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Douglas Landing Subdivision

PRELIMINARY STORMWATER MANAGEMENT REPORT

Douglas Landing Developments

Document Control

File:

522650

Date:

September
23, 2025

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Issue	Date	Description
0	December 13, 2024	Draft Report
1	January 13, 2025	Final Report
2	August 25, 2025	Draft Report
3	September 23, 2025	Final Report

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1 Introduction

Tatham Engineering Limited was retained by Douglas Landing Developments to prepare a preliminary stormwater management (SWM) report in support of a proposed 23-lot Draft Plan of Subdivision located beyond the west limit of Douglas Side Road in the Township of Beckwith. The subject site is legally described as Part of Lot 25, Concession 12, Township of Beckwith, County of Lanark.

The purpose of this report is to demonstrate the feasibility of the proposed development as it relates to stormwater management (SWM) in context with the local municipal, provincial and conservation authority SWM design guidelines and criteria.

1.1 SITE DESCRIPTION

The site consists of approximately 22.2 ha of land that is bounded by the recently developed Ridgemont Subdivision to the east, active agricultural lands to the north and west, and densely forested and wetland areas to the south.

The site location is illustrated on the key plan of the drawings attached at the back of this report.

1.2 PROPOSED DEVELOPMENT

The proposed development consists of approximately 22.2 ha of land, on which 23 privately serviced estate residential lots (varying in size from 0.38 ha to 1.84 ha) and approximately 1093 m of paved internal road having a rural cross section, are proposed for development.

Potable water and sewage treatment and disposal will be provided via individual privately-owned groundwater wells and septic systems on each lot. A hydrogeological assessment report was prepared by Pinchin dated September 22, 2025 and provides further detail regarding the feasibility of individual private wells and septic systems on each lot.

The future condition land cover will be a combination of trees, grass and impervious areas (buildings, driveways, and roadways) as well as natural forested and wetland areas, which will remain undisturbed.

The Draft Plan of Subdivision prepared by Fairhall Moffatt & Woodland Limited, received September 2, 2025, is included at the back of this report.



1.3 GUIDELINES AND BACKGROUND REPORTS

This report was prepared recognizing municipal, provincial and conservation authority guidelines on water resources and the environment, including the following publications:

- Ministry of Municipal Affairs and Housing Provincial Planning Statement (2024);
- Low Impact Development Stormwater Management Planning and Design Guide (CVC and TRCA, 2010);
- The Ministry of Environment (MOE) Stormwater Management Practices Planning and Design Manual (2003); and
- MTO Drainage Management Manual (Ministry of Transportation, 1997).

The following background reports pertaining to the site have also been referenced in the preparation of this report:

- Douglas Landing Subdivision Aquatic Habitat Assessment (GeoProcess Research Associates, September 5, 2025)
- Geotechnical Investigation – Proposed Residential Development (Pinchin Limited, November 26, 2024); and
- Hydrogeological Investigation – Proposed Residential Development (Pinchin Limited, September 22, 2025).



2 Geotechnical and Hydrogeological Investigations

2.1 GEOTECHNICAL INVESTIGATION

A Geotechnical Investigation within the site was completed by Pinchin Ltd. on September 15, 2022, and is documented in their report dated November 26, 2024.

A total of ten (10) sampled boreholes were advanced with the use of a CME55 track-mounted drill rig to practical refusal.

The subsurface conditions encountered in the boreholes revealed 50 mm to 150 mm of surficial organics underlain with glacial till. The glacial till material ranged in soil matrix from silty sand containing some gravel and some clay, to silty sandy gravel containing trace clay. Refusal to drill advancement was encountered on the probable bedrock surface in all boreholes at depths ranging from approximately 0.3 to 0.6 metres below the existing ground level (mbgl). Groundwater seepage was not observed within the open boreholes upon completion of drilling albeit seasonal variations in the groundwater elevation should be expected, with higher levels occurring during wet weather conditions in the spring and fall and lower levels occurring during dry weather conditions.

2.2 HYDROGEOLOGICAL INVESTIGATION

A Hydrogeological Investigation for the site was completed by Pinchin Ltd. and documented in their report dated September 22, 2025.

In addition to the ten boreholes described above, Pinchin Ltd. advanced four (4) groundwater test wells across the site. The hydrogeological report confirms the quantity of groundwater available from the proposed bedrock water supply aquifer is adequate to support a 23-lot residential development.

Water samples taken from the monitoring wells on the subject site to assess water quality are found to be safe for consumption based on the absence of persistent health-related exceedances.

However, water treatment for aesthetic parameters, such as hardness, may be considered on an individual lot and well basis. In addition, there are no anticipated negative impacts to the bedrock aquifer resulting from the onsite septic treatment systems proposed for the development.

In response to comments raised during peer review process Pinchin revised their report to provide additional information regarding the potential risk to the aquifer from sewage effluent and the potential of interference to existing wells in the area. In addition, resampling of the four



(4) test wells on Site for an extended list of parameters is scheduled for the third week of September and Pinchin will be providing an update regarding water quality.

Additional details related to the geotechnical and hydrogeological investigations, conclusions and recommendations can be found in each respective report which have been submitted under separate cover.



3 Internal Roadway and Transportation

Access to the subdivision will be provided via a short extension (approximately 125m in length) of Douglas Side Road and an internal local road. Douglas Side Road will be extended into an unopened road allowance and will follow the existing road cross section geometry. The proposed local road and Douglas Side Road extension will follow the typical Township of Beckwith Road cross-section, consisting of a 20.0 m wide rural road cross section having a 6.1 m wide asphalt surface, 1.5 m wide granular shoulders and open grassed ditches, as shown on Drawing SWM-1, included at the back of this report.

The Douglas Side Road extension will require continuation of the existing ditch, with the proposed ditch invert matched at the limits of construction limits. The proposed ditch has a larger top and bottom width than the existing, thereby providing increased hydraulic capacity. Cross-sections of the existing and proposed ditch are shown on Drawing XS-1, included at the back of this report.

Realignment of an existing watercourse located in the northeast corner of the site is required to accommodate the proposed internal road alignment. In the existing condition, the watercourse enters the property and outlets to the central wetland at approximately the same elevation, 135.10 m, resulting in an effective slope of 0%. To minimize impacts to the existing condition and maintain equivalent hydraulic capacity, the proposed realigned watercourse will match the width of the existing watercourse. To accommodate the watercourse realignment, the internal road ROW is proposed to be increased from 20 m to 23 m locally between station 0+382 and 0+521. Cross sections illustrating the proposed watercourse relocation are provided on Drawing XS 2, included at the back of this report.

Based on the findings of the geotechnical investigation, the minimum pavement structure design for the internal roadways will consist of the following:

- Surface course asphalt – 40 mm HL-3 (OPSS 1150);
- Binder course asphalt – 55 mm HL-8 (OPSS 1150);
- Granular Base Course – 150 mm OPSS 1010 granular 'A'; and
- Granular Subbase Course – 450 mm OPSS 1010 granular 'B' Type I or II.

In the future, the internal roads will be assumed by the Township who will undertake routine maintenance and snow plowing.



4 Grading

A preliminary road and ditch grading design was developed to match the existing drainage patterns within the site and the future connection to Douglas Side Road. The preliminary grading design reduces earth cut and fill and rock excavation to the extent possible while matching into the existing elevations along the perimeter of the site and at the existing drainage outlets. The road ditches have been designed to direct the majority of impaired stormwater runoff from the road and driveway surfaces to the proposed SWM facilities for water quality treatment and water quantity control. The minimum ditch depth is 1.0 m which allows for 0.3 m of vertical separation between the bottom of the granular B road subbase layer and the bottom of the ditch. Minimum ditch depths measured from the edge of the ROW in areas of fill will be resolved at the detailed design stage in order to contain municipal runoff within the ROW and to minimize earthworks throughout the site.

Individual lot grading will direct the front portion of each lot to the road ditches. The side and rear yard areas will only be graded immediately around the future dwellings to good engineering standards (minimum 2.0% away from the future dwelling) thus allowing a portion of the lots to remain undisturbed and reducing the need for large earthworks and tree clearing operations.

The proposed development will be graded in a manner which will satisfy the following goals:

- Minimum road and ditch grade: 0.5%;
- Maximum road and ditch grade: 5.0%;
- Minimum lot grade around the future dwellings: 2.0%;
- Maximum lot grade around the future dwellings: 7.0%;
- Minimize rock excavation; and
- Minimize the volume of earth to be moved and balance cut with fill on the site.

The preliminary site grading is shown on the Preliminary Site Grading plan, Drawing SG-1, included at the back of this report.



5 Stormwater Management

The primary objective of the preliminary SWM plan is to demonstrate that the proposed development will not adversely impact the hydrologic cycle and surface water runoff characteristics of the area. This will be accomplished by evaluating the effect of the proposed development on local drainage conditions. Where necessary, solutions will be provided to mitigate any adverse impacts. Issues to be addressed and criteria to be met regarding drainage and SWM are summarized as follows:

- The site will be developed in accordance with all relevant municipal, provincial and agency SWM criteria;
- MECP 'Enhanced' treatment level water quality treatment will be provided, to mitigate potential impacts from the proposed development on the downstream receivers;
- All post development peak flows directed to each existing outlet will be reduced at or below existing condition peak flow rates during the 2-100-year design storm events based on the 3-hour Chicago, 6-hour Chicago, and 24-hour SCS Type II design storms;
- Runoff from all storms up to and including the 100-year storm event will be safely conveyed through the subdivision to the intended outlet; and
- Erosion and sediment control measures will be implemented during and following construction until the ultimate build-out of the site, to minimize erosion and sediment transport off-site.

5.1 EXISTING SITE DRAINAGE CONDITIONS

The existing topography, ground cover, and drainage patterns were obtained through a review of relevant background studies, available plans, the latest Land Information Ontario (LIO) LIDAR data set, and a detailed topographic survey completed by Fairhall Moffatt & Woodland Limited on June 6, 2022, and additional survey work completed by Fairhall Moffatt & Woodland Limited in July and August 2025. Tatham also completed a site visit on April 13, 2023 to verify the existing drainage patterns and site features.

Two existing condition catchment areas were delineated within the site according to two existing surface water outlets. Each outlet is described below.

Outlet 1

The west portion of the site (Outlet 1, Catchment 101 - 6.2 ha) drains overland to the west at an average grade of 1.1% and discharges onto the neighbouring agricultural lands. Eventually, runoff



from Outlet 1 discharges into the Munro Municipal Drain before discharging into the Mississippi River.

Outlet 2

The balance of the site (Outlet 2, Catchment 102 – 16.0 ha), drains to the centrally located wetland feature within the site and south within the wetland discharging into a ditch that drains from east to west within an unopened road allowance located immediately beyond the south property boundary. Runoff within the ditch discharges to the Munro Municipal Drain and ultimately into the Mississippi River.

The existing conditions drainage patterns and outlets are illustrated on the Existing Condition Drainage Plan, Drawing DP-1, included at the back of this report.

5.2 EXTERNAL DRAINAGE CONDITIONS

External drainage conditions were evaluated using contour data from the LIO LIDAR dataset, and the Ridgemont Estates Subdivision SWM Report, dated January 16, 2015. North of the site, a swale along the rear of the Ridgemont subdivision intercepts flows from the subdivision and directs it north and south, around and away from the site. West of the site, the active agricultural lands generally drain northward away from the site. It is noted that portions of the agricultural lands to the north are tile drained as was confirmed onsite and using the Ontario Ministry of Agriculture, Food and rural Affairs 'AGMAPS' website. A manmade ditch exists immediately beyond the south property boundary, within an unopened road allowance, and intercepts runoff from the south. Lands west of the site drain westerly away from the site.

Based on the above, there is no external drainage of significance draining into the site.

The external drainage patterns are illustrated on the External Drainage Plan, Drawing EXT-1, included at the back of this report.

5.3 EXISTING CONDITION HYDROLOGIC ANALYSIS

A hydrologic analysis of the existing condition was completed utilizing the single event Visual OTTHYMO Hydrologic Model Version 6 (VO6). Peak flow rates for storms up to and including the 100-year storm were calculated for the 3-hour Chicago, the 6-hour Chicago, and 24-hour SCS Type II design storms generated using historic rainfall data from the Macdonald Cartier International Airport Climate station (Environment and Climate Change Canada Station ID#610600), which is attached in Appendix A.

The catchment delineations were completed based on the site area proposed for development, existing ground contour information, and the environmental constraint boundaries. As noted in Section 5.2, there is no external area of significance draining into the site. Land uses were



established based on field reconnaissance and a review of available mapping. The land uses and soil information taken from the Ministry of Agriculture, Food, and Agribusiness available mapping were used to establish the curve numbers (CN) and other catchment parameters used in the hydrologic model. The time to peak values for the catchment areas were calculated using the Bransby Williams and Airport Methods for runoff coefficients 'C' greater than and less than 0.4 respectively.

A summary of all catchment parameters established for the existing condition hydrologic model have been included in Appendix A.

Detailed calculations and Visual Otthymo modeling output are included in Appendix A with the results summarized below in Tables 1 and 2.

Table 1: Existing Condition Peak Flow Summary - Outlet 1

DESIGN STORM	CATCHMENT 101 6.2 ha (m ³ /s)		
	3-hr CHI	6-hr CHI	24-hr SCS Type II
25mm	0.026	-	-
2-Year	0.051	0.059	0.090
5-Year	0.098	0.112	0.162
10-Year	0.135	0.153	0.216
25-Year	0.188	0.210	0.292
50-Year	0.232	0.258	0.352
100-Year	0.280	0.311	0.415



Table 2: Existing Condition Peak Flow Summary – Outlet 2

DESIGN STORM	CATCHMENT 102 16.0 ha (m ³ /s)		
	3-hr CHI	6-hr CHI	24-hr SCS Type II
25mm	0.022	-	-
2-Year	0.049	0.057	0.092
5-Year	0.102	0.117	0.178
10-Year	0.145	0.165	0.245
25-Year	0.208	0.234	0.342
50-Year	0.261	0.292	0.419
100-Year	0.320	0.357	0.501

5.4 STORMWATER MANAGEMENT ALTERNATIVES

The preliminary SWM plan is subject to the review and approval of the Township, County and Mississippi Valley Conservation Authority. For intensive development SWM practices to provide both quantity and quality control of stormwater runoff are required. The MECP SWM design guidelines recommends using the following methods for stormwater management:

Lot Level Source Controls

Lot level controls include measures such as roof leader soak away pits, rear yard ponding areas, reduced grading, rear and side yard swales and other localized lot grading. Other methods of at-source stormwater management controls include Low impact development (LID) practices including rainwater harvesting, green roofs, roof downspout disconnection, infiltration trenches and chambers, vegetated filter strips and permeable pavement. These methods of stormwater control are beneficial since they reduce runoff close to the source. However, the above practices are site specific based on the existing soil, groundwater and bedrock conditions and require regular maintenance to be effective. Use of these practices is recommended but only to an extent that is achievable without requiring excessive maintenance.



Conveyance Controls

Infiltration trenches and perforated pipes are two examples of conveyance controls. Typically, these controls attempt to reduce runoff volume and attenuate peak flows on route to the downstream watershed by allowing stormwater runoff to infiltrate into the existing soil. These methods of controlling stormwater are only effective if the native soil has good drainage capabilities and groundwater and bedrock conditions allow for them to be implemented in an effective and practical manner. Poor construction practices also reduce the effectiveness of these stormwater management controls. Conveyance controls are not recommended due to the high bedrock conditions throughout the site.

End-of-Pipe Facilities

End-of-pipe facilities are typically wet ponds, dry ponds or wetlands that control stormwater runoff from larger development areas. These facilities allow stormwater to be retained and released at a controlled rate and can provide effective quality and quantity control during and following storm events. The major negative attributes of these facilities are that they require significant land area to provide the treatment controls thus the larger the development the greater the required pond size.

5.5 STORMWATER MANAGEMENT PLAN

The preliminary SWM plan has been developed recognizing the overall SWM criteria for the subdivision. The proposed internal roads and overall lot grading will be constructed to follow the existing topography of the land as much as possible to maintain the existing conditions drainage patterns, while still directing major flows overland to the proposed SWM facilities and the existing surface water outlets. The internal road design will also be constructed to a typical municipal road cross section standard with all minor and major system flows from the road right of way and front lot areas draining to the road ditches. The side and rear yard areas will only be graded immediately around the houses thus allowing a portion of the lots to remain undisturbed and reducing the need for large earthworks and tree clearing operations.

The proposed condition catchment delineations within the subdivision were completed utilizing the Draft Plan of Subdivision and the preliminary site grading design in combination with the topographic survey.

The proposed condition drainage patterns and outlets are illustrated on the Proposed Condition Drainage Plan, Drawing DP-2, included at the back of this report.

Separate SWM plans have been developed for each outlet and are described below.



Outlet 1

Runoff from Catchment 201 (2.7 ha) which consists of rear lot areas within the west portion of the subdivision will drain uncontrolled from east to west, eventually discharging at Outlet 1.

Outlet 2

Runoff from Catchment 202 (4.6 ha) which consists of internal lot areas, and internal roadways within the southwest portion of subdivision will drain to a proposed dry SWM facility (SWMF 1), via the proposed road ditches prior to discharging to the existing ditch located within the unopened road allowance. The road ditches are proposed as enhanced grassed swales consisting of 0.5 m wide flat bottoms and having minimum ditch slopes thereby encouraging filtering and settling of sediment and pollutants along the conveyance route. SWMF 1 has been designed as a dry SWM pond providing MECP basic level water quality treatment and quantity control. SWMF 1 will overcontrol flows from Catchment 202 such that the uncontrolled peak flows from Catchment 203 combined with the controlled peak flows from Catchments 202 and 204 are reduced at or below existing condition peak flow rates at Outlet 2.

Catchment 203 (11.6 ha) encompasses the existing wetland in the central portion of the subdivision, internal lot areas, and limited sections of the internal road that cannot drain to the proposed SWM facilities due to grading constraints. Runoff from this catchment drains from north to south through the central portion of the site via a proposed internal road cross-culvert, a proposed drainage easement, and the central wetland, prior to discharging into the existing ditch within the unopened road allowance at Outlet 2. A small portion of Catchment 203 at the entrance to the site will discharge directly into the existing ditch within the unopened road allowance. Douglas Side Road and ditches on either side will be extended and re-aligned as required to accommodate the new site entrance and further design details will be provided at the detailed design stage. MECP 'Enhanced' level water quality treatment of the road runoff will be provided within the internal road ditches and the drainage easement prior to discharging into the natural wetland and from the site. From a water quantity perspective, Catchment 203 will drain uncontrolled from the site.

Catchment 204 (3.3 ha) which consists of internal lot areas, and internal roadways within the northeast portion of subdivision, drains to a proposed SWM facility (SWMF 2), via the proposed road ditches, prior to discharging to the existing wetland, and ultimately to Outlet 2. The road ditches are proposed as enhanced grassed swales thereby providing MECP Enhanced level water quality treatment upstream of SWMF 2. SWMF 2 has been designed as a dry SWM facility providing MECP basic level water quality treatment and will overcontrol peak flows from Catchment 204 up to and including the 100-year storm such that the uncontrolled peak flows



from Catchment 203 combined with the controlled peak flows from Catchments 202 and 204 are reduced at or below the existing condition peak flow rates at Outlet 2.

SWM Facility Design Criteria

The detailed design of the dry SWM facilities will consider the following:

- Sizing of the stormwater quantity control component of the facilities must ensure the post development peak runoff rates from the site are reduced at or below existing conditions and must be exclusive of the storage needed for the quality control component based on current MECP design guidelines;
- Sizing of the stormwater quality control component of the facilities must achieve 'basic' level protection and erosion control and thus the facilities must have water quality control volumes as determined using Table 3.2 of the MECP SWM design guidelines. 24 hour extended detention of the 25 mm storm runoff volume must also be provided for erosion control;
- Any overtopping of the SWM facilities must be safely conveyed to the receiving drainage path;
- Optimization of suspended solids and heavy metal removal efficiencies by locating minor system inlets and SWM facility outlets as far apart as possible to prevent short circuiting;
- Optimize nutrient uptake potential and diversity of plantings to enhance local aquatic and wildlife habitats; and
- Consider operation and maintenance requirements and frequency and include as part of the design process.

5.5.1 Water Quantity Control

A hydrologic analysis of the post development condition was completed utilizing the single event Visual OTTHYMO Hydrologic Model (VO6). Peak flow rates for storms up to and including the 100-year storm were calculated for the 3-hour Chicago, the 6-hour Chicago, and 24-hour SCS Type II design storms generated using historic rainfall data as described in Section 5.3 above.

The catchment delineation for the contributing lands were completed utilizing the Draft Plan of Subdivision and the preliminary site grading design in combination with the topographic survey. The total impervious (TIMP) and percent directly connected imperviousness for the future lot development was calculated based on 200 m² average dwelling footprint areas and 6-metre-wide driveways each 17 m long. A summary of all catchment parameters established for the post development hydrologic model have been included in Appendix A.



The time to peak values for the individual catchment areas were calculated using either the Bransby Williams and Airport Methods for runoff coefficient “C” values greater than and less than 0.4 respectively.

Preliminary stage-storage-discharge data was input into the ‘route reservoir’ commands of the hydrologic model to confirm the quantity control storage requirements and that the corresponding land allocation for the SWM facility blocks are appropriate. Specific details relating to the pond outlet control structures will be determined at the detailed design stage.

Detailed calculations and Visual Otthymo modeling output are included in Appendix A with the results summarized below in Tables 3 and 4.

Table 3: Proposed Condition Peak Flow Summary – Outlet 1

DESIGN STORM	CATCHMENT 201 2.7 ha Uncontrolled (m ³ /s)		
	3-hr CHI	6-hr CHI	24-hr SCS Type II
25mm	0.015 (0.026)	-	-
2-Year	0.028 (0.051)	0.032 (0.059)	0.049 (0.090)
5-Year	0.053 (0.098)	0.060 (0.112)	0.087 (0.162)
10-Year	0.072 (0.135)	0.082 (0.153)	0.115 (0.216)
25-Year	0.100 (0.188)	0.112 (0.210)	0.155 (0.292)
50-Year	0.123 (0.232)	0.138 (0.258)	0.186 (0.352)
100-Year	0.148 (0.280)	0.165 (0.311)	0.219 (0.415)

Notes: (0.026) refers to the existing condition peak flow rate.



Table 4: Proposed Condition Peak Flow Summary - Outlet 2

DESIGN STORM	CATCHMENT 202 4.6 ha Controlled (m ³ /s)			CATCHMENT 203 11.6 ha Uncontrolled (m ³ /s)			CATCHMENT 204 3.3 ha Controlled (m ³ /s)			TOTAL OUTLET 2		
	3-hr CHI	6-hr CHI	24-hr SCS Type II	3-hr CHI	6-hr CHI	24-hr SCS Type II	3-hr CHI	6-hr CHI	24-hr SCS Type II	3-hr CHI	6-hr CHI	24-hr SCS Type II
25 mm	0.000	-	-	0.021	-	-	0.000	-	-	0.021 (0.022)	-	-
2-Year	0.000	0.001	0.001	0.045	0.052	0.083	0.001	0.001	0.002	0.046 (0.049)	0.053 (0.057)	0.084 (0.092)
5-Year	0.001	0.001	0.004	0.091	0.104	0.157	0.001	0.002	0.004	0.093 (0.102)	0.106 (0.117)	0.160 (0.178)
10-Year	0.001	0.003	0.006	0.129	0.146	0.215	0.002	0.004	0.007	0.131 (0.145)	0.148 (0.165)	0.220 (0.245)
25-Year	0.003	0.005	0.010	0.183	0.205	0.297	0.005	0.007	0.012	0.187 (0.208)	0.210 (0.234)	0.308 (0.342)
50-Year	0.005	0.007	0.013	0.228	0.255	0.363	0.007	0.010	0.016	0.234 (0.261)	0.262 (0.292)	0.379 (0.419)
100-Year	0.006	0.009	0.017	0.279	0.311	0.432	0.010	0.013	0.020	0.288 (0.320)	0.322 (0.357)	0.454 (0.501)

Notes: (0.022) refers to the existing condition peak flow rate.



A comparison of the tables above showing the post-development peak flow summaries with the existing condition peak flows confirms the SWM plans for each outlet can attenuate the 2-year through 100-year post-development peak flows at or below existing peak flow rates.

SWMF 1 is a dry pond and has approximately 2,159 m³ of active storage and an additional 0.3 m of freeboard as illustrated on Drawing SWM-1, whereas 1,990 m³ of active storage is required during the 100-year 24-hour SCS design storm.

SWMF 2 is also a dry pond and has approximately 1,234 m³ of active storage and an additional 0.3 m of freeboard, whereas 1,031 m³ of active storage is required during the 100-year 24-hour SCS design storm.

Preliminary stage-volume tables for each facility are included in Appendix A.

5.5.2 Water Quality Control

The proposed water quality control plan for the development will follow a treatment train approach consisting of enhanced 0.5 m wide flat bottom grassed swales in the road ditches and dry SWM ponds that are equipped with plunge pools within the pond forebays and a low flow channel between the pond inlet and the outlet. Within each individual lot, all roof leaders will be directed to pervious front and rear lot areas further promoting filtration of runoff and infiltration upstream of the conveyance route.

Water quality control plans have been developed for each outlet and are described below. The water quality control design calculations are attached in Appendix A. It is noted that the water quality control calculations and storage volumes provided within each SWM facility do not consider the additional water quality treatment from directing roof leaders to pervious front and rear lot areas and thus are conservative as it relates to water quality treatment of runoff from the proposed development.

Outlet 1

Runoff from Catchment 201 consists of rooftop and rear yard runoff and is unimpaired from a water quality perspective. On this basis, was quality treatment for runoff from Outlet 1 is not warranted or required.

Outlet 2

Enhanced 0.5 m Wide Flat Bottom Grassed Swales

Runoff from the road and driveways within Catchments 202, 203 and 204 will be captured by the road ditches which have been enhanced with 0.5 m wide flat bottoms and reduced longitudinal slopes (0.5% - 2.9%) thereby reducing flow velocities and promoting filtering and settling of sediment and pollutants. In accordance with the MECP SWM manual, enhanced grassed swales



are effective at providing water quality treatment when the maximum peak flow velocity does not exceed 0.5 m/s during a 4-hour 25 mm storm event. Typically, enhanced grassed swales are effective for drainage areas up to 2.0 ha however for low impervious areas including Catchment 202 (15% impervious), Catchment 203 (4% impervious) and Catchment 204 (10% impervious), the flow velocity is the more stringent requirement.

The maximum ditch velocity during the 25 mm storm event within all of the above catchments is within Catchment 202A and was determined to be 0.24 m/s which is less than the velocity threshold for providing MEPC enhanced water quality treatment. Further water quality treatment is provided within the proposed dry ponds downstream of the proposed enhanced grassed swales in Catchments 202 and 204.

The enhanced ditch velocity calculations are attached in Appendix A.

Dry SWM Facility

Catchment 202 (4.6 ha) has an estimated imperviousness of 15%. As per the MECP design guidelines the larger of the erosion control active storage (25 mm storm runoff volume) and the water quality active storage (MECP Table 3.2) is to be detained a minimum of 24 hours. The water quality storage requirement from MECP Table 3.2 was determined to be 143.2 m³ whereas the erosion control active storage volume was determined to be 161.9 m³ and therefore is the more stringent volume criteria. It is noted that SWMF 1 has approximately 2,159 m³ of active storage and the water quality active storage requirement will make up a portion of the water quantity control storage volume. Based on the above, SWMF 1 will provide basic level (60% TSS removal) water quality treatment of runoff from Catchment 202 in addition to the MECP enhanced level treatment provided in the upstream enhanced 0.5 m flat bottom grassed swales.

Catchment 204 (3.3 ha) has an estimated imperviousness of 10%. As per the MECP design guidelines the larger of the erosion control active storage (25 mm storm runoff volume) and the water quality active storage (MECP Table 3.2) is to be detained a minimum of 24 hours. The water quality storage requirement from MECP Table 3.2 was determined to be 47.0 m³ whereas the erosion control active storage volume was determined to be 78.5 m³ and therefore is the more stringent volume criteria. It is noted that SWMF 2 has approximately 1,234 m³ of active storage and the water quality active storage requirement will make up a portion of the water quantity control storage volume. Based on the above, SWMF 2 will provide basic level (60% TSS removal) water quality treatment of runoff from Catchment 202 in addition to the MECP enhanced level treatment provided in the upstream enhanced 0.5 m flat bottom grassed swales.

Vehicular access to SWMF 1 and 2 will be provided via maintenance access roads which have been allowed for in the SWM block sizing which are depicted on Drawings SG-1.



5.6 STORMWATER CONVEYANCE

Minor and major system drainage will be conveyed in the road ditches, culverts, easements and the SWM blocks to the intended outlets. The enhanced road ditches will be sized to convey peak flows from all storms up to and including the 100-year storm. Enhanced road ditch capacity calculations, confirming that the proposed enhanced grassed swales can convey the 100-year storm peak flow from the largest contributing drainage area (Catchment area 202A) at a depth of only 0.16 m, are included in Appendix A.

The proposed road cross culverts will be sized to convey the peak runoff rate from storms up to and including the 25-year storm prior to overtopping the road. The proposed driveway culverts will be designed to convey the 5-year storm peak flow rate at a minimum. The proposed culvert sizing calculations will be provided at the detailed design stage.

5.7 STORMWATER FACILITY PRELIMINARY MAINTENANCE SCHEDULE AND COST

To ensure the long-term functionality of the SWM system, regular inspection and maintenance will be required. The recommended activities and associated costs herein are presented as preliminary estimates only and are intended to provide the Township and the County with order-of-magnitude costs associated with the SWM facility maintenance needs and schedule. A general maintenance schedule is also suggested; however, the actual frequency of maintenance will depend on site-specific performance, weather conditions, and operational considerations. A general breakdown of routine and periodic activities, along with estimated costs, is summarized in Table 5 below.

Table 5: Estimated SWM Facility Maintenance Costs

TYPE OF MAINTENANCE REQUIRED	ESTIMATE OF PROBABLE COST
Routine Annual Maintenance	\$2,250/facility
Basic Repairs (when required)	\$1,000/repair
Inlet/Outlet Replacement	\$10,000/inlet or outlet
Sediment Removal (per 10-20 years)	\$125,000 (including \$250/m ³ of sediment removed)



The routine annual maintenance cost presented in Table 5 assumes a unit rate of \$90 per hour for labor, equipment and materials for the following tasks and costs per facility:

- Inspection (\$360/year) – Assumes a single Township staff person inspects four (4) stormwater management facilities per day (8-hours), twice per year;
- Debris removal (\$720/year) – Allowance for a two-person Township crew to remove debris from a SWM facility for 4 hours once per year;
- Grass Cutting (\$450/year) – Assumes a single Township staff cuts the grass at one SWM facility in 2.5 hours, twice per year; and
- Miscellaneous Repairs (\$720) – Allowance for a two-person crew for a half day to complete miscellaneous repairs once per year.

The cost of sediment removal can vary significantly based on climate, characteristics of the contributing drainage area, the size of the SWM facility, and the chemical composition of the sediment (sediment exceeding provincial requirements will require on-site management/remediation or disposal in a landfill as waste). It is recommended that the Township track maintenance activities and costs to improve future estimates and adjust annual budgets accordingly.

It is noted the costs presented herein reflect professional judgement based on industry experience only. The sediment removal cost allows for mobilization and an allowance of \$250/m³ for appropriate removal, hauling and offsite disposal of sediment.



6 Siltation and Erosion Control

Siltation and erosion control measures will be implemented for all construction activities within the site including vegetation clearing, topsoil stripping, grading, and stockpiling of materials. The basic principles considered to minimize erosion, sedimentation and resultant negative environmental impacts include:

- All erosion control devices to be specified in accordance with the Erosion and Sediment Control Guide for Urban Construction (Sustainable Technologies Evaluation Program, 2019);
- Silt control fences to be erected before the commencement of any grading operations to control sediment movement;
- A designated construction vehicle entrance(s) with a stone mud mat will be specified to reduce off-site tracking of material;
- Temporary swales, and earth berms will be constructed to control runoff during construction by lowering velocities and promoting settling of particulates;
- All topsoil and fill piles are to be surrounded with heavy duty silt fence and are to be seeded immediately upon completion of earthworks;
- Expose the smallest possible land area to erosion for the shortest possible time;
- Long term siltation and erosion control will be enhanced with a re-vegetation strategy for disturbed areas;
- Confine refuelling and servicing of equipment to areas well away from the drainage systems; and
- Regular inspection of control measures to be instituted through a monitoring and mitigation plan and repairs will be made as necessary. Bi-weekly inspections of the site erosion and sediment control should be completed.

A detailed erosion and sediment control plan will be prepared at the detailed design stage.



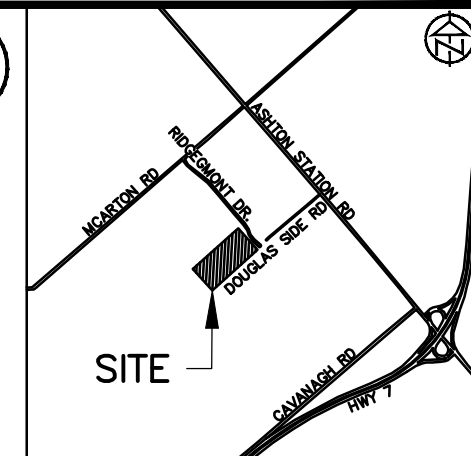
7 Summary

The proposed SWM plan demonstrates how existing drainage conditions will generally be maintained to the existing surface water outlets. Stormwater management facilities consisting of enhanced grassed swales in the road ditches and two dry SWM ponds are proposed and are sufficient to provide MEP enhanced level water quality treatment and water quantity controls. At-source LID practices consisting of roof leaders directed to pervious areas will also be provided thereby providing a treatment train approach to water quality control. The detailed design of SWM plans for each outlet will be provided at the detailed design stage, however the work completed to date confirms that appropriate stormwater management can be provided to support the proposed development.

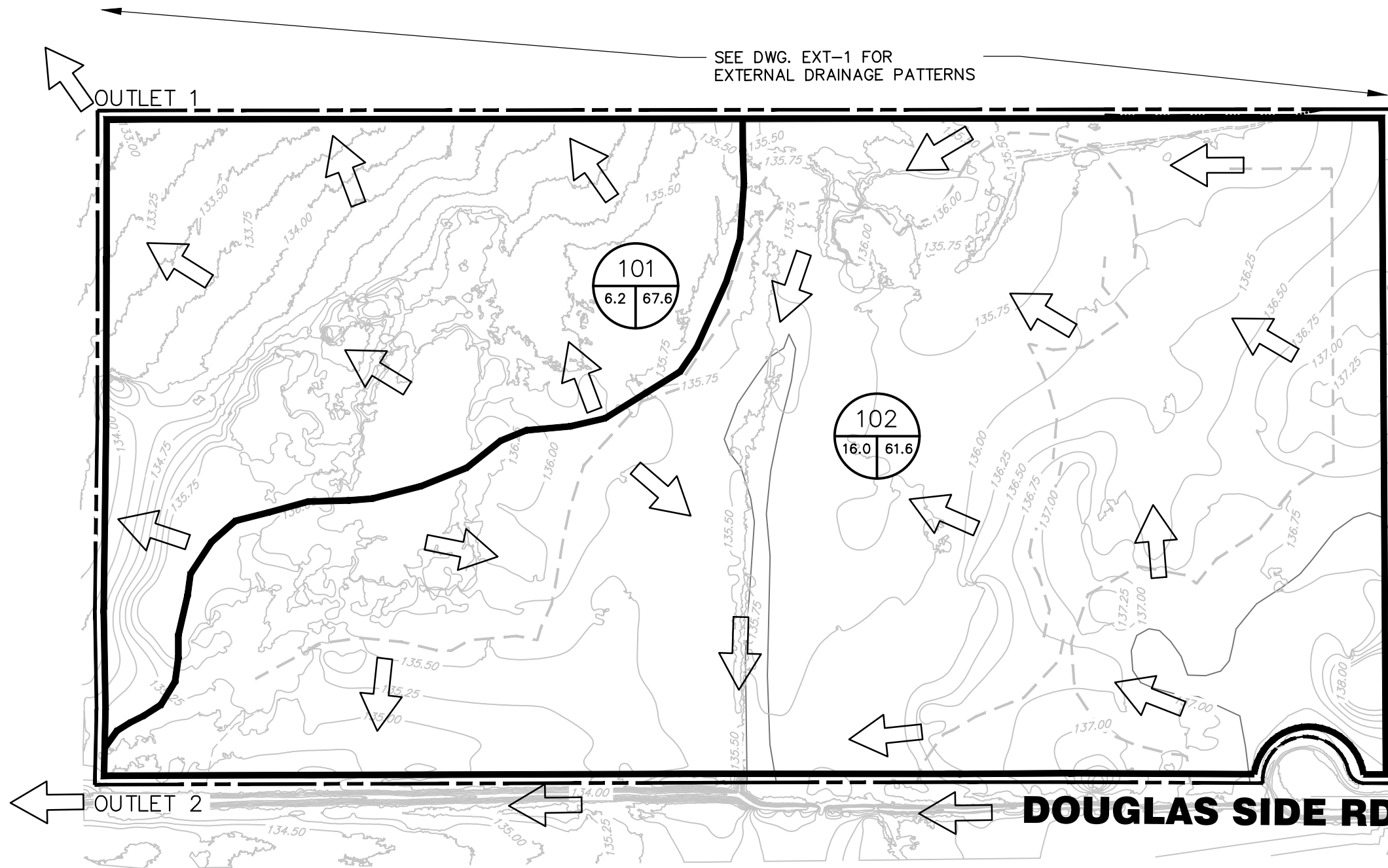
Siltation and erosion control will be provided with the proper construction mitigation efforts. Long-term erosion control will be enhanced with an effective revegetation strategy.

We trust this report demonstrates the feasibility of the proposed subdivision as it relates to stormwater management and is sufficient to support the proposed Draft Plan of subdivision application.





KEY PLAN



LEGEND

- SUBJECT PROPERTY BOUNDARY
- DRAINAGE AREA BOUNDARY
- ENVIRONMENTAL CONSTRAINT AREA
- EXISTING CONDITION DRAINAGE DIRECTION
- DRAINAGE AREA ID
- CURVE NUMBER
- AREA (ha.)

CONTRACT DRAWINGS

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**DOUGLAS LANDING SUBDIVISION
BECKWITH TOWNSHIP
LANARK COUNTY
EXISTING CONDITION DRAINAGE PLAN**

DWG. No.
DP-1

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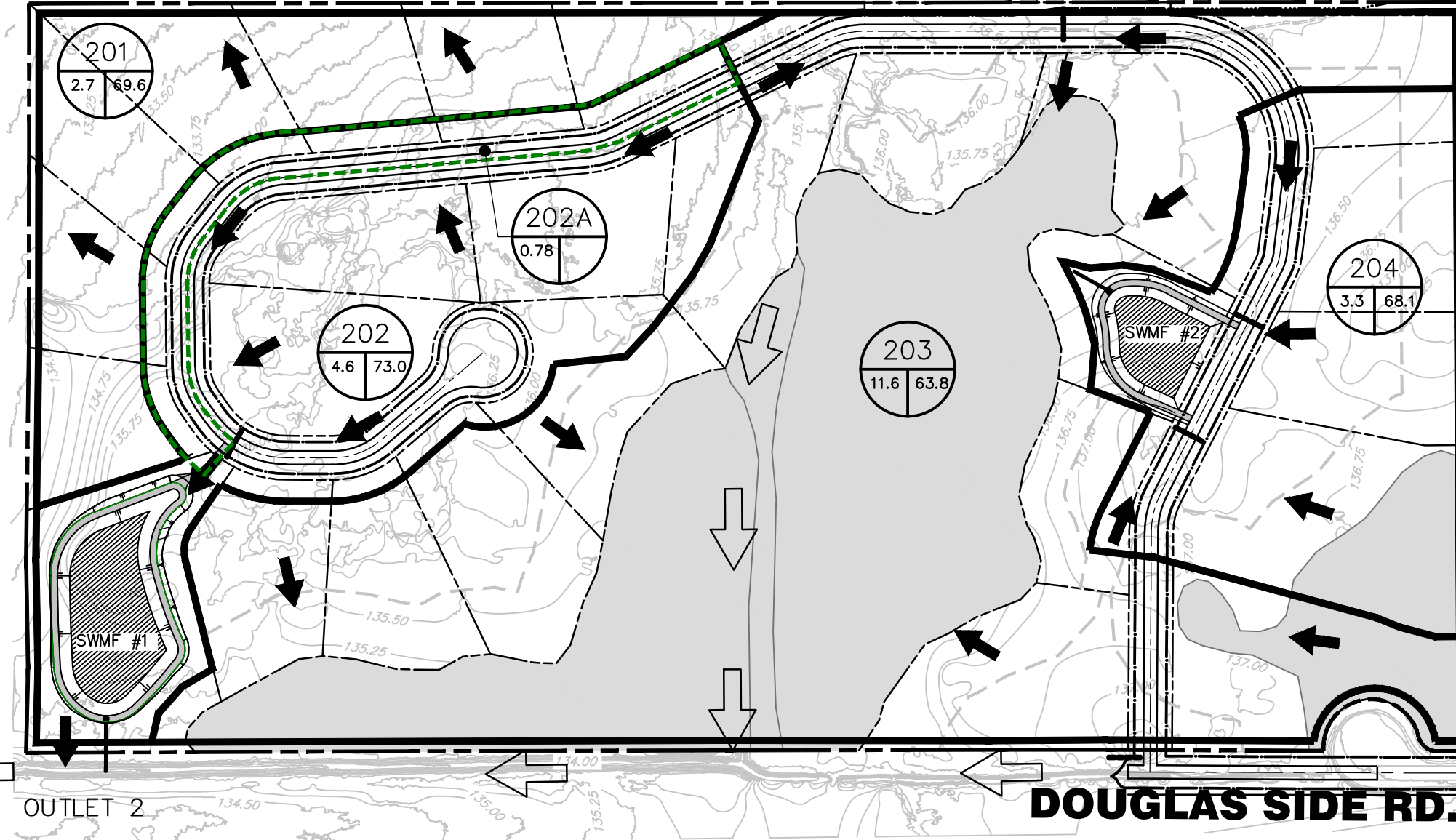
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DATE: APR, 2023

JOB NO. 522650

OUTLET 1

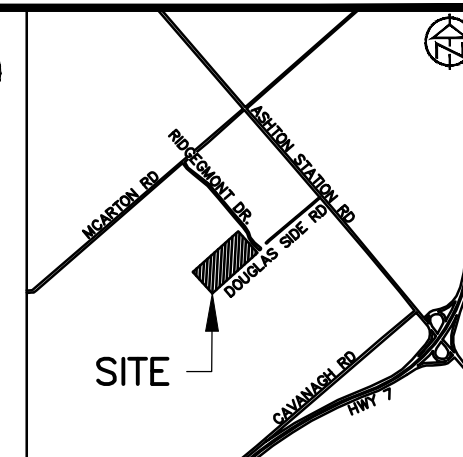
SEE DWG. EXT-1 FOR
EXTERNAL DRAINAGE PATTERNS



OUTLET 2

DOUGLAS SIDE RD.

RIDGEMONT DR.



KEY PLAN

LEGEND

- SUBJECT PROPERTY BOUNDARY
- DRAINAGE AREA BOUNDARY
- ENVIRONMENTAL CONSTRAINT AREA
- SUB-CATCHMENT AREA
- ← EXISTING CONDITION DRAINAGE DIRECTION
- PROPOSED CONDITION DRAINAGE DIRECTION
- 201
2.7 69.6
DRAINAGE AREA ID
CURVE NUMBER
AREA (ha.)

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TATHAM
ENGINEERING

**DOUGLAS LANDING SUBDIVISION
BECKWITH TOWNSHIP
LANARK COUNTY
PROPOSED CONDITION DRAINAGE PLAN**

DWG. No.

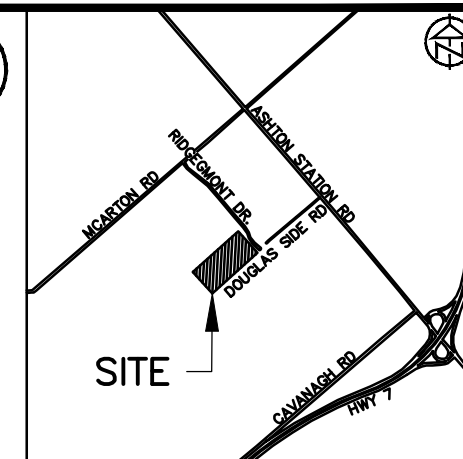
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DRAWN: HY

DATE: APR 2023

JOB NO. 522650



KEY PLAN

LEGEND

- SUBJECT PROPERTY BOUNDARY
- ← DRAINAGE DIRECTION

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**DOUGLAS LANDING SUBDIVISION
BECKWITH TOWNSHIP
LANARK COUNTY
EXTERNAL DRAINAGE PLAN**

DWG. No.

EXT-1

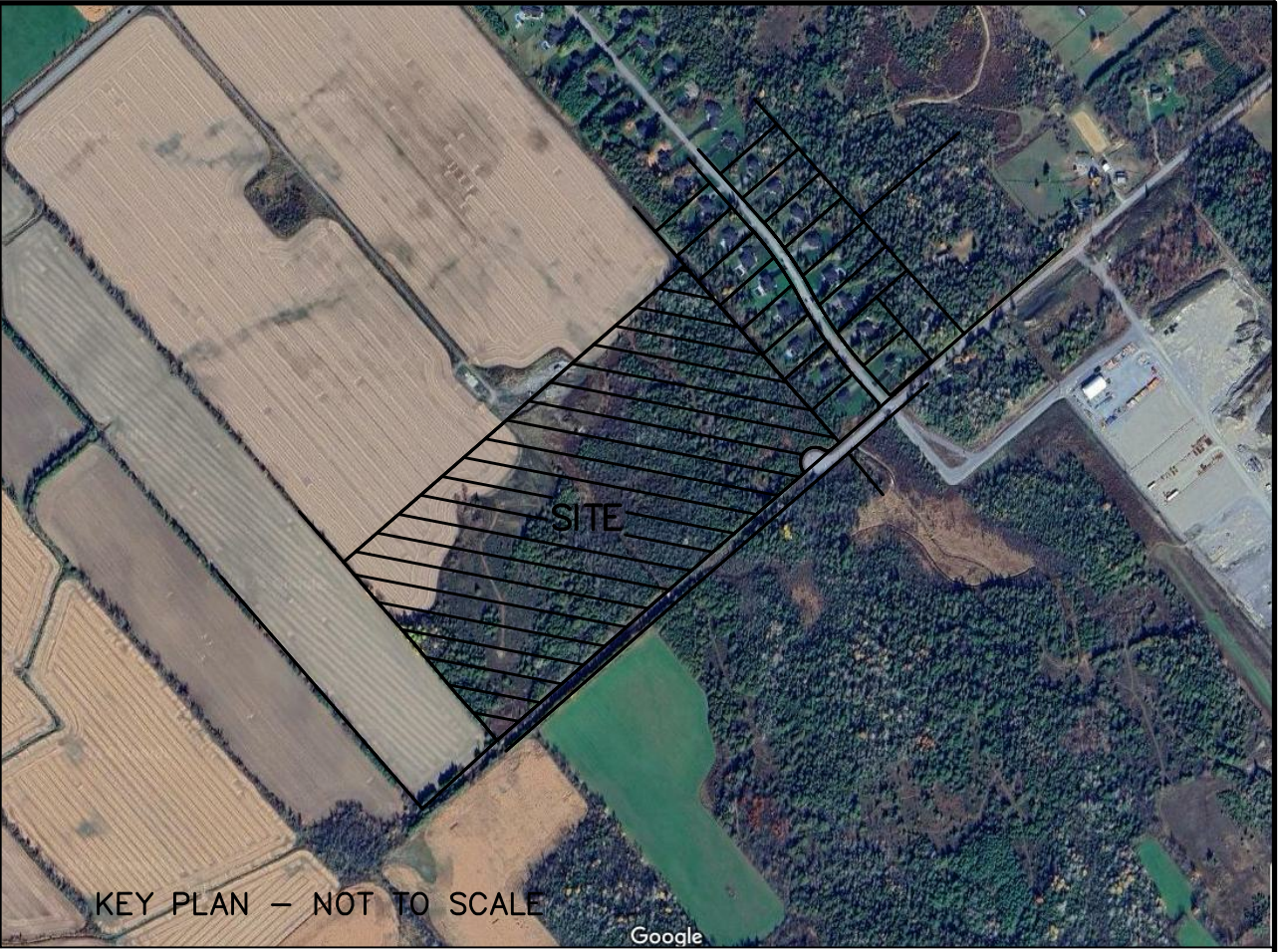
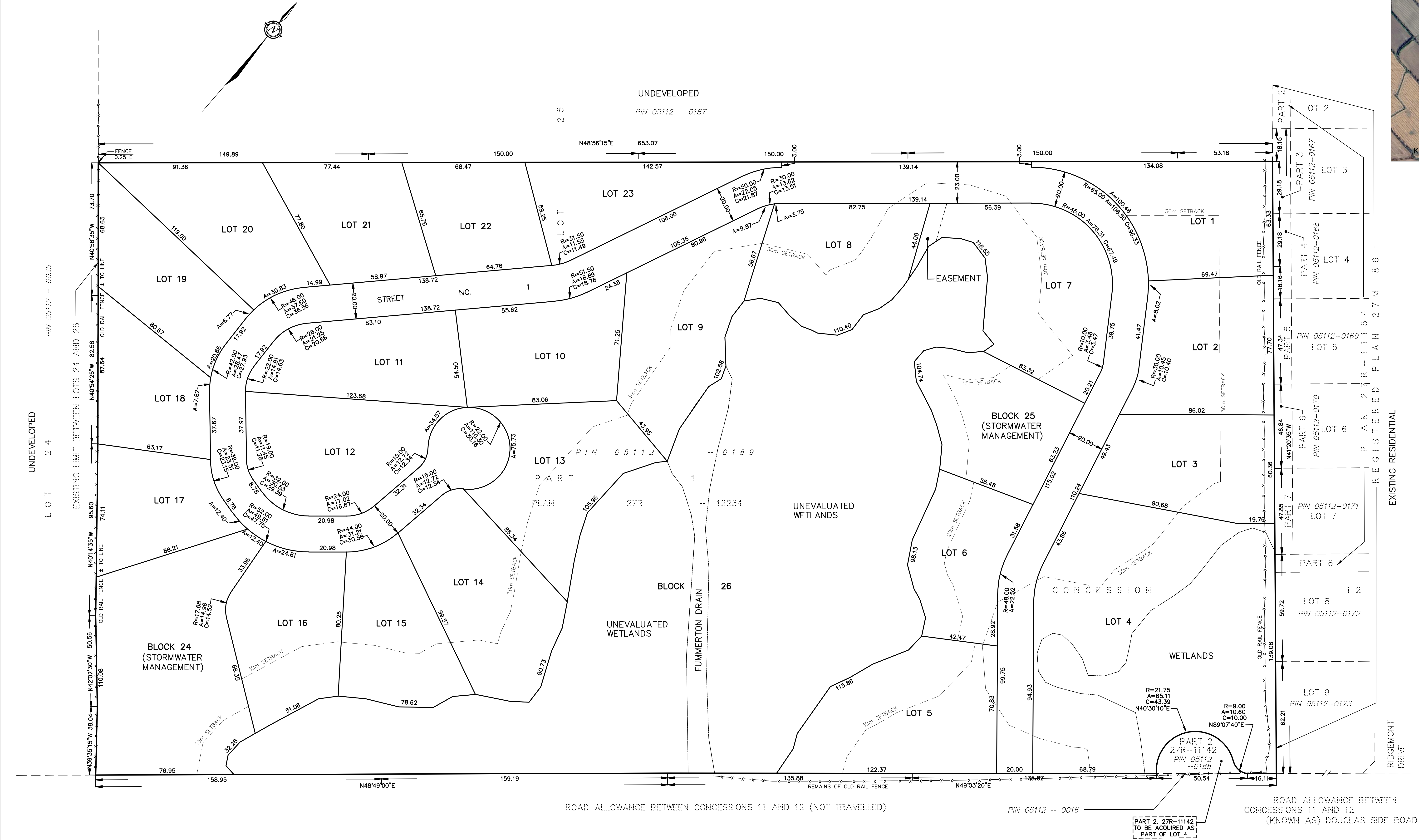
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DRAWN: HY

DATE: DEC, 2023

JOB NO. 522650

METRIC
DISTANCES AND ELEVATIONS SHOWN ON THIS PLAN ARE IN METRES
AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048



DRAFT PLAN OF SUBDIVISION OF
PART OF LOT 25
CONCESSION 12
TOWNSHIP OF BECKWITH
COUNTY OF LANARK

SCALE 1 : 1000
0 10 20 50 100 metres

FAIRHALL, MOFFATT & WOODLAND LIMITED
ONTARIO LAND SURVEYORS

OWNER'S AUTHORIZATION

I HEREBY AUTHORIZE THE SUBMISSION OF THIS PLAN FOR
APPROVAL.

