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PROPOSED RESIDENTIAL CONDOMINIUM TOWER & RETIREMENT HOME DEVELOPMENT 1157-1171 NORTH SHORE BOULEVARD EAST CITY OF BURLINGTON

PROJECT No. : 18204

FUNCTIONAL SERVICING REPORT

Prepared For:

Spruce Partners

Prepared By:

The Odan/Detech Group Inc.

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Pre-Development Visual OTTHYMO Output (2-year to 100-year storms)

Post-Development Visual OTTHYMO Output (2-year to 100-year storms)

CETV Verification Statement – Imbrium Systems Inc. Stormceptor OGS

CETV Verification Statement – Imbrium Systems Inc. Jellyfish Filter

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1.0 INTRODUCTION

The property under study is an approximately 1.22 Ha (3.0 acre) site located at 1157-1171 North Shore Boulevard East in the City of Burlington. The site is bound by the following:

- North Shore Boulevard to the south
- An existing residential highrise development to the east
- Existing detached house lots and a townhouse condominium to the north
- The Queen Elizabeth Way freeway (MTO Lands) to the west

Refer to the Key Plan in Appendix A for the site's layout and adjacent developments.

The site presently comprises two existing low rise residential buildings with associated driveway and parking structure.

For detailed topography of the existing site conditions as of March 12, 2018, refer to the topographic survey prepared by Mackay, Mackay & Peters Limited.

It is proposed to construct a residential highrise and retirement home development on the site. The proposed development comprises a driveway access from North Shore Boulevard at the site's southeast corner. The development comprises a single tower from ground floor to the 7th floor and two separate towers from the 8th floor to the 17th floor. Refer to the Site Plan by Montgomery Sisam Architects Inc. in Appendix A for the proposed development's layout. The development comprises 419 units total.

A road widening conveyance of North Shore Boulevard of varying width (typ. 5m) is being taken by the City of Burlington in the proposed development. The site's area post-development is 1.185 Ha.

This report will evaluate the serviceability of the site with respect to sanitary waste water, water and storm water management (SWM) and will implement the City's SWM criteria.

2.0 SCOPE OF WORK

THE ODAN/DETECH GROUP INC. was retained by **Spruce Partners** to review the Site, collect data, evaluate the Site for the proposed use and present the findings in a Functional Servicing Report in support of a Rezoning Application.

- a) Collecting existing servicing drawings from the CITY in order to establish availability and feasibility of Site servicing;
- b) Meetings/conversations with CITY Engineers and Design Team.
- c) Evaluation of the data and presentation of the findings in a Functional Servicing Report in support of a Rezoning Application.

3.0 SANITARY SEWERS

i) Existing Infrastructure

There is an existing 1800mm Region of Halton sanitary trunk sewer flowing westerly beneath the south boulevard of North Shore Boulevard, adjacent to the site's south frontage. Region plans show that the existing residential development on the site drains sanitary flows by an existing sanitary sewer connection directly into this trunk sewer. Refer to the Functional Servicing Plan for the existing sanitary lateral, to be abandoned. There is no local sanitary sewer beneath North Shore Boulevard.

Refer to the Functional Servicing Plan for the existing sanitary sewer infrastructure.

ii) Proposed Sanitary Servicing

Region of Halton engineering staff have preliminarily stated that the subject site may drain directly into the existing 1800mm sanitary trunk sewer adjacent to the site's south boundary, and that the receiving sewer has capacity for the proposed development. Refer to the email in Appendix A.

Refer to the Functional Servicing Plan for the proposed Sanitary Service Connection. Sanitary flows are calculated as follows.

The sanitary sewer design criteria and unit flow is provided in the Regional Municipality of Halton's *Water and Wastewater Linear Design Manual* (April 2015), as follows. The following information is provided in Tables 3-1 and 3-2 of the foregoing manual.

- Unit flow: q = average daily residential per capita dry weather unit flow = 0.275 m³/cap/day
- I/I = Unit of peak inflow/infiltration = 0. 286 L/s/ha
- Apartment (over 6-storey): 285 p/Ha and 0.275 m³/p/day or 0.003183 x 10⁻³ m³/p/s
- Apartment (less than 6-storey): 135 p/Ha and 0.275 $m^3/p/day$ or 0.003183 x 10⁻³ $m^3/p/s$
- Notwithstanding the above unit population, however, a unit population of 2.7 P/unit is assumed for the proposed condominium tower and retirement home development because the Region standard 285 P/Ha unit population would result in a unit population of approximately 1.0 P/unit for the foregoing proposed statistics, which is unrealistic

The proposed sanitary flows are as follows. Refer to the detailed calculation on the following pages. A pumped flow rate of groundwater is included, as per Section 6.0.

| TABLE 1 – Po | ost-Developme | ent Sanitary | Flow | | | |
|--------------|-------------------|-----------------------|-----------------------------|--------------------------------|-------------------------------------|---------------------|
| Component | Population (P) | Average Flow (l/s) | Peak Sanitary Flow (I/s) | Inflow & Infiltration (I/s) | Pumped Groundwater Flow (l/s) | Total Flow (I/s) |
| Proposed | 1131 | 3.14 | 11.8 | 0.35 | 3.2 | 15.4 |

Region of Halton engineering review staff confirmed in the enclosed email correspondence (Appendix A) that the receiving Halton Region sanitary trunk sewer has capacity for the proposed flows. The attached flow is marginally larger than originally anticipated on account of the pumped groundwater – Region staff are requested to review accordingly.

| SANITARY & WATER FLOW | ATIONS | SCENARIO: | | | PROPOSED DEVELOPMENT | | | | |
|--|----------------|----------------|-----------|---------------------|----------------------|-----------------|----------------------|---------------------------------------|----|
| This program calculates the sanitary | dia abarga fra | muoriouo I | and use | | | | | | |
| This program calculates the sanitary | uischarge in | JIII Valious I | | | | | | | |
| | | | | | FILL IN COLC | OURED CELLS | AS REQU | IRED | |
| | | | | | | | | | |
| COMMERCIAL SITE AREA (ha) = | | | NOTE: | | | | | | |
| RESIDENTIAL SITE AREA (ha) = | 1.23 | | | | | | | | |
| TOTAL SITE AREA (ha) = | 1.23 | | | | | | | | |
| LAND USE | NUMBER | SITE | GROSS | _ | TOTAL DAILY | AVERAGE | | | |
| | OF UNITS | AREA, | FLOOR | TOTAL POPULATION | FLOW | DAILY FLOW | 5 | TOTAL FLOW FROM LAND USE, l/sec | |
| | | (ha) | AREA, m2 | AT- | (LITERS) | l/sec | PEAKING FACTOR, M | | |
| | | | | , AL | | | I D L | AL M∣ | |
| | | | | 0 Q | | | PEAKING FACTOR, | TOT | |
| | | | | | | | | | |
| | | | | | | | | | |
| RESIDENTIAL Detached, using 55 | | | | | | _ | | | |
| person/site area | | | | 0 | 0 | 0.00 | 4.50 | 0.00 | |
| RESIDENTIAL Semi Houses, using | | | | | | | | | |
| 100 persons/site area | | | | 0 | 0 | 0.00 | 4.50 | 0.00 | |
| RESIDENTIAL Apartments (<6 st), | | | | | | | | | |
| using 135 persons/site area | | | | 0 | 0 | 0.00 | 4.50 | 0.00 | |
| | | | | _ | | | | | |
| RESIDENTIAL Apartments (>6 st), | | | | | | 0.00 | 4.50 | 0.00 | |
| using 285 persons/site area | | | | 0 | 0 | 0.00 | 4.50 | 0.00 | |
| RESIDENTIAL Density 3, using 2.7 | | | | | | | | | |
| persons/unit | 419 | | | 1131 | 271512 | 3.14 | 3.76 | 11.83 | |
| | | | | | | | | | |
| COMMERCIAL, Using 90 | | | | | | | | | |
| persons/ha (Floor Ha) | | | | 0 | 0 | 0.00 | 3.60 | 0.00 | |
| COMMERCIAL, Using 0.60 L/sec | - | | | 0 | 0 | 0.00 | 3.00 | 0.00 | |
| per ha | | | | | | | | | |
| | | | | 0 | 0 | 0.00 | 2.50 | 0.00 | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| TOTAL | | | | V1= | 271512 | Q1= | 11.83 | | |
| | | | | | | Q2= | 0.00 | | |
| Q = (MqP/86400) + A * I (L/sec) | | | | | | Qinfil | 0.35 | | |
| , , , , , , , , , , , , , , , , , | | | | | | Qtot | | | |
| Q1= total flow from Residential Land | Use (L/sec) | | where : | P is popu | lation | | | | |
| Q2= total flow from Commercial Lan | d Use (L/sec) | | | q = 0.275 | m3/d/p = 0.0 | 04 L/sec/pers | on for resid | ential and | |
| Qinfil = total flow from infiltration (L/s | | | | q = 0.60 l | L/sec/ha for co | ommercial and | | | |
| Qtot = total flow (Land use + infiltrat | ion) | | | | site area | | | | |
| | | | | | L/sec/ha (infilt | , | | | |
| V1= Total Volume from Land Use in | liters | | | | | + (P/1000,1/2 | <i>//</i> \ | | |
| | | | Peaking F | actor M | = 0.8* {1 + [1 | 4 / (4 + (P/100 | 00,1/2))]} (f | or Commercia | l) |

4.0 WATER DISTRIBUTION

i) Background Information & Existing Infrastructure

There is an existing 250mm Ductile Iron watermain beneath the south side of North Shore Boulevard East, adjacent to the site's south frontage. Refer to the Functional Servicing Plan for the layout of the adjacent watermains.

ii) Design Considerations

Fire and domestic water service will be provided by the above existing watermain. Refer to the Functional Servicing Plan for the proposed water services.

There are existing fire hydrants on the south side of North Shore Blvd, opposite the site, and on the north side, east of the subject site. Both existing adjacent hydrants are more than 45m from any point on the proposed building (refer to the radius shown on the Functional Servicing Plan) therefore a new hydrant is proposed as shown on the Functional Servicing Plan.

The pressures and volumes must be sufficient for Peak hour conditions and under fire conditions as established by the Ministry of Environment and the Fire Underwriters Survey booklet (1999). The minimal residual pressure under fire conditions is 140 kPa (20.3 psi).

The allowable pressures are as follows:

| Condition | Allowable Pressures (kp | | |
|-------------------------|-------------------------|------|--|
| | min. | max. | |
| 1) Min. Hour | 275 | 700 | |
| 2) Peak Hour | 275 | 700 | |
| 3) Peak Day + Fire Flow | 140 | 700 | |

The water demand for redeveloped Building is calculated as follows:

| a) | Average Day domestic demand – (7 | Table 1) | 3.1 L/s |
|----|----------------------------------|-----------------------------|---------|
| b) | Peak day demand - | 2.25 x average daily demand | 7.0 L/s |
| C) | Fire flow as per FUS 1999 manual | | 217 L/s |

TABLE 2 – Fire Flow Demand for Proposed Development

| | L/s | USGM |
|--------------------------------|-----|------|
| Peak Day Demand | 7.0 | 111 |
| Fire Flow (per FUS) Demand | 217 | 3434 |
| Total Development Water Demand | 224 | 3545 |

In the following FUS calculations, the following assumptions were made:

- a) The proposed building will be sprinklered and the sprinklers monitored according to the NFPA 13 criteria
- b) The buildings will be of fire-resistive construction (reinforced concrete)
- c) The building's contents will be of non-combustible nature
- d) The horizontal separation distance from the adjacent buildings is as shown on the following *Fire Separation Distance* Plan

A hydrant flow test was conducted on the 250mm watermain beneath North Shore Boulevard and is provided on the following pages. The test report shows that there is a flow rate of 7392 USGM available at 20 psi residual pressure based on extrapolating from the static pressure to the <u>First</u> Pitot Reading.

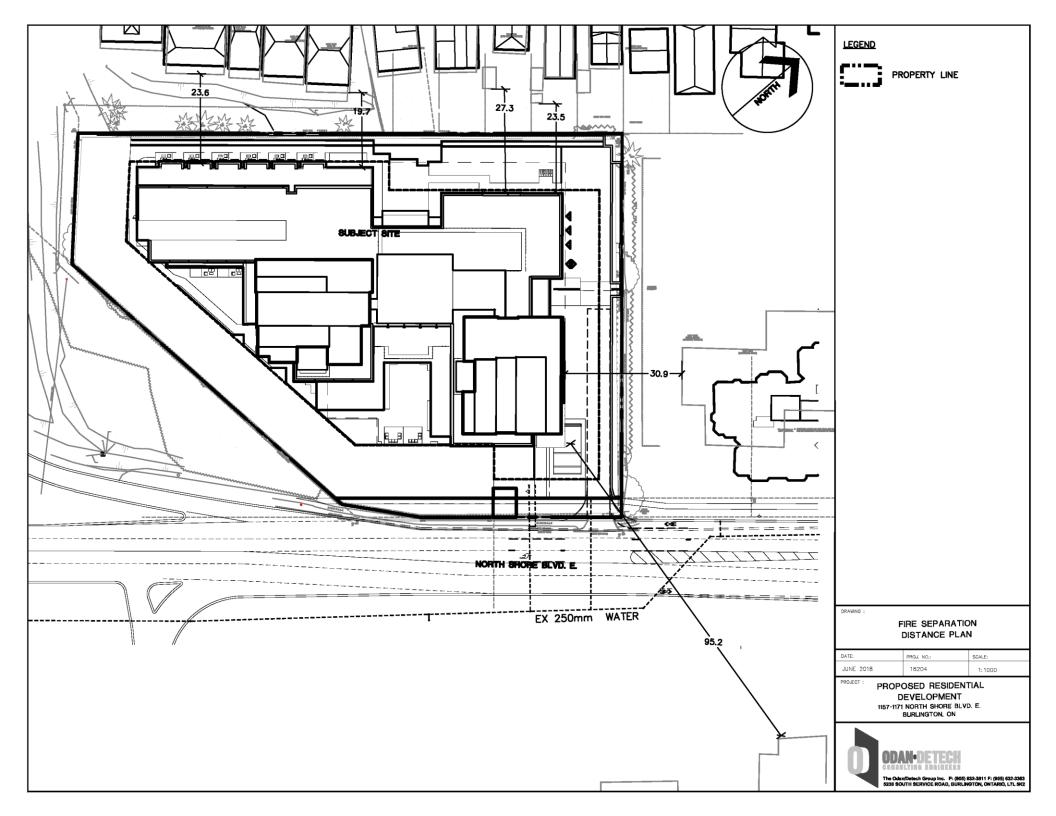
If the flow rate at 20 psi is conservatively calculated based on the static pressure and the <u>second</u> pitot reading using the NFPA Section 4.10.1.2 calculation, rather than the first pitot reading, as follows, there is a flow rate of 4469 USGM available at a residual pressure of 20 psi.

$$Q_R = Q_F * \frac{h_r^{0.54}}{h_f^{0.54}}$$

Where:

 Q_R = Flow at 20 psi Q_F = Total flow measured during test h_r = Pressure drop to 20 psi h_f = Pressure drop measured during test

The available flow (conservatively calculated based on the second, lower, pitot reading to be 4469 USGM) is greater than the development water demand – 3545 USGM – therefore it follows that the existing watermain is adequate to service the subject site.



PROPOSED RESIDENTIAL DEVELOPMENT – 1157-1171 NORTH SHORE BOULEVARD FUNCTIONAL SERVICING REPORT

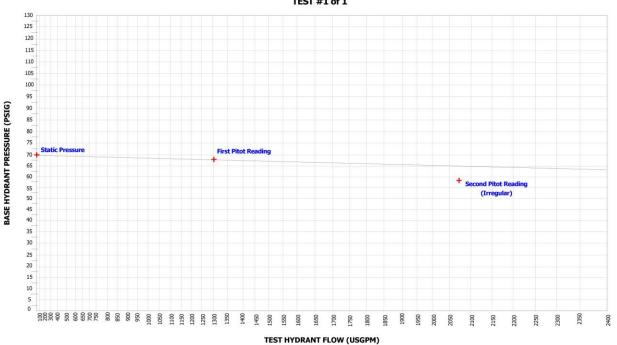
| F = 220 x C x VA Where: Conficient valued to the type of construction. Image: confidence of the type of construction. Confidence of the type of construction. Image: construction of the type of construction. Image: construction of type of construction. A = the table for the type of construction. Image: construction of type of construction. Image: construction of type of construction. A = the table for the type of construction. Image: construction. Image: construction. BUILDING FOOT PRINT (m2): 1313 Image: construction. BUILDING FOOT PRINT (m2): 1313 Image: construction. A OF STOREYS Image: construction. Image: construction. BUILDING FOOT PRINT (m2): 1313 Image: construction. A OF STOREYS Image: construction. Image: construction. A UTOMATED SPINNEEP POOTCTION Credit Total Image: construction. MUTOMATED SPINNEEP POOTCTION Credit Total Image: construction. Image: construction. BUPOSURE 1 (couth) N/A Distance to Expanse Huiling (m) Length - Height Image: construction. Image: construction. BUPOSURE 2 (cost) Existing Apartment Distance to Expanse Huiling (m) Length - Height Image: construction. Image: construction. BUPOSURE 2 | WATER SUPPLY FOR PUBLIC FIRE PROTEC GUIDE FOR DETERMINATION OF REQUIR | | | RITERS S | SURVEY | | | | | | |
|---|--|------------|----------------|--------------|---------------------|----------|--------------|-------------|---------------|--------------|------------|
| Provide of the flow in iters per minute C = Confidence related to the type of construction A = the transf and per meters considered Construction cLass: Fire Resistive Construction cLass: Fire Resistive Construction cLass: Construction cLa | | | | | | | | | | | o type of |
| P = request per formula 15 Concerticient relation the type of construction 0 A = the total floor area in square meters (excluding basewares) in the bulking considered 0 LOCATION: Burlington BURLDING FOOT PRINT (m2): 5133 BURLDING FOOT PRINT (m2): 117 PF requestion 117 CONSTRUCTION CLASS: Fire Resistive PROJECT No 12204 Content CONSTRUCTION CLASS: Fire Resistive AUTOMATED SPRINKLER PROTECTION SPA13 sprinkles standard Vest 300% Vest 300% 00% Standard Water Supply Vest 300% Vest 300% 00% CONTENTS FACTOR: Limited Combustible CONTENTS FACTOR: Limited Combustible CARDSURE 1 (south) N/A Distance to Exposure Building (m) Length - Height Length - Height 25% Standard Water Supply Vest 300% Vest 300% 01.300 20.1 - 300 1.30 Length - Height 25% EXPOSURE 2 (east) Bixting Apartment Distance to Exposure Building (m) Length - Height <th>where:</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th>Wood Frame</th> | where: | | | | | | | | | | Wood Frame |
| A = the total floor area in square meters (occulating basements) in the building considered Non contextile (a) LOCATION: COCCUPARCY: Burlington Recidential PROJECT: 1157 North Shore Bouleward BUILDING FOOT PRINT (m2): 5133 17 1157 North Shore Bouleward Project: 1157 North Shore Bouleward BUILDING FOOT PRINT (m2): 5133 17 17 Project: 1157 North Shore Bouleward CONSTRUCTION CLASS: Fire Resistive Project: 157 North Shore Bouleward AUTOMATED SPRINKLER PROTECTION NIPA 13 sprinkles standard Standard Mater Supply Fully Supervised System Credit: Total Vest 300% Sofk Contextible -25% 31-10m EXPOSURE 1 (south) N/A Distance to Exposure Building (m) Length - Height Length - Height | | ruction | | | | | | | | 1.5 | |
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| $ \begin{array}{c c c c c c c c c c c c c c c c c c c $ | | A = | 22609 | m2 | 2 Largest Floo | rs + 50 | 0% floors | above up | to 8 | |] |
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| REQUIRED FIRE FLOW F = 12750 L/min Round to Nearest 1000 L/min F = 13000 L/min 3434 usgm | EXPOSURE CHARGI | E | 4250 | L/min | | | | | | | |
| Round to Nearest 1000 L/min F = 13000 L/min 3434 usgm | REQUIRED FIRE FLOW | F = | 12750 | L/min | | | | | | 1400 | 10 |
| | | | 13000 | L/min | 3434 us | sgm | | | | | |
| | | F= | 217 | | | | | | | | |
| | | L | | | | | | | | | |

ACKSON WATERWORKS



(905) 547-6770 (800)-734-5732 jww@bellnet.ca www.jacksonwaterworks.ca

FIRE HYDRANT FLOW TEST RESULTS TEST #1 of 1



| o. of Ports Open | Port Dia. (in) | Pitot Reading (psig) | Pitot Conversion (usgpm) Conversion Factor = 0 | Residual Pressure (psig) | Test Date | 13 April 201 |
|------------------|------------------|----------------------|---|--------------------------|------------------------|--------------|
| T | 2,50 | 60 | 1300 | 68 | Test Time | 10:15am |
| 1 | | | | | New Discoster (in) | 10 |
| 2 | 2.50 | 38/38 | 2068 | 58 | Pipe Diameter (in) | 10 |
| THEORETI | CAL FLOW @ 20psi | | 7392 | | Static Pressure (psig) | 70 |

| Site Information | | | | | | |
|-----------------------------|--|---|--|--|--|--|
| Site Name or Developer Name | Spruce Partners Inc. | Engineer: Odan Detech Group | | | | |
| Site Address/Municipality | 1157-1171 North Shore Boulevard East, Burlington | | | | | |
| Location of Test Hydrant | Near 1157-1171 North Shore Boulevard East | | | | | |
| Location of Base Hydrant | Near 1225 North Shore Boulevard East | | | | | |
| Comments | Testing has been completed in accordance with NFP/ internal design and installation profile. Refer to attac | -291 guidelines wherever and whenever possible and practical. Conversion factors for pitot tube readings have been used depending on hose noz hed cover letter for additional information. | | | | |
| Verified By | Alf Mark Schmidt | | | | | |

221 Sherman Avenue North, Hamilton, Ontario L8L 6N2

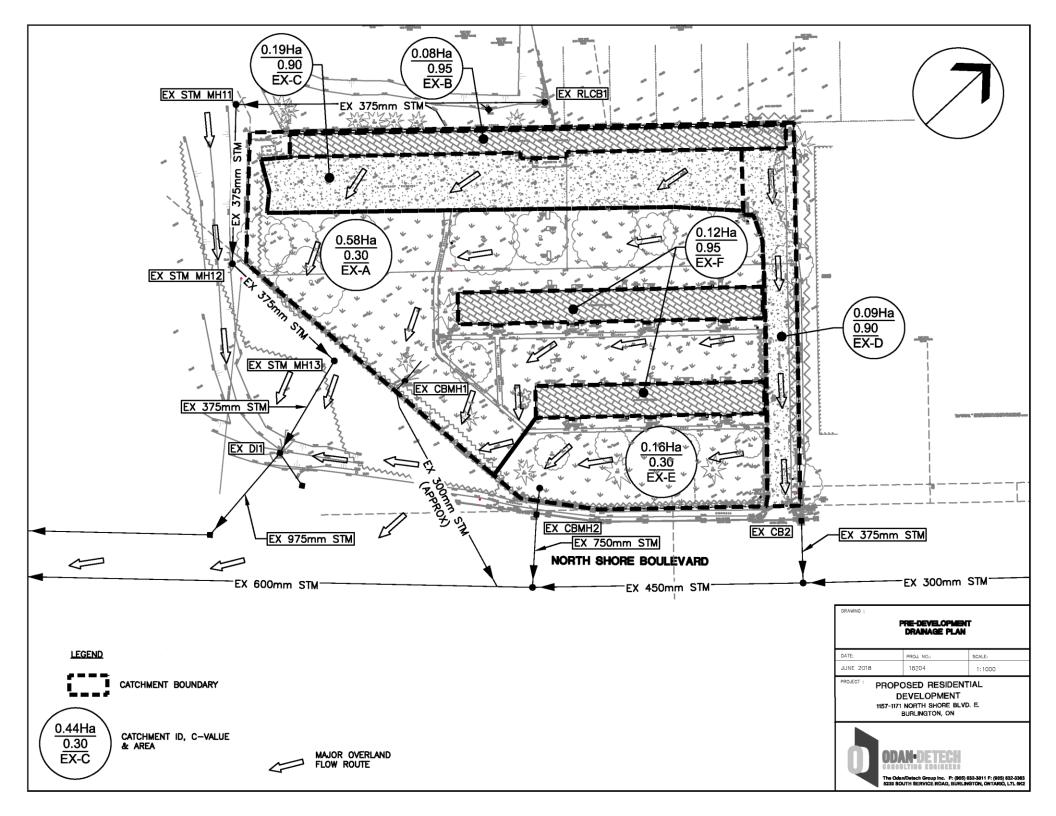
5.0 STORM DRAINAGE & STORMWATER MANAGEMENT

i) Background Information & Existing Infrastructure

The following storm sewers presently exist beneath the streets bordering the subject site:

- There is an existing 450mm/600mm storm sewer flowing westerly beneath the south side of North Shore Boulevard, adjacent to the site's south frontage. This sewer increases in size to 600mm west of the site and ultimately discharges into the Hamilton Harbour via Indian Creek west of the Queen Elizabeth Way. A portion of the subject site (Catchment EX-D, EX-E, EX-F) appears to presently drain into this sewer via overland flow and by an existing catchbasin-manhole near the site's west property line. Refer to the Pre-Development Drainage Plan on the following page for pre-development drainage patterns.
 - a. There is a catchbasin-manhole structure (EX CBMH2) in the north gutter of North Shore Boulevard which drains by a 750mm pipe southerly beneath North Shore Boulevard into the 600mm storm pipe flowing westerly beneath the south side of North Shore. The subject site existing topography is a portion of the site (EX-D, EX-E, EX-F) sheet flows overland into this structure as shown on the Pre-Development Drainage Plan on the following page.
 - b. There is additionally a catchbasin-manhole (EX CBMH1) within the site which the field notes from CCTV investigation by Markit Locates (Appendix B) identifies is connected to the 600mm storm sewer beneath North Shore Blvd. via a 300mm lead which is at-least partially collapsed.
- 2) There is an existing 975mm storm sewer flowing westerly beneath the north side of North Shore Boulevard, commencing southwest of the site in the adjacent MTO lands. This sewer receives flows from a portion of the subject site (Catchment EX-A, EX-B, EX-C) as well as the MTO Lands to the west, and the adjacent townhouse condominium to the north via the existing 375mm storm sewer, as follows.
- 3) There is an existing 375mm storm sewer adjacent to the north and west site limits. This sewer receives flows from the existing townhouse condominium to the north and conveys it into the above 975mm storm sewer on North Shore Boulevard. This sewer appears in the Buried Utility Map by Markit Locates in Appendix B.

Refer to the Pre-Development Drainage Plan on the following page for an overview of existing infrastructure and drainage patterns.



ii) Design Criteria

City of Burlington staff have provided the following stormwater management design criteria.

- 1) Quantity Control: Control 2-year to 100-year post-development storm flows to their respective pre-development storm flows.
- 2) Quality Control: 80% TSS Removal with a treatment train approach.

Design storm data for the City of Burlington 2-year to 100-year storms are shown below as per City standard S-IDF.

| IDF-Curve | Intensity when t, time of concentration, is 10 minutes: |
|-------------------------------------|---|
| $I_2 = 592.6 / (6 + t)^{0.780}$ | $I_2 = 68.2 \text{ mm/hr}$ |
| $I_5 = 697.4 / (5+t)^{0.764}$ | $I_5 = 88.1 \text{ mm/hr}$ |
| $I_{10} = 798.5 / (5+t)^{0.763}$ | $I_{10} = 101.1 \text{ mm/hr}$ |
| $I_{25} = 926.9 / (5+t)^{0.762}$ | I ₂₅ = 117.7 mm/hr |
| $I_{50} = 1019.4 / (5 + t)^{0.761}$ | I ₅₀ = 129.8 mm/hr |
| $I_{100} = 1114.1 / (5+t)^{0.761}$ | $I_{100} = 141.9 \text{ mm/hr}$ |

iii) Pre-Development (Allowable) Discharge Flow Rate

City staff have stated that the post-development storm flows should be controlled to the predevelopment flows for 2-year through 100-year storms. The pre-development 2-year to 100-year storms are therefore determined as follows.

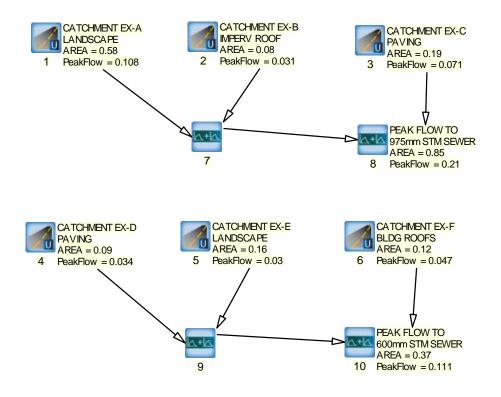
The pre-development catchment areas appear on the Pre-Development Drainage Plan on the prior page. The pre-development storm flows will be modelled using Visual OTTHYMO 2.3.2, with catchment statistics as follows. For drainage areas with significant imperviousness the calculation of effective rainfall in Visual OTTHYMO is accomplished using the "Standhyd" method. This method is used in urban watersheds to simulate runoff by combining two parallel standard unit hydrographs resulting from the effective rainfall intensity over the pervious and impervious surfaces. For pervious surfaces, losses are calculated using the SCS modified CN method.

Pre-Development storm catchment areas as modelled in Visual OTTHYMO are as follows in Table 3. Refer to the Pre-Development Drainage Plan (above) for the areas.

| TABLE 3 | - Pre-Catchme | ent Chara | acteristics for t | he Site | ; | | | | |
|------------------------------|---------------|--------------|----------------------|--------------|--|--|----------------------------|--|-----------------------------------|
| Receiving Outlet Sewer | Area I.D. | Area (ha) | Hydrograph Method | % impervious | imperviousnes s directly connected % | Loss Method for Pervious Area | CN for Pervious Area | Initial Abstraction for Pervious (mm) | Time to peak (T _P) |
| с ē | EX-A | 0.58 | StandHyd | 30 | 30 | SCS | 80 | 1 | - |
| 975mm N. Shore Blvd. | EX-B | 0.08 | StandHyd | 99 | 99 | SCS | 80 | 1 | - |
| 6 Z | EX-C | 0.19 | StandHyd | 90 | 90 | SCS | 80 | 1 | - |
| ۶ع | EX-D | 0.09 | StandHyd | 90 | 90 | SCS | 80 | 1 | - |
| 600mm N. Snore Blvd. | EX-E | 0.16 | StandHyd | 30 | 30 | SCS | 80 | 1 | - |
| <u> </u> | EX-F | 0.12 | StandHyd | 99 | 99 | SCS | 80 | 1 | - |
| | | | | | | | | | |

The foregoing areas were inputted into the Pre-Development Visual OTTHYMO Model as follows. Refer to the model output in Appendix B for the detailed output etc.





The pre-development flows in each of the design storms based on the Visual OTTHYMO Output is as follows. It is shown below that the post-development flows into the receiving sewers by the proposed storm service connections is no more than the following flows.

| TABLE 4 – Allowa | able Flow Rate | |
|------------------|---|--|
| Design Storm | Pre-Development or Allowable Discharge to 975mm North Shore Blvd. Sewer (L/s) | Pre-Development or Site Allowable Discharge to 600mm North Shore Blvd. Sewer (L/s) |
| 2-year | 84 | 48 |
| 5-year | 114 | 64 |
| 10-year | 133 | 74 |
| 25-year | 159 | 87 |
| 50-year | 178 | 100 |
| 100-year | 210 | 111 |

iv) Post Development Flow Analysis

City staff have stated that stormwater management quantity controls should be provided in the proposed development such that post-development flows are controlled so that they are no more than pre-development for each of the respective design storms, to the respective outlets, as shown in Table 4, above.

MTO was consulted regarding feasibility of maintaining the pre-development outlet to the 975mm storm sewer beneath the north side of North Shore Blvd. The email correspondence is provided in Appendix B. MTO Stated that they would not accept a storm drainage outlet to the 975mm storm sewer; that the outlet should strictly be the 600mm storm sewer beneath North Shore Blvd. Stormwater management criteria is thus the flow rates discharging to that sewer as established in Table 4.

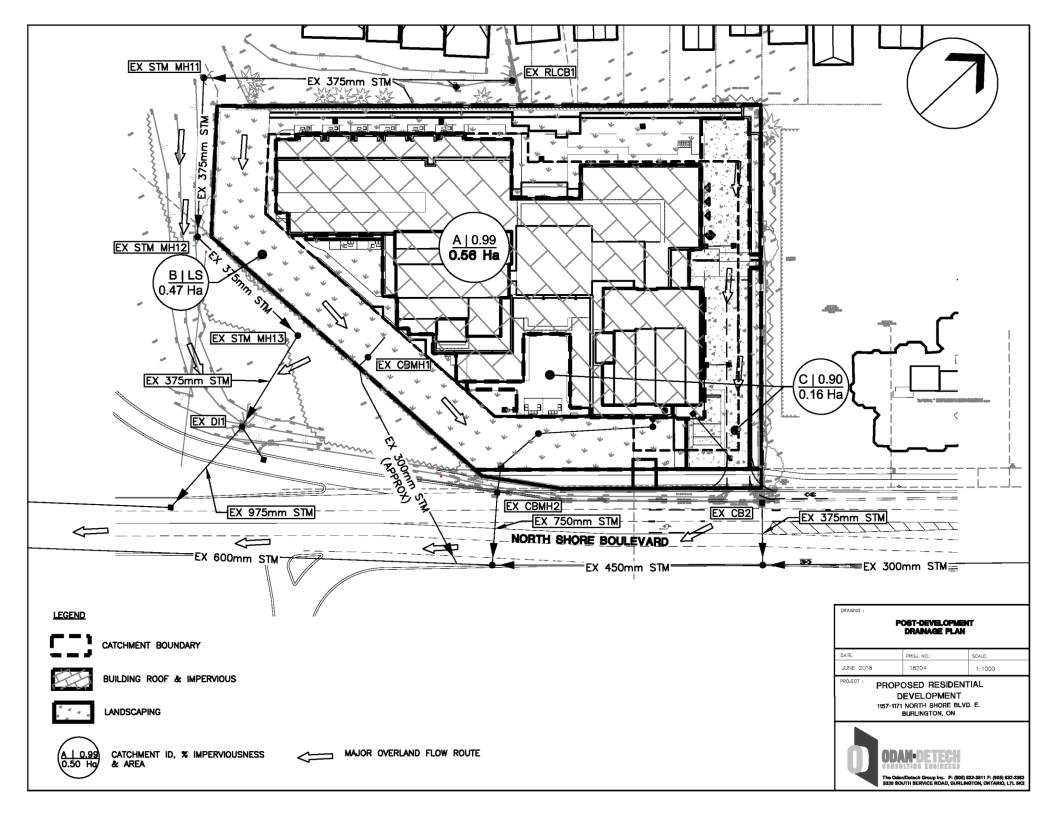
Storm runoff from all building roofs, including podiums and townhouses, will drain by mechanical roof drains, to mechanical storm piping, which will drain into the 100-year storm tank uncontrolled. There will be no rooftop ponding as per MTO Criteria. The ground-level areas will drain by a combination of area drains (where the areas are above the below-grade structure) and swales – such as in the MTO setback – which will drain to CB1 and thereafter drain to the 100-Year storm tank.

The storm tank will drain by site outlets to a storm connection to the existing structure on North Shore Blvd. The storm connection in the R.O.W. will also serve as the orifice tube, in accordance with MTO criteria.

Stormwater storage with controlled discharge will be required based on the foregoing criteria. The site has therefore been modelled using Visual OTTHYMO 2.3.2, as follows. For drainage areas with significant imperviousness the calculation of effective rainfall in Visual OTTHYMO is accomplished using the "Standhyd" method. This method is used in urban watersheds to simulate runoff by combining two parallel standard unit hydrographs resulting from the effective rainfall intensity over the pervious and impervious surfaces. For pervious surfaces, losses are calculated using the SCS modified CN method.

| TABLE 5 - Calch | | laraciensiics | | -0st-Develt | peu Sile | | | |
|-----------------|--------------|----------------------|--------------|---|-------------------------------------|----------------------------|--|----------------------|
| Area I.D. | Area (ha) | Hydrograph Method | % impervious | imperviousness directly connected % | Loss Method for Pervious Area | CN for Pervious Area | Initial Abstraction for Pervious (mm) | Time to peak (T_p) |
| A – Roof | 0.56 | StandHyd | 99 | 99 | SCS | 80 | 1 | - |
| B – Landscape | 0.47 | NashHyd | - | - | SCS | 80 | 5 | 0.11 |
| C - Paved | 0.16 | StandHyd | 90 | 90 | SCS | 80 | 1 | - |

TABLE 5 - Catchment Characteristics for the Post-Developed Site

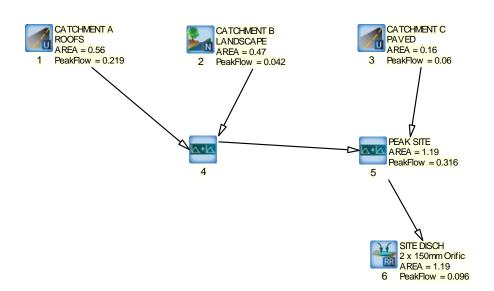


The runoff from the proposed development is greater than the pre-development scenario, therefore stormwater quantity controls are required to meet the pre-development stormwater quantity control criteria identified above.

Stormwater quantity control will be provided by a concrete storm tank located as shown on the Functional Servicing Plan. Two orifice tubes, as shown on the Functional Servicing Plan, will address the quantity control criteria.

The post-development Visual OTTHYMO hydrology and reservoir routing Model is as follows. Refer to the detailed output in Appendix B.

Figure 2 - Post-Development Visual OTTHYMO Model



The results of the Visual OTTHYMO model for the controlled discharge from the two orifices is as follows.

| TABLE 6 – Controlled discharge | e rate and stormw | ater storage volume | e | |
|--------------------------------|-------------------|-----------------------------------|-------------------------------|---|
| Location | Design Storm | Site Allowable Discharge (L/s) | Controlled Discharge (L/s) | Required Stormwater Storage (m ³) |
| Entire Site Post-Development | 2-year | 48 | 38 | 106 |
| Entire Site Post-Development | 5-year | 64 | 57 | 137 |
| Entire Site Post-Development | 10-year | 74 | 68 | 158 |
| Entire Site Post-Development | 25-year | 87 | 80 | 187 |
| Entire Site Post-Development | 50-year | 100 | 89 | 211 |
| Entire Site Post-Development | 100-year | 111 | 96 | 239 |

The stage/storage/discharge relationship for the orifices is as follows. The footprint of the storm tank must be 170m² which can be accommodated on the site as shown on the Functional Servicing Plan. A tank volume of 138m³ is required in the 100-year storm, which is provided as shown on the Functional Servicing Plan to storage depth 1.40m (elevation 79.65).

The stage/storage/discharge relationship for the storm tank is as follows. Two orifices are required to meet the storm-to-storm criteria for 2-year through 100-year storms.

The two orifices are both 150mm-diameter orifice tubes and are at elevations 78.25 and 78.85, as shown in the below Stage/Discharge relationship. Refer to the Functional Servicing Plan and Section E-E for the two proposed orifice tubes' locations.

Note that the two orifice tubes are located in the ROW so as to comply with MTO criteria.

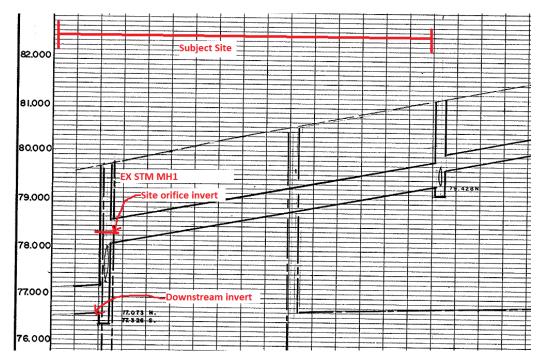
The 238m³ storage tank will be a concrete tank constructed with the subject site below-grade parking garage structure.

| Stage Discharge | | | | | | | | | |
|-----------------------|-----------|-----------|---|-----------|-----------|-----------|-----------|------|--------|
| | orifice 1 | | orifice 2 | | | | | | |
| Elevation Increment: | 0.20 | m | 0.20 | | | | | | |
| Orifice Coefficient: | 0.62 | | 0.62 | | | | | | |
| Orifice area | 0.0177 | m2 | 0.0177 | | | | | | |
| Orifice Size: | 150 | mm | 150 | | | | | | |
| Orifice Invert | 78.25 | m | 78.85 | | | | | | |
| Orifice centroid | 78.325 | | 78.925 | | | | | | |
| | | | | | | | | | |
| | Bottom | Тор | Volume | Discharge | Discharge | Total | | Tank | |
| Elevation Description | Elevation | Elevation | (m ³) | orifice1 | orifice2 | Discharge | Stage (m) | Area | |
| | (m) | (m) | (,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | (m³/s) | (m³/s) | (m³/s) | | (m2) | |
| Bottom of Tank | 78.00 | 78.25 | 0 | | | 0.000 | 0.00 | 0 | 0.0000 |
| Bollom of Tank | | | - | 0.047 | | | | - | |
| | 78.00 | 78.45 | 34 | 0.017 | | 0.017 | | 170 | 0.0170 |
| | 78.00 | 78.65 | 68 | 0.028 | | 0.028 | 0.40 | 170 | 0.0170 |
| | 78.00 | 78.85 | 102 | 0.035 | | 0.035 | 0.60 | 170 | 0.0170 |
| | 78.00 | 79.05 | 136 | 0.041 | 0.017 | 0.058 | 0.80 | 170 | 0.0170 |
| | 78.00 | 79.25 | 170 | 0.047 | 0.028 | 0.074 | 1.00 | 170 | 0.0170 |
| | 78.00 | 79.45 | 204 | 0.051 | 0.035 | 0.087 | 1.20 | 170 | 0.0170 |
| Roof of Tank | 78.00 | 79.65 | 238 | 0.056 | 0.041 | 0.097 | 1.40 | 170 | 0.0170 |

This analysis assumes the following:

- 1) There is capacity in the receiving North Shore Boulevard storm sewer for the subject site. This, given that the site drained to this outlet pre-development and stormwater quantity can be controlled such that it is in compliance with each respective pre-development storm in the post-development scenario as per the foregoing analysis.
- 2) There is no backwater/tailwater effect in the receiving storm sewer system impacting freeflow of water through the site orifices. That is, the two orifices flow by free-flow from the outlet and the driving head is as per the above orifice relationship. The rationale for this downstream condition assumption is as follows:
 - a. There is a significant fall across the manhole on the mainline North Shore Boulevard 600mm storm sewer that the site drains into. Figure 3, as follows, is an excerpt from City Plan-Profile drawing no. MN-5_21 showing EX STM MH2 – note that the site orifice invert is 78.00, whereas the invert of the outlet is 76.64; 1.4m lower. This is a significant freeboard – the effect of flows and surcharging in the downstream 600mm storm sewer will be mitigated by this freeboard.

Figure 3 - Excerpt from plan-profile MN-5_21 of North Shore Boulevard marked-up showing outlet condition at subject site storm sewer connection



v) Water Quality

City engineering staff identified the stormwater quality control criteria applying to the runoff from this site to be Enhanced Quality Control (80% total suspended solids removal), with a treatment-train approach to quality control.

City engineering staff recognize conventional Oil-Grit Separators as providing 50% TSS Removal. Most Canadian municipalities now consider the *Canadian Environmental Verification (CETV)* the approval authority for Oil-Grit Separators.

The CETV certification for the *Stormceptor STC*-model conventional Oil-Grit Separator by Imbrium Systems Inc. concurs with the town engineering staff comment that the conventional OGS provides 50% TSS removal. Figure 4, as follows, is an excerpt from the CETV *Verification Statement – Imbrium Systems Inc. Stormceptor … Oil-Grit Separators* (November 2017).

Figure 4 shows that the Stormceptor conventional OGS provides typically 50-70% TSS removal, therefore the conclusion holds that a conventional OGS does not satisfactorily address the stormwater quality criteria for this site because it does not provide 80% TSS.

| Particle size | | Surface loading rate (L/min/m ²) | | | | | | | | |
|-------------------------------|------------------------|--|------|------|------|------|------|--|--|--|
| fraction (µm) | 40 | 80 | 200 | 400 | 600 | 1000 | 1400 | | | |
| >500 | 90 | 58 | 58 | 100* | 86 | 72 | 100* | | | |
| 250 - 500 | 100* | 100* | 100 | 100* | 100* | 100* | 100* | | | |
| 150 - 250 | 90 | 82 | 26 | 100* | 100* | 67 | 90 | | | |
| 105 - 150 | 100* | 100* | 100* | 100* | 100* | 100* | 100 | | | |
| 75 - 105 | 100* | 92 | 74 | 82 | 77 | 68 | 76 | | | |
| 53 - 75 | Undefined ^a | 56 | 100* | 72 | 69 | 50 | 80 | | | |
| 20 - 53 | 54 | 100* | 54 | 33 | 36 | 40 | 31 | | | |
| 8 - 20 | 67 | 52 | 25 | 21 | 17 | 20 | 20 | | | |
| 5 – 8 | 33 | 29 | 11 | 12 | 9 | 7 | 19 | | | |
| <5 | 13 | 0 | 0 | 0 | 0 | 0 | 4 | | | |
| All particle sizes by mass | | | | | | | | | | |
| balance | 70.4 | 63.8 | 53.9 | 47.5 | 46.0 | 43.7 | 49.0 | | | |

Figure 4 - Excerpt from CETV Verification Statement for Stormceptor OGS

Table 1. Removal efficiencies (%) of the EF4 at specified surface loading rates

TSS Removal efficiency is ~50%

^a An outlier in the feed sample sieve data resulted in a negative removal efficiency for this size fraction. * Removal efficiencies were calculated to be above 100%. Calculated values ranged between 101 and 171% (average 128%).

See text and Bulletin # CETV 2016-11-0001 for more information.

The CETV also provides certification for stormwater quality filters that provide TSS removal by mechanical filtration through a filter media. One such model is the Jellyfish Filter by Imbrium Systems. The CETV verification statement for the Jelllyfish Filter by Imbrium Systems states that it provides a minimum 80% TSS Removal. Figure 5, as follows, is an excerpt from the CETV Verification Statement – Imbrium Systems Inc. Jellyfish Filter ... (August 2017).

Figure 5 shows that the Jellyfish Filter provides 80% TSS Removal, therefore it addresses the City criteria for 80% TSS Removal. The entire Jellyfish Filter CETV Verification Statement is provided here in Appendix B.

Figure 5 - Excerpt from CETV Verification Statement for Jellyfish Filter

| Water Quality Variable | Sampling | Min | Max | Median | Range | Mean | SD | Load based removal efficiency (%) |
|------------------------------|-----------------------|---------|----------|---------|---------|---------|---------|---|
| TSS | Influent (mg/L) | 16.30 | 261.00 | 79.30 | 244.70 | 86.26 | 51.37 | 87.2 |
| 155 | Effluent (mg/L) | 3.20 | 21.70 | 11.80 | 18.50 | 10.99 | 4.79 | 07.2 |
| SSC | Influent (mg/L) | 78.20 | 1401.70 | 444.50 | 1323.50 | 482.26 | 338.34 | 98.6 |
| 350 | Effluent (mg/L) | 2.80 | 18.10 | 7.30 | 15.30 | 7.88 | 3.77 | 56.0 |
| TP | Influent (µg/L) | 887.00 | 8793.00 | 3063.00 | 7906.00 | 3550.20 | 1914.50 | 64.2 |
| 16 | Effluent (µg/L) | 472.00 | 4769.00 | 1480.00 | 4297.00 | 1688.08 | 1059.98 | 04.2 |
| TN | Influent (µg/L) | 1170.00 | 10479.00 | 3110.00 | 9309.00 | 3519.32 | 2161.47 | 46.3 |
| | Effluent (µg/L) | 553.00 | 6579.00 | 1610.00 | 6026.00 | 2091.76 | 1613.61 | 40.5 |
| Zn | Influent (µg/L) | 0.005 | 7600.00 | 1500.00 | 7600.00 | 1792.00 | 1852.91 | 76.1 |
| 211 | Effluent (µg/L) | 0.005 | 2760.00 | 450.00 | 2760.00 | 561.64 | 594.70 | 70.1 |
| 0. | Influent (µg/L) | 0.001 | 880.40 | 79.50 | 880.40 | 171.28 | 229.33 | 02.1 |
| cu | Cu Effluent (µg/L) | | 51.30 | 6.90 | 51.30 | 14.36 | 17.22 | 92.1 |
| Oil and | Influent (mg/L) | 0.20 | 4.06 | 0.93 | 3.86 | 1.07 | 0.82 | 46.4 |
| Grease | Effluent (mg/L) | 0.00 | 2.32 | 0.35 | 2.32 | 0.50 | 0.60 | 40.4 |

| Table 4. Summary statistics for influent and effluent event mean concentrations for |
|---|
| selected constituents |

It is accordingly proposed to provide a Jellyfish Filter by Imbrium to address City criteria for 80% TSS Removal. This is lieu of providing a conventional OGS with a treatment-train approach to providing 80% TSSR. The Jellyfish filter will be sized at the SPA stage.

6.0 GROUNDWATER

A memorandum titled *Preliminary Groundwater Summary Results* was prepared by Pinchin Environmental dated February 21, 2019. The memo provides quantitative and qualitative results regarding groundwater conditions derived from monitored wells installed on-site.

Pinchin's memo concludes in page 7 that the steady-state flow rate of groundwater is 103.6 m³/day (1.2 L/s) average flow.

Pinchin's memo concludes in page 5 that there are quality exceedances for discharge to either the Regional Sanitary Sewer (against Regional Municipality of Halton criteria) or City of Burlington storm sewers. From page 5, it is evident that only TSS (total suspended solids) is in exceedance of the sanitary sewer discharge criteria, whereas there are exceedances in TSS, BOD (biochemical oxygen demand) and Manganese for discharge to the storm sewer.

Given the quality of the water and relative ease of treatment in the different scenarios, it is proposed to discharge the collected foundation drainage/groundwater into the Regional sanitary sewer. Thus, groundwater entering the building's foundation drains will drain into the mechanical sump, and thereafter be pumped by the mechanical foundation drain pump into the building's proposed sanitary outlet.

The pump flow rate of groundwater/foundation drainage water is thus considered in site sanitary flow calculations.

Given that the average flow rate is 1.2 L/s, a mechanical sump pump flow rate of 3.2 L/s (50 US gallons per minute) is assumed as the peak flow rate of foundation drainage that will be pumped into the sanitary outlet. This flow rate is included in Table 1, above, whereby the pumped flow rate of groundwater is included in sanitary flow calculations.

It is preliminarily anticipated that filtration by the foundation drain filter socks, filtration through the standard foundation drain sand pit, and settlement in the sump, the TSS exceedance for discharge to the Regional sanitary sewer will be addressed.

7.0 CONCLUSIONS

From the foregoing investigation, the site is serviceable utilizing existing sanitary, storm and watermain infrastructure within and adjacent to the site. Storm water management can be accommodated with on-site storage as described in this report.

The following table summarizes the SWM and Servicing components of the proposed development.

TABLE 7 - Summary

| | Proposed Development |
|---|--|
| Peak Sanitary Discharge (L/s) (including groundwater flow) | 15.4 |
| Proposed Sanitary Service | Proposed 300mm Sanitary Service |
| Receiving Sanitary Sewer | Existing Receiving 1800mm Regional Trunk Sewer |
| Existing Watermain | North Shore Blvd – 250mm |
| Development Water Demand | 3545 USGM |
| Available Flow in Watermain at 20 psi | 4469 USGM |
| Allowable release rate from site (100-Y) | 111 L/s |
| Proposed Controlled release rate from site (100-Y) | 96 L/s |
| 100-Y Storm SWM Storage (m ³) | 238 |

8.0 REFERENCES

1. Regional Municipality of Halton's *Water and Wastewater Linear Design Manual* (April 2015)

Respectfully Submitted; The Odan Detech Group Inc.



Daniel Bancroft, P.Eng.

