A 5 mm rainfall depth over this area represents 234 cubic metres. Approximately 1,200 cubic metres of storage will be provided in the base of the bioretention areas. This indicates retention of storm water from the first 5 mm of rainfall on the site can be achieved with the proposed stormwater management approach. Design assumptions and summary computations are provided in Attachment B.

3.6 Review and Discussion of Low Impact Development (LID) Options

A review was completed of Low Impact Development (LID) options for the proposed development and opportunities for integration with stormwater management planning. A comprehensive discussion of LID's has been provided by Credit Valley Conservation and Toronto and Region Conservation (2010) in the Low Impact Development Stormwater Management Planning and Design Guide.

The stormwater management plan for the proposed development incorporates the following transport/conveyance controls and end-of-pipe management techniques:

- roof top water quantity controls
- permeable pavement
- rain gardens
- oil/grit separators
- bioretention areas

In general, due to the presence of low permeability soils on the site (i.e., soils with an infiltration rate less than 15 millimetres per hour), the application of infiltration type LID's is limited (i.e., soak-away pits, infiltration trenches). Applicable LID's include encouragement of rain water harvesting and application of rain gardens and soft versus hard landscaping (i.e., permeable pavers), and bioretention areas.

4.0 MINOR AND MAJOR DRAINAGE SYSTEM DESIGN

The minor and major drainage system will consist of the proposed storm sewers and road system. As much as practical, the existing natural drainage patterns will be maintained. The drainage system will be designed to manage storm water for up to the 100-year design storm consistent with Town of Caledon Development Standards Manual (2019) and Toronto and Region Conservation stormwater management criteria. Peak flows up to the 100-year design level would be contained within the municipal road right-of-way and bioretention areas prior to release from the site.

Supporting design calculations are provided in Appendix B and engineering drawings in Appendix C.

5.0 DRAINAGE SYSTEM OPERATION AND MAINTENANCE CONSIDERATIONS

Listed below are operation and maintenance considerations for the drainage system and stormwater management features. Inspection and maintenance considerations for bioretention area are identified in Section 4.5.3 of the Low Impact Development Stormwater Management Planning and Design Guide (Credit Valley Conservation and Toronto and Region Conservation, 2010). Inspection and maintenance considerations for other types of LIDs are also identified in the respective design guide.

1. Construction of the drainage works, specifically Low Impact Development (LID) features be scheduled and phased to ensure integrity is not compromised during construction.

2. Drainage works, stormwater management measures, and LID features be inspected on a routine basis to verify they are functioning as intended. This could include periodic inspections after major storm events to determine whether corrective actions are required. For the first two years following construction the LID features should be inspected quarterly and after major storm events. Subsequently, inspections should be conducted in the spring and fall of each year and after major storm events.

3. With respect to the bioretention areas, summarized in Table 5.1 are suggested routine inspection and maintenance activities, and annual spring inspection and maintenance activities. This information is adapted from Credit Valley Conservation and Toronto and Region Conservation (2010).

In addition to the above, operation and maintenance considerations for stormwater management facilities are outlined in the Town of Caledon Development Standards Manual (2019).

TABLE 5.1: BIORETENTION AREA INSPECTION AND MAINTENANCE ACTIVITIES

Activity/Inspection Item	**Schedule/Corrective Action**
Routine Inspection and Maintenance Activities	
Inspect for vegetation density, damage by foot or vehicular traffic, channelization, accumulation of debris, trash and sediment, and structural damage to either pre-treatment devices or outlet works.	After every major storm event, quarterly for first two years, and twice annually thereafter.
Regular watering may be required during the first two years until vegetation established.	As needed for the first two years of operation.
Remove trash and debris from pre-treatment devices, bioretention area surface, and inlets and outlets.	At least twice annually. More frequently if desired for aesthetic reasons.
Remove accumulated sediment from pre-treatment devices and inlet/outlet areas, remove accumulated sediment on bioretention area surface, trim trees and shrubs, replace vegetation and remove invasive growth, repair eroded or sparsely vegetated areas.	Annually or as needed.
Annual Inspection Items and Corrective Actions	
Vegetation health, diversity, and density.	Remove dead and diseased plants, add reinforcement planting to maintain desired vegetation density, prune woody matter, check soil pH for specific vegetation, add mulch to maintain 25 mm layer if applicable.

Sediment build-up and clogging of inlets/outlets.	Remove sand that may accumulate at the inlets/outlets or on the surface following snow melt, examine the contributing drainage area for bare soil and stabilize accordingly, check that pre-treatment device or measures are properly functioning.
Ponding for more than 48 hours.	Check outlet piping for clogging and flush out, apply core aeration or deep tilling, mix amendments into the soil, remove and replace top 75 mm of bioretention soil.

6.0 SANITARY AND WATER SERVICING PLAN

6.1 Sanitary Servicing Plan

There is an existing 600-millimetre (mm) diameter concrete sanitary sewer on the west side of Airport Road. Preliminary information from the Regional Municipality of Peel indicates there is capacity to accommodate the proposed development. Based on the site grading and depth of the existing sanitary sewer on Airport Road, connection of the proposed development to the sanitary sewer can be made by gravity.

The sanitary sewer system design criteria for the proposed development would be based on the most current version of the Region of Peel Public Works Design, Specifications and Procedures Manual, Linear Infrastructure, Sanitary Sewer Design Criteria (2017) and applicable Ministry of Environment, Conservation and Parks guidelines. The proposed sanitary sewers will vary from 200 mm diameter to 250 mm diameter in size and there will be two connection points to the existing sanitary sewer on Airport Road.

The sanitary sewer design for the proposed development is shown on the engineering drawings provided in Appendix C.

6.2 Water Servicing Plan

6.2.1 Existing Water Supply Infrastructure

The site is currently not serviced with municipal (Regional Municipality of Peel) water supply infrastructure. The closest municipal water supply infrastructure (i.e., watermains) are located approximately 1.1 kilometres south on Airport Road and approximately 3 kilometres north on Airport Road (in Mono Road).

The watermain to the south is located in Pressure Zone 6 associated with the Regional Municipality of Peel lake-based water supply and distribution system. The watermain to the north is located in Pressure Zone 8B associated with one of the Regional Municipality of Peel's groundwater (well) based water supply and distribution systems servicing the Town of Caledon.

It is noted that approximately 5 kilometres to the east in Bolton is Pressure Zone 5B associated with the Regional Municipality of Peel lake-based water supply and distribution system. Connection to this system has not been considered due to distance to the site and cost.

As the subject site is outside of current Regional Municipality of Peel designated pressure zones, an interim water servicing plan is required until the Regional Municipality of Peel's water supply is extended to the Sandhill area. Review of the 2020 Water & Wastewater Master Plan for the Lake-Based System (Region of Peel, 2020) indicates that extension of the Regional Municipality of Peel's water supply to service Sandhill is not planned until post 2041 and that ultimately a new pressure zone will have to be created to service Sandhill and the surrounding area.

Current land use policies and zoning provisions in the Town of Caledon Official Plan (2018) recognize that the Sandhill will serve primarily as a small-scale highway commercial centre with limited dry industrial development, and that private systems will be used for water supply. It is inferred in the Official Plan that uses with high water demands will not be permitted and

stated that it is the landowner's responsibility to ensure that the water supply available to each block is adequate for the proposed use and scale of operation.

6.2.2 Water Supply Design Criteria

The design of water services for the site is based on design criteria as outlined in the 2020 Water & Wastewater Master Plan for the Lake-Based System (Region of Peel, 2020). With respect to water demand, the design criteria are as follows:

- average day water demand for industrial/commercial/institutional areas is 250 litres per employee per day
- maximum day demand peaking factor for industrial/commercial/institution areas is 1.4
- peak hour demand peaking factor for industrial/commercial/institutional areas is 3.0

With respect to water pressure, specified is a minimum operation pressure of 275 kPa (40 psi) and a maximum operation pressure of 690 kPa (100 psi). In addition, there is a requirement of a minimum operation pressure of 140 kPa (20 psi) for Maximum Day and Fire Flow demand.

For the purpose of this report, it has been assumed the proposed 3.82-hectare development will comprise eight buildings with a coverage of 15,222 square metres (163,851 square feet). The estimated water demand based on the proposed development and Regional Municipality of Peel design criteria is summarized in Table 6.1. A population density of 50 persons per hectare has been assumed.

TABLE 6.1: ESTIMATED WATER DEMAND

Land Use Type	Area (ha)	Population Density	Average Consumption Rate (L/cap/day)	Subdivision Average Day Consumption (L/day)	Subdivision Max. Day Consumption (L/day)	Subdivision Peak Hour Consumption (L/hour)
Light Industrial and Commercial	3.82	50	250	47,750	66,850	5,969

Note:
1. Units: ha – hectares; L/cap/day – litres per capita per day; L/day – litres per day; L/hour – litres per hour.
2. Water demand values determined based on a population density of 50 persons per hectare.

6.1.3 Review of Water Servicing Options

Informal discussions were held with staff of the Regional Municipality of Peel in August 2019 and September 2019. Based on these discussions and review of the Regional Municipality of Peel water supply infrastructure a series of water servicing options were developed. These options are summarized in this section.

The options developed were based on review of the following documents:

- 2020 Water & Wastewater Master Plan for the Lake-Based System, Volume 3, Water Master Plan (Region of Peel, 2020a)

- Water and Wastewater Commentary for SABE (Region of Peel, 2020b)

- Public Works Design, Specifications and Procedures Manual, Linear Infrastructure, Watermain Design Criteria (Region of Peel, 2010)

Option 1 – Connection to South

This option would involve connection to the Regional Municipality of Peel lake-based system in Pressure Zone 6. With this option, the existing 300 mm diameter watermain on Airport Road south of the site would be extended approximately 1,100 metres north to the site. Review of the proposed route indicates there would be no major watercourse crossings and the extension would occur primarily along agricultural land. The ground elevation at the terminal hydrant of the existing watermain was surveyed by Calder Engineering Ltd. and found to be at elevation 262.2 metres. Based on projected site grading, it is anticipated the building finished floor elevations will be in the range of elevation 273.5 metres to elevation 276 metres. A hydrant flow test was completed at the end of the existing water distribution system and the following results were obtained:

- static pressure of 46 psi
- residual pressure of 34 psi at a flow rate of 561 USGPM
- residual pressure of 25 psi at a flow rate of 870 USGPM

The hydrant flow test report is provided in Appendix B.

Review of the hydrant flow test results and discussions with the Regional Municipality of Peel indicate there would likely be insufficient pressure to meet operating design criteria and that a booster pumping station would be required. As reported in the 2020 Water & Wastewater Master Plan for the Lake-Based System (Region of Peel, 2020), the serviceable elevation for Pressure Zone 6 is 214.5 metres to 259.1 metres. The elevation of the subject site varies from approximately 270 metres to 274 metres with building finished floor elevations in the range of elevation 273.5 metres to elevation 276 metres.

With this option, the optimum location of a booster pumping station would be near the end of the existing Pressure Zone 6 water distribution system. A booster pumping station at this location would require land acquisition. In addition, hydraulic modelling of the Region's water distribution system would have to be undertaken to confirm availability of water supply to the site under design conditions given current water transmission infrastructure.

With this option, there would be suitable water supply for domestic uses but there may be inadequate water supply for fire protection purposes.

Option 2 – Connection to the South with Private Booster Pumps

This option is similar to Option 1 and involves connection to the existing 300 mm diameter watermain on Airport Road south of the site. The difference is that individual private booster pumps would be provided for each building to meet water pressure requirements. If required, storage tanks and dry hydrants would be provided within the proposed development to meet water supply needs for fire protection.

This option was not considered viable as the buildings will be sprinklered and a pressurized fire water supply system is required.

Option 3 – Connection to the North

With this option, the existing 300 mm diameter watermain on Airport Road north of the site in Mono Road would be extended approximately 3,000 metres south to the site. Review of the proposed route indicates there would be no major watercourse crossings and the extension would occur primarily along agricultural land, however, the watermain would have to be installed through the Sandhill Settlement area and Airport Road/King Street intersection.

Discussions with the Regional Municipality of Peel indicate this option would likely not be supported as the connection would be to the Caledon groundwater (well) based system and there may be water capacity constraints.

Should this option be pursued, review of well capacity would have to be undertaken to determine suitability as it is anticipated the subject site was not included in the water capacity allocation for this system. With this option there would not be any low-pressure constraints due to an elevation difference in the order of 90 metres between the Pressure Zone 8B reservoir location and site. In this case, a pressure reducing valve may be required to limit maximum operation pressure to 690 kPa (100 psi).

Option 4 – Private Water Supply

With this option, water supply would be from groundwater for both domestic uses and fire water supply. The viability of this option would be subject to further hydrogeological evaluation. Individual private wells would be provided for each building for domestic water use. The water distribution system within the proposed development would be designed for future connection to the Region Municipality of Peel water system.

This approach is considered viable due to low anticipated water demand associated with the highway commercial and light industrial land uses. It is recognized in the Town of Caledon Official Plan that private water supply will be required for development of this area.

Preliminary review of water well records in the area indicates the presence of a confined sand and gravel aquifer at a depth in the range of 10 to 20 metres. The aquifer is overlain with a clay stratum of corresponding 10 to 20 metre thickness. The recommended pumping rate in the water well records is typically in the order of 27,255 litres per day (5 U.S. gallons per day). As indicated previously, the estimated average day water consumption and maximum day water consumption is 47,750 litres per day and 66,850 litres per day, respectively. This indicates that in the order of three wells could provide water supply for domestic uses.

Existing groundwater use in the study area is documented in the hydrogeological investigation completed by HLV2K Engineering Limited (2020) for the proposed development. It is reported by HLV2K Engineering Limited (2020) that 54 well records were identified within 500 metres around the project site and that 28 wells were stated as water supply wells.

Review of Ministry of the Environment, Conservation and Parks water well records indicates there may be five and possibly six existing water supply wells on properties associated with the development proposal (i.e., 13846 Airport Road and 13940 Airport Road). The respective water well records are summarized in Table 6.2.

TABLE 6.2: SUMMARY OF PROJECT SITE WATER WELL RECORDS

Well ID	Well Use	Water Use	Well Type	Well Depth (m)	Date Installed	Recommended Pumping Rate (USGPM)
4903504	Water Supply	Domestic	Overburden	3.81	Nov. 11, 1970	5
4904396	Water Supply	Domestic	Overburden	9.14	May 21, 1974	6
4904626	Water Supply	Domestic	Overburden	14.93	Dec. 12, 1974	5
4904763	Water Supply	Domestic	Overburden	15.24	Sept. 25, 1975	6
4907601	Water Supply	Domestic	Overburden	18.29	Dec. 10, 1991	3
7124992	Water Supply	Commercial	Overburden	12.19	Jun. 26, 2009	9

Note:
1. Units: m – metres; USGPM – U.S. gallons per minute.
2. Well 7124992 may be located on the property immediately to the south of the project site.

Fire water supply would be provided by use of a standpipe of sufficient elevation and capacity to provide fire water supply to building sprinkler systems. The lower part of the standpipe would provide sufficient water supply to meet fire water supply volume requirements to site hydrants.

Provision of the proposed private water supply systems will require confirmation of adequate groundwater resources both in terms of water quantity and water quality, and possibly preparation of a Servicing Options Statement consistent with Ministry of the Environment, Conservation and Parks Procedure D-5-3. As previously noted, current land use policies and zoning provisions in the Town of Caledon Official Plan (2018) recognize that private systems will be used for water supply in the Sandhill Settlement Area.

Assuming a 2025 buildout of the proposed development, it is anticipated the private water supply systems would be in operation for an approximate twenty-year period.

7.0 EROSION AND SEDIMENT CONTROL

7.1 General

An Erosion and Sediment Control Plan has been prepared consistent with the Town of Caledon Development Standards Manual (2019) and the Erosion and Sediment Control Guide for Urban Construction prepared by the Toronto and Region Conservation Authority (2019). For project construction, the key items will be limiting construction activities to defined working areas, managing water from dewatering activities, managing surface runoff, and stabilization of disturbed surfaces. Summarized in Table 7.1 are general procedures and mitigation measures to be implemented to avoid impacts. A preliminary Erosion and Sediment Control Plan for the project is provided in Appendix C.

TABLE 7.1: GENERAL PROCEDURES AND MITIGATION MEASURES FOR EROSION AND SEDIMENT CONTROL

Principle No.	Description
1.	Prepare a typical Erosion and Sediment Control Plan for the project construction outside of stream crossings and water bodies.
2.	Install temporary sediment controls prior to the start of construction per the typical details on the Erosion and Sediment Control Plan.
3.	Delineate the working area prior to the start of construction and confine operations to the defined area.
4.	Enclose temporary topsoil and subsoil stockpile areas with sediment control fence.
5.	Maintain construction accesses, working areas, and temporary material storage areas in good repair.
6.	Operate machinery in a manner that minimizes disturbance to the environment: - protect entrances at machinery access points (e.g., using swamp mats, log mats, or rock pads), and establish single site entry and exit points. - construction equipment and machinery to arrive on site in a clean condition and be maintained free of fluid leaks. - no equipment operation on the streambed and in flowing water. - wash, refuel and service machinery and store fuel and other materials in designated areas away from water bodies. - keep an emergency spill kit on site in case of fluid leaks or spills.
7.	Inspect, maintain, and repair sediment controls until completion of construction and site restoration.
8.	Keep additional erosion and sediment control materials, such as sediment control fencing and clear stone, on-site for emergencies and repairs.
9.	Remove and dispose temporary sediment controls following completion of construction and site restoration.
10.	Vegetate any disturbed areas by planting and seeding preferably with native grasses and cover such areas with mulch to prevent soil erosion and to help seeds germinate. If there is insufficient time remaining in the growing season, the site should be stabilized (e.g., cover exposed areas with mulch, straw, or erosion control blankets to keep the soil in place and prevent erosion) and vegetated the following growing season.

The erosion and sediment controls will comprise management actions and measures to be implemented prior to any land grading or construction activities on the site. Consistent with

the Town of Caledon Development Standards Manual (2019), erosion and temporary sediment controls would be inspected on a weekly basis and after each rain event 10 millimetres or greater or a significant snow melt. These inspections would ensure that the controls are in proper working condition and maintained. A permanent record of these inspections is required to be forwarded to the Town of Caledon Finance and Infrastructure Department within five days of the inspection.

All disturbed ground left inactive, including topsoil stockpiles, would be stabilized by seeding, sodding, mulching or covering, or equivalent control measures. The period of time of inactivity shall not exceed 30 days, unless otherwise authorized by the Project Manager.

7.2 Emergency Contact Information

As part of the erosion and sediment control planning process, emergency contact numbers would be provided on the project engineering drawings, and a contact list kept on-site and be readily available. An example emergency contact list is provided in Table 7.2. The applicable contacts would be confirmed and updated, as required, at the detailed design and construction stages.

TABLE 7.2: EROSION AND SEDIMENT CONTROL PLAN EMERGENCY CONTACT LIST

Name/Agency	Phone Number
Town of Caledon – Finance and Infrastructure	(905) 584-2272
Toronto and Region Conservation Authority	(416) 661-6600
Ministry of the Environment, Conservation and Parks Spills Reporting	(416) 325-3000
Owner – Falco Group.	To be determined
Project Engineer – Calder Engineering Ltd.	(905) 857-7600

8.0 SUMMARY

1. Calder Engineering Ltd. has been retained by Airport King Inc. to complete a Functional Servicing and Stormwater Management Report for a proposed highway commercial/industrial development in the Sandhill Settlement Area of the Town of Caledon. The Functional Servicing and Stormwater Management report is supporting documentation for the respective Site Plan application.

2. The site is located within the Sandhill Settlement in the Town of Caledon and is bounded by Airport Road to the east, estate and rural residential development to the north, agricultural land to the west, and agricultural land and rural residential development to the south. The legal description of the property is Part of Lot 27, Concession 6, East of Hurontario Street, formerly in the Township of Chinguacousy, Town of Caledon, Regional Municipality of Peel.

3. The proposed development for the property comprises approximately 3.82 hectares of highway commercial/industrial land use fronting on Airport Road.

4. The site is located within the West Humber River Subwatershed which is part of the Humber River Watershed. Currently, existing site drainage is conveyed by overland flow to an existing road side ditch along the west side of Airport Road. The existing road side ditch along the west side of Airport Road drains south to a tributary of Salt Creek. Salt Creek is a tributary of the West Humber River. The site falls within the jurisdiction of the Toronto and Region Conservation Authority (TRCA).

5. The Region of Peel (2015) has completed a Schedule C Municipal Class Environmental Assessment (EA) for improvements to Airport Road between Mayfield Road and King Street. Recommendations from the Class EA include re-alignment of Airport Road and drainage improvements in vicinity of the project site. The respective improvements will require acquisition of property by the Region of Peel along the frontage of 13846 Airport Road property and 13940 Airport Road. At the time of this report, the Airport Road improvements were in the detailed design stage. For this project, coordination was undertaken with staff of the Region of Peel and the proposed design reflects both improvements to Airport Road and property acquisition. Refinement of the detailed design for this project will require further consultation and coordination with the Region of Peel.

6. The proposed stormwater management strategy comprises a “treatment train” approach utilizing a combination of lot level controls, Low Impact Development (LID) practices, and standard stormwater management measures to minimize potential increases in peak flows and volume of runoff. Measures are proposed to be undertaken at the source, and conveyance and end of pipe locations, and are as follows:

    - maximize the use of building roof top storage to retain storm water and release it at a maximum rate of 42 litres per second per hectare;

    - use of permeable pavers in four proposed Art Pod areas and select low volume parking areas to collect, filter, and slowly release storm water;

    - use of raised planters in pedestrian areas to create localized rain gardens;

- use of oil/grit separators to provide pre-treatment of road drainage prior to discharge to bioretention areas and the ditch along Airport Road; and

- use of localized bioretention areas to temporarily detain and slowly release storm water to meet applicable stormwater management criteria.

7. Hydrologic modelling and "desk-top" assessments were performed to develop and evaluate the proposed Stormwater Management Plan. Based on the respective technical analyses, proposed stormwater management criteria for quantity control, quality control, erosion control, and water balance can be achieved.

8. The minor and major drainage system will consist of the proposed storm sewers and road system. As much as practical, the existing natural drainage patterns will be maintained. The drainage system will be designed to manage storm water for up to the 100-year design storm consistent with Town of Caledon Development Standards Manual (2019) and Toronto and Region Conservation stormwater management criteria. Peak flows up to the 100-year design level would be contained within the municipal road right-of-way and bioretention areas prior to release from the site.

9. Sanitary servicing for the proposed development will be by connection to the Regional Municipality of Peel wastewater system. There is an existing 600-millimetre (mm) diameter concrete sanitary sewer on the west side of Airport Road. Preliminary information from the Regional Municipality of Peel indicates there is capacity to accommodate the proposed development. Based on the site grading and depth of the existing sanitary sewer on Airport Road, connection of the proposed development to the sanitary sewer can be made by gravity.

10. The site is currently not serviced with municipal (Regional Municipality of Peel) water supply infrastructure. The closest municipal water supply infrastructure (i.e., watermains) are located approximately 1.1 kilometres south on Airport Road and approximately 3 kilometres north on Airport Road.

11. As the subject site is outside of current Regional Municipality of Peel designated pressure zones, an interim water servicing plan is required until the Regional Municipality of Peel's water supply is extended to the Sandhill area. Review of the 2020 Water & Wastewater Master Plan for the Lake-Based System (Region of Peel, 2020) indicates that extension of the Regional Municipality of Peel's water supply is not planned until post 2041 and that ultimately a new pressure zone will have to be created to service Sandhill and the surrounding area.

12. A review of water servicing options was completed. At this time, water supply is proposed to be from groundwater for both domestic uses and fire water supply. Provision of the proposed private water supply systems will require confirmation of adequate groundwater resources both in terms of water quantity and water quality, and possibly preparation of a Servicing Options Statement consistent with Ministry of the Environment, Conservation and Parks Procedure D-5-3.

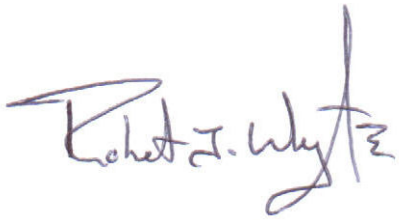
13. Current land use policies and zoning provisions in the Town of Caledon Official Plan (2018) recognize that private systems will be used for water supply in the Sandhill Settlement Area.

14. Assuming a 2025 buildout of the proposed development, it is anticipated the private water supply systems would be in operation for an approximate twenty-year period.

15. An Erosion and Sediment Control Plan has been prepared consistent with the Town of Caledon Development Standards Manual (2019) and the Erosion and Sediment Control Guide for Urban Construction prepared by the Toronto and Region Conservation Authority (2019). For project construction, the key items will be limiting construction activities to defined working areas, managing water from dewatering activities, managing surface runoff, and stabilization of disturbed surfaces.

Respectfully submitted,

CALDER ENGINEERING LTD.





Robert J. Whyte, M.Sc., P.Eng.
Project Manager

REFERENCES

Chapman L.J. and D.F. Putnam. 1984. The Physiography of Southern Ontario. 3rd Edition, OGS Special Volume 2, Ministry of Natural Resources.

City of Toronto. 2006. Wet Weather Flow Management Guidelines. November 2006.

Credit Valley Conservation and Toronto and Region Conservation. 2010. Low Impact Development Stormwater Management Planning and Design Guide. Version 1.0.

Google Maps. 2012.

HLV2K Engineering Limited. 2019. Geotechnical Investigation Report, Proposed Development of Industrial/Commercial Condo Blocks, 13846-13940 Airport Road, Caledon, ON. Draft Report prepared for RG Consulting Inc., October 10, 2019.

HLV2K Engineering Limited. 2020. Hydrogeological Investigation, Proposed Commercial/Industrial Development, 13846 & 13940 Airport Road, Caledon, ON. Draft Report prepared for Airport Caledon Inc., April 29, 2020.

Hoffman, D.W. and Richards, N.R. 1953. Soil Survey of Peel County. Report No. 18 of the Ontario Soil Survey, Experimental Farms Service, Canada Department of Agriculture and the Ontario Agricultural College.

Ministry of Environment. 2003. Stormwater Management Practices Planning and Design Manual. March 2003.

Ministry of Municipal Affairs and Housing. 2014. Provincial Policy Statement. Provincial Policy Statement issued under section 3 of the Planning Act, Ministry of Municipal Affairs and Housing, Provincial Planning Policy Branch.

Ministry of Transportation. 1997. MTO Drainage Management Manual. Drainage and Hydrology Section, Transportation Engineering Branch, Quality and Standards Division.

Ontario Ministry of Agriculture and Food. 1986. Drainage Guide for Ontario. Publication 29. Prepared by the School of Engineering, Ontario Agriculture College, University of Guelph.

Region of Peel. 2010. Public Works Design, Specifications and Procedures Manual, Linear Infrastructure, Watermain Design Criteria. Revised June 2010.

Region of Peel. 2015. Airport Road Environmental Study Report for Airport Road from 1.0 km north of Mayfield Road to 0.6 km north of King Street. Schedule C Municipal Class Environmental Assessment Study, October 2015.

Region of Peel. 2020a. 2020 Water & Wastewater Master Plan for the Lake-Based System. Volume 3, Water Master Plan.

Region of Peel. 2020b. Water and Wastewater Commentary for SABE. Memorandum, April 30, 2020.

Toronto and Region Conservation Authority. 2008. Humber River State of the Watershed Report – Geology and Groundwater Resources.

Toronto and Region Conservation Authority. 2012. Stormwater Management Criteria. August 2012, Version 1.0.

Toronto and Region Conservation Authority. 2019. Erosion and Sediment Control Guide for Urban Construction. Toronto and Region Conservation Authority, Vaughan, Ontario.

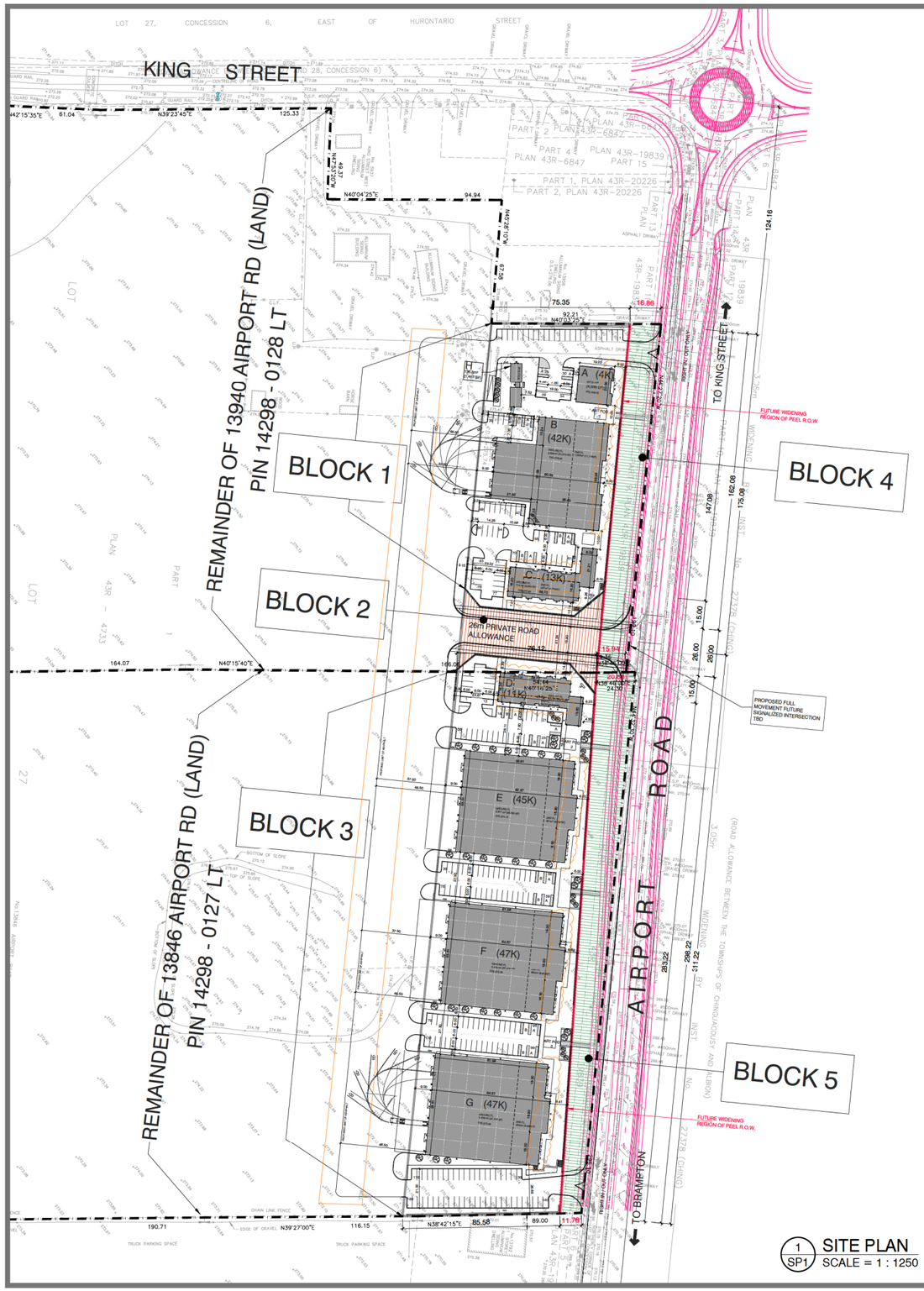
Town of Caledon. 2018. Town of Caledon Official Plan. April 2018 Consolidation.

Town of Caledon. 2019. Development Standards Manual, Town of Caledon. Prepared by the Town of Caledon, Version 5.0.

White, O.L. 1975. Quaternary Geology of the Bolton Area, Southern Ontario. Ontario Division of Mines, Geological Report 117, accompanied by Maps 2275 and 2276.

APPENDIX A

SITE PLAN



1 SP1 SITE PLAN
SCALE = 1 : 1250

LEGEND

- SITE BOUNDARY
- PROPOSED ROAD WIDENING BY REGION OF PEEL TRANSPORTATION (13940 AIRPORT RD - 15.94 TO 16.86 m WIDE))
- PROPOSED ROAD WIDENING BY REGION OF PEEL TRANSPORTATION (13846 AIRPORT RD - 11.76 TO 20.88 m WIDE)
- PROPOSED 26M ROAD ALLOWANCE
- PROPOSED BUILDING FOOTPRINT
- SP — PROPOSED SIGN PYLON LOCATION
- A — PROPOSED ACCESSIBLE PARKING TYPE A
- B — PROPOSED ACCESSIBLE PARKING TYPE B
- ART POD 1 — PROPOSED ART POD LOCATION REFER TO TYPICAL ENLARGEMENT BY LANDSCAPE ARCHITECT - STUDIO TLA
- a+w=SO — PROPOSED ART + WORK SIGN WALL LOCATION
- DC — PROPOSED DEPRESSED CURB. AS PER TOWN OF CALEDON STANDARDS.
- RW — PROPOSED RETAINING WALL REFER TO GRADING PLAN

NOTES - SITE PLAN CONSIDERATIONS :
1. AIRPORT ROAD IS PROPOSED TO EXPAND TO A 45m R.O.W.
2. NUMBER OF PARKING STALLS ARE DEPENDANT ON USE OF BUILDING
3. 26m R.O.W. TO SPLIT TWO PROPOSED BLOCKS
4. SUBJECT SITE IS CURRENTLY ZONED HIGHWAY COMMERCIAL UNDER BY-LAW 2006-50, CALEDON

LEGAL DESCRIPTION :

PART OF LOT 27, CONCESSION 6
EAST OF HURONTARIO STREET
FORMERLY IN THE TOWNSHIP OF CHINGUACOUSY,
COUNTY OF PEEL,
NEW IN THE TOWN OF CALEDON
REGIONAL MUNICIPALITY OF PEEL

SURVEY NOTE :

SITE PLAN INFORMATION TAKEN FROM BOUNDARY AND TOPOGRAPHIC SURVEY PLAN PREPARED BY
MANDARIN SURVEYORS LTD. O.L.S. C.L.S.
DATED:
FEBRUARY 10, 2020 - PROPERTY AT 13840 AIRPORT RD AND
FEBRUARY 11, 2020 - PROPERTY AT 13940 AIRPORT RD

BLOCK AND BUILDING SCHEDULE :

BLOCK 1
ZONING DESIGNATION - CH 563
11,715m² (1.17 hc = 2.90 ac)
BLOCK 1 BUILDING SCHEDULE:

	GROUND FLOOR AREA:	2ND FLOOR:	TOTAL BUILDING AREA:
H -	136.3 m² : 1,467 SF (EX. HOUSE INCLUDED - 64.6 m² - 695 SF)		
A -	375.0 m² : 4,036 SF		
B -	2,900.0 m² : 31,215 SF	1,033.0 m² : 11,119 SF	3,933.0 m² : 42,334 SF
C -	773.0 m² : 8,320 SF	437.0 m² : 4,703 SF	1,210.0 m² : 13,024 SF

TOTAL BUILDING AREA INCLUDING 2ND FLOOR:
5,654.3 m² : 60,862 SF (DENSITY 48.3%)

TOTAL NUMBER OF PARKING : 83
(5 TYPE A AND 3 TYPE B ACCESSIBLE PARKING INCLUDED)

BLOCK 2
ZONING DESIGNATION - CH 563 AND SOUTH PART - CH 302
2,280 m² (0.23 hc = 0.56 ac)
26 m WIDE ROAD ALLOWANCE - PRIVATE ROAD

BLOCK 3
ZONING DESIGNATION - CH 302 AND NORTH PART - CH 563
24,221 m² (2.42 hc = 5.99 ac)

	GROUND FLOOR AREA:	2ND FLOOR:	TOTAL BUILDING AREA:
D-	726.0 m² : 7,814 SF	391.0 m² : 4,208 SF	1,117.0 m² : 12,023 SF
E -	3,377.0 m² : 36,350 SF	821.0 m² : 8,837 SF	4,198.0 m² : 45,187 SF
F -	3,476.0 m² : 37,415 SF	920.0 m² : 9,902 SF	4,396.0 m² : 47,318 SF
G -	3,476.0 m² : 37,415 SF	920.0 m² : 9,902 SF	4,396.0 m² : 47,318 SF

TOTAL BUILDING AREA INCLUDING 2ND FLOOR:
14,107 m² : 151,846 SF (DENSITY 58.2%)

TOTAL NUMBER OF PARKING : 166
(6 TYPE A AND 6 TYPE B ACCESSIBLE PARKING INCLUDED)

BLOCK 4
ZONING DESIGNATION - CH 563
3,112 m² (0.31 hc = 0.77 ac)
ROAD WIDENING BY REGION OF PEEL TRANSPORTATION

BLOCK 5
ZONING DESIGNATION - CH 302
4,808 m² (0.48 hc = 1.19 ac)
ROAD WIDENING BY REGION OF PEEL TRANSPORTATION

KEY MAP - NTS — SUBJECT PROPERTY



CONSULTANT LIST :

PLANNING & ARCHITECTURE:	RG CONSULTING INC.	416.213.0200
LANDSCAPE DESIGN:	STUDIO TLA	416.638.4911
ENGINEERING:	CALDER ENGINEERING LTD.	905.857.7600
ENVIRONMENTAL: GEOTECHNICAL & HYDROGEOLOGICAL:	PEACE ENVIRONMENTAL	416.213.1700
	HLV2K ENGINEERING LIMITED	905.569.9765
O.L.SURVEYING:	MANDARIN SURVEY GROUP	647.430.1366

SITE STATISTICS :

TOWN OF CALEDON - ZONING BY-LAW 2006-50 - CH - HIGHWAY COMMERCIAL ZONING DESIGNATION CH-563 AND CH-302

		PROPOSED			REQUIRED
LOT AREA :	DEVELOPMENT AREA (26 m PRIVATE ROAD ALLOWANCE INCLUDED)	38,216 m² (2,280 m²)	3.82 hc (0.23 hc)	9.45 ac (0.53 ac)	
	PROPOSED ROAD WIDENING BY REGION OF PEEL TRANSPORTATION (13940 AIRPORT RD)	3,112 m²	0.31 hc	0.77 ac	
	PROPOSED ROAD WIDENING BY REGION OF PEEL TRANSPORTATION (13846 AIRPORT RD)	4,808 m²	0.48 hc	1.19 ac	
	TOTAL LOT AREA	46,136m²	4.61 hc	11.40 ac	
TOTAL COVERAGE :		15,239.3 m² (164,034 SF)			
TOTAL 2ND STOREY AREA :		4,522.0 m² (48,674 SF)			
TOTAL BUILDING GFA :		19,761.3 m² (212,708 SF)			
TOTAL DENSITY :		51.7%			
TOTAL NUMBER OF PARKING SPACES: (1 SPACE / 40m²) (ACCESSIBLE PARKING INCLUDED)		249			381
ACCESSIBLE PARKING : (REQUIRED 2 ACCESSIBLE SPACES +2%)		20			10
TOTAL NUMBER OF LOADING SPACES: (1 / 2,800 m² OF NET FLOOR AREA)		23			6

2 SP1 SITE PLAN SECTION A-A
SCALE = 1 : 250

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CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND ELEVATIONS AND BE RESPONSIBLE TO REPORT ON ADVANCE OF CONSTRUCTION IN WRITING ANY DISCREPANCIES BEFORE COMMENCING ANY WORK.

ONLY FINAL APPROVED DRAWINGS TO BE USED FOR CONSTRUCTION AND BY THE LOCAL MUNICIPAL AUTHORITY, ALL PRINTS TO BE RETURNED UPON COMPLETION OF WORK.