DOUGLAS LANDING DEVELOPMENTS

DATE

DR. GILLIAN ESPIE
(PRESIDENT)

SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LANDS TO BE
SUBDIVIDED AS SHOWN ON THIS PLAN AND THEIR RELATIONSHIP
TO ADJOINING LANDS ARE ACCURATELY AND CORRECTLY SHOWN.

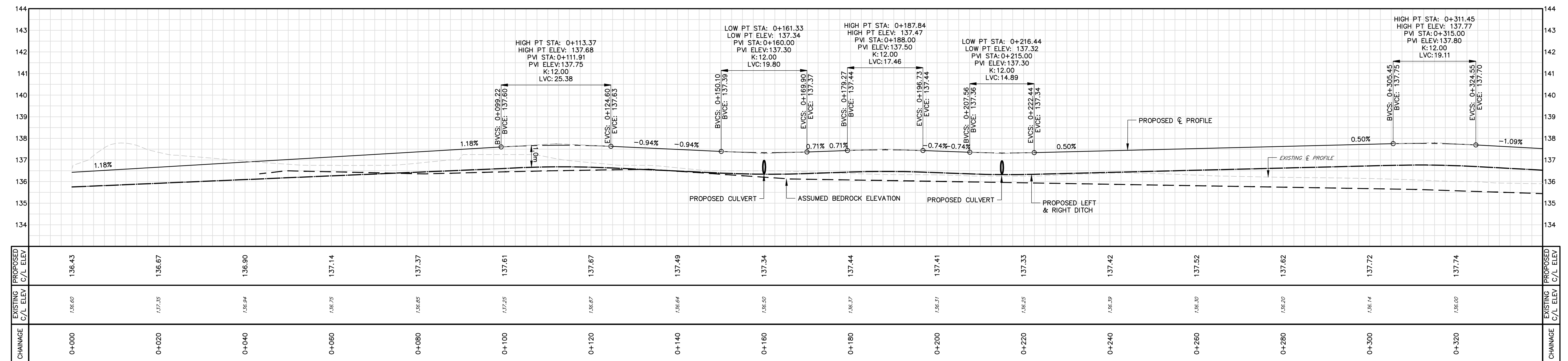
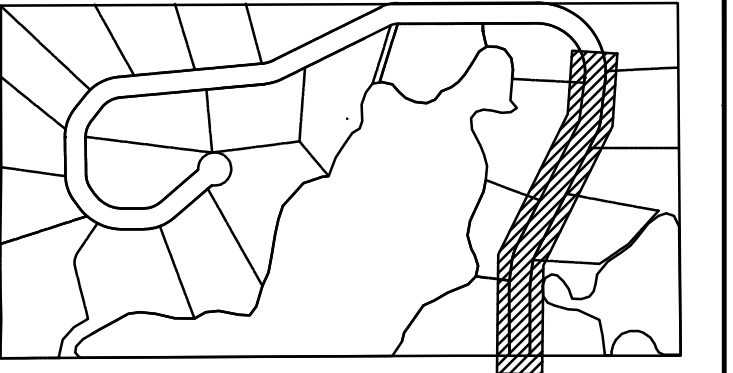
DATE

JOHN H. GUTRI
ONTARIO LAND SURVEYOR

SECTION 51 (17) OF THE PLANNING ACT.

- SHOWN ON PLAN
- SHOWN ON PLAN
- SHOWN ON PLAN
- 23 LOTS FOR SINGLE FAMILY HOMES (2 STOREYS EACH)
WETLAND
STORMWATER MANAGEMENT
- SHOWN ON PLAN
- SHOWN ON PLAN
- SHOWN ON PROJECT SITE PLAN
- WATER SUPPLY WILL BE FROM WELLS AS SHOWN ON
CONCEPT PLAN BY P2 CONCEPTS DATED SEP. 5, 2025.
ALSO SEE HYDROLOGICAL REPORT BY PINCHIN LTD.
DATED SEP. 5, 2025.
- SEE GEOTECHNICAL INVESTIGATION REPORT
BY PINCHIN LTD. DATED SEP. 5, 2025.
- SEE GRADING AND DRAINAGE PLAN BY TATHAM ENGINEERING LIMITED
DATED SEP. 5, 2025.
- FIRE PROTECTION, POLICING AND GARBAGE
COLLECTION ARE AVAILABLE.
- NONE REGISTERED

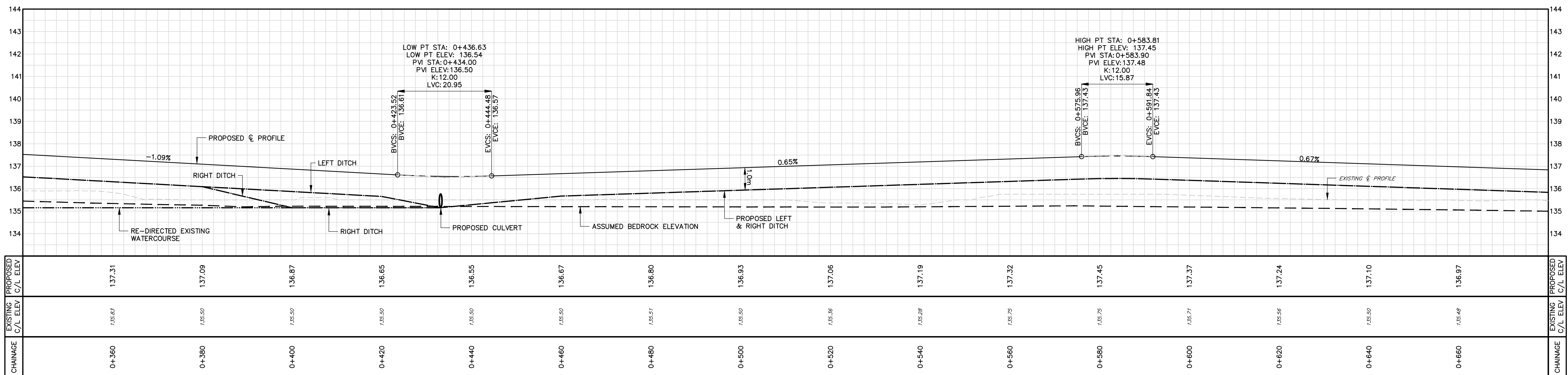
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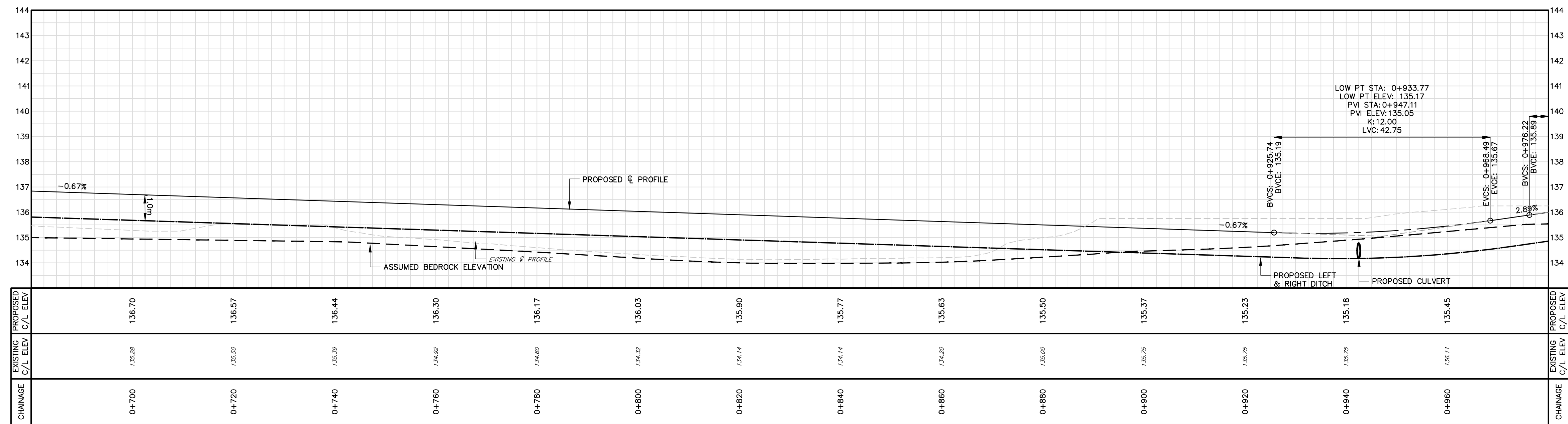
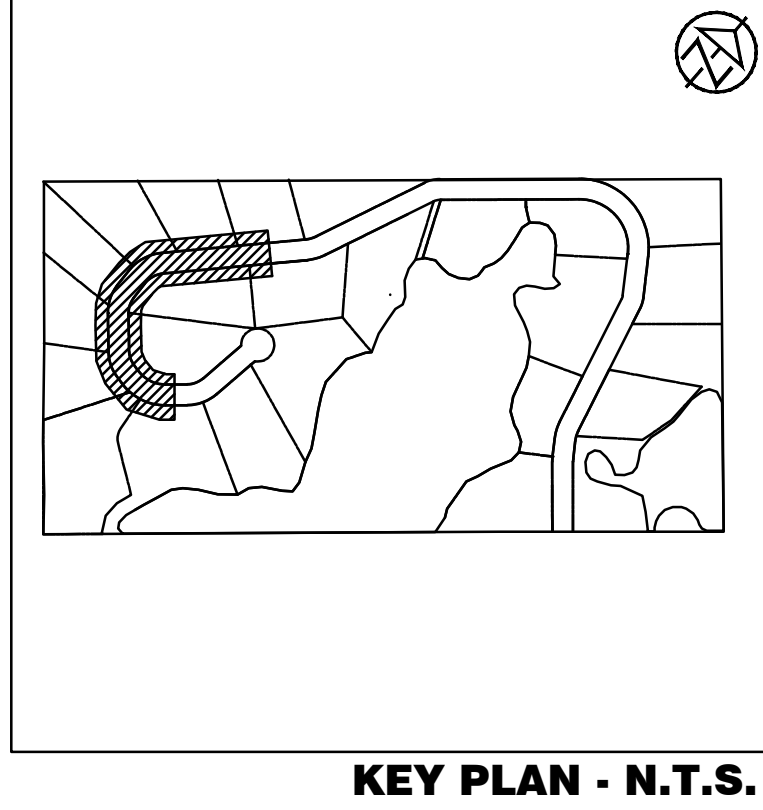
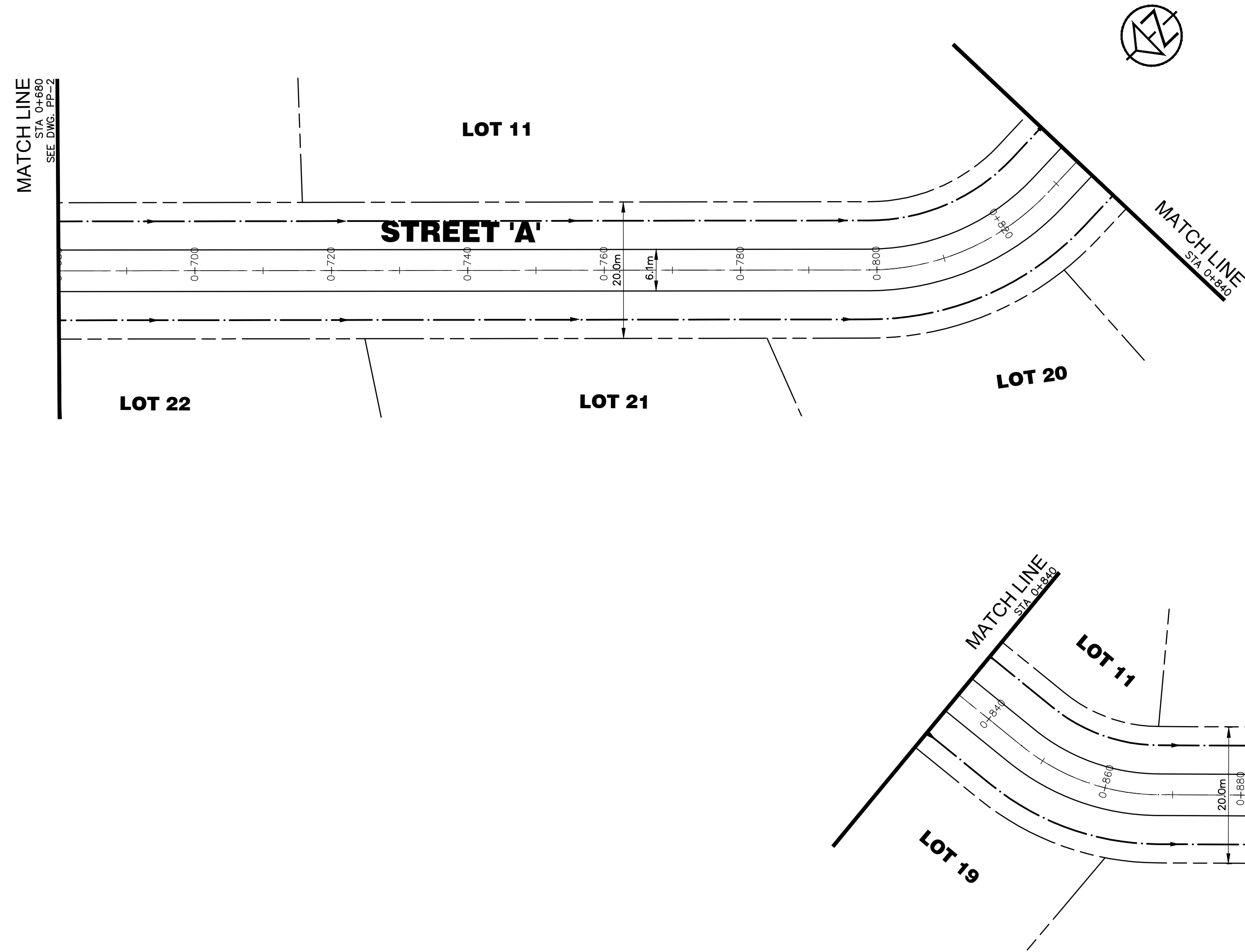
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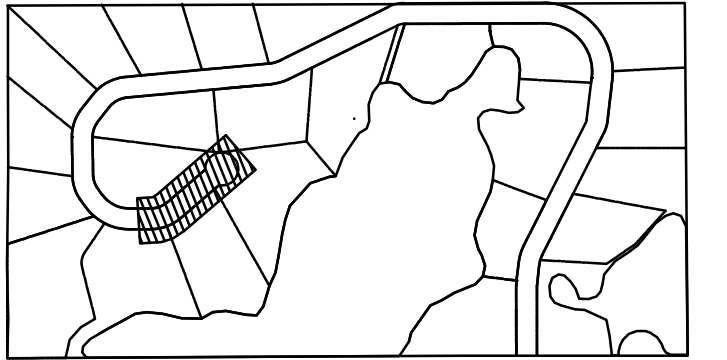
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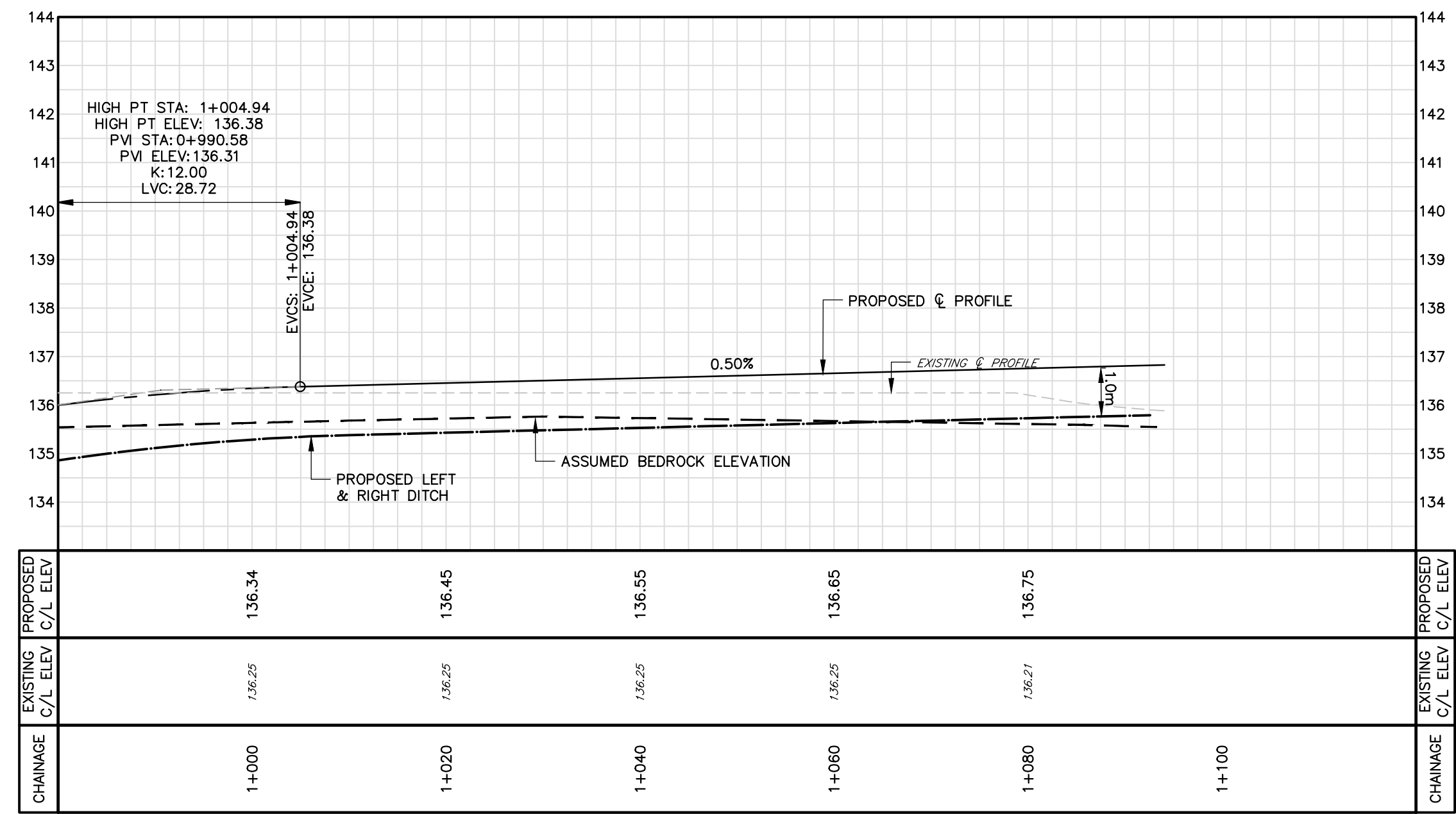
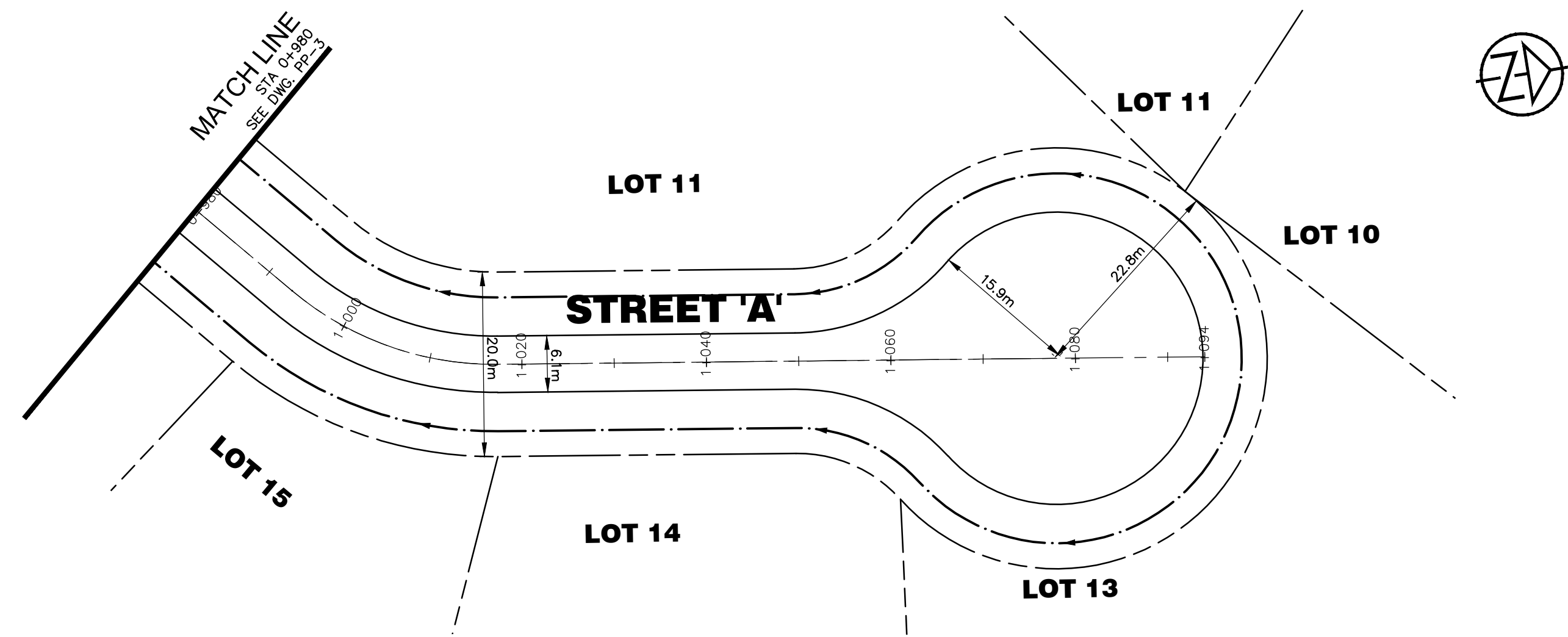
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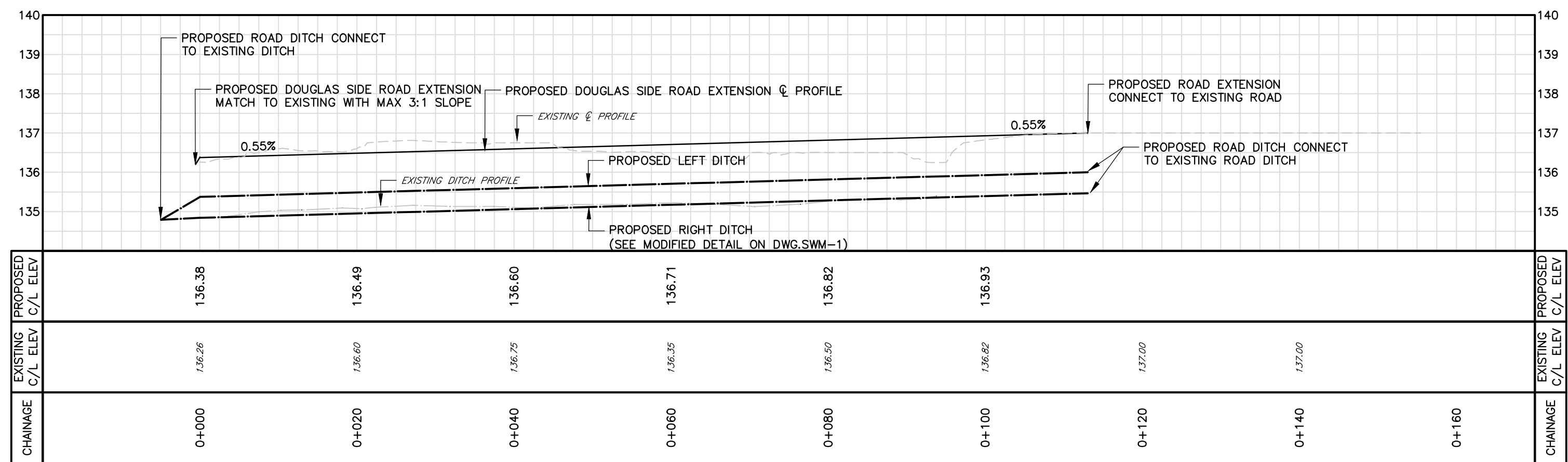
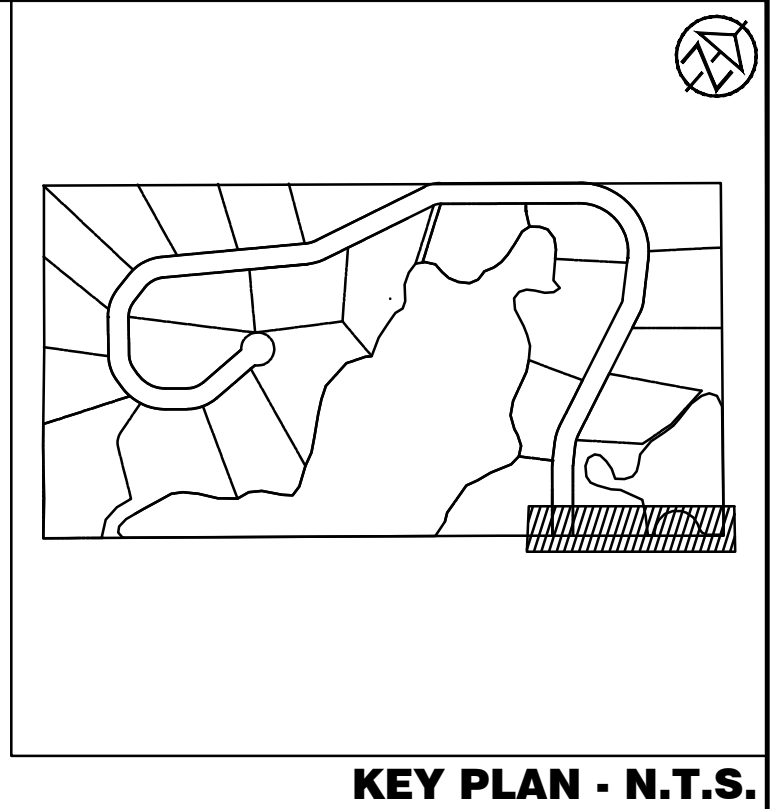
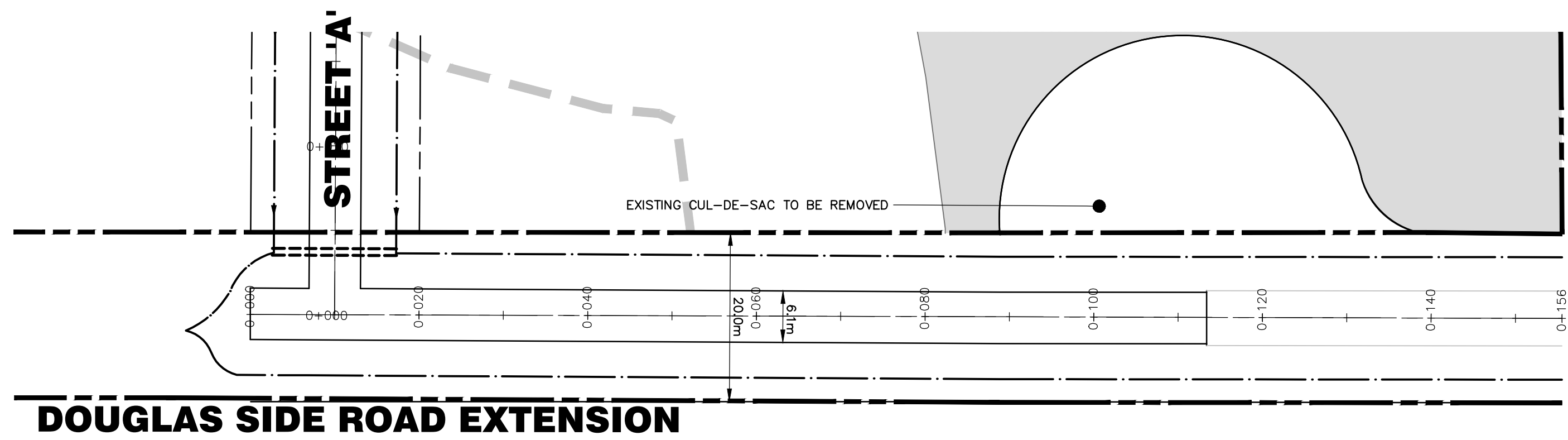


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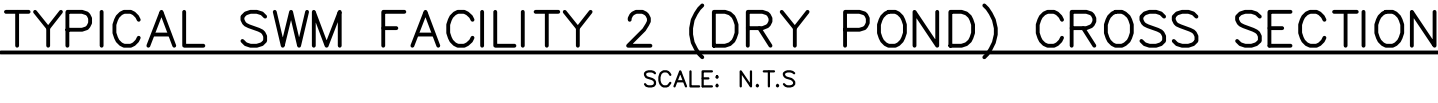


KEY PLAN - N.T.S.



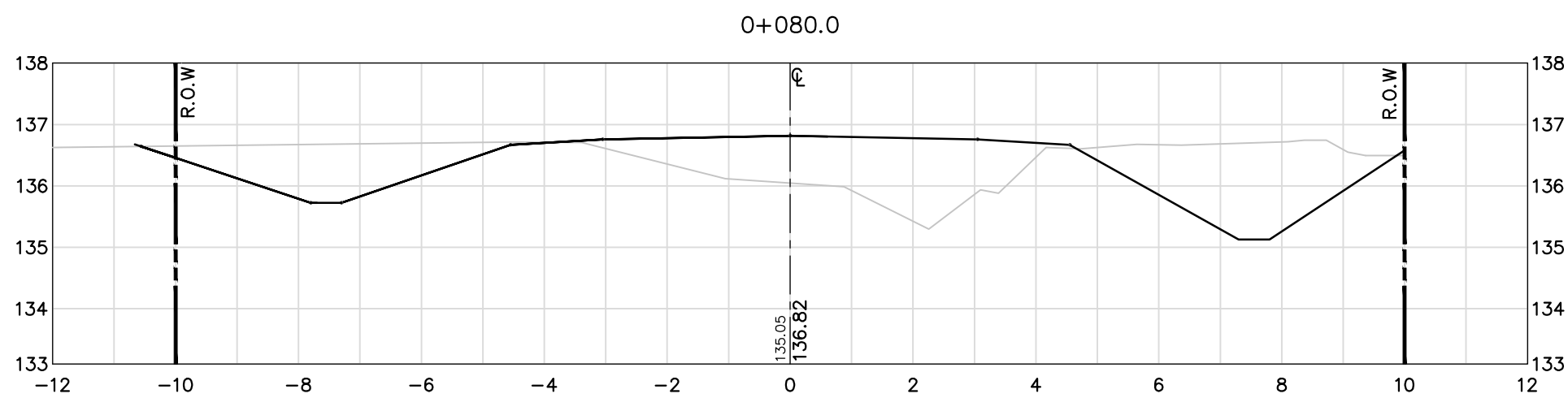
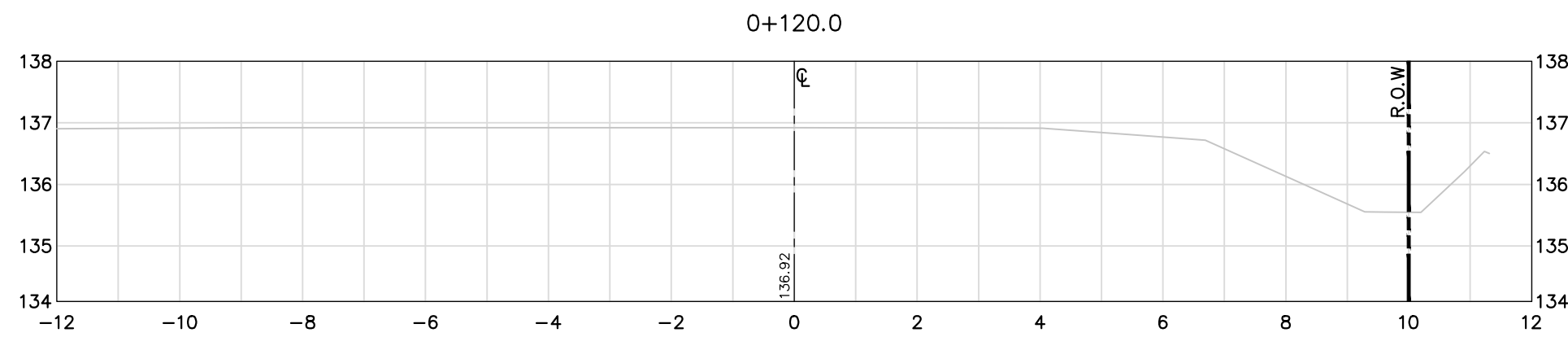
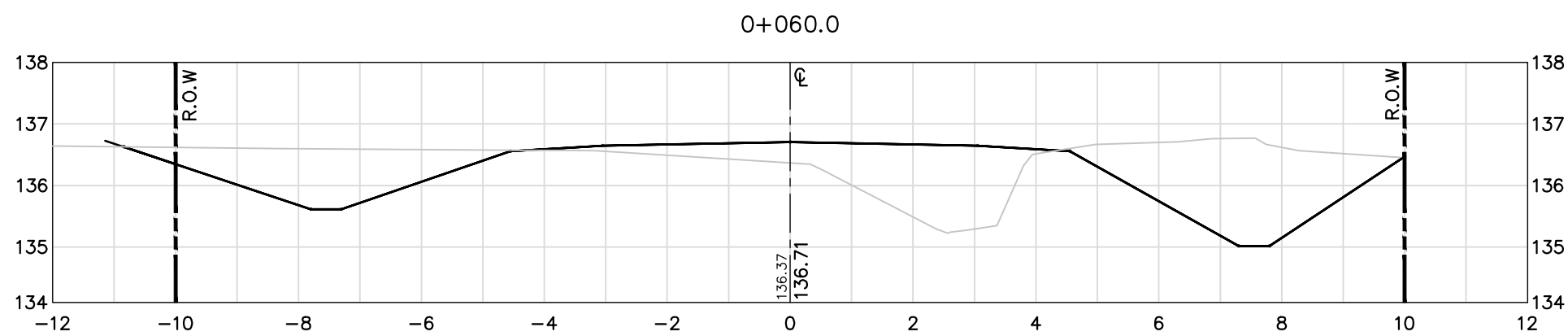
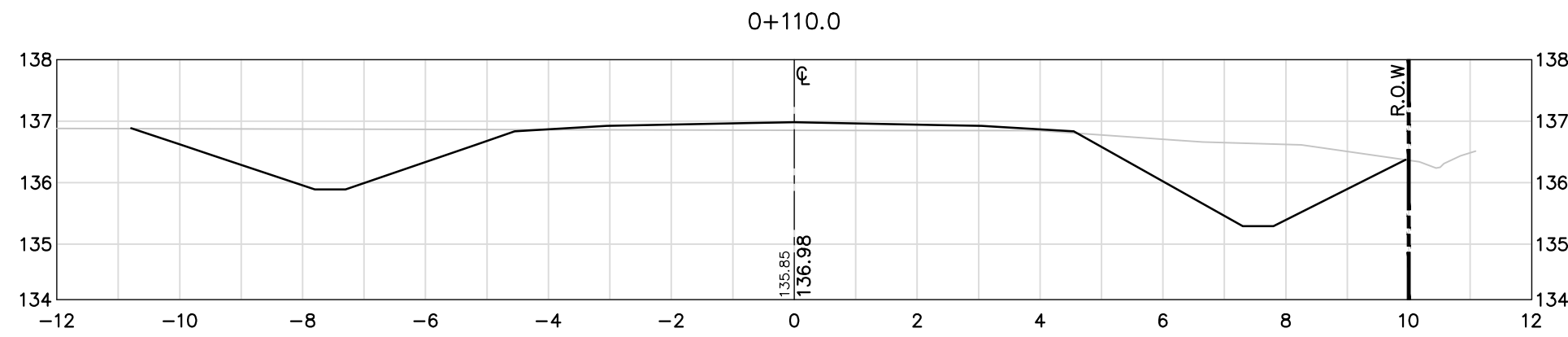
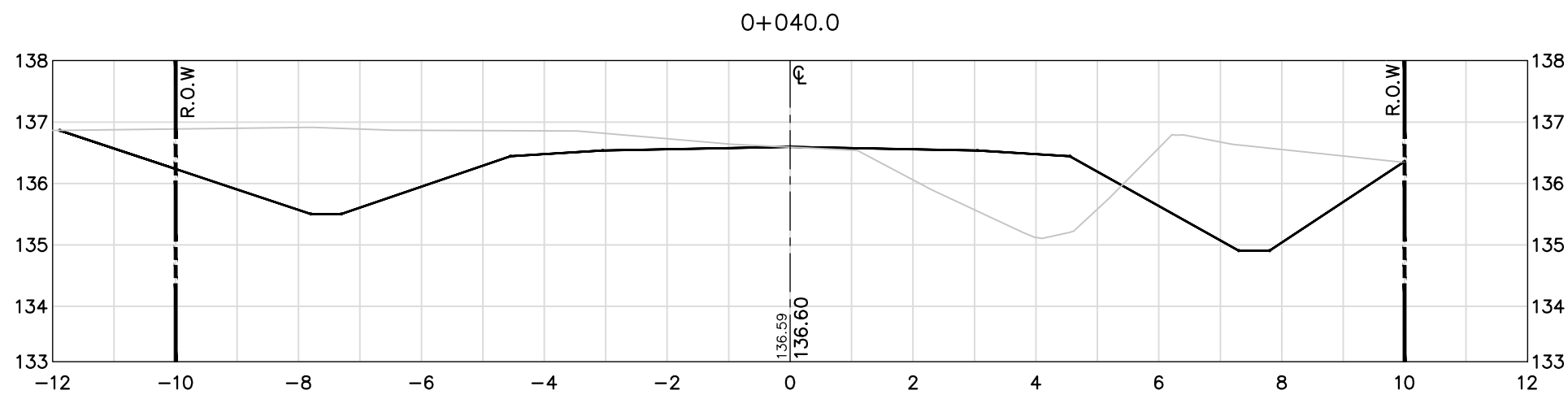
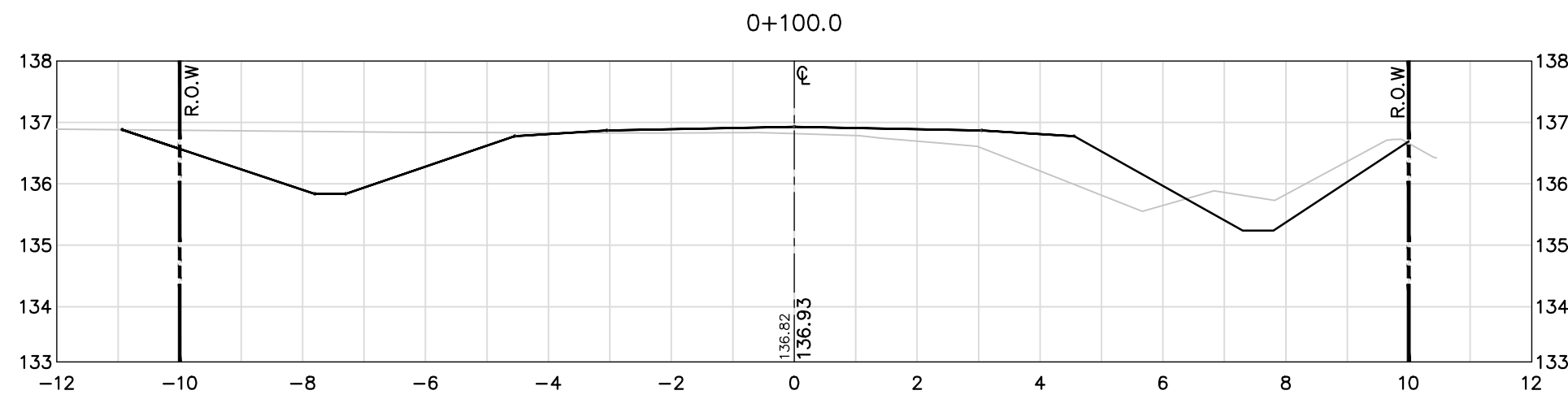
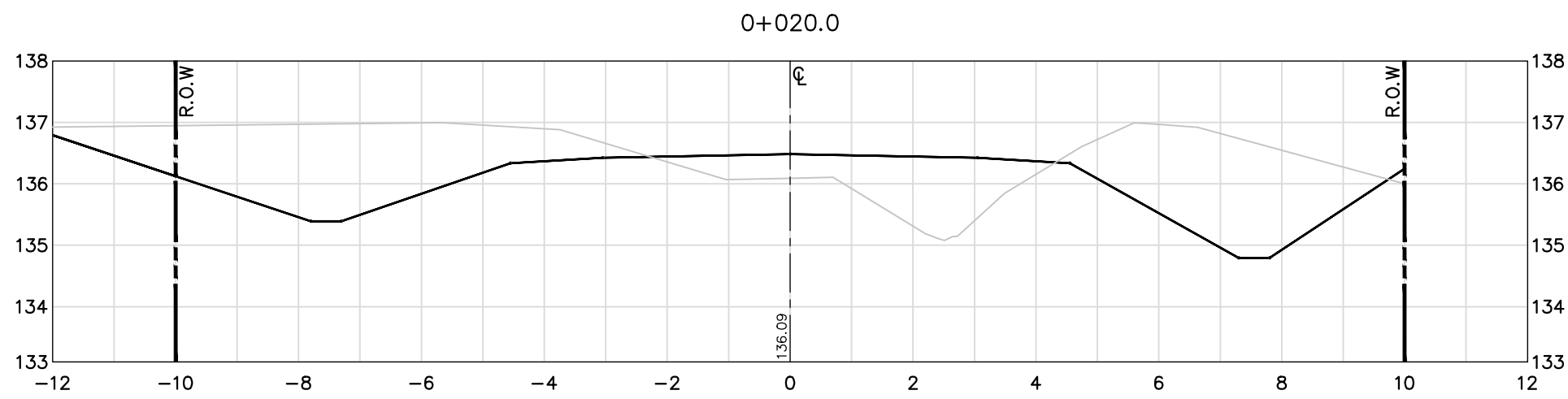


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DRAWN: HY	DATE: JAN 2023	
CHECK: JA	SCALE:	

SWM-1



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No.	REVISION DESCRIPTION	DATE

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DOUGLAS LANDING SUBDIVISION
BECKWITH TOWNSHIP
LANARK COUNTY

DOUGLAS SIDE ROAD
CROSS SECTIONS



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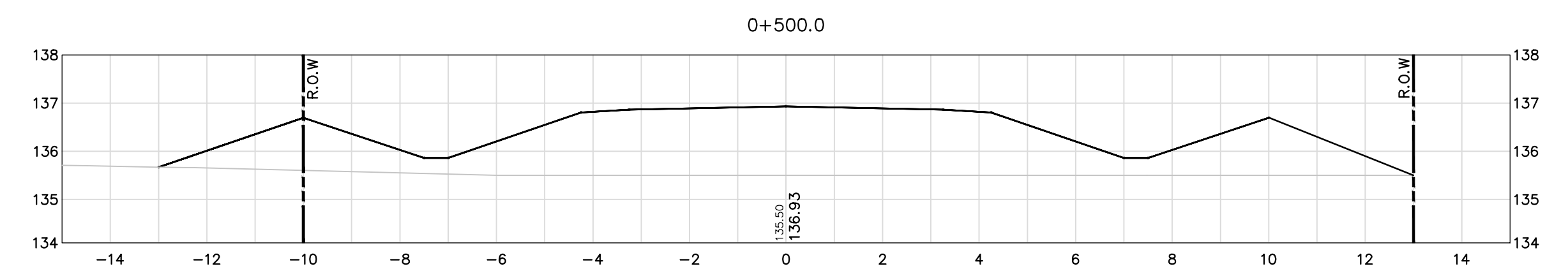
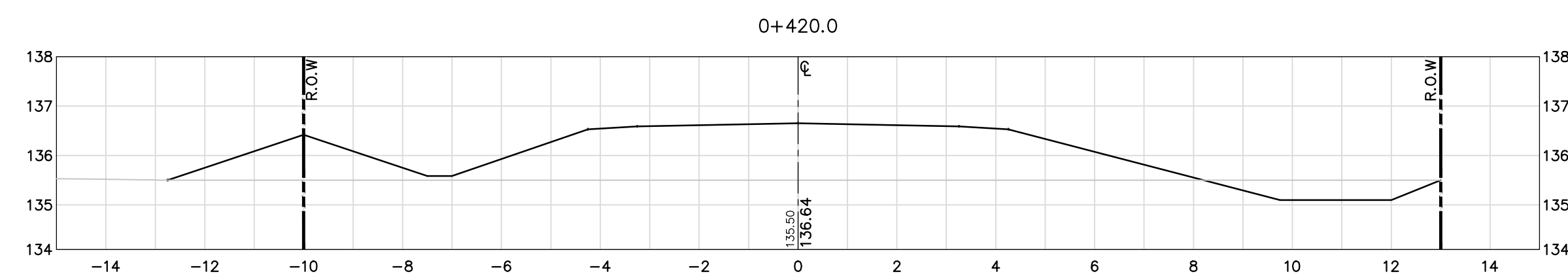
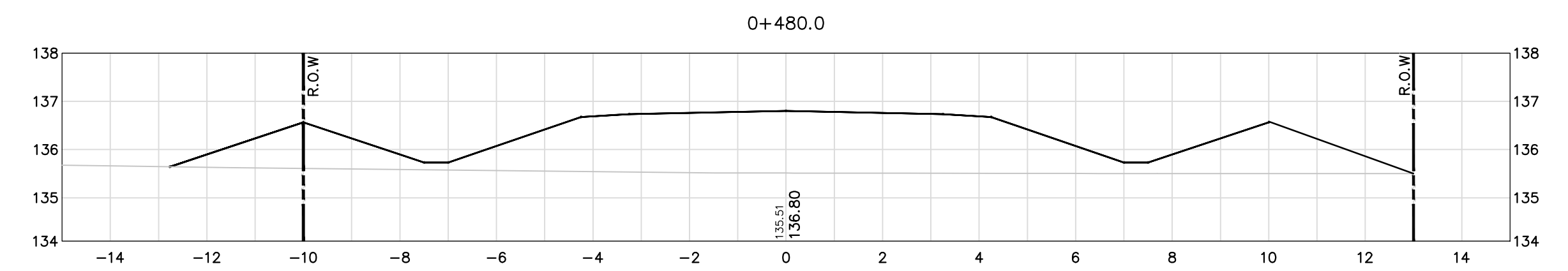
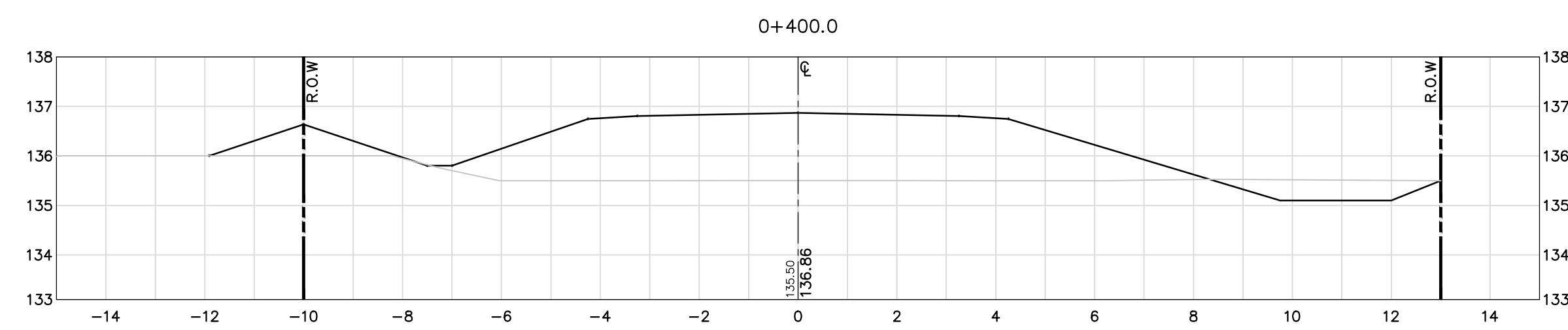
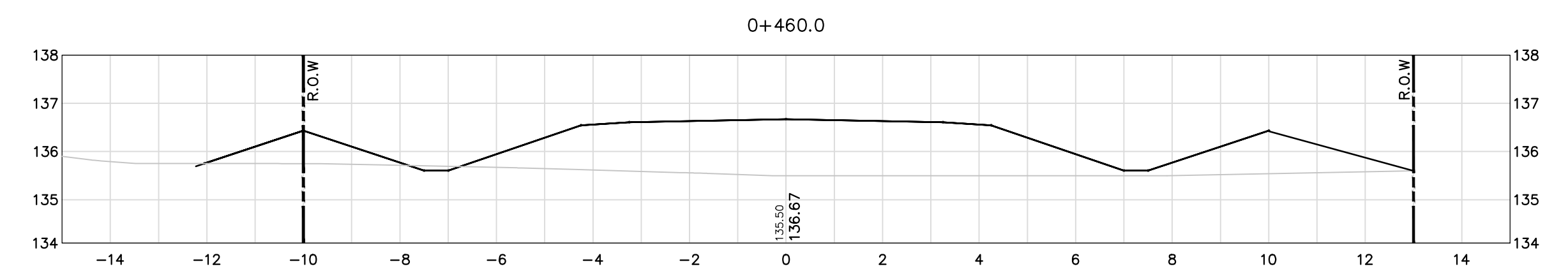
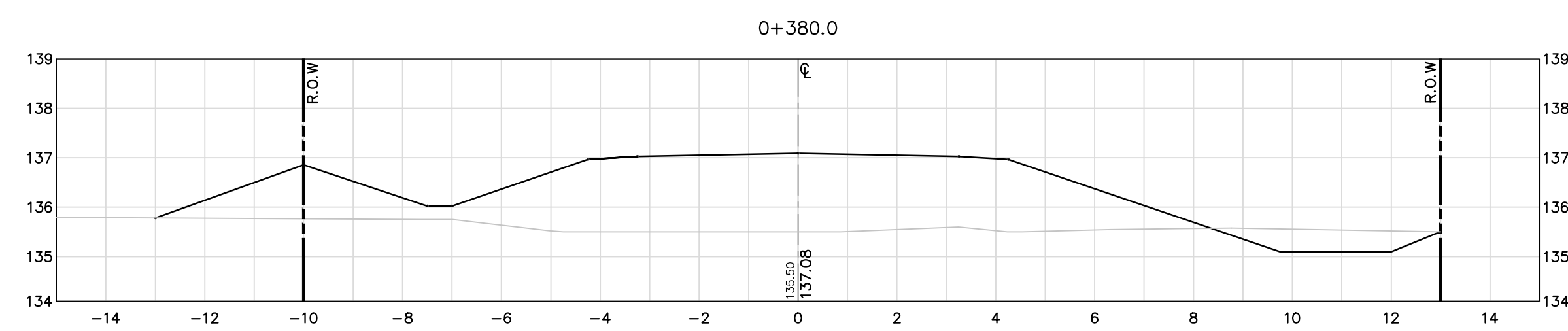
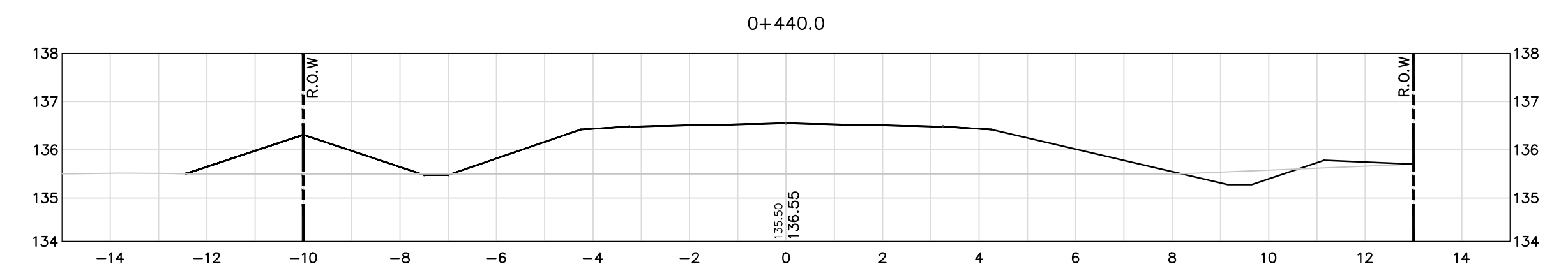
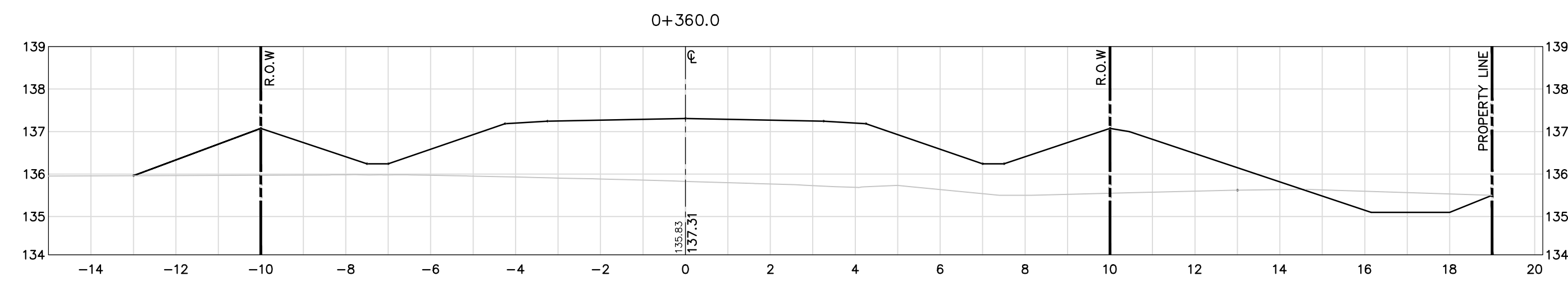
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DATE: JAN 2023

