

Project No.: CCO-24-1841

Prepared for:

Domenic Santaguida 3625 Rivergate Way Ottawa, ON K1V 2A4

Prepared by:

Egis Canada Ltd. 310-750 Palladium Drive Kanata, ON K2V 1C7

August 28, 2025



TABLE OF CONTENTS

1.0	PURPOSE	1
2.0	SITE DESCRIPTION	1
2.1	SOIL CONDITIONS	2
3.0	PROPOSED STORMWATER MANAGEMENT	2
3.1	DESIGN CRITERIA	2
3.2	METHODOLOGY	3
3.3	PRE-DEVELOPMENT DRAINAGE	4
3.4	POST-DEVELOPMENT DRAINAGE	6
3.5	Ultimate Off-Site Flow Destination	8
4.0	MAJOR DRAINAGE ROUTES	9
5.0	STORMWATER QUANTITY CONTROL	9
5.1	POST-DEVELOPMENT PEAK FLOW RATES SUMMARY	
6.0	STORMWATER QUALITY CONTROL	11
7.0	LOW IMPACT DEVELOPMENT	12
8.0	PROVINCIAL POLICY STATEMENT	13
9.0	EROSION AND SEDIMENT CONTROL	14
9.1	TEMPORARY MEASURES	14
9.2	PERMANENT MEASURES	14
10.0	SUMMARY	15
11.0	RECOMMENDATIONS	15
LIST (OF TABLES+	
Table 1	1: Curve Numbers and Initial Abstraction Values	4
Table 2	2: Pre-Development Input Parameters	5
Table 3	2: Pro Davolanment VO Madel Pack Flow Pocults (m3/s)	



Table 4: Post-Development Input Parameters	7
Table 5: Post-Development VO Model Peak Flow Results (m³/s)	8
Table 6: Pre-Development and Uncontrolled Post-Development Peak Flow Results (m3/s)	9
Table 7: Storage Requirements	.10
Table 8: Pre-Development and Controlled Post-Development Peak Flow Results (m³/s)	. 11
Table 9: Provincial Policy Statement	. 13



APPENDICES

APPENDIX A: LOCATION PLAN

APPENDIX B: PRE-DEVELOPMENT DRAINAGE PLAN, MODEL SCHEMATIC & CALCULATIONS APPENDIX C: POST-DEVELOPMENT DRAINAGE PLAN, MODEL SCHEMATIC & CALCULATIONS

APPENDIX D: VO6 MODEL SCHEMATIC & RESULTS



1.0 PURPOSE

Egis Canada Ltd. has prepared this Conceptual Stormwater Management Report in support of an application for Draft Plan Approval of the development known as the Santaguida Subdivision by Domenic Santaguida.

The objective of this stormwater management report is to evaluate the drainage characteristics of the site under existing and proposed conditions and to advance an integrated approach to facilitate the proposed development with no adverse impacts to the receiving drainage systems. The purpose of this report is to provide a conceptual stormwater management design in accordance with the recommendations and guidelines provided by the Ministry of the Environment, Conservation and Parks (MECP). These guidelines encourage the implementation of Best Management Practices (BMPs) for treating and controlling stormwater runoff.

The servicing constraints, design criteria, municipal standards and project specific quality and quantity control objectives were established based on the previous projects completed in Rideau Valley Conservation Authority (RVCA), Beckwith Township, and Lanark County regulatory areas.

During the detailed design stage, further information will be provided regarding the post-development peak flow rates, stormwater management outlet control features, and specifically how the proposed stormwater management strategy will meet quality and quantity control objectives.

2.0 SITE DESCRIPTION

The proposed development is in the Township of Beckwith. The legal description of the land is the Southwest Half of Lot 18, Concession 3, Township of Beckwith, County of Lanark. The subject site is bounded by Richmond Road to the north, vacant land to the east, the unmaintained 3rd Concession to the south and rural, single family residential dwellings to the west. This site currently encompasses one existing local unevaluated wetland in the northwest corner of the site. Based on the topography, the wetland does not appear to have a gravity outlet and will continue to pond in post-development conditions. The remainder of the site is comprised of sections of vegetated meadow and forested areas. The location plan can be found in Appendix A.

The subject property is approximately 33.7 hectares in area and the owner wishes to develop the subject lands into forty (40) rural estate lots accessed via a new street from Richmond Road ending in a cul-de-sac. The length of proposed road is approximately 1,050 m. Each side of the new local road will include a 1.5 m-wide paved asphalt shoulder, providing an active-transportation lane and adding additional impervious surface that is accounted for in the hydrologic model. Block 44, a 6 m-wide corridor along the south limit, will carry a 3 m stonedust multi-use trail, which is treated as pervious gravel in the stormwater analysis.

As per the topographic survey prepared by McIntosh Perry Surveying Inc. (August 2022), the subject property is relatively flat and gently slopes down in northwest and northeast directions. The elevations range from 130.0 to 135.5 metres above sea level. Surface water features include the unevaluated wetland located in the northwest corner of the property. A 30m setback is recommended for mitigating water quality impacts to protect wildlife habitat and to minimize Anthropocene influence.



2.1 SOIL CONDITIONS

It is understood that a Hydrogeological Investigation and Terrain Analysis Report will be prepared by McIntosh Perry for this site. As this conceptual design work is occurring concurrently with their work, for the purposes of this design, the Ontario GeoHub's soil survey complex was used to determine the underlying soil conditions. Based on this information, the site is comprised of Farmington soil, which is classified as having a hydrological soil group 'B' and Muck, which is classified as having a hydrological soil group 'D'.

Further investigations from the test pits and groundwater testing will be utilized in the detailed design to optimize the site with regards to construction practices for the dwelling placements, road profiles and ditching profiles.

3.0 PROPOSED STORMWATER MANAGEMENT

3.1 DESIGN CRITERIA

In Ontario, the watershed-level management and planning are typically done using watershed plans, sub-watershed plans and/or individual stormwater management plans, in that order. The subject property is not covered by any specific watershed or sub watershed plans and has no existing stormwater controls in place. As such, the subject site will require a site-specific stormwater management plan using the MECP Stormwater Management Planning and Design Manual (March 2003). This methodology promotes water management from an environmentally sustainable perspective. The intent of this stormwater management plan is to provide adequate stormwater treatment for both quantity and quality controls. Stormwater Best Management Practices (BMPs) will be implemented at the "Lot level", "Conveyance" and "End of Pipe" locations. To summarize, roof water will be directed to grass surfaces that in turn will be collected in grassed swales or roadside ditches prior to outletting from the development. Quantity and quality control objectives are expected to be achieved through these enhanced grass swales which will provide temporary attenuation.

The following design criteria is established based on the Stormwater Management Manual, 2003:

- Stormwater quantity controls will be required to regulate the post-development peak flows to predevelopment levels for all design storms including the 2, 5, 10, 25, 50 and 100-year storm events.
- Stormwater quality controls will be required to achieve the "Enhanced" level of protection, which corresponds to 80% long term average removal of Total Suspended Solids (TSS) as recommended in the MECP SWMPD Manual, 2003.
- Incorporate LID features (if applicable) in the stormwater management strategy by implementing a "treatment train" approach to supplement the stormwater quality control; and
- Grading should demonstrate that flows to the wetland will not change and incorporate the regulatory setback requirements (i.e.: maintain post to pre).



• VO6 hydrology inputs updated per the Post-Development Drainage Plan, including revised catchment areas and new impervious features.

3.2 METHODOLOGY

Runoff calculations were completed with the aid of a computer modelling program, Visual OTTHYMO (Version 6.0) (VO6). The proposed model was developed as a rural development and therefore employed NASHYD routines for calculating hydrographs. The overland travel time of concentration for each of the drainage areas was derived using the SCS Lag equation:

$$T_c = 60 \left(L^{0.8} \frac{(S' + 25.4)^{0.7}}{4238S^{0.33}} \right)$$
 (min)

Where:

L = Flow length (m)

S' = Potential maximum retention ($S' = \frac{25400}{CN} - 254$)

CN = Curve Number

S = Average watershed land slope (%)

A maximum value of 30m (100ft) was used in calculating the overland sheet flow time of concentration. The remaining overland sheet flow is assumed to form shallow concentrated flows and was calculated as such. The velocity for the shallow concentrated flow was calculated using the following formula:

$$V = K(s)^{0.5} (m/s)$$

Where: k = constant (referenced from the National Engineering Handbook, Table 15-3)

V = Velocity of water (m/s)

S = Average watershed land slope (%)

The velocity for channelized flow was also calculated using the above equation, substituting k=0.457. For predevelopment, shallow concentrated flows were calculated using a k-value of 5.032 as appropriate for woodlands and cultural meadow lands. For post-development, given that it is expected that much of the lots will be left in their natural state, a k-value of 5.032 was used as well. These values were taken from the National Engineering Handbook Table 15-3 (converting the velocity equation from imperial to metric units). The resulting time of concentration was then determined using the velocity method which "assumes the time of concentration is the sum of the travel times for segments along the hydraulically most distant flow path." (National Engineering Handbook, Page 15-6).

The time of concentration was used to estimate the time to peak through the relation that the time to peak occurs at approximately 67% of the time of concentration. The input value for the simulation time step (DT) in VO6 was taken as 5 minutes where the time of concentration was determined to be less than 20 minutes, and 10 minutes where the time of concentration was determined to be greater than 20 minutes. For the 24-hour SCS Type II distribution, where the time of concentration was determined to be greater than 30 minutes, a DT of 15 minutes was assigned.



No changes were made to the VO6 runoff-routing parameters or time-step; only catchment areas and the curve numbers were updated per Revision D inputs.

The following SCS land-use lookup values were used as the basis to develop composite curve numbers and initial abstraction values to reflect the catchment areas and added impervious shoulders under the Post Drainage Plan and are reflected in Table 4.

Soil Group В D **Curve Number Initial Abstraction (mm) Initial Abstraction (mm) Land Use Curve Number** Meadow 69 8 84 5 Grass 69 84 5 Woods 79 60 8 8 Wetland 50 10 77 10 Gravel 85 2.5 89 2.5 1.5 98 1.5 **Impervious**

Table 1: Curve Numbers and Initial Abstraction Values

As described in Section 2.1, and as per the available soil survey complex on the Ontario GeoHub's website, the existing soils have generally been classified as Class B and D. The drainage areas and land classifications were delineated using AutoCAD.

Given the proximity to the City of Ottawa, the design is based on the hyetographs for the City of Ottawa. The SCS Type II distributions (6-hour, 12-hour, and 24-hour) were reviewed in preparing the proposed design using a 5-minute time step.

It is anticipated that the on-site drainage ditches will be constructed at a minimum of 0.1% for rear yards, 0.3% for side yards and 0.5% for roadside ditches. During the final design process, opportunity to alter the slope of the ditches will be explored considering additional topographic information and final road and lot grading plans. It is expected that all roadside ditches are designed at a minimum depth of 0.85 m.

Driveway culverts will be sized for the 5-year storm while road crossing culverts will be sized for the 10-year storm. Flows during the 100-year storm will be reviewed to confirm they do not overtop the driveways/roads greater than 0.30 m. Driveway culverts are to be a minimum 400 mm diameter with road crossing culverts a minimum 600 mm diameter, consistent with Township standards.

3.3 PRE-DEVELOPMENT DRAINAGE

The pre-development boundary encompasses four (4) drainage areas. Appendix B includes the pre-development drainage plan, which illustrates the pre-development drainage areas within the subject property, noted as A1 through A4. Additionally, the supporting pre-development drainage calculations and associated VO model output results are provided in Appendix D. There are four (4) external drainage areas which contribute to the overall site drainage, noted as EXT1 through EXT4, and were included in the analyses under pre-development conditions. External drainage EXT3 measures 0.060 ha per the post-development; its contribution in pre-development flow increases by < 1% and has negligible hydraulic impact.



Three (3) main stormwater runoff outlet locations were identified, and are further referred to as OUT-1, OUT-2, and OUT-3. OUT-1 is the unevaluated wetland located within the northwest boundary of the subject property, adjacent to Richmond Road. OUT-2 is a large wetland located to the east of the subject property. OUT-3 is a small wetland located immediately northeast of the subject property boundary.

Pre-development drainage area A1 is comprised of the northwest portion of the subject property. The runoff generated generally flows in a northwest direction towards OUT-1. Aside from the wetland, the land uses present in A1 include vegetated meadows (or range), cultivated grass, woodlands, and gravel. Pre-development drainage area A2 is located adjacent to the southeast boundary of drainage area A1. The runoff generated generally flows in a northeast direction towards OUT-2. It is mainly comprised of range and woodlands in addition to a small wetland area. Pre-development drainage area A3 is located adjacent to the southeast boundary of drainage area A2. The runoff generated flows in a northeast direction towards OUT-3. This catchment is comprised of range and woodled area. Pre-development drainage area A4 is located adjacent to the southeast boundary of drainage area A3, and approximately accounts for the southeast half of the subject property. The runoff generated flows in a northeast direction towards OUT-2. This catchment is also comprised of range and woodled area.

External drainage area EXT1 is located immediately northwest of pre-development drainage area A1. The majority of this area is comprised of impervious area from Richmond Road, as well as a small portion of the unevaluated wetland that is mostly located on the subject property. The remaining land consists of gravel and grass. The area slopes down steeply away from the road, and the runoff generated will drain southeast towards OUT-1. External drainage area EXT2 is located along the southwest border of area A1 and drains in a northeast direction onto area A1 and eventually outlets to OUT-1. External drainage area EXT3 is located along the southwest border of area A2 and southeast border of EXT2. It drains northeast onto area A2 and then outlets to OUT-2. External drainage area EXT4 is located along the southwest border of area A4. Runoff generated in this catchment drains in a northeast direction onto area A4, which then outlets to OUT-2. These drainage areas area all comprised of range and woodlands.

The input parameters and results have been summarized in the following tables, while the full detailed output results can be found in Appendix B.

Table 2: Pre-Development Input Parameters

Catchment ID	Area (ha)	CN ¹	la² (mm)	Tp³ (hr)
		NASHYD		
A1	8.861	66.1	8.5	0.57
A2	4.703	66.4	8.0	0.55
A3	3.481	66.7	8.0	0.61
A4	16.455	70.3	8.0	0.57
EXT2	2.191	64.2	8.0	0.51
EXT3	0.45	64.6	8.0	0.12
EXT4	1.791	78.7	8.0	0.25
		STANDHYD		
EXT1	0.468	78.6	9.0	0.11
Total:	38.40			



Notes:

- 1. CN refers to the average weighted curve number based on the land cover and land
- 2. la refers to the initial abstraction
- 3. Tp refers to time to peak

Table 3: Pre-Development VO Model Peak Flow Results (m³/s)

Catchment	Outlet	6- Hour S	CS Type II	12- Hour	SCS Type II	24- Hour SCS Type II	
Catchment	Outlet	5-Year	100-Year	5-Year	100-Year	5-Year	100-Year
			NASH	YD			
A1	Out - 1	0.116	0.335	0.154	0.430	0.202	0.533
A2	Out - 2	0.062	0.180	0.083	0.229	0.108	0.284
A3	Out - 3	0.043	0.124	0.057	0.158	0.074	0.195
A4	Out - 2	0.266	0.739	0.350	0.933	0.449	1.138
EXT2	Out - 1	0.029	0.083	0.038	0.106	0.050	0.133
EXT3	Out - 2	0.002	0.005	0.002	0.007	0.003	0.009
EXT4	Out - 2	0.074	0.192	0.095	0.235	0.121	0.284
STANI				HYD			
EXT1	Out - 1	0.017	0.030	0.019	0.033	0.021	0.038

3.4 POST-DEVELOPMENT DRAINAGE

The conceptual post-development drainage scheme for the proposed development is comprised of six (6) drainage areas (B1-B6) which outlet to OUT-1 (northwest wetland), OUT-2 (east wetland) or OUT-3 (northeast wetland). The development will include the addition of ~1,050 m of asphalt roadway with roadside drainage ditches, along with 40 single family homes and associated driveways. Appendix C includes the post-development drainage plan, which illustrates the post-development sub-catchments for the subject lands, noted as B1 through B6. The external drainage areas EXT1 through EXT4 are to remain unchanged under post-development conditions. Supporting drainage calculations and associated VO model output results can also be found in Appendix C and Appendix D.

Post-development drainage area B1 encompasses most of the land contained in the pre-development area A1, as well as a small portion of pre-development area A2. Once developed, it will contain a segment of the asphalt roadway, as well as residential dwellings and their corresponding driveways and lawns. As most of the land will remain in its natural state, the other land uses will consist of range, grass, woodlands, and a portion of the unevaluated wetland on the subject property. Runoff generated within this catchment area will outlet to OUT-1.

Post-development drainage area B2 encompasses the remainder of the land from pre-development area A1, as well as a portion of pre-development area A2. Under post-development conditions, it will contain several backyard areas. However, the land use classifications will not be altered and include the wetland area and woodlands. Runoff generated in this catchment will also outlet to OUT-1. Post-development drainage area B3 encompasses a portion of the pre-development area A2, as well as the majority of pre-development drainage area A3. Similar to B1, it will contain a segment of the asphalt roadway, residential dwellings, driveways, and lawns. Range and grass will be present on the remainder of the area. Runoff generated within this catchment



area will outlet to OUT-3. Post-development drainage area B4 encompasses most of the land contained in predevelopment area A4. Once developed, it will contain a segment of the asphalt roadway, as well as residential dwellings and their corresponding driveways and lawns. As most of the land will remain in its natural state, the other land uses will consist of grass and woodlands. Runoff generated within this catchment area will outlet to OUT-2. Post-development drainage area B5 encompasses the remainder of pre-development areas A2 and A3. It will contain backyard areas under post-development conditions, where the original wooded area will not be altered. Runoff generated in this catchment will outlet to OUT-3. Post-development drainage area B6 encompasses the remainder of pre-development area A4. It will also contain backyard areas under post-development conditions and will be composed of woodlands. Runoff generated in this catchment will outlet to OUT-2.

The external drainage areas will not be altered as a result of the development and will be comprised of their original land use covers. Runoff generated in EXT1 will drain southeast into Out-1, located in areas B1 and B2. Runoff generated in EXT2 will drain northeast onto area B1, which will then be conveyed to Out-1 as well. EXT3 will drain northeast onto area B3, which will be conveyed to Out-3. EXT4 will drain northeast onto area B4, eventually outletting to Out-2.

Sub-catchments B1 (7.16 ha), B2 (2.97 ha), B3 (4.42 ha), B4 (11.24 ha), B5 (1.12 ha) and B6 (4.29 ha) collectively cover 31.2 ha of internal developable area. Land uses include paved shoulders, residential lots, driveways, lawns and remaining woodlands. Runoff from B1 and B2 outlets to OUT-1; B4 and B6 to OUT-2; B3 and B5 to OUT-3. Three 1.5 m-wide paved asphalt shoulders along Street A (total 3,150 m²) and a 6 m-wide Block 44 corridor with a 3 m stone-dust trail are included. Shoulders are modelled as impervious; the trail is treated as pervious gravel.

The input parameters and results have been summarized in the following tables, while the full detailed output results can be found in Appendix C.

Table 4: Post-Development Input Parameters

Catchment ID	Area (ha)	CN ¹	la² (mm)	Tp³ (hr)							
	NASHYD										
B1	7.16	79	7.6	0.85							
B2	2.97	80	7.0	0.75							
В3	4.42	79	6.8	0.80							
B4	11.24	78	6.6	1.00							
B5	1.12	83	4.5	0.50							
В6	4.29	68	8.0	0.60							
EXT2	2.191	70	7.5	0.75							
EXT3	0.060	65	8.0	0.20							
EXT4	1.791	69	8.0	0.90							
	STANDHYD										
EXT1	EXT1 0.468		2.0	0.20							
Total:	35.71										

Notes: CN refers to the average weighted curve number based on the land cover and land use. Ia refers to the initial abstraction. Tp refers to time to peak.



12- Hour SCS Type II 6-Hour SCS Type II 24- Hour SCS Type II Catchment Outlet 5-Year 100-Year 5-Year 100-Year 5-Year 100-Year **NASHYD** B1 Out - 1 0.110 0.305 0.144 0.386 0.184 0.472 0.039 0.116 0.053 0.150 0.070 0.188 B2 Out - 1 0.082 0.219 0.106 0.273 0.134 В3 Out - 3 0.332 В4 0.201 0.516 0.275 0.635 0.320 0.756 Out - 2 В5 Out - 3 0.023 0.066 0.030 0.084 0.040 0.106 В6 0.091 0.262 0.122 0.334 0.160 0.418 Out - 2 EXT2 Out - 1 0.029 0.083 0.038 0.106 0.050 0.133 EXT3 Out - 3 0.002 0.005 0.002 0.008 0.003 0.010 EXT4 Out - 2 0.074 0.192 0.095 0.235 0.121 0.284 **STANDHYD** 0.018 EXT1 Out - 1 0.016 0.029 0.033 0.021 0.038

Table 5: Post-Development VO Model Peak Flow Results (m³/s)

OUT-1's peak flows have increased from pre-development values of 0.153 to 0.177 m³/s (5-yr, 6 h) and 0.438 to 0.497 m³/s (100-yr, 6 h), reflecting the inclusion of the paved shoulders and adjusted B1/B2 areas. By contrast, OUT-2's peaks have decreased from 0.368 to 0.284 m³/s (5-yr, 6 h) and from 1.020 to 0.751 m³/s (100-yr, 6 h) because the reduction in B4's catchment area more than offsets its slight CN increase. OUT-3 shows a moderate rise, from 0.043 to 0.102 m³/s (5-yr, 6 h) and from 0.124 to 0.277 m³/s (100-yr, 6 h), driven by B3's higher curve number.

Consequently, OUT-1 and OUT-3 will require quantity-control measures to bring post-development peaks back to or below pre-development levels, whereas OUT-2 now falls below its existing peaks and does not require an outlet control structure.

The proposed detention basins, roadside swales, culvert sizes and outlet control settings remain appropriate. The 1.5 m-wide asphalt shoulders and 3 m stone-dust trail corridor do not create additional overland flow routes; all runoff continues to follow the roadside ditches and offtake swales as shown on the Post-Development Drainage Plan. OUT-1 and OUT-3 still require the same storage volumes to achieve post ≤ pre, while OUT-2 uncontrolled peaks now fall below existing levels and require no control structure. Water-quality targets and LID measures are likewise unaffected. No redesign of the conceptual SWM facilities is necessary.

3.5 Ultimate Off-Site Flow Destination

All post-development runoff released from Outlets 1-3 converges in the provincially significant wetlands east of the site. The wetland discharges via a tributary to Hutton Creek, which flows to the North Branch of the Jock River and ultimately to the Rideau River. Controlled post-development peaks at all outlets are less than or equal to pre-development peaks (see Table 8).



4.0 MAJOR DRAINAGE ROUTES

The proposed roadside ditches and offtake swales will have an important role in site drainage. They will act as the major drainage routes, will be sized to manage the required flow rate, and will adhere to the MECP guidelines for enhanced grass swales as much as possible. The driveway culverts will be sized for the 5-year storm; however, flows during the 100-year storm will not overtop the driveways greater than 0.30 m. Rock flow check dams will be incorporated to attenuate flows, promote infiltration, and allow for particle filtration. Further details will be provided during detailed design. The site will be designed such that the proposed dwellings will not be adversely affected by any 100-year ponding limits, nor by the adjacent wetlands.

5.0 STORMWATER QUANTITY CONTROL

The following is provided as a summary of pre-development peak flow rates in comparison to the uncontrolled post-development peak flow rates. Table 6 shows that uncontrolled post-development peaks increase at OUT-1 and OUT-3 and decrease at OUT-2 when compared to pre-development.

Design 6-Hour SCS Type II 12-Hour SCS Type II 24-Hour SCS Type II Storm Pre. Post. Δ Pre. Post. Δ Pre. Post. Δ (yr) OUT-1 5 0.153 0.177 0.024 0.204 0.233 0.029 0.264 0.299 0.035 100 0.438 0.497 0.059 0.559 0.627 0.068 0.774 0.084 0.690 OUT-2 5 0.368 0.284 -0.084 0.484 0.368 -0.116 0.623 0.469 -0.154 100 1.020 0.751 -0.269 1.291 0.954 -0.346 1.579 1.144 -0.435 OUT-3 0.043 0.102 0.059 0.057 0.075 0.074 0.095 5 0.132 0.169 100 0.124 0.277 0.153 0.158 0.348 0.190 0.195 0.425 0.230

Table 6: Pre-Development and Uncontrolled Post-Development Peak Flow Results (m3/s)

Based on the results, uncontrolled post-development peak flow, have increased slightly at OUT-1 and OUT-3, due to the increased impervious area from the addition of 1.5 m-wide paved shoulders and minor adjustments to drainage area boundaries. OUT-2, which collect runoff from B4 and B6, shows a reduction in peak flow due to reduction in total catchment area.

For outlets OUT-1 and OUT-3, stormwater management controls will be required to manage runoff and offer restriction of peak flow rates. The proposed stormwater management design will examine both the 5- and 100-year storm events. The roadside ditches and offtake swales to be constructed on-site will be equipped with permanent outlet control devices designed to restrict flows to specified flow rates. It is anticipated that the rear yard offtake swales will have easements associated with the adjacent properties to allow for the temporary storage of water and for future maintenance.

The proposed flat-bottom channels of the swales with estimated gradients of 0.50% along the road and 0.20% in the rear yards will provide ample opportunity for temporary stormwater storage. The ditches will be



constructed with 2.5:1 side slope and 3:1 side slope for those located along the road and in the rear yards, respectively. The opportunity to employ quality control enhancements such as through rock flow check dams will be explored to further offer quality control through a treatment train approach within the development.

For outlet OUT-2, which collects stormwater runoff from drainage areas B4, B6, and EXT4, post-development peak flow rates show a reduction when compared to pre-development peak flow rates. Because OUT-2's uncontrolled peaks now fall below pre-development for every storm event, no quantity-control structure is required at OUT-2.

Detailed sizing of the outlet control structures will be provided during the detailed design stage; however, a conceptual estimate of the requirements has been performed in VO6. The estimated storage requirements have been provided in the table below to confirm the required detention storage volumes for OUT-1 and OUT3.

Outlet ID	Catchment ID	5-Year Restricted Flow (m³/s)	5-Year Required Storage (m³)	100-Year Restricted Flow (m³/s)	100-Year Required Storage (m³)
OUT-1	A1+EXT1+EXT2 / B1+B2+EXT1+EXT2	0.234	600	0.648	1300
OUT-3	A3 / B3+B5+EXT3	0.065	500	0.184	1050

Table 7: Storage Requirements

Preliminary, high-level calculations have been completed to approximate the available storage on site. The exact location, geometry and alignment of these retention ditches and offtake swales will be confirmed during detailed design.

Concept feasibility is based on a trapezoidal swale section (1.5 m flat bottom, 3H:1V side slopes, 0.90 m ponding to the control crest, 0.3–0.5 % longitudinal grade), giving an active cross-sectional area at depth of A = 3.78 m^2 and a top-water width of $\approx 6.9 \text{ m}$. For near-level storage cells (L = V/A), the indicative lengths to satisfy Table 7 are, for OUT-1, 343.92 m for the 100-year volume and 158.73 m for the 5-year volume; for OUT-3, 277.78 m (100-year) and 132.28 m (5-year). For continuous-grade swales without internal checks (wedge storage, L = 2V/A), the required lengths are, for OUT-1, 687.83 m (100-year) and 317.46 m (5-year), and for OUT-3, 555.56 m (100-year) and 264.55 m (5-year). Corridors shown on the Post-Development Drainage Plan accommodate these ranges; final geometry, lining, driveway-culvert interfaces, and 24–48 h drawdown are addressed during detailed design. Overall, it is anticipated that sufficient storage can be provided to restrict post-development peak flow rates to pre-development levels.

5.1 POST-DEVELOPMENT PEAK FLOW RATES SUMMARY

Based on the maximum available storage, the following table summarizes the anticipated peak flow rates to the respective outlet locations under post-development conditions compared to pre-development levels. Full supporting calculations for the described storage conditions have been provided in Appendix C. Table 8 shows



that post-development peak flows at OUT-1 and OUT-3 are reduced below pre-development levels for all design storms and that proposed storage volumes continue to provide sufficient attenuation, and the post-development peak flows remain below predevelopment levels at both controlled outlets. Detailed design calculations for the proposed outlet control structures will be provided during the detailed design stage.

Design 6-Hour SCS Type II 12-Hour SCS Type II 24-Hour SCS Type II Storm Pre. Post. Δ Pre. Post. Δ Pre. Post. Δ (yr) OUT-1 5 0.153 0.124 -0.029 0.204 0.161 -0.043 0.264 0.208 -0.056 100 0.438 0.355 -0.083 0.559 0.463 -0.096 0.690 0.575 -0.115 OUT-3 5 0.043 0.040 -0.003 0.057 0.051 -0.006 0.074 0.065 -0.009 100 0.124 0.112 -0.012 0.158 0.146 -0.012 0.195 0.184 -0.011

Table 8: Pre-Development and Controlled Post-Development Peak Flow Results (m³/s)

6.0 STORMWATER QUALITY CONTROL

The entire subdivision will employ Best Management Practices (BMPs) wherever possible. The intent of implementing stormwater BMPs throughout the entire development is to ensure that water quality and quantity concerns are addressed at all stages of the development. The stormwater BMPs will be implemented at the lot, conveyance, and end of pipe levels. The new paved shoulders along Street A have been included in the impervious area used for the water-quality sizing to ensure the Enhanced (80 % TSS) target is still met.

Lot level BMPs include the directing of roof leaders onto grassed areas, minimizing ground slopes and maintaining as much of the lot as possible in a natural state. Roof leaders will flow to grass areas, which will provide an opportunity for initial filtration of any sediment and provide an opportunity for absorption and ground water recharge. Recent recommendations by Conservation Authorities and the MECP suggest that yard grading as flat as 0.5% be implemented to promote infiltration. The target range for finished ground slopes will be 1% - 5% where possible. This range of slope will still provide an opportunity for the absorption and filtration process.

The conveyance system to be used in the subdivision is natural overland sheet flow and a combination of roadside ditches and rear yard offtake swales. All swales and ditches will be constructed at minimal gradient where possible, thus promoting absorption and infiltration, as well as providing some opportunity for particle filtration. The gradient of the system will be enough to ensure the continuous flow of stormwater, minimizing standing water. To aid in achieving the quality control objective, additional measures such as permanent rock flow check dams within the ditches and swales will be explored during the detailed design stage. Riprap will be placed at erosion-prone areas and all disturbed areas shall be landscaped as soon as possible.

Given the significant length of open ditch and relatively low percentage of hard surfaced area, the proposed works to be constructed are believed to achieve an enhanced level of quality treatment (80% TSS removal). Details will be provided during the detailed design stage.



7.0 LOW IMPACT DEVELOPMENT

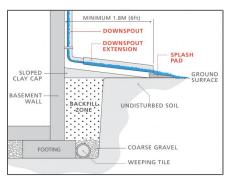
As the practice of SWM has evolved, increasing emphasis has been placed on treating the runoff as close as possible to the source using a sequence of treatment methods called a "treatment train approach". As a result, Low Impact Development (LID) approaches were established to mimic the existing natural hydrologic environment and to allow the rainwater to infiltrate, filter, and evaporate close to the source. Typical LID practices include rainwater harvesting, green roofs, downspout disconnection, soak-away pits, infiltration trenches and chambers, bio-retention, vegetated filter strips, enhanced grass swales, and permeable pavements.

Based on the type of the proposed development and the existing geotechnical information, downspout disconnections are the most suitable LID features for the site, as shown in the figure below. Downspout disconnection involves directing the runoff from roof leader downspouts to a pervious area, which drains away from the building. This gives an opportunity for the runoff to infiltrate before it reaches the typical curb and gutter system on the street. This also prevents the stormwater runoff from flowing across a "connected" impervious surface such as driveways.

Alternative LID features, such as rainfall harvesting, green roofs, or soak-away pits may not be suitable for the site. They require ongoing maintenance which may necessitate special operations and impose significant efforts to sustain their efficacy. Additionally, LID features on roadways, including permeable pavement or bioswales, may also present a challenge if they go unmaintained and can in turn be detrimental to the overall submission.