PRINTS ARE NOT TO BE SCALED

NO.:	DATE:	REVISION:
1	26/06/17	PRELIMINARY
8	27/05/19	PRELIMINARY
13	25/09/19	PRELIMINARY- FLOOR PLANS
14	15/11/19	ISSUED FOR DART MEETING
15	03/12/19	TOWN COMMENTS CHANGES
16	12/12/19	ISSUED FOR COORDINATRION
17	09/01/20	TOWN COMMENTS CHANGES
18	05/02/20	ISSUED FOR COORDINATRION
19	26/02/20	ISSUED FOR COORDINATRION
20	21/04/20	HERITAGE HOUSE LANDSCAPE
21	06/05/20	ISSUED FOR COORDINATION
28	19/11/20	ISSUED FOR COORDINATION
29	19/01/21	ISSUED FOR COORDINATION
30	23/03/21	ISSUED FOR COORDINATION
31	14/07/21	ISSUED FOR COORDINATION
32	09/08/21	ISSUED FOR COORDINATION
33	13/09/21	ISSUED FOR COORDINATION

- ☐ ISSUED FOR CONSTRUCTION
- ☐ ISSUED FOR PRICING
- ☐ ISSUED FOR BUILDING PERMIT
- ☐ ISSUED FOR PRELIMINARY REVIEW

www.rgcdesigngroup.com

RGC

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DRAFT FOR DISCUSSION ONLY

PROPOSED DEVELOPMENT
FOR FALCO GROUP
13846 & 13940 AIRPORT ROAD
SANDHILL, CALEDON, ON

project number:	1710
date:	SEPTEMBER 2021
scale:	AS NOTED
drawn by:	ZL
checked by:	RG
drawing number:	P17-01-01D

MASTER SITE PLAN

SP1

APPENDIX B

SERVICING AND STORMWATER MANAGEMENT CALCULATIONS AND DOCUMENTATION

10 YEAR STORM DESIGN SHEET - PROPOSED DEVELOPMENT

Location			Drainage Area				Runoff			Pipe Flow						
Catchment	From MH	To MH	A (ha)	C	A x C	Acc. A x C	Tc (min)	I (mm/hr)	Q (L/s)	Pipe Length (m)	Pipe Diameter (mm)	Pipe Slope (%)	Full Flow Capacity (L/s)	Full Flow Velocity (m/s)	Time of flow (min.)	% full
B1a	MH12	MH11	0.27	0.90	0.24	0.24	10.00	134.16	90.56	68.0	375	0.40	110.9	1.0	1.13	81.7%
	MH11	OGS10	0.00			0.24	11.13	128.20	86.54	43.6	375	0.40	110.9	1.0	0.72	78.0%
	OGS10	HW	0.00			0.24	11.85	124.67	84.15	10.3	375	0.40	110.9	1.0	0.17	75.9%
B2a	MH15	MH14	0.26	0.90	0.23	0.23	10.00	134.16	87.21	65.3	375	0.40	110.9	1.0	1.08	78.6%
	MH14	OGS13				0.23	11.08	128.43	83.48	43.7	375	0.40	110.9	1.0	0.73	75.3%
	OGS13	HW				0.23	11.81	124.87	81.17	10.3	375	0.40	110.9	1.0	0.17	73.2%
B3a	MH18	MH17	0.27	0.90	0.24	0.24	10.00	134.16	90.56	64.2	375	0.40	110.9	1.0	1.07	81.7%
	MH17	OG16				0.24	11.07	128.52	86.75	42.2	375	0.40	110.9	1.0	0.70	78.2%
	OG16	HW				0.24	11.77	125.08	84.43	12.8	375	0.40	110.9	1.0	0.21	76.1%
B4a	MH28	MH27	0.16	0.90	0.14	0.14	10.00	134.16	53.66	57.1	375	0.40	110.9	1.0	0.95	48.4%
	MH27	MH26				0.14	10.95	129.12	51.65	59.8	375	0.40	110.9	1.0	0.99	46.6%
B4b	MH26	OGS25	0.12	0.90	0.11	0.25	11.94	124.25	86.97	50.3	375	0.40	110.9	1.0	0.83	78.4%
	OGS25	HW				0.25	12.78	120.44	84.31	5.7	375	0.40	110.9	1.0	0.09	76.0%
B5a	MH31	MH30	0.10	0.90	0.09	0.09	10.00	134.16	33.54	26.6	375	0.40	110.9	1.0	0.44	30.2%
B5b	MH30	OG29	0.14	0.90	0.13	0.22	10.44	131.76	79.06	66.7	375	0.40	110.9	1.0	1.11	71.3%
	OG29	HW				0.22	11.55	126.12	75.67	5.7	375	0.40	110.9	1.0	0.09	68.2%
SWM5	MH24	MH23							0.01	62.6	300	0.40	61.2	0.9	1.21	0.0%
SWM4	MH23	MH22							0.03	23.8	300	0.40	61.2	0.9	0.46	0.0%
B6a	MH22	MH21	0.07	0.90	0.06	0.06	10.00	134.16	23.51	68.2	450	0.40	180.3	1.1	1.00	13.0%
B6b	MH21	MH20	0.29	0.90	0.26	0.32	11.00	128.84	115.99	46.7	450	0.40	180.3	1.1	0.69	64.3%
	MH20	OGS19				0.32	11.69	125.45	112.93	11.2	450	0.40	180.3	1.1	0.16	62.6%
	OGS19	HW				0.32	11.85	124.66	112.22	12.7	450	0.40	180.3	1.1	0.19	62.2%
B7	MH9	OG8	0.23	0.90	0.21	0.21	10.00	134.16	76.77	65.4	450	0.40	180.3	113.4	0.01	42.6%
	OGS8	MH1				0.21	10.01	134.11	76.74	4.6	450	0.40	180.3	113.4	0.00	42.6%
SWM3	MH7	MH6							0.02	82.8	300	0.40	61.2	86.5	0.02	0.0%
SWM2	MH6	MH5							0.03	82.1	300	0.40	61.2	86.5	0.02	0.1%
SWM1	MH5	MH4							0.05	31.5	300	0.40	61.2	86.5	0.01	0.1%
	MH4	MH3							0.05	54.3	375	0.40	110.9	100.4	0.01	0.0%
	MH3	MH2							0.05	54.3	375	0.40	110.9	100.4	0.01	0.0%
	MH2	MH1							0.05	11.9	375	0.40	110.9	100.4	0.00	0.0%
	MH1	HW							76.80	2.2	450	0.40	180.3	113.4	0.00	42.6%
Controlled Flow from SWMF (100yr indicated)																
	SWM1	MH5							0.02		100	0.40	3.3	0.4	0.00	0.6%
	SWM2	MH6							0.02		100	0.40	3.3	0.4	0.00	0.5%
	SWM3	MH7							0.02		100	0.40	3.3	0.4	0.00	0.6%
	SWM4	MH23							0.01		100	0.40	3.3	0.4	0.00	0.4%
	SWM5	MH24							0.01		100	0.40	3.3	0.4	0.00	0.4%

Notes

Manning's n = 0.013

$$I = \frac{A}{(t_c + B)^C}$$

where: A= 2221

B= 12

C= 0.908

CONSULTANT: Calder Engineering Ltd.

PROJECT: Art + Work, 13846 and 13940 Airpot Road

PROJECT NO: 19-216

LOCATION: Town of Caledon

TOWN OF CALEDON

Calder Engineering Ltd.

```
00001> 2     Metric units
00002> *#*************************************************************************
00003> *#  Project Name: [Sandhill]    Project Number: [19-216]
00004> *#  Date         : [2021-05-05]
00005> *#  Modeller     : [    MYS    ]
00006> *#  Company      : Calder Engineering Ltd.
00007> *#  License #    :  3375279
00008> *#*************************************************************************
00009> *# Existing Conditions:
00010> *# Filename: Sand-Ex.dat
00011> *#*************************************************************************
00012> START               TZERO=[0.0],  METOUT=[2],  NSTORM=[0],  NRUN=[0]
00013> *%
00014> *%-----------------|-------------------------------------------------------|
00015> READ STORM          STORM_FILENAME=["2Y6.STM"]
00016> *%-----------------|-------------------------------------------------------|
00017> CALIB NASHYD        ID=[ 1 ], NHYD=["A"], DT=[ 1 ]min, AREA=[ 8.51](ha),
00018>                     DWF=[ 0 ](cms),  CN/C=[ 80 ], IA=[ 10 ](mm),
00019>                     N=[  3 ], TP=[  0.35 ]hrs,
00020>                     RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
00021> *%-----------------|-------------------------------------------------------|
00022> READ STORM          STORM_FILENAME=["5Y6.STM"]
00023> *%-----------------|-------------------------------------------------------|
00024> CALIB NASHYD        ID=[ 1 ], NHYD=["A"], DT=[ 1 ]min, AREA=[ 8.51](ha),
00025>                     DWF=[ 0 ](cms),  CN/C=[ 80 ], IA=[ 10 ](mm),
00026>                     N=[  3 ], TP=[  0.35 ]hrs,
00027>                     RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
00028> *%-----------------|-------------------------------------------------------|
00029> READ STORM          STORM_FILENAME=["10Y6.STM"]
00030> *%-----------------|-------------------------------------------------------|
00031> CALIB NASHYD        ID=[ 1 ], NHYD=["A"], DT=[ 1 ]min, AREA=[ 8.51](ha),
00032>                     DWF=[ 0 ](cms),  CN/C=[ 80 ], IA=[ 10 ](mm),
00033>                     N=[  3 ], TP=[  0.35 ]hrs,
00034>                     RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
00035> *%-----------------|-------------------------------------------------------|
00036> READ STORM          STORM_FILENAME=["25Y6.STM"]
00037> *%-----------------|-------------------------------------------------------|
00038> CALIB NASHYD        ID=[ 1 ], NHYD=["A"], DT=[ 1 ]min, AREA=[ 8.51](ha),
00039>                     DWF=[ 0 ](cms),  CN/C=[ 80 ], IA=[ 10 ](mm),
00040>                     N=[  3 ], TP=[  0.35 ]hrs,
00041>                     RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
00042> *%-----------------|-------------------------------------------------------|
00043> READ STORM          STORM_FILENAME=["50Y6.STM"]
00044> *%-----------------|-------------------------------------------------------|
00045> CALIB NASHYD        ID=[ 1 ], NHYD=["A"], DT=[ 1 ]min, AREA=[ 8.51](ha),
00046>                     DWF=[ 0 ](cms),  CN/C=[ 80 ], IA=[ 10 ](mm),
00047>                     N=[  3 ], TP=[  0.35 ]hrs,
00048>                     RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
00049> *%-----------------|-------------------------------------------------------|
00050> READ STORM          STORM_FILENAME=["100Y6.STM"]
00051> *%-----------------|-------------------------------------------------------|
00052> CALIB NASHYD        ID=[ 1 ], NHYD=["A"], DT=[ 1 ]min, AREA=[ 8.51](ha),
00053>                     DWF=[ 0 ](cms),  CN/C=[ 80 ], IA=[ 10 ](mm),
00054>                     N=[  3 ], TP=[  0.35 ]hrs,
00055>                     RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
00056> *%-----------------|-------------------------------------------------------|
00057> FINISH
```

```
00001> ================================================================================
00002>
00003>    SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO        999    999    =========
00004>    S      W W W  MM MM  H   H   Y Y   MM MM  O   O      9   9  9   9
00005>    SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  9   9   Ver  4.05
00006>        S  W W  M   M  M  H   H    Y    M   M  O   O       9999   9999   Sept 2011
00007>    SSSSS   W W   M   M  H   H    Y    M   M   OOO           9      9    =========
00008>                                                          9   9  9   9   # 3375279
00009>          StormWater Management HYdrologic Model           999    999    =========
00010>
00011>  ****************************************************************************
00012>  ***************************** SWMHYMO Ver/4.05  ******************************
00013>  *********  A single event and continuous hydrologic simulation model  *********
00014>  *********     based on the principles of HYMO and its successors      *********
00015>  *********                  OTTHYMO-83 and OTTHYMO-89.                  *********
00016>  ****************************************************************************
00017>  ********* Distributed by:  J.F. Sabourin and Associates Inc.           *********
00018>  *********                  Ottawa,  Ontario: (613) 836-3884            *********
00019>  *********                  Gatineau, Quebec: (819) 243-6858            *********
00020>  *********                  E-Mail: swmhymo@jfsa.com                    *********
00021>  ****************************************************************************
00022>
00023>  ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
00024>  +++++++++ Licensed user: Calder Engineering Ltd.                      +++++++++
00025>  +++++++++                Bolton              SERIAL#:3375279         +++++++++
00026>  ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
00027>
00028>  ****************************************************************************
00029>  *********          ++++++ PROGRAM ARRAY DIMENSIONS ++++++            *********
00030>  *********          Maximum value for ID numbers  :     10            *********
00031>  *********          Max. number of rainfall points: 105408            *********
00032>  *********          Max. number of flow points    : 105408            *********
00033>  ****************************************************************************
00034>
00035>
00036>  **********************   D E T A I L E D   O U T P U T   **********************
00037>  ****************************************************************************
00038>  *         DATE: 2021-08-26     TIME: 12:20:52     RUN COUNTER: 000313         *
00039>  ****************************************************************************
00040>  * Input   filename: C:\PROGRA~2\SWMHYMO\Projects\sandX\Sand-E.dat            *
00041>  * Output  filename: C:\PROGRA~2\SWMHYMO\Projects\sandX\Sand-E.out            *
00042>  * Summary filename: C:\PROGRA~2\SWMHYMO\Projects\sandX\Sand-E.sum            *
00043>  * User comments:                                                            *
00044>  * 1:_____________________________________________________________________*
00045>  * 2:_____________________________________________________________________*
00046>  * 3:_____________________________________________________________________*
00047>  ****************************************************************************
00048>
00049> ----------------------------------------------------------------------------
00050> 001:0001----------------------------------------------------------------------
00051> *#**************************************************************************
00052> *#  Project Name: [Sandhill]    Project Number: [19-216]
00053> *#  Date        : [2021-05-05]
00054> *#  Modeller    : [    MYS    ]
00055> *#  Company     : Calder Engineering Ltd.
00056> *#  License #   :  3375279
00057> *#**************************************************************************
00058> *# Existing Conditions:
00059> *# Filename: Sand-Ex.dat
00060> *#**************************************************************************
00061> ---------------------
00062> | START              |  Project  dir.: C:\PROGRA~2\SWMHYMO\Projects\sandX\
00063> ---------------------  Rainfall dir.: C:\PROGRA~2\SWMHYMO\Projects\sandX\
00064>    TZERO =   .00 hrs on      0
00065>    METOUT=   2 (output = METRIC)
00066>    NRUN  = 001
00067>    NSTORM=   0
00068> ----------------------------------------------------------------------------
00069> 001:0002----------------------------------------------------------------------
00070> ---------------------
00071> | READ STORM       |    Filename: 2yr/6hr
00072> | Ptotal=  36.00 mm|    Comments: 2yr/6hr
00073> ---------------------
00074>               TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
00075>                hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
00076>                .25    .000 |   2.00  12.240 |   3.75   5.040 |   5.50    .720
00077>                .50    .720 |   2.25  12.240 |   4.00   2.880 |   5.75    .720
00078>                .75    .720 |   2.50  33.120 |   4.25   2.880 |   6.00    .720
00079>               1.00    .720 |   2.75  33.120 |   4.50   1.440 |   6.25    .720
00080>               1.25    .720 |   3.00   9.360 |   4.75   1.440 |
00081>               1.50   4.320 |   3.25   9.360 |   5.00    .720 |
00082>               1.75   4.320 |   3.50   5.040 |   5.25    .720 |
00083>
00084> ----------------------------------------------------------------------------
00085> 001:0003----------------------------------------------------------------------
00086> ----------------------
00087> | CALIB NASHYD       |   Area    (ha)=    8.51   Curve Number   (CN)=80.00
00088> | 01:A      DT= 1.00 |   Ia      (mm)=  10.000   # of Linear Res.(N)= 3.00
00089> ----------------------   U.H. Tp(hrs)=    .350
00090>
00091>      Unit Hyd Qpeak  (cms)=     .929
00092>
00093>      PEAK FLOW       (cms)=     .119 (i)
00094>      TIME TO PEAK    (hrs)=    3.083
00095>      RUNOFF VOLUME    (mm)=    7.553
00096>      TOTAL RAINFALL   (mm)=   36.000
00097>      RUNOFF COEFFICIENT   =     .210
00098>
00099>      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00100>
00101> ----------------------------------------------------------------------------
00102> 001:0004----------------------------------------------------------------------
00103> ---------------------
00104> | READ STORM       |    Filename: 5yr/6hr
00105> | Ptotal=  47.81 mm|    Comments: 5yr/6hr
00106> ---------------------
00107>               TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
00108>                hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
00109>                .25    .000 |   2.00  16.250 |   3.75   6.690 |   5.50    .960
00110>                .50    .960 |   2.25  16.250 |   4.00   3.820 |   5.75    .960
00111>                .75    .960 |   2.50  43.980 |   4.25   3.820 |   6.00    .960
00112>               1.00    .960 |   2.75  43.980 |   4.50   1.910 |   6.25    .960
00113>               1.25    .960 |   3.00  12.430 |   4.75   1.910 |
00114>               1.50   5.740 |   3.25  12.430 |   5.00    .960 |
00115>               1.75   5.740 |   3.50   6.690 |   5.25    .960 |
00116>
00117> ----------------------------------------------------------------------------
00118> 001:0005----------------------------------------------------------------------
00119> ----------------------
00120> | CALIB NASHYD       |   Area    (ha)=    8.51   Curve Number   (CN)=80.00
00121> | 01:A      DT= 1.00 |   Ia      (mm)=  10.000   # of Linear Res.(N)= 3.00
00122> ----------------------   U.H. Tp(hrs)=    .350
00123>
00124>      Unit Hyd Qpeak  (cms)=     .929
00125>
00126>      PEAK FLOW       (cms)=     .236 (i)
00127>      TIME TO PEAK    (hrs)=    3.033
00128>      RUNOFF VOLUME    (mm)=   14.111
00129>      TOTAL RAINFALL   (mm)=   47.810
00130>      RUNOFF COEFFICIENT   =     .295
00131>
00132>      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00133>
00134> ----------------------------------------------------------------------------
00135> 001:0006----------------------------------------------------------------------
00136> ---------------------
00137> | READ STORM       |    Filename: 10yr/6hr
00138> | Ptotal=  55.69 mm|    Comments: 10yr/6hr
00139> ---------------------
00140>               TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
00141>                hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
00142>                .25    .000 |   2.00  18.940 |   3.75   7.800 |   5.50   1.110
00143>                .50   1.110 |   2.25  18.940 |   4.00   4.460 |   5.75   1.110
00144>                .75   1.110 |   2.50  51.240 |   4.25   4.460 |   6.00   1.110
00145>               1.00   1.110 |   2.75  51.240 |   4.50   2.230 |   6.25   1.110
00146>               1.25   1.110 |   3.00  14.480 |   4.75   2.230 |
00147>               1.50   6.680 |   3.25  14.480 |   5.00   1.110 |
00148>               1.75   6.680 |   3.50   7.800 |   5.25   1.110 |
00149>
00150> ----------------------------------------------------------------------------
00151> 001:0007----------------------------------------------------------------------
00152> ----------------------
00153> | CALIB NASHYD       |   Area    (ha)=    8.51   Curve Number   (CN)=80.00
00154> | 01:A      DT= 1.00 |   Ia      (mm)=  10.000   # of Linear Res.(N)= 3.00
00155> ----------------------   U.H. Tp(hrs)=    .350
00156>
00157>      Unit Hyd Qpeak  (cms)=     .929
00158>
00159>      PEAK FLOW       (cms)=     .327 (i)
00160>      TIME TO PEAK    (hrs)=    3.017
00161>      RUNOFF VOLUME    (mm)=   19.119
00162>      TOTAL RAINFALL   (mm)=   55.690
00163>      RUNOFF COEFFICIENT   =     .343
00164>
00165>      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00166>
00167> ----------------------------------------------------------------------------
00168> 001:0008----------------------------------------------------------------------
00169> ---------------------
00170> | READ STORM       |    Filename: 25yr/6hr
00171> | Ptotal=  65.59 mm|    Comments: 25yr/6hr
00172> ---------------------
00173>               TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
00174>                hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
00175>                .25    .000 |   2.00  22.300 |   3.75   9.180 |   5.50   1.310
00176>                .50   1.310 |   2.25  22.300 |   4.00   5.250 |   5.75   1.310
00177>                .75   1.310 |   2.50  60.350 |   4.25   5.250 |   6.00   1.310
00178>               1.00   1.310 |   2.75  60.350 |   4.50   2.620 |   6.25   1.310
00179>               1.25   1.310 |   3.00  17.060 |   4.75   2.620 |
00180>               1.50   7.870 |   3.25  17.060 |   5.00   1.310 |
00181>               1.75   7.870 |   3.50   9.180 |   5.25   1.310 |
00182>
00183> ----------------------------------------------------------------------------
00184> 001:0009----------------------------------------------------------------------
00185> ----------------------
00186> | CALIB NASHYD       |   Area    (ha)=    8.51   Curve Number   (CN)=80.00
00187> | 01:A      DT= 1.00 |   Ia      (mm)=  10.000   # of Linear Res.(N)= 3.00
00188> ----------------------   U.H. Tp(hrs)=    .350
00189>
00190>      Unit Hyd Qpeak  (cms)=     .929
00191>
00192>      PEAK FLOW       (cms)=     .452 (i)
00193>      TIME TO PEAK    (hrs)=    3.000
00194>      RUNOFF VOLUME    (mm)=   25.949
00195>      TOTAL RAINFALL   (mm)=   65.590
00196>      RUNOFF COEFFICIENT   =     .396
00197>
00198>      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00199>
00200> ----------------------------------------------------------------------------
00201> 001:0010----------------------------------------------------------------------
00202> ---------------------
00203> | READ STORM       |    Filename: 50yr/6hr
00204> | Ptotal=  73.00 mm|    Comments: 50yr/6hr
00205> ---------------------
00206>               TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
00207>                hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
00208>                .25    .000 |   2.00  24.820 |   3.75  10.220 |   5.50   1.460
00209>                .50   1.460 |   2.25  24.820 |   4.00   5.840 |   5.75   1.460
00210>                .75   1.460 |   2.50  67.160 |   4.25   5.840 |   6.00   1.460
00211>               1.00   1.460 |   2.75  67.160 |   4.50   2.920 |   6.25   1.460
00212>               1.25   1.460 |   3.00  18.980 |   4.75   2.920 |
00213>               1.50   8.760 |   3.25  18.980 |   5.00   1.460 |
00214>               1.75   8.760 |   3.50  10.220 |   5.25   1.460 |
00215>
00216> ----------------------------------------------------------------------------
00217> 001:0011----------------------------------------------------------------------
00218> ----------------------
00219> | CALIB NASHYD       |   Area    (ha)=    8.51   Curve Number   (CN)=80.00
00220> | 01:A      DT= 1.00 |   Ia      (mm)=  10.000   # of Linear Res.(N)= 3.00
00221> ----------------------   U.H. Tp(hrs)=    .350
00222>
00223>      Unit Hyd Qpeak  (cms)=     .929
00224>
00225>      PEAK FLOW       (cms)=     .551 (i)
00226>      TIME TO PEAK    (hrs)=    2.983
00227>      RUNOFF VOLUME    (mm)=   31.375
00228>      TOTAL RAINFALL   (mm)=   73.000
00229>      RUNOFF COEFFICIENT   =     .430
00230>
00231>      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00232>
00233> ----------------------------------------------------------------------------
00234> 001:0012----------------------------------------------------------------------
00235> ---------------------
00236> | READ STORM       |    Filename: 100yr/6hr
00237> | Ptotal=  80.31 mm|    Comments: 100yr/6hr
00238> ---------------------
00239>               TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
00240>                hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
00241>                .25    .000 |   2.00  27.300 |   3.75  11.240 |   5.50   1.610
00242>                .50   1.610 |   2.25  27.300 |   4.00   6.420 |   5.75   1.610
00243>                .75   1.610 |   2.50  73.880 |   4.25   6.420 |   6.00   1.610
00244>               1.00   1.610 |   2.75  73.880 |   4.50   3.210 |   6.25   1.610
00245>               1.25   1.610 |   3.00  20.880 |   4.75   3.210 |
00246>               1.50   9.640 |   3.25  20.880 |   5.00   1.610 |
00247>               1.75   9.640 |   3.50  11.240 |   5.25   1.610 |
00248>
00249> ----------------------------------------------------------------------------
00250> 001:0013----------------------------------------------------------------------
00251> ---------------------
00252> | CALIB NASHYD       |   Area    (ha)=    8.51   Curve Number   (CN)=80.00
00253> | 01:A      DT= 1.00 |   Ia      (mm)=  10.000   # of Linear Res.(N)= 3.00
00254> ----------------------   U.H. Tp(hrs)=    .350
```

```
00255>
00256>      Unit Hyd Qpeak  (cms)=     .929
00257>
00258>      PEAK FLOW       (cms)=     .654 (i)
00259>      TIME TO PEAK    (hrs)=    2.983
00260>      RUNOFF VOLUME    (mm)=   36.944
00261>      TOTAL RAINFALL   (mm)=   80.310
00262>      RUNOFF COEFFICIENT   =     .460
00263>
00264>      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00265>
00266> ---------------------------------------------------------------------------
00267> 001:0014---------------------------------------------------------------------
00268>       FINISH
00269> ---------------------------------------------------------------------------
00270> ***************************************************************************
00271>      WARNINGS / ERRORS / NOTES
00272>      -------------------------
00273>    Simulation ended on 2021-08-26     at 12:20:52
00274> ===========================================================================
00275>
```

```
00001> 2     Metric units
00002> *#*****************************************************************************
00003> *#  Project Name: [Sandhill]    Project Number: [19-216]
00004> *#  Date        : [2022-02-15]
00005> *#  Modeller    : [    MYS    ]
00006> *#  Company     : Calder Engineering Ltd.
00007> *#  License #   :  3375279
00008> *#*****************************************************************************
00009> *# Proposed Conditions:
00010> *# Filename: Sand-P5.dat
00011> *#*****************************************************************************
00012> START               TZERO=[0.0],  METOUT=[2],  NSTORM=[0],  NRUN=[0]
00013> *%
00014> *%-----------------|-------------------------------------------------------|
00015> READ STORM          STORM_FILENAME=["2Y6.STM"]
00016> *%-----------------|-------------------------------------------------------|
00017> CALIB STANDHYD      ID=[1], NHYD=["B1"], DT=[ 1  ](min), AREA=[1.98](ha),
00018>                     XIMP=[0.001 ], TIMP=[ 0.32 ], DWF=[ 0 ](cms), LOSS=[2],
00019>                     SCS curve number CN=[80],
00020>                     Pervious   surfaces: IAper=[10](mm), SLPP=[2 ](%),
00021>                                         LGP=[100](m), MNP=[0.25], SCP=[0](min),
00022>                     Impervious surfaces: IAimp=[ 0.7](mm), SLPI=[ 1 ](%),
00023>                                         LGI=[ 100 ](m), MNI=[0.013], SCI=[0](mi
00024>                     RAINFALL=[ ,  ,  ,  , ](mm/hr) ,  END=-1
00025> *%-----------------|-------------------------------------------------------|
00026> ROUTE RESERVOIR     IDout=[2  ],   NHYD=["SWM1" ],  IDin=[ 1  ],
00027>                     RDT=[  1  ](min),
00028>                           TABLE of ( OUTFLOW-STORAGE ) values
00029>                                      (cms) - (ha-m)
00030>                                 [   0.0 ,  0.0120]
00031>                                 [   0.0 ,  0.0183]
00032>                                 [ 0.0096,  0.0251]
00033>                                 [ 0.0136,  0.0406]
00034>                                 [ 0.0167,  0.0586]
00035>                                 [ 0.0193,  0.0790]
00036>                                 [ 0.0215,  0.1022]
00037>                                 [   -1  ,  -1  ]  (max twenty pts)
00038>                           IDovf=[ 3  ], NHYDovf=["SWM1-OV"]
00039> *%-----------------|-------------------------------------------------------|
00040> CALIB STANDHYD      ID=[1], NHYD=["B2"], DT=[ 1  ](min), AREA=[1.38](ha),
00041>                     XIMP=[0.001 ], TIMP=[ 0.42 ], DWF=[ 0 ](cms), LOSS=[2],
00042>                     SCS curve number CN=[80],
00043>                     Pervious   surfaces: IAper=[10](mm), SLPP=[2 ](%),
00044>                                         LGP=[90](m), MNP=[0.25], SCP=[0](min),
00045>                     Impervious surfaces: IAimp=[ 0.7](mm), SLPI=[ 1 ](%),
00046>                                         LGI=[ 83 ](m), MNI=[0.013], SCI=[0](min
00047>                     RAINFALL=[ ,  ,  ,  , ](mm/hr) ,  END=-1
00048> *%-----------------|-------------------------------------------------------|
00049> ROUTE RESERVOIR     IDout=[4  ],   NHYD=["SWM2" ],  IDin=[ 1  ],
00050>                     RDT=[  1  ](min),
00051>                           TABLE of ( OUTFLOW-STORAGE ) values
00052>                                      (cms) - (ha-m)
00053>                                 [   0.0 ,  0.0120]
00054>                                 [   0.0 ,  0.0183]
00055>                                 [ 0.0096,  0.0251]
00056>                                 [ 0.0136,  0.0406]
00057>                                 [ 0.0167,  0.0586]
00058>                                 [ 0.0193,  0.0790]
00059>                                 [ 0.0215,  0.1022]
00060>                                 [   -1  ,  -1  ]  (max twenty pts)
00061>                           IDovf=[ 5  ], NHYDovf=["SWM2-OV"]
00062> *%-----------------|-------------------------------------------------------|
00063> CALIB STANDHYD      ID=[1], NHYD=["B3"], DT=[ 1  ](min), AREA=[1.67](ha),
00064>                     XIMP=[0.001 ], TIMP=[ 0.42 ], DWF=[ 0 ](cms), LOSS=[2],
00065>                     SCS curve number CN=[80],
00066>                     Pervious   surfaces: IAper=[10](mm), SLPP=[2 ](%),
00067>                                         LGP=[80](m), MNP=[0.25], SCP=[0](min),
00068>                     Impervious surfaces: IAimp=[ 0.7](mm), SLPI=[ 1 ](%),
00069>                                         LGI=[ 91 ](m), MNI=[0.013], SCI=[0](min
00070>                     RAINFALL=[ ,  ,  ,  , ](mm/hr) ,  END=-1
00071> *%-----------------|-------------------------------------------------------|
00072> ROUTE RESERVOIR     IDout=[6  ],   NHYD=["SWM3" ],  IDin=[ 1  ],
00073>                     RDT=[  1  ](min),
00074>                           TABLE of ( OUTFLOW-STORAGE ) values
00075>                                      (cms) - (ha-m)
00076>                                 [   0.0 ,  0.0120]
00077>                                 [   0.0 ,  0.0183]
00078>                                 [ 0.0096,  0.0251]
00079>                                 [ 0.0136,  0.0406]
00080>                                 [ 0.0167,  0.0586]
00081>                                 [ 0.0193,  0.0790]
00082>                                 [ 0.0215,  0.1022]
00083>                                 [   -1  ,  -1  ]  (max twenty pts)
00084>                           IDovf=[ 7  ], NHYDovf=["SWM3-OV"]
00085> *%-----------------|-------------------------------------------------------|
00086> CALIB STANDHYD      ID=[1], NHYD=["B4"], DT=[ 1  ](min), AREA=[0.98](ha),
00087>                     XIMP=[0.001 ], TIMP=[ 0.61 ], DWF=[ 0 ](cms), LOSS=[2],
00088>                     SCS curve number CN=[80],
00089>                     Pervious   surfaces: IAper=[10](mm), SLPP=[2 ](%),
00090>                                         LGP=[30](m), MNP=[0.25], SCP=[0](min),
00091>                     Impervious surfaces: IAimp=[ 0.7](mm), SLPI=[ 1 ](%),
00092>                                         LGI=[ 68 ](m), MNI=[0.013], SCI=[0](min
00093>                     RAINFALL=[ ,  ,  ,  , ](mm/hr) ,  END=-1
00094> *%-----------------|-------------------------------------------------------|
00095> ROUTE RESERVOIR     IDout=[8  ],   NHYD=["SWM4" ],  IDin=[ 1  ],
00096>                     RDT=[  1  ](min),
00097>                           TABLE of ( OUTFLOW-STORAGE ) values
00098>                                      (cms) - (ha-m)
00099>                                 [   0.0 ,  0.0120]
00100>                                 [   0.0 ,  0.0183]
00101>                                 [ 0.0096,  0.0251]
00102>                                 [ 0.0136,  0.0406]
00103>                                 [ 0.0167,  0.0586]
00104>                                 [ 0.0193,  0.0790]
00105>                                 [ 0.0215,  0.1022]
00106>                                 [   -1  ,  -1  ]  (max twenty pts)
00107>                           IDovf=[ 9  ], NHYDovf=["SWM4-OV"]
00108> *%-----------------|-------------------------------------------------------|
00109> ADD HYD             IDsum=[1  ], NHYD=["subtotal"], IDs to add=[2+3+4+5+6+7+8+9]
00110> *%-----------------|-------------------------------------------------------|
00111> CALIB STANDHYD      ID=[2], NHYD=["B5"], DT=[ 1  ](min), AREA=[0.83](ha),
00112>                     XIMP=[0.001 ], TIMP=[ 0.75 ], DWF=[ 0 ](cms), LOSS=[2],
00113>                     SCS curve number CN=[80],
00114>                     Pervious   surfaces: IAper=[10](mm), SLPP=[2 ](%),
00115>                                         LGP=[15](m), MNP=[0.25], SCP=[0](min),
00116>                     Impervious surfaces: IAimp=[ 0.7](mm), SLPI=[ 1 ](%),
00117>                                         LGI=[ 59](m), MNI=[0.013], SCI=[0](min)
00118>                     RAINFALL=[ ,  ,  ,  , ](mm/hr) ,  END=-1
00119> *%-----------------|-------------------------------------------------------|
00120> ROUTE RESERVOIR     IDout=[3  ],   NHYD=["SWM5" ],  IDin=[ 2  ],
00121>                     RDT=[  1  ](min),
00122>                           TABLE of ( OUTFLOW-STORAGE ) values
00123>                                      (cms) - (ha-m)
00124>                                 [   0.0 ,  0.0120]
00125>                                 [   0.0 ,  0.0183]
00126>                                 [ 0.0096,  0.0251]
00127>                                 [ 0.0136,  0.0406]
00128>                                 [ 0.0167,  0.0586]
00129>                                 [ 0.0193,  0.0790]
00130>                                 [ 0.0215,  0.1022]
00131>                                 [   -1  ,  -1  ]  (max twenty pts)
00132>                           IDovf=[ 4  ], NHYDovf=["SWM5-OV"]
00133> *%-----------------|-------------------------------------------------------|
00134> ADD HYD             IDsum=[ 9 ], NHYD=["Node1"], IDs to add=[1+3+4 ]
00135> *%-----------------|-------------------------------------------------------|
00136> CALIB STANDHYD      ID=[1], NHYD=["B6"], DT=[ 1  ](min), AREA=[0.40](ha),
00137>                     XIMP=[0.001 ], TIMP=[ 0.99 ], DWF=[ 0 ](cms), LOSS=[2],
00138>                     SCS curve number CN=[80],
00139>                     Pervious   surfaces: IAper=[10](mm), SLPP=[2 ](%),
00140>                                         LGP=[15](m), MNP=[0.25], SCP=[0](min),
00141>                     Impervious surfaces: IAimp=[ 0.7](mm), SLPI=[ 1 ](%),
00142>                                         LGI=[ 45](m), MNI=[0.013], SCI=[0](min)
00143>                     RAINFALL=[ ,  ,  ,  , ](mm/hr) ,  END=-1
00144> *%-----------------|-------------------------------------------------------|
00145> ROUTE RESERVOIR     IDout=[ 2 ],   NHYD=["SWM6"],  IDin=[ 1 ],
00146>                     RDT=[  1  ](min),
00147>                           TABLE of ( OUTFLOW-STORAGE ) values
00148>                                      (cms) - (ha-m)
00149>                                 [   0.0 ,  0.0 ]
00150>                                 [ 0.0038,  0.002]
00151>                                 [ 0.0054,  0.004]
00152>                                 [ 0.0077,  0.008]
00153>                                 [ 0.0094,  0.012]
00154>                                 [ 0.0108,  0.016]
00155>                                 [ 0.0121,  0.020]
00156>                                 [ 0.0133,  0.024]
00157>                                 [   -1  ,  -1  ]  (max twenty pts)
00158>                           IDovf=[3   ], NHYDovf=["SWM6-OV"]
00159> *%-----------------|-------------------------------------------------------|
00160> CALIB STANDHYD      ID=[4], NHYD=["B7"], DT=[ 1  ](min), AREA=[0.28](ha),
00161>                     XIMP=[0.001 ], TIMP=[ 0.99 ], DWF=[ 0 ](cms), LOSS=[2],
00162>                     SCS curve number CN=[80],
00163>                     Pervious   surfaces: IAper=[10](mm), SLPP=[2 ](%),
00164>                                         LGP=[15](m), MNP=[0.25], SCP=[0](min),
00165>                     Impervious surfaces: IAimp=[ 0.7](mm), SLPI=[ 1 ](%),
00166>                                         LGI=[ 37](m), MNI=[0.013], SCI=[0](min)
00167>                     RAINFALL=[ ,  ,  ,  , ](mm/hr) ,  END=-1
00168> *%-----------------|-------------------------------------------------------|
00169> ROUTE RESERVOIR     IDout=[ 5 ],   NHYD=["SWM7"],  IDin=[ 4  ],
00170>                     RDT=[  1  ](min),
00171>                           TABLE of ( OUTFLOW-STORAGE ) values
00172>                                      (cms) - (ha-m)
00173>                                 [   0.0 ,  0.0 ]
00174>                                 [ 0.0038,  0.0015]
00175>                                 [ 0.0054,  0.0030]
00176>                                 [ 0.0077,  0.0060]
00177>                                 [ 0.0094,  0.0090]
00178>                                 [ 0.0108,  0.0120]
00179>                                 [ 0.0121,  0.0150]
00180>                                 [ 0.0133,  0.0180]
00181>                                 [   -1  ,  -1  ]  (max twenty pts)
00182>                           IDovf=[6   ], NHYDovf=["SWM7-OV"]
00183> *%-----------------|-------------------------------------------------------|
00184> ADD HYD             IDsum=[7  ], NHYD=["node2"], IDs to add=[2+3+5+6]
00185> *%-----------------|-------------------------------------------------------|
00186> CALIB STANDHYD      ID=[1], NHYD=["C"], DT=[ 1  ](min), AREA=[1.51](ha),
00187>                     XIMP=[0.001 ], TIMP=[ 0.99 ], DWF=[ 0 ](cms), LOSS=[2],
00188>                     SCS curve number CN=[80],
00189>                     Pervious   surfaces: IAper=[10](mm), SLPP=[2 ](%),
00190>                                         LGP=[10](m), MNP=[0.25], SCP=[0](min),
00191>                     Impervious surfaces: IAimp=[ 0.7](mm), SLPI=[ 1 ](%),
00192>                                         LGI=[ 39](m), MNI=[0.013], SCI=[0](min)
00193>                     RAINFALL=[ ,  ,  ,  , ](mm/hr) ,  END=-1
00194> *%-----------------|-------------------------------------------------------|
00195> ROUTE RESERVOIR     IDout=[ 2 ],   NHYD=["RoofC"],  IDin=[ 1  ],
00196>                     RDT=[  1  ](min),
00197>                           TABLE of ( OUTFLOW-STORAGE ) values
00198>                                      (cms) - (ha-m)
00199>                                 [   0.0 ,  0.0 ]
00200>                                 [ 0.063, 0.0754]
00201>                                 [ 0.063, 0.1509]
00202>                                 [ 0.063, 0.2263]
00203>                                 [   -1  ,  -1  ]  (max twenty pts)
00204>                           IDovf=[ 3  ], NHYDovf=["roof-ovf"]
00205> *%-----------------|-------------------------------------------------------|
00206> ADD HYD             IDsum=[8 ], NHYD=["Node3"], IDs to add=[7+2+3 ]
00207> *%-----------------|-------------------------------------------------------|
00208> ADD HYD             IDsum=[ 1 ], NHYD=["Node4"], IDs to add=[8+9]
00209> *%-----------------|-------------------------------------------------------|
00210> FINISH
00211>
00212>
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00214>
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00227>
00228>
00229>
00230>
```

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00001> ================================================================================
00002>
00003>    SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO        999    999    =========
00004>    S      W W W  MM MM  H   H   Y Y   MM MM  O   O      9   9  9   9
00005>    SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  9   9   Ver  4.05
00006>        S  W W W  M   M  H   H    Y    M   M  O   O      9999   9999   Sept 2011
00007>    SSSSS   W W   M   M  H   H    Y    M   M   OOO           9      9   =========
00008>                                                          9   9  9   9   # 3375279
00009>          StormWater Management HYdrologic Model          999    999    =========
00010>
00011>  ********************************************************************************
00012>  ***************************** SWMHYMO Ver/4.05  ********************************
00013>  *********  A single event and continuous hydrologic simulation model  *********
00014>  *********     based on the principles of HYMO and its successors      *********
00015>  *********                 OTTHYMO-83 and OTTHYMO-89.                  *********
00016>  ********************************************************************************
00017>  ********* Distributed by:  J.F. Sabourin and Associates Inc.           *********
00018>  *********                  Ottawa,  Ontario: (613) 836-3884           *********
00019>  *********                  Gatineau, Quebec: (819) 243-6858           *********
00020>  *********                  E-Mail: swmhymo@jfsa.com                   *********
00021>  ********************************************************************************
00022>
00023>  ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
00024>  +++++++++ Licensed user: Calder Engineering Ltd.                      +++++++++
00025>  +++++++++                Bolton                SERIAL#:3375279       +++++++++
00026>  ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
00027>
00028>  ********************************************************************************
00029>  *********          ++++++ PROGRAM ARRAY DIMENSIONS ++++++             *********
00030>  *********          Maximum value for ID numbers  :     10            *********
00031>  *********          Max. number of rainfall points: 105408            *********
00032>  *********          Max. number of flow points    : 105408            *********
00033>  ********************************************************************************
00034>
00035>
00036>  **********************   D E T A I L E D   O U T P U T   **********************
00037>  ********************************************************************************
00038>  *         DATE: 2022-02-15     TIME: 16:45:36     RUN COUNTER: 000625          *
00039>  ********************************************************************************
00040>  * Input   filename: C:\USERS\CALDER\DOCUME~1\SWMMHY~1\Sand\SAND-2~1\Sand-P6.da*
00041>  * Output  filename: C:\USERS\CALDER\DOCUME~1\SWMMHY~1\Sand\SAND-2~1\Sand-P6.ou*
00042>  * Summary filename: C:\USERS\CALDER\DOCUME~1\SWMMHY~1\Sand\SAND-2~1\Sand-P6.su*
00043>  * User comments:                                                            *
00044>  * 1:_____________________________________________________________________*
00045>  * 2:_____________________________________________________________________*
00046>  * 3:_____________________________________________________________________*
00047>  ********************************************************************************
00048>
00049>  --------------------------------------------------------------------------------
00050> 001:0001--------------------------------------------------------------------------
00051>  *#*****************************************************************************
00052>  *#  Project Name: [Sandhill]    Project Number: [19-216]
00053>  *#  Date        : [2022-02-15]
00054>  *#  Modeller    : [    MYS    ]
00055>  *#  Company     : Calder Engineering Ltd.
00056>  *#  License #   :  3375279
00057>  *#*****************************************************************************
00058>  *# Proposed Conditions:
00059>  *# Filename: Sand-P5.dat
00060>  *#*****************************************************************************
00061>  ---------------------
00062>  | START        |  Project  dir.: C:\USERS\CALDER\DOCUME~1\SWMMHY~1\Sand\SAND
00063>  ---------------  Rainfall dir.: C:\USERS\CALDER\DOCUME~1\SWMMHY~1\Sand\SAND
00064>     TZERO =   .00 hrs on      0
00065>     METOUT=   2 (output = METRIC)
00066>     NRUN  = 001
00067>     NSTORM=   0
00068>  --------------------------------------------------------------------------------
00069> 001:0002--------------------------------------------------------------------------
00070>  --------------------
00071>  | READ STORM       |    Filename: 2yr/6hr
00072>  | Ptotal=  36.00 mm|    Comments: 2yr/6hr
00073>  --------------------
00074>                TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
00075>                 hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
00076>                 .25    .000 |   2.00  12.240 |   3.75   5.040 |   5.50    .720
00077>                 .50    .720 |   2.25  12.240 |   4.00   2.880 |   5.75    .720
00078>                 .75    .720 |   2.50  33.120 |   4.25   2.880 |   6.00    .720
00079>                1.00    .720 |   2.75  33.120 |   4.50   1.440 |   6.25    .720
00080>                1.25    .720 |   3.00   9.360 |   4.75   1.440 |
00081>                1.50   4.320 |   3.25   9.360 |   5.00    .720 |
00082>                1.75   4.320 |   3.50   5.040 |   5.25    .720 |
00083>
00084>  --------------------------------------------------------------------------------
00085> 001:0003--------------------------------------------------------------------------
00086>  ----------------------
00087>  | CALIB STANDHYD     |   Area    (ha)=    1.98
00088>  | 01:B1     DT= 1.00 |   Total Imp(%)=   32.00   Dir. Conn.(%)=     .10
00089>  ----------------------
00090>                              IMPERVIOUS    PERVIOUS (i)
00091>       Surface Area     (ha)=        .63         1.35
00092>       Dep. Storage     (mm)=        .70        10.00
00093>       Average Slope     (%)=       1.00         2.00
00094>       Length            (m)=     100.00       100.00
00095>       Mannings n             =      .013         .250
00096>
00097>       Max.eff.Inten.(mm/hr)=      33.12        16.78
00098>                  over (min)        4.00        29.00
00099>       Storage Coeff.  (min)=       3.97 (ii)   28.95 (ii)
00100>       Unit Hyd. Tpeak (min)=       4.00        29.00
00101>       Unit Hyd. peak  (cms)=        .28          .04
00102>                                                          *TOTALS*
00103>       PEAK FLOW       (cms)=        .00          .04          .039 (iii)
00104>       TIME TO PEAK    (hrs)=       2.67         3.15         3.150
00105>       RUNOFF VOLUME    (mm)=      35.30        11.77        11.792
00106>       TOTAL RAINFALL   (mm)=      36.00        36.00        36.000
00107>       RUNOFF COEFFICIENT   =        .98          .33          .328
00108>
00109>         (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
00110>             CN* =  80.0    Ia = Dep. Storage  (Above)
00111>        (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
00112>             THAN THE STORAGE COEFFICIENT.
00113>       (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00114>
00115>  --------------------------------------------------------------------------------
00116> 001:0004--------------------------------------------------------------------------
00117>  ----------------------
00118>  | ROUTE RESERVOIR    |    Requested routing time step =  1.0 min.
00119>  |  IN>01:(B1     )   |
00120>  | OUT<02:(SWM1  )   |    =========  OUTLFOW STORAGE TABLE  =========
00121>  ----------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
00122>                              (cms)    (ha.m.)   |    (cms)    (ha.m.)
00123>                               .000  .1200E-01   |     .017  .5860E-01
00124>                               .000  .1830E-01   |     .019  .7900E-01
00125>                               .010  .2510E-01   |     .022  .1022E+00
00126>                               .014  .4060E-01   |     .000  .0000E+00
00127>