APPENDIX A

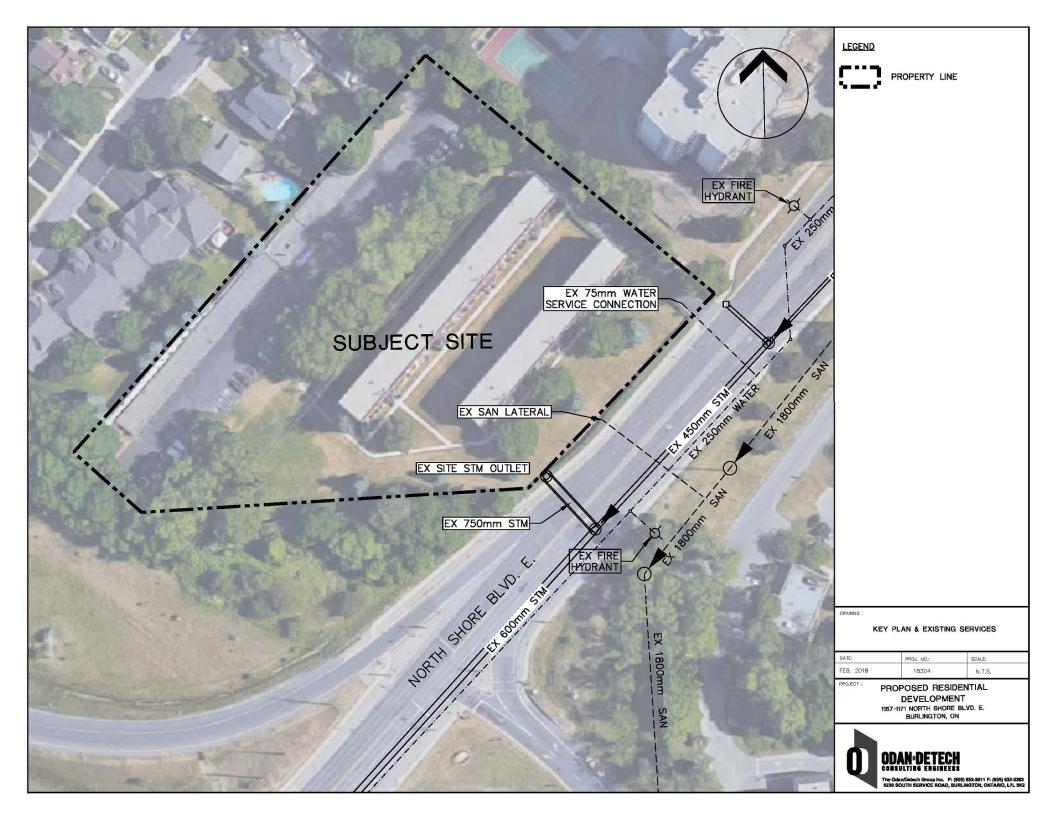
Existing Site

Aerial view of Site and surrounding areas

Site Plan by MontgomerySisam

Statistics by MontgomerySisam

Email Correspondence from Region Engineering Staff



Development Statistics

19.08.14

Montgomery Sisam Architects

| | | Statistic | Figure | Unit | Comments |
|-------------|-----------------------|--------------------------|--------|-----------------------------|---------------|
| | (A) | Existing Site Area | 12,186 | sm | 3.01 Acres |
| | (B) | ROW Dedication | 336 | sm | .08 Acres |
| Table A: | New Site Area (A - B) | 11,850 | sm | 2.93 Acres | |
| DEVELOPMENT | (D) | GFA | 42,532 | sm | * See Table D |
| STATISTICS | (E) | FAR (D / C) | 3.59 | | |
| STATISTICS | (F) | Unit Count | 419 | Units | * See Table B |
| (G) (H) | Resident Population | 600 | People | | |
| | Staff Population | 180 | People | * On site at any given time | |
| | (1) | Total Population on Site | 780 | People | |

| Table B: | | Neighbourhood | Percentage | Unit Count | Comments | |
|---------------|--------------------|-----------------|------------|------------|----------|--|
| UNIT | (A) | Assisted Living | 37% | 155 | | |
| | (B) | Memory Care | 13% | 55 | | |
| BREAKDOWN (C) | Independent Living | 50% | 209 | | | |
| | (D) | Total Units | | 419 | | |

| | | Neighbourhood | Percentage | Unit Count | Comments | |
|------------------------------------|-----|----------------------------------|------------|------------|----------|--|
| Table C: UNIT TYPE BREAKDOWN | (A) | Assisted Living - Studio | 80% | 124 | | |
| | (B) | Assisted Living - 1 Bed | 20% | 31 | | |
| | (C) | Memory Care - Studio | 80% | 44 | | |
| | (D) | Memory Care - 1 Bed | 20% | 11 | | |
| | (E) | Independent Living - Studio | 22% | 46 | | |
| | (F) | Independent Living - 1 Bed | 36% | 75 | | |
| | (G) | Independent Living - 1 Bed + Den | 25% | 53 | | |
| | (H) | Independent Living - 2 Bed | 17% | 35 | | |
| | (1) | Total Units | | 419 | | |
| | (1) | Premium Independent Living | 31% | 65 | | |

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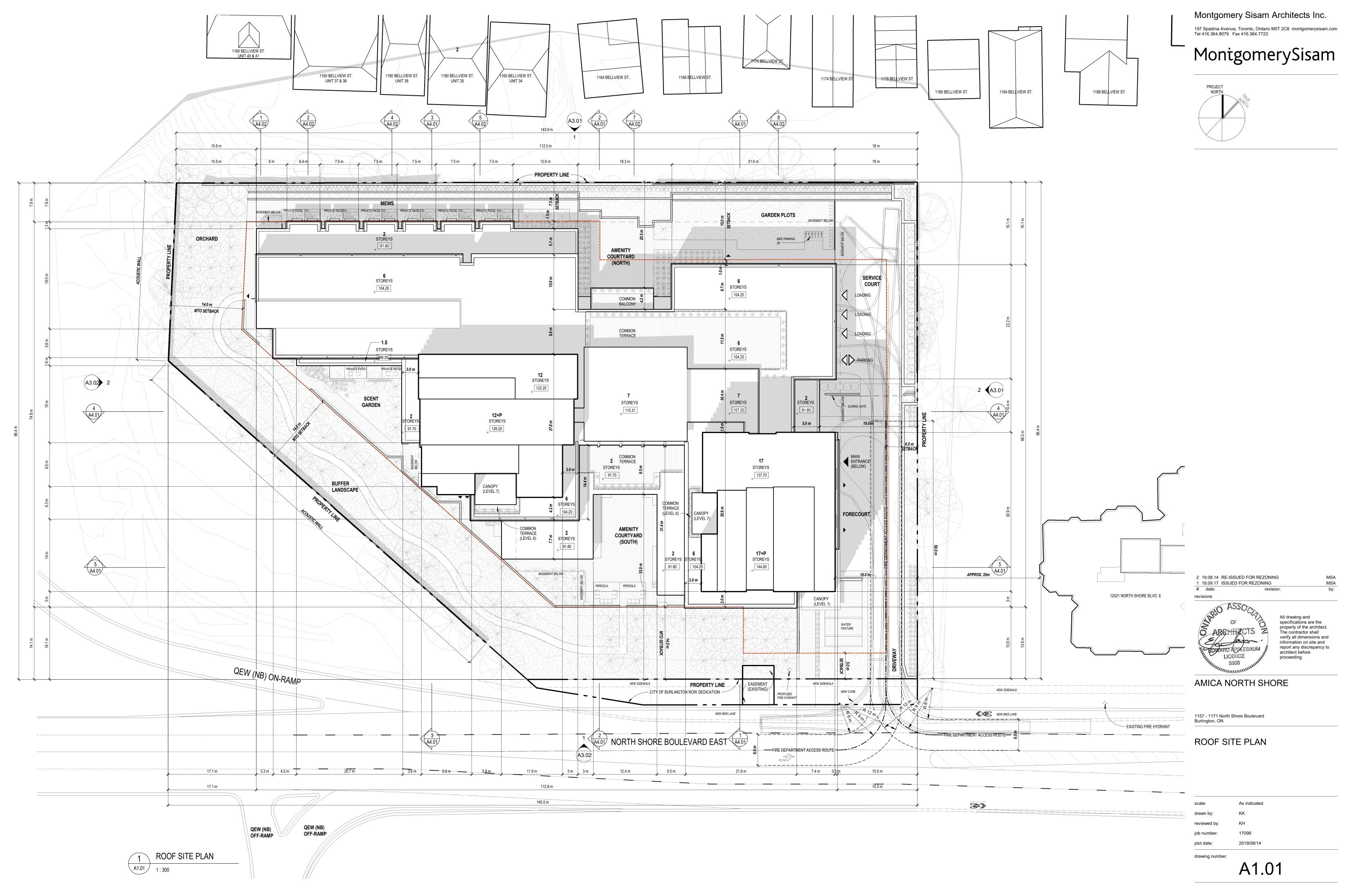
PROPOSED RESIDENTIAL DEVELOPMENT – 1157-1171 NORTH SHORE BOULEVARD FUNCTIONAL SERVICING REPORT

- 27 -

| ZONING GROSS FLOOR AREA (GFA) | | | |
|-------------------------------|------------------------|--|--|
| Level | Area | | |
| EVEL 17 | 7,855 SF | | |
| | 7,855 SF | | |
| EVEL 16 | 7,855 SF | | |
| | 7,855 SF | | |
| | 1,000 01 | | |
| EVEL 15 | 7,855 SF | | |
| | 7,855 SF | | |
| | 2 000 00 | | |
| LEVEL 14 | 7,855 SF 7,855 SF | | |
| | 1,655 5F | | |
| EVEL 13 | 7,855 SF | | |
| | 7,855 SF | | |
| | | | |
| LEVEL 12 | 15,711 SF | | |
| | 15,711 SF | | |
| EVEL 11 | 15,711 SF | | |
| AVEL II | 15,711 SF | | |
| | ra, rin an | | |
| LEVEL 10 | 15,711 SF | | |
| | 15,711 SF | | |
| | | | |
| LEVEL 9 | 15,711 SF | | |
| | 15,711 SF | | |
| EVEL 8 | 15,711 SF | | |
| | 15,711 SF | | |
| | | | |
| LEVEL 7 | 20,441 SF | | |
| | 20,441 SF | | |
| - | 10.070.07 | | |
| LEVEL 6 | 46,978 SF 46,978 SF | | |
| | 40,878 3P | | |
| LEVEL 5 - AL | 46,995 SF | | |
| | 46,995 SF | | |
| | | | |
| LEVEL 4 - AL | 47,028 SF | | |
| | 47,028 SF | | |
| EVEL 3 - MC | 47,004 SF | | |
| EVEL 3 - MO | 47,004 SF 47,004 SF | | |
| | | | |
| LEVEL 2 | 52,477 SF | | |
| | 52,477 SF | | |
| | | | |
| IEZZANINE | 14,437 SF | | |
| | 14,437 SF | | |
| EVEL 1 | 48,646 SF | | |
| | 48,646 SF | | |
| | | | |
| LEVEL P1 | 14,104 SF | | |
| | 14,104 SF | | |
| | 14 074 07 | | |
| EVEL P2 | 1,874 SF | | |
| Grand total | 1,874 SF 457,813 SF | | |
| arama sütät | -107,010 OF | | |
| | | | |

| INDOOR AMENITY AREA | | | | | |
|---------------------|----------------------|--|--|--|--|
| Level | Area | | | | |
| LEVEL 17 | 457 SF | | | | |
| | 457 SF | | | | |
| LEVEL 16 | 457 SF | | | | |
| LEVEL 10 | 457 SF | | | | |
| | 457 56 | | | | |
| LEVEL 15 | 457 SF | | | | |
| - | 457 SF | | | | |
| 1 51 51 44 | 152.05 | | | | |
| LEVEL 14 | 457 SF 457 SF | | | | |
| | 407 SF | | | | |
| LEVEL 13 | 457 SF | | | | |
| | 457 SF | | | | |
| | | | | | |
| LEVEL 12 | 932 SF | | | | |
| | 932 SF | | | | |
| LEVEL 11 | 932 SF | | | | |
| | 932 SF | | | | |
| | | | | | |
| LEVEL 10 | 932 SF | | | | |
| | 932 SF | | | | |
| LEVEL A | 000.05 | | | | |
| LEVEL 9 | 932 SF 932 SF | | | | |
| | 632 51 | | | | |
| LEVEL 8 | 932 SF | | | | |
| • | 932 SF | | | | |
| | | | | | |
| LEVEL 7 | 5,664 SF 5.664 SF | | | | |
| | 5,004 SF | | | | |
| LEVEL 6 | 4.688 SF | | | | |
| | 4,688 SF | | | | |
| | | | | | |
| LEVEL 5 - AL | 4,842 SF | | | | |
| | 4,842 SF | | | | |
| LEVEL 4 - AL | 4,847 SF | | | | |
| | 4,847 SF | | | | |
| | | | | | |
| LEVEL 3 - MC | 4,792 SF | | | | |
| | 4,792 SF | | | | |
| LEVEL 2 | 6,558 SF | | | | |
| LEVEL 2 | 6,558 SF | | | | |
| | | | | | |
| LEVEL 1 | 16,919 SF | | | | |
| | 16,919 SF | | | | |
| Grand total | 55,256 SF | | | | |
| | | | | | |

| OUTDOOR AMENITY AREA | | | | |
|----------------------|-----------|--|--|--|
| Level | Area | | | |
| LEVEL 7 | 5,299 SF | | | |
| | 5,299 SF | | | |
| LEVEL 6 | 1,938 SF | | | |
| | 1,938 SF | | | |
| LEVEL 5 - AL | 1,969 SF | | | |
| | 1,969 SF | | | |
| LEVEL 4 - AL | 1,938 SF | | | |
| | 1,938 SF | | | |
| LEVEL 3 - MC | 4,026 SF | | | |
| | 4,026 SF | | | |
| LEVEL 1 | 11,929 SF | | | |
| | 11,929 SF | | | |
| Grand total | 27,098 SF | | | |



119-08-13 1:42:55 PM C:\Users\kkrawczyk\Documents\MSA_NorthShore_2019_C_kkrawczykW4921

Email Correspondence from Region Engineering Staff

From: Kisneris, John [mailto:John.Kisneris@halton.ca]
Sent: Wednesday, February 28, 2018 2:25 PM
To: 'daniel@odandetech.com' <daniel@odandetech.com>
Cc: drago@odandetech.com
Subject: RE: 1157 - 1171 North Shore Blvd E. sanitary sewers

Hi Daniel.

Regarding your preliminary water and wastewater servicing capacity inquiry for a preliminary development proposal at 1157 - 1171 North Shore Boulevard East for a total of 407 units. Please be advised that I have been informed by the Region's Public Works department that the capacity can be accommodated in the Region's systems.

As for the sanitary sewer connection lateral, the Region cannot confirm at this time whether it is adequate for the proposed development. It can only be confirmed when more work is done toward the future site plan application submission by the owner. For example when the engineering consultant undertakes to complete an existing sanitary sewer connection lateral physical locate, a physical size confirmation, a condition inspection and assessment (CCTV) of the existing sanitary lateral, a confirmation of the development size and scope, a confirmation whether any land division severance will be requested by the developer (individual water and wastewater services, and cannot cross lot lines), whether there would be an need for a local wastewater main (sanitary sewer), etc., whether any sewage pumping is required, and the developer's engineering consultant has proposed site services on proposed draft site servicing plan drawings, and completes a Functional Servicing Report (if required). Only then can the Region review the information.

As you know, watermain and wastewater main (sanitary) servicing capacity is not guaranteed at the preliminary proposal stage. Servicing of development in the Burlington area of Halton Region is on a firstcome-first-serve basis. The owner can pre-consult about servicing capacity with the Region at any time in the future going forward. Capacity will be reviewed again and commented upon at the time of Planning application receipt. Should a servicing capacity issue be identified at that time then it will have to be dealt with, working through it with the Region. Servicing capacity is deemed to be in hand at the issuance of a Regional Servicing Agreement, Special Financial Agreement, and Regional Services Permit (all if required), which is reviewed and obtained toward the end of the City's Site Plan approval process.

Please let me know if you have any questions. Thanks.

...Interim emails omitted - DB

From: Daniel Bancroft - Odan Detech Group [mailto:daniel@odandetech.com]
Sent: Monday, February 05, 2018 12:21 PM
To: 'Kisneris, John' <<u>John.Kisneris@halton.ca</u>>
Cc: 'drago@odandetech.com' <<u>drago@odandetech.com</u>>
Subject: RE: 1171 North Shore Blvd E. sanitary sewers

Hi John,

In red:

So just to be clear, you would like me to find out whether there is capacity in the Region's trunk sewer across the street ? **Correct.**

You do not have any other information that I described below that has an impact on servicing. **Correct.** Can you please tell me what is going to happen to the existing buildings on the property ? **They would be demolished in the proposed development.**

Can you please tell me how many units currently exist in each building ? **56 Units** Can you please tell me how many bedrooms there are in each unit ?

Existing: 3 x 1BR, 53 x 2BR

- Proposed:
 - 1. Tower 1 (24 storey)
 - a. 130 x 1BR
 - b. 80 x 2BR
 - c. 25 x 3BR
 - 2. Tower 2 (12 storey)

a. 120 x Studio + 52 x 1BR

Can you please tell me how big the property is ? Approx. 1.18 Ha

Thanks for your help. Let us know next steps/any other info required from us.

Regards Daniel



Daniel Bancroft, P.Eng. The Odan/Detech Group Inc.

P: (905) 632-3811 ext.133 | **F**: (905) 632-3363 5230, SOUTH SERVICE ROAD, UNIT 107 | BURLINGTON, ONTARIO | L7L 5K2 www.odandetech.com | daniel@odandetech.com

APPENDIX B

Email Correspondence from MTO Review Staff

Pre-Development Visual OTTHYMO Output (2-year to 100-year storms)

Post-Development Visual OTTHYMO Output (2-year to 100-year storms)

CETV Verification Statement – Imbrium Systems Inc. Stormceptor OGS

CETV Verification Statement – Imbrium Systems Inc. Jellyfish Filter

Buried Utility Map by Markit Locates

Field Locate Notes by Markit Locates

- 30 -

Email Correspondence from MTO Review Staff

From: Polus, Asia (MTO) [mailto:Asia.Polus@ontario.ca]
Sent: Tuesday, July 30, 2019 11:04 AM
To: daniel@odandetech.com
Cc: White, Mark J. (MTO) <Mark.J.White@ontario.ca>; Lawrence, Morgan (MTO)
<Morgan.Lawrence@ontario.ca>
Subject: FW: OP and Zoning By-law – 505-05/18 and 505-07/18 - 1157-1171 North Shore Blvd - Pipe Connection

Hi Daniel,

Further to your e-mail please note that your request was reviewed and the following was provided by MTO Drainage Department:

- MTO doesn't allow any pipes within our Right-of-Way (ROW). Existing Drainage Plan in Functional Servicing Report dated November, 2018 and the one provided along with recent email show different connections of 375mm sewer (see Attached files).
- MTO is asking consultant to connect their drainage as proposed in their first submission and Functional Servicing Report dated November, 2018 as MTO doesn't allow pipes within MTO's ROW.
- Should the information provided through attached (updated) existing drainage plan (18204 STM Catchment key plan STM PRE-DEV(1).pdf) is correct then MTO should further investigate as no pipes are permitted as noted earlier.

I trust that the above is clear, however if you have any questions please feel free to ask.

Regards

W. Asia Polus Corridor Management Planner

Ministry of Transportation Central Region, Highway Corridor Management Section 159 Sir William Hearst Ave. 7th Floor Toronto, ON M3M 0B7 Tel. 416 - 235-3991 Fax 416 - 235-4267

From: Daniel Bancroft - Odan Detech Group <<u>daniel@odandetech.com</u>>
Sent: July-25-19 8:57 AM
To: Polus, Asia (MTO) <<u>Asia.Polus@ontario.ca</u>>
Subject: RE: OP and Zoning By-law – 505-05/18 and 505-07/18 - 1157-1171 North Shore Blvd

Hi Asia,

Further to our phone conversation just now,

My question is: Given that there are two existing drainage outlets presently serving the subject site (below) – how may we connect a proposed development of 1157 N. Shore Blvd. to the 975mm storm sewer beneath the North Side of N. Shore Blvd? This, given that that this the predominant outlet for the existing site. Would you have us connect directly to EX STM MH13 or the downstream 375mm pipe? Does that 375mm pipe belong to MTO? ...Or would MTO have us install a new pipe through the trees/landscaped area belonging to MTO, all the way to EX DI1?

Background: City of Burlington has stated that storm drainage should match post-dev't to pre-dev't flows to the respective pre-dev't storm outlets.

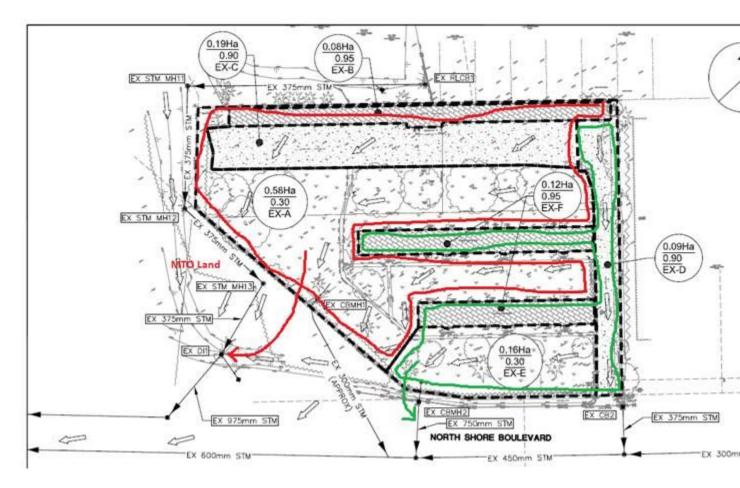
Two existing storm drainage outlets (see attached Pre-Development Drainage Plan & markup below):

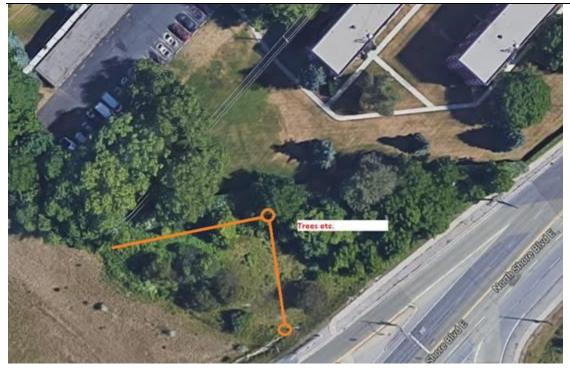
- 1) 975mm Storm beneath north side of N. Shore Blvd.
- 2) 600mm Storm beneath south side of N. Shore Blvd.

We recognize all other MTO Criteria and will comply (>5m orifice tube in ROW; only conventional SWM tanks; no rooftop storage etc.).

Appreciate your help on this.

Thanks! Daniel





Daniel Bancroft, P.Eng. The Odan/Detech Group Inc.

P: (905) 632-3811 ext.133 | **F**: (905) 632-3363 5230, SOUTH SERVICE ROAD, UNIT 107 | BURLINGTON, ONTARIO | L7L 5K2 www.odandetech.com | daniel@odandetech.com

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From: Daniel Bancroft - Odan Detech Group [mailto:daniel@odandetech.com]
Sent: Wednesday, July 24, 2019 1:57 PM
To: 'Asia.Polus@ontario.ca' <<u>Asia.Polus@ontario.ca</u>>
Subject: FW: OP and Zoning By-law – 505-05/18 and 505-07/18 - 1157-1171 North Shore Blvd

Hi Asia - I just left you a voicemail regarding below comments.

Can you please call me to touch base on drainage items when you've a moment?

Thanks, Daniel



The Odan/Detech Group Inc.

P: (905) 632-3811 ext.133 | **F**: (905) 632-3363 5230, SOUTH SERVICE ROAD, UNIT 107 | BURLINGTON, ONTARIO | L7L 5K2 www.odandetech.com | daniel@odandetech.com

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From: "Stern, Lisa" <<u>Lisa.Stern@burlington.ca</u>> Date: Tuesday, January 8, 2019 at 1:16 PM To: Tyler Grinyer <<u>tgrinyer@bousfields.ca</u>> Subject: FW: OP and Zoning By-law – 505-05/18 and 505-07/18 - 1157-1171 North Shore Blvd

Please find the MTO's comments below. I have put a call in to Kevin to get further clarification on the traffic comments provided.

From: Polus, Asia (MTO) [mailto:Asia.Polus@ontario.ca]
Sent: Thursday, January 03, 2019 12:58 PM
To: Stern, Lisa
Cc: Scholz, Kevin (MTO); Lawrence, Morgan (MTO)
Subject: OP and Zoning By-law – 505-05/18 and 505-07/18 - 1157-1171 North Shore Blvd

RE: Application to amend the OP and Zoning By-law – 505-05/18 and 505-07/18 To permit a Senior Living Campus 1157-1171 North Shore Blvd N/E corner of QEW and North Shore Blvd Burlington

Con BB, Lot 30 First Submission

Hi Lisa,

The above noted submission was reviewed by MTO and the following are the ministry comments:

With respects to the application, please note that in general the ministry has no objection to the proposed OP and Zoning By-law however as you are aware the land affected is located next to the QEW property limits and therefore the proponent must address all ministry's concerns and requirements regarding the development proposal to the MTO satisfaction prior to any ministry approval will be issued.

Current submission regarding the above noted subject has included a Drainage and Traffic components and these documents were reviewed by appropriate MTO offices and the following comments should be noted:

Drainage comments:

- Please provide separate Stormwater Management Report at time of detail design for MTO's review and approval. Report should be signed and stamped by a P.Eng.
- 2. The owner must be advised that all proposed permanent buildings and structures both above and below ground, utilities, frontage roads/fire routes, essential parking spaces, storm water management facilities, including ponds and associated berms, storages, and noise walls must be set back 14.0 metres (45 feet) from the Highway Right-of-way limit.
- 3. Please note that MTO only allows restrictor pipe of approximately 5m length for quantity control and part of it should be located within Municipal limits.
- 4. Please note that rooftop storage and unconventional underground storage such as chambers and infiltration systems are not permitted by MTO. Underground storages provided in manholes, stormsewer, super pipe or storage tank are permitted as such storages are accessible through a manhole and can be easily inspected for their continued functionality.

Traffic comments:

Please note that the following comments are initial comments only and they must be completed prior to continuing our review of the provided TIS Report:

- 1. Provide electronic copy of synchro models for TIS at 1161-1167 North Shore Blvd.
- 2. Concerns with the proximity of the QEW East Off Ramp to development site access. Vehicles exiting the Toronto Bound off ramp would have difficulty

accessing an eastbound left turn lane into site. Please propose measures to mitigate this concern and demonstrate how vehicles will safely access a properly designed left turn lane.

3. The proxy site used for trip generation has half the number of units as the proposed development. Therefore the proponent must assign additional trips to traffic generated by the proposed development.

General comments:

- On some of the architectural building "artist concept" sketches, it appears that there is some type of canopy or awning over the primary "Amenity Courtyard" which extends out towards North Shore Blvd. It's hard to tell, but this awning looks like it potentially encroaches into the 14 m MTO setback. It is not shown on the civil drawings. If this awning is in fact being proposed by the proponent, we would like to see where this awning extends to in relation to the 14 m setback.
- 2. On the Functional Servicing Drawing (Sheet 18204-1A), one corner of the building shown in the upper left side of the sheet encroaches into the 14 m MTO setback. This does not match what is shown on the architectural plans. Please provide some clarification which one is correct?
- 3. Although the proponent has provided a 14 m MTO setback on the QEW side of the building, it would appear that the proponent plans to make considerable use of this space for outdoor recreational purposes for residents. In fact, one of the "Amenity Patios" extends to approximately 4 m from the MTO property line, which is not acceptable. By looking at the landscape plan, it appears that the proponent wishes to create a rather extensive (and presumably expensive) landscaped area within the 14 m setback. I would suggest that this land use is very much integral to the overall site layout. It is obviously being placed there for the exclusive use and enjoyment by the building residents, so we would not consider what we see in these conceptual landscaping plans to be merely a "landscape buffer". We would have a lot of concerns about this being built exactly as shown within the 14 m setback the site would, without question, be negatively affected if MTO needed to acquire lands within that 14 m setback at a later date.
- 4. In the event that the 14 m setback is required by MTO in the future for highway purposes, how will pedestrians reach the western side of the building? The corners of the building touch the 14 m MTO setback line, meaning would be no room left for a path around the western side of the building.
- 5. MTO Building and Land Use permits are required prior to any grading/construction activity within 45m of QEW limits, or within 395m radius of centrepoint of QEW and North Shore Bulevard. All above and below ground structures (including but not limited to, fire routes, stormwater management

facilities and servicing/utilities) must be setback a minimum of 14m from all MTO property limits. The 14m setback from the ministry ROW must be clearly indicated on all plans submitted for our review.

- 6. Furthermore, the ministry would like to see a lighting plan and report for the site. The MTO will only accept plan in LUX unit. Also, the Hwy property limits must be clearly defined so that our electrical office can verify the amount of acceptable light trespass on the Hwy ROW.
- 7. In general, required parking must be setback a minimum of 14m from the QEW property limits. The Ministry will only allow surplus parking to be located within the 14m setback limit. Surplus parking must be labelled as "surplus" on the site plan.
- 8. All plans and reports must be stamped and signed, and circulated to the MTO through municipal site plan application process for a formal review and comments.
- 9. The ministry controls all signage within 400m of any provincial highway ROW.
- 10. We would request that all signage issues be kept as a separate entity from the site plan approval process, however, if the proponent prefer to have all signage approved as part of the site plan approval process, then all details regarding signage must be submitted to this ministry.
- 11. Sign permits must be obtained from this office for any sign visible to the highway prior to the placement of the sign. Any proposed sign shall be located at min of 3m setback.

Please note that any enquires and/or further submission regarding this development proposal should be sent to Kevin Scholz attention, he is included in this e-mail and he can be reached at 416-235-5383.

I trust that the above is clear and satisfactory. If you require any additional clarification do not hesitate to contact Kevin or me.

Best Regards

W. Asia Polus Corridor Management Planner

Ministry of Transportation Central Region, Highway Corridor Management Section 159 Sir William Hearst Ave. 7th Floor Toronto, ON M3M 0B7 Tel. 416 - 235-3991 Fax 416 - 235-4267

Pre-Development Visual OTTHYMO Output (2-year to 100-year storms)

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 Developed and Distributed by Clarifica Inc. Copyright 1996, 2007 Clarifica Inc. All rights reserved. ***** DETAILED OUTPUT ***** Input filename: C:\Program Files (x86)\Visual OTTHYMO 2.3.3\voin.dat Output filename: P:\2018\18204\Visual OTTHYMO\Rev1\18204 vo2\Pre-Development.out Summary filename: P:\2018\18204\Visual OTTHYMO\Rev1\18204 vo2\Pre-Development.sum DATE: 7/26/2019 TIME: 1:50:07 PM USER: COMMENTS: ********* ** SIMULATION NUMBER: 1 ** ***** | CHICAGO STORM | IDF curve parameters: A= 592.600 B= 6.000 C= .780 | Ptotal= 32.34 mm | _____ used in: INTENSITY = A / (t + B)^C Duration of storm = 4.00 hrs Storm time step = 10.00 min Time to peak ratio = .33
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| <pre>Surface Area (ha)= Dep. Storage (mm)= Average Slope (%)= Length (m)= Mannings n = Max.Eff.Inten.(mm/hr)= over (min) Storage Coeff. (min)= Unit Hyd. Tpeak (min)= Unit Hyd. Tpeak (min)= Unit Hyd. Tpeak (cms)= TIME TO PEAK (hrs)= RUNOFF VOLUME (mm)= TOTAL RAINFALL (mm)= RUNOFF COEFFICIENT = ****** WARNING: STORAGE COEFF. (i) CN PROCEDURE SELECT CN* = 80.0 Ia (ii) TIME STEP (DT) SHOU THAN THE STORAGE CO (iii) PEAK FLOW DOES NOT</pre> | <pre>IMPERVIOUS P</pre> | ERVIOUS (i) .00 1.00 2.00 40.00 .250 590.93 5.00 2.55 (ii) 5.00 .29 .00 1.33 10.36 32.34 .32 TIME STEP! LOSSES: (Above) R EQUAL W IF ANY. Dir. Conn. ERVIOUS (i) .41 | *TOTALS* .015 (iii) 1.33 31.13 32.34 .96 |
| <pre>Surface Area (ha) = Dep. Storage (mm) = Average Slope (%) = Length (m) = Mannings n = Max.Eff.Inten.(mm/hr) = over (min) Storage Coeff. (min) = Unit Hyd. Tpeak (min) = Unit Hyd. Tpeak (min) = Unit Hyd. peak (cms) = TIME TO PEAK (hrs) = RUNOFF VOLUME (mm) = TOTAL RAINFALL (mm) = RUNOFF COEFFICIENT = ****** WARNING: STORAGE COEFF. (i) CN PROCEDURE SELECT CN* = 80.0 Ia (ii) TIME STEP (DT) SHOU THAN THE STORAGE CO (iii) PEAK FLOW DOES NOT </pre> | <pre>IMPERVIOUS P</pre> | ERVIOUS (i) .00 1.00 2.00 40.00 .250 590.93 5.00 2.55 (ii) 5.00 .29 .00 1.33 10.36 32.34 .32 TIME STEP! LOSSES: (Above) R EQUAL W IF ANY. Dir. Conn. ERVIOUS (i) .41 1.00 2.00 | *TOTALS* .015 (iii) 1.33 31.13 32.34 .96 |
| <pre>Surface Area (ha) = Dep. Storage (mm) = Average Slope (%) = Length (m) = Mannings n = Max.Eff.Inten.(mm/hr) = over (min) Storage Coeff. (min) = Unit Hyd. Tpeak (min) = Unit Hyd. Tpeak (min) = Unit Hyd. peak (cms) = TIME TO PEAK (hrs) = RUNOFF VOLUME (mm) = TOTAL RAINFALL (mm) = RUNOFF COEFFICIENT = ****** WARNING: STORAGE COEFF. (i) CN PROCEDURE SELECT CN* = 80.0 Ia (ii) TIME STEP (DT) SHOU THAN THE STORAGE CO (iii) PEAK FLOW DOES NOT </pre> | <pre>IMPERVIOUS P</pre> | ERVIOUS (i) .00 1.00 2.00 40.00 .250 590.93 5.00 2.55 (ii) 5.00 .29 .00 1.33 10.36 32.34 .32 TIME STEP! LOSSES: (Above) R EQUAL W IF ANY. Dir. Conn. ERVIOUS (i) .41 1.00 2.00 40.00 | *TOTALS* .015 (iii) 1.33 31.13 32.34 .96 |
| <pre>Surface Area (ha) = Dep. Storage (mm) = Average Slope (%) = Length (m) = Mannings n = Max.Eff.Inten.(mm/hr) = over (min) Storage Coeff. (min) = Unit Hyd. Tpeak (min) = Unit Hyd. Tpeak (min) = Unit Hyd. peak (cms) = TIME TO PEAK (hrs) = RUNOFF VOLUME (mm) = TOTAL RAINFALL (mm) = RUNOFF COEFFICIENT = ****** WARNING: STORAGE COEFF. (i) CN PROCEDURE SELECT CN* = 80.0 Ia (ii) TIME STEP (DT) SHOU THAN THE STORAGE CO (iii) PEAK FLOW DOES NOT </pre> | <pre>IMPERVIOUS P</pre> | ERVIOUS (i) .00 1.00 2.00 40.00 .250 590.93 5.00 2.55 (ii) 5.00 .29 .00 1.33 10.36 32.34 .32 TIME STEP! LOSSES: (Above) R EQUAL W IF ANY. Dir. Conn. ERVIOUS (i) .41 1.00 2.00 | *TOTALS* .015 (iii) 1.33 31.13 32.34 .96 |

| <pre>Max.Eff.Inten.(mm/hr)= 68.16 15.57</pre> | |
|---|---|
| | - |
| <pre> CALIB STANDHYD (0006) Area (ha)= .12 ID= 1 DT= 5.0 min Total Imp(%)= 99.00 Dir. Conn.(%)= 99.00</pre> | |
| IMPERVIOUS PERVIOUS (i) Surface Area (ha) = .12 .00 Dep. Storage (mm) = 1.00 1.00 Average Slope (%) = 1.00 2.00 Length (m) = 28.30 40.00 Mannings n = .013 .250 Max.Eff.Inten.(mm/hr) = 68.16 663.36 over (min) Juit Hyd. Tpeak (min) = 1.40 (ii) 2.71 (ii) Unit Hyd. Tpeak (min) = 5.00 5.00 Unit Hyd. peak (cms) = .33 .29 PEAK FLOW (cms) = .02 .00 .023 (iii) TIME TO PEAK (hrs) = 1.33 1.33 1.33 RUNOFF VOLUME (mm) = 31.34 10.36 31.13 TOTAL RAINFALL (mm) = 32.34 32.34 32.34 RUNOFF COEFFICIENT = .97 .32 .96 ******* WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: .0* = 80.0 Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. .1011111 .102111 </td <td></td> | |
| <pre> CALIB STANDHYD (0005) Area (ha)= .16 ID= 1 DT= 5.0 min Total Imp(%)= 30.00 Dir. Conn.(%)= 30.00</pre> | - |
| IMPERVIOUS PERVIOUS (i) Surface Area (ha) = .05 .11 Dep. Storage (mm) = 1.00 1.00 Average Slope (%) = 1.00 2.00 Length (m) = 32.70 40.00 Mannings n = .013 .250 | |
| Max.Eff.Inten.(mm/hr)= 68.16 15.57 over (min) 5.00 20.00 Storage Coeff. (min)= 1.52 (ii) 16.37 (ii) Unit Hyd. Tpeak (min)= 5.00 20.00 Unit Hyd. peak (cms)= .33 .06 *TOTALS* | |
| PEAK FLOW (cms) = .01 .00 .010 (iii) TIME TO PEAK (hrs) = 1.33 1.58 1.33 RUNOFF VOLUME (mm) = 31.34 10.36 16.60 TOTAL RAINFALL (mm) = 32.34 32.34 32.34 RUNOFF COEFFICIENT = .97 .32 .51 | |
| ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! | |

- 40 -

| <pre>(i) CN PROCEDURE SEI CN* = 80.0</pre> | | | | | |
|--|---|--|--|--|---------------|
| (ii) TIME STEP (DT) S | | | | / | |
| THAN THE STORAGE | | | | | |
| (iii) PEAK FLOW DOES N | NOT INCLU | DE BASEFI | LOW IF ANY | • | |
| | | | | | |
| | | | | | |
| CALIB STANDHYD (0004) Area | (ha) | - 00 | | | |
| ID= 1 DT= 5.0 min Tota | al Imp(%): | 09 = 90.00 | Dir. Co | nn.(%)= | 90.00 |
| | - | | | | |
| | IMPER | VIOUS | PERVIOUS | (i) | |
| Surface Area (ha)= | = 1 | .08 | .01 | | |
| Dep. Storage (mm) = Average Slope (%) = Length (m) = Mannings n | = 1 | .00 | 1.00 2.00 | | |
| Length (m)= | = 24 | .50 | 40.00 | | |
| Mannings n = | | 013 | .250 | | |
| Max.Eff.Inten.(mm/hr)= | = 68 | .16 | 66.34 | | |
| | _ | | | | |
| over (min) Storage Coeff. (min)= Unit Hyd. Tpeak (min)= Unit Hyd. peak (cms)= | = 1 | .28 (ii) | 4.70 (| ii) | |
| Unit Hyd. Tpeak (min)= Unit Hyd peak (cms)= | = 5 | .00 | 5.00 | | |
| | | | | | 'OTALS* |
| PEAK FLOW (cms)= TIME TO PEAK (hrs)= RUNOFF VOLUME (mm)= | - | .02 | .00 | | .016 (iii) |
| TIME TO PEAK (hrs) = RUNOFF VOLUME (mm) = TOTAL RAINFALL (mm) = RUNOFF COEFFICIENT = | - 1 | .33 | 1.33 | | 1.33 29.23 |
| TOTAL RAINFALL (mm)= | = 31 | .34 | 10.36 32.34 | | 32.34 |
| RUNOFF COEFFICIENT = | = | .97 | .32 | | .90 |
| | | | | | |
| ***** WARNING: STORAGE COEF | F. IS SM | ALLER TH | AN TIME ST | EP! | |
| (i) CN PROCEDURE SEI | LECTED FO | R PERVIO | JS LOSSES: | | |
| CN* = 80.0 | | | |) | |
| (ii) TIME STEP (DT) S THAN THE STORAGE | | | OR EQUAL | | |
| (iii) PEAK FLOW DOES N | | | LOW IF ANY | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | TPEAK | R.V. | |
| | | | TPEAK (hrs) 1.33 | R.V. (mm) 31.13 | |
| ADD HYD (0007) 1 + 2 = 3 ID1= 1 (0002): + ID2= 2 (0001): | AREA (ha) .08 .58 | QPEAK (cms) .015 .036 | TPEAK (hrs) 1.33 1.33 | R.V. (mm) 31.13 16.63 | |
| ADD HYD (0007) 1 + 2 = 3 | AREA (ha) .08 .58 | QPEAK (cms) .015 .036 | | | |
| ADD HYD (0007) 1 + 2 = 3 ID1= 1 (0002): + ID2= 2 (0001): | AREA (ha) .08 .58 | QPEAK (cms) .015 .036 | | | |
| ADD HYD (0007) 1 + 2 = 3 | AREA (ha) .08 .58 | QPEAK (cms) .015 .036 | 1.33 | 18.39 | |
| ADD HYD (0007) 1 + 2 = 3 ID1= 1 (0002): + ID2= 2 (0001): ID = 3 (0007): | AREA (ha) .08 .58 | QPEAK (cms) .015 .036 | 1.33 | 18.39 | |
| ADD HYD (0007) 1 + 2 = 3 ID1= 1 (0002): + ID2= 2 (0001): ID = 3 (0007): | AREA (ha) .08 .58 | QPEAK (cms) .015 .036 | 1.33 | 18.39 | |
| ADD HYD (0007) 1 + 2 = 3 ID1= 1 (0002): + ID2= 2 (0001): ID = 3 (0007): | AREA (ha) .08 .58 | QPEAK (cms) .015 .036 | 1.33 | 18.39 | |
| ADD HYD (0007) 1 + 2 = 3 ID1= 1 (0002): + ID2= 2 (0001): ID = 3 (0007): NOTE: PEAK FLOWS DO N | AREA (ha) .08 .58 | QPEAK (cms) .015 .036 | 1.33 | 18.39 | |
| ADD HYD (0007) 1 + 2 = 3 ID1= 1 (0002): + ID2= 2 (0001): ID = 3 (0007): NOTE: PEAK FLOWS DO N | AREA (ha) .08 .58 .66 NOT INCLU AREA | QPEAK (cms) .015 .036 .051 DE BASEF1 | 1.33 LOWS IF AN | 18.39 Y. R.V. | |
| ADD HYD (0007) 1 + 2 = 3 ID1= 1 (0002): + ID2= 2 (0001): ID = 3 (0007): NOTE: PEAK FLOWS DO N ADD HYD (0009) 1 + 2 = 3 | AREA (ha) .08 .58 .66 NOT INCLU AREA | QPEAK (cms) .015 .036 .051 DE BASEF1 | 1.33 LOWS IF AN | 18.39 Y. R.V. | |
| ADD HYD (0007) 1 + 2 = 3 ID1= 1 (0002): + ID2= 2 (0001): ID = 3 (0007): NOTE: PEAK FLOWS DO N | AREA (ha) .08 .58 .66 NOT INCLU AREA | QPEAK (cms) .015 .036 .051 DE BASEF1 | 1.33 LOWS IF AN | 18.39 Y. R.V. | |
| ADD HYD (0007) 1 + 2 = 3 ID1= 1 (0002): + ID2= 2 (0001): ID = 3 (0007): NOTE: PEAK FLOWS DO N NOTE: PEAK FLOWS DO N ADD HYD (0009) 1 + 2 = 3 ID1= 1 (0005): + ID2= 2 (0004): ==================================== | AREA (ha) .08 .58 .66 NOT INCLU AREA (ha) .16 .09 | QPEAK (cms) .015 .036 .051 DE BASEF1 .010 .010 .016 | 1.33 LOWS IF AN TPEAK (hrs) 1.33 1.33 | 18.39 Y. R.V. (mm) 16.60 29.23 | |
| ADD HYD (0007) 1 + 2 = 3 ID1= 1 (0002): + ID2= 2 (0001): ID = 3 (0007): NOTE: PEAK FLOWS DO N | AREA (ha) .08 .58 .66 NOT INCLU AREA (ha) .16 .09 | QPEAK (cms) .015 .036 .051 DE BASEF1 .010 .010 .016 | 1.33 LOWS IF AN TPEAK (hrs) 1.33 1.33 | 18.39 Y. R.V. (mm) 16.60 29.23 | |
| ADD HYD (0007) 1 + 2 = 3 ID1= 1 (0002): + ID2= 2 (0001): ID = 3 (0007): NOTE: PEAK FLOWS DO N ADD HYD (0009) 1 + 2 = 3 ID1= 1 (0005): + ID2= 2 (0004): ID = 3 (0009): | AREA (ha) .08 .58 .66 NOT INCLU AREA (ha) .16 .09 .25 | QPEAK (cms) .015 .036 .051 DE BASEF1 .010 .010 .016 .026 | 1.33 LOWS IF AN TPEAK (hrs) 1.33 1.33 1.33 | R.V. (mm) 16.60 29.23 21.15 | |
| ADD HYD (0007) 1 + 2 = 3 ID1= 1 (0002): + ID2= 2 (0001): ID = 3 (0007): NOTE: PEAK FLOWS DO N ADD HYD (0009) 1 + 2 = 3 ID1= 1 (0005): + ID2= 2 (0004): ID = 3 (0009): NOTE: PEAK FLOWS DO N | AREA (ha) .08 .58 .66 NOT INCLU AREA (ha) .16 .09 .25 NOT INCLU | QPEAK (cms) .015 .036 .051 DE BASEF1 .010 .010 .016 .026 DE BASEF1 | 1.33 LOWS IF AN TPEAK (hrs) 1.33 1.33 1.33 LOWS IF AN | 18.39 Y. R.V. (mm) 16.60 29.23 21.15 Y. | |
| ADD HYD (0007) 1 + 2 = 3 ID1= 1 (0002): + ID2= 2 (0001): ID = 3 (0007): NOTE: PEAK FLOWS DO N ADD HYD (0009) 1 + 2 = 3 ID1= 1 (0005): + ID2= 2 (0004): ID = 3 (0009): | AREA (ha) .08 .58 .66 NOT INCLU AREA (ha) .16 .09 .25 NOT INCLU | QPEAK (cms) .015 .036 .051 DE BASEF1 .010 .010 .016 .026 DE BASEF1 | 1.33 LOWS IF AN TPEAK (hrs) 1.33 1.33 1.33 LOWS IF AN | 18.39 Y. R.V. (mm) 16.60 29.23 21.15 Y. | |
| ADD HYD (0007) 1 + 2 = 3 ID1= 1 (0002): + ID2= 2 (0001): ID = 3 (0007): NOTE: PEAK FLOWS DO N ADD HYD (0009) 1 + 2 = 3 ID1= 1 (0005): + ID2= 2 (0004): ID = 3 (0009): NOTE: PEAK FLOWS DO N | AREA (ha) .08 .58 .66 NOT INCLU AREA (ha) .16 .09 .25 NOT INCLU | QPEAK (cms) .015 .036 .051 DE BASEF1 .010 .010 .016 .026 DE BASEF1 | 1.33 LOWS IF AN TPEAK (hrs) 1.33 1.33 1.33 LOWS IF AN | 18.39 Y. R.V. (mm) 16.60 29.23 21.15 Y. | |
| ADD HYD (0007) 1 + 2 = 3 ID1= 1 (0002): + ID2= 2 (0001): ID = 3 (0007): NOTE: PEAK FLOWS DO N ADD HYD (0009) 1 + 2 = 3 ID1= 1 (0005): + ID2= 2 (0004): ID = 3 (0009): NOTE: PEAK FLOWS DO N | AREA (ha) .08 .58 .66 NOT INCLU AREA (ha) .16 .09 .25 NOT INCLU | QPEAK (cms) .015 .036 .051 DE BASEFI .010 .010 .016 DE BASEFI | 1.33 LOWS IF AN TPEAK (hrs) 1.33 1.33 1.33 LOWS IF AN | 18.39 Y. R.V. (mm) 16.60 29.23 21.15 Y. | |
| ADD HYD (0007) 1 + 2 = 3 ID1= 1 (0002): + ID2= 2 (0001): ID = 3 (0007): NOTE: PEAK FLOWS DO N ADD HYD (0009) 1 + 2 = 3 ID1= 1 (0005): + ID2= 2 (0004): ID = 3 (0009): NOTE: PEAK FLOWS DO N NOTE: PEAK FLOWS DO N NOTE: PEAK FLOWS DO N | AREA (ha) .08 .58 .66 NOT INCLU AREA (ha) .16 .09 .25 NOT INCLU | QPEAK (cms) .015 .036 .051 DE BASEFI .010 .010 .016 DE BASEFI | 1.33 LOWS IF AN TPEAK (hrs) 1.33 1.33 1.33 LOWS IF AN | 18.39 Y. R.V. (mm) 16.60 29.23 21.15 Y. | |
| ADD HYD (0007) 1 + 2 = 3 ID1= 1 (0002): + ID2= 2 (0001): ID = 3 (0007): NOTE: PEAK FLOWS DO N ADD HYD (0009) 1 + 2 = 3 ID1= 1 (0005): + ID2= 2 (0004): ID1= 3 (0009): NOTE: PEAK FLOWS DO N NOTE: PEAK FLOWS DO N NOTE: PEAK FLOWS DO N | AREA (ha) .08 .58 .66 NOT INCLU AREA (ha) .16 .09 .25 NOT INCLU | QPEAK (cms) .015 .036 .051 DE BASEFI .010 .010 .016 DE BASEFI | 1.33 LOWS IF AN TPEAK (hrs) 1.33 1.33 1.33 LOWS IF AN | 18.39 Y. R.V. (mm) 16.60 29.23 21.15 Y. | |
| ADD HYD (0007) 1 + 2 = 3 ID1= 1 (0002): + ID2= 2 (0001): ID = 3 (0007): NOTE: PEAK FLOWS DO N ADD HYD (0009) 1 + 2 = 3 ID1= 1 (0005): + ID2= 2 (0004): ID = 3 (0009): NOTE: PEAK FLOWS DO N NOTE: PEAK FLOWS DO N NOTE: PEAK FLOWS DO N | AREA (ha) .08 .58 .66 NOT INCLU AREA (ha) .16 .09 .25 NOT INCLU | QPEAK (cms) .015 .036 .051 DE BASEFI .010 .010 .016 DE BASEFI | 1.33 LOWS IF AN TPEAK (hrs) 1.33 1.33 1.33 LOWS IF AN | 18.39 Y. R.V. (mm) 16.60 29.23 21.15 Y. | |
| ADD HYD (0007) 1 + 2 = 3 ID1= 1 (0002): + ID2= 2 (0001): ID = 3 (0007): NOTE: PEAK FLOWS DO N ADD HYD (0009) 1 + 2 = 3 ID1= 1 (0005): + ID2= 2 (0004): ID = 3 (0009): NOTE: PEAK FLOWS DO N NOTE: PEAK FLOWS DO N ID = 3 (0009): NOTE: PEAK FLOWS DO N ID = 1 (0003): + ID2= 2 (0007): ID1= 1 (0003): | AREA (ha) .08 .58 .66 NOT INCLU AREA (ha) .16 .09 .25 NOT INCLU AREA (ha) .19 .66 | QPEAK (cms) .015 .036 .051 DE BASEF1 .010 .010 .016 DE BASEF1 .026 DE BASEF1 .026 DE BASEF1 .033 .051 | 1.33 LOWS IF AN TPEAK (hrs) 1.33 1.33 LOWS IF AN TPEAK (hrs) 1.33 1.33 | R.V. (mm) 16.60 29.23 21.15 Y. R.V. (mm) 29.22 18.39 | |
| ADD HYD (0007) 1 + 2 = 3 ID1= 1 (0002): + ID2= 2 (0001): ID = 3 (0007): NOTE: PEAK FLOWS DO N | AREA (ha) .08 .58 .66 NOT INCLU AREA (ha) .16 .09 .25 NOT INCLU AREA (ha) .19 .66 | QPEAK (cms) .015 .036 .051 DE BASEF1 .010 .010 .016 DE BASEF1 .026 DE BASEF1 .026 DE BASEF1 .033 .051 | 1.33 LOWS IF AN TPEAK (hrs) 1.33 1.33 LOWS IF AN TPEAK (hrs) 1.33 1.33 | R.V. (mm) 16.60 29.23 21.15 Y. R.V. (mm) 29.22 18.39 | |
| ADD HYD (0007) 1 + 2 = 3 ID1= 1 (0002): + ID2= 2 (0001): ID = 3 (0007): NOTE: PEAK FLOWS DO N ADD HYD (0009) 1 + 2 = 3 ID1= 1 (0005): + ID2= 2 (0004): ID = 3 (0009): NOTE: PEAK FLOWS DO N ADD HYD (0008) 1 + 2 = 3 ID1= 1 (0003): + ID2= 2 (0007): ID1= 1 (0003): + ID2= 2 (0007): ID1= 1 (0003): + ID2= 2 (0007): ID1= 3 (0008): | AREA (ha) .08 .58 .66 NOT INCLU AREA (ha) .16 .09 .25 NOT INCLU AREA (ha) .19 .66 .85 | QPEAK (cms) .015 .036 DE BASEF1 QPEAK (cms) .010 .016 DE BASEF1 QPEAK (cms) .033 .051 | 1.33 LOWS IF AN TPEAK (hrs) 1.33 1.33 1.33 LOWS IF AN TPEAK (hrs) 1.33 1.33 1.33 | R.V. (mm) 16.60 29.23 21.15 Y. R.V. (mm) 29.22 18.39 20.81 | |
| ADD HYD (0007) 1 + 2 = 3 ID1= 1 (0002): + ID2= 2 (0001): ID = 3 (0007): NOTE: PEAK FLOWS DO N ADD HYD (0009) 1 + 2 = 3 ID1= 1 (0005): + ID2= 2 (0004): ID = 3 (0009): NOTE: PEAK FLOWS DO N NOTE: PEAK FLOWS DO N NOTE: PEAK FLOWS DO N ID = 1 (0003): + ID2= 2 (0007): ID1= 1 (0003): | AREA (ha) .08 .58 .66 NOT INCLU AREA (ha) .16 .09 .25 NOT INCLU AREA (ha) .19 .66 .85 | QPEAK (cms) .015 .036 DE BASEF1 QPEAK (cms) .010 .016 DE BASEF1 QPEAK (cms) .033 .051 | 1.33 LOWS IF AN TPEAK (hrs) 1.33 1.33 1.33 LOWS IF AN TPEAK (hrs) 1.33 1.33 1.33 | R.V. (mm) 16.60 29.23 21.15 Y. R.V. (mm) 29.22 18.39 20.81 | |

| ADD HYD (0010) 1 + 2 = 3 | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) | | |
|---|--|--|--|---|--|--|
| ID1= 1 (0006) + ID2= 2 (0009) | : .12 | .023 | 1.33 3 | 1.13 | | |
| ID = 3 (0010) | | | | | | |
| NOTE: PEAK FLOWS | DO NOT INCL | UDE BASEFLO | WS IF ANY. | | | |
| ************************************** | ******* 2 ** | | | | | |
| CHICAGO STORM Ptotal= 41.69 mm | IDF curve | - | A= 697.40 B= 5.00 C= .76 | 0 | | |
| | used in: | INTENSITY | | | | |
| | Storm time | f storm = step = ak ratio = | 10.00 min | | | |
| hrs .17 .33 .50 .67 | RAIN T mm/hr 2.98 1 3.40 1 3.97 1 4.84 1 6.29 1 9.36 2 | hrs mm/hr .17 21.37 .33 88.09 .50 27.73 .67 15.03 | hrs 2.17 2.33 2.50 2.67 | mm/hr 6.78 5.81 5.11 4.57 | hrs mm/h 3.17 3.5 3.33 3.2 3.50 3.0 3.67 2.9 | nr 52 28 08 90 |
| CALIB STANDHYD (0003) ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n | Total Imp(% IMPE (ha) = (mm) = (%) = (m) = 3 |) = 90.00 | EDVICING (| | 00 | |
| NOTE: RAINFAI | LL WAS TRANS | FORMED TO | 5.0 MIN. | TIME STEP. | | |
| hrs | RAIN T mm/hr 2.98 1. 2.98 1. 3.40 1. 3.40 1. 3.97 1. 3.97 1. 4.84 1. 4.84 1. 6.29 1. 9.36 1. 9.36 2. | hrs mm/hr 083 21.37 167 21.37 250 88.09 333 88.09 417 27.73 500 27.73 583 15.03 667 15.03 750 10.53 833 10.53 917 8.21 | TIME hrs | RAIN mm/hr 6.78 5.81 5.81 5.81 5.11 4.57 4.57 4.15 3.81 | hrs mm/h | 1r 52 52 28 28 28 28 28 28 28 28 28 28 28 28 28 |
| TIME TO PEAK () RUNOFF VOLUME | <pre>nin) nin) = nin) = cms) = cms) = cms) = (rs) = (mm) = 4 (mm) = 4</pre> | 8.09 5.00 1.45 (ii) 5.00 .33 .04 1.33 0.69 1.69 .98 | 33.17 5.00 4.53 (ii 5.00 .23 .00 1.33 15.89 41.69 .38 | *TOTAI | 13 (iii) 33 20 59 | |