Figure 1 – Typical Downspout Disconnection (LID Planning and Design Guide, CVC 2011)







8.0 PROVINCIAL POLICY STATEMENT

The revised Provincial Policy Statement, which came into effect on April 30, 2014, (replacing the PPS issued March 1, 2005) and issued under Section 3 of the Planning Act, notes that Planning authorities shall protect, improve, or restore the quality and quantity of water by:

- a) Using the watershed as the ecologically meaningful scale for integrated and long-term planning, which can be a foundation for considering cumulative impacts of development.
- b) Minimizing potential negative impacts, including cross-jurisdictional and cross-watershed impacts.
- c) Identifying water resource systems consisting of ground water features, hydrologic functions, natural heritage features and areas and surface water features including shoreline areas, which are necessary for the ecological and hydrological integrity of the watershed.
- d) Maintaining linkages and related functions among ground water features, hydrologic functions, natural heritage features and areas and surface water features including shoreline areas.
- e) Implementing necessary restrictions on development and site alteration to:
 - a. protect all municipal drinking water supplies and designated vulnerable areas; and
 - b. protect, improve or restore vulnerable surface and ground water, sensitive surface water features and sensitive ground water features and their hydrologic functions.
- f) Planning for efficient and sustainable use of water resources, through practices for water conservation and sustaining water quality.
- g) Ensuring consideration of environmental lake capacity, where applicable; and
- h) Ensuring stormwater management practices minimize stormwater volumes and contaminant loads; and maintain or increase the extent of vegetative and pervious surfaces.

The following table summarizes how many of the above noted sub-sections have been met.

Table 9: Provincial Policy Statement

Sub-section	Applicability
b	The development proposed to limit disturbance as much as possible, maintaining much of the land in its natural state. The percent imperviousness is estimated at 58%, supporting minimized disturbances by preserving natural features.
d, e	The proposed stormwater management plan provides that post-development drainage patterns will be consistent with pre-development patterns such that natural features existing within the site are not negatively impacted by altered drainage flows.
f	The proposed stormwater management plan will provide an enhanced level of quality control. This will ensure that the proposed development does not have any negative impacts from a quality perspective, and through temporary ponding, etc., to achieve the necessary quality objectives. Enhanced grass swales, infiltration trench and rock check dams achieve the MECP enhanced quality control (80% TSS removal).
g	Prompt stabilization and swales conveyance minimize sediment loading and protect receiving water bodies.
h	Stormwater practices including paved shoulders and the trail minimize containment loads and maintain extensive previous surfaces.



9.0 EROSION AND SEDIMENT CONTROL

A site-specific Erosion and Sediment Control Plan will be prepared during the design development stage of the application process, delineating the proposed features to be implemented on-site as temporary and permanent means of managing erosion and sediment control. Following Best Management Practices are recommended to be incorporated into the Erosion and Sediment Control plans.

9.1 TEMPORARY MEASURES

Before construction begins, applicable temporary light silt fence (OPSD 219.110), straw bale and rock flow check dams shall be installed at all natural runoff outlets from the property. It is crucial that these controls be maintained throughout construction and inspection of sediment and erosion control will be facilitated by the Contractor or Contract Administration staff throughout the construction period.

The Contractor, at their discretion or at the instruction of the Township, Conservation Authority or the Contract Administrator shall increase the quantity of sediment and erosion controls on-site to ensure that the site is operating as intended and no additional sediment finds its way offsite or into the adjacent wetlands. Measures shall be inspected weekly and after all rainfall events. Care shall be taken to properly remove sediment from the fences and check dams as required.

Work through winter months shall be closely monitored for erosion along sloped areas. Should erosion be noted, the Contractor shall be alerted and shall take all necessary steps to rectify the situation. Should the Contractor's efforts fail at remediating the eroded areas, the Contractor shall contact the Conservation Authority to review the site conditions and determine the appropriate course of action.

9.2 PERMANENT MEASURES

Rip-rap shall be placed at all locations that have the potential for concentrated flow, particularly at the outflow of all proposed roadside ditches and offtake swales. In addition, rip-rap and geotextile shall be placed at the inlet and outlet of the road crossing culverts. It is crucial that the Contractor ensure that the geotextile is keyed in properly to ensure runoff does not undermine the rip-rapped area. Additional rip-rap is to be placed at erosion prone locations as identified by the Contractor / Contract Administrator / Township or RVCA.

It is expected that the Contractor will promptly ensure that all disturbed areas receive topsoil and seed and that grass be established as soon as possible. Any areas of excess fill shall be removed or levelled as soon as possible and must be located a sufficient distance from the wetlands to ensure that no sediment is washed out into the wetlands. As the vegetation growth along the proposed roadside, offtake swales and within the dry retention areas provides a key component to the control of sediment for the site, it must be properly maintained once established. As the lots are sold it will be up to the landowners to maintain that section of vegetation and ensure that they are not overgrown or impeded by foreign objects.



10.0 SUMMARY

- Runoff will be conveyed via overland sheet flow towards the proposed roadside ditches and offtake swales, which ultimately discharging to one of three local wetlands (OUT-1 on-site, OUT-2 east of the site, and OUT-3 northeast of the site).
- Preliminary calculations demonstrate that sufficient storage can be provided to restrict postdevelopment peak flow rates to pre-development levels. Roadside ditches and offtake swales are proposed to convey runoff, while rock flow check dams and outlet control structures will be employed to limit post-development peak flow rates to pre-development levels.
- Best Management Practices will be implemented throughout (lot level, conveyance and end-of-pipe) to achieve the Enhanced quality-control target (80 % TSS removal). All new impervious including the paved shoulders has been incorporated in the sizing. Further details will be confirmed during detailed design.

11.0 RECOMMENDATIONS

Based on the information presented in this report, we recommend that Beckwith Township and the Rideau Valley Conservation Authority grant approval to this Conceptual Stormwater Management Report, in support of the Santaguida Subdivision and its Post-Development Drainage Plan. The SWM strategy demonstrates that post-development peak flows at OUT-1 and OUT-3 will be controlled at or below pre-development levels, while OUT-2 requires no additional control. All impervious areas have been accurately accounted for in the hydrologic and water-quality designs, and the proposed measures meet the MECP Enhanced treatment objective. No further conceptual revisions are necessary.



This report is respectfully submitted by,

Egis Canada Ltd.

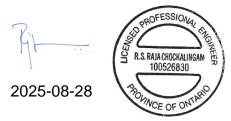
Report Prepared By:

Saeid Zahedi, Water Resources Designer T: 613-282-6311 Saeid.ZAHEDI@egis-group.com Monika Orwin, Engineering Intern T: 365-527-2732 Monika.ORWIN@egis-group.com

Report Reviewed By:

Raja Chockalingam, P.Eng. Design Lead, Water Resources T: 249-494-2971

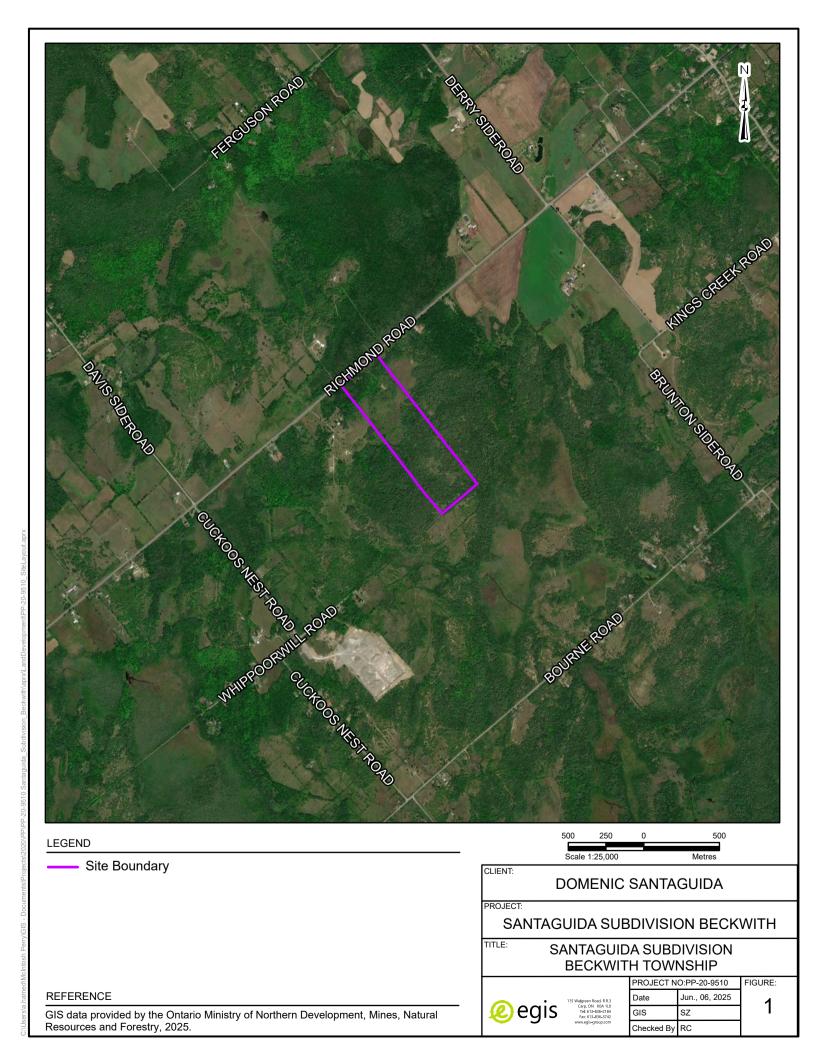
Raja.CHOCKALINGAM@egis-group.com





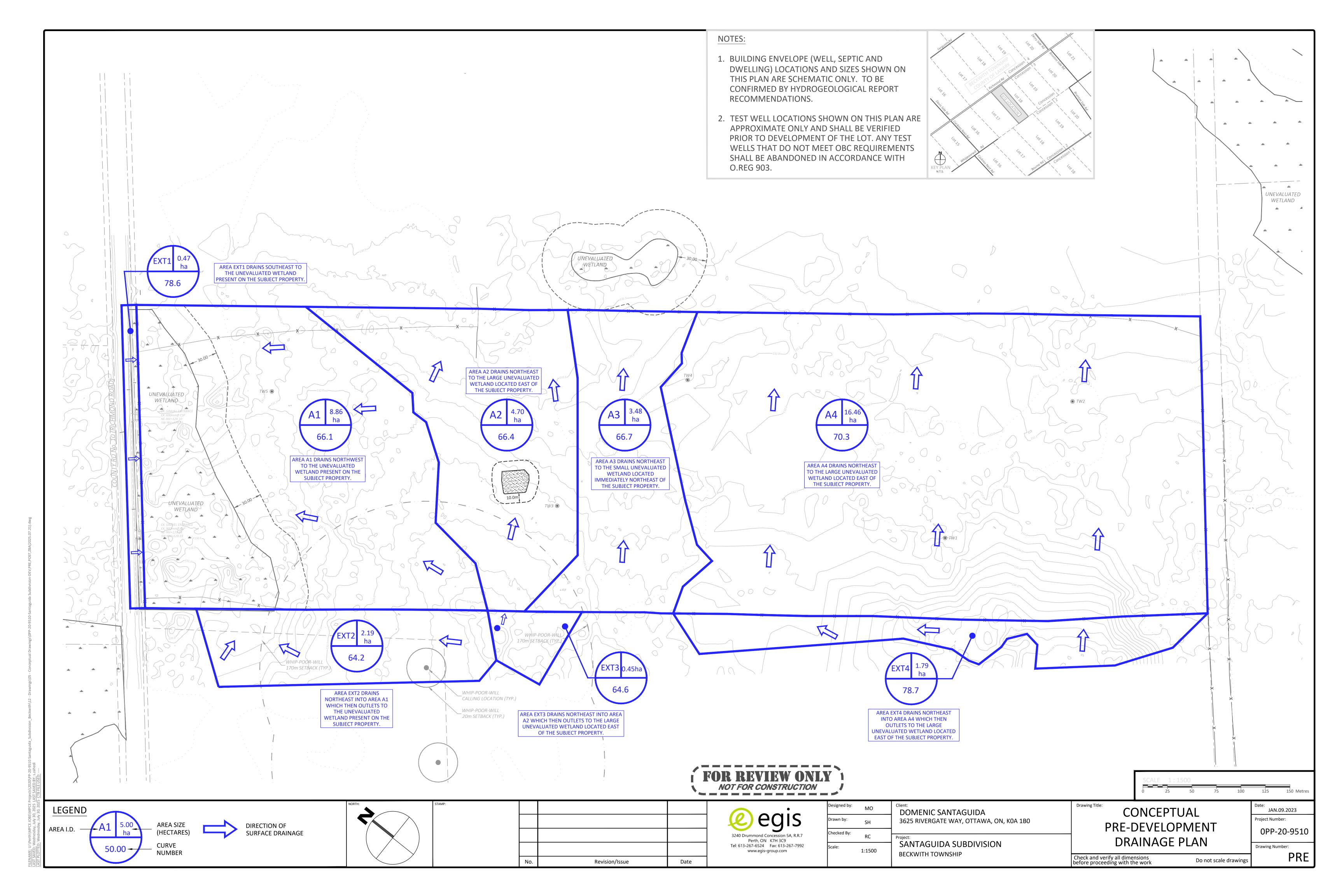


APPENDIX A – LOCATION PLAN





APPENDIX B – PRE-DEVELOPMENT DRAINAGE PLAN, MODEL SCHEMATIC & CALCULATIONS



	/		/		Irologic Parameters f	or A1				
Project Name:			Santaguida Subdivisio	n				Designed By:	SZ	
Project Number:			20-9510					Checked By:	RC	
atchment ID:			A1					Date:	2025-06-30	
		Drainage Area	8.861	ha				Rainfall Data		
		Precent Impervious	0.0	%				Guage Station	: Smith Falls IDF Looku	ıp
							100 Yea	ar 12 HR Rainfall Depth:		mm
				Slope, Lar	nduse and Soil Type Ide	entification				
		Agriculture	0	0	ha			Pervious Areas	Impervious Areas	
		Range		0	ha		Length	318.70	0	m
		Grass		0.008	ha		US Elev.	134.80	0	m
		Woods		0.239	ha		DS Elev.	130.00	0	m
		Wetland		2.08	ha		Slope	1.51	•	%
		Gravel		0	ha		Terrain	Flat		70
				0	ha		ICITAIII	Hat	*	
		Impervious	U	U	IId					
		Sum	6.534	2.327	ho		NI-40.			
					ha		Note:			
		Soil Name	-	Muck			Flat:0-2% slopes			
		Soil Type		D			Rolling:2-6% slopes			
		Composite C	0.11	0.06			Hilly:>6% slopes			
				Composite Ru	unoff and Curve Numb	er Calculations				
					Land Use				Compo	osite Values
Parameter	Hydrologic Soil Group								Incl.	Not Incl.
		Agriculture	Range	Grass	Woods	Wetland	Gravel	Imperv.	Imperv.	Imperv.
		rigitation	The state of the s	A		A TOUR	Joint	impu :	Nashyd	Standhyd
	FlatB	0.43	0.18	0.11	0.08	0.05	0.43	0.90	0.11	0.11
!	FlatD	0.43	0.18	0.20	0.08	0.05	0.43	0.90	0.06	0.11
Runoff Coefficient, C	UIBIT	0.73	U.32	0.20	U. 12	0.05	0.50	0.90	U.U6	0.06
		1								
		70.00	(0.00	(0.00	(0.00	50.00	05.00	20.00	40.00	(0.00
	В	78.00	69.00	69.00	60.00	50.00	85.00	98.00	62.09	62.09
SCS Curve No., CN	D	89.00	84.00	84.00	79.00	77.00	89.00	98.00	77.23	77.23
ļ		'								
	 	+	 	+		+	+	+	+	+
Initial Abstraction, mm		5	8	5	8	10	2.5	1.5	8.5	8.5
				Time	e of Concentration Calcul	lations				
Total Flow Length	US Elev.	DS Elev.	Avg. Slope	Terrain	Composite C	Airport Formula	Bransby Formula	Minimum	Tc (min)	Tp (hr)
318.7	134.80	130	1.51	Flat	0.10	50.80	13.45	10	50.8	0.57
				Hvd	rologic Parameters Sun	mmany				
				Catchment		.861	ha			
				Impervious Percent		0.0	%			
				Slope		1.51	%			
							%			
				Runoff Co-efficient		0.10				
				SCS Curve No:		66.07				
				Modified CN*		66				
				Initial Abstraction	8.5	8.5	mm			
			Tir	me of Concentration, Tc	. 5	50.8	min			
				Time to Peak, Tp	C	0.57	hr			
Notes:	-	-	-		-	-	-	-		
	in obtained from Desig	ın Chart H2-6A, M.T.O. D	Trainane Manual, 1980	1						
		esign Chart 1.07, M.T.O.								
			Didillaye ivianayemen	l MdHuai, 1777, anu						
	Maryland State Highway									
SCS Curve No. optain	ned from M.T.O. Design	n Chart 1.09, M.T.O. Drai	inage Management ivi	anual, 1997, and						

Table 2-2a, TR-55, page 2-5.

 $\label{eq:concentration} 4. Use Airport Equation to calculate time of concentration for C < 0.40, and Bransby-Williams for C > 0.40. \\$



	Rational Method - A1												
Project Name:	Santaguida Subdivision			Designed By:	SZ								
Project Number:	20-9510			Checked By:	RC								
Catchment ID:	A1				Date: 2025-06-30								
	Drainage Area	8.861	ha		Rainfall Data								
	Precent Impervious	0.0	%		Guage Station: Smith Falls IDF Lookup								
	Composite Runoff Co-efficent	0.10			100 Year 12 HR Rainfall Depth: 94.6 mm								

	IDF Parameters												
Co-efficient	25 mm	2 -Year	5 Year	10 Year	25 Year	50 Year	100 Year						
A	405	20.2	26.8	31.2	36.7	40.8	44.8						
В	3	0	0	0	0	0	0						
C	0.76	0.699	0.699	0.699	0.699	0.699	0.699						

	Rational Method												
Design Storm	Area (ha)	Composite C	Tc (min)	l (mm/hr)	Composite C Multiplier (%)	Peakflow (m3/s)	Peakflow (L/s)						
25 mm Storm	8.861	0.10	50.8	19.6	1	0.047	47						
2- Year	8.861	0.10	50.8	22.7	1	0.054	54						
5-Year	8.861	0.10	50.8	30.1	1	0.072	72						
10-Year	8.861	0.10	50.8	35.0	1	0.084	84						
25-Year	8.861	0.11	50.8	41.2	10	0.108	108						
50-Year	8.861	0.12	50.8	45.8	20	0.131	131						
100-Year	8.861	0.13	50.8	50.3	25	0.156	156						

- Notes:

 1. Composite runoff co-efficents are calculated based on the weighted landuse
- 2. Runoff co-effcients for 25, 50 and 100 year storms have been increased by 10%, 20% and 25% respectively.



				Hydi	rologic Parameters f	or A2				
Project Name:			Santaguida Subdivisio					Designed By:	SZ	
Project Number:			20-9510					Checked By:	RC	
Catchment ID:			A2						2025-06-30	
		Drainage Area		ha				Rainfall Data		
		Precent Impervious	0.0	%			400 V	-	Smith Falls IDF Lookup	
				Slope Lan	nduse and Soil Type Ide	atification.	100 Yea	r 12 HR Rainfall Depth:	94.6	mm
		Agriculture	0	ha	iduse and son rype ide	entineation — —	1	Pervious Areas	Impervious Areas	
		Range		ha			Length	305.50	0	m
I		Grass		ha			US Elev.	135.00	0	m
		Woods		ha			DS Elev.	131.00	0	m
		Wetland		ha			Slope	1.31		%
		Gravel		ha			Terrain	Flat		
İ		Impervious	0	ha					•	
		Sum	4.703	ha			Note:			
İ		Soil Name		IId			Flat:0-2% slopes			
		Soil Type					Rolling:2-6% slopes			
Ì		Composite C					Hilly:>6% slopes			
				Composite Ru	unoff and Curve Numb	er Calculations	<u> </u>			
					Land Use					ite Values
Parameter	Hydrologic Soil Group				Woods	Markey d	01		Incl.	Not Incl. Imperv.
		Agriculture	Range	Grass	Woods	Wetland	Gravel	Imperv.	Imperv. Nashyd	Standhyd
	FlatB	0.43	0.18	0.11	0.08	0.05	0.43	0.90	0.15	0.15
	riato	0.10	0.10	0.11	0.00	0.00	0.10	5.75	0.10	0.10
Runoff Coefficient, C										
	В	78.00	69.00	69.00	60.00	50.00	85.00	98.00	66.42	66.42
SCS Curve No., CN										
				-						
Initial Abstraction, mm		5	8	5	8	10	2.5	1.5	8.0	8.0
					of Concentration Calcula					
Total Flow Length	US Elev.	DS Elev.	Avg. Slope	Terrain	Composite C	Airport Formula	Bransby Formula	Minimum	Tc (min)	Tp (hr)
305.5	135.00	131	1.31	Flat	0.15	49.52	14.13	10	49.5	0.55
					ologic Parameters Sun					
				Catchment		703	ha			
				Impervious Percent		0.0	%			
				Slope Runoff Co-efficient		.31 .15	%			
				SCS Curve No:	66.42	66.42				
				Modified CN*	65	65				
				Initial Abstraction		8.0	mm			
			Tir	me of Concentration, Tc	4	9.5	min			
				Time to Peak, Tp	0	.55	hr			
Notes:										
	_	n Chart H2-6A, M.T.O. D	-							
		esign Chart 1.07, M.T.O.	Drainage Managemen	t Manual, 1997, and						
Tables 4-5a to 4-5d, M			:	I 1007I						
Table 2-2a, TR-55, pag		Chart 1.09, M.T.O. Dra	mage Management M	anuai, 1997, anu						
10010 2-20, 1K-33, pay	C 2-3.									

4.Use Airport Equation to calculate time of concentration for C < 0.40, and Bransby-Williams for C > 0.40.



			Rational Method - A2	2	
Project Name:	Santaguida Subdivision			Designed By:	SZ
Project Number:	20-9510			Checked By:	RC
Catchment ID:	A2				Date: 2025-06-30
	Drainage Area	4.703	ha		Rainfall Data
	Precent Impervious	0.0	%		Guage Station: Smith Falls IDF Lookup
	Composite Runoff Co-efficent	0.15			100 Year 12 HR Rainfall Depth: 94.6 mm

	IDF Parameters											
Co-efficient	25 mm	2 -Year	5 Year	10 Year	25 Year	50 Year	100 Year					
Α	405	20.2	26.8	31.2	36.7	40.8	44.8					
В	3	0	0	0	0	0	0					
С	0.76	0.699	0.699	0.699	0.699	0.699	0.699					

			Rationa	l Method			
Design Storm	Area (ha)	Composite C	Tc (min)	l (mm/hr)	Composite C Multiplier (%)	Peakflow (m3/s)	Peakflow (L/s)
25 mm Storm	4.703	0.15	49.5	20.0	1	0.038	38
2- Year	4.703	0.15	49.5	23.1	1	0.044	44
5-Year	4.703	0.15	49.5	30.7	1	0.058	58
10-Year	4.703	0.15	49.5	35.7	1	0.068	68
25-Year	4.703	0.17	49.5	42.0	10	0.091	91
50-Year	4.703	0.18	49.5	46.7	20	0.107	107
100-Year	4.703	0.19	49.5	51.2	25	0.124	124

- Notes:

 1. Composite runoff co-efficents are calculated based on the weighted landuse
- 2. Runoff co-effcients for 25, 50 and 100 year storms have been increased by 10%, 20% and 25% respectively.



					rologic Parameters f	or A3				
Project Name:			Santaguida Subdivisi	on				Designed By:	SZ	
roject Number:			20-9510					Checked By:	RC	
atchment ID:			A3					Date:	2025-06-30	
		Drainage Area	3.481	ha						
		Precent Impervious	0.0	%				Guage Station:	Smith Falls IDF Looku	р
							100 Yea	ar 12 HR Rainfall Depth:	94.6	mm
				Slope, Lar	nduse and Soil Type Id	entification				
		Agriculture	0	0	ha			Pervious Areas	Impervious Areas	
		Range	1.161	0	ha		Length	292.30	0	m
		Grass	0	0	ha		US Elev.	133.90	0	m
		Woods		0.672	ha		DS Elev.	131.00	0	m
		Wetland		0	ha		Slope	0.99	-	%
		Gravel		0	ha		Terrain	Flat		70
							remain	Hat		
		Impervious	0	0	ha					
		Sum	2.809	0.672	ha		Note:			
		Soil Name		Muck	na		Flat:0-2% slopes			
			-							
		Soil Type		D			Rolling:2-6% slopes			
		Composite C	0.12	0.12			Hilly:>6% slopes			
				Composite Ru	unoff and Curve Numb	er Calculations				
				- Composito ix	Land Use	- Calculations			0	. W. M. L
					Land Use					site Values
Parameter	Hydrologic Soil Group								Incl.	Not Incl.
		Agriculture	Range	Grass	Woods	Wetland	Gravel	Imperv.	Imperv.	Imperv.
									Nashyd	Standhyd
	FlatB	0.43	0.18	0.11	0.08	0.05	0.43	0.90	0.12	0.12
	FlatD	0.73	0.32	0.20	0.12	0.05	0.50	0.90	0.12	0.12
Runoff Coefficient, C									·	
	В	78.00	69.00	69.00	60.00	50.00	85.00	98.00	63.72	63.72
	D	89.00	84.00	84.00	79.00	77.00	89.00	98.00	79.00	79.00
SCS Curve No., CN	D	07.00	04.00	04.00	77.00	77.00	07.00	70.00	77.00	77.00
nitial Abstraction, mm		5	8	5	8	10	2.5	1.5	8.0	8.0
Total Flow Length	US Elev.	DS Elev.	Avg. Slope	Time Terrain	of Concentration Calcul Composite C	Airport Formula	Bransby Formula	Minimum	Tc (min)	Tp (hr)
292.3	133.90	131	0.99	Flat	0.12	54.80	14.74	10	54.8	0.61
272.3	133.70	131	0.77	Tidt	0.12	34.00	14.74	10	34.0	0.01
					rologic Parameters Sur					
				Catchment		.481	ha			
				Impervious Percent		0.0	%			
				Slope).99	%			
				Runoff Co-efficient).12				
				SCS Curve No:	66.67	66.67				
				Modified CN*	65	65				
				Initial Abstraction	8.0	8.0	mm			
			Ti	me of Concentration, To		i4.8	min			
				Time to Peak, Tp		0.61	hr			
lotes:				то годи, гр		-	***			
	b t - l d f D l -	- Ch+ IID (A MT O F	M 1000							
		n Chart H2-6A, M.T.O. D								
		esign Chart 1.07, M.T.O.	Drainage Managemer	it Manual, 1997, and						
	aryland State Highway									
CS Curve No. obtain	ed from M.T.O. Design	Chart 1.09, M.T.O. Dra	inage Management N	anual, 1997, and						

Table 2-2a, TR-55, page 2-5.

 $\label{eq:concentration} 4. Use Airport Equation to calculate time of concentration for C < 0.40, and Bransby-Williams for C > 0.40. \\$



			Rational Method - A3	3	
Project Name:	Santaguida Subdivision			Designed By:	SZ
Project Number:	20-9510			Checked By:	RC
Catchment ID:	A3				Date: 2025-06-30
	Drainage Area	3.481	ha		Rainfall Data
	Precent Impervious	0.0	%		Guage Station: Smith Falls IDF Lookup
	Composite Runoff Co-efficent	0.12			100 Year 12 HR Rainfall Depth: 94.6 mm

	IDF Parameters											
Co-efficient	25 mm	2 -Year	5 Year	10 Year	25 Year	50 Year	100 Year					
Α	405	20.2	26.8	31.2	36.7	40.8	44.8					
В	3	0	0	0	0	0	0					
С	0.76	0.699	0.699	0.699	0.699	0.699	0.699					

			Rationa	l Method			
Design Storm	Area (ha)	Composite C	Tc (min)	I (mm/hr)	Composite C Multiplier (%)	Peakflow (m3/s)	Peakflow (L/s)
25 mm Storm	3.481	0.12	54.8	18.6	1	0.021	21
2- Year	3.481	0.12	54.8	21.5	1	0.024	24
5-Year	3.481	0.12	54.8	28.6	1	0.032	32
10-Year	3.481	0.12	54.8	33.2	1	0.037	37
25-Year	3.481	0.13	54.8	39.1	10	0.048	48
50-Year	3.481	0.14	54.8	43.5	20	0.057	57
100-Year	3.481	0.15	54.8	47.7	25	0.067	67

- Notes:

 1. Composite runoff co-efficents are calculated based on the weighted landuse
- 2. Runoff co-effcients for 25, 50 and 100 year storms have been increased by 10%, 20% and 25% respectively.