00128>       ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
00129>       --------------------       (ha)     (cms)     (hrs)       (mm)
00130>       INFLOW >01: (B1    )       1.98      .039     3.150     11.792
00131>       OUTFLOW<02: (SWM1  )       1.98      .004     5.867      2.584
00132>      OVERFLOW<03: (SWM1-O)        .00      .000      .000       .000
00133>
00134>                     TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
00135>                     CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
00136>                     PERCENTAGE OF TIME OVERFLOWING    (%)=      .00
00137>
00138>
00139>                     PEAK   FLOW   REDUCTION [Qout/Qin](%)=    9.054
00140>                     TIME SHIFT OF PEAK FLOW         (min)=   163.00
00141>                     MAXIMUM  STORAGE   USED       (ha.m.)=.2082E-01
00142>
00143>       *** WARNING: Outflow volume is less than inflow volume.
00144>  --------------------------------------------------------------------------------
00145> 001:0005--------------------------------------------------------------------------
00146>  ----------------------
00147>  | CALIB STANDHYD     |   Area    (ha)=    1.38
00148>  | 01:B2     DT= 1.00 |   Total Imp(%)=   42.00   Dir. Conn.(%)=     .10
00149>  ----------------------
00150>                              IMPERVIOUS    PERVIOUS (i)
00151>       Surface Area     (ha)=        .58          .80
00152>       Dep. Storage     (mm)=        .70        10.00
00153>       Average Slope     (%)=       1.00         2.00
00154>       Length            (m)=      83.00        90.00
00155>       Mannings n             =      .013         .250
00156>
00157>       Max.eff.Inten.(mm/hr)=      33.12        25.87
00158>                  over (min)        4.00        23.00
00159>       Storage Coeff.  (min)=       3.55 (ii)   23.27 (ii)
00160>       Unit Hyd. Tpeak (min)=       4.00        23.00
00161>       Unit Hyd. peak  (cms)=        .31          .05
00162>                                                          *TOTALS*
00163>       PEAK FLOW       (cms)=        .00          .04          .036 (iii)
00164>       TIME TO PEAK    (hrs)=       2.62         3.03         3.033
00165>       RUNOFF VOLUME    (mm)=      35.30        13.59        13.617
00166>       TOTAL RAINFALL   (mm)=      36.00        36.00        36.000
00167>       RUNOFF COEFFICIENT   =        .98          .38          .378
00168>
00169>         (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
00170>             CN* =  80.0    Ia = Dep. Storage  (Above)
00171>        (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
00172>             THAN THE STORAGE COEFFICIENT.
00173>       (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00174>
00175>  --------------------------------------------------------------------------------
00176> 001:0006--------------------------------------------------------------------------
00177>  ----------------------
00178>  | ROUTE RESERVOIR    |    Requested routing time step =  1.0 min.
00179>  |  IN>01:(B2     )   |
00180>  | OUT<04:(SWM2  )   |    =========  OUTLFOW STORAGE TABLE  =========
00181>  ----------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
00182>                              (cms)    (ha.m.)   |    (cms)    (ha.m.)
00183>                               .000  .1200E-01   |     .017  .5860E-01
00184>                               .000  .1830E-01   |     .019  .7900E-01
00185>                               .010  .2510E-01   |     .022  .1022E+00
00186>                               .014  .4060E-01   |     .000  .0000E+00
00187>
00188>       ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
00189>       --------------------       (ha)     (cms)     (hrs)       (mm)
00190>       INFLOW >01: (B2    )       1.38      .036     3.033     13.617
00191>       OUTFLOW<04: (SWM2  )       1.38      .000     7.033      .405
00192>      OVERFLOW<05: (SWM2-O)        .00      .000      .000       .000
00193>
00194>                     TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
00195>                     CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
00196>                     PERCENTAGE OF TIME OVERFLOWING    (%)=      .00
00197>
00198>
00199>                     PEAK   FLOW   REDUCTION [Qout/Qin](%)=    1.272
00200>                     TIME SHIFT OF PEAK FLOW         (min)=   240.00
00201>                     MAXIMUM  STORAGE   USED       (ha.m.)=.1863E-01
00202>
00203>       *** WARNING: Outflow volume is less than inflow volume.
00204>  --------------------------------------------------------------------------------
00205> 001:0007--------------------------------------------------------------------------
00206>  ----------------------
00207>  | CALIB STANDHYD     |   Area    (ha)=    1.67
00208>  | 01:B3     DT= 1.00 |   Total Imp(%)=   42.00   Dir. Conn.(%)=     .10
00209>  ----------------------
00210>                              IMPERVIOUS    PERVIOUS (i)
00211>       Surface Area     (ha)=        .70          .97
00212>       Dep. Storage     (mm)=        .70        10.00
00213>       Average Slope     (%)=       1.00         2.00
00214>       Length            (m)=      91.00        80.00
00215>       Mannings n             =      .013         .250
00216>
00217>       Max.eff.Inten.(mm/hr)=      33.12        26.26
00218>                  over (min)        4.00        22.00
00219>       Storage Coeff.  (min)=       3.76 (ii)   22.02 (ii)
00220>       Unit Hyd. Tpeak (min)=       4.00        22.00
00221>       Unit Hyd. peak  (cms)=        .29          .05
00222>                                                          *TOTALS*
00223>       PEAK FLOW       (cms)=        .00          .05          .045 (iii)
00224>       TIME TO PEAK    (hrs)=       2.65         3.02         3.017
00225>       RUNOFF VOLUME    (mm)=      35.30        13.59        13.617
00226>       TOTAL RAINFALL   (mm)=      36.00        36.00        36.000
00227>       RUNOFF COEFFICIENT   =        .98          .38          .378
00228>
00229>         (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
00230>             CN* =  80.0    Ia = Dep. Storage  (Above)
00231>        (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
00232>             THAN THE STORAGE COEFFICIENT.
00233>       (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00234>
00235>  --------------------------------------------------------------------------------
00236> 001:0008--------------------------------------------------------------------------
00237>  ----------------------
00238>  | ROUTE RESERVOIR    |    Requested routing time step =  1.0 min.
00239>  |  IN>01:(B3     )   |
00240>  | OUT<06:(SWM3  )   |    =========  OUTLFOW STORAGE TABLE  =========
00241>  ----------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
00242>                              (cms)    (ha.m.)   |    (cms)    (ha.m.)
00243>                               .000  .1200E-01   |     .017  .5860E-01
00244>                               .000  .1830E-01   |     .019  .7900E-01
00245>                               .010  .2510E-01   |     .022  .1022E+00
00246>                               .014  .4060E-01   |     .000  .0000E+00
00247>
00248>       ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
00249>       --------------------       (ha)     (cms)     (hrs)       (mm)
00250>       INFLOW >01: (B3    )       1.67      .045     3.017     13.617
00251>       OUTFLOW<06: (SWM3  )       1.67      .003     5.550      2.699
00252>      OVERFLOW<07: (SWM3-O)        .00      .000      .000       .000
00253>
00254>                     TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
```

```
00255>                    CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
00256>                    PERCENTAGE OF TIME OVERFLOWING    (%)=      .00
00257>
00258>
00259>                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=    6.940
00260>                    TIME SHIFT OF PEAK FLOW         (min)=   152.00
00261>                    MAXIMUM  STORAGE   USED       (ha.m.)=.2052E-01
00262>
00263>       *** WARNING: Outflow volume is less than inflow volume.
00264> --------------------------------------------------------------------------------
00265> 001:0009--------------------------------------------------------------------------
00266> ----------------------
00267> | CALIB STANDHYD     |   Area    (ha)=     .98
00268> | 01:B4     DT= 1.00 |   Total Imp(%)=   61.00   Dir. Conn.(%)=     .10
00269> ----------------------
00270>                              IMPERVIOUS    PERVIOUS (i)
00271>      Surface Area     (ha)=        .60          .38
00272>      Dep. Storage     (mm)=        .70        10.00
00273>      Average Slope     (%)=       1.00         2.00
00274>      Length            (m)=      68.00        30.00
00275>      Mannings n           =       .013         .250
00276>
00277>      Max.eff.Inten.(mm/hr)=      33.12        57.04
00278>                   over (min)        3.00        11.00
00279>      Storage Coeff.  (min)=       3.15 (ii)   10.59 (ii)
00280>      Unit Hyd. Tpeak (min)=       3.00        11.00
00281>      Unit Hyd. peak  (cms)=        .36          .11
00282>                                                          *TOTALS*
00283>      PEAK FLOW       (cms)=        .00          .05          .050 (iii)
00284>      TIME TO PEAK    (hrs)=       2.57         2.80         2.800
00285>      RUNOFF VOLUME    (mm)=      35.30        18.11        18.126
00286>      TOTAL RAINFALL   (mm)=      36.00        36.00        36.000
00287>      RUNOFF COEFFICIENT   =        .98          .50          .504
00288>
00289>        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
00290>            CN* =  80.0    Ia = Dep. Storage  (Above)
00291>       (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
00292>            THAN THE STORAGE COEFFICIENT.
00293>      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00294>
00295> --------------------------------------------------------------------------------
00296> 001:0010--------------------------------------------------------------------------
00297> ----------------------
00298> | ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
00299> |  IN>01:(B4    )   |
00300> | OUT<08:(SWM4  )   |    =========  OUTLFOW STORAGE TABLE  =========
00301> ----------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
00302>                             (cms)    (ha.m.)   |    (cms)    (ha.m.)
00303>                              .000  .1200E-01   |     .017  .5860E-01
00304>                              .000  .1830E-01   |     .019  .7900E-01
00305>                              .010  .2510E-01   |     .022  .1022E+00
00306>                              .014  .4060E-01   |     .000  .0000E+00
00307>
00308>      ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
00309>      ---------------------      (ha)     (cms)     (hrs)       (mm)
00310>      INFLOW >01: (B4    )        .98      .050     2.800     18.126
00311>      OUTFLOW<08: (SWM4  )        .98      .000      .000       .000
00312>     OVERFLOW<09: (SWM4-O)        .00      .000      .000       .000
00313>
00314>                    TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
00315>                    CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
00316>                    PERCENTAGE OF TIME OVERFLOWING    (%)=      .00
00317>
00318>
00319>                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=     .000
00320>                    TIME SHIFT OF PEAK FLOW         (min)=  -168.00
00321>                    MAXIMUM  STORAGE   USED       (ha.m.)=.1776E-01
00322>
00323>       *** WARNING: Outflow volume is less than inflow volume.
00324> --------------------------------------------------------------------------------
00325> 001:0011--------------------------------------------------------------------------
00326> ------------------------
00327> | ADD HYD (subtotal  ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
00328> ------------------------                  (ha)     (cms)   (hrs)   (mm)   (cms)
00329>                        ID1 02:SWM1          1.98      .004    5.87   2.58    .000
00330>                       +ID2 03:SWM1-OV         .00      .000     .00    .00    .000
00331>                       +ID3 04:SWM2          1.38      .000    7.03    .40    .000
00332>                       +ID4 05:SWM2-OV         .00      .000     .00    .00    .000
00333>                       +ID5 06:SWM3          1.67      .003    5.55   2.70    .000
00334>                       +ID6 07:SWM3-OV         .00      .000     .00    .00    .000
00335>                       +ID7 08:SWM4          .98      .000     .00    .00    .000
00336>                       +ID8 09:SWM4-OV         .00      .000     .00    .00    .000
00337>                        ============================================================
00338>                        SUM 01:subtotal       6.01      .007    5.73   1.69    .000
00339>
00340>    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
00341>
00342> --------------------------------------------------------------------------------
00343> 001:0012--------------------------------------------------------------------------
00344> ----------------------
00345> | CALIB STANDHYD     |   Area    (ha)=     .83
00346> | 02:B5     DT= 1.00 |   Total Imp(%)=   75.00   Dir. Conn.(%)=     .10
00347> ----------------------
00348>                              IMPERVIOUS    PERVIOUS (i)
00349>      Surface Area     (ha)=        .62          .21
00350>      Dep. Storage     (mm)=        .70        10.00
00351>      Average Slope     (%)=       1.00         2.00
00352>      Length            (m)=      59.00        15.00
00353>      Mannings n           =       .013         .250
00354>
00355>      Max.eff.Inten.(mm/hr)=      33.12       107.89
00356>                   over (min)        3.00         7.00
00357>      Storage Coeff.  (min)=       2.90 (ii)    6.70 (ii)
00358>      Unit Hyd. Tpeak (min)=       3.00         7.00
00359>      Unit Hyd. peak  (cms)=        .39          .17
00360>                                                          *TOTALS*
00361>      PEAK FLOW       (cms)=        .00          .06          .058 (iii)
00362>      TIME TO PEAK    (hrs)=       2.53         2.77         2.750
00363>      RUNOFF VOLUME    (mm)=      35.30        22.72        22.732
00364>      TOTAL RAINFALL   (mm)=      36.00        36.00        36.000
00365>      RUNOFF COEFFICIENT   =        .98          .63          .631
00366>
00367>        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
00368>            CN* =  80.0    Ia = Dep. Storage  (Above)
00369>       (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
00370>            THAN THE STORAGE COEFFICIENT.
00371>      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00372>
00373> --------------------------------------------------------------------------------
00374> 001:0013--------------------------------------------------------------------------
00375> ----------------------
00376> | ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
00377> |  IN>02:(B5    )   |
00378> | OUT<03:(SWM5  )   |    =========  OUTLFOW STORAGE TABLE  =========
00379> ----------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
00380>                             (cms)    (ha.m.)   |    (cms)    (ha.m.)
00381>                              .000  .1200E-01   |     .017  .5860E-01
00382>                              .000  .1830E-01   |     .019  .7900E-01
00383>                              .010  .2510E-01   |     .022  .1022E+00
00384>                              .014  .4060E-01   |     .000  .0000E+00
00385>
00386>      ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
00387>      ---------------------      (ha)     (cms)     (hrs)       (mm)
00388>      INFLOW >02: (B5    )        .83      .058     2.750     22.732
00389>      OUTFLOW<03: (SWM5  )        .83      .001     6.417       .765
00390>     OVERFLOW<04: (SWM5-O)        .00      .000      .000       .000
00391>
00392>                    TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
00393>                    CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
00394>                    PERCENTAGE OF TIME OVERFLOWING    (%)=      .00
00395>
00396>
00397>                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=    1.016
00398>                    TIME SHIFT OF PEAK FLOW         (min)=   220.00
00399>                    MAXIMUM  STORAGE   USED       (ha.m.)=.1872E-01
00400>
00401>       *** WARNING: Outflow volume is less than inflow volume.
00402> --------------------------------------------------------------------------------
00403> 001:0014--------------------------------------------------------------------------
00404> ----------------------
00405> | ADD HYD (Node1     ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
00406> ----------------------                   (ha)     (cms)   (hrs)   (mm)   (cms)
00407>                         ID1 01:subtotal       6.01     .007    5.73   1.69    .000
00408>                        +ID2 03:SWM5             .83     .001    6.42    .77    .000
00409>                        +ID3 04:SWM5-OV          .00     .000     .00    .00    .000
00410>                         ============================================================
00411>                         SUM 09:Node1          6.84     .007    6.43   1.58    .000
00412>
00413>    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
00414>
00415> --------------------------------------------------------------------------------
00416> 001:0015--------------------------------------------------------------------------
00417> ----------------------
00418> | CALIB STANDHYD     |   Area    (ha)=     .40
00419> | 01:B6     DT= 1.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=     .10
00420> ----------------------
00421>                              IMPERVIOUS    PERVIOUS (i)
00422>      Surface Area     (ha)=        .40          .00
00423>      Dep. Storage     (mm)=        .70        10.00
00424>      Average Slope     (%)=       1.00         2.00
00425>      Length            (m)=      45.00        15.00
00426>      Mannings n           =       .013         .250
00427>
00428>      Max.eff.Inten.(mm/hr)=      33.12      3306.60
00429>                   over (min)        2.00         3.00
00430>      Storage Coeff.  (min)=       2.46 (ii)    3.43 (ii)
00431>      Unit Hyd. Tpeak (min)=       2.00         3.00
00432>      Unit Hyd. peak  (cms)=        .49          .34
00433>                                                          *TOTALS*
00434>      PEAK FLOW       (cms)=        .00          .04          .037 (iii)
00435>      TIME TO PEAK    (hrs)=       2.47         2.75         2.750
00436>      RUNOFF VOLUME    (mm)=      35.30        35.27        35.275
00437>      TOTAL RAINFALL   (mm)=      36.00        36.00        36.000
00438>      RUNOFF COEFFICIENT   =        .98          .98          .980
00439>
00440>        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
00441>            CN* =  80.0    Ia = Dep. Storage  (Above)
00442>       (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
00443>            THAN THE STORAGE COEFFICIENT.
00444>      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00445>
00446> --------------------------------------------------------------------------------
00447> 001:0016--------------------------------------------------------------------------
00448> ----------------------
00449> | ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
00450> |  IN>01:(B6    )   |
00451> | OUT<02:(SWM6  )   |    =========  OUTLFOW STORAGE TABLE  =========
00452> ----------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
00453>                             (cms)    (ha.m.)   |    (cms)    (ha.m.)
00454>                              .000  .0000E+00   |     .009  .1200E-01
00455>                              .004  .2000E-02   |     .011  .1600E-01
00456>                              .005  .4000E-02   |     .012  .2000E-01
00457>                              .008  .8000E-02   |     .013  .2400E-01
00458>
00459>      ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
00460>      ---------------------      (ha)     (cms)     (hrs)       (mm)
00461>      INFLOW >01: (B6    )        .40      .037     2.750     35.275
00462>      OUTFLOW<02: (SWM6  )        .40      .008     3.317     35.275
00463>     OVERFLOW<03: (SWM6-O)        .00      .000      .000       .000
00464>
00465>                    TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
00466>                    CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
00467>                    PERCENTAGE OF TIME OVERFLOWING    (%)=      .00
00468>
00469>
00470>                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=   21.536
00471>                    TIME SHIFT OF PEAK FLOW         (min)=    34.00
00472>                    MAXIMUM  STORAGE   USED       (ha.m.)=.8517E-02
00473>
00474> --------------------------------------------------------------------------------
00475> 001:0017--------------------------------------------------------------------------
00476> ----------------------
00477> | CALIB STANDHYD     |   Area    (ha)=     .28
00478> | 04:B7     DT= 1.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=     .10
00479> ----------------------
00480>                              IMPERVIOUS    PERVIOUS (i)
00481>      Surface Area     (ha)=        .28          .00
00482>      Dep. Storage     (mm)=        .70        10.00
00483>      Average Slope     (%)=       1.00         2.00
00484>      Length            (m)=      37.00        15.00
00485>      Mannings n           =       .013         .250
00486>
00487>      Max.eff.Inten.(mm/hr)=      33.12      3306.60
00488>                   over (min)        2.00         3.00
00489>      Storage Coeff.  (min)=       2.19 (ii)    3.16 (ii)
00490>      Unit Hyd. Tpeak (min)=       2.00         3.00
00491>      Unit Hyd. peak  (cms)=        .53          .36
00492>                                                          *TOTALS*
00493>      PEAK FLOW       (cms)=        .00          .03          .026 (iii)
00494>      TIME TO PEAK    (hrs)=       2.43         2.75         2.750
00495>      RUNOFF VOLUME    (mm)=      35.30        35.28        35.275
00496>      TOTAL RAINFALL   (mm)=      36.00        36.00        36.000
00497>      RUNOFF COEFFICIENT   =        .98          .98          .980
00498>
00499>        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
00500>            CN* =  80.0    Ia = Dep. Storage  (Above)
00501>       (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
00502>            THAN THE STORAGE COEFFICIENT.
00503>      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00504>
00505> --------------------------------------------------------------------------------
00506> 001:0018--------------------------------------------------------------------------
00507> ----------------------
00508> | ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
```

```
|  IN>04:(B7    )   |
| OUT<05:(SWM7  )   |    =========  OUTLFOW STORAGE TABLE  =========
--------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                          (cms)    (ha.m.)   |    (cms)    (ha.m.)
                           .000  .0000E+00   |     .009  .9000E-02
                           .004  .1500E-02   |     .011  .1200E-01
                           .005  .3000E-02   |     .012  .1500E-01
                           .008  .6000E-02   |     .013  .1800E-01

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     --------------------       (ha)     (cms)     (hrs)       (mm)
     INFLOW >04: (B7    )        .28      .026     2.750     35.275
     OUTFLOW<05: (SWM7  )        .28      .007     3.267     35.275
    OVERFLOW<06: (SWM7-O)        .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](%)=   27.791
                    TIME SHIFT OF PEAK FLOW         (min)=    31.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=.5288E-02

--------------------------------------------------------------------------------
001:0019--------------------------------------------------------------------------
-------------------------
| ADD HYD (node2     ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
-----------------------                   (ha)     (cms)   (hrs)   (mm)   (cms)
                      ID1 02:SWM6           .40      .008    3.32  35.28    .000
                     +ID2 03:SWM6-OV        .00      .000     .00    .00    .000
                     +ID3 05:SWM7           .28      .007    3.27  35.28    .000
                     +ID4 06:SWM7-OV        .00      .000     .00    .00    .000
                      ========================================================
                      SUM 07:node2          .68      .015    3.28  35.28    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
001:0020--------------------------------------------------------------------------
----------------------
| CALIB STANDHYD     |   Area    (ha)=    1.51
| 01:C      DT= 1.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=     .10
----------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.49          .02
     Dep. Storage     (mm)=        .70        10.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      39.00        10.00
     Mannings n           =       .013         .250

     Max.eff.Inten.(mm/hr)=      33.12      3306.60
                  over (min)        2.00         3.00
     Storage Coeff.  (min)=       2.26 (ii)    3.02 (ii)
     Unit Hyd. Tpeak (min)=       2.00         3.00
     Unit Hyd. peak  (cms)=        .52          .37
                                                      *TOTALS*
     PEAK FLOW       (cms)=        .00          .14          .139 (iii)
     TIME TO PEAK    (hrs)=       2.50         2.75         2.750
     RUNOFF VOLUME    (mm)=      35.30        35.27        35.275
     TOTAL RAINFALL   (mm)=      36.00        36.00        36.000
     RUNOFF COEFFICIENT   =        .98          .98          .980

       (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.

--------------------------------------------------------------------------------
001:0021--------------------------------------------------------------------------
--------------------
| ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
|  IN>01:(C     )   |
| OUT<02:(RoofC )   |    =========  OUTLFOW STORAGE TABLE  =========
--------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                          (cms)    (ha.m.)   |    (cms)    (ha.m.)
                           .000  .0000E+00   |     .063  .1509E+00
                           .063  .7540E-01   |     .063  .2263E+00

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     --------------------       (ha)     (cms)     (hrs)       (mm)
     INFLOW >01: (C     )       1.51      .139     2.750     35.275
     OUTFLOW<02: (RoofC )       1.51      .029     3.317     35.275
    OVERFLOW<03: (roof-o)        .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](%)=   20.844
                    TIME SHIFT OF PEAK FLOW         (min)=    34.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=.3463E-01

--------------------------------------------------------------------------------
001:0022--------------------------------------------------------------------------
-------------------------
| ADD HYD (Node3     ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
-----------------------                   (ha)     (cms)   (hrs)   (mm)   (cms)
                      ID1 07:node2          .68      .015    3.28  35.28    .000
                     +ID2 02:RoofC         1.51      .029    3.32  35.27    .000
                     +ID3 03:roof-ovf       .00      .000     .00    .00    .000
                      ========================================================
                      SUM 08:Node3         2.19      .044    3.30  35.27    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
001:0023--------------------------------------------------------------------------
-------------------------
| ADD HYD (Node4     ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
-----------------------                   (ha)     (cms)   (hrs)   (mm)   (cms)
                      ID1 08:Node3          2.19      .044    3.30  35.27    .000
                     +ID2 09:Node1          6.84      .007    6.43   1.58    .000
                      ========================================================
                      SUM 01:Node4          9.03      .044    3.30   9.72    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
001:0024--------------------------------------------------------------------------
      FINISH
--------------------------------------------------------------------------------
********************************************************************************
     WARNINGS / ERRORS / NOTES
     -------------------------
001:0004 ROUTE RESERVOIR
     *** WARNING: Outflow volume is less than inflow volume.
001:0006 ROUTE RESERVOIR
     *** WARNING: Outflow volume is less than inflow volume.
001:0008 ROUTE RESERVOIR
     *** WARNING: Outflow volume is less than inflow volume.
001:0010 ROUTE RESERVOIR
     *** WARNING: Outflow volume is less than inflow volume.
001:0013 ROUTE RESERVOIR
     *** WARNING: Outflow volume is less than inflow volume.
  Simulation ended on 2022-02-15     at 16:45:36
================================================================================
```

```
00001> ================================================================================
00002>
00003>    SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO        999    999    =========
00004>    S      W W W  MM MM  H   H   Y Y   MM MM  O   O      9   9  9   9
00005>    SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  9   9   Ver  4.05
00006>        S  W W W  M   M  H   H    Y    M   M  O   O       9999   9999   Sept 2011
00007>    SSSSS   W W   M   M  H   H    Y    M   M   OOO           9      9    =========
00008>                                                          9   9  9   9   # 3375279
00009>          StormWater Management HYdrologic Model          999    999    =========
00010>
00011>  ********************************************************************************
00012>  ***************************** SWMHYMO Ver/4.05  ********************************
00013>  *********  A single event and continuous hydrologic simulation model  *********
00014>  *********     based on the principles of HYMO and its successors      *********
00015>  *********                 OTTHYMO-83 and OTTHYMO-89.                  *********
00016>  ********************************************************************************
00017>  ********* Distributed by:  J.F. Sabourin and Associates Inc.           *********
00018>  *********                  Ottawa,  Ontario: (613) 836-3884           *********
00019>  *********                  Gatineau, Quebec: (819) 243-6858           *********
00020>  *********                  E-Mail: swmhymo@jfsa.com                   *********
00021>  ********************************************************************************
00022>
00023>  ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
00024>  +++++++++ Licensed user: Calder Engineering Ltd.                      +++++++++
00025>  +++++++++                 Bolton               SERIAL#:3375279       +++++++++
00026>  ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
00027>
00028>  ********************************************************************************
00029>  *********          ++++++ PROGRAM ARRAY DIMENSIONS ++++++             *********
00030>  *********          Maximum value for ID numbers  :     10            *********
00031>  *********          Max. number of rainfall points: 105408            *********
00032>  *********          Max. number of flow points    : 105408            *********
00033>  ********************************************************************************
00034>
00035>
00036>  **********************   D E T A I L E D   O U T P U T   **********************
00037>  ********************************************************************************
00038>  *         DATE: 2022-02-15     TIME: 16:45:07     RUN COUNTER: 000624          *
00039>  ********************************************************************************
00040>  * Input   filename: C:\USERS\CALDER\DOCUME~1\SWMMHY~1\Sand\SAND-2~1\Sand-P6.da*
00041>  * Output  filename: C:\USERS\CALDER\DOCUME~1\SWMMHY~1\Sand\SAND-2~1\Sand-P6.ou*
00042>  * Summary filename: C:\USERS\CALDER\DOCUME~1\SWMMHY~1\Sand\SAND-2~1\Sand-P6.su*
00043>  * User comments:                                                            *
00044>  * 1:_____________________________________________________________________*
00045>  * 2:_____________________________________________________________________*
00046>  * 3:_____________________________________________________________________*
00047>  ********************************************************************************
00048>
00049>  --------------------------------------------------------------------------------
00050> 001:0001--------------------------------------------------------------------------
00051>  *#*****************************************************************************
00052>  *#  Project Name: [Sandhill]    Project Number: [19-216]
00053>  *#  Date        : [2022-02-15]
00054>  *#  Modeller    : [    MYS    ]
00055>  *#  Company     : Calder Engineering Ltd.
00056>  *#  License #   :  3375279
00057>  *#*****************************************************************************
00058>  *# Proposed Conditions:
00059>  *# Filename: Sand-P5.dat
00060>  *#*****************************************************************************
00061>  ---------------------
00062>  | START          |  Project  dir.: C:\USERS\CALDER\DOCUME~1\SWMMHY~1\Sand\SAND
00063>  ------------------  Rainfall dir.: C:\USERS\CALDER\DOCUME~1\SWMMHY~1\Sand\SAND
00064>     TZERO =   .00 hrs on      0
00065>     METOUT=   2 (output = METRIC)
00066>     NRUN  = 001
00067>     NSTORM=   0
00068>  --------------------------------------------------------------------------------
00069> 001:0002--------------------------------------------------------------------------
00070>  ---------------------
00071>  | READ STORM       |    Filename: 5yr/6hr
00072>  | Ptotal=  47.81 mm|    Comments: 5yr/6hr
00073>  ---------------------
00074>                TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
00075>                 hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
00076>                 .25    .000 |   2.00  16.250 |   3.75   6.690 |   5.50    .960
00077>                 .50    .960 |   2.25  16.250 |   4.00   3.820 |   5.75    .960
00078>                 .75    .960 |   2.50  43.980 |   4.25   3.820 |   6.00    .960
00079>                1.00    .960 |   2.75  43.980 |   4.50   1.910 |   6.25    .960
00080>                1.25    .960 |   3.00  12.430 |   4.75   1.910 |
00081>                1.50   5.740 |   3.25  12.430 |   5.00    .960 |
00082>                1.75   5.740 |   3.50   6.690 |   5.25    .960 |
00083>
00084>  --------------------------------------------------------------------------------
00085> 001:0003--------------------------------------------------------------------------
00086>  ----------------------
00087>  | CALIB STANDHYD     |   Area    (ha)=    1.98
00088>  | 01:B1     DT= 1.00 |   Total Imp(%)=   32.00   Dir. Conn.(%)=     .10
00089>  ----------------------
00090>                              IMPERVIOUS    PERVIOUS (i)
00091>       Surface Area     (ha)=        .63         1.35
00092>       Dep. Storage     (mm)=        .70        10.00
00093>       Average Slope     (%)=       1.00         2.00
00094>       Length            (m)=     100.00       100.00
00095>       Mannings n            =       .013         .250
00096>
00097>       Max.eff.Inten.(mm/hr)=      43.98        32.55
00098>                   over (min)        4.00        23.00
00099>       Storage Coeff.  (min)=       3.55 (ii)   22.71 (ii)
00100>       Unit Hyd. Tpeak (min)=       4.00        23.00
00101>       Unit Hyd. peak  (cms)=        .31          .05
00102>                                                          *TOTALS*
00103>       PEAK FLOW       (cms)=        .00          .08          .078 (iii)
00104>       TIME TO PEAK    (hrs)=       2.73         3.02         3.017
00105>       RUNOFF VOLUME    (mm)=      47.11        19.96        19.988
00106>       TOTAL RAINFALL   (mm)=      47.81        47.81        47.810
00107>       RUNOFF COEFFICIENT   =        .99          .42          .418
00108>
00109>         (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
00110>             CN* =  80.0    Ia = Dep. Storage  (Above)
00111>        (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
00112>             THAN THE STORAGE COEFFICIENT.
00113>       (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00114>
00115>  --------------------------------------------------------------------------------
00116> 001:0004--------------------------------------------------------------------------
00117>  ---------------------
00118>  | ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
00119>  |  IN>01:(B1    )   |
00120>  | OUT<02:(SWM1  )   |    =========  OUTLFOW STORAGE TABLE  =========
00121>  ---------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
00122>                             (cms)    (ha.m.)   |    (cms)    (ha.m.)
00123>                              .000  .1200E-01   |     .017  .5860E-01
00124>                              .000  .1830E-01   |     .019  .7900E-01
00125>                              .010  .2510E-01   |     .022  .1022E+00
00126>                              .014  .4060E-01   |     .000  .0000E+00
00127>
00128>       ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
00129>       --------------------       (ha)     (cms)     (hrs)       (mm)
00130>       INFLOW >01: (B1    )       1.98      .078     3.017     19.988
00131>       OUTFLOW<02: (SWM1  )       1.98      .011     4.933     10.746
00132>      OVERFLOW<03: (SWM1-O)        .00      .000      .000       .000
00133>
00134>                     TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
00135>                     CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
00136>                     PERCENTAGE OF TIME OVERFLOWING    (%)=      .00
00137>
00138>
00139>                     PEAK   FLOW   REDUCTION [Qout/Qin](%)=   14.103
00140>                     TIME SHIFT OF PEAK FLOW         (min)=   115.00
00141>                     MAXIMUM  STORAGE   USED       (ha.m.)=.3055E-01
00142>
00143>       *** WARNING: Outflow volume is less than inflow volume.
00144>  --------------------------------------------------------------------------------
00145> 001:0005--------------------------------------------------------------------------
00146>  ---------------------
00147>  | CALIB STANDHYD     |   Area    (ha)=    1.38
00148>  | 01:B2     DT= 1.00 |   Total Imp(%)=   42.00   Dir. Conn.(%)=     .10
00149>  ---------------------
00150>                              IMPERVIOUS    PERVIOUS (i)
00151>       Surface Area     (ha)=        .58          .80
00152>       Dep. Storage     (mm)=        .70        10.00
00153>       Average Slope     (%)=       1.00         2.00
00154>       Length            (m)=      83.00        90.00
00155>       Mannings n            =       .013         .250
00156>
00157>       Max.eff.Inten.(mm/hr)=      43.98        44.74
00158>                   over (min)        3.00        19.00
00159>       Storage Coeff.  (min)=       3.17 (ii)   19.01 (ii)
00160>       Unit Hyd. Tpeak (min)=       3.00        19.00
00161>       Unit Hyd. peak  (cms)=        .36          .06
00162>                                                          *TOTALS*
00163>       PEAK FLOW       (cms)=        .00          .07          .068 (iii)
00164>       TIME TO PEAK    (hrs)=       2.73         2.93         2.933
00165>       RUNOFF VOLUME    (mm)=      47.11        22.37        22.395
00166>       TOTAL RAINFALL   (mm)=      47.81        47.81        47.810
00167>       RUNOFF COEFFICIENT   =        .99          .47          .468
00168>
00169>         (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
00170>             CN* =  80.0    Ia = Dep. Storage  (Above)
00171>        (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
00172>             THAN THE STORAGE COEFFICIENT.
00173>       (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00174>
00175>  --------------------------------------------------------------------------------
00176> 001:0006--------------------------------------------------------------------------
00177>  ---------------------
00178>  | ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
00179>  |  IN>01:(B2    )   |
00180>  | OUT<04:(SWM2  )   |    =========  OUTLFOW STORAGE TABLE  =========
00181>  ---------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
00182>                             (cms)    (ha.m.)   |    (cms)    (ha.m.)
00183>                              .000  .1200E-01   |     .017  .5860E-01
00184>                              .000  .1830E-01   |     .019  .7900E-01
00185>                              .010  .2510E-01   |     .022  .1022E+00
00186>                              .014  .4060E-01   |     .000  .0000E+00
00187>
00188>       ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
00189>       --------------------       (ha)     (cms)     (hrs)       (mm)
00190>       INFLOW >01: (B2    )       1.38      .068     2.933     22.395
00191>       OUTFLOW<04: (SWM2  )       1.38      .009     4.683      9.134
00192>      OVERFLOW<05: (SWM2-O)        .00      .000      .000       .000
00193>
00194>                     TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
00195>                     CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
00196>                     PERCENTAGE OF TIME OVERFLOWING    (%)=      .00
00197>
00198>
00199>                     PEAK   FLOW   REDUCTION [Qout/Qin](%)=   13.703
00200>                     TIME SHIFT OF PEAK FLOW         (min)=   105.00
00201>                     MAXIMUM  STORAGE   USED       (ha.m.)=.2486E-01
00202>
00203>       *** WARNING: Outflow volume is less than inflow volume.
00204>  --------------------------------------------------------------------------------
00205> 001:0007--------------------------------------------------------------------------
00206>  ---------------------
00207>  | CALIB STANDHYD     |   Area    (ha)=    1.67
00208>  | 01:B3     DT= 1.00 |   Total Imp(%)=   42.00   Dir. Conn.(%)=     .10
00209>  ---------------------
00210>                              IMPERVIOUS    PERVIOUS (i)
00211>       Surface Area     (ha)=        .70          .97
00212>       Dep. Storage     (mm)=        .70        10.00
00213>       Average Slope     (%)=       1.00         2.00
00214>       Length            (m)=      91.00        80.00
00215>       Mannings n            =       .013         .250
00216>
00217>       Max.eff.Inten.(mm/hr)=      43.98        45.18
00218>                   over (min)        3.00        18.00
00219>       Storage Coeff.  (min)=       3.35 (ii)   18.05 (ii)
00220>       Unit Hyd. Tpeak (min)=       3.00        18.00
00221>       Unit Hyd. peak  (cms)=        .35          .06
00222>                                                          *TOTALS*
00223>       PEAK FLOW       (cms)=        .00          .08          .084 (iii)
00224>       TIME TO PEAK    (hrs)=       2.75         2.92         2.917
00225>       RUNOFF VOLUME    (mm)=      47.11        22.37        22.395
00226>       TOTAL RAINFALL   (mm)=      47.81        47.81        47.810
00227>       RUNOFF COEFFICIENT   =        .99          .47          .468
00228>
00229>         (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
00230>             CN* =  80.0    Ia = Dep. Storage  (Above)
00231>        (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
00232>             THAN THE STORAGE COEFFICIENT.
00233>       (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00234>
00235>  --------------------------------------------------------------------------------
00236> 001:0008--------------------------------------------------------------------------
00237>  ---------------------
00238>  | ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
00239>  |  IN>01:(B3    )   |
00240>  | OUT<06:(SWM3  )   |    =========  OUTLFOW STORAGE TABLE  =========
00241>  ---------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
00242>                             (cms)    (ha.m.)   |    (cms)    (ha.m.)
00243>                              .000  .1200E-01   |     .017  .5860E-01
00244>                              .000  .1830E-01   |     .019  .7900E-01
00245>                              .010  .2510E-01   |     .022  .1022E+00
00246>                              .014  .4060E-01   |     .000  .0000E+00
00247>
00248>       ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
00249>       --------------------       (ha)     (cms)     (hrs)       (mm)
00250>       INFLOW >01: (B3    )       1.67      .084     2.917     22.395
00251>       OUTFLOW<06: (SWM3  )       1.67      .011     4.700     11.437
00252>      OVERFLOW<07: (SWM3-O)        .00      .000      .000       .000
00253>
00254>                     TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
```