SCALE: 1:100

DWG:

XS-1



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No.	REVISION DESCRIPTION	DATE	ENGINEER STAMP

**DOUGLAS LANDING SUBDIVISION
BECKWITH TOWNSHIP
LANARK COUNTY**

STREET A CROSS SECTIONS



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CHECK: JA	SCALE: 1:100	

Appendix A: Stormwater Management Calculations

Visual OTTHYMO Model Parameter Calculations (NasHYD)

Project Details

Project Number	522650
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Data Sources

Detailed Soil Survey Reports for Ontario, MTO Drainage Management Manual (1997)
--

Prepared By

Name	HY
------	----

Pre-Development Condition

Watershed:	N/A
Catchment ID:	101
Catchment Area (ha):	6.20
Impervious %:	

Average Curve Number (CN), Runoff Coefficient (C) and Initial Abstraction (IA)

Soil Symbol		FI				Os							
Soil Series		Farmington				Osgoode							
Hydrologic Soils Group		B				B							
Soil Texture		Loam or Silt Loam				Silt Loam							
Runoff Coefficient Type		2				2							
Area (ha)		2.90				3.30							
Percentage of Catchment		47%				53%							
Land Cover Category	IA	A (ha)	CN	C	A (ha)	CN	C	A (ha)	CN	C	A (ha)	CN	C
Impervious	2		100	0.95		100	0.95						
Gravel	3		89	0.27		89	0.27						
Woodland	10	0.37	60	0.25	0.58	60	0.25						
Pasture/Lawns	5	2.53	69	0.28	2.72	69	0.28						
Meadows	8		65	0.27		65	0.27						
Cultivated	7		74	0.35		74	0.35						
Waterbody	12		50	0.05		50	0.05						
Average CN		67.85				67.42							
Average C		0.28				0.27							
Average IA		5.64				5.88							

Time to Peak Calculations

Max. Catchment Elev. (m):	136.25
Min. Catchment Elev. (m):	133.00
Catchment Length (m):	285
Catchment Slope (%):	1.14%
Method: Airport Method	
Time of Concentration (mins):	43.46

Summary

Catchment CN:	67.6
Catchment C:	0.28
Catchment IA (mm):	5.77
Time of Concentration (hrs):	0.72
Catchment Time to Peak (hrs):	0.48
Catchment Time Step (mins):	5.79

Visual OTTHYMO Model Parameter Calculations (NasHYD)

Project Details

Project Number	522650
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Data Sources

Detailed Soil Survey Reports for Ontario, MTO Drainage Management Manual (1997)
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Prepared By

Name	HY
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Pre-Development Condition

Watershed:	N/A
Catchment ID:	102
Catchment Area (ha):	16.00
Impervious %:	

Average Curve Number (CN), Runoff Coefficient (C) and Initial Abstraction (IA)

Soil Symbol		FI				M							
Soil Series		Farmington				Muck							
Hydrologic Soils Group		B				B							
Soil Texture		Loam or Silt Loam				Muck							
Runoff Coefficient Type		2				2							
Area (ha)		9.00				7.00							
Percentage of Catchment		56%				44%							
Land Cover Category	IA	A (ha)	CN	C	A (ha)	CN	C	A (ha)	CN	C	A (ha)	CN	C
Impervious	2		100	0.95		100	0.95						
Gravel	3		89	0.27		89	0.27						
Woodland	10	6.08	60	0.25	7.00	60	0.25						
Pasture/Lawns	5	2.92	69	0.28		69	0.28						
Meadows	8		65	0.27		65	0.27						
Cultivated	7		74	0.35		74	0.35						
Waterbody	12		50	0.05		50	0.05						
Average CN		62.92				60.00							
Average C		0.26				0.25							
Average IA		8.38				10.00							

Time to Peak Calculations

Max. Catchment Elev. (m):	138.00
Min. Catchment Elev. (m):	134.00
Catchment Length (m):	738
Catchment Slope (%):	0.54%
Method: Airport Method	
Time of Concentration (mins):	91.55

Summary

Catchment CN:	61.6
Catchment C:	0.26
Catchment IA (mm):	9.09
Time of Concentration (hrs):	1.53
Catchment Time to Peak (hrs):	1.02
Catchment Time Step (mins):	12.21

Visual OTTHYMO Model Parameter Calculations (NasHYD)

Project Details

Project Number	522650
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Data Sources

Detailed Soil Survey Reports for Ontario, MTO Drainage Management Manual (1997)
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Prepared By

Name	HY
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Pre-Development Condition

Watershed:	N/A
Catchment ID:	201
Catchment Area (ha):	2.70
Impervious %:	5%

Average Curve Number (CN), Runoff Coefficient (C) and Initial Abstraction (IA)

Soil Symbol		FI				Os							
Soil Series		Farmington				Osgoode							
Hydrologic Soils Group		B				B							
Soil Texture		Loam or Silt Loam				Silt Loam							
Runoff Coefficient Type		2				2							
Area (ha)		0.40				2.30							
Percentage of Catchment		15%				85%							
Land Cover Category	IA	A (ha)	CN	C	A (ha)	CN	C	A (ha)	CN	C	A (ha)	CN	C
Impervious	2	0.02	100	0.95	0.12	100	0.95						
Gravel	3		89	0.27		89	0.27						
Woodland	10	0.12	60	0.25	0.18	60	0.25						
Pasture/Lawns	5	0.26	69	0.28	2.00	69	0.28						
Meadows	8		65	0.27		65	0.27						
Cultivated	7		74	0.35		74	0.35						
Waterbody	12		50	0.05		50	0.05						
Average CN		67.85				69.91							
Average C		0.30				0.31							
Average IA		6.35				5.23							

Time to Peak Calculations

Max. Catchment Elev. (m):	135.75
Min. Catchment Elev. (m):	133.00
Catchment Length (m):	225
Catchment Slope (%):	1.22%
Method: Airport Method	
Time of Concentration (mins):	36.09

Summary

Catchment CN:	69.6
Catchment C:	0.31
Catchment IA (mm):	5.40
Time of Concentration (hrs):	0.60
Catchment Time to Peak (hrs):	0.40
Catchment Time Step (mins):	4.81

Visual OTTHYMO Model Parameter Calculations (NasHYD)

Project Details

Project Number	522650
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Data Sources

Detailed Soil Survey Reports for Ontario, MTO Drainage Management Manual (1997)

Prepared By

Name	HY
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Pre-Development Condition

Watershed:	N/A
Catchment ID:	202
Catchment Area (ha):	4.60
Impervious %:	15%

Average Curve Number (CN), Runoff Coefficient (C) and Initial Abstraction (IA)

Soil Symbol		FI				Os							
Soil Series		Farmington				Osgoode							
Hydrologic Soils Group		B				B							
Soil Texture		Loam or Silt Loam				Silt Loam							
Runoff Coefficient Type		2				2							
Area (ha)		3.72				0.88							
Percentage of Catchment		81%				19%							
Land Cover Category	IA	A (ha)	CN	C	A (ha)	CN	C	A (ha)	CN	C	A (ha)	CN	C
Impervious	2	0.51	100	0.95	0.20	100	0.95						
Gravel	3		89	0.27		89	0.27						
Woodland	10	0.39	60	0.25		60	0.25						
Pasture/Lawns	5	2.81	69	0.28	0.68	69	0.28						
Meadows	8		65	0.27		65	0.27						
Cultivated	7		74	0.35		74	0.35						
Waterbody	12		50	0.05		50	0.05						
Average CN		72.30				76.03							
Average C		0.37				0.43							
Average IA		5.12				4.32							

Time to Peak Calculations

Max. Catchment Elev. (m):	137.88
Min. Catchment Elev. (m):	136.00
Catchment Length (m):	376
Catchment Slope (%):	0.50%
Method:	Airport Method
Time of Concentration (mins):	57.14

Summary

Catchment CN:	73.0
Catchment C:	0.38
Catchment IA (mm):	4.97
Time of Concentration (hrs):	0.95
Catchment Time to Peak (hrs):	0.63
Catchment Time Step (mins):	7.62

Visual OTTHYMO Model Parameter Calculations (NasHYD)

Project Details

Project Number	522650
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Data Sources

Detailed Soil Survey Reports for Ontario, MTO Drainage Management Manual (1997)
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Prepared By

Name	HY
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Pre-Development Condition

Watershed:	N/A
Catchment ID:	203
Catchment Area (ha):	11.60
Impervious %:	4%

Average Curve Number (CN), Runoff Coefficient (C) and Initial Abstraction (IA)

Soil Symbol		M				FI							
Soil Series		Muck				Farmington							
Hydrologic Soils Group		B				B							
Soil Texture		Muck				Loam or Silt Loam							
Runoff Coefficient Type		2				2							
Area (ha)		6.68				4.92							
Percentage of Catchment		58%				42%							
Land Cover Category	IA	A (ha)	CN	C	A (ha)	CN	C	A (ha)	CN	C	A (ha)	CN	C
Impervious	2	0.43	100	0.95		100	0.95						
Gravel	3		89	0.27		89	0.27						
Woodland	10	3.69	60	0.25	4.55	60	0.25						
Pasture/Lawns	5	2.56	69	0.28	0.37	69	0.28						
Meadows	8		65	0.27		65	0.27						
Cultivated	7		74	0.35		74	0.35						
Waterbody	12		50	0.05		50	0.05						
Average CN		66.04				60.68							
Average C		0.31				0.25							
Average IA		7.57				9.62							

Time to Peak Calculations

Max. Catchment Elev. (m):	136.50
Min. Catchment Elev. (m):	134.00
Catchment Length (m):	546
Catchment Slope (%):	0.46%
Method: Airport Method	
Time of Concentration (mins):	80.47

Summary

Catchment CN:	63.8
Catchment C:	0.28
Catchment IA (mm):	8.44
Time of Concentration (hrs):	1.34
Catchment Time to Peak (hrs):	0.89
Catchment Time Step (mins):	10.73

Visual OTTHYMO Model Parameter Calculations (NasHYD)

Project Details

Project Number	522650
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Data Sources

Detailed Soil Survey Reports for Ontario, MTO Drainage Management Manual (1997)
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Prepared By

Name	HY
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Pre-Development Condition

Watershed:	N/A
Catchment ID:	204
Catchment Area (ha):	3.30
Impervious %:	10%

Average Curve Number (CN), Runoff Coefficient (C) and Initial Abstraction (IA)

Soil Symbol		FI											
Soil Series		Farmington											
Hydrologic Soils Group		B											
Soil Texture		Loam or Silt Loam											
Runoff Coefficient Type		2											
Area (ha)		3.30											
Percentage of Catchment		100%											
Land Cover Category	IA	A (ha)	CN	C	A (ha)	CN	C	A (ha)	CN	C	A (ha)	CN	C
Impervious	2	0.33	100	0.95									
Gravel	3		89	0.27									
Woodland	10	1.47	60	0.25									
Pasture/Lawns	5	1.51	69	0.28									
Meadows	8		65	0.27									
Cultivated	7		74	0.35									
Waterbody	12		50	0.05									
Average CN		68.06											
Average C		0.33											
Average IA		6.93											

Time to Peak Calculations

Max. Catchment Elev. (m):	138.32
Min. Catchment Elev. (m):	136.15
Catchment Length (m):	102
Catchment Slope (%):	2.13%
Method:	Airport Method
Time of Concentration (mins):	19.69

Summary

Catchment CN:	68.1
Catchment C:	0.33
Catchment IA (mm):	6.93
Time of Concentration (hrs):	0.33
Catchment Time to Peak (hrs):	0.22
Catchment Time Step (mins):	2.63



Project :	Douglas Landing Subdivision
File No.	522650
Date:	Sep-25
Designed By:	HY
Checked By:	JA
Subject:	Impervious Area Calculations

Impervious Area Calculations

Soil type: FI

201 Area (ha)

Asphalt	0.000
House	0.020
Driveway	0.00
Total Impervious Area (ha)	0.02

202 Area (ha)

Asphalt	0.330
House	0.100
Driveway	0.081
Total Impervious Area (ha)	0.51

203 Area (ha)

Asphalt	0.265
House	0.140
Driveway	0.03
Total Impervious Area (ha)	0.43

204 Area (ha)

Asphalt	0.192
House	0.080
Driveway	0.054
Total Impervious Area (ha)	0.33

Soil type: Os

201 Area (ha)

Asphalt	0.000
House	0.12
Driveway	0.00
Total Impervious Area (	0.12

202 Area (ha)

Asphalt	0.155
House	0.00
Driveway	0.05
Total Impervious Area (	0.20

203 Area (ha)

Asphalt	0.000
House	0.00
Driveway	0.00
Total Impervious Area (	0.00

204 Area (ha)

Asphalt	0.000
House	0.000
Driveway	0.000
Total Impervious Area (	0.00



TATHAM

ENGINEERING

Project :	Douglas Landing Subdivision
File No.	522650
Date:	Sep-25
Designed By:	HY
Checked By:	JA
Subject:	SWM Facility 1

Dry Pond Storage

Elevation	Depth	Increasing Area	Accum Area	Volume	Storage Volume ¹	Storage Volume ¹
(m)	(m)	(m ²)	(m ²)	(m ³)	(m ³)	(m ³)
133.65	0.00	0.00	2623.00	0.00	0.00	0.00
133.70	0.05	62.92	2685.92	132.72	132.72	132.72
133.75	0.10	63.66	2749.58	135.88	268.60	268.60
133.80	0.15	64.41	2813.99	139.09	407.69	407.69
133.85	0.20	65.15	2879.14	142.33	550.02	550.02
133.90	0.25	65.90	2945.04	145.60	695.62	695.62
133.95	0.30	66.64	3011.68	148.91	844.53	844.53
134.00	0.35	67.39	3079.07	152.27	996.80	996.80
134.05	0.40	68.14	3147.21	155.65	1152.45	1152.45
134.10	0.45	68.88	3216.09	159.08	1311.53	1311.53
134.15	0.50	69.63	3285.72	162.54	1474.07	1474.07
134.20	0.55	70.37	3356.09	166.04	1640.11	1640.11
134.25	0.60	71.12	3427.21	169.58	1809.69	1809.69
134.30	0.65	71.86	3499.07	173.15	1982.85	1982.85
134.35	0.70	72.61	3571.68	176.77	2159.61	2159.61
134.40	0.75	73.36	3645.04	180.41	2340.03	2340.03
134.45	0.80	74.10	3719.14	184.10	2524.13	2524.13
134.50	0.85	74.85	3793.99	187.83	2711.95	2711.95
134.55	0.90	75.59	3869.58	191.59	2903.54	2903.54
134.60	0.95	76.34	3945.92	195.38	3098.93	3098.93
134.65	1.00	77.08	4023.00	199.22	3298.14	3298.14

 TATHAM ENGINEERING	Project :	Douglas Landing Subdivision
	File No.	522650
	Date:	Sep-25
	Designed By:	HY
	Checked By:	JA
	Subject:	SWM Facility 2

Dry Pond Storage

Elevation	Depth	Increasing Area	Accum Area	Volume	Storage Volume ¹
(m)	(m)	(m ²)	(m ²)	(m ³)	(m ³)
135.90	0.00	0.00	1307.00	0.00	0.00
135.95	0.05	28.02	1335.02	66.05	66.05
136.00	0.10	28.31	1363.33	67.46	133.51
136.05	0.15	28.61	1391.94	68.88	202.39
136.10	0.20	28.91	1420.85	70.32	272.71
136.15	0.25	29.21	1450.05	71.77	344.48
136.20	0.30	29.50	1479.56	73.24	417.72
136.25	0.35	29.80	1509.36	74.72	492.44
136.30	0.40	30.10	1539.45	76.22	568.66
136.35	0.45	30.39	1569.85	77.73	646.39
136.40	0.50	30.69	1600.54	79.26	725.65
136.45	0.55	30.99	1631.53	80.80	806.45
136.50	0.60	31.28	1662.81	82.36	888.80
136.55	0.65	31.58	1694.39	83.93	972.73
136.60	0.70	31.88	1726.27	85.52	1058.25
136.65	0.75	32.18	1758.45	87.12	1145.36
136.70	0.80	32.47	1790.92	88.73	1234.10
136.75	0.85	32.77	1823.69	90.36	1324.46
136.80	0.90	33.07	1856.76	92.01	1416.47
136.85	0.95	33.36	1890.12	93.67	1510.14
136.90	1.00	33.66	1923.79	95.35	1605.49
136.95	1.05	33.96	1957.74	97.04	1702.53
137.00	1.10	34.26	1992.00	98.74	1801.27

Water quality Calculation (Catchment 202)

Swale Characteristics

Design Storms
25mm (m ³ /s)
0.023

Channel Depth	Channel Type	Manning's N	Base Width	Side Slopes	Min. Slope	Total Area	Area Contributing
1.00 m	Grass Ditch	0.035	0.50 m	3H : 1V	0.65%	4.600	0.410

Storm Conditions		Swale Flow Conditions					
Return Period	Peak Flow (m ³ /s)	Flow Depth	Area (m ²)	WP	R	Q (m ³ /s)	V (m/s)
25mm storm	0.004	0.034	0.02	0.72	0.03	0.004	0.22

Comments:

1. Area contributing is the max. sub drainage area contributing to a 0.5 m flat bottom grass swale within 202 (See Dwg. DP-2).
2. MTO pro-rating methodology for obtaining peak flow is as per the equation below.
3. V is lower than 0.5 m/s during the 25 mm storm.

$$Q = (1.00/n)AR^{2/3}S^{1/2}$$

Where Q = Peak Flow (m³)

n = Roughness Coefficient

A = Cross Sectional Area (m²)

R = Hydraulic Radius

S = Channel Slope (m/m)

Water quality Calculation (Catchment 203)

Swale Characteristics

Design Storms
25mm (m ³ /s)
0.020

Channel Depth	Channel Type	Manning's N	Base Width	Side Slopes	Min. Slope	Total Area	Area Contributing
1.00 m	Grass Ditch	0.035	0.50 m	3H : 1V	0.75%	3.900	0.060

Storm Conditions		Swale Flow Conditions					
Return Period	Peak Flow (m ³ /s)	Flow Depth	Area (m ²)	WP	R	Q (m ³ /s)	V (m/s)
25mm storm	0.001	0.010	0.01	0.56	0.01	0.001	0.11

Comments:

1. Area contributing is the max. sub drainage area contributing to a 0.5 m flat bottom grass swale within 203 (See Dwg. DP-2).
2. MTO pro-rating methodology for obtaining peak flow is as per the equation below.
3. V is lower than 0.5 m/s during the 25 mm storm.

$$Q = (1.00/n)AR^{2/3}S^{1/2}$$

Where Q = Peak Flow (m³)

n = Roughness Coefficient

A = Cross Sectional Area (m²)

R = Hydraulic Radius

S = Channel Slope (m/m)



Project:	Douglas Landing Subdivision	Date:	Sep-25
File No.:	522650	Designed:	HY
Subject:	Ditch Capacity Calcs.	Checked	JA

Ditch Capacity Calculation (Catchment 202)

Swale Characteristics

Design Storms
100-Year Storm (m ³ /s)
0.296

<u>Channel Depth</u>	<u>Channel Type</u>	<u>Manning's N</u>	<u>Base Width</u>	<u>Side Slopes</u>	<u>Min. Slope</u>	<u>Total Area</u>	<u>Area Contributing</u>
1.00 m	Grass Ditch	0.035	0.50 m	3H : 1V	0.65%	4.600	0.780

Storm Conditions		Swale Flow Conditions					
Return Period	Peak Flow (m ³ /s)	Flow Depth	Area (m ²)	WP	R	Q (m ³ /s)	V (m/s)
100-Year storm	0.078	0.160	0.16	1.51	0.10	0.080	0.51

Comments:

1. Area contributing is the max. sub drainage area contributing to a 0.5 m flat bottom grass swale within 202 (See Dwg. DP-2, Catchment 202A).
2. MTO pro-rating methodology for obtaining peak flow is as per the equation below.
3. The 0.5 m flat-bottom road ditch has sufficient capacity to convey the 100-year storm at a depth of approximatey 0.16 m.

$$Q = (1.00/n)AR^{2/3}S^{1/2}$$

Where Q = Peak Flow (m³)

n = Roughness Coefficient

A = Cross Sectional Area (m²)

R = Hydraulic Radius

S = Channel Slope (m/m)



Project: Douglas Landing Subdivision

Date: Sep-25

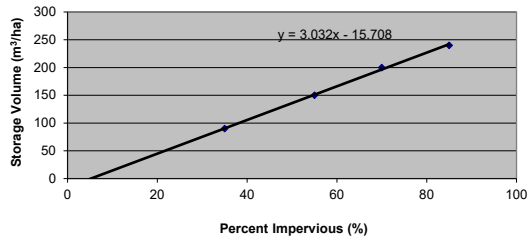
File No.: 522650

Designed By: HY

Subject: Dry SWM Pond Water Quality Calculations

Checked By: JA

Dry Pond Water Quality Storage Requirements (MECP)



MECP Water Quality Storage Volumes

Table 3.2 Values

% imp	Storage (m³/ha)
35	90
55	150
70	200
85	240

(Basic 60% long-term TSS Removal)

SWMF 1 (Catchment 202)

Drainage Area (ha): 4.6
% imp: 15.4%
MECP Storage Volume Required (m³/ha): 31.1
Water Quality Storage Requirement (m³): **143.2**
25 mm Runoff Volume (m³): **161.9** (3.52 mm RV from Catchment 202 during a 25 mm storm)

As per the MECP manual, the larger of the 25 mm runoff volume erosion control active storage (162 m³) and the water quality active storage (143 m³) is to be detained a minimum of 24 hrs. As is recommended in the MECP manual, a detention time of 48 hours will be incorporated into the detailed design to improve suspended solids removal.

SWMF 2 (Catchment 204)

Drainage Area (ha): 3.3
% imp: 9.9%
MECP Storage Volume Required (m³/ha): 14.3
Water Quality Storage Requirement (m³): **47.0**
25 mm Runoff Volume (m³): **71.0** (2.15 mm RV from Catchment 205 during a 25 mm storm)

As per the MECP manual, the larger of the 25 mm runoff volume erosion control active storage (84 m³) and the water quality active storage (38 m³) is to be detained a minimum of 24 hrs. As is recommended in the MECP manual, a detention time of 48 hours will be incorporated into the detailed design to improve suspended solids removal.

 ** SIMULATION:Run 01 **

READ STORM	Filename: C:\Users\DFendler\AppData Local\Temp\ 2b931d24-afe9-4572-9170-036e90265ade\83aa445
Ptotal= 49.09 mm	Comments: Ottawa Macdonald Cartier SCS 24 2yr

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	0.54	6.00	0.98	12.00	7.07	18.00	0.88
0.08	0.54	6.08	0.98	12.08	7.07	18.08	0.88
0.17	0.54	6.17	0.98	12.17	7.07	18.17	0.88
0.25	0.54	6.25	0.98	12.25	7.07	18.25	0.88
0.33	0.54	6.33	0.98	12.33	7.07	18.33	0.88
0.42	0.54	6.42	0.98	12.42	7.07	18.42	0.88
0.50	0.54	6.50	0.98	12.50	3.63	18.50	0.88
0.58	0.54	6.58	0.98	12.58	3.63	18.58	0.88
0.67	0.54	6.67	0.98	12.67	3.63	18.67	0.88
0.75	0.54	6.75	0.98	12.75	3.63	18.75	0.88
0.83	0.54	6.83	0.98	12.83	3.63	18.83	0.88
0.92	0.54	6.92	0.98	12.92	3.63	18.92	0.88
1.00	0.54	7.00	0.98	13.00	0.69	19.00	0.88
1.08	0.54	7.08	0.98	13.08	0.69	19.08	0.88
1.17	0.54	7.17	0.98	13.17	0.69	19.17	0.88
1.25	0.54	7.25	0.98	13.25	0.69	19.25	0.88
1.33	0.54	7.33	0.98	13.33	0.69	19.33	0.88
1.42	0.54	7.42	0.98	13.42	0.69	19.42	0.88
1.50	0.54	7.50	0.98	13.50	4.03	19.50	0.88
1.58	0.54	7.58	0.98	13.58	4.03	19.58	0.88
1.67	0.54	7.67	0.98	13.67	4.03	19.67	0.88
1.75	0.54	7.75	0.98	13.75	4.03	19.75	0.88
1.83	0.54	7.83	0.98	13.83	4.03	19.83	0.88
1.92	0.54	7.92	0.98	13.92	4.03	19.92	0.88
2.00	0.64	8.00	1.33	14.00	1.47	20.00	0.59
2.08	0.64	8.08	1.33	14.08	1.47	20.08	0.59
2.17	0.64	8.17	1.33	14.17	1.47	20.17	0.59
2.25	0.64	8.25	1.33	14.25	1.47	20.25	0.59
2.33	0.64	8.33	1.33	14.33	1.47	20.33	0.59
2.42	0.64	8.42	1.33	14.42	1.47	20.42	0.59
2.50	0.64	8.50	1.33	14.50	1.47	20.50	0.59
2.58	0.64	8.58	1.33	14.58	1.47	20.58	0.59
2.67	0.64	8.67	1.33	14.67	1.47	20.67	0.59
2.75	0.64	8.75	1.33	14.75	1.47	20.75	0.59
2.83	0.64	8.83	1.33	14.83	1.47	20.83	0.59
2.92	0.64	8.92	1.33	14.92	1.47	20.92	0.59
3.00	0.64	9.00	1.57	15.00	1.47	21.00	0.59
3.08	0.64	9.08	1.57	15.08	1.47	21.08	0.59

3.17	0.64	9.17	1.57	15.17	1.47	21.17	0.59
3.25	0.64	9.25	1.57	15.25	1.47	21.25	0.59
3.33	0.64	9.33	1.57	15.33	1.47	21.33	0.59
3.42	0.64	9.42	1.57	15.42	1.47	21.42	0.59
3.50	0.64	9.50	1.77	15.50	1.47	21.50	0.59
3.58	0.64	9.58	1.77	15.58	1.47	21.58	0.59
3.67	0.64	9.67	1.77	15.67	1.47	21.67	0.59
3.75	0.64	9.75	1.77	15.75	1.47	21.75	0.59
3.83	0.64	9.83	1.77	15.83	1.47	21.83	0.59
3.92	0.64	9.92	1.77	15.92	1.47	21.92	0.59
4.00	0.79	10.00	2.26	16.00	0.88	22.00	0.59
4.08	0.79	10.08	2.26	16.08	0.88	22.08	0.59
4.17	0.79	10.17	2.26	16.17	0.88	22.17	0.59
4.25	0.79	10.25	2.26	16.25	0.88	22.25	0.59
4.33	0.79	10.33	2.26	16.33	0.88	22.33	0.59
4.42	0.79	10.42	2.26	16.42	0.88	22.42	0.59
4.50	0.79	10.50	3.04	16.50	0.88	22.50	0.59
4.58	0.79	10.58	3.04	16.58	0.88	22.58	0.59
4.67	0.79	10.67	3.04	16.67	0.88	22.67	0.59
4.75	0.79	10.75	3.04	16.75	0.88	22.75	0.59
4.83	0.79	10.83	3.04	16.83	0.88	22.83	0.59
4.92	0.79	10.92	3.04	16.92	0.88	22.92	0.59
5.00	0.79	11.00	4.71	17.00	0.88	23.00	0.59
5.08	0.79	11.08	4.71	17.08	0.88	23.08	0.59
5.17	0.79	11.17	4.71	17.17	0.88	23.17	0.59
5.25	0.79	11.25	4.71	17.25	0.88	23.25	0.59
5.33	0.79	11.33	4.71	17.33	0.88	23.33	0.59
5.42	0.79	11.42	4.71	17.42	0.88	23.42	0.59
5.50	0.79	11.50	20.43	17.50	0.88	23.50	0.59
5.58	0.79	11.58	20.43	17.58	0.88	23.58	0.59
5.67	0.79	11.67	20.43	17.67	0.88	23.67	0.59
5.75	0.79	11.75	54.21	17.75	0.88	23.75	0.59
5.83	0.79	11.83	54.21	17.83	0.88	23.83	0.59
5.92	0.79	11.92	54.21	17.92	0.88	23.92	0.59

CALIB			
NASHYD (0101)	Area (ha)=	6.20	Curve Number (CN)= 67.6
ID= 1 DT= 5.0 min	Ia (mm)=	5.77	# of Linear Res.(N)= 3.00
-----		U.H. Tp(hrs)=	0.48

Unit Hyd Qpeak (cms)= 0.493

PEAK FLOW (cms)= 0.090 (i)

TIME TO PEAK (hrs)= 12.417

RUNOFF VOLUME (mm)= 11.371

TOTAL RAINFALL (mm)= 49.095

RUNOFF COEFFICIENT = 0.232

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

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-----
| CALIB |
| NASHYD ( 0102) | Area (ha)= 16.00 Curve Number (CN)= 61.6
| ID= 1 DT= 5.0 min | Ia (mm)= 9.09 # of Linear Res.(N)= 3.00
|-----| U.H. Tp(hrs)= 1.02
```

Unit Hyd Qpeak (cms)= 0.599

PEAK FLOW (cms)= 0.092 (i)
TIME TO PEAK (hrs)= 13.083
RUNOFF VOLUME (mm)= 8.069
TOTAL RAINFALL (mm)= 49.095
RUNOFF COEFFICIENT = 0.164

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

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*****
** SIMULATION:Run 02 **
*****
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| READ STORM | Filename: C:\Users\DFendler\AppData
| | ata\Local\Temp\
| | 2b931d24-afe9-4572-9170-036e90265ade\5aca6ac2
| Ptotal= 65.91 mm | Comments: Ottawa Macdonald Cartier SCS 24 5yr
|-----|
```

TIME	RAIN	TIME	RAIN	'	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	'	hrs	mm/hr	hrs	mm/hr
0.00	0.72	6.00	1.32	12.00	9.49	18.00	1.19	
0.08	0.72	6.08	1.32	12.08	9.49	18.08	1.19	
0.17	0.72	6.17	1.32	12.17	9.49	18.17	1.19	
0.25	0.72	6.25	1.32	12.25	9.49	18.25	1.19	
0.33	0.72	6.33	1.32	12.33	9.49	18.33	1.19	
0.42	0.72	6.42	1.32	12.42	9.49	18.42	1.19	
0.50	0.72	6.50	1.32	12.50	4.88	18.50	1.19	
0.58	0.72	6.58	1.32	12.58	4.88	18.58	1.19	
0.67	0.72	6.67	1.32	12.67	4.88	18.67	1.19	
0.75	0.72	6.75	1.32	12.75	4.88	18.75	1.19	
0.83	0.72	6.83	1.32	12.83	4.88	18.83	1.19	
0.92	0.72	6.92	1.32	12.92	4.88	18.92	1.19	
1.00	0.72	7.00	1.32	13.00	0.92	19.00	1.19	
1.08	0.72	7.08	1.32	13.08	0.92	19.08	1.19	
1.17	0.72	7.17	1.32	13.17	0.92	19.17	1.19	
1.25	0.72	7.25	1.32	13.25	0.92	19.25	1.19	
1.33	0.72	7.33	1.32	13.33	0.92	19.33	1.19	

1.42	0.72	7.42	1.32	13.42	0.92	19.42	1.19
1.50	0.72	7.50	1.32	13.50	5.40	19.50	1.19
1.58	0.72	7.58	1.32	13.58	5.40	19.58	1.19
1.67	0.72	7.67	1.32	13.67	5.40	19.67	1.19
1.75	0.72	7.75	1.32	13.75	5.40	19.75	1.19
1.83	0.72	7.83	1.32	13.83	5.40	19.83	1.19
1.92	0.72	7.92	1.32	13.92	5.40	19.92	1.19
2.00	0.86	8.00	1.78	14.00	1.98	20.00	0.79
2.08	0.86	8.08	1.78	14.08	1.98	20.08	0.79
2.17	0.86	8.17	1.78	14.17	1.98	20.17	0.79
2.25	0.86	8.25	1.78	14.25	1.98	20.25	0.79
2.33	0.86	8.33	1.78	14.33	1.98	20.33	0.79
2.42	0.86	8.42	1.78	14.42	1.98	20.42	0.79
2.50	0.86	8.50	1.78	14.50	1.98	20.50	0.79
2.58	0.86	8.58	1.78	14.58	1.98	20.58	0.79
2.67	0.86	8.67	1.78	14.67	1.98	20.67	0.79
2.75	0.86	8.75	1.78	14.75	1.98	20.75	0.79
2.83	0.86	8.83	1.78	14.83	1.98	20.83	0.79
2.92	0.86	8.92	1.78	14.92	1.98	20.92	0.79
3.00	0.86	9.00	2.11	15.00	1.98	21.00	0.79
3.08	0.86	9.08	2.11	15.08	1.98	21.08	0.79
3.17	0.86	9.17	2.11	15.17	1.98	21.17	0.79
3.25	0.86	9.25	2.11	15.25	1.98	21.25	0.79
3.33	0.86	9.33	2.11	15.33	1.98	21.33	0.79
3.42	0.86	9.42	2.11	15.42	1.98	21.42	0.79
3.50	0.86	9.50	2.37	15.50	1.98	21.50	0.79
3.58	0.86	9.58	2.37	15.58	1.98	21.58	0.79
3.67	0.86	9.67	2.37	15.67	1.98	21.67	0.79
3.75	0.86	9.75	2.37	15.75	1.98	21.75	0.79
3.83	0.86	9.83	2.37	15.83	1.98	21.83	0.79
3.92	0.86	9.92	2.37	15.92	1.98	21.92	0.79
4.00	1.05	10.00	3.03	16.00	1.19	22.00	0.79
4.08	1.05	10.08	3.03	16.08	1.19	22.08	0.79
4.17	1.05	10.17	3.03	16.17	1.19	22.17	0.79
4.25	1.05	10.25	3.03	16.25	1.19	22.25	0.79
4.33	1.05	10.33	3.03	16.33	1.19	22.33	0.79
4.42	1.05	10.42	3.03	16.42	1.19	22.42	0.79
4.50	1.05	10.50	4.09	16.50	1.19	22.50	0.79
4.58	1.05	10.58	4.09	16.58	1.19	22.58	0.79
4.67	1.05	10.67	4.09	16.67	1.19	22.67	0.79
4.75	1.05	10.75	4.09	16.75	1.19	22.75	0.79
4.83	1.05	10.83	4.09	16.83	1.19	22.83	0.79
4.92	1.05	10.92	4.09	16.92	1.19	22.92	0.79
5.00	1.05	11.00	6.33	17.00	1.19	23.00	0.79
5.08	1.05	11.08	6.33	17.08	1.19	23.08	0.79
5.17	1.05	11.17	6.33	17.17	1.19	23.17	0.79
5.25	1.05	11.25	6.33	17.25	1.19	23.25	0.79
5.33	1.05	11.33	6.33	17.33	1.19	23.33	0.79
5.42	1.05	11.42	6.33	17.42	1.19	23.42	0.79
5.50	1.05	11.50	27.41	17.50	1.19	23.50	0.79

5.58	1.05	11.58	27.41	17.58	1.19	23.58	0.79
5.67	1.05	11.67	27.41	17.67	1.19	23.67	0.79
5.75	1.05	11.75	72.75	17.75	1.19	23.75	0.79
5.83	1.05	11.83	72.75	17.83	1.19	23.83	0.79
5.92	1.05	11.92	72.75	17.92	1.19	23.92	0.79

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-----
| CALIB                                     |
| NASHYD ( 0101) | Area (ha)= 6.20   Curve Number (CN)= 67.6
| ID= 1 DT= 5.0 min | Ia (mm)= 5.77   # of Linear Res.(N)= 3.00
-----
|                                     |
|                                     | U.H. Tp(hrs)= 0.48
|                                     |

```

Unit Hyd Qpeak (cms)= 0.493

PEAK FLOW (cms)= 0.162 (i)
 TIME TO PEAK (hrs)= 12.333
 RUNOFF VOLUME (mm)= 19.884
 TOTAL RAINFALL (mm)= 65.910
 RUNOFF COEFFICIENT = 0.302

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

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-----
| CALIB                                     |
| NASHYD ( 0102) | Area (ha)= 16.00   Curve Number (CN)= 61.6
| ID= 1 DT= 5.0 min | Ia (mm)= 9.09   # of Linear Res.(N)= 3.00
-----
|                                     |
|                                     | U.H. Tp(hrs)= 1.02
|                                     |

```

Unit Hyd Qpeak (cms)= 0.599

PEAK FLOW (cms)= 0.178 (i)
 TIME TO PEAK (hrs)= 13.083
 RUNOFF VOLUME (mm)= 15.005
 TOTAL RAINFALL (mm)= 65.910
 RUNOFF COEFFICIENT = 0.228

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

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*****
** SIMULATION:Run 03          **
*****