Second					Hyd	rologic Parameters f	or A4				
Controlled Con	Project Name:			Santaguida Subdivisio		·			Designed By:	SZ	
Process Proc											
Precent properties 1,655 No	-								-		
Process Pro	atomiciti ib.		Drainano Aroa		ha					2023-00-30	
Suppose			-							Smith Falls IDF Look	in.
Separation Sep			rrecent impervious	0.0	70			100 //			
Agriculum 0					CI .		110 11	100 Yea	ır 12 HK Kainiaii Deptin:	94.0	mm
State Part							entification	1			
Carrie C			-								
Westland Carrier Westland Westland Carrier Westland Carrie			_					-			
Western O			Grass	0	0	ha			134.80	0	m
Composition Figure Figur			Woods	7.219	8.15	ha		DS Elev.	131.00	0	m
Marganization Marganizatio			Wetland	0	0	ha		Slope	1.29		%
Marganization Marganizatio			Gravel	0	0	ha		Terrain	Flat		
Sulf Name			Impervious	. 0	0	ha				*	
Soli Name Soli Name Composite Soli Name Soli Name Composite Soli Name Soli			, , , , ,								
Soli Name Soli Name Composite Soli Name Soli Name Composite Soli Name Soli			Sum	7 968	8 487	ha		Note:			
Solityse B						110					
Parameter March				_							
Parameter Hydrobogic Soil Group Hydrobogic Soil											
Parameter Hydrologic Soil Group tained from Dosign Chart I 12-64, M.T.O. Drainage Manual, 1963. Hydrologic Soil Group obtained from Dosign Chart I 12-64, M.T.O. Drainage Manual, 1963. Hydrologic Soil Group obtained from M.T.O. Design Chart I 12-64, M.T.O. Drainage Manual, 1963. Hydrologic Soil Group obtained from M.T.O. Design Chart I 12-64, M.T.O. Drainage Manual, 1963. Hydrologic Soil Group obtained from M.T.O. Design Chart I 12-64, M.T.O. Drainage Manual, 1963. Hydrologic Soil Group obtained from M.T.O. Design Chart I 12-64, M.T.O. Drainage Manual, 1963. Hydrologic Soil Group obtained from M.T.O. Design Chart I 12-64, M.T.O. Drainage Manual, 1963. Hydrologic Soil Group obtained from M.T.O. Design Chart I 107, M.T.O. Drainage Manual, 1963. Hydrologic Soil Group obtained from M.T.O. Design Chart I 107, M.T.O. Drainage Manual, 1963. Hydrologic Manual Hydrologic Soil Group obtained from M.T.O. Design Chart I 107, M.T.O. Drainage Manual, 1963. Hydrologic Manual Hydrologic Soil Group obtained from M.T.O. Design Chart I 107, M.T.O. Drainage Manual, 1963. Hydrologic Manual Hydrologic Soil Group obtained from M.T.O. Design Chart I 107, M.T.O. Drainage Manual, 1963. Hydrologic Manual Hydrologic Soil Group obtained from M.T.O. Design Chart I 107, M.T.O. Drainage Manual, 1963. Hydrologic Manual Hydrologic Soil Group obtained from M.T.O. Design Chart I 107, M.T.O. Drainage Manual, 1963. Hydrologic Manual Hydrologic Soil Group Obtained from M.T.O. Design Chart I 107, M.T.O. Drainage Manual, 1963. Hydrologic Manual Hydrologic Manual Hydrologic Manual Hydrologic Manual Hydrologic Manual Hydrologic Manual Hydrologic Manual Hydrologic Manual Hydrologic Manual H			Composite C	0.09	0.13			Hilly:>6% slopes			
Parameter Hydrologic Soil Group tained from Dosign Chart I 12-64, M.T.O. Drainage Manual, 1963. Hydrologic Soil Group obtained from Dosign Chart I 12-64, M.T.O. Drainage Manual, 1963. Hydrologic Soil Group obtained from M.T.O. Design Chart I 12-64, M.T.O. Drainage Manual, 1963. Hydrologic Soil Group obtained from M.T.O. Design Chart I 12-64, M.T.O. Drainage Manual, 1963. Hydrologic Soil Group obtained from M.T.O. Design Chart I 12-64, M.T.O. Drainage Manual, 1963. Hydrologic Soil Group obtained from M.T.O. Design Chart I 12-64, M.T.O. Drainage Manual, 1963. Hydrologic Soil Group obtained from M.T.O. Design Chart I 12-64, M.T.O. Drainage Manual, 1963. Hydrologic Soil Group obtained from M.T.O. Design Chart I 107, M.T.O. Drainage Manual, 1963. Hydrologic Soil Group obtained from M.T.O. Design Chart I 107, M.T.O. Drainage Manual, 1963. Hydrologic Manual Hydrologic Soil Group obtained from M.T.O. Design Chart I 107, M.T.O. Drainage Manual, 1963. Hydrologic Manual Hydrologic Soil Group obtained from M.T.O. Design Chart I 107, M.T.O. Drainage Manual, 1963. Hydrologic Manual Hydrologic Soil Group obtained from M.T.O. Design Chart I 107, M.T.O. Drainage Manual, 1963. Hydrologic Manual Hydrologic Soil Group obtained from M.T.O. Design Chart I 107, M.T.O. Drainage Manual, 1963. Hydrologic Manual Hydrologic Soil Group obtained from M.T.O. Design Chart I 107, M.T.O. Drainage Manual, 1963. Hydrologic Manual Hydrologic Soil Group Obtained from M.T.O. Design Chart I 107, M.T.O. Drainage Manual, 1963. Hydrologic Manual Hydrologic Manual Hydrologic Manual Hydrologic Manual Hydrologic Manual Hydrologic Manual Hydrologic Manual Hydrologic Manual Hydrologic Manual H											
Parameter Hydrologic Soli Group Agriculture Range Cress Woods Welfund Gravel Imperiv. Imperiv. Imperiv. Imperiv. Imperv.					Composite Ru	unoff and Curve Numb	er Calculations				
Agriculture Range Crass Woods Weltard Gravel Imperiv Imperv Imperiv Imperv Imperiv Imperviv Imperiv						Land Use				Compo	osite Values
Part Part	Parameter	Hydrologic Soil Group								Incl.	Not Incl.
Ramoff Coefficient, C FlatD 0.73 0.18 0.11 0.08 0.05 0.43 0.90 0.09			Agriculture	Range	Grass	Woods	Wetland	Gravel	Impery.	Impery.	
Runoff Coefficient, C Filat B 0.43 0.48 0.11 0.08 0.05 0.43 0.90 0.09 0.09 Runoff Coefficient, C Filat B 0.73 0.32 0.20 0.12 0.05 0.50 0.50 0.90 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13			,	. 3							
Runoff Coefficient, C Field 0.73 0.32 0.32 0.20 0.12 0.05 0.50 0.50 0.90 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.1		FlatR	0.43	0.18	0.11	0.08	0.05	0.43	0.90		
Runoff Coefficient											
SCS Curve No., CN D 89.00 84.00 84.00 79.00 77.00 89.00 98.00 79.2	Runoff Coefficient, C	FIALD	0.73	0.32	0.20	0.12	0.05	0.50	0.90	0.13	0.13
SCS Curve No., CN D 89.00 84.00 84.00 79.00 77.00 89.00 98.00 79.2											
SCS Curve No., CN D 89.00 84.00 84.00 79.00 77.00 89.00 98.00 79.2											
A											
Section Sect	SCS Curve No CN	D	89.00	84.00	84.00	79.00	77.00	89.00	98.00	79.20	79.20
S 8 5 8 10 2.5 1.5 8.0											
S 8 5 8 10 2.5 1.5 8.0											
S 8 5 8 10 2.5 1.5 8.0	Initial Abstraction mm										
Total Flow Length US Elev. DS Elev. Avg. Slope Terrain Composite C Airport Formula Bransby Formula Minimum Tc (min) Tp (hr)	initial Abstraction, min		5	8	5	8	10	2.5	1.5	8.0	8.0
Total Flow Length US Elev. DS Elev. Avg. Slope Terrain Composite C Airport Formula Bransby Formula Minimum Tc (min) Tp (hr)											
Hydrologic Parameters Summary Su											
Hydrologic Parameters Summary											
Catchment 16.455 ha Impervious Percent 0.0 % Slope 1.29 % Runoff Co-efficient 0.11 70.31 SCS Curve No: 70.31 70.31 Modified CN* 71 71 Initial Abstraction 8.0 8.0 mm Time of Concentration, Tc 51.0 min Time to Peak, Tp 0.57 hr otes: Hydrologic Soil Group obtained from Design Chart H2-6A, M.T.O. Drainage Manual, 1980. Runoff coefficient obtained from M.T.O. Design Chart 1.07, M.T.O. Drainage Manual, 1997, and Signature 1.00 S	294.9	134.80	131	1.29	Flat	0.11	50.96	12.07	10	51.0	0.57
Catchment 16.455 ha Impervious Percent 0.0 % Slope 1.29 % Runoff Co-efficient 0.11 70.31 SCS Curve No: 70.31 70.31 Modified CN* 71 71 Initial Abstraction 8.0 8.0 mm Time of Concentration, Tc 51.0 min Time to Peak, Tp 0.57 hr otes: Hydrologic Soil Group obtained from Design Chart H2-6A, M.T.O. Drainage Manual, 1980. Runoff coefficient obtained from M.T.O. Design Chart 1.07, M.T.O. Drainage Manual, 1997, and Signature 1.00 S											
Catchment 16.455 ha Impervious Percent 0.0 % Slope 1.29 % Runoff Co-efficient 0.11 70.31 SCS Curve No: 70.31 70.31 Modified CN* 71 71 Initial Abstraction 8.0 8.0 mm Time of Concentration, Tc 51.0 min Time to Peak, Tp 0.57 hr otes: Hydrologic Soil Group obtained from Design Chart H2-6A, M.T.O. Drainage Manual, 1980. Runoff coefficient obtained from M.T.O. Design Chart 1.07, M.T.O. Drainage Manual, 1997, and Signature 1.00 S											
Impervious Percent 0.0											
Slope 1.29 %					Catchment	16	.455	ha			
Runoff Co-efficient SCS Curve No: Nodified CN* Initial Abstraction Time of Concentration, Tc Time to Peak, Tp Otes: Runoff coefficient obtained from Design Chart Hz-6A, M.T.O. Drainage Manual, 1980. Runoff coefficient obtained from M.T.O. Design Chart 1.07, M.T.O. Drainage Manual, 1997, and					Impervious Percent	(0.0	%			
SCS Curve No: 70.31 70.31 Modified CN* 71 71 Initial Abstraction Time of Concentration, Tc 51.0 min Time to Peak, Tp 0.57 hr otes: Hydrologic Soil Group obtained from Design Chart H2-6A, M.T.O. Drainage Manual, 1980. Runoff coefficient obtained from M.T.O. Design Chart 1.07, M.T.O. Drainage Manual, 1997, and					Slope	1	.29	%			
SCS Curve No: 70.31 70.31 Modified CN* 71 71 Initial Abstraction Time of Concentration, Tc 51.0 min Time to Peak, Tp 0.57 hr otes: Hydrologic Soil Group obtained from Design Chart H2-6A, M.T.O. Drainage Manual, 1980. Runoff coefficient obtained from M.T.O. Design Chart 1.07, M.T.O. Drainage Manual, 1997, and					Runoff Co-efficient	0	.11				
Modified CN* 71 71 Initial Abstraction 8.0 8.0 mm Time of Concentration, Tc 51.0 min Time to Peak, Tp 0.57 hr Dies: Hydrologic Soil Group obtained from Design Chart H2-6A, M.T.O. Drainage Manual, 1980. Runoff coefficient obtained from M.T.O. Design Chart 1.07, M.T.O. Drainage Manual, 1997, and											
Initial Abstraction Time of Concentration, Tc Time to Peak, Tp 0.57 hr											
Time of Concentration, Tc 51.0 min Time to Peak, Tp 0.57 hr bles: Hydrologic Soil Group obtained from Design Chart H2-6A, M.T.O. Drainage Manual, 1980. Runoff coefficient obtained from M.T.O. Design Chart 1.07, M.T.O. Drainage Management Manual, 1997, and								mm			
Time to Peak, Tp 0.57 hr totes: Hydrologic Soil Group obtained from Design Chart H2-6A, M.T.O. Drainage Manual, 1980. Runoff coefficient obtained from M.T.O. Design Chart 1.07, M.T.O. Drainage Management Manual, 1997, and				-							
otes: Hydrologic Soll Group obtained from Design Chart H2-6A, M.T.O. Drainage Manual, 1980. Runoff coefficient obtained from M.T.O. Design Chart 1.07, M.T.O. Drainage Management Manual, 1997, and				T II							
Hydrologic Soll Group obtained from Design Chart H2-6A, M.T.O. Drainage Manual, 1980. Runoff coefficient obtained from M.T.O. Design Chart 1.07, M.T.O. Drainage Management Manual, 1997, and					Time to Peak, Tp	0	.57	hr			
Runoff coefficient obtained from M.T.O. Design Chart 1.07, M.T.O. Drainage Management Manual, 1997, and	Notes:										
	.Hydrologic Soil Grou	p obtained from Desig	n Chart H2-6A, M.T.O. [Orainage Manual, 1980							
bles 4-5a to 4-5d, Maryland State Highway Administration.	Runoff coefficient of	tained from M.T.O. De	esign Chart 1.07, M.T.O.	Drainage Managemen	t Manual, 1997, and						
	ables 4-5a to 4-5d. M	arvland State Highway	Administration.								
S Curve No. obtained from M.T.O. Design Chart 1.09, M.T.O. Drainage Management Manual, 1997, and											

Table 2-2a, TR-55, page 2-5.

 $\label{eq:concentration} 4. Use Airport Equation to calculate time of concentration for C < 0.40, and Bransby-Williams for C > 0.40. \\$



			Rational Method - A4		
Project Name:	Santaguida Subdivision			Designed By:	SZ
Project Number:	20-9510			Checked By:	RC
Catchment ID:	A4				Date: 2025-06-30
	Drainage Area	16.455	ha		Rainfall Data
	Precent Impervious	0.0	%		Guage Station: Smith Falls IDF Lookup
	Composite Runoff Co-efficent	0.11			100 Year 12 HR Rainfall Depth: 94.6 mm

	IDF Parameters											
Co-efficient	25 mm	2 -Year	5 Year	10 Year	25 Year	50 Year	100 Year					
A	405	20.2	26.8	31.2	36.7	40.8	44.8					
В	3	0	0	0	0	0	0					
С	0.76	0.699	0.699	0.699	0.699	0.699	0.699					

			Rationa	l Method			
Design Storm	Area (ha)	Composite C	Tc (min)	l (mm/hr)	Composite C Multiplier (%)	Peakflow (m3/s)	Peakflow (L/s)
25 mm Storm	16.455	0.11	51.0	19.5	1	0.095	95
2- Year	16.455	0.11	51.0	22.6	1	0.110	110
5-Year	16.455	0.11	51.0	30.0	1	0.147	147
10-Year	16.455	0.11	51.0	35.0	1	0.171	171
25-Year	16.455	0.12	51.0	41.1	10	0.219	219
50-Year	16.455	0.13	51.0	45.7	20	0.264	264
100-Year	16.455	0.14	51.0	50.2	25	0.312	312

- Notes:

 1. Composite runoff co-efficents are calculated based on the weighted landuse
- 2. Runoff co-effcients for 25, 50 and 100 year storms have been increased by 10%, 20% and 25% respectively.



			Hydro	ologic Parameters fo	r EXT1				
			n						
								202530	
	Precent Impervious	33.1	%						
			Slana Lan	dues and Call Time Id	antification	100 Ye	ar 12 HK Kaintail Deptr	1: 94.6	mm
	Agriculturo	0		iduse and soil Type id	енинсации		Donaious Arons	Imponious Aross	
						Length			m
									m
						DS Elev.	129.30	130.8	m
	Wetland	0.267	ha			Slope	17.24	4.00	%
	Gravel	0.035	ha			Terrain	Hilly	Rolling	
	Impervious	0.155	ha						
			ha						
	Composite C	0.39				Hilly:>6% slopes			
			Composite Ru	inoff and Curve Numb	er Calculations				
			composite ita		er odicalations				
				Land Use				Comp	osite Values
Hydrologic Soil Group								Incl.	Not Incl.
	Agriculture	Range	Grass	Woods	Wetland	Gravel	Imperv.	Imperv.	Imperv.
								-	Standhyd
HillyD	0.78	0.35	0.28	0.21	0.05	0.70	0.90	0.39	0.13
D	90.00	94.00	94.00	70.00	77.00	90.00	00.00	9E 02	78.59
b	07.00	04.00	04.00	77.00	77.00	07.00	70.00	03.02	70.37
	5	8	5	8	10	2.5	1.5	6.5	9.0
									Tp (hr) 0.11
131.00	129.3	12.41	Hilly	0.39	3.73	0.51	10	10.0	0.11
			Hydr	ologic Parameters Sur	nmary				
			Catchment	0.	468	ha			
			Impervious Percent	3	3.1	%			
			Slope			%			
			Runoff Co-efficient		.39	_			
			SCS Curve No:	85.02	78.59				
					81				
			Modified CN*	87					
		-	Initial Abstraction	6.5	9.0	mm			
		Т	Initial Abstraction ime of Concentration, Tc	6.5	9.0 0.0	min			
		т	Initial Abstraction	6.5	9.0				
obtained from Design	Chart H2-6A, M.T.O Drz		Initial Abstraction ime of Concentration, Tc	6.5	9.0 0.0	min			
	Chart H2-6A, M.T.O. Dra sign Chart 1.07, M.T.O. I	ainage Manual, 1980.	Initial Abstraction ime of Concentration, Tc Time to Peak, Tp	6.5	9.0 0.0	min			
	sign Chart 1.07, M.T.O. I	ainage Manual, 1980.	Initial Abstraction ime of Concentration, Tc Time to Peak, Tp	6.5	9.0 0.0	min			
tained from M.T.O. De aryland State Highway A	sign Chart 1.07, M.T.O. I	ainage Manual, 1980. Drainage Managemen	Initial Abstraction ime of Concentration, Tc Time to Peak, Tp t Manual, 1997, and	6.5	9.0 0.0	min			
tained from M.T.O. De aryland State Highway A	sign Chart 1.07, M.T.O. I Idministration.	ainage Manual, 1980. Drainage Managemen	Initial Abstraction ime of Concentration, Tc Time to Peak, Tp t Manual, 1997, and	6.5	9.0 0.0	min			
	Hydrologic Soil Group HillyO D US Elev. 131.00	Precent Impervious Agriculture Range Grass Woods Wetland Grave Impervious Sum Soil Name Soil Type Composite C Hydrologic Soil Group D 89.00 5 US Elev. DS Elev.	20.9510 EXT1	Santaguida Subdivision	Santaguida Subdivision 20-9510	Drainage Area	Santagaids Subdivision 20-9510	Santagade Sachivision Designed 8 Checked 8 Checked 9	Set Set



	Rational Method - EXT1									
Project Name:	Santaguida Subdivision			Designed By: SZ						
Project Number:	20-9510			Checked By: RC						
Catchment ID:	EXT1			Date: 202	25-06-30					
	Drainage Area	0.468	ha		Rainfall Data					
	Precent Impervious	33.1	%		Guage Station: Smith F	alls IDF Looku	ip			
	Composite Runoff Co-efficent	0.39		100 Year 12	2 HR Rainfall Depth:	94.6	mm			

IDF Parameters										
Co-efficient	25 mm	2 -Year	5 Year	10 Year	25 Year	50 Year	100 Year			
A	405	20.2	26.8	31.2	36.7	40.8	44.8			
В	3	0	0	0	0	0	0			
С	0.76	0.699	0.699	0.699	0.699	0.699	0.699			

	Rational Method									
Design Storm	Area (ha)	Composite C	Tc (min)	I (mm/hr)	Composite C Multiplier (%)	Peakflow (m3/s)	Peakflow (L/s)			
25 mm Storm	0.468	0.39	10.0	57.7	1	0.028	28			
2- Year	0.468	0.39	10.0	70.7	1	0.035	35			
5-Year	0.468	0.39	10.0	93.8	1	0.046	46			
10-Year	0.468	0.39	10.0	109.2	1	0.054	54			
25-Year	0.468	0.43	10.0	128.4	10	0.070	70			
50-Year	0.468	0.47	10.0	142.8	20	0.085	85			
100-Year	0.468	0.49	10.0	156.7	25	0.097	97			

- Notes:

 1. Composite runoff co-efficents are calculated based on the weighted landuse
 2. Runoff co-efficients for 25, 50 and 100 year storms have been increased by 10%, 20% and 25% respectively.



				Hydro	ologic Parameters fo	or EXT2				
Project Name:			Santaguida Subdivisi					Designed By:	SZ	
Project Number:			20-9510					Checked By:		
Catchment ID:			EXT2						2025-06-30	
		Drainage Area	2.191	ha				Rainfall Data		
		Precent Impervious	0.0	%				Guage Station:	Smith Falls IDF Looku	0
							100 Yea	ır 12 HR Rainfall Depth:	94.6	mm
					nduse and Soil Type Id	entification	T			
		Agriculture		0	ha			Pervious Areas	Impervious Areas	
		Range		0	ha		Length	285.80 135.90	0	m
		Grass Woods		0.086	ha ha		US Elev. DS Elev.	135.90	0	m m
		Wetland		0.086	na ha		Slope	131.00	U	m %
		Gravel		0	ha		Terrain	Flat		70
		Impervious		0	ha		retrain	riat		
		impervious	Ü	U	IId					
		Sum	2.105	0.086	ha		Note:			
		Soil Name	Farmington	Muck			Flat:0-2% slopes			
		Soil Type	В	D			Rolling:2-6% slopes			
		Composite C	0.12	0.12			Hilly:>6% slopes			
				Composite Ru	unoff and Curve Numb	er Calculations				
					Land Use					ite Values
Parameter	Hydrologic Soil Group		Range	Grass	Woods	Wetland	Gravel		Incl.	Not Incl. Imperv.
		Agriculture	kange	GIBSS	Woods	wetiand	Glavei	Imperv.	Imperv. Nashyd	Standhyd
	FlatB	0.43	0.18	0.11	0.08	0.05	0.43	0.90	0.12	0.12
	FlatD	0.73	0.32	0.20	0.12	0.05	0.50	0.90	0.12	0.12
Runoff Coefficient, C	Hatb	0.73	0.52	0.20	0.12	0.03	0.50	0.70	0.12	0.12
	В	78.00	69.00	69.00	60.00	50.00	85.00	98.00	63.59	63.59
SCS Curve No., CN	D	89.00	84.00	84.00	79.00	77.00	89.00	98.00	79.00	79.00
3C3 Curve No., CN										
Initial Abstraction, mm		5	8	5	8	10	2.5	1.5	8.0	8.0
		5	8	2	8	10	2.5	1.5	8.0	8.0
				Time	e of Concentration Calcu	lations				
Total Flow Length	US Elev.	DS Elev.	Avg. Slope	Terrain	Composite C	Airport Formula	Bransby Formula	Minimum	Tc (min)	Tp (hr)
285.8	135.90	131	1.71	Flat	0.12	45.25	13.53	10	45.3	0.51
					rologic Parameters Sur					
				Catchment		.191	ha			
				Impervious Percent		0.0	%			
				Slope		.71	%			
				Runoff Co-efficient).12				
				SCS Curve No:	64.20	64.20				
				Modified CN*	63	63				
				Initial Abstraction		8.0	mm			
			11	me of Concentration, To Time to Peak, Tp		15.3).51	min hr			
Natas				Time to Peak, Tp		J.51	nr			
Notes: 1 Hydrologic Soil Grou	n ohtained from Design	n Chart H2-6A, M.T.O. E	Irainane Manual 1000							
		sign Chart 1.07, M.T.O. L								
	aryland State Highway		Diamage Managemen	it ividitudi, 1777, dilu						
		Chart 1.09, M.T.O. Dra	inane Management M	anual 1007 and						
Table 2-2a, TR-55, pag	-	Chart 1.07, W.T.O. Dra	mage Management W	andai, 1777, and						
		concontration for C < 0	40 D \40000							

4.Use Airport Equation to calculate time of concentration for C < 0.40, and Bransby-Williams for C > 0.40.



	Rational Method - EXT2									
Project Name:	Santaguida Subdivision			Designed By:	SZ					
Project Number:	20-9510			Checked By:	RC					
Catchment ID:	EXT2				Date: 2025-06-30					
	Drainage Area	2.191	ha							
	Precent Impervious	0.0	%		Guage Station: Smith Falls IDF Lookup					
	Composite Runoff Co-efficent	0.12			100 Year 12 HR Rainfall Depth: 94.6 mm					

1											
	IDF Parameters										
Co-efficient 25 mm 2 - Year 5 Year 10 Year 25 Year 50 Year 100 Year											
A	405	20.2	26.8	31.2	36.7	40.8	44.8				
В	3	0	0	0	0	0	0				
С	0.76	0.699	0.699	0.699	0.699	0.699	0.699				

	Rational Method									
Design Storm	Area (ha)	Composite C	Tc (min)	I (mm/hr)	Composite C Multiplier (%)	Peakflow (m3/s)	Peakflow (L/s)			
25 mm Storm	2.191	0.12	45.3	21.3	1	0.015	15			
2- Year	2.191	0.12	45.3	24.6	1	0.017	17			
5-Year	2.191	0.12	45.3	32.6	1	0.023	23			
10-Year	2.191	0.12	45.3	38.0	1	0.027	27			
25-Year	2.191	0.13	45.3	44.7	10	0.034	34			
50-Year	2.191	0.14	45.3	49.7	20	0.041	41			
100-Year	2.191	0.15	45.3	54.5	25	0.048	48			

- Notes:

 1. Composite runoff co-efficients are calculated based on the weighted landuse
 2. Runoff co-effcients for 25, 50 and 100 year storms have been increased by 10%, 20% and 25% respectively.



				Hydr	ologic Parameters fo	r FXT3				
Project Name:			Santaguida Subdivisi		ologio i di dillotero re	. EXTO		Designed By	: SZ	
Project Number:			20-9510					Checked By		
Catchment ID:			EXT3					Date	2025-06-30	
		Drainage Area	0.055	ha				Rainfall Data		
		Precent Impervious	0.0	%				Guage Station	: Smith Falls IDF Looku	р
							100 Yea	r 12 HR Rainfall Depth	94.6	mm
					nduse and Soil Type Id	entification	_			
		Agriculture		ha				Pervious Areas	Impervious Areas	
		Range		ha			Length	28.60	0	m
		Grass		ha			US Elev.	136.00	0	m
		Woods		ha			DS Elev.	135.00	0	m
		Wetland Gravel	0	ha ha			Slope Terrain	3.50 Rolling		%
		Impervious		na ha			rerrain	Rolling	*	
		impervious	U	па						
		Sum	0.055	ha			Note:			
		Soil Name		na			Flat:0-2% slopes			
		Soil Type					Rolling:2-6% slopes			
		Composite C					Hilly:>6% slopes			
							,			
				Composite R	unoff and Curve Numb	er Calculations	1			
					Land Use				Compos	site Values
Parameter	11-1-1-1-1-6-10		I			1			Incl.	Not Incl.
Parameter	Hydrologic Soil Group	Agriculture	Range	Grass	Woods	Wetland	Gravel	Imperv.	Imperv.	Imperv.
		Agriculture	Range	Grass	Woods	Wettand	Graver	imperv.	Nashyd	Standhyd
	RollingB	0.48	0.20	0.16	0.11	0.05	0.53	0.90	0.16	0.16
	Komingo	0.10	0.20	0.10	0.11	0.00	0.00	0.70	0.10	0.10
Runoff Coefficient, C										
	В	78.00	69.00	69.00	60.00	50.00	85.00	98.00	64.58	64.58
SCS Curve No., CN										
Initial Abstraction, mm										
		5	8	5	8	10	2.5	1.5	8.0	8.0
				-						
					e of Concentration Calcul					- 0)
Total Flow Length 28.6	US Elev. 136.00	DS Elev.	Avg. Slope 3.50	Terrain Rolling	Composite C 0.16	Airport Formula 10.84	Bransby Formula 1.70	Minimum 10	Tc (min) 10.8	Tp (hr) 0.12
26.0	136.00	135	3.50	Rolling	0.10	10.84	1.70	10	10.8	0.12
				Hydi	rologic Parameters Sur	nmary				
				Catchment	. 0	055	ha			
				Impervious Percent		0.0	%			
				Slope	3	.50	%			
				Runoff Co-efficient		1.16				
				SCS Curve No:		64.58				
				Modified CN*		63				
				Initial Abstraction		8.0	mm			
			Ti	me of Concentration, To		0.8	min			
				Time to Peak, Tp	(1.12	hr			
Notes:										
		n Chart H2-6A, M.T.O. [
		esign Chart 1.07, M.T.O.	Drainage Managemei	nt Manual, 1997, and						
Tables 4-5a to 4-5d, M				II 1007						
		n Chart 1.09, M.T.O. Dra	ınage ıvıanagement N	ianual, 1997, and						
Table 2-2a, TR-55, pag		concentration for C < 0.	40 and Pranchy Willi	ame for C > 0.40						
T.OSE MILPULL EQUALIO	ii to calculate tillie 01 (JOINETHI BUILT IUI U < U.	TO, and bransby-Willi	ama 101 6 > 0.40.						



			Rational Method - EX	Г3	
Project Name:	Santaguida Subdivision			Designed By:	SZ
Project Number:	20-9510			Checked By:	RC
Catchment ID:	EXT3				Date: 2025-06-30
	Drainage Area	0.055	ha		Rainfall Data
	Precent Impervious	0.0	%		Guage Station: Smith Falls IDF Lookup
	Composite Runoff Co-efficent	0.16			100 Year 12 HR Rainfall Depth: 94.6 mm

			IDF Par	ameters			
Co-efficient	25 mm	2 -Year	5 Year	10 Year	25 Year	50 Year	100 Year
Α	405	20.2	26.8	31.2	36.7	40.8	44.8
В	3	0	0	0	0	0	0
С	0.76	0.699	0.699	0.699	0.699	0.699	0.699

			Rationa	l Method			
Design Storm	Area (ha)	Composite C	Tc (min)	l (mm/hr)	Composite C Multiplier (%)	Peakflow (m3/s)	Peakflow (L/s)
25 mm Storm	0.055	0.16	10.8	55.1	1	0.001	1
2- Year	0.055	0.16	10.8	67.0	1	0.002	2
5-Year	0.055	0.16	10.8	88.9	1	0.002	2
10-Year	0.055	0.16	10.8	103.4	1	0.002	2
25-Year	0.055	0.18	10.8	121.7	10	0.003	3
50-Year	0.055	0.19	10.8	135.3	20	0.004	4
100-Year	0.055	0.20	10.8	148.5	25	0.004	4

- Notes:

 1. Composite runoff co-efficients are calculated based on the weighted landuse
 2. Runoff co-effcients for 25, 50 and 100 year storms have been increased by 10%, 20% and 25% respectively.



roject Name: Project Number: Aatchment ID:		Drainage Area Precent Impervious Agriculture Range Grass Woods Wetland	0 0.06 0	ha % Slope, Lar 0	nduse and Soil Type Id			Rainfall Data		10
-		Drainage Area Precent Impervious Agriculture Range Grass Woods Wetland	1.791 0.0 0 0 0 0.06 0	% Slope, Lar	nduse and Soil Type Id			Date: Rainfall Data	2025-06-30	ID.
tchment ID:		Drainage Area Precent Impervious Agriculture Range Grass Woods Wetland	0 0.06 0	% Slope, Lar	nduse and Soil Type Id			Rainfall Data		un.
		Agriculture Range Grass Woods Wetland	0.0 0 0.06 0	% Slope, Lar	nduse and Soil Type Id				Smith Falls IDF Look	ID.
		Agriculture Range Grass Woods Wetland	0 0.06 0	Slope, Lan O	nduse and Soil Type Id			Guage Station:	Smith Falls IDF Looku	up.
		Range Grass Woods Wetland	0.06 0	0	nduse and Soil Type Id					ηþ
		Range Grass Woods Wetland	0.06 0	0	nduse and Soil Type Id		100 Yea	ır 12 HR Rainfall Depth:	94.6	mm
		Range Grass Woods Wetland	0.06 0			entification	T.			
		Grass Woods Wetland	0		ha			Pervious Areas	Impervious Areas	
		Woods Wetland		0	ha		Length	119.20	0	m
		Wetland		0	ha		US Elev.	137.60	0	m
				1.731	ha		DS Elev.	133.50	0	m
				0	ha		Slope	3.44		%
		Gravel		0	ha		Terrain	Rolling		
		Impervious	0	0	ha				•	
		Sum		1.731	ha		Note:			
		Soil Name		Muck			Flat:0-2% slopes			
		Soil Type		D			Rolling:2-6% slopes			
		Composite C	0.20	0.15			Hilly:>6% slopes			
				Composite Ru	unoff and Curve Numb	er Calculations				
					Land Use				Compo	osite Values
					T.		1	1		
Parameter Hyd	ydrologic Soil Group		_						Incl.	Not Incl.
		Agriculture	Range	Grass	Woods	Wetland	Gravel	Imperv.	Imperv.	Imperv.
	D. III. D.	0.40	0.00	0.17	0.44	0.05	0.50	0.00	Nashyd	Standhyd
	RollingB	0.48	0.20	0.16	0.11	0.05	0.53	0.90	0.20	0.20
unoff Coefficient, C	RollingD	0.78	0.34	0.24	0.15	0.05	0.60	0.90	0.15	0.15
	В	78.00	69.00	69.00	60.00	50.00	85.00	98.00	69.00	69.00
	D	89.00	84.00	84.00	79.00	77.00	89.00	98.00	79.00	79.00
SCS Curve No., CN	Ь	69.00	04.00	04.00	79.00	77.00	69.00	96.00	79.00	79.00
itial Abstraction, mm										
		5	8	5	8	10	2.5	1.5	8.0	8.0
					of Concentration Calcul					
Total Flow Length	US Elev.	DS Elev.	Avg. Slope	Terrain	Composite C	Airport Formula	Bransby Formula	Minimum	Tc (min)	Tp (hr)
119.2	137.60	133.5	3.44	Rolling	0.15	22.49	5.01	10	22.5	0.25
				Llude	ologic Parameters Sur	nman/				
				Catchment		.791	ha			1
				Impervious Percent		0.0	%			
				Slope		3.44	%			
				Runoff Co-efficient).15	,,			
				SCS Curve No:	78.66	78.66				
				Modified CN*	80	80				
				Initial Abstraction		8.0	mm			
			т	me of Concentration, To		22.5	min			
			"	Time to Peak, Tp		1.25	hr			
otes:				Time to reak, 1p						

3.SCS Curve No. obtained from M.T.O. Design Chart 1.09, M.T.O. Drainage Management Manual, 1997, and

Table 2-2a, TR-55, page 2-5.