```
00255>                    CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
00256>                    PERCENTAGE OF TIME OVERFLOWING    (%)=      .00
00257>
00258>
00259>                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=   12.675
00260>                    TIME SHIFT OF PEAK FLOW         (min)=   107.00
00261>                    MAXIMUM  STORAGE   USED       (ha.m.)=.2914E-01
00262>
00263>       *** WARNING: Outflow volume is less than inflow volume.
00264> --------------------------------------------------------------------------------
00265> 001:0009--------------------------------------------------------------------------
00266> ----------------------
00267> | CALIB STANDHYD     |   Area    (ha)=     .98
00268> | 01:B4     DT= 1.00 |   Total Imp(%)=   61.00   Dir. Conn.(%)=     .10
00269> ----------------------
00270>                              IMPERVIOUS    PERVIOUS (i)
00271>      Surface Area     (ha)=        .60          .38
00272>      Dep. Storage     (mm)=        .70        10.00
00273>      Average Slope     (%)=       1.00         2.00
00274>      Length            (m)=      68.00        30.00
00275>      Mannings n            =       .013         .250
00276>
00277>      Max.eff.Inten.(mm/hr)=      43.98        86.48
00278>                   over (min)        3.00         9.00
00279>      Storage Coeff.  (min)=       2.82 (ii)    9.11 (ii)
00280>      Unit Hyd. Tpeak (min)=       3.00         9.00
00281>      Unit Hyd. peak  (cms)=        .39          .12
00282>                                                          *TOTALS*
00283>      PEAK FLOW       (cms)=        .00          .08          .080 (iii)
00284>      TIME TO PEAK    (hrs)=       2.73         2.78         2.783
00285>      RUNOFF VOLUME    (mm)=      47.11        28.06        28.081
00286>      TOTAL RAINFALL   (mm)=      47.81        47.81        47.810
00287>      RUNOFF COEFFICIENT   =        .99          .59          .587
00288>
00289>        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
00290>            CN* =  80.0    Ia = Dep. Storage  (Above)
00291>       (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
00292>            THAN THE STORAGE COEFFICIENT.
00293>      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00294>
00295> --------------------------------------------------------------------------------
00296> 001:0010--------------------------------------------------------------------------
00297> ----------------------
00298> | ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
00299> |  IN>01:(B4    )   |
00300> | OUT<08:(SWM4  )   |    =========  OUTLFOW STORAGE TABLE  =========
00301> ----------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
00302>                             (cms)    (ha.m.)   |    (cms)    (ha.m.)
00303>                              .000  .1200E-01   |     .017  .5860E-01
00304>                              .000  .1830E-01   |     .019  .7900E-01
00305>                              .010  .2510E-01   |     .022  .1022E+00
00306>                              .014  .4060E-01   |     .000  .0000E+00
00307>
00308>      ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
00309>      ---------------------      (ha)     (cms)     (hrs)       (mm)
00310>      INFLOW >01: (B4    )        .98      .080     2.783     28.081
00311>      OUTFLOW<08: (SWM4  )        .98      .007     4.433      9.476
00312>     OVERFLOW<09: (SWM4-O)        .00      .000      .000       .000
00313>
00314>                    TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
00315>                    CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
00316>                    PERCENTAGE OF TIME OVERFLOWING    (%)=      .00
00317>
00318>
00319>                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=    8.502
00320>                    TIME SHIFT OF PEAK FLOW         (min)=    99.00
00321>                    MAXIMUM  STORAGE   USED       (ha.m.)=.2314E-01
00322>
00323>       *** WARNING: Outflow volume is less than inflow volume.
00324> --------------------------------------------------------------------------------
00325> 001:0011--------------------------------------------------------------------------
00326> ------------------------
00327> | ADD HYD (subtotal  ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
00328> ------------------------                  (ha)     (cms)   (hrs)   (mm)   (cms)
00329>                        ID1 02:SWM1          1.98      .011    4.93  10.75    .000
00330>                       +ID2 03:SWM1-OV         .00      .000     .00    .00    .000
00331>                       +ID3 04:SWM2          1.38      .009    4.68   9.13    .000
00332>                       +ID4 05:SWM2-OV         .00      .000     .00    .00    .000
00333>                       +ID5 06:SWM3          1.67      .011    4.70  11.44    .000
00334>                       +ID6 07:SWM3-OV         .00      .000     .00    .00    .000
00335>                       +ID7 08:SWM4          .98      .007    4.43   9.48    .000
00336>                       +ID8 09:SWM4-OV         .00      .000     .00    .00    .000
00337>                        ================================================================
00338>                        SUM 01:subtotal       6.01     .038    4.63  10.35    .000
00339>
00340>    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
00341>
00342> --------------------------------------------------------------------------------
00343> 001:0012--------------------------------------------------------------------------
00344> ----------------------
00345> | CALIB STANDHYD     |   Area    (ha)=     .83
00346> | 02:B5     DT= 1.00 |   Total Imp(%)=   75.00   Dir. Conn.(%)=     .10
00347> ----------------------
00348>                              IMPERVIOUS    PERVIOUS (i)
00349>      Surface Area     (ha)=        .62          .21
00350>      Dep. Storage     (mm)=        .70        10.00
00351>      Average Slope     (%)=       1.00         2.00
00352>      Length            (m)=      59.00        15.00
00353>      Mannings n            =       .013         .250
00354>
00355>      Max.eff.Inten.(mm/hr)=      43.98       153.91
00356>                   over (min)        3.00         6.00
00357>      Storage Coeff.  (min)=       2.59 (ii)    5.88 (ii)
00358>      Unit Hyd. Tpeak (min)=       3.00         6.00
00359>      Unit Hyd. peak  (cms)=        .41          .19
00360>                                                          *TOTALS*
00361>      PEAK FLOW       (cms)=        .00          .08          .085 (iii)
00362>      TIME TO PEAK    (hrs)=       2.73         2.75         2.750
00363>      RUNOFF VOLUME    (mm)=      47.11        33.54        33.556
00364>      TOTAL RAINFALL   (mm)=      47.81        47.81        47.810
00365>      RUNOFF COEFFICIENT   =        .99          .70          .702
00366>
00367>        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
00368>            CN* =  80.0    Ia = Dep. Storage  (Above)
00369>       (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
00370>            THAN THE STORAGE COEFFICIENT.
00371>      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00372>
00373> --------------------------------------------------------------------------------
00374> 001:0013--------------------------------------------------------------------------
00375> ----------------------
00376> | ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
00377> |  IN>02:(B5    )   |
00378> | OUT<03:(SWM5  )   |    =========  OUTLFOW STORAGE TABLE  =========
00379> ----------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
00380>                             (cms)    (ha.m.)   |    (cms)    (ha.m.)
00381>                              .000  .1200E-01   |     .017  .5860E-01
00382>                              .000  .1830E-01   |     .019  .7900E-01
00383>                              .010  .2510E-01   |     .022  .1022E+00
00384>                              .014  .4060E-01   |     .000  .0000E+00
00385>
00386>      ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
00387>      ---------------------      (ha)     (cms)     (hrs)       (mm)
00388>      INFLOW >02: (B5    )        .83      .085     2.750     33.556
00389>      OUTFLOW<03: (SWM5  )        .83      .007     4.333     11.589
00390>     OVERFLOW<04: (SWM5-O)        .00      .000      .000       .000
00391>
00392>                    TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
00393>                    CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
00394>                    PERCENTAGE OF TIME OVERFLOWING    (%)=      .00
00395>
00396>
00397>                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=    8.350
00398>                    TIME SHIFT OF PEAK FLOW         (min)=    95.00
00399>                    MAXIMUM  STORAGE   USED       (ha.m.)=.2333E-01
00400>
00401>       *** WARNING: Outflow volume is less than inflow volume.
00402> --------------------------------------------------------------------------------
00403> 001:0014--------------------------------------------------------------------------
00404> ----------------------
00405> | ADD HYD (Node1     ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
00406> ----------------------                   (ha)     (cms)   (hrs)   (mm)   (cms)
00407>                         ID1 01:subtotal       6.01     .038    4.63  10.35    .000
00408>                        +ID2 03:SWM5             .83      .007    4.33  11.59    .000
00409>                        +ID3 04:SWM5-OV          .00      .000     .00    .00    .000
00410>                         ================================================================
00411>                         SUM 09:Node1          6.84     .044    4.55  10.57    .000
00412>
00413>    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
00414>
00415> --------------------------------------------------------------------------------
00416> 001:0015--------------------------------------------------------------------------
00417> ----------------------
00418> | CALIB STANDHYD     |   Area    (ha)=     .40
00419> | 01:B6     DT= 1.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=     .10
00420> ----------------------
00421>                              IMPERVIOUS    PERVIOUS (i)
00422>      Surface Area     (ha)=        .40          .00
00423>      Dep. Storage     (mm)=        .70        10.00
00424>      Average Slope     (%)=       1.00         2.00
00425>      Length            (m)=      45.00        15.00
00426>      Mannings n            =       .013         .250
00427>
00428>      Max.eff.Inten.(mm/hr)=      43.98      4392.01
00429>                   over (min)        2.00         3.00
00430>      Storage Coeff.  (min)=       2.20 (ii)    3.06 (ii)
00431>      Unit Hyd. Tpeak (min)=       2.00         3.00
00432>      Unit Hyd. peak  (cms)=        .53          .37
00433>                                                          *TOTALS*
00434>      PEAK FLOW       (cms)=        .00          .05          .049 (iii)
00435>      TIME TO PEAK    (hrs)=       2.75         2.75         2.750
00436>      RUNOFF VOLUME    (mm)=      47.11        47.08        47.083
00437>      TOTAL RAINFALL   (mm)=      47.81        47.81        47.810
00438>      RUNOFF COEFFICIENT   =        .99          .98          .985
00439>
00440>        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
00441>            CN* =  80.0    Ia = Dep. Storage  (Above)
00442>       (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
00443>            THAN THE STORAGE COEFFICIENT.
00444>      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00445>
00446> --------------------------------------------------------------------------------
00447> 001:0016--------------------------------------------------------------------------
00448> ----------------------
00449> | ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
00450> |  IN>01:(B6    )   |
00451> | OUT<02:(SWM6  )   |    =========  OUTLFOW STORAGE TABLE  =========
00452> ----------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
00453>                             (cms)    (ha.m.)   |    (cms)    (ha.m.)
00454>                              .000  .0000E+00   |     .009  .1200E-01
00455>                              .004  .2000E-02   |     .011  .1600E-01
00456>                              .005  .4000E-02   |     .012  .2000E-01
00457>                              .008  .8000E-02   |     .013  .2400E-01
00458>
00459>      ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
00460>      ---------------------      (ha)     (cms)     (hrs)       (mm)
00461>      INFLOW >01: (B6    )        .40      .049     2.750     47.083
00462>      OUTFLOW<02: (SWM6  )        .40      .009     3.333     47.082
00463>     OVERFLOW<03: (SWM6-O)        .00      .000      .000       .000
00464>
00465>                    TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
00466>                    CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
00467>                    PERCENTAGE OF TIME OVERFLOWING    (%)=      .00
00468>
00469>
00470>                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=   19.095
00471>                    TIME SHIFT OF PEAK FLOW         (min)=    35.00
00472>                    MAXIMUM  STORAGE   USED       (ha.m.)=.1183E-01
00473>
00474> --------------------------------------------------------------------------------
00475> 001:0017--------------------------------------------------------------------------
00476> ----------------------
00477> | CALIB STANDHYD     |   Area    (ha)=     .28
00478> | 04:B7     DT= 1.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=     .10
00479> ----------------------
00480>                              IMPERVIOUS    PERVIOUS (i)
00481>      Surface Area     (ha)=        .28          .00
00482>      Dep. Storage     (mm)=        .70        10.00
00483>      Average Slope     (%)=       1.00         2.00
00484>      Length            (m)=      37.00        15.00
00485>      Mannings n            =       .013         .250
00486>
00487>      Max.eff.Inten.(mm/hr)=      43.98      4392.01
00488>                   over (min)        2.00         3.00
00489>      Storage Coeff.  (min)=       1.95 (ii)    2.82 (ii)
00490>      Unit Hyd. Tpeak (min)=       2.00         3.00
00491>      Unit Hyd. peak  (cms)=        .57          .39
00492>                                                          *TOTALS*
00493>      PEAK FLOW       (cms)=        .00          .03          .034 (iii)
00494>      TIME TO PEAK    (hrs)=       2.75         2.75         2.750
00495>      RUNOFF VOLUME    (mm)=      47.11        47.08        47.083
00496>      TOTAL RAINFALL   (mm)=      47.81        47.81        47.810
00497>      RUNOFF COEFFICIENT   =        .99          .98          .985
00498>
00499>        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
00500>            CN* =  80.0    Ia = Dep. Storage  (Above)
00501>       (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
00502>            THAN THE STORAGE COEFFICIENT.
00503>      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00504>
00505> --------------------------------------------------------------------------------
00506> 001:0018--------------------------------------------------------------------------
00507> ----------------------
00508> | ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
```

```
|  IN>04:(B7    )   |
| OUT<05:(SWM7  )   |    =========  OUTLFOW STORAGE TABLE  =========
--------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                          (cms)    (ha.m.)   |    (cms)    (ha.m.)
                           .000  .0000E+00   |     .009  .9000E-02
                           .004  .1500E-02   |     .011  .1200E-01
                           .005  .3000E-02   |     .012  .1500E-01
                           .008  .6000E-02   |     .013  .1800E-01

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     --------------------       (ha)     (cms)     (hrs)       (mm)
     INFLOW >04: (B7    )        .28      .034     2.750     47.083
     OUTFLOW<05: (SWM7  )        .28      .009     3.283     47.083
    OVERFLOW<06: (SWM7-O)        .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](%)=   24.881
                    TIME SHIFT OF PEAK FLOW         (min)=    32.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=.7426E-02

--------------------------------------------------------------------------------
001:0019--------------------------------------------------------------------------
-------------------------
| ADD HYD (node2     ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
-----------------------                    (ha)     (cms)   (hrs)   (mm)   (cms)
                       ID1 02:SWM6           .40      .009    3.33  47.08    .000
                      +ID2 03:SWM6-OV        .00      .000     .00    .00    .000
                      +ID3 05:SWM7           .28      .009    3.28  47.08    .000
                      +ID4 06:SWM7-OV        .00      .000     .00    .00    .000
                       ============================================================
                       SUM 07:node2          .68      .018    3.30  47.08    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
001:0020--------------------------------------------------------------------------
----------------------
| CALIB STANDHYD     |   Area    (ha)=    1.51
| 01:C      DT= 1.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=     .10
----------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.49          .02
     Dep. Storage     (mm)=        .70        10.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      39.00        10.00
     Mannings n           =       .013         .250

     Max.eff.Inten.(mm/hr)=      43.98      4392.01
                  over (min)        2.00         3.00
     Storage Coeff.  (min)=       2.02 (ii)    2.69 (ii)
     Unit Hyd. Tpeak (min)=       2.00         3.00
     Unit Hyd. peak  (cms)=        .56          .40
                                                      *TOTALS*
     PEAK FLOW       (cms)=        .00          .18          .184 (iii)
     TIME TO PEAK    (hrs)=       2.73         2.75         2.750
     RUNOFF VOLUME    (mm)=      47.11        47.08        47.083
     TOTAL RAINFALL   (mm)=      47.81        47.81        47.810
     RUNOFF COEFFICIENT   =        .99          .98          .985

       (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.

--------------------------------------------------------------------------------
001:0021--------------------------------------------------------------------------
--------------------
| ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
|  IN>01:(C     )   |
| OUT<02:(RoofC )   |    =========  OUTLFOW STORAGE TABLE  =========
--------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                          (cms)    (ha.m.)   |    (cms)    (ha.m.)
                           .000  .0000E+00   |     .063  .1509E+00
                           .063  .7540E-01   |     .063  .2263E+00

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     --------------------       (ha)     (cms)     (hrs)       (mm)
     INFLOW >01: (C     )       1.51      .184     2.750     47.083
     OUTFLOW<02: (RoofC )       1.51      .039     3.317     47.082
    OVERFLOW<03: (roof-o)        .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](%)=   20.937
                    TIME SHIFT OF PEAK FLOW         (min)=    34.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=.4621E-01

--------------------------------------------------------------------------------
001:0022--------------------------------------------------------------------------
-------------------------
| ADD HYD (Node3     ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
-----------------------                    (ha)     (cms)   (hrs)   (mm)   (cms)
                       ID1 07:node2          .68      .018    3.30  47.08    .000
                      +ID2 02:RoofC         1.51      .039    3.32  47.08    .000
                      +ID3 03:roof-ovf       .00      .000     .00    .00    .000
                       ============================================================
                       SUM 08:Node3         2.19      .056    3.30  47.08    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
001:0023--------------------------------------------------------------------------
-------------------------
| ADD HYD (Node4     ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
-----------------------                    (ha)     (cms)   (hrs)   (mm)   (cms)
                       ID1 08:Node3          2.19      .056    3.30  47.08    .000
                      +ID2 09:Node1          6.84      .044    4.55  10.57    .000
                       ============================================================
                       SUM 01:Node4          9.03      .095    4.27  19.36    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
001:0024--------------------------------------------------------------------------
      FINISH
--------------------------------------------------------------------------------
********************************************************************************
     WARNINGS / ERRORS / NOTES
     -------------------------
001:0004 ROUTE RESERVOIR
     *** WARNING: Outflow volume is less than inflow volume.
001:0006 ROUTE RESERVOIR
     *** WARNING: Outflow volume is less than inflow volume.
001:0008 ROUTE RESERVOIR
     *** WARNING: Outflow volume is less than inflow volume.
001:0010 ROUTE RESERVOIR
     *** WARNING: Outflow volume is less than inflow volume.
001:0013 ROUTE RESERVOIR
     *** WARNING: Outflow volume is less than inflow volume.
  Simulation ended on 2022-02-15     at 16:45:07
================================================================================
```

```
00001> ================================================================================
00002>
00003>    SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO        999    999    =========
00004>    S      W W W  MM MM  H   H   Y Y   MM MM  O   O      9   9  9   9
00005>    SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  9   9   Ver  4.05
00006>        S  W W W  M   M  H   H    Y    M   M  O   O      9999   9999   Sept 2011
00007>    SSSSS   W W   M   M  H   H    Y    M   M   OOO           9      9   =========
00008>                                                          9   9  9   9   # 3375279
00009>          StormWater Management HYdrologic Model          999    999    =========
00010>
00011>  ********************************************************************************
00012>  ***************************** SWMHYMO Ver/4.05  ********************************
00013>  *********  A single event and continuous hydrologic simulation model  *********
00014>  *********     based on the principles of HYMO and its successors      *********
00015>  *********                 OTTHYMO-83 and OTTHYMO-89.                  *********
00016>  ********************************************************************************
00017>  ********* Distributed by:  J.F. Sabourin and Associates Inc.           *********
00018>  *********                  Ottawa,  Ontario: (613) 836-3884           *********
00019>  *********                  Gatineau, Quebec: (819) 243-6858           *********
00020>  *********                  E-Mail: swmhymo@jfsa.Com                   *********
00021>  ********************************************************************************
00022>
00023>  ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
00024>  +++++++++ Licensed user: Calder Engineering Ltd.                       +++++++++
00025>  +++++++++                 Bolton                SERIAL#:3375279       +++++++++
00026>  ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
00027>
00028>  ********************************************************************************
00029>  *********          ++++++ PROGRAM ARRAY DIMENSIONS ++++++             *********
00030>  *********          Maximum value for ID numbers  :     10            *********
00031>  *********          Max. number of rainfall points: 105408            *********
00032>  *********          Max. number of flow points    : 105408            *********
00033>  ********************************************************************************
00034>
00035>
00036>  **********************   D E T A I L E D   O U T P U T   **********************
00037>  ********************************************************************************
00038>  *         DATE: 2022-02-15     TIME: 16:44:36     RUN COUNTER: 000623          *
00039>  ********************************************************************************
00040>  * Input   filename: C:\USERS\CALDER\DOCUME~1\SWMMHY~1\Sand\SAND-2~1\Sand-P6.da*
00041>  * Output  filename: C:\USERS\CALDER\DOCUME~1\SWMMHY~1\Sand\SAND-2~1\Sand-P6.ou*
00042>  * Summary filename: C:\USERS\CALDER\DOCUME~1\SWMMHY~1\Sand\SAND-2~1\Sand-P6.su*
00043>  * User comments:                                                             *
00044>  * 1:_____________________________________________________________________*
00045>  * 2:_____________________________________________________________________*
00046>  * 3:_____________________________________________________________________*
00047>  ********************************************************************************
00048>
00049>  --------------------------------------------------------------------------------
00050> 001:0001--------------------------------------------------------------------------
00051>  *#*****************************************************************************
00052>  *#  Project Name: [Sandhill]    Project Number: [19-216]
00053>  *#  Date        : [2022-02-15]
00054>  *#  Modeller    : [    MYS    ]
00055>  *#  Company     : Calder Engineering Ltd.
00056>  *#  License #   :  3375279
00057>  *#*****************************************************************************
00058>  *# Proposed Conditions:
00059>  *# Filename: Sand-P5.dat
00060>  *#*****************************************************************************
00061>  ---------------------
00062>  | START        |  Project  dir.: C:\USERS\CALDER\DOCUME~1\SWMMHY~1\Sand\SAND
00063>  ---------------------  Rainfall dir.: C:\USERS\CALDER\DOCUME~1\SWMMHY~1\Sand\SAND
00064>     TZERO =   .00 hrs on      0
00065>     METOUT=   2 (output = METRIC)
00066>     NRUN  = 001
00067>     NSTORM=   0
00068>  --------------------------------------------------------------------------------
00069> 001:0002--------------------------------------------------------------------------
00070>  --------------------
00071>  | READ STORM       |    Filename: 10yr/6hr
00072>  | Ptotal=  55.69 mm|    Comments: 10yr/6hr
00073>  --------------------
00074>                TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
00075>                 hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
00076>                 .25    .000 |   2.00  18.940 |   3.75   7.800 |   5.50   1.110
00077>                 .50   1.110 |   2.25  18.940 |   4.00   4.460 |   5.75   1.110
00078>                 .75   1.110 |   2.50  51.240 |   4.25   4.460 |   6.00   1.110
00079>                1.00   1.110 |   2.75  51.240 |   4.50   2.230 |   6.25   1.110
00080>                1.25   1.110 |   3.00  14.480 |   4.75   2.230 |
00081>                1.50   6.680 |   3.25  14.480 |   5.00   1.110 |
00082>                1.75   6.680 |   3.50   7.800 |   5.25   1.110 |
00083>
00084>  --------------------------------------------------------------------------------
00085> 001:0003--------------------------------------------------------------------------
00086>  ----------------------
00087>  | CALIB STANDHYD     |   Area    (ha)=    1.98
00088>  | 01:B1     DT= 1.00 |   Total Imp(%)=   32.00   Dir. Conn.(%)=     .10
00089>  ----------------------
00090>                              IMPERVIOUS    PERVIOUS (i)
00091>       Surface Area     (ha)=        .63         1.35
00092>       Dep. Storage     (mm)=        .70        10.00
00093>       Average Slope     (%)=       1.00         2.00
00094>       Length            (m)=     100.00       100.00
00095>       Mannings n            =       .013         .250
00096>
00097>       Max.eff.Inten.(mm/hr)=      51.24        43.83
00098>                   over (min)=       3.00        20.00
00099>       Storage Coeff.  (min)=       3.34 (ii)   20.35 (ii)
00100>       Unit Hyd. Tpeak (min)=       3.00        20.00
00101>       Unit Hyd. peak  (cms)=        .35          .06
00102>                                                        *TOTALS*
00103>       PEAK FLOW       (cms)=        .00          .11          .109 (iii)
00104>       TIME TO PEAK    (hrs)=       2.63         2.97         2.967
00105>       RUNOFF VOLUME    (mm)=      54.99        25.94        25.972
00106>       TOTAL RAINFALL   (mm)=      55.69        55.69        55.690
00107>       RUNOFF COEFFICIENT   =        .99          .47          .466
00108>
00109>         (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
00110>             CN* =  80.0    Ia = Dep. Storage  (Above)
00111>        (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
00112>             THAN THE STORAGE COEFFICIENT.
00113>       (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00114>
00115>  --------------------------------------------------------------------------------
00116> 001:0004--------------------------------------------------------------------------
00117>  ----------------------
00118>  | ROUTE RESERVOIR    |    Requested routing time step =  1.0 min.
00119>  |  IN>01:(B1     )   |
00120>  | OUT<02:(SWM1  )    |    =========  OUTLFOW STORAGE TABLE  =========
00121>  ----------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
00122>                              (cms)    (ha.m.)   |    (cms)    (ha.m.)
00123>                               .000  .1200E-01   |     .017  .5860E-01
00124>                               .000  .1830E-01   |     .019  .7900E-01
00125>                               .010  .2510E-01   |     .022  .1022E+00
00126>                               .014  .4060E-01   |     .000  .0000E+00
00127>
00128>       ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
00129>       --------------------       (ha)     (cms)     (hrs)       (mm)
00130>       INFLOW >01: (B1    )       1.98      .109     2.967     25.972
00131>       OUTFLOW<02: (SWM1  )       1.98      .013     4.867     16.730
00132>      OVERFLOW<03: (SWM1-O)        .00      .000      .000       .000
00133>
00134>                     TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
00135>                     CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
00136>                     PERCENTAGE OF TIME OVERFLOWING    (%)=      .00
00137>
00138>
00139>                     PEAK   FLOW   REDUCTION [Qout/Qin](%)=   12.264
00140>                     TIME SHIFT OF PEAK FLOW         (min)=   114.00
00141>                     MAXIMUM  STORAGE   USED       (ha.m.)=.3963E-01
00142>
00143>       *** WARNING: Outflow volume is less than inflow volume.
00144>  --------------------------------------------------------------------------------
00145> 001:0005--------------------------------------------------------------------------
00146>  ----------------------
00147>  | CALIB STANDHYD     |   Area    (ha)=    1.38
00148>  | 01:B2     DT= 1.00 |   Total Imp(%)=   42.00   Dir. Conn.(%)=     .10
00149>  ----------------------
00150>                              IMPERVIOUS    PERVIOUS (i)
00151>       Surface Area     (ha)=        .58         .80
00152>       Dep. Storage     (mm)=        .70        10.00
00153>       Average Slope     (%)=       1.00         2.00
00154>       Length            (m)=      83.00        90.00
00155>       Mannings n            =       .013         .250
00156>
00157>       Max.eff.Inten.(mm/hr)=      51.24        57.96
00158>                   over (min)=       3.00        17.00
00159>       Storage Coeff.  (min)=       2.98 (ii)   17.26 (ii)
00160>       Unit Hyd. Tpeak (min)=       3.00        17.00
00161>       Unit Hyd. peak  (cms)=        .38          .07
00162>                                                        *TOTALS*
00163>       PEAK FLOW       (cms)=        .00          .09          .092 (iii)
00164>       TIME TO PEAK    (hrs)=       2.58         2.90         2.900
00165>       RUNOFF VOLUME    (mm)=      54.99        28.68        28.711
00166>       TOTAL RAINFALL   (mm)=      55.69        55.69        55.690
00167>       RUNOFF COEFFICIENT   =        .99          .52          .516
00168>
00169>         (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
00170>             CN* =  80.0    Ia = Dep. Storage  (Above)
00171>        (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
00172>             THAN THE STORAGE COEFFICIENT.
00173>       (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00174>
00175>  --------------------------------------------------------------------------------
00176> 001:0006--------------------------------------------------------------------------
00177>  ----------------------
00178>  | ROUTE RESERVOIR    |    Requested routing time step =  1.0 min.
00179>  |  IN>01:(B2     )   |
00180>  | OUT<04:(SWM2  )    |    =========  OUTLFOW STORAGE TABLE  =========
00181>  ----------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
00182>                              (cms)    (ha.m.)   |    (cms)    (ha.m.)
00183>                               .000  .1200E-01   |     .017  .5860E-01
00184>                               .000  .1830E-01   |     .019  .7900E-01
00185>                               .010  .2510E-01   |     .022  .1022E+00
00186>                               .014  .4060E-01   |     .000  .0000E+00
00187>
00188>       ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
00189>       --------------------       (ha)     (cms)     (hrs)       (mm)
00190>       INFLOW >01: (B2    )       1.38      .092     2.900     28.711
00191>       OUTFLOW<04: (SWM2  )       1.38      .011     4.650     15.450
00192>      OVERFLOW<05: (SWM2-O)        .00      .000      .000       .000
00193>
00194>                     TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
00195>                     CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
00196>                     PERCENTAGE OF TIME OVERFLOWING    (%)=      .00
00197>
00198>
00199>                     PEAK   FLOW   REDUCTION [Qout/Qin](%)=   12.101
00200>                     TIME SHIFT OF PEAK FLOW         (min)=   105.00
00201>                     MAXIMUM  STORAGE   USED       (ha.m.)=.3084E-01
00202>
00203>       *** WARNING: Outflow volume is less than inflow volume.
00204>  --------------------------------------------------------------------------------
00205> 001:0007--------------------------------------------------------------------------
00206>  ----------------------
00207>  | CALIB STANDHYD     |   Area    (ha)=    1.67
00208>  | 01:B3     DT= 1.00 |   Total Imp(%)=   42.00   Dir. Conn.(%)=     .10
00209>  ----------------------
00210>                              IMPERVIOUS    PERVIOUS (i)
00211>       Surface Area     (ha)=        .70         .97
00212>       Dep. Storage     (mm)=        .70        10.00
00213>       Average Slope     (%)=       1.00         2.00
00214>       Length            (m)=      91.00        80.00
00215>       Mannings n            =       .013         .250
00216>
00217>       Max.eff.Inten.(mm/hr)=      51.24        58.42
00218>                   over (min)=       3.00        16.00
00219>       Storage Coeff.  (min)=       3.15 (ii)   16.42 (ii)
00220>       Unit Hyd. Tpeak (min)=       3.00        16.00
00221>       Unit Hyd. peak  (cms)=        .36          .07
00222>                                                        *TOTALS*
00223>       PEAK FLOW       (cms)=        .00          .11          .114 (iii)
00224>       TIME TO PEAK    (hrs)=       2.62         2.88         2.883
00225>       RUNOFF VOLUME    (mm)=      54.99        28.68        28.711
00226>       TOTAL RAINFALL   (mm)=      55.69        55.69        55.690
00227>       RUNOFF COEFFICIENT   =        .99          .52          .516
00228>
00229>         (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
00230>             CN* =  80.0    Ia = Dep. Storage  (Above)
00231>        (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
00232>             THAN THE STORAGE COEFFICIENT.
00233>       (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00234>
00235>  --------------------------------------------------------------------------------
00236> 001:0008--------------------------------------------------------------------------
00237>  ----------------------
00238>  | ROUTE RESERVOIR    |    Requested routing time step =  1.0 min.
00239>  |  IN>01:(B3     )   |
00240>  | OUT<06:(SWM3  )    |    =========  OUTLFOW STORAGE TABLE  =========
00241>  ----------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
00242>                              (cms)    (ha.m.)   |    (cms)    (ha.m.)
00243>                               .000  .1200E-01   |     .017  .5860E-01
00244>                               .000  .1830E-01   |     .019  .7900E-01
00245>                               .010  .2510E-01   |     .022  .1022E+00
00246>                               .014  .4060E-01   |     .000  .0000E+00
00247>
00248>       ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
00249>       --------------------       (ha)     (cms)     (hrs)       (mm)
00250>       INFLOW >01: (B3    )       1.67      .114     2.883     28.711
00251>       OUTFLOW<06: (SWM3  )       1.67      .013     4.650     17.753
00252>      OVERFLOW<07: (SWM3-O)        .00      .000      .000       .000
00253>
00254>                     TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
```

```
00255>                    CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
00256>                    PERCENTAGE OF TIME OVERFLOWING    (%)=      .00
00257>
00258>
00259>                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=   11.194
00260>                    TIME SHIFT OF PEAK FLOW         (min)=   106.00
00261>                    MAXIMUM  STORAGE   USED       (ha.m.)=.3716E-01
00262>
00263>       *** WARNING: Outflow volume is less than inflow volume.
00264> --------------------------------------------------------------------------------
00265> 001:0009--------------------------------------------------------------------------
00266> ----------------------
00267> | CALIB STANDHYD     |   Area    (ha)=     .98
00268> | 01:B4     DT= 1.00 |   Total Imp(%)=   61.00   Dir. Conn.(%)=     .10
00269> ----------------------
00270>                              IMPERVIOUS    PERVIOUS (i)
00271>      Surface Area     (ha)=        .60         .38
00272>      Dep. Storage     (mm)=        .70       10.00
00273>      Average Slope     (%)=       1.00        2.00
00274>      Length            (m)=      68.00       30.00
00275>      Mannings n           =       .013        .250
00276>
00277>      Max.eff.Inten.(mm/hr)=      51.24      106.35
00278>                   over (min)       3.00        8.00
00279>      Storage Coeff.  (min)=       2.65 (ii)   8.44 (ii)
00280>      Unit Hyd. Tpeak (min)=       3.00        8.00
00281>      Unit Hyd. peak  (cms)=        .41         .14
00282>                                                          *TOTALS*
00283>      PEAK FLOW       (cms)=        .00         .10          .102 (iii)
00284>      TIME TO PEAK    (hrs)=       2.55        2.77         2.767
00285>      RUNOFF VOLUME    (mm)=      54.99       35.02        35.042
00286>      TOTAL RAINFALL   (mm)=      55.69       55.69        55.690
00287>      RUNOFF COEFFICIENT   =        .99         .63          .629
00288>
00289>        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
00290>            CN* =  80.0    Ia = Dep. Storage  (Above)
00291>       (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
00292>            THAN THE STORAGE COEFFICIENT.
00293>      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00294>
00295> --------------------------------------------------------------------------------
00296> 001:0010--------------------------------------------------------------------------
00297> ----------------------
00298> | ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
00299> |  IN>01:(B4    )   |
00300> | OUT<08:(SWM4  )   |    =========  OUTLFOW STORAGE TABLE  =========
00301> ----------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
00302>                             (cms)    (ha.m.)   |    (cms)    (ha.m.)
00303>                              .000  .1200E-01   |     .017  .5860E-01
00304>                              .000  .1830E-01   |     .019  .7900E-01
00305>                              .010  .2510E-01   |     .022  .1022E+00
00306>                              .014  .4060E-01   |     .000  .0000E+00
00307>
00308>      ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
00309>      --------------------       (ha)     (cms)     (hrs)       (mm)
00310>      INFLOW >01: (B4    )        .98      .102     2.767     35.042
00311>      OUTFLOW<08: (SWM4  )        .98      .010     4.333     16.368
00312>     OVERFLOW<09: (SWM4-O)        .00      .000      .000       .000
00313>
00314>                    TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
00315>                    CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
00316>                    PERCENTAGE OF TIME OVERFLOWING    (%)=      .00
00317>
00318>
00319>                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=    9.955
00320>                    TIME SHIFT OF PEAK FLOW         (min)=    94.00
00321>                    MAXIMUM  STORAGE   USED       (ha.m.)=.2713E-01
00322>
00323>       *** WARNING: Outflow volume is less than inflow volume.
00324> --------------------------------------------------------------------------------
00325> 001:0011--------------------------------------------------------------------------
00326> ------------------------
00327> | ADD HYD (subtotal  ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
00328> ------------------------                  (ha)     (cms)   (hrs)   (mm)   (cms)
00329>                        ID1 02:SWM1          1.98      .013    4.87  16.73    .000
00330>                       +ID2 03:SWM1-OV        .00      .000     .00    .00    .000
00331>                       +ID3 04:SWM2          1.38      .011    4.65  15.45    .000
00332>                       +ID4 05:SWM2-OV        .00      .000     .00    .00    .000
00333>                       +ID5 06:SWM3          1.67      .013    4.65  17.75    .000
00334>                       +ID6 07:SWM3-OV        .00      .000     .00    .00    .000
00335>                       +ID7 08:SWM4           .98      .010    4.33  16.37    .000
00336>                       +ID8 09:SWM4-OV        .00      .000     .00    .00    .000
00337>                        ================================================================
00338>                        SUM 01:subtotal       6.01      .047    4.65  16.66    .000
00339>
00340>    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
00341>
00342> --------------------------------------------------------------------------------
00343> 001:0012--------------------------------------------------------------------------
00344> ----------------------
00345> | CALIB STANDHYD     |   Area    (ha)=     .83
00346> | 02:B5     DT= 1.00 |   Total Imp(%)=   75.00   Dir. Conn.(%)=     .10
00347> ----------------------
00348>                              IMPERVIOUS    PERVIOUS (i)
00349>      Surface Area     (ha)=        .62         .21
00350>      Dep. Storage     (mm)=        .70       10.00
00351>      Average Slope     (%)=       1.00        2.00
00352>      Length            (m)=      59.00       15.00
00353>      Mannings n           =       .013        .250
00354>
00355>      Max.eff.Inten.(mm/hr)=      51.24      184.68
00356>                   over (min)       2.00        5.00
00357>      Storage Coeff.  (min)=       2.43 (ii)   5.50 (ii)
00358>      Unit Hyd. Tpeak (min)=       2.00        5.00
00359>      Unit Hyd. peak  (cms)=        .49         .21
00360>                                                          *TOTALS*
00361>      PEAK FLOW       (cms)=        .00         .10          .103 (iii)
00362>      TIME TO PEAK    (hrs)=       2.52        2.75         2.750
00363>      RUNOFF VOLUME    (mm)=      54.99       40.95        40.966
00364>      TOTAL RAINFALL   (mm)=      55.69       55.69        55.690
00365>      RUNOFF COEFFICIENT   =        .99         .74          .736
00366>
00367>        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
00368>            CN* =  80.0    Ia = Dep. Storage  (Above)
00369>       (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
00370>            THAN THE STORAGE COEFFICIENT.
00371>      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00372>
00373> --------------------------------------------------------------------------------
00374> 001:0013--------------------------------------------------------------------------
00375> ----------------------
00376> | ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
00377> |  IN>02:(B5    )   |
00378> | OUT<03:(SWM5  )   |    =========  OUTLFOW STORAGE TABLE  =========
00379> ----------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
00380>                             (cms)    (ha.m.)   |    (cms)    (ha.m.)
00381>                              .000  .1200E-01   |     .017  .5860E-01
00382>                              .000  .1830E-01   |     .019  .7900E-01
00383>                              .010  .2510E-01   |     .022  .1022E+00
00384>                              .014  .4060E-01   |     .000  .0000E+00
00385>
00386>      ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
00387>      --------------------       (ha)     (cms)     (hrs)       (mm)
00388>      INFLOW >02: (B5    )        .83      .103     2.750     40.966
00389>      OUTFLOW<03: (SWM5  )        .83      .010     4.050     18.918
00390>     OVERFLOW<04: (SWM5-O)        .00      .000      .000       .000
00391>
00392>                    TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
00393>                    CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
00394>                    PERCENTAGE OF TIME OVERFLOWING    (%)=      .00
00395>
00396>
00397>                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=    9.739
00398>                    TIME SHIFT OF PEAK FLOW         (min)=    78.00
00399>                    MAXIMUM  STORAGE   USED       (ha.m.)=.2690E-01
00400>
00401>       *** WARNING: Outflow volume is less than inflow volume.
00402> --------------------------------------------------------------------------------
00403> 001:0014--------------------------------------------------------------------------
00404> ----------------------
00405> | ADD HYD (Node1     ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
00406> ----------------------                   (ha)     (cms)   (hrs)   (mm)   (cms)
00407>                         ID1 01:subtotal       6.01      .047    4.65  16.66    .000
00408>                        +ID2 03:SWM5           .83      .010    4.05  18.92    .000
00409>                        +ID3 04:SWM5-OV        .00      .000     .00    .00    .000
00410>                         ================================================================
00411>                         SUM 09:Node1          6.84      .057    4.57  16.94    .000
00412>
00413>    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
00414>
00415> --------------------------------------------------------------------------------
00416> 001:0015--------------------------------------------------------------------------
00417> ----------------------
00418> | CALIB STANDHYD     |   Area    (ha)=     .40
00419> | 01:B6     DT= 1.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=     .10
00420> ----------------------
00421>                              IMPERVIOUS    PERVIOUS (i)
00422>      Surface Area     (ha)=        .40         .00
00423>      Dep. Storage     (mm)=        .70       10.00
00424>      Average Slope     (%)=       1.00        2.00
00425>      Length            (m)=      45.00       15.00
00426>      Mannings n           =       .013        .250
00427>
00428>      Max.eff.Inten.(mm/hr)=      51.24      5117.50
00429>                   over (min)       2.00         3.00
00430>      Storage Coeff.  (min)=       2.07 (ii)    2.88 (ii)
00431>      Unit Hyd. Tpeak (min)=       2.00         3.00
00432>      Unit Hyd. peak  (cms)=        .55          .39
00433>                                                          *TOTALS*
00434>      PEAK FLOW       (cms)=        .00          .06          .057 (iii)
00435>      TIME TO PEAK    (hrs)=       2.52         2.75         2.750
00436>      RUNOFF VOLUME    (mm)=      54.99        54.96        54.962
00437>      TOTAL RAINFALL   (mm)=      55.69        55.69        55.690
00438>      RUNOFF COEFFICIENT   =        .99          .99          .987
00439>
00440>        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
00441>            CN* =  80.0    Ia = Dep. Storage  (Above)
00442>       (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
00443>            THAN THE STORAGE COEFFICIENT.
00444>      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00445>
00446> --------------------------------------------------------------------------------
00447> 001:0016--------------------------------------------------------------------------
00448> ----------------------
00449> | ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
00450> |  IN>01:(B6    )   |
00451> | OUT<02:(SWM6  )   |    =========  OUTLFOW STORAGE TABLE  =========
00452> ----------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
00453>                             (cms)    (ha.m.)   |    (cms)    (ha.m.)
00454>                              .000  .0000E+00   |     .009  .1200E-01
00455>                              .004  .2000E-02   |     .011  .1600E-01
00456>                              .005  .4000E-02   |     .012  .2000E-01
00457>                              .008  .8000E-02   |     .013  .2400E-01
00458>
00459>      ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
00460>      --------------------       (ha)     (cms)     (hrs)       (mm)
00461>      INFLOW >01: (B6    )        .40      .057     2.750     54.962
00462>      OUTFLOW<02: (SWM6  )        .40      .010     3.350     54.961
00463>     OVERFLOW<03: (SWM6-O)        .00      .000      .000       .000
00464>
00465>                    TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
00466>                    CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
00467>                    PERCENTAGE OF TIME OVERFLOWING    (%)=      .00
00468>
00469>
00470>                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=   17.802
00471>                    TIME SHIFT OF PEAK FLOW         (min)=    36.00
00472>                    MAXIMUM  STORAGE   USED       (ha.m.)=.1409E-01
00473>
00474> --------------------------------------------------------------------------------
00475> 001:0017--------------------------------------------------------------------------
00476> ----------------------
00477> | CALIB STANDHYD     |   Area    (ha)=     .28
00478> | 04:B7     DT= 1.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=     .10
00479> ----------------------
00480>                              IMPERVIOUS    PERVIOUS (i)
00481>      Surface Area     (ha)=        .28         .00
00482>      Dep. Storage     (mm)=        .70       10.00
00483>      Average Slope     (%)=       1.00        2.00
00484>      Length            (m)=      37.00       15.00
00485>      Mannings n           =       .013        .250
00486>
00487>      Max.eff.Inten.(mm/hr)=      51.24      5117.50
00488>                   over (min)       2.00         3.00
00489>      Storage Coeff.  (min)=       1.84 (ii)    2.65 (ii)
00490>      Unit Hyd. Tpeak (min)=       2.00         3.00
00491>      Unit Hyd. peak  (cms)=        .59          .41
00492>                                                          *TOTALS*
00493>      PEAK FLOW       (cms)=        .00          .04          .040 (iii)
00494>      TIME TO PEAK    (hrs)=       2.52         2.75         2.750
00495>      RUNOFF VOLUME    (mm)=      54.99        54.96        54.962
00496>      TOTAL RAINFALL   (mm)=      55.69        55.69        55.690
00497>      RUNOFF COEFFICIENT   =        .99          .99          .987
00498>
00499>        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
00500>            CN* =  80.0    Ia = Dep. Storage  (Above)
00501>       (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
00502>            THAN THE STORAGE COEFFICIENT.
00503>      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00504>
00505> --------------------------------------------------------------------------------
00506> 001:0018--------------------------------------------------------------------------
00507> ----------------------
00508> | ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
```

```
|  IN>04:(B7    )   |
| OUT<05:(SWM7  )   |    =========  OUTLFOW STORAGE TABLE  =========
--------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                          (cms)    (ha.m.)   |    (cms)    (ha.m.)
                           .000  .0000E+00   |     .009  .9000E-02
                           .004  .1500E-02   |     .011  .1200E-01
                           .005  .3000E-02   |     .012  .1500E-01
                           .008  .6000E-02   |     .013  .1800E-01

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     --------------------       (ha)     (cms)     (hrs)       (mm)
     INFLOW >04: (B7    )        .28      .040     2.750     54.962
     OUTFLOW<05: (SWM7  )        .28      .009     3.300     54.962
    OVERFLOW<06: (SWM7-O)        .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](%)=   23.448
                    TIME SHIFT OF PEAK FLOW         (min)=    33.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=.8900E-02

----------------------------------------------------------------------------
001:0019----------------------------------------------------------------------
-------------------------
| ADD HYD (node2     ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
-----------------------                    (ha)     (cms)   (hrs)   (mm)   (cms)
                       ID1 02:SWM6           .40      .010    3.35  54.96    .000
                      +ID2 03:SWM6-OV        .00      .000     .00    .00    .000
                      +ID3 05:SWM7           .28      .009    3.30  54.96    .000
                      +ID4 06:SWM7-OV        .00      .000     .00    .00    .000
                       ============================================================
                       SUM 07:node2          .68      .019    3.32  54.96    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

----------------------------------------------------------------------------
001:0020----------------------------------------------------------------------
----------------------
| CALIB STANDHYD     |   Area    (ha)=    1.51
| 01:C      DT= 1.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=     .10
----------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.49          .02
     Dep. Storage     (mm)=        .70        10.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      39.00        10.00
     Mannings n           =       .013         .250

     Max.eff.Inten.(mm/hr)=      51.24      5117.50
                  over (min)        2.00         3.00
     Storage Coeff.  (min)=       1.90 (ii)    2.53 (ii)
     Unit Hyd. Tpeak (min)=       2.00         3.00
     Unit Hyd. peak  (cms)=        .58          .42
                                                      *TOTALS*
     PEAK FLOW       (cms)=        .00          .21          .215 (iii)
     TIME TO PEAK    (hrs)=       2.52         2.75         2.750
     RUNOFF VOLUME    (mm)=      54.99        54.96        54.962
     TOTAL RAINFALL   (mm)=      55.69        55.69        55.690
     RUNOFF COEFFICIENT   =        .99          .99          .987

       (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.