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-----
| READ STORM | Filename: C:\Users\DFendler\AppData
|             |   ata\Local\Temp\
|             |   2b931d24-afe9-4572-9170-036e90265ade\937e7433
|             |

```

| Ptotal= 77.00 mm |

Comments: Ottawa Macdonald Cartier SCS 24 10yr

TIME	RAIN	TIME	RAIN	'	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	'	hrs	mm/hr	hrs	mm/hr
0.00	0.85	6.00	1.54		12.00	11.09	18.00	1.39
0.08	0.85	6.08	1.54		12.08	11.09	18.08	1.39
0.17	0.85	6.17	1.54		12.17	11.09	18.17	1.39
0.25	0.85	6.25	1.54		12.25	11.09	18.25	1.39
0.33	0.85	6.33	1.54		12.33	11.09	18.33	1.39
0.42	0.85	6.42	1.54		12.42	11.09	18.42	1.39
0.50	0.85	6.50	1.54		12.50	5.70	18.50	1.39
0.58	0.85	6.58	1.54		12.58	5.70	18.58	1.39
0.67	0.85	6.67	1.54		12.67	5.70	18.67	1.39
0.75	0.85	6.75	1.54		12.75	5.70	18.75	1.39
0.83	0.85	6.83	1.54		12.83	5.70	18.83	1.39
0.92	0.85	6.92	1.54		12.92	5.70	18.92	1.39
1.00	0.85	7.00	1.54		13.00	1.08	19.00	1.39
1.08	0.85	7.08	1.54		13.08	1.08	19.08	1.39
1.17	0.85	7.17	1.54		13.17	1.08	19.17	1.39
1.25	0.85	7.25	1.54		13.25	1.08	19.25	1.39
1.33	0.85	7.33	1.54		13.33	1.08	19.33	1.39
1.42	0.85	7.42	1.54		13.42	1.08	19.42	1.39
1.50	0.85	7.50	1.54		13.50	6.31	19.50	1.39
1.58	0.85	7.58	1.54		13.58	6.31	19.58	1.39
1.67	0.85	7.67	1.54		13.67	6.31	19.67	1.39
1.75	0.85	7.75	1.54		13.75	6.31	19.75	1.39
1.83	0.85	7.83	1.54		13.83	6.31	19.83	1.39
1.92	0.85	7.92	1.54		13.92	6.31	19.92	1.39
2.00	1.00	8.00	2.08		14.00	2.31	20.00	0.92
2.08	1.00	8.08	2.08		14.08	2.31	20.08	0.92
2.17	1.00	8.17	2.08		14.17	2.31	20.17	0.92
2.25	1.00	8.25	2.08		14.25	2.31	20.25	0.92
2.33	1.00	8.33	2.08		14.33	2.31	20.33	0.92
2.42	1.00	8.42	2.08		14.42	2.31	20.42	0.92
2.50	1.00	8.50	2.08		14.50	2.31	20.50	0.92
2.58	1.00	8.58	2.08		14.58	2.31	20.58	0.92
2.67	1.00	8.67	2.08		14.67	2.31	20.67	0.92
2.75	1.00	8.75	2.08		14.75	2.31	20.75	0.92
2.83	1.00	8.83	2.08		14.83	2.31	20.83	0.92
2.92	1.00	8.92	2.08		14.92	2.31	20.92	0.92
3.00	1.00	9.00	2.46		15.00	2.31	21.00	0.92
3.08	1.00	9.08	2.46		15.08	2.31	21.08	0.92
3.17	1.00	9.17	2.46		15.17	2.31	21.17	0.92
3.25	1.00	9.25	2.46		15.25	2.31	21.25	0.92
3.33	1.00	9.33	2.46		15.33	2.31	21.33	0.92
3.42	1.00	9.42	2.46		15.42	2.31	21.42	0.92
3.50	1.00	9.50	2.77		15.50	2.31	21.50	0.92
3.58	1.00	9.58	2.77		15.58	2.31	21.58	0.92
3.67	1.00	9.67	2.77		15.67	2.31	21.67	0.92
3.75	1.00	9.75	2.77		15.75	2.31	21.75	0.92

3.83	1.00	9.83	2.77	15.83	2.31	21.83	0.92
3.92	1.00	9.92	2.77	15.92	2.31	21.92	0.92
4.00	1.23	10.00	3.54	16.00	1.39	22.00	0.92
4.08	1.23	10.08	3.54	16.08	1.39	22.08	0.92
4.17	1.23	10.17	3.54	16.17	1.39	22.17	0.92
4.25	1.23	10.25	3.54	16.25	1.39	22.25	0.92
4.33	1.23	10.33	3.54	16.33	1.39	22.33	0.92
4.42	1.23	10.42	3.54	16.42	1.39	22.42	0.92
4.50	1.23	10.50	4.77	16.50	1.39	22.50	0.92
4.58	1.23	10.58	4.77	16.58	1.39	22.58	0.92
4.67	1.23	10.67	4.77	16.67	1.39	22.67	0.92
4.75	1.23	10.75	4.77	16.75	1.39	22.75	0.92
4.83	1.23	10.83	4.77	16.83	1.39	22.83	0.92
4.92	1.23	10.92	4.77	16.92	1.39	22.92	0.92
5.00	1.23	11.00	7.39	17.00	1.39	23.00	0.92
5.08	1.23	11.08	7.39	17.08	1.39	23.08	0.92
5.17	1.23	11.17	7.39	17.17	1.39	23.17	0.92
5.25	1.23	11.25	7.39	17.25	1.39	23.25	0.92
5.33	1.23	11.33	7.39	17.33	1.39	23.33	0.92
5.42	1.23	11.42	7.39	17.42	1.39	23.42	0.92
5.50	1.23	11.50	32.03	17.50	1.39	23.50	0.92
5.58	1.23	11.58	32.03	17.58	1.39	23.58	0.92
5.67	1.23	11.67	32.03	17.67	1.39	23.67	0.92
5.75	1.23	11.75	85.01	17.75	1.39	23.75	0.92
5.83	1.23	11.83	85.01	17.83	1.39	23.83	0.92
5.92	1.23	11.92	85.01	17.92	1.39	23.92	0.92

CALIB			
NASHYD (0101)	Area (ha)=	6.20	Curve Number (CN)= 67.6
ID= 1 DT= 5.0 min	Ia (mm)=	5.77	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.48	

Unit Hyd Qpeak (cms)= 0.493

PEAK FLOW (cms)= 0.216 (i)

TIME TO PEAK (hrs)= 12.333

RUNOFF VOLUME (mm)= 26.288

TOTAL RAINFALL (mm)= 76.995

RUNOFF COEFFICIENT = 0.341

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

CALIB			
NASHYD (0102)	Area (ha)=	16.00	Curve Number (CN)= 61.6
ID= 1 DT= 5.0 min	Ia (mm)=	9.09	# of Linear Res.(N)= 3.00

----- U.H. Tp(hrs)= 1.02

Unit Hyd Qpeak (cms)= 0.599

PEAK FLOW (cms)= 0.245 (i)

TIME TO PEAK (hrs)= 13.000

RUNOFF VOLUME (mm)= 20.381

TOTAL RAINFALL (mm)= 76.995

RUNOFF COEFFICIENT = 0.265

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

** SIMULATION:Run 04 **

| READ STORM | Filename: C:\Users\DFendler\AppData
| | ata\Local\Temp\
| | 2b931d24-afe9-4572-9170-036e90265ade\8677e260
| Ptotal= 91.08 mm | Comments: Ottawa Macdonald Cartier SCS 24 25yr

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	1.00	6.00	1.82	12.00	13.12	18.00	1.64
0.08	1.00	6.08	1.82	12.08	13.12	18.08	1.64
0.17	1.00	6.17	1.82	12.17	13.12	18.17	1.64
0.25	1.00	6.25	1.82	12.25	13.12	18.25	1.64
0.33	1.00	6.33	1.82	12.33	13.12	18.33	1.64
0.42	1.00	6.42	1.82	12.42	13.12	18.42	1.64
0.50	1.00	6.50	1.82	12.50	6.74	18.50	1.64
0.58	1.00	6.58	1.82	12.58	6.74	18.58	1.64
0.67	1.00	6.67	1.82	12.67	6.74	18.67	1.64
0.75	1.00	6.75	1.82	12.75	6.74	18.75	1.64
0.83	1.00	6.83	1.82	12.83	6.74	18.83	1.64
0.92	1.00	6.92	1.82	12.92	6.74	18.92	1.64
1.00	1.00	7.00	1.82	13.00	1.28	19.00	1.64
1.08	1.00	7.08	1.82	13.08	1.28	19.08	1.64
1.17	1.00	7.17	1.82	13.17	1.28	19.17	1.64
1.25	1.00	7.25	1.82	13.25	1.28	19.25	1.64
1.33	1.00	7.33	1.82	13.33	1.28	19.33	1.64
1.42	1.00	7.42	1.82	13.42	1.28	19.42	1.64
1.50	1.00	7.50	1.82	13.50	7.47	19.50	1.64
1.58	1.00	7.58	1.82	13.58	7.47	19.58	1.64
1.67	1.00	7.67	1.82	13.67	7.47	19.67	1.64
1.75	1.00	7.75	1.82	13.75	7.47	19.75	1.64
1.83	1.00	7.83	1.82	13.83	7.47	19.83	1.64
1.92	1.00	7.92	1.82	13.92	7.47	19.92	1.64
2.00	1.18	8.00	2.46	14.00	2.73	20.00	1.09

2.08	1.18	8.08	2.46	14.08	2.73	20.08	1.09
2.17	1.18	8.17	2.46	14.17	2.73	20.17	1.09
2.25	1.18	8.25	2.46	14.25	2.73	20.25	1.09
2.33	1.18	8.33	2.46	14.33	2.73	20.33	1.09
2.42	1.18	8.42	2.46	14.42	2.73	20.42	1.09
2.50	1.18	8.50	2.46	14.50	2.73	20.50	1.09
2.58	1.18	8.58	2.46	14.58	2.73	20.58	1.09
2.67	1.18	8.67	2.46	14.67	2.73	20.67	1.09
2.75	1.18	8.75	2.46	14.75	2.73	20.75	1.09
2.83	1.18	8.83	2.46	14.83	2.73	20.83	1.09
2.92	1.18	8.92	2.46	14.92	2.73	20.92	1.09
3.00	1.18	9.00	2.92	15.00	2.73	21.00	1.09
3.08	1.18	9.08	2.92	15.08	2.73	21.08	1.09
3.17	1.18	9.17	2.92	15.17	2.73	21.17	1.09
3.25	1.18	9.25	2.92	15.25	2.73	21.25	1.09
3.33	1.18	9.33	2.92	15.33	2.73	21.33	1.09
3.42	1.18	9.42	2.92	15.42	2.73	21.42	1.09
3.50	1.18	9.50	3.28	15.50	2.73	21.50	1.09
3.58	1.18	9.58	3.28	15.58	2.73	21.58	1.09
3.67	1.18	9.67	3.28	15.67	2.73	21.67	1.09
3.75	1.18	9.75	3.28	15.75	2.73	21.75	1.09
3.83	1.18	9.83	3.28	15.83	2.73	21.83	1.09
3.92	1.18	9.92	3.28	15.92	2.73	21.92	1.09
4.00	1.46	10.00	4.19	16.00	1.64	22.00	1.09
4.08	1.46	10.08	4.19	16.08	1.64	22.08	1.09
4.17	1.46	10.17	4.19	16.17	1.64	22.17	1.09
4.25	1.46	10.25	4.19	16.25	1.64	22.25	1.09
4.33	1.46	10.33	4.19	16.33	1.64	22.33	1.09
4.42	1.46	10.42	4.19	16.42	1.64	22.42	1.09
4.50	1.46	10.50	5.65	16.50	1.64	22.50	1.09
4.58	1.46	10.58	5.65	16.58	1.64	22.58	1.09
4.67	1.46	10.67	5.65	16.67	1.64	22.67	1.09
4.75	1.46	10.75	5.65	16.75	1.64	22.75	1.09
4.83	1.46	10.83	5.65	16.83	1.64	22.83	1.09
4.92	1.46	10.92	5.65	16.92	1.64	22.92	1.09
5.00	1.46	11.00	8.75	17.00	1.64	23.00	1.09
5.08	1.46	11.08	8.75	17.08	1.64	23.08	1.09
5.17	1.46	11.17	8.75	17.17	1.64	23.17	1.09
5.25	1.46	11.25	8.75	17.25	1.64	23.25	1.09
5.33	1.46	11.33	8.75	17.33	1.64	23.33	1.09
5.42	1.46	11.42	8.75	17.42	1.64	23.42	1.09
5.50	1.46	11.50	37.90	17.50	1.64	23.50	1.09
5.58	1.46	11.58	37.90	17.58	1.64	23.58	1.09
5.67	1.46	11.67	37.90	17.67	1.64	23.67	1.09
5.75	1.46	11.75	100.57	17.75	1.64	23.75	1.09
5.83	1.46	11.83	100.57	17.83	1.64	23.83	1.09
5.92	1.46	11.92	100.57	17.92	1.64	23.92	1.09

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| CALIB |
| NASHYD ( 0101) | Area (ha)= 6.20 Curve Number (CN)= 67.6
| ID= 1 DT= 5.0 min | Ia (mm)= 5.77 # of Linear Res.(N)= 3.00
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| U.H. Tp(hrs)= 0.48

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Unit Hyd Qpeak (cms)= 0.493

PEAK FLOW (cms)= 0.292 (i)
 TIME TO PEAK (hrs)= 12.333
 RUNOFF VOLUME (mm)= 35.146
 TOTAL RAINFALL (mm)= 91.077
 RUNOFF COEFFICIENT = 0.386

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

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-----
| CALIB |
| NASHYD ( 0102) | Area (ha)= 16.00 Curve Number (CN)= 61.6
| ID= 1 DT= 5.0 min | Ia (mm)= 9.09 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 1.02

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Unit Hyd Qpeak (cms)= 0.599

PEAK FLOW (cms)= 0.342 (i)
 TIME TO PEAK (hrs)= 13.000
 RUNOFF VOLUME (mm)= 27.970
 TOTAL RAINFALL (mm)= 91.077
 RUNOFF COEFFICIENT = 0.307

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

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** SIMULATION:Run 05 **
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| READ STORM |
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| | |
| Ptotal=101.52 mm |
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| Filename: C:\Users\DFendler\AppData
| ata\Local\Temp\
| 2b931d24-afe9-4572-9170-036e90265ade\55c88cf1
| Comments: Ottawa Macdonald Cartier SCS 24 50yr

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TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	1.12	6.00	2.03	12.00	14.62	18.00	1.83
0.08	1.12	6.08	2.03	12.08	14.62	18.08	1.83
0.17	1.12	6.17	2.03	12.17	14.62	18.17	1.83
0.25	1.12	6.25	2.03	12.25	14.62	18.25	1.83

0.33	1.12	6.33	2.03	12.33	14.62	18.33	1.83
0.42	1.12	6.42	2.03	12.42	14.62	18.42	1.83
0.50	1.12	6.50	2.03	12.50	7.51	18.50	1.83
0.58	1.12	6.58	2.03	12.58	7.51	18.58	1.83
0.67	1.12	6.67	2.03	12.67	7.51	18.67	1.83
0.75	1.12	6.75	2.03	12.75	7.51	18.75	1.83
0.83	1.12	6.83	2.03	12.83	7.51	18.83	1.83
0.92	1.12	6.92	2.03	12.92	7.51	18.92	1.83
1.00	1.12	7.00	2.03	13.00	1.42	19.00	1.83
1.08	1.12	7.08	2.03	13.08	1.42	19.08	1.83
1.17	1.12	7.17	2.03	13.17	1.42	19.17	1.83
1.25	1.12	7.25	2.03	13.25	1.42	19.25	1.83
1.33	1.12	7.33	2.03	13.33	1.42	19.33	1.83
1.42	1.12	7.42	2.03	13.42	1.42	19.42	1.83
1.50	1.12	7.50	2.03	13.50	8.32	19.50	1.83
1.58	1.12	7.58	2.03	13.58	8.32	19.58	1.83
1.67	1.12	7.67	2.03	13.67	8.32	19.67	1.83
1.75	1.12	7.75	2.03	13.75	8.32	19.75	1.83
1.83	1.12	7.83	2.03	13.83	8.32	19.83	1.83
1.92	1.12	7.92	2.03	13.92	8.32	19.92	1.83
2.00	1.32	8.00	2.74	14.00	3.05	20.00	1.22
2.08	1.32	8.08	2.74	14.08	3.04	20.08	1.22
2.17	1.32	8.17	2.74	14.17	3.05	20.17	1.22
2.25	1.32	8.25	2.74	14.25	3.04	20.25	1.22
2.33	1.32	8.33	2.74	14.33	3.05	20.33	1.22
2.42	1.32	8.42	2.74	14.42	3.04	20.42	1.22
2.50	1.32	8.50	2.74	14.50	3.05	20.50	1.22
2.58	1.32	8.58	2.74	14.58	3.04	20.58	1.22
2.67	1.32	8.67	2.74	14.67	3.05	20.67	1.22
2.75	1.32	8.75	2.74	14.75	3.04	20.75	1.22
2.83	1.32	8.83	2.74	14.83	3.05	20.83	1.22
2.92	1.32	8.92	2.74	14.92	3.04	20.92	1.22
3.00	1.32	9.00	3.25	15.00	3.05	21.00	1.22
3.08	1.32	9.08	3.25	15.08	3.04	21.08	1.22
3.17	1.32	9.17	3.25	15.17	3.05	21.17	1.22
3.25	1.32	9.25	3.25	15.25	3.04	21.25	1.22
3.33	1.32	9.33	3.25	15.33	3.05	21.33	1.22
3.42	1.32	9.42	3.25	15.42	3.04	21.42	1.22
3.50	1.32	9.50	3.65	15.50	3.05	21.50	1.22
3.58	1.32	9.58	3.65	15.58	3.04	21.58	1.22
3.67	1.32	9.67	3.65	15.67	3.05	21.67	1.22
3.75	1.32	9.75	3.65	15.75	3.04	21.75	1.22
3.83	1.32	9.83	3.65	15.83	3.04	21.83	1.22
3.92	1.32	9.92	3.65	15.92	3.05	21.92	1.22
4.00	1.62	10.00	4.67	16.00	1.83	22.00	1.22
4.08	1.62	10.08	4.67	16.08	1.83	22.08	1.22
4.17	1.62	10.17	4.67	16.17	1.83	22.17	1.22
4.25	1.62	10.25	4.67	16.25	1.83	22.25	1.22
4.33	1.62	10.33	4.67	16.33	1.83	22.33	1.22
4.42	1.62	10.42	4.67	16.42	1.83	22.42	1.22

4.50	1.62	10.50	6.29	16.50	1.83	22.50	1.22
4.58	1.62	10.58	6.29	16.58	1.83	22.58	1.22
4.67	1.62	10.67	6.29	16.67	1.83	22.67	1.22
4.75	1.62	10.75	6.29	16.75	1.83	22.75	1.22
4.83	1.62	10.83	6.29	16.83	1.83	22.83	1.22
4.92	1.62	10.92	6.29	16.92	1.83	22.92	1.22
5.00	1.62	11.00	9.74	17.00	1.83	23.00	1.22
5.08	1.62	11.08	9.74	17.08	1.83	23.08	1.22
5.17	1.62	11.17	9.74	17.17	1.83	23.17	1.22
5.25	1.62	11.25	9.74	17.25	1.83	23.25	1.22
5.33	1.62	11.33	9.74	17.33	1.83	23.33	1.22
5.42	1.62	11.42	9.74	17.42	1.83	23.42	1.22
5.50	1.62	11.50	42.22	17.50	1.83	23.50	1.22
5.58	1.62	11.58	42.22	17.58	1.83	23.58	1.22
5.67	1.62	11.67	42.22	17.67	1.83	23.67	1.22
5.75	1.62	11.75	112.06	17.75	1.83	23.75	1.22
5.83	1.62	11.83	112.06	17.83	1.83	23.83	1.22
5.92	1.62	11.92	112.06	17.92	1.83	23.92	1.22

CALIB			
NASHYD (0101)	Area (ha)=	6.20	Curve Number (CN)= 67.6
ID= 1 DT= 5.0 min	Ia (mm)=	5.77	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.48	

Unit Hyd Qpeak (cms)= 0.493

PEAK FLOW (cms)= 0.352 (i)
TIME TO PEAK (hrs)= 12.333
RUNOFF VOLUME (mm)= 42.148
TOTAL RAINFALL (mm)= 101.515
RUNOFF COEFFICIENT = 0.415

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

CALIB			
NASHYD (0102)	Area (ha)=	16.00	Curve Number (CN)= 61.6
ID= 1 DT= 5.0 min	Ia (mm)=	9.09	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	1.02	

Unit Hyd Qpeak (cms)= 0.599

PEAK FLOW (cms)= 0.419 (i)
TIME TO PEAK (hrs)= 13.000
RUNOFF VOLUME (mm)= 34.065
TOTAL RAINFALL (mm)= 101.515

RUNOFF COEFFICIENT = 0.336

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

** SIMULATION:Run 06 **

| READ STORM | Filename: C:\Users\DFendler\AppData
| | ata\Local\Temp\
| | 2b931d24-afe9-4572-9170-036e90265ade\20e7578
| Ptotal=111.87 mm | Comments: Ottawa Macdonald Cartier SCS 24 100yr

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	1.23	6.00	2.24	12.00	16.11	18.00	2.01
0.08	1.23	6.08	2.24	12.08	16.11	18.08	2.01
0.17	1.23	6.17	2.24	12.17	16.11	18.17	2.01
0.25	1.23	6.25	2.24	12.25	16.11	18.25	2.01
0.33	1.23	6.33	2.24	12.33	16.11	18.33	2.01
0.42	1.23	6.42	2.24	12.42	16.11	18.42	2.01
0.50	1.23	6.50	2.24	12.50	8.28	18.50	2.01
0.58	1.23	6.58	2.24	12.58	8.28	18.58	2.01
0.67	1.23	6.67	2.24	12.67	8.28	18.67	2.01
0.75	1.23	6.75	2.24	12.75	8.28	18.75	2.01
0.83	1.23	6.83	2.24	12.83	8.28	18.83	2.01
0.92	1.23	6.92	2.24	12.92	8.28	18.92	2.01
1.00	1.23	7.00	2.24	13.00	1.57	19.00	2.01
1.08	1.23	7.08	2.24	13.08	1.57	19.08	2.01
1.17	1.23	7.17	2.24	13.17	1.57	19.17	2.01
1.25	1.23	7.25	2.24	13.25	1.57	19.25	2.01
1.33	1.23	7.33	2.24	13.33	1.57	19.33	2.01
1.42	1.23	7.42	2.24	13.42	1.57	19.42	2.01
1.50	1.23	7.50	2.24	13.50	9.18	19.50	2.01
1.58	1.23	7.58	2.24	13.58	9.18	19.58	2.01
1.67	1.23	7.67	2.24	13.67	9.18	19.67	2.01
1.75	1.23	7.75	2.24	13.75	9.18	19.75	2.01
1.83	1.23	7.83	2.24	13.83	9.18	19.83	2.01
1.92	1.23	7.92	2.24	13.92	9.18	19.92	2.01
2.00	1.45	8.00	3.02	14.00	3.36	20.00	1.34
2.08	1.45	8.08	3.02	14.08	3.36	20.08	1.34
2.17	1.45	8.17	3.02	14.17	3.36	20.17	1.34
2.25	1.45	8.25	3.02	14.25	3.36	20.25	1.34
2.33	1.45	8.33	3.02	14.33	3.36	20.33	1.34
2.42	1.45	8.42	3.02	14.42	3.36	20.42	1.34
2.50	1.45	8.50	3.02	14.50	3.36	20.50	1.34
2.58	1.45	8.58	3.02	14.58	3.36	20.58	1.34
2.67	1.45	8.67	3.02	14.67	3.36	20.67	1.34

2.75	1.45	8.75	3.02	14.75	3.36	20.75	1.34
2.83	1.45	8.83	3.02	14.83	3.36	20.83	1.34
2.92	1.45	8.92	3.02	14.92	3.36	20.92	1.34
3.00	1.45	9.00	3.58	15.00	3.36	21.00	1.34
3.08	1.45	9.08	3.58	15.08	3.36	21.08	1.34
3.17	1.45	9.17	3.58	15.17	3.36	21.17	1.34
3.25	1.45	9.25	3.58	15.25	3.36	21.25	1.34
3.33	1.45	9.33	3.58	15.33	3.36	21.33	1.34
3.42	1.45	9.42	3.58	15.42	3.36	21.42	1.34
3.50	1.45	9.50	4.03	15.50	3.36	21.50	1.34
3.58	1.45	9.58	4.03	15.58	3.36	21.58	1.34
3.67	1.45	9.67	4.03	15.67	3.36	21.67	1.34
3.75	1.45	9.75	4.03	15.75	3.36	21.75	1.34
3.83	1.45	9.83	4.03	15.83	3.36	21.83	1.34
3.92	1.45	9.92	4.03	15.92	3.36	21.92	1.34
4.00	1.79	10.00	5.15	16.00	2.01	22.00	1.34
4.08	1.79	10.08	5.15	16.08	2.01	22.08	1.34
4.17	1.79	10.17	5.15	16.17	2.01	22.17	1.34
4.25	1.79	10.25	5.15	16.25	2.01	22.25	1.34
4.33	1.79	10.33	5.15	16.33	2.01	22.33	1.34
4.42	1.79	10.42	5.15	16.42	2.01	22.42	1.34
4.50	1.79	10.50	6.94	16.50	2.01	22.50	1.34
4.58	1.79	10.58	6.94	16.58	2.01	22.58	1.34
4.67	1.79	10.67	6.94	16.67	2.01	22.67	1.34
4.75	1.79	10.75	6.94	16.75	2.01	22.75	1.34
4.83	1.79	10.83	6.94	16.83	2.01	22.83	1.34
4.92	1.79	10.92	6.94	16.92	2.01	22.92	1.34
5.00	1.79	11.00	10.74	17.00	2.01	23.00	1.34
5.08	1.79	11.08	10.74	17.08	2.01	23.08	1.34
5.17	1.79	11.17	10.74	17.17	2.01	23.17	1.34
5.25	1.79	11.25	10.74	17.25	2.01	23.25	1.34
5.33	1.79	11.33	10.74	17.33	2.01	23.33	1.34
5.42	1.79	11.42	10.74	17.42	2.01	23.42	1.34
5.50	1.79	11.50	46.55	17.50	2.01	23.50	1.34
5.58	1.79	11.58	46.55	17.58	2.01	23.58	1.34
5.67	1.79	11.67	46.55	17.67	2.01	23.67	1.34
5.75	1.79	11.75	123.54	17.75	2.01	23.75	1.34
5.83	1.79	11.83	123.54	17.83	2.01	23.83	1.34
5.92	1.79	11.92	123.54	17.92	2.01	23.92	1.34

CALIB			
NASHYD (0101)			
ID= 1 DT= 5.0 min			

Area	(ha)=	6.20	Curve Number (CN)= 67.6
Ia	(mm)=	5.77	# of Linear Res.(N)= 3.00
U.H. Tp(hrs)=		0.48	

Unit Hyd Qpeak (cms)= 0.493

PEAK FLOW (cms)= 0.415 (i)
TIME TO PEAK (hrs)= 12.333
RUNOFF VOLUME (mm)= 49.407
TOTAL RAINFALL (mm)= 111.872
RUNOFF COEFFICIENT = 0.442

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

| CALIB |
| NASHYD (0102) | Area (ha)= 16.00 Curve Number (CN)= 61.6
| ID= 1 DT= 5.0 min | Ia (mm)= 9.09 # of Linear Res.(N)= 3.00

U.H. Tp(hrs)= 1.02

Unit Hyd Qpeak (cms)= 0.599

PEAK FLOW (cms)= 0.501 (i)
TIME TO PEAK (hrs)= 13.000
RUNOFF VOLUME (mm)= 40.457
TOTAL RAINFALL (mm)= 111.872
RUNOFF COEFFICIENT = 0.362

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

 ** SIMULATION:1 **

```

-----
| READ STORM |      Filename: C:\Users\DFendler\AppData
|            |      ata\Local\Temp\
|            |      3bbb193a-7890-4214-b2b4-fa9a6f047901\ed1aeef3
| Ptotal= 25.00 mm |      Comments: 25MM4HR
-----
  
```

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	1.42	1.00	13.41	2.00	3.64	3.00	1.73
0.17	1.64	1.17	58.68	2.17	3.05	3.17	1.60
0.33	1.96	1.33	17.94	2.33	2.64	3.33	1.48
0.50	2.45	1.50	9.06	2.50	2.32	3.50	1.39
0.67	3.30	1.67	6.03	2.67	2.08	3.67	1.30
0.83	5.22	1.83	4.53	2.83	1.89	3.83	1.23

```

-----
| CALIB      |
| NASHYD ( 0102) |      Area (ha)= 16.00      Curve Number (CN)= 61.6
| ID= 1 DT= 5.0 min |      Ia (mm)= 9.09      # of Linear Res.(N)= 3.00
-----
|              |      U.H. Tp(hrs)= 1.02
  
```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```

----- TRANSFORMED HYETOGRAPH -----

```

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	1.42	1.083	13.41	2.083	3.64	3.08	1.73
0.167	1.42	1.167	13.41	2.167	3.64	3.17	1.73
0.250	1.64	1.250	58.68	2.250	3.05	3.25	1.60
0.333	1.64	1.333	58.68	2.333	3.05	3.33	1.60
0.417	1.96	1.417	17.94	2.417	2.64	3.42	1.48
0.500	1.96	1.500	17.94	2.500	2.64	3.50	1.48
0.583	2.45	1.583	9.06	2.583	2.32	3.58	1.39
0.667	2.45	1.667	9.06	2.667	2.32	3.67	1.39
0.750	3.30	1.750	6.03	2.750	2.08	3.75	1.30
0.833	3.30	1.833	6.03	2.833	2.08	3.83	1.30
0.917	5.22	1.917	4.53	2.917	1.89	3.92	1.23
1.000	5.22	2.000	4.53	3.000	1.89	4.00	1.23

Unit Hyd Qpeak (cms)= 0.599

PEAK FLOW (cms)= 0.022 (i)

TIME TO PEAK (hrs)= 2.917

RUNOFF VOLUME (mm)= 1.452
TOTAL RAINFALL (mm)= 24.998
RUNOFF COEFFICIENT = 0.058

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

```
-----
| CALIB |
| NASHYD ( 0101) | Area (ha)= 6.20 Curve Number (CN)= 67.6
| ID= 1 DT= 5.0 min | Ia (mm)= 5.77 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 0.48
```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```
----- TRANSFORMED HYETOGRAPH -----
TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN
hrs mm/hr | hrs mm/hr | hrs mm/hr | hrs mm/hr
0.083 1.42 | 1.083 13.41 | 2.083 3.64 | 3.08 1.73
0.167 1.42 | 1.167 13.41 | 2.167 3.64 | 3.17 1.73
0.250 1.64 | 1.250 58.68 | 2.250 3.05 | 3.25 1.60
0.333 1.64 | 1.333 58.68 | 2.333 3.05 | 3.33 1.60
0.417 1.96 | 1.417 17.94 | 2.417 2.64 | 3.42 1.48
0.500 1.96 | 1.500 17.94 | 2.500 2.64 | 3.50 1.48
0.583 2.45 | 1.583 9.06 | 2.583 2.32 | 3.58 1.39
0.667 2.45 | 1.667 9.06 | 2.667 2.32 | 3.67 1.39
0.750 3.30 | 1.750 6.03 | 2.750 2.08 | 3.75 1.30
0.833 3.30 | 1.833 6.03 | 2.833 2.08 | 3.83 1.30
0.917 5.22 | 1.917 4.53 | 2.917 1.89 | 3.92 1.23
1.000 5.22 | 2.000 4.53 | 3.000 1.89 | 4.00 1.23
```

Unit Hyd Qpeak (cms)= 0.493

PEAK FLOW (cms)= 0.026 (i)
TIME TO PEAK (hrs)= 2.000
RUNOFF VOLUME (mm)= 2.622
TOTAL RAINFALL (mm)= 24.998
RUNOFF COEFFICIENT = 0.105

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

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*****
** SIMULATION:2 **
*****
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-----
| CHICAGO STORM | IDF curve parameters: A= 732.951
| Ptotal= 31.86 mm | B= 6.199
| | C= 0.810
```

used in: $INTENSITY = A / (t + B)^C$

Duration of storm = 3.00 hrs

Storm time step = 10.00 min

Time to peak ratio = 0.33

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	2.81	0.83	76.81	1.67	5.09	2.50	2.68
0.17	3.50	1.00	24.08	1.83	4.29	2.67	2.46
0.33	4.69	1.17	12.36	2.00	3.72	2.83	2.28
0.50	7.30	1.33	8.32	2.17	3.29		
0.67	18.21	1.50	6.30	2.33	2.95		

```
-----
| CALIB                                     |
| NASHYD ( 0102) | Area (ha)= 16.00 Curve Number (CN)= 61.6
| ID= 1 DT= 5.0 min | Ia (mm)= 9.09 # of Linear Res.(N)= 3.00
|-----| U.H. Tp(hrs)= 1.02
```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	2.81	0.833	18.21	1.583	6.30	2.33	3.29
0.167	2.81	0.917	76.80	1.667	6.30	2.42	2.95
0.250	3.50	1.000	76.81	1.750	5.09	2.50	2.95
0.333	3.50	1.083	24.08	1.833	5.09	2.58	2.68
0.417	4.69	1.167	24.08	1.917	4.29	2.67	2.68
0.500	4.69	1.250	12.36	2.000	4.29	2.75	2.46
0.583	7.30	1.333	12.36	2.083	3.72	2.83	2.46
0.667	7.30	1.417	8.32	2.167	3.72	2.92	2.28
0.750	18.21	1.500	8.32	2.250	3.29	3.00	2.28

Unit Hyd Qpeak (cms)= 0.599

PEAK FLOW (cms)= 0.049 (i)

TIME TO PEAK (hrs)= 2.500

RUNOFF VOLUME (mm)= 2.863

TOTAL RAINFALL (mm)= 31.860

RUNOFF COEFFICIENT = 0.090

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

CALIB			
NASHYD (0101)	Area (ha)=	6.20	Curve Number (CN)= 67.6
ID= 1 DT= 5.0 min	Ia (mm)=	5.77	# of Linear Res.(N)= 3.00
-----	U.H. Tp(hrs)=	0.48	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	2.81	0.833	18.21	1.583	6.30	2.33	3.29
0.167	2.81	0.917	76.80	1.667	6.30	2.42	2.95
0.250	3.50	1.000	76.81	1.750	5.09	2.50	2.95
0.333	3.50	1.083	24.08	1.833	5.09	2.58	2.68
0.417	4.69	1.167	24.08	1.917	4.29	2.67	2.68
0.500	4.69	1.250	12.36	2.000	4.29	2.75	2.46
0.583	7.30	1.333	12.36	2.083	3.72	2.83	2.46
0.667	7.30	1.417	8.32	2.167	3.72	2.92	2.28
0.750	18.21	1.500	8.32	2.250	3.29	3.00	2.28

Unit Hyd Qpeak (cms)= 0.493

PEAK FLOW (cms)= 0.051 (i)
 TIME TO PEAK (hrs)= 1.667
 RUNOFF VOLUME (mm)= 4.604
 TOTAL RAINFALL (mm)= 31.860
 RUNOFF COEFFICIENT = 0.145

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

 ** SIMULATION:3 **

CHICAGO STORM	IDF curve parameters: A= 998.071
Ptotal= 42.51 mm	B= 6.053
-----	C= 0.814

used in: INTENSITY = $A / (t + B)^C$

Duration of storm = 3.00 hrs
 Storm time step = 10.00 min
 Time to peak ratio = 0.33

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	3.68	0.83	104.19	1.67	6.69	2.50	3.51
0.17	4.58	1.00	32.04	1.83	5.63	2.67	3.22
0.33	6.15	1.17	16.34	2.00	4.87	2.83	2.98

0.50	9.61		1.33	10.96		2.17	4.30	
0.67	24.17		1.50	8.29		2.33	3.86	

CALIB			
NASHYD (0102)		Area (ha)= 16.00	Curve Number (CN)= 61.6
ID= 1 DT= 5.0 min		Ia (mm)= 9.09	# of Linear Res.(N)= 3.00
-----		U.H. Tp(hrs)= 1.02	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	3.68	0.833	24.17	1.583	8.29	2.33	4.30
0.167	3.68	0.917	104.19	1.667	8.29	2.42	3.86
0.250	4.58	1.000	104.19	1.750	6.69	2.50	3.86
0.333	4.58	1.083	32.04	1.833	6.69	2.58	3.51
0.417	6.15	1.167	32.04	1.917	5.63	2.67	3.51
0.500	6.15	1.250	16.34	2.000	5.63	2.75	3.22
0.583	9.61	1.333	16.34	2.083	4.87	2.83	3.22
0.667	9.61	1.417	10.96	2.167	4.87	2.92	2.98
0.750	24.17	1.500	10.96	2.250	4.30	3.00	2.98

Unit Hyd Qpeak (cms)= 0.599

PEAK FLOW (cms)= 0.102 (i)
 TIME TO PEAK (hrs)= 2.417
 RUNOFF VOLUME (mm)= 5.826
 TOTAL RAINFALL (mm)= 42.514
 RUNOFF COEFFICIENT = 0.137

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

CALIB			
NASHYD (0101)		Area (ha)= 6.20	Curve Number (CN)= 67.6
ID= 1 DT= 5.0 min		Ia (mm)= 5.77	# of Linear Res.(N)= 3.00
-----		U.H. Tp(hrs)= 0.48	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr

0.083	3.68	0.833	24.17	1.583	8.29	2.33	4.30
0.167	3.68	0.917	104.19	1.667	8.29	2.42	3.86
0.250	4.58	1.000	104.19	1.750	6.69	2.50	3.86
0.333	4.58	1.083	32.04	1.833	6.69	2.58	3.51
0.417	6.15	1.167	32.04	1.917	5.63	2.67	3.51
0.500	6.15	1.250	16.34	2.000	5.63	2.75	3.22
0.583	9.61	1.333	16.34	2.083	4.87	2.83	3.22
0.667	9.61	1.417	10.96	2.167	4.87	2.92	2.98
0.750	24.17	1.500	10.96	2.250	4.30	3.00	2.98

Unit Hyd Qpeak (cms)= 0.493

PEAK FLOW (cms)= 0.098 (i)

TIME TO PEAK (hrs)= 1.583

RUNOFF VOLUME (mm)= 8.518

TOTAL RAINFALL (mm)= 42.514

RUNOFF COEFFICIENT = 0.200

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

** SIMULATION:4 **

CHICAGO STORM
Ptotal= 49.50 mm

IDF curve parameters: A=1174.184

B= 6.014

C= 0.816

used in: INTENSITY = $A / (t + B)^C$

Duration of storm = 3.00 hrs

Storm time step = 10.00 min

Time to peak ratio = 0.33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	4.25	0.83	122.14	1.67	7.73	2.50	4.05
0.17	5.29	1.00	37.28	1.83	6.50	2.67	3.71
0.33	7.11	1.17	18.95	2.00	5.63	2.83	3.43
0.50	11.13	1.33	12.70	2.17	4.97		
0.67	28.10	1.50	9.59	2.33	4.46		

CALIB
NASHYD (0102)
ID= 1 DT= 5.0 min

Area (ha)= 16.00 Curve Number (CN)= 61.6

Ia (mm)= 9.09 # of Linear Res.(N)= 3.00

U.H. Tp(hrs)= 1.02

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	4.25	0.833	28.10	1.583	9.59	2.33	4.97
0.167	4.25	0.917	122.14	1.667	9.59	2.42	4.46
0.250	5.29	1.000	122.14	1.750	7.73	2.50	4.46
0.333	5.29	1.083	37.28	1.833	7.73	2.58	4.05
0.417	7.11	1.167	37.28	1.917	6.50	2.67	4.05
0.500	7.11	1.250	18.95	2.000	6.50	2.75	3.71
0.583	11.13	1.333	18.95	2.083	5.63	2.83	3.71
0.667	11.13	1.417	12.70	2.167	5.63	2.92	3.43
0.750	28.10	1.500	12.70	2.250	4.97	3.00	3.43

Unit Hyd Qpeak (cms)= 0.599

PEAK FLOW (cms)= 0.145 (i)
 TIME TO PEAK (hrs)= 2.417
 RUNOFF VOLUME (mm)= 8.218
 TOTAL RAINFALL (mm)= 49.505
 RUNOFF COEFFICIENT = 0.166

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

CALIB			
NASHYD (0101)	Area (ha)=	6.20	Curve Number (CN)= 67.6
ID= 1 DT= 5.0 min	Ia (mm)=	5.77	# of Linear Res.(N)= 3.00
-----		U.H. Tp(hrs)=	0.48

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	4.25	0.833	28.10	1.583	9.59	2.33	4.97
0.167	4.25	0.917	122.14	1.667	9.59	2.42	4.46
0.250	5.29	1.000	122.14	1.750	7.73	2.50	4.46
0.333	5.29	1.083	37.28	1.833	7.73	2.58	4.05
0.417	7.11	1.167	37.28	1.917	6.50	2.67	4.05
0.500	7.11	1.250	18.95	2.000	6.50	2.75	3.71
0.583	11.13	1.333	18.95	2.083	5.63	2.83	3.71
0.667	11.13	1.417	12.70	2.167	5.63	2.92	3.43
0.750	28.10	1.500	12.70	2.250	4.97	3.00	3.43

Unit Hyd Qpeak (cms)= 0.493

PEAK FLOW (cms)= 0.135 (i)
 TIME TO PEAK (hrs)= 1.583
 RUNOFF VOLUME (mm)= 11.558
 TOTAL RAINFALL (mm)= 49.505
 RUNOFF COEFFICIENT = 0.233

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

 ** SIMULATION:5 **

 | CHICAGO STORM | IDF curve parameters: A=1402.884
 | Ptotal= 58.23 mm | B= 6.018
 ----- C= 0.819
 used in: INTENSITY = $A / (t + B)^C$

 Duration of storm = 3.00 hrs
 Storm time step = 10.00 min
 Time to peak ratio = 0.33

TIME	RAIN	TIME	RAIN	'	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	'	hrs	mm/hr	hrs	mm/hr
0.00	4.93	0.83	144.69		1.67	9.01	2.50	4.70
0.17	6.15	1.00	43.90		1.83	7.57	2.67	4.31
0.33	8.28	1.17	22.22		2.00	6.54	2.83	3.98
0.50	13.01	1.33	14.85		2.17	5.78		
0.67	33.04	1.50	11.19		2.33	5.18		

 | CALIB |
 | NASHYD (0102) | Area (ha)= 16.00 Curve Number (CN)= 61.6
 | ID= 1 DT= 5.0 min | Ia (mm)= 9.09 # of Linear Res.(N)= 3.00
 ----- U.H. Tp(hrs)= 1.02

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----

TIME	RAIN	TIME	RAIN	'	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	'	hrs	mm/hr	hrs	mm/hr
0.083	4.93	0.833	33.04		1.583	11.19	2.33	5.78
0.167	4.93	0.917	144.69		1.667	11.19	2.42	5.18
0.250	6.15	1.000	144.69		1.750	9.01	2.50	5.18
0.333	6.15	1.083	43.90		1.833	9.01	2.58	4.70
0.417	8.28	1.167	43.90		1.917	7.57	2.67	4.70

0.500	8.28	1.250	22.22	2.000	7.57	2.75	4.31
0.583	13.01	1.333	22.22	2.083	6.54	2.83	4.31
0.667	13.01	1.417	14.85	2.167	6.54	2.92	3.98
0.750	33.04	1.500	14.85	2.250	5.78	3.00	3.98

Unit Hyd Qpeak (cms)= 0.599

PEAK FLOW (cms)= 0.208 (i)
 TIME TO PEAK (hrs)= 2.333
 RUNOFF VOLUME (mm)= 11.637
 TOTAL RAINFALL (mm)= 58.226
 RUNOFF COEFFICIENT = 0.200

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

```

-----
| CALIB |
| NASHYD ( 0101) | Area (ha)= 6.20 Curve Number (CN)= 67.6
| ID= 1 DT= 5.0 min | Ia (mm)= 5.77 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 0.48

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	4.93	0.833	33.04	1.583	11.19	2.33	5.78
0.167	4.93	0.917	144.69	1.667	11.19	2.42	5.18
0.250	6.15	1.000	144.69	1.750	9.01	2.50	5.18
0.333	6.15	1.083	43.90	1.833	9.01	2.58	4.70
0.417	8.28	1.167	43.90	1.917	7.57	2.67	4.70
0.500	8.28	1.250	22.22	2.000	7.57	2.75	4.31
0.583	13.01	1.333	22.22	2.083	6.54	2.83	4.31
0.667	13.01	1.417	14.85	2.167	6.54	2.92	3.98
0.750	33.04	1.500	14.85	2.250	5.78	3.00	3.98

Unit Hyd Qpeak (cms)= 0.493

PEAK FLOW (cms)= 0.188 (i)
 TIME TO PEAK (hrs)= 1.583
 RUNOFF VOLUME (mm)= 15.795
 TOTAL RAINFALL (mm)= 58.226
 RUNOFF COEFFICIENT = 0.271

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

** SIMULATION:6 **

```

-----
| CHICAGO STORM |      IDF curve parameters: A=1569.580
| Ptotal= 64.81 mm |                      B=   6.014
-----                      C=   0.820
                                used in:  INTENSITY = A / (t + B)^C
  
```

Duration of storm = 3.00 hrs
 Storm time step = 10.00 min
 Time to peak ratio = 0.33

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	5.47	0.83	161.47	1.67	10.00	2.50	5.21
0.17	6.82	1.00	48.88	1.83	8.40	2.67	4.77
0.33	9.19	1.17	24.70	2.00	7.26	2.83	4.41
0.50	14.44	1.33	16.49	2.17	6.40		
0.67	36.76	1.50	12.42	2.33	5.74		

```

-----
| CALIB |
| NASHYD ( 0102) | Area (ha)= 16.00 Curve Number (CN)= 61.6
| ID= 1 DT= 5.0 min | Ia (mm)= 9.09 # of Linear Res.(N)= 3.00
-----
                                U.H. Tp(hrs)= 1.02
  
```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	5.47	0.833	36.76	1.583	12.42	2.33	6.40
0.167	5.47	0.917	161.47	1.667	12.42	2.42	5.74
0.250	6.82	1.000	161.47	1.750	10.00	2.50	5.74
0.333	6.82	1.083	48.88	1.833	10.00	2.58	5.21
0.417	9.19	1.167	48.88	1.917	8.40	2.67	5.21
0.500	9.19	1.250	24.70	2.000	8.40	2.75	4.77
0.583	14.44	1.333	24.70	2.083	7.26	2.83	4.77
0.667	14.44	1.417	16.49	2.167	7.26	2.92	4.41
0.750	36.76	1.500	16.49	2.250	6.40	3.00	4.41

Unit Hyd Qpeak (cms)= 0.599

PEAK FLOW (cms)= 0.261 (i)

TIME TO PEAK (hrs)= 2.333

RUNOFF VOLUME (mm)= 14.502

TOTAL RAINFALL (mm)= 64.806

RUNOFF COEFFICIENT = 0.224

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

```
-----
| CALIB |
| NASHYD ( 0101) | Area (ha)= 6.20 Curve Number (CN)= 67.6
| ID= 1 DT= 5.0 min | Ia (mm)= 5.77 # of Linear Res.(N)= 3.00
|-----| U.H. Tp(hrs)= 0.48
```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```
----- TRANSFORMED HYETOGRAPH -----
TIME    RAIN | TIME    RAIN | TIME    RAIN | TIME    RAIN
hrs      mm/hr | hrs      mm/hr | hrs      mm/hr | hrs      mm/hr
0.083    5.47 | 0.833    36.76 | 1.583    12.42 | 2.33     6.40
0.167    5.47 | 0.917   161.47 | 1.667    12.42 | 2.42     5.74
0.250    6.82 | 1.000   161.47 | 1.750    10.00 | 2.50     5.74
0.333    6.82 | 1.083    48.88 | 1.833    10.00 | 2.58     5.21
0.417    9.19 | 1.167    48.88 | 1.917     8.40 | 2.67     5.21
0.500    9.19 | 1.250    24.70 | 2.000     8.40 | 2.75     4.77
0.583   14.44 | 1.333    24.70 | 2.083     7.26 | 2.83     4.77
0.667   14.44 | 1.417    16.49 | 2.167     7.26 | 2.92     4.41
0.750   36.76 | 1.500    16.49 | 2.250     6.40 | 3.00     4.41
```

Unit Hyd Qpeak (cms)= 0.493

PEAK FLOW (cms)= 0.232 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 19.278
TOTAL RAINFALL (mm)= 64.806
RUNOFF COEFFICIENT = 0.297

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

```
*****
** SIMULATION:7 **
*****
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```
-----
| CHICAGO STORM | IDF curve parameters: A=1735.688
| Ptotal= 71.66 mm | B= 6.014
|-----| C= 0.820
used in: INTENSITY = A / (t + B)^C

Duration of storm = 3.00 hrs
Storm time step = 10.00 min
Time to peak ratio = 0.33
```

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	6.05	0.83	178.56	1.67	11.06	2.50	5.76
0.17	7.54	1.00	54.05	1.83	9.29	2.67	5.28
0.33	10.16	1.17	27.32	2.00	8.02	2.83	4.88
0.50	15.97	1.33	18.24	2.17	7.08		
0.67	40.65	1.50	13.74	2.33	6.35		

```

-----
| CALIB                                     |
| NASHYD ( 0102) | Area (ha)= 16.00 Curve Number (CN)= 61.6
| ID= 1 DT= 5.0 min | Ia (mm)= 9.09 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 1.02

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	6.05	0.833	40.65	1.583	13.74	2.33	7.08
0.167	6.05	0.917	178.56	1.667	13.74	2.42	6.35
0.250	7.54	1.000	178.56	1.750	11.06	2.50	6.35
0.333	7.54	1.083	54.05	1.833	11.06	2.58	5.76
0.417	10.16	1.167	54.05	1.917	9.29	2.67	5.76
0.500	10.16	1.250	27.32	2.000	9.29	2.75	5.28
0.583	15.97	1.333	27.32	2.083	8.02	2.83	5.28
0.667	15.97	1.417	18.24	2.167	8.02	2.92	4.88
0.750	40.65	1.500	18.24	2.250	7.08	3.00	4.88

Unit Hyd Qpeak (cms)= 0.599

PEAK FLOW (cms)= 0.320 (i)
 TIME TO PEAK (hrs)= 2.333
 RUNOFF VOLUME (mm)= 17.724
 TOTAL RAINFALL (mm)= 71.665
 RUNOFF COEFFICIENT = 0.247

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

```

-----
| CALIB                                     |
| NASHYD ( 0101) | Area (ha)= 6.20 Curve Number (CN)= 67.6
| ID= 1 DT= 5.0 min | Ia (mm)= 5.77 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 0.48

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	6.05	0.833	40.65	1.583	13.74	2.33	7.08
0.167	6.05	0.917	178.56	1.667	13.74	2.42	6.35
0.250	7.54	1.000	178.56	1.750	11.06	2.50	6.35
0.333	7.54	1.083	54.05	1.833	11.06	2.58	5.76
0.417	10.16	1.167	54.05	1.917	9.29	2.67	5.76
0.500	10.16	1.250	27.32	2.000	9.29	2.75	5.28
0.583	15.97	1.333	27.32	2.083	8.02	2.83	5.28
0.667	15.97	1.417	18.24	2.167	8.02	2.92	4.88
0.750	40.65	1.500	18.24	2.250	7.08	3.00	4.88

Unit Hyd Qpeak (cms)= 0.493

PEAK FLOW (cms)= 0.280 (i)

TIME TO PEAK (hrs)= 1.583

RUNOFF VOLUME (mm)= 23.140

TOTAL RAINFALL (mm)= 71.665

RUNOFF COEFFICIENT = 0.323

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

 ** SIMULATION:1 **

```

-----
| CHICAGO STORM | IDF curve parameters: A= 732.951
| Ptotal= 36.86 mm | B= 6.199
-----
                        C= 0.810
used in:  INTENSITY = A / (t + B)^C

Duration of storm = 6.00 hrs
Storm time step   = 10.00 min
Time to peak ratio = 0.33