			Rational Method - EX	T4	
Project Name:	Santaguida Subdivision			Designed By:	SZ
Project Number:	20-9510			Checked By:	RC
Catchment ID:	EXT4				Date: 2025-06-30
	Drainage Area	1.791	ha		Rainfall Data
	Precent Impervious	0.0	%		Guage Station: Smith Falls IDF Lookup
	Composite Runoff Co-efficent	0.15			100 Year 12 HR Rainfall Depth: 94.6 mm

			IDF Par	ameters			
Co-efficient	25 mm	2 -Year	5 Year	10 Year	25 Year	50 Year	100 Year
A	405	20.2	26.8	31.2	36.7	40.8	44.8
В	3	0	0	0	0	0	0
C	0.76	0.699	0.699	0.699	0.699	0.699	0.699

			Rationa	l Method			
Design Storm	Area (ha)	Composite C	Tc (min)	l (mm/hr)	Composite C Multiplier (%)	Peakflow (m3/s)	Peakflow (L/s)
25 mm Storm	1.791	0.15	22.5	34.6	1	0.025	25
2- Year	1.791	0.15	22.5	40.1	1	0.029	29
5-Year	1.791	0.15	22.5	53.2	1	0.039	39
10-Year	1.791	0.15	22.5	61.9	1	0.045	45
25-Year	1.791	0.17	22.5	72.8	10	0.060	60
50-Year	1.791	0.18	22.5	81.0	20	0.071	71
100-Year	1.791	0.19	22.5	88.9	25	0.082	82

- Notes:

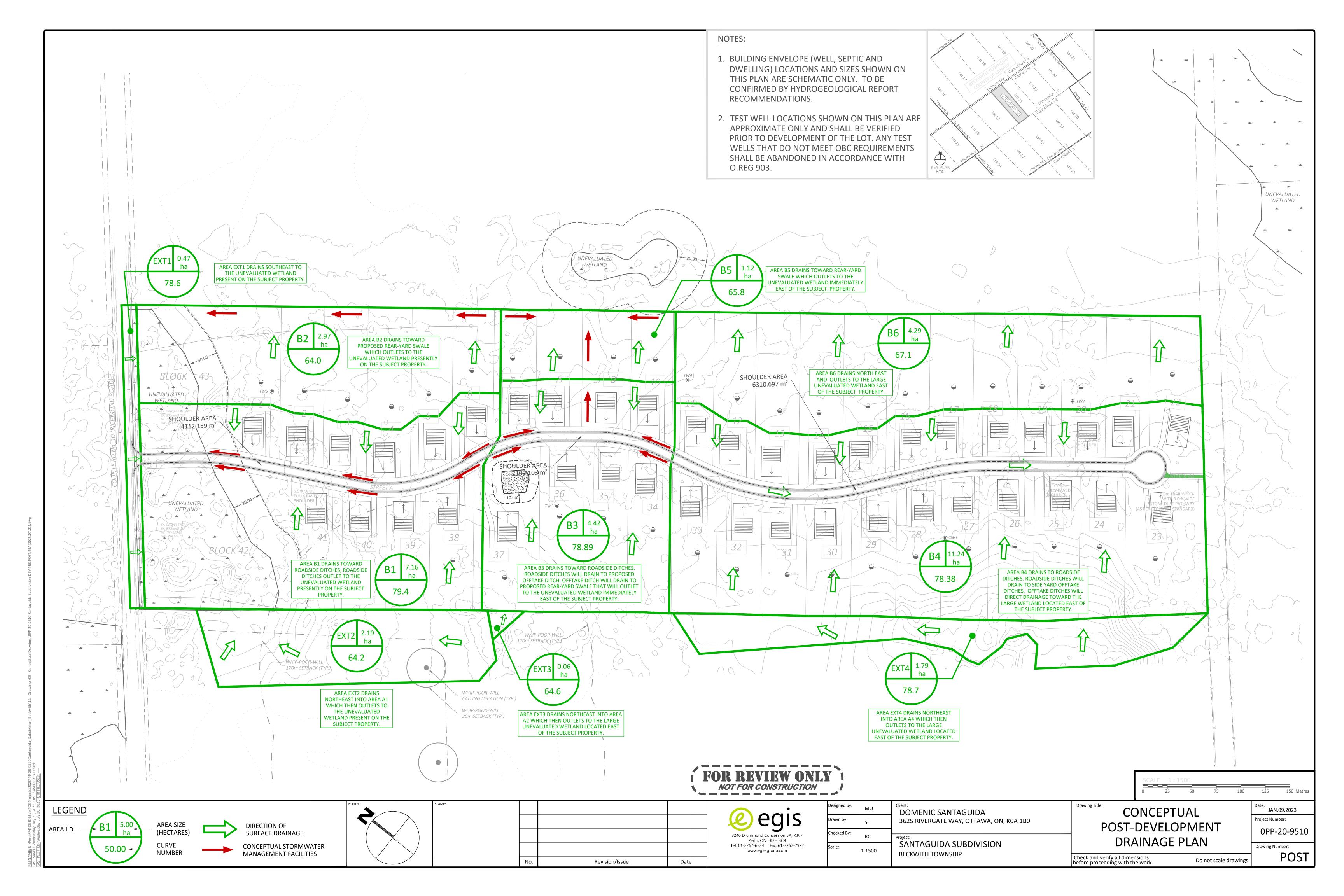
 1. Composite runoff co-efficients are calculated based on the weighted landuse
 2. Runoff co-effcients for 25, 50 and 100 year storms have been increased by 10%, 20% and 25% respectively.



CONCEPTUAL STORMWATER MANAGEMENT REPORT SANTAGUIDA SUBDIVISION



APPENDIX C – POST-DEVELOPMENT DRAINAGE PLAN, MODEL SCHEMATIC & CALCULATIONS



			Н	ydrologic Parameters	for B1				
Project Name:	Sa	ntaguida Subdivi:	sion				Designed By:	SZ	
Project Number:	20	0-9510					Checked By:	RC	
Catchment ID:	B	1					Date:	2025-06-30	
	Drainage Area	8.070	ha						
	Precent Impervious	9.2	%				Guage Station:	Smith Falls IDF Look	лb
						100 Yea	ır 12 HR Rainfall Depth:	94.6	mm
					lentification				
	Agriculture	0	0	ha			Pervious Areas	Impervious Areas	
	Range	1.163	0	ha		Length	310.00	45	m
	Grass	0.9	0	ha		US Elev.	135.20	135.7	m
	Woods	3.054	0.143	ha		DS Elev.	130.50	135.2	m
	Wetland	0.337	1.73	ha		Slope	1.52	1.11	%
	Gravel	0	0	ha		Terrain	Flat	Flat	
	Impervious	0.683	0.06	ha				•	
	Sum	6.137	1.933	ha		Note:			
	Soil Name	Farmington	Muck			Flat:0-2% slopes			
	Soil Type	В	D			Rolling:2-6% slopes			
	Composite C	0.19	0.08			Hilly:>6% slopes			
			Composite	Runoff and Curve Num	per Calculations				
				Land Use				Comp	osite Values
Parameter Hydrologic Soil Grou	n							Incl.	Not Incl.

					anon and care reambe					
					Land Use				Compos	ite Values
Parameter	Hydrologic Soil Group								Incl.	Not Incl.
		Agriculture	Range	Grass	Woods	Wetland	Gravel	Imperv.	Imperv.	Imperv.
									Nashyd	Standhyd
	FlatB	0.43	0.18	0.11	0.08	0.05	0.43	0.90	0.19	0.10
Runoff Coefficient, C	FlatD	0.73	0.32	0.20	0.12	0.05	0.50	0.90	0.08	0.06
Kullott Coetticlett, C										
	В	78.00	69.00	69.00	60.00	50.00	85.00	98.00	66.71	62.79
SCS Curve No., CN	D	89.00	84.00	84.00	79.00	77.00	89.00	98.00	77.80	77.15
303 curve No., CIV										

Total Flow Length	US Elev.	DS Elev.	Avg. Slope	Terrain	Composite C	Airport Formula	Bransby Formula	Minimum	Tc (min)	Tp (hr)
355	135.70	130.5	1.46	Flat	0.16	50.96	15.22	10	51.0	0.57

Catchment		8.07		ha
Impervious Percent		9.2		%
Slope		1.46		%
Runoff Co-efficient		0.16		
SCS Curve No:	69.36		66.46	
Modified CN*	69		66	
Initial Abstraction	7.6		8.2	mm
Time of Concentration, Tc		51.0		min
Time to Peak, Tp		0.57		hr

Notes:

1. Hydrologic Soil Group obtained from Design Chart H2-6A, M.T.O. Drainage Manual, 1980.

2.Runoff coefficient obtained from M.T.O. Design Chart 1.07, M.T.O. Drainage Management Manual, 1997, and

Tables 4-5a to 4-5d, Maryland State Highway Administration.

3.SCS Curve No. obtained from M.T.O. Design Chart 1.09, M.T.O. Drainage Management Manual, 1997, and

Table 2-2a, TR-55, page 2-5.

Initial Abstraction, mm

			Rational Method - B		
Project Name:	Santaguida Subdivision			Designed By:	SZ
Project Number:	20-9510			Checked By:	RC
Catchment ID:	B1				Date: 2025-06-30
	Drainage Area	8.07	ha		Rainfall Data
	Precent Impervious	9.2	%		Guage Station: Smith Falls IDF Lookup
	Composite Runoff Co-efficent	0.16			100 Year 12 HR Rainfall Depth: 94.6 mm

1								
IDF Parameters								
Co-efficient	25 mm	2 -Year	5 Year	10 Year	25 Year	50 Year	100 Year	
A	405	20.2	26.8	31.2	36.7	40.8	44.8	
В	3	0	0	0	0	0	0	
С	0.76	0.699	0.699	0.699	0.699	0.699	0.699	

Rational Method										
Design Storm	Area (ha)	Composite C	Tc (min)	l (mm/hr)	Composite C Multiplier (%)	Peakflow (m3/s)	Peakflow (L/s)			
25 mm Storm	8.07	0.16	51.0	19.5	1	0.068	68			
2- Year	8.07	0.16	51.0	22.6	1	0.079	79			
5-Year	8.07	0.16	51.0	30.0	1	0.105	105			
10-Year	8.07	0.16	51.0	35.0	1	0.122	122			
25-Year	8.07	0.18	51.0	41.1	10	0.161	161			
50-Year	8.07	0.19	51.0	45.7	20	0.189	189			
100-Year	8.07	0.20	51.0	50.2	25	0.219	219			

- Notes:

 1. Composite runoff co-efficients are calculated based on the weighted landuse
 2. Runoff co-efficients for 25, 50 and 100 year storms have been increased by 10%, 20% and 25% respectively.

			Ну	drologic Parameters fo	or B2				
Project Name:	Si	antaguida Subdivis	ion				Designed By:	SZ	
Project Number:	2	0-9510					Checked By:	RC	
Catchment ID:	В	2					Date:	2025-06-30	
	Drainage Area	2.966	ha				Rainfall Data		
	Precent Impervious	0.0	%				Guage Station:	Smith Falls IDF Look	up
						100 Yea	r 12 HR Rainfall Depth:	94.6	mm
			Slope, La	anduse and Soil Type Ide	ntification				
	Agriculture	0	0	ha			Pervious Areas	Impervious Areas	
	Range	0.703	0.047	ha		Length	214.00	0	m
	Grass	0	0	ha		US Elev.	133.70	0	m
	Woods	1.865	0	ha		DS Elev.	130.50	0	m
	Wetland	0.06	0.291	ha		Slope	1.50		%
	Gravel	0	0	ha		Terrain	Flat		
	Impervious	0	0	ha				*	
	Sum	2.628	0.338	ha		Note:			
	Soil Name	Farmington	Muck			Flat:0-2% slopes			
	Soil Type	В	D			Rolling:2-6% slopes			
	Composite C	0.11	0.09			Hilly:>6% slopes			
			Composite F	Runoff and Curve Number	er Calculations				
				Land Use				Comp	osite Values
Parameter Hydrologic Soil	Group							Incl.	Not Incl.

	Composite Runoff and Curve Number Calculations											
	Land Use									Composite Values		
Parameter	Hydrologic Soil Group	Hydrologic Soil Group Agriculture		Grass	Woods	Wetland	Gravel			Not Incl. Imperv.		
									Nashyd	Standhyd		
	FlatB	0.43	0.18	0.11	0.08	0.05	0.43	0.90	0.11	0.11		
Runoff Coefficient, C	FlatD	0.73	0.32	0.20	0.12	0.05	0.50	0.90	0.09	0.09		
Kunon coemcient, c												
	В	78.00	69.00	69.00	60.00	50.00	85.00	98.00	62.18	62.18		
SCS Curve No., CN	D	89.00	84.00	84.00	79.00	77.00	89.00	98.00	77.97	77.97		
SCS CUIVE NO., CN												
Initial Abstraction, mm		5	8	5	8	10	2.5	1.5	8.2	8.2		

Total Flow Length	US Elev.	DS Elev.	Avg. Slope	Terrain	Composite C	Airport Formula	Bransby Formula	Minimum	Tc (min)	Tp (hr)
214	133.70	130.5	1.50	Flat	0.11	41.30	10.09	10	41.3	0.46

	Catchment		2.966		ha				
Imperv	vious Percent		0.0		%				
	Slope		1.50		%				
Runofi	f Co-efficient		0.11						
Science	CS Curve No:	63.98		63.98					
N.	Modified CN*	62		62					
Initia	l Abstraction	8.2		8.2	mm				
Time of Conc	entration, Tc		41.3		min				
Time	e to Peak, Tp		0.46		hr				

Notes:

1. Hydrologic Soil Group obtained from Design Chart H2-6A, M.T.O. Drainage Manual, 1980.

2.Runoff coefficient obtained from M.T.O. Design Chart 1.07, M.T.O. Drainage Management Manual, 1997, and

Tables 4-5a to 4-5d, Maryland State Highway Administration.

3.SCS Curve No. obtained from M.T.O. Design Chart 1.09, M.T.O. Drainage Management Manual, 1997, and

Table 2-2a, TR-55, page 2-5.

			Rational Method - B	2	
Project Name:	Santaguida Subdivision			Designed By:	SZ
Project Number:	20-9510			Checked By:	RC
Catchment ID:	B2				Date: 2025-06-30
	Drainage Area	2.966	ha		Rainfall Data
	Precent Impervious	0.0	%		Guage Station: Smith Falls IDF Lookup
	Composite Runoff Co-efficent	0.11			100 Year 12 HR Rainfall Depth: 94.6 mm

	IDF Parameters								
Co-efficient	25 mm	2 -Year	5 Year	10 Year	25 Year	50 Year	100 Year		
A	405	20.2	26.8	31.2	36.7	40.8	44.8		
В	3	0	0	0	0	0	0		
С	0.76	0.699	0.699	0.699	0.699	0.699	0.699		

Rational Method										
Design Storm	Area (ha)	Composite C	Tc (min)	l (mm/hr)	Composite C Multiplier (%)	Peakflow (m3/s)	Peakflow (L/s)			
25 mm Storm	2.966	0.11	41.3	22.7	1	0.020	20			
2- Year	2.966	0.11	41.3	26.2	1	0.023	23			
5-Year	2.966	0.11	41.3	34.8	1	0.031	31			
10-Year	2.966	0.11	41.3	40.5	1	0.036	36			
25-Year	2.966	0.12	41.3	47.6	10	0.046	46			
50-Year	2.966	0.13	41.3	53.0	20	0.055	55			
100-Year	2.966	0.14	41.3	58.2	25	0.065	65			

- Notes:

 1. Composite runoff co-efficents are calculated based on the weighted landuse
 2. Runoff co-efficients for 25, 50 and 100 year storms have been increased by 10%, 20% and 25% respectively.

					rologic Parameters	for B3				
oject Name:			Santaguida Subdivis	ion				Designed By:		
roject Number:			20-9510					Checked By:		
atchment ID:			B3						2025-06-30	
		Drainage Area	4.576	ha				Rainfall Data		
		Precent Impervious	11.6	%					Smith Falls IDF Look	
							100 Yea	ar 12 HR Rainfall Depth:	94.6	mm
			_		iduse and Soil Type I	dentification				
		Agriculture	0	ha				Pervious Areas	Impervious Areas	
		Range	3.291	ha			Length	340.00	0	m
		Grass		ha			US Elev.	136.10	0	m
		Woods		ha			DS Elev.	132.00	0	m %
		Wetland		ha			Slope			%
		Gravel	0	ha			Terrain	Flat		
		Impervious	0.53	ha						
		Sum	4.576	ha			Note:			
		Soil Name		TIG.			Flat:0-2% slopes			
		Soil Type	_				Rolling:2-6% slopes			
		Composite C	0.25				Hilly:>6% slopes			
							,			
				Composite Ru	inoff and Curve Num	ber Calculations	<u> </u>			
					Land Use				Comp	osite Values
Parameter	11111								Incl.	Not Incl.
Parameter	Hydrologic Soil Group	Agriculture	Damas	Grass	Woods	Wetland	Gravel			Imperv.
		Agriculture	Range	Grass	vvoods	wetiand	Gravei	Imperv.	Imperv.	
	FlatB	0.43	0.18	0.11	0.08	0.05	0.43	0.90	Nashyd 0.25	Standhyd 0.17
	FIGID	0.43	0.16	0.11	0.06	0.05	0.43	0.90	0.25	0.17
Runoff Coefficient, C										
	В	78.00	69.00	69.00	60.00	50.00	85.00	98.00	72.13	68.74
		70.00	07.00	07.00	00.00	00.00	00.00	70.00	72.10	00.71
SCS Curve No., CN										
nitial Abstraction, mm										
IIIIIai Abstraction, IIIII		5	8	5	8	10	2.5	1.5	6.8	7.5
Total Flow Length	US Elev.	DS Elev.	Avg. Slope	Terrain	of Concentration Calcu Composite C	Airport Formula	Bransby Formula	Minimum	Tc (min)	Tp (hr
340	136.10	132	1.21	Flat	0.25	47.98	16.02	10	48.0	0.54
340	130.10	132	1.21	ridi	0.25	47.90	10.02	10	40.0	0.34
					ologic Parameters Su					
				Catchment		4.576	ha			
				Impervious Percent		11.6	%			
				Slope		1.21	%			
				Runoff Co-efficient		0.25				
				SCS Curve No:	72.13	68.74				
				Modified CN*	72	68				
				Initial Abstraction	6.8	7.5	mm			
			T	ime of Concentration, Tc		48.0	min			
lotes:				Time to Peak, Tp		0.54	hr			

Tables 4-5a to 4-5d, Maryland State Highway Administration.

3.SCS Curve No. obtained from M.T.O. Design Chart 1.09, M.T.O. Drainage Management Manual, 1997, and Table 2-2a, TR-55, page 2-5.

			Rational Method - B	3	
Project Name:	Santaguida Subdivision			Designed By:	SZ
Project Number:	20-9510			Checked By:	RC
Catchment ID:	В3				Date: 2025-06-30
	Drainage Area	4.576	ha		Rainfall Data
	Precent Impervious	11.6	%		Guage Station: Smith Falls IDF Lookup
	Composite Runoff Co-efficent	0.25			100 Year 12 HR Rainfall Depth: 94.6 mm

			IDF Par	ameters					
Co-efficient	Co-efficient 25 mm 2 - Year 5 Year 10 Year 25 Year 50 Year 100 Year								
A	405	20.2	26.8	31.2	36.7	40.8	44.8		
В	3	0	0	0	0	0	0		
С	0.76	0.699	0.699	0.699	0.699	0.699	0.699		

			Rationa	l Method			
Design Storm	Area (ha)	Composite C	Tc (min)	l (mm/hr)	Composite C Multiplier (%)	Peakflow (m3/s)	Peakflow (L/s)
25 mm Storm	4.576	0.25	48.0	20.4	1	0.063	63
2- Year	4.576	0.25	48.0	23.6	1	0.073	73
5-Year	4.576	0.25	48.0	31.3	1	0.097	97
10-Year	4.576	0.25	48.0	36.5	1	0.113	113
25-Year	4.576	0.28	48.0	42.9	10	0.148	148
50-Year	4.576	0.30	48.0	47.7	20	0.177	177
100-Year	4.576	0.31	48.0	52.4	25	0.201	201

- Notes:

 1. Composite runoff co-efficents are calculated based on the weighted landuse
 2. Runoff co-efficients for 25, 50 and 100 year storms have been increased by 10%, 20% and 25% respectively.

				Hvd	rologic Parameters	for B4				
Project Name:			Santaguida Subdivisio		rologic i arameters	101 04		Designed By	: SZ	
roject Number:			20-9510					Checked By		
Catchment ID:			B4						: 2025-06-30	
		Drainage Area		ha				Rainfall Data		
		Precent Impervious		%					: Smith Falls IDF Looku	ID.
							100 Ye	ar 12 HR Rainfall Depth		mm
				Slope, Lar	nduse and Soil Type Io	dentification				
		Agriculture	. 0	0	ha			Pervious Areas	Impervious Areas	
		Range		0	ha		Length	590.00	45	m
		Grass		1.1	ha		US Elev.	139.70	140.2	m
		Woods		5.554	ha		DS Elev.	132.00	139.7	m
		Wetland		0	ha		Slope	1.31	1.11	%
		Gravel		0	ha		Terrain	Flat	Flat	70
		Impervious		0.78	ha		Terrain	riat	, I lat	
		impervious	0.03	0.70	na na					
		Sum	5.042	7.434	ha		Note:			
		Soil Name		Muck	na na		Flat:0-2% slopes			
		Soil Type		D			Rolling:2-6% slopes			
		Composite C		0.21			Hilly:>6% slopes			
		composite c	0.22	0.21			miliy:>0% slopes			
				Composite Pu	inoff and Curve Num	her Calculations				
				composite ite		Der Calculations				
					Land Use				Compo	osite Values
Parameter	Hydrologic Soil Group								Incl.	Not Incl.
		Agriculture	Range	Grass	Woods	Wetland	Gravel	Imperv.	Imperv.	Imperv.
									Nashyd	Standhyd
	FlatB	0.43	0.18	0.11	0.08	0.05	0.43	0.90	0.22	0.09
	FlatD	0.73	0.32	0.20	0.12	0.05	0.50	0.90	0.21	0.13
Runoff Coefficient, C										
	В	78.00	69.00	69.00	60.00	50.00	85.00	98.00	68.40	62.56
SCS Curve No., CN	D	89.00	84.00	84.00	79.00	77.00	89.00	98.00	81.73	79.83
SCS CUI Ve INO., CIN										
nitial Abstraction, mm										
		5	8	5	8	10	2.5	1.5	6.6	7.4
				-						
Total Flow Length	US Elev.	DS Elev.	Avg. Slope	Terrain	of Concentration Calcu Composite C	Airport Formula	Bransby Formula	Minimum	Tc (min)	Tp (hr)
	US Elev.		Avg. Slope						67.2	0.75
	140.20		1.20	Flat						
635	140.20	132	1.29	Flat	0.21	67.22	26.73	10	07.2	0.75
	140.20		1.29	Flat	0.21	67.22	26.73	10	07.2	0.75
	140.20		1.29	Flat	0.21	67.22	26.73	10	07.2	0.73
	140.20		1.29		0.21 ologic Parameters Su		26.73	10	07.2	0.75
	140.20		1.29		ologic Parameters Su		26.73	10	01.2	0.73
	140.20		1.29	Hydr	ologic Parameters Su 1	mmary		10	07.2	0.73
	140.20		1.29	Hydr Catchment	ologic Parameters Su 1	mmary 2.476	ha	10	VI.E	0.73
	140.20		1.29	Hydr Catchment Impervious Percent	ologic Parameters Su 1	mmary 2.476 12.9	ha %	10	07.2	0.73
	140.20		1.29	Hydr Catchment Impervious Percent Slope	ologic Parameters Su 1	mmary 2.476 12.9 1.29	ha %	10	07.2	0.73
	140.20		1.29	Hydr Catchment Impervious Percent Slope Runoff Co-efficient	ologic Parameters Su 1	mmary 2.476 12.9 1.29 0.21	ha %	10	07.2	0.73
	140.20		1.29	Hydr Catchment Impervious Percent Slope Runoff Co-efficient SCS Curve No:	ologic Parameters Su 1 76.34	mmary 2.476 12.9 1.29 0.21	ha %	10	07.2	0.73
	140.20			Hydr Catchment Impervious Percent Slope Runoff Co-efficient SCS Curve No: Modified CN* Initial Abstraction	ologic Parameters Su 1 76.34 77 6.6	mmary 2.476 12.9 1.29 0.21 73.14 74	ha % %	10	0.2	0.73
	140.20			Hydr Catchment Impervious Percent Slope Runoff Co-efficient SCS Curve No: Modified CN*	76.34 77 6.6	mmary 2.476 12.9 1.29 0.21 73.14 74	ha % %	10	V/-Z	0.73
635	140.20			Hydr Catchment Impervious Percent Slope Runoff Co-efficient SCS Curve No: Modified CN* Initial Abstraction me of Concentration, Tc	76.34 77 6.6	mmary 2.476 12.9 0.21 73.14 74 7.4	ha % %	10	0.2	0.73
635		132	71	Hydr Catchment Impervious Percent Slope Runoff Co-efficient SCS Curve No: Modified CN* Initial Abstraction me of Concentration, Tc	76.34 77 6.6	mmary 2.476 12.9 0.21 73.14 74 7.4	ha % %	10	V.Z	0.73
635 otes: Hydrologic Soil Group	obtained from Design (132	Tii	Hydr Catchment Impervious Percent Stope Runoff Co-efficient SCS Curve No: Modified CN* Initial Abstraction me of Concentration, Tc Time to Peak, Tp	76.34 77 6.6	mmary 2.476 12.9 0.21 73.14 74 7.4	ha % %	10	V.Z	0.73
635 otes: Hydrologic Soil Group Runoff coefficient of	b obtained from Design Itained from M.T.O. Des	132 Chart H2-6A, M.T.O. Drasigin Chart 1.07, M.T.O.	Tii	Hydr Catchment Impervious Percent Stope Runoff Co-efficient SCS Curve No: Modified CN* Initial Abstraction me of Concentration, Tc Time to Peak, Tp	76.34 77 6.6	mmary 2.476 12.9 0.21 73.14 74 7.4	ha % %	10	0.2	0.73
635 lotes: Hydrologic Soll Grou, Runoff coefficient ot bables 4-5a to 4-5d, M	o obtained from Design Italined from M.T.O. Des pryjand State Highway A	132 Chart H2-6A, M.T.O. Dr. sign Chart 1.07, M.T.O. Idministration	Tii sinage Manual, 1980. Drainage Management	Lydr Catchment Impervious Percent Stope Runoff Co-efficient SCS Curve No: Modified CN* Initial Abstraction me of Concentration, Tc Time to Peak, Tp Manual, 1997, and	76.34 77 6.6	mmary 2.476 12.9 0.21 73.14 74 7.4	ha % %	10	V-2	0.73
635 lotes: .Hydrologic Soil Grou, kunoff coefficient ot ables 4-5a to 4-5d, M	obtained from Design i tained from M.T.O. Des yan/and State High and State West	132 Chart H2-6A, M.T.O. Drasigin Chart 1.07, M.T.O.	Tii sinage Manual, 1980. Drainage Management	Lydr Catchment Impervious Percent Stope Runoff Co-efficient SCS Curve No: Modified CN* Initial Abstraction me of Concentration, Tc Time to Peak, Tp Manual, 1997, and	76.34 77 6.6	mmary 2.476 12.9 0.21 73.14 74 7.4	ha % %	10	V.Z	0.73

Project Name:	Santaguida Subdivision			Designed By:	SZ
Project Number:	20-9510			Checked By:	RC
Catchment ID:	B4				Date: 2025-06-30
	Drainage Area	12.476	ha		Rainfall Data
	Precent Impervious	12.9	%		Guage Station: Smith Falls IDF Lookup
	Composite Runoff Co-efficent	0.21			100 Year 12 HR Rainfall Depth: 94.6 mm

	IDF Parameters										
Co-efficient	o-efficient 25 mm 2 -Year 5 Year 10 Year 25 Year 50 Year 100 Y										
A	405	20.2	26.8	31.2	36.7	40.8	44.8				
В	3	0	0	0	0	0	0				
С	0.76	0.699	0.699	0.699	0.699	0.699	0.699				

			Rationa	l Method			
Design Storm	Area (ha)	Composite C	Tc (min)	I (mm/hr)	Composite C Multiplier (%)	Peakflow (m3/s)	Peakflow (L/s)
25 mm Storm	12.476	0.21	67.2	16.0	1	0.113	113
2- Year	12.476	0.21	67.2	18.7	1	0.132	132
5-Year	12.476	0.21	67.2	24.8	1	0.175	175
10-Year	12.476	0.21	67.2	28.8	1	0.204	204
25-Year	12.476	0.23	67.2	33.9	10	0.263	263
50-Year	12.476	0.25	67.2	37.7	20	0.317	317
100-Year	12.476	0.26	67.2	41.4	25	0.363	363

- Notes:

 1. Composite runoff co-efficents are calculated based on the weighted landuse
 2. Runoff co-efficients for 25, 50 and 100 year storms have been increased by 10%, 20% and 25% respectively.

				Llud	rologic Parameters	for DE				
Project Name:			Santaguida Subdivisio		Tologic Parameters	IUI B3		Designed By	57	
Project Number:			20-9510	J11				Checked By		
Catchment ID:			B5					,	2025-06-30	
catchinent ib.		Drainage Area		ha				Rainfall Data	. 2023-06-30	
		Precent Impervious		%					Smith Falls IDF Lookup	
		riecent impervious	0.0	/0			100 Vo	ar 12 HR Rainfall Depth		mm
				Slope Lar	nduse and Soil Type I	Iontification	100 10	ат 12 нк каппап верпт	. 74.0	111111
		Agriculture	0	0	ha	iertinication		Pervious Areas	Impervious Areas	
		Range		0	ha		Length	67.80	0	m
		Grass		0	ha		US Elev.	132.00	0	m
		Woods		0.341	ha		DS Elev.	131.20	0	m
		Wetland		0.341	ha		Slope	1.18		%
		Gravel		0	ha		Terrain	Flat		70
		Impervious		0	ha		renam	riat		
		impervious	U	0	11d					
		Sum	0.781	0.341	ha		Note:			
		Soil Name		Muck			Flat:0-2% slopes			
		Soil Type		D			Rolling:2-6% slopes			
		Composite C		0.12			Hilly:>6% slopes			
		composite o	0.00	0.12			Timy. For Stopes			
				Composite Ru	unoff and Curve Num	ber Calculations				
					Land Use				Compos	ite Values
Parameter	Hydrologic Soil Group								Incl.	Not Incl.
		Agriculture	Range	Grass	Woods	Wetland	Gravel	Imperv.	Imperv.	Imperv.
									Nashyd	Standhyd
	FlatB	0.43	0.18	0.11	0.08	0.05	0.43	0.90	0.08	0.08
D	FlatD	0.73	0.32	0.20	0.12	0.05	0.50	0.90	0.12	0.12
Runoff Coefficient, C										
	В	78.00	69.00	69.00	60.00	50.00	85.00	98.00	60.00	60.00
	D	89.00	84.00	84.00	79.00	77.00	89.00	98.00	79.00	79.00
SCS Curve No., CN	, , , , , , , , , , , , , , , , , , ,	87.00	04.00	04.00	77.00	77.00	07.00	70.00	77.00	77.00
Initial Abstraction, mm										
Tiltidi Abstraction, Tilli		5	8	5	8	10	2.5	1.5	8.0	8.0
					of Concentration Calc				- ()	
Total Flow Length	US Elev.	DS Elev.	Avg. Slope	Terrain	Composite C	Airport Formula	Bransby Formula	Minimum	Tc (min)	Tp (hr)
67.8	132.00	131.2	1.18	Flat	0.09	25.67	3.70	10	25.7	0.29
				Hydr	rologic Parameters Su	mmary				
				Catchment		.122	ha			
				Impervious Percent		0.0	%			
				Slope		1.18	%			
				Runoff Co-efficient		0.09				
				SCS Curve No:	65.77	65.77				
				Modified CN*	64	64				
				Initial Abstraction		8.0	mm			
			Т	ime of Concentration, To		25.7	min			
				Time to Peak, Tp		0.29	hr			
Notes:										
	obtained from Design	Chart H2-6A, M.T.O. Dra	inage Manual, 1980.							
1.Hydrologic Soil Group				t Manual, 1997, and						
	otained from M.T.O. De:	sign chart 1.07, IVI.1.0. t								
2.Runoff coefficient ob	otained from M.T.O. De: aryland State Highway A									
2.Runoff coefficient ob Tables 4-5a to 4-5d, Ma	aryland State Highway A									
2.Runoff coefficient ob Tables 4-5a to 4-5d, Ma	aryland State Highway A ed from M.T.O. Design	Administration.								