----------------------------------------------------------------------------
001:0021----------------------------------------------------------------------
--------------------
| ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
|  IN>01:(C     )   |
| OUT<02:(RoofC )   |    =========  OUTLFOW STORAGE TABLE  =========
--------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                          (cms)    (ha.m.)   |    (cms)    (ha.m.)
                           .000  .0000E+00   |     .063  .1509E+00
                           .063  .7540E-01   |     .063  .2263E+00

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     --------------------       (ha)     (cms)     (hrs)       (mm)
     INFLOW >01: (C     )       1.51      .215     2.750     54.962
     OUTFLOW<02: (RoofC )       1.51      .045     3.300     54.962
    OVERFLOW<03: (roof-o)        .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](%)=   20.975
                    TIME SHIFT OF PEAK FLOW         (min)=    33.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=.5394E-01

----------------------------------------------------------------------------
001:0022----------------------------------------------------------------------
------------------------
| ADD HYD (Node3     ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
------------------------                   (ha)     (cms)   (hrs)   (mm)   (cms)
                       ID1 07:node2          .68      .019    3.32  54.96    .000
                      +ID2 02:RoofC         1.51      .045    3.30  54.96    .000
                      +ID3 03:roof-ovf       .00      .000     .00    .00    .000
                       ============================================================
                       SUM 08:Node3         2.19      .065    3.30  54.96    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

----------------------------------------------------------------------------
001:0023----------------------------------------------------------------------
------------------------
| ADD HYD (Node4     ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
------------------------                   (ha)     (cms)   (hrs)   (mm)   (cms)
                       ID1 08:Node3          2.19      .065    3.30  54.96    .000
                      +ID2 09:Node1          6.84      .057    4.57  16.94    .000
                       ============================================================
                       SUM 01:Node4          9.03      .117    3.83  26.16    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

----------------------------------------------------------------------------
001:0024----------------------------------------------------------------------
      FINISH
----------------------------------------------------------------------------
*******************************************************************************
     WARNINGS / ERRORS / NOTES
     -------------------------

001:0004 ROUTE RESERVOIR
     *** WARNING: Outflow volume is less than inflow volume.
001:0006 ROUTE RESERVOIR
     *** WARNING: Outflow volume is less than inflow volume.
001:0008 ROUTE RESERVOIR
     *** WARNING: Outflow volume is less than inflow volume.
001:0010 ROUTE RESERVOIR
     *** WARNING: Outflow volume is less than inflow volume.
001:0013 ROUTE RESERVOIR
     *** WARNING: Outflow volume is less than inflow volume.
  Simulation ended on 2022-02-15     at 16:44:36
================================================================================
```

```
00001> ================================================================================
00002>
00003>    SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO        999    999    =========
00004>    S      W W W  MM MM  H   H   Y Y   MM MM  O   O      9   9  9   9
00005>    SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  9   9   Ver  4.05
00006>        S  W W W  M   M  H   H    Y    M   M  O   O       9999   9999   Sept 2011
00007>    SSSSS   W W   M   M  H   H    Y    M   M   OOO           9      9    =========
00008>                                                          9   9  9   9   # 3375279
00009>          StormWater Management HYdrologic Model          999    999    =========
00010>
00011>  ********************************************************************************
00012>  ***************************** SWMHYMO Ver/4.05  ********************************
00013>  *********  A single event and continuous hydrologic simulation model  *********
00014>  *********     based on the principles of HYMO and its successors      *********
00015>  *********                 OTTHYMO-83 and OTTHYMO-89.                  *********
00016>  ********************************************************************************
00017>  ********* Distributed by:  J.F. Sabourin and Associates Inc.           *********
00018>  *********                  Ottawa,  Ontario: (613) 836-3884           *********
00019>  *********                  Gatineau, Quebec: (819) 243-6858           *********
00020>  *********                  E-Mail: swmhymo@jfsa.com                   *********
00021>  ********************************************************************************
00022>
00023>  ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
00024>  +++++++++ Licensed user: Calder Engineering Ltd.                      +++++++++
00025>  +++++++++                 Bolton              SERIAL#:3375279        +++++++++
00026>  ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
00027>
00028>  ********************************************************************************
00029>  *********          ++++++ PROGRAM ARRAY DIMENSIONS ++++++             *********
00030>  *********          Maximum value for ID numbers  :     10            *********
00031>  *********          Max. number of rainfall points: 105408            *********
00032>  *********          Max. number of flow points    : 105408            *********
00033>  ********************************************************************************
00034>
00035>
00036>  **********************   D E T A I L E D   O U T P U T   **********************
00037>  ********************************************************************************
00038>  *         DATE: 2022-02-15     TIME: 16:44:04     RUN COUNTER: 000622          *
00039>  ********************************************************************************
00040>  * Input   filename: C:\USERS\CALDER\DOCUME~1\SWMMHY~1\Sand\SAND-2~1\Sand-P6.da*
00041>  * Output  filename: C:\USERS\CALDER\DOCUME~1\SWMMHY~1\Sand\SAND-2~1\Sand-P6.ou*
00042>  * Summary filename: C:\USERS\CALDER\DOCUME~1\SWMMHY~1\Sand\SAND-2~1\Sand-P6.su*
00043>  * User comments:                                                             *
00044>  * 1:_____________________________________________________________________*
00045>  * 2:_____________________________________________________________________*
00046>  * 3:_____________________________________________________________________*
00047>  ********************************************************************************
00048>
00049>  --------------------------------------------------------------------------------
00050> 001:0001--------------------------------------------------------------------------
00051>  *#*****************************************************************************
00052>  *#  Project Name: [Sandhill]    Project Number: [19-216]
00053>  *#  Date        : [2022-02-15]
00054>  *#  Modeller    : [    MYS    ]
00055>  *#  Company     : Calder Engineering Ltd.
00056>  *#  License #   :  3375279
00057>  *#*****************************************************************************
00058>  *# Proposed Conditions:
00059>  *# Filename: Sand-P5.dat
00060>  *#*****************************************************************************
00061>  ---------------------
00062>  | START          |  Project  dir.: C:\USERS\CALDER\DOCUME~1\SWMMHY~1\Sand\SAND
00063>  ---------------------  Rainfall dir.: C:\USERS\CALDER\DOCUME~1\SWMMHY~1\Sand\SAND
00064>     TZERO =   .00 hrs on      0
00065>     METOUT=   2 (output = METRIC)
00066>     NRUN  = 001
00067>     NSTORM=   0
00068>  --------------------------------------------------------------------------------
00069> 001:0002--------------------------------------------------------------------------
00070>  --------------------
00071>  | READ STORM       |    Filename: 25yr/6hr
00072>  | Ptotal=  65.59 mm|    Comments: 25yr/6hr
00073>  --------------------
00074>               TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
00075>                hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
00076>                .25    .000 |   2.00  22.300 |   3.75   9.180 |   5.50   1.310
00077>                .50   1.310 |   2.25  22.300 |   4.00   5.250 |   5.75   1.310
00078>                .75   1.310 |   2.50  60.350 |   4.25   5.250 |   6.00   1.310
00079>               1.00   1.310 |   2.75  60.350 |   4.50   2.620 |   6.25   1.310
00080>               1.25   1.310 |   3.00  17.060 |   4.75   2.620 |
00081>               1.50   7.870 |   3.25  17.060 |   5.00   1.310 |
00082>               1.75   7.870 |   3.50   9.180 |   5.25   1.310 |
00083>
00084>  --------------------------------------------------------------------------------
00085> 001:0003--------------------------------------------------------------------------
00086>  ----------------------
00087>  | CALIB STANDHYD     |   Area    (ha)=    1.98
00088>  | 01:B1     DT= 1.00 |   Total Imp(%)=   32.00   Dir. Conn.(%)=     .10
00089>  ----------------------
00090>                             IMPERVIOUS    PERVIOUS (i)
00091>       Surface Area     (ha)=        .63         1.35
00092>       Dep. Storage     (mm)=        .70        10.00
00093>       Average Slope     (%)=       1.00         2.00
00094>       Length            (m)=     100.00       100.00
00095>       Mannings n            =       .013         .250
00096>
00097>       Max.eff.Inten.(mm/hr)=      60.35        57.90
00098>                   over (min)=       3.00        18.00
00099>       Storage Coeff.  (min)=       3.13 (ii)   18.34 (ii)
00100>       Unit Hyd. Tpeak (min)=       3.00        18.00
00101>       Unit Hyd. peak  (cms)=        .37          .06
00102>                                                          *TOTALS*
00103>       PEAK FLOW       (cms)=        .00          .15          .151 (iii)
00104>       TIME TO PEAK    (hrs)=       2.63         2.92         2.917
00105>       RUNOFF VOLUME    (mm)=      64.89        33.87        33.906
00106>       TOTAL RAINFALL   (mm)=      65.59        65.59        65.590
00107>       RUNOFF COEFFICIENT   =        .99          .52          .517
00108>
00109>         (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
00110>             CN* =  80.0    Ia = Dep. Storage  (Above)
00111>        (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
00112>             THAN THE STORAGE COEFFICIENT.
00113>       (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00114>
00115>  --------------------------------------------------------------------------------
00116> 001:0004--------------------------------------------------------------------------
00117>  ----------------------
00118>  | ROUTE RESERVOIR    |    Requested routing time step =  1.0 min.
00119>  |  IN>01:(B1     )   |
00120>  | OUT<02:(SWM1  )   |    =========  OUTLFOW STORAGE TABLE  =========
00121>  ----------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
00122>                              (cms)    (ha.m.)   |    (cms)    (ha.m.)
00123>                               .000  .1200E-01   |     .017  .5860E-01
00124>                               .000  .1830E-01   |     .019  .7900E-01
00125>                               .010  .2510E-01   |     .022  .1022E+00
00126>                               .014  .4060E-01   |     .000  .0000E+00
00127>
00128>       ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
00129>       --------------------       (ha)     (cms)     (hrs)       (mm)
00130>       INFLOW >01: (B1    )       1.98      .151     2.917     33.906
00131>       OUTFLOW<02: (SWM1  )       1.98      .016     4.850     24.664
00132>      OVERFLOW<03: (SWM1-O)        .00      .000      .000       .000
00133>
00134>                     TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
00135>                     CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
00136>                     PERCENTAGE OF TIME OVERFLOWING    (%)=      .00
00137>
00138>
00139>                     PEAK   FLOW   REDUCTION [Qout/Qin](%)=   10.367
00140>                     TIME SHIFT OF PEAK FLOW         (min)=   116.00
00141>                     MAXIMUM  STORAGE   USED       (ha.m.)=.5240E-01
00142>
00143>       *** WARNING: Outflow volume is less than inflow volume.
00144>  --------------------------------------------------------------------------------
00145> 001:0005--------------------------------------------------------------------------
00146>  ----------------------
00147>  | CALIB STANDHYD     |   Area    (ha)=    1.38
00148>  | 01:B2     DT= 1.00 |   Total Imp(%)=   42.00   Dir. Conn.(%)=     .10
00149>  ----------------------
00150>                             IMPERVIOUS    PERVIOUS (i)
00151>       Surface Area     (ha)=        .58         .80
00152>       Dep. Storage     (mm)=        .70        10.00
00153>       Average Slope     (%)=       1.00         2.00
00154>       Length            (m)=      83.00        90.00
00155>       Mannings n            =       .013         .250
00156>
00157>       Max.eff.Inten.(mm/hr)=      60.35        74.37
00158>                   over (min)=       3.00        16.00
00159>       Storage Coeff.  (min)=       2.80 (ii)   15.72 (ii)
00160>       Unit Hyd. Tpeak (min)=       3.00        16.00
00161>       Unit Hyd. peak  (cms)=        .39          .07
00162>                                                          *TOTALS*
00163>       PEAK FLOW       (cms)=        .00          .12          .123 (iii)
00164>       TIME TO PEAK    (hrs)=       2.68         2.87         2.867
00165>       RUNOFF VOLUME    (mm)=      64.89        36.98        37.008
00166>       TOTAL RAINFALL   (mm)=      65.59        65.59        65.590
00167>       RUNOFF COEFFICIENT   =        .99          .56          .564
00168>
00169>         (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
00170>             CN* =  80.0    Ia = Dep. Storage  (Above)
00171>        (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
00172>             THAN THE STORAGE COEFFICIENT.
00173>       (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00174>
00175>  --------------------------------------------------------------------------------
00176> 001:0006--------------------------------------------------------------------------
00177>  ----------------------
00178>  | ROUTE RESERVOIR    |    Requested routing time step =  1.0 min.
00179>  |  IN>01:(B2     )   |
00180>  | OUT<04:(SWM2  )   |    =========  OUTLFOW STORAGE TABLE  =========
00181>  ----------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
00182>                              (cms)    (ha.m.)   |    (cms)    (ha.m.)
00183>                               .000  .1200E-01   |     .017  .5860E-01
00184>                               .000  .1830E-01   |     .019  .7900E-01
00185>                               .010  .2510E-01   |     .022  .1022E+00
00186>                               .014  .4060E-01   |     .000  .0000E+00
00187>
00188>       ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
00189>       --------------------       (ha)     (cms)     (hrs)       (mm)
00190>       INFLOW >01: (B2    )       1.38      .123     2.867     37.008
00191>       OUTFLOW<04: (SWM2  )       1.38      .013     4.617     23.747
00192>      OVERFLOW<05: (SWM2-O)        .00      .000      .000       .000
00193>
00194>                     TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
00195>                     CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
00196>                     PERCENTAGE OF TIME OVERFLOWING    (%)=      .00
00197>
00198>
00199>                     PEAK   FLOW   REDUCTION [Qout/Qin](%)=   10.855
00200>                     TIME SHIFT OF PEAK FLOW         (min)=   105.00
00201>                     MAXIMUM  STORAGE   USED       (ha.m.)=.3967E-01
00202>
00203>       *** WARNING: Outflow volume is less than inflow volume.
00204>  --------------------------------------------------------------------------------
00205> 001:0007--------------------------------------------------------------------------
00206>  ----------------------
00207>  | CALIB STANDHYD     |   Area    (ha)=    1.67
00208>  | 01:B3     DT= 1.00 |   Total Imp(%)=   42.00   Dir. Conn.(%)=     .10
00209>  ----------------------
00210>                             IMPERVIOUS    PERVIOUS (i)
00211>       Surface Area     (ha)=        .70         .97
00212>       Dep. Storage     (mm)=        .70        10.00
00213>       Average Slope     (%)=       1.00         2.00
00214>       Length            (m)=      91.00        80.00
00215>       Mannings n            =       .013         .250
00216>
00217>       Max.eff.Inten.(mm/hr)=      60.35        74.85
00218>                   over (min)=       3.00        15.00
00219>       Storage Coeff.  (min)=       2.95 (ii)   14.97 (ii)
00220>       Unit Hyd. Tpeak (min)=       3.00        15.00
00221>       Unit Hyd. peak  (cms)=        .38          .08
00222>                                                          *TOTALS*
00223>       PEAK FLOW       (cms)=        .00          .15          .152 (iii)
00224>       TIME TO PEAK    (hrs)=       2.65         2.87         2.867
00225>       RUNOFF VOLUME    (mm)=      64.89        36.98        37.008
00226>       TOTAL RAINFALL   (mm)=      65.59        65.59        65.590
00227>       RUNOFF COEFFICIENT   =        .99          .56          .564
00228>
00229>         (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
00230>             CN* =  80.0    Ia = Dep. Storage  (Above)
00231>        (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
00232>             THAN THE STORAGE COEFFICIENT.
00233>       (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00234>
00235>  --------------------------------------------------------------------------------
00236> 001:0008--------------------------------------------------------------------------
00237>  ----------------------
00238>  | ROUTE RESERVOIR    |    Requested routing time step =  1.0 min.
00239>  |  IN>01:(B3     )   |
00240>  | OUT<06:(SWM3  )   |    =========  OUTLFOW STORAGE TABLE  =========
00241>  ----------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
00242>                              (cms)    (ha.m.)   |    (cms)    (ha.m.)
00243>                               .000  .1200E-01   |     .017  .5860E-01
00244>                               .000  .1830E-01   |     .019  .7900E-01
00245>                               .010  .2510E-01   |     .022  .1022E+00
00246>                               .014  .4060E-01   |     .000  .0000E+00
00247>
00248>       ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
00249>       --------------------       (ha)     (cms)     (hrs)       (mm)
00250>       INFLOW >01: (B3    )       1.67      .152     2.867     37.008
00251>       OUTFLOW<06: (SWM3  )       1.67      .015     4.650     26.050
00252>      OVERFLOW<07: (SWM3-O)        .00      .000      .000       .000
00253>
00254>                     TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
```

```
00255>                    CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
00256>                    PERCENTAGE OF TIME OVERFLOWING    (%)=      .00
00257>
00258>
00259>                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=    9.798
00260>                    TIME SHIFT OF PEAK FLOW         (min)=   107.00
00261>                    MAXIMUM  STORAGE   USED       (ha.m.)=.4831E-01
00262>
00263>       *** WARNING: Outflow volume is less than inflow volume.
00264> --------------------------------------------------------------------------------
00265> 001:0009--------------------------------------------------------------------------
00266> ----------------------
00267> | CALIB STANDHYD     |   Area    (ha)=     .98
00268> | 01:B4     DT= 1.00 |   Total Imp(%)=   61.00   Dir. Conn.(%)=     .10
00269> ----------------------
00270>                              IMPERVIOUS    PERVIOUS (i)
00271>      Surface Area     (ha)=        .60          .38
00272>      Dep. Storage     (mm)=        .70        10.00
00273>      Average Slope     (%)=       1.00         2.00
00274>      Length            (m)=      68.00        30.00
00275>      Mannings n           =       .013         .250
00276>
00277>      Max.eff.Inten.(mm/hr)=      60.35       130.88
00278>                   over (min)        2.00         8.00
00279>      Storage Coeff.  (min)=       2.48 (ii)    7.81 (ii)
00280>      Unit Hyd. Tpeak (min)=       2.00         8.00
00281>      Unit Hyd. peak  (cms)=        .48          .14
00282>                                                          *TOTALS*
00283>      PEAK FLOW       (cms)=        .00          .13          .128 (iii)
00284>      TIME TO PEAK    (hrs)=       2.58         2.77         2.767
00285>      RUNOFF VOLUME    (mm)=      64.89        44.00        44.024
00286>      TOTAL RAINFALL   (mm)=      65.59        65.59        65.590
00287>      RUNOFF COEFFICIENT   =        .99          .67          .671
00288>
00289>        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
00290>            CN* =  80.0    Ia = Dep. Storage  (Above)
00291>       (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
00292>            THAN THE STORAGE COEFFICIENT.
00293>      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00294>
00295> --------------------------------------------------------------------------------
00296> 001:0010--------------------------------------------------------------------------
00297> ----------------------
00298> | ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
00299> |  IN>01:(B4    )   |
00300> | OUT<08:(SWM4  )   |    =========  OUTLFOW STORAGE TABLE  =========
00301> ----------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
00302>                             (cms)    (ha.m.)   |    (cms)    (ha.m.)
00303>                              .000  .1200E-01   |     .017  .5860E-01
00304>                              .000  .1830E-01   |     .019  .7900E-01
00305>                              .010  .2510E-01   |     .022  .1022E+00
00306>                              .014  .4060E-01   |     .000  .0000E+00
00307>
00308>      ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
00309>      --------------------       (ha)     (cms)     (hrs)       (mm)
00310>      INFLOW >01: (B4    )        .98      .128     2.767     44.024
00311>      OUTFLOW<08: (SWM4  )        .98      .012     4.350     25.351
00312>     OVERFLOW<09: (SWM4-O)        .00      .000      .000       .000
00313>
00314>                    TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
00315>                    CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
00316>                    PERCENTAGE OF TIME OVERFLOWING    (%)=      .00
00317>
00318>
00319>                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=    9.250
00320>                    TIME SHIFT OF PEAK FLOW         (min)=    95.00
00321>                    MAXIMUM  STORAGE   USED       (ha.m.)=.3376E-01
00322>
00323>       *** WARNING: Outflow volume is less than inflow volume.
00324> --------------------------------------------------------------------------------
00325> 001:0011--------------------------------------------------------------------------
00326> ------------------------
00327> | ADD HYD (subtotal  ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
00328> ------------------------                  (ha)     (cms)   (hrs)   (mm)   (cms)
00329>                        ID1 02:SWM1          1.98      .016    4.85  24.66    .000
00330>                       +ID2 03:SWM1-OV        .00      .000     .00    .00    .000
00331>                       +ID3 04:SWM2          1.38      .013    4.62  23.75    .000
00332>                       +ID4 05:SWM2-OV        .00      .000     .00    .00    .000
00333>                       +ID5 06:SWM3          1.67      .015    4.65  26.05    .000
00334>                       +ID6 07:SWM3-OV        .00      .000     .00    .00    .000
00335>                       +ID7 08:SWM4           .98      .012    4.35  25.35    .000
00336>                       +ID8 09:SWM4-OV        .00      .000     .00    .00    .000
00337>                        ================================================================
00338>                        SUM 01:subtotal       6.01     .056    4.60  24.95    .000
00339>
00340>    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
00341>
00342> --------------------------------------------------------------------------------
00343> 001:0012--------------------------------------------------------------------------
00344> ----------------------
00345> | CALIB STANDHYD     |   Area    (ha)=     .83
00346> | 02:B5     DT= 1.00 |   Total Imp(%)=   75.00   Dir. Conn.(%)=     .10
00347> ----------------------
00348>                              IMPERVIOUS    PERVIOUS (i)
00349>      Surface Area     (ha)=        .62          .21
00350>      Dep. Storage     (mm)=        .70        10.00
00351>      Average Slope     (%)=       1.00         2.00
00352>      Length            (m)=      59.00        15.00
00353>      Mannings n           =       .013         .250
00354>
00355>      Max.eff.Inten.(mm/hr)=      60.35       222.67
00356>                   over (min)        2.00         5.00
00357>      Storage Coeff.  (min)=       2.28 (ii)    5.12 (ii)
00358>      Unit Hyd. Tpeak (min)=       2.00         5.00
00359>      Unit Hyd. peak  (cms)=        .51          .22
00360>                                                          *TOTALS*
00361>      PEAK FLOW       (cms)=        .00          .13          .126 (iii)
00362>      TIME TO PEAK    (hrs)=       2.53         2.75         2.750
00363>      RUNOFF VOLUME    (mm)=      64.89        50.39        50.408
00364>      TOTAL RAINFALL   (mm)=      65.59        65.59        65.590
00365>      RUNOFF COEFFICIENT   =        .99          .77          .769
00366>
00367>        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
00368>            CN* =  80.0    Ia = Dep. Storage  (Above)
00369>       (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
00370>            THAN THE STORAGE COEFFICIENT.
00371>      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00372>
00373> --------------------------------------------------------------------------------
00374> 001:0013--------------------------------------------------------------------------
00375> ----------------------
00376> | ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
00377> |  IN>02:(B5    )   |
00378> | OUT<03:(SWM5  )   |    =========  OUTLFOW STORAGE TABLE  =========
00379> ----------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
00380>                             (cms)    (ha.m.)   |    (cms)    (ha.m.)
00381>                              .000  .1200E-01   |     .017  .5860E-01
00382>                              .000  .1830E-01   |     .019  .7900E-01
00383>                              .010  .2510E-01   |     .022  .1022E+00
00384>                              .014  .4060E-01   |     .000  .0000E+00
00385>
00386>      ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
00387>      --------------------       (ha)     (cms)     (hrs)       (mm)
00388>      INFLOW >02: (B5    )        .83      .126     2.750     50.408
00389>      OUTFLOW<03: (SWM5  )        .83      .012     4.250     28.360
00390>     OVERFLOW<04: (SWM5-O)        .00      .000      .000       .000
00391>
00392>                    TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
00393>                    CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
00394>                    PERCENTAGE OF TIME OVERFLOWING    (%)=      .00
00395>
00396>
00397>                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=    9.230
00398>                    TIME SHIFT OF PEAK FLOW         (min)=    90.00
00399>                    MAXIMUM  STORAGE   USED       (ha.m.)=.3283E-01
00400>
00401>       *** WARNING: Outflow volume is less than inflow volume.
00402> --------------------------------------------------------------------------------
00403> 001:0014--------------------------------------------------------------------------
00404> ----------------------
00405> | ADD HYD (Node1     ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
00406> ----------------------                   (ha)     (cms)   (hrs)   (mm)   (cms)
00407>                         ID1 01:subtotal       6.01     .056    4.60  24.95    .000
00408>                        +ID2 03:SWM5           .83      .012    4.25  28.36    .000
00409>                        +ID3 04:SWM5-OV        .00      .000     .00    .00    .000
00410>                         ================================================================
00411>                         SUM 09:Node1          6.84     .067    4.52  25.36    .000
00412>
00413>    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
00414>
00415> --------------------------------------------------------------------------------
00416> 001:0015--------------------------------------------------------------------------
00417> ----------------------
00418> | CALIB STANDHYD     |   Area    (ha)=     .40
00419> | 01:B6     DT= 1.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=     .10
00420> ----------------------
00421>                              IMPERVIOUS    PERVIOUS (i)
00422>      Surface Area     (ha)=        .40          .00
00423>      Dep. Storage     (mm)=        .70        10.00
00424>      Average Slope     (%)=       1.00         2.00
00425>      Length            (m)=      45.00        15.00
00426>      Mannings n           =       .013         .250
00427>
00428>      Max.eff.Inten.(mm/hr)=      60.35      6027.81
00429>                   over (min)        2.00         3.00
00430>      Storage Coeff.  (min)=       1.94 (ii)    2.70 (ii)
00431>      Unit Hyd. Tpeak (min)=       2.00         3.00
00432>      Unit Hyd. peak  (cms)=        .57          .40
00433>                                                          *TOTALS*
00434>      PEAK FLOW       (cms)=        .00          .07          .067 (iii)
00435>      TIME TO PEAK    (hrs)=       2.60         2.75         2.750
00436>      RUNOFF VOLUME    (mm)=      64.89        64.86        64.860
00437>      TOTAL RAINFALL   (mm)=      65.59        65.59        65.590
00438>      RUNOFF COEFFICIENT   =        .99          .99          .989
00439>
00440>        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
00441>            CN* =  80.0    Ia = Dep. Storage  (Above)
00442>       (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
00443>            THAN THE STORAGE COEFFICIENT.
00444>      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00445>
00446> --------------------------------------------------------------------------------
00447> 001:0016--------------------------------------------------------------------------
00448> ----------------------
00449> | ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
00450> |  IN>01:(B6    )   |
00451> | OUT<02:(SWM6  )   |    =========  OUTLFOW STORAGE TABLE  =========
00452> ----------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
00453>                             (cms)    (ha.m.)   |    (cms)    (ha.m.)
00454>                              .000  .0000E+00   |     .009  .1200E-01
00455>                              .004  .2000E-02   |     .011  .1600E-01
00456>                              .005  .4000E-02   |     .012  .2000E-01
00457>                              .008  .8000E-02   |     .013  .2400E-01
00458>
00459>      ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
00460>      --------------------       (ha)     (cms)     (hrs)       (mm)
00461>      INFLOW >01: (B6    )        .40      .067     2.750     64.860
00462>      OUTFLOW<02: (SWM6  )        .40      .011     3.367     64.860
00463>     OVERFLOW<03: (SWM6-O)        .00      .000      .000       .000
00464>
00465>                    TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
00466>                    CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
00467>                    PERCENTAGE OF TIME OVERFLOWING    (%)=      .00
00468>
00469>
00470>                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=   16.582
00471>                    TIME SHIFT OF PEAK FLOW         (min)=    37.00
00472>                    MAXIMUM  STORAGE   USED       (ha.m.)=.1698E-01
00473>
00474> --------------------------------------------------------------------------------
00475> 001:0017--------------------------------------------------------------------------
00476> ----------------------
00477> | CALIB STANDHYD     |   Area    (ha)=     .28
00478> | 04:B7     DT= 1.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=     .10
00479> ----------------------
00480>                              IMPERVIOUS    PERVIOUS (i)
00481>      Surface Area     (ha)=        .28          .00
00482>      Dep. Storage     (mm)=        .70        10.00
00483>      Average Slope     (%)=       1.00         2.00
00484>      Length            (m)=      37.00        15.00
00485>      Mannings n           =       .013         .250
00486>
00487>      Max.eff.Inten.(mm/hr)=      60.35      6027.84
00488>                   over (min)        2.00         2.00
00489>      Storage Coeff.  (min)=       1.72 (ii)    2.48 (ii)
00490>      Unit Hyd. Tpeak (min)=       2.00         2.00
00491>      Unit Hyd. peak  (cms)=        .61          .48
00492>                                                          *TOTALS*
00493>      PEAK FLOW       (cms)=        .00          .05          .047 (iii)
00494>      TIME TO PEAK    (hrs)=       2.53         2.75         2.750
00495>      RUNOFF VOLUME    (mm)=      64.89        64.86        64.860
00496>      TOTAL RAINFALL   (mm)=      65.59        65.59        65.590
00497>      RUNOFF COEFFICIENT   =        .99          .99          .989
00498>
00499>        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
00500>            CN* =  80.0    Ia = Dep. Storage  (Above)
00501>       (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
00502>            THAN THE STORAGE COEFFICIENT.
00503>      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00504>
00505> --------------------------------------------------------------------------------
00506> 001:0018--------------------------------------------------------------------------
00507> ----------------------
00508> | ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
```

```
|  IN>04:(B7    )   |
| OUT<05:(SWM7  )   |    =========  OUTLFOW STORAGE TABLE  =========
--------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                          (cms)    (ha.m.)   |    (cms)    (ha.m.)
                           .000  .0000E+00   |     .009  .9000E-02
                           .004  .1500E-02   |     .011  .1200E-01
                           .005  .3000E-02   |     .012  .1500E-01
                           .008  .6000E-02   |     .013  .1800E-01

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     --------------------       (ha)     (cms)     (hrs)       (mm)
     INFLOW >04: (B7    )        .28      .047     2.750     64.860
     OUTFLOW<05: (SWM7  )        .28      .010     3.283     64.860
    OVERFLOW<06: (SWM7-O)        .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](%)=   21.816
                    TIME SHIFT OF PEAK FLOW         (min)=    32.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=.1080E-01

-------------------------------------------------------------------------------
001:0019---------------------------------------------------------------------
-------------------------
| ADD HYD (node2     ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
----------------------- |                  (ha)     (cms)   (hrs)   (mm)   (cms)
                        ID1 02:SWM6           .40      .011    3.37  64.86    .000
                       +ID2 03:SWM6-OV        .00      .000     .00    .00    .000
                       +ID3 05:SWM7           .28      .010    3.28  64.86    .000
                       +ID4 06:SWM7-OV        .00      .000     .00    .00    .000
                        ========================================================
                        SUM 07:node2          .68      .021    3.32  64.86    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0020---------------------------------------------------------------------
----------------------
| CALIB STANDHYD     |   Area    (ha)=    1.51
| 01:C      DT= 1.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=     .10
----------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.49          .02
     Dep. Storage     (mm)=        .70        10.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      39.00        10.00
     Mannings n           =       .013         .250

     Max.eff.Inten.(mm/hr)=      60.35      6027.84
                  over (min)        2.00         2.00
     Storage Coeff.  (min)=       1.78 (ii)    2.37 (ii)
     Unit Hyd. Tpeak (min)=       2.00         2.00
     Unit Hyd. peak  (cms)=        .60          .50
                                                      *TOTALS*
     PEAK FLOW       (cms)=        .00          .25          .253 (iii)
     TIME TO PEAK    (hrs)=       2.53         2.75         2.750
     RUNOFF VOLUME    (mm)=      64.89        64.86        64.861
     TOTAL RAINFALL   (mm)=      65.59        65.59        65.590
     RUNOFF COEFFICIENT   =        .99          .99          .989

       (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.

-------------------------------------------------------------------------------
001:0021---------------------------------------------------------------------
--------------------
| ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
|  IN>01:(C     )   |
| OUT<02:(RoofC )   |    =========  OUTLFOW STORAGE TABLE  =========
--------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                          (cms)    (ha.m.)   |    (cms)    (ha.m.)
                           .000  .0000E+00   |     .063  .1509E+00
                           .063  .7540E-01   |     .063  .2263E+00

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     --------------------       (ha)     (cms)     (hrs)       (mm)
     INFLOW >01: (C     )       1.51      .253     2.750     64.861
     OUTFLOW<02: (RoofC )       1.51      .053     3.300     64.860
    OVERFLOW<03: (roof-o)        .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](%)=   21.015
                    TIME SHIFT OF PEAK FLOW         (min)=    33.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=.6366E-01

-------------------------------------------------------------------------------
001:0022---------------------------------------------------------------------
-------------------------
| ADD HYD (Node3     ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
------------------------ |                  (ha)     (cms)   (hrs)   (mm)   (cms)
                        ID1 07:node2          .68      .021    3.32  64.86    .000
                       +ID2 02:RoofC         1.51      .053    3.30  64.86    .000
                       +ID3 03:roof-ovf       .00      .000     .00    .00    .000
                        ========================================================
                        SUM 08:Node3          2.19      .075    3.30  64.86    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0023---------------------------------------------------------------------
-------------------------
| ADD HYD (Node4     ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
------------------------ |                  (ha)     (cms)   (hrs)   (mm)   (cms)
                        ID1 08:Node3          2.19      .075    3.30  64.86    .000
                       +ID2 09:Node1          6.84      .067    4.52  25.36    .000
                        ========================================================
                        SUM 01:Node4          9.03      .137    3.80  34.94    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0024---------------------------------------------------------------------
      FINISH
-------------------------------------------------------------------------------
*******************************************************************************
     WARNINGS / ERRORS / NOTES
     -------------------------
001:0004 ROUTE RESERVOIR
     *** WARNING: Outflow volume is less than inflow volume.
001:0006 ROUTE RESERVOIR
     *** WARNING: Outflow volume is less than inflow volume.
001:0008 ROUTE RESERVOIR
     *** WARNING: Outflow volume is less than inflow volume.
001:0010 ROUTE RESERVOIR
     *** WARNING: Outflow volume is less than inflow volume.
001:0013 ROUTE RESERVOIR
     *** WARNING: Outflow volume is less than inflow volume.
  Simulation ended on 2022-02-15     at 16:44:04
================================================================================
```

```
00001> ================================================================================
00002>
00003>    SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO        999    999    =========
00004>    S      W W W  MM MM  H   H   Y Y   MM MM  O   O      9   9  9   9
00005>    SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  9   9   Ver  4.05
00006>        S  W W W  M   M  H   H    Y    M   M  O   O       9999   9999   Sept 2011
00007>    SSSSS   W W   M   M  H   H    Y    M   M   OOO           9      9    =========
00008>                                                          9   9  9   9   # 3375279
00009>          StormWater Management HYdrologic Model          999    999    =========
00010>
00011>  ********************************************************************************
00012>  ***************************** SWMHYMO Ver/4.05  ********************************
00013>  *********  A single event and continuous hydrologic simulation model  *********
00014>  *********     based on the principles of HYMO and its successors      *********
00015>  *********                 OTTHYMO-83 and OTTHYMO-89.                  *********
00016>  ********************************************************************************
00017>  ********* Distributed by:  J.F. Sabourin and Associates Inc.           *********
00018>  *********                  Ottawa,  Ontario: (613) 836-3884           *********
00019>  *********                  Gatineau, Quebec: (819) 243-6858           *********
00020>  *********                  E-Mail: swmhymo@jfsa.Com                   *********
00021>  ********************************************************************************
00022>
00023>  ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
00024>  +++++++++ Licensed user: Calder Engineering Ltd.                        +++++++++
00025>  +++++++++                 Bolton                SERIAL#:3375279        +++++++++
00026>  ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
00027>
00028>  ********************************************************************************
00029>  *********          ++++++ PROGRAM ARRAY DIMENSIONS ++++++             *********
00030>  *********          Maximum value for ID numbers  :     10             *********
00031>  *********          Max. number of rainfall points: 105408             *********
00032>  *********          Max. number of flow points    : 105408             *********
00033>  ********************************************************************************
00034>
00035>
00036>  **********************   D E T A I L E D   O U T P U T   **********************
00037>  ********************************************************************************
00038>  *         DATE: 2022-02-15     TIME: 16:43:31     RUN COUNTER: 000621         *
00039>  ********************************************************************************
00040>  * Input   filename: C:\USERS\CALDER\DOCUME~1\SWMMHY~1\Sand\SAND-2~1\Sand-P6.da*
00041>  * Output  filename: C:\USERS\CALDER\DOCUME~1\SWMMHY~1\Sand\SAND-2~1\Sand-P6.ou*
00042>  * Summary filename: C:\USERS\CALDER\DOCUME~1\SWMMHY~1\Sand\SAND-2~1\Sand-P6.su*
00043>  * User comments:                                                            *
00044>  * 1:_____________________________________________________________________*
00045>  * 2:_____________________________________________________________________*
00046>  * 3:_____________________________________________________________________*
00047>  ********************************************************************************
00048>
00049>  --------------------------------------------------------------------------------
00050> 001:0001--------------------------------------------------------------------------
00051>  *#*****************************************************************************
00052>  *#  Project Name: [Sandhill]    Project Number: [19-216]
00053>  *#  Date        : [2022-02-15]
00054>  *#  Modeller    : [    MYS    ]
00055>  *#  Company     : Calder Engineering Ltd.
00056>  *#  License #   :  3375279
00057>  *#*****************************************************************************
00058>  *# Proposed Conditions:
00059>  *# Filename: Sand-P5.dat
00060>  *#*****************************************************************************
00061>  ---------------------
00062>  | START        |  Project  dir.: C:\USERS\CALDER\DOCUME~1\SWMMHY~1\Sand\SAND
00063>  ---------------  Rainfall dir.: C:\USERS\CALDER\DOCUME~1\SWMMHY~1\Sand\SAND
00064>     TZERO =   .00 hrs on      0
00065>     METOUT=   2 (output = METRIC)
00066>     NRUN  = 001
00067>     NSTORM=   0
00068>  --------------------------------------------------------------------------------
00069> 001:0002--------------------------------------------------------------------------
00070>  --------------------
00071>  | READ STORM       |    Filename: 50yr/6hr
00072>  | Ptotal=  73.00 mm|    Comments: 50yr/6hr
00073>  --------------------
00074>               TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
00075>                hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
00076>                .25    .000 |   2.00  24.820 |   3.75  10.220 |   5.50   1.460
00077>                .50   1.460 |   2.25  24.820 |   4.00   5.840 |   5.75   1.460
00078>                .75   1.460 |   2.50  67.160 |   4.25   5.840 |   6.00   1.460
00079>               1.00   1.460 |   2.75  67.160 |   4.50   2.920 |   6.25   1.460
00080>               1.25   1.460 |   3.00  18.980 |   4.75   2.920 |
00081>               1.50   8.760 |   3.25  18.980 |   5.00   1.460 |
00082>               1.75   8.760 |   3.50  10.220 |   5.25   1.460 |
00083>
00084>  --------------------------------------------------------------------------------
00085> 001:0003--------------------------------------------------------------------------
00086>  ----------------------
00087>  | CALIB STANDHYD     |   Area    (ha)=    1.98
00088>  | 01:B1     DT= 1.00 |   Total Imp(%)=   32.00   Dir. Conn.(%)=     .10
00089>  ----------------------
00090>                              IMPERVIOUS    PERVIOUS (i)
00091>       Surface Area     (ha)=        .63         1.35
00092>       Dep. Storage     (mm)=        .70        10.00
00093>       Average Slope     (%)=       1.00         2.00
00094>       Length            (m)=     100.00       100.00
00095>       Mannings n            =       .013         .250
00096>
00097>       Max.eff.Inten.(mm/hr)=      67.16        68.49
00098>                   over (min)        3.00        17.00
00099>       Storage Coeff.  (min)=        3.00 (ii)   17.22 (ii)
00100>       Unit Hyd. Tpeak (min)=        3.00        17.00
00101>       Unit Hyd. peak  (cms)=         .38          .07
00102>                                                          *TOTALS*
00103>       PEAK FLOW       (cms)=         .00          .18          .184 (iii)
00104>       TIME TO PEAK    (hrs)=        2.75         2.90         2.900
00105>       RUNOFF VOLUME    (mm)=       72.30        40.04        40.077
00106>       TOTAL RAINFALL   (mm)=       73.00        73.00        73.000
00107>       RUNOFF COEFFICIENT   =         .99          .55          .549
00108>
00109>         (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
00110>             CN* =  80.0    Ia = Dep. Storage  (Above)
00111>        (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
00112>             THAN THE STORAGE COEFFICIENT.
00113>       (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00114>
00115>  --------------------------------------------------------------------------------
00116> 001:0004--------------------------------------------------------------------------
00117>  ----------------------
00118>  | ROUTE RESERVOIR    |    Requested routing time step =  1.0 min.
00119>  |  IN>01:(B1     )   |
00120>  | OUT<02:(SWM1  )    |    =========  OUTLFOW STORAGE TABLE  =========
00121>  ----------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
00122>                              (cms)    (ha.m.)   |    (cms)    (ha.m.)
00123>                               .000  .1200E-01   |     .017  .5860E-01
00124>                               .000  .1830E-01   |     .019  .7900E-01
00125>                               .010  .2510E-01   |     .022  .1022E+00
00126>                               .014  .4060E-01   |     .000  .0000E+00
00127>