```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	'	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	1.37	1.50	7.30		3.00	3.72	4.50	1.77
0.17	1.49	1.67	18.21		3.17	3.29	4.67	1.68
0.33	1.63	1.83	76.81		3.33	2.95	4.83	1.60
0.50	1.82	2.00	24.08		3.50	2.68	5.00	1.52
0.67	2.05	2.17	12.36		3.67	2.46	5.17	1.46
0.83	2.37	2.33	8.32		3.83	2.28	5.33	1.40
1.00	2.81	2.50	6.30		4.00	2.12	5.50	1.34
1.17	3.50	2.67	5.09		4.17	1.99	5.67	1.29
1.33	4.69	2.83	4.29		4.33	1.87	5.83	1.24

```

-----
| CALIB |
| NASHYD ( 0102) | Area (ha)= 16.00 Curve Number (CN)= 61.6
| ID= 1 DT= 5.0 min | Ia (mm)= 9.09 # of Linear Res.(N)= 3.00
-----
                        U.H. Tp(hrs)= 1.02

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	'	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.37	1.583	7.30		3.083	3.72	4.58	1.77
0.167	1.37	1.667	7.30		3.167	3.72	4.67	1.77
0.250	1.49	1.750	18.21		3.250	3.29	4.75	1.68
0.333	1.49	1.833	18.21		3.333	3.29	4.83	1.68
0.417	1.63	1.917	76.81		3.417	2.95	4.92	1.60
0.500	1.63	2.000	76.80		3.500	2.95	5.00	1.60
0.583	1.82	2.083	24.08		3.583	2.68	5.08	1.52
0.667	1.82	2.167	24.08		3.667	2.68	5.17	1.52
0.750	2.05	2.250	12.36		3.750	2.46	5.25	1.46
0.833	2.05	2.333	12.36		3.833	2.46	5.33	1.46
0.917	2.37	2.417	8.32		3.917	2.28	5.42	1.40

1.000	2.37	2.500	8.32	4.000	2.28	5.50	1.40
1.083	2.81	2.583	6.30	4.083	2.12	5.58	1.34
1.167	2.81	2.667	6.30	4.167	2.12	5.67	1.34
1.250	3.50	2.750	5.09	4.250	1.99	5.75	1.29
1.333	3.50	2.833	5.09	4.333	1.99	5.83	1.29
1.417	4.69	2.917	4.29	4.417	1.87	5.92	1.24
1.500	4.69	3.000	4.29	4.500	1.87	6.00	1.24

Unit Hyd Qpeak (cms)= 0.599

PEAK FLOW (cms)= 0.057 (i)

TIME TO PEAK (hrs)= 3.417

RUNOFF VOLUME (mm)= 4.144

TOTAL RAINFALL (mm)= 36.860

RUNOFF COEFFICIENT = 0.112

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

CALIB			
NASHYD (0101)	Area (ha)= 6.20	Curve Number (CN)= 67.6	
ID= 1 DT= 5.0 min	Ia (mm)= 5.77	# of Linear Res.(N)= 3.00	
-----		U.H. Tp(hrs)= 0.48	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	1.37	1.583	7.30	3.083	3.72	4.58	1.77
0.167	1.37	1.667	7.30	3.167	3.72	4.67	1.77
0.250	1.49	1.750	18.21	3.250	3.29	4.75	1.68
0.333	1.49	1.833	18.21	3.333	3.29	4.83	1.68
0.417	1.63	1.917	76.81	3.417	2.95	4.92	1.60
0.500	1.63	2.000	76.80	3.500	2.95	5.00	1.60
0.583	1.82	2.083	24.08	3.583	2.68	5.08	1.52
0.667	1.82	2.167	24.08	3.667	2.68	5.17	1.52
0.750	2.05	2.250	12.36	3.750	2.46	5.25	1.46
0.833	2.05	2.333	12.36	3.833	2.46	5.33	1.46
0.917	2.37	2.417	8.32	3.917	2.28	5.42	1.40
1.000	2.37	2.500	8.32	4.000	2.28	5.50	1.40
1.083	2.81	2.583	6.30	4.083	2.12	5.58	1.34
1.167	2.81	2.667	6.30	4.167	2.12	5.67	1.34
1.250	3.50	2.750	5.09	4.250	1.99	5.75	1.29
1.333	3.50	2.833	5.09	4.333	1.99	5.83	1.29
1.417	4.69	2.917	4.29	4.417	1.87	5.92	1.24
1.500	4.69	3.000	4.29	4.500	1.87	6.00	1.24

Unit Hyd Qpeak (cms)= 0.493

PEAK FLOW (cms)= 0.059 (i)

TIME TO PEAK (hrs)= 2.583

RUNOFF VOLUME (mm)= 6.324

TOTAL RAINFALL (mm)= 36.860

RUNOFF COEFFICIENT = 0.172

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

** SIMULATION:2 **

| CHICAGO STORM | IDF curve parameters: A= 998.071
| Ptotal= 49.04 mm | B= 6.053
C= 0.814

used in: INTENSITY = $A / (t + B)^C$

Duration of storm = 6.00 hrs

Storm time step = 10.00 min

Time to peak ratio = 0.33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	'	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	1.78	1.50	9.61		3.00	4.87	4.50	2.31
0.17	1.94	1.67	24.17		3.17	4.30	4.67	2.19
0.33	2.13	1.83	104.19		3.33	3.86	4.83	2.08
0.50	2.37	2.00	32.04		3.50	3.51	5.00	1.99
0.67	2.68	2.17	16.34		3.67	3.22	5.17	1.90
0.83	3.10	2.33	10.96		3.83	2.98	5.33	1.82
1.00	3.68	2.50	8.29		4.00	2.77	5.50	1.75
1.17	4.58	2.67	6.69		4.17	2.60	5.67	1.68
1.33	6.15	2.83	5.63		4.33	2.44	5.83	1.62

| CALIB |
| NASHYD (0102) | Area (ha)= 16.00 Curve Number (CN)= 61.6
| ID= 1 DT= 5.0 min | Ia (mm)= 9.09 # of Linear Res.(N)= 3.00

U.H. Tp(hrs)= 1.02

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	'	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
-------------	---------------	-------------	---------------	---	-------------	---------------	-------------	---------------

0.083	1.78	1.583	9.61	3.083	4.87	4.58	2.31
0.167	1.78	1.667	9.61	3.167	4.87	4.67	2.31
0.250	1.94	1.750	24.17	3.250	4.30	4.75	2.19
0.333	1.94	1.833	24.17	3.333	4.30	4.83	2.19
0.417	2.13	1.917	104.19	3.417	3.86	4.92	2.08
0.500	2.13	2.000	104.19	3.500	3.86	5.00	2.08
0.583	2.37	2.083	32.04	3.583	3.51	5.08	1.99
0.667	2.37	2.167	32.04	3.667	3.51	5.17	1.99
0.750	2.68	2.250	16.34	3.750	3.22	5.25	1.90
0.833	2.68	2.333	16.34	3.833	3.22	5.33	1.90
0.917	3.10	2.417	10.96	3.917	2.98	5.42	1.82
1.000	3.10	2.500	10.96	4.000	2.98	5.50	1.82
1.083	3.68	2.583	8.29	4.083	2.77	5.58	1.75
1.167	3.68	2.667	8.29	4.167	2.77	5.67	1.75
1.250	4.58	2.750	6.69	4.250	2.60	5.75	1.68
1.333	4.58	2.833	6.69	4.333	2.60	5.83	1.68
1.417	6.15	2.917	5.63	4.417	2.44	5.92	1.62
1.500	6.15	3.000	5.63	4.500	2.44	6.00	1.62

Unit Hyd Qpeak (cms)= 0.599

PEAK FLOW (cms)= 0.117 (i)

TIME TO PEAK (hrs)= 3.333

RUNOFF VOLUME (mm)= 8.048

TOTAL RAINFALL (mm)= 49.038

RUNOFF COEFFICIENT = 0.164

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

CALIB			
NASHYD (0101)	Area (ha)= 6.20	Curve Number (CN)= 67.6	
ID= 1 DT= 5.0 min	Ia (mm)= 5.77	# of Linear Res.(N)= 3.00	

	U.H. Tp(hrs)= 0.48		

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	1.78	1.583	9.61	3.083	4.87	4.58	2.31
0.167	1.78	1.667	9.61	3.167	4.87	4.67	2.31
0.250	1.94	1.750	24.17	3.250	4.30	4.75	2.19
0.333	1.94	1.833	24.17	3.333	4.30	4.83	2.19
0.417	2.13	1.917	104.19	3.417	3.86	4.92	2.08
0.500	2.13	2.000	104.19	3.500	3.86	5.00	2.08
0.583	2.37	2.083	32.04	3.583	3.51	5.08	1.99
0.667	2.37	2.167	32.04	3.667	3.51	5.17	1.99

0.750	2.68	2.250	16.34	3.750	3.22	5.25	1.90
0.833	2.68	2.333	16.34	3.833	3.22	5.33	1.90
0.917	3.10	2.417	10.96	3.917	2.98	5.42	1.82
1.000	3.10	2.500	10.96	4.000	2.98	5.50	1.82
1.083	3.68	2.583	8.29	4.083	2.77	5.58	1.75
1.167	3.68	2.667	8.29	4.167	2.77	5.67	1.75
1.250	4.58	2.750	6.69	4.250	2.60	5.75	1.68
1.333	4.58	2.833	6.69	4.333	2.60	5.83	1.68
1.417	6.15	2.917	5.63	4.417	2.44	5.92	1.62
1.500	6.15	3.000	5.63	4.500	2.44	6.00	1.62

Unit Hyd Qpeak (cms)= 0.493

PEAK FLOW (cms)= 0.112 (i)
TIME TO PEAK (hrs)= 2.583
RUNOFF VOLUME (mm)= 11.345
TOTAL RAINFALL (mm)= 49.038
RUNOFF COEFFICIENT = 0.231

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

** SIMULATION:3 **

CHICAGO STORM	IDF curve parameters: A=1174.184						
Ptotal= 57.02 mm	B= 6.014						
	C= 0.816						
	used in: INTENSITY = A / (t + B)^C						
	Duration of storm = 6.00 hrs						
	Storm time step = 10.00 min						
	Time to peak ratio = 0.33						
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	2.05	1.50	11.13	3.00	5.63	4.50	2.66
0.17	2.23	1.67	28.10	3.17	4.97	4.67	2.52
0.33	2.45	1.83	122.14	3.33	4.46	4.83	2.40
0.50	2.73	2.00	37.28	3.50	4.05	5.00	2.29
0.67	3.09	2.17	18.95	3.67	3.71	5.17	2.19
0.83	3.57	2.33	12.70	3.83	3.43	5.33	2.09
1.00	4.25	2.50	9.59	4.00	3.20	5.50	2.01
1.17	5.29	2.67	7.73	4.17	2.99	5.67	1.94
1.33	7.11	2.83	6.50	4.33	2.81	5.83	1.87

CALIB		
NASHYD (0102)	Area (ha)= 16.00	Curve Number (CN)= 61.6
ID= 1 DT= 5.0 min	Ia (mm)= 9.09	# of Linear Res.(N)= 3.00
-----	U.H. Tp(hrs)= 1.02	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	2.05	1.583	11.13	3.083	5.63	4.58	2.66
0.167	2.05	1.667	11.13	3.167	5.63	4.67	2.66
0.250	2.23	1.750	28.10	3.250	4.97	4.75	2.52
0.333	2.23	1.833	28.10	3.333	4.97	4.83	2.52
0.417	2.45	1.917	122.14	3.417	4.46	4.92	2.40
0.500	2.45	2.000	122.14	3.500	4.46	5.00	2.40
0.583	2.73	2.083	37.28	3.583	4.05	5.08	2.29
0.667	2.73	2.167	37.28	3.667	4.05	5.17	2.29
0.750	3.09	2.250	18.95	3.750	3.71	5.25	2.19
0.833	3.09	2.333	18.95	3.833	3.71	5.33	2.19
0.917	3.57	2.417	12.70	3.917	3.43	5.42	2.09
1.000	3.57	2.500	12.70	4.000	3.43	5.50	2.09
1.083	4.25	2.583	9.59	4.083	3.20	5.58	2.01
1.167	4.25	2.667	9.59	4.167	3.20	5.67	2.01
1.250	5.29	2.750	7.73	4.250	2.99	5.75	1.94
1.333	5.29	2.833	7.73	4.333	2.99	5.83	1.94
1.417	7.11	2.917	6.50	4.417	2.81	5.92	1.87
1.500	7.11	3.000	6.50	4.500	2.81	6.00	1.87

Unit Hyd Qpeak (cms)= 0.599

PEAK FLOW (cms)= 0.165 (i)

TIME TO PEAK (hrs)= 3.333

RUNOFF VOLUME (mm)= 11.137

TOTAL RAINFALL (mm)= 57.019

RUNOFF COEFFICIENT = 0.195

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

CALIB		
NASHYD (0101)	Area (ha)= 6.20	Curve Number (CN)= 67.6
ID= 1 DT= 5.0 min	Ia (mm)= 5.77	# of Linear Res.(N)= 3.00
-----	U.H. Tp(hrs)= 0.48	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	2.05	1.583	11.13	3.083	5.63	4.58	2.66
0.167	2.05	1.667	11.13	3.167	5.63	4.67	2.66
0.250	2.23	1.750	28.10	3.250	4.97	4.75	2.52
0.333	2.23	1.833	28.10	3.333	4.97	4.83	2.52
0.417	2.45	1.917	122.14	3.417	4.46	4.92	2.40
0.500	2.45	2.000	122.14	3.500	4.46	5.00	2.40
0.583	2.73	2.083	37.28	3.583	4.05	5.08	2.29
0.667	2.73	2.167	37.28	3.667	4.05	5.17	2.29
0.750	3.09	2.250	18.95	3.750	3.71	5.25	2.19
0.833	3.09	2.333	18.95	3.833	3.71	5.33	2.19
0.917	3.57	2.417	12.70	3.917	3.43	5.42	2.09
1.000	3.57	2.500	12.70	4.000	3.43	5.50	2.09
1.083	4.25	2.583	9.59	4.083	3.20	5.58	2.01
1.167	4.25	2.667	9.59	4.167	3.20	5.67	2.01
1.250	5.29	2.750	7.73	4.250	2.99	5.75	1.94
1.333	5.29	2.833	7.73	4.333	2.99	5.83	1.94
1.417	7.11	2.917	6.50	4.417	2.81	5.92	1.87
1.500	7.11	3.000	6.50	4.500	2.81	6.00	1.87

Unit Hyd Qpeak (cms)= 0.493

PEAK FLOW (cms)= 0.153 (i)

TIME TO PEAK (hrs)= 2.583

RUNOFF VOLUME (mm)= 15.182

TOTAL RAINFALL (mm)= 57.019

RUNOFF COEFFICIENT = 0.266

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

** SIMULATION:4 **

| CHICAGO STORM |
| Ptotal= 66.93 mm |

IDF curve parameters: A=1402.884

B= 6.018

C= 0.819

used in: INTENSITY = $A / (t + B)^C$

Duration of storm = 6.00 hrs

Storm time step = 10.00 min

Time to peak ratio = 0.33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	2.37	1.50	13.01	3.00	6.54	4.50	3.08
0.17	2.58	1.67	33.04	3.17	5.78	4.67	2.92

0.33	2.84	1.83	144.69	3.33	5.18	4.83	2.77
0.50	3.17	2.00	43.90	3.50	4.70	5.00	2.65
0.67	3.58	2.17	22.22	3.67	4.31	5.17	2.53
0.83	4.14	2.33	14.85	3.83	3.98	5.33	2.42
1.00	4.93	2.50	11.19	4.00	3.71	5.50	2.33
1.17	6.15	2.67	9.01	4.17	3.47	5.67	2.24
1.33	8.28	2.83	7.57	4.33	3.26	5.83	2.16

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| CALIB                                     |
| NASHYD ( 0102) | Area (ha)= 16.00 Curve Number (CN)= 61.6
| ID= 1 DT= 5.0 min | Ia (mm)= 9.09 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 1.02

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NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	2.37	1.583	13.01	3.083	6.54	4.58	3.08
0.167	2.37	1.667	13.01	3.167	6.54	4.67	3.08
0.250	2.58	1.750	33.04	3.250	5.78	4.75	2.92
0.333	2.58	1.833	33.04	3.333	5.78	4.83	2.92
0.417	2.84	1.917	144.69	3.417	5.18	4.92	2.77
0.500	2.84	2.000	144.69	3.500	5.18	5.00	2.77
0.583	3.17	2.083	43.90	3.583	4.70	5.08	2.65
0.667	3.17	2.167	43.90	3.667	4.70	5.17	2.65
0.750	3.58	2.250	22.22	3.750	4.31	5.25	2.53
0.833	3.58	2.333	22.22	3.833	4.31	5.33	2.53
0.917	4.14	2.417	14.85	3.917	3.98	5.42	2.42
1.000	4.14	2.500	14.85	4.000	3.98	5.50	2.42
1.083	4.93	2.583	11.19	4.083	3.71	5.58	2.33
1.167	4.93	2.667	11.19	4.167	3.71	5.67	2.33
1.250	6.15	2.750	9.01	4.250	3.47	5.75	2.24
1.333	6.15	2.833	9.01	4.333	3.47	5.83	2.24
1.417	8.28	2.917	7.57	4.417	3.26	5.92	2.16
1.500	8.28	3.000	7.57	4.500	3.26	6.00	2.16

Unit Hyd Qpeak (cms)= 0.599

PEAK FLOW (cms)= 0.234 (i)

TIME TO PEAK (hrs)= 3.333

RUNOFF VOLUME (mm)= 15.474

TOTAL RAINFALL (mm)= 66.928

RUNOFF COEFFICIENT = 0.231

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

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-----
| CALIB |
| NASHYD ( 0101) | Area (ha)= 6.20 Curve Number (CN)= 67.6
| ID= 1 DT= 5.0 min | Ia (mm)= 5.77 # of Linear Res.(N)= 3.00
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| U.H. Tp(hrs)= 0.48

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NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

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----- TRANSFORMED HYETOGRAPH -----

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TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	2.37	1.583	13.01	3.083	6.54	4.58	3.08
0.167	2.37	1.667	13.01	3.167	6.54	4.67	3.08
0.250	2.58	1.750	33.04	3.250	5.78	4.75	2.92
0.333	2.58	1.833	33.04	3.333	5.78	4.83	2.92
0.417	2.84	1.917	144.69	3.417	5.18	4.92	2.77
0.500	2.84	2.000	144.69	3.500	5.18	5.00	2.77
0.583	3.17	2.083	43.90	3.583	4.70	5.08	2.65
0.667	3.17	2.167	43.90	3.667	4.70	5.17	2.65
0.750	3.58	2.250	22.22	3.750	4.31	5.25	2.53
0.833	3.58	2.333	22.22	3.833	4.31	5.33	2.53
0.917	4.14	2.417	14.85	3.917	3.98	5.42	2.42
1.000	4.14	2.500	14.85	4.000	3.98	5.50	2.42
1.083	4.93	2.583	11.19	4.083	3.71	5.58	2.33
1.167	4.93	2.667	11.19	4.167	3.71	5.67	2.33
1.250	6.15	2.750	9.01	4.250	3.47	5.75	2.24
1.333	6.15	2.833	9.01	4.333	3.47	5.83	2.24
1.417	8.28	2.917	7.57	4.417	3.26	5.92	2.16
1.500	8.28	3.000	7.57	4.500	3.26	6.00	2.16

Unit Hyd Qpeak (cms)= 0.493

PEAK FLOW (cms)= 0.210 (i)

TIME TO PEAK (hrs)= 2.583

RUNOFF VOLUME (mm)= 20.449

TOTAL RAINFALL (mm)= 66.928

RUNOFF COEFFICIENT = 0.306

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

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** SIMULATION:5 **
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| CHICAGO STORM | IDF curve parameters: A=1569.580
| Ptotal= 74.44 mm | B= 6.014

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 C= 0.820
 used in: INTENSITY = A / (t + B)^C

Duration of storm = 6.00 hrs
 Storm time step = 10.00 min
 Time to peak ratio = 0.33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	'	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	2.63	1.50	14.44		3.00	7.26	4.50	3.41
0.17	2.86	1.67	36.76		3.17	6.40	4.67	3.23
0.33	3.15	1.83	161.47		3.33	5.74	4.83	3.07
0.50	3.51	2.00	48.88		3.50	5.21	5.00	2.93
0.67	3.97	2.17	24.70		3.67	4.77	5.17	2.80
0.83	4.59	2.33	16.49		3.83	4.41	5.33	2.68
1.00	5.47	2.50	12.42		4.00	4.10	5.50	2.58
1.17	6.82	2.67	10.00		4.17	3.84	5.67	2.48
1.33	9.19	2.83	8.40		4.33	3.61	5.83	2.39

 | CALIB |
 | NASHYD (0102) | Area (ha)= 16.00 Curve Number (CN)= 61.6
 | ID= 1 DT= 5.0 min | Ia (mm)= 9.09 # of Linear Res.(N)= 3.00

 U.H. Tp(hrs)= 1.02

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	'	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	2.63	1.583	14.44		3.083	7.26	4.58	3.41
0.167	2.63	1.667	14.44		3.167	7.26	4.67	3.41
0.250	2.86	1.750	36.76		3.250	6.40	4.75	3.23
0.333	2.86	1.833	36.76		3.333	6.40	4.83	3.23
0.417	3.15	1.917	161.47		3.417	5.74	4.92	3.07
0.500	3.15	2.000	161.47		3.500	5.74	5.00	3.07
0.583	3.51	2.083	48.88		3.583	5.21	5.08	2.93
0.667	3.51	2.167	48.88		3.667	5.21	5.17	2.93
0.750	3.97	2.250	24.70		3.750	4.77	5.25	2.80
0.833	3.97	2.333	24.70		3.833	4.77	5.33	2.80
0.917	4.59	2.417	16.49		3.917	4.41	5.42	2.68
1.000	4.59	2.500	16.49		4.000	4.41	5.50	2.68
1.083	5.47	2.583	12.42		4.083	4.10	5.58	2.58
1.167	5.47	2.667	12.42		4.167	4.10	5.67	2.58
1.250	6.82	2.750	10.00		4.250	3.84	5.75	2.48
1.333	6.82	2.833	10.00		4.333	3.84	5.83	2.48
1.417	9.19	2.917	8.40		4.417	3.61	5.92	2.39

1.500 9.19 | 3.000 8.40 | 4.500 3.61 | 6.00 2.39

Unit Hyd Qpeak (cms)= 0.599

PEAK FLOW (cms)= 0.292 (i)
 TIME TO PEAK (hrs)= 3.250
 RUNOFF VOLUME (mm)= 19.092
 TOTAL RAINFALL (mm)= 74.441
 RUNOFF COEFFICIENT = 0.256

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

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| CALIB |
| NASHYD ( 0101) | Area (ha)= 6.20 Curve Number (CN)= 67.6
| ID= 1 DT= 5.0 min | Ia (mm)= 5.77 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 0.48
  
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NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

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----- TRANSFORMED HYETOGRAPH -----
    TIME    RAIN |    TIME    RAIN |    TIME    RAIN |    TIME    RAIN
    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
0.083    2.63 | 1.583   14.44 | 3.083    7.26 | 4.58    3.41
0.167    2.63 | 1.667   14.44 | 3.167    7.26 | 4.67    3.41
0.250    2.86 | 1.750   36.76 | 3.250    6.40 | 4.75    3.23
0.333    2.86 | 1.833   36.76 | 3.333    6.40 | 4.83    3.23
0.417    3.15 | 1.917  161.47 | 3.417    5.74 | 4.92    3.07
0.500    3.15 | 2.000  161.47 | 3.500    5.74 | 5.00    3.07
0.583    3.51 | 2.083   48.88 | 3.583    5.21 | 5.08    2.93
0.667    3.51 | 2.167   48.88 | 3.667    5.21 | 5.17    2.93
0.750    3.97 | 2.250   24.70 | 3.750    4.77 | 5.25    2.80
0.833    3.97 | 2.333   24.70 | 3.833    4.77 | 5.33    2.80
0.917    4.59 | 2.417   16.49 | 3.917    4.41 | 5.42    2.68
1.000    4.59 | 2.500   16.49 | 4.000    4.41 | 5.50    2.68
1.083    5.47 | 2.583   12.42 | 4.083    4.10 | 5.58    2.58
1.167    5.47 | 2.667   12.42 | 4.167    4.10 | 5.67    2.58
1.250    6.82 | 2.750   10.00 | 4.250    3.84 | 5.75    2.48
1.333    6.82 | 2.833   10.00 | 4.333    3.84 | 5.83    2.48
1.417    9.19 | 2.917    8.40 | 4.417    3.61 | 5.92    2.39
1.500    9.19 | 3.000    8.40 | 4.500    3.61 | 6.00    2.39
  
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Unit Hyd Qpeak (cms)= 0.493

PEAK FLOW (cms)= 0.258 (i)
 TIME TO PEAK (hrs)= 2.500
 RUNOFF VOLUME (mm)= 24.764
 TOTAL RAINFALL (mm)= 74.441

RUNOFF COEFFICIENT = 0.333

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

** SIMULATION:6 **

| CHICAGO STORM | IDF curve parameters: A=1735.688
| Ptotal= 82.32 mm | B= 6.014
C= 0.820

used in: INTENSITY = A / (t + B)^C

Duration of storm = 6.00 hrs

Storm time step = 10.00 min

Time to peak ratio = 0.33

TIME	RAIN	TIME	RAIN	'	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	'	hrs	mm/hr	hrs	mm/hr
0.00	2.90	1.50	15.97	'	3.00	8.02	4.50	3.77
0.17	3.16	1.67	40.65	'	3.17	7.08	4.67	3.57
0.33	3.48	1.83	178.56	'	3.33	6.35	4.83	3.40
0.50	3.88	2.00	54.05	'	3.50	5.76	5.00	3.24
0.67	4.39	2.17	27.32	'	3.67	5.28	5.17	3.10
0.83	5.07	2.33	18.24	'	3.83	4.88	5.33	2.97
1.00	6.05	2.50	13.74	'	4.00	4.54	5.50	2.85
1.17	7.54	2.67	11.06	'	4.17	4.25	5.67	2.74
1.33	10.16	2.83	9.29	'	4.33	3.99	5.83	2.64

| CALIB |
| NASHYD (0102) | Area (ha)= 16.00 Curve Number (CN)= 61.6
| ID= 1 DT= 5.0 min | Ia (mm)= 9.09 # of Linear Res.(N)= 3.00

U.H. Tp(hrs)= 1.02

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----

TIME	RAIN	TIME	RAIN	'	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	'	hrs	mm/hr	hrs	mm/hr
0.083	2.90	1.583	15.97	'	3.083	8.02	4.58	3.77
0.167	2.90	1.667	15.97	'	3.167	8.02	4.67	3.77
0.250	3.16	1.750	40.65	'	3.250	7.08	4.75	3.57
0.333	3.16	1.833	40.66	'	3.333	7.08	4.83	3.57
0.417	3.48	1.917	178.56	'	3.417	6.35	4.92	3.40
0.500	3.48	2.000	178.56	'	3.500	6.35	5.00	3.40

0.583	3.88	2.083	54.05	3.583	5.76	5.08	3.24
0.667	3.88	2.167	54.05	3.667	5.76	5.17	3.24
0.750	4.39	2.250	27.32	3.750	5.28	5.25	3.10
0.833	4.39	2.333	27.32	3.833	5.28	5.33	3.10
0.917	5.07	2.417	18.24	3.917	4.88	5.42	2.97
1.000	5.07	2.500	18.24	4.000	4.88	5.50	2.97
1.083	6.05	2.583	13.74	4.083	4.54	5.58	2.85
1.167	6.05	2.667	13.74	4.167	4.54	5.67	2.85
1.250	7.54	2.750	11.06	4.250	4.25	5.75	2.74
1.333	7.54	2.833	11.06	4.333	4.25	5.83	2.74
1.417	10.16	2.917	9.29	4.417	3.99	5.92	2.64
1.500	10.16	3.000	9.29	4.500	3.99	6.00	2.64

Unit Hyd Qpeak (cms)= 0.599

PEAK FLOW (cms)= 0.357 (i)

TIME TO PEAK (hrs)= 3.250

RUNOFF VOLUME (mm)= 23.157

TOTAL RAINFALL (mm)= 82.319

RUNOFF COEFFICIENT = 0.281

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

CALIB			
NASHYD (0101)	Area (ha)= 6.20	Curve Number (CN)= 67.6	
ID= 1 DT= 5.0 min	Ia (mm)= 5.77	# of Linear Res.(N)= 3.00	
-----		U.H. Tp(hrs)= 0.48	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	2.90	1.583	15.97	3.083	8.02	4.58	3.77
0.167	2.90	1.667	15.97	3.167	8.02	4.67	3.77
0.250	3.16	1.750	40.65	3.250	7.08	4.75	3.57
0.333	3.16	1.833	40.66	3.333	7.08	4.83	3.57
0.417	3.48	1.917	178.56	3.417	6.35	4.92	3.40
0.500	3.48	2.000	178.56	3.500	6.35	5.00	3.40
0.583	3.88	2.083	54.05	3.583	5.76	5.08	3.24
0.667	3.88	2.167	54.05	3.667	5.76	5.17	3.24
0.750	4.39	2.250	27.32	3.750	5.28	5.25	3.10
0.833	4.39	2.333	27.32	3.833	5.28	5.33	3.10
0.917	5.07	2.417	18.24	3.917	4.88	5.42	2.97
1.000	5.07	2.500	18.24	4.000	4.88	5.50	2.97
1.083	6.05	2.583	13.74	4.083	4.54	5.58	2.85
1.167	6.05	2.667	13.74	4.167	4.54	5.67	2.85

1.250	7.54		2.750	11.06		4.250	4.25		5.75	2.74
1.333	7.54		2.833	11.06		4.333	4.25		5.83	2.74
1.417	10.16		2.917	9.29		4.417	3.99		5.92	2.64
1.500	10.16		3.000	9.29		4.500	3.99		6.00	2.64

Unit Hyd Qpeak (cms)= 0.493

PEAK FLOW (cms)= 0.311 (i)

TIME TO PEAK (hrs)= 2.500

RUNOFF VOLUME (mm)= 29.550

TOTAL RAINFALL (mm)= 82.319

RUNOFF COEFFICIENT = 0.359

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

 ** SIMULATION:Run 01 **

READ STORM	Filename: C:\Users\DFendler\AppData\Local\Temp\3c64f2df-5603-4168-8877-c06187b6db57\83aa445
Ptotal= 49.09 mm	Comments: Ottawa Macdonald Cartier SCS 24 2yr

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	0.54	6.00	0.98	12.00	7.07	18.00	0.88
0.08	0.54	6.08	0.98	12.08	7.07	18.08	0.88
0.17	0.54	6.17	0.98	12.17	7.07	18.17	0.88
0.25	0.54	6.25	0.98	12.25	7.07	18.25	0.88
0.33	0.54	6.33	0.98	12.33	7.07	18.33	0.88
0.42	0.54	6.42	0.98	12.42	7.07	18.42	0.88
0.50	0.54	6.50	0.98	12.50	3.63	18.50	0.88
0.58	0.54	6.58	0.98	12.58	3.63	18.58	0.88
0.67	0.54	6.67	0.98	12.67	3.63	18.67	0.88
0.75	0.54	6.75	0.98	12.75	3.63	18.75	0.88
0.83	0.54	6.83	0.98	12.83	3.63	18.83	0.88
0.92	0.54	6.92	0.98	12.92	3.63	18.92	0.88
1.00	0.54	7.00	0.98	13.00	0.69	19.00	0.88
1.08	0.54	7.08	0.98	13.08	0.69	19.08	0.88
1.17	0.54	7.17	0.98	13.17	0.69	19.17	0.88
1.25	0.54	7.25	0.98	13.25	0.69	19.25	0.88
1.33	0.54	7.33	0.98	13.33	0.69	19.33	0.88
1.42	0.54	7.42	0.98	13.42	0.69	19.42	0.88
1.50	0.54	7.50	0.98	13.50	4.03	19.50	0.88
1.58	0.54	7.58	0.98	13.58	4.03	19.58	0.88
1.67	0.54	7.67	0.98	13.67	4.03	19.67	0.88
1.75	0.54	7.75	0.98	13.75	4.03	19.75	0.88
1.83	0.54	7.83	0.98	13.83	4.03	19.83	0.88
1.92	0.54	7.92	0.98	13.92	4.03	19.92	0.88
2.00	0.64	8.00	1.33	14.00	1.47	20.00	0.59
2.08	0.64	8.08	1.33	14.08	1.47	20.08	0.59
2.17	0.64	8.17	1.33	14.17	1.47	20.17	0.59
2.25	0.64	8.25	1.33	14.25	1.47	20.25	0.59
2.33	0.64	8.33	1.33	14.33	1.47	20.33	0.59
2.42	0.64	8.42	1.33	14.42	1.47	20.42	0.59
2.50	0.64	8.50	1.33	14.50	1.47	20.50	0.59
2.58	0.64	8.58	1.33	14.58	1.47	20.58	0.59
2.67	0.64	8.67	1.33	14.67	1.47	20.67	0.59
2.75	0.64	8.75	1.33	14.75	1.47	20.75	0.59
2.83	0.64	8.83	1.33	14.83	1.47	20.83	0.59
2.92	0.64	8.92	1.33	14.92	1.47	20.92	0.59
3.00	0.64	9.00	1.57	15.00	1.47	21.00	0.59
3.08	0.64	9.08	1.57	15.08	1.47	21.08	0.59

3.17	0.64	9.17	1.57	15.17	1.47	21.17	0.59
3.25	0.64	9.25	1.57	15.25	1.47	21.25	0.59
3.33	0.64	9.33	1.57	15.33	1.47	21.33	0.59
3.42	0.64	9.42	1.57	15.42	1.47	21.42	0.59
3.50	0.64	9.50	1.77	15.50	1.47	21.50	0.59
3.58	0.64	9.58	1.77	15.58	1.47	21.58	0.59
3.67	0.64	9.67	1.77	15.67	1.47	21.67	0.59
3.75	0.64	9.75	1.77	15.75	1.47	21.75	0.59
3.83	0.64	9.83	1.77	15.83	1.47	21.83	0.59
3.92	0.64	9.92	1.77	15.92	1.47	21.92	0.59
4.00	0.79	10.00	2.26	16.00	0.88	22.00	0.59
4.08	0.79	10.08	2.26	16.08	0.88	22.08	0.59
4.17	0.79	10.17	2.26	16.17	0.88	22.17	0.59
4.25	0.79	10.25	2.26	16.25	0.88	22.25	0.59
4.33	0.79	10.33	2.26	16.33	0.88	22.33	0.59
4.42	0.79	10.42	2.26	16.42	0.88	22.42	0.59
4.50	0.79	10.50	3.04	16.50	0.88	22.50	0.59
4.58	0.79	10.58	3.04	16.58	0.88	22.58	0.59
4.67	0.79	10.67	3.04	16.67	0.88	22.67	0.59
4.75	0.79	10.75	3.04	16.75	0.88	22.75	0.59
4.83	0.79	10.83	3.04	16.83	0.88	22.83	0.59
4.92	0.79	10.92	3.04	16.92	0.88	22.92	0.59
5.00	0.79	11.00	4.71	17.00	0.88	23.00	0.59
5.08	0.79	11.08	4.71	17.08	0.88	23.08	0.59
5.17	0.79	11.17	4.71	17.17	0.88	23.17	0.59
5.25	0.79	11.25	4.71	17.25	0.88	23.25	0.59
5.33	0.79	11.33	4.71	17.33	0.88	23.33	0.59
5.42	0.79	11.42	4.71	17.42	0.88	23.42	0.59
5.50	0.79	11.50	20.43	17.50	0.88	23.50	0.59
5.58	0.79	11.58	20.43	17.58	0.88	23.58	0.59
5.67	0.79	11.67	20.43	17.67	0.88	23.67	0.59
5.75	0.79	11.75	54.21	17.75	0.88	23.75	0.59
5.83	0.79	11.83	54.21	17.83	0.88	23.83	0.59
5.92	0.79	11.92	54.21	17.92	0.88	23.92	0.59

CALIB			
NASHYD (0101)	Area (ha)=	2.70	Curve Number (CN)= 69.6
ID= 1 DT= 5.0 min	Ia (mm)=	5.40	# of Linear Res.(N)= 3.00

	U.H. Tp(hrs)=	0.40	

Unit Hyd Qpeak (cms)= 0.258

PEAK FLOW (cms)= 0.049 (i)

TIME TO PEAK (hrs)= 12.250

RUNOFF VOLUME (mm)= 12.345

TOTAL RAINFALL (mm)= 49.095

RUNOFF COEFFICIENT = 0.251

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

```
-----
| CALIB                                     |
| NASHYD ( 0076) | Area (ha)= 4.60 Curve Number (CN)= 73.0
| ID= 1 DT= 5.0 min | Ia (mm)= 4.97 # of Linear Res.(N)= 3.00
|-----| U.H. Tp(hrs)= 0.63
```

Unit Hyd Qpeak (cms)= 0.279

PEAK FLOW (cms)= 0.070 (i)

TIME TO PEAK (hrs)= 12.583

RUNOFF VOLUME (mm)= 14.101

TOTAL RAINFALL (mm)= 49.095

RUNOFF COEFFICIENT = 0.287

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

```
-----
| RESERVOIR( 0080) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min |
|-----|
| OUTFLOW STORAGE | OUTFLOW STORAGE
| (cms) (ha.m.) | (cms) (ha.m.)
|-----|
| ***** WARNING : FIRST OUTFLOW IS NOT ZERO.
| 0.0010 0.0595 | 0.0100 0.1538
| 0.0040 0.0952 | 0.0140 0.1780
| 0.0060 0.1206 | 0.0170 0.2021
|-----|
| AREA QPEAK TPEAK R.V.
| (ha) (cms) (hrs) (mm)
| INFLOW : ID= 2 ( 0076) 4.600 0.070 12.58 14.10
| OUTFLOW: ID= 1 ( 0080) 4.600 0.001 25.17 8.48
```

PEAK FLOW REDUCTION [Qout/Qin](%)= 1.58
TIME SHIFT OF PEAK FLOW (min)=755.00
MAXIMUM STORAGE USED (ha.m.)= 0.0608

```
-----
| CALIB                                     |
| NASHYD ( 0081) | Area (ha)= 3.30 Curve Number (CN)= 68.1
| ID= 1 DT= 5.0 min | Ia (mm)= 6.93 # of Linear Res.(N)= 3.00
|-----| U.H. Tp(hrs)= 0.22
```

Unit Hyd Qpeak (cms)= 0.573

PEAK FLOW (cms)= 0.081 (i)

TIME TO PEAK (hrs)= 12.083
 RUNOFF VOLUME (mm)= 11.018
 TOTAL RAINFALL (mm)= 49.095
 RUNOFF COEFFICIENT = 0.224

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

```

-----
| RESERVOIR( 0077) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
-----
      OUTFLOW   STORAGE   |   OUTFLOW   STORAGE
      (cms)     (ha.m.)   |   (cms)     (ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.
      0.0020    0.0366   |   0.0160    0.0883
      0.0060    0.0551   |   0.0200    0.1025
      0.0100    0.0704   |   0.0240    0.1200

                        AREA   QPEAK   TPEAK   R.V.
                        (ha)   (cms)   (hrs)   (mm)
INFLOW : ID= 2 ( 0081)   3.300   0.081   12.08   11.02
OUTFLOW: ID= 1 ( 0077)   3.300   0.002   24.17   9.61

      PEAK FLOW REDUCTION [Qout/Qin](%)= 2.03
      TIME SHIFT OF PEAK FLOW (min)=725.00
      MAXIMUM STORAGE USED (ha.m.)= 0.0300
  
```

```

-----
| CALIB |
| NASHYD ( 0078) | Area (ha)= 11.60 Curve Number (CN)= 63.8
| ID= 1 DT= 5.0 min | Ia (mm)= 8.44 # of Linear Res.(N)= 3.00
-----
      U.H. Tp(hrs)= 0.89
  
```

Unit Hyd Qpeak (cms)= 0.498

PEAK FLOW (cms)= 0.083 (i)
 TIME TO PEAK (hrs)= 12.917
 RUNOFF VOLUME (mm)= 8.945
 TOTAL RAINFALL (mm)= 49.095
 RUNOFF COEFFICIENT = 0.182

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

```

-----
| ADD HYD ( 0079) |
| 1 + 2 = 3 |
-----
      AREA   QPEAK   TPEAK   R.V.
      (ha)   (cms)   (hrs)   (mm)
  
```

ID1= 1 (0077):	3.30	0.002	24.17	9.61
+ ID2= 2 (0078):	11.60	0.083	12.92	8.94
=====				
ID = 3 (0079):	14.90	0.084	12.92	9.09

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0079)				
3 + 2 = 1				

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0079):	14.90	0.084	12.92	9.09
+ ID2= 2 (0080):	4.60	0.001	25.17	8.48
=====				
ID = 1 (0079):	19.50	0.084	12.92	8.95

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 ** SIMULATION:Run 02 **

READ STORM	Filename: C:\Users\DFendler\AppData
	ata\Local\Temp\
	3c64f2df-5603-4168-8877-c06187b6db57\5aca6ac2
Ptotal= 65.91 mm	Comments: Ottawa Macdonald Cartier SCS 24 5yr

TIME	RAIN	TIME	RAIN	'	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	'	hrs	mm/hr	hrs	mm/hr
0.00	0.72	6.00	1.32	12.00	9.49	18.00	1.19	
0.08	0.72	6.08	1.32	12.08	9.49	18.08	1.19	
0.17	0.72	6.17	1.32	12.17	9.49	18.17	1.19	
0.25	0.72	6.25	1.32	12.25	9.49	18.25	1.19	
0.33	0.72	6.33	1.32	12.33	9.49	18.33	1.19	
0.42	0.72	6.42	1.32	12.42	9.49	18.42	1.19	
0.50	0.72	6.50	1.32	12.50	4.88	18.50	1.19	
0.58	0.72	6.58	1.32	12.58	4.88	18.58	1.19	
0.67	0.72	6.67	1.32	12.67	4.88	18.67	1.19	
0.75	0.72	6.75	1.32	12.75	4.88	18.75	1.19	
0.83	0.72	6.83	1.32	12.83	4.88	18.83	1.19	
0.92	0.72	6.92	1.32	12.92	4.88	18.92	1.19	
1.00	0.72	7.00	1.32	13.00	0.92	19.00	1.19	
1.08	0.72	7.08	1.32	13.08	0.92	19.08	1.19	
1.17	0.72	7.17	1.32	13.17	0.92	19.17	1.19	
1.25	0.72	7.25	1.32	13.25	0.92	19.25	1.19	
1.33	0.72	7.33	1.32	13.33	0.92	19.33	1.19	
1.42	0.72	7.42	1.32	13.42	0.92	19.42	1.19	
1.50	0.72	7.50	1.32	13.50	5.40	19.50	1.19	

1.58	0.72	7.58	1.32	13.58	5.40	19.58	1.19
1.67	0.72	7.67	1.32	13.67	5.40	19.67	1.19
1.75	0.72	7.75	1.32	13.75	5.40	19.75	1.19
1.83	0.72	7.83	1.32	13.83	5.40	19.83	1.19
1.92	0.72	7.92	1.32	13.92	5.40	19.92	1.19
2.00	0.86	8.00	1.78	14.00	1.98	20.00	0.79
2.08	0.86	8.08	1.78	14.08	1.98	20.08	0.79
2.17	0.86	8.17	1.78	14.17	1.98	20.17	0.79
2.25	0.86	8.25	1.78	14.25	1.98	20.25	0.79
2.33	0.86	8.33	1.78	14.33	1.98	20.33	0.79
2.42	0.86	8.42	1.78	14.42	1.98	20.42	0.79
2.50	0.86	8.50	1.78	14.50	1.98	20.50	0.79
2.58	0.86	8.58	1.78	14.58	1.98	20.58	0.79
2.67	0.86	8.67	1.78	14.67	1.98	20.67	0.79
2.75	0.86	8.75	1.78	14.75	1.98	20.75	0.79
2.83	0.86	8.83	1.78	14.83	1.98	20.83	0.79
2.92	0.86	8.92	1.78	14.92	1.98	20.92	0.79
3.00	0.86	9.00	2.11	15.00	1.98	21.00	0.79
3.08	0.86	9.08	2.11	15.08	1.98	21.08	0.79
3.17	0.86	9.17	2.11	15.17	1.98	21.17	0.79
3.25	0.86	9.25	2.11	15.25	1.98	21.25	0.79
3.33	0.86	9.33	2.11	15.33	1.98	21.33	0.79
3.42	0.86	9.42	2.11	15.42	1.98	21.42	0.79
3.50	0.86	9.50	2.37	15.50	1.98	21.50	0.79
3.58	0.86	9.58	2.37	15.58	1.98	21.58	0.79
3.67	0.86	9.67	2.37	15.67	1.98	21.67	0.79
3.75	0.86	9.75	2.37	15.75	1.98	21.75	0.79
3.83	0.86	9.83	2.37	15.83	1.98	21.83	0.79
3.92	0.86	9.92	2.37	15.92	1.98	21.92	0.79
4.00	1.05	10.00	3.03	16.00	1.19	22.00	0.79
4.08	1.05	10.08	3.03	16.08	1.19	22.08	0.79
4.17	1.05	10.17	3.03	16.17	1.19	22.17	0.79
4.25	1.05	10.25	3.03	16.25	1.19	22.25	0.79
4.33	1.05	10.33	3.03	16.33	1.19	22.33	0.79
4.42	1.05	10.42	3.03	16.42	1.19	22.42	0.79
4.50	1.05	10.50	4.09	16.50	1.19	22.50	0.79
4.58	1.05	10.58	4.09	16.58	1.19	22.58	0.79
4.67	1.05	10.67	4.09	16.67	1.19	22.67	0.79
4.75	1.05	10.75	4.09	16.75	1.19	22.75	0.79
4.83	1.05	10.83	4.09	16.83	1.19	22.83	0.79
4.92	1.05	10.92	4.09	16.92	1.19	22.92	0.79
5.00	1.05	11.00	6.33	17.00	1.19	23.00	0.79
5.08	1.05	11.08	6.33	17.08	1.19	23.08	0.79
5.17	1.05	11.17	6.33	17.17	1.19	23.17	0.79
5.25	1.05	11.25	6.33	17.25	1.19	23.25	0.79
5.33	1.05	11.33	6.33	17.33	1.19	23.33	0.79
5.42	1.05	11.42	6.33	17.42	1.19	23.42	0.79
5.50	1.05	11.50	27.41	17.50	1.19	23.50	0.79
5.58	1.05	11.58	27.41	17.58	1.19	23.58	0.79
5.67	1.05	11.67	27.41	17.67	1.19	23.67	0.79

5.75	1.05		11.75	72.75		17.75	1.19		23.75	0.79
5.83	1.05		11.83	72.75		17.83	1.19		23.83	0.79
5.92	1.05		11.92	72.75		17.92	1.19		23.92	0.79

CALIB							
NASHYD (0101)	Area (ha)=	2.70	Curve Number (CN)=	69.6			
ID= 1 DT= 5.0 min	Ia (mm)=	5.40	# of Linear Res.(N)=	3.00			
	U.H. Tp(hrs)=	0.40					

Unit Hyd Qpeak (cms)= 0.258

PEAK FLOW (cms)= 0.087 (i)
 TIME TO PEAK (hrs)= 12.250
 RUNOFF VOLUME (mm)= 21.352
 TOTAL RAINFALL (mm)= 65.910
 RUNOFF COEFFICIENT = 0.324

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

CALIB							
NASHYD (0076)	Area (ha)=	4.60	Curve Number (CN)=	73.0			
ID= 1 DT= 5.0 min	Ia (mm)=	4.97	# of Linear Res.(N)=	3.00			
	U.H. Tp(hrs)=	0.63					

Unit Hyd Qpeak (cms)= 0.279

PEAK FLOW (cms)= 0.121 (i)
 TIME TO PEAK (hrs)= 12.583
 RUNOFF VOLUME (mm)= 23.976
 TOTAL RAINFALL (mm)= 65.910
 RUNOFF COEFFICIENT = 0.364

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

RESERVOIR(0080)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.				
	0.0010	0.0595	0.0100	0.1538
	0.0040	0.0952	0.0140	0.1780
	0.0060	0.1206	0.0170	0.2021

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0076)	4.600	0.121	12.58	23.98
OUTFLOW: ID= 1 (0080)	4.600	0.004	24.67	16.70

PEAK FLOW REDUCTION [Qout/Qin](%)= 3.35
 TIME SHIFT OF PEAK FLOW (min)=725.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0960

CALIB	Area (ha)=	Curve Number (CN)=
NASHYD (0081)	3.30	68.1
ID= 1 DT= 5.0 min	Ia (mm)= 6.93	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.22	

Unit Hyd Qpeak (cms)= 0.573

PEAK FLOW (cms)= 0.146 (i)
 TIME TO PEAK (hrs)= 12.083
 RUNOFF VOLUME (mm)= 19.521
 TOTAL RAINFALL (mm)= 65.910
 RUNOFF COEFFICIENT = 0.296

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

RESERVOIR(0077)	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
IN= 2---> OUT= 1				
DT= 5.0 min				
***** WARNING : FIRST OUTFLOW IS NOT ZERO.				
	0.0020	0.0366	0.0160	0.0883
	0.0060	0.0551	0.0200	0.1025
	0.0100	0.0704	0.0240	0.1200

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0081)	3.300	0.146	12.08	19.52
OUTFLOW: ID= 1 (0077)	3.300	0.004	20.33	18.11

PEAK FLOW REDUCTION [Qout/Qin](%)= 3.07
 TIME SHIFT OF PEAK FLOW (min)=495.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0481

CALIB	Area (ha)=	Curve Number (CN)=
NASHYD (0078)	11.60	63.8

| ID= 1 DT= 5.0 min | Ia (mm)= 8.44 # of Linear Res.(N)= 3.00
----- U.H. Tp(hrs)= 0.89

Unit Hyd Qpeak (cms)= 0.498

PEAK FLOW (cms)= 0.157 (i)
TIME TO PEAK (hrs)= 12.917
RUNOFF VOLUME (mm)= 16.383
TOTAL RAINFALL (mm)= 65.910
RUNOFF COEFFICIENT = 0.249

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

| ADD HYD (0079) |
| 1 + 2 = 3 | AREA QPEAK TPEAK R.V.
----- (ha) (cms) (hrs) (mm)
ID1= 1 (0077): 3.30 0.004 20.33 18.11
+ ID2= 2 (0078): 11.60 0.157 12.92 16.38
=====

ID = 3 (0079): 14.90 0.159 12.92 16.77

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0079) |
| 3 + 2 = 1 | AREA QPEAK TPEAK R.V.
----- (ha) (cms) (hrs) (mm)
ID1= 3 (0079): 14.90 0.159 12.92 16.77
+ ID2= 2 (0080): 4.60 0.004 24.67 16.70
=====

ID = 1 (0079): 19.50 0.160 12.92 16.75

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

** SIMULATION:Run 03 **

| READ STORM | Filename: C:\Users\DFendler\AppData
| | ata\Local\Temp\
| | 3c64f2df-5603-4168-8877-c06187b6db57\937e7433
| Ptotal= 77.00 mm | Comments: Ottawa Macdonald Cartier SCS 24 10yr

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr

0.00	0.85	6.00	1.54	12.00	11.09	18.00	1.39
0.08	0.85	6.08	1.54	12.08	11.09	18.08	1.39
0.17	0.85	6.17	1.54	12.17	11.09	18.17	1.39
0.25	0.85	6.25	1.54	12.25	11.09	18.25	1.39
0.33	0.85	6.33	1.54	12.33	11.09	18.33	1.39
0.42	0.85	6.42	1.54	12.42	11.09	18.42	1.39
0.50	0.85	6.50	1.54	12.50	5.70	18.50	1.39
0.58	0.85	6.58	1.54	12.58	5.70	18.58	1.39
0.67	0.85	6.67	1.54	12.67	5.70	18.67	1.39
0.75	0.85	6.75	1.54	12.75	5.70	18.75	1.39
0.83	0.85	6.83	1.54	12.83	5.70	18.83	1.39
0.92	0.85	6.92	1.54	12.92	5.70	18.92	1.39
1.00	0.85	7.00	1.54	13.00	1.08	19.00	1.39
1.08	0.85	7.08	1.54	13.08	1.08	19.08	1.39
1.17	0.85	7.17	1.54	13.17	1.08	19.17	1.39
1.25	0.85	7.25	1.54	13.25	1.08	19.25	1.39
1.33	0.85	7.33	1.54	13.33	1.08	19.33	1.39
1.42	0.85	7.42	1.54	13.42	1.08	19.42	1.39
1.50	0.85	7.50	1.54	13.50	6.31	19.50	1.39
1.58	0.85	7.58	1.54	13.58	6.31	19.58	1.39
1.67	0.85	7.67	1.54	13.67	6.31	19.67	1.39
1.75	0.85	7.75	1.54	13.75	6.31	19.75	1.39
1.83	0.85	7.83	1.54	13.83	6.31	19.83	1.39
1.92	0.85	7.92	1.54	13.92	6.31	19.92	1.39
2.00	1.00	8.00	2.08	14.00	2.31	20.00	0.92
2.08	1.00	8.08	2.08	14.08	2.31	20.08	0.92
2.17	1.00	8.17	2.08	14.17	2.31	20.17	0.92
2.25	1.00	8.25	2.08	14.25	2.31	20.25	0.92
2.33	1.00	8.33	2.08	14.33	2.31	20.33	0.92
2.42	1.00	8.42	2.08	14.42	2.31	20.42	0.92
2.50	1.00	8.50	2.08	14.50	2.31	20.50	0.92
2.58	1.00	8.58	2.08	14.58	2.31	20.58	0.92
2.67	1.00	8.67	2.08	14.67	2.31	20.67	0.92
2.75	1.00	8.75	2.08	14.75	2.31	20.75	0.92
2.83	1.00	8.83	2.08	14.83	2.31	20.83	0.92
2.92	1.00	8.92	2.08	14.92	2.31	20.92	0.92
3.00	1.00	9.00	2.46	15.00	2.31	21.00	0.92
3.08	1.00	9.08	2.46	15.08	2.31	21.08	0.92
3.17	1.00	9.17	2.46	15.17	2.31	21.17	0.92
3.25	1.00	9.25	2.46	15.25	2.31	21.25	0.92
3.33	1.00	9.33	2.46	15.33	2.31	21.33	0.92
3.42	1.00	9.42	2.46	15.42	2.31	21.42	0.92
3.50	1.00	9.50	2.77	15.50	2.31	21.50	0.92
3.58	1.00	9.58	2.77	15.58	2.31	21.58	0.92
3.67	1.00	9.67	2.77	15.67	2.31	21.67	0.92
3.75	1.00	9.75	2.77	15.75	2.31	21.75	0.92
3.83	1.00	9.83	2.77	15.83	2.31	21.83	0.92
3.92	1.00	9.92	2.77	15.92	2.31	21.92	0.92
4.00	1.23	10.00	3.54	16.00	1.39	22.00	0.92
4.08	1.23	10.08	3.54	16.08	1.39	22.08	0.92

4.17	1.23	10.17	3.54	16.17	1.39	22.17	0.92
4.25	1.23	10.25	3.54	16.25	1.39	22.25	0.92
4.33	1.23	10.33	3.54	16.33	1.39	22.33	0.92
4.42	1.23	10.42	3.54	16.42	1.39	22.42	0.92
4.50	1.23	10.50	4.77	16.50	1.39	22.50	0.92
4.58	1.23	10.58	4.77	16.58	1.39	22.58	0.92
4.67	1.23	10.67	4.77	16.67	1.39	22.67	0.92
4.75	1.23	10.75	4.77	16.75	1.39	22.75	0.92
4.83	1.23	10.83	4.77	16.83	1.39	22.83	0.92
4.92	1.23	10.92	4.77	16.92	1.39	22.92	0.92
5.00	1.23	11.00	7.39	17.00	1.39	23.00	0.92
5.08	1.23	11.08	7.39	17.08	1.39	23.08	0.92
5.17	1.23	11.17	7.39	17.17	1.39	23.17	0.92
5.25	1.23	11.25	7.39	17.25	1.39	23.25	0.92
5.33	1.23	11.33	7.39	17.33	1.39	23.33	0.92
5.42	1.23	11.42	7.39	17.42	1.39	23.42	0.92
5.50	1.23	11.50	32.03	17.50	1.39	23.50	0.92
5.58	1.23	11.58	32.03	17.58	1.39	23.58	0.92
5.67	1.23	11.67	32.03	17.67	1.39	23.67	0.92
5.75	1.23	11.75	85.01	17.75	1.39	23.75	0.92
5.83	1.23	11.83	85.01	17.83	1.39	23.83	0.92
5.92	1.23	11.92	85.01	17.92	1.39	23.92	0.92

CALIB			
NASHYD (0101)			
ID= 1 DT= 5.0 min			

Area	(ha)=	2.70	Curve Number (CN)= 69.6
Ia	(mm)=	5.40	# of Linear Res.(N)= 3.00
U.H. Tp(hrs)=		0.40	

Unit Hyd Qpeak (cms)= 0.258

PEAK FLOW (cms)= 0.115 (i)

TIME TO PEAK (hrs)= 12.250

RUNOFF VOLUME (mm)= 28.077

TOTAL RAINFALL (mm)= 76.995

RUNOFF COEFFICIENT = 0.365

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

CALIB			
NASHYD (0076)			
ID= 1 DT= 5.0 min			

Area	(ha)=	4.60	Curve Number (CN)= 73.0
Ia	(mm)=	4.97	# of Linear Res.(N)= 3.00
U.H. Tp(hrs)=		0.63	

Unit Hyd Qpeak (cms)= 0.279

PEAK FLOW (cms)= 0.160 (i)
 TIME TO PEAK (hrs)= 12.500
 RUNOFF VOLUME (mm)= 31.255
 TOTAL RAINFALL (mm)= 76.995
 RUNOFF COEFFICIENT = 0.406

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

```

-----
| RESERVOIR( 0080) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
-----
      OUTFLOW   STORAGE   |   OUTFLOW   STORAGE
      (cms)     (ha.m.)   |   (cms)     (ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.
      0.0010     0.0595   |   0.0100     0.1538
      0.0040     0.0952   |   0.0140     0.1780
      0.0060     0.1206   |   0.0170     0.2021

                        AREA   QPEAK   TPEAK   R.V.
                        (ha)   (cms)   (hrs)   (mm)
INFLOW : ID= 2 ( 0076)   4.600   0.160   12.50   31.26
OUTFLOW: ID= 1 ( 0080)   4.600   0.006   24.50   23.34

      PEAK FLOW REDUCTION [Qout/Qin](%)= 3.80
      TIME SHIFT OF PEAK FLOW (min)=720.00
      MAXIMUM STORAGE USED (ha.m.)= 0.1211
  
```

```

-----
| CALIB |
| NASHYD ( 0081) | Area (ha)= 3.30 Curve Number (CN)= 68.1
| ID= 1 DT= 5.0 min | Ia (mm)= 6.93 # of Linear Res.(N)= 3.00
-----
      U.H. Tp(hrs)= 0.22
  
```

Unit Hyd Qpeak (cms)= 0.573

PEAK FLOW (cms)= 0.196 (i)
 TIME TO PEAK (hrs)= 12.083
 RUNOFF VOLUME (mm)= 25.934
 TOTAL RAINFALL (mm)= 76.995
 RUNOFF COEFFICIENT = 0.337

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

```

-----
| RESERVOIR( 0077) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
-----
      OUTFLOW   STORAGE   |   OUTFLOW   STORAGE
  
```

```

-----
          (cms)      (ha.m.) |      (cms)      (ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.
          0.0020      0.0366 |      0.0160      0.0883
          0.0060      0.0551 |      0.0200      0.1025
          0.0100      0.0704 |      0.0240      0.1200

```

```

          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
INFLOW : ID= 2 ( 0081)      3.300      0.196      12.08      25.93
OUTFLOW: ID= 1 ( 0077)      3.300      0.007      20.08      24.52

```

```

PEAK FLOW REDUCTION [Qout/Qin](%)= 3.65
TIME SHIFT OF PEAK FLOW      (min)=480.00
MAXIMUM STORAGE USED      (ha.m.)= 0.0596

```

```

-----
| CALIB |
| NASHYD ( 0078) | Area (ha)= 11.60 Curve Number (CN)= 63.8
| ID= 1 DT= 5.0 min | Ia (mm)= 8.44 # of Linear Res.(N)= 3.00
-----
          U.H. Tp(hrs)= 0.89

```

Unit Hyd Qpeak (cms)= 0.498

```

PEAK FLOW      (cms)= 0.215 (i)
TIME TO PEAK   (hrs)= 12.833
RUNOFF VOLUME  (mm)= 22.098
TOTAL RAINFALL (mm)= 76.995
RUNOFF COEFFICIENT = 0.287

```

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

```

-----
| ADD HYD ( 0079) |
| 1 + 2 = 3 |
-----
          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
ID1= 1 ( 0077):      3.30      0.007      20.08      24.52
+ ID2= 2 ( 0078):      11.60      0.215      12.83      22.10
=====
ID = 3 ( 0079):      14.90      0.219      12.83      22.64

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| ADD HYD ( 0079) |
| 3 + 2 = 1 |
-----
          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)

```

```

ID1= 3 ( 0079):    14.90    0.219    12.83    22.64
+ ID2= 2 ( 0080):    4.60    0.006    24.50    23.34
=====
ID = 1 ( 0079):    19.50    0.220    12.92    22.80

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

*****
** SIMULATION:Run 04          **
*****

```

```

-----
| READ STORM |      Filename: C:\Users\DFendler\AppData
|            |      ata\Local\Temp\
|            |      3c64f2df-5603-4168-8877-c06187b6db57\8677e260
| Ptotal= 91.08 mm |      Comments: Ottawa Macdonald Cartier SCS 24 25yr
-----

```

TIME	RAIN	TIME	RAIN	'	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	'	hrs	mm/hr	hrs	mm/hr
0.00	1.00	6.00	1.82		12.00	13.12	18.00	1.64
0.08	1.00	6.08	1.82		12.08	13.12	18.08	1.64
0.17	1.00	6.17	1.82		12.17	13.12	18.17	1.64
0.25	1.00	6.25	1.82		12.25	13.12	18.25	1.64
0.33	1.00	6.33	1.82		12.33	13.12	18.33	1.64
0.42	1.00	6.42	1.82		12.42	13.12	18.42	1.64
0.50	1.00	6.50	1.82		12.50	6.74	18.50	1.64
0.58	1.00	6.58	1.82		12.58	6.74	18.58	1.64
0.67	1.00	6.67	1.82		12.67	6.74	18.67	1.64
0.75	1.00	6.75	1.82		12.75	6.74	18.75	1.64
0.83	1.00	6.83	1.82		12.83	6.74	18.83	1.64
0.92	1.00	6.92	1.82		12.92	6.74	18.92	1.64
1.00	1.00	7.00	1.82		13.00	1.28	19.00	1.64
1.08	1.00	7.08	1.82		13.08	1.28	19.08	1.64
1.17	1.00	7.17	1.82		13.17	1.28	19.17	1.64
1.25	1.00	7.25	1.82		13.25	1.28	19.25	1.64
1.33	1.00	7.33	1.82		13.33	1.28	19.33	1.64
1.42	1.00	7.42	1.82		13.42	1.28	19.42	1.64
1.50	1.00	7.50	1.82		13.50	7.47	19.50	1.64
1.58	1.00	7.58	1.82		13.58	7.47	19.58	1.64
1.67	1.00	7.67	1.82		13.67	7.47	19.67	1.64
1.75	1.00	7.75	1.82		13.75	7.47	19.75	1.64
1.83	1.00	7.83	1.82		13.83	7.47	19.83	1.64
1.92	1.00	7.92	1.82		13.92	7.47	19.92	1.64
2.00	1.18	8.00	2.46		14.00	2.73	20.00	1.09
2.08	1.18	8.08	2.46		14.08	2.73	20.08	1.09
2.17	1.18	8.17	2.46		14.17	2.73	20.17	1.09
2.25	1.18	8.25	2.46		14.25	2.73	20.25	1.09
2.33	1.18	8.33	2.46		14.33	2.73	20.33	1.09
2.42	1.18	8.42	2.46		14.42	2.73	20.42	1.09
2.50	1.18	8.50	2.46		14.50	2.73	20.50	1.09

2.58	1.18	8.58	2.46	14.58	2.73	20.58	1.09
2.67	1.18	8.67	2.46	14.67	2.73	20.67	1.09
2.75	1.18	8.75	2.46	14.75	2.73	20.75	1.09
2.83	1.18	8.83	2.46	14.83	2.73	20.83	1.09
2.92	1.18	8.92	2.46	14.92	2.73	20.92	1.09
3.00	1.18	9.00	2.92	15.00	2.73	21.00	1.09
3.08	1.18	9.08	2.92	15.08	2.73	21.08	1.09
3.17	1.18	9.17	2.92	15.17	2.73	21.17	1.09
3.25	1.18	9.25	2.92	15.25	2.73	21.25	1.09
3.33	1.18	9.33	2.92	15.33	2.73	21.33	1.09
3.42	1.18	9.42	2.92	15.42	2.73	21.42	1.09
3.50	1.18	9.50	3.28	15.50	2.73	21.50	1.09
3.58	1.18	9.58	3.28	15.58	2.73	21.58	1.09
3.67	1.18	9.67	3.28	15.67	2.73	21.67	1.09
3.75	1.18	9.75	3.28	15.75	2.73	21.75	1.09
3.83	1.18	9.83	3.28	15.83	2.73	21.83	1.09
3.92	1.18	9.92	3.28	15.92	2.73	21.92	1.09
4.00	1.46	10.00	4.19	16.00	1.64	22.00	1.09
4.08	1.46	10.08	4.19	16.08	1.64	22.08	1.09
4.17	1.46	10.17	4.19	16.17	1.64	22.17	1.09
4.25	1.46	10.25	4.19	16.25	1.64	22.25	1.09
4.33	1.46	10.33	4.19	16.33	1.64	22.33	1.09
4.42	1.46	10.42	4.19	16.42	1.64	22.42	1.09
4.50	1.46	10.50	5.65	16.50	1.64	22.50	1.09
4.58	1.46	10.58	5.65	16.58	1.64	22.58	1.09
4.67	1.46	10.67	5.65	16.67	1.64	22.67	1.09
4.75	1.46	10.75	5.65	16.75	1.64	22.75	1.09
4.83	1.46	10.83	5.65	16.83	1.64	22.83	1.09
4.92	1.46	10.92	5.65	16.92	1.64	22.92	1.09
5.00	1.46	11.00	8.75	17.00	1.64	23.00	1.09
5.08	1.46	11.08	8.75	17.08	1.64	23.08	1.09
5.17	1.46	11.17	8.75	17.17	1.64	23.17	1.09
5.25	1.46	11.25	8.75	17.25	1.64	23.25	1.09
5.33	1.46	11.33	8.75	17.33	1.64	23.33	1.09
5.42	1.46	11.42	8.75	17.42	1.64	23.42	1.09
5.50	1.46	11.50	37.90	17.50	1.64	23.50	1.09
5.58	1.46	11.58	37.90	17.58	1.64	23.58	1.09
5.67	1.46	11.67	37.90	17.67	1.64	23.67	1.09
5.75	1.46	11.75	100.57	17.75	1.64	23.75	1.09
5.83	1.46	11.83	100.57	17.83	1.64	23.83	1.09
5.92	1.46	11.92	100.57	17.92	1.64	23.92	1.09

CALIB			
NASHYD (0101)	Area (ha)=	2.70	Curve Number (CN)= 69.6
ID= 1 DT= 5.0 min	Ia (mm)=	5.40	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.40	

Unit Hyd Qpeak (cms)= 0.258

PEAK FLOW (cms)= 0.155 (i)
TIME TO PEAK (hrs)= 12.250
RUNOFF VOLUME (mm)= 37.329
TOTAL RAINFALL (mm)= 91.077
RUNOFF COEFFICIENT = 0.410

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