Project Name:	Santaguida Subdivision			Designed By: SZ	
Project Number:	20-9510			Checked By: RC	
Catchment ID:	B5			Date: 2025-06-30	
	Drainage Area	1.122	ha	Rainfall Data	
	Precent Impervious	0.0	%	Guage Station: Smith Falls IDF Lookup	
	Composite Runoff Co-efficent	0.09		100 Year 12 HR Rainfall Depth: 94.6 mm	

	IDF Parameters										
Co-efficient	o-efficient 25 mm 2 -Year 5 Year 10 Year 25 Year 50 Year 100 Y										
A	405	20.2	26.8	31.2	36.7	40.8	44.8				
В	3	0	0	0	0	0	0				
С	0.76	0.699	0.699	0.699	0.699	0.699	0.699				

			Rationa	l Method			
Design Storm	Area (ha)	Composite C	Tc (min)	I (mm/hr)	Composite C Multiplier (%)	Peakflow (m3/s)	Peakflow (L/s)
25 mm Storm	1.122	0.09	25.7	31.6	1	0.009	9
2- Year	1.122	0.09	25.7	36.5	1	0.010	10
5-Year	1.122	0.09	25.7	48.5	1	0.013	13
10-Year	1.122	0.09	25.7	56.4	1	0.015	15
25-Year	1.122	0.10	25.7	66.4	10	0.020	20
50-Year	1.122	0.11	25.7	73.8	20	0.025	25
100-Year	1.122	0.11	25.7	81.0	25	0.027	27

- Notes:

 1. Composite runoff co-efficents are calculated based on the weighted landuse

 2. Runoff co-efficients for 25, 50 and 100 year storms have been increased by 10%, 20% and 25% respectively.

			H	ydrologic Parameters	for B6				
Project Name:	Sa	antaguida Subdivi	sion				Designed By:	SZ	
Project Number:	20	0-9510					Checked By:	RC	
Catchment ID:	Be	6					Date:	2025-06-30	
	Drainage Area	4.290	ha				Rainfall Data		
	Precent Impervious	0.0	%				Guage Station:	Smith Falls IDF Loc	okup
						100 Yea	r 12 HR Rainfall Depth:	94.6	mm
			Slope,	Landuse and Soil Type I	dentification				
	Agriculture	0	0	ha			Pervious Areas	Impervious Are	as
	Range	0	0	ha		Length	85.00	0	m
	Grass	0	0	ha		US Elev.	132.10	0	m
	Woods	2.696	1.594	ha		DS Elev.	131.00	0	m
	Wetland	0	0	ha		Slope	1.29		%
	Gravel	0	0	ha		Terrain	Flat		
	Impervious	0	0	ha				*	
	Sum	2.696	1.594	ha		Note:			
	Soil Name	Farmington	Muck			Flat:0-2% slopes			
	Soil Type	В	D			Rolling:2-6% slopes			
	Composite C	0.08	0.12			Hilly:>6% slopes			
			Composite	Runoff and Curve Num	ber Calculations				
				Land Use				Con	nposite Values
Baramotor Hudrologic	Cail Canna							leal	Makingl

			Land Use							
Parameter	Hydrologic Soil Group	Agriculture	Range	Grass	Woods	Wetland	Gravel			Not Incl. Imperv.
									Nashyd	Standhyd
	FlatB	0.43	0.18	0.11	0.08	0.05	0.43	0.90	0.08	0.08
Donnett Confficient C	FlatD	0.73	0.32	0.20	0.12	0.05	0.50	0.90	0.12	0.12
Runoff Coefficient, C										
	В	78.00	69.00	69.00	60.00	50.00	85.00	98.00	60.00	60.00
606 0 N. ON	D	89.00	84.00	84.00	79.00	77.00	89.00	98.00	79.00	79.00
SCS Curve No., CN										
Initial Abstraction, mm		5	8	5	8	10	2.5	1.5	8.0	8.0

Total Flow Length US Elev. DS Elev. Avg. Slope Terrain Composite C Airport Formula Bransby Formula Minimum Tc (min) Tp (hr)													
85	132.10	131	1.29	Flat	0.09	27.91	3.98	10	27.9	0.31			

	Catchment		4.29		ha
	Impervious Percent		0.0		%
	Slope		1.29		%
	Runoff Co-efficient		0.09		
	SCS Curve No:	67.06		67.06	
	Modified CN*	67		67	
	Initial Abstraction	8.0		8.0	mm
Time o	of Concentration, Tc		27.9		min
	Time to Peak, Tp		0.31		hr

Notes:

1. Hydrologic Soil Group obtained from Design Chart H2-6A, M.T.O. Drainage Manual, 1980.

2.Runoff coefficient obtained from M.T.O. Design Chart 1.07, M.T.O. Drainage Management Manual, 1997, and

Tables 4-5a to 4-5d, Maryland State Highway Administration.

3.SCS Curve No. obtained from M.T.O. Design Chart 1.09, M.T.O. Drainage Management Manual, 1997, and

Table 2-2a, TR-55, page 2-5.

	Rational Method - B6										
Project Name:	Santaguida Subdivision			Designed By:	SZ						
Project Number:	20-9510			Checked By:	RC						
Catchment ID:	B6				Date: 2025-06-30						
	Drainage Area	4.29	ha		Rainfall Data						
	Precent Impervious	0.0	%		Guage Station: Smith Falls IDF Lookup						
	Composite Runoff Co-efficent	0.09			100 Year 12 HR Rainfall Depth: 94.6 mm						

	IDF Parameters											
Co-efficient	25 mm	2 -Year	5 Year	10 Year	25 Year	50 Year	100 Year					
A	405	20.2	26.8	31.2	36.7	40.8	44.8					
В	3	0	0	0	0	0	0					
С	0.76	0.699	0.699	0.699	0.699	0.699	0.699					

	Rational Method											
Design Storm	Area (ha)	Composite C	Tc (min)	l (mm/hr)	Composite C Multiplier (%)	Peakflow (m3/s)	Peakflow (L/s)					
25 mm Storm	4.29	0.09	27.9	29.9	1	0.031	31					
2- Year	4.29	0.09	27.9	34.5	1	0.036	36					
5-Year	4.29	0.09	27.9	45.8	1	0.048	48					
10-Year	4.29	0.09	27.9	53.3	1	0.056	56					
25-Year	4.29	0.10	27.9	62.7	10	0.073	73					
50-Year	4.29	0.11	27.9	69.7	20	0.089	89					
100-Year	4.29	0.11	27.9	76.5	25	0.097	97					

- Notes:

 1. Composite runoff co-efficents are calculated based on the weighted landuse
 2. Runoff co-efficients for 25, 50 and 100 year storms have been increased by 10%, 20% and 25% respectively.

				Hydr	ologic Parameters f	or EXT1				
Project Name:			Santaguida Subdivisio		·			Designed By:	SZ	
Project Number:			20-9510					Checked By:	RC	
Catchment ID:			EXT1						2025-06-30	
		Drainage Area		ha				Rainfall Data		
		Precent Impervious	33.1	%					Smith Falls IDF Lookup	
							100 Ye	ar 12 HR Rainfall Depth:	94.6	mm
					nduse and Soil Type Io	lentification	1			
		Agriculture		ha			Locath	Pervious Areas	Impervious Areas	
		Range		ha			Length US Elev.	8.70 130.80	5 131	m
		Grass		ha			DS Elev.	130.80	130.8	m m
		Woods Wetland		ha ha				17.24	4.00	m %
		Gravel		na ha			Slope Terrain	17.24 Hilly	4.00 Rolling	%
							rerrain	HIIIY	Kolling	
		Impervious	0.155	ha						
		Sum	0.468	ha			Note:			
		Soil Name		nu .			Flat:0-2% slopes			
		Soil Type					Rolling:2-6% slopes			
		Composite C					Hilly:>6% slopes			
		composite c	0.37				rilly.>0/0 slopes			
				Composite Ri	unoff and Curve Num	oer Calculations	1			
					Land Use				Compos	ite Values
Parameter			1		1	1		1		
Parameter	Hydrologic Soil Group			Grass	Woods	Wetland			Incl.	Not Incl.
		Agriculture	Range	Grass	Woods	vvetiand	Gravel	Imperv.	Imperv. Nashyd	Imperv. Standhyd
	HillyD	0.78	0.35	0.28	0.21	0.05	0.70	0.90	0.39	0.13
	niliyo	0.76	0.35	0.28	0.21	0.05	0.70	0.90	0.39	0.13
Runoff Coefficient, C										
	D	89.00	84.00	84.00	79.00	77.00	89.00	98.00	85.02	78.59
SCS Curve No., CN										
nitial Abstraction, mm										
nitial Abstraction, mm		5	8	5	8	10	2.5	1.5	6.5	9.0
				•						
					of Concentration Calc					,
Total Flow Length	US Elev.	DS Elev.	Avg. Slope	Terrain	Composite C	Airport Formula	Bransby Formula	Minimum	Tc (min)	Tp (hr)
13.7	131.00	129.3	12.41	Hilly	0.39	3.73	0.51	10	10.0	0.11
				Hydi	rologic Parameters Su	mmary				
				Catchment		.468	ha			
				Impervious Percent		33.1	%			
				Slope		2.41	%			
				Runoff Co-efficient		0.39				
				SCS Curve No:	85.02	78.59				
				Modified CN*	87	81				
				Initial Abstraction		9.0	mm			
			T	me of Concentration, To		10.0	min			
				Time to Peak, Tp		0.11	hr			
lotes:					·		·			
	-	Chart H2-6A, M.T.O. Dra	-							
		ign Chart 1.07, M.T.O. [Drainage Management	Manual, 1997, and						
	ryland State Highway A									
		Chart 1.09, M.T.O. Drain	nage Management Ma	nual, 1997, and						
Table 2-2a, TR-55, pag		ncentration for C < 0.40								

Rational Method - EXT1											
Project Name:	Santaguida Subdivision			Designed By: SZ							
Project Number:	20-9510			Checked By: RC							
Catchment ID:	EXT1			Date: 2025-06-30							
	Drainage Area	0.468	ha	Rainfall Data							
	Precent Impervious	33.1	%	Guage Station: Smith Falls IDF Lookup							
	Composite Runoff Co-efficent	0.39		100 Year 12 HR Rainfall Depth: 94.6 mm							

	IDF Parameters											
Co-efficient	25 mm	2 -Year	5 Year	10 Year	25 Year	50 Year	100 Year					
A	405	20.2	26.8	31.2	36.7	40.8	44.8					
В	3	0	0	0	0	0	0					
С	0.76	0.699	0.699	0.699	0.699	0.699	0.699					

	Rational Method											
Design Storm	Area (ha)	Composite C	Tc (min)	I (mm/hr)	Composite C Multiplier (%)	Peakflow (m3/s)	Peakflow (L/s)					
25 mm Storm	0.468	0.39	10.0	57.7	1	0.028	28					
2- Year	0.468	0.39	10.0	70.7	1	0.035	35					
5-Year	0.468	0.39	10.0	93.8	1	0.046	46					
10-Year	0.468	0.39	10.0	109.2	1	0.054	54					
25-Year	0.468	0.43	10.0	128.4	10	0.070	70					
50-Year	0.468	0.47	10.0	142.8	20	0.085	85					
100-Year	0.468	0.49	10.0	156.7	25	0.097	97					

- Notes:

 1. Composite runoff co-efficents are calculated based on the weighted landuse

 2. Runoff co-efficients for 25, 50 and 100 year storms have been increased by 10%, 20% and 25% respectively.

				H	Hydrologic Parameters fo	r EXT2					
Project Name:			Santaguida Subdivi	sion				Designed By:	SZ		
Project Number:			20-9510			Checked By: RC					
Catchment ID:			EXT2			Date: 2025-06-30					
		Drainage Area	2.191	ha				Rainfall Data			
		Precent Impervious	0.0	%		Guage Station: Smith Falls IDF Lookup					
							100 Yea	ır 12 HR Rainfall Depth:		mm	
				Slope	e, Landuse and Soil Type Id	entification					
		Agriculture	0	0	ha			Pervious Areas	Impervious Areas		
		Range	0.84	0	ha		Length	285.80	0	m	
		Grass	0	0	ha		US Elev.	135.90	0	m	
		Woods	1.265	0.086	ha		DS Elev.	131.00	0	m	
		Wetland	0	0	ha		Slope	1.71		%	
		Gravel	0	0	ha		Terrain	Flat			
		Impervious	0	0	ha						
		Sum	2.105	0.086	ha		Note:				
		Soil Name	Farmington	Muck			Flat:0-2% slopes				
		Soil Type	В	D			Rolling:2-6% slopes				
		Composite C	0.12	0.12			Hilly:>6% slopes				
				Composi	te Runoff and Curve Numb	er Calculations	*				
					Land Use				Compo	site Values	
Parameter Hydrol	logic Soil Group								Incl.	Not Incl.	
		A contract the con-	D	0	Maria and a	Maria and	01				

Composite Runoff and Curve Number Calculations												
					Land Use				Composite Values			
Parameter	Hydrologic Soil Group	Agriculture	Range	Grass	Woods	Wetland	Gravel			Not Incl. Imperv.		
									Nashyd	Standhyd		
	FlatB	0.43	0.18	0.11	0.08	0.05	0.43	0.90	0.12	0.12		
	FlatD	0.73	0.32	0.20	0.12	0.05	0.50	0.90	0.12	0.12		
Runoff Coefficient, C												
	В	78.00	69.00	69.00	60.00	50.00	85.00	98.00	63.59	63.59		
606 0 N ON	D	89.00	84.00	84.00	79.00	77.00	89.00	98.00	79.00	79.00		
SCS Curve No., CN												
Initial Abstraction, mm		5	8	5	8	10	2.5	1.5	8.0	8.0		

Total Flow Length US Elev. DS Elev. Avg. Slope Terrain Composite C Airport Formula Bransby Formula Minimum Tc (min) Tp (hr)												
285.8	135.90	131	1.71	Flat	0.12	45.25	13.53	10	45.3	0.51		

Catchment	2	.191	ha						
Impervious Percent		0.0	%						
Slope	1	1.71	%						
Runoff Co-efficient	(0.12							
SCS Curve No:	64.20	64.20							
Modified CN*	63	63							
Initial Abstraction	8.0	8.0	mm						
Time of Concentration, Tc	4	15.3	min						
Time to Peak, Tp	(0.51	hr						

Notes: 1. Hydrologic Soil Group obtained from Design Chart H2-6A, M.T.O. Drainage Manual, 1980.

2.Runoff coefficient obtained from M.T.O. Design Chart 1.07, M.T.O. Drainage Management Manual, 1997, and

Tables 4-5a to 4-5d, Maryland State Highway Administration.

3.SCS Curve No. obtained from M.T.O. Design Chart 1.09, M.T.O. Drainage Management Manual, 1997, and

Table 2-2a, TR-55, page 2-5.

Rational Method - EXT2											
Project Name:	Santaguida Subdivision			Designed By:	SZ						
Project Number:	20-9510			Checked By:	RC						
Catchment ID:	EXT2				Date: 2025-06-30						
	Drainage Area	2.191	ha		Rainfall Data						
	Precent Impervious	0.0	%		Guage Station: Smith Falls IDF Lookup						
	Composite Runoff Co-efficent	0.12			100 Year 12 HR Rainfall Depth: 94.6 mm						

	IDF Parameters										
Co-efficient	25 mm	2 -Year	5 Year	10 Year	25 Year	50 Year	100 Year				
A	405	20.2	26.8	31.2	36.7	40.8	44.8				
В	3	0	0	0	0	0	0				
С	0.76	0.699	0.699	0.699	0.699	0.699	0.699				

	Rational Method										
Design Storm	Area (ha)	Composite C	Tc (min)	l (mm/hr)	Composite C Multiplier (%)	Peakflow (m3/s)	Peakflow (L/s)				
25 mm Storm	2.191	0.12	45.3	21.3	1	0.015	15				
2- Year	2.191	0.12	45.3	24.6	1	0.017	17				
5-Year	2.191	0.12	45.3	32.6	1	0.023	23				
10-Year	2.191	0.12	45.3	38.0	1	0.027	27				
25-Year	2.191	0.13	45.3	44.7	10	0.034	34				
50-Year	2.191	0.14	45.3	49.7	20	0.041	41				
100-Year	2.191	0.15	45.3	54.5	25	0.048	48				

- Notes:

 1. Composite runoff co-efficents are calculated based on the weighted landuse
 2. Runoff co-efficients for 25, 50 and 100 year storms have been increased by 10%, 20% and 25% respectively.

					ologic Parameters fo	r EXT3				
oject Name:			Santaguida Subdivisi	on				Designed By	: SZ	
oject Number:			20-9510					Checked By	: RC	
tchment ID:			EXT3					Date	2025-06-30	
		Drainage Area	0.055	ha				Rainfall Data		
		Precent Impervious	0.0	%				Guage Station	: Smith Falls IDF Look	ın
							100 Yea	r 12 HR Rainfall Depth		mm
				Slope, Lar	nduse and Soil Type Ide	entification				
		Agriculture	0	ha	, , , , , , , , , , , , , , , , , , , ,			Pervious Areas	Impervious Areas	
		Range	0.028	ha			Length	28.60	0	m
		Grass	0.028	ha			US Elev.	136.00	0	m
			0.027					135.00	0	
		Woods		ha			DS Elev.		U	m
		Wetland	0	ha			Slope	3.50		%
		Gravel	0	ha			Terrain	Rolling		
		Impervious	0	ha					•	
		Sum	0.055	ha			Note:			
		Soil Name	Farmington				Flat:0-2% slopes			
		Soil Type	В				Rolling:2-6% slopes			
		Composite C	0.16				Hilly:>6% slopes			
				Composite Ru	unoff and Curve Numbe	er Calculations				
					Land Use				Compo	osite Values
Parameter	Hydrologic Soil Group								Incl.	Not Incl.
		Agriculture	Range	Grass	Woods	Wetland	Gravel	Imperv.	Imperv.	Imperv.
									Nashyd	Standhyd
	RollingB	0.48	0.20	0.16	0.11	0.05	0.53	0.90	0.16	0.16
	i	!								
Runoff Coefficient, C	•	1								
	•	1								
	В	78.00	69.00	69.00	60.00	50.00	85.00	98.00	64.58	64.58
	i									
SCS Curve No., CN	i	!								
	i	!								
nitial Abstraction, mm	•	5	8	5	8	10	2.5	1.5	8.0	8.0
				Time	e of Concentration Calcula	ations				
Total Flow Length	US Elev.	DS Elev.	Avg. Slope	Terrain	Composite C	Airport Formula	Bransby Formula	Minimum	Tc (min)	Tp (hr)
			3.50	Rolling	0.16	10.84	1.70	10	10.8	0.12
28.6	136.00	135				ļ				
28.6	136.00	135	0.00							
28.6	136.00	135	0.00							
28.6	136.00	135	0.00							
28.6	136.00	135	0.50	Hydr	rologic Parameters Sum	nmary				
28.6	136.00	135	5.50	Hydr Catchment		nmary .055	ha			
28.6	136.00	135	5.50	Catchment	: 0.0	055				
28.6	136.00	135	5.50	Catchment Impervious Percent	: 0.i		%			
28.6	136.00	135	5.00	Catchment Impervious Percent Slope	: 0.i	055 0.0 3.50				
28.6	136.00	135	5.00	Catchment Impervious Percent Slope Runoff Co-efficient	: 0.0 : 0 3.0	055 0.0 .50 .16	%			
28.6	136.00	135	5.00	Catchment Impervious Percent Slope Runoff Co-efficient SCS Curve No:	0.0 3. 0. 64.58	055 0.0 .50 .16 64.58	%			
28.6	136.00	135	0.00	Catchment Impervious Percent Slope Runoff Co-efficient SCS Curve No: Modified CN*	0.1 3.3 64.58	055 0.0 .50 .16 64.58 63	%			
28.6	136.00	135		Catchment Impervious Percent Slope Runoff Co-efficient SCS Curve No: Modified CN* Initial Abstraction	0.0 3 0 64.58 63 8.0	055 0.0 .50 .16 64.58 63 8.0	% %			
28.6	136.00	135		Catchment Impervious Percent Slope Runoff Co-efficient SCS Curve No: Modified CN* Initial Abstraction me of Concentration, Tc	64.58 63 8.0	055 0.0 .50 .16 64.58 63 8.0	% % mm min			
,	136.00	135		Catchment Impervious Percent Slope Runoff Co-efficient SCS Curve No: Modified CN* Initial Abstraction	64.58 63 8.0	055 0.0 .50 .16 64.58 63 8.0	% %			
lotes:			ті	Catchment Impervious Percent Slope Runoff Co-efficient SCS Curve No: Modified CN* Initial Abstraction me of Concentration, Tc Time to Peak, Tp	64.58 63 8.0	055 0.0 .50 .16 64.58 63 8.0	% % mm min			
lotes:		135	ті	Catchment Impervious Percent Slope Runoff Co-efficient SCS Curve No: Modified CN* Initial Abstraction me of Concentration, Tc Time to Peak, Tp	64.58 63 8.0	055 0.0 .50 .16 64.58 63 8.0	% % mm min			
otes: Hydrologic Soll Group	p obtained from Design		Ti rainage Manual, 1980	Catchment Impervious Percent Slope Runoff Co-efficient SCS Curve No: Modified CN* Initial Abstraction me of Concentration, Tc Time to Peak, Tp	64.58 63 8.0	055 0.0 .50 .16 64.58 63 8.0	% % mm min			
otes: Hydrologic Soil Group Runoff coefficient ob	p obtained from Design	n Chart HZ-6A, M.T.O. D ssign Chart 1.07, M.T.O.	Ti rainage Manual, 1980	Catchment Impervious Percent Slope Runoff Co-efficient SCS Curve No: Modified CN* Initial Abstraction me of Concentration, Tc Time to Peak, Tp	64.58 63 8.0	055 0.0 .50 .16 64.58 63 8.0	% % mm min			
otes: Hydrologic Soil Group Runoff coefficient ob ables 4-5a to 4-5d, Ma	p obtained from Desigr tained from M.T.O. De aryland State Highway	n Chart HZ-6A, M.T.O. D ssign Chart 1.07, M.T.O.	Ti rainage Manual, 1980 Drainage Managemer	Catchment Impervious Percent Slope Runoff Co-efficient SCS Curve No: Modified CM* Initial Abstraction me of Concentration, Tc Time to Peak, Tp	64.58 63 8.0	055 0.0 .50 .16 64.58 63 8.0	% % mm min			

	Rational Method - EXT3											
Project Name:	Santaguida Subdivision			Designed By:	SZ							
Project Number:	20-9510			Checked By:	RC							
Catchment ID:	EXT3				Date: 2025-06-30							
	Drainage Area	0.055	ha		Rainfall Data							
	Precent Impervious	0.0	%		Guage Station: Smith Falls IDF Lookup							
	Composite Runoff Co-efficent	0.16			100 Year 12 HR Rainfall Depth: 94.6 mm							

	IDF Parameters										
Co-efficient	25 mm	2 -Year	5 Year	10 Year	25 Year	50 Year	100 Year				
A	405	20.2	26.8	31.2	36.7	40.8	44.8				
В	3	0	0	0	0	0	0				
С	0.76	0.699	0.699	0.699	0.699	0.699	0.699				

	Rational Method										
Design Storm	Area (ha)	Composite C	Tc (min)	I (mm/hr)	Composite C Multiplier (%)	Peakflow (m3/s)	Peakflow (L/s)				
25 mm Storm	0.055	0.16	10.8	55.1	1	0.001	1				
2- Year	0.055	0.16	10.8	67.0	1	0.002	2				
5-Year	0.055	0.16	10.8	88.9	1	0.002	2				
10-Year	0.055	0.16	10.8	103.4	1	0.002	2				
25-Year	0.055	0.18	10.8	121.7	10	0.003	3				
50-Year	0.055	0.19	10.8	135.3	20	0.004	4				
100-Year	0.055	0.20	10.8	148.5	25	0.004	4				

- Notes:

 1. Composite runoff co-efficents are calculated based on the weighted landuse
 2. Runoff co-efficients for 25, 50 and 100 year storms have been increased by 10%, 20% and 25% respectively.

oject Name:			Santaguida Subdivis	ion				Designed By:	SZ	
oject Number:			20-9510					Checked By:	RC	
tchment ID:			EXT4					Date:	2025-06-30	
		Drainage Area	1.791	ha						
		Precent Impervious	0.0	%				Guage Station:	Smith Falls IDF Looku	р
							100 Yea	ar 12 HR Rainfall Depth:	94.6	mm
						lentification				
		Agriculture	0	0	ha			Pervious Areas	Impervious Areas	
		Range	0.06	0	ha		Length	119.20	0	m
		Grass	0	0	ha		US Elev.	137.60	0	m
		Woods	0	1.731	ha		DS Elev.	133.50	0	m
		Wetland	0	0	ha		Slope	3.44		%
		Gravel	0	0	ha		Terrain	Rolling		
		Impervious	0	0	ha				*	
		Sum	0.06	1.731	ha		Note:			
		Soil Name	Farmington	Muck			Flat:0-2% slopes			
		Soil Type	В	D			Rolling:2-6% slopes			
		Composite C	0.20	0.15			Hilly:>6% slopes			
				Composite	Runoff and Curve Numl	per Calculations				
					Land Use				Compo	site Values
Parameter	Hydrologic Soil Group								Incl.	Not Incl.
		Agriculture	Range	Grass	Woods	Wetland	Gravel	Imperv.	Imperv.	Imperv.
									Nashyd	Standhyd
	RollingB	0.48	0.20	0.16	0.11	0.05	0.53	0.90	0.20	0.20
	RollingD	0.78	0.34	0.24	0.15	0.05	0.60	0.90	0.15	0.15

Total Flow Length	US Elev.	DS Elev.	Avg. Slope	Terrain	Composite C	Airport Formula	Bransby Formula	Minimum	Tc (min)	Tp (hr)	
119.2	137.60	133.5	3.44	Rollina	0.15	22.49	5.01	10	22.5	0.25	

60.00

79.00

50.00

77.00

10

85.00

89.00

2.5

98.00

98.00

1.5

69.00

79.00

8.0

69.00

79.00

8.0

Catchment	1	.791		ha						
Impervious Percent		0.0		%						
Slope	3	3.44		%						
Runoff Co-efficient	().15								
SCS Curve No:	78.66		78.66							
Modified CN [⋆]	80		80							
Initial Abstraction	8.0		8.0	mm						
Time of Concentration, Tc	2	2.5		min						
Time to Peak, Tp	(0.25		hr						

Notes: 1. Hydrologic Soil Group obtained from Design Chart H2-6A, M.T.O. Drainage Manual, 1980.

2.Runoff coefficient obtained from M.T.O. Design Chart 1.07, M.T.O. Drainage Management Manual, 1997, and

78.00

89.00

69.00

84.00

69.00

84.00

Tables 4-5a to 4-5d, Maryland State Highway Administration.

D

SCS Curve No., CN

Initial Abstraction, mm

3.SCS Curve No. obtained from M.T.O. Design Chart 1.09, M.T.O. Drainage Management Manual, 1997, and

Table 2-2a, TR-55, page 2-5.

	Rational Method - EXT4										
Project Name:	Santaguida Subdivision			Designed By:	SZ						
Project Number:	20-9510			Checked By:	RC						
Catchment ID:	EXT4				Date: 2025-06-30						
	Drainage Area	1.791	ha		Rainfall Data						
	Precent Impervious	0.0	%		Guage Station: Smith Falls IDF Lookup						
	Composite Runoff Co-efficent	0.15			100 Year 12 HR Rainfall Depth: 94.6 mm						

	IDF Parameters									
Co-efficient	25 mm	2 -Year	5 Year	10 Year	25 Year	50 Year	100 Year			
A	405	20.2	26.8	31.2	36.7	40.8	44.8			
В	3	0	0	0	0	0	0			
С	0.76	0.699	0.699	0.699	0.699	0.699	0.699			

Rational Method									
Design Storm	Area (ha)	Composite C	Tc (min)	l (mm/hr)	Composite C Multiplier (%)	Peakflow (m3/s)	Peakflow (L/s)		
25 mm Storm	1.791	0.15	22.5	34.6	1	0.025	25		
2- Year	1.791	0.15	22.5	40.1	1	0.029	29		
5-Year	1.791	0.15	22.5	53.2	1	0.039	39		
10-Year	1.791	0.15	22.5	61.9	1	0.045	45		
25-Year	1.791	0.17	22.5	72.8	10	0.060	60		
50-Year	1.791	0.18	22.5	81.0	20	0.071	71		
100-Year	1.791	0.19	22.5	88.9	25	0.082	82		

- Notes:

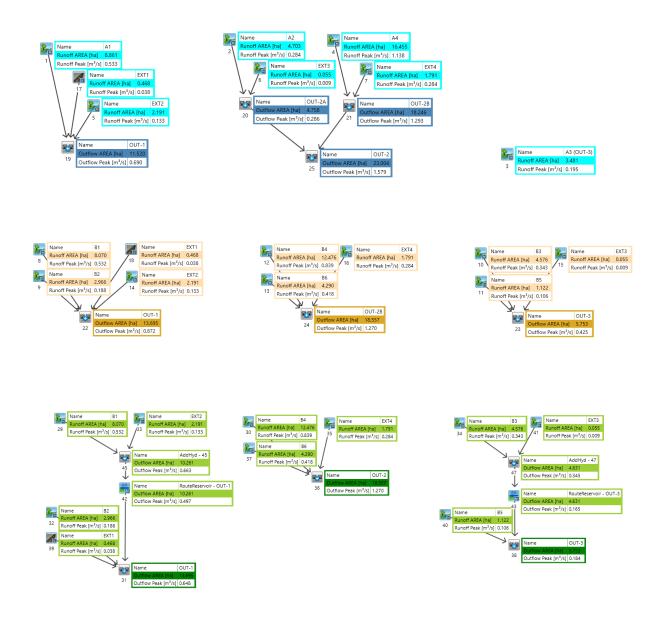
 1. Composite runoff co-efficents are calculated based on the weighted landuse
 2. Runoff co-efficients for 25, 50 and 100 year storms have been increased by 10%, 20% and 25% respectively.