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN^* = 80.0 Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. _____ -----| CALIB | STANDHYD (0002) | Area (ha) = .08 |ID= 1 DT= 5.0 min | Total Imp(%) = 99.00 Dir. Conn.(%) = 99.00 _____
 .08
 .00

 1.00
 1.00

 23.10
 40.00
 IMPERVIOUS PERVIOUS (i) Surface Area (ha) = Dep. Storage (mm) = . Average Slope (%) = (m) = Length = Mannings n .013 .250 Max.Eff.Inten.(mm/hr) = 88.09 165.84 over (min) 5.00 5.00 Storage Coeff. (min) = 1.12 (ii) 2.30 (ii) Unit Hyd. Tpeak (min) = 5.00 5.00 Unit Hyd. peak (cms) = .34 .30 *TOTALS* .019 (iii) 1.33 .02 .00 1.33 1.33 40.69 15.89 41.69 41.69 .98 .38 PEAK FLOW (cms) = (hrs) = (mm) = TIME TO PEAK RUNOFF VOLUME (mm) = TOTAL RAINFALL (mm) = 40.44 41.69 .98 RUNOFF COEFFICIENT = .38 .97 ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN^* = 80.0 Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. _____ _____ | CALIB | STANDHYD (0001) | Area (ha) = .58 |ID= 1 DT= 5.0 min | Total Imp(%) = 30.00 Dir. Conn.(%) = 30.00 _____
 .17
 .41

 1.00
 1.00

 1.00
 2.00

 62.20
 40.00

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

 62.20
 40.00

 .013
 .250
 = Mannings n Max.Eff.Inten.(mm/hr) = 88.09 24.33 over (min) 5.00 15.00 Storage Coeff. (min) = 2.02 (ii) 14.44 (ii) Unit Hyd. Tpeak (min) = 5.00 15.00
 5.00
 14.44

 5.10
 15.00

 .31
 .08
 .08 Unit Hyd. peak (cms)= *TOTALS* .051 (iii) 1.33 .04 .02 1.33 1.50 40.69 15.89 41.69 41.69 .98 .38 PEAK FLOW (cms) = TIME TO PEAK (hrs) = RUNOFF VOLUME (mm) = TOTAL RAINFALL (mm) = 23.32 41.69 RUNOFF COEFFICIENT = .56 ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 80.0 Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. _____ _____ | CALIB | STANDHYD (0006) | Area (ha)= .12 |ID= 1 DT= 5.0 min | Total Imp(%)= 99.00 Dir. Conn.(%)= 99.00

| Surface Area Dep. Storage Average Slope Length Mannings n | (ha) = | IMPERVIOUS .12 1.00 1.00 28.30 .013 | .00 | |
|--|---|--|--|---|
| Max.Eff.Inten.(m over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | (min) (min) = (min) = (cms) = | 5.00 1.26 (ii) 5.00 .33 | 5.00 2.44 (ii) 5.00 .30 | *TOTALS* |
| PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICIE | (cms) = (hrs) = (mm) = (mm) = ENT = | .03 1.33 40.69 41.69 .98 | .00 1.33 15.89 41.69 .38 | .029 (iii) 1.33 40.44 41.69 .97 |
| (ii) TIME STEP | IRE SELECTE 80.0 Ia (DT) SHOUI | ED FOR PERVIOU = Dep. Storag LD BE SMALLER | JS LOSSES: je (Above) | |
| THAN THE S (iii) PEAK FLOW | | | LOW IF ANY. | |
| CALIB STANDHYD (0005) ID= 1 DT= 5.0 min | Area Total In | | | |
| Surface Area Dep. Storage Average Slope Length Mannings n | | IMPERVIOUS .05 1.00 1.00 32.70 | PERVIOUS (i) .11 1.00 2.00 | |
| Mannings n Max.Eff.Inten.(m | (m) = = m/hr) = | .013 | .250 | |
| Max.Eff.Inten.(m over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | (min) (min) = (min) = (cms) = | 5.00 1.37 (ii) 5.00 .33 | 15.00 13.80 (ii) 15.00 .08 | |
| PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICIE | | | | *TOTALS* .014 (iii) 1.33 23.27 41.69 .56 |
| **** WARNING: STORAG | | | | |
| (i) CN PROCEDU CN* = 8 (ii) TIME STEP THAN THE S (iii) PEAK FLOW | 0.0 Ia (DT) SHOUI STORAGE COB | = Dep. Storag D BE SMALLER SFFICIENT. | ge (Above) OR EQUAL | |
| CALIB | | | | |
| STANDHYD (0004) ID= 1 DT= 5.0 min | | | | %)= 90.00 |
| Surface Area Dep. Storage Average Slope Length Mannings n | (ha) = (mm) = (%) = (m) = = | IMPERVIOUS .08 1.00 1.00 24.50 .013 | PERVIOUS (i) .01 1.00 2.00 40.00 .250 | |
| Max.Eff.Inten.(m over Storage Coeff. | (hr) - | <u></u> | 105 02 | |

| FUNCTIONAL SERVICE | | | | | | |
|--|---------------------------|-----------|--------------------------------|--------------|-------|-------|
| PEAK FLOW (c TIME TO PEAK (h | ms)= | .02 | .00 1.33 | | .021 | (iii) |
| TIME TO PEAK (h | rs)= 1 | .33 | 1.33 | | 1.33 | |
| RUNOFF VOLUME (| mm) = 40 | .69 | 15.89 | | 38.20 | |
| TOTAL RAINFALL (| | .69 | 41.69 | | 41.69 | |
| RUNOFF COEFFICIENT | = | .98 | .38 | | .92 | |
| ***** WARNING: STORAGE | COEFF. IS SM | ALLER THA | N TIME ST | EP! | | |
| (i) CN PROCEDURE | | | | | | |
| CN* = 80. (ii) TIME STEP (D | | | |) | | |
| (II) TIME SIEP (D THAN THE STO | | | OK EQUAL | | | |
| (iii) PEAK FLOW DO | | | OW IF ANY | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| ADD HYD (0007) | | | | | | |
| 1 + 2 = 3 | AREA | OPEAK | TPEAK | R.V. | | |
| | (ha) | (cms) | (hrs) | (mm) | | |
| ID1= 1 (0002) | : .08 | .019 | 1.33 | 40.44 | | |
| + ID2= 2 (0001) | : .58 | .051 | TPEAK (hrs) 1.33 1.33 | 23.32 | | |
| | | | | | | |
| ID = 3 (0007) | : .66 | .071 | 1.33 | 25.39 | | |
| NOTE: PEAK FLOWS | DO NOT INCLU | DE BASEFI | OWS IF AN | Υ. | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| ADD HYD (0009) | | | | | | |
| 1 + 2 = 3 | AREA | QPEAK | TPEAK | R.V. | | |
| TD1 = 1 (0005) | (na) • 16 | (Cms) | (nrs) 1 33 | (11111) | | |
| ID1 + 2 = 3 ID1= 1 (0005) + ID2= 2 (0004) | 09 | .021 | 1.33 | 38.20 | | |
| | | | | | | |
| ID = 3 (0009) | : .25 | .035 | 1.33 | 28.65 | | |
| NOTE: PEAK FLOWS | DO NOT TNELL | DE DAGEET | OWS TE AN | v | | |
| NOTE: TEAK FLOWS | DO NOI INCLO | DE DAGETI | IOND IF AN | ±• | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| ADD HYD (0008) | | 000014 | | D 11 | | |
| 1 + 2 = 3 | (ba) | (CTRS) | (brs) | K.V. (mm) | | |
| TD1 = 1 (0003) | : .19 | .043 | 1.33 | 38.20 | | |
| ID1 = 1 (0003) ID1 = 1 (0003) + ID2 = 2 (0007) | : .66 | .071 | 1.33 | 25.39 | | |
| | | | | | | |
| ID = 3 (0008) | : .85 | .114 | 1.33 | 28.26 | | |
| NOTE: PEAK FLOWS | DO NOT INCLU | DE BASEFI | OWS IF AN | Υ. | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| ADD HYD (0010) | | | | | | |
| 1 + 2 = 3 | AREA | QPEAK | TPEAK (hrs) 1.33 | R.V. | | |
| | (ha) | (cms) | (hrs) | (mm) | | |
| ID1= 1 (0006) | : .12 | .029 | 1.33 | 40.44 | | |
| + ID2= 2 (0009) | : .25 | .035 | 1.33 | 28.65 | | |
| ID = 3 (0010) | | | | | | |
| NOTE: PEAK FLOWS | DO NOT TNOLI | DE DACEET | OWC TE AN | v | | |
| NOIL. FEAR FLOWS | DO NOT INCLU | DE DAGEFI | IONO IE AN | ± • | | |
| | | | | | | |
| ***** | | | | | | |
| ** SIMULATION NUMBER: | | | | | | |
| ***** | * * * * * * | | | | | |
| | | | | | | |
| CHICAGO STORM | IDF curve p | arameters | · A= 798 | 500 | | |
| Ptotal= 48.00 mm | TDE CUIVE P | arameters | B= 5. | | | |
| | | | C= . | | | |
| | used in: | INTENSITY | | | 2 | |
| | | | 4 | | | |
| | Duration of | | | | | |
| | Storm time Time to pea | | | 11 | | |
| | co pea | | | | | |
| | | | | | | |

| hr: .1: .3: .5: .6: .8: | E RAIN mm/hr 3.45 3.93 0.4.59 7.5.58 3.7.26 0.10.79 | hrs 1.17 1.33 1.50 1.67 1.83 | mm/hr 24.60 101.14 31.91 17.31 12.14 | hrs 2.17 2.33 2.50 2.67 2.83 | <pre>mm/hr 7.83 6.71 5.90 5.28 4.79 </pre> | hrs 3.17 3.33 3.50 3.67 3.83 | mm/hr 4.07 3.79 3.55 3.35 3.17 |
|---|--|--|--|--|---|---|--|
| | | | | | | | |
| CALIB STANDHYD (0003) ID= 1 DT= 5.0 min | Area Total I | mp(%)= 9 | 0.00 | | | 0.00 | |
| _ | | IMPERVIOU | S PE | RVIOUS (i |) | | |
| Surface Area Dep. Storage Average Slope Length Mannings n | = | .013 | | | | | |
| NOTE: RAIN | FALL WAS T | RANSFORME | D TO | 5.0 MIN. ' | TIME STEE | • | |
| | | | | | | | |
| hr: .08 .16 .25 .33 .41 .50 .58 .66 .75 | E RAIN s mm/hr 3 .45 0 .3.93 3 .393 7 .4.59 0 .4.59 3 .5.58 7 .5.58 0 .7.26 3 .7.26 7 .26 7 .0.79 0 .0.79 | TIME hrs 1.083 1.167 1.250 1.333 1.417 1.500 1.583 1.667 1.750 | RAIN mm/hr 24.60 24.60 101.14 101.14 31.91 31.91 17.31 17.31 12.14 | <pre>hrs 2.083 2.167 2.250 2.333 2.417 2.500 2.583 2.667 2.750</pre> | RAIN mm/hr 7.83 7.83 6.71 6.71 5.90 5.90 5.28 5.28 4.79 | TIME hrs 3.08 3.17 3.25 3.33 3.42 3.50 3.58 3.67 3.75 | <pre>mm/hr 4.07 4.07 3.79 3.79 3.55 3.55 3.35 3.35 3.35 3.17</pre> |
| | | | | | | | |
| Max.Eff.Inten.(r over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICID | (min) = (min) = (cms) = | 1.37 5.00 .33 | (11) | 4.29 (ii 5.00 .23 | *TOTA .0 1. 44. 48. |)50 (iii .33 .29 | L) |
| | | | | | | | |
| ***** WARNING: STORA (i) CN PROCEDU CN* = = (ii) TIME STEP THAN THE : (iii) PEAK FLOW | URE SELECT 80.0 Ia (DT) SHOU STORAGE CO DOES NOT | ED FOR PE: = Dep. S LD BE SMA: EFFICIENT INCLUDE B. | RVIOUS torage LLER OR ASEFLOW | LOSSES: (Above) EQUAL IF ANY. | | | |
| CALIB STANDHYD (0002) ID= 1 DT= 5.0 min | Area Total I | (ha) = | .08 | | | | |
| Surface Area Dep. Storage Average Slope Length Mannings n | (ha) = (mm) = (%) = (m) = = | .08 1.00 1.00 23.10 .013 | | RVIOUS (i .00 1.00 2.00 40.00 .250 | | | |
| Max.Eff.Inten.(n over Storage Coeff. Unit Hyd. Tpeak | <pre>nm/hr) = (min) (min) = (min) =</pre> | 101.14 5.00 1.06 5.00 | 2 (ii) | 62.54 5.00 2.17 (ii 5.00 |) | | |

| FUNCTIONAL SERV | | | | |
|---|--------------------|-------------------|-------------------|--------------------|
| Unit Hyd. peak | (cms)= | .34 | .31 | *TOTALS* |
| PEAK FLOW | (cms) = | .02 | .00 | .022 (iii) |
| TIME TO PEAK RUNOFF VOLUME | (hrs) = | 1.33 | 1.33 19.99 | 1.33 |
| RUNOFF VOLUME | (mm) = | 47.00 | 19.99 | 46.73 |
| TOTAL RAINFALL RUNOFF COEFFICI | (mm) = | 48.00 | 48.00 | 48.00 |
| RUNOFF COEFFICI | ENT = | .98 | .42 | .97 |
| ***** WARNING: STORA | GE COEFF | . IS SMALLER TH | AN TIME STEP! | |
| (i) CN PROCED | URE SELE | CTED FOR PERVIO | US LOSSES: | |
| CN* = | 80.0 | Ia = Dep. Stora | ge (Above) | |
| | | OULD BE SMALLER | OR EQUAL | |
| THAN THE (iii) PEAK FLOW | | COEFFICIENT. | TOW TE ANY | |
| (III) PEAK FLOW | DOES NO. | I INCLUDE BASEF | LOW IF ANI. | |
| | | | | |
| | | | | |
| CALIB | Aroa | (ba) - 59 | | |
| STANDHYD (0001) ID= 1 DT= 5.0 min | Total | Tmp(%) = 30.00 | Dir. Conn.(| (3) = 30.00 |
| | | | | ., |
| | | IMPERVIOUS | PERVIOUS (i) | |
| Surface Area Dep. Storage Average Slope Length Mannings n | (ha) = | .17 | .41 | |
| Average Slope | (11111) = (%) = | 1 00 | 2.00 | |
| Length | (m) = | 62.20 | 40.00 | |
| Mannings n | = | .013 | .250 | |
| | | | | |
| Max.Eff.Inten.(| mm/hr)= | 101.14 | 30.92 | |
| over Storage Coeff. Unit Hyd. Tpeak | (min) = | 5.00 1.91 (ii) | 13.00 (ii) | |
| Unit Hyd. Tpeak | (min) = | 5.00 | 15.00 | |
| Unit Hyd. peak | (cms) = | .31 | .08 | |
| | | | | *TOTALS* |
| PEAK FLOW | (cms) = | .05 | .02 | .061 (iii) 1.33 |
| BUNOFF VOLUME | (IIIS) = (mm) = | 47 00 | 19 99 | 28 08 |
| TOTAL RAINFALL | (mm) = | 48.00 | 48.00 | 28.08 48.00 |
| PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI | ENT = | .98 | .42 | .58 |
| | | | | |
| ***** WARNING: STORA | GE COEFF. | . IS SMALLER TH | AN TIME STEP! | |
| (i) CN PROCED | URE SELE | CTED FOR PERVIO | US LOSSES: | |
| | | Ia = Dep. Stora | | |
| | | OULD BE SMALLER | OR EQUAL | |
| THAN THE (iii) PEAK FLOW | | COEFFICIENT. | TOW TE ANY | |
| (III) IDAK IDOW | DOLD NO. | I INCLUDE DADEF | LOW IF ANI. | |
| | | | | |
| | | | | |
| CALIB STANDHYD (0006) | 7 200 | (ha) = 12 | | |
| ID= 1 DT= 5.0 min | | | | %) = 99.00 |
| | | | | ., |
| | | IMPERVIOUS | | |
| | (ha) = | .12 | .00 | |
| Dep. Storage Average Slope | (mm) = (%) = | 1.00 | 1.00 2.00 | |
| Length | (m) = | | 40.00 | |
| Mannings n | = | .013 | .250 | |
| | | | 1000 51 | |
| Max.Eff.Inten.(| | | 1338.34 | |
| over Storage Coeff. | (min) (min)= | 5.00 1.19 (ii) | 5.00 2.31 (ii) | |
| Unit Hyd. Tpeak | (min) = | 5.00 | 5.00 | |
| Unit Hyd. peak | | .33 | .30 | |
| | | | | *TOTALS* |
| PEAK FLOW | (cms) = | .03 | .00 | .034 (iii) |
| TIME TO PEAK RUNOFF VOLUME | (hrs) = (mm) = | | 1.33 19.99 | 1.33 46.73 |
| TOTAL RAINFALL | , , | | 48.00 | 48.00 |
| RUNOFF COEFFICI | | | .42 | .97 |
| | | | | |
| ***** WARNING: STORA | GE COEFF. | . IS SMALLER TH | AN TIME STEP! | |
| (i) CN PROCED | URE SELEC | CTED FOR PERVIO | US LOSSES: | |
| | | Ia = Dep. Stora | | |

 (i) CN *= 80.0 Ia = Dep. Storage (Above)
 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. - 47 -

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

| CALIB STANDHYD (0005) | Area | (ha) - 1 | 6 | |
|--|---|--|--|---|
| STANDHYD (0005) ID= 1 DT= 5.0 min | Area Total | (11d) = .1 Imp(%) = 30.0 | 0 Dir. Conn.(%) | = 30.00 |
| | | | | |
| Surface Area | (ha) = | IMPERVIOUS 05 | PERVIOUS (i) | |
| Dep. Storage | (mm) = | 1.00 | 1.00 | |
| Average Slope | (%)= | 1.00 | 2.00 | |
| Length | (m) = | 32.70 | 40.00 | |
| Surface Area Dep. Storage Average Slope Length Mannings n | = | .013 | .250 | |
| | | | | |
| Max.Eff.Inten.(| mm/hr)= | 101.14 | 30.92 | |
| Storage Coeff | (min) = | J.00 1 30 (ii | 12.00 12.59 (ii) | |
| Unit Hvd. Tpeak | (min) = | 5.00 | 15.00 | |
| Max.Eff.Inten.(over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | (cms) = | .33 | .08 | |
| | | | | *TOTALS* |
| PEAK FLOW | (cms) = | .01 | .01 | .017 (iii) |
| TIME TO PEAK | (hrs) = | 1.33 | 1.50 | 1.33 |
| RUNOFF VOLUME | (mm) = | 4/.00 | 19.99 19.99 | 28.06 48.00 |
| RUNOFF COEFFICT | ENT = | -0.00 | .01 1.50 19.99 48.00 .42 | .58 |
| | | | | |
| **** WARNING: STORA | GE COEFF | IS SMALLER T | HAN TIME STEP! | |
| (i) CN PROCED | URE SELEO | TED FOR PERVI | OUS LOSSES: | |
| | | a = Dep. Stor | | |
| (ii) TIME STEP | | | R OR EQUAL | |
| | | COEFFICIENT. | | |
| (iii) PEAK FLOW | DOES NO. | . INCLUDE BASE | LTOM IL ANY. | |
| | | | | |
| | | | | |
| CALIB STANDHYD (0004) ID= 1 DT= 5.0 min | 7 | (b-) = 0 | 0 | |
| STANDHYD (0004) TD= 1 DT- 5 0 min / | Area | (ha) = .0 | 9 O Dir Corr (°) | = 90 00 |
| | | | | - 90.00 |
| | | IMPERVIOUS | PERVIOUS (i) | |
| Surface Area | (ha) = | .08 | .01 | |
| Dep. Storage | (mm) = | 1.00 | 1.00 | |
| Average Slope | (%)= | 1.00 | 2.00 | |
| | (m) - | 24.50 | 40.00 | |
| Length | (111) - | | | |
| Length Mannings n | (111) = | .013 | .250 | |
| Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.() | (m) = = mm/hr) = | .013 | .250 | |
| Length Mannings n Max.Eff.Inten.(n over | (m) = = mm/hr) = (min) | .013 101.14 5.00 | .250 133.83 5.00 | |
| Length Mannings n Max.Eff.Inten.(n over Storage Coeff. | (m) = = mm/hr) = (min) (min) = | .013 101.14 5.00 1.09 (ii | .250 133.83 5.00) 4.01 (ii) | |
| Length Mannings n Max.Eff.Inten.(n over Storage Coeff. Unit Hyd. Tpeak | <pre>(m) = mm/hr) = (min) (min) = (min) =</pre> | .013 101.14 5.00 1.09 (ii 5.00 | .250 133.83 5.00) 4.01 (ii) 5.00 | |
| Length Mannings n Max.Eff.Inten.(n over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | <pre>(m) = mm/hr) = (min) (min) = (min) = (cms) =</pre> | .013 101.14 5.00 1.09 (ii 5.00 .34 | .250 133.83 5.00) 4.01 (ii) 5.00 .24 | |
| Max.Eff.Inten.() over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | <pre>mm/hr) = (min) (min) = (min) = (cms) =</pre> | 101.14 5.00 1.09 (ii 5.00 .34 | 133.83 5.00) 4.01 (ii) 5.00 .24 | *TOTALS* |
| Max.Eff.Inten.() over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | <pre>mm/hr) = (min) (min) = (min) = (cms) =</pre> | 101.14 5.00 1.09 (ii 5.00 .34 | 133.83 5.00) 4.01 (ii) 5.00 .24 | |
| Max.Eff.Inten.() over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | <pre>mm/hr) = (min) (min) = (min) = (cms) =</pre> | 101.14 5.00 1.09 (ii 5.00 .34 | 133.83 5.00) 4.01 (ii) 5.00 .24 | .024 (iii) 1.33 |
| Max.Eff.Inten.() over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | <pre>mm/hr) = (min) (min) = (min) = (cms) =</pre> | 101.14 5.00 1.09 (ii 5.00 .34 | 133.83 5.00) 4.01 (ii) 5.00 .24 | .024 (iii) 1.33 44.29 |
| Max.Eff.Inten.() over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL PAINERLI | <pre>mm/hr) = (min) (min) = (min) = (cms) = (cms) = (hrs) = (mm) = (mm) = </pre> | 101.14 5.00 1.09 (ii 5.00 .34 .02 1.33 47.00 | 133.83 5.00) 4.01 (ii) 5.00 .24 .00 1.33 19.99 48.00 | .024 (iii) 1.33 44.29 48.00 |
| Max.Eff.Inten.() over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | <pre>mm/hr) = (min) (min) = (min) = (cms) = (cms) = (hrs) = (mm) = (mm) = </pre> | 101.14 5.00 1.09 (ii 5.00 .34 .02 1.33 47.00 | 133.83 5.00) 4.01 (ii) 5.00 .24 | .024 (iii) 1.33 44.29 |
| Max.Eff.Inten.() over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI | <pre>mm/hr) = (min) (min) = (min) = (cms) = (cms) = (hrs) = (mm) = (mm) = ENT =</pre> | 101.14 5.00 1.09 (ii 5.00 .34 .02 1.33 47.00 48.00 .98 | 133.83 5.00) 4.01 (ii) 5.00 .24 .00 1.33 19.99 48.00 .42 | .024 (iii) 1.33 44.29 48.00 |
| Max.Eff.Inten.() over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI | <pre>mm/hr) = (min) (min) = (min) = (cms) = (cms) = (hrs) = (mm) = (mm) = ENT = GE COEFF.</pre> | 101.14 5.00 1.09 (ii 5.00 .34 .02 1.33 47.00 48.00 .98 IS SMALLER T | 133.83 5.00) 4.01 (ii) 5.00 .24 .00 1.33 19.99 48.00 .42 HAN TIME STEP! | .024 (iii) 1.33 44.29 48.00 |
| Max.Eff.Inten.() over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI ***** WARNING: STORA (i) CN PROCED | <pre>mm/hr) = (min) (min) = (min) = (cms) = (cms) = (hrs) = (mm) = (mm) = ENT = GE COEFF. URE SELEC</pre> | 101.14 5.00 1.09 (ii 5.00 .34 .02 1.33 47.00 48.00 .98 IS SMALLER T CTED FOR PERVI | 133.83 5.00 4.01 (ii) 5.00 .24 .00 1.33 19.99 48.00 .42 HAN TIME STEP! OUS LOSSES: | .024 (iii) 1.33 44.29 48.00 |
| Max.Eff.Inten.() over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI ***** WARNING: STORA (i) CN PROCED | <pre>mm/hr) = (min) (min) = (min) = (cms) = (cms) = (hrs) = (mm) = (mm) = ENT = GE COEFF. URE SELEC(80.0 1)</pre> | 101.14 5.00 1.09 (ii 5.00 .34 .02 1.33 47.00 48.00 .98 IS SMALLER T CTED FOR PERVI Ca = Dep. Stor | 133.83 5.00 4.01 (ii) 5.00 .24 .00 1.33 19.99 48.00 .42 HAN TIME STEP! OUS LOSSES: age (Above) | .024 (iii) 1.33 44.29 48.00 |
| Max.Eff.Inten.(over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI: **** WARNING: STORA (i) CN PROCED CN* = (ii) TIME STEP THAN THE | <pre>mm/hr) = (min) (min) = (min) = (cms) = (cms) = (hrs) = (mm) = (mm) = ENT = ENT = URE SELEC URE SELEC (DT) SHO STORAGE (COMMERCE) </pre> | 101.14 5.00 1.09 (ii 5.00 .34 .02 1.33 47.00 48.00 .98 IS SMALLER T CTED FOR PERVI CALLER T CTED FOR PERVI CALLER T CALLER T CALLE | 133.83 5.00 4.01 (ii) 5.00 .24 .00 1.33 19.99 48.00 .42 HAN TIME STEP! OUS LOSSES: age (Above) R OR EQUAL | .024 (iii) 1.33 44.29 48.00 |
| Max.Eff.Inten.() over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI ***** WARNING: STORA (i) CN PROCED CN* = (ii) TIME STEP | <pre>mm/hr) = (min) (min) = (min) = (cms) = (cms) = (hrs) = (mm) = (mm) = ENT = ENT = URE SELEC URE SELEC (DT) SHO STORAGE (COMMERCE) </pre> | 101.14 5.00 1.09 (ii 5.00 .34 .02 1.33 47.00 48.00 .98 IS SMALLER T CTED FOR PERVI CALLER T CTED FOR PERVI CALLER T CALLER T CALLE | 133.83 5.00 4.01 (ii) 5.00 .24 .00 1.33 19.99 48.00 .42 HAN TIME STEP! OUS LOSSES: age (Above) R OR EQUAL | .024 (iii) 1.33 44.29 48.00 |
| Max.Eff.Inten.() over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI: ***** WARNING: STORA (i) CN PROCED CN* = (ii) TIME STEP THAN THE ((iii) PEAK FLOW | <pre>mm/hr) = (min) (min) = (min) = (cms) = (cms) = (hrs) = (mm) = (mm) = ENT = GE COEFF. URE SELEC 80.0 I (DT) SHC STORAGE (DOES NOT)</pre> | 101.14 5.00 1.09 (ii 5.00 .34 .02 1.33 47.00 48.00 .98 IS SMALLER T CTED FOR PERVI CA = Dep. Stor DULD BE SMALLE COEFFICIENT. CINCLUDE BASE | 133.83 5.00 4.01 (ii) 5.00 .24 .00 1.33 19.99 48.00 .42 HAN TIME STEP! OUS LOSSES: age (Above) R OR EQUAL FLOW IF ANY. | .024 (iii) 1.33 44.29 48.00 .92 |
| Max.Eff.Inten.() over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI: ***** WARNING: STORA (i) CN PROCED CN* = (ii) TIME STEP THAN THE ((iii) PEAK FLOW | <pre>mm/hr) = (min) (min) = (min) = (cms) = (cms) = (hrs) = (mm) = (mm) = ENT = GE COEFF. URE SELEC 80.0 I (DT) SHC STORAGE (DOES NOT)</pre> | 101.14 5.00 1.09 (ii 5.00 .34 .02 1.33 47.00 48.00 .98 IS SMALLER T CTED FOR PERVI CA = Dep. Stor DULD BE SMALLE COEFFICIENT. CINCLUDE BASE | 133.83 5.00 4.01 (ii) 5.00 .24 .00 1.33 19.99 48.00 .42 HAN TIME STEP! OUS LOSSES: age (Above) R OR EQUAL FLOW IF ANY. | .024 (iii) 1.33 44.29 48.00 .92 |
| Max.Eff.Inten.() over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI: **** WARNING: STORA (i) CN PROCED CN* = (ii) TIME STEP THAN THE (iii) PEAK FLOW | <pre>mm/hr) = (min) (min) = (min) = (cms) = (cms) = (hrs) = (mm) = (mm) = ENT = GE COEFF. URE SELEC 80.0 I (DT) SHC STORAGE (DOES NOT)</pre> | 101.14 5.00 1.09 (ii 5.00 .34 .02 1.33 47.00 48.00 .98 IS SMALLER T CTED FOR PERVI CA = Dep. Stor DULD BE SMALLE COEFFICIENT. CINCLUDE BASE | 133.83 5.00 4.01 (ii) 5.00 .24 .00 1.33 19.99 48.00 .42 HAN TIME STEP! OUS LOSSES: age (Above) R OR EQUAL FLOW IF ANY. | .024 (iii) 1.33 44.29 48.00 .92 |
| Max.Eff.Inten.() over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI: **** WARNING: STORA (i) CN PROCED CN* = (ii) TIME STEP THAN THE (iii) PEAK FLOW | <pre>mm/hr) = (min) (min) = (min) = (cms) = (cms) = (hrs) = (mm) = (mm) = ENT = GE COEFF. URE SELEC(80.0 1 (DT) SHO STORAGE (DOES NO?</pre> | 101.14 5.00 1.09 (ii 5.00 .34 .02 1.33 47.00 48.00 .98 IS SMALLER T CTED FOR PERVI Ca = Dep. Stor DULD BE SMALLE COEFFICIENT. TINCLUDE BASE | 133.83 5.00 4.01 (ii) 5.00 .24 .00 1.33 19.99 48.00 .42 HAN TIME STEP! OUS LOSSES: age (Above) R OR EQUAL FLOW IF ANY. | .024 (iii) 1.33 44.29 48.00 .92 |
| Max.Eff.Inten.() over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI: **** WARNING: STORA (i) CN PROCED CN* = (ii) TIME STEP THAN THE (iii) PEAK FLOW | <pre>mm/hr) = (min) (min) = (min) = (cms) = (cms) = (hrs) = (mm) = (mm) = ENT = GE COEFF. URE SELEC(80.0 1 (DT) SHO STORAGE (DOES NO?</pre> | 101.14 5.00 1.09 (ii 5.00 .34 .02 1.33 47.00 48.00 .98 IS SMALLER T CTED FOR PERVI Ca = Dep. Stor DULD BE SMALLE COEFFICIENT. TINCLUDE BASE | 133.83 5.00 4.01 (ii) 5.00 .24 .00 1.33 19.99 48.00 .42 HAN TIME STEP! OUS LOSSES: age (Above) R OR EQUAL FLOW IF ANY. | .024 (iii) 1.33 44.29 48.00 .92 |
| Max.Eff.Inten.() over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI: **** WARNING: STORA (i) CN PROCED CN* = (ii) TIME STEP THAN THE (iii) PEAK FLOW | <pre>mm/hr) = (min) (min) = (min) = (cms) = (cms) = (hrs) = (mm) = (mm) = ENT = GE COEFF. URE SELEC(80.0 1 (DT) SHO STORAGE (DOES NO?</pre> | 101.14 5.00 1.09 (ii 5.00 .34 .02 1.33 47.00 48.00 .98 IS SMALLER T CTED FOR PERVI Ca = Dep. Stor DULD BE SMALLE COEFFICIENT. TINCLUDE BASE | 133.83 5.00 4.01 (ii) 5.00 .24 .00 1.33 19.99 48.00 .42 HAN TIME STEP! OUS LOSSES: age (Above) R OR EQUAL FLOW IF ANY. | .024 (iii) 1.33 44.29 48.00 .92 |
| Max.Eff.Inten.() over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI: **** WARNING: STORA (i) CN PROCED CN* = (ii) TIME STEP THAN THE (iii) PEAK FLOW | <pre>mm/hr) = (min) (min) = (min) = (cms) = (cms) = (hrs) = (mm) = (mm) = ENT = GE COEFF. URE SELEC(80.0 1 (DT) SHO STORAGE (DOES NO?</pre> | 101.14 5.00 1.09 (ii 5.00 .34 .02 1.33 47.00 48.00 .98 IS SMALLER T CTED FOR PERVI Ca = Dep. Stor DULD BE SMALLE COEFFICIENT. TINCLUDE BASE | 133.83 5.00 4.01 (ii) 5.00 .24 .00 1.33 19.99 48.00 .42 HAN TIME STEP! OUS LOSSES: age (Above) R OR EQUAL FLOW IF ANY. | .024 (iii) 1.33 44.29 48.00 .92 |
| Max.Eff.Inten.() over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI: ***** WARNING: STORA (i) CN PROCEDI CN* = (ii) TIME STEP THAN THE (iii) PEAK FLOW ADD HYD (0007) 1 + 2 = 3 ID1= 1 (00 + ID2= 2 (00 | <pre>mm/hr) = (min) (min) = (min) = (cms) = (cms) = (hrs) = (mm) = (mm) = ENT = GE COEFF. URE SELEC(80.0 I (DT) SH(STORAGE (DOES NO? 02): 02): 01): =========</pre> | 101.14 5.00 1.09 (ii 5.00 .34 .02 1.33 47.00 48.00 .98 IS SMALLER T CTED FOR PERVI Ca = Dep. Stor DULD BE SMALLE COEFFICIENT. COEFFICIENT. COEFFICIENT. COEFFICIENT. AREA QPEAK (ha) (cms) .08 .022 .58 .061 | 133.83 5.00 4.01 (ii) 5.00 .24 .00 1.33 19.99 48.00 .42 HAN TIME STEP! OUS LOSSES: age (Above) R OR EQUAL FLOW IF ANY. | .024 (iii) 1.33 44.29 48.00 .92 |
| Max.Eff.Inten.() over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI: ***** WARNING: STORA (i) CN PROCEDI CN* = (ii) TIME STEP THAN THE (iii) PEAK FLOW ADD HYD (0007) 1 + 2 = 3 ID1= 1 (00 + ID2= 2 (00 | <pre>mm/hr) = (min) (min) = (min) = (cms) = (cms) = (hrs) = (mm) = (mm) = ENT = GE COEFF. URE SELEC(80.0 I (DT) SH(STORAGE (DOES NO? 02): 02): 01): =========</pre> | 101.14 5.00 1.09 (ii 5.00 .34 .02 1.33 47.00 48.00 .98 IS SMALLER T CTED FOR PERVI Ca = Dep. Stor DULD BE SMALLE COEFFICIENT. COEFFICIENT. COEFFICIENT. COEFFICIENT. AREA QPEAK (ha) (cms) .08 .022 .58 .061 | 133.83 5.00) 4.01 (ii) 5.00 .24 .00 1.33 19.99 48.00 .42 HAN TIME STEP! OUS LOSSES: age (Above) R OR EQUAL FLOW IF ANY. | .024 (iii) 1.33 44.29 48.00 .92 |

_____ | ADD HYD (0009) | 1 + 2 = 3 AREA QPEAK TPEAK R.V. (ha) (cms) (hrs) .16 .017 1.33 _____ (mm) 28.06 44.29 ID1= 1 (0005): + ID2= 2 (0004): .09 .024 1.33 _____ .25 .041 1.33 33.90 ID = 3 (0009): NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. _____ | ADD HYD (0008) | 1 + 2 = 3 AREA QPEAK TPEAK R.V.
 ID1=
 1
 (0003):
 .19
 .050
 1.33
 44.29

 +
 ID2=
 2
 (0007):
 .66
 .083
 1.33
 30.34
 _____ (mm) _____ ID = 3 (0008): .85 .133 1.33 33.46 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. _____ | ADD HYD (0010) | 1 + 2 = 3AREA QPEAK TPEAK R.V.
 ID1=
 1
 (0006):
 .12
 .034
 1.33
 46.73

 +
 ID2=
 2
 (0009):
 .25
 .041
 1.33
 33.90
 _____ (mm) _____ ID = 3 (0010): .37 .074 1.33 38.06 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. _____ ***** ** SIMULATION NUMBER: 4 ** ***** | CHICAGO STORM | IDF curve parameters: A= 926.900 B= 5.000 C= .762 | Ptotal= 56.03 mm | _____ used in: INTENSITY = A / (t + B)^C Duration of storm = 4.00 hrs Storm time step = 10.00 min Time to peak ratio = .33 TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN mm/hr | hrs mm/hr | 4.04 | 1.17 28.70 | hrs hrs mm/hr | hrs mm/hr 9.15 | 3.17 .17 2.17 4.77

 4.60
 1.33
 117.72
 2.33

 5.37
 1.50
 37.22
 2.50

 .33 7.85 | 3.33 4.44 .50 6.90 | 3.50 4.16
 6.54
 1.67
 20.22
 2.67
 6.18
 3.67

 8.49
 1.83
 14.18
 2.83
 5.61
 3.83

 12.61
 2.00
 11.07
 3.00
 5.15
 4.00
 .67 3.92 3.71 3.53 .83 1.00 _____ | CALIB | STANDHYD (0003) | Area (ha)= .19 |ID= 1 DT= 5.0 min | Total Imp(%)= 90.00 Dir. Conn.(%)= 90.00 IMPERVIOUS PERVIOUS (i)
 IMPERVICES
 FERVICES

 .17
 .02

 1.00
 1.00

 1.00
 2.00

 35.60
 40.00

 .013
 .250
 Surface Area (ha) = Dep. Storage (mm) = (ha)= (%) = (m) = Average Slope Length .013 Mannings n = .250 NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