```
-----
| CALIB |
| NASHYD ( 0076) | Area (ha)= 4.60 Curve Number (CN)= 73.0
| ID= 1 DT= 5.0 min | Ia (mm)= 4.97 # of Linear Res.(N)= 3.00
|-----| U.H. Tp(hrs)= 0.63
```

Unit Hyd Qpeak (cms)= 0.279

PEAK FLOW (cms)= 0.212 (i)
TIME TO PEAK (hrs)= 12.500
RUNOFF VOLUME (mm)= 41.178
TOTAL RAINFALL (mm)= 91.077
RUNOFF COEFFICIENT = 0.452

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

```
-----
| RESERVOIR( 0080) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min |
|-----|
| OUTFLOW STORAGE | OUTFLOW STORAGE
| (cms) (ha.m.) | (cms) (ha.m.)
|-----|
| ***** WARNING : FIRST OUTFLOW IS NOT ZERO.
| 0.0010 0.0595 | 0.0100 0.1538
| 0.0040 0.0952 | 0.0140 0.1780
| 0.0060 0.1206 | 0.0170 0.2021
```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0076)	4.600	0.212	12.50	41.18
OUTFLOW: ID= 1 (0080)	4.600	0.010	24.17	32.73

PEAK FLOW REDUCTION [Qout/Qin](%)= 4.61
TIME SHIFT OF PEAK FLOW (min)=700.00
MAXIMUM STORAGE USED (ha.m.)= 0.1519

```
-----
| CALIB |
```

NASHYD (0081)	Area (ha)= 3.30	Curve Number (CN)= 68.1
ID= 1 DT= 5.0 min	Ia (mm)= 6.93	# of Linear Res.(N)= 3.00
-----	U.H. Tp(hrs)= 0.22	

Unit Hyd Qpeak (cms)= 0.573

PEAK FLOW (cms)= 0.266 (i)
 TIME TO PEAK (hrs)= 12.083
 RUNOFF VOLUME (mm)= 34.813
 TOTAL RAINFALL (mm)= 91.077
 RUNOFF COEFFICIENT = 0.382

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

RESERVOIR(0077)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
-----	**** WARNING : FIRST OUTFLOW IS NOT ZERO.			
	0.0020	0.0366	0.0160	0.0883
	0.0060	0.0551	0.0200	0.1025
	0.0100	0.0704	0.0240	0.1200

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0081)	3.300	0.266	12.08	34.81
OUTFLOW: ID= 1 (0077)	3.300	0.012	16.25	33.40

PEAK FLOW REDUCTION [Qout/Qin](%)= 4.53
 TIME SHIFT OF PEAK FLOW (min)=250.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0765

CALIB		
NASHYD (0078)	Area (ha)= 11.60	Curve Number (CN)= 63.8
ID= 1 DT= 5.0 min	Ia (mm)= 8.44	# of Linear Res.(N)= 3.00
-----	U.H. Tp(hrs)= 0.89	

Unit Hyd Qpeak (cms)= 0.498

PEAK FLOW (cms)= 0.297 (i)
 TIME TO PEAK (hrs)= 12.833
 RUNOFF VOLUME (mm)= 30.115
 TOTAL RAINFALL (mm)= 91.077
 RUNOFF COEFFICIENT = 0.331

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

```

-----
| ADD HYD ( 0079) |
| 1 + 2 = 3 |
-----

```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0077):	3.30	0.012	16.25	33.40
+ ID2= 2 (0078):	11.60	0.297	12.83	30.12
=====				
ID = 3 (0079):	14.90	0.305	12.83	30.84

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| ADD HYD ( 0079) |
| 3 + 2 = 1 |
-----

```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0079):	14.90	0.305	12.83	30.84
+ ID2= 2 (0080):	4.60	0.010	24.17	32.73
=====				
ID = 1 (0079):	19.50	0.308	12.83	31.29

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

*****
** SIMULATION:Run 05          **
*****

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-----
| READ STORM |
|           |
| Ptotal=101.52 mm |
-----

```

Filename: C:\Users\DFendler\AppData
 Local\Temp\
 3c64f2df-5603-4168-8877-c06187b6db57\55c88cf1
 Comments: Ottawa Macdonald Cartier SCS 24 50yr

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	1.12	6.00	2.03	12.00	14.62	18.00	1.83
0.08	1.12	6.08	2.03	12.08	14.62	18.08	1.83
0.17	1.12	6.17	2.03	12.17	14.62	18.17	1.83
0.25	1.12	6.25	2.03	12.25	14.62	18.25	1.83
0.33	1.12	6.33	2.03	12.33	14.62	18.33	1.83
0.42	1.12	6.42	2.03	12.42	14.62	18.42	1.83
0.50	1.12	6.50	2.03	12.50	7.51	18.50	1.83
0.58	1.12	6.58	2.03	12.58	7.51	18.58	1.83
0.67	1.12	6.67	2.03	12.67	7.51	18.67	1.83
0.75	1.12	6.75	2.03	12.75	7.51	18.75	1.83
0.83	1.12	6.83	2.03	12.83	7.51	18.83	1.83
0.92	1.12	6.92	2.03	12.92	7.51	18.92	1.83

1.00	1.12	7.00	2.03	13.00	1.42	19.00	1.83
1.08	1.12	7.08	2.03	13.08	1.42	19.08	1.83
1.17	1.12	7.17	2.03	13.17	1.42	19.17	1.83
1.25	1.12	7.25	2.03	13.25	1.42	19.25	1.83
1.33	1.12	7.33	2.03	13.33	1.42	19.33	1.83
1.42	1.12	7.42	2.03	13.42	1.42	19.42	1.83
1.50	1.12	7.50	2.03	13.50	8.32	19.50	1.83
1.58	1.12	7.58	2.03	13.58	8.32	19.58	1.83
1.67	1.12	7.67	2.03	13.67	8.32	19.67	1.83
1.75	1.12	7.75	2.03	13.75	8.32	19.75	1.83
1.83	1.12	7.83	2.03	13.83	8.32	19.83	1.83
1.92	1.12	7.92	2.03	13.92	8.32	19.92	1.83
2.00	1.32	8.00	2.74	14.00	3.05	20.00	1.22
2.08	1.32	8.08	2.74	14.08	3.04	20.08	1.22
2.17	1.32	8.17	2.74	14.17	3.05	20.17	1.22
2.25	1.32	8.25	2.74	14.25	3.04	20.25	1.22
2.33	1.32	8.33	2.74	14.33	3.05	20.33	1.22
2.42	1.32	8.42	2.74	14.42	3.04	20.42	1.22
2.50	1.32	8.50	2.74	14.50	3.05	20.50	1.22
2.58	1.32	8.58	2.74	14.58	3.04	20.58	1.22
2.67	1.32	8.67	2.74	14.67	3.05	20.67	1.22
2.75	1.32	8.75	2.74	14.75	3.04	20.75	1.22
2.83	1.32	8.83	2.74	14.83	3.05	20.83	1.22
2.92	1.32	8.92	2.74	14.92	3.04	20.92	1.22
3.00	1.32	9.00	3.25	15.00	3.05	21.00	1.22
3.08	1.32	9.08	3.25	15.08	3.04	21.08	1.22
3.17	1.32	9.17	3.25	15.17	3.05	21.17	1.22
3.25	1.32	9.25	3.25	15.25	3.04	21.25	1.22
3.33	1.32	9.33	3.25	15.33	3.05	21.33	1.22
3.42	1.32	9.42	3.25	15.42	3.04	21.42	1.22
3.50	1.32	9.50	3.65	15.50	3.05	21.50	1.22
3.58	1.32	9.58	3.65	15.58	3.04	21.58	1.22
3.67	1.32	9.67	3.65	15.67	3.05	21.67	1.22
3.75	1.32	9.75	3.65	15.75	3.04	21.75	1.22
3.83	1.32	9.83	3.65	15.83	3.04	21.83	1.22
3.92	1.32	9.92	3.65	15.92	3.05	21.92	1.22
4.00	1.62	10.00	4.67	16.00	1.83	22.00	1.22
4.08	1.62	10.08	4.67	16.08	1.83	22.08	1.22
4.17	1.62	10.17	4.67	16.17	1.83	22.17	1.22
4.25	1.62	10.25	4.67	16.25	1.83	22.25	1.22
4.33	1.62	10.33	4.67	16.33	1.83	22.33	1.22
4.42	1.62	10.42	4.67	16.42	1.83	22.42	1.22
4.50	1.62	10.50	6.29	16.50	1.83	22.50	1.22
4.58	1.62	10.58	6.29	16.58	1.83	22.58	1.22
4.67	1.62	10.67	6.29	16.67	1.83	22.67	1.22
4.75	1.62	10.75	6.29	16.75	1.83	22.75	1.22
4.83	1.62	10.83	6.29	16.83	1.83	22.83	1.22
4.92	1.62	10.92	6.29	16.92	1.83	22.92	1.22
5.00	1.62	11.00	9.74	17.00	1.83	23.00	1.22
5.08	1.62	11.08	9.74	17.08	1.83	23.08	1.22

5.17	1.62	11.17	9.74	17.17	1.83	23.17	1.22
5.25	1.62	11.25	9.74	17.25	1.83	23.25	1.22
5.33	1.62	11.33	9.74	17.33	1.83	23.33	1.22
5.42	1.62	11.42	9.74	17.42	1.83	23.42	1.22
5.50	1.62	11.50	42.22	17.50	1.83	23.50	1.22
5.58	1.62	11.58	42.22	17.58	1.83	23.58	1.22
5.67	1.62	11.67	42.22	17.67	1.83	23.67	1.22
5.75	1.62	11.75	112.06	17.75	1.83	23.75	1.22
5.83	1.62	11.83	112.06	17.83	1.83	23.83	1.22
5.92	1.62	11.92	112.06	17.92	1.83	23.92	1.22

CALIB			
NASHYD (0101)		Area (ha)= 2.70	Curve Number (CN)= 69.6
ID= 1 DT= 5.0 min		Ia (mm)= 5.40	# of Linear Res.(N)= 3.00
		U.H. Tp(hrs)= 0.40	

Unit Hyd Qpeak (cms)= 0.258

PEAK FLOW (cms)= 0.186 (i)
 TIME TO PEAK (hrs)= 12.250
 RUNOFF VOLUME (mm)= 44.610
 TOTAL RAINFALL (mm)= 101.515
 RUNOFF COEFFICIENT = 0.439

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

CALIB			
NASHYD (0076)		Area (ha)= 4.60	Curve Number (CN)= 73.0
ID= 1 DT= 5.0 min		Ia (mm)= 4.97	# of Linear Res.(N)= 3.00
		U.H. Tp(hrs)= 0.63	

Unit Hyd Qpeak (cms)= 0.279

PEAK FLOW (cms)= 0.253 (i)
 TIME TO PEAK (hrs)= 12.500
 RUNOFF VOLUME (mm)= 48.930
 TOTAL RAINFALL (mm)= 101.515
 RUNOFF COEFFICIENT = 0.482

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

RESERVOIR(0080)		OVERFLOW IS OFF
IN= 2---> OUT= 1		

DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
***** WARNING : FIRST OUTFLOW IS NOT ZERO.				
	0.0010	0.0595	0.0100	0.1538
	0.0040	0.0952	0.0140	0.1780
	0.0060	0.1206	0.0170	0.2021

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0076)	4.600	0.253	12.50	48.93
OUTFLOW: ID= 1 (0080)	4.600	0.013	21.08	40.21

PEAK FLOW REDUCTION [Qout/Qin](%)= 5.31
 TIME SHIFT OF PEAK FLOW (min)=515.00
 MAXIMUM STORAGE USED (ha.m.)= 0.1747

CALIB			
NASHYD (0081)	Area (ha)=	3.30	Curve Number (CN)= 68.1
ID= 1 DT= 5.0 min	Ia (mm)=	6.93	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.22	

Unit Hyd Qpeak (cms)= 0.573

PEAK FLOW (cms)= 0.321 (i)
 TIME TO PEAK (hrs)= 12.083
 RUNOFF VOLUME (mm)= 41.835
 TOTAL RAINFALL (mm)= 101.515
 RUNOFF COEFFICIENT = 0.412

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

RESERVOIR(0077)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
***** WARNING : FIRST OUTFLOW IS NOT ZERO.				
	0.0020	0.0366	0.0160	0.0883
	0.0060	0.0551	0.0200	0.1025
	0.0100	0.0704	0.0240	0.1200

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0081)	3.300	0.321	12.08	41.83
OUTFLOW: ID= 1 (0077)	3.300	0.016	16.17	40.42

PEAK FLOW REDUCTION [Qout/Qin](%)= 5.06

TIME SHIFT OF PEAK FLOW (min)=245.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0893

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-----
| CALIB |
| NASHYD ( 0078) | Area (ha)= 11.60 Curve Number (CN)= 63.8
| ID= 1 DT= 5.0 min | Ia (mm)= 8.44 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 0.89

```

Unit Hyd Qpeak (cms)= 0.498

PEAK FLOW (cms)= 0.363 (i)
 TIME TO PEAK (hrs)= 12.833
 RUNOFF VOLUME (mm)= 36.522
 TOTAL RAINFALL (mm)= 101.515
 RUNOFF COEFFICIENT = 0.360

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

```

-----
| ADD HYD ( 0079) |
| 1 + 2 = 3 |
-----
          AREA    QPEAK    TPEAK    R.V.
          (ha)    (cms)    (hrs)    (mm)
ID1= 1 ( 0077):    3.30    0.016    16.17    40.42
+ ID2= 2 ( 0078):    11.60    0.363    12.83    36.52
=====
ID = 3 ( 0079):    14.90    0.375    12.83    37.39

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| ADD HYD ( 0079) |
| 3 + 2 = 1 |
-----
          AREA    QPEAK    TPEAK    R.V.
          (ha)    (cms)    (hrs)    (mm)
ID1= 3 ( 0079):    14.90    0.375    12.83    37.39
+ ID2= 2 ( 0080):    4.60    0.013    21.08    40.21
=====
ID = 1 ( 0079):    19.50    0.379    12.83    38.05

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
*****
** SIMULATION:Run 06 **
*****
-----

```

READ STORM	Filename: C:\Users\DFendler\AppData ata\Local\Temp\ 3c64f2df-5603-4168-8877-c06187b6db57\e20e7578
Ptotal=111.87 mm	Comments: Ottawa Macdonald Cartier SCS 24 100yr

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	1.23	6.00	2.24	12.00	16.11	18.00	2.01
0.08	1.23	6.08	2.24	12.08	16.11	18.08	2.01
0.17	1.23	6.17	2.24	12.17	16.11	18.17	2.01
0.25	1.23	6.25	2.24	12.25	16.11	18.25	2.01
0.33	1.23	6.33	2.24	12.33	16.11	18.33	2.01
0.42	1.23	6.42	2.24	12.42	16.11	18.42	2.01
0.50	1.23	6.50	2.24	12.50	8.28	18.50	2.01
0.58	1.23	6.58	2.24	12.58	8.28	18.58	2.01
0.67	1.23	6.67	2.24	12.67	8.28	18.67	2.01
0.75	1.23	6.75	2.24	12.75	8.28	18.75	2.01
0.83	1.23	6.83	2.24	12.83	8.28	18.83	2.01
0.92	1.23	6.92	2.24	12.92	8.28	18.92	2.01
1.00	1.23	7.00	2.24	13.00	1.57	19.00	2.01
1.08	1.23	7.08	2.24	13.08	1.57	19.08	2.01
1.17	1.23	7.17	2.24	13.17	1.57	19.17	2.01
1.25	1.23	7.25	2.24	13.25	1.57	19.25	2.01
1.33	1.23	7.33	2.24	13.33	1.57	19.33	2.01
1.42	1.23	7.42	2.24	13.42	1.57	19.42	2.01
1.50	1.23	7.50	2.24	13.50	9.18	19.50	2.01
1.58	1.23	7.58	2.24	13.58	9.18	19.58	2.01
1.67	1.23	7.67	2.24	13.67	9.18	19.67	2.01
1.75	1.23	7.75	2.24	13.75	9.18	19.75	2.01
1.83	1.23	7.83	2.24	13.83	9.18	19.83	2.01
1.92	1.23	7.92	2.24	13.92	9.18	19.92	2.01
2.00	1.45	8.00	3.02	14.00	3.36	20.00	1.34
2.08	1.45	8.08	3.02	14.08	3.36	20.08	1.34
2.17	1.45	8.17	3.02	14.17	3.36	20.17	1.34
2.25	1.45	8.25	3.02	14.25	3.36	20.25	1.34
2.33	1.45	8.33	3.02	14.33	3.36	20.33	1.34
2.42	1.45	8.42	3.02	14.42	3.36	20.42	1.34
2.50	1.45	8.50	3.02	14.50	3.36	20.50	1.34
2.58	1.45	8.58	3.02	14.58	3.36	20.58	1.34
2.67	1.45	8.67	3.02	14.67	3.36	20.67	1.34
2.75	1.45	8.75	3.02	14.75	3.36	20.75	1.34
2.83	1.45	8.83	3.02	14.83	3.36	20.83	1.34
2.92	1.45	8.92	3.02	14.92	3.36	20.92	1.34
3.00	1.45	9.00	3.58	15.00	3.36	21.00	1.34
3.08	1.45	9.08	3.58	15.08	3.36	21.08	1.34
3.17	1.45	9.17	3.58	15.17	3.36	21.17	1.34
3.25	1.45	9.25	3.58	15.25	3.36	21.25	1.34
3.33	1.45	9.33	3.58	15.33	3.36	21.33	1.34
3.42	1.45	9.42	3.58	15.42	3.36	21.42	1.34
3.50	1.45	9.50	4.03	15.50	3.36	21.50	1.34

3.58	1.45	9.58	4.03	15.58	3.36	21.58	1.34
3.67	1.45	9.67	4.03	15.67	3.36	21.67	1.34
3.75	1.45	9.75	4.03	15.75	3.36	21.75	1.34
3.83	1.45	9.83	4.03	15.83	3.36	21.83	1.34
3.92	1.45	9.92	4.03	15.92	3.36	21.92	1.34
4.00	1.79	10.00	5.15	16.00	2.01	22.00	1.34
4.08	1.79	10.08	5.15	16.08	2.01	22.08	1.34
4.17	1.79	10.17	5.15	16.17	2.01	22.17	1.34
4.25	1.79	10.25	5.15	16.25	2.01	22.25	1.34
4.33	1.79	10.33	5.15	16.33	2.01	22.33	1.34
4.42	1.79	10.42	5.15	16.42	2.01	22.42	1.34
4.50	1.79	10.50	6.94	16.50	2.01	22.50	1.34
4.58	1.79	10.58	6.94	16.58	2.01	22.58	1.34
4.67	1.79	10.67	6.94	16.67	2.01	22.67	1.34
4.75	1.79	10.75	6.94	16.75	2.01	22.75	1.34
4.83	1.79	10.83	6.94	16.83	2.01	22.83	1.34
4.92	1.79	10.92	6.94	16.92	2.01	22.92	1.34
5.00	1.79	11.00	10.74	17.00	2.01	23.00	1.34
5.08	1.79	11.08	10.74	17.08	2.01	23.08	1.34
5.17	1.79	11.17	10.74	17.17	2.01	23.17	1.34
5.25	1.79	11.25	10.74	17.25	2.01	23.25	1.34
5.33	1.79	11.33	10.74	17.33	2.01	23.33	1.34
5.42	1.79	11.42	10.74	17.42	2.01	23.42	1.34
5.50	1.79	11.50	46.55	17.50	2.01	23.50	1.34
5.58	1.79	11.58	46.55	17.58	2.01	23.58	1.34
5.67	1.79	11.67	46.55	17.67	2.01	23.67	1.34
5.75	1.79	11.75	123.54	17.75	2.01	23.75	1.34
5.83	1.79	11.83	123.54	17.83	2.01	23.83	1.34
5.92	1.79	11.92	123.54	17.92	2.01	23.92	1.34

CALIB			
NASHYD (0101)	Area (ha)=	2.70	Curve Number (CN)= 69.6
ID= 1 DT= 5.0 min	Ia (mm)=	5.40	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.40	

Unit Hyd Qpeak (cms)= 0.258

PEAK FLOW (cms)= 0.219 (i)

TIME TO PEAK (hrs)= 12.250

RUNOFF VOLUME (mm)= 52.135

TOTAL RAINFALL (mm)= 111.872

RUNOFF COEFFICIENT = 0.466

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

CALIB		
NASHYD (0076)	Area (ha)= 4.60	Curve Number (CN)= 73.0
ID= 1 DT= 5.0 min	Ia (mm)= 4.97	# of Linear Res.(N)= 3.00
-----	U.H. Tp(hrs)= 0.63	

Unit Hyd Qpeak (cms)= 0.279

PEAK FLOW (cms)= 0.296 (i)
 TIME TO PEAK (hrs)= 12.500
 RUNOFF VOLUME (mm)= 56.898
 TOTAL RAINFALL (mm)= 111.872
 RUNOFF COEFFICIENT = 0.509

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

RESERVOIR(0080)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW	STORAGE	OUTFLOW	STORAGE
-----	(cms)	(ha.m.)	(cms)	(ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.				
	0.0010	0.0595	0.0100	0.1538
	0.0040	0.0952	0.0140	0.1780
	0.0060	0.1206	0.0170	0.2021
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (0076)	4.600	0.296	12.50	56.90
OUTFLOW: ID= 1 (0080)	4.600	0.017	20.75	47.96

PEAK FLOW REDUCTION [Qout/Qin](%)= 5.61
 TIME SHIFT OF PEAK FLOW (min)=495.00
 MAXIMUM STORAGE USED (ha.m.)= 0.1990

CALIB		
NASHYD (0081)	Area (ha)= 3.30	Curve Number (CN)= 68.1
ID= 1 DT= 5.0 min	Ia (mm)= 6.93	# of Linear Res.(N)= 3.00
-----	U.H. Tp(hrs)= 0.22	

Unit Hyd Qpeak (cms)= 0.573

PEAK FLOW (cms)= 0.379 (i)
 TIME TO PEAK (hrs)= 12.083
 RUNOFF VOLUME (mm)= 49.117
 TOTAL RAINFALL (mm)= 111.872
 RUNOFF COEFFICIENT = 0.439

.....

.....

ADD HYD (0079)				
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.
-----	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0077):	3.30	0.020	16.08	47.71
+ ID2= 2 (0078):	11.60	0.432	12.83	43.22
=====				
ID = 3 (0079):	14.90	0.449	12.83	44.21

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0079) |
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0079):	14.90	0.449	12.83	44.21
+ ID2= 2 (0080):	4.60	0.017	20.75	47.96
=====				
ID = 1 (0079):	19.50	0.454	12.83	45.09

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 ** SIMULATION:1 **

```

-----
| READ STORM |      Filename: C:\Users\DFendler\AppData
|             |      ata\Local\Temp\
|             |      18b89df8-f961-4c8d-8342-416371377292\ed1aeef3
| Ptotal= 25.00 mm |      Comments: 25MM4HR
-----

```

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	1.42	1.00	13.41	2.00	3.64	3.00	1.73
0.17	1.64	1.17	58.68	2.17	3.05	3.17	1.60
0.33	1.96	1.33	17.94	2.33	2.64	3.33	1.48
0.50	2.45	1.50	9.06	2.50	2.32	3.50	1.39
0.67	3.30	1.67	6.03	2.67	2.08	3.67	1.30
0.83	5.22	1.83	4.53	2.83	1.89	3.83	1.23

```

-----
| CALIB      |
| NASHYD ( 0101) |      Area (ha)= 2.70      Curve Number (CN)= 69.6
| ID= 1 DT= 5.0 min |      Ia (mm)= 5.40      # of Linear Res.(N)= 3.00
-----
|              |      U.H. Tp(hrs)= 0.40

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```

----- TRANSFORMED HYETOGRAPH -----

```

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	1.42	1.083	13.41	2.083	3.64	3.08	1.73
0.167	1.42	1.167	13.41	2.167	3.64	3.17	1.73
0.250	1.64	1.250	58.68	2.250	3.05	3.25	1.60
0.333	1.64	1.333	58.68	2.333	3.05	3.33	1.60
0.417	1.96	1.417	17.94	2.417	2.64	3.42	1.48
0.500	1.96	1.500	17.94	2.500	2.64	3.50	1.48
0.583	2.45	1.583	9.06	2.583	2.32	3.58	1.39
0.667	2.45	1.667	9.06	2.667	2.32	3.67	1.39
0.750	3.30	1.750	6.03	2.750	2.08	3.75	1.30
0.833	3.30	1.833	6.03	2.833	2.08	3.83	1.30
0.917	5.22	1.917	4.53	2.917	1.89	3.92	1.23
1.000	5.22	2.000	4.53	3.000	1.89	4.00	1.23

Unit Hyd Qpeak (cms)= 0.258

PEAK FLOW (cms)= 0.015 (i)

TIME TO PEAK (hrs)= 1.833

RUNOFF VOLUME (mm)= 2.942
TOTAL RAINFALL (mm)= 24.998
RUNOFF COEFFICIENT = 0.118

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

```

-----
| CALIB |
| NASHYD ( 0082) | Area (ha)= 11.60 Curve Number (CN)= 63.8
| ID= 1 DT= 5.0 min | Ia (mm)= 8.44 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 0.89

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```

----- TRANSFORMED HYETOGRAPH -----
TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN
hrs mm/hr | hrs mm/hr | hrs mm/hr | hrs mm/hr
0.083 1.42 | 1.083 13.41 | 2.083 3.64 | 3.08 1.73
0.167 1.42 | 1.167 13.41 | 2.167 3.64 | 3.17 1.73
0.250 1.64 | 1.250 58.68 | 2.250 3.05 | 3.25 1.60
0.333 1.64 | 1.333 58.68 | 2.333 3.05 | 3.33 1.60
0.417 1.96 | 1.417 17.94 | 2.417 2.64 | 3.42 1.48
0.500 1.96 | 1.500 17.94 | 2.500 2.64 | 3.50 1.48
0.583 2.45 | 1.583 9.06 | 2.583 2.32 | 3.58 1.39
0.667 2.45 | 1.667 9.06 | 2.667 2.32 | 3.67 1.39
0.750 3.30 | 1.750 6.03 | 2.750 2.08 | 3.75 1.30
0.833 3.30 | 1.833 6.03 | 2.833 2.08 | 3.83 1.30
0.917 5.22 | 1.917 4.53 | 2.917 1.89 | 3.92 1.23
1.000 5.22 | 2.000 4.53 | 3.000 1.89 | 4.00 1.23

```

Unit Hyd Qpeak (cms)= 0.498

PEAK FLOW (cms)= 0.021 (i)
TIME TO PEAK (hrs)= 2.667
RUNOFF VOLUME (mm)= 1.706
TOTAL RAINFALL (mm)= 24.998
RUNOFF COEFFICIENT = 0.068

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

```

-----
| CALIB |
| NASHYD ( 0084) | Area (ha)= 4.60 Curve Number (CN)= 73.0
| ID= 1 DT= 5.0 min | Ia (mm)= 4.97 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 0.63

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	1.42	1.083	13.41	2.083	3.64	3.08	1.73
0.167	1.42	1.167	13.41	2.167	3.64	3.17	1.73
0.250	1.64	1.250	58.68	2.250	3.05	3.25	1.60
0.333	1.64	1.333	58.68	2.333	3.05	3.33	1.60
0.417	1.96	1.417	17.94	2.417	2.64	3.42	1.48
0.500	1.96	1.500	17.94	2.500	2.64	3.50	1.48
0.583	2.45	1.583	9.06	2.583	2.32	3.58	1.39
0.667	2.45	1.667	9.06	2.667	2.32	3.67	1.39
0.750	3.30	1.750	6.03	2.750	2.08	3.75	1.30
0.833	3.30	1.833	6.03	2.833	2.08	3.83	1.30
0.917	5.22	1.917	4.53	2.917	1.89	3.92	1.23
1.000	5.22	2.000	4.53	3.000	1.89	4.00	1.23

Unit Hyd Qpeak (cms)= 0.279

PEAK FLOW (cms)= 0.023 (i)

TIME TO PEAK (hrs)= 2.167

RUNOFF VOLUME (mm)= 3.519

TOTAL RAINFALL (mm)= 24.998

RUNOFF COEFFICIENT = 0.141

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

 | RESERVOIR(0083) |
 | IN= 2---> OUT= 1 |
DT= 5.0 min

OVERFLOW IS OFF

OUTFLOW	STORAGE	OUTFLOW	STORAGE
(cms)	(ha.m.)	(cms)	(ha.m.)
0.0010	0.0595	0.0100	0.1538
0.0040	0.0952	0.0140	0.1780
0.0060	0.1206	0.0170	0.2021

**** WARNING : FIRST OUTFLOW IS NOT ZERO.

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (0084)	4.600	0.023	2.17	3.52
OUTFLOW: ID= 1 (0083)	4.600	0.000	6.00	0.22

PEAK FLOW REDUCTION [Qout/Qin](%)= 1.17

TIME SHIFT OF PEAK FLOW (min)=230.00

MAXIMUM STORAGE USED (ha.m.)= 0.0158

CALIB			
NASHYD (0086)		Area (ha)= 3.30	Curve Number (CN)= 68.1
ID= 1 DT= 5.0 min		Ia (mm)= 6.93	# of Linear Res.(N)= 3.00
-----		U.H. Tp(hrs)= 0.22	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	1.42	1.083	13.41	2.083	3.64	3.08	1.73
0.167	1.42	1.167	13.41	2.167	3.64	3.17	1.73
0.250	1.64	1.250	58.68	2.250	3.05	3.25	1.60
0.333	1.64	1.333	58.68	2.333	3.05	3.33	1.60
0.417	1.96	1.417	17.94	2.417	2.64	3.42	1.48
0.500	1.96	1.500	17.94	2.500	2.64	3.50	1.48
0.583	2.45	1.583	9.06	2.583	2.32	3.58	1.39
0.667	2.45	1.667	9.06	2.667	2.32	3.67	1.39
0.750	3.30	1.750	6.03	2.750	2.08	3.75	1.30
0.833	3.30	1.833	6.03	2.833	2.08	3.83	1.30
0.917	5.22	1.917	4.53	2.917	1.89	3.92	1.23
1.000	5.22	2.000	4.53	3.000	1.89	4.00	1.23

Unit Hyd Qpeak (cms)= 0.573

PEAK FLOW (cms)= 0.019 (i)

TIME TO PEAK (hrs)= 1.583

RUNOFF VOLUME (mm)= 2.379

TOTAL RAINFALL (mm)= 24.998

RUNOFF COEFFICIENT = 0.095

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

RESERVOIR(0085)		OVERFLOW IS OFF			
IN= 2---> OUT= 1					
DT= 5.0 min		OUTFLOW	STORAGE	OUTFLOW	STORAGE
-----		(cms)	(ha.m.)	(cms)	(ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.					
		0.0020	0.0366	0.0160	0.0883
		0.0060	0.0551	0.0200	0.1025
		0.0100	0.0704	0.0240	0.1200
		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (0086)		3.300	0.019	1.58	2.38
OUTFLOW: ID= 1 (0085)		3.300	0.000	4.50	0.97

PEAK FLOW REDUCTION [Qout/Qin](%)= 2.18
 TIME SHIFT OF PEAK FLOW (min)=175.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0075

```

-----
| ADD HYD ( 0087) |
| 1 + 2 = 3 |
-----
          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
ID1= 1 ( 0082):   11.60    0.021    2.67    1.71
+ ID2= 2 ( 0083):    4.60    0.000    6.00    0.22
=====
ID = 3 ( 0087):   16.20    0.021    2.67    1.29
  
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| ADD HYD ( 0087) |
| 3 + 2 = 1 |
-----
          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
ID1= 3 ( 0087):   16.20    0.021    2.67    1.29
+ ID2= 2 ( 0085):    3.30    0.000    4.50    0.97
=====
ID = 1 ( 0087):   19.50    0.021    2.67    1.23
  
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

*****
** SIMULATION:2          **
*****
  
```

```

-----
| CHICAGO STORM |
| Ptotal= 31.86 mm |
-----
IDF curve parameters: A= 732.951
                      B=   6.199
                      C=   0.810
used in: INTENSITY = A / (t + B)^C

Duration of storm = 3.00 hrs
Storm time step   = 10.00 min
Time to peak ratio = 0.33
  
```

TIME	RAIN	TIME	RAIN	'	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	'	hrs	mm/hr	hrs	mm/hr
0.00	2.81	0.83	76.81		1.67	5.09	2.50	2.68
0.17	3.50	1.00	24.08		1.83	4.29	2.67	2.46
0.33	4.69	1.17	12.36		2.00	3.72	2.83	2.28
0.50	7.30	1.33	8.32		2.17	3.29		
0.67	18.21	1.50	6.30		2.33	2.95		

```

-----
| CALIB |
| NASHYD ( 0101) | Area (ha)= 2.70 Curve Number (CN)= 69.6
| ID= 1 DT= 5.0 min | Ia (mm)= 5.40 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 0.40

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```

----- TRANSFORMED HYETOGRAPH -----
TIME    RAIN | TIME    RAIN | ' TIME    RAIN | TIME    RAIN
hrs     mm/hr | hrs     mm/hr | '  hrs     mm/hr | hrs     mm/hr
0.083   2.81 | 0.833   18.21 | 1.583   6.30 | 2.33    3.29
0.167   2.81 | 0.917   76.80 | 1.667   6.30 | 2.42    2.95
0.250   3.50 | 1.000   76.81 | 1.750   5.09 | 2.50    2.95
0.333   3.50 | 1.083   24.08 | 1.833   5.09 | 2.58    2.68
0.417   4.69 | 1.167   24.08 | 1.917   4.29 | 2.67    2.68
0.500   4.69 | 1.250   12.36 | 2.000   4.29 | 2.75    2.46
0.583   7.30 | 1.333   12.36 | 2.083   3.72 | 2.83    2.46
0.667   7.30 | 1.417    8.32 | 2.167   3.72 | 2.92    2.28
0.750   18.21 | 1.500    8.32 | 2.250   3.29 | 3.00    2.28

```

Unit Hyd Qpeak (cms)= 0.258

PEAK FLOW (cms)= 0.028 (i)

TIME TO PEAK (hrs)= 1.500

RUNOFF VOLUME (mm)= 5.095

TOTAL RAINFALL (mm)= 31.860

RUNOFF COEFFICIENT = 0.160

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

```

-----
| CALIB |
| NASHYD ( 0082) | Area (ha)= 11.60 Curve Number (CN)= 63.8
| ID= 1 DT= 5.0 min | Ia (mm)= 8.44 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 0.89

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```

----- TRANSFORMED HYETOGRAPH -----
TIME    RAIN | TIME    RAIN | ' TIME    RAIN | TIME    RAIN
hrs     mm/hr | hrs     mm/hr | '  hrs     mm/hr | hrs     mm/hr
0.083   2.81 | 0.833   18.21 | 1.583   6.30 | 2.33    3.29
0.167   2.81 | 0.917   76.80 | 1.667   6.30 | 2.42    2.95
0.250   3.50 | 1.000   76.81 | 1.750   5.09 | 2.50    2.95

```

0.333	3.50	1.083	24.08	1.833	5.09	2.58	2.68
0.417	4.69	1.167	24.08	1.917	4.29	2.67	2.68
0.500	4.69	1.250	12.36	2.000	4.29	2.75	2.46
0.583	7.30	1.333	12.36	2.083	3.72	2.83	2.46
0.667	7.30	1.417	8.32	2.167	3.72	2.92	2.28
0.750	18.21	1.500	8.32	2.250	3.29	3.00	2.28

Unit Hyd Qpeak (cms)= 0.498

PEAK FLOW (cms)= 0.045 (i)
TIME TO PEAK (hrs)= 2.333
RUNOFF VOLUME (mm)= 3.274
TOTAL RAINFALL (mm)= 31.860
RUNOFF COEFFICIENT = 0.103

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

```

-----
| CALIB |
| NASHYD ( 0084) | Area (ha)= 4.60 Curve Number (CN)= 73.0
| ID= 1 DT= 5.0 min | Ia (mm)= 4.97 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 0.63

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	2.81	0.833	18.21	1.583	6.30	2.33	3.29
0.167	2.81	0.917	76.80	1.667	6.30	2.42	2.95
0.250	3.50	1.000	76.81	1.750	5.09	2.50	2.95
0.333	3.50	1.083	24.08	1.833	5.09	2.58	2.68
0.417	4.69	1.167	24.08	1.917	4.29	2.67	2.68
0.500	4.69	1.250	12.36	2.000	4.29	2.75	2.46
0.583	7.30	1.333	12.36	2.083	3.72	2.83	2.46
0.667	7.30	1.417	8.32	2.167	3.72	2.92	2.28
0.750	18.21	1.500	8.32	2.250	3.29	3.00	2.28

Unit Hyd Qpeak (cms)= 0.279

PEAK FLOW (cms)= 0.042 (i)
TIME TO PEAK (hrs)= 1.833
RUNOFF VOLUME (mm)= 5.984
TOTAL RAINFALL (mm)= 31.860
RUNOFF COEFFICIENT = 0.188

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

```

-----
| RESERVOIR( 0083) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
-----
      **** WARNING : FIRST OUTFLOW IS NOT ZERO.
      0.0010      0.0595 | 0.0100      0.1538
      0.0040      0.0952 | 0.0140      0.1780
      0.0060      0.1206 | 0.0170      0.2021

      AREA      QPEAK      TPEAK      R.V.
      (ha)      (cms)      (hrs)      (mm)
INFLOW : ID= 2 ( 0084) 4.600      0.042      1.83      5.98
OUTFLOW: ID= 1 ( 0083) 4.600      0.000      5.17      2.69

      PEAK FLOW REDUCTION [Qout/Qin](%)= 1.08
      TIME SHIFT OF PEAK FLOW (min)=200.00
      MAXIMUM STORAGE USED (ha.m.)= 0.0270

```

```

-----
| CALIB |
| NASHYD ( 0086) | Area (ha)= 3.30 Curve Number (CN)= 68.1
| ID= 1 DT= 5.0 min | Ia (mm)= 6.93 # of Linear Res.(N)= 3.00
-----
      U.H. Tp(hrs)= 0.22

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```

      ----- TRANSFORMED HYETOGRAPH -----
      TIME      RAIN | TIME      RAIN | TIME      RAIN | TIME      RAIN
      hrs      mm/hr | hrs      mm/hr | hrs      mm/hr | hrs      mm/hr
0.083      2.81 | 0.833     18.21 | 1.583     6.30 | 2.33      3.29
0.167      2.81 | 0.917     76.80 | 1.667     6.30 | 2.42      2.95
0.250      3.50 | 1.000     76.81 | 1.750     5.09 | 2.50      2.95
0.333      3.50 | 1.083     24.08 | 1.833     5.09 | 2.58      2.68
0.417      4.69 | 1.167     24.08 | 1.917     4.29 | 2.67      2.68
0.500      4.69 | 1.250     12.36 | 2.000     4.29 | 2.75      2.46
0.583      7.30 | 1.333     12.36 | 2.083     3.72 | 2.83      2.46
0.667      7.30 | 1.417      8.32 | 2.167     3.72 | 2.92      2.28
0.750     18.21 | 1.500      8.32 | 2.250     3.29 | 3.00      2.28

```

Unit Hyd Qpeak (cms)= 0.573

PEAK FLOW (cms)= 0.039 (i)
 TIME TO PEAK (hrs)= 1.250
 RUNOFF VOLUME (mm)= 4.313
 TOTAL RAINFALL (mm)= 31.860
 RUNOFF COEFFICIENT = 0.135

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

```
-----
| RESERVOIR( 0085)| OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
-----
      OUTFLOW    STORAGE    OUTFLOW    STORAGE
      (cms)      (ha.m.)    (cms)      (ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.
      0.0020      0.0366    0.0160      0.0883
      0.0060      0.0551    0.0200      0.1025
      0.0100      0.0704    0.0240      0.1200

      AREA      QPEAK      TPEAK      R.V.
      (ha)      (cms)      (hrs)      (mm)
INFLOW : ID= 2 ( 0086)  3.300      0.039      1.25      4.31
OUTFLOW: ID= 1 ( 0085)  3.300      0.001      3.50      2.90

      PEAK FLOW REDUCTION [Qout/Qin](%)= 1.93
      TIME SHIFT OF PEAK FLOW (min)=135.00
      MAXIMUM STORAGE USED (ha.m.)= 0.0137
-----
```

```
-----
| ADD HYD ( 0087)|
| 1 + 2 = 3      |
-----
      AREA      QPEAK      TPEAK      R.V.
      (ha)      (cms)      (hrs)      (mm)
      ID1= 1 ( 0082):  11.60    0.045      2.33      3.27
      + ID2= 2 ( 0083):   4.60    0.000      5.17      2.69
      =====
      ID = 3 ( 0087):  16.20    0.045      2.33      3.11
-----
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
| ADD HYD ( 0087)|
| 3 + 2 = 1      |
-----
      AREA      QPEAK      TPEAK      R.V.
      (ha)      (cms)      (hrs)      (mm)
      ID1= 3 ( 0087):  16.20    0.045      2.33      3.11
      + ID2= 2 ( 0085):   3.30    0.001      3.50      2.90
      =====
      ID = 1 ( 0087):  19.50    0.046      2.33      3.07
-----
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
*****
** SIMULATION:3      **
-----
```

```

-----
| CHICAGO STORM |      IDF curve parameters: A= 998.071
| Ptotal= 42.51 mm |                      B=   6.053
-----                      C=   0.814
                        used in:  INTENSITY = A / (t + B)^C

Duration of storm = 3.00 hrs
Storm time step   = 10.00 min
Time to peak ratio = 0.33

```

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	3.68	0.83	104.19	1.67	6.69	2.50	3.51
0.17	4.58	1.00	32.04	1.83	5.63	2.67	3.22
0.33	6.15	1.17	16.34	2.00	4.87	2.83	2.98
0.50	9.61	1.33	10.96	2.17	4.30		
0.67	24.17	1.50	8.29	2.33	3.86		

```

-----
| CALIB |
| NASHYD ( 0101) |      Area (ha)= 2.70  Curve Number (CN)= 69.6
| ID= 1 DT= 5.0 min |      Ia (mm)= 5.40  # of Linear Res.(N)= 3.00
-----      U.H. Tp(hrs)= 0.40

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```

----- TRANSFORMED HYETOGRAPH -----

```

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	3.68	0.833	24.17	1.583	8.29	2.33	4.30
0.167	3.68	0.917	104.19	1.667	8.29	2.42	3.86
0.250	4.58	1.000	104.19	1.750	6.69	2.50	3.86
0.333	4.58	1.083	32.04	1.833	6.69	2.58	3.51
0.417	6.15	1.167	32.04	1.917	5.63	2.67	3.51
0.500	6.15	1.250	16.34	2.000	5.63	2.75	3.22
0.583	9.61	1.333	16.34	2.083	4.87	2.83	3.22
0.667	9.61	1.417	10.96	2.167	4.87	2.92	2.98
0.750	24.17	1.500	10.96	2.250	4.30	3.00	2.98

Unit Hyd Qpeak (cms)= 0.258

PEAK FLOW (cms)= 0.053 (i)
 TIME TO PEAK (hrs)= 1.500
 RUNOFF VOLUME (mm)= 9.302
 TOTAL RAINFALL (mm)= 42.514
 RUNOFF COEFFICIENT = 0.219

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

```
-----
| CALIB                                     |
| NASHYD ( 0082) | Area (ha)= 11.60 Curve Number (CN)= 63.8
| ID= 1 DT= 5.0 min | Ia (mm)= 8.44 # of Linear Res.(N)= 3.00
|-----| U.H. Tp(hrs)= 0.89
```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```
----- TRANSFORMED HYETOGRAPH -----
TIME    RAIN | TIME    RAIN | TIME    RAIN | TIME    RAIN
hrs      mm/hr | hrs      mm/hr | hrs      mm/hr | hrs      mm/hr
0.083    3.68 | 0.833   24.17 | 1.583    8.29 | 2.33     4.30
0.167    3.68 | 0.917  104.19 | 1.667    8.29 | 2.42     3.86
0.250    4.58 | 1.000  104.19 | 1.750    6.69 | 2.50     3.86
0.333    4.58 | 1.083   32.04 | 1.833    6.69 | 2.58     3.51
0.417    6.15 | 1.167   32.04 | 1.917    5.63 | 2.67     3.51
0.500    6.15 | 1.250   16.34 | 2.000    5.63 | 2.75     3.22
0.583    9.61 | 1.333   16.34 | 2.083    4.87 | 2.83     3.22
0.667    9.61 | 1.417   10.96 | 2.167    4.87 | 2.92     2.98
0.750   24.17 | 1.500   10.96 | 2.250    4.30 | 3.00     2.98
```

Unit Hyd Qpeak (cms)= 0.498

PEAK FLOW (cms)= 0.091 (i)
TIME TO PEAK (hrs)= 2.250
RUNOFF VOLUME (mm)= 6.515
TOTAL RAINFALL (mm)= 42.514
RUNOFF COEFFICIENT = 0.153

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

```
-----
| CALIB                                     |
| NASHYD ( 0084) | Area (ha)= 4.60 Curve Number (CN)= 73.0
| ID= 1 DT= 5.0 min | Ia (mm)= 4.97 # of Linear Res.(N)= 3.00
|-----| U.H. Tp(hrs)= 0.63
```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```
----- TRANSFORMED HYETOGRAPH -----
TIME    RAIN | TIME    RAIN | TIME    RAIN | TIME    RAIN
hrs      mm/hr | hrs      mm/hr | hrs      mm/hr | hrs      mm/hr
0.083    3.68 | 0.833   24.17 | 1.583    8.29 | 2.33     4.30
```

0.167	3.68	0.917	104.19	1.667	8.29	2.42	3.86
0.250	4.58	1.000	104.19	1.750	6.69	2.50	3.86
0.333	4.58	1.083	32.04	1.833	6.69	2.58	3.51
0.417	6.15	1.167	32.04	1.917	5.63	2.67	3.51
0.500	6.15	1.250	16.34	2.000	5.63	2.75	3.22
0.583	9.61	1.333	16.34	2.083	4.87	2.83	3.22
0.667	9.61	1.417	10.96	2.167	4.87	2.92	2.98
0.750	24.17	1.500	10.96	2.250	4.30	3.00	2.98

Unit Hyd Qpeak (cms)= 0.279

PEAK FLOW (cms)= 0.077 (i)

TIME TO PEAK (hrs)= 1.750

RUNOFF VOLUME (mm)= 10.719

TOTAL RAINFALL (mm)= 42.514

RUNOFF COEFFICIENT = 0.252

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

```

-----
| RESERVOIR( 0083) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
-----
          OUTFLOW   STORAGE   | OUTFLOW   STORAGE
          (cms)     (ha.m.)   | (cms)     (ha.m.)
***** WARNING : FIRST OUTFLOW IS NOT ZERO.
          0.0010     0.0595   | 0.0100     0.1538
          0.0040     0.0952   | 0.0140     0.1780
          0.0060     0.1206   | 0.0170     0.2021

          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
INFLOW : ID= 2 ( 0084) 4.600      0.077      1.75      10.72
OUTFLOW: ID= 1 ( 0083) 4.600      0.001      5.08      6.75

          PEAK FLOW REDUCTION [Qout/Qin](%)= 1.05
          TIME SHIFT OF PEAK FLOW (min)=200.00
          MAXIMUM STORAGE USED (ha.m.)= 0.0484

```

```

-----
| CALIB |
| NASHYD ( 0086) | Area (ha)= 3.30 Curve Number (CN)= 68.1
| ID= 1 DT= 5.0 min | Ia (mm)= 6.93 # of Linear Res.(N)= 3.00
-----
          U.H. Tp(hrs)= 0.22

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	3.68	0.833	24.17	1.583	8.29	2.33	4.30
0.167	3.68	0.917	104.19	1.667	8.29	2.42	3.86
0.250	4.58	1.000	104.19	1.750	6.69	2.50	3.86
0.333	4.58	1.083	32.04	1.833	6.69	2.58	3.51
0.417	6.15	1.167	32.04	1.917	5.63	2.67	3.51
0.500	6.15	1.250	16.34	2.000	5.63	2.75	3.22
0.583	9.61	1.333	16.34	2.083	4.87	2.83	3.22
0.667	9.61	1.417	10.96	2.167	4.87	2.92	2.98
0.750	24.17	1.500	10.96	2.250	4.30	3.00	2.98

Unit Hyd Qpeak (cms)= 0.573

PEAK FLOW (cms)= 0.079 (i)
 TIME TO PEAK (hrs)= 1.250
 RUNOFF VOLUME (mm)= 8.181
 TOTAL RAINFALL (mm)= 42.514
 RUNOFF COEFFICIENT = 0.192

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

```

-----
| RESERVOIR( 0085) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
-----
          OUTFLOW   STORAGE   OUTFLOW   STORAGE
          (cms)     (ha.m.)   (cms)     (ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.
          0.0020     0.0366   0.0160     0.0883
          0.0060     0.0551   0.0200     0.1025
          0.0100     0.0704   0.0240     0.1200

          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
INFLOW : ID= 2 ( 0086) 3.300     0.079      1.25      8.18
OUTFLOW: ID= 1 ( 0085) 3.300     0.001      3.50      6.77