CONCEPTUAL STORMWATER MANAGEMENT REPORT SANTAGUIDA SUBDIVISION



APPENDIX D – VO6 MODEL SCHEMATIC & RESULTS

VO6 MODEL SCHEMATIC: Pre-Development, Post-Development (Uncontrolled) and Post-Development (Controlled)



```
_____
_____
               / I SSSSS U U A L
/ I SS U U AAA L
I SS U U AAAAA L
I SS U U A A L
          VV
                 I SSSSS UUUUU A A LLLLL
        000 TTTTT TTTTT H H Y Y M M 000
0 0 T T H H Y Y MM MM 0 0
0 0 T T H H Y M M 0 0
000 T T H H Y M M 000
        0 0
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.
                     ***** DETAILED OUTPUT *****
  Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output filename:
C:\Users\s.zahedi\AppData\Local\Civica\VH5\e58e56e5-dd85-4558-af7a-fb9e8006ce04\316
c3e59-3e52-47b0-b7b3-ac19e64bb5d4\sce
C:\Users\s.zahedi\AppData\Local\Civica\VH5\e58e56e5-dd85-4558-af7a-fb9e8006ce04\316
c3e59-3e52-47b0-b7b3-ac19e64bb5d4\sce
DATE: 07-30-2025
                                                TIME: 04:57:17
USER:
COMMENTS:
  *************
  Filename: C:\Users\s.zahedi\AppD
     READ STORM
                                       ata\Local\Temp\
     Unit Hyd Qpeak (cms)= 0.218
     PEAK FLOW (cms)= 0.158
TIME TO PEAK (hrs)= 6.667
RUNOFF VOLUME (mm)= 33.699
TOTAL RAINFALL (mm)= 94.800
RUNOFF COEFFICIENT = 0.355
                                  0.158 (i)
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
  CALIB
  NASHYD ( 0001)
                         Area (ha)= 8.86 Curve Number (CN)= 66.0
Ia (mm)= 8.50 # of Linear Res.(N)= 3.00
|ID= 1 DT= 5.0 min |
 ----- U.H. Tp(hrs)= 0.57
     Unit Hyd Qpeak (cms)= 0.594
      PEAK FLOW
                                0.430 (i)
                       (cms)=
     TIME TO PEAK (hrs)= 6.583
RUNOFF VOLUME (mm)= 34.297
TOTAL RAINFALL (mm)= 94.800
RUNOFF COEFFICIENT = 0.362
      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
  CALTR
            ( 0005)
                         Area (ha)= 2.19 Curve Number (CN)= 63.0 Ia (mm)= 8.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.51
  NASHYD
|ID= 1 DT= 5.0 min |
     Unit Hyd Qpeak (cms)= 0.164
     PEAK FLOW
                       (cms)=
                                  0.106 (i)
     TIME TO PEAK (hrs)= 6.500
RUNOFF VOLUME (mm)= 31.926
TOTAL RAINFALL (mm)= 94.800
RUNOFF COEFFICIENT = 0.337
      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

Area (ha)= 0.47 Total Imp(%)= 15.50 Dir. Conn.(%)= 15.50

STANDHYD (0017) |ID= 1 DT= 5.0 min |

hrs 0.00	mm/hr				RAIN		
				' hrs			
		3.08				9.25	3.32
0.08			3.79				3.32
0.17	2.37		3.79			9.42	3.32
0.25		3.33	3.79		17.06		3.32
0.33	2.37		3.79			9.58	3.32
0.42		3.50		6.58	7.58	9.67 9.75	3.32
0.50		3.58	3.79				3.32
0.58	2.37					9.83	3.32
0.67		3.75	3.79		7.58	9.92	3.32
0.75		3.83		6.92	7.58	10.00	3.32
0.83		3.92	3.79	7.00	7.58	10.08	1.90
0.92		4.00				10.17	1.90
1.00		4.08		7.17	5.69	10.25	1.90
1.08		4.17				10.33	1.90
1.17		4.25				10.42	1.90
1.25	2.37	4.33	5.69	7.42	5.69	10.50 10.58	1.90
1.33		4.42					1.90
1.42		4.50		7.58	5.69	10.67	1.90
1.50		4.58	7.58			10.75	1.90
1.58		4.67				10.83	1.90
1.67		4.75	7.58			10.92	1.90
1.75		4.83		7.92			1.90
1.83		4.92		8.00	5.69	11.08 11.17	1.90
1.92		5.00					1.90
2.00		5.08				11.25	1.90
2.08		5.17				11.33	1.90
2.17				8.33		11.42	1.90
2.25			11.38			11.50	1.90
2.33		5.42	11.38	8.50	3.32	11.58	1.90
2.42	2.84	5.50	11.38	8.58 8.67	3.32	11.67	1.90
2.58	2.84	0.08	45.50	8.67	3.32	11.75	1.90
2.67	2.04] 5.0/ E 7E	45.50	8.75 8.83	2.22	11.03	1.90
2.75	2.04] 5./5	125 14	8.92	2.22	12.00	
2.83				9.00			1.96
2.92				9.08			
3.00				9.17			
3.00	2.04	0.00	17.00	1 9.17	3.32		

		IMPERVIOUS	PERVIOUS	(i)
Surface Area	(ha)=	0.07	0.40	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	4.00	17.24	
Length	(m)=	5.00	8.70	
Mannings n	=	0.130	0.250	
Max.Eff.Inten.(m	ım/hr)=	125.14	99.33	
over	(min)	5.00	5.00	
Storage Coeff.	(min)=	1.02 (ii) 60.00 (ii)
Unit Hyd. Tpeak	(min)=	5.00	60.00	
Unit Hyd. peak	(cms)=	0.34	0.02	
				TOTALS
PEAK FLOW	(cms)=	0.03	0.03	0.033 (iii)
TIME TO PEAK	(hrs)=	6.08	6.92	6.08
RUNOFF VOLUME	(mm)=	93.80	63.02	67.72
TOTAL RAINFALL	(mm)=	94.80	94.80	94.80
RUNOFF COEFFICIE	NT =	0.99	0.66	0.71

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! ***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20% YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

 CN* = 85.0 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.

ADD HYD (0019)								
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.				
	(ha)	(cms)	(hrs)	(mm)				
ID1= 1 (0001):	8.86	0.430	6.58	34.30				
+ ID2= 2 (0017):	0.47	0.033	6.08	67.72				
=======================================								
ID = 3 (0019):	9.33	0.454	6.58	35.97				

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0019)				
3 + 2 = 1	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0019):	9.33	0.454	6.58	35.97
+ ID2= 2 (0005):	2.19	0.106	6.50	31.93

```
ID = 1 ( 0019): 11.52 0.559 6.58 35.20
```

Area (ha)= 8.07 Curve Number (CN)= 69.0 Ia (mm)= 7.60 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.57

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB

NASHYD

(0008)

ID= 1 DT= 5.0 min

Unit Hyd Qpeak (cms)= 0.541 PEAK FLOW 0.435 (i) (cms)= TIME TO PEAK (hrs)= 6.583
RUNOFF VOLUME (mm)= 37.769
TOTAL RAINFALL (mm)= 94.800
RUNOFF COEFFICIENT = 0.398 (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. CALTR Area (ha)= 2.97 Curve Number (CN)= 62.0 Ia (mm)= 8.20 # of Linear Res.(N)= 3.00 NASHYD |ID= 1 DT= 5.0 min | U.H. Tp(hrs)= 0.46 Unit Hyd Qpeak (cms)= 0.246 PEAK FLOW (cms)= 0.150 (i) PEAK FLOW (cms) = 0.150
TIME TO PEAK (hrs) = 6.417
RUNOFF VOLUME (mm) = 30.952
TOTAL RAINFALL (mm) = 94.800
RUNOFF COEFFICIENT = 0.326 (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. Area (ha)= 2.19 Curve Number (CN)= 63.0 NASHYD (0014) Ia (mm)= 8.00 U.H. Tp(hrs)= 0.51 |ID= 1 DT= 5.0 min | # of Linear Res.(N)= 3.00 Unit Hyd Qpeak (cms)= PEAK FLOW TIME TO PEAK 0.106 (i) (hrs)= 6.500 RUNOFF VOLUME (mm)= 31.926 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. ADD HYD (0022) | 3 + 2 = 1AREA **OPEAK** TPEAK R.V. (ha) 2.66 (cms) 0.129 (hrs) 6.58 (mm) 38.23 ID1= 3 (0022): + ID2= 2 (0008): 8.07 0.435 6.58 37.77 ID = 1 (0022): 10.73 0.564 6.58 37.88 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. ADD HYD (0022)| 1 + 2 = 3 | AREA OPEAK TPEAK R.V. (cms) 0.564 (ha) 10.73 (hrs) 6.58 (mm) 37.88 ID1= 1 (0022): + ID2= 2 (0009): 2.97 0.150 6.42 30.95 ID = 3 (0022): 13.69 0.707 6.58 36.38 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. CALTB NASHYD (0010) Area (ha)= 4.58 Curve Number (CN)= 72.0 |ID= 1 DT= 5.0 min | Ia (mm)= 6.80 ----- U.H. Tp(hrs)= 0.54 # of Linear Res.(N)= 3.00 Unit Hyd Qpeak (cms)= 0.324 PEAK FLOW (cms)= 0.283
TIME TO PEAK (hrs)= 6.500
RUNOFF VOLUME (mm)= 41.459
TOTAL RAINFALL (mm)= 94.800
RUNOFF COEFFICIENT = 0.437 0.283 (i) (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. Area (ha)= 1.12 Curve Number (CN)= 64.0 Ia (mm)= 8.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.29 NASHYD (0011) ID= 1 DT= 5.0 min |

TOTAL RAINFALL (mm)= 94.800 RUNOFF COEFFICIENT = 0.337

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

I CALTE Area (ha)= 0.47 Total Imp(%)= 15.50 Dir. Conn.(%)= 15.50 STANDHYD (0018) ID= 1 DT= 5.0 min | IMPERVIOUS PERVIOUS (i) Surface Area (ha)= 0.07 (mm)= (%)= (m)= 1.00 1.50 Dep. Storage Average Slope 4.00 17.24 8.70 55.86 Length Mannings n 0.130 0.250 Max.Eff.Inten.(mm/hr)= 125.14 99.33 over (min) Storage Coeff. (min)= 5.00 4.33 (ii) 60.00 (ii) Unit Hyd. Tpeak (min)= Unit Hyd. peak (cms)= 5.00 60.00 0.23 0.02 *TOTALS* PEAK FLOW TIME TO PEAK (cms)= 0.033 (iii) TIME TO PEAK (hrs)=
RUNOFF VOLUME (mm)=
TOTAL RAINFALL (mm)= 6.08 6.92 6.08 93.80 67.72 94.80 94.80 94.80 RUNOFF COEFFICIENT 0.99 0.66 0.71 ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

***** WARNING: FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
- CN* = 85.0 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.

ADD HYD (0022) 1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0014):	2.19	0.106	6.50	31.93
+ ID2= 2 (0018):	0.47	0.033	6.08	67.72
ID = 3 (0022):	2.66	0.129	6.58	38.23

Unit Hyd Qpeak (cms)= 0.148 PEAK FLOW (cms)= 0.084 (i) TIME TO PEAK (hrs)= 6.250 (mm)= 32.789 RUNOFF VOLUME TOTAL RAINFALL TOTAL RAINFALL (mm)= 94.800 RUNOFF COEFFICIENT = 0.346

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

-----| CALIB Area (ha)= 0.05 Curve Number (CN)= 63.0 Ia (mm)= 8.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.12 NASHYD (0015) |ID= 1 DT= 5.0 min | Unit Hyd Qpeak (cms)= 0.018 PEAK FLOW TIME TO PEAK 0.007 (i) (hrs)= 6.083 RUNOFF VOLUME (mm)= 31.494
TOTAL RAINFALL (mm)= 94.800
RUNOFF COEFFICIENT = 0.332

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

| ADD HYD (0023)| | 1 + 2 = 3 | AREA QPEAK TPEAK (ha) (cms) (hrs) (mm) ID1= 1 (0010): + ID2= 2 (0011): 0.283 6.50 41.46 1.12 0.084 6.25 32.79 ID = 3 (0023): 5.70 0.346 6.42 39.75

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0023)				
3 + 2 = 1	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0023):	5.70	0.346	6.42	39.75
+ ID2= 2 (0015):	0.05	0.007	6.08	31.49
ID = 1 (0023):	5.75	0.348	6.42	39.67

```
Area (ha)= 12.48 Curve Number (CN)= 77.0 Ia (mm)= 6.60 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.75
 NASHYD
             ( 0012)
|ID= 1 DT= 5.0 min |
     Unit Hyd Qpeak (cms)= 0.635
                                     0.705 (i)
     TIME TO PEAK (hrs)= 6.750
RUNOFF VOLUME (mm)= 47.414
TOTAL RAINFALL (mm)= 94.800
      TIME TO PEAK
      RUNOFF COEFFICIENT =
      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
 CALIB |
NASHYD ( 0013)
                            Area (ha)= 4.29 Curve Number (CN)= 67.0 Ia (mm)= 8.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.31
|ID= 1 DT= 5.0 min |
     Unit Hyd Qpeak (cms)= 0.529
      PEAK FLOW
                          (cms) = 0.334 (i)
     TIME TO PEAK (hrs)= 6.250
RUNOFF VOLUME (mm)= 35.543
TOTAL RAINFALL (mm)= 94.800
RUNOFF COEFFICIENT = 0.375
      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
 CALTB
           ( 0016)
                            Area (ha)= 1.79
  NASHYD
                                                        Curve Number
|ID= 1 DT= 5.0 min | Ia (mm)= 8.00
----- U.H. Tp(hrs)= 0.25
                                       (mm)= 8.00
                                                        # of Linear Res.(N)= 3.00
      Unit Hyd Qpeak (cms)= 0.274
     PEAK FLOW (cms)= 0.235
TIME TO PEAK (hrs)= 6.167
RUNOFF VOLUME (mm)= 50.088
TOTAL RAINFALL (mm)= 94.800
                                     0.235 (i)
      RUNOFF COEFFICIENT =
                                    0.528
     Unit Hyd Qpeak (cms)= 0.018
      PEAK FLOW
                          (cms)=
                                     0.007 (i)
     TIME TO PEAK (hrs)= 6.083
RUNOFF VOLUME (mm)= 31.494
TOTAL RAINFALL (mm)= 94.800
RUNOFF COEFFICIENT = 0.332
      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
 ADD HYD ( 0020)|
1 + 2 = 3 |
                                    ΔRFΔ
                                              OPEAK
                                                          TΡΕΔΚ
                                                                      R.V.
                                    (ha)
                                              (cms)
                                                          (hrs)
                                                                       (mm)
       ID1= 1 ( 0002):
+ ID2= 2 ( 0006):
                                    4.70
                                             a 229
                                                          6.58
                                                                    33.70
                                             0.007
         ID = 3 (0020):
                                    4.76 0.231
                                                                  33.67
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
          ( 0004)
Unit Hyd Qpeak (cms)= 1.103
                                     0.933 (i)
      PEAK FLOW
                          (cms)=
     TIME TO PEAK (hrs)= 6.583
RUNOFF VOLUME (mm)= 39.539
TOTAL RAINFALL (mm)= 94.800
RUNOFF COEFFICIENT = 0.417
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
 CALIB |
NASHYD ( 0007)
                            Area (ha)= 1.79 Curve Number (CN)= 80.0 Ia (mm)= 8.00 # of Linear Res.(N)= 3.00
ID= 1 DT= 5.0 min
                            U.H. Tp(hrs)= 0.25
     Unit Hyd Qpeak (cms)= 0.274
      PEAK FLOW
                          (cms) = 0.235 (i)
```

TIME TO PEAK

```
(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
| ADD HYD ( 0024)|
| 1 + 2 = 3 |
                                 AREA
                                          QPEAK
                                                     TPEAK
                                  (ha)
                                         (cms)
0.705
                                                     (hrs)
                                                               (mm)
47.41
      ID1= 1 ( 0012):
+ ID2= 2 ( 0013):
                                12.48
                                 4.29
                                         0.334
                                                     6.25
                                                               35.54
        ID = 3 (0024):
                               16.77
                                        0.903
                                                     6.58
                                                               44.38
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 ADD HYD ( 0024)|
3 + 2 = 1 |
                                AREA QPEAK
                                                     TPEAK
                                                                R.V.
                               (ha)
16.77
                                         (cms)
0.903
                                                     (hrs)
6.58
                                                               (mm)
44.38
        ID1= 3 ( 0024):
      + ID2= 2 ( 0016):
                                1.79
                                         0.235
                                                     6.17
                                                               50.09
      ID = 1 ( 0024): 18.56 1.049
                                                     6.42
                                                             44 93
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 CALTB
  NASHYD ( 0002)
                          Area (ha)= 4.70 Curve Number (CN)= 65.0
|ID= 1 DT= 5.0 min |
                          Ta
                                    (mm)= 8.00 # of Linear Res.(N)= 3.00
                         U.H. Tp(hrs)= 0.55
     Unit Hyd Qpeak (cms)= 0.327
     PEAK FLOW
TIME TO PEAK
                                  0.229 (i)
                        (cms)=
                       (hrs)=
                                   6.583
     TIME TO PEAK (hrs)= 6.583
RUNOFF VOLUME (mm)= 33.698
TOTAL RAINFALL (mm)= 94.800
RUNOFF COEFFICIENT = 0.355
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
 NASHYD ( 0006)
                          Area (ha)= 0.05 Curve Number (CN)= 63.0 Ia (mm)= 8.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.12
|ID= 1 DT= 5.0 min |
     RUNOFF VOLUME (mm)= 50.088
TOTAL RAINFALL (mm)= 94.800
RUNOFF COEFFICIENT = 0.528
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
| ADD HYD ( 0021)|
| 1 + 2 = 3 |
                                 AREA
                                 (ha)
                                           (cms)
                                                     (hrs)
                                                                 (mm)
      ID1= 1 ( 0004):
+ ID2= 2 ( 0007):
                                16.45
                                         0.933
                                                      6.58
                                                               39.54
                                 1.79
                                         0.235
                                                     6.17
                                                               50.09
        ID = 3 ( 0021): 18.25
                                        1.061
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
| ADD HYD ( 0025)|
| 1 + 2 = 3 |
                                 AREA
                                         QPEAK
                                                     TPEAK
                                                                 R.V.
                                 (ha)
4.76
                                         (cms)
0.231
                                                     (hrs)
6.58
                                                               (mm)
33.67
      ID1= 1 ( 0020):
+ ID2= 2 ( 0021):
                                18.25
                                         1.061
                                                     6.50
                                                               40.57
       ID = 3 ( 0025):
                               23.00 1.291
                                                     6.50
                                                              39.15
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 CALIB
                          Area (ha)= 8.07 Curve Number (CN)= 69.0 Ia (mm)= 7.60 # of Linear Res.(N)= 3.00
            ( 0029)
| ID= 1 DT= 5.0 min |
                          U.H. Tp(hrs)= 0.57
     Unit Hyd Qpeak (cms)= 0.541
     PEAK FLOW
                        (cms) = 0.435 (i)
      TIME TO PEAK
                       (hrs)= 6.583
(mm)= 37.769
     RUNOFF VOLUME
     TOTAL RAINFALL (mm)= 94.800
RUNOFF COEFFICIENT = 0.398
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

| CALIB

```
Ia (mm)= 8.00
U.H. Tp(hrs)= 0.51
                                                                                                                                Unit Hyd Qpeak (cms)= 0.246
                                                                                                                                PEAK FLOW (cms)= 0.150
TIME TO PEAK (hrs)= 6.417
RUNOFF VOLUME (mm)= 30.952
TOTAL RAINFALL (mm)= 94.800
RUNOFF COEFFICIENT = 0.326
     Unit Hvd Opeak (cms)= 0.164
      PEAK FLOW
                                   0.106 (i)
                         (cms)=
      TIME TO PEAK (hrs)= 6.500
RUNOFF VOLUME (mm)= 31.926
TOTAL RAINFALL (mm)= 94.800
      TOTAL RAINFALL (mm)= 94.800
RUNOFF COEFFICIENT = 0.337
      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
                                                                                                                           CALIB
                                                                                                                            STANDHYD ( 0039)
                                                                                                                           |ID= 1 DT= 5.0 min |
 ADD HYD ( 0045)|
1 + 2 = 3 |
                                  AREA QPEAK
(ha) (cms)
8.07 0.435
                                                               R.V.
                                                                                                                                Surface Area
                                                      TPEAK
                                                      (hrs) (mm)
6.58 37.77
6.50 31.93
                                                                                                                                Dep. Storage
         ID1= 1 ( 0029):
                                                                                                                                Average Slope
      + ID2= 2 ( 0033):
                                 2.19 0.106
                                                                                                                                Length
          Mannings n
        ID = 3 ( 0045): 10.26 0.540 6.58 36.52
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 RESERVOIR( 0042)|
IN= 2---> OUT= 1 |
                             OVERFLOW IS OFF
                             OUTFLOW STORAGE | OUTFLOW STORAGE (cms) (ha.m.) | (cms) (ha.m.) 0.0000 | 0.6520 0.1
 DT= 5.0 min
                                                                             0.1300
                                               QPEAK TPEAK
(cms) (hrs)
0.540 6.58
0.398 7.08
                                     ARFA
                                                                           (mm)
                                      (ha)
                                              (cms)
                                                                       (mm)
36.52
36.52
   INFLOW: ID= 2 ( 0045)
                                    10.261
   OUTFLOW: ID= 1 ( 0042)
                                  10.261
                      PEAK FLOW REDUCTION [Qout/Qin](%)= 73.74
TIME SHIFT OF PEAK FLOW (min)= 30.00
                      MAXIMUM STORAGE USED
 CAL TR
                          Area (ha)= 2.97 Curve Number (CN)= 62.0
Ia (mm)= 8.20 # of Linear Res.(N)= 3.00
|ID= 1 DT= 5.0 min |
                                                     # of Linear Res.(N)= 3.00
                           U.H. Tp(hrs)= 0.46
                                                                                                                          | ADD HYD ( 0031)|
1 + 2 = 3
                                  ΔRFΔ
                                           OPEAK
                                                      TΡΕΔΚ
                                                                  R.V.
                                  (ha)
2.97
                                            (cms)
                                                      (hrs)
                                                                   (mm)
      ID1= 1 ( 0032):
+ ID2= 2 ( 0039):
                                          0.150
                                                      6.42
                                                                30.95
         ID = 3 (0031):
                                                                                                                            CALIB |
NASHYD ( 0037)|
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 ADD HYD ( 0031)|
3 + 2 = 1 |
                                  AREA
                                           QPEAK
                                                      TPEAK
                                                                   R.V.
                                                                                                                                PEAK FLOW
                                  (ha)
                                            (cms)
                                                      (hrs)
                                                             35.96
                                                                   (mm)
      ID1= 3 ( 0031):
+ ID2= 2 ( 0042):
                                                      6.50
                                  3.43 0.170
10.26 0.398
                                 10.26
                                          0.398
                                                                36.52
        ID = 1 ( 0031): 13.70 0.522
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 CALIB
  NASHYD ( 0030)
                          Area (ha)= 12.48 Curve Number (CN)= 77.0 Ia (mm)= 6.60 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.75
|ID= 1 DT= 5.0 min |
                                                                                                                           ADD HYD ( 0036)
     Unit Hyd Qpeak (cms)= 0.635
     TIME TO PEAK (hrs)= 6.750
RUNOFF VOLUME (mm)= 47.414
TOTAL RAINFALL (mm)= 94.800
RUNOFF COEFFICIENT = 0.500
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
                                                                                                                            ADD HYD ( 0036)|
                                                                                                                             3 + 2 = 1
                          Area (ha)= 1.79 Curve Number (CN)= 80.0 Ia (mm)= 8.00 # of Linear Res.(N)= 3.00
|ID= 1 DT= 5.0 min |
                           U.H. Tp(hrs)= 0.25
     Unit Hyd Qpeak (cms)= 0.274
      PEAK FLOW
                        (cms)= 0.235 (i)
     TIME TO PEAK (hrs)=
RUNOFF VOLUME (mm)=
                          (hrs)= 6.167
(mm)= 50.088
      RUNOFF VOLUME (mm)= 50.088
TOTAL RAINFALL (mm)= 94.800
```

```
(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
                          Area (ha)= 0.47
Total Imp(%)= 15.50 Dir. Conn.(%)= 15.50
                                                   PERVIOUS (i)
                          (ha)=
                                       0.07
                                                       0.40
                          (mm)=
(%)=
                                       1.00
                                                       1.50
                                                      17.24
                                       55.86
                                                       8.70
                                                      0.250
                                      0.130
      Max.Eff.Inten.(mm/hr)=
     over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)=
                                       5.00
4.33 (ii)
                                                      10.00
                                                      60.00 (ii)
                                        5.00
                                                      60.00
     PEAK FLOW (cms)=
TIME TO PEAK (hrs)=
RUNOFF VOLUME (mm)=
TOTAL RAINFALL (mm)=
                                       9.92
                                                       0.03
                                                                       0.033 (iii)
                                                                         6.08
                                        6.08
                                                       6.92
                                       93.80
                                                      63.02
                                                                        67.72
      RUNOFF COEFFICIENT =
                                       0.99
                                                       0.66
                                                                         0.71
***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20% YOU SHOULD CONSIDER SPLITTING THE AREA.
        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
       CN* = 85.0 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.
     RUNOFF COEFFICIENT = 0.528
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
Unit Hyd Qpeak (cms)= 0.529
                        (cms)=
                                  0.334 (i)
     TIME TO PEAK (hrs)= 6.250
RUNOFF VOLUME (mm)= 35.543
TOTAL RAINFALL (mm)= 94.800
RUNOFF COEFFICIENT = 0.375
      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
                                  AREA
                                          OPEAK
                                                      TPEAK
                                                                  R.V.
                                                      (hrs)
6.75
                                                               (mm)
47.41
      ID1= 1 ( 0030): 12.48 0.705
+ ID2= 2 ( 0035): 1.79 0.235
                                                               50.09
                                                      6.67
         ID = 3 ( 0036):
                               14.27 0.791
                                                              47.75
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
                                 ARFA
                                          QPEAK
                                                      TPFAK
                                                                 R.V.
                                                     6.67 47.75
6.25 35
                               (ha)
14.27
                                           (cms)
      ID1= 3 ( 0036):
+ ID2= 2 ( 0037):
                                         0.791
                                          0.334
        ID = 1 ( 0036): 18.56 1.049
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 CALIB
                                  (ha)= 4.58 Curve Number (CN)= 72.0
(mm)= 6.80 # of Linear Res.(N)= 3.00
                          Area
```

```
----- U.H. Tp(hrs)= 0.54
     Unit Hyd Qpeak (cms)= 0.324
     PEAK FLOW
                              0.283 (i)
                      (cms)=
     TIME TO PEAK (hrs)= 6.500
RUNOFF VOLUME (mm)= 41.459
TOTAL RAINFALL (mm)= 94.800
     RUNOFF COEFFICIENT =
                              0.437
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
  CALTR
                       Area (ha)= 0.05
  NASHYD
                                              Curve Number
                                                               (CN) = 63.0
 |ID= 1 DT= 5.0 min |
                       Ta
                                (mm)= 8.00
                                              # of Linear Res.(N)= 3.00
                      U.H. Tp(hrs)=
     Unit Hyd Qpeak (cms)= 0.018
                              0.007 (i)
     PEAK FLOW
                      (cms)=
     TIME TO PEAK (hrs)= 6.083
RUNOFF VOLUME (mm)= 31.494
TOTAL RAINFALL (mm)= 94.800
      TIME TO PEAK
     RUNOFF COEFFICIENT = 0.332
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
  ADD HYD ( 0047) |
1 + 2 = 3
                              ARFA
                                      QPEAK
                              (ha)
                                      (cms)
                                               (hrs)
                                                          (mm)
      ID1= 1 ( 0034):
+ ID2= 2 ( 0041):
                              4 58
                                     0.283
                                               6.50
                                                       41 46
                                     0.007
                              0.05
                                                        31.49
         _____
        ID = 3 (0047):
                            4.63 0.284
                                              6.50
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
                          OVERFLOW IS OFF
  RESERVOIR( 0043)
  IN= 2---> OUT= 1
DT= 5.0 min
                          OUTFLOW
                                     STORAGE | OUTFLOW STORAGE
                                     (ha.m.) |
0.0000
                                                 (cms) (ha.m.)
| 0.1950 0.1
                           (cms)
                            0.0740
                                        0.0500
                                                      0.0000
                                                                   0.0000
0 0 T T H H Y M M 0 0.
000 T T H H Y M M 00.
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.
                   ***** DETAILED OUTPUT *****
  Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
 C:\Users\s.zahedi\AppData\Local\Civica\VH5\e58e56e5-dd85-4558-af7a-fb9e8006ce04\011
 21eb9-f801-4dde-8ad9-9c10dd3e1d9f\sce
  Summary filename:
 C:\Users\s.zahedi\AppData\Local\Civica\VH5\e58e56e5-dd85-4558-af7a-fb9e8006ce04\011
 21eb9-f801-4dde-8ad9-9c10dd3e1d9f\sce
DATE: 07-30-2025
                                            TIME: 04:57:18
USER:
   **********
   READ STORM
                        Filename: C:\Users\s.zahedi\AppD
                                   ata\Local\Temp\
ec928a9d-07b7-4727-811a-533524b929ca\cf0589b1
                        Comments: 100yr 24hr 5min SCS
                  TIME
                          RATN I
                                  TTME
                                          RATN I
                                         mm/hr
                                                           mm/hr
                   hrs
                         mm/hr
                                   hrs
                                                    hrs
                                                                     hrs
                                                                           mm/hr
                         0.00
                  0.00
                                  6.08
                                          2.12
                                                 12.17
                                                          16.93 I
                                                                  18.25
                                                                           2.12
                                          2.12
                                                          16.93
                                  6.17
                                                                  18.33
```

0.17

0.33

1.29

1.29

1.29

6.25

6.33

6.42

2.12 İ

2.12

2.12

2.12 12.58

12.33

12.42 12.50

16.93 I

16.93

16.93

8.70

18.42

18.50

18.58

2.12

2.12

2.12

ΔRFΔ ΟΡΕΔΚ TPFΔK R.V. (cms) (ha) (hrs) (mm) INFLOW: ID= 2 (0047) 4.631 0.284 6.50 41.34 OUTFLOW: ID= 1 (0043) 41.31 0.132 7.42 PEAK FLOW REDUCTION [Qout/Qin](%)= 46.38
TIME SHIFT OF PEAK FLOW (min)= 55.00
MAXIMUM STORAGE USED (ha.m.)= 0.076 (min)= 55.00 (ha.m.)= 0.0763 | CALIB Unit Hyd Qpeak (cms)= 0.148 PEAK FLOW (cms) = 0.084 (i)| Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Company | Comp TOTAL RAINFALL (mm)= 94.800 RUNOFF COEFFICIENT = 0.346 (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. | ADD HYD (0038)| 1 + 2 = 3 ΔRFΔ ΟΡΕΔΚ TPFΔK R.V. (ha) (cms) (hrs) (mm) ID1= 1 (0040): + ID2= 2 (0043): 6.25 1.12 0.084 32.79 ID = 3 (0038): 5.75 0.146 39.64 7.25 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. ______ SSSSS U U A L SS U U AAA L SS U U AAAAA L SS U U A A L

SSSSS UUUUU A A LLLLL

6.58

2.12 L 12.67

OOO TTTTT TTTTT H H Y Y M M COO T T H H Y Y MM MM O

1.29

v v I

W т

0.50

4.33

4.50

1.88

1.88

1.88

10.42

10.50

10.58

10.67

0.58 1.29 6.67 2.12 12.75 8.70 18.83 2.12 0.67 1.29 6.75 2.12 12.83 8.70 18.92 2.12 0.83 1.29 6.92 2.12 | 13.00 8.70 19.08 2.12 7.00 1.29 2.12 13.08 6.35 2.12 0.92 19.17 1.29 7.08 2.59 1.00 13.17 6.35 19.25 2.12 19.33 19.42 1.08 1.29 7.17 2.59 13.25 6.35 2.12 13.33 2.59 2.12 1.25 1.29 7.33 2.59 13.42 6.35 19.50 2.12 13.50 13.58 6.35 1.42 1.29 7.50 2.59 4.94 19.67 2.12 2.59 13.67 4.94 19.75 2.12 1.29 1.58 1.29 7.67 2.59 13.75 4.94 19.83 2.12 13.83 13.92 1.67 1.29 7.75 2.59 4.94 19.92 2.12 1.75 1.29 7.83 2.59 4.94 20.00 2.12 1.83 1.29 7.92 2.59 14.00 4.94 20.08 1.41 2.00 1.29 8.08 3.06 14.17 3.53 20.25 1.41 1.53 1.53 14.25 14.33 3.53 3.53 1.41 3.06 20.33 2.17 3.06 | 20.42 8.25 8.33 3.06 14.42 14.50 2.25 1.53 3.53 20.50 1.41 20.58 1.41 2.33 1.53 3.06 3.53 2.42 1.53 8.50 3.06 14.58 3.53 20.67 1.41 3.29 14.67 2.50 8.58 3.53 1.41 3.53 2.58 1.53 8.67 3.29 14.75 20.83 1.41 14.83 14.92 1.41 2.75 1.53 8.83 3.29 3.53 21.00 1.41 2.83 1.53 1.53 8.92 3.29 15.00 15.08 3.53 21.08 1.41 9.00 3.29 3.53 21.17 1.41 3 00 1.53 9.08 3.76 15.17 3.53 21.25 1.41 15.25 3.53 21.33 9.17 3.17 1.53 9.25 3.76 15.33 3.53 21.42 1.41 3.76 3.76 15.42 15.50 9.33 3.53 1.41 1.53 3.33 9.42 3.53 21.58 1.41 3 42 1.53 1.53 9.50 3.76 4.23 15.58 15.67 3.53 3.53 21.67 21.75 1.41 9.58 3.58 1.53 9.67 4.23 İ 15.75 3.53 21.83 1.41 15.83 9.75 3.53 1.41 1.53 4.23 3.67 21.92 3.75 1.53 9.83 4.23 15.92 3.53 22.00 1.41 16.00 3.92 1.53 10.00 4.23 l 16.08 2.12 22.17 1.41 1.53 1.88 10.08 5.41 5.41 16.17 16.25 2.12 22.25 1.41 4.08 10.17 4.17 1.88 10.25 5.41 16.33 2.12 22.42 1.41

16.42

16.58

16.67

16.75

2.12

2.12

2.12

2.12 22.83

22.58

22.67

22.75

1.41

1.41

5.41 İ 16.50

5.41

7.29

7.29

(v 6.2.2019)