| | | | FORMED HYETOGRA | | | |
|--|---|--|---|--------------------------------------|---|-------------------|
| | | | RAIN TIME | | | |
| 11 | | 1 1 0 9 3 2 | m/hr hrs | 0 15 1 | 3 09 | 11111/111 1 77 |
| .00 | 53 4.04 57 4.04 | 1 1 167 2 | 8 70 2.083 | 9.15 | 3.00 | 4.77 |
| 25 | 50 4 60 | 1 1 250 11 | 8.70 2.083 8.70 2.167 7.72 2.250 | 7 85 1 | 3 25 | 4 44 |
| .33 | 33 4.60 | 1.333 11 | 7.72 2.333 | 7.85 | 3.33 | 4.44 |
| . 4 1 | 5.37 | 1.417 3 | 7.72 2.333 7.22 2.417 7.22 2.500 | 6.90 | 3.42 | 4.16 |
| .50 | 5.37 | 1.500 3 | 7.22 2.500 | 6.90 | 3.50 | 4.16 |
| .58 | 6.54 | 1.583 2 | 0.22 2.583 | 6.18 | 3.58 | 3.92 |
| .66 | 6.54 | 1.667 2 | 0.22 2.667 | 6.18 | 3.67 | 3.92 |
| .75 | 50 8.49 | 1.750 1 | 0.22 2.583 0.22 2.667 4.18 2.750 | 5.61 | 3.75 | 3.71 |
| .83 | 33 8.49 | 1.833 1 | 4.18 2.833 | 5.61 | 3.83 | 3.71 |
| .91 | 12.61 | 1.917 1 | 4.18 2.833 1.07 2.917 1.07 3.000 | 5.15 | 3.92 | 3.53 |
| 1.00 | 12.61 | 2.000 1 | 1.07 3.000 | 5.15 | 4.00 | 3.53 |
| Max.Eff.Inten. over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | (mm/hr)= | 117.72 | 66.92 | | | |
| over | c (min) | 5.00 | 5.00 | | | |
| Storage Coeff. | (min) = | 1.29 (i | i) 4.03 (ii) |) | | |
| Unit Hyd. Tpeak | c (min)= | 5.00 | 5.00 | | | |
| Unit Hyd. peak | (cms) = | .33 | .24 | * | T 0 + | |
| PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL BAINFALL | (cmg) - | 0.6 | 0.0 | TOTA* | LS* 59 (iii) | |
| TIME TO PEAK | (hrs) = | .00 1 33 | 1 33 | .0 | | |
| RUNOFF VOLUME | (mm) = | 55.03 | 25.55 | 52. | 06 | |
| TOTAL RAINFALL | (mm) = | 56.03 | 56.03 | 56. | | |
| TOTAL RAINFALL RUNOFF COEFFICI | IENT = | .98 | .46 | | | |
| **** WARNING: STOR | | | | | | |
| | | | | | | |
| (i) CN PROCED | | | IOUS LOSSES: rage (Above) | | | |
| (ii) TIME STEE | | | | | | |
| | | EFFICIENT. | TT. OIL DÃOUD | | | |
| (iii) PEAK FLOW | | | EFLOW IF ANY. | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| CALIB | | | | | | |
| 0.000 | - | (1) | 0.0 | | | |
| STANDHYD (0002) | Area | (ha) = . | 08 | (%) - 00 | 0.0 | |
| STANDHYD (0002) ID= 1 DT= 5.0 min | Area Total I | (ha) = . mp(%) = 99. | 08 00 Dir.Conn | .(%)= 99 | .00 | |
| ID= 1 DT= 5.0 min | Area Total I - | mp(%) = 99. | 00 Dir. Conn | | .00 | |
| ID= 1 DT= 5.0 min | Area Total I - | mp(%) = 99. | 00 Dir. Conn | | .00 | |
| ID= 1 DT= 5.0 min | Area Total I - | mp(%) = 99. | 00 Dir. Conn | | .00 | |
| ID= 1 DT= 5.0 min | Area Total I - | mp(%) = 99. | 00 Dir. Conn | | .00 | |
| ID= 1 DT= 5.0 min | Area Total I - | mp(%) = 99. | 00 Dir. Conn | | .00 | |
| ID= 1 DT= 5.0 min | Area Total I - | mp(%) = 99. | 00 Dir. Conn | | .00 | |
| ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n | Area Total I (ha) = (mm) = (%) = (m) = = | mp(%) = 99. IMPERVIOUS .08 1.00 1.00 23.10 .013 | 00 Dir. Conn PERVIOUS (i) .00 1.00 2.00 40.00 .250 |) | .00 | |
| ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n | Area Total I (ha) = (mm) = (%) = (m) = = | mp(%) = 99. IMPERVIOUS .08 1.00 1.00 23.10 .013 | 00 Dir. Conn PERVIOUS (i) .00 1.00 2.00 40.00 .250 |) | .00 | |
| ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n | Area Total I (ha) = (mm) = (%) = (m) = = | mp(%) = 99. IMPERVIOUS .08 1.00 1.00 23.10 .013 | 00 Dir. Conn PERVIOUS (i) .00 1.00 2.00 40.00 .250 |) | .00 | |
| ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n | Area Total I (ha) = (mm) = (%) = (m) = = | mp(%) = 99. IMPERVIOUS .08 1.00 1.00 23.10 .013 | 00 Dir. Conn PERVIOUS (i) .00 1.00 2.00 40.00 .250 |) | .00 | |
| ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten. over Storage Coeff. Unit Hyd. Tpeak | <pre>Area Total I Total I (ha) = (mm) = (%) = (m) = = (mm/hr) = c (min) (min) = c (min) =</pre> | mp(%) = 99. IMPERVIOUS .08 1.00 23.10 .013 117.72 5.00 .99 (i | 00 Dir. Conn PERVIOUS (i) .00 1.00 2.00 40.00 .250 334.58 5.00 i) 2.05 (ii) |) | .00 | |
| ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n | <pre>Area Total I Total I (ha) = (mm) = (%) = (m) = = (mm/hr) = c (min) (min) = c (min) =</pre> | mp(%) = 99. IMPERVIOUS .08 1.00 23.10 .013 117.72 5.00 .99 (i | 00 Dir. Conn PERVIOUS (i) .00 1.00 2.00 40.00 .250 334.58 5.00 i) 2.05 (ii) |) | | |
| <pre>ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak</pre> | <pre>Area Total I (ha) = (mm) = (%) = (m) = = (mm/hr) = c (min) (min) = c (min) = (cms) =</pre> | mp(%) = 99. IMPERVIOUS .08 1.00 23.10 .013 117.72 5.00 .99 (i 5.00 .34 | 00 Dir. Conn PERVIOUS (i) .00 1.00 2.00 40.00 .250 334.58 5.00 i) 2.05 (ii) 5.00 .31 |)) *TOTA | LS* | |
| ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten. over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | <pre>Area Total I (ha) = (mm) = (%) = (m) = = (mm/hr) = c (min) (min) = c (min) = (cms) =</pre> | mp(%) = 99. IMPERVIOUS .08 1.00 1.00 23.10 .013 117.72 5.00 .99 (i 5.00 .34 03 | 00 Dir. Conn PERVIOUS (i) .00 1.00 2.00 40.00 .250 334.58 5.00 i) 2.05 (ii) 5.00 .31 |)) .0 | LS* 26 (iii) | |
| ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten. over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | <pre>Area Total I (ha) = (mm) = (%) = (m) = = (mm/hr) = c (min) (min) = c (min) = (cms) =</pre> | mp(%) = 99. IMPERVIOUS .08 1.00 1.00 23.10 .013 117.72 5.00 .99 (i 5.00 .34 03 | 00 Dir. Conn PERVIOUS (i) .00 1.00 2.00 40.00 .250 334.58 5.00 i) 2.05 (ii) 5.00 .31 |) *TOTA .0 1. | LS* 26 (iii) 33 | |
| ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten. over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | <pre>Area Total I (ha) = (mm) = (%) = (m) = = (mm/hr) = c (min) (min) = c (min) = (cms) =</pre> | mp(%) = 99. IMPERVIOUS .08 1.00 1.00 23.10 .013 117.72 5.00 .99 (i 5.00 .34 03 | 00 Dir. Conn PERVIOUS (i) .00 1.00 2.00 40.00 .250 334.58 5.00 i) 2.05 (ii) 5.00 .31 | *TOTA .0 1. 54. | LS* 26 (iii) 33 73 | |
| <pre>ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten over Storage Coeff. Unit Hyd. peak Unit Hyd. peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL</pre> | <pre>Area Total I (ha) = (mm) = (%) = (mm/hr) = c (min) (min) = c (min) = (cms) = (cms) = (hrs) = (mm) = (mm) =</pre> | mp(%) = 99. IMPERVIOUS .08 1.00 23.10 .013 117.72 5.00 .99 (i 5.00 .34 .03 1.33 55.03 56.03 | 00 Dir. Conn PERVIOUS (i) .00 1.00 2.00 40.00 .250 334.58 5.00 .31 .00 1.33 25.55 56.03 | *TOTA .0 1. 54. 56. | LS* 26 (iii) 33 73 03 | |
| ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten. Over Storage Coeff. Unit Hyd. Tpeał Unit Hyd. peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI | <pre>Area Total I (ha) = (mm) = (%) = (m) = (m) = (min) = (min) = (cms) = (cms) = (hrs) = (mm) = (mm) = IENT =</pre> | mp(%) = 99. IMPERVIOUS .08 1.00 1.00 23.10 .013 117.72 5.00 .99 (i 5.00 .34 .03 1.33 55.03 56.03 .98 | 00 Dir. Conn PERVIOUS (i) .00 1.00 2.00 40.00 .250 334.58 5.00 i) 2.05 (ii) 5.00 .31 .00 1.33 25.55 56.03 .46 | *TOTA .0 1. 54. 56. | LS* 26 (iii) 33 73 03 | |
| <pre>ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI</pre> | <pre>Area Total I (ha) = (mm) = (%) = (m) = (m) = (min) = (min) = (cms) = (cms) = (hrs) = (mm) = (mm) = IENT =</pre> | mp(%) = 99. IMPERVIOUS .08 1.00 1.00 23.10 .013 117.72 5.00 .99 (i 5.00 .34 .03 1.33 55.03 56.03 .98 | 00 Dir. Conn PERVIOUS (i) .00 1.00 2.00 40.00 .250 334.58 5.00 i) 2.05 (ii) 5.00 .31 .00 1.33 25.55 56.03 .46 | *TOTA .0 1. 54. 56. | LS* 26 (iii) 33 73 03 | |
| <pre>ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten. over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. Tpeak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI ****** WARNING: STOR# (i) CN PROCEI</pre> | <pre>Area Total I (ha) = (mm) = (%) = (m) = (m) = (min) = (min) = (cms) = (cms) = (cms) = (hrs) = (hrs) = (mm) = HENT = AGE COEFF.</pre> | <pre>mp(%) = 99. IMPERVIOUS</pre> | 00 Dir. Conn PERVIOUS (i) .00 1.00 2.00 40.00 .250 334.58 5.00 1.33 2.05 (ii) 5.00 1.33 25.55 56.03 .46 THAN TIME STEP IOUS LOSSES: | *TOTA .0 1. 54. 56. | LS* 26 (iii) 33 73 03 | |
| <pre>IDD= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI ***** WARNING: STOR# (i) CN PROCEI CN* =</pre> | <pre>Area Total I (ha) = (mm) = (%) = (mm/hr) = c (min) (min) = c (min) = (cms) = (hrs) = (hrs) = (hrs) = (hrs) = AGE COEFF. DURE SELECT 80.0 Iz</pre> | <pre>mp(%) = 99. IMPERVIOUS</pre> | 00 Dir. Conn PERVIOUS (i) .00 1.00 2.00 40.00 .250 334.58 5.00 i) 2.05 (ii) 5.00 .31 .00 1.33 25.55 56.03 .46 THAN TIME STEP IOUS LOSSES: rage (Above) | *TOTA .0 1. 54. 56. | LS* 26 (iii) 33 73 03 | |
| <pre>ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten. Over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. Tpeak DINT Hyd. peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI ***** WARNING: STOR (i) CN PROCEI CN* = (ii) TIME STEH</pre> | <pre>Area Total I (ha) = (mm) = (%) = (m) = = (mm/hr) = c (min) = (cms) = (cms) = (hrs) = (hrs) = (hrs) = (mm) = IENT = AGE COEFF. DURE SELECT 80.0 Ia c (DT) SHOUT</pre> | <pre>mp(%) = 99. IMPERVIOUS</pre> | 00 Dir. Conn PERVIOUS (i) .00 1.00 2.00 40.00 .250 334.58 5.00 i) 2.05 (ii) 5.00 .31 .00 1.33 25.55 56.03 .46 THAN TIME STEP IOUS LOSSES: rage (Above) | *TOTA .0 1. 54. 56. | LS* 26 (iii) 33 73 03 | |
| <pre>ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten. Over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI ***** WARNING: STORA (i) CN PROCEI CN* = (ii) TIME STEI THAN THE</pre> | <pre>Area Total I (ha) = (mm) = (%) = (m) = = (mm/hr) = c (min) = (cms) = (cms) = (hrs) = (hrs) = (mm) = HENT = AGE COEFF. DURE SELECT 80.0 Ia 2 (DT) SHOU STORAGE CO</pre> | <pre>mp(%) = 99. IMPERVIOUS</pre> | 00 Dir. Conn PERVIOUS (i) .00 1.00 2.00 40.00 .250 334.58 5.00 (i) 2.05 (ii) 5.00 .31 .00 1.33 25.55 56.03 .46 THAN TIME STEP IOUS LOSSES: rage (Above) ER OR EQUAL | *TOTA .0 1. 54. 56. | LS* 26 (iii) 33 73 03 | |
| <pre>ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten. over Storage Coeff. Unit Hyd. Tpeał Unit Hyd. Tpeał Unit Hyd. peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI ***** WARNING: STOR# (i) CN PROCEI CN* = (ii) TIME STEH</pre> | <pre>Area Total I (ha) = (mm) = (%) = (m) = = (mm/hr) = c (min) = (cms) = (cms) = (hrs) = (hrs) = (mm) = HENT = AGE COEFF. DURE SELECT 80.0 Ia 2 (DT) SHOU STORAGE CO</pre> | <pre>mp(%) = 99. IMPERVIOUS</pre> | 00 Dir. Conn PERVIOUS (i) .00 1.00 2.00 40.00 .250 334.58 5.00 (i) 2.05 (ii) 5.00 .31 .00 1.33 25.55 56.03 .46 THAN TIME STEP IOUS LOSSES: rage (Above) ER OR EQUAL | *TOTA .0 1. 54. 56. | LS* 26 (iii) 33 73 03 | |
| <pre>ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI ***** WARNING: STORA (i) CN PROCEI CN* = (ii) TIME STER THAN THE (iii) PEAK FLOW</pre> | Area Total I (ha) = (mm) = (%) = (mm) = (mn) = (min) = (cms) = (hrs) = (hrs) = (hrs) = (hrs) = (mm) = ENT = AGE COEFF. DURE SELECT 80.0 Ia (DT) SHOU STORAGE COM | <pre>mp(%) = 99. IMPERVIOUS</pre> | 00 Dir. Conn PERVIOUS (i) .00 1.00 2.00 40.00 .250 334.58 5.00 i) 2.05 (ii) 5.00 .31 .00 1.33 25.55 56.03 .46 THAN TIME STEP IOUS LOSSES: rage (Above) ER OR EQUAL EFLOW IF ANY. | *TOTA .0 1. 54. 56. | LS* 26 (iii) 33 73 03 98 | |
| <pre>ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten. Over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI ***** WARNING: STORA (i) CN PROCEI CN* = (ii) TIME STEH THAN THE (iii) PEAK FLOW</pre> | Area Total I (ha) = (mm) = (%) = (m) = = (mm/hr) = c (min) = (cms) = (cms) = (hrs) = (mm) = (mm) = (mm) = MGE COEFF. DURE SELECT 80.0 Ia 2 (DT) SHOU STORAGE CON | <pre>mp(%) = 99. IMPERVIOUS</pre> | 00 Dir. Conn PERVIOUS (i) .00 1.00 2.00 40.00 .250 334.58 5.00 i) 2.05 (ii) 5.00 .31 .00 1.33 25.55 56.03 .46 THAN TIME STEP IOUS LOSSES: rage (Above) ER OR EQUAL EFLOW IF ANY. | *TOTA .0 1. 54. 56. | LS* 26 (iii) 33 73 03 98 | |
| <pre>ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten. 0 ver Storage Coeff. Unit Hyd. Tpeak Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI ***** WARNING: STORF (i) CN PROCEI CN* = (ii) TIME STEI THAN THE (iii) PEAK FLOW CALIB</pre> | Area Total I (ha) = (mm) = (%) = (mm) = (mm) = (min) = (min) = (cms) = (hrs) = (hrs) = (hrs) = (hrs) = (mm) = HENT = AGE COEFF. DURE SELECT 80.0 Ia 2 (DT) SHOU STORAGE COM | <pre>mp(%) = 99. IMPERVIOUS</pre> | 00 Dir. Conn PERVIOUS (i) .00 1.00 2.00 40.00 .250 334.58 5.00 i) 2.05 (ii) 5.00 1.33 25.55 56.03 .46 THAN TIME STEP IOUS LOSSES: rage (Above) ER OR EQUAL EFLOW IF ANY. | *TOTA .0 1. 54. 56. | LS* 26 (iii) 33 73 03 98 | |
| <pre>ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten. 0 ver Storage Coeff. Unit Hyd. Tpeak Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI ***** WARNING: STORF (i) CN PROCEI CN* = (ii) TIME STEI THAN THE (iii) PEAK FLOW CALIB</pre> | Area Total I (ha) = (mm) = (%) = (mm) = (mm) = (min) = (min) = (cms) = (hrs) = (hrs) = (hrs) = (hrs) = (mm) = HENT = AGE COEFF. DURE SELECT 80.0 Ia 2 (DT) SHOU STORAGE COM | <pre>mp(%) = 99. IMPERVIOUS</pre> | 00 Dir. Conn PERVIOUS (i) .00 1.00 2.00 40.00 .250 334.58 5.00 i) 2.05 (ii) 5.00 1.33 25.55 56.03 .46 THAN TIME STEP IOUS LOSSES: rage (Above) ER OR EQUAL EFLOW IF ANY. | *TOTA .0 1. 54. 56. | LS* 26 (iii) 33 73 03 98 | |
| <pre>ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten. Over Storage Coeff. Unit Hyd. Tpeał Unit Hyd. Tpeał Unit Hyd. peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI ***** WARNING: STOR (i) CN PROCEI CN* = (ii) TIME STEH THAN THE (iii) PEAK FLOW</pre> | Area Total I (ha) = (mm) = (%) = (m) = (mn/hr) = c (min) = (cms) = (cms) = (cms) = (hrs) = (mm) = (mm) = IENT = AGE COEFF. DURE SELECT 80.0 Ia c (DT) SHOU STORAGE CO V DOES NOT Area Total I | <pre>mp(%) = 99. IMPERVIOUS</pre> | 00 Dir. Conn PERVIOUS (i) .00 1.00 2.00 40.00 .250 334.58 5.00 i) 2.05 (ii) 5.00 .31 .00 1.33 25.55 56.03 .46 THAN TIME STEP IOUS LOSSES: rage (Above) ER OR EQUAL EFLOW IF ANY. | *TOTA .0 1. 54. 56. ! | LS* 26 (iii) 33 73 03 98 | |
| <pre>IDD= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten. over Storage Coeff. Unit Hyd. Tpeał Unit Hyd. Tpeał Unit Hyd. peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI ***** WARNING: STORA (i) CN PROCEI CN* = (ii) TIME STORA (iii) PEAK FLOW THAN THE (iii) PEAK FLOW CALIB STANDHYD (0001) IDD= 1 DT= 5.0 min</pre> | Area Total I (ha) = (mm) = (%) = (m) = (m) = (min) = (min) = (cms) = (cms) = (hrs) = (hrs) = (hrs) = (hrs) = (mm) = HENT = AGE COEFF. DURE SELECT 80.0 Ia 2 (DT) SHOU STORAGE COV DOES NOT Area Total I | <pre>mp(%) = 99. IMPERVIOUS</pre> | 00 Dir. Conn PERVIOUS (i) .00 1.00 2.00 40.00 .250 334.58 5.00 i) 2.05 (ii) 5.00 1.33 25.55 56.03 .46 THAN TIME STEP IOUS LOSSES: rage (Above) ER OR EQUAL EFLOW IF ANY. | *TOTA .0 1. 54. 56. ! | LS* 26 (iii) 33 73 03 98 | |
| <pre>ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten. over Storage Coeff. Unit Hyd. Tpeał Unit Hyd. Tpeał Unit Hyd. peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI ***** WARNING: STORA (i) CN PROCEI CN* = (ii) TIME STORA (iii) PEAK FLOW THAN THE (iii) PEAK FLOW CALIB STANDHYD (0001) ID= 1 DT= 5.0 min</pre> | Area Total I (ha) = (mm) = (%) = (m) = (m) = (min) = (min) = (cms) = (cms) = (hrs) = (hrs) = (hrs) = (hrs) = (mm) = HENT = AGE COEFF. DURE SELECT 80.0 Ia 2 (DT) SHOU STORAGE COV DOES NOT Area Total I | <pre>mp(%) = 99. IMPERVIOUS</pre> | 00 Dir. Conn PERVIOUS (i) .00 1.00 2.00 40.00 .250 334.58 5.00 i) 2.05 (ii) 5.00 1.33 25.55 56.03 .46 THAN TIME STEP IOUS LOSSES: rage (Above) ER OR EQUAL EFLOW IF ANY. | *TOTA .0 1. 54. 56. ! | LS* 26 (iii) 33 73 03 98 | |
| Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI ****** WARNING: STORA (i) CN PROCEI CN* = (ii) TIME STEI THAN THE | Area Total I (ha) = (mm) = (%) = (m) = (m) = (min) = (min) = (cms) = (cms) = (hrs) = (hrs) = (hrs) = (hrs) = (mm) = HENT = AGE COEFF. DURE SELECT 80.0 Ia 2 (DT) SHOU STORAGE COV DOES NOT Area Total I | <pre>mp(%) = 99. IMPERVIOUS</pre> | 00 Dir. Conn PERVIOUS (i) .00 1.00 2.00 40.00 .250 334.58 5.00 i) 2.05 (ii) 5.00 1.33 25.55 56.03 .46 THAN TIME STEP IOUS LOSSES: rage (Above) ER OR EQUAL EFLOW IF ANY. | *TOTA .0 1. 54. 56. ! | LS* 26 (iii) 33 73 03 98 | |

| FUNCTIONAL SERV | | | | |
|--|---|---|--|---|
| Length Mannings n | (m) = = | 62.20 .013 | 40.00 .250 | |
| Max.Eff.Inten.(r over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | | | | *TOTALS* |
| PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICIE | (cms) = (hrs) = (mm) = (mm) = ENT = | .06 1.33 55.03 56.03 .98 | .03 1.50 25.55 56.03 .46 | .074 (iii) 1.33 34.38 56.03 .61 |
| ***** WARNING: STORAG | GE COEFF. 1 | IS SMALLER TH | HAN TIME STEP! | |
| (ii) TIME STEP | 30.0 Ia (DT) SHOUI STORAGE COB | = Dep. Stora LD BE SMALLEF EFFICIENT. | age (Above) R OR EQUAL | |
| CALIB STANDHYD (0006) ID= 1 DT= 5.0 min | Area Total In | (ha)= .12 np(%)= 99.00 | 2) Dir. Conn.(% |)= 99.00 |
| | | MDEDUTOUS | DEDUTOUS (;) | |
| Surface Area Dep. Storage Average Slope Length Mannings n | (ha) = (mm) = (%) = (m) = = | .12 1.00 1.00 28.30 .013 | .00 1.00 2.00 40.00 .250 | |
| Max.Eff.Inten.(r over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | (min) (min) = (min) = (cms) = | 5.00 1.12 (ii) 5.00 .34 | 5.00 2.17 (ii) 5.00 .31 | *TOTALS* |
| PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI | (cms) = (hrs) = (mm) = (mm) = ENT = | .04 1.33 55.03 56.03 .98 | .00 1.33 25.55 56.03 .46 | .039 (iii) 1.33 54.73 56.03 .98 |
| ***** WARNING: STORA | | | | |
| (ii) TIME STEP | 30.0 Ia (DT) SHOUI STORAGE COB | = Dep. Stora LD BE SMALLEF EFFICIENT. | age (Above) R OR EQUAL | |
| | | | | |
| CALIB STANDHYD (0005) ID= 1 DT= 5.0 min | | (ha) = .16 mp(%) = 30.00 | 6) Dir. Conn.(% |)= 30.00 |
| Surface Area Dep. Storage Average Slope Length Mannings n | (ha) = | .05 | PERVIOUS (i) .11 1.00 2.00 40.00 .250 | |
| Max.Eff.Inten.(r over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | (min) (min) = (min) = | 117.72 5.00 1.22 (ii) 5.00 .33 | 49.58 15.00 10.57 (ii) 15.00 .09 | |
| PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI | (hrs) = (mm) = (mm) = | 1 33 | .01 1.50 25.55 56.03 .46 | *TOTALS* .021 (iii) 1.33 34.35 56.03 .61 |

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: $CN^* = 80.0$ Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. _____ _____ | CALTB .09 | STANDHYD (0004) | Area (ha)= |ID= 1 DT= 5.0 min | Total Imp(%) = 90.00 Dir. Conn.(%) = 90.00 _____ ____ IMPERVIOUS PERVIOUS (i) Surface Area (ha) = Dep. Storage (mm) = .08 1.00 .01 1 00 1.00 1.00 24.50 . Average Slope (%) = (m) = 2.00 40.00 Length = Mannings n .013 .250 Max.Eff.Inten.(mm/hr) = 117.72 173.52
 5.00
 5.00

 1.03 (ii)
 3.77 (ii)

 5.00
 5.00

 .34
 .25
 over (min) Storage Coeff. (min) = Unit Hyd. Tpeak (min)= Unit Hyd. peak (cms)= *TOTALS* .028 (iii) 1.33 .03 .00 1.33 1.33 55.03 25.55 56.03 56.03 .98 .46 PEAK FLOW (cms) = TIME TO PEAK (hrs) = RUNOFF VOLUME (mm) = TOTAL RAINFALL (mm) = 52.07 56.03 .98 .46 RUNOFF COEFFICIENT = .93 ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN^* = 80.0 Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. _____ | ADD HYD (0007) |
 D
 (0007)
 AREA
 QPEAK
 TPEAK
 R.V.

 2
 3
 |
 AREA
 QPEAK
 TPEAK
 R.V.

 ID1=
 1
 (0002):
 .08
 .026
 1.33
 54.73

 +
 ID2=
 2
 (0001):
 .58
 .074
 1.33
 34.38
 1 + 2 = 3~ I ID = 3 (0007): .66 .100 1.33 36.84 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. _____ | ADD HYD (0009) | . _ . _ = 3 | 1 + 2 = 3 AREA QPEAK TPEAK R.V.
 ID1=1 (0005):
 .16
 .021
 1.33
 34.35

 ID2=2 (0004):
 .09
 .028
 1.33
 52.07
 (ha) (mm) + ID2= 2 (0004): _____ _____ ID = 3 (0009):.25 .048 1.33 40.73 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | ADD HYD (0008) | AREA QPEAK (ha) (cms) 1 + 2 = 3 TPEAK R.V. ~ I (cms) (hrs) (mm) .059 1.33 52.06 .100 1.33 36.84 (ha) (mm) .19 .66 ID1= 1 (0003): + ID2= 2 (0007): ID = 3 (0008):.85 .159 1.33 40.25 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

_____ | ADD HYD (0010) | 1 + 2 = 3AREA QPEAK TPEAK R.V. (ha) (cms) (hrs) (mm) .12 .039 1.33 54.73 .25 .048 1.33 40.73 _____ (mm) ID1= 1 (0006): + ID2= 2 (0009): _____ ID = 3 (0010): .37 .087 1.33 45.27 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. _____ ******** ** SIMULATION NUMBER: 5 ** ***** _____ | CHICAGO STORM | IDF curve parameters: A=1019.400 | Ptotal= 61.96 mm | B= 5.000 C= .761 ----used in: INTENSITY = A / (t + B) ^C Duration of storm = 4.00 hrs Storm time step = 10.00 min Time to peak ratio = .33 TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN
 mm/hr
 hrs
 mm/hr
 hrs</thr>
 hrs
 tun
 <thr hrs .17 .33 .50 .67 .83 1.00 _____ _____ | CALTB Area (ha) = .19 | STANDHYD (0003) | Total Imp(%) = 90.00 Dir. Conn.(%) = 90.00 |ID= 1 DT= 5.0 min | ------IMPERVIOUS PERVIOUS (i) .17 1.00 Surface Area (ha) = .02 1.00 Dep. Storage (mm) = Average Slope (%)= 1.00 2.00 (\$) = 1.00 2.00 (m) = 35.60 40.00 = .013 .250 Length .013 .250 Mannings n = NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP. ---- TRANSFORMED HYETOGRAPH ----
 TIME
 RAIN
 TIME
 RAIN
 TIME
 RAIN
 TIME

 hrs
 mm/hr
 hrs
 30.8
 31.74
 2.083
 10.15
 3.08
 31.74
 2.167
 10.15
 3.17

 250
 5.10
 1.250
 129.82
 2.250
 8.70
 3.25
 TIME RAIN mm/hr .083 5.29 .167 5.29 .250 5.10 | 1.250 129.82 | 2.250 8.70 | 3.25 4.93 5.10 | 1.333 129.82 | 2.333 8.70 | 3.33 .333 4.93 .417 5.96 | 1.417 41.13 | 2.417 7.66 | 3.42 4.62
 5.96
 | 1.500
 41.13
 | 2.500
 7.66
 | 3.50

 7.25
 | 1.583
 22.38
 | 2.583
 6.86
 | 3.58
 .500 4.62 .583 4.35
 7.25
 1.667
 22.38
 2.667

 9.41
 1.750
 15.71
 2.750

 9.41
 1.833
 15.71
 2.833
 .667 6.86 | 3.67 4.35 .750 6.23 | 3.75 4.12 .833 6.23 | 3.83 4.12 13.97 | 1.917 12.26 | 2.917 .917 5.71 | 3.92 3.91 1.000 13.97 | 2.000 12.26 | 3.000 5.71 | 4.00 3.91 Max.Eff.Inten.(mm/hr)= 129.82 86.76 over (min) 5.00 5.00 Storage Coeff. (min)= 1.24 (ii) 3.88 (ii) 5.00 5.00 .33 .25 Unit Hyd. Tpeak (min)= Unit Hyd. peak (cms)=

 PEAK FLOW
 (cms) =
 .06
 .00
 .065 (iii)

 TIME TO PEAK
 (hrs) =
 1.33
 1.33
 1.33

 RUNOFF VOLUME
 (mm) =
 60.96
 29.86
 57.83

| <pre>**** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (1) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:</pre> | **** WARNING: STOR | | .98 | .48 | .93 |
|--|---|---|---|--|------------------------|
| CN* = 80.0 IA = Dep. Storage (Above) (i) THE STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. CALLE CALLE STANDHYD (0002) Area (ha)= .08 ID= 1 DT= 5.0 min Total Imp(%)= 99.00 Dir. Conn.(%)= 99.00 Dep. Storage (mm)= 1.00 1.00 Average Slope (%)= 1.00 2.00 Length (m)= 23.10 40.00 Mannings n = .013 .250 Max.Eff.Inten.(mm/hr)= 129.82 433.80 over (min) 5.00 5.00 Storage Coeff. (min)= .34 .31 "TOTALS" PEAK FLOW (cms)= .03 .00 .029 (iii) TIME TO PEAK (hrs)= 1.33 1.33 1.33 RUNOFF VOLUME (mm)= 61.96 61.96 61.96 RUNOFF COEFFICIENT = .98 .48 .98 ***** WARNING: STORAGE COEFF. IS SMALLER THAN THE STEP! (i) CN PEORGE COEFF. IS SMALLER THAN THE STEP! (i) CN PEORGE COEFFICIENT = .98 .48 .98 ***** WARNING: STORAGE COEFF. IS SMALLER THAN THE STEP! (i) CN PEORGE COEFFICIENT = .98 .48 .98 ***** WARNING: STORAGE COEFF. IS SMALLER THAN THE STEP! (i) CN PEORGE COEFFICIENT (ii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. ***** WARNING: STORAGE COEFF. IS SMALLER THAN THE STEP! (ii) CN PEORGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. ***** CALLE SURFace Area (ha)= .17 .41 Dep. Storage (mm)= 1.00 1.00 Average Slope (%)= 1.00 2.00 Length (m)= 62.20 40.00 Mannings n = .013 1.50 Storage Coeff. (min)= 1.73 (ii) 10.48 (ii) Unit Hyd. Peak (ms)= .32 .09 *TOTALS* PEAK FLOW (cms)= .20 *TOTALS* PEAK FLOW (cms)= .20 *TOTALS* PEAK FLOW (cms)= .20 % Max.Eff.Inten.(mm/hr)= 129.82 58.42 Nax.Eff.Inten.(mm/hr)= 129.82 58.42 NAX.Eff.Inten.(mr/hr)= 129.82 58.42 NAX.Eff.Inten.(mr/hr)= 129.82 58.42 NAX.Eff.Inten.(mr/hr)= 129.82 58.42 NAX.Eff.Inten.(mr | | AGE COEFF. | IS SMALLER T | HAN TIME STEP! | |
| <pre>(ii) THE STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. </pre> | | | | | |
| THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. TALES INCOMPLYING (002) Area (ha)= .08 ID=1 DT= 5.0 min Total Imp(%)= 99.00 Dir. Conn.(%)= 99.00 TMPERVIOUS PERVIOUS (i) Surface Area (ha)= .08 .00 Dep. Storage (mm)= 1.00 1.00 Average Slope (%)= 1.00 2.00 Length (m)= 23.10 40.00 Mannings n = .013 .250 Max.Eff.Inten.(mm/hr)= 129.82 433.80 over (min) 5.00 5.00 Storage Coeff. (min)= .96 (ii) 1.97 (ii) Unit Hyd. Tpeak (mn)= .03 .00 .029 (iii) TIME TO FEAK (hrs)= .133 1.33 1.33 RUNOFF VOLUME (mm)= 60.96 29.86 60.64 TOTAL AINFALL (mm)= 60.96 29.86 60.64 TOTAL AINFALL (mm)= 61.96 61.96 RUNOFF COEFFICIENT = .98 .48 .98 **** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 80.0 I Ia = Dep. Storage (Above) (ii) THE STEP (DT) SHOULD ES SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. | | | | | |
| CALLE STANDHYD (0002) Area (ha) = .08 ID=1 DT= 5.0 min Total Imp(%) = 99.00 Dir. Conn.(%) = 99.00 IMPERVIOUS PERVIOUS (i) Surface Area (ha) = .08 .00 Dep. Storage (mm) = 1.00 1.00 Average Slope (%) = 1.00 2.00 Length (m) = 23.10 40.00 Mannings n = .013 .250 Max.Eff.Inten.(mm/hr) = 129.82 433.80 over (min) = .96 (ii) 1.97 (ii) Unit Hyd. Tpeak (min) = .50 5.00 Unit Hyd. Tpeak (min) = .50 5.00 Unit Hyd. Tpeak (min) = .34 .31 TIME TO FEAK (hrs) = 1.33 1.33 1.33 RUNOFF VOLUME (mm) = 60.96 29.86 60.64 TOTAL SHORE (COMS) = .34 .31 TOTALS* PEAK FLOW (cms) = .34 .31 TIME TO FEAK (hrs) = 1.33 1.33 1.33 RUNOFF VOLUME (mm) = 60.96 29.86 60.64 TOTAL SHORE (COMS) = .98 .48 .98 **** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN FPECEDURE SELECTED FOR PERVIOUS LOSSES: | | | | IN ON EQUAL | |
| CALLE Area (ha) = .08 DTAIDENTD (0002) Area (ha) = .08 DT = 1 DT = 5.0 min Total Imp(%) = 99.00 Dir. Conn.(%) = 99.00 IMPERVIOUS PERVIOUS (i) Surface Area (ha) = .00 1.00 Average Slope (%) = 1.00 2.00 Length (m) = 23.10 40.00 Mannings n = .013 .250 Max.Eff.Inten.(mm/hr) = 129.82 433.80 over (min) 5.00 5.00 Storage Coeff. (min) = .96 (ii) 1.97 (ii) Unit Hyd. Tpeak (min) = 5.00 5.00 Unit Hyd. Tpeak (min) = .03 .00 .029 (iii) TIME TO PEAK (hrs) = 1.33 1.33 1.33 RUNOFF VOLUME (mm) = 60.96 29.86 60.64 TOTAL RAINFALL (mm) = 61.96 61.96 61.96 RUNOFF COEFFICIENT = .98 .48 .98 **** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN FROCEDURE SELECTED FOR PERVIOUS LOSSES: CN' = 80.0 Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD EE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. THERVIOUS PERVIOUS (i) Surface Area (ha) = .17 .41 Dep. Storage (m) = 1.00 1.00 Average Slope (%) = 1.00 2.00 Length (m) = 62.20 40.00 Mannings n = .013 .250 Max.Eff.Inten.(mm/hr) = 129.82 58.42 over (min) 5.00 15.00 Storage Coeff. (min) = 1.73 (ii) 10.48 (ii) Unit Hyd. Peak (ms) = .32 .9 ***** WARNING: MORE COEFF. IS SMALLER (N COND Mannings n = .013 .250 Max.Eff.Inten.(mm/hr) = 129.82 58.42 over (min) 5.00 15.00 Storage Coeff. (min) = 1.73 (ii) 10.48 (ii) Unit Hyd. Peak (ms) = .32 .9 ***** PEAK FLOW (cms) = .06 .04 .034 (iii) Unit Hyd. Peak (ms) = .32 .9 ***** PEAK FLOW (cms) = .06 .04 .034 (iii) Unit Hyd. Peak (ms) = .32 .9 ***** PEAK FLOW (cms) = .06 .04 .034 (iii) TIME TO PEAK (hrs) = 1.33 1.50 1.33 RUNOFF VOLUME (mm) = 60.96 29.86 39.17 TOTALS* PEAK FLOW (cms) = .06 .61.96 61.96 RUNOFF COEFFICIENT = .98 .48 .63 | (iii) PEAK FLO | W DOES NOT | INCLUDE BASE | FLOW IF ANY. | |
| CALLE Area (ha) = .08 DTAIDENTD (0002) Area (ha) = .08 DT = 1 DT = 5.0 min Total Imp(%) = 99.00 Dir. Conn.(%) = 99.00 IMPERVIOUS PERVIOUS (i) Surface Area (ha) = .00 1.00 Average Slope (%) = 1.00 2.00 Length (m) = 23.10 40.00 Mannings n = .013 .250 Max.Eff.Inten.(mm/hr) = 129.82 433.80 over (min) 5.00 5.00 Storage Coeff. (min) = .96 (ii) 1.97 (ii) Unit Hyd. Tpeak (min) = 5.00 5.00 Unit Hyd. Tpeak (min) = .03 .00 .029 (iii) TIME TO PEAK (hrs) = 1.33 1.33 1.33 RUNOFF VOLUME (mm) = 60.96 29.86 60.64 TOTAL RAINFALL (mm) = 61.96 61.96 61.96 RUNOFF COEFFICIENT = .98 .48 .98 **** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN FROCEDURE SELECTED FOR PERVIOUS LOSSES: CN' = 80.0 Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD EE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. THERVIOUS PERVIOUS (i) Surface Area (ha) = .17 .41 Dep. Storage (m) = 1.00 1.00 Average Slope (%) = 1.00 2.00 Length (m) = 62.20 40.00 Mannings n = .013 .250 Max.Eff.Inten.(mm/hr) = 129.82 58.42 over (min) 5.00 15.00 Storage Coeff. (min) = 1.73 (ii) 10.48 (ii) Unit Hyd. Peak (ms) = .32 .9 ***** WARNING: MORE COEFF. IS SMALLER (N COND Mannings n = .013 .250 Max.Eff.Inten.(mm/hr) = 129.82 58.42 over (min) 5.00 15.00 Storage Coeff. (min) = 1.73 (ii) 10.48 (ii) Unit Hyd. Peak (ms) = .32 .9 ***** PEAK FLOW (cms) = .06 .04 .034 (iii) Unit Hyd. Peak (ms) = .32 .9 ***** PEAK FLOW (cms) = .06 .04 .034 (iii) Unit Hyd. Peak (ms) = .32 .9 ***** PEAK FLOW (cms) = .06 .04 .034 (iii) TIME TO PEAK (hrs) = 1.33 1.50 1.33 RUNOFF VOLUME (mm) = 60.96 29.86 39.17 TOTALS* PEAK FLOW (cms) = .06 .61.96 61.96 RUNOFF COEFFICIENT = .98 .48 .63 | | | | | |
| STANDAVD (0002) Area (ha)= .08 ID= 1 DT= 5.0 min Total Imp(%)= 99.00 Dir. Conn.(%)= 99.00 Surface Area (ha)= .08 .00 Dep. Storage (mm)= 1.00 1.00 Average Slope (%)= 1.00 2.00 Length (m)= 23.10 40.00 Max.Eff.Inten.(mm/hr)= 129.82 433.80 over (min) 5.00 5.00 Storage Coeff. (min)= .96 (ii) 1.97 (ii) Unit Hyd. Tpeak (min)= 5.00 5.00 Unit Hyd. peak (cms)= .33 1.33 1.33 1.33 RUNOFF VOLUME (mm)= 60.96 29.86 60.64 TOTALS* PEAK FLOW (cms)= .03 .00 .029 (iii) TIME TO PEAK (hrs)= 1.33 1.33 1.33 RUNOFF VOLUME (mm)= 61.96 61.96 61.96 RUNOFF VOLUME (mm)= 61.96 A8 RUNOFF VOLUME (mm)= 5.00 IA = Dep. Storage (Above) (ii) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 80.0 IA = Dep. Storage (Above) (iii) THME STORAGE COEFF. IS SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (AIB i STANDHYD (0001) Area (ha)= .58 ID= 1 DT= 5.0 min Total Imp(%) = 30.00 Dir. Conn.(%)= 30.00 THMERVIOUS PERVIOUS (i) Strade Area (ha)= .17 .41 Dep. Storage (mm) = .00 1.00 Average Slope (%) = 1.00 2.00 Average Slope | | - | | | |
| <pre>IMPERVIOUS PERVIOUS (i) Surface Area (ha) = .08 .00 Dep. Storage (mm) = 1.00 1.00 Average Slope (%) = 1.00 2.00 Length (m) = 23.10 40.00 Mannings n = .013 .250 Max.Eff.Inten.(mm/hr) = 129.82 433.80 over (min) 5.00 5.00 Unit Hyd. Tpeak (min) = .96 (ii) 1.97 (ii) Unit Hyd. Tpeak (min) = .34 .31 TIME TO PEAK (hrs) = .33 1.33 1.33 1.33 RUNOFF COEFFICIENT = .98 .48 .98 ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 80.0 T a Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.</pre> | CALIB | | (1) | 0 | |
| <pre>IMPERVIOUS PERVIOUS (i) Surface Area (ha) = .08 .00 Dep.Storage (mm) = 1.00 1.00 Average Slope (%) = 1.00 2.00 Length (m) = 23.10 40.00 Mannings n = .013 .250 Max.Eff.Inten.(mm/hr) = 129.82 433.80 over (min) 5.00 5.00 Unit Hyd. Tpeak (min) = 5.06 (ii) 1.37 (ii) Unit Hyd. Tpeak (ms) = .34 .31 *TOTALS* PEAK FLOW (cms) = .03 .00 .029 (iii) TIME TO PEAK (hrs) = 1.33 1.33 1.33 RUNOFF VOLUME (mm) = 60.96 29.86 60.64 TOTAL RAINFALL (mm) = 60.96 61.96 61.96 RUNOFF COEFFICIENT = .98 .48 .98 ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 80.0 Ia = Dep.Storage (Above) (ii) TIME STOP (DT) SHOALDE DE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.</pre> | TD = 1 DT = 5 0 min | Area | (ha) = .0 (%) = .0 | 0 Dir Conn (| <pre>%) = 99 00</pre> |
| Surface Area (ha)= .08 .00 Dep. Storage (mm)= 1.00 1.00 Average Slope (%)= 1.00 2.00 Length (m)= 23.10 40.00 Mannings n = .013 .250 Max.Eff.Inten.(mm/hr)= 129.82 433.80 over (min) 5.00 5.00 Unit Hyd. Tpeak (min)= .96 (ii) 1.97 (ii) Unit Hyd. Tpeak (min)= .34 .31 *TOTALS* PEAK FLOW (cms)= .03 .00 .029 (iii) TIME TO PEAK (hrs)= 1.33 1.33 1.33 RUNOFF VOLUME (mm)= 60.96 29.86 60.64 TOTAL RAINFALL (mm)= 61.96 61.96 61.96 RUNOFF VOLUME (mm)= 60.96 29.86 60.64 TOTAL RAINFALL (mm)= 61.96 61.96 61.96 RUNOFF COEFFICIENT = .98 .48 .98 **** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 80.0 I a Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. | | - | | | ., |
| <pre>Max.Eff.Inten.(mm/hr)= 129.82 433.80</pre> | 0 | (1) | IMPERVIOUS | PERVIOUS (i) | |
| <pre>Max.Eff.Inten.(mm/hr)= 129.82 433.80</pre> | Dep Storage | (mm) = | 1 00 | 1 00 | |
| <pre>Max.Eff.Inten.(mm/hr)= 129.82 433.80</pre> | Average Slope | (%) = | 1.00 | 2.00 | |
| <pre>Max.Eff.Inten.(mm/hr)= 129.82 433.80</pre> | Length | (m) = | 23.10 | 40.00 | |
| <pre>Max.Eff.Inten.(mm/hr)= 129.82 433.80</pre> | Mannings n | = | .013 | .250 | |
| <pre>PEAK FLOW (cms)= .03 .00 .029 (iii) TIME TO PEAK (hrs)= 1.33 1.33 1.33 RUNOFF VOLUME (mm)= 60.96 29.86 60.64 TOTAL RAINFALL (mm)= 61.96 61.96 61.96 RUNOFF COEFFICIENT = .98 .48 .98 ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:</pre> | Max.Eff.Inten. | (mm/hr)= | 129.82 | 433.80 | |
| <pre>PEAK FLOW (cms)= .03 .00 .029 (iii) TIME TO PEAK (hrs)= 1.33 1.33 1.33 RUNOFF VOLUME (mm)= 60.96 29.86 60.64 TOTAL RAINFALL (mm)= 61.96 61.96 61.96 RUNOFF COEFFICIENT = .98 .48 .98 ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:</pre> | ove | r (min) | 5.00 | 5.00 | |
| <pre>PEAK FLOW (cms)= .03 .00 .029 (iii) TIME TO PEAK (hrs)= 1.33 1.33 1.33 RUNOFF VOLUME (mm)= 60.96 29.86 60.64 TOTAL RAINFALL (mm)= 61.96 61.96 61.96 RUNOFF COEFFICIENT = .98 .48 .98 ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:</pre> | Storage Coeff. | (min) = | .96 (ii |) 1.97 (ii) | |
| PEAK FLOW (cms) = .03 .00 .029 (iii) TIME TO PEAK (hrs) = 1.33 1.33 1.33 RUNOFF VOLUME (mm) = 60.96 29.86 60.64 TOTAL RAINFALL (mm) = 61.96 61.96 61.96 RUNOFF COEFFICIENT = .98 .48 .98 ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 80.0 Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. CALIB IMPERVIOUS PERVIOUS (i) Surface Area (ha) = .58 IMPERVIOUS PERVIOUS (i) Surface Area (ha) = .17 .41 Dep. Storage (mm) = 1.00 2.00 .00 Length (m) = 62.20 40.00 .03 .250 Max.Eff.Inten.(mm/hr) = 129.82 58.42 .00 .04 .04 .04 Over (min) 5.00 15.00 Notage (| Unit Hyd. Tpeal | k (min) = | 5.00 | 5.00 | |
| <pre>PEAK FLOW (cms)= .03 .00 .029 (iii) TIME TO PEAK (hrs)= 1.33 1.33 1.33 RUNOFF VOLUME (mm)= 60.96 29.86 60.64 TOTAL RAINFALL (mm)= 61.96 61.96 61.96 RUNOFF COEFFICIENT = .98 .48 .98 **** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:</pre> | Unit Hyd. peak | (cms) = | .34 | .31 | *TOTALS* |
| <pre>**** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 80.0 Ia = Dep. Storage (Above) (i) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. CALLB STANDHYD (0001) Area (ha)= .58 D= 1 DT= 5.0 min Total Imp(%)= 30.00 Dir. Conn.(%)= 30.00</pre> | PEAK FLOW | (cms) = | .03 | .00 | .029 (iii) |
| <pre>**** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 80.0 Ia = Dep. Storage (Above) (i) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. CALLE I STANDHYD (0001) Area (ha)= .58 D.D 1 DT= 5.0 min Total Imp(%)= 30.00 Dir. Conn.(%)= 30.00</pre> | TIME TO PEAK | (hrs) = | 1.33 | 1.33 | 1.33 |
| <pre>**** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 80.0 Ia = Dep. Storage (Above) (i) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. CALLE I STANDHYD (0001) Area (ha)= .58 D.D 1 DT= 5.0 min Total Imp(%)= 30.00 Dir. Conn.(%)= 30.00</pre> | RUNOFF VOLUME | (mm) = | 60.96 | 29.86 | 60.64 |
| <pre>**** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 80.0 Ia = Dep. Storage (Above) (i) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. CALLE I STANDHYD (0001) Area (ha)= .58 D.D 1 DT= 5.0 min Total Imp(%)= 30.00 Dir. Conn.(%)= 30.00</pre> | TOTAL RAINFALL | (mm) = TENT = | 61.96 98 | 61.96 | 61.96 98 |
| <pre>(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 80.0 Ia = Dep. Storage (Above) (i) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. CALIB STANDHYD (0001) Area (ha) = .58 D = 1 DT = 5.0 min Total Imp(%) = 30.00 Dir. Conn.(%) = 30.00</pre> | | | | | |
| <pre>CN* = 80.0 Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. CALIB STANDHYD (0001) Area (ha) = .58 D= 1 DT= 5.0 min Total Imp(%) = 30.00 Dir. Conn.(%) = 30.00 THERVIOUS PERVIOUS (i) Surface Area (ha) = .17 .41 Dep. Storage (mm) = 1.00 1.00 Average Slope (%) = 1.00 2.00 Length (m) = 62.20 40.00 Mannings n = .013 .250 Max.Eff.Inten.(mm/hr) = 129.82 58.42</pre> | *** WARNING: STOR | AGE COEFF. | IS SMALLER T | HAN TIME STEP! | |
| CN* = 80.0 Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. CALIB STANDHYD (0001) Area (ha) = .58 ID= 1 DT= 5.0 min Total Imp(%) = 30.00 Dir. Conn.(%) = 30.00 | (i) CN PROCE | DURE SELECI | ED FOR PERVI | OUS LOSSES: | |
| <pre>(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. CALIB STANDHYD (0001) Area (ha) = .58 ID= 1 DT= 5.0 min Total Imp(%) = 30.00 Dir. Conn.(%) = 30.00 IMPERVIOUS PERVIOUS (i) Surface Area (ha) = .17 .41 Dep. Storage (mm) = 1.00 1.00 Average Slope (%) = 1.00 2.00 Length (m) = 62.20 40.00 Mannings n = .013 .250 Max.Eff.Inten.(mm/hr) = 129.82 58.42 over (min) 5.00 15.00 Storage Coeff. (min) = 1.73 (ii) 10.48 (ii) Unit Hyd. Tpeak (min) = 5.00 15.00 Unit Hyd. Tpeak (min) = 5.00 15.00 Unit Hyd. peak (cms) = .32 .09 *TOTALS* PEAK FLOW (cms) = .06 .04 .084 (iii) TIME TO PEAK (hrs) = 1.33 1.50 1.33 RUNOFF VOLUME (mm) = 60.96 29.86 39.17 TOTAL RAINFALL (mm) = 61.96 61.96 61.96 RUNOFF COEFFICIENT = .98 .48 .63</pre> | | | | | |
| <pre>(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. CALIB STANDHYD (0001) Area (ha)= .58 ID=1 DT= 5.0 min Total Imp(%)= 30.00 Dir. Conn.(%)= 30.00 </pre> | CN* = | 80.0 Ia | a = Dep. Stor | age (Above) | |
| CALIB STANDHYD (0001) Area (ha) = .58 ID= 1 DT= 5.0 min Total Imp(%) = 30.00 Dir. Conn.(%) = 30.00 IMPERVIOUS PERVIOUS (i) Surface Area (ha) = .17 .41 Dep. Storage (mm) = 1.00 1.00 Average Slope (%) = 1.00 2.00 Length (m) = 62.20 40.00 Mannings n = .013 .250 Max.Eff.Inten.(mm/hr) = 129.82 58.42 over (min) 5.00 15.00 Storage Coeff. (min) = 1.73 (ii) 10.48 (ii) Unit Hyd. Tpeak (min) = 5.00 15.00 Unit Hyd. peak (cms) = .32 .09 *TOTALS* PEAK FLOW (cms) = .06 .04 .084 (iii) TIME TO PEAK (hrs) = 1.33 1.50 1.33 RUNOFF VOLUME (mm) = 60.96 29.86 39.17 TOTAL RAINFALL (mm) = 61.96 61.96 61.96 RUNOFF COEFFICIENT = .98 .48 .63 | (ii) TIME STE | P (DT) SHOU | JLD BE SMALLE | age (Above) R OR EQUAL | |
| CALIB STANDHYD (0001) Area (ha) = .58 ID= 1 DT= 5.0 min Total Imp(%) = 30.00 Dir. Conn.(%) = 30.00 | (ii) TIME STE THAN THE | P (DT) SHOU STORAGE CO | JLD BE SMALLE DEFFICIENT. | R OR EQUAL | |
| STANDHYD (0001) Area (ha)= .58 ID= 1 DT= 5.0 min Total Imp(%)= 30.00 Dir. Conn.(%)= 30.00 IMPERVIOUS PERVIOUS (i) Surface Area (ha)= .17 .41 Dep. Storage (mm)= 1.00 1.00 Average Slope (%)= 1.00 2.00 Length (m)= 62.20 40.00 Mannings n = .013 .250 Max.Eff.Inten.(mm/hr)= 129.82 58.42 over (min) 5.00 15.00 Storage Coeff. (min)= 1.73 (ii) 10.48 (ii) Unit Hyd. Tpeak (min)= 5.00 15.00 Unit Hyd. peak (cms)= .32 .09 *TOTALS* PEAK FLOW (cms)= .06 .04 .084 (iii) TIME TO PEAK (hrs)= 1.33 1.50 1.33 RUNOFF VOLUME (mm)= 60.96 29.86 39.17 TOTAL RAINFALL (mm)= 61.96 61.96 61.96 RUNOFF COEFFICIENT = .98 .48 .63 | (ii) TIME STE THAN THE | P (DT) SHOU STORAGE CO | JLD BE SMALLE DEFFICIENT. | R OR EQUAL | |
| IMPERVIOUS PERVIOUS (i) Surface Area (ha) = .17 .41 Dep. Storage (mm) = 1.00 1.00 Average Slope (%) = 1.00 2.00 Length (m) = 62.20 40.00 Mannings n = .013 .250 Max.Eff.Inten.(mm/hr) = 129.82 58.42 over (min) 5.00 15.00 Storage Coeff. (min) = 1.73 (ii) 10.48 (ii) Unit Hyd. Tpeak (min) = 5.00 15.00 Unit Hyd. peak (cms) = .32 .09 *TOTALS* *TOTALS* PEAK FLOW (cms) = 1.33 1.50 1.33 RUNOFF VOLUME (mm) = 60.96 29.86 39.17 TOTAL RAINFALL (mm) = 61.96 61.96 61.96 RUNOFF COEFFICIENT = .98 .48 .63 | (ii) TIME STE THAN THE (iii) PEAK FLO | P (DT) SHOU STORAGE CC W DOES NOT | JLD BE SMALLE DEFFICIENT. | R OR EQUAL | |
| IMPERVIOUS PERVIOUS (i) Surface Area (ha) = .17 .41 Dep. Storage (mm) = 1.00 1.00 Average Slope (%) = 1.00 2.00 Length (m) = 62.20 40.00 Mannings n = .013 .250 Max.Eff.Inten.(mm/hr) = 129.82 58.42 over (min) 5.00 15.00 Storage Coeff. (min) = 1.73 (ii) 10.48 (ii) Unit Hyd. Tpeak (min) = 5.00 15.00 Unit Hyd. peak (cms) = .32 .09 *TOTALS* *TOTALS* PEAK FLOW (cms) = 1.33 1.50 1.33 RUNOFF VOLUME (mm) = 60.96 29.86 39.17 TOTAL RAINFALL (mm) = 61.96 61.96 61.96 RUNOFF COEFFICIENT = .98 .48 .63 | (ii) TIME STE THAN THE (iii) PEAK FLOU | P (DT) SHOU STORAGE CO W DOES NOT | JLD BE SMALLE DEFFICIENT. INCLUDE BASE | R OR EQUAL | |
| Max.Eff.Inten.(mm/hr) = 129.82 58.42 over (min) 5.00 15.00 Storage Coeff. (min) = 1.73 (ii) 10.48 (ii) Unit Hyd. Tpeak (min) = 5.00 15.00 Unit Hyd. peak (cms) = .32 .09 *TOTALS* PEAK FLOW (cms) = 1.33 1.50 TIME TO PEAK (hrs) = 1.33 1.50 RUNOFF VOLUME (mm) = 60.96 29.86 39.17 TOTAL RAINFALL (mm) = 61.96 61.96 61.96 RUNOFF COEFFICIENT = .98 .48 .63 | (ii) TIME STE THAN THE (iii) PEAK FLOU | P (DT) SHOU STORAGE CO W DOES NOT | JLD BE SMALLE DEFFICIENT. INCLUDE BASE | R OR EQUAL | *)- 30.00 |
| Max.Eff.Inten.(mm/hr) = 129.82 58.42 over (min) 5.00 15.00 Storage Coeff. (min) = 1.73 (ii) 10.48 (ii) Unit Hyd. Tpeak (min) = 5.00 15.00 Unit Hyd. peak (cms) = .32 .09 *TOTALS* PEAK FLOW (cms) = 1.33 1.50 TIME TO PEAK (hrs) = 1.33 1.50 TOTAL RAINFALL (mm) = 61.96 61.96 RUNOFF COEFFICIENT = .98 .48 .63 | (ii) TIME STE THAN THE (iii) PEAK FLOU CALIB STANDHYD (0001) D= 1 DT= 5.0 min | P (DT) SHOU STORAGE CC W DOES NOT | JLD BE SMALLE DEFFICIENT. INCLUDE BASE (ha) = .5 Cmp(%) = 30.0 | R OR EQUAL FLOW IF ANY. 8 0 Dir. Conn.(| *)= 30.00 |
| Max.Eff.Inten.(mm/hr) = 129.82 58.42 over (min) 5.00 15.00 Storage Coeff. (min) = 1.73 (ii) 10.48 (ii) Unit Hyd. Tpeak (min) = 5.00 15.00 Unit Hyd. peak (cms) = .32 .09 *TOTALS* PEAK FLOW (cms) = 1.33 1.50 TIME TO PEAK (hrs) = 1.33 1.50 TOTAL RAINFALL (mm) = 61.96 61.96 RUNOFF COEFFICIENT = .98 .48 .63 | (ii) TIME STE THAN THE (iii) PEAK FLOU CALIB STANDHYD (0001) D= 1 DT= 5.0 min | P (DT) SHOU STORAGE CC W DOES NOT | JLD BE SMALLE DEFFICIENT. INCLUDE BASE (ha) = .5 Cmp(%) = 30.0 | R OR EQUAL FLOW IF ANY. 8 0 Dir. Conn.(| %)= 30.00 |
| Max.Eff.Inten.(mm/hr) = 129.82 58.42 over (min) 5.00 15.00 Storage Coeff. (min) = 1.73 (ii) 10.48 (ii) Unit Hyd. Tpeak (min) = 5.00 15.00 Unit Hyd. peak (cms) = .32 .09 *TOTALS* PEAK FLOW (cms) = 1.33 1.50 TIME TO PEAK (hrs) = 1.33 1.50 RUNOFF VOLUME (mm) = 60.96 29.86 39.17 TOTAL RAINFALL (mm) = 61.96 61.96 61.96 RUNOFF COEFFICIENT = .98 .48 .63 | (ii) TIME STE THAN THE (iii) PEAK FLOU CALIB STANDHYD (0001) D= 1 DT= 5.0 min | P (DT) SHOU STORAGE CC W DOES NOT | JLD BE SMALLE DEFFICIENT. INCLUDE BASE (ha) = .5 Cmp(%) = 30.0 | R OR EQUAL FLOW IF ANY. 8 0 Dir. Conn.(| <pre>%) = 30.00</pre> |
| Max.Eff.Inten.(mm/hr) = 129.82 58.42 over (min) 5.00 15.00 Storage Coeff. (min) = 1.73 (ii) 10.48 (ii) Unit Hyd. Tpeak (min) = 5.00 15.00 Unit Hyd. peak (cms) = .32 .09 *TOTALS* PEAK FLOW (cms) = 1.33 1.50 TIME TO PEAK (hrs) = 1.33 1.50 RUNOFF VOLUME (mm) = 60.96 29.86 39.17 TOTAL RAINFALL (mm) = 61.96 61.96 61.96 RUNOFF COEFFICIENT = .98 .48 .63 | (ii) TIME STE THAN THE (iii) PEAK FLOU CALIB STANDHYD (0001) D= 1 DT= 5.0 min | P (DT) SHOU STORAGE CC W DOES NOT | JLD BE SMALLE DEFFICIENT. INCLUDE BASE (ha) = .5 Cmp(%) = 30.0 | R OR EQUAL FLOW IF ANY. 8 0 Dir. Conn.(| <pre>%) = 30.00</pre> |
| over (min) 5.00 15.00 Storage Coeff. (min)= 1.73 (ii) 10.48 (ii) Unit Hyd. Tpeak (min)= 5.00 15.00 Unit Hyd. Tpeak (min)= 5.00 15.00 Unit Hyd. peak (cms)= .32 .09 PEAK FLOW (cms)= .06 .04 .084 (iii) TIME TO PEAK (hrs)= 1.33 1.50 1.33 RUNOFF VOLUME (mm)= 60.96 29.86 39.17 TOTAL RAINFALL (mm)= 61.96 61.96 61.96 RUNOFF COEFFICIENT = .98 .48 .63 | (ii) TIME STE THAN THE (iii) PEAK FLOU CALIB STANDHYD (0001) D= 1 DT= 5.0 min | P (DT) SHOU STORAGE CC W DOES NOT | JLD BE SMALLE DEFFICIENT. INCLUDE BASE (ha) = .5 Cmp(%) = 30.0 | R OR EQUAL FLOW IF ANY. 8 0 Dir. Conn.(| %)= 30.00 |
| over (min) 5.00 15.00 Storage Coeff. (min)= 1.73 (ii) 10.48 (ii) Unit Hyd. Tpeak (min)= 5.00 15.00 Unit Hyd. Tpeak (min)= 5.00 15.00 Unit Hyd. peak (cms)= .32 .09 PEAK FLOW (cms)= .06 .04 .084 (iii) TIME TO PEAK (hrs)= 1.33 1.50 1.33 RUNOFF VOLUME (mm)= 60.96 29.86 39.17 TOTAL RAINFALL (mm)= 61.96 61.96 61.96 RUNOFF COEFFICIENT = .98 .48 .63 | <pre>(ii) TIME STE THAN THE (iii) PEAK FLOI CALIB STANDHYD (0001) D= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length</pre> | P (DT) SHOU STORAGE CC W DOES NOT | <pre>LLD BE SMALLE DEFFICIENT. INCLUDE BASE </pre> | R OR EQUAL FLOW IF ANY. 0 Dir. Conn.(PERVIOUS (i) .41 1.00 2.00 40.00 | %)= 30.00 |
| *TOTALS* PEAK FLOW (cms) = .06 .04 .084 (iii) TIME TO PEAK (hrs) = 1.33 1.50 1.33 RUNOFF VOLUME (mm) = 60.96 29.86 39.17 TOTAL RAINFALL (mm) = 61.96 61.96 61.96 RUNOFF COEFFICIENT = .98 .48 .63 | <pre>(ii) TIME STEL THAN THE (iii) PEAK FLOU (iii) PEAK FLOU CALIB STANDHYD (0001) D= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n</pre> | <pre>P (DT) SHOU STORAGE CC W DOES NOT </pre> | <pre>JLD BE SMALLE DEFFICIENT. INCLUDE BASE </pre> | R OR EQUAL FLOW IF ANY. | %)= 30.00 |
| *TOTALS* PEAK FLOW (cms) = .06 .04 .084 (iii) TIME TO PEAK (hrs) = 1.33 1.50 1.33 RUNOFF VOLUME (mm) = 60.96 29.86 39.17 TOTAL RAINFALL (mm) = 61.96 61.96 61.96 RUNOFF COEFFICIENT = .98 .48 .63 | <pre>(ii) TIME STE THAN THE (iii) PEAK FLOU (iii) PEAK FLOU CALIB STANDHYD (0001) D= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max Eff Inten</pre> | <pre>P (DT) SHOU STORAGE CC W DOES NOT </pre> | <pre>JLD BE SMALLE DEFFICIENT. INCLUDE BASE </pre> | R OR EQUAL FLOW IF ANY. B 0 Dir. Conn.(PERVIOUS (i) .41 1.00 2.00 40.00 .250 58.42 | %)= 30.00 |
| *TOTALS* PEAK FLOW (cms) = .06 .04 .084 (iii) TIME TO PEAK (hrs) = 1.33 1.50 1.33 RUNOFF VOLUME (mm) = 60.96 29.86 39.17 TOTAL RAINFALL (mm) = 61.96 61.96 61.96 RUNOFF COEFFICIENT = .98 .48 .63 | <pre>(ii) TIME STE THAN THE (iii) PEAK FLOU (iii) PEAK FLOU CALIB STANDHYD (0001) D= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max Eff Inten</pre> | <pre>P (DT) SHOU STORAGE CC W DOES NOT </pre> | <pre>JLD BE SMALLE DEFFICIENT. INCLUDE BASE </pre> | R OR EQUAL FLOW IF ANY. B 0 Dir. Conn.(PERVIOUS (i) .41 1.00 2.00 40.00 .250 58.42 | %)= 30.00 |
| PEAK FLOW (cms) = .06 .04 .084 (iii) TIME TO PEAK (hrs) = 1.33 1.50 1.33 RUNOFF VOLUME (mm) = 60.96 29.86 39.17 TOTAL RAINFALL (mm) = 61.96 61.96 61.96 RUNOFF COEFFICIENT = .98 .48 .63 | <pre>(ii) TIME STE THAN THE (iii) PEAK FLOU (iii) PEAK FLOU CALIB STANDHYD (0001) D= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max Eff Inten</pre> | <pre>P (DT) SHOU STORAGE CC W DOES NOT </pre> | <pre>JLD BE SMALLE DEFFICIENT. INCLUDE BASE </pre> | R OR EQUAL FLOW IF ANY. B 0 Dir. Conn.(PERVIOUS (i) .41 1.00 2.00 40.00 .250 58.42 | %)= 30.00 |
| | <pre>(ii) TIME STE THAN THE (iii) PEAK FLOU (iii) PEAK FLOU CALIB STANDHYD (0001) D= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max Eff Inten</pre> | <pre>P (DT) SHOU STORAGE CC W DOES NOT </pre> | <pre>JLD BE SMALLE DEFFICIENT. INCLUDE BASE </pre> | R OR EQUAL FLOW IF ANY. B 0 Dir. Conn.(PERVIOUS (i) .41 1.00 2.00 40.00 .250 58.42 | |
| | <pre>(ii) TIME STE: THAN THE (iii) PEAK FLOU (iii) PEAK FLOU CALIB STANDHYD (0001) D= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten. ove: Storage Coeff. Unit Hyd. Tpeak</pre> | <pre>P (DT) SHOU STORAGE CC W DOES NOT </pre> | <pre>JLD BE SMALLE DEFFICIENT. INCLUDE BASE </pre> | R OR EQUAL FLOW IF ANY. B 0 Dir. Conn.(PERVIOUS (i) .41 1.00 2.00 40.00 .250 58.42 15.00) 10.48 (ii) 15.00 .09 | *TOTALS* |
| | <pre>(ii) TIME STE: THAN THE (iii) PEAK FLOU (iii) PEAK FLOU CALIB STANDHYD (0001) D= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten. ove: Storage Coeff. Unit Hyd. Tpeak</pre> | <pre>P (DT) SHOU STORAGE CC W DOES NOT </pre> | <pre>JLD BE SMALLE DEFFICIENT. INCLUDE BASE </pre> | R OR EQUAL FLOW IF ANY. B 0 Dir. Conn.(PERVIOUS (i) .41 1.00 2.00 40.00 .250 58.42 15.00) 10.48 (ii) 15.00 .09 .04 | *TOTALS* .084 (iii) |
| | <pre>(ii) TIME STE: THAN THE (iii) PEAK FLOU (iii) PEAK FLOU CALIB STANDHYD (0001) D= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten. ove: Storage Coeff. Unit Hyd. Tpeak</pre> | <pre>P (DT) SHOU STORAGE CC W DOES NOT </pre> | <pre>JLD BE SMALLE DEFFICIENT. INCLUDE BASE </pre> | R OR EQUAL FLOW IF ANY. B 0 Dir. Conn.(PERVIOUS (i) .41 1.00 2.00 40.00 .250 58.42 15.00) 10.48 (ii) 15.00 .09 .04 | *TOTALS* .084 (iii) |
| | <pre>(ii) TIME STE: THAN THE (iii) PEAK FLOU (iii) PEAK FLOU CALIB STANDHYD (0001) D= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten. ove: Storage Coeff. Unit Hyd. Tpeak</pre> | <pre>P (DT) SHOU STORAGE CC W DOES NOT </pre> | <pre>JLD BE SMALLE DEFFICIENT. INCLUDE BASE </pre> | R OR EQUAL FLOW IF ANY. B 0 Dir. Conn.(PERVIOUS (i) .41 1.00 2.00 40.00 .250 58.42 15.00) 10.48 (ii) 15.00 .09 .04 | *TOTALS* .084 (iii) |
| | <pre>(ii) TIME STE: THAN THE (iii) PEAK FLOU (iii) PEAK FLOU CALIB STANDHYD (0001) D= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten. ove: Storage Coeff. Unit Hyd. Tpeak</pre> | <pre>P (DT) SHOU STORAGE CC W DOES NOT </pre> | <pre>JLD BE SMALLE DEFFICIENT. INCLUDE BASE </pre> | R OR EQUAL FLOW IF ANY. B 0 Dir. Conn.(PERVIOUS (i) .41 1.00 2.00 40.00 .250 58.42 15.00) 10.48 (ii) 15.00 .09 .04 | *TOTALS* .084 (iii) |
| (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: | <pre>(ii) TIME STEL THAN THE (iii) PEAK FLOU (iii) PEAK FLOU CALIB STANDHYD (0001) D= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten. Ove: Storage Coeff. Unit Hyd. Tpeal Unit Hyd. Tpeal Unit Hyd. peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFIC:</pre> | <pre>P (DT) SHOU STORAGE CC W DOES NOT </pre> | <pre>JLD BE SMALLE DEFFICIENT. INCLUDE BASE (ha) = .5 Imp(%) = 30.0 IMPERVIOUS .17 1.00 1.00 62.20 .013 129.82 5.00 1.73 (ii 5.00 .32 .06 1.33 60.96 61.96 .98</pre> | R OR EQUAL FLOW IF ANY. | *TOTALS* .084 (iii) |
| $CN^* = 80.0$ Ia = Dep. Storage (Above) | <pre>(ii) TIME STEL THAN THE (iii) PEAK FLOU (iii) PEAK FLOU CALIB STANDHYD (0001) ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten. ove: Storage Coeff. Unit Hyd. Tpeak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFIC: ***** WARNING: STOR</pre> | <pre>P (DT) SHOU STORAGE CC W DOES NOT </pre> | <pre>JLD BE SMALLE DEFFICIENT. INCLUDE BASE (ha) = .5 imp(%) = 30.0 IMPERVIOUS .17 1.00 1.00 62.20 .013 129.82 5.00 1.73 (ii 5.00 .32 .06 1.33 60.96 61.96 .98 IS SMALLER T</pre> | <pre>R OR EQUAL FLOW IF ANY. FLOW IF ANY. Dir. Conn.(PERVIOUS (i)</pre> | *TOTALS* .084 (iii) |
| (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL | <pre>(ii) TIME STEL THAN THE (iii) PEAK FLOU (iii) PEAK FLOU CALIE STANDHYD (0001) ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten. ove: Storage Coeff. Unit Hyd. Tpeal Unit Hyd. Tpeal Unit Hyd. Tpeak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFIC: ***** WARNING: STORI (i) CN PROCEI</pre> | <pre>P (DT) SHOU STORAGE CC W DOES NOT </pre> | <pre>JLD BE SMALLE DEFFICIENT. INCLUDE BASE </pre> | <pre>R OR EQUAL FLOW IF ANY. B 0 Dir. Conn.(PERVIOUS (i)</pre> | *TOTALS* .084 (iii) |
| THAN THE STORAGE COEFFICIENT. | <pre>(ii) TIME STE THAN THE (iii) PEAK FLOU (iii) PEAK FLOU CALIB STANDHYD (0001) ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten. ove: Storage Coeff. Unit Hyd. Tpeak Unit Hyd. Tpeak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFIC: **** WARNING: STORA (i) CN PROCEL CN* = (ii) TIME STEL</pre> | <pre>P (DT) SHOU STORAGE CC W DOES NOT </pre> | <pre>JLD BE SMALLE DeFFICIENT. INCLUDE BASE (ha) = .5 Smp(%) = 30.0 IMPERVIOUS .17 1.00 1.00 62.20 .013 129.82 5.00 1.73 (ii 5.00 .32 .06 1.33 60.96 61.96 .98 IS SMALLER T 'ED FOR PERVI a = Dep. Stor JLD BE SMALLE</pre> | <pre>R OR EQUAL FLOW IF ANY 8 0 Dir. Conn.(PERVIOUS (i) .41 1.00 2.00 40.00 .250 58.42 15.00) 10.48 (ii) 15.00 .09 .04 1.50 29.86 61.96 .48 HAN TIME STEP! OUS LOSSES: age (Above)</pre> | *TOTALS* .084 (iii) |
| (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. | <pre>(ii) TIME STE THAN THE (iii) PEAK FLOU (iii) PEAK FLOU CALIB STANDHYD (0001) ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten. ove: Storage Coeff. Unit Hyd. Tpeak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFIC: **** WARNING: STORM (i) CN PROCED CN* = (ii) TIME STE THAN THE</pre> | <pre>P (DT) SHOU STORAGE CC W DOES NOT </pre> | <pre>LD BE SMALLE DEFFICIENT. INCLUDE BASE </pre> | <pre>R OR EQUAL FLOW IF ANY. FLOW IF ANY. PERVIOUS (i)</pre> | *TOTALS* .084 (iii) |
| | <pre>(ii) TIME STE THAN THE (iii) PEAK FLOU (iii) PEAK FLOU CALIB STANDHYD (0001) D= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten. ove: Storage Coeff. Unit Hyd. Tpeal Unit Hyd. Tpeal Unit Hyd. Tpeak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFIC: **** WARNING: STORI (i) CN PROCEI CN* = (ii) TIME STE! THAN THE</pre> | <pre>P (DT) SHOU STORAGE CC W DOES NOT </pre> | <pre>LD BE SMALLE DEFFICIENT. INCLUDE BASE </pre> | <pre>R OR EQUAL FLOW IF ANY. FLOW IF ANY. PERVIOUS (i)</pre> | *TOTALS* .084 (iii) |