          PEAK FLOW REDUCTION [Qout/Qin](%)= 1.80
          TIME SHIFT OF PEAK FLOW (min)=135.00
          MAXIMUM STORAGE USED (ha.m.)= 0.0260
  
```

```

-----
| ADD HYD ( 0087) |
| 1 + 2 = 3       |
-----
          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
          ID1= 1 ( 0082): 11.60    0.091      2.25      6.52
          + ID2= 2 ( 0083): 4.60     0.001      5.08      6.75
  
```

=====

ID = 3 (0087):	16.20	0.092	2.25	6.58
-----------------	-------	-------	------	------

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0087)				
3 + 2 = 1				
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0087):	16.20	0.092	2.25	6.58
+ ID2= 2 (0085):	3.30	0.001	3.50	6.77
ID = 1 (0087):	19.50	0.093	2.25	6.61

=====

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

** SIMULATION:4 **

CHICAGO STORM	IDF curve parameters: A=1174.184
Ptotal= 49.50 mm	B= 6.014
	C= 0.816

used in: INTENSITY = $A / (t + B)^C$

Duration of storm = 3.00 hrs

Storm time step = 10.00 min

Time to peak ratio = 0.33

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	4.25	0.83	122.14	1.67	7.73	2.50	4.05
0.17	5.29	1.00	37.28	1.83	6.50	2.67	3.71
0.33	7.11	1.17	18.95	2.00	5.63	2.83	3.43
0.50	11.13	1.33	12.70	2.17	4.97		
0.67	28.10	1.50	9.59	2.33	4.46		

CALIB	
NASHYD (0101)	Area (ha)= 2.70 Curve Number (CN)= 69.6
ID= 1 DT= 5.0 min	Ia (mm)= 5.40 # of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.40

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	4.25	0.833	28.10	1.583	9.59	2.33	4.97
0.167	4.25	0.917	122.14	1.667	9.59	2.42	4.46
0.250	5.29	1.000	122.14	1.750	7.73	2.50	4.46
0.333	5.29	1.083	37.28	1.833	7.73	2.58	4.05
0.417	7.11	1.167	37.28	1.917	6.50	2.67	4.05
0.500	7.11	1.250	18.95	2.000	6.50	2.75	3.71
0.583	11.13	1.333	18.95	2.083	5.63	2.83	3.71
0.667	11.13	1.417	12.70	2.167	5.63	2.92	3.43
0.750	28.10	1.500	12.70	2.250	4.97	3.00	3.43

Unit Hyd Qpeak (cms)= 0.258

PEAK FLOW (cms)= 0.072 (i)
 TIME TO PEAK (hrs)= 1.500
 RUNOFF VOLUME (mm)= 12.544
 TOTAL RAINFALL (mm)= 49.505
 RUNOFF COEFFICIENT = 0.253

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

```

-----
| CALIB                                     |
| NASHYD ( 0082) | Area (ha)= 11.60 Curve Number (CN)= 63.8
| ID= 1 DT= 5.0 min | Ia (mm)= 8.44 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 0.89

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	4.25	0.833	28.10	1.583	9.59	2.33	4.97
0.167	4.25	0.917	122.14	1.667	9.59	2.42	4.46
0.250	5.29	1.000	122.14	1.750	7.73	2.50	4.46
0.333	5.29	1.083	37.28	1.833	7.73	2.58	4.05
0.417	7.11	1.167	37.28	1.917	6.50	2.67	4.05
0.500	7.11	1.250	18.95	2.000	6.50	2.75	3.71
0.583	11.13	1.333	18.95	2.083	5.63	2.83	3.71
0.667	11.13	1.417	12.70	2.167	5.63	2.92	3.43
0.750	28.10	1.500	12.70	2.250	4.97	3.00	3.43

Unit Hyd Qpeak (cms)= 0.498

PEAK FLOW (cms)= 0.129 (i)
 TIME TO PEAK (hrs)= 2.167
 RUNOFF VOLUME (mm)= 9.106

TOTAL RAINFALL (mm)= 49.505
RUNOFF COEFFICIENT = 0.184

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

```
-----
| CALIB |
| NASHYD ( 0084) | Area (ha)= 4.60 Curve Number (CN)= 73.0
| ID= 1 DT= 5.0 min | Ia (mm)= 4.97 # of Linear Res.(N)= 3.00
|-----| U.H. Tp(hrs)= 0.63
```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```
----- TRANSFORMED HYETOGRAPH -----
TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN
hrs mm/hr | hrs mm/hr | hrs mm/hr | hrs mm/hr
0.083 4.25 | 0.833 28.10 | 1.583 9.59 | 2.33 4.97
0.167 4.25 | 0.917 122.14 | 1.667 9.59 | 2.42 4.46
0.250 5.29 | 1.000 122.14 | 1.750 7.73 | 2.50 4.46
0.333 5.29 | 1.083 37.28 | 1.833 7.73 | 2.58 4.05
0.417 7.11 | 1.167 37.28 | 1.917 6.50 | 2.67 4.05
0.500 7.11 | 1.250 18.95 | 2.000 6.50 | 2.75 3.71
0.583 11.13 | 1.333 18.95 | 2.083 5.63 | 2.83 3.71
0.667 11.13 | 1.417 12.70 | 2.167 5.63 | 2.92 3.43
0.750 28.10 | 1.500 12.70 | 2.250 4.97 | 3.00 3.43
```

Unit Hyd Qpeak (cms)= 0.279

PEAK FLOW (cms)= 0.105 (i)
TIME TO PEAK (hrs)= 1.750
RUNOFF VOLUME (mm)= 14.322
TOTAL RAINFALL (mm)= 49.505
RUNOFF COEFFICIENT = 0.289

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

```
-----
| RESERVOIR( 0083) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min |
|-----|
**** WARNING : FIRST OUTFLOW IS NOT ZERO.
OUTFLOW STORAGE | OUTFLOW STORAGE
(cms) (ha.m.) | (cms) (ha.m.)
0.0010 0.0595 | 0.0100 0.1538
0.0040 0.0952 | 0.0140 0.1780
0.0060 0.1206 | 0.0170 0.2021
```

AREA QPEAK TPEAK R.V.

	(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (0084)	4.600	0.105	1.75	14.32
OUTFLOW: ID= 1 (0083)	4.600	0.001	5.00	9.09

PEAK FLOW REDUCTION [Qout/Qin](%)= 1.35
 TIME SHIFT OF PEAK FLOW (min)=195.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0645

CALIB			
NASHYD (0086)	Area (ha)= 3.30	Curve Number (CN)= 68.1	
ID= 1 DT= 5.0 min	Ia (mm)= 6.93	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.22		

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	4.25	0.833	28.10	1.583	9.59	2.33	4.97
0.167	4.25	0.917	122.14	1.667	9.59	2.42	4.46
0.250	5.29	1.000	122.14	1.750	7.73	2.50	4.46
0.333	5.29	1.083	37.28	1.833	7.73	2.58	4.05
0.417	7.11	1.167	37.28	1.917	6.50	2.67	4.05
0.500	7.11	1.250	18.95	2.000	6.50	2.75	3.71
0.583	11.13	1.333	18.95	2.083	5.63	2.83	3.71
0.667	11.13	1.417	12.70	2.167	5.63	2.92	3.43
0.750	28.10	1.500	12.70	2.250	4.97	3.00	3.43

Unit Hyd Qpeak (cms)= 0.573

PEAK FLOW (cms)= 0.111 (i)
 TIME TO PEAK (hrs)= 1.250
 RUNOFF VOLUME (mm)= 11.205
 TOTAL RAINFALL (mm)= 49.505
 RUNOFF COEFFICIENT = 0.226

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

RESERVOIR(0085)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW	STORAGE	OUTFLOW	STORAGE
	(cms)	(ha.m.)	(cms)	(ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.				
	0.0020	0.0366	0.0160	0.0883
	0.0060	0.0551	0.0200	0.1025

0.0100 0.0704 | 0.0240 0.1200

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0086)	3.300	0.111	1.25	11.20
OUTFLOW: ID= 1 (0085)	3.300	0.002	3.50	9.79

PEAK FLOW REDUCTION [Qout/Qin](%)= 1.75
TIME SHIFT OF PEAK FLOW (min)=135.00
MAXIMUM STORAGE USED (ha.m.)= 0.0356

```
-----
| ADD HYD ( 0087) |
| 1 + 2 = 3 |
-----
      AREA   QPEAK   TPEAK   R.V.
      (ha)   (cms)   (hrs)   (mm)
ID1= 1 ( 0082):  11.60  0.129   2.17   9.11
+ ID2= 2 ( 0083):   4.60  0.001   5.00   9.09
=====
ID = 3 ( 0087):  16.20  0.129   2.17   9.10
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
| ADD HYD ( 0087) |
| 3 + 2 = 1 |
-----
      AREA   QPEAK   TPEAK   R.V.
      (ha)   (cms)   (hrs)   (mm)
ID1= 3 ( 0087):  16.20  0.129   2.17   9.10
+ ID2= 2 ( 0085):   3.30  0.002   3.50   9.79
=====
ID = 1 ( 0087):  19.50  0.131   2.17   9.22
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

** SIMULATION:5 **

```
-----
| CHICAGO STORM |
| Ptotal= 58.23 mm |
-----
IDF curve parameters: A=1402.884
                      B= 6.018
                      C= 0.819
used in: INTENSITY = A / (t + B)^C

Duration of storm = 3.00 hrs
Storm time step = 10.00 min
Time to peak ratio = 0.33
```

TIME RAIN | TIME RAIN |' TIME RAIN | TIME RAIN

hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	4.93	0.83	144.69	1.67	9.01	2.50	4.70
0.17	6.15	1.00	43.90	1.83	7.57	2.67	4.31
0.33	8.28	1.17	22.22	2.00	6.54	2.83	3.98
0.50	13.01	1.33	14.85	2.17	5.78		
0.67	33.04	1.50	11.19	2.33	5.18		

CALIB			
NASHYD (0101)	Area (ha)=	2.70	Curve Number (CN)= 69.6
ID= 1 DT= 5.0 min	Ia (mm)=	5.40	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.40	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	4.93	0.833	33.04	1.583	11.19	2.33	5.78
0.167	4.93	0.917	144.69	1.667	11.19	2.42	5.18
0.250	6.15	1.000	144.69	1.750	9.01	2.50	5.18
0.333	6.15	1.083	43.90	1.833	9.01	2.58	4.70
0.417	8.28	1.167	43.90	1.917	7.57	2.67	4.70
0.500	8.28	1.250	22.22	2.000	7.57	2.75	4.31
0.583	13.01	1.333	22.22	2.083	6.54	2.83	4.31
0.667	13.01	1.417	14.85	2.167	6.54	2.92	3.98
0.750	33.04	1.500	14.85	2.250	5.78	3.00	3.98

Unit Hyd Qpeak (cms)= 0.258

PEAK FLOW (cms)= 0.100 (i)

TIME TO PEAK (hrs)= 1.417

RUNOFF VOLUME (mm)= 17.037

TOTAL RAINFALL (mm)= 58.226

RUNOFF COEFFICIENT = 0.293

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

CALIB			
NASHYD (0082)	Area (ha)=	11.60	Curve Number (CN)= 63.8
ID= 1 DT= 5.0 min	Ia (mm)=	8.44	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.89	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	4.93	0.833	33.04	1.583	11.19	2.33	5.78
0.167	4.93	0.917	144.69	1.667	11.19	2.42	5.18
0.250	6.15	1.000	144.69	1.750	9.01	2.50	5.18
0.333	6.15	1.083	43.90	1.833	9.01	2.58	4.70
0.417	8.28	1.167	43.90	1.917	7.57	2.67	4.70
0.500	8.28	1.250	22.22	2.000	7.57	2.75	4.31
0.583	13.01	1.333	22.22	2.083	6.54	2.83	4.31
0.667	13.01	1.417	14.85	2.167	6.54	2.92	3.98
0.750	33.04	1.500	14.85	2.250	5.78	3.00	3.98

Unit Hyd Qpeak (cms)= 0.498

PEAK FLOW (cms)= 0.183 (i)

TIME TO PEAK (hrs)= 2.167

RUNOFF VOLUME (mm)= 12.783

TOTAL RAINFALL (mm)= 58.226

RUNOFF COEFFICIENT = 0.220

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

CALIB			
NASHYD (0084)	Area (ha)=	4.60	Curve Number (CN)= 73.0
ID= 1 DT= 5.0 min	Ia (mm)=	4.97	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.63	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	4.93	0.833	33.04	1.583	11.19	2.33	5.78
0.167	4.93	0.917	144.69	1.667	11.19	2.42	5.18
0.250	6.15	1.000	144.69	1.750	9.01	2.50	5.18
0.333	6.15	1.083	43.90	1.833	9.01	2.58	4.70
0.417	8.28	1.167	43.90	1.917	7.57	2.67	4.70
0.500	8.28	1.250	22.22	2.000	7.57	2.75	4.31
0.583	13.01	1.333	22.22	2.083	6.54	2.83	4.31
0.667	13.01	1.417	14.85	2.167	6.54	2.92	3.98
0.750	33.04	1.500	14.85	2.250	5.78	3.00	3.98

Unit Hyd Qpeak (cms)= 0.279

PEAK FLOW (cms)= 0.143 (i)

TIME TO PEAK (hrs)= 1.750
 RUNOFF VOLUME (mm)= 19.267
 TOTAL RAINFALL (mm)= 58.226
 RUNOFF COEFFICIENT = 0.331

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

```

-----
| RESERVOIR( 0083) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
-----
      OUTFLOW   STORAGE | OUTFLOW   STORAGE
      (cms)     (ha.m.) | (cms)     (ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.
      0.0010     0.0595 | 0.0100     0.1538
      0.0040     0.0952 | 0.0140     0.1780
      0.0060     0.1206 | 0.0170     0.2021

      AREA      QPEAK      TPEAK      R.V.
      (ha)      (cms)      (hrs)      (mm)
INFLOW : ID= 2 ( 0084)  4.600      0.143      1.75      19.27
OUTFLOW: ID= 1 ( 0083)  4.600      0.003      4.75      13.12

      PEAK FLOW REDUCTION [Qout/Qin](%)= 2.24
      TIME SHIFT OF PEAK FLOW (min)=180.00
      MAXIMUM STORAGE USED (ha.m.)= 0.0858
  
```

```

-----
| CALIB |
| NASHYD ( 0086) | Area (ha)= 3.30 Curve Number (CN)= 68.1
| ID= 1 DT= 5.0 min | Ia (mm)= 6.93 # of Linear Res.(N)= 3.00
-----
      U.H. Tp(hrs)= 0.22
  
```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```

----- TRANSFORMED HYETOGRAPH -----
      TIME    RAIN | TIME    RAIN | TIME    RAIN | TIME    RAIN
      hrs    mm/hr | hrs    mm/hr | hrs    mm/hr | hrs    mm/hr
0.083    4.93 | 0.833   33.04 | 1.583   11.19 | 2.33    5.78
0.167    4.93 | 0.917  144.69 | 1.667   11.19 | 2.42    5.18
0.250    6.15 | 1.000  144.69 | 1.750    9.01 | 2.50    5.18
0.333    6.15 | 1.083   43.90 | 1.833    9.01 | 2.58    4.70
0.417    8.28 | 1.167   43.90 | 1.917    7.57 | 2.67    4.70
0.500    8.28 | 1.250   22.22 | 2.000    7.57 | 2.75    4.31
0.583   13.01 | 1.333   22.22 | 2.083    6.54 | 2.83    4.31
0.667   13.01 | 1.417   14.85 | 2.167    6.54 | 2.92    3.98
0.750   33.04 | 1.500   14.85 | 2.250    5.78 | 3.00    3.98
  
```

Unit Hyd Qpeak (cms)= 0.573

PEAK FLOW (cms)= 0.157 (i)
TIME TO PEAK (hrs)= 1.250
RUNOFF VOLUME (mm)= 15.432
TOTAL RAINFALL (mm)= 58.226
RUNOFF COEFFICIENT = 0.265

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

```
-----
| RESERVOIR( 0085) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
-----
      OUTFLOW    STORAGE    OUTFLOW    STORAGE
      (cms)      (ha.m.)    (cms)      (ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.
      0.0020      0.0366    0.0160      0.0883
      0.0060      0.0551    0.0200      0.1025
      0.0100      0.0704    0.0240      0.1200

      AREA      QPEAK      TPEAK      R.V.
      (ha)      (cms)      (hrs)      (mm)
INFLOW : ID= 2 ( 0086)  3.300      0.157      1.25      15.43
OUTFLOW: ID= 1 ( 0085)  3.300      0.005      3.42      14.02

      PEAK FLOW REDUCTION [Qout/Qin](%)= 2.88
      TIME SHIFT OF PEAK FLOW (min)=130.00
      MAXIMUM STORAGE USED (ha.m.)= 0.0483
-----
```

```
-----
| ADD HYD ( 0087) |
| 1 + 2 = 3       |
-----
      AREA      QPEAK      TPEAK      R.V.
      (ha)      (cms)      (hrs)      (mm)
      ID1= 1 ( 0082):  11.60      0.183      2.17      12.78
      + ID2= 2 ( 0083):  4.60      0.003      4.75      13.12
      =====
      ID = 3 ( 0087):  16.20      0.184      2.17      12.88
-----
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
| ADD HYD ( 0087) |
| 3 + 2 = 1       |
-----
      AREA      QPEAK      TPEAK      R.V.
      (ha)      (cms)      (hrs)      (mm)
      ID1= 3 ( 0087):  16.20      0.184      2.17      12.88
      + ID2= 2 ( 0085):  3.30      0.005      3.42      14.02
-----
```

```
=====
ID = 1 ( 0087):    19.50    0.187    2.17    13.07
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

** SIMULATION:6 **

```
-----
| CHICAGO STORM | IDF curve parameters: A=1569.580
| Ptotal= 64.81 mm | B= 6.014
| | C= 0.820
-----
used in: INTENSITY = A / (t + B)^C
```

Duration of storm = 3.00 hrs
Storm time step = 10.00 min
Time to peak ratio = 0.33

TIME	RAIN	TIME	RAIN	'	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	'	hrs	mm/hr	hrs	mm/hr
0.00	5.47	0.83	161.47		1.67	10.00	2.50	5.21
0.17	6.82	1.00	48.88		1.83	8.40	2.67	4.77
0.33	9.19	1.17	24.70		2.00	7.26	2.83	4.41
0.50	14.44	1.33	16.49		2.17	6.40		
0.67	36.76	1.50	12.42		2.33	5.74		

```
-----
| CALIB |
| NASHYD ( 0101) | Area (ha)= 2.70 Curve Number (CN)= 69.6
| ID= 1 DT= 5.0 min | Ia (mm)= 5.40 # of Linear Res.(N)= 3.00
| | U.H. Tp(hrs)= 0.40
-----
```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```
----- TRANSFORMED HYETOGRAPH -----
```

TIME	RAIN	TIME	RAIN	'	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	'	hrs	mm/hr	hrs	mm/hr
0.083	5.47	0.833	36.76		1.583	12.42	2.33	6.40
0.167	5.47	0.917	161.47		1.667	12.42	2.42	5.74
0.250	6.82	1.000	161.47		1.750	10.00	2.50	5.74
0.333	6.82	1.083	48.88		1.833	10.00	2.58	5.21
0.417	9.19	1.167	48.88		1.917	8.40	2.67	5.21
0.500	9.19	1.250	24.70		2.000	8.40	2.75	4.77
0.583	14.44	1.333	24.70		2.083	7.26	2.83	4.77
0.667	14.44	1.417	16.49		2.167	7.26	2.92	4.41
0.750	36.76	1.500	16.49		2.250	6.40	3.00	4.41

Unit Hyd Qpeak (cms)= 0.258

PEAK FLOW (cms)= 0.123 (i)

TIME TO PEAK (hrs)= 1.417

RUNOFF VOLUME (mm)= 20.714

TOTAL RAINFALL (mm)= 64.806

RUNOFF COEFFICIENT = 0.320

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

```
-----
| CALIB |
| NASHYD ( 0082) | Area (ha)= 11.60 Curve Number (CN)= 63.8
| ID= 1 DT= 5.0 min | Ia (mm)= 8.44 # of Linear Res.(N)= 3.00
|-----| U.H. Tp(hrs)= 0.89
```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```
----- TRANSFORMED HYETOGRAPH -----
TIME    RAIN | TIME    RAIN | TIME    RAIN | TIME    RAIN
hrs     mm/hr | hrs     mm/hr | hrs     mm/hr | hrs     mm/hr
0.083   5.47 | 0.833   36.76 | 1.583   12.42 | 2.33    6.40
0.167   5.47 | 0.917  161.47 | 1.667   12.42 | 2.42    5.74
0.250   6.82 | 1.000  161.47 | 1.750   10.00 | 2.50    5.74
0.333   6.82 | 1.083   48.88 | 1.833   10.00 | 2.58    5.21
0.417   9.19 | 1.167   48.88 | 1.917    8.40 | 2.67    5.21
0.500   9.19 | 1.250   24.70 | 2.000    8.40 | 2.75    4.77
0.583  14.44 | 1.333   24.70 | 2.083    7.26 | 2.83    4.77
0.667  14.44 | 1.417   16.49 | 2.167    7.26 | 2.92    4.41
0.750  36.76 | 1.500   16.49 | 2.250    6.40 | 3.00    4.41
```

Unit Hyd Qpeak (cms)= 0.498

PEAK FLOW (cms)= 0.228 (i)

TIME TO PEAK (hrs)= 2.167

RUNOFF VOLUME (mm)= 15.847

TOTAL RAINFALL (mm)= 64.806

RUNOFF COEFFICIENT = 0.245

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

```
-----
| CALIB |
| NASHYD ( 0084) | Area (ha)= 4.60 Curve Number (CN)= 73.0
| ID= 1 DT= 5.0 min | Ia (mm)= 4.97 # of Linear Res.(N)= 3.00
|-----| U.H. Tp(hrs)= 0.63
```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	5.47	0.833	36.76	1.583	12.42	2.33	6.40
0.167	5.47	0.917	161.47	1.667	12.42	2.42	5.74
0.250	6.82	1.000	161.47	1.750	10.00	2.50	5.74
0.333	6.82	1.083	48.88	1.833	10.00	2.58	5.21
0.417	9.19	1.167	48.88	1.917	8.40	2.67	5.21
0.500	9.19	1.250	24.70	2.000	8.40	2.75	4.77
0.583	14.44	1.333	24.70	2.083	7.26	2.83	4.77
0.667	14.44	1.417	16.49	2.167	7.26	2.92	4.41
0.750	36.76	1.500	16.49	2.250	6.40	3.00	4.41

Unit Hyd Qpeak (cms)= 0.279

PEAK FLOW (cms)= 0.174 (i)

TIME TO PEAK (hrs)= 1.750

RUNOFF VOLUME (mm)= 23.281

TOTAL RAINFALL (mm)= 64.806

RUNOFF COEFFICIENT = 0.359

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

RESERVOIR(0083)		OVERFLOW IS OFF			
IN= 2---> OUT= 1					
DT= 5.0 min					
		OUTFLOW	STORAGE	OUTFLOW	STORAGE
		(cms)	(ha.m.)	(cms)	(ha.m.)
***** WARNING : FIRST OUTFLOW IS NOT ZERO.					
		0.0010	0.0595	0.0100	0.1538
		0.0040	0.0952	0.0140	0.1780
		0.0060	0.1206	0.0170	0.2021
		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (0084)		4.600	0.174	1.75	23.28
OUTFLOW: ID= 1 (0083)		4.600	0.005	4.67	16.66

PEAK FLOW REDUCTION [Qout/Qin](%)= 2.65

TIME SHIFT OF PEAK FLOW (min)=175.00

MAXIMUM STORAGE USED (ha.m.)= 0.1030

CALIB					
NASHYD (0086)		Area	(ha)= 3.30	Curve Number	(CN)= 68.1

| ID= 1 DT= 5.0 min | Ia (mm)= 6.93 # of Linear Res.(N)= 3.00
 ----- U.H. Tp(hrs)= 0.22

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	5.47	0.833	36.76	1.583	12.42	2.33	6.40
0.167	5.47	0.917	161.47	1.667	12.42	2.42	5.74
0.250	6.82	1.000	161.47	1.750	10.00	2.50	5.74
0.333	6.82	1.083	48.88	1.833	10.00	2.58	5.21
0.417	9.19	1.167	48.88	1.917	8.40	2.67	5.21
0.500	9.19	1.250	24.70	2.000	8.40	2.75	4.77
0.583	14.44	1.333	24.70	2.083	7.26	2.83	4.77
0.667	14.44	1.417	16.49	2.167	7.26	2.92	4.41
0.750	36.76	1.500	16.49	2.250	6.40	3.00	4.41

Unit Hyd Qpeak (cms)= 0.573

PEAK FLOW (cms)= 0.195 (i)
 TIME TO PEAK (hrs)= 1.250
 RUNOFF VOLUME (mm)= 18.915
 TOTAL RAINFALL (mm)= 64.806
 RUNOFF COEFFICIENT = 0.292

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

RESERVOIR(0085)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.				
	0.0020	0.0366	0.0160	0.0883
	0.0060	0.0551	0.0200	0.1025
	0.0100	0.0704	0.0240	0.1200
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0086)	3.300	0.195	1.25	18.91
OUTFLOW: ID= 1 (0085)	3.300	0.007	3.33	17.50
PEAK FLOW REDUCTION [Qout/Qin](%)= 3.52				
TIME SHIFT OF PEAK FLOW (min)=125.00				
MAXIMUM STORAGE USED (ha.m.)= 0.0584				

```

-----
| ADD HYD ( 0087) |
| 1 + 2 = 3 |
-----
          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
ID1= 1 ( 0082):    11.60    0.228    2.17    15.85
+ ID2= 2 ( 0083):    4.60    0.005    4.67    16.66
=====
ID = 3 ( 0087):    16.20    0.229    2.17    16.08

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| ADD HYD ( 0087) |
| 3 + 2 = 1 |
-----
          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
ID1= 3 ( 0087):    16.20    0.229    2.17    16.08
+ ID2= 2 ( 0085):    3.30    0.007    3.33    17.50
=====
ID = 1 ( 0087):    19.50    0.234    2.17    16.32

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
*****
** SIMULATION:7                **
*****

```

```

-----
| CHICAGO STORM |
| Ptotal= 71.66 mm |
-----
IDF curve parameters: A=1735.688
                      B= 6.014
                      C= 0.820
used in: INTENSITY = A / (t + B)^C

Duration of storm = 3.00 hrs
Storm time step = 10.00 min
Time to peak ratio = 0.33

```

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	6.05	0.83	178.56	1.67	11.06	2.50	5.76
0.17	7.54	1.00	54.05	1.83	9.29	2.67	5.28
0.33	10.16	1.17	27.32	2.00	8.02	2.83	4.88
0.50	15.97	1.33	18.24	2.17	7.08		
0.67	40.65	1.50	13.74	2.33	6.35		

```

-----
| CALIB |
| NASHYD ( 0101) |
Area (ha)= 2.70 Curve Number (CN)= 69.6

```

| ID= 1 DT= 5.0 min | Ia (mm)= 5.40 # of Linear Res.(N)= 3.00
 ----- U.H. Tp(hrs)= 0.40

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	6.05	0.833	40.65	1.583	13.74	2.33	7.08
0.167	6.05	0.917	178.56	1.667	13.74	2.42	6.35
0.250	7.54	1.000	178.56	1.750	11.06	2.50	6.35
0.333	7.54	1.083	54.05	1.833	11.06	2.58	5.76
0.417	10.16	1.167	54.05	1.917	9.29	2.67	5.76
0.500	10.16	1.250	27.32	2.000	9.29	2.75	5.28
0.583	15.97	1.333	27.32	2.083	8.02	2.83	5.28
0.667	15.97	1.417	18.24	2.167	8.02	2.92	4.88
0.750	40.65	1.500	18.24	2.250	7.08	3.00	4.88

Unit Hyd Qpeak (cms)= 0.258

PEAK FLOW (cms)= 0.148 (i)
 TIME TO PEAK (hrs)= 1.417
 RUNOFF VOLUME (mm)= 24.776
 TOTAL RAINFALL (mm)= 71.665
 RUNOFF COEFFICIENT = 0.346

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

 | CALIB |
 | NASHYD (0082) | Area (ha)= 11.60 Curve Number (CN)= 63.8
 | ID= 1 DT= 5.0 min | Ia (mm)= 8.44 # of Linear Res.(N)= 3.00
 ----- U.H. Tp(hrs)= 0.89

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	6.05	0.833	40.65	1.583	13.74	2.33	7.08
0.167	6.05	0.917	178.56	1.667	13.74	2.42	6.35
0.250	7.54	1.000	178.56	1.750	11.06	2.50	6.35
0.333	7.54	1.083	54.05	1.833	11.06	2.58	5.76
0.417	10.16	1.167	54.05	1.917	9.29	2.67	5.76
0.500	10.16	1.250	27.32	2.000	9.29	2.75	5.28
0.583	15.97	1.333	27.32	2.083	8.02	2.83	5.28
0.667	15.97	1.417	18.24	2.167	8.02	2.92	4.88

0.750 40.65 | 1.500 18.24 | 2.250 7.08 | 3.00 4.88

Unit Hyd Qpeak (cms)= 0.498

PEAK FLOW (cms)= 0.279 (i)

TIME TO PEAK (hrs)= 2.083

RUNOFF VOLUME (mm)= 19.279

TOTAL RAINFALL (mm)= 71.665

RUNOFF COEFFICIENT = 0.269

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

```
-----
| CALIB |
| NASHYD ( 0084) | Area (ha)= 4.60 Curve Number (CN)= 73.0
| ID= 1 DT= 5.0 min | Ia (mm)= 4.97 # of Linear Res.(N)= 3.00
|-----| U.H. Tp(hrs)= 0.63
```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```
----- TRANSFORMED HYETOGRAPH -----
TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN
hrs mm/hr | hrs mm/hr | hrs mm/hr | hrs mm/hr
0.083 6.05 | 0.833 40.65 | 1.583 13.74 | 2.33 7.08
0.167 6.05 | 0.917 178.56 | 1.667 13.74 | 2.42 6.35
0.250 7.54 | 1.000 178.56 | 1.750 11.06 | 2.50 6.35
0.333 7.54 | 1.083 54.05 | 1.833 11.06 | 2.58 5.76
0.417 10.16 | 1.167 54.05 | 1.917 9.29 | 2.67 5.76
0.500 10.16 | 1.250 27.32 | 2.000 9.29 | 2.75 5.28
0.583 15.97 | 1.333 27.32 | 2.083 8.02 | 2.83 5.28
0.667 15.97 | 1.417 18.24 | 2.167 8.02 | 2.92 4.88
0.750 40.65 | 1.500 18.24 | 2.250 7.08 | 3.00 4.88
```

Unit Hyd Qpeak (cms)= 0.279

PEAK FLOW (cms)= 0.209 (i)

TIME TO PEAK (hrs)= 1.750

RUNOFF VOLUME (mm)= 27.690

TOTAL RAINFALL (mm)= 71.665

RUNOFF COEFFICIENT = 0.386

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

```
-----
| RESERVOIR( 0083) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min | OUTFLOW STORAGE | OUTFLOW STORAGE
```

```

-----
          (cms)      (ha.m.) |      (cms)      (ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.
          0.0010      0.0595 |      0.0100      0.1538
          0.0040      0.0952 |      0.0140      0.1780
          0.0060      0.1206 |      0.0170      0.2021

```

```

          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
INFLOW : ID= 2 ( 0084) 4.600      0.209      1.75      27.69
OUTFLOW: ID= 1 ( 0083) 4.600      0.006      4.58      20.66

```

```

PEAK FLOW REDUCTION [Qout/Qin](%)= 2.95
TIME SHIFT OF PEAK FLOW (min)=170.00
MAXIMUM STORAGE USED (ha.m.)= 0.1219

```

```

-----
| CALIB |
| NASHYD ( 0086) | Area (ha)= 3.30 Curve Number (CN)= 68.1
| ID= 1 DT= 5.0 min | Ia (mm)= 6.93 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 0.22

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```

----- TRANSFORMED HYETOGRAPH -----
TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN
hrs mm/hr | hrs mm/hr | hrs mm/hr | hrs mm/hr
0.083 6.05 | 0.833 40.65 | 1.583 13.74 | 2.33 7.08
0.167 6.05 | 0.917 178.56 | 1.667 13.74 | 2.42 6.35
0.250 7.54 | 1.000 178.56 | 1.750 11.06 | 2.50 6.35
0.333 7.54 | 1.083 54.05 | 1.833 11.06 | 2.58 5.76
0.417 10.16 | 1.167 54.05 | 1.917 9.29 | 2.67 5.76
0.500 10.16 | 1.250 27.32 | 2.000 9.29 | 2.75 5.28
0.583 15.97 | 1.333 27.32 | 2.083 8.02 | 2.83 5.28
0.667 15.97 | 1.417 18.24 | 2.167 8.02 | 2.92 4.88
0.750 40.65 | 1.500 18.24 | 2.250 7.08 | 3.00 4.88

```

Unit Hyd Qpeak (cms)= 0.573

```

PEAK FLOW (cms)= 0.237 (i)
TIME TO PEAK (hrs)= 1.167
RUNOFF VOLUME (mm)= 22.780
TOTAL RAINFALL (mm)= 71.665
RUNOFF COEFFICIENT = 0.318

```

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

```

| RESERVOIR( 0085)|      OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |      OUTFLOW    STORAGE |      OUTFLOW    STORAGE
-----            (cms)   (ha.m.) |      (cms)      (ha.m.)
      ***** WARNING : FIRST OUTFLOW IS NOT ZERO.
                        0.0020    0.0366 |      0.0160    0.0883
                        0.0060    0.0551 |      0.0200    0.1025
                        0.0100    0.0704 |      0.0240    0.1200

                        AREA      QPEAK      TPEAK      R.V.
                        (ha)      (cms)      (hrs)      (mm)
INFLOW : ID= 2 ( 0086)      3.300      0.237      1.17      22.78
OUTFLOW: ID= 1 ( 0085)      3.300      0.010      3.33      21.37

      PEAK FLOW REDUCTION [Qout/Qin](%)= 4.11
      TIME SHIFT OF PEAK FLOW      (min)=130.00
      MAXIMUM STORAGE USED      (ha.m.)= 0.0694

```

```

-----
| ADD HYD ( 0087)|
| 1 + 2 = 3      |
-----
      ID1= 1 ( 0082):      11.60    0.279    2.08    19.28
+ ID2= 2 ( 0083):      4.60    0.006    4.58    20.66
=====
      ID = 3 ( 0087):      16.20    0.281    2.17    19.67

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| ADD HYD ( 0087)|
| 3 + 2 = 1      |
-----
      ID1= 3 ( 0087):      16.20    0.281    2.17    19.67
+ ID2= 2 ( 0085):      3.30    0.010    3.33    21.37
=====
      ID = 1 ( 0087):      19.50    0.288    2.17    19.96

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 ** SIMULATION:1 **

```

-----
| CHICAGO STORM | IDF curve parameters: A= 732.951
| Ptotal= 36.86 mm | B= 6.199
-----
                        C= 0.810
used in:  INTENSITY = A / (t + B)^C

Duration of storm = 6.00 hrs
Storm time step   = 10.00 min
Time to peak ratio = 0.33

```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	'	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	1.37	1.50	7.30		3.00	3.72	4.50	1.77
0.17	1.49	1.67	18.21		3.17	3.29	4.67	1.68
0.33	1.63	1.83	76.81		3.33	2.95	4.83	1.60
0.50	1.82	2.00	24.08		3.50	2.68	5.00	1.52
0.67	2.05	2.17	12.36		3.67	2.46	5.17	1.46
0.83	2.37	2.33	8.32		3.83	2.28	5.33	1.40
1.00	2.81	2.50	6.30		4.00	2.12	5.50	1.34
1.17	3.50	2.67	5.09		4.17	1.99	5.67	1.29
1.33	4.69	2.83	4.29		4.33	1.87	5.83	1.24

```

-----
| CALIB |
| NASHYD ( 0101) | Area (ha)= 2.70 Curve Number (CN)= 69.6
| ID= 1 DT= 5.0 min | Ia (mm)= 5.40 # of Linear Res.(N)= 3.00
-----
                        U.H. Tp(hrs)= 0.40

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```

----- TRANSFORMED HYETOGRAPH -----

```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	'	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.37	1.583	7.30		3.083	3.72	4.58	1.77
0.167	1.37	1.667	7.30		3.167	3.72	4.67	1.77
0.250	1.49	1.750	18.21		3.250	3.29	4.75	1.68
0.333	1.49	1.833	18.21		3.333	3.29	4.83	1.68
0.417	1.63	1.917	76.81		3.417	2.95	4.92	1.60
0.500	1.63	2.000	76.80		3.500	2.95	5.00	1.60
0.583	1.82	2.083	24.08		3.583	2.68	5.08	1.52
0.667	1.82	2.167	24.08		3.667	2.68	5.17	1.52
0.750	2.05	2.250	12.36		3.750	2.46	5.25	1.46
0.833	2.05	2.333	12.36		3.833	2.46	5.33	1.46
0.917	2.37	2.417	8.32		3.917	2.28	5.42	1.40

1.000	2.37	2.500	8.32	4.000	2.28	5.50	1.40
1.083	2.81	2.583	6.30	4.083	2.12	5.58	1.34
1.167	2.81	2.667	6.30	4.167	2.12	5.67	1.34
1.250	3.50	2.750	5.09	4.250	1.99	5.75	1.29
1.333	3.50	2.833	5.09	4.333	1.99	5.83	1.29
1.417	4.69	2.917	4.29	4.417	1.87	5.92	1.24
1.500	4.69	3.000	4.29	4.500	1.87	6.00	1.24

Unit Hyd Qpeak (cms)= 0.258

PEAK FLOW (cms)= 0.032 (i)

TIME TO PEAK (hrs)= 2.500

RUNOFF VOLUME (mm)= 6.949

TOTAL RAINFALL (mm)= 36.860

RUNOFF COEFFICIENT = 0.189

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

CALIB			
NASHYD (0078)		Area (ha)= 11.60	Curve Number (CN)= 63.8
ID= 1 DT= 5.0 min		Ia (mm)= 8.44	# of Linear Res.(N)= 3.00
-----		U.H. Tp(hrs)= 0.89	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	1.37	1.583	7.30	3.083	3.72	4.58	1.77
0.167	1.37	1.667	7.30	3.167	3.72	4.67	1.77
0.250	1.49	1.750	18.21	3.250	3.29	4.75	1.68
0.333	1.49	1.833	18.21	3.333	3.29	4.83	1.68
0.417	1.63	1.917	76.81	3.417	2.95	4.92	1.60
0.500	1.63	2.000	76.80	3.500	2.95	5.00	1.60
0.583	1.82	2.083	24.08	3.583	2.68	5.08	1.52
0.667	1.82	2.167	24.08	3.667	2.68	5.17	1.52
0.750	2.05	2.250	12.36	3.750	2.46	5.25	1.46
0.833	2.05	2.333	12.36	3.833	2.46	5.33	1.46
0.917	2.37	2.417	8.32	3.917	2.28	5.42	1.40
1.000	2.37	2.500	8.32	4.000	2.28	5.50	1.40
1.083	2.81	2.583	6.30	4.083	2.12	5.58	1.34
1.167	2.81	2.667	6.30	4.167	2.12	5.67	1.34
1.250	3.50	2.750	5.09	4.250	1.99	5.75	1.29
1.333	3.50	2.833	5.09	4.333	1.99	5.83	1.29
1.417	4.69	2.917	4.29	4.417	1.87	5.92	1.24
1.500	4.69	3.000	4.29	4.500	1.87	6.00	1.24

Unit Hyd Qpeak (cms)= 0.498

PEAK FLOW (cms)= 0.052 (i)

TIME TO PEAK (hrs)= 3.250

RUNOFF VOLUME (mm)= 4.681

TOTAL RAINFALL (mm)= 36.860

RUNOFF COEFFICIENT = 0.127

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

```
-----
| CALIB |
| NASHYD ( 0076) | Area (ha)= 4.60 Curve Number (CN)= 73.0
| ID= 1 DT= 5.0 min | Ia (mm)= 4.97 # of Linear Res.(N)= 3.00
|-----| U.H. Tp(hrs)= 0.63
```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```
----- TRANSFORMED HYETOGRAPH -----
TIME    RAIN | TIME    RAIN | ' TIME    RAIN | TIME    RAIN
hrs      mm/hr | hrs      mm/hr | ' hrs      mm/hr | hrs      mm/hr
0.083    1.37 | 1.583    7.30 | ' 3.083    3.72 | 4.58    1.77
0.167    1.37 | 1.667    7.30 | ' 3.167    3.72 | 4.67    1.77
0.250    1.49 | 1.750   18.21 | ' 3.250    3.29 | 4.75    1.68
0.333    1.49 | 1.833   18.21 | ' 3.333    3.29 | 4.83    1.68
0.417    1.63 | 1.917   76.81 | ' 3.417    2.95 | 4.92    1.60
0.500    1.63 | 2.000   76.80 | ' 3.500    2.95 | 5.00    1.60
0.583    1.82 | 2.083   24.08 | ' 3.583    2.68 | 5.08    1.52
0.667    1.82 | 2.167   24.08 | ' 3.667    2.68 | 5.17    1.52
0.750    2.05 | 2.250   12.36 | ' 3.750    2.46 | 5.25    1.46
0.833    2.05 | 2.333   12.36 | ' 3.833    2.46 | 5.33    1.46
0.917    2.37 | 2.417    8.32 | ' 3.917    2.28 | 5.42    1.40
1.000    2.37 | 2.500    8.32 | ' 4.000    2.28 | 5.50    1.40
1.083    2.81 | 2.583    6.30 | ' 4.083    2.12 | 5.58    1.34
1.167    2.81 | 2.667    6.30 | ' 4.167    2.12 | 5.67    1.34
1.250    3.50 | 2.750    5.09 | ' 4.250    1.99 | 5.75    1.29
1.333    3.50 | 2.833    5.09 | ' 4.333    1.99 | 5.83    1.29
1.417    4.69 | 2.917    4.29 | ' 4.417    1.87 | 5.92    1.24
1.500    4.69 | 3.000    4.29 | ' 4.500    1.87 | 6.00    1.24
```

Unit Hyd Qpeak (cms)= 0.279

PEAK FLOW (cms)= 0.048 (i)

TIME TO PEAK (hrs)= 2.750

RUNOFF VOLUME (mm)= 8.081

TOTAL RAINFALL (mm)= 36.860

RUNOFF COEFFICIENT = 0.219

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

```

-----
| RESERVOIR( 0080) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
-----
      OUTFLOW    STORAGE | OUTFLOW    STORAGE
      (cms)      (ha.m.) | (cms)      (ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.
      0.0010      0.0595 | 0.0100      0.1538
      0.0040      0.0952 | 0.0140      0.1780
      0.0060      0.1206 | 0.0170      0.2021

      AREA      QPEAK      TPEAK      R.V.
      (ha)      (cms)      (hrs)      (mm)
INFLOW : ID= 2 ( 0076) 4.600      0.048      2.75      8.08
OUTFLOW: ID= 1 ( 0080) 4.600      0.001      7.75      4.79

      PEAK FLOW REDUCTION [Qout/Qin](%)= 1.27
      TIME SHIFT OF PEAK FLOW (min)=300.00
      MAXIMUM STORAGE USED (ha.m.)= 0.0362

```

```

-----
| CALIB
| NASHYD ( 0081) | Area (ha)= 3.30 Curve Number (CN)= 68.1
| ID= 1 DT= 5.0 min | Ia (mm)= 6.93 # of Linear Res.(N)= 3.00
-----
      U.H. Tp(hrs)= 0.22

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```

----- TRANSFORMED HYETOGRAPH -----
      TIME      RAIN | TIME      RAIN | TIME      RAIN | TIME      RAIN
      hrs      mm/hr | hrs      mm/hr | hrs      mm/hr | hrs      mm/hr
0.083      1.37 | 1.583      7.30 | 3.083      3.72 | 4.58      1.77
0.167      1.37 | 1.667      7.30 | 3.167      3.72 | 4.67      1.77
0.250      1.49 | 1.750     18.21 | 3.250      3.29 | 4.75      1.68
0.333      1.49 | 1.833     18.21 | 3.333      3.29 | 4.83      1.68
0.417      1.63 | 1.917     76.81 | 3.417      2.95 | 4.92      1.60
0.500      1.63 | 2.000     76.80 | 3.500      2.95 | 5.00      1.60
0.583      1.82 | 2.083     24.08 | 3.583      2.68 | 5.08      1.52
0.667      1.82 | 2.167     24.08 | 3.667      2.68 | 5.17      1.52
0.750      2.05 | 2.250     12.36 | 3.750      2.46 | 5.25      1.46
0.833      2.05 | 2.333     12.36 | 3.833      2.46 | 5.33      1.46
0.917      2.37 | 2.417      8.32 | 3.917      2.28 | 5.42      1.40
1.000      2.37 | 2.500      8.32 | 4.000      2.28 | 5.50      1.40
1.083      2.81 | 2.583      6.30 | 4.083      2.12 | 5.58      1.34
1.167      2.81 | 2.667      6.30 | 4.167      2.12 | 5.67      1.34
1.250      3.50 | 2.750      5.09 | 4.250      1.99 | 5.75      1.29

```

1.333	3.50	2.833	5.09	4.333	1.99	5.83	1.29
1.417	4.69	2.917	4.29	4.417	1.87	5.92	1.24
1.500	4.69	3.000	4.29	4.500	1.87	6.00	1.24

Unit Hyd Qpeak (cms)= 0.573

PEAK FLOW (cms)= 0.046 (i)

TIME TO PEAK (hrs)= 2.250

RUNOFF VOLUME (mm)= 6.008

TOTAL RAINFALL (mm)= 36.860

RUNOFF COEFFICIENT = 0.163

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

```

-----
| RESERVOIR( 0077) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
-----
      OUTFLOW   STORAGE   |   OUTFLOW   STORAGE
      (cms)     (ha.m.)   |   (cms)     (ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.
      0.0020     0.0366   |   0.0160     0.0883
      0.0060     0.0551   |   0.0200     0.1025
      0.0100     0.0704   |   0.0240     0.1200

                        AREA   QPEAK   TPEAK   R.V.
                        (ha)   (cms)   (hrs)   (mm)
INFLOW : ID= 2 ( 0081)   3.300   0.046   2.25   6.01
OUTFLOW: ID= 1 ( 0077)   3.300   0.001   6.42   4.60

      PEAK FLOW REDUCTION [Qout/Qin](%)= 2.20
      TIME SHIFT OF PEAK FLOW           (min)=250.00
      MAXIMUM STORAGE USED              (ha.m.)= 0.0186

```

```

-----
| ADD HYD ( 0079) |
| 1 + 2 = 3       |
-----
      ID1= 1 ( 0077):   3.30   0.001   6.42   4.60
+ ID2= 2 ( 0078):   11.60   0.052   3.25   4.68
=====
      ID = 3 ( 0079):   14.90   0.053   3.25   4.66

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| ADD HYD ( 0079) |

```

3 + 2 = 1	AREA	QPEAK	TPEAK	R.V.
-----	(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0079):	14.90	0.053	3.25	4.66
+ ID2= 2 (0080):	4.60	0.001	7.75	4.79
=====				
ID = 1 (0079):	19.50	0.053	3.25	4.69

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 ** SIMULATION:2 **

CHICAGO STORM	IDF curve parameters: A= 998.071
Ptotal= 49.04 mm	B= 6.053
-----	C= 0.814

used in: INTENSITY = A / (t + B)^C

Duration of storm = 6.00 hrs
 Storm time step = 10.00 min
 Time to peak ratio = 0.33

TIME	RAIN	TIME	RAIN	'	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	'	hrs	mm/hr	hrs	mm/hr
0.00	1.78	1.50	9.61	'	3.00	4.87	4.50	2.31
0.17	1.94	1.67	24.17	'	3.17	4.30	4.67	2.19
0.33	2.13	1.83	104.19	'	3.33	3.86	4.83	2.08
0.50	2.37	2.00	32.04	'	3.50	3.51	5.00	1.99
0.67	2.68	2.17	16.34	'	3.67	3.22	5.17	1.90
0.83	3.10	2.33	10.96	'	3.83	2.98	5.33	1.82
1.00	3.68	2.50	8.29	'	4.00	2.77	5.50	1.75
1.17	4.58	2.67	6.69	'	4.17	2.60	5.67	1.68
1.33	6.15	2.83	5.63	'	4.33	2.44	5.83	1.62

CALIB	
NASHYD (0101)	Area (ha)= 2.70 Curve Number (CN)= 69.6
ID= 1 DT= 5.0 min	Ia (mm)= 5.40 # of Linear Res.(N)= 3.00
-----	U.H. Tp(hrs)= 0.40

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----

TIME	RAIN	TIME	RAIN	'	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	'	hrs	mm/hr	hrs	mm/hr
0.083	1.78	1.583	9.61	'	3.083	4.87	4.58	2.31
0.167	1.78	1.667	9.61	'	3.167	4.87	4.67	2.31

0.250	1.94	1.750	24.17	3.250	4.30	4.75	2.19
0.333	1.94	1.833	24.17	3.333	4.30	4.83	2.19
0.417	2.13	1.917	104.19	3.417	3.86	4.92	2.08
0.500	2.13	2.000	104.19	3.500	3.86	5.00	2.08
0.583	2.37	2.083	32.04	3.583	3.51	5.08	1.99
0.667	2.37	2.167	32.04	3.667	3.51	5.17	1.99
0.750	2.68	2.250	16.34	3.750	3.22	5.25	1.90
0.833	2.68	2.333	16.34	3.833	3.22	5.33	1.90
0.917	3.10	2.417	10.96	3.917	2.98	5.42	1.82
1.000	3.10	2.500	10.96	4.000	2.98	5.50	1.82
1.083	3.68	2.583	8.29	4.083	2.77	5.58	1.75
1.167	3.68	2.667	8.29	4.167	2.77	5.67	1.75
1.250	4.58	2.750	6.69	4.250	2.60	5.75	1.68
1.333	4.58	2.833	6.69	4.333	2.60	5.83	1.68
1.417	6.15	2.917	5.63	4.417	2.44	5.92	1.62
1.500	6.15	3.000	5.63	4.500	2.44	6.00	1.62

Unit Hyd Qpeak (cms)= 0.258

PEAK FLOW (cms)= 0.060 (i)

TIME TO PEAK (hrs)= 2.417

RUNOFF VOLUME (mm)= 12.317

TOTAL RAINFALL (mm)= 49.038

RUNOFF COEFFICIENT = 0.251

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

```

-----
| CALIB |
| NASHYD ( 0078) | Area (ha)= 11.60 Curve Number (CN)= 63.8
| ID= 1 DT= 5.0 min | Ia (mm)= 8.44 # of Linear Res.(N)= 3.00
|-----| U.H. Tp(hrs)= 0.89

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	1.78	1.583	9.61	3.083	4.87	4.58	2.31
0.167	1.78	1.667	9.61	3.167	4.87	4.67	2.31
0.250	1.94	1.750	24.17	3.250	4.30	4.75	2.19
0.333	1.94	1.833	24.17	3.333	4.30	4.83	2.19
0.417	2.13	1.917	104.19	3.417	3.86	4.92	2.08
0.500	2.13	2.000	104.19	3.500	3.86	5.00	2.08
0.583	2.37	2.083	32.04	3.583	3.51	5.08	1.99
0.667	2.37	2.167	32.04	3.667	3.51	5.17	1.99
0.750	2.68	2.250	16.34	3.750	3.22	5.25	1.90
0.833	2.68	2.333	16.34	3.833	3.22	5.33	1.90

0.917	3.10	2.417	10.96	3.917	2.98	5.42	1.82
1.000	3.10	2.500	10.96	4.000	2.98	5.50	1.82
1.083	3.68	2.583	8.29	4.083	2.77	5.58	1.75
1.167	3.68	2.667	8.29	4.167	2.77	5.67	1.75
1.250	4.58	2.750	6.69	4.250	2.60	5.75	1.68
1.333	4.58	2.833	6.69	4.333	2.60	5.83	1.68
1.417	6.15	2.917	5.63	4.417	2.44	5.92	1.62
1.500	6.15	3.000	5.63	4.500	2.44	6.00	1.62