8.70 I 18.75

000 0

```
7.29 l
                  4.67
                           1.88
                                 I 10.75
                                                     16.83
                                                               2.12 I
                                                                       22.92
                                                                                 1.41
                   4.75
                           1.88
                                             7.29
                                                               2.12
                                                                       23.00
                                                                                 1.41
                                   10.83
                                                     16.92
                   4.83
                           1.88
                                   10.92
                                             7.29
                                                     17.00
                                                               2.12
                                                                       23.08
                                                                                 1.41
                                                     17.08
                                            11.29 İ
                                                     17.17
                   5.00
                           1.88
                                   11.08
                                                               2.12
                                                                       23.25
                                                                                 1.41
                                   11.17
                                            11.29
                                                     17.25
                                                               2.12
                                                                       23.33
                                                                                  1.41
                   5.08
                           1.88
                                            11.29
                                                     17.33
                   5.17
                            1.88
                                   11.25
                                                               2.12
                                                                       23.42
                                                                                  1.41
                   5.25
                            1.88
                                   11.33
                                            11.29
                                                     17.42
                                                               2.12
                                                                       23.50
                                                                                  1.41
                                                     17.50
                                            11.29
                           1.88
                                                               2.12
                                                                       23.58
                                                                                  1.41
                   5.33
                                   11.42
                   5.42
                           1.88
                                   11.50
                                            11.29
                                                     17.58
                                                               2.12
                                                                       23.67
                                                                                 1.41
                                   11.58
                                            34.81
                                                     17.75
                   5.58
                           1.88
                                   11.67
                                            34.81
                                                               2.12
                                                                       23.83
                                                                                 1.41
                            1.88
                                   11.75
                                            34.81
                                                     17.83
                                                               2.12
                                                                                  1.41
                   5.75
                           1.88
                                  | 11.83 | 143.94 | 17.92
                                                               2.12 | 24.00
                                                                                 1.41
                                   11.92 143.94 |
12.00 143.94 |
                   5.83
                           1.88
                                                     18.00
                                                               2.12
                           1.88
                                                               2.12
                   5.92
                                                     18.08
                   6.00
                           1.88 | 12.08
                                            16.93 | 18.17
                                                               2.12
               0003)
                         Area (ha)= 3.48 Curve Number (CN)= 65.0 Ia (mm)= 8.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.61
NASHYD ( 0005, ID= 1 DT= 5.0 min |
     Unit Hyd Qpeak (cms)= 0.218
                       (cms)= 0.195 (i)
     PEAK FLOW
     PEAK FLOW (cms) = 0.195
TIME TO PEAK (hrs) = 12.583
RUNOFF VOLUME (mm) = 48.755
TOTAL RAINFALL (mm) = 117.600
RUNOFF COEFFICIENT = 0.415
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
 CALIB
Unit Hyd Qpeak (cms)= 0.594
     PEAK FLOW (cms)= 0.533 (i)
TIME TO PEAK (hrs)= 12.583
RUNOFF VOLUME (mm)= 49.604
TOTAL RAINFALL (mm)= 117.600
RUNOFF COEFFICIENT = 0.422
      $\sf CN^*=85.0\> 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.
 ADD HYD ( 0019)|
1 + 2 = 3 |
                                                           R.V.
                                AREA QPEAK
                                                  TPEAK
                                                 (hrs) (mm)
12.58 49.60
12.08 88.77
                                (ha)
                                       (cms)
0.533
      ID1= 1 ( 0001):
+ ID2= 2 ( 0017):
                                8.86
                                0.47 0.038
        _____
       ID = 3 ( 0019): 9.33 0.560 12.58 51.57
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY
| ADD HYD ( 0019)|
| 3 + 2 = 1 |
                                AREA
                                         QPEAK
                                                  TPEAK
                                                              R.V.
                                (ha)
                                                   (hrs)
                                         (cms)
                                                           (mm)
51.57
      ID1= 3 ( 0019):
+ ID2= 2 ( 0005):
                                9.33 0.560
                                                  12.58
                                2.19
                                        0.133
                                                  12.50
                                                            46.42
        ID = 1 ( 0019): 11.52 0.690
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
Unit Hyd Qpeak (cms)= 0.541
     PEAK FLOW
                       (cms)=
                                 0.532 (i)
     TIME TO PEAK (hrs)= 12.583
RUNOFF VOLUME (mm)= 53.988
TOTAL RAINFALL (mm)= 117.600
     RUNOFF COEFFICIENT = 0.459
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

(0009) Area (ha)= 2.97 Curve Number (CN)= 62.0

CALTR

CALIB

NASHYD

NASHYD

```
(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
CALTR
           ( 0005)
                           Area (ha)= 2.19 Curve Number (CN)= 63.0
Ia (mm)= 8.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.51
  NASHYD
|ID= 1 DT= 5.0 min |
      Unit Hyd Qpeak (cms)= 0.164
      PEAK FLOW
                          (cms)=
                                     0.133 (i)
      TIME TO PEAK (hrs)= 12.500
RUNOFF VOLUME (mm)= 46.417
TOTAL RAINFALL (mm)= 117.600
RUNOFF COFFETTEENT
      RUNOFF COEFFICIENT = 0.395
      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
  CALIB
  STANDHYD ( 0017)
                            Area
                                      (ha) = 0.47
                             Total Imp(%)= 15.50 Dir. Conn.(%)= 15.50
|ID= 1 DT= 5.0 min |
                                      IMPERVIOUS PERVIOUS (i)
                           (ha)=
      Surface Area
                                          0.07
                                                          0.40
      Dep. Storage
Average Slope
                           (mm)=
(%)=
                                          1.00
4.00
                                                          1.50
      Length
                           (m)=
                                          5.00
                                                           8.70
      Mannings n
                                         0.130
                                                          0.250
                                        143.94
                                                        119.44
      Max.Eff.Inten.(mm/hr)=
      over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
                                          5.00
                                                          5.00
                                          0.96 (ii)
5.00
                                                          60.00 (ii)
                                                          60.00
      Unit Hyd. peak (cms)=
                                          0.34
                                                           0.02
                                                                           *TOTALS*
      PEAK FLOW
                          (cms)=
                                          0.03
                                                           0.03
                                                                             0.038 (iii)
      TIME TO PEAK (hrs)=
RUNOFF VOLUME (mm)=
TOTAL RAINFALL (mm)=
RUNOFF COEFFICIENT =
                                        116.60
                                                          83.76
                                                                             88.77
                                                                            117.60
                                        117.60
                                          0.99
                                                          0.71
                                                                              0.75
***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
                  YOU SHOULD CONSIDER SPLITTING THE AREA.
        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
|ID= 1 DT= 5.0 min | Ia (mm)= 8.20 # of Linear Res.(N)= 3.00 ----- U.H. Tp(hrs)= 0.46
      Unit Hyd Opeak (cms)= 0.246
                          (cms)= 0.188 (i)
      PEAK FLOW
      TIME TO PEAK (hrs)= 12.417
RUNOFF VOLUME (mm)= 45.147
TOTAL RAINFALL (mm)= 117.600
      RUNOFF COEFFICIENT
                                = 0.384
      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
| CALIB | NASHYD ( 0014) | Area (ha)= 2.19 Curve Number (CN)= 63.0 | | ID= 1 DT= 5.0 min | Ia (mm)= 8.00 # of Linear Res.(N)= 3.00 | U.H. Tp(hrs)= 0.51
      Unit Hyd Qpeak (cms)= 0.164
      PEAK FLOW (cms)= 0.133
TIME TO PEAK (hrs)= 12.500
RUNOFF VOLUME (mm)= 46.417
TOTAL RAINFALL (mm)= 117.600
RUNOFF COEFFICIENT = 0.395
                                     0.133 (i)
      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
 CALIB
  STANDHYD ( 0018)
                            Area (ha)= 0.47
Total Imp(%)= 15.50 Dir. Conn.(%)= 15.50
|ID= 1 DT= 5.0 min |
                                      IMPERVIOUS PERVIOUS (i)
                                      0.07
      Surface Area
                           (ha)=
                                                        0.40
                                                           1.50
      Dep. Storage
                                          1.00
                           (mm)=
      Average Slope
Length
                             `(%)=
                                          4.00
                                                          17.24
                            (m)=
      Mannings n
                                         0.130
                                                          0.250
      Max.Eff.Inten.(mm/hr)=
                                                         119.44
      over (min)
Storage Coeff. (min)=
                                          5.00
4.09 (ii)
                                                          10.00
                                                          60.00 (ii)
      Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)=
                                          5.00
                                                          60.00
```

0.24

0.03

(cms)=

PEAK FLOW

0.02

0.03

TOTALS

0.038 (iii)

```
TIME TO PEAK (hrs)=
RUNOFF VOLUME (mm)=
TOTAL RAINFALL (mm)=
                                      12.08
                                                      12.92
                                                                        12.08
                                                      83.76
                                     116.60
                                     117.60
                                                     117.60
                                                                       117.60
      RUNOFF COEFFICIENT
                                      0.99
                                                       0.71
***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
                YOU SHOULD CONSIDER SPLITTING THE AREA.
        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
       (1) CN* = 85.0 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.
| ADD HYD ( 0022)|
| 1 + 2 = 3 |
                                  ARFA
                                           QPEAK
                                  (ha)
                                            (cms)
                                                      (hrs)
                                                                  (mm)
        ID1= 1 ( 0014):
                                  2.19
                                          0.133
                                                     12.50
                                                                46 42
      + ID2= 2 ( 0018):
                                                                88.77
                                          0.038
                                                     12.08
                                  0.47
         ID = 3 (0022):
                                2.66 0.157
      NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
| ADD HYD ( 0022)|
| 3 + 2 = 1 |
                                           QPEAK
                                                      TPEAK
                                          (cms)
0.157
                                  (ha)
                                                      (hrs)
                                                                   (mm)
      ID1= 3 ( 0022):
+ ID2= 2 ( 0008):
                                  8.07
                                          0.532
                                                     12.58
                                                                53.99
                                10.73 0.689
        ID = 1 (0022):
                                                    12.58
                                                               53.96
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 ADD HYD ( 0022)|
1 + 2 = 3
                                  AREA
                                           QPEAK
                                 (ha)
10.73
                                          (cms)
0.689
                                                      (hrs)
                                                                  (mm)
      + ID2= 2 ( 0009):
                                  2.97
                                          0.188
                                                     12.42
                                                                45.15
         ID = 3 (0022):
                                 13.69
                                          0.872
                                                     12.50
                                                               52.05
      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
 ADD HYD ( 0023)|
1 + 2 = 3
                                  AREA
                                           OPEAK
                                                     TPEAK
                                                                R.V.
                                  (ha)
4.58
                                          (cms)
0.343
                                                     (hrs)
                                                                (mm)
58.58
      + ID2= 2 ( 0011):
                                  1.12
                                          0.106
                                                     12.25
                                                                47.56
        ID = 3 (0023):
                                 5.70 0.423 12.42
                                                               56.41
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 ADD HYD ( 0023)|
3 + 2 = 1 |
                                  AREA
                                          OPEAK
                                                      TPEAK
                                                                 R.V.
                                  (ha)
5.70
                                          (cms)
0.423
                                                     (hrs)
12.42
                                                                (mm)
56.41
         ID1= 3 ( 0023):
      + ID2= 2 ( 0015):
                                  0.05
                                          0.009
                                                     12.08
                                                                45.79
        ID = 1 ( 0023): 5.75 0.425 12.42 56.30
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 CALTB
  NASHYD ( 0012)
                           Area (ha)= 12.48 Curve Number (CN)= 77.0
|ID= 1 DT= 5.0 min | Ia (mm)= 6.60
----- U.H. Tp(hrs)= 0.75
                                                     # of Linear Res.(N)= 3.00
      Unit Hyd Qpeak (cms)= 0.635
     PEAK FLOW (cms)= 0.839
TIME TO PEAK (hrs)= 12.750
RUNOFF VOLUME (mm)= 65.933
TOTAL RAINFALL (mm)= 117.600
RUNOFF COEFFICIENT = 0.561
                                   0.839 (i)
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
                          Area (ha)= 4.29 Curve Number (CN)= 67.0 Ia (mm)= 8.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.31
 NASHYD
            ( 0013)
```

ID= 1 DT= 5.0 min |

```
NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
                                                     Area (ha)= 4.58 Curve Number (CN)= 72.0
   NASHYD
                         ( 0010)
|ID= 1 DT= 5.0 min |
                                                     Ia (mm)= 6.80
U.H. Tp(hrs)= 0.54
                                                                          (mm)= 6.80 # of Linear Res.(N)= 3.00
           Unit Hyd Qpeak (cms)= 0.324
                                                (cms)= 0.343 (i)
(hrs)= 12.500
            TIME TO PEAK
           RUNOFF VOLUME
TOTAL RAINFALL
                                                    (mm)= 58.575
           TOTAL RAINFALL (mm)= 117.600
RUNOFF COEFFICIENT = 0.498
            (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
Area (ha)= 1.12 Curve Number (CN)= 64.0 Ia (mm)= 8.00 # of Linear Res.(N)= 3.00
|ID= 1 DT= 5.0 min |
                                                  Ia (mm)= 8.00
U.H. Tp(hrs)= 0.29
           Unit Hyd Qpeak (cms)= 0.148
           PEAK FLOW
                                                 (cms)=
                                                                      0.106 (i)
           TIME TO PEAK (hrs)= 12.250
RUNOFF VOLUME (mm)= 47.556
TOTAL RAINFALL (mm)= 117.600
           TOTAL RAINFALL (mm)= 117.600
RUNOFF COEFFICIENT = 0.404
            (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
I CALTB
                     ( 0015)
                                                      Area (ha)= 0.05 Curve Number
   NASHYD
                                                                                                                                                 (CN) = 63.0
|ID= 1 DT= 5.0 min |
                                                     Ia
                                                                          (mm)= 8.00
                                                                                                           # of Linear Res.(N)= 3.00
                                                   U.H. Tp(hrs)= 0.12
            Unit Hyd Qpeak (cms)= 0.018
                                                                      0.009 (i)
           PEAK FLOW
TIME TO PEAK
                                                  (cms)=
           TIME TO PEAK (hrs)= 0.009
TIME TO PEAK (hrs)= 12.083
RUNOFF VOLUME (mm)= 45.793
TOTAL RAINFALL (mm)= 117.600
RUNOFF COEFFICIENT = 0.389
           Unit Hyd Qpeak (cms)= 0.529
           | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Collection | Col
            PEAK FLOW
                                                  (cms) = 0.418 (i)
           TOTAL RAINFALL (mm)= 117.600
RUNOFF COEFFICIENT = 0.435
           (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
| CALIB
                                                  Area (ha)= 1.79 Curve Number (CN)= 80.0
Ia (mm)= 8.00 # of Linear Res.(N)= 3.00
   NASHYD
                          ( 0016)
|ID= 1 DT= 5.0 min |
                                                   U.H. Tp(hrs)=
                                                                                         0.25
            Unit Hyd Qpeak (cms)= 0.274
           PEAK FLOW
TIME TO PEAK
                                                  (cms)= 0.284 (i)
                                                 (hrs)= 12.167
           RUNOFF VOLUME (mm)= 69.339
TOTAL RAINFALL (mm)= 117.600
RUNOFF COEFFICIENT = 0.590
           (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
| ADD HYD ( 0024)|
| 1 + 2 = 3 |
                                                                                      QPEAK
                                                                                                              TPEAK
                                                                     (ha)
                                                                                        (cms)
                                                                                                              (hrs)
                                                                                                                                      (mm)
             ID1= 1 ( 0012):
+ ID2= 2 ( 0013):
                                                                                                            12.75
                                                                    4.29
                                                                                     0.418
                                                                                                           12.25
                                                                                                                                  51.16
                                                                 16.77 1.086
                 ID = 3 (0024):
                                                                                                          12.50
                                                                                                                                62.15
           NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
| ADD HYD ( 0024)|
| 3 + 2 = 1 |
                                                                                                             TPEAK
                                                                                       QPEAK
  -----
                                                                      (ha)
                                                                                         (cms)
                                                                                                              (hrs)
                                                                                                                                      (mm)
             + ID2= 2 ( 0016):
                                                                    1.79 0.284
                                                                                                           12.17
                                                                                                                                 69.34
```

ID = 1 (0024):

18.56 1.270

12.33

62.85

```
NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS TE ANY
                         Area (ha)= 4.70 Curve Number (CN)= 65.0
 NASHYD
            ( 0002)
|ID= 1 DT= 5.0 min |
                        Ia (mm)= 8.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.55
     Unit Hyd Qpeak (cms)= 0.327
                     (cms)= 0.284
(hrs)= 12.500
                                0.284 (i)
     TIME TO PEAK
     RUNOFF VOLUME
TOTAL RAINFALL
                        (mm)= 48.755
                        (mm) = 117.600
     RUNOFF COEFFICIENT =
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW TE ANY
 NASHYD ( 0006)|
                        Area (ha)= 0.05 Curve Number (CN)= 63.0
Ia (mm)= 8.00 # of Linear Res.(N)= 3.00
|ID= 1 DT= 5.0 min |
                        Ia (mm)= 8.00
U.H. Tp(hrs)= 0.12
     Unit Hyd Qpeak (cms)= 0.018
     PEAK FLOW
                       (cms)=
                                0.009 (i)
     TIME TO PEAK (hrs)= 12.083
RUNOFF VOLUME (mm)= 45.793
TOTAL RAINFALL (mm)= 117.600
                        (mm)= 117.600
     RUNOFF COEFFICIENT =
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
| ADD HYD ( 0020)|
| 1 + 2 = 3 |
                               AREA
                                        OPEAK
                                                  TPEAK
                                                             R.V.
                                         (cms)
                                                 (hrs)
        ID1= 1 ( 0002):
                                4.70
                                       0.284
                                                           48.75
      + ID2= 2 ( 0006):
                                       0.009
                                                          45.79
                                0.05
                                                 12.08
        ID = 3 (0020):
                               4.76
                                       0.286
                                                            48.72
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS TE ANY
| CALIB
      + ID2= 2 ( 0021): 18.25 1.293 12.50 57.58
        ID = 3 ( 0025): 23.00 1.579
                                                12.50 55.75
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 CAL TR
                        Area (ha)= 8.07
Ia (mm)= 7.60
                                          8.07 Curve Number (CN)= 69.0
7.60 # of Linear Res.(N)= 3.00
  NASHYD
            ( 0029)
|ID= 1 DT= 5.0 min |
                         U.H. Tp(hrs)=
     Unit Hyd Qpeak (cms)= 0.541
                      (cms)= 0.532 (i)
     PEAK FLOW
     TIME TO PEAK (hrs)= 12.583
RUNOFF VOLUME (mm)= 53.988
TOTAL RAINFALL (mm)= 117.600
RUNOFF COEFFICIENT = 0.459
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
        ) ( 0033)
 ID= 1 DT= 5.0 min
     Unit Hyd Qpeak (cms)= 0.164
     PEAK FLOW
                       (cms)=
                                 0.133 (i)
     TIME TO PEAK (hrs)= 2.500
RUNOFF VOLUME (mm)= 46.417
TOTAL RAINFALL (mm)= 117.600
RUNOFF COEFFICIENT = 0.395
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
 ADD HYD ( 0045)|
1 + 2 = 3
                                AREA
                                        QPEAK
                                (ha)
                                         (cms)
                                                   (hrs)
                                                              (mm)
      + ID2= 2 ( 0033):
                               2.19
                                       0.133
                                                 12.50
                                                           46 42
```

ID = 3 (0045):

10.26 0.663

12.58

52.37

```
U.H. Tp(hrs)=
                                           0.57
     Unit Hvd Opeak (cms)= 1.103
     PEAK FLOW
                                 1.138 (i)
                        (cms)=
     TIME TO PEAK
RUNOFF VOLUME
TOTAL RAINFALL
                       (hrs)= 12.583
(mm)= 56.302
     TOTAL RAINFALL (mm)= 117.600
RUNOFF COEFFICIENT = 0.479
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
I CALTR
                         Area (ha)= 1.79 Curve Number (CN)= 80.0 Ia (mm)= 8.00 # of Linear Res.(N)= 3.00
            ( 0007)
|ID= 1 DT= 5.0 min |
                          U.H. Tp(hrs)=
     Unit Hyd Qpeak (cms)= 0.274
     PEAK FLOW
                        (cms) = 0.284 (i)
     TIME TO PEAK (hrs)= 0.284

RUNOFF VOLUME (mm)= 69.339

TOTAL RAINFALL (mm)= 117.600

RUNOFF COEFFICIENT = 0.590
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
| ADD HYD ( 0021)|
                                          QPEAK
                                                                R.V.
   1 + 2 = 3
                                ARFA
                                                    TPFAK
                                 (ha)
                                                    (hrs)
                                                                (mm)
                                          (cms)
      ID1= 1 ( 0004):
+ ID2= 2 ( 0007):
                               16.45
                                        1.138
                                                   12.58
                                                              56.30
                                1.79
                                         0.284
                                                   12.17
                                                              69.34
        ID = 3 ( 0021): 18.25 1.293
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
| ADD HYD ( 0025)|
| 1 + 2 = 3 |
                                 AREA
                                 (ha)
                                          (cms)
                                                     (hrs)
                                                                (mm)
        ID1= 1 ( 0020):
                                         0.286
                                                   12.50
                                                              48.72
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
RESERVOIR(
                            OVERFLOW IS OFF
 IN= 2---> OUT= 1
                                        STORAGE |
(ha.m.) |
 DT= 5.0 min
                            OUTFLOW
                                                       OUTFLOW STORAGE
                              (cms)
                                                         (cms)
                                                                    (ha.m.)
                              ิด ดดดด
                                            0 0000
                                                            0.6520
                                                                          0 1300
                              0.2430
                                            0.0600
                                                            0.0000
                                                                          0.0000
                                    AREA
                                               QPEAK
                                    (ha)
                                              (cms)
                                                          (hrs)
                                                                        (mm)
   INFLOW : ID= 2 ( 0045)
                                   10.261
                                                 0.663
                                                            12.58
                                                                         52.37
                                               0.497
   OUTFLOW: ID= 1 ( 0042)
                                  10.261
                                                            13.00
                                                                         52.37
                     PEAK FLOW REDUCTION [Qout/Qin](%)= 74.97
TIME SHIFT OF PEAK FLOW (min)= 25.00
                     MAXIMUM STORAGE USED
                                                        (ha.m.)= 0.1035
 CALTR
          ( 0032)
                        Area (ha)= 2.97 Curve Number (CN)= 62.0
Ia (mm)= 8.20 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.46
 NASHYD
|ID= 1 DT= 5.0 min |
     Unit Hyd Qpeak (cms)=
     PEAK FLOW
                        (cms)= 0.188 (i)
      TIME TO PEAK
                       (hrs)= 12.417
                         (mm)= 45.147
(mm)= 117.600
     RUNOFF VOLUME
     RUNOFF COEFFICIENT = 0.384
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
 STANDHYD ( 0039)
                          Area
                                   (ha) = 0.47
                          Total Imp(%)= 15.50
ID= 1 DT= 5.0 min |
                                                  Dir. Conn.(%)= 15.50
                                                  PERVIOUS (i)
                                  IMPERVIOUS
     Surface Area
                         (ha)=
                                      0.07
                                                     0.40
     Dep. Storage
Average Slope
                         (mm)=
(%)=
                                      1.00
                                                     1.50
     Length
                          (m)=
                                     55.86
                                                     8.70
     Mannings n
                                                    0.250
                                     0.130
```

Max.Eff.Inten.(mm/hr)=

143.94

119.44

Area (ha)= 16.45 Curve Number (CN)= 71.0 Ia (mm)= 8.00 # of Linear Res.(N)= 3.00

| NASHYD (0004)| |ID= 1 DT= 5.0 min |

```
over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
                                       5.00
                                                     10.00
                                       4.09 (ii)
                                                     60.00 (ii)
                                       5.00
                                                     60.00
     Unit Hyd. peak (cms)=
                                                                     *TOTALS*
     PEAK FLOW
                                                      9.93
                                                                      0.038 (iii)
     TIME TO PEAK (hrs)=
RUNOFF VOLUME (mm)=
TOTAL RAINFALL (mm)=
     TIME TO PEAK
                                      12.08
                                                     12.92
                                                                       12.08
                                    116.60
117.60
                                                     83.76
                                                                       88.77
                                                   117.60
                                                                     117.60
     RUNOFF COEFFICIENT
                                      0.99
                                                      0.71
***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING: FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.
       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
      CN* = 85.0 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.
 ADD HYD ( 0031)|
1 + 2 = 3 |
                                 AREA
                                          OPEAK
                                                    TPEAK
                                                                R.V.
                                 (ha)
2.97
                                                             45.15
                                                   12.42
         ID1= 1 ( 0032):
                                         0.188
                                                   12.08
      + ID2= 2 ( 0039):
                                 0.47
                                         0.038
                                                              88.77
        ID = 3 ( 0031):
                               3.43 0.210
                                                   12.42
                                                             51.09
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 ADD HYD ( 0031)|
   3 + 2 = 1
                                 ARFA
                                          OPEAK
                                                    TPEAK
                                                                R.V.
                                 (ha)
                                           (cms)
                                                     (hrs)
                                                                 (mm)
      ID1= 3 ( 0031):
+ ID2= 2 ( 0042):
                                 3.43
                                         0.210
                                                    12.42
                                                               51.09
        ID = 1 ( 0031): 13.70 0.648
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
         ( 0030)
  NASHYD
                          Area
                                    (ha)= 12.48 Curve Number (CN)= 77.0
ID= 1 DT= 5.0 min
                                    (mm)= 6.60 # of Linear Res.(N)= 3.00
  1 + 2 = 3
                                 ΔRFΔ
                                          OPEAK
                                                     TΡΕΔΚ
                                                                 R.V.
                                 (ha)
                                           (cms)
                                                   (hrs)
12.75
                                                                 (mm)
      ID1= 1 ( 0030):
+ ID2= 2 ( 0035):
                                12.48
                                         0.839
                                                               65.93
                                 1.79
         ID = 3 ( 0036): 14.27 0.938
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
| ADD HYD ( 0036)|
| 3 + 2 = 1 |
                                 AREA
                                          QPEAK
                                                     TPEAK
                                                                 R.V.
                                  (ha)
                                           (cms)
                                                     (hrs)
                                                                 (mm)
      ID1= 3 ( 0036):
+ ID2= 2 ( 0037):
                                14.27
                                         0.938
                                                   12.58
                                                               66.36
                                 4.29
                                         0.418
                                                    12.25
                                                               51.16
        ID = 1 ( 0036):
                               18.56 1.270
                                                   12.33
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 CALIB
  NASHYD ( 0034)
                          Area (ha)= 4.58 Curve Number (CN)= 72.0 Ia (mm)= 6.80 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.54
|ID= 1 DT= 5.0 min |
     Unit Hyd Qpeak (cms)= 0.324
     TIME TO PEAK (hrs)= 12.500

RUNOFF VOLUME (mm)= 58.575

TOTAL RAINFALL (mm)= 117.600

RUNOFF COEFFICIENT = 0.498
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
          ( 0041)
                          Area (ha)= 0.05 Curve Number (CN)= 63.0
Ia (mm)= 8.00 # of Linear Res.(N)= 3.00
|ID= 1 DT= 5.0 min |
                          U.H. Tp(hrs)= 0.12
     Unit Hyd Qpeak (cms)= 0.018
     PEAK FLOW
                        (cms) = 0.009 (i)
                      (hrs)= 12.083
(mm)= 45.793
      TIME TO PEAK
     RUNOFF VOLUME
      TOTAL RAINFALL (mm)= 117.600
```

```
----- U.H. Tp(hrs)= 0.75
      Unit Hyd Qpeak (cms)= 0.635
      PEAK FLOW
                          (cms)=
                                     0.839 (i)
      TIME TO PEAK (hrs)= 12.750
RUNOFF VOLUME (mm)= 65.933
TOTAL RAINFALL (mm)= 117.600
RUNOFF COEFFICIENT = 0.561
      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
 CALTR
                            Area (ha)= 1.79 Curve Number
Ia (mm)= 8 00 # of '
  NASHYD
|ID= 1 DT= 5.0 min |
                                                         # of Linear Res.(N)= 3.00
                           U.H. Tp(hrs)=
      Unit Hyd Qpeak (cms)= 0.274
      PEAK FLOW
TIME TO PEAK
                          (cms)= 0.284 (i)
      PEAK FLUW (cms) = 0.284
TIME TO PEAK (hrs)= 12.167
RUNOFF VOLUME (mm)= 69.339
TOTAL RAINFALL (mm)= 117.600
RUNOFF COEFFICIENT = 0.590
      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
 CALIB
           ( 0037)
                           Area (ha)= 4.29 Curve Number (CN)= 67.0 Ia (mm)= 8.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.31
 NASHYD
|ID= 1 DT= 5.0 min |
      Unit Hyd Qpeak (cms)= 0.529
      PEAK FLOW
                           (cms)=
                                     0.418 (i)
      TIME TO PEAK (hrs)= 12.250
RUNOFF VOLUME (mm)= 51.162
TOTAL RAINFALL (mm)= 117.600
RUNOFF COEFFICIENT = 0.435
      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
| ADD HYD ( 0036)|
      RUNOFF COEFFICIENT = 0.389
      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
| ADD HYD ( 0047)|
| 1 + 2 = 3 |
                                              QPEAK
                                    AREA
                                                          TPEAK
                                    (ha)
4.58
                                               (cms)
                                                           (hrs)
                                                                        (mm)
       ID1= 1 ( 0034):
+ ID2= 2 ( 0041):
                                     0.05
                                             0.009
                                                         12.08
                                                                     45.79
         ID = 3 (0047):
                                    4.63 0.345
                                                         12.50 58.42
      NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 RESERVOIR( 0043)|
                               OVERFLOW IS OFF
 IN= 2---> OUT= 1
DT= 5.0 min
                                             | STORAGE | OUTFLOW STORAGE | (ha.m.) | (cms) (ha.m.) | 0.0000 | 0.1950 0.1
                                OUTFLOW
                                 (cms)
0.0000
                                                                                   0.1050
                                                 0.0500
                                  0.0740
                                                                    0 0000
                                                                                   9 9999
                                                                 TPEAK
                                         AREA
                                                    OPEAK
                                                                                 R.V.
                                                                                 (mm)
58.42
                                                    (cms)
0.345
                                                                 (hrs)
12.50
   INFLOW : ID= 2 ( 0047)
                                         4.631
   OUTFLOW: ID= 1 ( 0043)
                       PEAK FLOW REDUCTION [Qout/Qin](%)= 48.02
TIME SHIFT OF PEAK FLOW (min)= 50.00
                        TIME SHIFT OF PEAK FLUW (וווווו) = סיט.שכ
MAXIMUM STORAGE USED (ha.m.)= 0.0916
 CALIB |
NASHYD ( 0040)|
                          Area (ha)= 1.12 Curve Number (CN)= 64.0
Ia (mm)= 8.00 # of Linear Res.(N)= 3.00
|ID= 1 DT= 5.0 min |
 ----- U.H. Tp(hrs)= 0.29
      Unit Hyd Qpeak (cms)= 0.148
      PEAK FLOW
                           (cms)=
                                     0.106 (i)
                          (hrs)= 12.250
(mm)= 47.556
      TIME TO PEAK
      RUNOFF VOLUME
TOTAL RAINFALL
      TOTAL RAINFALL (mm)= 117.600
RUNOFF COEFFICIENT = 0.404
      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
ADD HYD ( 0038)
   1 + 2 = 3
                               ΔRFΔ
                                       QPEAK
                                                 TPEAK
                                                                                                               COMMENTS:
                               (ha)
                                        (cms)
                                                  (hrs)
                                                             (mm)
        ID1= 1 ( 0040):
                               1.12
                                      0.106
                                                12.25
                                                          47 56
      + ID2= 2 ( 0043):
                                       0.165
                                                           58.39
                               4.63
                                                 13.33
        ID = 3 ( 0038):
                                     0.184
                                                                                                                  NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
                                                                                                                   READ STORM
                                                                                                                                         Filename: C:\Users\s.zahedi\AppD
                                                                                                                                                    ata\Local\Temp\
                                                                                                                                                     ec928a9d-07b7-4727-811a-533524b929ca\f533f344
                                                                                                                | Ptotal= 76.80 mm |
                                                                                                                                         Comments: 100yr 6hr 5min SCS
                      SSSSS U U A L
SS U U A A L
SS U U AAAAA L
                                                                                                                                  TIME
                                                                                                                                                   TIME
                                                             (v 6.2.2019)
                                                                                                                                           RAIN
                                                                                                                                                            RAIN |
                                                                                                                                                                     TIME
       v
           V
                т
                                                                                                                                   hrs
                                                                                                                                         mm/hr
0.00
                                                                                                                                                    hrs
                                                                                                                                                           mm/hr
7.68
                                                                                                                                                                       hrs
                                                                                                                                                                             mm/hr
16.90 |
                                                                                                                                                   1.58
                                                                                                                                                                     3.17
                                                                                                                                  0.00
        v v
                        SS
                 Ι
                             U
                                  UAAL
                                                                                                                                  0.08
                                                                                                                                           3.07
                                                                                                                                                   1.67
                                                                                                                                                            7.68
                                                                                                                                                                     3.25
                                                                                                                                                                             16.90
         VV
                      SSSSS UUUUU A A LLLLL
                Ι
                                                                                                                                  0.25
                                                                                                                                           3.07
                                                                                                                                                   1.83
                                                                                                                                                            7.68
                                                                                                                                                                     3.42
                                                                                                                                                                             16.90
       0.33
                                                                                                                                           3.07
3.07
                                                                                                                                                   1.92
                                                                                                                                                            7.68
7.68
                                                                                                                                                                     3.50
3.58
                                                                                                                                                                             16.90
7.68
                                                                                                                                  0.42
                                                                                                                                                   2.00
       0
                                                                                                                                  0.50
                                                                                                                                           3.07
                                                                                                                                                   2.08
                                                                                                                                                            9.22
                                                                                                                                                                     3.67
                                                                                                                                  0.58
                                                                                                                                           4.61
                                                                                                                                                            9.22
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
                                                                                                                                  0.67
                                                                                                                                           4.61
                                                                                                                                                   2.25
                                                                                                                                                            9.22
                                                                                                                                                                     3.83
                                                                                                                                                    2.33
All rights reserved.
                                                                                                                                  0.83
                                                                                                                                           4.61
                                                                                                                                                   2.42
                                                                                                                                                            9.22
                                                                                                                                                                     4.00
                                                                                                                                  0.92
                                                                                                                                                   2.50
                                                                                                                                                            9.22
                                                                                                                                                                     4.08
                                                                                                                                                    2.58
                                                                                                                                  1.00
                                                                                                                                                           46.08
                                                                                                                                           4.61
                    ***** DETAILED OUTPUT *****
                                                                                                                                  1.08
                                                                                                                                           4.61
                                                                                                                                                   2.67
                                                                                                                                                           46.08
                                                                                                                                                                     4.25
                                                                                                                                                   2.75
                                                                                                                                                           46.08
                                                                                                                                  1.17
                                                                                                                                           4.61
                                                                                                                                                                     4.33
                                                                                                                                  1.25
                                                                                                                                           4.61
                                                                                                                                                   2.83
                                                                                                                                                         119.81
                                                                                                                                                                     4.42
         filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
                                                                                                                                  1.42
                                                                                                                                           4.61
                                                                                                                                                   3.00
                                                                                                                                                         119.81
                                                                                                                                                                     4.58
C:\Users\s.zahedi\AppData\Local\Civica\VH5\e58e56e5-dd85-4558-af7a-fb9e8006ce04\779
ead43-33bf-4b10-b291-75bd72b7be58\sce Summary filename:
C:\Users\s.zahedi\AppData\Local\Civica\VH5\e58e56e5-dd85-4558-af7a-fb9e8006ce04\779
ead43-33bf-4b10-b291-75bd72b7be58\sce
                                                                                                                           ( 0003)
                                                                                                                 NASHYD
                                                                                                                                        Area
                                                                                                                                                 (ha)=
                                                                                                                                                          3.48
                                                                                                                                                                 Curve Number (CN)= 65.0
                                                                                                                |ID= 1 DT= 5.0 min |
                                                                                                                                                                 # of Linear Res.(N)= 3.00
                                                                                                                                                 (mm)=
                                                                                                                                                          8.00
----- U.H. Tp(hrs)= 0.61
                                                                                                                |ID= 1 DT= 5.0 min | Total Imp(%)= 15.50 Dir. Conn.(%)= 15.50
                                                                                                                                                               PERVIOUS (i)
     Unit Hyd Qpeak (cms)= 0.218
                                                                                                                                                IMPERVIOUS
                                                                                                                                                                  0.40
1.50
                                                                                                                     Surface Area
     PEAK FLOW
                      (cms)=
                                0.124 (i)
                                                                                                                                                    1.00
                                                                                                                     Dep. Storage
                                                                                                                                       (mm)=
                       (hrs)= 3.667
(mm)= 23.025
     TIME TO PEAK
                     (hrs)=
                                                                                                                     Average Slope
                                                                                                                                        (%)=
                                                                                                                                                     4.00
                                                                                                                                                                  17.24
     RUNOFF VOLUME
     TOTAL RAINFALL
                                                                                                                     Length
                                                                                                                                        (m)=
                                                                                                                                                     5.00
                                                                                                                                                                   8.70
     TOTAL RAINFALL (mm)=
RUNOFF COEFFICIENT =
                              76.800
                                                                                                                     Mannings n
                                                                                                                                                   0.130
                                                                                                                                                                  0.250
                                0.300
                                                                                                                     Max.Eff.Inten.(mm/hr)=
                                                                                                                                                  119.81
                                                                                                                                                                  89.31
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
                                                                                                                     over (min)
Storage Coeff. (min)=
                                                                                                                                                    5.00
1.03 (ii)
                                                                                                                                                                  60.00 (ii)
                                                                                                                     Unit Hyd. Tpeak (min)=
                                                                                                                                                     5.00
                                                                                                                                                                  60.00
                                                                                                                     Unit Hyd. peak (cms)=
                                                                                                                                                    0.34
                                                                                                                                                                   0.02
 CALTR
                        Area (ha)= 8.86 Curve Number (CN)= 66.0
Ia (mm)= 8.50 # of Linear Res.(N)= 3.00
  NASHYD
            ( 0001)
                                                                                                                     PEAK FLOW
                                                                                                                                       (cms)=
                                                                                                                                                     0.02
                                                                                                                                                                   0.02
|ID= 1 DT= 5.0 min |
                                                # of Linear Res.(N)= 3.00
                                                                                                                     TIME TO PEAK
                                                                                                                                      (hrs)=
                                                                                                                                                    3.08
                                                                                                                                                                   3.92
                        U.H. Tp(hrs)=
                                                                                                                     RUNOFF VOLUME
TOTAL RAINFALL
                                                                                                                                       (mm)=
(mm)=
                                                                                                                                                    75.80
                                                                                                                                                   76.80
                                                                                                                                                                  76.80
                                                                                                                     RUNOFF COEFFICIENT
     Unit Hyd Qpeak (cms)=
                                0.335 (i)
                                                                                                               ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
     PEAK FLOW
                      (cms)=
     TIME TO PEAK
                      (hrs)=
                                3.583
     RUNOFF VOLUME (mm)= 23.423
TOTAL RAINFALL (mm)= 76.800
                                                                                                                              YOU SHOULD CONSIDER SPLITTING THE AREA.
                                                                                                                       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
     RUNOFF COEFFICIENT
                               0.305
                                                                                                                      CN* = 85.0 Ia = Dep. Storage (Above
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
                                                                                                                     THAN THE STORAGE COEFFICIENT.