00128>       ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
00129>       --------------------       (ha)     (cms)     (hrs)       (mm)
00130>       INFLOW >01: (B1    )       1.98      .184     2.900     40.077
00131>       OUTFLOW<02: (SWM1  )       1.98      .017     4.850     30.834
00132>      OVERFLOW<03: (SWM1-O)        .00      .000      .000       .000
00133>
00134>                     TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
00135>                     CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
00136>                     PERCENTAGE OF TIME OVERFLOWING    (%)=      .00
00137>
00138>
00139>                     PEAK   FLOW   REDUCTION [Qout/Qin](%)=    9.357
00140>                     TIME SHIFT OF PEAK FLOW         (min)=   117.00
00141>                     MAXIMUM  STORAGE   USED       (ha.m.)=.6263E-01
00142>
00143>       *** WARNING: Outflow volume is less than inflow volume.
00144>  --------------------------------------------------------------------------------
00145> 001:0005--------------------------------------------------------------------------
00146>  ----------------------
00147>  | CALIB STANDHYD     |   Area    (ha)=    1.38
00148>  | 01:B2     DT= 1.00 |   Total Imp(%)=   42.00   Dir. Conn.(%)=     .10
00149>  ----------------------
00150>                              IMPERVIOUS    PERVIOUS (i)
00151>       Surface Area     (ha)=        .58          .80
00152>       Dep. Storage     (mm)=        .70        10.00
00153>       Average Slope     (%)=       1.00         2.00
00154>       Length            (m)=      83.00        90.00
00155>       Mannings n            =       .013         .250
00156>
00157>       Max.eff.Inten.(mm/hr)=      67.16        86.98
00158>                   over (min)        3.00        15.00
00159>       Storage Coeff.  (min)=        2.68 (ii)   14.82 (ii)
00160>       Unit Hyd. Tpeak (min)=        3.00        15.00
00161>       Unit Hyd. peak  (cms)=         .40          .08
00162>                                                          *TOTALS*
00163>       PEAK FLOW       (cms)=         .00          .15          .148 (iii)
00164>       TIME TO PEAK    (hrs)=        2.75         2.85         2.850
00165>       RUNOFF VOLUME    (mm)=       72.30        43.38        43.417
00166>       TOTAL RAINFALL   (mm)=       73.00        73.00        73.000
00167>       RUNOFF COEFFICIENT   =         .99          .59          .595
00168>
00169>         (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
00170>             CN* =  80.0    Ia = Dep. Storage  (Above)
00171>        (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
00172>             THAN THE STORAGE COEFFICIENT.
00173>       (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00174>
00175>  --------------------------------------------------------------------------------
00176> 001:0006--------------------------------------------------------------------------
00177>  ----------------------
00178>  | ROUTE RESERVOIR    |    Requested routing time step =  1.0 min.
00179>  |  IN>01:(B2     )   |
00180>  | OUT<04:(SWM2  )    |    =========  OUTLFOW STORAGE TABLE  =========
00181>  ----------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
00182>                              (cms)    (ha.m.)   |    (cms)    (ha.m.)
00183>                               .000  .1200E-01   |     .017  .5860E-01
00184>                               .000  .1830E-01   |     .019  .7900E-01
00185>                               .010  .2510E-01   |     .022  .1022E+00
00186>                               .014  .4060E-01   |     .000  .0000E+00
00187>
00188>       ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
00189>       --------------------       (ha)     (cms)     (hrs)       (mm)
00190>       INFLOW >01: (B2    )       1.38      .148     2.850     43.417
00191>       OUTFLOW<04: (SWM2  )       1.38      .015     4.617     30.156
00192>      OVERFLOW<05: (SWM2-O)        .00      .000      .000       .000
00193>
00194>                     TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
00195>                     CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
00196>                     PERCENTAGE OF TIME OVERFLOWING    (%)=      .00
00197>
00198>
00199>                     PEAK   FLOW   REDUCTION [Qout/Qin](%)=    9.897
00200>                     TIME SHIFT OF PEAK FLOW         (min)=   106.00
00201>                     MAXIMUM  STORAGE   USED       (ha.m.)=.4684E-01
00202>
00203>       *** WARNING: Outflow volume is less than inflow volume.
00204>  --------------------------------------------------------------------------------
00205> 001:0007--------------------------------------------------------------------------
00206>  ----------------------
00207>  | CALIB STANDHYD     |   Area    (ha)=    1.67
00208>  | 01:B3     DT= 1.00 |   Total Imp(%)=   42.00   Dir. Conn.(%)=     .10
00209>  ----------------------
00210>                              IMPERVIOUS    PERVIOUS (i)
00211>       Surface Area     (ha)=        .70          .97
00212>       Dep. Storage     (mm)=        .70        10.00
00213>       Average Slope     (%)=       1.00         2.00
00214>       Length            (m)=      91.00        80.00
00215>       Mannings n            =       .013         .250
00216>
00217>       Max.eff.Inten.(mm/hr)=      67.16        87.46
00218>                   over (min)        3.00        14.00
00219>       Storage Coeff.  (min)=        2.83 (ii)   14.12 (ii)
00220>       Unit Hyd. Tpeak (min)=        3.00        14.00
00221>       Unit Hyd. peak  (cms)=         .39          .08
00222>                                                          *TOTALS*
00223>       PEAK FLOW       (cms)=         .00          .18          .183 (iii)
00224>       TIME TO PEAK    (hrs)=        2.75         2.83         2.833
00225>       RUNOFF VOLUME    (mm)=       72.30        43.38        43.417
00226>       TOTAL RAINFALL   (mm)=       73.00        73.00        73.000
00227>       RUNOFF COEFFICIENT   =         .99          .59          .595
00228>
00229>         (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
00230>             CN* =  80.0    Ia = Dep. Storage  (Above)
00231>        (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
00232>             THAN THE STORAGE COEFFICIENT.
00233>       (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00234>
00235>  --------------------------------------------------------------------------------
00236> 001:0008--------------------------------------------------------------------------
00237>  ----------------------
00238>  | ROUTE RESERVOIR    |    Requested routing time step =  1.0 min.
00239>  |  IN>01:(B3     )   |
00240>  | OUT<06:(SWM3  )    |    =========  OUTLFOW STORAGE TABLE  =========
00241>  ----------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
00242>                              (cms)    (ha.m.)   |    (cms)    (ha.m.)
00243>                               .000  .1200E-01   |     .017  .5860E-01
00244>                               .000  .1830E-01   |     .019  .7900E-01
00245>                               .010  .2510E-01   |     .022  .1022E+00
00246>                               .014  .4060E-01   |     .000  .0000E+00
00247>
00248>       ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
00249>       --------------------       (ha)     (cms)     (hrs)       (mm)
00250>       INFLOW >01: (B3    )       1.67      .183     2.833     43.417
00251>       OUTFLOW<06: (SWM3  )       1.67      .016     4.633     32.459
00252>      OVERFLOW<07: (SWM3-O)        .00      .000      .000       .000
00253>
00254>                     TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
```

```
                    CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                    PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=    8.979
                    TIME SHIFT OF PEAK FLOW         (min)=   108.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=.5722E-01

      *** WARNING: Outflow volume is less than inflow volume.
--------------------------------------------------------------------------------
001:0009--------------------------------------------------------------------------
----------------------
| CALIB STANDHYD     |   Area    (ha)=     .98
| 01:B4     DT= 1.00 |   Total Imp(%)=   61.00   Dir. Conn.(%)=     .10
----------------------
                             IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        .60          .38
     Dep. Storage     (mm)=        .70        10.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      68.00        30.00
     Mannings n           =       .013         .250

     Max.eff.Inten.(mm/hr)=      67.16       149.62
                  over (min)       2.00         7.00
     Storage Coeff.  (min)=       2.38 (ii)    7.43 (ii)
     Unit Hyd. Tpeak (min)=       2.00         7.00
     Unit Hyd. peak  (cms)=        .50          .16
                                                        *TOTALS*
     PEAK FLOW       (cms)=        .00          .15          .148 (iii)
     TIME TO PEAK    (hrs)=       2.75         2.75         2.750
     RUNOFF VOLUME    (mm)=      72.30        50.85        50.873
     TOTAL RAINFALL   (mm)=      73.00        73.00        73.000
     RUNOFF COEFFICIENT   =        .99          .70          .697

       (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.

--------------------------------------------------------------------------------
001:0010--------------------------------------------------------------------------
----------------------
| ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
|  IN>01:(B4    )   |
| OUT<08:(SWM4  )   |    =========  OUTLFOW STORAGE TABLE  =========
----------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                            (cms)    (ha.m.)   |    (cms)    (ha.m.)
                             .000  .1200E-01   |     .017  .5860E-01
                             .000  .1830E-01   |     .019  .7900E-01
                             .010  .2510E-01   |     .022  .1022E+00
                             .014  .4060E-01   |     .000  .0000E+00

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     --------------------       (ha)     (cms)     (hrs)       (mm)
     INFLOW >01: (B4    )        .98      .148     2.750     50.873
     OUTFLOW<08: (SWM4  )        .98      .013     4.333     32.200
    OVERFLOW<09: (SWM4-O)        .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](%)=    8.900
                    TIME SHIFT OF PEAK FLOW         (min)=    95.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=.3909E-01

      *** WARNING: Outflow volume is less than inflow volume.
--------------------------------------------------------------------------------
001:0011--------------------------------------------------------------------------
------------------------
| ADD HYD (subtotal  ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
------------------------                  (ha)     (cms)   (hrs)   (mm)   (cms)
                      ID1 02:SWM1          1.98      .017    4.85  30.83    .000
                     +ID2 03:SWM1-OV        .00      .000     .00    .00    .000
                     +ID3 04:SWM2          1.38      .015    4.62  30.16    .000
                     +ID4 05:SWM2-OV        .00      .000     .00    .00    .000
                     +ID5 06:SWM3          1.67      .016    4.63  32.46    .000
                     +ID6 07:SWM3-OV        .00      .000     .00    .00    .000
                     +ID7 08:SWM4           .98      .013    4.33  32.20    .000
                     +ID8 09:SWM4-OV        .00      .000     .00    .00    .000
                      ============================================================
                      SUM 01:subtotal       6.01     .061    4.57  31.35    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
001:0012--------------------------------------------------------------------------
----------------------
| CALIB STANDHYD     |   Area    (ha)=     .83
| 02:B5     DT= 1.00 |   Total Imp(%)=   75.00   Dir. Conn.(%)=     .10
----------------------
                             IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        .62          .21
     Dep. Storage     (mm)=        .70        10.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      59.00        15.00
     Mannings n           =       .013         .250

     Max.eff.Inten.(mm/hr)=      67.16       250.94
                  over (min)       2.00         5.00
     Storage Coeff.  (min)=       2.18 (ii)    4.89 (ii)
     Unit Hyd. Tpeak (min)=       2.00         5.00
     Unit Hyd. peak  (cms)=        .53          .23
                                                        *TOTALS*
     PEAK FLOW       (cms)=        .00          .14          .142 (iii)
     TIME TO PEAK    (hrs)=       2.75         2.75         2.750
     RUNOFF VOLUME    (mm)=      72.30        57.53        57.544
     TOTAL RAINFALL   (mm)=      73.00        73.00        73.000
     RUNOFF COEFFICIENT   =        .99          .79          .788

       (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.

--------------------------------------------------------------------------------
001:0013--------------------------------------------------------------------------
----------------------
| ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
|  IN>02:(B5    )   |
| OUT<03:(SWM5  )   |    =========  OUTLFOW STORAGE TABLE  =========
----------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                            (cms)    (ha.m.)   |    (cms)    (ha.m.)
                             .000  .1200E-01   |     .017  .5860E-01
                             .000  .1830E-01   |     .019  .7900E-01
                             .010  .2510E-01   |     .022  .1022E+00
                             .014  .4060E-01   |     .000  .0000E+00

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     --------------------       (ha)     (cms)     (hrs)       (mm)
     INFLOW >02: (B5    )        .83      .142     2.750     57.544
     OUTFLOW<03: (SWM5  )        .83      .013     4.267     35.496
    OVERFLOW<04: (SWM5-O)        .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](%)=    9.010
                    TIME SHIFT OF PEAK FLOW         (min)=    91.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=.3754E-01

      *** WARNING: Outflow volume is less than inflow volume.
--------------------------------------------------------------------------------
001:0014--------------------------------------------------------------------------
------------------------
| ADD HYD (Node1     ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
------------------------                  (ha)     (cms)   (hrs)   (mm)   (cms)
                       ID1 01:subtotal      6.01     .061    4.57  31.35    .000
                      +ID2 03:SWM5           .83      .013    4.27  35.50    .000
                      +ID3 04:SWM5-OV        .00      .000     .00    .00    .000
                       ============================================================
                       SUM 09:Node1         6.84     .074    4.50  31.86    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
001:0015--------------------------------------------------------------------------
----------------------
| CALIB STANDHYD     |   Area    (ha)=     .40
| 01:B6     DT= 1.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=     .10
----------------------
                             IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        .40          .00
     Dep. Storage     (mm)=        .70        10.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      45.00        15.00
     Mannings n           =       .013         .250

     Max.eff.Inten.(mm/hr)=      67.16      6708.23
                  over (min)       2.00         3.00
     Storage Coeff.  (min)=       1.86 (ii)    2.58 (ii)
     Unit Hyd. Tpeak (min)=       2.00         3.00
     Unit Hyd. peak  (cms)=        .59          .41
                                                        *TOTALS*
     PEAK FLOW       (cms)=        .00          .07          .075 (iii)
     TIME TO PEAK    (hrs)=       2.75         2.75         2.750
     RUNOFF VOLUME    (mm)=      72.30        72.27        72.270
     TOTAL RAINFALL   (mm)=      73.00        73.00        73.000
     RUNOFF COEFFICIENT   =        .99          .99          .990

       (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.

--------------------------------------------------------------------------------
001:0016--------------------------------------------------------------------------
----------------------
| ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
|  IN>01:(B6    )   |
| OUT<02:(SWM6  )   |    =========  OUTLFOW STORAGE TABLE  =========
----------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                            (cms)    (ha.m.)   |    (cms)    (ha.m.)
                             .000  .0000E+00   |     .009  .1200E-01
                             .004  .2000E-02   |     .011  .1600E-01
                             .005  .4000E-02   |     .012  .2000E-01
                             .008  .8000E-02   |     .013  .2400E-01

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     --------------------       (ha)     (cms)     (hrs)       (mm)
     INFLOW >01: (B6    )        .40      .075     2.750     72.270
     OUTFLOW<02: (SWM6  )        .40      .012     3.400     72.269
    OVERFLOW<03: (SWM6-O)        .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](%)=   15.849
                    TIME SHIFT OF PEAK FLOW         (min)=    39.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=.1915E-01

--------------------------------------------------------------------------------
001:0017--------------------------------------------------------------------------
----------------------
| CALIB STANDHYD     |   Area    (ha)=     .28
| 04:B7     DT= 1.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=     .10
----------------------
                             IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        .28          .00
     Dep. Storage     (mm)=        .70        10.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      37.00        15.00
     Mannings n           =       .013         .250

     Max.eff.Inten.(mm/hr)=      67.16      6708.25
                  over (min)       2.00         2.00
     Storage Coeff.  (min)=       1.65 (ii)    2.38 (ii)
     Unit Hyd. Tpeak (min)=       2.00         2.00
     Unit Hyd. peak  (cms)=        .63          .50
                                                        *TOTALS*
     PEAK FLOW       (cms)=        .00          .05          .052 (iii)
     TIME TO PEAK    (hrs)=       2.75         2.75         2.750
     RUNOFF VOLUME    (mm)=      72.30        72.27        72.270
     TOTAL RAINFALL   (mm)=      73.00        73.00        73.000
     RUNOFF COEFFICIENT   =        .99          .99          .990

       (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.

--------------------------------------------------------------------------------
001:0018--------------------------------------------------------------------------
----------------------
| ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
```

```
|  IN>04:(B7    )   |
| OUT<05:(SWM7  )   |    =========  OUTLFOW STORAGE TABLE  =========
--------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                          (cms)    (ha.m.)   |    (cms)    (ha.m.)
                           .000  .0000E+00   |     .009  .9000E-02
                           .004  .1500E-02   |     .011  .1200E-01
                           .005  .3000E-02   |     .012  .1500E-01
                           .008  .6000E-02   |     .013  .1800E-01

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     --------------------       (ha)     (cms)     (hrs)       (mm)
     INFLOW >04: (B7    )        .28      .052     2.750     72.270
     OUTFLOW<05: (SWM7  )        .28      .011     3.300     72.269
    OVERFLOW<06: (SWM7-O)        .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](%)=   20.870
                    TIME SHIFT OF PEAK FLOW         (min)=    33.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=.1223E-01

-------------------------------------------------------------------------------
001:0019--------------------------------------------------------------------------
-------------------------
| ADD HYD (node2     ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
----------------------- ----------------  (ha)     (cms)   (hrs)   (mm)   (cms)
                         ID1 02:SWM6          .40      .012    3.40  72.27    .000
                        +ID2 03:SWM6-OV       .00      .000     .00    .00    .000
                        +ID3 05:SWM7          .28      .011    3.30  72.27    .000
                        +ID4 06:SWM7-OV       .00      .000     .00    .00    .000
                         ============================================================
                         SUM 07:node2         .68      .023    3.33  72.27    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0020--------------------------------------------------------------------------
---------------------
| CALIB STANDHYD    |   Area    (ha)=    1.51
| 01:C      DT= 1.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=     .10
---------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.49          .02
     Dep. Storage     (mm)=        .70        10.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      39.00        10.00
     Mannings n           =       .013         .250

     Max.eff.Inten.(mm/hr)=      67.16      6708.25
                   over (min)        2.00         2.00
     Storage Coeff.  (min)=       1.70 (ii)    2.27 (ii)
     Unit Hyd. Tpeak (min)=       2.00         2.00
     Unit Hyd. peak  (cms)=        .62          .51
                                                      *TOTALS*
     PEAK FLOW       (cms)=        .00          .28          .282 (iii)
     TIME TO PEAK    (hrs)=       2.75         2.75         2.750
     RUNOFF VOLUME    (mm)=      72.30        72.27        72.270
     TOTAL RAINFALL   (mm)=      73.00        73.00        73.000
     RUNOFF COEFFICIENT   =        .99          .99          .990

       (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.

-------------------------------------------------------------------------------
001:0021--------------------------------------------------------------------------
---------------------
| ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
|  IN>01:(C     )   |
| OUT<02:(RoofC )   |    =========  OUTLFOW STORAGE TABLE  =========
--------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                          (cms)    (ha.m.)   |    (cms)    (ha.m.)
                           .000  .0000E+00   |     .063  .1509E+00
                           .063  .7540E-01   |     .063  .2263E+00

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     --------------------       (ha)     (cms)     (hrs)       (mm)
     INFLOW >01: (C     )       1.51      .282     2.750     72.270
     OUTFLOW<02: (RoofC )       1.51      .059     3.300     72.269
    OVERFLOW<03: (roof-o)        .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](%)=   21.036
                    TIME SHIFT OF PEAK FLOW         (min)=    33.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=.7092E-01

-------------------------------------------------------------------------------
001:0022--------------------------------------------------------------------------
-------------------------
| ADD HYD (Node3     ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
------------------------ ----------------  (ha)     (cms)   (hrs)   (mm)   (cms)
                         ID1 07:node2         .68      .023    3.33  72.27    .000
                        +ID2 02:RoofC        1.51      .059    3.30  72.27    .000
                        +ID3 03:roof-ovf      .00      .000     .00    .00    .000
                         ============================================================
                         SUM 08:Node3        2.19      .082    3.30  72.27    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0023--------------------------------------------------------------------------
-------------------------
| ADD HYD (Node4     ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
------------------------ ----------------  (ha)     (cms)   (hrs)   (mm)   (cms)
                         ID1 08:Node3         2.19      .082    3.30  72.27    .000
                        +ID2 09:Node1         6.84      .074    4.50  31.86    .000
                         ============================================================
                         SUM 01:Node4         9.03      .151    3.80  41.66    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0024--------------------------------------------------------------------------
      FINISH
-------------------------------------------------------------------------------
*******************************************************************************
     WARNINGS / ERRORS / NOTES
     -------------------------
001:0004 ROUTE RESERVOIR
     *** WARNING: Outflow volume is less than inflow volume.
001:0006 ROUTE RESERVOIR
     *** WARNING: Outflow volume is less than inflow volume.
001:0008 ROUTE RESERVOIR
     *** WARNING: Outflow volume is less than inflow volume.
001:0010 ROUTE RESERVOIR
     *** WARNING: Outflow volume is less than inflow volume.
001:0013 ROUTE RESERVOIR
     *** WARNING: Outflow volume is less than inflow volume.
  Simulation ended on 2022-02-15     at 16:43:31
================================================================================
```

```
00001> ================================================================================
00002>
00003>    SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO        999    999    =========
00004>    S      W W W  MM MM  H   H   Y Y   MM MM  O   O      9   9  9   9
00005>    SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  9   9   Ver  4.05
00006>        S  W W W  M   M  H   H    Y    M   M  O   O       9999   9999   Sept 2011
00007>    SSSSS   W W   M   M  H   H    Y    M   M   OOO            9      9   =========
00008>                                                          9   9  9   9   # 3375279
00009>          StormWater Management HYdrologic Model          999    999    =========
00010>
00011>  ********************************************************************************
00012>  ***************************** SWMHYMO Ver/4.05  ********************************
00013>  *********  A single event and continuous hydrologic simulation model  *********
00014>  *********     based on the principles of HYMO and its successors      *********
00015>  *********                 OTTHYMO-83 and OTTHYMO-89.                  *********
00016>  ********************************************************************************
00017>  ********* Distributed by:  J.F. Sabourin and Associates Inc.           *********
00018>  *********                  Ottawa,  Ontario: (613) 836-3884           *********
00019>  *********                  Gatineau, Quebec: (819) 243-6858           *********
00020>  *********                  E-Mail: swmhymo@jfsa.Com                   *********
00021>  ********************************************************************************
00022>
00023>  ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
00024>  +++++++++ Licensed user: Calder Engineering Ltd.                       +++++++++
00025>  +++++++++                 Bolton                SERIAL#:3375279       +++++++++
00026>  ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
00027>
00028>  ********************************************************************************
00029>  *********          ++++++ PROGRAM ARRAY DIMENSIONS ++++++             *********
00030>  *********          Maximum value for ID numbers  :     10            *********
00031>  *********          Max. number of rainfall points: 105408            *********
00032>  *********          Max. number of flow points    : 105408            *********
00033>  ********************************************************************************
00034>
00035>
00036>  **********************   D E T A I L E D   O U T P U T   **********************
00037>  ********************************************************************************
00038>  *         DATE: 2022-02-15     TIME: 16:42:56     RUN COUNTER: 000620          *
00039>  ********************************************************************************
00040>  * Input   filename: C:\USERS\CALDER\DOCUME~1\SWMMHY~1\Sand\SAND-2~1\Sand-P6.da*
00041>  * Output  filename: C:\USERS\CALDER\DOCUME~1\SWMMHY~1\Sand\SAND-2~1\Sand-P6.ou*
00042>  * Summary filename: C:\USERS\CALDER\DOCUME~1\SWMMHY~1\Sand\SAND-2~1\Sand-P6.su*
00043>  * User comments:                                                             *
00044>  * 1:_____________________________________________________________________*
00045>  * 2:_____________________________________________________________________*
00046>  * 3:_____________________________________________________________________*
00047>  ********************************************************************************
00048>
00049>  --------------------------------------------------------------------------------
00050> 001:0001--------------------------------------------------------------------------
00051>  *#*****************************************************************************
00052>  *#  Project Name: [Sandhill]    Project Number: [19-216]
00053>  *#  Date        : [2022-02-15]
00054>  *#  Modeller    : [    MYS    ]
00055>  *#  Company     : Calder Engineering Ltd.
00056>  *#  License #   :  3375279
00057>  *#*****************************************************************************
00058>  *# Proposed Conditions:
00059>  *# Filename: Sand-P5.dat
00060>  *#*****************************************************************************
00061>  ---------------------
00062>  | START        |  Project  dir.: C:\USERS\CALDER\DOCUME~1\SWMMHY~1\Sand\SAND
00063>  ---------------  Rainfall dir.: C:\USERS\CALDER\DOCUME~1\SWMMHY~1\Sand\SAND
00064>     TZERO =   .00 hrs on      0
00065>     METOUT=   2 (output = METRIC)
00066>     NRUN  = 001
00067>     NSTORM=   0
00068>  --------------------------------------------------------------------------------
00069> 001:0002--------------------------------------------------------------------------
00070>  --------------------
00071>  | READ STORM       |    Filename: 100yr/6hr
00072>  | Ptotal=  80.31 mm|    Comments: 100yr/6hr
00073>  --------------------
00074>               TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
00075>                hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
00076>                .25    .000 |   2.00  27.300 |   3.75  11.240 |   5.50   1.610
00077>                .50   1.610 |   2.25  27.300 |   4.00   6.420 |   5.75   1.610
00078>                .75   1.610 |   2.50  73.880 |   4.25   6.420 |   6.00   1.610
00079>               1.00   1.610 |   2.75  73.880 |   4.50   3.210 |   6.25   1.610
00080>               1.25   1.610 |   3.00  20.880 |   4.75   3.210 |
00081>               1.50   9.640 |   3.25  20.880 |   5.00   1.610 |
00082>               1.75   9.640 |   3.50  11.240 |   5.25   1.610 |
00083>
00084>  --------------------------------------------------------------------------------
00085> 001:0003--------------------------------------------------------------------------
00086>  ----------------------
00087>  | CALIB STANDHYD     |   Area    (ha)=    1.98
00088>  | 01:B1     DT= 1.00 |   Total Imp(%)=   32.00   Dir. Conn.(%)=     .10
00089>  ----------------------
00090>                              IMPERVIOUS    PERVIOUS (i)
00091>       Surface Area     (ha)=        .63         1.35
00092>       Dep. Storage     (mm)=        .70        10.00
00093>       Average Slope     (%)=       1.00         2.00
00094>       Length            (m)=     100.00       100.00
00095>       Mannings n            =       .013         .250
00096>
00097>       Max.eff.Inten.(mm/hr)=      73.88        79.11
00098>                   over (min)        3.00        16.00
00099>       Storage Coeff.  (min)=        2.88 (ii)   16.32 (ii)
00100>       Unit Hyd. Tpeak (min)=        3.00        16.00
00101>       Unit Hyd. peak  (cms)=         .39          .07
00102>                                                          *TOTALS*
00103>       PEAK FLOW       (cms)=         .00          .22          .218 (iii)
00104>       TIME TO PEAK    (hrs)=        2.72         2.87         2.867
00105>       RUNOFF VOLUME    (mm)=       79.61        46.28        46.319
00106>       TOTAL RAINFALL   (mm)=       80.31        80.31        80.310
00107>       RUNOFF COEFFICIENT   =         .99          .58          .577
00108>
00109>         (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
00110>             CN* =  80.0    Ia = Dep. Storage  (Above)
00111>        (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
00112>             THAN THE STORAGE COEFFICIENT.
00113>       (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00114>
00115>  --------------------------------------------------------------------------------
00116> 001:0004--------------------------------------------------------------------------
00117>  ----------------------
00118>  | ROUTE RESERVOIR    |    Requested routing time step =  1.0 min.
00119>  |  IN>01:(B1     )   |
00120>  | OUT<02:(SWM1  )   |    =========  OUTLFOW STORAGE TABLE  =========
00121>  ----------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
00122>                              (cms)    (ha.m.)   |    (cms)    (ha.m.)
00123>                               .000  .1200E-01   |     .017  .5860E-01
00124>                               .000  .1830E-01   |     .019  .7900E-01
00125>                               .010  .2510E-01   |     .022  .1022E+00
00126>                               .014  .4060E-01   |     .000  .0000E+00
00127>

00128>       ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
00129>       --------------------       (ha)     (cms)     (hrs)       (mm)
00130>       INFLOW >01: (B1    )       1.98      .218     2.867     46.319
00131>       OUTFLOW<02: (SWM1  )       1.98      .019     4.850     37.076
00132>      OVERFLOW<03: (SWM1-O)        .00      .000      .000       .000
00133>
00134>                     TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
00135>                     CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
00136>                     PERCENTAGE OF TIME OVERFLOWING    (%)=      .00
00137>
00138>
00139>                     PEAK   FLOW   REDUCTION [Qout/Qin](%)=    8.500
00140>                     TIME SHIFT OF PEAK FLOW         (min)=   119.00
00141>                     MAXIMUM  STORAGE   USED       (ha.m.)=.7321E-01
00142>
00143>       *** WARNING: Outflow volume is less than inflow volume.
00144>  --------------------------------------------------------------------------------
00145> 001:0005--------------------------------------------------------------------------
00146>  ----------------------
00147>  | CALIB STANDHYD     |   Area    (ha)=    1.38
00148>  | 01:B2     DT= 1.00 |   Total Imp(%)=   42.00   Dir. Conn.(%)=     .10
00149>  ----------------------
00150>                              IMPERVIOUS    PERVIOUS (i)
00151>       Surface Area     (ha)=        .58         .80
00152>       Dep. Storage     (mm)=        .70        10.00
00153>       Average Slope     (%)=       1.00         2.00
00154>       Length            (m)=      83.00        90.00
00155>       Mannings n            =       .013         .250
00156>
00157>       Max.eff.Inten.(mm/hr)=      73.88        99.53
00158>                   over (min)        3.00        14.00
00159>       Storage Coeff.  (min)=        2.58 (ii)   14.08 (ii)
00160>       Unit Hyd. Tpeak (min)=        3.00        14.00
00161>       Unit Hyd. peak  (cms)=         .41          .08
00162>                                                          *TOTALS*
00163>       PEAK FLOW       (cms)=         .00          .17          .174 (iii)
00164>       TIME TO PEAK    (hrs)=        2.72         2.83         2.833
00165>       RUNOFF VOLUME    (mm)=       79.61        49.84        49.871
00166>       TOTAL RAINFALL   (mm)=       80.31        80.31        80.310
00167>       RUNOFF COEFFICIENT   =         .99          .62          .621
00168>
00169>         (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
00170>             CN* =  80.0    Ia = Dep. Storage  (Above)
00171>        (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
00172>             THAN THE STORAGE COEFFICIENT.
00173>       (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00174>
00175>  --------------------------------------------------------------------------------
00176> 001:0006--------------------------------------------------------------------------
00177>  ----------------------
00178>  | ROUTE RESERVOIR    |    Requested routing time step =  1.0 min.
00179>  |  IN>01:(B2     )   |
00180>  | OUT<04:(SWM2  )   |    =========  OUTLFOW STORAGE TABLE  =========
00181>  ----------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
00182>                              (cms)    (ha.m.)   |    (cms)    (ha.m.)
00183>                               .000  .1200E-01   |     .017  .5860E-01
00184>                               .000  .1830E-01   |     .019  .7900E-01
00185>                               .010  .2510E-01   |     .022  .1022E+00
00186>                               .014  .4060E-01   |     .000  .0000E+00
00187>
00188>       ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
00189>       --------------------       (ha)     (cms)     (hrs)       (mm)
00190>       INFLOW >01: (B2    )       1.38      .174     2.833     49.871
00191>       OUTFLOW<04: (SWM2  )       1.38      .016     4.600     36.610
00192>      OVERFLOW<05: (SWM2-O)        .00      .000      .000       .000
00193>
00194>                     TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
00195>                     CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
00196>                     PERCENTAGE OF TIME OVERFLOWING    (%)=      .00
00197>
00198>
00199>                     PEAK   FLOW   REDUCTION [Qout/Qin](%)=    9.162
00200>                     TIME SHIFT OF PEAK FLOW         (min)=   106.00
00201>                     MAXIMUM  STORAGE   USED       (ha.m.)=.5423E-01
00202>
00203>       *** WARNING: Outflow volume is less than inflow volume.
00204>  --------------------------------------------------------------------------------
00205> 001:0007--------------------------------------------------------------------------
00206>  ----------------------
00207>  | CALIB STANDHYD     |   Area    (ha)=    1.67
00208>  | 01:B3     DT= 1.00 |   Total Imp(%)=   42.00   Dir. Conn.(%)=     .10
00209>  ----------------------
00210>                              IMPERVIOUS    PERVIOUS (i)
00211>       Surface Area     (ha)=        .70         .97
00212>       Dep. Storage     (mm)=        .70        10.00
00213>       Average Slope     (%)=       1.00         2.00
00214>       Length            (m)=      91.00        80.00
00215>       Mannings n            =       .013         .250
00216>
00217>       Max.eff.Inten.(mm/hr)=      73.88       100.01
00218>                   over (min)        3.00        13.00
00219>       Storage Coeff.  (min)=        2.72 (ii)   13.42 (ii)
00220>       Unit Hyd. Tpeak (min)=        3.00        13.00
00221>       Unit Hyd. peak  (cms)=         .40          .09
00222>                                                          *TOTALS*
00223>       PEAK FLOW       (cms)=         .00          .21          .215 (iii)
00224>       TIME TO PEAK    (hrs)=        2.72         2.82         2.817
00225>       RUNOFF VOLUME    (mm)=       79.61        49.84        49.871
00226>       TOTAL RAINFALL   (mm)=       80.31        80.31        80.310
00227>       RUNOFF COEFFICIENT   =         .99          .62          .621
00228>
00229>         (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
00230>             CN* =  80.0    Ia = Dep. Storage  (Above)
00231>        (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
00232>             THAN THE STORAGE COEFFICIENT.
00233>       (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00234>
00235>  --------------------------------------------------------------------------------
00236> 001:0008--------------------------------------------------------------------------
00237>  ----------------------
00238>  | ROUTE RESERVOIR    |    Requested routing time step =  1.0 min.
00239>  |  IN>01:(B3     )   |
00240>  | OUT<06:(SWM3  )   |    =========  OUTLFOW STORAGE TABLE  =========
00241>  ----------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
00242>                              (cms)    (ha.m.)   |    (cms)    (ha.m.)
00243>                               .000  .1200E-01   |     .017  .5860E-01
00244>                               .000  .1830E-01   |     .019  .7900E-01
00245>                               .010  .2510E-01   |     .022  .1022E+00
00246>                               .014  .4060E-01   |     .000  .0000E+00
00247>
00248>       ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
00249>       --------------------       (ha)     (cms)     (hrs)       (mm)
00250>       INFLOW >01: (B3    )       1.67      .215     2.817     49.871
00251>       OUTFLOW<06: (SWM3  )       1.67      .018     4.650     38.913
00252>      OVERFLOW<07: (SWM3-O)        .00      .000      .000       .000
00253>
00254>                     TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
```

```
                    CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                    PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=    8.227
                    TIME SHIFT OF PEAK FLOW         (min)=   110.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=.6635E-01

      *** WARNING: Outflow volume is less than inflow volume.
--------------------------------------------------------------------------------
001:0009--------------------------------------------------------------------------
----------------------
| CALIB STANDHYD     |   Area    (ha)=     .98
| 01:B4     DT= 1.00 |   Total Imp(%)=   61.00   Dir. Conn.(%)=     .10
----------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        .60          .38
     Dep. Storage     (mm)=        .70        10.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      68.00        30.00
     Mannings n           =       .013         .250

     Max.eff.Inten.(mm/hr)=     73.88       167.70
                  over (min)       2.00         7.00
     Storage Coeff.  (min)=       2.29 (ii)    7.12 (ii)
     Unit Hyd. Tpeak (min)=       2.00         7.00
     Unit Hyd. peak  (cms)=        .51          .16
                                                      *TOTALS*
     PEAK FLOW       (cms)=        .00          .17          .168 (iii)
     TIME TO PEAK    (hrs)=       2.70         2.75         2.750
     RUNOFF VOLUME    (mm)=      79.61        57.69        57.711
     TOTAL RAINFALL   (mm)=      80.31        80.31        80.310
     RUNOFF COEFFICIENT   =        .99          .72          .719

       (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.

--------------------------------------------------------------------------------
001:0010--------------------------------------------------------------------------
----------------------
| ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
|  IN>01:(B4    )   |
| OUT<08:(SWM4  )   |    =========  OUTLFOW STORAGE TABLE  =========
----------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                            (cms)    (ha.m.)   |    (cms)    (ha.m.)
                            .000  .1200E-01   |     .017  .5860E-01
                            .000  .1830E-01   |     .019  .7900E-01
                            .010  .2510E-01   |     .022  .1022E+00
                            .014  .4060E-01   |     .000  .0000E+00

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     --------------------       (ha)     (cms)     (hrs)       (mm)
     INFLOW >01: (B4    )        .98      .168     2.750     57.711
     OUTFLOW<08: (SWM4  )        .98      .014     4.350     39.038
    OVERFLOW<09: (SWM4-O)        .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](%)=    8.497
                    TIME SHIFT OF PEAK FLOW         (min)=    96.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=.4454E-01

      *** WARNING: Outflow volume is less than inflow volume.
--------------------------------------------------------------------------------
001:0011--------------------------------------------------------------------------
------------------------
| ADD HYD (subtotal  ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
------------------------                  (ha)     (cms)   (hrs)   (mm)   (cms)
                        ID1 02:SWM1          1.98      .019    4.85  37.08    .000
                       +ID2 03:SWM1-OV         .00      .000     .00    .00    .000
                       +ID3 04:SWM2          1.38      .016    4.60  36.61    .000
                       +ID4 05:SWM2-OV         .00      .000     .00    .00    .000
                       +ID5 06:SWM3          1.67      .018    4.65  38.91    .000
                       +ID6 07:SWM3-OV         .00      .000     .00    .00    .000
                       +ID7 08:SWM4          .98      .014    4.35  39.04    .000
                       +ID8 09:SWM4-OV         .00      .000     .00    .00    .000
                        ================================================================
                        SUM 01:subtotal       6.01     .066    4.60  37.80    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
001:0012--------------------------------------------------------------------------
----------------------
| CALIB STANDHYD     |   Area    (ha)=     .83
| 02:B5     DT= 1.00 |   Total Imp(%)=   75.00   Dir. Conn.(%)=     .10
----------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        .62          .21
     Dep. Storage     (mm)=        .70        10.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      59.00        15.00
     Mannings n           =       .013         .250

     Max.eff.Inten.(mm/hr)=     73.88       278.75
                  over (min)       2.00         5.00
     Storage Coeff.  (min)=       2.10 (ii)    4.70 (ii)
     Unit Hyd. Tpeak (min)=       2.00         5.00
     Unit Hyd. peak  (cms)=        .54          .24
                                                      *TOTALS*
     PEAK FLOW       (cms)=        .00          .16          .158 (iii)
     TIME TO PEAK    (hrs)=       2.70         2.75         2.750
     RUNOFF VOLUME    (mm)=      79.61        64.61        64.627
     TOTAL RAINFALL   (mm)=      80.31        80.31        80.310
     RUNOFF COEFFICIENT   =        .99          .80          .805

       (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.

--------------------------------------------------------------------------------
001:0013--------------------------------------------------------------------------
----------------------
| ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
|  IN>02:(B5    )   |
| OUT<03:(SWM5  )   |    =========  OUTLFOW STORAGE TABLE  =========
----------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                            (cms)    (ha.m.)   |    (cms)    (ha.m.)
                            .000  .1200E-01   |     .017  .5860E-01
                            .000  .1830E-01   |     .019  .7900E-01
                            .010  .2510E-01   |     .022  .1022E+00
                            .014  .4060E-01   |     .000  .0000E+00

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     --------------------       (ha)     (cms)     (hrs)       (mm)
     INFLOW >02: (B5    )        .83      .158     2.750     64.627
     OUTFLOW<03: (SWM5  )        .83      .014     4.283     42.579
    OVERFLOW<04: (SWM5-O)        .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](%)=    8.766
                    TIME SHIFT OF PEAK FLOW         (min)=    92.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=.4227E-01

      *** WARNING: Outflow volume is less than inflow volume.
--------------------------------------------------------------------------------
001:0014--------------------------------------------------------------------------
----------------------
| ADD HYD (Node1     ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
----------------------                    (ha)     (cms)   (hrs)   (mm)   (cms)
                         ID1 01:subtotal       6.01     .066    4.60  37.80    .000
                        +ID2 03:SWM5            .83      .014    4.28  42.58    .000
                        +ID3 04:SWM5-OV         .00      .000     .00    .00    .000
                         ================================================================
                         SUM 09:Node1          6.84     .080    4.53  38.38    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
001:0015--------------------------------------------------------------------------
----------------------
| CALIB STANDHYD     |   Area    (ha)=     .40
| 01:B6     DT= 1.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=     .10
----------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        .40          .00
     Dep. Storage     (mm)=        .70        10.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      45.00        15.00
     Mannings n           =       .013         .250

     Max.eff.Inten.(mm/hr)=     73.88      7379.68
                  over (min)       2.00         2.00
     Storage Coeff.  (min)=       1.79 (ii)    2.49 (ii)
     Unit Hyd. Tpeak (min)=       2.00         2.00
     Unit Hyd. peak  (cms)=        .60          .48
                                                      *TOTALS*
     PEAK FLOW       (cms)=        .00          .08          .082 (iii)
     TIME TO PEAK    (hrs)=       2.70         2.75         2.750
     RUNOFF VOLUME    (mm)=      79.61        79.58        79.579
     TOTAL RAINFALL   (mm)=      80.31        80.31        80.310
     RUNOFF COEFFICIENT   =        .99          .99          .991

       (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.

--------------------------------------------------------------------------------
001:0016--------------------------------------------------------------------------
----------------------
| ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
|  IN>01:(B6    )   |
| OUT<02:(SWM6  )   |    =========  OUTLFOW STORAGE TABLE  =========
----------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                            (cms)    (ha.m.)   |    (cms)    (ha.m.)
                             .000  .0000E+00   |     .009  .1200E-01
                             .004  .2000E-02   |     .011  .1600E-01
                             .005  .4000E-02   |     .012  .2000E-01
                             .008  .8000E-02   |     .013  .2400E-01

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     --------------------       (ha)     (cms)     (hrs)       (mm)
     INFLOW >01: (B6    )        .40      .082     2.750     79.579
     OUTFLOW<02: (SWM6  )        .40      .012     3.533     79.579
    OVERFLOW<03: (SWM6-O)        .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](%)=   15.227
                    TIME SHIFT OF PEAK FLOW         (min)=    47.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=.2133E-01

--------------------------------------------------------------------------------
001:0017--------------------------------------------------------------------------
----------------------
| CALIB STANDHYD     |   Area    (ha)=     .28
| 04:B7     DT= 1.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=     .10
----------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        .28          .00
     Dep. Storage     (mm)=        .70        10.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      37.00        15.00
     Mannings n           =       .013         .250

     Max.eff.Inten.(mm/hr)=     73.88      7379.68
                  over (min)       2.00         2.00
     Storage Coeff.  (min)=       1.59 (ii)    2.29 (ii)
     Unit Hyd. Tpeak (min)=       2.00         2.00
     Unit Hyd. peak  (cms)=        .65          .51
                                                      *TOTALS*
     PEAK FLOW       (cms)=        .00          .06          .057 (iii)
     TIME TO PEAK    (hrs)=       2.70         2.75         2.750
     RUNOFF VOLUME    (mm)=      79.61        79.58        79.579
     TOTAL RAINFALL   (mm)=      80.31        80.31        80.310
     RUNOFF COEFFICIENT   =        .99          .99          .991

       (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.