Unit Hyd Qpeak (cms)= 0.498

PEAK FLOW (cms)= 0.104 (i)

TIME TO PEAK (hrs)= 3.167

RUNOFF VOLUME (mm)= 8.923

TOTAL RAINFALL (mm)= 49.038

RUNOFF COEFFICIENT = 0.182

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

CALIB			
NASHYD (0076)			
ID= 1 DT= 5.0 min			

Area (ha)= 4.60		Curve Number (CN)= 73.0	
Ia (mm)= 4.97		# of Linear Res.(N)= 3.00	
U.H. Tp(hrs)= 0.63			

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	1.78	1.583	9.61	3.083	4.87	4.58	2.31
0.167	1.78	1.667	9.61	3.167	4.87	4.67	2.31
0.250	1.94	1.750	24.17	3.250	4.30	4.75	2.19
0.333	1.94	1.833	24.17	3.333	4.30	4.83	2.19
0.417	2.13	1.917	104.19	3.417	3.86	4.92	2.08
0.500	2.13	2.000	104.19	3.500	3.86	5.00	2.08
0.583	2.37	2.083	32.04	3.583	3.51	5.08	1.99
0.667	2.37	2.167	32.04	3.667	3.51	5.17	1.99
0.750	2.68	2.250	16.34	3.750	3.22	5.25	1.90
0.833	2.68	2.333	16.34	3.833	3.22	5.33	1.90
0.917	3.10	2.417	10.96	3.917	2.98	5.42	1.82
1.000	3.10	2.500	10.96	4.000	2.98	5.50	1.82
1.083	3.68	2.583	8.29	4.083	2.77	5.58	1.75
1.167	3.68	2.667	8.29	4.167	2.77	5.67	1.75
1.250	4.58	2.750	6.69	4.250	2.60	5.75	1.68
1.333	4.58	2.833	6.69	4.333	2.60	5.83	1.68
1.417	6.15	2.917	5.63	4.417	2.44	5.92	1.62
1.500	6.15	3.000	5.63	4.500	2.44	6.00	1.62

Unit Hyd Qpeak (cms)= 0.279

PEAK FLOW (cms)= 0.087 (i)

TIME TO PEAK (hrs)= 2.750

RUNOFF VOLUME (mm)= 14.070

TOTAL RAINFALL (mm)= 49.038

RUNOFF COEFFICIENT = 0.287

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

```
-----
| RESERVOIR( 0080) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
-----
          OUTFLOW   STORAGE | OUTFLOW   STORAGE
          (cms)    (ha.m.) | (cms)    (ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.
          0.0010    0.0595 | 0.0100    0.1538
          0.0040    0.0952 | 0.0140    0.1780
          0.0060    0.1206 | 0.0170    0.2021

          AREA      QPEAK    TPEAK      R.V.
          (ha)      (cms)    (hrs)      (mm)
INFLOW : ID= 2 ( 0076) 4.600    0.087    2.75    14.07
OUTFLOW: ID= 1 ( 0080) 4.600    0.001    7.58    8.86

          PEAK FLOW REDUCTION [Qout/Qin](%)= 1.47
          TIME SHIFT OF PEAK FLOW (min)=290.00
          MAXIMUM STORAGE USED (ha.m.)= 0.0629
-----
```

```
-----
| CALIB          |
| NASHYD ( 0081) | Area (ha)= 3.30 Curve Number (CN)= 68.1
| ID= 1 DT= 5.0 min | Ia (mm)= 6.93 # of Linear Res.(N)= 3.00
-----
          U.H. Tp(hrs)= 0.22
-----
```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```
----- TRANSFORMED HYETOGRAPH -----
TIME    RAIN | TIME    RAIN | TIME    RAIN | TIME    RAIN
hrs     mm/hr | hrs     mm/hr | hrs     mm/hr | hrs     mm/hr
0.083   1.78 | 1.583   9.61 | 3.083   4.87 | 4.58   2.31
0.167   1.78 | 1.667   9.61 | 3.167   4.87 | 4.67   2.31
0.250   1.94 | 1.750  24.17 | 3.250   4.30 | 4.75   2.19
0.333   1.94 | 1.833  24.17 | 3.333   4.30 | 4.83   2.19
0.417   2.13 | 1.917 104.19 | 3.417   3.86 | 4.92   2.08
0.500   2.13 | 2.000 104.19 | 3.500   3.86 | 5.00   2.08
```

0.583	2.37	2.083	32.04	3.583	3.51	5.08	1.99
0.667	2.37	2.167	32.04	3.667	3.51	5.17	1.99
0.750	2.68	2.250	16.34	3.750	3.22	5.25	1.90
0.833	2.68	2.333	16.34	3.833	3.22	5.33	1.90
0.917	3.10	2.417	10.96	3.917	2.98	5.42	1.82
1.000	3.10	2.500	10.96	4.000	2.98	5.50	1.82
1.083	3.68	2.583	8.29	4.083	2.77	5.58	1.75
1.167	3.68	2.667	8.29	4.167	2.77	5.67	1.75
1.250	4.58	2.750	6.69	4.250	2.60	5.75	1.68
1.333	4.58	2.833	6.69	4.333	2.60	5.83	1.68
1.417	6.15	2.917	5.63	4.417	2.44	5.92	1.62
1.500	6.15	3.000	5.63	4.500	2.44	6.00	1.62

Unit Hyd Qpeak (cms)= 0.573

PEAK FLOW (cms)= 0.091 (i)

TIME TO PEAK (hrs)= 2.250

RUNOFF VOLUME (mm)= 10.992

TOTAL RAINFALL (mm)= 49.038

RUNOFF COEFFICIENT = 0.224

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

```

-----
| RESERVOIR( 0077) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
-----
          OUTFLOW   STORAGE   |   OUTFLOW   STORAGE
          (cms)     (ha.m.)   |   (cms)     (ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.
          0.0020     0.0366   |   0.0160     0.0883
          0.0060     0.0551   |   0.0200     0.1025
          0.0100     0.0704   |   0.0240     0.1200

          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
INFLOW : ID= 2 ( 0081)  3.300      0.091      2.25      10.99
OUTFLOW: ID= 1 ( 0077)  3.300      0.002      6.42      9.58

          PEAK FLOW REDUCTION [Qout/Qin](%)= 2.03
          TIME SHIFT OF PEAK FLOW (min)=250.00
          MAXIMUM STORAGE USED (ha.m.)= 0.0339

```

```

-----
| ADD HYD ( 0079) |
| 1 + 2 = 3       |
-----
          ID1= 1 ( 0077):
          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
          3.30      0.002      6.42      9.58

```

```

+ ID2= 2 ( 0078):    11.60    0.104    3.17    8.92
=====
ID = 3 ( 0079):    14.90    0.105    3.17    9.07

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| ADD HYD ( 0079) |
| 3 + 2 = 1 |
-----
          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
ID1= 3 ( 0079):    14.90    0.105    3.17    9.07
+ ID2= 2 ( 0080):    4.60    0.001    7.58    8.86
=====
ID = 1 ( 0079):    19.50    0.106    3.17    9.02

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

*****
** SIMULATION:3          **
*****

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-----
| CHICAGO STORM |
| Ptotal= 57.02 mm |
-----
          IDF curve parameters: A=1174.184
                                   B= 6.014
                                   C= 0.816
          used in:  INTENSITY = A / (t + B)^C

          Duration of storm = 6.00 hrs
          Storm time step   = 10.00 min
          Time to peak ratio = 0.33

```

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	2.05	1.50	11.13	3.00	5.63	4.50	2.66
0.17	2.23	1.67	28.10	3.17	4.97	4.67	2.52
0.33	2.45	1.83	122.14	3.33	4.46	4.83	2.40
0.50	2.73	2.00	37.28	3.50	4.05	5.00	2.29
0.67	3.09	2.17	18.95	3.67	3.71	5.17	2.19
0.83	3.57	2.33	12.70	3.83	3.43	5.33	2.09
1.00	4.25	2.50	9.59	4.00	3.20	5.50	2.01
1.17	5.29	2.67	7.73	4.17	2.99	5.67	1.94
1.33	7.11	2.83	6.50	4.33	2.81	5.83	1.87

```

-----
| CALIB
| NASHYD ( 0101) |
| ID= 1 DT= 5.0 min |
-----
          Area      (ha)= 2.70  Curve Number (CN)= 69.6
          Ia        (mm)= 5.40  # of Linear Res.(N)= 3.00
          U.H. Tp(hrs)= 0.40

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	2.05	1.583	11.13	3.083	5.63	4.58	2.66
0.167	2.05	1.667	11.13	3.167	5.63	4.67	2.66
0.250	2.23	1.750	28.10	3.250	4.97	4.75	2.52
0.333	2.23	1.833	28.10	3.333	4.97	4.83	2.52
0.417	2.45	1.917	122.14	3.417	4.46	4.92	2.40
0.500	2.45	2.000	122.14	3.500	4.46	5.00	2.40
0.583	2.73	2.083	37.28	3.583	4.05	5.08	2.29
0.667	2.73	2.167	37.28	3.667	4.05	5.17	2.29
0.750	3.09	2.250	18.95	3.750	3.71	5.25	2.19
0.833	3.09	2.333	18.95	3.833	3.71	5.33	2.19
0.917	3.57	2.417	12.70	3.917	3.43	5.42	2.09
1.000	3.57	2.500	12.70	4.000	3.43	5.50	2.09
1.083	4.25	2.583	9.59	4.083	3.20	5.58	2.01
1.167	4.25	2.667	9.59	4.167	3.20	5.67	2.01
1.250	5.29	2.750	7.73	4.250	2.99	5.75	1.94
1.333	5.29	2.833	7.73	4.333	2.99	5.83	1.94
1.417	7.11	2.917	6.50	4.417	2.81	5.92	1.87
1.500	7.11	3.000	6.50	4.500	2.81	6.00	1.87

Unit Hyd Qpeak (cms)= 0.258

PEAK FLOW (cms)= 0.082 (i)

TIME TO PEAK (hrs)= 2.417

RUNOFF VOLUME (mm)= 16.388

TOTAL RAINFALL (mm)= 57.019

RUNOFF COEFFICIENT = 0.287

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

CALIB			
NASHYD (0078)	Area (ha)= 11.60	Curve Number (CN)= 63.8	
ID= 1 DT= 5.0 min	Ia (mm)= 8.44	# of Linear Res.(N)= 3.00	
-----	U.H. Tp(hrs)= 0.89		

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	2.05	1.583	11.13	3.083	5.63	4.58	2.66

0.167	2.05	1.667	11.13	3.167	5.63	4.67	2.66
0.250	2.23	1.750	28.10	3.250	4.97	4.75	2.52
0.333	2.23	1.833	28.10	3.333	4.97	4.83	2.52
0.417	2.45	1.917	122.14	3.417	4.46	4.92	2.40
0.500	2.45	2.000	122.14	3.500	4.46	5.00	2.40
0.583	2.73	2.083	37.28	3.583	4.05	5.08	2.29
0.667	2.73	2.167	37.28	3.667	4.05	5.17	2.29
0.750	3.09	2.250	18.95	3.750	3.71	5.25	2.19
0.833	3.09	2.333	18.95	3.833	3.71	5.33	2.19
0.917	3.57	2.417	12.70	3.917	3.43	5.42	2.09
1.000	3.57	2.500	12.70	4.000	3.43	5.50	2.09
1.083	4.25	2.583	9.59	4.083	3.20	5.58	2.01
1.167	4.25	2.667	9.59	4.167	3.20	5.67	2.01
1.250	5.29	2.750	7.73	4.250	2.99	5.75	1.94
1.333	5.29	2.833	7.73	4.333	2.99	5.83	1.94
1.417	7.11	2.917	6.50	4.417	2.81	5.92	1.87
1.500	7.11	3.000	6.50	4.500	2.81	6.00	1.87

Unit Hyd Qpeak (cms)= 0.498

PEAK FLOW (cms)= 0.146 (i)
TIME TO PEAK (hrs)= 3.167
RUNOFF VOLUME (mm)= 12.246
TOTAL RAINFALL (mm)= 57.019
RUNOFF COEFFICIENT = 0.215

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

```

-----
| CALIB |
| NASHYD ( 0076) | Area (ha)= 4.60 Curve Number (CN)= 73.0
| ID= 1 DT= 5.0 min | Ia (mm)= 4.97 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 0.63

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	2.05	1.583	11.13	3.083	5.63	4.58	2.66
0.167	2.05	1.667	11.13	3.167	5.63	4.67	2.66
0.250	2.23	1.750	28.10	3.250	4.97	4.75	2.52
0.333	2.23	1.833	28.10	3.333	4.97	4.83	2.52
0.417	2.45	1.917	122.14	3.417	4.46	4.92	2.40
0.500	2.45	2.000	122.14	3.500	4.46	5.00	2.40
0.583	2.73	2.083	37.28	3.583	4.05	5.08	2.29
0.667	2.73	2.167	37.28	3.667	4.05	5.17	2.29
0.750	3.09	2.250	18.95	3.750	3.71	5.25	2.19

0.833	3.09	2.333	18.95	3.833	3.71	5.33	2.19
0.917	3.57	2.417	12.70	3.917	3.43	5.42	2.09
1.000	3.57	2.500	12.70	4.000	3.43	5.50	2.09
1.083	4.25	2.583	9.59	4.083	3.20	5.58	2.01
1.167	4.25	2.667	9.59	4.167	3.20	5.67	2.01
1.250	5.29	2.750	7.73	4.250	2.99	5.75	1.94
1.333	5.29	2.833	7.73	4.333	2.99	5.83	1.94
1.417	7.11	2.917	6.50	4.417	2.81	5.92	1.87
1.500	7.11	3.000	6.50	4.500	2.81	6.00	1.87

Unit Hyd Qpeak (cms)= 0.279

PEAK FLOW (cms)= 0.117 (i)

TIME TO PEAK (hrs)= 2.750

RUNOFF VOLUME (mm)= 18.555

TOTAL RAINFALL (mm)= 57.019

RUNOFF COEFFICIENT = 0.325

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

```

-----
| RESERVOIR( 0080) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
-----
      OUTFLOW   STORAGE   | OUTFLOW   STORAGE
      (cms)     (ha.m.)   | (cms)     (ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.
      0.0010     0.0595   | 0.0100     0.1538
      0.0040     0.0952   | 0.0140     0.1780
      0.0060     0.1206   | 0.0170     0.2021

                        AREA   QPEAK   TPEAK   R.V.
                        (ha)   (cms)   (hrs)   (mm)
INFLOW : ID= 2 ( 0076)  4.600   0.117   2.75   18.56
OUTFLOW: ID= 1 ( 0080)  4.600   0.003   7.33   12.45

```

PEAK FLOW REDUCTION [Qout/Qin](%)= 2.44
 TIME SHIFT OF PEAK FLOW (min)=275.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0818

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-----
| CALIB           |
| NASHYD ( 0081) | Area (ha)= 3.30 Curve Number (CN)= 68.1
| ID= 1 DT= 5.0 min | Ia (mm)= 6.93 # of Linear Res.(N)= 3.00
-----
                        U.H. Tp(hrs)= 0.22

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	2.05	1.583	11.13	3.083	5.63	4.58	2.66
0.167	2.05	1.667	11.13	3.167	5.63	4.67	2.66
0.250	2.23	1.750	28.10	3.250	4.97	4.75	2.52
0.333	2.23	1.833	28.10	3.333	4.97	4.83	2.52
0.417	2.45	1.917	122.14	3.417	4.46	4.92	2.40
0.500	2.45	2.000	122.14	3.500	4.46	5.00	2.40
0.583	2.73	2.083	37.28	3.583	4.05	5.08	2.29
0.667	2.73	2.167	37.28	3.667	4.05	5.17	2.29
0.750	3.09	2.250	18.95	3.750	3.71	5.25	2.19
0.833	3.09	2.333	18.95	3.833	3.71	5.33	2.19
0.917	3.57	2.417	12.70	3.917	3.43	5.42	2.09
1.000	3.57	2.500	12.70	4.000	3.43	5.50	2.09
1.083	4.25	2.583	9.59	4.083	3.20	5.58	2.01
1.167	4.25	2.667	9.59	4.167	3.20	5.67	2.01
1.250	5.29	2.750	7.73	4.250	2.99	5.75	1.94
1.333	5.29	2.833	7.73	4.333	2.99	5.83	1.94
1.417	7.11	2.917	6.50	4.417	2.81	5.92	1.87
1.500	7.11	3.000	6.50	4.500	2.81	6.00	1.87

Unit Hyd Qpeak (cms)= 0.573

PEAK FLOW (cms)= 0.127 (i)

TIME TO PEAK (hrs)= 2.250

RUNOFF VOLUME (mm)= 14.820

TOTAL RAINFALL (mm)= 57.019

RUNOFF COEFFICIENT = 0.260

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

-----		OVERFLOW IS OFF			
RESERVOIR(0077)					
IN= 2---> OUT= 1					
DT= 5.0 min					
-----		OUTFLOW	STORAGE	OUTFLOW	STORAGE
		(cms)	(ha.m.)	(cms)	(ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.					
		0.0020	0.0366	0.0160	0.0883
		0.0060	0.0551	0.0200	0.1025
		0.0100	0.0704	0.0240	0.1200
		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (0081)		3.300	0.127	2.25	14.82
OUTFLOW: ID= 1 (0077)		3.300	0.004	6.25	13.41

PEAK FLOW REDUCTION [Qout/Qin](%)= 3.00

TIME SHIFT OF PEAK FLOW (min)=240.00

MAXIMUM STORAGE USED (ha.m.)= 0.0449

```
-----
| ADD HYD ( 0079) |
| 1 + 2 = 3 |
-----
          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
ID1= 1 ( 0077):    3.30    0.004    6.25    13.41
+ ID2= 2 ( 0078):   11.60    0.146    3.17    12.25
=====
ID = 3 ( 0079):   14.90    0.148    3.17    12.50
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
| ADD HYD ( 0079) |
| 3 + 2 = 1 |
-----
          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
ID1= 3 ( 0079):   14.90    0.148    3.17    12.50
+ ID2= 2 ( 0080):    4.60    0.003    7.33    12.45
=====
ID = 1 ( 0079):   19.50    0.148    3.17    12.49
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
*****
** SIMULATION:4 **
*****
```

```
-----
| CHICAGO STORM | IDF curve parameters: A=1402.884
| Ptotal= 66.93 mm | B= 6.018
| | C= 0.819
-----
used in: INTENSITY = A / (t + B)^C

Duration of storm = 6.00 hrs
Storm time step = 10.00 min
Time to peak ratio = 0.33
```

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	2.37	1.50	13.01	3.00	6.54	4.50	3.08
0.17	2.58	1.67	33.04	3.17	5.78	4.67	2.92
0.33	2.84	1.83	144.69	3.33	5.18	4.83	2.77
0.50	3.17	2.00	43.90	3.50	4.70	5.00	2.65
0.67	3.58	2.17	22.22	3.67	4.31	5.17	2.53
0.83	4.14	2.33	14.85	3.83	3.98	5.33	2.42
1.00	4.93	2.50	11.19	4.00	3.71	5.50	2.33
1.17	6.15	2.67	9.01	4.17	3.47	5.67	2.24

1.33 8.28 | 2.83 7.57 | 4.33 3.26 | 5.83 2.16

```

-----
| CALIB                                     |
| NASHYD   ( 0101) | Area   (ha)= 2.70   Curve Number   (CN)= 69.6
| ID= 1 DT= 5.0 min | Ia     (mm)= 5.40   # of Linear Res.(N)= 3.00
-----
|                                     |
|                                     | U.H. Tp(hrs)= 0.40
|                                     |

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```

----- TRANSFORMED HYETOGRAPH -----

```

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	2.37	1.583	13.01	3.083	6.54	4.58	3.08
0.167	2.37	1.667	13.01	3.167	6.54	4.67	3.08
0.250	2.58	1.750	33.04	3.250	5.78	4.75	2.92
0.333	2.58	1.833	33.04	3.333	5.78	4.83	2.92
0.417	2.84	1.917	144.69	3.417	5.18	4.92	2.77
0.500	2.84	2.000	144.69	3.500	5.18	5.00	2.77
0.583	3.17	2.083	43.90	3.583	4.70	5.08	2.65
0.667	3.17	2.167	43.90	3.667	4.70	5.17	2.65
0.750	3.58	2.250	22.22	3.750	4.31	5.25	2.53
0.833	3.58	2.333	22.22	3.833	4.31	5.33	2.53
0.917	4.14	2.417	14.85	3.917	3.98	5.42	2.42
1.000	4.14	2.500	14.85	4.000	3.98	5.50	2.42
1.083	4.93	2.583	11.19	4.083	3.71	5.58	2.33
1.167	4.93	2.667	11.19	4.167	3.71	5.67	2.33
1.250	6.15	2.750	9.01	4.250	3.47	5.75	2.24
1.333	6.15	2.833	9.01	4.333	3.47	5.83	2.24
1.417	8.28	2.917	7.57	4.417	3.26	5.92	2.16
1.500	8.28	3.000	7.57	4.500	3.26	6.00	2.16

Unit Hyd Qpeak (cms)= 0.258

PEAK FLOW (cms)= 0.112 (i)

TIME TO PEAK (hrs)= 2.417

RUNOFF VOLUME (mm)= 21.947

TOTAL RAINFALL (mm)= 66.928

RUNOFF COEFFICIENT = 0.328

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

```

-----
| CALIB                                     |
| NASHYD   ( 0078) | Area   (ha)= 11.60   Curve Number   (CN)= 63.8
| ID= 1 DT= 5.0 min | Ia     (mm)= 8.44   # of Linear Res.(N)= 3.00

```

----- U.H. Tp(hrs)= 0.89

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	2.37	1.583	13.01	3.083	6.54	4.58	3.08
0.167	2.37	1.667	13.01	3.167	6.54	4.67	3.08
0.250	2.58	1.750	33.04	3.250	5.78	4.75	2.92
0.333	2.58	1.833	33.04	3.333	5.78	4.83	2.92
0.417	2.84	1.917	144.69	3.417	5.18	4.92	2.77
0.500	2.84	2.000	144.69	3.500	5.18	5.00	2.77
0.583	3.17	2.083	43.90	3.583	4.70	5.08	2.65
0.667	3.17	2.167	43.90	3.667	4.70	5.17	2.65
0.750	3.58	2.250	22.22	3.750	4.31	5.25	2.53
0.833	3.58	2.333	22.22	3.833	4.31	5.33	2.53
0.917	4.14	2.417	14.85	3.917	3.98	5.42	2.42
1.000	4.14	2.500	14.85	4.000	3.98	5.50	2.42
1.083	4.93	2.583	11.19	4.083	3.71	5.58	2.33
1.167	4.93	2.667	11.19	4.167	3.71	5.67	2.33
1.250	6.15	2.750	9.01	4.250	3.47	5.75	2.24
1.333	6.15	2.833	9.01	4.333	3.47	5.83	2.24
1.417	8.28	2.917	7.57	4.417	3.26	5.92	2.16
1.500	8.28	3.000	7.57	4.500	3.26	6.00	2.16

Unit Hyd Qpeak (cms)= 0.498

PEAK FLOW (cms)= 0.205 (i)

TIME TO PEAK (hrs)= 3.083

RUNOFF VOLUME (mm)= 16.884

TOTAL RAINFALL (mm)= 66.928

RUNOFF COEFFICIENT = 0.252

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

CALIB			
NASHYD (0076)	Area (ha)=	4.60	Curve Number (CN)= 73.0
ID= 1 DT= 5.0 min	Ia (mm)=	4.97	# of Linear Res.(N)= 3.00
-----		U.H. Tp(hrs)=	0.63

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr

0.083	2.37	1.583	13.01	3.083	6.54	4.58	3.08
0.167	2.37	1.667	13.01	3.167	6.54	4.67	3.08
0.250	2.58	1.750	33.04	3.250	5.78	4.75	2.92
0.333	2.58	1.833	33.04	3.333	5.78	4.83	2.92
0.417	2.84	1.917	144.69	3.417	5.18	4.92	2.77
0.500	2.84	2.000	144.69	3.500	5.18	5.00	2.77
0.583	3.17	2.083	43.90	3.583	4.70	5.08	2.65
0.667	3.17	2.167	43.90	3.667	4.70	5.17	2.65
0.750	3.58	2.250	22.22	3.750	4.31	5.25	2.53
0.833	3.58	2.333	22.22	3.833	4.31	5.33	2.53
0.917	4.14	2.417	14.85	3.917	3.98	5.42	2.42
1.000	4.14	2.500	14.85	4.000	3.98	5.50	2.42
1.083	4.93	2.583	11.19	4.083	3.71	5.58	2.33
1.167	4.93	2.667	11.19	4.167	3.71	5.67	2.33
1.250	6.15	2.750	9.01	4.250	3.47	5.75	2.24
1.333	6.15	2.833	9.01	4.333	3.47	5.83	2.24
1.417	8.28	2.917	7.57	4.417	3.26	5.92	2.16
1.500	8.28	3.000	7.57	4.500	3.26	6.00	2.16

Unit Hyd Qpeak (cms)= 0.279

PEAK FLOW (cms)= 0.159 (i)

TIME TO PEAK (hrs)= 2.750

RUNOFF VOLUME (mm)= 24.622

TOTAL RAINFALL (mm)= 66.928

RUNOFF COEFFICIENT = 0.368

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

RESERVOIR(0080)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW	STORAGE	OUTFLOW	STORAGE
-----	(cms)	(ha.m.)	(cms)	(ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.				
	0.0010	0.0595	0.0100	0.1538
	0.0040	0.0952	0.0140	0.1780
	0.0060	0.1206	0.0170	0.2021
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (0076)	4.600	0.159	2.75	24.62
OUTFLOW: ID= 1 (0080)	4.600	0.005	7.17	17.80
PEAK FLOW REDUCTION [Qout/Qin](%)= 3.09				
TIME SHIFT OF PEAK FLOW (min)=265.00				
MAXIMUM STORAGE USED (ha.m.)= 0.1069				

```

-----
| CALIB |
| NASHYD ( 0081) | Area (ha)= 3.30 Curve Number (CN)= 68.1
| ID= 1 DT= 5.0 min | Ia (mm)= 6.93 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 0.22

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```

----- TRANSFORMED HYETOGRAPH -----

```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	2.37	1.583	13.01	3.083	6.54	4.58	3.08
0.167	2.37	1.667	13.01	3.167	6.54	4.67	3.08
0.250	2.58	1.750	33.04	3.250	5.78	4.75	2.92
0.333	2.58	1.833	33.04	3.333	5.78	4.83	2.92
0.417	2.84	1.917	144.69	3.417	5.18	4.92	2.77
0.500	2.84	2.000	144.69	3.500	5.18	5.00	2.77
0.583	3.17	2.083	43.90	3.583	4.70	5.08	2.65
0.667	3.17	2.167	43.90	3.667	4.70	5.17	2.65
0.750	3.58	2.250	22.22	3.750	4.31	5.25	2.53
0.833	3.58	2.333	22.22	3.833	4.31	5.33	2.53
0.917	4.14	2.417	14.85	3.917	3.98	5.42	2.42
1.000	4.14	2.500	14.85	4.000	3.98	5.50	2.42
1.083	4.93	2.583	11.19	4.083	3.71	5.58	2.33
1.167	4.93	2.667	11.19	4.167	3.71	5.67	2.33
1.250	6.15	2.750	9.01	4.250	3.47	5.75	2.24
1.333	6.15	2.833	9.01	4.333	3.47	5.83	2.24
1.417	8.28	2.917	7.57	4.417	3.26	5.92	2.16
1.500	8.28	3.000	7.57	4.500	3.26	6.00	2.16

Unit Hyd Qpeak (cms)= 0.573

PEAK FLOW (cms)= 0.178 (i)

TIME TO PEAK (hrs)= 2.167

RUNOFF VOLUME (mm)= 20.086

TOTAL RAINFALL (mm)= 66.928

RUNOFF COEFFICIENT = 0.300

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

```

-----
| RESERVOIR( 0077) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min |
-----

```

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0020	0.0366	0.0160	0.0883
0.0060	0.0551	0.0200	0.1025

**** WARNING : FIRST OUTFLOW IS NOT ZERO.

INFLOW : ID= 2 (0081)

OUTFLOW: ID= 1 (0077)

TIME SHIFT OF PEAK FLOW

MAXIMUM STORAGE USED

| ADD HYD (0079) |

$$1 + 2 = 3$$

ID1= 1 (0077):

+ ID2= 2 (0078):

ID = 3 (0079):

AREA	QPEAK	TPEAK	R.V.
(ha)	(cms)	(hrs)	(mm)

3.30 0.007 6.17 18.68

11.60 0.205 3.08 16.88

14.90 0.209 3.17 17.28

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0079) |

$$3 + 2 = 1$$

ID1= 3 (0079):

+ ID2= 2 (0080):

ID = 1 (0079):

AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
--------------	----------------	----------------	--------------

14.90 0.209 3.17 17.28

4.60 0.005 7.17 17.80

19.50 0.210 3.17 17.40

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
** SIMULATION:5
```

| CHICAGO STORM |

Ptotal= 74.44 mm

IDF curve parameters: A=1569.580

B= 6.014

C= 0.820

used in: $INTENSITY = A / (t + B)^C$

Duration of storm = 6.00 hrs

Storm time step = 10.00 min

Time to peak ratio = 0.33

```
TIME    RAIN |  TIME    RAIN | '  TIME    RAIN |  TIME    RAIN
```

hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	2.63	1.50	14.44	3.00	7.26	4.50	3.41
0.17	2.86	1.67	36.76	3.17	6.40	4.67	3.23
0.33	3.15	1.83	161.47	3.33	5.74	4.83	3.07
0.50	3.51	2.00	48.88	3.50	5.21	5.00	2.93
0.67	3.97	2.17	24.70	3.67	4.77	5.17	2.80
0.83	4.59	2.33	16.49	3.83	4.41	5.33	2.68
1.00	5.47	2.50	12.42	4.00	4.10	5.50	2.58
1.17	6.82	2.67	10.00	4.17	3.84	5.67	2.48
1.33	9.19	2.83	8.40	4.33	3.61	5.83	2.39

```

-----
| CALIB                                     |
| NASHYD ( 0101) | Area (ha)= 2.70 Curve Number (CN)= 69.6
| ID= 1 DT= 5.0 min | Ia (mm)= 5.40 # of Linear Res.(N)= 3.00
|-----| U.H. Tp(hrs)= 0.40

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	2.63	1.583	14.44	3.083	7.26	4.58	3.41
0.167	2.63	1.667	14.44	3.167	7.26	4.67	3.41
0.250	2.86	1.750	36.76	3.250	6.40	4.75	3.23
0.333	2.86	1.833	36.76	3.333	6.40	4.83	3.23
0.417	3.15	1.917	161.47	3.417	5.74	4.92	3.07
0.500	3.15	2.000	161.47	3.500	5.74	5.00	3.07
0.583	3.51	2.083	48.88	3.583	5.21	5.08	2.93
0.667	3.51	2.167	48.88	3.667	5.21	5.17	2.93
0.750	3.97	2.250	24.70	3.750	4.77	5.25	2.80
0.833	3.97	2.333	24.70	3.833	4.77	5.33	2.80
0.917	4.59	2.417	16.49	3.917	4.41	5.42	2.68
1.000	4.59	2.500	16.49	4.000	4.41	5.50	2.68
1.083	5.47	2.583	12.42	4.083	4.10	5.58	2.58
1.167	5.47	2.667	12.42	4.167	4.10	5.67	2.58
1.250	6.82	2.750	10.00	4.250	3.84	5.75	2.48
1.333	6.82	2.833	10.00	4.333	3.84	5.83	2.48
1.417	9.19	2.917	8.40	4.417	3.61	5.92	2.39
1.500	9.19	3.000	8.40	4.500	3.61	6.00	2.39

Unit Hyd Qpeak (cms)= 0.258

PEAK FLOW (cms)= 0.138 (i)

TIME TO PEAK (hrs)= 2.417

RUNOFF VOLUME (mm)= 26.480

TOTAL RAINFALL (mm)= 74.441

RUNOFF COEFFICIENT = 0.356

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

```
-----
| CALIB                                     |
| NASHYD ( 0078) | Area (ha)= 11.60 Curve Number (CN)= 63.8
| ID= 1 DT= 5.0 min | Ia (mm)= 8.44 # of Linear Res.(N)= 3.00
|-----| U.H. Tp(hrs)= 0.89
```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```
----- TRANSFORMED HYETOGRAPH -----
TIME    RAIN | TIME    RAIN | TIME    RAIN | TIME    RAIN
hrs      mm/hr | hrs      mm/hr | hrs      mm/hr | hrs      mm/hr
0.083    2.63 | 1.583   14.44 | 3.083    7.26 | 4.58    3.41
0.167    2.63 | 1.667   14.44 | 3.167    7.26 | 4.67    3.41
0.250    2.86 | 1.750   36.76 | 3.250    6.40 | 4.75    3.23
0.333    2.86 | 1.833   36.76 | 3.333    6.40 | 4.83    3.23
0.417    3.15 | 1.917  161.47 | 3.417    5.74 | 4.92    3.07
0.500    3.15 | 2.000  161.47 | 3.500    5.74 | 5.00    3.07
0.583    3.51 | 2.083   48.88 | 3.583    5.21 | 5.08    2.93
0.667    3.51 | 2.167   48.88 | 3.667    5.21 | 5.17    2.93
0.750    3.97 | 2.250   24.70 | 3.750    4.77 | 5.25    2.80
0.833    3.97 | 2.333   24.70 | 3.833    4.77 | 5.33    2.80
0.917    4.59 | 2.417   16.49 | 3.917    4.41 | 5.42    2.68
1.000    4.59 | 2.500   16.49 | 4.000    4.41 | 5.50    2.68
1.083    5.47 | 2.583   12.42 | 4.083    4.10 | 5.58    2.58
1.167    5.47 | 2.667   12.42 | 4.167    4.10 | 5.67    2.58
1.250    6.82 | 2.750   10.00 | 4.250    3.84 | 5.75    2.48
1.333    6.82 | 2.833   10.00 | 4.333    3.84 | 5.83    2.48
1.417    9.19 | 2.917    8.40 | 4.417    3.61 | 5.92    2.39
1.500    9.19 | 3.000    8.40 | 4.500    3.61 | 6.00    2.39
```

Unit Hyd Qpeak (cms)= 0.498

PEAK FLOW (cms)= 0.255 (i)
TIME TO PEAK (hrs)= 3.083
RUNOFF VOLUME (mm)= 20.731
TOTAL RAINFALL (mm)= 74.441
RUNOFF COEFFICIENT = 0.278

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

```
-----
| CALIB                                     |
| NASHYD ( 0076) | Area (ha)= 4.60 Curve Number (CN)= 73.0
```

| ID= 1 DT= 5.0 min | Ia (mm)= 4.97 # of Linear Res.(N)= 3.00
 ----- U.H. Tp(hrs)= 0.63

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	2.63	1.583	14.44	3.083	7.26	4.58	3.41
0.167	2.63	1.667	14.44	3.167	7.26	4.67	3.41
0.250	2.86	1.750	36.76	3.250	6.40	4.75	3.23
0.333	2.86	1.833	36.76	3.333	6.40	4.83	3.23
0.417	3.15	1.917	161.47	3.417	5.74	4.92	3.07
0.500	3.15	2.000	161.47	3.500	5.74	5.00	3.07
0.583	3.51	2.083	48.88	3.583	5.21	5.08	2.93
0.667	3.51	2.167	48.88	3.667	5.21	5.17	2.93
0.750	3.97	2.250	24.70	3.750	4.77	5.25	2.80
0.833	3.97	2.333	24.70	3.833	4.77	5.33	2.80
0.917	4.59	2.417	16.49	3.917	4.41	5.42	2.68
1.000	4.59	2.500	16.49	4.000	4.41	5.50	2.68
1.083	5.47	2.583	12.42	4.083	4.10	5.58	2.58
1.167	5.47	2.667	12.42	4.167	4.10	5.67	2.58
1.250	6.82	2.750	10.00	4.250	3.84	5.75	2.48
1.333	6.82	2.833	10.00	4.333	3.84	5.83	2.48
1.417	9.19	2.917	8.40	4.417	3.61	5.92	2.39
1.500	9.19	3.000	8.40	4.500	3.61	6.00	2.39

Unit Hyd Qpeak (cms)= 0.279

PEAK FLOW (cms)= 0.193 (i)
 TIME TO PEAK (hrs)= 2.750
 RUNOFF VOLUME (mm)= 29.532
 TOTAL RAINFALL (mm)= 74.441
 RUNOFF COEFFICIENT = 0.397

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

 | RESERVOIR(0080) | OVERFLOW IS OFF
 | IN= 2---> OUT= 1 |
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0010	0.0595	0.0100	0.1538
0.0040	0.0952	0.0140	0.1780
0.0060	0.1206	0.0170	0.2021

**** WARNING : FIRST OUTFLOW IS NOT ZERO.

AREA QPEAK TPEAK R.V.

	(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (0076)	4.600	0.193	2.75	29.53
OUTFLOW: ID= 1 (0080)	4.600	0.007	7.08	22.30

PEAK FLOW REDUCTION [Qout/Qin](%)= 3.52
 TIME SHIFT OF PEAK FLOW (min)=260.00
 MAXIMUM STORAGE USED (ha.m.)= 0.1271

CALIB			
NASHYD (0081)	Area (ha)= 3.30	Curve Number (CN)= 68.1	
ID= 1 DT= 5.0 min	Ia (mm)= 6.93	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.22		

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	2.63	1.583	14.44	3.083	7.26	4.58	3.41
0.167	2.63	1.667	14.44	3.167	7.26	4.67	3.41
0.250	2.86	1.750	36.76	3.250	6.40	4.75	3.23
0.333	2.86	1.833	36.76	3.333	6.40	4.83	3.23
0.417	3.15	1.917	161.47	3.417	5.74	4.92	3.07
0.500	3.15	2.000	161.47	3.500	5.74	5.00	3.07
0.583	3.51	2.083	48.88	3.583	5.21	5.08	2.93
0.667	3.51	2.167	48.88	3.667	5.21	5.17	2.93
0.750	3.97	2.250	24.70	3.750	4.77	5.25	2.80
0.833	3.97	2.333	24.70	3.833	4.77	5.33	2.80
0.917	4.59	2.417	16.49	3.917	4.41	5.42	2.68
1.000	4.59	2.500	16.49	4.000	4.41	5.50	2.68
1.083	5.47	2.583	12.42	4.083	4.10	5.58	2.58
1.167	5.47	2.667	12.42	4.167	4.10	5.67	2.58
1.250	6.82	2.750	10.00	4.250	3.84	5.75	2.48
1.333	6.82	2.833	10.00	4.333	3.84	5.83	2.48
1.417	9.19	2.917	8.40	4.417	3.61	5.92	2.39
1.500	9.19	3.000	8.40	4.500	3.61	6.00	2.39

Unit Hyd Qpeak (cms)= 0.573

PEAK FLOW (cms)= 0.221 (i)
 TIME TO PEAK (hrs)= 2.167
 RUNOFF VOLUME (mm)= 24.407
 TOTAL RAINFALL (mm)= 74.441
 RUNOFF COEFFICIENT = 0.328

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

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-----
| RESERVOIR( 0077) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
-----
      OUTFLOW    STORAGE    |    OUTFLOW    STORAGE
      (cms)      (ha.m.)    |    (cms)      (ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.
      0.0020      0.0366    |    0.0160      0.0883
      0.0060      0.0551    |    0.0200      0.1025
      0.0100      0.0704    |    0.0240      0.1200

      AREA      QPEAK      TPEAK      R.V.
      (ha)      (cms)      (hrs)      (mm)
INFLOW : ID= 2 ( 0081)    3.300      0.221      2.17      24.41
OUTFLOW: ID= 1 ( 0077)    3.300      0.010      6.17      22.99

      PEAK FLOW REDUCTION [Qout/Qin](%)= 4.40
      TIME SHIFT OF PEAK FLOW (min)=240.00
      MAXIMUM STORAGE USED (ha.m.)= 0.0693

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-----
| ADD HYD ( 0079) |
| 1 + 2 = 3       |
-----
      AREA      QPEAK      TPEAK      R.V.
      (ha)      (cms)      (hrs)      (mm)
      ID1= 1 ( 0077):    3.30    0.010      6.17      22.99
+ ID2= 2 ( 0078):    11.60    0.255      3.08      20.73
=====
      ID = 3 ( 0079):    14.90    0.261      3.08      21.23

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| ADD HYD ( 0079) |
| 3 + 2 = 1       |
-----
      AREA      QPEAK      TPEAK      R.V.
      (ha)      (cms)      (hrs)      (mm)
      ID1= 3 ( 0079):    14.90    0.261      3.08      21.23
+ ID2= 2 ( 0080):     4.60    0.007      7.08      22.30
=====
      ID = 1 ( 0079):    19.50    0.262      3.17      21.48

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NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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*****
** SIMULATION:6                      **
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| CHICAGO STORM | IDF curve parameters: A=1735.688

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Ptotal= 82.32 mm

B= 6.014

C= 0.820

used in: INTENSITY = A / (t + B)^C

Duration of storm = 6.00 hrs

Storm time step = 10.00 min

Time to peak ratio = 0.33

TIME	RAIN	TIME	RAIN	'	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	'	hrs	mm/hr	hrs	mm/hr
0.00	2.90	1.50	15.97		3.00	8.02	4.50	3.77
0.17	3.16	1.67	40.65		3.17	7.08	4.67	3.57
0.33	3.48	1.83	178.56		3.33	6.35	4.83	3.40
0.50	3.88	2.00	54.05		3.50	5.76	5.00	3.24
0.67	4.39	2.17	27.32		3.67	5.28	5.17	3.10
0.83	5.07	2.33	18.24		3.83	4.88	5.33	2.97
1.00	6.05	2.50	13.74		4.00	4.54	5.50	2.85
1.17	7.54	2.67	11.06		4.17	4.25	5.67	2.74
1.33	10.16	2.83	9.29		4.33	3.99	5.83	2.64

| CALIB |
| NASHYD (0101) |
ID= 1 DT= 5.0 min

Area (ha)= 2.70 Curve Number (CN)= 69.6
Ia (mm)= 5.40 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.40

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----

TIME	RAIN	TIME	RAIN	'	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	'	hrs	mm/hr	hrs	mm/hr
0.083	2.90	1.583	15.97		3.083	8.02	4.58	3.77
0.167	2.90	1.667	15.97		3.167	8.02	4.67	3.77
0.250	3.16	1.750	40.65		3.250	7.08	4.75	3.57
0.333	3.16	1.833	40.66		3.333	7.08	4.83	3.57
0.417	3.48	1.917	178.56		3.417	6.35	4.92	3.40
0.500	3.48	2.000	178.56		3.500	6.35	5.00	3.40
0.583	3.88	2.083	54.05		3.583	5.76	5.08	3.24
0.667	3.88	2.167	54.05		3.667	5.76	5.17	3.24
0.750	4.39	2.250	27.32		3.750	5.28	5.25	3.10
0.833	4.39	2.333	27.32		3.833	5.28	5.33	3.10
0.917	5.07	2.417	18.24		3.917	4.88	5.42	2.97
1.000	5.07	2.500	18.24		4.000	4.88	5.50	2.97
1.083	6.05	2.583	13.74		4.083	4.54	5.58	2.85
1.167	6.05	2.667	13.74		4.167	4.54	5.67	2.85
1.250	7.54	2.750	11.06		4.250	4.25	5.75	2.74
1.333	7.54	2.833	11.06		4.333	4.25	5.83	2.74

1.417	10.16		2.917	9.29		4.417	3.99		5.92	2.64
1.500	10.16		3.000	9.29		4.500	3.99		6.00	2.64

Unit Hyd Qpeak (cms)= 0.258

PEAK FLOW (cms)= 0.165 (i)
 TIME TO PEAK (hrs)= 2.417
 RUNOFF VOLUME (mm)= 31.490
 TOTAL RAINFALL (mm)= 82.319
 RUNOFF COEFFICIENT = 0.383

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

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-----
| CALIB |
| NASHYD ( 0078) | Area (ha)= 11.60 Curve Number (CN)= 63.8
| ID= 1 DT= 5.0 min | Ia (mm)= 8.44 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 0.89

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NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

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----- TRANSFORMED HYETOGRAPH -----

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TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	2.90	1.583	15.97	3.083	8.02	4.58	3.77
0.167	2.90	1.667	15.97	3.167	8.02	4.67	3.77
0.250	3.16	1.750	40.65	3.250	7.08	4.75	3.57
0.333	3.16	1.833	40.66	3.333	7.08	4.83	3.57
0.417	3.48	1.917	178.56	3.417	6.35	4.92	3.40
0.500	3.48	2.000	178.56	3.500	6.35	5.00	3.40
0.583	3.88	2.083	54.05	3.583	5.76	5.08	3.24
0.667	3.88	2.167	54.05	3.667	5.76	5.17	3.24
0.750	4.39	2.250	27.32	3.750	5.28	5.25	3.10
0.833	4.39	2.333	27.32	3.833	5.28	5.33	3.10
0.917	5.07	2.417	18.24	3.917	4.88	5.42	2.97
1.000	5.07	2.500	18.24	4.000	4.88	5.50	2.97
1.083	6.05	2.583	13.74	4.083	4.54	5.58	2.85
1.167	6.05	2.667	13.74	4.167	4.54	5.67	2.85
1.250	7.54	2.750	11.06	4.250	4.25	5.75	2.74
1.333	7.54	2.833	11.06	4.333	4.25	5.83	2.74
1.417	10.16	2.917	9.29	4.417	3.99	5.92	2.64
1.500	10.16	3.000	9.29	4.500	3.99	6.00	2.64

Unit Hyd Qpeak (cms)= 0.498

PEAK FLOW (cms)= 0.311 (i)
 TIME TO PEAK (hrs)= 3.083
 RUNOFF VOLUME (mm)= 25.037

TOTAL RAINFALL (mm)= 82.319
RUNOFF COEFFICIENT = 0.304

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

| CALIB |
| NASHYD (0076) | Area (ha)= 4.60 Curve Number (CN)= 73.0
| ID= 1 DT= 5.0 min | Ia (mm)= 4.97 # of Linear Res.(N)= 3.00

U.H. Tp(hrs)= 0.63

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	2.90	1.583	15.97	3.083	8.02	4.58	3.77
0.167	2.90	1.667	15.97	3.167	8.02	4.67	3.77
0.250	3.16	1.750	40.65	3.250	7.08	4.75	3.57
0.333	3.16	1.833	40.66	3.333	7.08	4.83	3.57
0.417	3.48	1.917	178.56	3.417	6.35	4.92	3.40
0.500	3.48	2.000	178.56	3.500	6.35	5.00	3.40
0.583	3.88	2.083	54.05	3.583	5.76	5.08	3.24
0.667	3.88	2.167	54.05	3.667	5.76	5.17	3.24
0.750	4.39	2.250	27.32	3.750	5.28	5.25	3.10
0.833	4.39	2.333	27.32	3.833	5.28	5.33	3.10
0.917	5.07	2.417	18.24	3.917	4.88	5.42	2.97
1.000	5.07	2.500	18.24	4.000	4.88	5.50	2.97
1.083	6.05	2.583	13.74	4.083	4.54	5.58	2.85
1.167	6.05	2.667	13.74	4.167	4.54	5.67	2.85
1.250	7.54	2.750	11.06	4.250	4.25	5.75	2.74
1.333	7.54	2.833	11.06	4.333	4.25	5.83	2.74
1.417	10.16	2.917	9.29	4.417	3.99	5.92	2.64
1.500	10.16	3.000	9.29	4.500	3.99	6.00	2.64

Unit Hyd Qpeak (cms)= 0.279

PEAK FLOW (cms)= 0.230 (i)
TIME TO PEAK (hrs)= 2.750
RUNOFF VOLUME (mm)= 34.926
TOTAL RAINFALL (mm)= 82.319
RUNOFF COEFFICIENT = 0.424

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

| RESERVOIR(0080) | OVERFLOW IS OFF

IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW	STORAGE	OUTFLOW	STORAGE
-----	(cms)	(ha.m.)	(cms)	(ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.				
	0.0010	0.0595	0.0100	0.1538
	0.0040	0.0952	0.0140	0.1780
	0.0060	0.1206	0.0170	0.2021

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (0076)	4.600	0.230	2.75	34.93
OUTFLOW: ID= 1 (0080)	4.600	0.009	7.00	27.36

PEAK FLOW REDUCTION [Qout/Qin](%)= 4.08
 TIME SHIFT OF PEAK FLOW (min)=255.00
 MAXIMUM STORAGE USED (ha.m.)= 0.1487

CALIB			
NASHYD (0081)	Area (ha)= 3.30	Curve Number (CN)= 68.1	
ID= 1 DT= 5.0 min	Ia (mm)= 6.93	# of Linear Res.(N)= 3.00	
-----	U.H. Tp(hrs)= 0.22		

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	2.90	1.583	15.97	3.083	8.02	4.58	3.77
0.167	2.90	1.667	15.97	3.167	8.02	4.67	3.77
0.250	3.16	1.750	40.65	3.250	7.08	4.75	3.57
0.333	3.16	1.833	40.66	3.333	7.08	4.83	3.57
0.417	3.48	1.917	178.56	3.417	6.35	4.92	3.40
0.500	3.48	2.000	178.56	3.500	6.35	5.00	3.40
0.583	3.88	2.083	54.05	3.583	5.76	5.08	3.24
0.667	3.88	2.167	54.05	3.667	5.76	5.17	3.24
0.750	4.39	2.250	27.32	3.750	5.28	5.25	3.10
0.833	4.39	2.333	27.32	3.833	5.28	5.33	3.10
0.917	5.07	2.417	18.24	3.917	4.88	5.42	2.97
1.000	5.07	2.500	18.24	4.000	4.88	5.50	2.97
1.083	6.05	2.583	13.74	4.083	4.54	5.58	2.85
1.167	6.05	2.667	13.74	4.167	4.54	5.67	2.85
1.250	7.54	2.750	11.06	4.250	4.25	5.75	2.74
1.333	7.54	2.833	11.06	4.333	4.25	5.83	2.74
1.417	10.16	2.917	9.29	4.417	3.99	5.92	2.64
1.500	10.16	3.000	9.29	4.500	3.99	6.00	2.64

Unit Hyd Qpeak (cms)= 0.573

PEAK FLOW (cms)= 0.269 (i)
 TIME TO PEAK (hrs)= 2.167
 RUNOFF VOLUME (mm)= 29.202
 TOTAL RAINFALL (mm)= 82.319
 RUNOFF COEFFICIENT = 0.355

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

```

-----
| RESERVOIR( 0077) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
-----
      OUTFLOW   STORAGE   |   OUTFLOW   STORAGE
      (cms)     (ha.m.)   |   (cms)     (ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.
      0.0020    0.0366   |   0.0160    0.0883
      0.0060    0.0551   |   0.0200    0.1025
      0.0100    0.0704   |   0.0240    0.1200

                        AREA   QPEAK   TPEAK   R.V.
                        (ha)   (cms)   (hrs)   (mm)
INFLOW : ID= 2 ( 0081)   3.300   0.269   2.17   29.20
OUTFLOW: ID= 1 ( 0077)   3.300   0.013   6.08   27.79

      PEAK FLOW REDUCTION [Qout/Qin](%)= 5.00
      TIME SHIFT OF PEAK FLOW (min)=235.00
      MAXIMUM STORAGE USED (ha.m.)= 0.0806
  
```

```

-----
| ADD HYD ( 0079) |
| 1 + 2 = 3       |
-----
      AREA   QPEAK   TPEAK   R.V.
      (ha)   (cms)   (hrs)   (mm)
ID1= 1 ( 0077):   3.30   0.013   6.08   27.79
+ ID2= 2 ( 0078):  11.60   0.311   3.08   25.04
=====
ID = 3 ( 0079):  14.90   0.320   3.08   25.65
  
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| ADD HYD ( 0079) |
| 3 + 2 = 1       |
-----
      AREA   QPEAK   TPEAK   R.V.
      (ha)   (cms)   (hrs)   (mm)
ID1= 3 ( 0079):  14.90   0.320   3.08   25.65
+ ID2= 2 ( 0080):   4.60   0.009   7.00   27.36
=====
  
```

ID = 1 (0079): 19.50 0.322 3.08 26.05

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