| TONOTIONAL GENT | | | | |
|--|--|--|--|---|
| STANDHYD (0006) ID= 1 DT= 5.0 min | Area Total | (ha) = .1 Imp(%) = 99.0 | 2 O Dir. Conn.(% | s) = 99.00 |
| Surface Area Dep. Storage Average Slope Length Mannings n | | IMPERVIOUS .12 1.00 1.00 28.30 .013 | PERVIOUS (i) .00 1.00 2.00 40.00 .250 | |
| Max.Eff.Inten.(r over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | nm/hr) = (min) (min) = (min) = (cms) = | 129.82 5.00 1.08 (ii 5.00 .34 | 2044.66 5.00) 2.09 (ii) 5.00 .31 | *TOTALS* |
| PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICII | (cms) = (hrs) = (mm) = (mm) = ENT = | .04 1.33 60.96 61.96 .98 | .00 1.33 29.86 61.96 .48 | .043 (iii) 1.33 60.64 61.96 .98 |
| (ii) TIME STEP THAN THE S (iii) PEAK FLOW | JRE SELEC 30.0 I (DT) SHO STORAGE C DOES NOT | TED FOR PERVI a = Dep. Stor ULD BE SMALLE OEFFICIENT. INCLUDE BASE | OUS LOSSES: age (Above) R OR EQUAL FLOW IF ANY. | |
| CALIB STANDHYD (0005) ID= 1 DT= 5.0 min | Area Total | | | ;)= 30.00 |
| Surface Area Dep. Storage Average Slope Length Mannings n | (ha) = (mm) = (%) = (m) = = | IMPERVIOUS .05 1.00 1.00 32.70 .013 | PERVIOUS (i) .11 1.00 2.00 40.00 .250 | |
| Max.Eff.Inten.(r over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | <pre>nm/hr) = (min) (min) = (min) = (cms) =</pre> | 129.82 5.00 1.18 (ii 5.00 .33 | 58.42 10.00) 9.93 (ii) 10.00 .11 | *TOTALS* |
| PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI | (cms) = (hrs) = (mm) = (mm) = ENT = | .02 1.33 60.96 61.96 .98 | .01 1.42 29.86 61.96 .48 | .027 (iii) 1.33 39.16 61.96 .63 |
| (ii) TIME STEP THAN THE S (iii) PEAK FLOW | JRE SELEC 30.0 I (DT) SHO STORAGE C DOES NOT | TED FOR PERVI a = Dep. Stor ULD BE SMALLE OEFFICIENT. INCLUDE BASE | OUS LOSSES: age (Above) R OR EQUAL FLOW IF ANY. | |
| CALIB STANDHYD (0004) ID= 1 DT= 5.0 min | Area Total | | | |
| Surface Area Dep. Storage Average Slope Length Mannings n | (ha) = (mm) = (%) = (m) = = | .08 1.00 1.00 24.50 | PERVIOUS (i) .01 1.00 2.00 40.00 .250 | |
| Max.Eff.Inten.(r over Storage Coeff. Unit Hyd. Tpeak | <pre>nm/hr) = (min) (min) = (min) =</pre> | 129.82 5.00 .99 (ii 5.00 | 204.47 5.00) 3.63 (ii) 5.00 | |

| m) = 1 m) = 60 | .96 .98 | .00 1.33 29.86 | *TOTAL .03 1.3 | 1 (iii) |
|--|---|--|---|---|
| m)= 61 = OEFF. IS SM | .33 .96 .96 .98 | 1.33 29.86 | 1 3 | |
| m)= 61 = OEFF. IS SM | .96 .98 | 29.86 | | |
| m)= 61 = OEFF. IS SM | .96 .98 | | 57.8 | |
| = OEFF. IS SM | .98 | 61.96 | 61.9 | |
| | ALLER THA | .48 | | |
| SELECTED FO | | N TIME ST | 'EP! | |
| T | | | | |
| Ia = De) SHOULD BE | | | 2) | |
| | | OK LQUAL | | |
| | | OW IF ANY | | |
| | | | | |
| | | | | |
| | | | | |
| AREA | QPEAK | TPEAK | R.V. | |
| (ha) | (cms) | (hrs) | (mm) | |
| .08 | .029 | 1.33 | 60.64 | |
| | | | | |
| | | | | |
| O NOT INCLU | DE BASEFL | OWS IF AN | IY. | |
| | | | | |
| | | | | |
| AREA | OPEAK | TPEAK | R.V. | |
| (ha) | (cms) | (hrs) | (mm) | |
| .16 | .027 | 1.33 | 39.16 | |
| .09 | .031 | 1.33 | 57.84 | |
| | | | | |
| .25 | | 1.33 | 45.88 | |
| | .057 | | | |
| .25 O NOT INCLU | .057 | | | |
| | .057 | | | |
| | .057 | | | |
| O NOT INCLU | .057 IDE BASEFL | OWS IF AN | Ρ. V. | |
| O NOT INCLU | .057 IDE BASEFL | OWS IF AN | Ρ. V. | |
| O NOT INCLU | .057 IDE BASEFL | OWS IF AN | Ρ. V. | |
| O NOT INCLU AREA (ha) .19 | .057 IDE BASEFL QPEAK (cms) .065 | TPEAK (hrs) 1.33 | R.V. (mm) 57.83 | |
| O NOT INCLU AREA (ha) .19 .66 | .057 IDE BASEFL | TPEAK (hrs) 1.33 1.33 | R.V. (mm) 57.83 41.78 | |
| 0 NOT INCLU AREA (ha) .19 .66 | .057 IDE BASEFL | TPEAK (hrs) 1.33 1.33 | R.V. (mm) 57.83 41.78 | |
| O NOT INCLU AREA (ha) .19 .66 | .057 IDE BASEFL QPEAK (cms) .065 .113 .178 | TPEAK (hrs) 1.33 1.33 | R.V. (mm) 57.83 41.78 | |
| AREA (ha) .19 .66 .85 | .057 IDE BASEFL QPEAK (cms) .065 .113 .178 | TPEAK (hrs) 1.33 1.33 | R.V. (mm) 57.83 41.78 | |
| AREA (ha) .19 .66 .85 | .057 IDE BASEFL QPEAK (cms) .065 .113 .178 | TPEAK (hrs) 1.33 1.33 | R.V. (mm) 57.83 41.78 | |
| AREA (ha) .19 .66 .85 O NOT INCLU | .057 JDE BASEFL _ | TPEAK (hrs) 1.33 1.33 | R.V. (mm) 57.83 41.78 45.37 | |
| AREA (ha) .19 .66 .85 O NOT INCLU | .057 JDE BASEFL _ | TPEAK (hrs) 1.33 1.33 | R.V. (mm) 57.83 41.78 45.37 | |
| AREA (ha) .19 .66 .85 O NOT INCLU AREA (ha) | .057 DE BASEFL QPEAK (cms) .065 .113 .178 IDE BASEFL | TPEAK (hrs) 1.33 1.33 | NY. R.V. (mm) 57.83 41.78 45.37 NY. R.V. (mm) | |
| AREA (ha) .19 .66 .85 0 NOT INCLU AREA (ha) .12 .25 | .057 DE BASEFL QPEAK (cms) .065 .113 .178 DE BASEFL | TPEAK (hrs) 1.33 1.33 | R.V. (mm) 57.83 41.78 45.37 IY. R.V. (mm) 60.64 45.88 | |
| AREA (ha) .19 .66 .85 O NOT INCLU AREA (ha) .12 | .057 JDE BASEFL | TPEAK (hrs) 1.33 1.33 | R.V. (mm) 57.83 41.78 45.37 IY. R.V. (mm) 60.64 45.88 | |
| | S NOT INCLU AREA (ha) .08 .58 .66 O NOT INCLU AREA (ha) .16 .09 | AREA QPEAK (ha) (cms) .08 .029 .58 .084 .66 .113 O NOT INCLUDE BASEFI AREA QPEAK (ha) (cms) .16 .027 .09 .031 | AREA QPEAK TPEAK (ha) (cms) (hrs) .08 .029 1.33 .58 .084 1.33 .66 .113 1.33 O NOT INCLUDE BASEFLOWS IF AN AREA QPEAK TPEAK (ha) (cms) (hrs) .16 .027 1.33 .09 .031 1.33 | AREA QPEAK TPEAK R.V. (ha) (cms) (hrs) (mm) .08 .029 1.33 60.64 .58 .084 1.33 39.17 .66 .113 1.33 41.78 O NOT INCLUDE BASEFLOWS IF ANY. .66 .027 1.33 39.16 .09 .031 1.33 57.84 |

| FUNCTIONAL SERVICING REPORT | |
|---|---|
| Storm time step = 10.00 min Time to peak ratio = .33 | - |
| TIMERAINITIMERAINITIMERAINITIMERAINhrsmm/hrhrsmm/hrhrsmm/hrhrsmm/hrhrsmm/hr.174.901.1734.682.1711.093.175.78.335.581.33141.882.339.513.335.39.506.521.5044.962.508.373.505.05.677.921.6724.462.677.493.674.76.8310.291.8317.172.836.803.834.501.0015.272.0013.403.006.244.004.28 | |
| CALIB STANDHYD (0003) Area (ha) = .19 | |
| STANDHYD (0003) Area (na)= .19 ID= 1 DT= 5.0 min Total Imp(%)= 90.00 Dir. Conn.(%)= 90.00 | |
| IMPERVIOUS PERVIOUS (i) Surface Area (ha) = .17 .02 Dep. Storage (mm) = 1.00 1.00 Average Slope (%) = 1.00 2.00 Length (m) = 35.60 40.00 Mannings n = .013 .250 NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP. | |
| | |
| $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | |
| ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! | |
| (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 80.0 Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. | |
| STANDHYD (0002) Area (ha) = .08 ID= 1 DT= 5.0 min Total Imp(%) = 99.00 Dir. Conn.(%) = 99.00 IMPERVIOUS PERVIOUS (i) Surface Area (ha) = .08 .00 Dep. Storage (mm) = 1.00 1.00 Average Slope (%) = 1.00 2.00 Length (m) = 23.10 40.00 Mannings n = .013 .250 | |

Max.Eff.Inten.(mm/hr)= 141.88 511.17 over (min) 5.00 5.00

| FUNCTIONAL SERVICE | | | | |
|---|--|---------------|-------------------------------|-----------------------------|
| Storage Coeff. (m | in)= . | 92 (ii) | 1.90 (ii) | |
| Storage Coeff. (m Unit Hyd. Tpeak (m Unit Hyd. peak (c | in)= 5. | 00 | 5.00 | |
| Unit Hyd. peak (c | ms)= . | 34 | .32 | |
| | | | | TOTALS* |
| PEAK FLOW (C | ms)= . | 03 | .00 | .031 (iii) |
| TIME TO PEAK (h | rs)= 1. | 33 | 1.33 | 1.33 |
| PEAK FLOW (C TIME TO PEAK (h RUNOFF VOLUME (TOTAL RAINFALL (RUNOFF COEFFICIENT | mm) = 66. | /1 3 | 34.18 | 66.39 |
| TOTAL RAINFALL (| ((((())))) = ((())) (((| /1 (| 50 | 67.71 .98 |
| KONOFF COEFFICIENT | | 55 | . 50 | .90 |
| ***** WARNING: STORAGE | COEFF. IS SMA | LLER THAN T | TIME STEP! | |
| | | | | |
| (i) CN PROCEDURE | SELECTED FOR | PERVIOUS I | LOSSES: | |
| | 0 Ia = Dep | | | |
| (ii) TIME STEP (D | | | EQUAL | |
| | RAGE COEFFICI | | | |
| (iii) PEAK FLOW DO | ES NOT INCLUL | E BASEFLOW | IF ANI. | |
| | | | | |
| | | | | |
| CALIB | | | | |
| STANDHYD (0001) | | | | |
| ID= 1 DT= 5.0 min | Total Imp(%)= | 30.00 I | Dir. Conn.(%)= | = 30.00 |
| | TYPEPU | | | |
| Surface Area (| IMPERV | 1005 PEF | A1 | |
| Surface Area (Dep. Storage (Average Slope Length Mannings n | mm) = 1 | ± / | 1.00 | |
| Average Slope | (%) = 1. | 00 | 2.00 | |
| Length | (m) = 62. | 20 4 | 10.00 | |
| Mannings n | = .0 | 13 | .250 | |
| | | | | |
| Max.Eff.Inten.(mm/ | hr)= 141. | 88 6 | 57.54 | |
| over (m | in) 5. | 00 1 | L0.00 | |
| Storage Coeff. (m | in)= 1. | 67 (11) | 9.93 (11) | |
| Max.Eff.Inten.(mm/ over (m Storage Coeff. (m Unit Hyd. Tpeak (m Unit Hyd. peak (c | III) = J. | 32 | 11 | |
| | | | | TOTALS* |
| PEAK FLOW (c | ms)= . | 07 | .05 | .108 (iii) |
| TIME TO PEAK (h | rs)= 1. | 33 | 1.42 | .108 (iii) 1.33 43.93 |
| RUNOFF VOLUME (| mm)= 66. | 71 3 | 34.18 | 43.93 |
| TOTAL RAINFALL (| mm) = 67. | 71 6 | 57.71 | 67.71 |
| PEAK FLOW (C TIME TO PEAK (h RUNOFF VOLUME (TOTAL RAINFALL (RUNOFF COEFFICIENT | = . | 99 | .50 | .65 |
| ***** WARNING: STORAGE | COFFE TO CMA | | THE COED! | |
| WARNING: SIORAGE | COLFF. IS SMA | LITER IUMN 1 | LIME SIEP: | |
| (i) CN PROCEDURE | SELECTED FOR | PERVIOUS I | LOSSES: | |
| CN* = 80. | 0 Ia = Dep | . Storage | (Above) | |
| (ii) TIME STEP (D | | | EQUAL | |
| | RAGE COEFFICI | | | |
| (iii) PEAK FLOW DO | ES NOT INCLUL | E BASEFLOW | IF ANY. | |
| | | | | |
| | | | | |
| CALIB | | | | |
| STANDHYD (0006) | | | | |
| ID= 1 DT= 5.0 min | Total Imp(%)= | 99.00 I | Dir. Conn.(%)= | = 99.00 |
| Surface Area (Dep. Storage (Average Slope Length Mannings n | TMPFPU | IOUS PEF | RVIOUS (i) | |
| Surface Area (| ha)= | 12 | .00 | |
| Dep. Storage (| mm) = 1. | 00 | 1.00 | |
| Average Slope | (%)= 1. | 00 | 2.00 | |
| Length | (m) = 28. | 30 4 | 10.00 | |
| Mannings n | = .0 | 13 | .250 | |
| | | | | |
| Max.Eff.Inten.(mm/ | nr)= 141. | oo 230 | 5 00 | |
| over (m Storage Coeff (m | in)= 1 | 00 04 (ii) | 2 02 (11) | |
| Unit Hvd. Tpeak (m | in)= 5. | 00 | 5.00 | |
| over (m Storage Coeff. (m Unit Hyd. Tpeak (m Unit Hyd. peak (c | ms)= | 34 | .31 | |
| | | | , | TOTALS* |
| PEAK FLOW (C TIME TO PEAK (h RUNOFF VOLUME (TOTAL RAINFALL (RUNOFF COEFFICIENT | ms)= . | 05 | .00 1.33 34.18 57.71 | .047 (iii) |
| TIME TO PEAK (h | rs)= 1. | 33 | 1.33 | 1.33 |
| RUNOFF VOLUME (| mm) = 66. | 71 3 | 34.18 | 66.38 |
| TOTAL RAINFALL (| mm) = 67. | /1 6 | 50 | 67.71 .98 |
| RUNOFF COEFFICIENT | = . | 22 | .50 | . 90 |
| ***** WARNING: STORAGE | COEFF. IS SMA | LLER THAN 7 | FIME STEP! | |
| | | | | |
| (i) CN PROCEDURE | | | | |
| CN* = 80. | 0 Ia = Dep | . Storage | (Above) | |
| | | | | |

| (ii) TIME STEP (| | | - | UAL | |
|--|--|--|--|--|--|
| THAN THE ST | | | | 2211 | |
| (iii) PEAK FLOW D | OES NOT | INCLUDE E | ASEFLOW IF | ANY. | |
| | | | | | |
| | | | | | |
| CALIB | | | | | |
| STANDHYD (0005) | Area | (ha) = | .16 | | |
| ID= 1 DT= 5.0 min | Total | Imp(%)= 3 | 0.00 Dir | . Conn.(%)= | 30.00 |
| | | | | | |
| Surface Area | (h a) = | IMPERVIOU | IS PERVI | JUS (1) 11 | |
| Dep Storage | (mm) = | 1 00 | | 0.0 | |
| Average Slope | (%) = | 1.00 | 2. | 00 | |
| Length | (m) = | 32.70 | 40. | 00 | |
| Surface Area Dep. Storage Average Slope Length Mannings n | = | .013 | .2 | 50 | |
| | | | | | |
| Max.Eff.Inten.(mm over (| /hr)= | 141.88 | 67. | 54 | |
| over (. Storage Coeff () | m(1) | 5.00 | 10. | 00 39 (ii) | |
| Unit Hvd. Tpeak (| min) = | 5.00 | 10. | 00 | |
| Storage Coeff. (Unit Hyd. Tpeak (Unit Hyd. peak (| cms)= | .34 | | 12 | |
| | | | | * | TOTALS* |
| PEAK FLOW (TIME TO PEAK (| cms)= | .02 | | 01 | .030 (iii) 1.33 |
| TIME TO PEAK (| hrs)= | 1.33 | 1. | 42 | 1.33 |
| RUNDEE VOLUME | (mm) = | 66./1 67.71 | 34. | 18 | 43.91 |
| RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICIEN | (IIIIII) — T = | 99 | 07. | 7 I 5 0 | 65 |
| Renorr contrictin | - | • • • • | • | 50 | .00 |
| ***** WARNING: STORAGE | COEFF. | IS SMALLE | R THAN TIM | E STEP! | |
| | | | | | |
| (i) CN PROCEDUR | | | | | |
| $CN^* = 80$ | | | | | |
| (ii) TIME STEP (THAN THE ST | | | - | UAL | |
| (iii) PEAK FLOW D | | | | ANY | |
| (, | | | | | |
| | | | | | |
| | | | | | |
| CALIB STANDHYD (0004) | | | | | |
| | Area | | | | |
| ITD= 1 DE= 5 0 min | met al | (IId) = 0 | .09 0.00 Dim | Conn (%) - | 80.00 |
| ID= 1 DT= 5.0 min | Total | Imp(%) = 9 | 0.00 Dir | . Conn.(%)= | 90.00 |
| ID= 1 DT= 5.0 min | Total | Imp(%) = 9 | 0.00 Dir | OUS (i) | 90.00 |
| ID= 1 DT= 5.0 min | Total | Imp(%) = 9 | 0.00 Dir | OUS (i) | 90.00 |
| ID= 1 DT= 5.0 min | Total | Imp(%) = 9 | 0.00 Dir | OUS (i) | 90.00 |
| ID= 1 DT= 5.0 min | Total | Imp(%) = 9 | 0.00 Dir | OUS (i) | 90.00 |
| ID= 1 DT= 5.0 min | Total | Imp(%) = 9 | 0.00 Dir | OUS (i) | 90.00 |
| ID= 1 DT= 5.0 min | Total | Imp(%) = 9 | 0.00 Dir | OUS (i) | 90.00 |
| ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n | Total (ha) = (mm) = (%) = (m) = = | <pre>Imp (%) = 9 IMPERVIOU</pre> | 0.00 Dir IS PERVIO 1. 2. 40. .2 | DUS (i) 01 00 00 00 50 | 90.00 |
| ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n | Total (ha) = (mm) = (%) = (m) = = | <pre>Imp (%) = 9 IMPERVIOU</pre> | 0.00 Dir IS PERVIO 1. 2. 40. .2 | DUS (i) 01 00 00 00 50 | 90.00 |
| ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n | Total (ha) = (mm) = (%) = (m) = = | <pre>Imp (%) = 9 IMPERVIOU</pre> | 0.00 Dir IS PERVIO 1. 2. 40. .2 | DUS (i) 01 00 00 00 50 | 90.00 |
| ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n | Total (ha) = (mm) = (%) = (m) = = | <pre>Imp (%) = 9 IMPERVIOU</pre> | 0.00 Dir IS PERVIO 1. 2. 40. .2 | DUS (i) 01 00 00 00 50 | 90.00 |
| ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n | Total (ha) = (mm) = (%) = (m) = = | <pre>Imp (%) = 9 IMPERVIOU</pre> | 0.00 Dir IS PERVIO 1. 2. 40. .2 | DUS (i) 01 00 00 50 37 00 50 (ii) 00 26 | |
| ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(mm over (Storage Coeff. (Unit Hyd. Tpeak (Unit Hyd. peak (| Total (ha) = (mm) = (%) = (m) = min) = min) = min) = cms) = | <pre>Imp(%) = 9 IMPERVIOU .08 1.00 1.00 24.50 .013 141.88 5.00 .96 5.00 .34</pre> | 00.00 Dir IS PERVIG 1. 2. 40. .2 236. 5. (ii) 3. | DUS (i) 01 00 00 00 50 37 00 50 (ii) 00 26 * | TOTALS* |
| ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(mm over (Storage Coeff. (Unit Hyd. Tpeak (Unit Hyd. peak (| Total (ha) = (mm) = (%) = (m) = = /hr) = min) = min) = cms) = | Imp(%) = 9 IMPERVIOU .08 1.00 24.50 .013 141.88 5.00 .96 5.00 .34 | 00.00 Dir IS PERVIG 1. 2. 40. .2 236. 5. (ii) 3. | DUS (i) 00 00 00 50 50 50 50 (ii) 00 26 * 00 | TOTALS* .034 (iii) |
| ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(mm over (Storage Coeff. (Unit Hyd. Tpeak (Unit Hyd. peak (| Total (ha) = (mm) = (%) = (m) = = /hr) = min) = min) = cms) = | Imp(%) = 9 IMPERVIOU .08 1.00 24.50 .013 141.88 5.00 .96 5.00 .34 | 00.00 Dir IS PERVIG 1. 2. 40. .2 236. 5. (ii) 3. | DUS (i) 01 00 00 00 50 37 00 50 (ii) 00 26 * 33 | TOTALS* .034 (iii) 1.33 |
| ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(mm over (Storage Coeff. (Unit Hyd. Tpeak (Unit Hyd. peak (PEAK FLOW (TIME TO PEAK (RUNOFF VOLUME | Total (ha) = (mm) = (%) = (m) = = /hr) = min) = min) = cms) = hrs) = (mm) = | <pre>Imp(%) = 9 IMPERVIOU .08 1.00 1.00 24.50 .013 141.88 5.00 .96 5.00 .34 .03 1.33 66.71</pre> | 00.00 Dir IS PERVIO 1. 2. 40. 236. 5. (ii) 3. 5. | DUS (i) 01 00 00 00 50 37 00 50 (ii) 00 26 * 00 33 18 | TOTALS* .034 (iii) 1.33 63.45 |
| ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(mm over (Storage Coeff. (Unit Hyd. Tpeak (Unit Hyd. peak (PEAK FLOW (TIME TO PEAK (RUNOFF VOLUME | Total (ha) = (mm) = (%) = (m) = = /hr) = min) = min) = cms) = hrs) = (mm) = | <pre>Imp(%) = 9 IMPERVIOU .08 1.00 1.00 24.50 .013 141.88 5.00 .96 5.00 .34 .03 1.33 66.71</pre> | 00.00 Dir IS PERVIO 1. 2. 40. 236. 5. (ii) 3. 5. | DUS (i) 01 00 00 00 50 37 00 50 (ii) 00 26 * 00 33 18 | TOTALS* .034 (iii) 1.33 |
| ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(mm over (Storage Coeff. (Unit Hyd. Tpeak (Unit Hyd. Tpeak (Unit Hyd. peak (PEAK FLOW (TIME TO PEAK (RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICIEN | Total (ha) = (mm) = (%) = (m) = min) = min) = min) = cms) = hrs) = (mm) = (mm) = T = | <pre>Imp(%) = 9 IMPERVIOU .08 1.00 1.00 24.50 .013 141.88 5.00 .34 .03 1.33 66.71 67.71 .99</pre> | 00.00 Dir IS PERVIG 1. 2. 40. 236. 5. (ii) 3. 1. 34. 67. | DUS (i) 00 00 00 50 50 50 (ii) 00 26 * 00 33 18 71 50 | TOTALS* .034 (iii) 1.33 63.45 67.71 |
| ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(mm over (Storage Coeff. (Unit Hyd. Tpeak (Unit Hyd. peak (PEAK FLOW (TIME TO PEAK (RUNOFF VOLUME | Total (ha) = (mm) = (%) = (m) = min) = min) = min) = cms) = hrs) = (mm) = (mm) = T = | <pre>Imp(%) = 9 IMPERVIOU .08 1.00 1.00 24.50 .013 141.88 5.00 .34 .03 1.33 66.71 67.71 .99</pre> | 00.00 Dir IS PERVIG 1. 2. 40. 236. 5. (ii) 3. 1. 34. 67. | DUS (i) 00 00 00 50 50 50 (ii) 00 26 * 00 33 18 71 50 | TOTALS* .034 (iii) 1.33 63.45 67.71 |
| <pre>ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(mm</pre> | Total (ha) = (mm) = (%) = (m) = (m) = min) = min) = min) = cms) = hrs) = (mm) = T = COEFFF. | <pre>Imp(%) = 9 IMPERVIOU .08 1.00 1.00 24.50 .013 141.88 5.00 .96 5.00 .34 .03 1.33 66.71 67.71 .99 IS SMALLE</pre> | 00.00 Dir S PERVIG 1. 2. 40. 236. 5. (ii) 3. 5. (iii) 3. (iii) | DUS (i) 01 00 00 00 50 37 00 50 (ii) 00 26 * 00 33 18 71 50 E STEP! | TOTALS* .034 (iii) 1.33 63.45 67.71 |
| <pre> ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(mm over () Storage Coeff. () Unit Hyd. Tpeak () Unit Hyd. Tpeak () PEAK FLOW () TIME TO PEAK () RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICIEN ****** WARNING: STORAGE (i) CN PROCEDUR</pre> | Total (ha) = (mm) = (%) = (m) = min) = min) = cms) = hrs) = hrs) = T = COEFF. E SELEC | <pre>Imp(%) = 9 IMPERVIOU</pre> | 0.00 Dir S PERVIG 1. 2. 40. 236. 5. (ii) 3. 5. | DUS (i) 01 00 00 00 50 37 00 50 (ii) 00 26 * 00 33 18 71 50 E STEP! SES: | TOTALS* .034 (iii) 1.33 63.45 67.71 |
| <pre> ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(mm over () Storage Coeff. () Unit Hyd. Tpeak () Unit Hyd. Tpeak () PEAK FLOW () TIME TO PEAK () RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICIEN ***** WARNING: STORAGE (i) CN PROCEDUR CN* = 80</pre> | Total (ha) = (mm) = (%) = (m) = (mn) = min) = min) = cms) = hrs) = (mm) = (mm) = COEFF. E SELEC .0 I | <pre>Imp(%) = 9 IMPERVIOU .08 1.00 1.00 24.50 .013 141.88 5.00 .34 .03 1.33 66.71 67.71 .99 IS SMALLE TED FOR PE a = Dep. S</pre> | 00.00 Dir S PERVIG 1. 2. 40. 236. 5. (ii) 3. (ii) 5. | DUS (i) 01 00 00 00 50 50 50 50 (ii) 00 26 * 00 33 18 71 50 E STEP! SES: bove) | TOTALS* .034 (iii) 1.33 63.45 67.71 |
| <pre> ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(mm over () Storage Coeff. () Unit Hyd. Tpeak () Unit Hyd. Tpeak () PEAK FLOW () TIME TO PEAK () RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICIEN ****** WARNING: STORAGE (i) CN PROCEDUR</pre> | Total (ha) = (mm) = (%) = (m) = (mn) = min) = min) = cms) = hrs) = (mm) = (mm) = (mm) = COEFF. E SELECC .0 I DT) SHO | <pre>Imp(%) = 9 IMPERVIOU</pre> | 0.00 Dir S PERVIG 1. 2. 40. 236. 5. (ii) 3. (ii) 5. | DUS (i) 01 00 00 00 50 50 50 50 (ii) 00 26 * 00 33 18 71 50 E STEP! SES: bove) | TOTALS* .034 (iii) 1.33 63.45 67.71 |
| <pre> ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(mm over (Storage Coeff. (Unit Hyd. Tpeak (Unit Hyd. Tpeak (Unit Hyd. peak (PEAK FLOW (TIME TO PEAK (RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICIEN ****** WARNING: STORAGE (i) CN PROCEDUR CN* = 80 (ii) TIME STEP (</pre> | Total (ha) = (mm) = (%) = (m) = (mn) = (mm) = (mm) = (mm) = (mm) = COEFF. E SELEC .0 I DT) SHO ORAGE C | <pre>Imp(%) = 9 IMPERVIOU</pre> | 0.00 Dir S PERVIG 1. 2. 40. 236. 5. (ii) 3. (ii) 3. 1. 34. 67. | DUS (i) 01 00 00 00 00 50 37 00 50 (ii) 00 26 * 00 33 18 71 50 E STEP! SES: bove) UAL | TOTALS* .034 (iii) 1.33 63.45 67.71 |
| <pre>ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(mm over () Storage Coeff. () Unit Hyd. Tpeak () Unit Hyd. Tpeak () Unit Hyd. peak () PEAK FLOW () TIME TO PEAK () RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICIEN ***** WARNING: STORAGE (i) CN PROCEDUR CN* = 80 (ii) TIME STEP () THAN THE ST (iii) PEAK FLOW D</pre> | Total (ha) = (mm) = (%) = (m) = min) = min) = min) = cms) = hrs) = (mm) = (mm) = COEFF. E SELEC .0 I DT) SHO ORAGE C OES NOT | <pre>Imp(%) = 9 IMPERVIOU</pre> | 0.00 Dir S PERVIG 1. 2. 40. .2 236. 5. (ii) 3. 5. (ii) 3. 5. 40. .2 236. 5. .2 236. 5. .2 .2 .2 .2 .2 .2 .2 .2 .2 | DUS (i) 01 00 00 00 50 50 50 (ii) 00 26 * 00 33 18 71 50 E STEP! SES: bove) UAL ANY. | TOTALS* .034 (iii) 1.33 63.45 67.71 .94 |
| <pre> ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(mm over(Storage Coeff. (Unit Hyd. Tpeak (Unit Hyd. Tpeak (Unit Hyd. peak (TIME TO PEAK (RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICIEN ***** WARNING: STORAGE (i) CN PROCEDUR CN* = 80 (ii) TIME STEP (THAN THE ST</pre> | Total (ha) = (mm) = (%) = (m) = min) = min) = min) = cms) = hrs) = (mm) = (mm) = COEFF. E SELEC .0 I DT) SHO ORAGE C OES NOT | <pre>Imp(%) = 9 IMPERVIOU</pre> | 0.00 Dir S PERVIG 1. 2. 40. .2 236. 5. (ii) 3. 5. (ii) 3. 5. 40. .2 236. 5. .2 236. 5. .2 .2 .2 .2 .2 .2 .2 .2 .2 | DUS (i) 01 00 00 00 50 50 50 (ii) 00 26 * 00 33 18 71 50 E STEP! SES: bove) UAL ANY. | TOTALS* .034 (iii) 1.33 63.45 67.71 .94 |
| <pre> ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(mm over(Storage Coeff. (Unit Hyd. Tpeak (Unit Hyd. peak (Unit Hyd. peak (Unit Hyd. peak (TIME TO PEAK (RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICIEN ***** WARNING: STORAGE (i) CN PROCEDUR CN* = 80 (ii) TIME STEP (THAN THE ST (iii) PEAK FLOW D</pre> | Total (ha) = (mm) = (%) = (m) = min) = min) = min) = cms) = hrs) = (mm) = (mm) = COEFF. E SELEC .0 I DT) SHO ORAGE C OES NOT | <pre>Imp(%) = 9 IMPERVIOU</pre> | 0.00 Dir S PERVIG 1. 2. 40. .2 236. 5. (ii) 3. 5. (ii) 3. 5. 40. .2 236. 5. .2 236. 5. .2 .2 .2 .2 .2 .2 .2 .2 .2 | DUS (i) 01 00 00 00 50 50 50 (ii) 00 26 * 00 33 18 71 50 E STEP! SES: bove) UAL ANY. | TOTALS* .034 (iii) 1.33 63.45 67.71 .94 |
| <pre> ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(mm over () Storage Coeff. () Unit Hyd. Tpeak () Unit Hyd. Tpeak () Unit Hyd. peak () PEAK FLOW () TIME TO PEAK () RUNOFF VOLUME TOTAL RAINFALL RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICIEN ***** WARNING: STORAGE (i) CN PROCEDUR CN* = 80 (ii) TIME STEP () THAN THE ST (iii) PEAK FLOW D</pre> | Total (ha) = (mm) = (%) = (m) = min) = min) = min) = cms) = hrs) = (mm) = (mm) = COEFF. E SELEC .0 I DT) SHO ORAGE C OES NOT | <pre>Imp(%) = 9 IMPERVIOU</pre> | 0.00 Dir S PERVIG 1. 2. 40. .2 236. 5. (ii) 3. 5. (ii) 3. 5. 40. .2 236. 5. .2 236. 5. .2 .2 .2 .2 .2 .2 .2 .2 .2 | DUS (i) 01 00 00 00 50 50 50 (ii) 00 26 * 00 33 18 71 50 E STEP! SES: bove) UAL ANY. | TOTALS* .034 (iii) 1.33 63.45 67.71 .94 |
| <pre> ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(mm Over () Storage Coeff. () Unit Hyd. Tpeak () Unit Hyd. Tpeak () Unit Hyd. peak () PEAK FLOW () TIME TO PEAK () RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICIEN ***** WARNING: STORAGE (i) CN PROCEDUR CN* = 80 (ii) TIME STEP () THAN THE ST (iii) PEAK FLOW D </pre> | Total (ha) = (mm) = (%) = (m) = min) = min) = min) = cms) = hrs) = (mm) = (mm) = COEFF. E SELEC .0 I DT) SHO ORAGE C OES NOT | <pre>Imp(%) = 9 IMPERVIOU</pre> | 0.00 Dir S PERVIG 1. 2. 40. 236. 5. (ii) 3. (ii) 5. | DUS (i) 01 00 00 00 50 50 50 (ii) 00 26 * 00 33 18 71 50 E STEP! SES: bove) UAL ANY. | TOTALS* .034 (iii) 1.33 63.45 67.71 .94 |
| <pre> ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(mm over (Storage Coeff. (Unit Hyd. Tpeak (Unit Hyd. Tpeak (Unit Hyd. peak (Unit Hyd. peak (PEAK FLOW (TIME TO PEAK (RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICIEN ****** WARNING: STORAGE (i) CN PROCEDUR CN* = 80 (ii) TIME STEP (THAN THE ST (iii) PEAK FLOW D </pre> | Total (ha) = (mm) = (%) = (m) = (mn) = cms) = cms) = hrs) = (mm) = (mm) = T = COEFF. E SELECC .0 I DT) SHO ORAGE C OES NOT | <pre>Imp(%) = 9 IMPERVIOU</pre> | 10.00 Dir IS PERVIG 1. 2. 40. 236. 5. (ii) 3. (ii) 5. | DUS (i) 01 00 00 00 50 50 50 (ii) 00 26 * 00 33 18 71 50 E STEP! SES: bove) UAL ANY. AK R.V. | TOTALS* .034 (iii) 1.33 63.45 67.71 .94 |
| <pre> ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(mm over (Storage Coeff. (Unit Hyd. Tpeak (Unit Hyd. Tpeak (Unit Hyd. peak (Unit Hyd. peak (PEAK FLOW (TIME TO PEAK (RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICIEN ****** WARNING: STORAGE (i) CN PROCEDUR CN* = 80 (ii) TIME STEP (THAN THE ST (iii) PEAK FLOW D </pre> | Total (ha) = (mm) = (%) = (m) = (mn) = cms) = cms) = hrs) = (mm) = (mm) = T = COEFF. E SELECC .0 I DT) SHO ORAGE C OES NOT | <pre>Imp(%) = 9 IMPERVIOU</pre> | 10.00 Dir IS PERVIG 1. 2. 40. 236. 5. (ii) 3. (ii) 5. | DUS (i) 01 00 00 00 50 50 50 (ii) 00 26 * 00 33 18 71 50 E STEP! SES: bove) UAL ANY. AK R.V. | TOTALS* .034 (iii) 1.33 63.45 67.71 .94 |
| <pre> ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(mm Over () Storage Coeff. () Unit Hyd. Tpeak () Unit Hyd. Tpeak () Unit Hyd. peak () PEAK FLOW () TIME TO PEAK () RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICIEN ***** WARNING: STORAGE (i) CN PROCEDUR CN* = 80 (ii) TIME STEP () THAN THE ST (iii) PEAK FLOW D </pre> | Total (ha) = (mm) = (%) = (m) = min) = min) = min) = cms) = hrs) = (mm) = (mm) = COEFF. E SELEC .0 I DT) SHO ORAGE C OES NOT | Imp(%) = 9 IMPERVIOU .08 1.00 24.50 .013 141.88 5.00 .34 .03 1.33 66.71 67.71 .99 IS SMALLE TED FOR PE a = Dep. S ULD BE SMA OEFFICIENT INCLUDE E | 00.00 Dir (S PERVIG 1. 2. 40. 236. 5. (ii) 3. (ii) 5. (ii) 5. (ii) 3. (ii) 3. (iii) 4. (iii) 4 | DUS (i) 01 00 00 00 00 50 37 00 50 (ii) 00 26 * 00 26 * 00 33 18 71 50 E STEP! SES: bove) UAL ANY. AK R.V. s) (mm) 3 66.39 3 43.93 | TOTALS* .034 (iii) 1.33 63.45 67.71 .94 |
| <pre> ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(mm over (Storage Coeff. (Unit Hyd. Tpeak (Unit Hyd. Tpeak (Unit Hyd. peak (Unit Hyd. peak (PEAK FLOW (TIME TO PEAK (RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICIEN ****** WARNING: STORAGE (i) CN PROCEDUR CN* = 80 (ii) TIME STEP (THAN THE ST (iii) PEAK FLOW D </pre> | Total (ha) = (mm) = (%) = (m) = min) = min) = min) = cms) = hrs) = (mm) = (mm) = (mm) = T = COEFF. E SELEC .0 I I DT) SHO ORAGE C OES NOT | <pre>Imp(%) = 9 IMPERVIOU</pre> | 00.00 Dir S PERVIG 1. 2. 40. 236. 5. (ii) 3. (ii) 5. | DUS (i) 01 00 00 00 00 00 00 00 00 00 | TOTALS* .034 (iii) 1.33 63.45 67.71 .94 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. _____ _____ | ADD HYD (0009) |

 11D
 (0003)
 AREA
 QPEAK
 TPEAK
 R.V.

 ----- (ha)
 (cms)
 (hrs)
 (mm)

 ID1=
 1
 (0005):
 .16
 .030
 1.33
 43.91

 +
 ID2=
 2
 (0004):
 .09
 .034
 1.33
 63.45

 1 + 2 = 3 _____ _____ ID = 3 (0009): .25 .064 1.33 50.95 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. _____ | ADD HYD (0008) |

 YD
 (0008) |

 2 = 3
 |
 AREA
 QPEAK
 TPEAK
 R.V.