--------------------------------------------------------------------------------
001:0018--------------------------------------------------------------------------
----------------------
| ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
                            .000  .1830E-01   |     .019  .7900E-01
                            .010  .2510E-01   |     .022  .1022E+00
                            .014  .4060E-01   |     .000  .0000E+00
```

```
|  IN>04:(B7    )   |
| OUT<05:(SWM7  )   |    =========  OUTLFOW STORAGE TABLE  =========
--------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                          (cms)    (ha.m.)   |    (cms)    (ha.m.)
                           .000  .0000E+00   |     .009  .9000E-02
                           .004  .1500E-02   |     .011  .1200E-01
                           .005  .3000E-02   |     .012  .1500E-01
                           .008  .6000E-02   |     .013  .1800E-01

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     --------------------       (ha)     (cms)     (hrs)       (mm)
     INFLOW >04: (B7    )        .28      .057     2.750     79.579
     OUTFLOW<05: (SWM7  )        .28      .012     3.300     79.579
    OVERFLOW<06: (SWM7-O)        .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](%)=   20.051
                    TIME SHIFT OF PEAK FLOW         (min)=    33.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=.1366E-01

--------------------------------------------------------------------------------
001:0019--------------------------------------------------------------------------
-------------------------
| ADD HYD (node2     ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
-----------------------                   (ha)     (cms)   (hrs)   (mm)   (cms)
                       ID1 02:SWM6          .40      .012    3.53  79.58    .000
                      +ID2 03:SWM6-OV       .00      .000     .00    .00    .000
                      +ID3 05:SWM7          .28      .012    3.30  79.58    .000
                      +ID4 06:SWM7-OV       .00      .000     .00    .00    .000
                       ============================================================
                       SUM 07:node2         .68      .024    3.33  79.58    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
001:0020--------------------------------------------------------------------------
---------------------
| CALIB STANDHYD    |   Area    (ha)=    1.51
| 01:C      DT= 1.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=     .10
---------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.49          .02
     Dep. Storage     (mm)=        .70        10.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      39.00        10.00
     Mannings n           =       .013         .250

     Max.eff.Inten.(mm/hr)=      73.88      7379.68
                  over (min)        2.00         2.00
     Storage Coeff.  (min)=       1.64 (ii)    2.19 (ii)
     Unit Hyd. Tpeak (min)=       2.00         2.00
     Unit Hyd. peak  (cms)=        .63          .53
                                                      *TOTALS*
     PEAK FLOW       (cms)=        .00          .31          .310 (iii)
     TIME TO PEAK    (hrs)=       2.70         2.75         2.750
     RUNOFF VOLUME    (mm)=      79.61        79.58        79.579
     TOTAL RAINFALL   (mm)=      80.31        80.31        80.310
     RUNOFF COEFFICIENT   =        .99          .99          .991

       (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.

--------------------------------------------------------------------------------
001:0021--------------------------------------------------------------------------
--------------------
| ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
|  IN>01:(C     )   |
| OUT<02:(RoofC )   |    =========  OUTLFOW STORAGE TABLE  =========
--------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                          (cms)    (ha.m.)   |    (cms)    (ha.m.)
                           .000  .0000E+00   |     .063  .1509E+00
                           .063  .7540E-01   |     .063  .2263E+00

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     --------------------       (ha)     (cms)     (hrs)       (mm)
     INFLOW >01: (C     )       1.51      .310     2.750     79.579
     OUTFLOW<02: (RoofC )       1.51      .063     2.967     79.579
    OVERFLOW<03: (roof-o)        .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](%)=   20.333
                    TIME SHIFT OF PEAK FLOW         (min)=    13.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=.7823E-01