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
 CALIB
         ( 0005)
                        Area (ha)= 2.19 Curve Number (CN)= 63.0 Ia (mm)= 8.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.51
 NASHYD
ID= 1 DT= 5.0 min |
                                                                                                                | ADD HYD ( 0019)|
                                                                                                                   1 + 2 =
                                                                                                                                               ΔRFΔ
                                                                                                                                                       QPEAK
                                                                                                                                                                  TPFAK
                                                                                                                                                                             R.V.
                               0.164
     Unit Hyd Qpeak (cms)=
                                                                                                                                               (ha)
                                                                                                                                                                             (mm)
                                                                                                                                                        (cms)
                                                                                                                                                                  (hrs)
                                                                                                                      ID1= 1 ( 0001):
+ ID2= 2 ( 0017):
                                                                                                                                               8.86
                                                                                                                                                      0.335
                                                                                                                                                                  3.58
                                                                                                                                                                          23.42
     PEAK FLOW
                                0.083 (i)
                       (cms)=
                                                                                                                                               0.47
                                                                                                                                                      0.030
                                                                                                                                                                           51.56
                                                                                                                                                                  3.08
     TIME TO PEAK
                      (hrs)=
                                3.583
     RUNOFF VOLUME
                       (mm)= 21.714
(mm)= 76.800
     TOTAL RAINFALL
RUNOFF COST
                                                                                                                        ID = 3 ( 0019):
                                                                                                                                               9.33 0.356
     RUNOFF COEFFICIENT
                                                                                                                     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
                                                                                                                 ADD HYD ( 0019) |
3 + 2 = 1 |
                                                                                                                                               (ha)
                                                                                                                                                        (cms)
                                                                                                                                                                  (hrs)
                                                                                                                                                                             (mm)
```

STANDHYD (0017) Area

(ha)= 0.47

DATE: 07-30-2025

ID1= 3 (0019):

9.33

0.356

3.58

24.83

USER:

TIME: 04:57:17

RAIN

7.68

7.68

7.68

7.68

6.14

6.14

6.14

6.14

6.14

4.61

TOTALS

3.08

76.80

0.030 (iii)

TIME

4.83

5.00

5.08 5.17

5.25

5.33

5.42

5.58

5.83

5.92

6.00

hrs

RAIN

mm/hr

4.61

4.61

4.61

3.07

3.07

3.07

3.07

3.07

3.07

3.07

3.07

3.07

3.07

```
+ ID2= 2 ( 0005): 2.19 0.083
                                             3.58 21.71
       ID = 1 ( 0019): 11.52 0.438 3.58 24.24
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 CAL TR
Unit Hyd Qpeak (cms)=
                             0.541
    PEAK FLOW (cms)= 0.344 (i)
TIME TO PEAK (hrs)= 3.583
RUNOFF VOLUME (mm)= 26.121
TOTAL RAINFALL (mm)= 76.800
    RUNOFF COEFFICIENT = 0.340
    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
 CALIB |
NASHYD ( 0009)|
Unit Hyd Qpeak (cms)= 0.246
    PEAK FLOW (cms)= 0.116 (i)
TIME TO PEAK (hrs)= 3.500
RUNOFF VOLUME (mm)= 20.981
TOTAL RAINFALL (mm)= 76.800
RUNOFF COEFFICIENT = 0.273
    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
 CALIB
 NASHYD ( 0014)
                       Area (ha)= 2.19 Curve Number (CN)= 63.0 Ia (mm)= 8.00 # of Linear Res.(N)= 3.00
|ID= 1 DT= 5.0 min |
                       U.H. Tp(hrs)= 0.51
    Unit Hyd Qpeak (cms)= 0.164
    PEAK FLOW (cms)= 0.083 (i)
TIME TO PEAK (hrs)= 3.583
       ID = 3 ( 0022):
                          2.66 0.103 3.58 26.97
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 ADD HYD ( 0022) | 3 + 2 = 1 |
                             ΔRFΔ
                                     QPEAK
                                               TΡΕΔΚ
                                                         R.V.
                             (ha)
                                      (cms)
                                               (hrs)
                                                          (mm)
     ID1= 3 ( 0022):
+ ID2= 2 ( 0008):
                             2.66
                                   0.103
                                               3.58
                                                       26.97
                           10.73 0.447
       ID = 1 ( 0022):
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 ADD HYD ( 0022) |
1 + 2 = 3 |
                             AREA
                                    QPEAK
                             (ha)
                                      (cms)
                                               (hrs)
                                                          (mm)
                                                     26.33
                          10.73
     ID1= 1 ( 0022): 10.73
+ ID2= 2 ( 0009): 2.97
                                   0.447
                                               3.58
                                    0.116
                                               3.50
                                                       20.98
      ID = 3 ( 0022): 13.69 0.560
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
Unit Hyd Qpeak (cms)= 0.324
    PEAK FLOW
                     (cms)= 0.227 (i)
    TIME TO PEAK (hrs)= 3.583
RUNOFF VOLUME (mm)= 29.031
TOTAL RAINFALL (mm)= 76.800
RUNOFF COEFFICIENT = 0.378
    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
 CALIB
MASHYD ( 0011)
                       Area (ha)= 1.12 Curve Number (CN)= 64.0
Ia (mm)= 8.00 # of Linear Res.(N)= 3.00
```

of Linear Res.(N)= 3.00

|ID= 1 DT= 5.0 min |

U.H. Tp(hrs)= 0.29

```
RUNOFF VOLUME (mm)= 21.714
TOTAL RAINFALL (mm)= 76.800
```

RUNOFF COEFFICE			01. TE AND	
(i) PEAK FLOW D	OES NOT IT	NCTODE BASEFL	JW IF ANY.	
CALIB STANDHYD (0018)	Area	(ha)= 0.4	7	
STANDHYD (0018) ID= 1 DT= 5.0 min	Total	Imp(%)= 15.5	Dir. Con	n.(%)= 15.50
C	(6-)	IMPERVIOUS	PERVIOUS (.	1)
Surface Area Dep. Storage Average Slope	(na)=	0.07	0.40	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope Length	(%)= (m)-	4.00	0.70	
Mannings n	(111)=	0 120	0.70	
		0.130		
Max.Eff.Inten.(over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak	(mm/hr)=	119.81	89.31	
over	(min)	5.00	10.00	
Storage Coeff.	(min)=	4.40 (ii) 60.00 (i	i)
Unit Hyd. Tpeak	(min)=	5.00	60.00	
Unit Hyd. peak	(cms)=	0.23	0.02	
				101ALS
PEAK FLOW	(cms)=	0.02	0.02	0.029 (iii)
TIME TO PEAK	(hrs)=	3.08	3.92	3.08
RUNOFF VOLUME	(mm)=	75.80	47.20	51.56
PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL	(mm)=	76.80	76.80	76.80
RUNOFF COEFFICE	ENT =	0.99	0.61	0.67
***** WARNING: STORA	CE COEFE	TC CMALLED T	JAN TIME STE	n.I.
***** WARNING: FOR AF				
		IDER SPLITTIN		576
(i) CN PROCED				
		a = Dep. Stor		
(ii) TIME STER			R OR EQUAL	
		DEFFICIENT.		
(iii) PEAK FLOW	DOES NOT	INCLUDE BASE	FLOW IF ANY.	
ADD HYD (0022)				
1D1= 1 (00 1D2= 2 (00		AREA QPEAK	TPEAK	R.V.
		(ha) (cms)	(hrs)	(mm)
ID1= 1 (00	914):	2.19 0.083	3.58	21.71
+ ID2= 2 (06	918): (0.029	3.08	51.56
=========				=====

```
Unit Hyd Qpeak (cms)= 0.148

        PEAK FLOW
        (cms)=
        0.066

        TIME TO PEAK
        (hrs)=
        3.250

        RUNOFF VOLUME
        (mm)=
        22.351

        TOTAL RAINFALL
        (mm)=
        76.880

        RUNOFF COEFFICIENT
        0.291

      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
Area (ha)= 0.05 Curve Number (CN)= 63.0
Ia (mm)= 8.00 # of Linear Res.(N)= 3.00
|ID= 1 DT= 5.0 min |
 U.H. Tp(hrs)= 0.12
      Unit Hyd Qpeak (cms)= 0.018
       PEAK FLOW
                             (cms)=
                                        0.005 (i)
      TIME TO PEAK (hrs)= 3.083
RUNOFF VOLUME (mm)= 21.421
TOTAL RAINFALL (mm)= 76.800
RUNOFF COEFFICIENT = 0.279
       (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
______
 ADD HYD ( 0023)|
1 + 2 = 3 |
                                               QPEAK
                                       AREA
                                                               TPEAK
                                                                            R.V.
                                       (ha)
4.58
                                                 (cms)
0.227
                                                               (hrs)
3.58
       ID1= 1 ( 0010):
+ ID2= 2 ( 0011):
                                                               3.58 29.03
3.25 22.35
                                       1.12
                                               0.066
                                                                        27.72
         ID = 3 ( 0023): 5.70 0.275
                                                               3.50
      NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

ARFA

(ha)

5.70

0.05

5.75

OPEAK

(cms)

0.275

0.005

0.277

TPFAK

(hrs)

3.50

3.08

R.V.

27.72

21.42

27.66

| ADD HYD (0023)| | 3 + 2 = 1 |

ID1= 3 (0023): + ID2= 2 (0015):

ID = 1 (0023):

```
NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 CALIB
                           Area (ha)= 12.48 Curve Number (CN)= 77.0
Ia (mm)= 6.60 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.75
 NASHYD ( 0012)
|ID= 1 DT= 5.0 min |
     Unit Hyd Qpeak (cms)= 0.635
     PEAK FLOW
                         (cms)= 0.573 (i)
     TIME TO PEAK (hrs)= 0.573
TIME TO PEAK (hrs)= 3.833
RUNOFF VOLUME (mm)= 33.737
TOTAL RAINFALL (mm)= 76.800
RUNOFF COEFFICIENT = 0.439
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
 CAL TR
                0013)
                           Area (ha)= 4.29 Curve Number (CN)= 67.0 Ia (mm)= 8.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.31
 NASHYD
|ID= 1 DT= 5.0 min |
     Unit Hyd Qpeak (cms)= 0.529
     PEAK FLOW (cms)= 0.262 (i)
TIME TO PEAK (hrs)= 3.250
RUNOFF VOLUME (mm)= 24.403
TOTAL RAINFALL (mm)= 76.800
RUNOFF COEFFICIENT = 0.318
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
 CALIB
Unit Hyd Qpeak (cms)= 0.274
     PEAK FLOW
                         (cms) = 0.192 (i)
     TIME TO PEAK (hrs)= 3.167
RUNOFF VOLUME (mm)= 35.749
TOTAL RAINFALL (mm)= 76.800
     RUNOFF COEFFICIENT
     Unit Hyd Qpeak (cms)= 0.018
     PEAK FLOW (cms)= 0.005
TIME TO PEAK (hrs)= 3.083
RUNOFF VOLUME (mm)= 21.421
TOTAL RAINFALL (mm)= 76.800
RUNOFF COEFFICIENT = 0.279
                                    0.005 (i)
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
 ADD HYD ( 0020)|
1 + 2 = 3
                                            QPEAK
                                                         TPEAK
                                                                     R.V.
                                    (ha)
                                              (cms)
                                                         (hrs)
                                                                     (mm)
      ID1= 1 ( 0002):
+ ID2= 2 ( 0006):
                                   0.05
                                            0.005
                                                         3.08
                                                                   21.42
        ID = 3 (0020):
                                  4.76 0.181
                                                        3.58
                                                                 23.01
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 CALIB
Unit Hyd Qpeak (cms)= 1.103
     PEAK FLOW
                         (cms) = 0.739 (i)
     TIME TO PEAK (hrs)= 8.758

RUNOFF VOLUME (mm)= 27.432

TOTAL RAINFALL (mm)= 76.800

RUNOFF COEFFICIENT = 0.357
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
          ( 0007)
                           Area (ha)= 1.79 Curve Number (CN)= 80.0
  NASHYD
|ID= 1 DT= 5.0 min | Ia (mm)= 8.00
----- U.H. Tp(hrs)= 0.25
                                                       # of Linear Res.(N)= 3.00
     Unit Hyd Qpeak (cms)= 0.274
```

PEAK FLOW

(cms)= 0.192 (i)

```
(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
| ADD HYD ( 0024)|
| 1 + 2 = 3 |
                              ΔRFΔ
                                       OPEAK
                                                 TPFΔK
                                                            R.V.
                               (ha)
                                        (cms)
                                                 (hrs)
                                                         (mm)
33.74
      ID1= 1 ( 0012):
+ ID2= 2 ( 0013):
                             12.48
                                      0.573
                                                 3.83
       ID = 3 ( 0024): 16.77
                                      0.725
                                                         31.35
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
| ADD HYD ( 0024)|
| 3 + 2 = 1 |
                              ARFA
                                      QPEAK
                                                 TPEAK
                               (ha)
                                       (cms)
                                                 (hrs)
                                                            (mm)
     ID1= 3 ( 0024):
+ ID2= 2 ( 0016):
                             16.77
                                      0.725
                                                 3.58
                                                         31.35
                              1.79
                                      0.192
                                                 3.17
                                                          35.75
        ID = 1 ( 0024): 18.56
                                    0.834
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
Unit Hvd Opeak (cms)= 0.327
     PEAK FLOW
                      (cms)= 0.180 (i)
     TIME TO PEAK (hrs)= 0.180

RUNOFF VOLUME (mm)= 23.025

TOTAL RAINFALL (mm)= 76.800

RUNOFF COEFFICIENT = 0.300
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
______
 CALIB
                        Area (ha)= 0.05 Curve Number (CN)= 63.0 Ia (mm)= 8.00 # of Linear Res.(N)= 3.00
|ID= 1 DT= 5.0 min |
                        U.H. Tp(hrs)= 0.12
     TIME TO PEAK (hrs)= 3.167
RUNOFF VOLUME (mm)= 35.749
TOTAL RAINFALL (mm)= 76.800
RUNOFF COEFFICIENT = 0.465
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
| ADD HYD ( 0021)|
| 1 + 2 = 3 |
                              AREA
                                      OPEAK
                                                 TPEAK
                                                           R.V.
                               (ha)
                                        (cms)
                                                 (hrs)
        ID1= 1 ( 0004):
                                     0.739
                                                         27.43
                                                 3.58
                             16.45
      + ID2= 2 ( 0007):
                              1.79
                                      0.192
                                                          35.75
       ID = 3 ( 0021): 18.25 0.842
                                                3.50 28.25
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
| ADD HYD ( 0025)|
| 1 + 2 = 3 |
                              ΔRFΔ
                                      ΟΡΕΔΚ
                                                 TΡΕΔΚ
                                                            R.V.
                                                 (hrs)
                              (ha)
4.76
                                       (cms)
                                                            (mm)
     ID1= 1 ( 0020):
+ ID2= 2 ( 0021):
                                      0.181
                                                         23.01
                             18.25
        ID = 3 ( 0025): 23.00 1.020
                                                        27.16
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 NASHYD ( 0029)
                        Area (ha)= 8.07 Curve Number (CN)= 69.0
|ID= 1 DT= 5.0 min | Ia (mm)= 7.60
----- U.H. Tp(hrs)= 0.57
                                               # of Linear Res.(N)= 3.00
     Unit Hyd Qpeak (cms)= 0.541
                               0.344 (i)
     PEAK FLOW
     TIME TO PEAK
                      (hrs)=
     TIME TO PEAK (hrs)= 3.583
RUNOFF VOLUME (mm)= 26.121
TOTAL RAINFALL (mm)= 76.800
RUNOFF COEFFICIENT = 0.340
                               3.583
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW TE ANY
```

```
CAL TR
                                                                                                                          ----- U.H. Tp(hrs)= 0.46
                           Area (ha)= 2.19 Curve Number (CN)= 63.0
Ia (mm)= 8.00 # of Linear Res.(N)= 3.00
  NASHYD
             ( 0033)
|ID= 1 DT= 5.0 min |
                                                     # of Linear Res.(N)= 3.00
                                                                                                                                 Unit Hyd Qpeak (cms)= 0.246
                           U.H. Tp(hrs)= 0.51
                                                                                                                                 PEAK FLOW
                                                                                                                                                    (cms)=
                                                                                                                                                              0.116 (i)
                                                                                                                                 TIME TO PEAK (hrs)= 3.500
RUNOFF VOLUME (mm)= 20.981
TOTAL RAINFALL (mm)= 76.800
      Unit Hyd Qpeak (cms)=
                                   0.083 (i)
     PEAK FLOW
TIME TO PEAK
                         (cms)=
     TIME TO PEAK (hrs)= 3.583
RUNOFF VOLUME (mm)= 21.714
TOTAL RAINFALL (mm)= 76.800
                                                                                                                                 RUNOFF COEFFICIENT =
                                                                                                                                                              0.273
      RUNOFF COEFFICIENT
                                   0.283
      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
                                                                                                                           | CALIB
                                                                                                                             STANDHYD ( 0039)
                                                                                                                                                                (ha)=
                                                                                                                                                      Area
                                                                                                                           TD= 1 DT= 5.0 min |
| ADD HYD ( 0045)|
| 1 + 2 = 3 |
                                  ARFA
                                                                                                                                 Surface Area
                                            QPEAK
                                                                                                                                 Dep. Storage
                                                                                                                                                     (mm)=
                                  (ha)
                                            (cms)
                                                       (hrs)
                                                                   (mm)
         ID1= 1 ( 0029):
                                  8.07
                                          0.344
                                                       3.58
                                                                26.12
                                                                                                                                 Average Slope
                                                                                                                                                      (%)=
      + ID2= 2 ( 0033):
                                           0.083
                                                                21.71
                                  2.19
                                                       3.58
                                                                                                                                 Length
                                                                                                                                                      (m)=
                                                                                                                                 Mannings n
         ID = 3 ( 0045): 10.26 0.426
                                                                                                                                 Max.Eff.Inten.(mm/hr)=
                                                                                                                                over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)=
      NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 RESERVOIR( 0042)|
                             OVERFLOW IS OFF
  IN= 2---> OUT= 1
                                          STORAGE | OUTFLOW (ha.m.) | (cms) | 0.6520
                                                        (cms)
 DT= 5.0 min
                             OUTFLOW
                                                                                                                                 PEAK FLOW
                               (cms)
0.0000
                                                                                                                                 TIME TO PEAK
                                                                       (ha.m.)
                                                                                                                                                    (hrs)=
                                                                                                                                 TIME TO PEAK (hrs)=
RUNOFF VOLUME (mm)=
TOTAL RAINFALL (mm)=
                                                               0.6520
                                                            0.0000
                                0.2430
                                              0.0600
                                                                             0.0000
                                                                                                                                 RUNOFF COEFFICIENT
                                      AREA
                                                OPEAK
                                                             TPEAK
                                    (ha)
10.261
                                                 (cms)
0.426
                                                             (hrs)
                                                                            (mm)
   INFLOW : ID= 2 ( 0045)
OUTFLOW: ID= 1 ( 0042)
                                    10.261
                                                   0.305
                                                               4.17
                                                                            25.18
                      PEAK FLOW REDUCTION [Qout/Qin](%)= 71.54
                      TIME SHIFT OF PEAK FLOW
MAXIMUM STORAGE USED
                                                         (min)= 35.00
(ha.m.)= 0.0708
                                    (ha)= 2.97 Curve Number (CN)= 62.0
(mm)= 8.20 # of Linear Res.(N)= 3.00
            ( 0032)
  NASHYD
                           Area
|ID= 1 DT= 5.0 min | Ia
 ADD HYD ( 0031)|
1 + 2 = 3 |
                                                                                                                                 TOTAL RAINFALL (mm)= 76.800
RUNOFF COEFFICIENT = 0.465
                                            QPEAK
                                   (ha)
                                            (cms)
                                                       (hrs)
                                                                   (mm)
                                                       3.50
      + ID2= 2 ( 0039):
                                  0.47
                                           0.029
                                                       3.08
                                                                51.56
         ID = 3 (0031):
                                  3.43
                                          0.134
                                                      3.50
                                                                25.15
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
                                                                                                                             NASHYD
                                                                                                                           |ID= 1 DT= 5.0 min |
| ADD HYD ( 0031)|
| 3 + 2 = 1 |
                                                                                                                                 Unit Hyd Qpeak (cms)= 0.529
                                  AREA
                                           OPEAK
                                                      TPEAK
                                                                   R.V.
                                  (ha)
3.43
                                          (cms)
0.134
                                                      (hrs)
                                                                (mm)
25.15
                                                                                                                                 PEAK FLOW
                                                                                                                                                    (cms)=
      ID1= 3 ( 0031):
+ ID2= 2 ( 0042):
                                                                                                                                 TIME TO PEAK
                                                                                                                                                    (hrs)=
                                                                                                                                                              3.250
                                                                                                                                 RUNOFF VOLUME (mm)= 24.403
TOTAL RAINFALL (mm)= 76.800
RUNOFF COEFFICIENT = 0.318
                                10.26
                                          0.305
                                                      4.17
                                                                25.18
         ID = 1 ( 0031): 13.70 0.400
                                                      4.00
                                                                25.17
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 CALIB
| ADD HYD ( 0036)|
| 1 + 2 = 3 |
                                                                                                                                                              AREA
                                                                                                                                                              (ha)
     Unit Hyd Qpeak (cms)= 0.635
                                                                                                                                  ID1= 1 ( 0030):
+ ID2= 2 ( 0035):
                                                                                                                                                            12.48
1.79
      PEAK FLOW
                                   0.573 (i)
     TIME TO PEAK (hrs)= 0.573

RUNOFF VOLUME (mm)= 33.737

TOTAL RAINFALL (mm)= 76.800

RUNOFF COEFFICIENT = 0.439
                                                                                                                                    ID = 3 ( 0036):
      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
                                                                                                                           | ADD HYD ( 0036)|
| 3 + 2 = 1 |
                                                                                                                                                              (ha)
                                                                                                                                 ID1= 3 ( 0036):
+ ID2= 2 ( 0037):
          ( 0035)
  NASHYD
                          Area (ha)= 1.79 Curve Number (CN)= 80.0 Ia (mm)= 8.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.25
                                                                                                                                                              4.29
|ID= 1 DT= 5.0 min |
                                                                                                                                    ID = 1 (0036):
                                                                                                                                                           18.56
      Unit Hyd Qpeak (cms)=
                       (cms)= 0.192 (i)
(hrs)= 3.167
      TIME TO PEAK
      RUNOFF VOLUME
                          (mm)= 35.749
```

```
(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
                         Total Imp(%)= 15.50 Dir. Conn.(%)= 15.50
                                 IMPERVIOUS
                                                 PERVIOUS (i)
                                     0.07
1.00
                                                    0.40
1.50
                                      4.00
                                                   17.24
                                     55.86
                                                     8.70
                                     0.130
                                                   0.250
                                    119.81
                                                   89.31
                                      5.00
4.40 (ii)
                                                   60.00 (ii)
                                      5.00
                                                   60.00
                                      0.23
                                                                   *TOTALS*
                                                                    0.029 (iii)
                                      3.08
                                                     3.92
                                                                      3.08
                                     75.80
                                                   47.20
                                     76.80
                                                   76.80
                                                                     76.80
                                      0.99
                                                     0.61
                                                                      0.67
***** WARNING: STORAGE COFFE. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
               YOU SHOULD CONSIDER SPLITTING THE AREA.
       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
       (1) CN* FINCEOUS SECTION TO TENTIOR COSTS.

(N* = 85.0 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.
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
                        Area (ha)= 4.29 Curve Number (CN)= 67.0
Ia (mm)= 8.00 # of Linear Res.(N)= 3.00
                         U.H. Tp(hrs)=
                                0.262 (i)
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
                                         QPEAK
                                                    TPEAK
                                         (cms)
                                                   (hrs)
                                                               (mm)
                                        0.573
                                                   3.83
                                                             33.74
                                        0.192
                                                   3.17
                              14.27 0.643
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
                                         QPEAK
                                                    TPEAK
                                                               R.V.
                                         (cms)
                                                    (hrs)
                                                               (mm)
                                        0.262
                                                   3.25
                                                             24.40
                                                   3.42
                                                            31.77
                                      0.834
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 NASHYD
           ( 0034) Area
                                (ha)= 4.58 Curve Number (CN)= 72.0
```

```
|ID= 1 DT= 5.0 min | Ia (mm)= 6.80 # of Linear Res.(N)= 3.00 ----- U.H. Tp(hrs)= 0.54
       Unit Hyd Qpeak (cms)= 0.324
       PEAK FLOW (cms)= 0.227 (i)
TIME TO PEAK (hrs)= 3.583
RUNOFF VOLUME (mm)= 29.031
TOTAL RAINFALL (mm)= 76.800
RUNOFF COEFFICIENT = 0.378
       (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
Unit Hyd Qpeak (cms)= 0.018
       PEAK FLOW (cms)= 0.005 (i)
TIME TO PEAK (hrs)= 3.083
RUNOFF VOLUME (mm)= 21.421
TOTAL RAINFALL (mm)= 76.800
RUNOFF COEFFICIENT = 0.279
       (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
| ADD HYD ( 0047)|
| 1 + 2 = 3 |
                                                                                  R.V.
                                            AREA QPEAK
                                                                     TPEAK
                                                                      (hrs) (mm)
3.58 29.03
3.08 21.42
                                            (ha) (cms)
4.58 0.227
        TD1= 1 ( 0034): 4.58 0.227 3.58 29.03
+ TD2= 2 ( 0041): 0.05 0.005 3.08 21.42
         ID = 3 ( 0047): 4.63 0.228 3.58 28.94
      NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
| RESERVOIR( 0043)|
| IN= 2---> OUT= 1 |
| DT= 5.0 min |
                                      OVERFLOW IS OFF

        STORAGE
        OUTFLOW
        STORAGE

        (ha.m.)
        (cms)
        (ha.m.)

        0.0000
        0.1950
        0.1050

        0.0500
        0.0000
        0.0000

                                      OUTFLOW
                                       (cms)
0.0000
                                         0.0740
```

```
| AREA | QPEAK | TPEAK | R.V. | (ha) | (cms) | (hrs) | (mm) | | INFLOW : ID= 2 ( 0047) | 4.631 | 0.228 | 3.58 | 28.94 | OUTFLOW: ID= 1 ( 0043) | 4.631 | 0.101 | 4.50 | 28.90 |
```

PEAK FLOW REDUCTION [Qout/Qin](%)= 44.19
TIME SHIFT OF PEAK FLOW (min)= 55.00
MAXIMUM STORAGE USED (ha m)= 0.063

	TIME SHI	FT OF PEA	K FLOW	(n	nin)= 55.00	
	MAXIMUM	STORAGE	USED	(ha.	m.)= 0.0622	
L CALED						
CALIB		41	4 42		(611)	
NASHYD (0040) ID= 1 DT= 5.0 min) Area	(na)=	1.12	curve N	number (CN):	= 64.0
1D= 1 D1= 5.0 MIN				# OT LI	inear kes.(N)	= 3.00
	О.П.	ip(iii·s)=	0.29			
Unit Hyd Opea	((cms)=	0.148				
	. ()					
PEAK FLOW	(cms)=	0.066	(i)			
TIME TO PEAK	(hrs)=	3.250				
RUNOFF VOLUME						
TOTAL RAINFALL						
RUNOFF COEFFIC	CIENT =	0.291				
/11						
(i) PEAK FLOW	DOES NOT	INCLUDE	BASEFLOW	IF ANY.		
ADD HYD (0038)) [
1 + 2 = 3		AREA	QPEAK	TPEAK	R.V.	
ID1= 1 (6	0040):	ì.12	0.066	3.25	22.35	
+ ID2= 2 (6						
========						
ID = 3 (6	0038):	5.75	0.112	4.42	27.63	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.