 ------ (ha)
 (cms)
 (hrs)
 (mm)

 ID1= 1
 (0003):
 .19
 .071
 1.33
 63.45

 + ID2= 2
 (0007):
 .66
 .139
 1.33
 46.65

 1 + 2 = 3 _____ _____ ID = 3 (0008):.85 .210 1.33 50.40 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. _____ | ADD HYD (0010) |

 D
 (0010) |

 2 = 3 |
 AREA
 QPEAK
 TPEAK
 R.V.

 ----- (ha)
 (cms)
 (hrs)
 (mm)

 ID1= 1
 (0006):
 .12
 .047
 1.33
 66.38

 + ID2= 2
 (0009):
 .25
 .064
 1.33
 50.95

 1 + 2 = 3_____ + ID2= 2 (0009): _____ ID = 3 (0010): .37 .111 1.33 55.95 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. _____ FINISH

- 60 -

Post-Development Visual OTTHYMO Model Output (2-year to 100-year storms)

V V I SSSSS U U A L V V I SS U U AA L V V I SS U U AAAAA L V V I SS U U AAAAA L V V I SS U U A A L V V I V V I VV I SSSSS UUUUU A A LLLLL
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 0 0 0 0 Developed and Distributed by Clarifica Inc. Copyright 1996, 2007 Clarifica Inc. All rights reserved. ***** DETAILED OUTPUT ***** Input filename: C:\Program Files (x86)\Visual OTTHYMO 2.3.3\voin.dat Output filename: P:\2018\18204\Visual OTTHYMO\Rev2\18204 vo2\Post-Development.out Summary filename: P:\2018\18204\Visual OTTHYMO\Rev2\18204 vo2\Post-Development.sum DATE: 8/16/2019 TIME: 8:08:14 AM USER: COMMENTS: _____ ***** ** SIMULATION NUMBER: 1 ** ***** _____ | CHICAGO STORM | IDF curve parameters: A= 592.600 B= 6.000 C= .780 | Ptotal= 32.34 mm | _____ used in: INTENSITY = A / (t + B)^C Duration of storm = 4.00 hrs Storm time step = 10.00 min Time to peak ratio = .33 TIMERAINITIMERAINITIMERAINITIMERAINhrsmm/hrhrsmm/hrhrsmm/hrhrsmm/hrhrsmm/hr.172.211.1717.152.175.203.172.63.332.531.3368.162.334.433.332.44.502.981.5022.382.503.873.502.28.673.651.6711.942.673.453.672.14.834.811.838.242.833.113.832.021.007.292.006.353.002.854.001.92 _____ -----| CALIB STANDHYD (0003) | Area (ha) = .16
|ID= 1 DT= 5.0 min | Total Imp(%) = 90.00 Dir. Conn.(%) = 90.00 _____
 IMPERVIOUS
 PERVIOUS (i)

 Surface Area (ha) =
 .14
 .02

 Dep. Storage (mm) =
 1.00
 1.00

 Average Slope (%) =
 1.00
 2.00

 Length (m) =
 32.70
 40.00

 Mannings n =
 .013
 .250
 = .250 Mannings n .013 NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

| hrs mm/hr .083 2.21 .167 2.21 .250 2.53 .333 2.53 .417 2.98 .500 2.98 .583 3.65 .667 3.65 .750 4.81 .833 4.81 .917 7.29 1.000 7.29 | Image: Transformed Hyerograph Im |
|--|--|
| <pre>Max.Eff.Inten.(mm/hr)=</pre> | 68.16 18.95 5.00 5.00 1.52 (ii) 4.94 (ii) 5.00 5.00 .33 .22 *TOTALS* .03 .00 .028 (iii) 1.33 1.33 1.33 31.34 10.36 29.23 32.34 32.34 32.34 .97 .32 .90 |
| CN* = 80.0 Ia (ii) TIME STEP (DT) SHOU THAN THE STORAGE CC (iii) PEAK FLOW DOES NOT CALIB NASHYD (0002) Area ID= 1 DT=10.0 min Ia U.H. Tp | ED FOR PERVIOUS LOSSES: = Dep. Storage (Above) LD BE SMALLER OR EQUAL EFFICIENT. INCLUDE BASEFLOW IF ANY. (ha) = .47 Curve Number (CN) = 80.0 (mm) = 5.00 # of Linear Res.(N) = 3.00 (hrs) = .20 |
| TIME RAIN hrs mm/hr .167 2.21 .333 2.53 .500 2.98 .667 3.65 .833 4.81 1.000 7.29 Unit Hyd Qpeak (cms)= PEAK FLOW (cms)= TIME TO PEAK (hrs)= RUNOFF VOLUME (mm)= TOTAL RAINFALL (mm)= 3 RUNOFF COEFFICIENT = | .010 (i) 1.500 7.855 2.020 .245 |
| Surface Area (ha) = Dep. Storage (mm) = Average Slope (%) = | <pre>(ha) = .56 mp(%) = 99.00 Dir. Conn.(%) = 99.00 IMPERVIOUS PERVIOUS (i) 55 01</pre> |

| <pre> TRANSFORMED HYETOGRAPH THE FAIN THE FAIN THE BAIN THE BAIN THE BAIN hes mm/hr hes mm/hr hes mm/hr hes mm/hr 083 2.21 1.083 17.15 2.083 5.20 3.17 2.63 1.27 2.21 1.17 7.15 2.083 5.20 3.17 3.22 2.44 1.333 2.23 1.230 66.16 2.230 4.43 3.33 2.44 1.417 2.98 1.417 22.38 2.417 3.57 3.42 2.28 1.500 2.98 1.500 22.38 2.607 3.57 3.50 2.28 1.501 2.98 1.501 22.38 2.417 3.57 3.20 2.28 1.503 3.65 1.563 11.34 2.583 3.1.45 3.57 2.14 1.570 4.81 1.750 8.24 2.750 3.11 3.75 2.02 1.317 7.29 1.917 6.35 2.917 2.65 3.002 2.28 1.000 7.29 2.000 6.35 3.000 2.28 4.000 1.92 1.000 7.29 2.000 6.35 3.000 2.28 4.000 1.92 HAM.SETF.INE.(mm/hr) = 68.16 94.77 OVER (min) = 5.00 5.00 Storage Coeff. (min) = 2.02 (11) 3.53 (11) Unit Hyd. peak (cms) = .10 .00 .104 (11) TIME TOFAK (hrs) = 1.33 1.33 1.33 RUNOFF VOLUME (mm) = 31.34 10.36 31.13 TOTALST (mm) = 32.34 32.34 RUNOFF COEFFICIENT = .97 .32 .96 **** WARNING: STORAGE COEFF. IS SHALLER THAN THE STEP! (1) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN = 80.00 I Ea = Bep. Storage (LADOV) (1) THE TIC (DT) DOE NOT INCLUDE BASEFLOW IF ANY. ***** WARNING: STORAGE COEFF. IS SHALLER THAN THE STEP! (1) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN = 80.00 I Ea = Bep. Storage (LADOV) (1) THE TIC (DT) ODE SE DESTIT: (11) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. ************************************</pre> | NOTE: RAINFALL W | | MED TO | 5.0 MIN. | TIME ST | EP. | |
|--|--|--|---|--|--|--|--|
| TIME RAIN TIME RAIN TIME RAIN TIME RAIN TIME RAIN hrss mm/hr 1.083 2.21 1.083 7.15 2.083 5.20 3.08 2.63 1.67 2.21 1.167 17.15 2.083 5.20 3.08 2.63 1.333 2.53 1.333 68.16 2.233 4.43 3.32 2.44 .417 2.98 1.417 22.38 2.437 3.45 3.42 2.28 .503 3.65 1.563 11.94 2.583 3.45 3.52 2.24 .667 3.65 1.667 11.94 2.683 3.11 3.75 2.02 .917 7.29 1.917 6.35 0.2937 2.685 4.00 1.92 Max.Eff.Inten.(mm/hr)= 68.16 94.77 0.00 1.03 1.03 1.03 1.03 1.03 1.03 1.03 1.03 1.03 1.03 1.03 1 | | | | ED UVEROC | וות גם | | |
| | hrs mm | AIN TIME hr hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | mm/hr |
| <pre>Max.Eff.Inten.(mm/hr)= 68.16 94.77</pre> | .333 2 417 2 .500 2 .583 3 .667 3 .750 4 | 2.53 1.333 2.98 1.417 2.98 1.500 3.65 1.583 3.65 1.667 4.81 1.750 | 68.16 22.38 22.38 11.94 11.94 8.24 | 2.333 2.417 2.500 2.583 2.667 2.750 | 4.43 3.87 3.87 3.45 3.45 3.11 | 3.33 3.42 3.50 3.58 3.67 3.75 | 2.44 2.28 2.28 2.14 2.14 2.02 |
| Storage Coeff. (min)= 2.22 (i) 3.53 (i) Unit Hyd. Tpeak (mm)= 5.00 Unit Hyd. peak (mm)= 3.0 .26 *TOTALS* PEAK FLOM (cms)= .10 .00 .104 (iii) TIME TO PEAK (hrs)= 1.33 .1.33 1.33 RUNOFF VOLUME (mm)= 31.34 10.36 31.13 TOTAL RAINFALL (mm)= 32.34 32.34 32.34 RUNOFF COEFFICIENT = .97 .32 .96 ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 80.0 I a = Dep. Storage (Above) (i) TIME STEP (DT) SHOULD EE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. | | | | | 2.85 | 4.00 | 1.92 |
| <pre>PEAK FLOW (cms) = .10 .00 .104 (iii) TIME TO PEAK (hrs) = 1.33 1.33 1.33 RUNOFF VOLUME (mm) = 31.34 10.36 31.13 TOTAL RAINFALL (mm) = 32.34 32.34 32.34 RUNOFF COEFFICIENT = .97 .32 .96 ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:</pre> | Storage Coeff. (min) Unit Hyd. Tpeak (min) Unit Hyd. peak (cms) | = 2.2 = 5.0 = .3 | 2 (ii) 0 0 | 3.53 (i 5.00 .26 | i) *TC | ሞልፒ.ና.* | |
| <pre>(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 80.0 Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. </pre> | PEAK FLOW (cms) TIME TO PEAK (hrs) RUNOFF VOLUME (mm) TOTAL RAINFALL (mm) RUNOFF COEFFICIENT | = .1 = 1.3 = 31.3 = 32.3 = .9 | 0 3 3 4 3 4 3 4 9 7 | .00 1.33 10.36 32.34 .32 | | .104 (iii) 1.33 | |
| CN* = 80.0 IA = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. ADD HYD (0004) 1 + 2 = 3 AREA QPEAK TPEAK R.V. | ***** WARNING: STORAGE COE | CFF. IS SMAI | LER THAN | TIME STE | P! | | |
| ADD HYD (0004) 1 + 2 = 3 AREA QPEAK TPEAK R.V. | CN* = 80.0 (ii) TIME STEP (DT) THAN THE STORAG (iii) PEAK FLOW DOES | Ia = Dep. SHOULD BE S SE COEFFICIE NOT INCLUDE | Storage MALLER O NT. BASEFLO | (Above) R EQUAL | | | |
| <pre> 1 + 2 = 3 AREA QPEAK TPEAK R.V. (ha) (cms) (hrs) (mm) ID1= 1 (0002): .47 .010 1.50 7.85 + ID2= 2 (0001): .56 .104 1.33 31.13 </pre> | | | | | | | |
| ID = 3 (0004): 1.03 .112 1.33 20.51 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. ADD HYD (0005) ADD HYD (0005) ADD HYD (0005) AREA QPEAK TPEAK R.V. ID1= 1 (0003): .16 .028 1.33 29.23 + ID2= 2 (0004): 1.03 .112 1.33 20.51 ID = 3 (0005): 1.19 .140 1.33 21.68 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. RESERVOIR (0006) IN= 2> OUT= 1 DT= 5.0 min OUTFLOW STORAGE OUTFLOW STORAGE (cms) (ha.m.) (cms) (ha.m.) .0000 .0000 .0580 .0136 .0170 .0034 .0740 .0170 .0280 .0068 .0870 .0204 | ADD HYD (0004) 1 + 2 = 3 | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) | | |
| NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | | | | | | | |
| ADD HYD (0005) 1 + 2 = 3 AREA QPEAK TPEAK R.V. | | | | | | | |
| ADD HYD (0005) 1 + 2 = 3 AREA QPEAK TPEAK R.V. | | | | | | | |
| ID1= 1 (0003):16 .028 1.33 29.23 + ID2= 2 (0004): 1.03 .112 1.33 20.51 | ADD HYD (0005) | | | | | | |
| ID = 3 (0005): 1.19 .140 1.33 21.68 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | ID1= 1 (0003): | .16 | .028 | 1.33 | 29.23 | | |
| RESERVOIR (0006) IN= 2> OUT= 1 DT= 5.0 min OUTFLOW STORAGE OUTFLOW STORAGE | | | | | | | |
| RESERVOIR (0006) IN= 2> OUT= 1 DT= 5.0 min OUTFLOW STORAGE OUTFLOW STORAGE (cms) (ha.m.) (cms) (ha.m.) .0000 .0000 .0580 .0136 .0170 .0034 .0740 .0170 .0280 .0068 .0870 .0204 | NOTE: PEAK FLOWS DO | NOT INCLUDE | BASEFLO | WS IF ANY | • | | |
| RESERVOIR (0006) IN= 2> OUT= 1 DT= 5.0 min OUTFLOW STORAGE OUTFLOW STORAGE (cms) (ha.m.) (cms) (ha.m.) .0000 .0000 .0580 .0136 .0170 .0034 .0740 .0170 .0280 .0068 .0870 .0204 | | | | | | | |
| (cms) (ha.m.) (cms) (ha.m.) .0000 .0000 .0580 .0136 .0170 .0034 .0740 .0170 .0280 .0068 .0870 .0204 | RESERVOIR (0006) IN= 2> OUT= 1 DT= 5.0 min C | DUTFLOW S | TORAGE | OUTFL | .ow st | ORAGE | |
| | | (cms) (.0000 .0170 .0280 | ha.m.) .0000 .0034 .0068 | (cms .05 .07 .08 |) (h 80 40 70 | a.m.) .0136 .0170 .0204 | |
| AREA QPEAK TPEAK R.V. (ha) (cms) (hrs) (mm) INFLOW: ID= 2 (0005) 1.190 .140 1.33 21.68 OUTFLOW: ID= 1 (0006) 1.190 .038 1.58 21.64 | | (ha) 1.190 | (ci | ms) 140 | (hrs) 1.33 | (mm) 21.68 | |

| TIME S | SHIFT OF PEAK FI | ION [Qout/Qin](%) LOW (min) SED (ha.m.) | = 15.00 | |
|--|---|---|----------------------------|--------------|
| | | | | |
| ******* | | | | |
| ** SIMULATION NUMBER: | | | | |
| CHICAGO STORM I Ptotal= 41.69 mm | IDF curve parame | eters: A= 697.400 B= 5.000 | | |
| υ | | C= .764 NSITY = A / (t + | | |
| S | Duration of sto: Storm time step Cime to peak rat | = 10.00 min | | |
| TIME | RAIN TIME | RAIN TIME | RAIN TIME | RAIN |
| hrs m | nm/hr hrs | mm/hr hrs 21.37 2.17 | mm/hr hrs | mm/hr |
| .17 | 2.98 1.17 | 21.37 2.17 | 6.78 3.17 5.91 3.33 | 3.52 |
| . 50 | 3.97 1.50 | 88.09 2.33 27.73 2.50 15.03 2.67 | 5.11 3.50 | 3.08 |
| .67 | 4.84 1.67 | 15.03 2.67 | 4.57 3.67 | 2.90 |
| .83 | 6.29 1.83 | 10.53 2.83 8.21 3.00 | 4.15 3.83 | 2.74 |
| 1.00 | 9.36 2.00 | 8.21 3.00 | 3.81 4.00 | 2.60 |
| | | | | |
| CALIB STANDHYD (0003) Ar ID= 1 DT= 5.0 min Tc | | | (%)= 90.00 | |
| | IMPERVIOU | S PERVIOUS (i) | | |
| Surface Area (ha Dep. Storage (mm | a) = .14 | .02 | | |
| Dep. Storage (mm Average Slope (% | n) = 1.00 b) = 1.00 | 1.00 2.00 | | |
| Length (n | n) = 32.70 | 40.00 | | |
| | = .013 | | | |
| NOTE: RAINFALL | WAS TRANSFORME | о то 5.0 MIN. Т | IME STEP. | |
| | ر م در m | ICEODMED IVEROCDA | DU | |
| TTME | | NSFORMED HYETOGRA RAIN TIME | | RATN |
| | | mm/hr hrs | | |
| | | 21.37 2.083 21.37 2.167 | | |
| .167 | 2.98 1.167 | 21.37 2.167 | 6.78 3.17 | 3.52 |
| .250 | 3.40 1.250 | 88.09 2.250 88.09 2.333 27.73 2.417 | 5.81 3.25 | 3.28 |
| . 333 | 3.97 1.417 | 27.73 2.417 | 5.11 3.42 | 3.08 |
| .500 | 3.97 1.500 | 27.73 2.500 | 5.11 3.50 | 3.08 |
| .583 | 4.84 1.583 | 15.03 2.583 | 4.57 3.58 | 2.90 |
| .667 | | 15.03 2.667 | | |
| .750 | 6.29 1.750 | | 4.15 3.75 | 2.74 |
| .055 | 9 36 1 917 | 10.53 2.833 8.21 2.917 | 4.1J 3.03 3.81 3.92 | 2.74 2.60 |
| 1.000 | 9.36 2.000 | 8.21 3.000 | 3.81 4.00 | 2.60 |
| Max.Eff.Inten.(mm/hr | c)= 88.09 | 30.00 | | |
| over (mir | n) 5.00 | 5.00 | | |
| Storage Coeff. (min Unit Hyd. Tpeak (min | 1.37 | | | |
| Unit Hyd. Tpeak (mir Unit Hyd. peak (cms | | 5.00 | | |
| , and pour (one | | | *TOTALS* | |
| PEAK FLOW (cms | s) = .04 | .00 | .037 (iii |) |
| TIME TO PEAK (hrs | , | 1.33 | 1.33 | |
| | n)= 40.69 | 15.89 | 38.20 | |
| TOTAL RAINFALL (mm RUNOFF COEFFICIENT | | 41.69 .38 | 41.69 | |
| KONGEL CONFLICIENT | .90 | | • 22 | |
| ***** WARNING: STORAGE CC | DEFF. IS SMALLED | R THAN TIME STEP! | | |

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

 $CN^* = 80.0$ Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.

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

| | - | | | | | | |
|---|---|--|-------------|---|------------------------|--|--------------|
| CALIB NASHYD (0002) ID= 1 DT=10.0 min | Area | (ha)= | .47 | Curve Nur | nber (Cl | N)= 80.0 | |
| D= 1 DT=10.0 min | Ia - U.H. Tp(| (mm) = hrs) = | 5.00 .20 | # of Line | ear Res.(1 | 4)= 3.00 | |
| NOTE: RAIN | JFALL WAS TR | ANSFORME | D TO 1 | 10.0 MIN. | TIME STE | 2. | |
| | | TRA | ANSFORM | ED HYETOGI | RAPH | | |
| h | ME RAIN rs mm/hr | hra | mm /hr | l hro | mm/hr l | hrc | mm / hr |
| .16 | 57 2.98 | 1.167 | 21.37 | 2.167 | 6.78 | 3.17 | 3.52 |
| .50 |)0 3.97 | 1.500 | 27.73 | 2.533 | 5.81 | 3.50 | 3.28 |
| .66 | 57 4.84 33 6.29 | 1.667 | 15.03 | 2.667 | 4.57 4 15 | 3.67 3.83 | 2.90 |
| 1.00 | 57 2.98 33 3.40 00 3.97 57 4.84 33 6.29 00 9.36 | 2.000 | 8.21 | 3.000 | 3.81 | 4.00 | .00 |
| Unit Hyd Qpeak | (cms)= | .090 | | | | | |
| PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI | (mm) = 12 (mm) = 41 | .836 .259 | | | | | |
| (i) PEAK FLOW I | OES NOT INC | LUDE BAS | SEFLOW 1 | IF ANY. | | | |
| | | | | | | | |
| CALIB STANDHYD (0001) | | (ba) = | 56 | | | | |
| D= 1 DT= 5.0 min | Total Im | | | Dir. Conr | n.(%)= 9 | 9.00 | |
| | т | MPERVIOU | JS PI | ERVIOUS (i | L) | | |
| Surface Area | (ha) = | .55 | | .01 | | | |
| Average Slope | (%) = | 1.00 | | 2.00 | | | |
| Surface Area Dep. Storage Average Slope Length Mannings n | (m) = = | 61.10 | | 40.00 | | | |
| | IFALL WAS TR | | | | TIME STE | 2. | |
| | | | | | | | |
| ΠTN | 1E RAIN | | | ED HYETOGH | | | DATM |
| h | co mm/hrcl | hrc | mm /hr | l hro | mm / hr l | hro | mm / h r |
| .08 | 33 2.98 57 2.98 50 3.40 | 1.083 | 21.37 | 2.083 | 6.78 | 3.08 | 3.52 |
| .25 | 50 3.40 | 1.250 | 88.09 | 2.250 | 5.81 | 3.25 | 3.28 |
| .33 | 33 3.40 17 3.97 30 3.97 33 4.84 | 1.333 | 88.09 | 2.333 | 5.81 | 3.33 | 3.28 |
| .5(|)0 3.97 | 1.500 | 27.73 | 2.417 | 5.11 | 3.42 3.50 | 3.08 |
| .58 | 33 4.84 | 1.583 | 15.03 | 2.583 | 4.57 | 3.58 | 2.90 |
| | | | | 2.667 2.750 | | | 2.90 2.74 |
| .83 | 33 6.29 | 1.833 | 10.53 | 2.833 | 4.15 | 3.83 | 2.74 |
| | .7 9.36 | 1.917 | 8.21 | 2.917 | 3.81 | 3.92 | 2.60 |
| .91 | 10 a 26 i | 2 000 | | | | 00 | 2.00 |
| | 6.29 7 9.36 0 9.36 (mm/hr)= | | | | 5.01 | | |
| Max.Eff.Inten. over | (mm/hr)= c (min) | 88.09 5.00 | 1 | 150.02 5.00 | | | |
| Max.Eff.Inten. over Storage Coeff. | (mm/hr) = c (min) (min) = | 88.09 5.00 2.00 | (ii) | 150.02 5.00 3.18 (ii | | | |
| Max.Eff.Inten. over | (mm/hr) = c (min) (min) = c (min) = | 88.09 5.00 | (ii) | 150.02 5.00 | L) | | |
| Max.Eff.Inten. over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | <pre>(mm/hr) = c (min) (min) = c (min) = (cms) =</pre> | 88.09 5.00 2.00 5.00 .31 | (ii) | 150.02 5.00 3.18 (ii 5.00 .27 | i) *Tota | ALS* | λ. |
| Max.Eff.Inten. over Storage Coeff. Unit Hyd. Tpeał | <pre>(mm/hr) = c (min) (min) = c (min) = (cms) = (cms) = (cms) = (hrs) =</pre> | 88.09 5.00 2.00 5.00 .31 | (ii) | 150.02 5.00 3.18 (ii 5.00 .27 .00 |) *TOTA | |) |
| Max.Eff.Inten. over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW TIME TO PEAK | <pre>(mm/hr) = (min) (min) = (cms) = (cms) = (hrs) = (mm) =</pre> | 88.09 5.00 2.00 5.00 .31 .13 1.33 40.69 | (ii) | 150.02 5.00 3.18 (ii 5.00 .27 .00 1.33 15.89 | *TOT/ | ALS* 135 (iiii .33 .44 |) |
| Max.Eff.Inten. over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW TIME TO PEAK | <pre>(mm/hr) = c (min) (min) = c (min) = (cms) = (cms) = (hrs) = (mm) = (mm) =</pre> | 88.09 5.00 2.00 5.00 .31 1.33 40.69 41.69 | (ii) | 150.02 5.00 3.18 (ii 5.00 .27 .00 1.33 | *TOT/ | ALS* 135 (iiii .33 .44 |) |
| Max.Eff.Inten. over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL | <pre>(mm/hr) = c (min) (min) = c (min) = (cms) = (cms) = (hrs) = (mm) = (mm) = EENT =</pre> | 88.09 5.00 5.00 .31 1.33 40.69 41.69 .98 | (ii) | 150.02 5.00 3.18 (ii 5.00 .27 .00 1.33 15.89 41.69 .38 | *TOTA 1 40 41 | ALS* 135 (iiii .33 .44 .69 |) |

(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. ------| ADD HYD (0004) | | 1 + 2 = 3 | AREA QPEAK TPEAK R.V.
 ID1=
 1
 (0002):
 .47
 .017
 1.50
 12.84

 +
 ID2=
 2
 (0001):
 .56
 .135
 1.33
 40.44
 _____ (mm) _____ ID = 3 (0004): 1.03 .149 1.33 27.85 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. _____ _____ | ADD HYD (0005) | 1 + 2 = 3 AREA QPEAK TPEAK R.V. (ha) (cms) (hrs) (mm) .16 .037 1.33 38.20 1.03 .149 1.33 27.85 (mm) ID1= 1 (0003): + ID2= 2 (0004): _____ ID = 3 (0005): 1.19 .186 1.33 29.24 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. _____ _____ | RESERVOIR (0006) | IN= 2---> OUT= 1 |
 OUTFLOW
 STORAGE
 |
 OUTFLOW
 STORAGE

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

 .0000
 .0000
 |
 .0580
 .0136

 .0170
 .0034
 .0740
 .0170

 .0280
 .0068
 .0870
 .0204

 .0350
 .0102
 .0970
 .0238
 | DT= 5.0 min | _____
 AREA
 QPEAK
 TPEAK
 R.V.

 (ha)
 (cms)
 (hrs)
 (mm)

 INFLOW:
 ID= 2 (0005)
 1.190
 .186
 1.33
 29.24

 OUTFLOW:
 ID= 1 (0006)
 1.190
 .057
 1.58
 29.20
 PEAK FLOW REDUCTION [Qout/Qin](%) = 30.85 TIME SHIFT OF PEAK FLOW (min) = 15.00 MAXIMUM STORAGE USED (ha.m.) = .011 (min) = 15.00MAXIMUM STORAGE USED (ha.m.)= .0137 ***** ** SIMULATION NUMBER: 3 ** **** _____ | CHICAGO STORM | IDF curve parameters: A= 798.500 B= 5.000 C= .763 | Ptotal= 48.00 mm | _____ used in: INTENSITY = A / (t + B)^C Duration of storm = 4.00 hrs Storm time step = 10.00 min Time to peak ratio = .33 TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN mm/hr | hrs mm/hr | hrs mm/hr | hrs mm/hr 3.45 | 1.17 24.60 | 2.17 7.83 | 3.17 4.07 hrs .17
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 ...</th _____ _____ | CALIB | STANDHYD (0003) | Area (ha)= .16 |ID= 1 DT= 5.0 min | Total Imp(%)= 90.00 Dir. Conn.(%)= 90.00

PROJECT No. 18204

File No. 18204 1171 N Shore FSR Rev1.0

| Surface Area (h Dep. Storage (m Average Slope (Length (r Mannings n NOTE: RAINFALL TIME hrs r .083 .167 .250 .333 .417 .500 583 | WAS TRANS RAIN mm/hr 3.45 1 3.45 1 3.93 1 4.59 1 4.59 1 4.59 1 5.58 1 5.58 1 7.26 1 7.26 1 10.79 1 10.79 2 | .14 1.00 32.70 .013 SFORME hrs .083 .167 .250 .333 .417 .500 | D TO RAIN mm/hr 24.60 24.60 101.14 31.91 31.91 31.91 | .02 1.00 2.00 40.00 .250 5.0 MIN. D HYETOGFF TIME hrs 2.083 2.167 2.250 2.333 2.417 2.500 .2583 | TIME STEP RAPH RAIN mm/hr 7.83 7.83 6.71 6.71 5.90 5.90 5.28 | TIME hrs 3.08 3.17 3.25 3.33 | mm/hr 4.07 4.07 3.79 3.79 |
|--|--|---|---|--|--|---|---------------------------------------|
| NOTE: RAINFALL TIME hrs .083 .167 .250 .333 .417 .500 .583 .667 .750 .833 .917 1.000 Max Eff Inten (mm/h | WAS TRANS RAIN mm/hr 3.45 1 3.45 1 3.93 1 4.59 1 4.59 1 4.59 1 5.58 1 5.58 1 7.26 1 7.26 1 10.79 1 10.79 2 | TRAI FIME hrs .083 .167 .250 .333 .417 .500 | D TO NSFORME RAIN mm/hr 24.60 24.60 101.14 101.14 31.91 31.91 17.31 | 5.0 MIN. D HYETOGF TIME hrs 2.083 2.167 2.250 2.333 2.417 2.500 2.583 | RAPH RAIN mm/hr 7.83 6.71 6.71 5.90 5.90 5.28 | TIME hrs 3.08 3.17 3.25 3.33 | mm/hr 4.07 4.07 3.79 3.79 |
| NOTE: RAINFALL TIME hrs .083 .167 .250 .333 .417 .500 .583 .667 .750 .833 .917 1.000 Max Eff Inten (mm/h | WAS TRANS RAIN mm/hr 3.45 1 3.45 1 3.93 1 4.59 1 4.59 1 4.59 1 5.58 1 5.58 1 7.26 1 7.26 1 10.79 1 10.79 2 | TRAI FIME hrs .083 .167 .250 .333 .417 .500 | D TO NSFORME RAIN mm/hr 24.60 24.60 101.14 101.14 31.91 31.91 17.31 | 5.0 MIN. D HYETOGF TIME hrs 2.083 2.167 2.250 2.333 2.417 2.500 2.583 | RAPH RAIN mm/hr 7.83 6.71 6.71 5.90 5.90 5.28 | TIME hrs 3.08 3.17 3.25 3.33 | mm/hr 4.07 4.07 3.79 3.79 |
| NOTE: RAINFALL TIME hrs .083 .167 .250 .333 .417 .500 .583 .667 .750 .833 .917 1.000 Max Eff Inten (mm/h | WAS TRANS RAIN mm/hr 3.45 1 3.45 1 3.93 1 4.59 1 4.59 1 4.59 1 5.58 1 5.58 1 7.26 1 7.26 1 10.79 1 10.79 2 | TRAI FIME hrs .083 .167 .250 .333 .417 .500 | D TO NSFORME RAIN mm/hr 24.60 24.60 101.14 101.14 31.91 31.91 17.31 | 5.0 MIN. D HYETOGF TIME hrs 2.083 2.167 2.250 2.333 2.417 2.500 2.583 | RAPH RAIN mm/hr 7.83 6.71 6.71 5.90 5.90 5.28 | TIME hrs 3.08 3.17 3.25 3.33 | mm/hr 4.07 4.07 3.79 3.79 |
| NOTE: RAINFALL TIME hrs .083 .167 .250 .333 .417 .500 .583 .667 .750 .833 .917 1.000 Max Eff Inten (mm/h | WAS TRANS RAIN mm/hr 3.45 1 3.45 1 3.93 1 4.59 1 4.59 1 4.59 1 5.58 1 5.58 1 7.26 1 7.26 1 10.79 1 10.79 2 | TRAI FIME hrs .083 .167 .250 .333 .417 .500 | D TO NSFORME RAIN mm/hr 24.60 24.60 101.14 101.14 31.91 31.91 17.31 | 5.0 MIN. D HYETOGF TIME hrs 2.083 2.167 2.250 2.333 2.417 2.500 2.583 | RAPH RAIN mm/hr 7.83 6.71 6.71 5.90 5.90 5.28 | TIME hrs 3.08 3.17 3.25 3.33 | mm/hr 4.07 4.07 3.79 3.79 |
| TIME hrs .083 .167 .250 .333 .417 .500 .583 .667 .750 .833 .917 1.000 Max Eff Inten (mm/h | RAIN 7 mm/hr 3.45 1 3.93 1 3.93 1 4.59 1 5.58 1 5.58 1 5.58 1 7.26 1 7.26 1 10.79 1 10.79 2 | TRA FIME hrs .083 .167 .250 .333 .417 .500 .583 | NSFORME RAIN mm/hr 24.60 24.60 101.14 101.14 31.91 31.91 17.31 | D HYETOGF TIME hrs 2.083 2.167 2.250 2.333 2.417 2.500 2.583 | RAPH RAIN mm/hr 7.83 6.71 6.71 5.90 5.90 5.28 | TIME hrs 3.08 3.17 3.25 3.33 | mm/hr 4.07 4.07 3.79 3.79 |
| hrs : .083 .167 .250 .333 .417 .500 .583 .667 .750 .833 .917 1.000 Max Eff Inten (mm/h | RAIN 2 mm/hr 3.45 1 3.93 1 3.93 1 4.59 1 4.59 1 5.58 1 7.26 1 7.26 1 7.26 1 10.79 1 | FIME hrs .083 .167 .250 .333 .417 .500 | RAIN mm/hr 24.60 24.60 101.14 101.14 31.91 31.91 | TIME hrs 2.083 2.167 2.250 2.333 2.417 2.500 2.583 | RAIN mm/hr 7.83 6.71 6.71 5.90 5.90 | hrs 3.08 3.17 3.25 3.33 | mm/hr 4.07 4.07 3.79 3.79 |
| hrs : .083 .167 .250 .333 .417 .500 .583 .667 .750 .833 .917 1.000 Max Eff Inten (mm/h | RAIN 2 mm/hr 3.45 1 3.93 1 3.93 1 4.59 1 4.59 1 5.58 1 7.26 1 7.26 1 7.26 1 10.79 1 | FIME hrs .083 .167 .250 .333 .417 .500 | RAIN mm/hr 24.60 24.60 101.14 101.14 31.91 31.91 | TIME hrs 2.083 2.167 2.250 2.333 2.417 2.500 2.583 | RAIN mm/hr 7.83 6.71 6.71 5.90 5.90 | hrs 3.08 3.17 3.25 3.33 | mm/hr 4.07 4.07 3.79 3.79 |
| .083 .167 .250 .333 .417 .500 .583 .667 .750 .833 .917 1.000 Max Eff Inten (mm/h | $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | .083 .167 .250 .333 .417 .500 | 24.60 24.60 101.14 101.14 31.91 31.91 | 2.083 2.167 2.250 2.333 2.417 2.500 | 7.83 7.83 6.71 6.71 5.90 5.90 | 3.08 3.17 3.25 3.33 | 4.07 4.07 3.79 3.79 |
| .167 .250 .333 .417 .500 .583 .667 .750 .833 .917 1.000 Max Eff Inten (mm/h | $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | .167 .250 .333 .417 .500 | 24.60 101.14 101.14 31.91 31.91 17 31 | 2.167 2.250 2.333 2.417 2.500 | 7.83 6.71 6.71 5.90 5.90 | 3.17 3.25 3.33 | 4.07 3.79 3.79 |
| .417 .500 .583 .667 .750 .833 .917 1.000 Max Eff Inten (mm/h | 4.59 1 4.59 1 5.58 1 5.58 1 7.26 1 7.26 1 10.79 1 | .417 | 31.91 31.91 17 31 | 2.41/ | 5.90 5.90 5.28 | 3.17 3.25 3.33 3.42 3.50 | 4.07 3.79 3.79 |
| .417 .500 .583 .667 .750 .833 .917 1.000 Max Eff Inten (mm/h | 4.59 1 4.59 1 5.58 1 5.58 1 7.26 1 7.26 1 10.79 1 | .417 | 31.91 31.91 17 31 | 2.41/ | 5.90 5.90 5.28 | 3.25 3.33 3.42 3.50 | 3.79 3.79 3.55 |
| .417 .500 .583 .667 .750 .833 .917 1.000 Max Eff Inten (mm/h | 4.59 1 4.59 1 5.58 1 5.58 1 7.26 1 7.26 1 10.79 1 | .417 | 31.91 31.91 17 31 | 2.41/ | 5.90 5.90 5.28 | 3.33 3.42 3.50 | 3.79 |
| .667 .750 .833 .917 1.000 Max Eff Inten (mm/h | 5.58 1 7.26 1 7.26 1 10.79 1 10.79 2 | .417 .500 .583 .667 .750 .833 .917 | 31.91 31.91 17.31 17.31 12.14 12.14 9.47 | 2.417 2.500 2.583 2.667 2.750 2.833 | 5.90 5.28 5.28 | 3.42 | |
| .667 .750 .833 .917 1.000 Max Eff Inten (mm/h | 5.58 1 7.26 1 7.26 1 10.79 1 10.79 2 | .583 .667 .750 .833 .917 | 17.31 17.31 12.14 12.14 9.47 | 2.583 2.667 2.750 2.833 | 5.28 | 3.50 | 3.55 |
| .667 .750 .833 .917 1.000 Max Eff Inten (mm/h | 5.58 1 7.26 1 7.26 1 10.79 1 10.79 2 | .667 .750 .833 .917 | 17.31 12.14 12.14 9.47 | 2.667 2.750 2.833 | 5.28 | | 3.35 |
| Max Eff Inten (mm/h | | .750 .833 .917 | 12.14 12.14 9.47 | 2.750 2.833 | 4 70 1 | 3.67 | 3.35 |
| Max Eff Inten (mm/h | | .833 | 12.14 9.47 | 2.833 | 4./9 | 3.75 | 3.17 |
| Max Eff Inten (mm/h | | .917 | 9.47 | | 4.79 | 3.83 | 3.17 |
| Max Eff Inten (mm/h | | 000 | | 2.917 | 4.40 | 3.92 | 3.01 |
| Max.Eff.Inten.(mm/h over (mi Storage Coeff. (mi Unit Hyd. Tpeak (mi | | .000 | 9.47 | 3.000 | 4.40 | 4.00 | 3.01 |
| over (mi Storage Coeff. (mi Unit Hyd. Tpeak (mi | (r) = 10 | 01.14 | | 38.24 | | | |
| Unit Hyd. Tpeak (mi | n) | 5.00 | | 5.00 | | | |
| UNIC HYA. TPEAK (MI | n) = | 1.30 | (11) | 4.22 (11 | .) | | |
| Unit Urd poply (am | n)= | 5.00 | | 5.00 | | | |
| | | | | | | LS* | |
| PEAK FLOW (cm | s) = | 0.4 | | 0.0 | 101A | 42 (iii |) |
| TIME TO PEAK (hr | s)= | 1.33 | | 1.33 | 1. | 33 | - / |
| PEAK FLOW (cm TIME TO PEAK (hr RUNOFF VOLUME (m | m) = 4 | 47.00 | | .00 1.33 19.99 48.00 | 44. 48. | 29 | |
| TOTAL RAINFALL (m RUNOFF COEFFICIENT | m) = 4 | 48.00 | | 48.00 | 48. | 00 | |
| RUNOFF COEFFICIENT | = | .98 | | .42 | • | 92 | |
| (ii) TIME STEP (DT THAN THE STOR (iii) PEAK FLOW DOE | AGE COEFF | ICIENT | • | | | | |
| ALIB ASHYD (0002) A = 1 DT=10.0 min I U NOTE: RAINFALL | .H. Tp(hrs | a) = n) = s) = | .47 5.00 .20 | Curve Num # of Line | nber (CN ear Res.(N |)= 80.0)= 3.00 | |
| | | | | | | | |
| TIME | RAIN 7 | | | D HYETOGH | | TIME | RAIN |
| hrs | mm/hr | hrs | mm/hr | hrs | mm/hr | hrs | mm/hr |
| | 3.45 1 | | | | | | 4.07 |
| | 3.93 1 | | | | | | 3.79 |
| .500 | 4.59 1. | .500 | 31.91 | 2.500 | 5.90 | | |
| | 5.58 1 7.26 1 | | | | | | |
| | 10.79 2 | | | | | | 3.17 |
| | | | 5.47 | 1 3.000 | 1.10 | 4.00 | .00 |
| Unit Hyd Qpeak (cm | .09 | 90 | | | | | |
| | m) = 1.50 m) = 16.59 m) = 47.49 | 00 96 99 | | | | | |
| (i) PEAK FLOW DOES | NOT INCLUI | de basi | EFLOW I | F ANY. | | | |