--------------------------------------------------------------------------------
001:0022--------------------------------------------------------------------------
-------------------------
| ADD HYD (Node3     ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
-----------------------                   (ha)     (cms)   (hrs)   (mm)   (cms)
                       ID1 07:node2         .68      .024    3.33  79.58    .000
                      +ID2 02:RoofC        1.51      .063    2.97  79.58    .000
                      +ID3 03:roof-ovf      .00      .000     .00    .00    .000
                       ============================================================
                       SUM 08:Node3        2.19      .087    3.33  79.58    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
001:0023--------------------------------------------------------------------------
-------------------------
| ADD HYD (Node4     ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
-----------------------                   (ha)     (cms)   (hrs)   (mm)   (cms)
                       ID1 08:Node3         2.19      .087    3.33  79.58    .000
                      +ID2 09:Node1         6.84      .080    4.53  38.38    .000
                       ============================================================
                       SUM 01:Node4         9.03      .165    3.80  48.37    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
001:0024--------------------------------------------------------------------------
      FINISH
--------------------------------------------------------------------------------
********************************************************************************
     WARNINGS / ERRORS / NOTES
     -------------------------
001:0004 ROUTE RESERVOIR
     *** WARNING: Outflow volume is less than inflow volume.
001:0006 ROUTE RESERVOIR
     *** WARNING: Outflow volume is less than inflow volume.
001:0008 ROUTE RESERVOIR
     *** WARNING: Outflow volume is less than inflow volume.
001:0010 ROUTE RESERVOIR
     *** WARNING: Outflow volume is less than inflow volume.
001:0013 ROUTE RESERVOIR
     *** WARNING: Outflow volume is less than inflow volume.
  Simulation ended on 2022-02-15     at 16:42:56
================================================================================
```

Table B1.1
13846 and 13940 Airport Road
EXISTING CONDITIONS

NASHYD PARAMETERS

Basin ID	NHYD ID	DT min	Area ha	DWF cms	CN/C Group	CN/C	IA mm	N	TP hrs
A	A	1	8.51	0	C	80	10	3	0.35

PROPOSED CONDITIONS

STANDHYD PARAMETERS

Basin ID	NHYD ID	Area ha	CN	TIMP	XIMP	IAPer mm	SLPP %	LGP m	MNP	SCP min	IAimp mm	SLPI %	LGI m	MNI	SCI min
B1	B1	1.98	80	0.32	0.001	10	2	100	0.25	0	0.7	1	99	0.013	0
B2	B2	1.38	80	0.42	0.001	10	2	90	0.25	0	0.7	1	83	0.013	0
B3	B3	1.67	80	0.42	0.001	10	2	80	0.25	0	0.7	1	91	0.013	0
B4	B4	0.98	80	0.61	0.001	10	2	30	0.25	0	0.7	1	70	0.013	0
B5	B5	0.83	80	0.75	0.001	10	2	15	0.25	0	0.7	1	64	0.013	0
B6	B6	0.40	80	0.99	0.001	10	2	15	0.25	0	0.7	1	45	0.013	0
B7	B7	0.28	80	0.99	0.001	10	2	15	0.25	0	0.7	1	37	0.013	0
C	C	1.51	80	0.99	0.001	10	2	10	0.25	0	0.7	1	39	0.013	0

NOTES:

1. Soils is Chingacousey Clay loam, tend to be poorly drained, with low infiltration capacity (Ref: Airport Rd EA, Appendix F of Drainage and Stormwater)

Table B1.2
13846 and 13940 Airport Road
Time to Peak

Bransby Williams Method

$$T_c = \frac{0.057L}{S^{0.2}A^{0.1}}$$

Where; T_c = Time of Concentration (min.)
L = Length of watershed (m)
S = slope of watershed (%)
A = watershed area (ha.)

Kirpich Formula

$$T_c = \frac{0.06628L^{0.77}}{S^{0.385}}$$

Where; T_c = Time of Concentration (hr.)
L = Length of watershed (km)
S = slope of watershed (m/m)

Watt & Chow

$$T_c = 0.0293(L/S^{0.5})^{0.79}$$

Where; T_c = Time of Concentration (min.)
L = Length of watershed (m)
S = slope of watershed (m/m)

Airport Method

$$T_c = \frac{3.26(1.1-C)L^{0.5}}{S^{0.33}}$$

Where; T_c = Time of Concentration (min.)
C = Runoff Coefficient
L = Length of watershed (m)
S = slope of watershed (%)

EXISTING CONDITIONS (NASHYD)

Catchment	Catchment					T_c							$T_p = {}^2/_3T_c$					
ID	Area (sq.m)	Area (ha.)	Length (m)	Runoff Coeff. C	Slope (%)	Bransby Williams (min.)	(hr.)	Kirpich (hr.)	Watt & Chow (min.)	(hr.)	Airport Method (min.)	(hr.)	Bransby Williams (hr.)	Kirpich (hr.)	Watt & Chow (hr.)	Airport Method (hr.)	Airport Method (min)	Catchment
A	85,067	8.51	216	0.25	2.25	8	0.1	0.1	9.2	0.2	31.16	0.52	0.09	0.09	0.10	0.35	20.8	A

Table B2
13846 and 13940 Airport Road
UNIT FLOW RATES
Using Humber River Unit Flow Rates

Total Discharge from Site

Total Proposed Drainage Area to Pond= 8.836 ha

Return Period	Equation F Unit Flow Equation (l/s/ha)	Unit Flow (l/s/ha)	Unit Flow l/s	Unit Flow cms
2-Year	Q =9.506 - 0.719 * ln (A)	7.939	70.150	0.070
5-Year	Q =14.652 - 1.136 * ln (A)	12.177	107.591	0.108
10-year	Q =17.957 - 1.373 * ln (A)	14.966	132.230	0.132
25-year	Q =22.639 - 1.741 * ln (A)	18.846	166.514	0.167
50-Year	Q =26.566 - 2.082 * ln (A)	22.030	194.647	0.195
100-year	Q =29.912 - 2.316 * ln (A)	24.866	219.707	0.220

Notes:
1. Unit flow equation taken from Table E.1 Summary of Unit Flow Rate Relationships, Humber River Watershed, Equation F Sub-Basin 36, where Q=unit flow rate in l/s/ha, and A=area in hectares.
2. units: ha-hectares; l/s/ha-liters per second per hecare; l/s-liters per second
3. Used post development areas for calculating unit flow rates.

WATER FLOW TEST REPORT

DEMAND SPRINKLER DESIGN INC.
Fire Protection Systems Design

LOCATION: Airport Road, South of King Street, Caledon East, ON **DATE:** July 22, 2020

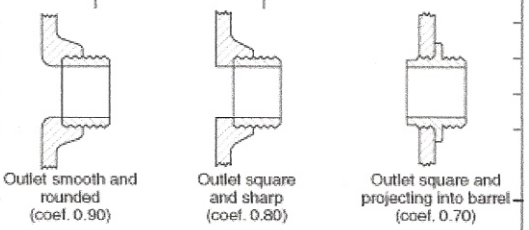
TEST BY: DSD, Calder + Region **Time of Day** 12:10 PM **Min. of Flow** 4 **PROJECT:** 822.0

WATER SUPPLIED BY: 12" Municipal supply main

PURPOSE OF TEST: Fire Flow Analysis

TEST DATA

Test #	Outlet Ø	Coefficient	Static	Residual	Pitot	Flow	Net Flow
1	1 x 1¾"	0.97	46	34	40	561	561
2	2 x 1¾"	0.97	46	25	24, 24	435 + 435	870
3							
4							

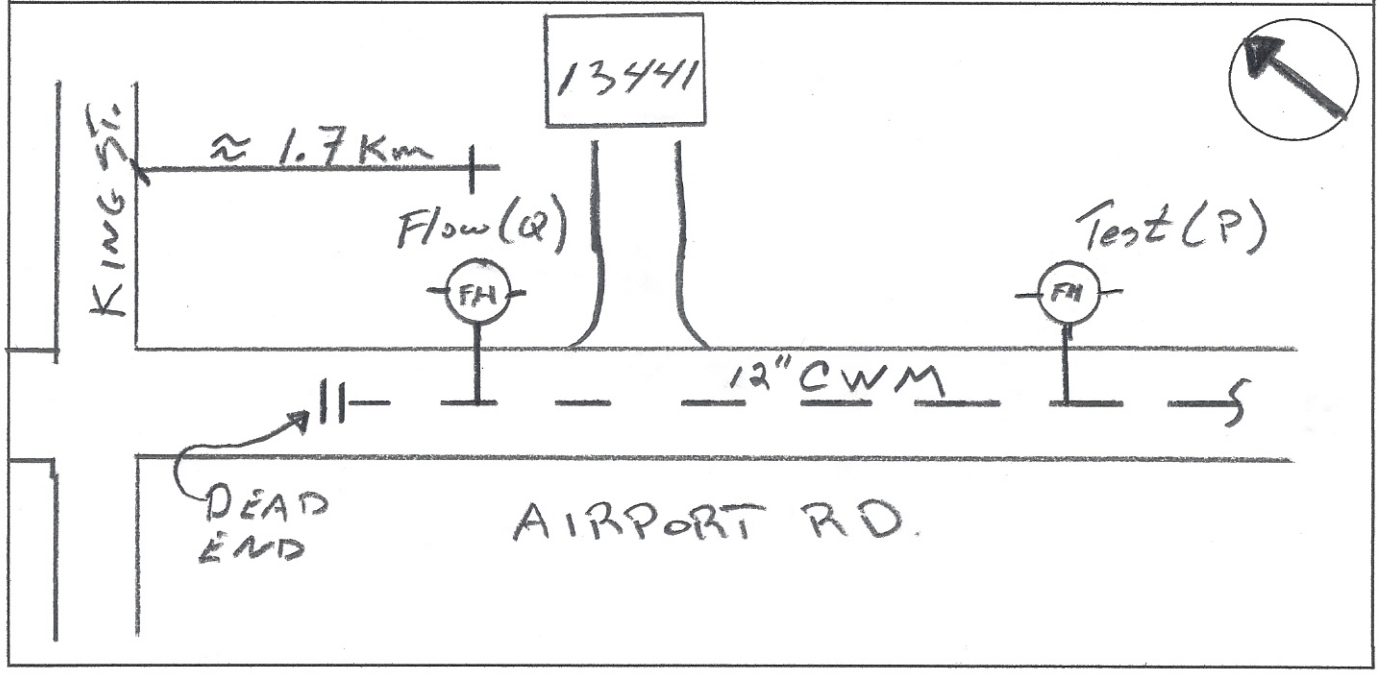


REMARKS: **Hydrant in front of property 13441 and next hydrant south used**

Underwriters Playpipes used for test

(Unit of measurement = psi and Usgpm)

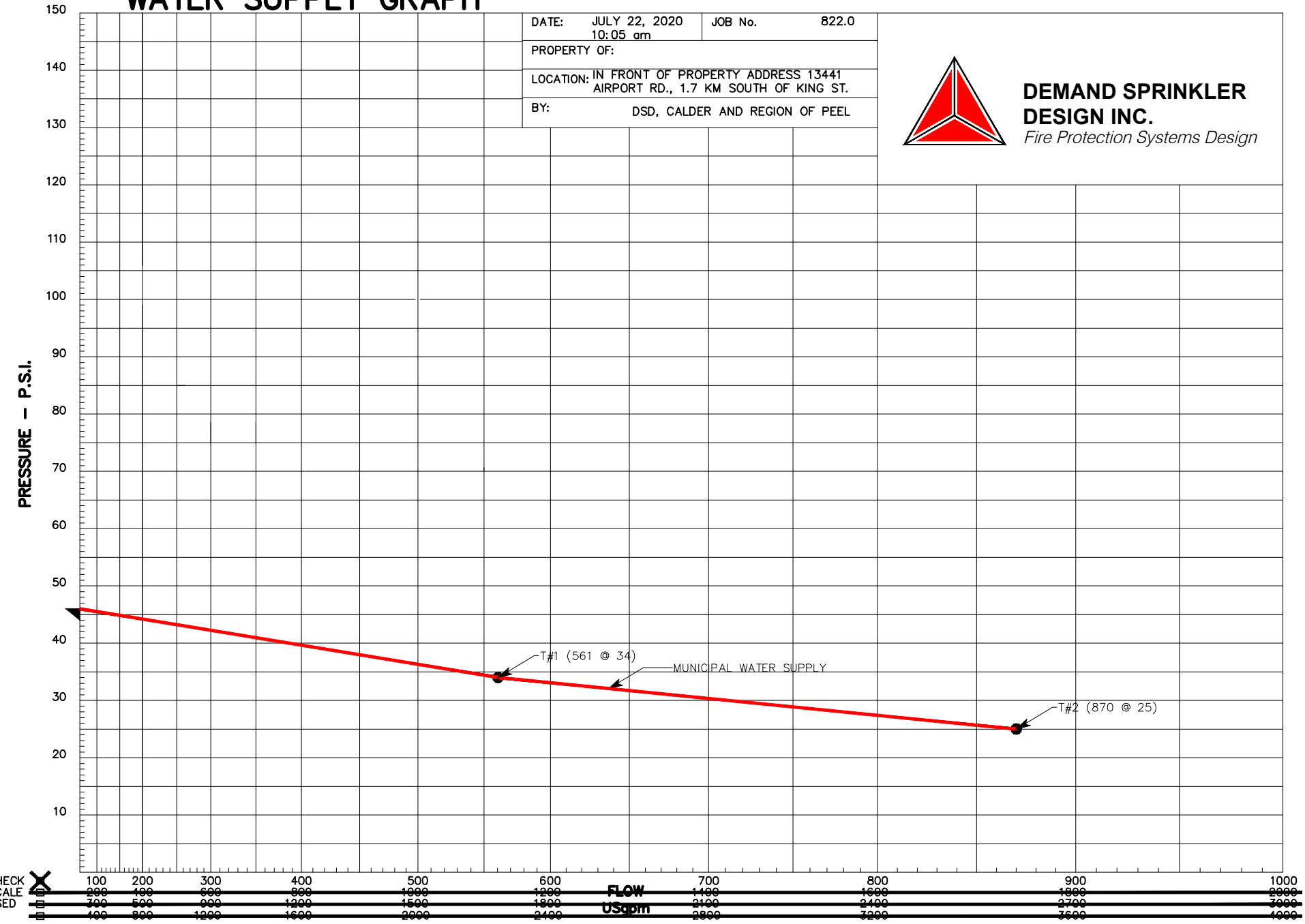
TEST SKETCH



WATER SUPPLY GRAPH

DATE:	JULY 22, 2020 10:05 am	JOB No.	822.0
PROPERTY OF:			
LOCATION:	IN FRONT OF PROPERTY ADDRESS 13441 AIRPORT RD., 1.7 KM SOUTH OF KING ST.		
BY:	DSD, CALDER AND REGION OF PEEL		

DEMAND SPRINKLER DESIGN INC.
Fire Protection Systems Design



APPENDIX C

ENGINEERING DRAWINGS

ART + WORK
13846 & 13940 AIRPORT ROAD
SITE PLAN APPLICATION
TOWN OF CALEDON
REGION OF PEEL

THE CORPORATION
OF THE
TOWN OF CALEDON

REGION OF PEEL

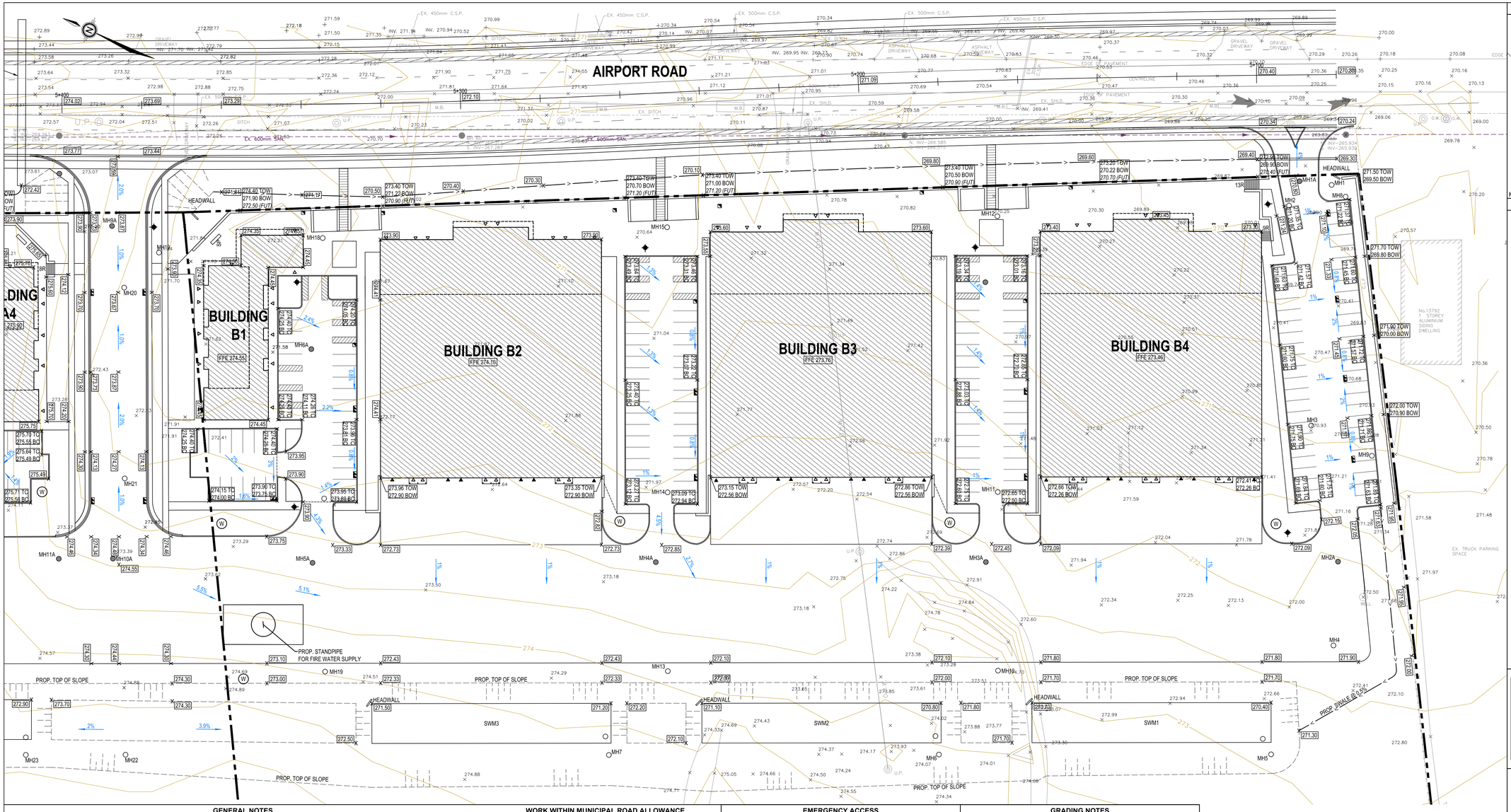
Calder Engineering Ltd.
T 905-857-7600 E calder@caldereng.com W www.caldereng.com

AIRPORT KING INC.
4 ABACUS ROAD
UNIT #3
BRAMPTON, ON L6T 5J6

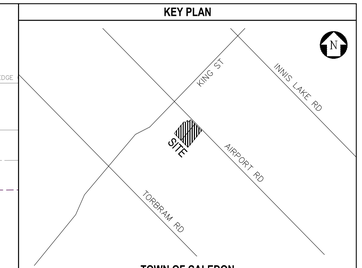
LIST OF DRAWINGS

TITLE	DRAWING	SHEET
GRADING PLAN - SHEET 1 OF 2	19-216-01	1
GRADING PLAN - SHEET 2 OF 2	19-216-02	2
GENERAL UNDERGROUND PLAN - SHEET 1 OF 2	19-216-03	3
GENERAL UNDERGROUND PLAN - SHEET 2 OF 2	19-216-04	4
STORM DRAINAGE PLAN	19-216-05	5
EROSION AND SEDIMENT CONTROL PLAN	19-216-06	6

ISSUED FOR APPROVAL
REVISION 0 - FEBRUARY 15, 2022



KEY PLAN



KEY PLAN — TOWN OF CALEDON — NTS

LEGEND

- PROPERTY LINE
- 264 EXISTING MAJOR CONTOUR
- 264 EXISTING MINOR CONTOUR
- × 269.64 EXISTING ELEVATION
- 266.30 PROPOSED ELEVATION
- 3.0% PROPOSED DRAINAGE DIRECTION AND SLOPE
- PROPOSED STORM MANHOLE
- PROPOSED DOUBLE CATCHBASIN
- PROPOSED SINGLE CATCHBASIN
- PROPOSED SANITARY MANHOLE
- W PROPOSED DRILLED WELL
- PROPOSED HYDRANT LOCATION
- PROPOSED GATE VALVE

GENERAL NOTES

1. CONSTRUCTION FOR THIS PROJECT TO COMPLY WITH THE MOST CURRENT VERSION OF THE DEVELOPMENT STANDARDS, POLICIES, AND GUIDELINES OF THE TOWN OF CALEDON AND THE ONTARIO BUILDING CODE.
2. ALL PROPOSED CONSTRUCTION SHALL BE CARRIED OUT IN ACCORDANCE WITH THE REQUIREMENTS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS.
3. ALL ELEVATIONS ARE IN METERS AND ALL DIMENSIONS ARE IN METRIC UNITS, UNLESS OTHERWISE NOTED. TOPOGRAPHIC SURVEY AND BASE MAPPING BY MANDARIN SURVEYORS LIMITED (JUNE 2017). ACTUAL ELEVATIONS MAY VARY FROM THOSE SHOWN.
4. A MINIMUM OF FORTY-EIGHT (48) HOURS PRIOR TO COMMENCING CONSTRUCTION WITHIN THE MUNICIPAL RIGHT OF WAY THE CONTRACTOR MUST CONTACT THE FOLLOWING:

THE TOWN OF CALEDON	905-584-2272
THE REGION OF PEEL	905-791-7800
FIRE AND EMERGENCY SERVICES	
HYDRO ONE	
ENBRIDGE CONSUMERS GAS	
BELL CANADA	
ROGERS CABLE	

5. A ROAD OCCUPANCY PERMIT MUST BE OBTAINED FROM THE REGION OF PEEL PRIOR TO COMMENCING ANY WORKS WITHIN THE MUNICIPAL ROAD ALLOWANCE.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LAYOUT AND SURVEY CONTROL DURING CONSTRUCTION.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVISION, MAINTENANCE AND RESTORATION OF ALL CONSTRUCTION ACCESS REQUIREMENTS.
8. THE CONTRACTOR SHALL DELINEATE THE REQUIRED WORKING AREA PRIOR TO THE START OF WORK AND SHALL CONFINE OPERATIONS WITHIN THE DEFINED AREA.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND PROTECTING ALL EXISTING UTILITIES AND SERVICES PRIOR TO AND DURING CONSTRUCTION. LOCATION OF EXISTING UTILITIES AND SERVICES WHERE SHOWN ARE APPROXIMATE AND ARE TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR. DAMAGES TO EXISTING UTILITIES AND SERVICES TO BE REPAIRED TO THE SATISFACTION OF THE APPROPRIATE UTILITY AT THE CONTRACTORS EXPENSE.
10. WORKING AREAS, ACCESS REQUIREMENTS AND TEMPORARY MATERIAL STORAGE AREAS TO BE MAINTAINED IN GOOD REPAIR BY THE CONTRACTOR AT ALL TIMES. AREAS AFFECTED BY THE CONTRACTORS ACTIVITIES ARE TO BE REINSTATED TO THE EXISTING CONDITIONS OR BETTER.
11. SEDIMENT CONTROL DEVICES SHALL BE INSTALLED PRIOR TO ANY CONSTRUCTION ON THE SITE AND SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION PERIOD TO THE SATISFACTION OF THE TOWN OF CALEDON. REFER TO DRAWING 19-216-06 FOR TYPICAL CONTROLS.
12. A MINIMUM OF 1.5m CLEARANCE IS TO BE PROVIDED FROM THE LIMITS OF ALL SIDEWALKS AND DRIVEWAYS TO EXISTING UTILITY STRUCTURES WITHIN THE MUNICIPAL RIGHT OF WAY. IF THIS CLEARANCE IS NOT MAINTAINED, THEY SHALL BE RELOCATED AT THE APPLICANTS EXPENSE.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL AND DISPOSAL OF ALL DEBRIS RELATED TO CONSTRUCTION OF THE WORKS.
14. RETAINING WALLS TO BE DESIGNED BY OTHERS AND IN CONFORMANCE WITH GOOD ENGINEERING PRACTICES AND THE ONTARIO BUILDING CODE. RETAINING WALLS TO BE DESIGNED BY QUALIFIED ENGINEER IF HEIGHT EXCEEDS 1.0m. RETAINING WALLS TO BE CONSTRUCTED ENTIRELY WITHIN OWNER'S PROPERTY. ADJACENT PROPERTIES NOT BE DISTURBED WITHOUT PRIOR WRITTEN CONSENT OF ADJACENT PROPERTY OWNER(S). RETAINING WALLS TO BE PROVIDED WITH GUARDS IN GENERAL CONFORMANCE WITH THE ONTARIO BUILDING CODE AND MUNICIPAL STANDARDS.
15. ALL GENERAL BACKFILL TO BE APPROVED MATERIAL AND COMPACTED TO MINIMUM 95% STANDARD PROCTOR MAX. DRY DENSITY UNLESS OTHERWISE STATED.
16. STREET CURBS (IF PRESENT) ARE TO BE CONTINUOUS THROUGH THE PROPOSED ENTRANCE.
17. MUNICIPAL SIDEWALK (IF PRESENT) IS TO BE CONTINUOUS THROUGH ALL ENTRANCES TO THE SITE AND THE CURB SHALL BE TAPERED BACK 600mm.
18. ALL BOULEVARDS TO BE RESTORED TO THE SATISFACTION OF THE REGION OF PEEL. GRASSED AREAS WITHIN BOULEVARD TO BE RESTORED WITH MIN. 150mm TOPSOIL AND SOD, ASPHALT SPLASH PAD (IF PRESENT) TO BE RESTORED PER PEEL STANDARD DRAWING 5-1-3.
19. THE MINIMUM PAVEMENT DESIGN FOR THE ASPHALT APRON WITHIN THE MUNICIPAL ROAD ALLOWANCE SHALL BE AS FOLLOWS (OR AS RECOMMENDED BY A GEOTECHNICAL ENGINEER):
    - 40mm HL3 ASPHALT
    - 50mm HL8 ASPHALT
    - 150mm GRANULAR 'A'
    - 300mm GRANULAR 'B'
20. ANY CHANGES TO SERVICING OR GRADING FROM THE ORIGINALLY APPROVED SITE PLAN MUST BE SUBMITTED TO THE TOWN FOR APPROVAL PRIOR TO CONSTRUCTION.
21. ALL ERRORS, OMISSIONS AND OR CHANGE OF CONDITIONS AT THE SITE SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO PERFORMING THE RELATED WORK.
22. STORM DRAINAGE TO BE SELF-CONTAINED AND SHALL NOT ADVERSELY AFFECT ADJACENT PROPERTIES. DRAINAGE TO DISCHARGE TO A LOCATION APPROVED BY THE TOWN PRIOR TO ISSUANCE OF A BUILDING PERMIT. GRADING SHALL NOT EXTEND ONTO ADJACENT PROPERTIES WITHOUT PRIOR WRITTEN CONSENT FROM THE ADJACENT PROPERTY OWNER.
23. IT IS THE OWNER'S AND CONTRACTOR'S RESPONSIBILITY TO CONFIRM ALL LEGAL PROPERTY BOUNDARIES AND EASEMENTS PRIOR TO CONSTRUCTION.

WORK WITHIN MUNICIPAL ROAD ALLOWANCE

1. A ROAD OCCUPANCY PERMIT MUST BE OBTAINED PRIOR TO COMMENCING ANY WORKS WITHIN THE ROAD ALLOWANCE. CONTRACTOR TO CONFORM TO REQUIREMENTS OF THE ROAD OCCUPANCY PERMIT.
2. A MINIMUM OF 48 HOURS PRIOR TO COMMENCING CONSTRUCTION WITHIN THE MUNICIPAL RIGHT OF WAY THE CONTRACTOR MUST CONTACT THE FOLLOWING:

TOWN OF CALEDON PUBLIC WORKS	905-584-2272
REGION OF PEEL	905-781-7800
ENBRIDGE GAS	905-758-7924
HYDRO ONE	519-941-1211
BELL CANADA	416-296-6927
DUFFERIN-PEEL CATHOLIC SCHOOL BOARD	905-890-1221
PEEL DISTRICT SCHOOL BOARD	905-890-1010
FIRE AND EMERGENCY SERVICES	905-584-1477

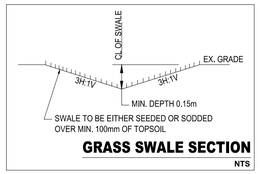
3. ROAD MUST BE MAINTAINED TO A MINIMUM OF ONE LANE AT ALL TIMES FOR EMERGENCY ACCESS AS PER THE OTM GUIDELINES.
4. NOTIFICATION TO FIRE AND EMERGENCY SERVICES AND SCHOOL BOARDS REQUIRED TO BE PROVIDED A MIMIMUM OF 48 HOURS PRIOR TO COMMENCING WORK.
5. CONTRACTOR IS RESPONSIBLE FOR PROPERLY COMPACTING THE BACKFILL MATERIAL AND REPLACING ALL SURFACES TO ORIGINAL CONDITION OR BETTER.
6. BACKFILL MATERIALS AND PLACEMENT SHALL CONFORM TO THE ROAD OCCUPANCY PERMIT UNLESS OTHERWISE SPECIFIED.
7. IF APPLICABLE, SUBDRAINS MUST REMAIN INTACT AND AT GRADE DURING CONSTRUCTION AND RESTORATION.
8. STREET CURBS ARE TO BE CONTINUOUS THROUGH THE PROPOSED ENTRANCE.
9. MUNICIPAL SIDEWALKS SHALL BE CONTINUOUS THROUGH ALL ENTRANCES TO THE SITE AND THE CURB SHALL BE TAPERED BACK 600mm. ANY EXISTING SIDEWALKS ACROSS PROPOSED ENTRANCES SHALL BE REMOVED AND REPLACED WITH A 200mm MINIMUM CONCRETE THICKNESS, 32 MPa AND 5% TO 7% AIR ENTRAINMENT, OR AS REQUIRED BY THE REGION OF PEEL.
10. AS APPLICABLE, ALL BOULEVARDS TO BE RESTORED WITH MINIMUM 300mm TOPSOIL AND SEED OR SOD, OR SPLASH PAD PER REGION STANDARD 5-1-3 TO THE SATISFACTION OF THE REGION OF PEEL.
11. TOP ASPHALT ASPHALT COLD JOINTS TO BE SEALED WITH T-BOND HOT ASPHALT JOINT TAPE FROM MCASPHALT OR DENSO BRAND BY DENSO. THESE SEALANTS ARE TO BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TRAFFIC CONTROL IN ACCORDANCE WITH OTM BOOK 7 - TEMPORARY CONDITIONS.

EMERGENCY ACCESS

1. FIRE ROUTE TO COMPLY WITH APPLICABLE TOWN OF CALEDON BYLAWS AND THE ONTARIO BUILDING CODE.
2. A MINIMUM OF 3.0m CLEAR WIDTH ALONG BOTH SIDES OF THE ACCESS MEASURED FROM THE ACCESS CENTRELINE TO BE PROVIDED.
3. ANY OVERHEAD OBSTRUCTIONS, INCLUDING VEGETATATION, TO BE AT LEAST 5m ABOVE THE DRIVEWAY SURFACE.
4. MAXIMUM CHANGE IN GRADIENT OF NOT MORE THAN 1 IN 12.5 OVER A MINIMUM OF 15 METRES.
5. A TURNAROUND FACILITY TO PROVIDED IF DRIVEWAY LENGTH IS GREATER THAN 90m.
6. CENTRELINE RADIUS OF ACCESS TO BE NOT LESS THAN 12m.
7. STRUCTURAL DESIGN OF DRIVEWAY IS REQUIRED TO SUPPORT AN 18-TON VEHICLE FOR EMERGENCY VEHICLE ACCESS.
8. FIRE ROUTE SIGNS SHALL BE PERMANENTLY MOUNTED ON A RIGID SIGN POST, POLE OR BUILDING STRUCTURE.
9. FIRE ROUTE SIGNS SHALL BE ERECTED AT A HEIGHT OF BETWEEN 1.9m AND 2.5m AS MEASURED FROM THE EDGE OF THE TRAVELLED PORTION OF THE DESIGNATED ROUTE, TO THE BOTTOM EDGE OF THE SIGN.
10. FIRE ROUTE SIGNS SHALL BE INSTALLED AT A DISTANCE OF BETWEEN 0.3m AND 3m FROM THE TRAVELLED PATH EDGE OF THE DESIGNATED ROUTE.
11. STANDARD FIRE ROUTE SIGNS SHALL BE INSTALLED ALONG THE ROUTE AT APPROXIMATELY 30m INTERVALS OR AS FREQUENTLY AS IS NECESSARY TO IDENTIFY THE ROUTE IN THE JUDGEMENT OF THE FIRE CHIEF OR HIS/HER DESIGNATE.

GRADING NOTES

1. DRIVEWAY GRADES TO BE MAXIMUM 6%.
2. ALL SLOPES ARE TO BE 3H:1V MAXIMUM, UNLESS OTHERWISE NOTED.
3. A MINIMUM OF 1.5m CLEARANCE IS TO BE PROVIDED FROM THE LIMIT OF THE DRIVEWAY TO EXISTING UTILITY STRUCTURES WITHIN THE MUNICIPAL RIGHT-OF-WAY. IF THIS CLEARANCE IS NOT MAINTAINED THEY SHALL BE RELOCATED AT THE APPLICANT'S EXPENSE.
4. DISTURBED SITE AREAS TO BE RESTORED WITH MINIMUM 100mm TOPSOIL AND EITHER SEED OR SOD.
5. GRADING AROUND PROPOSED WELLS TO PROVIDE POSITIVE DRAINAGE AWAY FROM WELL.
6. ALL GRADING TO BE IN GENERAL CONFORMANCE WITH THE TOWN OF CALEDON "DEVELOPMENT STANDARDS MANUAL".



GRASS SWALE SECTION
NTS

Calder Engineering Ltd.
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LICENSED PROFESSIONAL ENGINEER — R. J. WHYTE — 49877509 — FEB 15, 2022 — PROVINCE OF ONTARIO

DESIGNED BY | APPROVED BY

N°	Date	Revisions	Dwn.	Dsg'd.	Chk'd.
0	15/FEB/22	ISSUED FOR APPROVAL	KC	KC	RJW

Client:

AIRPORT KING INC.

Project Name:

ART + WORK
13846 & 13940 AIRPORT ROAD
TOWN OF CALEDON

Title Name:

GRADING PLAN
1 OF 2

Drawing N°:	Sheet N°:	Rev. N°:
19-216-01	1 OF 2	0
	Scale: 1:500	

AIRPORT ROAD

KING STREET

BUILDING A2
FFE 276.05

BUILDING A3
FFE 276.05

BUILDING A4
FFE 275.90

A1
FFE 275.95

No. 13958
ALUMINUM SIDING
DWELLING
D.S.=276.06

No. 5937
KING STREET WEST
ALUMINUM
SIDING
DWELLING

ALUMINUM SIDING BUILDING

ALUMINUM SIDING BUILDING

HORSE BARN

FUTURE CULVERT
(BY OTHERS)
W. INV. = 272.42
E. INV. = 272.12

MH31
MH15A
MH30
MH14A
MH13A
MH28
MH27
MH26
MH25
MH24
MH29
MH12A
MH11A
MH10A
MH9A
MH19
MH20
MH21
MH22
MH23

SWM5
SWM4

HEADWALL

PROP. TOP OF SLOPE

ASPHALT DRIVEWAY

GRAVEL DRIVEWAY

DITCH

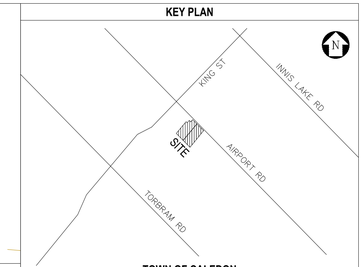
CONCRETE CURB

C.L.F.

O.H.W.

SCALE 1:500

KEY PLAN



KEY PLAN — TOWN OF CALEDON — NTS

LEGEND

- PROPERTY LINE
- 264 EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- × 269.64 EXISTING ELEVATION
- 266.30 PROPOSED ELEVATION
- 3.0% PROPOSED DRAINAGE DIRECTION AND SLOPE
- PROPOSED STORM MANHOLE
- PROPOSED DOUBLE CATCHBASIN
- PROPOSED SINGLE CATCHBASIN
- PROPOSED SANITARY MANHOLE
- PROPOSED DRILLED WELL
- PROPOSED HYDRANT LOCATION
- PROPOSED GATE VALVE

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LICENSED PROFESSIONAL ENGINEER
R. J. WHYTE
49877509
FEB. 15, 2022
PROVINCE OF ONTARIO

DESIGNED BY | APPROVED BY

N°	Date	Revisions	Dwn.	Dsg'd.	Chk'd.
0	15/FEB/22	ISSUED FOR APPROVAL	KC	KC	RJW

Client:

AIRPORT KING INC.

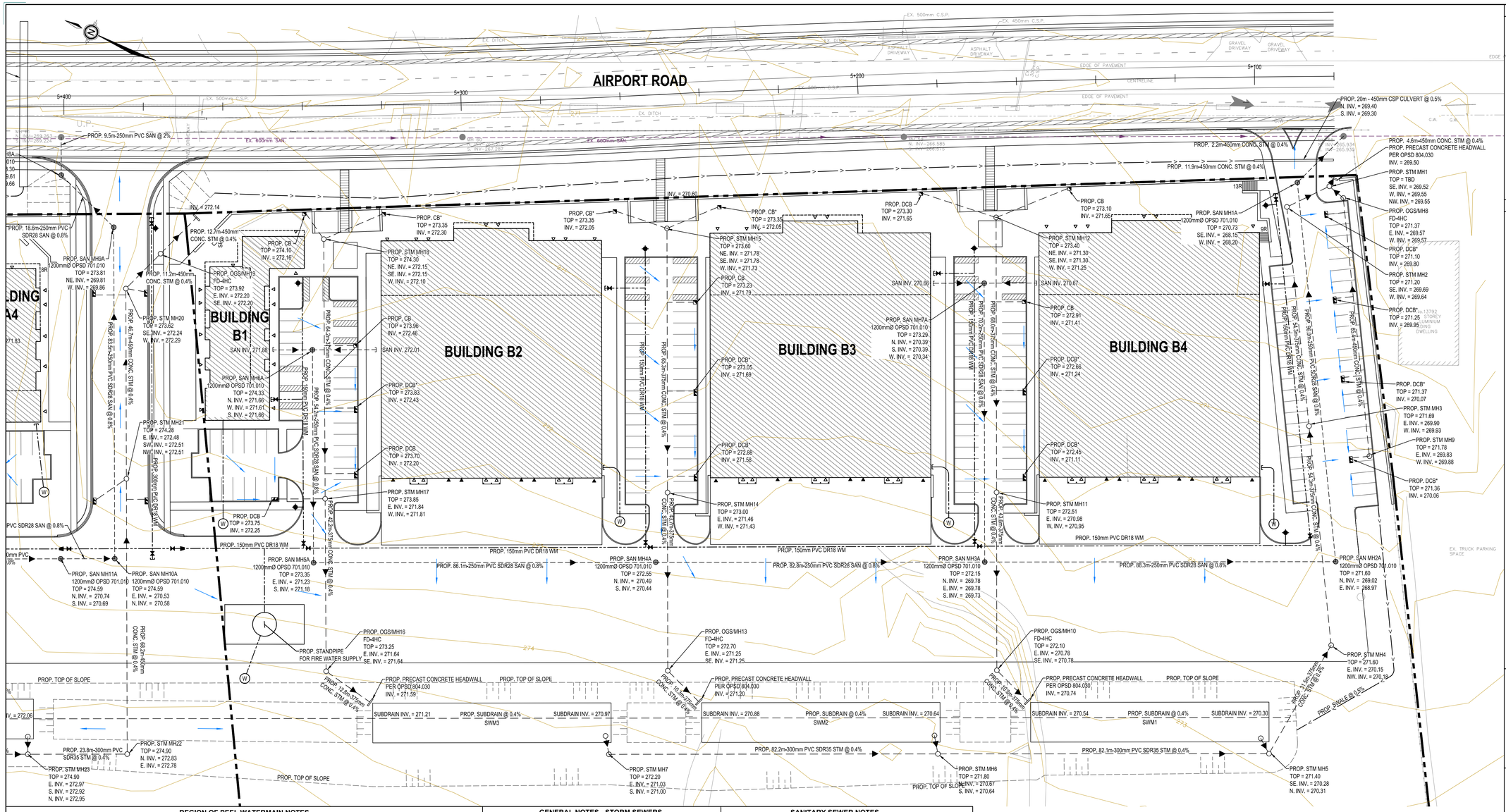
Project Name:

ART + WORK
13846 & 13940 AIRPORT ROAD
TOWN OF CALEDON

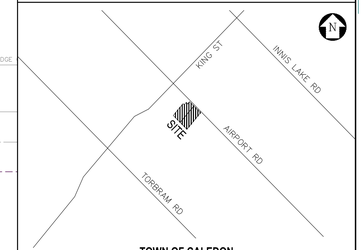
Title Name:

GRADING PLAN
2 OF 2

Drawing N°:	Sheet N°:	Rev. N°:
19-216-02	2 OF 2	0
	Scale: 1:500	



KEY PLAN



KEY PLAN — TOWN OF CALEDON — NTS

LEGEND

- PROPERTY LINE
- 264 EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED DRAINAGE DIRECTION
- PROPOSED STORM MANHOLE
- PROPOSED DOUBLE CATCHBASIN
- PROPOSED SINGLE CATCHBASIN
- PROPOSED SANITARY MANHOLE
- PROPOSED DRILLED WELL WITH 50mm TYPE K COPPER WS
- PROPOSED HYDRANT LOCATION
- PROPOSED GATE VALVE

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LICENSED PROFESSIONAL ENGINEER — R. J. WHYTE — 49877509 — FEB. 15, 2022 — PROVINCE OF ONTARIO

DESIGNED BY	APPROVED BY

N°	Date	Revisions	Dwn.	Dsg'd.	Chk'd.
0	15/FEB/22	ISSUED FOR APPROVAL	KC	KC	RJW

Client:

AIRPORT KING INC.

Project Name:

ART + WORK
13846 & 13940 AIRPORT ROAD
TOWN OF CALEDON

Title Name:

GENERAL UNDERGROUND PLAN 1 OF 2

Drawing N°: **19-216-03**

Sheet N°: 1 OF 2

Scale: 1:500

Rev. N°: 0

REGION OF PEEL WATERMAIN NOTES

1. ALL MATERIALS AND CONSTRUCTION METHODS MUST CORRESPOND TO THE CURRENT PEEL PUBLIC WORKS STANDARDS AND SPECIFICATIONS.
2. WATERMAIN AND/OR WATER SERVICE MATERIALS 100mm (4") AND LARGER MUST BE DDR18 PVC PIPE MANUFACTURED TO AWWA SPEC. C900-16 SPEC COMPLETE WITH TRACER WIRE. SIZE 50mm (2") AND SMALLER MUST BE TYPE 'K' SOFT COPPER PIPE PER ASTM B88-49 SPECIFICATION.
3. WATERMAINS AND/OR WATER SERVICES ARE TO HAVE A MINIMUM COVER OF 1.7m (5'6") WITH A MINIMUM HORIZONTAL SPACING OF 1.2m (4') FROM THEMSELVES AND ALL OTHER UTILITIES.
4. PROVISIONS FOR FLUSHING WATER LINE PRIOR TO TESTING, ETC, MUST BE PROVIDED WITH AT LEAST A 50mm (2") OUTLET ON 100mm (4") AND LARGER LINES. COPPER LINES ARE TO HAVE FLUSHING POINTS AT THE END, THE SAME SIZE AS THE LINE. THEY MUST ALSO BE HOSED OR PIPED TO ALLOW THE WATER TO DRAIN ONTO A PARKING LOT OR DOWN A DRAIN. ON FIRE LINES, FLUSHING OUTLET TO BE 100mm (4") DIAMETER MINIMUM ON A HYDRANT.
5. ALL CURB STOPS TO BE 3.0m (10') OFF THE FACE OF THE BUILDING UNLESS OTHERWISE NOTED.
6. HYDRANT AND VALVE SET TO REGION STANDARD 1-6-1 DIMENSION A AND B, 0.7m (2') AND 0.9m (3') AND TO HAVE PUMPER NOZZLE.
7. WATERMAINS TO BE INSTALLED TO GRADES AS SHOWN ON THE APPROVED SITE PLAN. COPY OF GRADE SHEET MUST BE SUPPLIED TO INSPECTOR PRIOR TO COMMENCEMENT OF WORK, WHERE REQUESTED BY INSPECTOR.
8. WATERMAINS MUST HAVE A MINIMUM VERTICAL CLEARANCE OF 0.3m (12") OVER / 0.5m (20") UNDER SEWERS AND ALL OTHER UTILITIES WHEN CROSSING.
9. ALL PROPOSED WATER PIPING MUST BE ISOLATED FROM EXISTING LINES IN ORDER TO ALLOW INDEPENDENT PRESSURE TESTING AND CHLORINATING FROM EXISTING SYSTEMS.
10. ALL LIVE TAPPING AND OPERATION OF REGION WATER VALVES SHALL BE ARRANGED THROUGH THE REGIONAL INSPECTOR ASSIGNED OR BY CONTACTING THE OPERATIONS AND MAINTENANCE DIVISION.
11. LOCATION OF ALL EXISTING UTILITIES IN THE FIELD TO BE ESTABLISHED BY THE CONTRACTOR.
12. THE CONTRACTOR(S) SHALL BE SOLELY RESPONSIBLE FOR LOCATES, EXPOSING, SUPPORTING, AND PROTECTING ALL UNDERGROUND AND OVERHEAD UTILITIES AND STRUCTURES EXISTING AT THE TIME OF CONSTRUCTION IN THE AREA OF THEIR WORK WHETHER SHOWN ON THE PLANS OR NOT AND FOR ALL REPAIRS AND CONSEQUENCES RESULTING FROM DAMAGE TO SAME.
13. THE CONTRACTOR(S) SHALL BE SOLELY RESPONSIBLE TO GIVE 72 HOURS WRITTEN NOTICE TO THE UTILITIES PRIOR TO CROSSING SUCH UTILITIES, FOR THE PURPOSED OF INSPECTION BY THE CONCERNED UTILITY. THIS INSPECTION WILL BE FOR THE DURATION OF THE CONSTRUCTION, WITH THE CONTRACTOR RESPONSIBLE FOR ALL COSTS ARISING FROM SUCH INSPECTION.
14. ALL PROPOSED WATER PIPING MUST BE ISOLATED THROUGH A TEMPORARY CONNECTION THAT SHALL INCLUDE AN APPROPRIATE CROSS-CONNECTION CONTROL DEVICE, CONSISTENT WITH THE DEGREE OF HAZARD, FOR BACKFLOW PREVENTION OF THE ACTIVE DISTRIBUTION SYSTEM, CONFORMING TO REGION OF PEEL STANDARDS 1-7-7 AND 1-7-8.

ALL UNDERGROUND SERVICE MATERIALS AND INSTALLATIONS TO BE IN GENERAL CONFORMANCE WITH MINISTRY OF THE ENVIRONMENT, CONSERVATION AND PARKS GUIDELINES. A MINIMUM HORIZONTAL SEPARATION OF 2.5m MUST BE MAINTAINED BETWEEN WATERMAINS AND SANITARY OR STORM SEWERS, INCLUDING SERVICE LATERALS.

GENERAL NOTES - STORM SEWERS

1. STORM SEWER CONSTRUCTION TO COMPLY WITH TOWN OF CALEDON STANDARD 101. REFER TO GENERAL NOTES 2 TO 11.
2. STORM SEWER TO BE PROVIDED ON ALL ROADS WITH CURB AND GUTTER.
3. PLACE ALL CATCH BASIN LATERALS AT 2% GRADE UNLESS OTHERWISE NOTED. PIPE SIZE MINIMUM 250mm DIA. SINGLE, 300mm DIA DOUBLE.
4. STORM SEWERS SHALL BE CONSTRUCTED WITH BEDDING AS PER OPSD 802.020 FOR RIGID PIPE OR OPSD 802.010 WITH GRANULAR 'A' FOR FLEXIBLE PIPE UNLESS APPROVED OTHERWISE BY THE DIRECTOR OF PUBLIC WORKS AND ENGINEERING.
5. MAINTENANCE HOLE TOPS (FRAMES) AND CATCHBASIN (FRAMES) ARE TO BE SET TO BASE COURSE ASPHALT AND THEN ADJUSTED TO FINAL GRADE WHEN THE TOP LIFT OF ASPHALT IS PLACED.
6. STORM SEWER TO BE LOCATED OFFSET 1.5m SOUTH OR WEST OF CENTRELINE UNLESS OTHERWISE SPECIFIED.
7. ALL CONNECTIONS TO THE STORM MAIN SHALL BE MADE WITH A STORM MANHOLE OR APPROVED FACTORY TEE CONNECTIONS AS PER OPSD 708.01 OR 708.03.
8. PIPE MATERIAL TO BE REINFORCED CONCRETE WITH A STRENGTH OF 50 N/m/mm CERTIFIED CLASS II) OR PVC CERTIFIED TO C.S.A. STANDARD A247.2-1982. CLASS 50-D (PREVIOUSLY C.S.A. STANDARD A257.2-1974 CLASS II) OR PVC CERTIFIED TO C.S.A. STANDARDS 182.2 AND 182.4 MAX. PVC PIPE DIA. IS 600mm BIG O BOSS 2000 POLYETHYLENE PIPE WITH GASKETED BELL WITH SPIGOT JOINTS CERTIFIED C.S.A. B182.8 FOR STORM SEWERS UP TO 900mm DIA. WHERE ONLY CONNECTION STD CATCHBASINS ARE CONSIDERED.
9. STORM SEWER TO BE MINIMUM 300mm DIA. WITH JOINTS CONFORMING TO C.S.A. STANDARD A 257.3.
10. ALL PIPE BEDDING MUST CONFORM TO OPSD MAXIMUM COVER TABLE. NO FLEXIBLE PIPE SEWERS WILL BE INSTALLED WITH A DEPTH COVER GREATER THAN 6m UNLESS SPECIFICALLY APPROVED BY THE DIRECTOR OF PUBLIC WORKS AND ENGINEERING.
11. ALL PIPE HANDLING INSTRUCTIONS MUST BE IN STRICT COMPLIANCE WITH MANUFACTURERS INSTALLATION GUIDES AND THE OCPA OR UNIBELL GUIDELINES.
12. STORM SEWER MANHOLES SHALL BE BENCHED TO THE OBVERT OF THE OUTLET PIPE.
13. ALL CATCHBASINS SHALL HAVE 0.3m SUMPS EXCEPT CATCHBASIN MANHOLES WHICH SHALL BE PROVIDED WITH BENCHING.
14. FROST PROTECTION TO BE PROVIDED WHERE 1.5m OF COVER CAN NOT BE ACHIEVED.

SANITARY SEWER NOTES

1. ALL MATERIALS AND CONSTRUCTION METHODS MUST CORRESPOND TO THE CURRENT REGION OF PEEL PUBLIC WORKS STANDARDS AND SPECIFICATIONS.
2. ALL CONCRETE AND PVC PIPE SHALL HAVE RUBBER GASKET JOINTS.
3. ALL PVC SEWERS SHALL BE CONSTRUCTED WITH BEDDING IN ACCORDANCE WITH OPSD 802.010 CLASS 'B' UNLESS OTHERWISE NOTED.
4. PROPOSED SANITARY LATERAL TO BE PVC SDR 28.
5. ALL SANITARY SEWER BEDDING AS PER ROP STANDARD 2-3-1.
6. SANITARY LATERALS TO BE AT MINIMUM 2% SLOPE.
7. ALL MANHOLES SHALL BE AS PER ROP STANDARD 2-5-2 AND 2-5-3 WITH BENCHING PER ROP STANDARD 2-5-20.
8. MANHOLE FRAME AND COVER SHALL BE PER ROP STANDARD 2-6-4.
9. MANHOLE STEPS PER ROP STANDARD 2-6-11.
10. MANHOLES DEEPER THAN 5.0m MUST BE EQUIPPED WITH SAFETY PLATFORMS PER ROP STANDARD 2-6-14.
11. ALL PLUGS TO BE MARKED WITH 2" x 4" x 6' STUDS
12. SANITARY SEWERS AND MANHOLES MUST BE MODIFIED IN THE FIELD TO PREVENT I&I (INFLOW AND INFILTRATION)

ROOF DRAIN NOTES

1. CONTROL FLOW ROOF DRAINS TO BE PROVIDED TO RESTRICT PEAK FLOW FROM BUILDING ROOFS TO 42 LITRES PER SECOND PER HECTARE.

AIRPORT ROAD

KING STREET

EDGE OF PAVEMENT

EX. 600mm SAN

EX. 300mm C.S.P.

EX. 500mm SAN

MH 62
IN. INV. = 270.328
OUT INV. = 270.278

MH 63
IN. INV. = 269.772
OUT INV. = 269.722

5+500

5+400

FUTURE CULVERT
(BY OTHERS)
W. INV. = 272.42
E. INV. = 272.12

PROP. 9.5m-250mm PVC SAN @ 2%

PROP. SAN MH9A
1200mmØ OPSD 701.010
TOP = 273.30
E. INV. = 269.61
SW. INV. = 269.66

PROP. 25m - 450mm CSP CULVERT @ 0.5%

PROP. 57.1m-375mm CONC. STM @ 0.4%

PROP. 18.6m-250mm PVC
SDR28 SAN @ 0.8%

PROP. SAN MH9A
1200mmØ OPSD 701.010
TOP = 273.81
NE. INV. = 269.81
W. INV. = 269.86

PROP. 11.2m-450mm
CONC. STM @ 0.4%

PROP. 12.7m-450mm
CONC. STM @ 0.4%

INV. = 272.14

BUILDING A2

BUILDING A3

BUILDING A4

BUILDING A1

PROP. CB*
TOP = 275.70
INV. = 274.25

PROP. STM MH28
TOP = 275.69
N. INV. = 274.19
S. INV. = 274.16

PROP. STM MH27
TOP = 275.55
N. INV. = 273.93
S. INV. = 273.93
W. INV. = 273.88

PROP. DCB*
TOP = 275.34
INV. = 273.99

PROP. DCB*
TOP = 275.54
INV. = 274.21

PROP. SAN MH15A
1200mmØ OPSD 701.010
TOP = 275.65
SE. INV. = 272.60 PROP. STM MH31
W. INV. = 272.55 TOP = TBD
NE. INV. = 274.08
W. INV. = 274.03

SAN INV. 272.85

PROP. 26.8m-375mm
CONC. STM @ 0.4%

PROP. 150mm PVC DR18 WM

PROP. 34.9m-250mm PVC SDR28 SAN @ 1.0%

PROP. DCB*
TOP = 275.51
INV. = 274.21

PROP. 59.4m-375mm CONC. STM @ 0.4%

SAN INV. 271.83

SAN INV. 271.77
PROP. SAN MH16A
1200mmØ OPSD 701.010
TOP = 275.42
N. INV. = 271.56
S. INV. = 271.56
W. INV. = 271.51

PROP. 54.7m-250mm PVC SDR28 SAN @ 0.8%

PROP. 45.7m-450mm CONC. STM @ 0.4%

PROP. STM MH20
TOP = 273.62
SE. INV. = 272.24
W. INV. = 272.29

PROP. 85.5m-300mm PVC SDR28 SAN @ 0.8%

PROP. DCB*
TOP = 275.40
INV. = 274.10

PROP. STM MH30
TOP = TBD
E. INV. = 273.92
W. INV. = 273.89
S. INV. = 273.94

PROP. 66.7m-375mm
CONC. STM @ 0.4%

PROP. 94.6m-250mm PVC
SDR28 SAN @ 0.8%

SAN INV. 272.40

PROP. STM MH26
TOP = 275.00
E. INV. = 273.64
S. INV. = 273.64
W. INV. = 273.59

PROP. DCB*
TOP = 275.15
INV. = 273.59

PROP. 150mm PVC DR18 WM

PROP. DCB*
TOP = 275.40
INV. = 274.10

PROP. STM MH21
TOP = 274.28
E. INV. = 272.48
SW. INV. = 272.51
NW. INV. = 272.51

PROP. 300mm PVC DR18 WM

PROP. 13.6m-250mm PVC SDR28 SAN @ 0.8%

PROP. DCB*
TOP = 275.30
INV. = 274.00

PROP. SAN MH14A
1200mmØ OPSD 701.010
TOP = 275.65
E. INV. = 272.20
W. INV. = 272.15
S. INV. = 272.20

PROP. 150mm PVC DR18 WM

PROP. 103.9m-250mm PVC SDR28 SAN @ 0.8%

PROP. 150mm PVC DR18 WM

PROP. 34.7m-250mm PVC
SDR28 SAN @ 0.8%

PROP. SAN MH12A
1200mmØ OPSD 701.010
TOP = 274.70
N. INV. = 271.07
S. INV. = 271.02
W. INV. = 271.07

PROP. SAN MH11A
1200mmØ OPSD 701.010
TOP = 274.59
N. INV. = 270.74
S. INV. = 270.69

PROP. SAN MH10A
1200mmØ OPSD 701.010
TOP = 274.59
E. INV. = 270.53
N. INV. = 270.58

PROP. 50.3m-375mm CONC. STM @ 0.4%

PROP. SAN MH13A
1200mmØ OPSD 701.010
TOP = 275.25
E. INV. = 271.95
S. INV. = 271.90

PROP. OGS/MH29
FD-4HC
TOP = 275.10
E. INV. = 273.62
W. INV. = 273.62

PROP. OGS/MH25
FD-4HC
TOP 274.80
E. INV. = 273.38
W. INV. = 273.38

PROP. 69.2m-450mm
CONC. STM @ 0.4%

PROP. TOP OF SLOPE

PROP. 5.7m-375mm CONC. STM @ 0.4%

PROP. PRECAST CONCRETE HEADWALL
PER OPSD 804.030
INV. = 273.35

PROP. TOP OF SLOPE

PROP. PRECAST CONCRETE HEADWALL
PER OPSD 804.030
INV. = 273.60

SUBDRAIN INV. = 272.57

PROP. SUBDRAIN @ 0.4%

SWM5

SUBDRAIN INV. = 272.35

SUBDRAIN INV. = 272.30

PROP. SUBDRAIN @ 0.4%

SWM4

SUBDRAIN INV. = 272.06

PROP. 62.6m-300mm PVC SDR35 STM @ 0.4%

PROP. 23.8m-300mm PVC
SDR35 STM @ 0.4%

PROP. STM MH22
TOP = 274.90
N. INV. = 272.83
E. INV. = 272.78

PROP. STM MH23
TOP = 274.90
E. INV. = 272.97
S. INV. = 272.92
N. INV. = 272.95

PROP. TOP OF SLOPE

PROP. STM MH24
TOP = 274.30
E. INV. = 273.23
S. INV. = 273.20

PROP. TOP OF SLOPE

10m 0 10m 20m
SCALE 1:500

KEY PLAN



KEY PLAN — TOWN OF CALEDON — NTS

LEGEND

- PROPERTY LINE
- 264 EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED DRAINAGE DIRECTION
- PROPOSED STORM MANHOLE
- PROPOSED DOUBLE CATCHBASIN
- PROPOSED SINGLE CATCHBASIN
- PROPOSED SANITARY MANHOLE
- W PROPOSED DRILLED WELL WITH 50mm TYPE K COPPER WS
- PROPOSED HYDRANT LOCATION
- PROPOSED GATE VALVE

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FEB. 15, 2022
PROVINCE OF ONTARIO

DESIGNED BY | APPROVED BY

N°	Date	Revisions	Dwn.	Dsg'd.	Chk'd.
0	15/FEB/22	ISSUED FOR APPROVAL	KC	KC	RJW

Client:

AIRPORT KING INC.

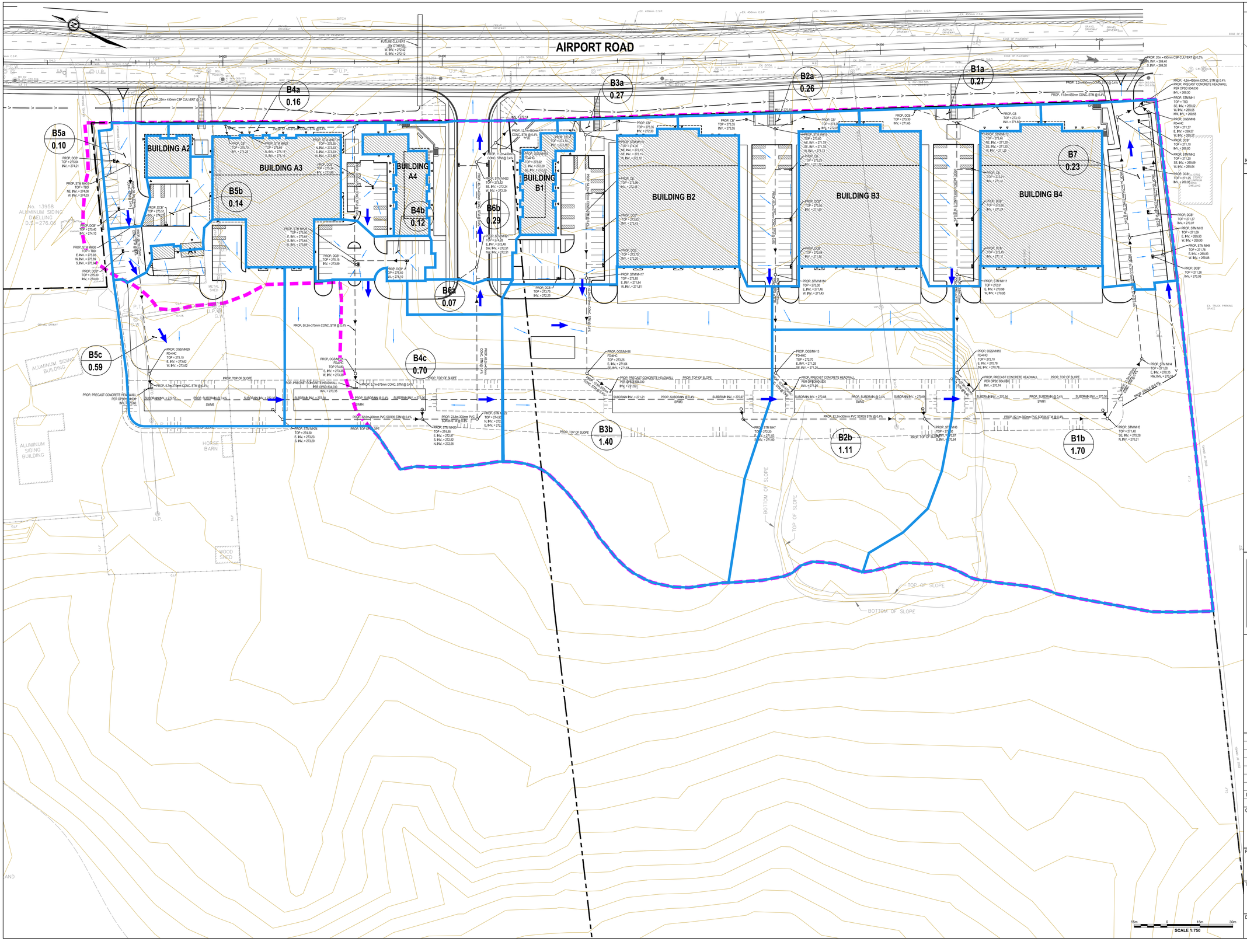
Project Name:

ART + WORK
13846 & 13940 AIRPORT ROAD
TOWN OF CALEDON

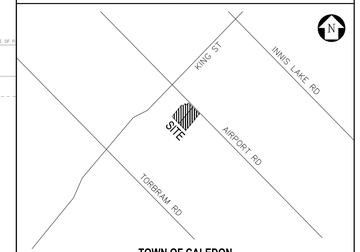
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GENERAL UNDERGROUND PLAN 2 OF 2

Drawing N°:	Sheet N°:	Rev. N°:
19-216-04	2 OF 2	0
	Scale: 1:500	



KEY PLAN



LEGEND

- PROPERTY LINE
- EXISTING CONTOUR
- PROPOSED STORM MANHOLE
- PROPOSED DOUBLE CATCHBASIN
- PROPOSED SINGLE CATCHBASIN
- PROPOSED OVERLAND FLOW ROUTE
- B1b / 1.70 — PROPOSED CATCHMENT ID / PROPOSED DRAINAGE AREA
- EXISTING DRAINAGE BOUNDARY
- PROPOSED DRAINAGE BOUNDARY

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N°	Date	Revisions	Dwn.	Dsg'd.	Chk'd.
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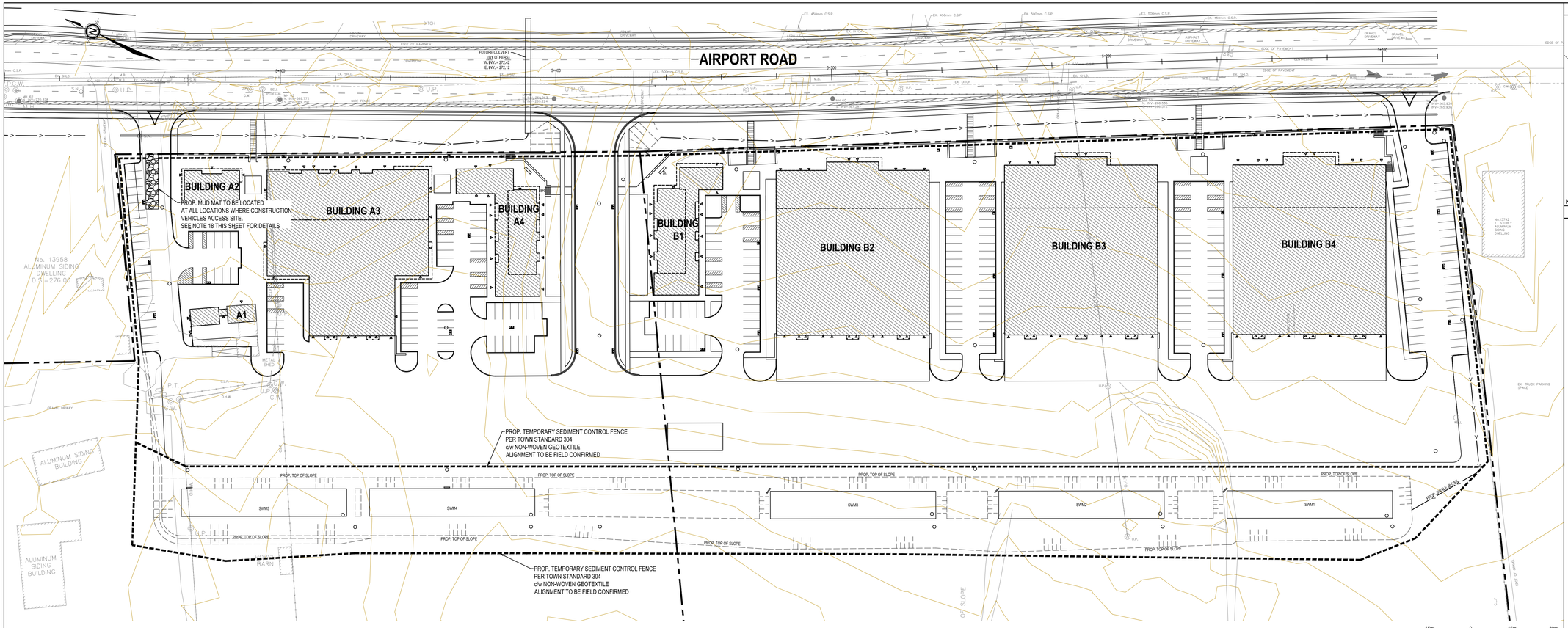
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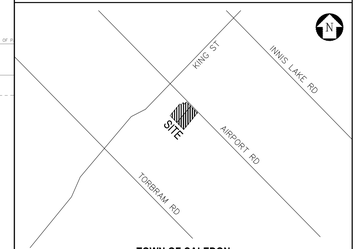
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STORM DRAINAGE PLAN

Drawing N°:	Sheet N°:	Rev. N°:
19-216-05	1 OF 1	0
	Scale: 1:750	



KEY PLAN



KEY PLAN — TOWN OF CALEDON — NTS

LEGEND

- PROPERTY LINE
- EXISTING CONTOUR
- PROPOSED STORM MANHOLE
- PROPOSED DOUBLE CATCHBASIN
- PROPOSED SINGLE CATCHBASIN
- PROPOSED TEMPORARY SEDIMENT CONTROL FENCE PER TOWN STANDARD DRAWING 304 c/w NON-WOVEN GEOTEXTILE ALIGNMENT TO BE FIELD DETERMINED

EROSION AND SEDIMENT CONTROL NOTES

SITE MANAGEMENT

1. A MULTI-BARRIER APPROACH TO BE IMPLEMENTED FOR EROSION AND SEDIMENT CONTROL. ALL TEMPORARY EROSION AND SEDIMENT CONTROLS TO BE IN GENERAL CONFORMANCE WITH THE EROSION AND SEDIMENT CONTROL GUIDE FOR URBAN CONSTRUCTION (2019).
2. EROSION AND SEDIMENT CONTROL (ESC) MEASURES TO BE IMPLEMENTED PRIOR TO, AND MAINTAINED DURING THE CONSTRUCTION PHASES, TO PREVENT ENTRY OF SEDIMENT INTO THE WATER. ALL DAMAGED EROSION AND SEDIMENT CONTROL MEASURES SHOULD BE REPAIRED AND/OR REPLACED WITHIN 48 HOURS OF INSPECTION.
3. DISTURBED AREAS TO BE MINIMIZED TO THE EXTENT POSSIBLE, AND TEMPORARILY OR PERMANENTLY STABILIZED OR RESTORED AS THE WORK PROGRESSES. PER EROSION AND SEDIMENT CONTROL GUIDE FOR URBAN CONSTRUCTION (2019), ANY DISTURBED AREA LEFT EXPOSED FOR 30 DAYS OR GREATER ARE TO BE STABILIZED. STABILIZATION SHALL BE BY HYDROSEEDING WITH AN APPROVED SEED MIXTURE AND APPLICATION OF STRAW MULCH PER OPSS 804. REFER TO SEED MIXTURE NOTES THIS SHEET.
4. THE EROSION AND SEDIMENT CONTROL STRATEGIES OUTLINED ON THE PLANS ARE NOT STATIC AND MAY NEED TO BE UPGRADED/AMENDED AS SITE CONDITIONS CHANGE TO MINIMIZE SEDIMENT LADEN RUNOFF FROM LEAVING THE WORK AREAS. IF THE PRESCRIBED MEASURES ON THE PLANS ARE NOT EFFECTIVE IN PREVENTING THE RELEASE OF A DELETERIOUS SUBSTANCE, INCLUDING SEDIMENT, THEN ALTERNATIVE MEASURES MUST BE IMPLEMENTED IMMEDIATELY TO MINIMIZE POTENTIAL ECOLOGICAL IMPACTS. TRCA ENFORCEMENT OFFICER SHOULD BE IMMEDIATELY CONTACTED. ADDITIONAL ESC MEASURES TO BE KEPT ON SITE AND USED AS NECESSARY.
5. AN ENVIRONMENTAL MONITOR TO ATTEND THE SITE TO INSPECT ALL NEW CONTROLS, AS WELL AS ON A REGULAR BASIS, OR FOLLOWING RAIN/SNOWMELT EVENT, TO MONITOR ALL WORKS, AND IN PARTICULAR WORKS RELATED TO EROSION AND SEDIMENT CONTROLS, DEWATERING OR UNWATERING, RESTORATION AND IN-WATER OR NEAR WATER WORKS. SHOULD CONCERNS ARISE ON SITE THE ENVIRONMENTAL MONITOR SHALL CONTACT THE TRCA ENFORCEMENT OFFICER AS WELL AS THE PROPONENT.
6. ALL ACTIVITIES, INCLUDING MAINTENANCE PROCEDURES, TO BE CONTROLLED TO PREVENT THE ENTRY OF PETROLEUM PRODUCTS, DEBRIS, RUBBLE, CONCRETE OR OTHER DELETERIOUS SUBSTANCES INTO THE WATER. VEHICULAR REFUELING AND MAINTENANCE TO BE CONDUCTED A MINIMUM OF 30 METRES FROM THE WATER.
7. ALL GRADES WITHIN THE REGULATORY FLOODPLAIN WILL BE MAINTAINED OR MATCHED.
8. ALL CONSTRUCTION VEHICLES MUST ENTER AND EXIT THE SITE ONLY FROM THE APPROVED ACCESS ROUTE AS SHOWN ON THE PLAN. CONSTRUCTION ACCESS TO BE MAINTAINED TO THE SATISFACTION OF THE TOWN. STREET SWEEPING IS REQUIRED AS NEEDED.
9. NO CONSTRUCTION ACTIVITY OF MACHINERY SHALL BE ALLOWED BEYOND THE TEMPORARY SEDIMENT CONTROL FENCE OR LIMITS OF THE SITE WORKS.
10. THE CONTRACTOR IS RESPONSIBLE TO IMPLEMENT DUST CONTROL MEASURES AND CONSTRUCTION BEST PRACTICE GUIDELINES AS APPROVED BY THE TOWN AND/OR TRCA.
11. THE PROPONENT/CONTRACTOR SHALL MONITOR THE WEATHER SEVERAL DAYS IN ADVANCE OF THE ONSET OF THE PROJECT TO ENSURE THAT THE WORKS TO BE CONDUCTED DURING FAVOURABLE WEATHER CONDITIONS. SHOULD AN UNEXPECTED STORM ARISE, THE CONTRACTOR SHALL REMOVE ALL UNFIXED ITEMS FROM THE REGIONAL STORM FLOOD PLAIN THAT WOULD HAVE THE POTENTIAL TO CAUSE A SPILL OR AN OBSTRUCTION TO FLOW, E.G. FUEL TANKS, PORTA-POTTIES, MACHINERY, EQUIPMENT, CONSTRUCTION MATERIALS, ETC.
12. ALL DEWATERING/UNWATERING SHALL BE TREATED AND RELEASED TO THE ENVIRONMENT AT LEAST 30 METRES FROM A WATERCOURSE OR WETLAND AND ALLOWED TO DRAIN THROUGH A WELL-VEGETATED AREA. NO DEWATERING EFFLUENT SHALL BE SENT DIRECTLY TO ANY WATERCOURSE, WETLAND OR FOREST, OR ALLOWED TO DRAIN ONTO DISTURBED SOILS WITHIN THE WORK AREA. THESE CONTROL MEASURES SHALL BE MONITORED FOR EFFECTIVENESS AND MAINTAINED OR REVISED TO MEET THE OBJECTIVE OF PREVENTING THE RELEASE OF SEDIMENT LADEN WATER.
13. CONTRACTOR SHALL TAKE CARE AND CONTROL SPILLS, FLUIDS AND MATERIALS DURING CONSTRUCTION TO MINIMIZE RISK TO THE ENVIRONMENT.

CONSTRUCTION TIMING

14. IN ORDER TO COMPLY WITH THE MIGRATORY BIRDS CONVENTION ACT, TREE REMOVALS SHOULD BE COMPLETED BETWEEN AUGUST 1 AND APRIL 1.

ENVIRONMENTAL COMPLIANCE

15. PLEASE NOTIFY THE TRCA AT 416-661-6000 48 HOURS PRIOR TO COMMENCING CONSTRUCTION.
16. AN ENVIRONMENTAL MONITOR TO BE ON SITE, AND PROVIDE ADVICE, TO ENSURE THAT ACTIVITIES THAT COULD HAVE A NEGATIVE IMPACT TO THE NATURAL ENVIRONMENT ARE EFFECTIVELY MITIGATED AS CONSTRUCTION PROCEEDS. THE ENVIRONMENTAL MONITOR SHALL NOTIFY THE TRCA ENFORCEMENT OFFICER AND PROJECT MANAGER IF AN ISSUE ARISES.

EROSION AND SEDIMENT CONTROLS

17. TEMPORARY EROSION AND SEDIMENT CONTROLS TO BE REGULARLY INSPECTED. THE FOLLOWING MINIMUM FREQUENCY OF INSPECTION IS RECOMMENDED:
    - 17.1. FOLLOWING INSTALLATION OF TEMPORARY SEDIMENT CONTROLS
    - 17.2. ON A WEEKLY BASIS DURING ACTIVE CONSTRUCTION
    - 17.3. MONTHLY DURING INACTIVE PERIODS (>30 DAYS)
    - 17.4. BEFORE AND AFTER SIGNIFICANT RAINFALL EVENTS
    - 17.5. AFTER SIGNIFICANT SNOWMELT EVENTS
    - 17.6. AFTER ANY EXTREME WEATHER WHICH COULD DAMAGE ESC MEASURES
    - 17.7. DAILY DURING EXTENDED RAIN OF SNOWMELT PERIODS
    - 17.8. DURING OR FOLLOWING ANY SPILL EVENT
    - 17.9. BEFORE CONSTRUCTION IS SHUT DOWN FOR THE WINTER
    - 17.10. AT THE END OF CONSTRUCTION BEFORE REMOVAL OF TEMPORARY CONTROLS
18. MUD MAT PER CURRENT TOWN STANDARDS TO BE INSTALLED WHERE CONSTRUCTION VEHICLES ACCESS THE SITE. MUD MAT TO BE 4.5m WIDE BY 20m LONG WITH MINIMUM 450mm THICK LAYER OF STONE OVER NON-WOVEN GEOTEXTILE. FOR THE FIRST 10m LENGTH FROM THE ROAD, MUD MAT TO BE COMPRISED OF 50mm DIAMETER CLEARSTONE. FOR THE REMAINING LENGTH, MUD MAT TO BE COMPRISED OF 150mm DIAMETER CLEARSTONE.
19. TOPSOIL AND MATERIAL STOCKPILES TO BE ENCLOSED WITH SEDIMENT CONTROL FENCE. SEDIMENT CONTROL FENCE FOR STOCKPILES TO BE TERRAFIX TERRAFENCE OR APPROVED EQUIVALENT. THE MAXIMUM SIDE SLOPE SHALL BE 2H:1V. ONCE TOPSOIL STRIPPING IS COMPLETED, THE STOCKPILE SHALL BE VEGETATED, SUBJECT TO WEATHER CONDITIONS, BY HYDROSEEDING, OR AN APPROVED EQUIVALENT, TO THE SATISFACTION OF THE TOWN.
20. REMOVE TEMPORARY SEDIMENT CONTROLS FOLLOWING COMPLETION OF CONSTRUCTION AND SITE STABILIZATION AND REINSTATE AFFECTED AREAS TO EXISTING CONDITIONS OR BETTER. REMOVAL TO BE COMPLETED AFTER SITE HAS ACHIEVED AT LEAST 80% STABILIZATION AND PERMANENT VEGETATION AREAS ARE WELL-ESTABLISHED AND EFFECTIVELY PREVENTING EROSION. TIMING OF REMOVAL OF TEMPORARY SEDIMENT CONTROLS TO BE APPROVED BY TOWN STAFF.

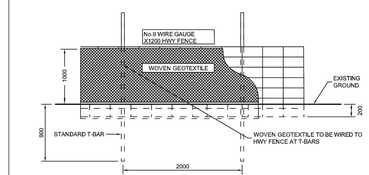
SEED MIXTURE NOTES

MIN. 150mm TOPSOIL TO BE PLACED, FINE-GRADED AND HYDROSEEDED WITH MIX AS SUPPLIED BY ONTARIO SEED COMPANY (OR APPROVED EQUIVALENT).

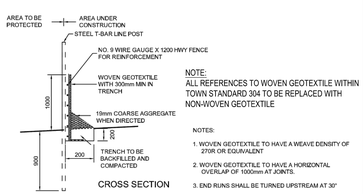
8140 - NATIVE UPLAND FORAGE & MEADOW MIXTURE

CANADIAN WILD RYE (Elymus canadensis)	35%
FOWL BLUEGRASS / FOWL MEADOWGRASS (Poa palustris)	10%
FOX SEDGE (Carex vulpinoidea)	5%
LITTLE BLUE STEM (Schizachyrium scoparium)	5%
SAND DROPSEED (Sporobolus cryptandrus)	10%
VIRGINIA WILD RYE (Elymus virginicus ssp. virginicus)	35%

APPLIED AT THE RATE OF 22 - 25 kg/Ha AND IN ACCORDANCE WITH THE SUPPLIERS INSTRUCTIONS. WITH NURSE CROP - A NURSE CROP WITH EQUAL PARTS ANNUAL OATS (Avena sativa) AND CANADIAN WILD RYE (Elymus canadensis) APPLIED AT A RATE OF 22 kg/ha.



ELEVATION



CROSS SECTION

NOTE:
ALL REFERENCES TO WOVEN GEOTEXTILE WITHIN TOWN STANDARD 304 TO BE REPLACED WITH NON-WOVEN GEOTEXTILE

NOTES:
1. WOVEN GEOTEXTILE TO HAVE A WEAVE DENSITY OF 270R OR EQUIVALENT
2. WOVEN GEOTEXTILE TO HAVE A HORIZONTAL OVERLAP OF 1000mm AT JOINTS.
3. END RUNS SHALL BE TURNED UPSTREAM AT 30°

NO.	REVISION	APP'D	DATE
2	NAME CHANGED, STANDARD No. 325.01 NOW 304		JUNE 08
1	SUPPORT FENCING CHANGED TO HWY FENCE		Oct 02

TOWN OF CALEDON

SEDIMENT CONTROL FENCE

APP'D: C.C. DATE: APRIL 2000
DRAWN: BJM SCALE: N.T.S.
STANDARD No. 304

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LICENSED PROFESSIONAL ENGINEER — R. J. WHYTE — 49877509 — FEB. 15, 2022 — PROVINCE OF ONTARIO

DESIGNED BY | APPROVED BY

N°	Date	Revisions	Dwn.	Dsg'd.	Chk'd.
3	15/FEB/22	ISSUED FOR APPROVAL	KC	KC	RJW

Client:

AIRPORT KING INC.

Project Name:

ART + WORK
13846 & 13940 AIRPORT ROAD
TOWN OF CALEDON

Title Name:

EROSION AND SEDIMENT CONTROL PLAN

Drawing N°: **19-216-06**
Sheet N°: 1 OF 1
Scale: 1:750
Rev. N°: 0