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| STANDHYD (0001) ID= 1 DT= 5.0 min | Area Total Im | (ha) = 1p (%) = 9 | .56 | Dir. Con | ın.(%)= | 99.00 | |
|--|---|--|---|--|--|------------------|---------------|
| | т | MPERVIO | IS PF | RVIOUS (| | | |
| Surface Area Dep. Storage Average Slope Length | (ha) = | .55 | | .01 1.00 | | | |
| Average Slope | (1000) = (%) = | 1.00 | | 2.00 | | | |
| Length | (m) = | 61.10 | | 40.00 | | | |
| Mannings n | = | .013 | | .250 | | | |
| NOTE: RAINFA | ALL WAS TR | RANSFORME | D TO | 5.0 MIN. | TIME ST | EP. | |
| | | TRA | NSFORME | ED HYETOG | GRAPH | | |
| | RAIN | | | | | | |
| nrs .083 | mm/hr 3.45 | nrs 1.083 | mm/nr 24.60 | nrs | mm/nr 7.83 | nrs 3.08 | mm/nr 4.07 |
| .167 | 3.45 | 1.167 | 24.60 | 2.167 | 7.83 | 3.17 | 4.07 |
| .250 | 3.93 | 1.250 | 101.14 | 2.250 | 6.71 | 3.25 | 3.79 |
| .333 417 | 3.93 4 59 | 1.333 | 31 91 | 2.333 | 6./1 5.90 | 3.33 3.42 | 3.79 |
| .500 | 4.59 | 1.500 | 31.91 | 2.500 | 5.90 | 3.50 | 3.55 |
| .583 | 5.58 | 1.583 | 17.31 | 2.583 | 5.28 | 3.58 | 3.35 |
| .667 | 5.58 | 1.667 | 17.31 | 2.667 | 5.28 | 3.67 | 3.35 |
| ./50 | 7.26 | 1.750 | 12.14 | 2.750 | 4.79 | 3.75 | 3.17 |
| .917 | 10.79 | 1.917 | 9.47 | 2.917 | 4.40 | 3.92 | 3.01 |
| 1.000 | <pre>mm/hr 3.45 3.45 3.93 3.93 4.59 4.59 5.58 5.58 7.26 7.26 10.79 10.79 </pre> | 2.000 | 9.47 | 3.000 | 4.40 | 4.00 | 3.01 |
| Max.Eff.Inten.(m over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak | m/hr)= | 101.14 | 1 | .91.19 | | | |
| over | (min) | 5.00 | | 5.00 | | | |
| Storage Coeff. Unit Hvd Theak | (min) = (min) = | 1.89 | (11) | 3.01 (1 5.00 | .1) | | |
| Unit Hyd. peak | (cms) = | .32 | | .28 | | | |
| | | | | | * TC | TALS* | |
| PEAK FLOW | (cms) = | .16 | | .00 | | .156 (ii 1.33 | i) |
| TIME TO PEAK | (nrs) = | 47.00 | | 19.99 | 4 | 1.33 | |
| | | | | ± > • > > | | | |
| TOTAL RAINFALL | (mm) = | 48.00 | | 48.00 | 4 | 18.00 | |
| PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICIEN | (mm) = NT = | 48.00 .98 | | 48.00 | 4 | .97 | |
| RUNOFF COEFFICIES | NT = | .98 | | .42 | | .97 | |
| TOTAL RAINFALL RUNOFF COEFFICIEN | NT = | .98 | | .42 | | .97 | |
| <pre>***** WARNING: STORAG! (i) CN PROCEDUI</pre> | nt = E COEFF. I RE SELECTE | .98 IS SMALLE ID FOR PE | R THAN | .42 TIME STE LOSSES: | IP ! | .97 | |
| <pre>kunoff Coefficien ***** WARNING: STORAGN (i) CN PROCEDUN CN* = 80</pre> | NT = E COEFF. I RE SELECTE 0.0 Ia | .98 S SMALLE D FOR PE = Dep. S | R THAN RVIOUS Storage | .42 TIME STE LOSSES: (Above) | IP ! | 18.00 .97 | |
| <pre>***** WARNING: STORAG! (i) CN PROCEDUI</pre> | RT = E COEFF. I RE SELECTE 0.0 Ia (DT) SHOUI | .98 S SMALLE D FOR PE Dep. S D BE SMA | R THAN RVIOUS Storage ALLER OF | .42 TIME STE LOSSES: (Above) | IP ! | .97 | |
| <pre>kunoff Coefficien ***** WARNING: STORAGN (i) CN PROCEDUN CN* = 80 (ii) TIME STEP</pre> | RI = E COEFF. I RE SELECTE 0.0 Ia (DT) SHOUI TORAGE COE | .98 S SMALLE D FOR PE Dep. S D BE SMA CFFICIENT | CR THAN CRVIOUS Storage ALLER OF | .42 TIME STE LOSSES: (Above) R EQUAL | IP! | .97 | |
| <pre>(i) CN PROCEDUI (i) CN PROCEDUI CN* = 8((ii) TIME STEP THAN THE S'</pre> | RI = E COEFF. I RE SELECTE 0.0 Ia (DT) SHOUI TORAGE COE | .98 S SMALLE D FOR PE Dep. S D BE SMA CFFICIENT | CR THAN CRVIOUS Storage ALLER OF | .42 TIME STE LOSSES: (Above) R EQUAL | IP! | .97 | |
| <pre>(i) CN PROCEDUI (i) CN PROCEDUI CN* = 8((ii) TIME STEP THAN THE S'</pre> | RI = E COEFF. I RE SELECTE 0.0 Ia (DT) SHOUI TORAGE COE | .98 S SMALLE D FOR PE Dep. S D BE SMA CFFICIENT | CR THAN CRVIOUS Storage ALLER OF | .42 TIME STE LOSSES: (Above) R EQUAL | IP! | .97 | |
| <pre>kNNOFF COEFFICIEN ***** WARNING: STORAGH (i) CN PROCEDUN CN* = 8((ii) TIME STEP THAN THE S: (iii) PEAK FLOW N</pre> | RI = E COEFF. I RE SELECTE 0.0 Ia (DT) SHOUI TORAGE COE | .98 S SMALLE D FOR PE Dep. S D BE SMA CFFICIENT | CR THAN CRVIOUS Storage ALLER OF | .42 TIME STE LOSSES: (Above) R EQUAL | IP! | .97 | |
| <pre>kNNOFF COEFFICIEN ***** WARNING: STORAGN (i) CN PROCEDUL CN* = 8((ii) TIME STEP THAN THE S? (iii) PEAK FLOW N</pre> | NI = E COEFF. I RE SELECTE 0.0 Ia (DT) SHOUI (DT) SHOUI TORAGE COE DOES NOT I | .98 S SMALLE D FOR PE D DEP. S D BE SMA FFFICIENT NCLUDE E | CR THAN CRVIOUS Storage LLER OF SASEFLOW | .42 TIME STE LOSSES: (Above) R EQUAL N IF ANY. | .₽! | .97 | |
| <pre>kNNOFF COEFFICIEN ***** WARNING: STORAGN (i) CN PROCEDUL CN* = 8((ii) TIME STEP THAN THE S? (iii) PEAK FLOW N</pre> | NI = E COEFF. I RE SELECTE 0.0 Ia (DT) SHOUI (DT) SHOUI TORAGE COE DOES NOT I | .98 S SMALLE D FOR PE D DEP. S D BE SMA FFFICIENT NCLUDE E | CR THAN CRVIOUS Storage LLER OF SASEFLOW | .42 TIME STE LOSSES: (Above) R EQUAL N IF ANY. | .₽! | .97 | |
| <pre>kNNOFF COEFFICIEN ***** WARNING: STORAGH (i) CN PROCEDUN CN* = 80 (ii) TIME STEP THAN THE S? (iii) PEAK FLOW N</pre> | NI = E COEFF. I RE SELECTE 0.0 Ia (DT) SHOUL TORAGE COE DOES NOT I AF (h 2): | .98 SS SMALLE D FOR PE = Dep. SM D BE SM2 SFFICIENT NCLUDE F COLUDE F | CR THAN CRVIOUS Storage LLER OF MASEFLOW | .42 TIME STE (Above) R EQUAL W IF ANY. | R.V. (mm) 16.60 | .97 | |
| <pre>kNNOFF COEFFICIEN ***** WARNING: STORAGH (i) CN PROCEDUN CN* = 8((ii) TIME STEP THAN THE S: (iii) PEAK FLOW N</pre> | RI = E COEFF. I RE SELECTE 0.0 Ia (DT) SHOUL TORAGE COE DOES NOT I | .98 SS SMALLE D FOR PE = Dep. SM SFFICIENT NCLUDE E REA QE ha) (c 47 .0 56 .1 | CR THAN CRVIOUS Ctorage LiLER OF MASEFLOW MASEFL | .42 TIME STE (Above) R EQUAL W IF ANY. TPEAK (hrs) 1.50 1.33 | R.V. (mm) 16.60 46.73 | .97 | |
| <pre>kNNOFF COEFFICIEN ***** WARNING: STORAGH (i) CN PROCEDUN CN* = 80 (ii) TIME STEP THAN THE S? (iii) PEAK FLOW N</pre> | NI = E COEFF. I RE SELECTE 0.0 Ia (DT) SHOUI DOES NOT I DOES NOT I | .98 S SMALLE D FOR PE D DE SMA FFICIENT NCLUDE F CALLER | CR THAN CRVIOUS Storage LLER OF ASEFLOV ASEFLOV CRAK (ms) 123 56 | .42 TIME STE (Above) R EQUAL N IF ANY. TPEAK (hrs) 1.50 1.33 | R.V. (mm) 16.60 46.73 | .97 | |
| <pre>kNNOFF COEFFICIEN ***** WARNING: STORAGH (i) CN PROCEDUN CN* = 80 (ii) TIME STEP THAN THE S? (iii) PEAK FLOW N</pre> | RI = E COEFF. I RE SELECTE (DO.) IA (DT) SHOUL TORAGE COE DOES NOT I | .98 CD FOR PE = Dep. S D BE SMA CFFICIENT NCLUDE E CA A A A A A A A A A A A A A | CR THAN CRVIOUS Ctorage LLER OF ASEFLOV PEAK mms) 23 56 | .42 TIME STE (Above) R EQUAL N IF ANY. TPEAK (hrs) 1.50 1.33 | R.V. (mm) 16.60 46.73 32.98 | .97 | |
| <pre>kNNOFF COEFFICIEN ***** WARNING: STORAGE (i) CN PROCEDUI CN* = 80 (ii) TIME STEP THAN THE ST: (iii) PEAK FLOW I ADD HYD (0004) 1 1 + 2 = 3 ID1= 1 (0002 + ID2= 2 (0002 ==================================</pre> | RI = E COEFF. I RE SELECTE (DO.) IA (DT) SHOUL TORAGE COE DOES NOT I | .98 CD FOR PE = Dep. S D BE SMA CFFICIENT NCLUDE E CA A A A A A A A A A A A A A | CR THAN CRVIOUS Ctorage LLER OF ASEFLOV PEAK mms) 23 56 | .42 TIME STE (Above) R EQUAL N IF ANY. TPEAK (hrs) 1.50 1.33 | R.V. (mm) 16.60 46.73 32.98 | .97 | |
| <pre>kNNOFF COEFFICIEN ***** WARNING: STORAGH (i) CN PROCEDUN CN* = 80 (ii) TIME STEP THAN THE S? (iii) PEAK FLOW N</pre> | NI = E COEFF. I RE SELECTE 0.0 Ia (DT) SHOUL TORAGE COE DOES NOT I | .98 CD FOR PE = Dep. S D BE SM2 CFFICIENT NCLUDE E REA QE ha) (c 56 .1 | CR THAN CRVIOUS Storage LLER OF ASSEFLOV CRAK CRASEFLOV CRAK CRASEFLOV | TIME STE (Above) (Above) EQUAL IF ANY. TPEAK (hrs) 1.50 1.33 | R.V. (mm) 16.60 46.73 32.98 | .97 | |
| <pre>kNNOFF COEFFICIEN ***** WARNING: STORAGH</pre> | NI = E COEFF. I RE SELECTE 0.0 Ia (DT) SHOUL TORAGE COE DOES NOT I | .98 CD FOR PE = Dep. S D BE SM2 CFFICIENT NCLUDE E REA QE ha) (c 56 .1 | CR THAN CRVIOUS Storage LLER OF ASSEFLOV CRAK CRASEFLOV CRAK CRASEFLOV | TIME STE (Above) (Above) EQUAL IF ANY. TPEAK (hrs) 1.50 1.33 | R.V. (mm) 16.60 46.73 32.98 | .97 | |
| <pre>kNNOFF COEFFICIEN ***** WARNING: STORAGH (i) CN PROCEDUI CN* = 8((ii) TIME STEP THAN THE S? (iii) PEAK FLOW I</pre> | NI = E COEFF. I RE SELECTE 0.0 Ia (DT) SHOUL TORAGE COE DOES NOT I | .98 CD FOR PE = Dep. S D BE SM2 CFFICIENT NCLUDE E REA QE ha) (c 56 .1 | CR THAN CRVIOUS Storage LLER OF ASSEFLOV CRAK CRASEFLOV CRAK CRASEFLOV | TIME STE (Above) (Above) EQUAL IF ANY. TPEAK (hrs) 1.50 1.33 | R.V. (mm) 16.60 46.73 32.98 | .97 | |
| <pre>kNNOFF COEFFICIEN ***** WARNING: STORAGH (i) CN PROCEDUI CN* = 8((ii) TIME STEP THAN THE ST (iii) PEAK FLOW I (iii) PEAK FLOW I 1 + 2 = 3 ID1= 1 (0002 + ID2= 2 (0002 ID1= 3 (0004 NOTE: PEAK FLOWS NOTE: PEAK FLOWS NOTE: PEAK FLOWS </pre> | AF | .98 CS SMALLE CD FOR PE = Dep. S D BE SMA CFFICIENT NCLUDE E CA A7 .0 56 .1 CA A7 .0 56 .1 CA CA A7 .0 56 .1 CA CA A7 .0 56 .1 CA CA A7 .0 56 .1 CA CA A7 .0 56 .1 CA CA A7 .0 56 .1 CA CA A7 .0 56 .1 CA A7 .0 CA A7 .0 CA | CR THAN CRVIOUS Ctorage LLER OF ASSEFLOV CRAK (ms) 223 56 56 | TIME STE (Above) EQUAL V IF ANY. TPEAK (hrs) 1.50 1.33 NS IF ANY TPEAK | R.V. (mm) 16.60 46.73 32.98 R.V. | .97 | |
| <pre>kNNOFF COEFFICIEN ***** WARNING: STORAGH (i) CN PROCEDUI CN* = 8((ii) TIME STEP THAN THE ST (iii) PEAK FLOW I (iii) PEAK FLOW I 1 + 2 = 3 ID1= 1 (0002 + ID2= 2 (0002 ID1= 3 (0004 NOTE: PEAK FLOWS NOTE: PEAK FLOWS NOTE: PEAK FLOWS </pre> | AF | .98 CS SMALLE CD FOR PE = Dep. S D BE SMA CFFICIENT NCLUDE E CA A7 .0 56 .1 CA A7 .0 56 .1 CA CA A7 .0 56 .1 CA CA A7 .0 56 .1 CA CA A7 .0 56 .1 CA CA A7 .0 56 .1 CA CA A7 .0 56 .1 CA CA A7 .0 56 .1 CA A7 .0 CA A7 .0 CA | CR THAN CRVIOUS Ctorage LLER OF ASSEFLOV CRAK (ms) 223 56 56 | TIME STE (Above) EQUAL V IF ANY. TPEAK (hrs) 1.50 1.33 NS IF ANY TPEAK | R.V. (mm) 16.60 46.73 32.98 R.V. | .97 | |
| <pre>kNNOFF COEFFICIEN ***** WARNING: STORAGH (i) CN PROCEDUI CN* = 8((ii) TIME STEP THAN THE ST (iii) PEAK FLOW I (iii) PEAK FLOW I 1 + 2 = 3 ID1= 1 (0002 + ID2= 2 (0002 ID1= 3 (0004 NOTE: PEAK FLOWS NOTE: PEAK FLOWS NOTE: PEAK FLOWS </pre> | AF | .98 CS SMALLE CD FOR PE = Dep. S D BE SMA CFFICIENT NCLUDE E CA A7 .0 56 .1 CA A7 .0 56 .1 CA CA A7 .0 56 .1 CA CA A7 .0 56 .1 CA CA A7 .0 56 .1 CA CA A7 .0 56 .1 CA CA A7 .0 56 .1 CA CA A7 .0 56 .1 CA A7 .0 CA A7 .0 CA | CR THAN CRVIOUS Ctorage LLER OF ASSEFLOV CRAK (ms) 223 56 56 | TIME STE (Above) EQUAL V IF ANY. TPEAK (hrs) 1.50 1.33 NS IF ANY TPEAK | R.V. (mm) 16.60 46.73 32.98 R.V. | .97 | |
| <pre>kNNOFF COEFFICIEN ***** WARNING: STORAGH (i) CN PROCEDUI CN* = 8((ii) TIME STEP THAN THE S? (iii) PEAK FLOW 1</pre> | NI = E COEFF. I RE SELECTE 0.0 Ia (DT) SHOUL TORAGE COE DOES NOT I | S SMALLE D FOR PE = Dep. SMA D BE SMA EFFICIENT NCLUDE E CALLER (C 47 .C 56 .1 CALLER 03 .1 CALLER (C 03 .1 CALLER (C 03 .1 CALLER (C 03 .1 CALLER (C 03 .1 CALLER (C 03 .1 (C 03 .1 (C) . | PEAK PEAK PEAK PEAK PEAK PEAK PEAK PEAK | .42 TIME STE (Above) R EQUAL N IF ANY. TPEAK (hrs) 1.33 NS IF ANY TPEAK (hrs) 1.33 NS IF ANY TPEAK (hrs) 1.33 | R.V. (mm) 16.60 46.73 32.98 7. R.V. (mm) 44.29 32.98 | .97 | |
| <pre>kNNOFF COEFFICIEN ***** WARNING: STORAGH (i) CN PROCEDUI CN* = 8((ii) TIME STEP THAN THE ST (iii) PEAK FLOW I (iii) PEAK FLOW I 1 + 2 = 3 ID1= 1 (0002 + ID2= 2 (0002 ID1= 3 (0004 NOTE: PEAK FLOWS NOTE: PEAK FLOWS NOTE: PEAK FLOWS </pre> | RI = E COEFF. I RE SELECTE 0.0 Ia (DT) SHOUI TORAGE COE DOES NOT I | S SMALLE D FOR PE = Dep. S D BE SMA EFFICIENT NCLUDE E CA A7 .(56 .1 CA CA CA CA CA CA CA CA CA CA | CR THAN CRVIOUS Corage LLER OF CASEFLOV CRAK CRAK CRAK CRAK CRAK CRAK CRAK CRAK CRAK CRAK CRAK CRAK CRAC CRA | TIME STE LOSSES: (Above) R EQUAL N IF ANY. TPEAK (hrs) 1.33 NS IF ANY TPEAK (hrs) 1.33 I.33 NS IF ANY | R.V. (mm) 16.60 46.73 32.98 | .97 | |
| <pre>kNNOFF COEFFICIEN ***** WARNING: STORAGH (i) CN PROCEDUI CN* = 8((ii) TIME STEP THAN THE ST (iii) PEAK FLOW I ADD HYD (0004) 1 + 2 = 3 TD1= 1 (0007 H ID2= 2 (0007 TD1= 1 (0007 NOTE: PEAK FLOWS NOTE: PEAK FLOWS TD1= 1 (0007 ADD HYD (0005) 1 + 2 = 3 TD1= 1 (0007 H ID2= 2 (007 H ID2= 2 (00</pre> | <pre>NI = E COEFF. I RE SELECTE O.0 Ia (DT) SHOUL TORAGE COE DOES NOT I</pre> | S SMALLE D FOR PE = Dep. S D BE SMA SFFICIENT NCLUDE E CAR QE (c) 47 .C 56 .1 | PR THAN RVIOUS Storage LLER OF ASSEFLOV PEAK ms) 23 56 | .42 TIME STE (Above) R EQUAL W IF ANY. TPEAK (hrs) 1.33 WS IF ANY TPEAK (hrs) 1.33 I.33 I.33 I.33 | R.V. (mm) 16.60 46.73 32.98 | .97 | |
| <pre>kNNOFF COEFFICIEN ****** WARNING: STORAGH (i) CN PROCEDUI CN* = 8((ii) TIME STEP THAN THE S? (iii) PEAK FLOW I ADD HYD (0004) 1 1 + 2 = 3 ID1= 1 (0007 + ID2= 2 (0007 ID1= 1 (0007 NOTE: PEAK FLOWS NOTE: PEAK FLOWS ID1= 1 (0007 + ID2= 2 (0007 ID1= 1 (0007</pre> | RI = E COEFF. I RE SELECTE (D.0 Ia (DT) SHOUI TORAGE COE DOES NOT I | S SMALLE CD FOR PE = Dep. S D BE SMA EFFICIENT NCLUDE E CA A7 . (C 47 . (C 56 . 1) CNCLUDE E CA CA CA CA CA CA CA CA CA CA | CR THAN CRVIOUS Corace LLER OF CASEFLOV CRAK CRA | .42 TIME STE (Above) R EQUAL N IF ANY. | R.V. (mm) 16.60 46.73 32.98 7. R.V. (mm) 44.29 32.98 34.50 7. | .91 | |
| <pre>kNNOFF COEFFICIEN ***** WARNING: STORAGH (i) CN PROCEDUN CN* = 8((ii) TIME STEP THAN THE S? (iii) PEAK FLOW I ADD HYD (0004) 1 1 + 2 = 3 ID1= 1 (0007 ID1= 1 (0007 ID = 3 (0007 NOTE: PEAK FLOWS ID1= 1 (0007 ID1= 3 (000</pre> | RI = E COEFF. I RE SELECTE (D.0 Ia (DT) SHOUI TORAGE COE DOES NOT I | S SMALLE CD FOR PE = Dep. S D BE SMA EFFICIENT NCLUDE E CA A7 . (C 47 . (C 56 . 1) CNCLUDE E CA CA CA CA CA CA CA CA CA CA | CR THAN CRVIOUS Corace LLER OF CASEFLOV CRAK CRA | .42 TIME STE (Above) R EQUAL N IF ANY. | R.V. (mm) 16.60 46.73 32.98 7. R.V. (mm) 44.29 32.98 34.50 7. | .91 | |
| <pre>kNNOFF COEFFICIEN ****** WARNING: STORAGH (i) CN PROCEDUI CN* = 8((ii) TIME STEP THAN THE S? (iii) PEAK FLOW I ADD HYD (0004) 1 1 + 2 = 3 ID1= 1 (0007 + ID2= 2 (0007 ID1= 1 (0007 NOTE: PEAK FLOWS NOTE: PEAK FLOWS ID1= 1 (0007 + ID2= 2 (0007 ID1= 1 (0007</pre> | RI = E COEFF. I RE SELECTE (D.0 Ia (DT) SHOUI TORAGE COE DOES NOT I | S SMALLE CD FOR PE = Dep. S D BE SMA EFFICIENT NCLUDE E CA A7 . (C 47 . (C 56 . 1) CNCLUDE E CA CA CA CA CA CA CA CA CA CA | CR THAN CRVIOUS Corace LLER OF CASEFLOV CRAK CRA | .42 TIME STE (Above) R EQUAL N IF ANY. | R.V. (mm) 16.60 46.73 32.98 7. R.V. (mm) 44.29 32.98 34.50 7. | .91 | |
| <pre>kNNOFF COEFFICIEN ****** WARNING: STORAGH (i) CN PROCEDUI CN* = 8((i) TIME STEP THAN THE STEP (iii) PEAK FLOW I ADD HYD (0004) 1 1 + 2 = 3 ID1= 1 (0007 ID1= 1 (0007 ID1= 1 (0007 ID1= 1 (0007) 1 1 + 2 = 3 ID1= 1 (0007 NOTE: PEAK FLOW3 ID1= 1 (0007 ID1=</pre> | NI = E COEFF. I RE SELECTE (D) Ia (DT) SHOUI TORAGE COE DOES NOT I | S SMALLE CD FOR PE = Dep. S D BE SMA FFFICIENT NCLUDE E CA CA CA CA CA CA CA CA CA CA | CR THAN CRVIOUS Corace LLER OF CASEFLOW CRAK CRA | .42 TIME STE (Above) R EQUAL N IF ANY. | R.V. (mm) 16.60 46.73 32.98 7. R.V. (mm) 44.29 32.98 34.50 7. | .91 | |
| <pre>kNNOFF COEFFICIEN ***** WARNING: STORAGH (i) CN PROCEDUI CN* = 8((ii) TIME STEP THAN THE S? (iii) PEAK FLOW I ADD HYD (0004) 1 1 + 2 = 3 ID1= 1 (0007 H ID2= 2 (0007 ID = 3 (0007 NOTE: PEAK FLOW? ID = 3 (0007 NOTE: PEAK FLOW? ID1= 1 (0005) 1 1 + 2 = 3 ID1= 1 (0007 H ID2= 2 (0007 ID1= 1 (0007 H ID2= 2 (0007 ID1= 1 (0007 H ID2= 2 (0007 ID1= 3 (007 ID1= 3 (007</pre> | NI = E COEFF. I RE SELECTE (D) Ia (DT) SHOUI TORAGE COE DOES NOT I | S SMALLE CD FOR PE = Dep. S D BE SMA FFFICIENT NCLUDE E CA CA CA CA CA CA CA CA CA CA | CR THAN CRVIOUS Corace LLER OF CASEFLOW CRAK CRA | .42 TIME STE (Above) R EQUAL N IF ANY. | R.V. (mm) 16.60 46.73 32.98 7. R.V. (mm) 44.29 32.98 34.50 7. | .91 | |

| | .0000 | (ha) . | a.m.) .0000 | (cms) .0580 .0740 | (ha | .m.) .0136 | |
|---|--|--|---|---|--|---|---|
| | .0170 |) . | .0034 | .0740 .0870 .0970 | | .0170 | |
| | .0280 |) . | .0068 | 0870 | | .0204 | |
| | | | | | | | |
| | | AREA | QPE (cm | AK T | PEAK hrs) | | |
| INFLOW : ID= 2 (00 | 005) | 1.190 | . 2 | 17 | 1.33 | (mm) 34.50 | |
| OUTFLOW: ID= 1 (00 | 006) | 1.190 | .0 | 68 | 1.58 | 34.46 | |
| DEAL | Z ELOW | PEDIIC | TON DO | ut/Qin](%) | - 31 16 | | |
| | | | | | | | |
| MAX | IMUM STOP | RAGE U | JSED | (min) (ha.m.) | = .01 | 58 | |
| | | | | | | | |
| **** | | | | | | | |
| ** SIMULATION NUMBER: | | | | | | | |
| | | | | | | | |
| | TDD | | | | | | |
| CHICAGO STORM Ptotal= 56.03 mm | IDF Curv | ve parar | | A= 926.900 B= 5.000 | | | |
| | | | | C= .762 | | | |
| | used in | INTI | ENSITY = | A / (t + | B)^C | | |
| | Duration | n of sto | orm = | 4.00 hrs | | | |
| | | | | 0.00 min | | | |
| | Time to | peak ra | atio = | .33 | | | |
| TIME | RAIN | TIME | RAIN | TIME | RAIN | TIME | RAIN |
| hrs | mm/hr | hrs | mm/hr | hrs : 2.17 | mm/hr | hrs | mm/hr |
| .17 | 4.04 4.60 | 1.17 | 28.70 | 2.17 | 9.15 7.85 | 3.17 | 4.77 |
| .50 | 5.37 | 1.50 | 37.22 | 2.33 2.50 2.67 | 6.90 | 3.50 | 4.16 |
| . 67 | 6.54 | 1.67 | 20.22 | 2.67 | 6.18 | 3.67 | 3.92 |
| .83 | 12.61 | 2.00 | 11.07 | 2.83 3.00 | 5.15 | 3.83 4.00 | 3.53 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| CALIB STANDHYD (0003) | Aroa | (ba) - | 1.6 | | | | |
| ID= 1 DT= 5.0 min | Total Imp | (11a) = (%) = (%) | 90.00 | Dir. Conn. | (%)= 9 | 0.00 | |
| | | | | | | | |
| | | | 10 00 | | | | |
| Surface Area | (ha) = | IPERVIOU .14 | JS PE | RVIOUS (i) .02 | | | |
| Surface Area Dep. Storage | (ha) = (mm) = | .14 | | .02 | | | |
| Surface Area Dep. Storage Average Slope | (ha) = (mm) = | .14 | | .02 | | | |
| Average Slope Length | IN (ha) = (mm) = (%) = (m) = = | .14 | | .02 | | | |
| Average Slope Length Mannings n | (ha) = (mm) = (%) = (m) = = | .14 1.00 1.00 32.70 .013 | | .02 1.00 2.00 40.00 .250 | | | |
| Average Slope Length | (ha) = (mm) = (%) = (m) = = | .14 1.00 1.00 32.70 .013 | | .02 1.00 2.00 40.00 .250 | IME STE | Ρ. | |
| Average Slope Length Mannings n | (ha) = (mm) = (%) = (m) = = LL WAS TRA | .14 1.00 1.00 32.70 .013 | ed to | .02 1.00 2.00 40.00 .250 5.0 MIN. T | | Ρ. | |
| Average Slope Length Mannings n NOTE: RAINFAI | (ha) = (mm) = (%) = (m) = = LL WAS TRA | .14 1.00 1.00 32.70 .013 ANSFORM | ED TO ANSFORME | .02 1.00 2.00 40.00 .250 5.0 MIN. T D HYETOGRA | PH | | DATN |
| Average Slope Length Mannings n NOTE: RAINFAI TIME | (ha) = (mm) = (%) = (m) = = LL WAS TR/ RAIN | .14 1.00 1.00 32.70 .013 ANSFORM | ED TO ANSFORME RAIN | .02 1.00 2.00 40.00 .250 5.0 MIN. T D HYETOGRA TIME | PH RAIN | TIME | |
| Average Slope Length Mannings n NOTE: RAINFAJ TIME hrs .083 | (ha) = (mm) = (%) = (m) = = LL WAS TRA RAIN 4.04 | .14 1.00 32.70 .013 ANSFORMA TIME hrs 1.083 | ED TO ANSFORME RAIN mm/hr 28.70 | .02 1.00 2.00 40.00 .250 5.0 MIN. T D HYETOGRA TIME hrs 2.083 | PH RAIN mm/hr 9.15 | TIME hrs 3.08 | mm/hr 4.77 |
| Average Slope Length Mannings n NOTE: RAINFAI TIME hrs .083 .167 | (ha) = (mm) = (%) = (m) = = LL WAS TRA RAIN mm/hr 4.04 4.04 | .14 1.00 1.00 32.70 .013 ANSFORMA TIME hrs 1.083 1.167 | ED TO ANSFORME RAIN mm/hr 28.70 28.70 | .02 1.00 2.00 40.00 .250 5.0 MIN. T D HYETOGRA TIME hrs 2.083 2.167 | PH RAIN mm/hr 9.15 9.15 | TIME hrs 3.08 3.17 | mm/hr 4.77 4.77 |
| Average Slope Length Mannings n NOTE: RAINFAJ TIME hrs .083 | (ha) = (mm) = (%) = (m) = = LL WAS TR2 RAIN mm/hr 4.04 4.04 4.60 | .14 1.00 1.00 32.70 .013 ANSFORM TIME hrs 1.083 1.167 1.250 | ED TO ANSFORME RAIN mm/hr 28.70 28.70 117.72 | .02 1.00 2.00 40.00 .250 5.0 MIN. T D HYETOGRA TIME hrs 2.083 | PH RAIN mm/hr 9.15 | TIME hrs 3.08 3.17 3.25 | mm/hr 4.77 4.77 4.44 |
| Average Slope Length Mannings n NOTE: RAINFAI TIME hrs .083 .167 .250 .333 .417 | (ha) = (mm) = (%) = (m) = = LL WAS TR# RAIN mm/hr 4.04 4.04 4.60 4.60 5.37 | .14 1.00 32.70 .013 ANSFORM TIME hrs 1.083 1.167 1.250 1.333 1.417 | ED TO ANSFORME RAIN mm/hr 28.70 28.70 117.72 117.72 37.22 | .02 1.00 2.00 40.00 .250 5.0 MIN. T D HYETOGRA TIME hrs 2.083 2.167 2.250 2.333 2.417 | PH RAIN mm/hr 9.15 9.15 7.85 7.85 6.90 | TIME hrs 3.08 3.17 3.25 3.33 3.42 | mm/hr 4.77 4.77 4.44 4.44 4.16 |
| Average Slope Length Mannings n NOTE: RAINFAI TIME hrs .083 .167 .250 .333 .417 .500 | (ha) = (mm) = (%) = (m) = = RAIN Mm/hr 4.04 4.04 4.60 5.37 5.37 | .14 1.00 32.70 .013 ANSFORME TIME hrs 1.083 1.167 1.250 1.333 1.417 1.500 | ED TO ANSFORME RAIN mm/hr 28.70 28.70 117.72 117.72 37.22 37.22 | .02 1.00 2.00 40.00 .250 5.0 MIN. T D HYETOGRA TIME hrs 2.083 2.167 2.250 2.333 2.417 2.500 | PH RAIN 9.15 9.15 7.85 7.85 6.90 6.90 | TIME hrs 3.08 3.17 3.25 3.33 3.42 3.50 | mm/hr 4.77 4.77 4.44 4.44 4.16 4.16 |
| Average Slope Length Mannings n NOTE: RAINFAI TIME hrs .083 .167 .250 .333 .417 | (ha) = (mm) = (%) = (m) = = LL WAS TR# RAIN mm/hr 4.04 4.04 4.60 4.60 5.37 | .14 1.00 32.70 .013 ANSFORME TIME hrs 1.083 1.167 1.250 1.333 1.417 1.500 1.583 | ED TO ANSFORME RAIN mm/hr 28.70 28.70 117.72 117.72 37.22 20.22 | .02 1.00 2.00 40.00 .250 5.0 MIN. T D HYETOGRA TIME hrs 2.083 2.167 2.250 2.333 2.417 2.500 2.583 | PH RAIN 9.15 9.15 7.85 7.85 6.90 6.90 6.18 | TIME hrs 3.08 3.17 3.25 3.33 3.42 3.50 3.58 | mm/hr 4.77 4.77 4.44 4.44 4.16 4.16 3.92 |
| Average Slope Length Mannings n NOTE: RAINFAI hrs .083 .167 .250 .333 .417 .500 .583 .667 .750 | (ha) = (mm) = (%) = (m) = = LL WAS TRJ RAIN mm/hr 4.04 4.04 4.04 4.60 5.37 5.37 6.54 6.54 8.49 | .14 1.00 32.70 .013 ANSFORMH TRJ TIME hrs 1.083 1.167 1.250 1.333 1.417 1.500 1.583 1.667 1.750 | ED TO ANSFORME RAIN mm/hr 28.70 117.72 117.72 37.22 37.22 20.22 20.22 14.18 | .02 1.00 2.00 40.00 .250 5.0 MIN. T D HYETOGRA TIME hrs 2.083 2.167 2.250 2.333 2.417 2.500 2.583 2.667 2.750 | PH RAIN 9.15 9.15 7.85 7.85 6.90 6.18 6.18 5.61 | TIME hrs 3.08 3.17 3.25 3.33 3.42 3.50 3.58 3.67 3.75 | mm/hr 4.77 4.44 4.44 4.16 4.16 3.92 3.92 3.71 |
| Average Slope Length Mannings n NOTE: RAINFAI hrs .083 .167 .250 .333 .417 .500 .583 .667 .750 .833 | (ha) = (mm) = (%) = (m) = = LL WAS TRA RAIN 4.04 4.04 4.04 4.04 4.00 5.37 5.37 6.54 8.49 8.49 | .14 1.00 32.70 .013 ANSFORMI TRJ TIME hrs 1.083 1.167 1.250 1.333 1.417 1.500 1.417 1.500 1.417 1.750 1.750 | ED TO ANSFORME RAIN mm/hr 28.70 117.72 37.22 37.22 20.22 20.22 20.22 14.18 14.18 | .02 1.00 2.00 40.00 .250 5.0 MIN. T D HYETOGRA TIME hrs 2.083 2.167 2.250 2.333 2.417 2.500 2.583 2.667 2.750 2.833 | PH RAIN mm/hr 9.15 9.15 7.85 6.90 6.90 6.18 6.18 5.61 | TIME hrs 3.08 3.17 3.25 3.33 3.42 3.50 3.58 3.67 3.75 3.83 | RAIN mm/hr 4.77 4.44 4.44 4.16 3.92 3.92 3.71 3.71 2.52 |
| Average Slope Length Mannings n NOTE: RAINFAI hrs .083 .167 .250 .333 .417 .500 .583 .667 .750 .833 .917 | (ha) = (mm) = (%) = (m) = = RAIN mm/hr 4.04 4.04 4.04 4.04 5.37 5.37 5.37 6.54 6.54 8.49 8.49 12.61 | .14 1.00 32.70 .013 ANSFORME TIME hrs 1.083 1.167 1.250 1.333 1.417 1.500 1.583 1.667 1.750 1.833 1.667 1.750 | ED TO ANSFORME RAIN mm/hr 28.70 28.70 117.72 37.22 37.22 20.22 20.22 14.18 14.18 11.07 | .02 1.00 2.00 40.00 .250 5.0 MIN. T D HYETOGRA TIME hrs 1 2.083 2.167 2.250 2.333 2.417 2.500 2.583 2.667 2.750 2.833 2.917 | PH RAIN 9.15 9.15 7.85 6.90 6.18 6.18 5.61 5.61 5.15 | TIME hrs 3.08 3.17 3.25 3.33 3.42 3.50 3.58 3.67 3.75 3.83 3.92 | mm/hr 4.77 4.44 4.44 4.16 4.16 3.92 3.92 3.71 3.71 3.53 |
| Average Slope Length Mannings n NOTE: RAINFAI hrs .083 .167 .250 .333 .417 .500 .583 .667 .750 .833 .917 1.000 | (ha) = (mm) = (%) = (m) = = LL WAS TR2 RAIN mm/hr 4.04 4.04 4.00 4.60 5.37 5.37 6.54 8.49 8.49 12.61 12.61 | .14 1.00 32.70 .013 ANSFORME TIME hrs 1.083 1.67 1.250 1.333 1.417 1.583 1.667 1.583 1.667 1.583 1.67 2.500 | ED TO ANSFORME RAIN mm/hr 28.70 117.72 37.22 37.22 20.22 20.22 20.22 14.18 14.18 14.18 11.07 | .02 1.00 2.00 40.00 .250 5.0 MIN. T D HYETOGRA TIME hrs 2.083 2.167 2.250 2.333 2.417 2.500 2.583 2.667 2.750 2.833 2.917 3.000 | PH RAIN 9.15 9.15 7.85 6.90 6.18 6.18 5.61 5.61 5.15 | TIME hrs 3.08 3.17 3.25 3.33 3.42 3.50 3.58 3.67 3.75 3.83 | mm/hr 4.77 4.44 4.44 4.16 4.16 3.92 3.92 3.71 3.71 |
| Average Slope Length Mannings n NOTE: RAINFAI hrs .083 .167 .250 .333 .417 .500 .583 .667 .750 .833 .917 1.000 Max.Eff.Inten.(mm, | <pre>(ha) = (mm) = (%) = (m) = = LL WAS TRA RAIN Mm/hr 4.04 4.04 4.04 4.00 5.37 6.54 6.54 8.49 12.61 12.61 /hr) =</pre> | .14 1.00 32.70 .013 ANSFORMA TRJ TIME hrs 1.083 1.167 1.250 1.333 1.417 1.500 1.333 1.417 1.750 | ED TO ANSFORME RAIN mm/hr 28.70 117.72 117.72 37.22 20.22 20.22 14.18 14.18 11.07 11.07 | .02 1.00 2.00 40.00 .250 5.0 MIN. T D HYETOGRA TIME hrs 2.083 2.167 2.250 2.333 2.417 2.500 2.583 2.667 2.750 2.750 2.833 2.917 3.000 49.58 | PH RAIN 9.15 9.15 7.85 6.90 6.18 6.18 5.61 5.61 5.15 | TIME hrs 3.08 3.17 3.25 3.33 3.42 3.50 3.58 3.67 3.75 3.83 3.92 | mm/hr 4.77 4.44 4.44 4.16 4.16 3.92 3.92 3.71 3.71 3.53 |
| Average Slope Length Mannings n NOTE: RAINFAI hrs .083 .167 .250 .333 .417 .500 .583 .667 .750 .833 .917 1.000 | <pre>(ha) = (mm) = (%) = (m) = = LL WAS TRJ RAIN Mm/hr 4.04 4.04 4.04 4.04 4.06 5.37 6.54 8.49 12.61 12.61 12.61 /hr) = nin)</pre> | .14 1.00 32.70 .013 ANSFORME TIME hrs 1.083 1.167 1.250 1.333 1.417 1.500 1.583 1.667 1.750 1.833 1.917 2.000 117.72 5.00 | ED TO ANSFORME RAIN mm/hr 28.70 117.72 117.72 37.22 20.22 20.22 14.18 14.18 11.07 11.07 | .02 1.00 2.00 40.00 .250 5.0 MIN. T D HYETOGRA TIME hrs 2.083 2.167 2.250 2.333 2.417 2.500 2.583 2.667 2.750 2.833 2.917 3.000 | PH RAIN 9.15 9.15 7.85 6.90 6.18 6.18 5.61 5.61 5.15 | TIME hrs 3.08 3.17 3.25 3.33 3.42 3.50 3.58 3.67 3.75 3.83 3.92 | mm/hr 4.77 4.44 4.44 4.16 4.16 3.92 3.92 3.71 3.71 3.53 |
| Average Slope Length Mannings n NOTE: RAINFAI hrs .083 .167 .250 .333 .417 .500 .583 .667 .750 .833 .917 1.000 Max.Eff.Inten.(mm, over (r Storage Coeff. (r Unit Hyd. Tpeak (r | <pre>(ha) = (mm) = (mm) = (%) = (m) = = LL WAS TR2 RAIN mm/hr 4.04 4.04 4.04 4.60 5.37 6.54 8.49 8.49 12.61 12.61 /hr) = nin) nin) = nin) =</pre> | .14 1.00 32.70 .013 ANSFORME TIME hrs 1.083 1.167 1.250 1.333 1.417 1.500 1.583 1.667 1.750 1.583 1.917 2.000 117.72 5.000 | ED TO ANSFORME RAIN mm/hr 28.70 28.70 117.72 37.22 37.22 20.22 20.22 20.22 14.18 14.18 11.07 11.07 | .02 1.00 2.00 40.00 .250 5.0 MIN. T D HYETOGRA TIME hrs 2.083 2.167 2.250 2.333 2.417 2.500 2.583 2.667 2.750 2.833 2.917 3.000 49.58 5.00 3.97 (ii) 5.00 | PH RAIN 9.15 9.15 7.85 6.90 6.18 6.18 5.61 5.61 5.15 | TIME hrs 3.08 3.17 3.25 3.33 3.42 3.50 3.58 3.67 3.75 3.83 3.92 | mm/hr 4.77 4.44 4.44 4.16 4.16 3.92 3.92 3.71 3.71 3.53 |
| Average Slope Length Mannings n NOTE: RAINFAI TIME hrs .083 .167 .250 .333 .417 .500 .583 .667 .750 .833 .917 1.000 Max.Eff.Inten.(mm, over (r Storage Coeff. (r | <pre>(ha) = (mm) = (mm) = (%) = (m) = = LL WAS TR2 RAIN mm/hr 4.04 4.04 4.04 4.60 5.37 6.54 8.49 8.49 12.61 12.61 /hr) = nin) nin) = nin) =</pre> | .14 1.00 32.70 .013 ANSFORME TIME hrs 1.083 1.167 1.250 1.333 1.417 1.500 1.583 1.667 1.750 1.583 1.917 2.000 117.72 5.00 1.22 | ED TO ANSFORME RAIN mm/hr 28.70 28.70 117.72 37.22 37.22 20.22 20.22 20.22 14.18 14.18 11.07 11.07 | .02 1.00 2.00 40.00 .250 5.0 MIN. T D HYETOGRA TIME hrs ! 2.083 ! 2.167 ! 2.250 ! 2.333 ! 2.167 ! 2.250 ! 2.333 ! 2.417 ! 2.500 ! 2.583 ! 2.667 ! 2.583 ! 2.667 ! 2.833 ! 2.917 ! 3.000 49.58 5.00 3.97 (ii) | PH RAIN 9.15 9.15 7.85 7.85 6.90 6.90 6.18 6.18 5.61 5.61 5.15 | TIME hrs 3.08 3.17 3.25 3.33 3.42 3.50 3.58 3.67 3.75 3.83 3.92 4.00 | mm/hr 4.77 4.44 4.44 4.16 4.16 3.92 3.92 3.71 3.71 3.53 |
| Average Slope Length Mannings n NOTE: RAINFAI hrs .083 .167 .250 .333 .417 .500 .583 .667 .750 .833 .917 1.000 Max.Eff.Inten.(mm, over (r Storage Coeff. (r Unit Hyd. Tpeak (r Unit Hyd. peak (r | <pre>(ha) = (mm) = (mm) = (%) = (m) = = LL WAS TR2 RAIN mm/hr 4.04 4.04 4.04 4.60 5.37 6.54 8.49 8.49 12.61 12.61 /hr) = nin) nin) = nin) =</pre> | .14 1.00 32.70 .013 ANSFORMA TRJ TIME hrs 1.083 1.167 1.250 1.333 1.417 1.500 1.533 1.667 1.750 1.833 1.917 2.000 117.72 5.00 1.22 5.00 .33 | ED TO ANSFORME RAIN mm/hr 28.70 117.72 117.72 37.22 37.22 20.22 14.18 14.18 11.07 11.07 (ii) | .02 1.00 2.00 40.00 .250 5.0 MIN. T D HYETOGRA TIME hrs 2.083 2.167 2.250 2.333 2.417 2.500 2.583 2.667 2.750 2.833 2.917 3.000 49.58 5.00 3.97 (ii) 5.00 | PH RAIN 9.15 9.15 7.85 7.85 7.85 6.90 6.90 6.90 6.90 6.18 5.61 5.61 5.15 5.15 | TIME hrs 3.08 3.17 3.25 3.33 3.42 3.50 3.58 3.67 3.75 3.83 3.92 4.00 | mm/hr 4.77 4.47 4.44 4.46 4.16 3.92 3.92 3.71 3.53 3.53 |
| Average Slope Length Mannings n NOTE: RAINFAI TIME hrs .083 .167 .250 .333 .417 .500 .583 .667 .750 .833 .917 1.000 Max.Eff.Inten.(mm, over (r Storage Coeff. (r Unit Hyd. Tpeak (r Unit Hyd. peak (c PEAK FLOW (c | <pre>(ha) = (mm) = (%) = (m) = = RAIN Mm/hr 4.04 4.04 4.04 4.00 5.37 6.54 8.49 12.61 12.61 12.61 12.61 (/hr) = nin) nin) = nin) = cms) =</pre> | .14 1.00 32.70 .013 ANSFORME TIME hrs 1.083 1.167 1.250 1.333 1.417 1.500 1.583 1.667 1.750 1.583 1.917 2.000 117.72 5.000 | ED TO ANSFORME RAIN mm/hr 28.70 28.70 117.72 37.22 37.22 20.22 14.18 11.07 11.07 (ii) | .02 1.00 2.00 40.00 .250 5.0 MIN. T D HYETOGRA TIME hrs ! 2.083 ! 2.167 ! 2.250 ! 2.333 ! 2.417 ! 2.500 ! 2.583 ! 2.667 ! 2.750 ! 2.833 ! 2.917 ! 3.000 49.58 5.00 3.97 (ii) 5.00 .24 | PH RAIN mm/hr 9.15 9.15 7.85 6.90 6.90 6.90 6.18 5.61 5.61 5.15 5.15 *TOT. | TIME hrs 3.08 3.17 3.25 3.33 3.42 3.50 3.58 3.67 3.75 3.83 3.92 4.00 | mm/hr 4.77 4.47 4.44 4.46 4.16 3.92 3.92 3.71 3.53 3.53 |

| RUNOFF VOLUME | (mm) = | 55.03 | 25.55 | 52.07 | |
|---|-----------------|----------------------------------|------------------------|---|---------------|
| RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICIE | (mm) = | 56.03 | 56.03 | 56.03 .93 | |
| KUNOFF COEFFICIE | - 11/1 | . 90 | .40 | . 95 | |
| ***** WARNING: STORAG | E COEFF. I | S SMALLER THAN | I TIME STEP | ! | |
| (i) CN PROCEDU | | | | | |
| CN* = 8 (ii) TIME STEP | | = Dep. Storage D BE SMALLER (| | | |
| | TORAGE COE | FFICIENT. | | | |
| (III) PEAK FLOW | DOES NOT I | NCLUDE BASEFLO | JW IF ANI. | | |
| | | | | | |
| CALIB | | | | | |
| NASHYD (0002) ID= 1 DT=10.0 min | Area Ia | (na) = .4/ (mm) = 5.00 | # of Line | ar Res.(N) = 3.00 |) |
| | U.H. Tp(1 | hrs)= .20 | | | |
| NOTE: RAINF | ALL WAS TR | ANSFORMED TO | 10.0 MIN. | TIME STEP. | |
| | | | | | |
| | | TRANSFORM | | | |
| TIME | mm/hr | hrs mm/hi | r TIME | RAIN TIME mm/hr hrs | mm/hr |
| .167 | 4.04 | 1.167 28.70 |) 2.167 | 9.15 3.17 | 4.77 |
| .500 | 5.37 | 1.500 37.22 | 2 2.500 | 6.90 3.50 | 4.16 |
| .667 | 6.54 8 49 | 1.667 20.22 | 2 2.667 | 6.18 3.67 5.61 3.83 | 3.92 3.71 |
| 1.000 | 12.61 | 2.000 11.0 | 7 3.000 | mm/hr hrs 9.15 3.17 7.85 3.33 6.90 3.50 6.18 3.67 5.61 3.83 5.15 4.00 | .00 |
| Unit Hyd Qpeak | | | | | |
| PEAK FLOW | (cms) = | 030 (i) | | | |
| PEAK FLOW TIME TO PEAK | (hrs) = 1 | .500 | | | |
| RUNOFF VOLUME TOTAL RAINFALL | | | | | |
| RUNOFF COEFFICIE | | | | | |
| (i) PEAK FLOW DO | ES NOT INC | LUDE BASEFLOW | IF ANY. | | |
| | | | | | |
| | | | | | |
| CALIB STANDHYD (0001) | Area | (ha) = .56 | | | |
| ID= 1 DT= 5.0 min | Total Imp | p(%)= 99.00 | Dir. Conn | .(%)= 99.00 | |
| | II | MPERVIOUS I | PERVIOUS (i |) | |
| Surface Area Dep. Storage | (ha) = (mm) = | .55 | .01 | | |
| Average Slope | (%) = | 1.00 | 2.00 | | |
| Average Slope Length Mannings n | (m) = = | 61.10 013 | 40.00 250 | | |
| | | | | | |
| NOTE: RAINF | ALL WAS TR | ANSFORMED TO | 5.0 MIN. | TIME STEP. | |
| | | TRANSFORM | APD UVETOCD | 7 DU | |
| TIME | RAIN | TIME RAIN | I TIME | RAIN TIME | RAIN |
| hrs .083 | | | r hrs) 2.083 | mm/hr hrs 9.15 3.08 | mm/hr 4.77 |
| .167 | 4.04 | 1.167 28.70 |) 2.167 | 9.15 3.17 | 4.77 |
| .250 .333 | | | 2 2.250 | 7.85 3.25 7.85 3.33 | 4.44 |
| .417 | 5.37 | 1.417 37.22 | 2 2.417 | 6.90 3.42 | 4.16 |
| .500 .583 | | | 2 2.500 2 2.583 | 6.90 3.50 6.18 3.58 | 4.16 3.92 |
| .667 | 6.54 | 1.667 20.22 | 2 2.667 | 6.18 3.67 | 3.92 |
| .750 .833 | | | 3 2.750 3 2.833 | 5.61 3.75 5.61 3.83 | 3.71 3.71 |
| .917 1.000 | | | 7 2.917 7 3.000 | 5.15 3.92 5.15 4.00 | 3.53 |
| | | | | J.1J 4.00 | 3.53 |
| Max.Eff.Inten.(m over | m/hr)= (min) | 117.72 5.00 | 247.88 5.00 | | |
| Storage Coeff. | (min) = | 1.78 (ii) | 2.83 (ii |) | |
| Unit Hyd. Tpeak | | | | | |
| Unit Hyd. peak | | 5.00 .32 | 5.00 .28 | | |
| Unit Hyd. peak | | | | *TOTALS* | |

| PEAK FLOW TIME TO PEAK RUNOFF VOLUME | | | 10 | 0.0 | | 100 (111) |
|--|--|---|--|--|---|---|
| DINIORE HOLING | (CIIIS) = (hrs) = | 1 | .⊥¤ .33 | .00 1.33 | | .182 (iii) 1.33 |
| | (| | 0.0 | 25.55 | | 54.73 |
| TOTAL RAINFAL | L (mm) = | 56 | .03 | 56.03 | | 56.03 |
| TOTAL RAINFAL RUNOFF COEFFI | CIENT = | | .98 | .46 | | .98 |
| *** WARNING: STO | RAGE COEFI | . IS SM | ALLER THA | N TIME S | FEP! | |
| (i) CN PROC | | | | | | |
| CN* = (ii) TIME ST | 80.0 EP (DT) SH | | | | ∋) | |
| | E STORAGE | | | on Lgoin | | |
| (iii) PEAK FL | OW DOES NO | OT INCLU | DE BASEFI | LOW IF AN | ľ. | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| ADD HYD (0004) | | | | | | |
| 1 + 2 = 3 | | AREA | QPEAK (cms) | TPEAK | R.V. | |
| ID1= 1 (| | (na) .47 | (cms) .030 | (nrs) 1.50 | (mm) 21.75 | |
| + ID2= 2 (| | | .182 | | | |
| | | | | | | |
| ID = 3 (| 0004): | 1.03 | .207 | 1.33 | 39.68 | |
| NOTE: PEAK F | LOWS DO NO | OT INCLU | DE BASEFI | LOWS IF AN | NY. | |
| | | | | | | |
| ADD HYD (0005) | 1 | | | | | |
| 1 + 2 = 3 | 1 | AREA | QPEAK | TPEAK | R.V. | |
| | | (ha) | (cms) | (hrs) | (mm) | |
| ID1= 1 (+ TD2= 2 (| 0003): | .16 | .049 | 1.33 | 52.07 | |
| ======== | | | | | | |
| ID = 3 (| 0005): | 1.19 | .257 | 1.33 | 41.35 | |
| NOTE: PEAK F | LOWS DO NO | T INCLU | DE BASEFI | LOWS IF AN | NY. | |
| RESERVOIR (0006) IN= 2> OUT= 1 DT= 5.0 min | | CFLOW cms) 0000 0170 0280 0350 | STORAGE (ha.m.) .0000 .0034 .0068 .0102 | OUT (ci | FLOW S ns) ()580)740)870)970 | STORAGE (ha.m.) .0136 .0170 .0204 0238 |
| | | | | | | |
| | | AR | H A C | INFAK | TPEAK | U 1/ |
| | | (h | EA Ç | (cms) | | |
| INFLOW : ID= | 2 (0005) | (h 1.1 | a) (90 | (cms) .257 | (hrs) | (mm) |
| INFLOW : ID= OUTFLOW: ID= | 2 (0005) 1 (0006) | (h 1.1 1.1 | a) (90 90 | (cms) .257 .080 | | (mm) |
| INFLOW : ID= OUTFLOW: ID= | PEAK FI | (h 1.1 1.1 LOW RE TT OF PE | a) (90 90 DUCTION [AK FLOW | (cms) .257 .080 (Qout/Qin (1 | (hrs) 1.33 1.58](%)= 31. nin)= 15. | (rmm) 41.35 41.31 15 00 |
| INFLOW : ID= OUTFLOW: ID= | PEAK FI TIME SHIH MAXIMUM | (h 1.1 1.1 LOW RE TT OF PE STORAGE | a) (90 90 DUCTION [AK FLOW USED | (cms) .257 .080 (Qout/Qin (1 (ha | (hrs) 1.33 1.58](%)= 31. nin)= 15. .m.)= | (rmn) 41.35 41.31 15 00 0187 |
| | PEAK FI TIME SHIF MAXIMUM | (h 1.1 1.1 .OW RE T OF PE STORAGE | a) (90 90 DUCTION [AK FLOW USED | (cms) .257 .080 (Qout/Qin (1 (ha | (hrs) 1.33 1.58](%)= 31. nin)= 15. .m.)= | (rmm) 41.35 41.31 15 00 |
| | PEAK FI TIME SHIF MAXIMUM | (h 1.1 1.1 .OW RE TT OF PE STORAGE | a) (90 90 DUCTION [AK FLOW USED | (cms) .257 .080 (Qout/Qin (1 (ha | (hrs) 1.33 1.58](%)= 31. nin)= 15. .m.)= | (rmn) 41.35 41.31 15 00 0187 |
| | PEAK FI TIME SHIF MAXIMUM | (h 1.1 1.1 .OW RE TT OF PE STORAGE | a) (90 90 DUCTION [AK FLOW USED | (cms) .257 .080 (Qout/Qin (1 (ha | (hrs) 1.33 1.58](%)= 31. nin)= 15. .m.)= | (rmn) 41.35 41.31 15 00 0187 |
| | PEAK FI TIME SHIF MAXIMUM | (h 1.1 1.1 .OW RE TT OF PE STORAGE | a) (90 90 DUCTION [AK FLOW USED | (cms) .257 .080 (Qout/Qin (1 (ha | (hrs) 1.33 1.58](%)= 31. nin)= 15. .m.)= | (rmn) 41.35 41.31 15 00 0187 |
| ************************************** | PEAK FI TIME SHIH MAXIMUM | (h 1.1 1.1 SOW RE TT OF PE STORAGE | a) (90 90 DUCTION [AK FLOW USED | (cms) .257 .080 (qout/Qin (n (ha | (hrs) 1.33 1.58](%) = 31. nin) = 15. .m.) = . | (rmn) 41.35 41.31 15 00 0187 |
| ************************************** | PEAK FI TIME SHIH MAXIMUM MBER: 5 *********** IDF . | (h 1.1 1.1 COW RE TT OF PE STORAGE *** ** ** ** | a) (90 90 DUCTION [AK FLOW USED | (cms) .257 .080 :Qout/Qin (ha | (hrs) 1.33 1.58](%)= 31. nin)= 15. .m.)= . .400 .000 .761 | (rmn) 41.35 41.31 15 00 .0187 |
| ************************************** | PEAK FI TIME SHIM MAXIMUM | (h 1.1 1.1 LOW RE T OF PE STORAGE | a) (90 90 DUCTION [AK FLOW USED | (cms) .257 .080 (Qout/Qin (ha | (hrs) 1.33 1.58](%) = 31. min) = 15. .m.) = .400 .000 .761 (t + B)^C | (rmn) 41.35 41.31 15 00 .0187 |
| ************************************** | PEAK FI TIME SHIH MAXIMUM MBER: 5 ********** IDF usec Dura Stoi | (h 1.1 1.1 COW RE TT OF PE STORAGE *** ** curve p d in: tion of m time | a) (90 90 DUCTION [AK FLOW USED | (cms) .257 .080 (Qout/Qin (ha | (hrs) 1.33 1.58](%) = 31. nin) = 15. .m.) = .400 .000 .761 (t + B)^C | (rmn) 41.35 41.31 15 00 .0187 |
| ************************************** | PEAK FI TIME SHIH MAXIMUM MBER: 5 ********** IDF usec Dura Ston Time | (h 1.1 1.1 LOW RE T OF PE STORAGE | a) (90 90 DUCTION [AK FLOW USED | <pre>(cms) .257 .080 CQout/Qin () (ha</pre> | (hrs) 1.33 1.58](%) = 31. nin) = 15. .m.) = .400 .000 .761 (t + B)^C rs in | (rmn) 41.35 41.31 15 00 .0187 |
| ************************************** | PEAK FI TIME SHIH MAXIMUM MBER: 5 ************************************ | (h 1.1 1.1 | a) (90 90 DUCTION [AK FLOW USED | <pre>(cms) .257 .080 :Qout/Qin (i (ha </pre> | (hrs) 1.33 1.58](%) = 31. nin) = 15. .m.) = . .400 .000 .761 (t + B)^C rs in E RAIN s mm/hz | (rmn) 41.35 41.31 15 00 0187 |
| ************************************** | PEAK FI TIME SHIH MAXIMUM MBER: 5 ************************************ | (h 1.1 1.1 | a) (90 90 DUCTION [AK FLOW USED | <pre>(cms) .257 .080 :Qout/Qin (i (ha </pre> | (hrs) 1.33 1.58](%) = 31. nin) = 15. .m.) = . .400 .000 .761 (t + B)^C rs in E RAIN s mm/hz | (rmn) 41.35 41.31 15 00 0187 |

| FUNCTIONAL SERVIC | | | | | | | |
|---|--|---|---|--|--|---|---|
| .67 .83 1.00 | 7.25 9.41 13.97 | 1.67 1.83 2.00 | 22.38 15.71 12.26 | 2.67 2.83 3.00 | 6.86 6.23 5.71 | 3.67 3.83 4.00 | 4.35 4.12 3.91 |
| | | | | | | | |
| CALIB STANDHYD (0003) ID= 1 DT= 5.0 min | Area Total Im | (ha) = 1p(%) = 9 | .16 | Dir. Conn | n.(%)= 9 | 90.00 | |
| | I | MPERVIOU | JS PI | ERVIOUS (i |) | | |
| Surface Area Dep. Storage Average Slope Length Mannings n | (ha) = (mm) = (%) = (m) = = | .14 1.00 1.00 32.70 .013 | | .02 1.00 2.00 40.00 .250 | | | |
| NOTE: RAINF. | ALL WAS TF | ANSFORME | D TO | 5.0 MIN. | TIME STE | IP. | |
| | | | | | | | |
| hrs .083 .167 .250 .333 .417 .500 .583 .667 .750 .833 .917 1.000 | RAIN mm/hr 4.48 5.10 5.96 7.25 9.41 13.97 | TIME hrs 1.083 1.167 1.250 1.333 1.417 1.500 1.583 1.667 1.750 1.833 1.917 2.000 | RAIN mm/hr 31.74 31.74 129.82 129.82 41.13 41.13 22.38 22.38 15.71 15.71 12.26 12.26 | <pre>hrs 2.083 2.167 2.250 2.333 2.417 2.500 2.583 2.667 2.750 2.833 2.917 3.000</pre> | RAIN mm/hr 10.15 8.70 8.70 7.66 7.66 6.86 6.23 6.23 5.71 5.71 | TIME hrs 3.08 3.17 3.25 3.33 3.42 3.50 3.58 3.67 3.75 | mm/hr 5.29 5.29 4.93 4.93 4.62 4.62 4.62 4.35 4.35 4.12 |
| Max.Eff.Inten.(m over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICIE | (cmc) = | 05 | | 0.0 | *101 | TALS* 055 (iii 1.33 7.83 1.96 .93 | _) |
| | | | | | | | |
| ***** WARNING: STORAG (i) CN PROCEDU CN* = 8 (ii) TIME STEP THAN THE S' (iii) PEAK FLOW | RE SELECTE 0.0 Ia (DT) SHOUI FORAGE COE | D FOR PE = Dep. S D BE SMA SFFICIENT | ERVIOUS Storage ALLER OF | LOSSES: (Above) R EQUAL | | | |
| CALIB NASHYD (0002) ID= 1 DT=10.0 min | Ia | (mm) = | 5.00 | Curve Num # of Line | uber (C ear Res.) | CN)= 80.0 (N)= 3.00 |) |
| NOTE: RAINF. | ALL WAS TF | RANSFORME | ID TO 1 | LO.O MIN. | TIME STE | EP. | |
| hrs 167 .333 .500 .667 | RAIN mm/hr 4.48 | TIME hrs 1.167 1.333 1.500 1.667 | RAIN mm/hr 31.74 129.82 41.13 22.38 | hrs 2.167 2.333 2.500 2.667 | RAIN mm/hr 10.15 8.70 7.66 6.86 | TIME hrs 3.17 3.33 3.50 3.67 | mm/hr 5.29 4.93 4.62 4.35 |
| Unit Hyd Qpeak | (cms)= | .090 | | | | | |
| PEAK FLOW | (cms) = | .036 (i) | | | | | |

- 72 -

| TIME TO PEAK | (hrs) = | 1.500 |
|-----------------|---------|--------|
| RUNOFF VOLUME | (mm) = | 25.774 |
| TOTAL RAINFALL | (mm) = | 61.305 |
| RUNOFF COEFFICI | ENT = | .420 |

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

_____ _____

| CALIB | | | | | | |
|-------------------|-------|---------|-------|------|-----------|-------|
| STANDHYD (0001) | | (-) | | | | |
| ID= 1 DT= 5.0 min | Total | Imp(%)= | 99.00 | Dir. | Conn.(%)= | 99.00 |

| | | IMPERVIOUS | PERVIOUS (i) |
|---------------|--------|------------|--------------|
| Surface Area | (ha) = | .55 | .01 |
| Dep. Storage | (mm) = | 1.00 | 1.00 |
| Average Slope | (%)= | 1.00 | 2.00 |
| Length | (m) = | 61.10 | 40.00 |
| Mannings n | = | .013 | .250 |

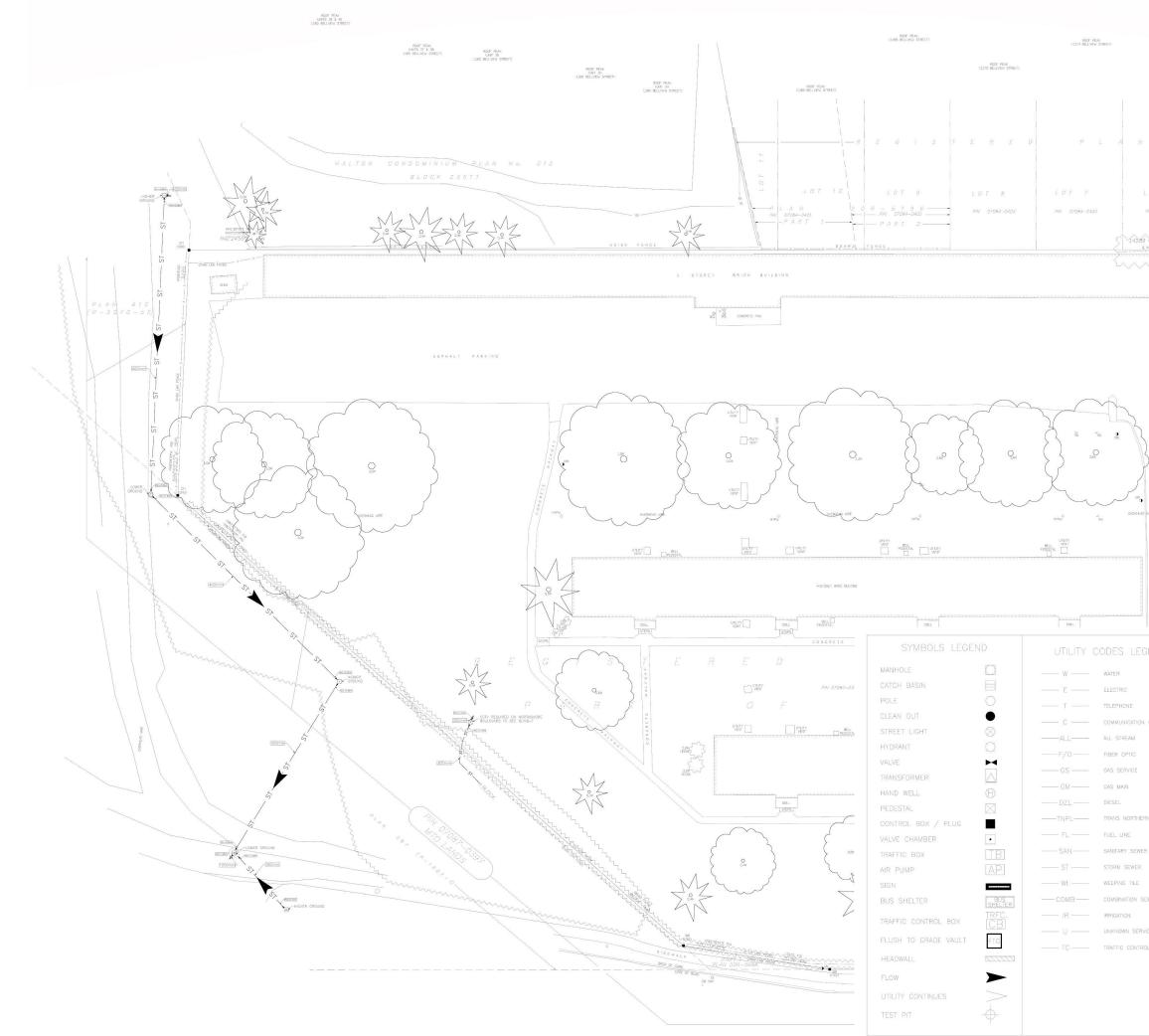
NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

| | I | RANSFORM | ED HYETOG | RAPH | | |
|--|--|--|--|---|----------|------|
| TIME RA hrs mm/ | IN TIME | S RAIN | TIME | RAIN | TIME | RAIN |
| | | 5 IIIII/III 2 31 74 | nrs | 10 15 1 | 3 09 | 5 20 |
| 167 4 | 48 1.000 | 31 74 | 2.005 | 10.15 | 3.00 | 5 29 |
| .250 5. | 10 1.250 | 129.82 | 2.250 | 8.70 | 3.25 | 4.93 |
| .083 4. .167 4. .250 5. .333 5. | 10 1.333 | 129.82 | 2.333 | 8.70 | 3.33 | 4.93 |
| .417 5. | 96 1.417 | 41.13 | 2.417 | 7.66 | 3.42 | 4.62 |
| .500 5. | 96 1.500 | 41.13 | 2.500 | 7.66 | 3.50 | 4.62 |
| .583 7. | 25 1.583 | 22.38 | 2.583 | 6.86 | 3.58 | 4.35 |
| .667 7. | 25 1.667 | 22.38 | 2.667 | 6.86 | 3.67 | 4.35 |
| ./50 9. | 41 1.750 |) 15./1 | 2./50 | 6.23 | 3./5 | 4.12 |
| .055 9. | 97 1.035 97 1.917 | 12 26 | 2.033 | 5 71 1 | 3.05 | 3 91 |
| . 333 5. .417 5. .500 5. .583 7. .667 7. .750 9. .833 9. .917 13. 1.000 13. | 97 2.000 | 12.20 | 3.000 | 5.71 | 4.00 | 3.91 |
| | | | | | | |
| Max.Eff.Inten.(mm/hr)= over (min) Storage Coeff. (min)= Unit Hyd. Tpeak (min)= Unit Hyd. peak (cms)= | 129.8 | 32 | 292.09 | | | |
| over (min) | 5.0 | 0 | 5.00 | | | |
| Storage Coeff. (min)= | 1.7 | /1 (ii) | 2.72 (i | .i) | | |
| Unit Hyd. 'Ipeak (min)= | 5.0 | 10 | 5.00 | | | |
| | | | | | ALS* | |
| PEAK FLOW (cms)= TIME TO PEAK (hrs)= RUNOFF VOLUME (mm)= TOTAL RAINFALL (mm)= | 2 | 0 | .00 1.33 29.86 61.96 | 101 | 200 (iii | i) |
| TIME TO PEAK (hrs)= | 1.3 | 33 | 1.33 | 1 | 33 | _ , |
| RUNOFF VOLUME (mm) = | 60.9 | 96 | 29.86 | 60 61 | .65 | |
| TOTAL RAINFALL (mm) = | 61.9 | 96 | 61.96 | 61 | | |
| RUNOFF COEFFICIENT = | .9 | 98 | .48 | | .98 | |
| ***** WARNING: STORAGE COEF | F. IS SMAI | LER THAN | TIME STE | P! | | |
| | | | | | | |
| (i) CN PROCEDURE SEL | | | | | | |
| CN* = 80.0 | Ia = Dep. | Storage | (Above) | | | |
| CN* = 80.0 (ii) TIME STEP (DT) S | Ia = Dep. HOULD BE S | Storage MALLER O | (Above) | | | |
| CN* = 80.0 | Ia = Dep. HOULD BE S COEFFICIE | Storage MALLER O | (Above) R EQUAL | | | |
| CN* = 80.0 (ii) TIME STEP (DT) S THAN THE STORAGE (iii) PEAK FLOW DOES N | Ia = Dep. HOULD BE S COEFFICIE OT INCLUDE | Storage SMALLER O SNT. BASEFLO | (Above) R EQUAL W IF ANY. | | | |
| CN* = 80.0 (ii) TIME STEP (DT) S THAN THE STORAGE | Ia = Dep. HOULD BE S COEFFICIE OT INCLUDE | Storage SMALLER O SNT. BASEFLO | (Above) R EQUAL W IF ANY. | | | |
| CN* = 80.0 (ii) TIME STEP (DT) S THAN THE STORAGE (iii) PEAK FLOW DOES N | Ia = Dep. HOULD BE S COEFFICIE OT INCLUDE | Storage SMALLER O SNT. BASEFLO | (Above) R EQUAL W IF ANY. | | | |
| CN* = 80.0 (ii) TIME STEP (DT) S THAN THE STORAGE (iii) PEAK FLOW DOES N | Ia = Dep. HOULD BE S COEFFICIE OT INCLUDE | Storage SMALLER O SNT. BASEFLO | (Above) R EQUAL W IF ANY. | | | |
| CN* = 80.0 (ii) TIME STEP (DT) S THAN THE STORAGE (iii) PEAK FLOW DOES N | Ia = Dep. HOULD BE S COEFFICIE OT INCLUDE | Storage SMALLER O SNT. BASEFLO | (Above) R EQUAL W IF ANY. | | | |
| CN* = 80.0 (ii) TIME STEP (DT) S THAN THE STORAGE (iii) PEAK FLOW DOES N | Ia = Dep. HOULD BE S COEFFICIE OT INCLUDE | Storage SMALLER O SNT. BASEFLO | (Above) R EQUAL W IF ANY. | | | |
| CN* = 80.0 (ii) TIME STEP (DT) S THAN THE STORAGE (iii) PEAK FLOW DOES N | Ia = Dep. HOULD BE S COEFFICIE OT INCLUDE | Storage SMALLER O SNT. BASEFLO | (Above) R EQUAL W IF ANY. | | | |
| CN* = 80.0 (ii) TIME STEP (DT) S THAN THE STORAGE (iii) PEAK FLOW DOES N | Ia = Dep. HOULD BE S COEFFICIE OT INCLUDE AREA (ha) .47 .56 | Storage SMALLER OI INT. BASEFLOI QPEAK (cms) .036 .200 | (Above) R EQUAL W IF ANY. TPEAK (hrs) 1.50 1.33 | R.V. (mm) 25.77 60.65 | | |
| CN* = 80.0 (ii) TIME STEP (DT) S THAN THE STORAGE (iii) PEAK FLOW DOES N | Ia = Dep. HOULD BE S COEFFICIE OT INCLUDE AREA (ha) .47 .56 | Storage MALLER OD SNT. BASEFLOU QPEAK (cms) .036 .200 | (Above) R EQUAL W IF ANY. TPEAK (hrs) 1.50 1.33 | R.V. (mm) 25.77 60.65 | | |
| CN* = 80.0 (ii) TIME STEP (DT) S THAN THE STORAGE (iii) PEAK FLOW DOES N | Ia = Dep. HOULD BE S COEFFICIE OT INCLUDE AREA (ha) .47 .56 | Storage MALLER OD SNT. BASEFLOU QPEAK (cms) .036 .200 | (Above) R EQUAL W IF ANY. TPEAK (hrs) 1.50 1.33 | R.V. (mm) 25.77 60.65 | | |
| CN* = 80.0 (ii) TIME STEP (DT) S THAN THE STORAGE (iii) PEAK FLOW DOES N | Ia = Dep. HOULD BE S COEFFICIE OT INCLUDE AREA (ha) .47 .56 1.03 | Storage MALLER 02 INT. BASEFLO QPEAK (cms) .036 .200 .232 | (Above) R EQUAL W IF ANY. TPEAK (hrs) 1.50 1.33 1.33 | R.V. (mm) 25.77 60.65 | | |
| CN* = 80.0 (ii) TIME STEP (DT) S THAN THE STORAGE (iii) PEAK FLOW DOES N | Ia = Dep. HOULD BE S COEFFICIE OT INCLUDE AREA (ha) .47 .56 1.03 | Storage MALLER 02 INT. BASEFLO QPEAK (cms) .036 .200 .232 | (Above) R EQUAL W IF ANY. TPEAK (hrs) 1.50 1.33 1.33 | R.V. (mm) 25.77 60.65 | | |
| CN* = 80.0 (ii) TIME STEP (DT) S THAN THE STORAGE (iii) PEAK FLOW DOES N | Ia = Dep. HOULD BE S COEFFICIE OT INCLUDE AREA (ha) .56 1.03 OT INCLUDE | Storage MALLER OD SNT. BASEFLOU QPEAK (cms) .036 .200 .232 BASEFLOU | (Above) R EQUAL W IF ANY. TPEAK (hrs) 1.50 1.33 1.33 WS IF ANY | R.V. (mm) 25.77 60.65 44.73 | | |
| CN* = 80.0 (ii) TIME STEP (DT) S THAN THE STORAGE (iii) PEAK FLOW DOES N | Ia = Dep. HOULD BE S COEFFICIE OT INCLUDE AREA (ha) .56 1.03 OT INCLUDE | Storage MALLER OD SNT. BASEFLOU QPEAK (cms) .036 .200 .232 BASEFLOU | (Above) R EQUAL W IF ANY. TPEAK (hrs) 1.50 1.33 1.33 WS IF ANY | R.V. (mm) 25.77 60.65 44.73 | | |
| CN* = 80.0 (ii) TIME STEP (DT) S THAN THE STORAGE (iii) PEAK FLOW DOES N | Ia = Dep. HOULD BE S COEFFICIE OT INCLUDE AREA (ha) .47 .56 1.03 OT INCLUDE | Storage MALLER O: SNT. BASEFLOU QPEAK (cms) .036 .200 .232 BASEFLOU | (Above) R EQUAL W IF ANY. TPEAK (hrs) 1.50 1.33 1.33 WS IF ANY | R.V. (mm) 25.77 60.65 44.73 | | |
| CN* = 80.0 (ii) TIME STEP (DT) S THAN THE STORAGE (iii) PEAK FLOW DOES N | Ia = Dep. HOULD BE S COEFFICIE OT INCLUDE AREA (ha) .47 .56 1.03 OT INCLUDE | Storage MALLER O: SNT. BASEFLOU QPEAK (cms) .036 .200 .232 BASEFLOU | (Above) R EQUAL W IF ANY. TPEAK (hrs) 1.50 1.33 1.33 WS IF ANY | R.V. (mm) 25.77 60.65 44.73 | | |
| CN* = 80.0 (ii) TIME STEP (DT) S THAN THE STORAGE (iii) PEAK FLOW DOES N | Ia = Dep. HOULD BE S COEFFICIE OT INCLUDE AREA (ha) .47 .56 1.03 OT INCLUDE | Storage MALLER O: SNT. BASEFLOU QPEAK (cms) .036 .200 .232 BASEFLOU | (Above) R EQUAL W IF ANY. TPEAK (hrs) 1.50 1.33 1.33 WS IF ANY | R.V. (mm) 25.77 60.65 44.73 | | |
| CN* = 80.0 (ii) TIME STEP (DT) S THAN THE STORAGE (iii) PEAK FLOW DOES N | Ia = Dep. HOULD BE S COEFFICIE OT INCLUDE AREA (ha) .47 .56 1.03 OT INCLUDE | Storage MALLER O: SNT. BASEFLOU QPEAK (cms) .036 .200 .232 BASEFLOU | (Above) R EQUAL W IF ANY. TPEAK (hrs) 1.50 1.33 1.33 WS IF ANY | R.V. (mm) 25.77 60.65 44.73 | | |
| CN* = 80.0 (ii) TIME STEP (DT) S THAN THE STORAGE (iii) PEAK FLOW DOES N | Ia = Dep. HOULD BE S COEFFICIE OT INCLUDE AREA (ha) .47 .56 1.03 OT INCLUDE | Storage MALLER O: SNT. BASEFLOU QPEAK (cms) .036 .200 .232 BASEFLOU | (Above) R EQUAL W IF ANY. TPEAK (hrs) 1.50 1.33 1.33 WS IF ANY | R.V. (mm) 25.77 60.65 44.73 | | |

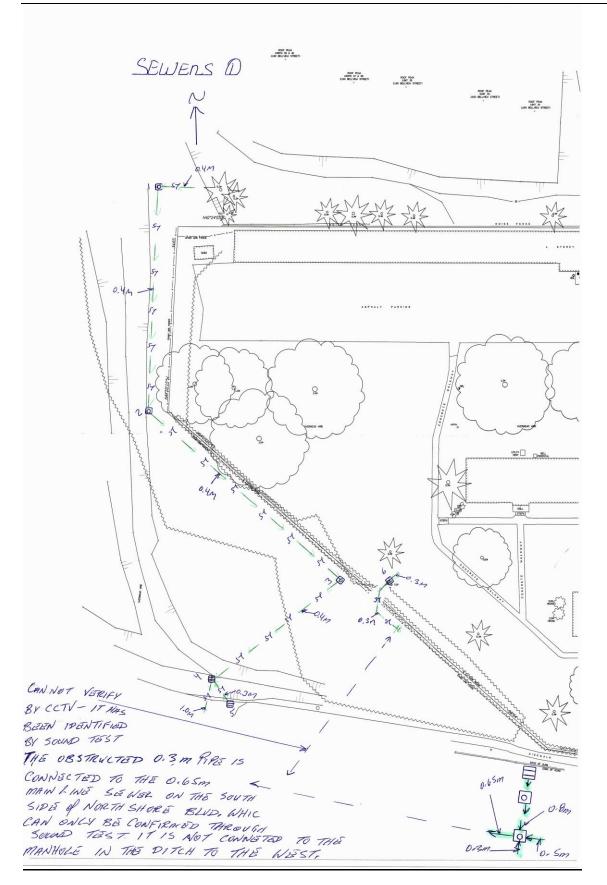
| ID = 3 (0005): 1.19 .286 1.33 46.49 |
|---|
| NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. |
| |
| RESERVOIR (0006) IN= 2> OUT= 1 DT= 5.0 min OUTFLOW STORAGE OUTFLOW STORAGE .0000 .0000 .0580 .0136 .0170 .0034 .0740 .0170 .0280 .0068 .0870 .0204 .0350 .0102 .0970 .0238 |
| AREA QPEAK TPEAK R.V. (ha) (cms) (hrs) (mm) INFLOW: ID= 2 (0005) 1.190 .286 1.33 46.49 OUTFLOW: ID= 1 (0006) 1.190 .089 1.58 46.46 |
| PEAK FLOW REDUCTION [Qout/Qin](%)= 30.90 TIME SHIFT OF PEAK FLOW (min)= 15.00 MAXIMUM STORAGE USED (ha.m.)= .0211 |
| ************************************** |
| CHICAGO STORM IDF curve parameters: A=1114.100 Ptotal= 67.71 mm B= 5.000 C= .761 |
| used in: INTENSITY = $A / (t + B)^{C}$ |
| Duration of storm = 4.00 hrs Storm time step = 10.00 min Time to peak ratio = .33 |
| TIMERAIN TIMERAIN TIMERAIN TIMERAIN TIMERAIN hrsmm/hr hrsmm/hr hrsmm/hr hrsmm/hr hrsmm/hr.174.90 1.1734.68 2.1711.09 3.175.78.335.58 1.33141.88 2.339.51 3.335.39.506.52 1.5044.96 2.508.37 3.505.05.677.92 1.6724.46 2.677.49 3.674.76.8310.29 1.8317.17 2.836.80 3.834.501.0015.27 2.0013.40 3.006.24 4.004.28 |
| |
| CALIB STANDHYD (0003) Area (ha)= .16 ID= 1 DT= 5.0 min Total Imp(%)= 90.00 Dir. Conn.(%)= 90.00 |
| IMPERVIOUS PERVIOUS (i) Surface Area (ha) = .14 .02 Dep. Storage (mm) = 1.00 1.00 Average Slope (%) = 1.00 2.00 Length (m) = 32.70 40.00 Mannings n = .013 .250 |
| NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP. |
| TRANSFORMED HYETOGRAPHTIMERAINITIMERAINITIMERAINITIMERAINhrsmm/hrhrsmm/hrhrsmm/hrhrsmm/hrhrsmm/hr.0834.90 1.08334.68 2.08311.09 3.085.78.1674.90 1.16734.68 2.16711.09 3.175.78.2505.58 1.250141.88 2.2339.51 3.255.39.3335.58 1.333141.88 2.3339.51 3.335.39.4176.52 1.41744.96 2.4178.37 3.425.05.5837.92 1.58324.46 2.5837.49 3.584.76.6677.92 1.66724.46 2.6677.49 3.674.50.83310.29 1.75017.17 2.7506.80 3.754.50.91715.27 1.91713.40 2.9176.24 3.924.28 |

| FUNCTIONAL SERVI | CING REP | UKI | | | | | |
|---|----------------|----------------|-----------------|---|-----------|------------------|---------|
| 1.000 | 15.27 | 2.000 | 13.40 | 3.000 | 6.24 | 4.00 | 4.28 |
| | | | | | | | |
| Max.Eff.Inten.(m | | | | | | | |
| over Storage Coeff. | (min) | 5.00 | | 5.00 | | | |
| Storage Coeff. | (min) = | 1.14 | (ii) | 3.68 (ii) | | | |
| Unit Hyd. Tpeak Unit Hyd. peak | (min) = | 5.00 | | 5.00 | | | |
| Unit Hyd. peak | (Cms) = | .34 | | .25 | *TOTAI | T C * | |
| PEAK FLOW | (cms) = | .06 | | .00 | | 60 (iii |) |
| TIME TO DEAK | (cms) = | 1 33 | | 1 33 | 1.3 | |) |
| RUNOFE VOLUME | (III S) = | 66 71 | | 1.33 34.18 67.71 | 63.4 | | |
| TOTAL RAINFALL | (mm) = | 67.71 | | 67.71 | 67. | 71 | |
| TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICIE | NT = | .99 | | .50 | | | |
| | | | | | | | |
| ***** WARNING: STORAG | E COEFF. I | S SMALLE | ER THAN | TIME STEP! | | | |
| | | | | | | | |
| (i) CN PROCEDU | | | | | | | |
| CN* = 8 | | | | | | | |
| (ii) TIME STEP | | | | R EQUAL | | | |
| THAN THE S (iii) PEAK FLOW | | | | TE ANY | | | |
| (III) FEAR FLOW | DOES NOT I | NCLODE I | SASEFLO | W IF ANI. | | | |
| | | | | | | | |
| | | | | | | | |
| CALIB | | | | | | | |
| NASHYD (0002) ID= 1 DT=10.0 min | Area | (ha)= | .47 | Curve Numb | er (CN) |) = 80.0 | |
| ID= 1 DT=10.0 min | Ia | (mm) = | 5.00 | # of Linea | ar Res.(N |) = 3.00 | |
| | U.Н. Тр(| hrs)= | .20 | | | | |
| | | | | | | | |
| NOTE: RAINF | ALL WAS TR | ANSFORME | ED TO C | 10.0 MIN. 1 | IME STEP | | |
| | | | | | | | |
| | | | | | | | |
| | | | | ED HYETOGRA | | T T 1 (7) | D 1 T 1 |
| TIME | RAIN | TIME | RAIN mm /h m | TIME | RAIN | TIME | RAIN |
| 167 | 1 90 1 | 1 167 | 34 68 | hrs 2.167 | 11 09 1 | 3 17 | 5 78 |
| .±07 | 5 58 1 | 1 333 | 1/1 88 | 2.107 | 9 51 1 | 3.17 | 5 39 |
| 500 | 6 52 1 | 1 500 | 44 96 | 2.555 | 8 37 1 | 3 50 | 5.05 |
| .500 | 7 92 1 | 1 667 | 24 46 | 2.500 | 7 49 1 | 3 67 | 4 76 |
| .833 | 10.29 | 1.833 | 17.17 | 2.833 | 6.80 | 3.83 | 4.50 |
| 1.000 | 15.27 | 2.000 | 13.40 | 2.333 2.500 2.667 2.833 3.000 | 6.24 | 4.00 | .00 |
| | | | | | | | |
| Unit Hyd Qpeak | (cms) = | .090 | | | | | |
| | | | | | | | |
| PEAK FLOW TIME TO PEAK | (cms) = | .042 (i) | | | | | |
| TIME TO PEAK | (hrs) = 1 | .500 | | | | | |
| RUNOFF VOLUME | (mm) = 29 | .833 | | | | | |
| TOTAL RAINFALL | | | | | | | |
| RUNOFF COEFFICIE | NT = | .445 | | | | | |
| (i) PEAK FLOW DO | EC NOT THE | | TET ON . | TE ANY | | | |
| (I) PEAK FLOW DO | ES NOI INC | LUDE DA: | SEFLOW . | LE ANI. | | | |
| | | | | | | | |
| | | | | | | | |
| CALIB | | | | | | | |
| STANDHYD (0001) | Area | (ha)= | .56 | | | | |
| ID= 1 DT= 5.0 min | | | | Dir. Conn. | (%)= 99 | .00 | |
| | | | | | | | |
| | | | | ERVIOUS (i) | | | |
| Surface Area | (ha)= | .55 | | .01 | | | |
| Dep. Storage | (mm) = | 1.00 | | 1.00 | | | |
| Average Slope | (%)= | 1.00 | | 2.00 | | | |
| Length | (m) = | 61.10 | | 40.00 | | | |
| Mannings n | = | .013 | | .250 | | | |
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| TIME | | | | TIME | | TIME | RAIN |
| hrs | | | | hrs | | | |
| .083 | | | | 2.083 | | | 5.78 |
| .167 | 4.90 | 1.167 | 34.68 | 2.167 | | | 5.78 |
| .250 | 5.58 | 1.250 | 141.88 | | 9.51 | | 5.39 |
| .333 | 5.58 | 1.333 | 141.88 | 2.333 | 9.51 | 3.33 | 5.39 |
| .417 | 6.52 | 1.417 | 44.96 | 2.417 2.500 | 8.37 | 3.42 | 5.05 |
| .500 | 0.52 | 1 500 | 44.90 | 1 2.300 | 0.3/ | 3.50 | 5.05 |
| .583 667 | 1.92 7 92 | 1.503 1.667 | 24.40 | 1 2.303 | 7 49 1 | 3.50 | 4 76 |
| .007 | 10.29 | 1.750 | 17.17 | 2.583 2.667 2.750 | 6.80 | 3.75 | 4.50 |
| .750 | / | | _ · • ± / | , | | | |
| | | | | | | | |

| .917 15.27 1.917 13.40 2.917 6.24 3.92 4.28 1.000 15.27 2.000 13.40 3.000 6.24 4.00 4.28 Max.Eff.Inten.(mm/hr)= 141.88 337.68 over (min) 5.00 5.00 Storage Coeff. (min)= 1.65 (ii) 2.63 (ii) Unit Hyd. Tpeak (min)= 5.00 5.00 Unit Hyd. peak (cms)= .32 .29 |
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| Max.Eff.Inten.(mm/hr)= 141.88 337.68 over (min) 5.00 5.00 Storage Coeff. (min)= 1.65 (ii) 2.63 (ii) Unit Hyd. Tpeak (min)= 5.00 5.00 Unit Hyd. peak (cms)= .32 .29 |
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| Unit nya. peak (cms)52 .29 |
| *TOTALS* |
| PEAK FLOW (cms)= .22 .00 .219 (iii) TIME TO PEAK (hrs)= 1.33 1.33 1.33 RUNOFF VOLUME (mm)= 66.71 34.18 66.39 |
| TIME TO PEAK (hrs)= 1.33 1.33 1.33 RUNOFF VOLUME (mm)= 66.71 34.18 66.39 |
| RUNOFF VOLUME (mm) = 66.71 34.18 66.39 TOTAL RAINFALL (mm) = 67.71 67.71 67.71 RUNOFF COEFFICIENT = .99 .50 .98 |
| RUNOFF COEFFICIENT = .99 .50 .98 |
| *** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! |
| (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: |
| CN* = 80.0 Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL |
| THAN THE STORAGE COEFFICIENT. |
| (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. |
| |
| |
| ADD HYD (0004) 1 + 2 = 3 AREA QPEAK TPEAK R.V. |
| (ha) (cms) (hrs) (mm) |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$ |
| + ID2= 2 (0001): .56 .219 1.33 66.39 |
| ID = 3 (0004): 1.03 .256 1.33 49.71 |
| NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. |
| |
| |
| ADD HYD (0005) |
| 1 + 2 = 3 AREA QPEAK TPEAK R.V. |
| ADD HYD (0005) 1 + 2 = 3 AREA QPEAK TPEAK R.V. (ha) (cms) (hrs) (mm) DD = 1 (0003) + 16 060 1 33 63 45 |
| I I I Z I S I I I I I I I I I I I I I I |
| |
| ID = 3 (0005): 1.19 .316 1.33 51.55 |
| |
| NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. |
| |
| RESERVOIR (0006) |
| RESERVOIR (0006) IN= 2> OUT= 1 |
| RESERVOIR (0006) IN= 2> OUT= 1 DT= 5.0 min OUTFLOW STORAGE OUTFLOW STORAGE |
| RESERVOIR (0006) IN= 2> OUT= 1 DT= 5.0 min OUTFLOW STORAGE OUTFLOW STORAGE (cms) (ha.m.) (cms) (ha.m.) |
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| RESERVOIR (0006) IN= 2> OUT= 1 DT= 5.0 min OUTFLOW STORAGE OUTFLOW STORAGE (cms) (ha.m.) (cms) (ha.m.) .0000 .0000 .0580 .0136 .0170 .0034 .0740 .0170 .0280 .0068 .0870 .0204 .0350 .0102 .0970 .0238 |
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| TIDE RECYFLE STREET. |
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| |
| Locates Inc. |
| QL-A - Locating exact vertical and horizontal position of underground utilities using appropriate safe excavation techniques and recording these data. |
| QL-B - Designating the horizontal position of underground utilities by the application of appropriate surface geophysical methods. Limited in scope to verification of provided level D information. Utilities may escape detection. (See Notes) |
| QL-C - Survey of surface features. QL-D - Records and plans research including record collection and review. |
| Notes: 1. This information is not a substitute for senctioned locates as provided by the utility owner. 2. This information is not a substitute for senctioned locates as provided by the utility owner. 3. Prior to any excavation, all utility owners must be contacted to obtain senctioned locates, as stipulated by the Occupational Health & Safety Act. 4. Inferred utility depths indicated on this drawing are only estimates and should be verified by direct physical exposure. 5. Underground infrastructure shown on this drawing was obtained on a best-effort, best-practices basis, within the technical limitations of the instrumentation. 6. The spatial accuracy of the base maps information as provided by others. 7. This information is provided on a best effort basis within the limitations of the technology. Consequently some utilities may escape detection (i.e., non-conductive, inaccessible, incomplete Level D information provided by the Olitent and/or physical expression nat reasonably identifiable at the time of the survey, etc.) 8. The information herein documents the position of suspected or known utilities existing at this site as of the drawing date. 9. Quolity Level 'O' information was obtained by Mark IT Locates Inc. during the course of this investigation. |
| Buried Utility Map For: Odan Detech Site: 1157 Northshare Boulevard East, Burlington, DN Project#2019-08854 Date: APR 11, 2019 Checked: MS / RC |



Environmental Technology Verification

ETV Canada Verified

The Stormceptor[®] STC

Technology Fact Sheet for Imbrium Systems Inc.

Performance Claim

The Stormceptor[®] STC is capable of removing the following pollutants from stormwater runoff when designed in accordance with the PCSWMM for Stormceptor:

- Total Suspended Solids (TSS) overall loading removal range from 76% to 94%
- Total Kjeldahl Nitrogen (TKN) overall loading removal range from 43% to 65%

The TSS claim is based on three overall loading tests performed at three geographically different sites. Site 1 included eight rain events, site 2 had three rain events and site 3 had four rain events. The rain events varied in intensity and duration.

The TKN claim is based on two overall loading tests performed at two geographically different sites. Site 1 included eight rain events and site 3 had four rain events. The rain events varied in intensity and duration.

Simulations produced by the PCSWMM for Stormceptor are based on runoff that is generated from a stabilized catchment with all areas covered by vegetation, concrete, asphalt, structures and/or other non-erodible surfaces.

Technology Application

The patented Stormceptor[®] STC is a stormwater quality treatment device that can be installed in place of a conventional maintenance hole in a storm drainage system.

The Stormceptor[®] STC is a vertically oriented precast concrete cylindrical chamber that is separated into upper and lower compartments by a fiberglass insert.

Technology Operation

Stormceptor[®] STC flows into the upper by-pass chamber from the sewer. Inflows less than the design flow rate are diverted by a weir and orifice/drop pipe-assembly through the fibreglass insert into the lower treatment chamber. The drop pipe discharges water parallel to the circular chamber wall to increase detention time and inhibit mixing. From the treatment chamber, water flows up through the riser pipe into the by-pass chamber on the downstream side of the weir and is discharged into the storm sewer.

The water velocity slows when it enters the treatment chamber. Oil or other liquids with a specific gravity less than water will rise and become trapped beneath the fiberglass insert. These pollutants are retained in the treatment chamber because the entrance to the outlet riser pipe is submerged. Sediment will settle to the bottom of the chamber by gravity.

Flows in excess of the orifice/drop pipe capacity will flow over the weir and into the downstream sewer. This action prevents high flows from entering the lower treatment chamber and ensures that captured pollutants are not resuspended.







Performance Claim Conditions

The conditions for this performance claim are as follows:

St. Paul, MN, COMO PARK - SITE 1 0.4 ha

| | 3 Aug 98 | 7 Aug 98 | 27 Aug 98 | 19 Sep 98 | 23 Sep 98 | 7 Sep 99 | 11 Sep 99 | 19 Sep 99 | OVERALL |
|-----------------|----------|----------|-----------|-----------|-----------|----------|-----------|-----------|---------|
| TSS in, kg | 5.22 | 19.47 | 1.35 | 1.42 | 0.72 | 0.25 | 14.59 | 0.13 | 43.15 |
| TSS out, kg | 1.30 | 3.61 | 0.40 | 1.70 | 0.89 | 0.21 | 2.31 | 0.03 | 10.45 |
| TSS removed, kg | 3.92 | 15.86 | 0.95 | -0.28 | -0.17 | 0.04 | 12.28 | 0.10 | 32.70 |
| removal % mass | 75 | 81 | 70 | -19 | -24 | 16 | 84 | 77 | 76 |
| TKN in, kg | 0.188 | 0.141 | 0.011 | 0.153 | 0.011 | 0.013 | 0.486 | 0.002 | 1.005 |
| TKN out, kg | 0.166 | 0.055 | 0.012 | 0.066 | 0.011 | 0.001 | 0.091 | 0.001 | 0.345 |
| TKN removed, kg | 0.08 | 0.09 | 0.00 | 0.09 | 0.00 | 0.01 | 0.40 | 0.00 | 0.66 |
| removal % mass | 44 | 61 | -9 | 57 | 0 | 92 | 81 | 50 | 65 |

Boston, MA, Westwood - SITE 2 0.3 ha

Seattle, WA, Seatac - SITE 3 0.4 ha

| | 5 Aug 97 | 21 Aug 97 | 29 Sep 97 | OVERALL | 13 Mar 99 | 25 Apr 99 | 3 May 99 | 28 Oct 99 | OVERALL |
|-----------------|----------|-----------|-----------|---------|-----------|-----------|----------|-----------|---------|
| TSS in, kg | 0.185 | 0.099 | 0.120 | 0.404 | 1.891 | 0.699 | 0.296 | 7.401 | 10.287 |
| TSS out, kg | 0.002 | 0.008 | 0.013 | 0.023 | 0.658 | 0.315 | 0.093 | 0.308 | 1.373 |
| TSS removed, kg | 0.183 | 0.091 | 0.107 | 0.381 | 1.233 | 0.384 | 0.203 | 7.093 | 8.914 |
| removal % mass | 99 | 92 | 89 | 94 | 65 | 55 | 69 | 96 | 87 |
| TKN in, kg | - | - | - | - | 0.099 | 0.024 | 0.028 | 0.083 | 0.234 |
| TKN out, kg | | | | | 0.033 | 0.024 | 0.024 | 0.052 | 0.133 |
| TKN removed, kg | - | - | - | - | 0.066 | 0.000 | 0.004 | 0.031 | 0.101 |
| removal % mass | - | - | - | - | 67 | 0 | 14 | 37 | 43 |

The performance claim is based on the above data from three field studies conducted at three geographically different locations, comprising fourteen storm events of varying intensity (1 to 131 mm/hr, 1 to 24 hrs duration).

Verification

Testing was done by the following: Service Environmental & Engineering (St. Paul, MN site); Environmental Sampling Technology (Boston, MA site); Associated Earth Sciences Inc. (Seattle, WA site). The evaluation was conducted by Pollutech Group of Companies Inc. following the Canadian ETV Program's General Verification Protocol (March 2000).

What is the ETV Program?

The Canadian Environmental Technology Verification (ETV) Program is delivered by The Bloom Centre for Sustainability (BLOOM) under a license agreement from Environment Canada. The Canadian ETV Program is designed to support Canada's environment industry by providing credible and independent verification of technology performance claims.

Stormceptor[®] STC Contact Information:

Imbrium Systems Inc. 2 St Clair Avenue West, Suite 2100 Toronto, Ontario M4V 1L5 Canada Tel: (416) 960 9900 Toll Free: (800) 565 4801 Fax: (416) 960 5637 Email: info@imbriumsystems.com www.imbriumsystems.com

Canadian ETV Program Contact Information:

BLOOM 2070 Hadwen Road, Suite 101A Mississauga, Ontario L5K 2C9 Canada Tel: (905) 822-4133 Fax: (905) 822-3558 E-mail: melhallak@bloomcentre.com www.etvcanada.ca



Limitation of Verification

Environment Canada, BLOOM, and the Verification Entity provide the verification services solely on the basis of the information supplied by the applicant or vendor and assume no liability thereafter. The responsibility for the information supplied remains solely with the applicant or vendor and the liability for the purchase, installation, and operation (whether consequential or otherwise) is not transferred to any other party as a result of the verification.

Printed March 2000

VERIFICATION STATEMENT

GLOBE Performance Solutions

Verifies the performance of

Jellyfish[®] Filter JF4-2-I

Developed by Imbrium Systems, Inc., Whitby, Ontario, Canada

In accordance with

ISO |4034:20|6

Environmental management — Environmental technology verification (ETV)

John D. Wiebe, PhD Executive Chairman GLOBE Performance Solutions

August 3, 2017 Vancouver, BC, Canada



Verification Body GLOBE Performance Solutions 404 – 999 Canada Place | Vancouver, B.C | Canada |V6C 3E2

Technology description and application

The Jellyfish® Filter is an engineered stormwater quality treatment technology designed to remove a variety of stormwater pollutants including floatable trash and debris, oil, coarse and fine suspended sediments, and particulate-bound pollutants such as nutrients, heavy metals, and hydrocarbons. The Jellyfish Filter combines gravitational pre-treatment (sedimentation and floatation) and membrane filtration in a single compact structure. The system utilizes membrane filtration cartridges comprised of multiple pleated filter elements ("filtration tentacles") that provide high filtration surface area with the associated advantages of high flow rate, high sediment capacity, and low filtration flux rate.



Figure I. Cut-away graphic of a Jellyfish® Filter manhole with 6 hi-flo cartridges and I draindown cartridge

Figure I depicts a cut-away graphic of a typical 6-ft diameter Jellyfish® Filter manhole with 6 hi-flo cartridges and I draindown cartridge (JF6-6-1). Stormwater influent enters the system through the inlet pipe and builds a pond behind the maintenance access wall, with the pond elevation providing driving head. Flow is channeled downward into the lower chamber beneath the cartridge deck. A flexible separator skirt (not shown in the graphic) surrounds the filtration zone where the filtration tentacles of each cartridge are suspended, and the volume between the vessel wall and the outside surface of the separator skirt comprises a pretreatment channel. As flow spreads throughout the pretreatment channel, floatable pollutants accumulate at the surface of the pond behind the maintenance access wall and also beneath the cartridge deck in the pretreatment channel, while coarse sediments settle to the sump. Flow proceeds under the separator skirt and upward into the filtration zone, entering each filtration tentacle and depositing fine suspended sediment and associated particulate-bound pollutants on the outside surface of the membranes. Filtered water proceeds up the center tube of each tentacle, with the flow from each tentacle combining under the cartridge lid, and discharging to the top of the

cartridge deck through the cartridge lid orifice. Filtered effluent from the hi-flo cartridges enters a pool enclosed by a 15-cm high weir, and if storm intensity and resultant driving head is sufficient, filtered water overflows the weir and proceeds across the cartridge deck to the outlet pipe. Filtered effluent discharging from the draindown cartridge(s) passes directly to the outlet pipe, and requires only a minimal amount of driving head (2.5 cm) to provide forward flow. As storm intensity subsides and driving head drops below 15 cm, filtered water within the backwash pool reverses direction and passes backward through the hi-flo cartridges, and thereby dislodges sediment from the membranes which subsequently settles to the sump below the filtration zone. During this passive backwashing process, water in the lower chamber is displaced only through the draindown cartridge(s). Additional self-cleaning processes include gravity, as well as vibrational pulses emitted when flow exits the orifice of each cartridge lid, and these combined processes significantly extend the cartridge service life and maintenance cleaning interval. Sediment removal from the sump by vacuum is required when sediment depths reach 30 cm, and cartridges are typically removed, externally rinsed, and recommissioned on an annual basis, or as site-specific maintenance conditions require. Filtration tentacle replacement is typically required every 3 - 5 years.

Performance conditions

The data and results published in this Technology Fact Sheet were obtained from a field monitoring program conducted on a Jellyfish[®] Filter JF4-2-1 (4-ft diameter manhole with 2 hi-flo cartridges and 1 draindown cartridge), in accordance with the provisions of the TARP Tier II Protocol (TARP, 2003) and New Jersey Tier II Stormwater Test Requirements—Amendments to TARP Tier II Protocol (NJDEP, 2009). Testing was completed by researchers led by Dr. John Sansalone at the University of Florida's Engineering School of Sustainable Infrastructure and Environment. The drainage area providing stormwater runoff to the test unit varied between 502 m² and 799 m² (5400 ft² to 8600 ft²) depending on storm intensity and wind direction. The unit was monitored for a total of 25 TARP qualifying storm events (i.e. \geq 2.5 mm of rainfall) contributing cumulative rainfall of 381 mm (15 in) over the 13-month period between May 28, 2010 and June 27, 2011. Only TARP-qualified storms were routed through the unit, and maintenance was not required during the testing period based on sediment accumulation less than the depth indicated for maintenance, and also based on hydraulic testing performed on the system after the conclusion of monitoring.

Table I shows the specified and achieved amended TARP criteria for storm selection and sampling. **Table 2** shows the observed ranges of operational conditions that occurred over the testing period.

| Description | Criteria value | Achieved value |
|---|---|--|
| Total rainfall | <u>></u> 2.5 mm (0.1 in) | > 2.5 mm (0.1 in) |
| Minimum inter-event period | 6 hrs | 10 hrs |
| Minimum flow-weighted composite sample storm coverage | 70% including as much of the first 20% of the storm | 100% |
| Minimum influent/effluent samples | 10, but a minimum of 5 subsamples for composite samples | Minimum of 8 subsamples for composite samples |
| Total sampled rainfall | Minimum 381 mm (15 in) | 384 mm (15.01 in) |
| Number of storms | Minimum 20 | 25 |

Table I. Specified and achieved amended TARP criteria for storm selection and sampling

| Operational condition | Observed range |
|-------------------------------------|----------------|
| Storm durations | 26 – 691 min |
| Previous dry hours | 10 - 910 hrs |
| Rainfall depth | 3 – 50 mm |
| Initial rainfall to runoff lag time | I – 34 min |
| Runoff volume | 206 – 13,229 L |
| Peak rainfall intensity | 5 – 137 mm/hr |
| Peak runoff flow rate | 0.5 – 14.3 L/s |
| Event median flow rate | 0.01 – 5.5 L/s |

Table 2. Observed operational conditions for events monitored over the study period

The 4-ft diameter test unit has sedimentation surface area of 1.17 m^2 (12.56 ft²). Each of the three filter cartridges employed in the test unit uses filtration tentacles of 137 cm (54 in) length, with filter surface area of 35.4 m² (381 ft²) per cartridge, and total filter surface area of 106.2 m² (1143 ft²) for the three cartridges combined. The design treatment flow rate is 5 L/s (80 gal/min) for each of the two hi-flo cartridges and 2.5 L/s (40 gal/min) for the single draindown cartridge, for a total design treatment flow rate of 12.6 L/s (200 gal/min) at design driving head of 457 mm (18 in). This translates to a filtration flux rate (flow rate per unit filter surface area) of 0.14 L/s/m² (0.21 gal/min/ft²) for each hi-flo cartridge and 0.07 L/s/m² (0.11 gal/min/ft²) for the draindown cartridge. The design flow rate for each cartridge is controlled by the sizing of the orifice in the cartridge lid. The distance from the bottom of the filtration tentacles to the sump is 61 cm (24 in).

Performance claims

The Jellyfish® Filter demonstrated the removal efficiencies indicated in **Table 3** for respective constituents during field monitoring of 25 TARP qualified storm events with cumulative rainfall of 381 mm, conducted in accordance with the provisions of the TARP Tier II Protocol (TARP, 2003) and New Jersey Tier II Stormwater Test Requirements—Amendments to TARP Tier II Protocol (NJDEP, 2009), and using the following design parameters:

- System hydraulic loading rate (system treatment flow rate per unit of sedimentation surface area) of 10.8 L/s/m² (15.9 gal/min/ft²) or lower
- Filtration flux rate (flow rate per unit filter surface area) of 0.14 L/s/m² (0.21 gal/min/ft²) or lower for each hi-flo cartridge and 0.07 L/s/m² (0.11 gal/min/ft²) or lower for each draindown cartridge
- Distance from the bottom of the filtration tentacles to the sump of 61 cm (24 in) or greater
- Driving head of 457 mm (18 in) or greater

| Table 3. Mean, median and 95% | confidence | interval | (median) | for | removal | efficiencies | of |
|----------------------------------|------------|----------|----------|-----|---------|--------------|----|
| selected stormwater constituents | | | | | | | |

| | | | Median - 95% | Median - 95% |
|------------------|------|--------|--------------|--------------|
| Parameter | Mean | Median | Lower Limit | Upper Limit |
| TSS | 84.7 | 85.6 | 82.8 | 89.8 |
| SSC | 97.5 | 98.3 | 97.1 | 98.7 |
| Total phosphorus | 48.8 | 49.1 | 43.3 | 60.1 |
| Total nitrogen | 37.9 | 39.3 | 31.2 | 54.6 |
| Zinc | 55.3 | 69 | 39 | 75 |
| Copper | 83.0 | 91.7 | 75.1 | 98.9 |
| Oil and grease | 60.1 | 60 | 42.7 | 100 |

N.B. As with any field test of stormwater treatment devices, removal efficiencies will vary based on pollutant influent concentrations and other site specific conditions.

Performance results

The frequency of rainfall depths monitored during the study is presented in **Figure 2**. The median and 90th percentile rainfall depths were 11 mm and 31.7 mm, respectively. These values represent the depth of rainfall that is not exceeded in 50 and 90 percent of the monitored rainfall events.

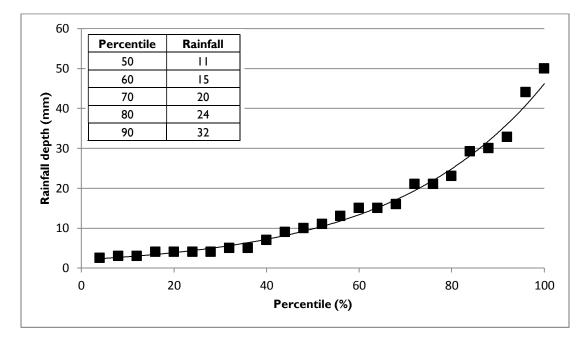


Figure 2. Rainfall depth frequency curve

Sediment removal performance was assessed by measuring the event mean concentration and mass of suspended sediment entering and leaving the unit during runoff events. This involved sampling the full cross-section of influent and effluent flows manually at 2 - 10 minute intervals for the full duration of each storm event and combining discrete samples into flow-weighted composites. Comparing the theoretical mass recovery from the sump calculated by the difference between the influent and effluent mass to the actual dry weight of the recovered sump mass showed an overall mass balance recovery of 94.5% over the study period.

The median d50 particle size (i.e. 50^{th} percentile particle size) of the influent and effluent was 82 and 3 μ m, respectively (**Figure 3**). The median influent particles sizes ranged between 22 and 263 μ m, whereas median effluent particle sizes ranged between 1 and 11 μ m.

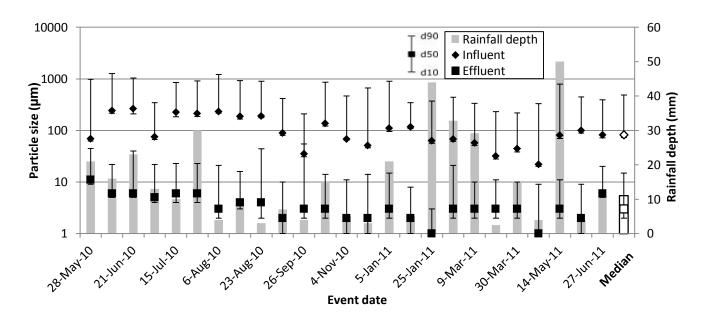


Figure 3. The rainfall depth and d10, d50, and d90 particle sizes of the influent and effluent composite samples for each monitored storm event over the 13-month testing period

Sampling of flows into and out of the Jellyfish Filter over the testing period showed statistically significant reductions (p < 0.05; Wilcoxon signed-rank test) in influent event mean concentrations for all selected stormwater constituents (**Table 4** and **Figure 4**). Effluent event mean Suspended Sediment Concentrations (SSC) were below 19 mg/L during all monitored events. Load-based removal rates were also calculated based on the sum of loads over the study period. These removal rages ranged from 46.3 for Total Nitrogen to 98.6 for SSC (**Table 4**).

| Water Quality Variable | Sampling Location | Min | Max | Median | Range | Mean | SD | Load based removal efficiency (%) |
|------------------------------|----------------------|---------|----------|---------|---------|---------|---------|---|
| TSS | Influent (mg/L) | 16.30 | 261.00 | 79.30 | 244.70 | 86.26 | 51.37 | 87.2 |
| 155 | Effluent (mg/L) | 3.20 | 21.70 | 11.80 | 18.50 | 10.99 | 4.79 | 07.2 |
| SSC | Influent (mg/L) | 78.20 | 1401.70 | 444.50 | 1323.50 | 482.26 | 338.34 | 98.6 |
| 330 | Effluent (mg/L) | 2.80 | 18.10 | 7.30 | 15.30 | 7.88 | 3.77 | 96.0 |
| ТР | Influent (µg/L) | 887.00 | 8793.00 | 3063.00 | 7906.00 | 3550.20 | 1914.50 | 64.2 |
| IP | Effluent (µg/L) | 472.00 | 4769.00 | 1480.00 | 4297.00 | 1688.08 | 1059.98 | 64.2 |
| TN | Influent (µg/L) | 1170.00 | 10479.00 | 3110.00 | 9309.00 | 3519.32 | 2161.47 | 46.3 |
| | Effluent (µg/L) | 553.00 | 6579.00 | 1610.00 | 6026.00 | 2091.76 | 1613.61 | 40.5 |
| Zn | Influent (µg/L) | 0.005 | 7600.00 | 1500.00 | 7600.00 | 1792.00 | 1852.91 | 76.1 |
| 211 | Effluent (µg/L) | 0.005 | 2760.00 | 450.00 | 2760.00 | 561.64 | 594.70 | 70.1 |
| Cu | Influent (µg/L) | 0.001 | 880.40 | 79.50 | 880.40 | 171.28 | 229.33 | 92.1 |
| Cu | Effluent (µg/L) | 0.001 | 51.30 | 6.90 | 51.30 | 14.36 | 17.22 | 92.1 |
| Oil and | Influent (mg/L) | 0.20 | 4.06 | 0.93 | 3.86 | 1.07 | 0.82 | 46.4 |
| Grease | Effluent (mg/L) | 0.00 | 2.32 | 0.35 | 2.32 | 0.50 | 0.60 | 40.4 |

Table 4. Summary statistics for influent and effluent event mean concentrations for selected constituents

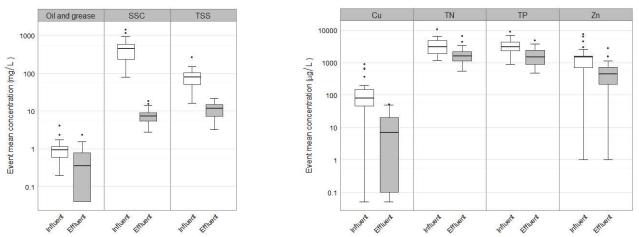


Figure 4. Boxplots showing the distribution of influent and effluent event mean concentrations (EMC) for selected stormwater constituents over the study period

Verification

The verification was completed by the Verification Expert, Toronto and Region Conservation Authority, contracted by GLOBE Performance Solutions, using the International Standard **ISO 14034:2016 Environmental management -- Environmental technology verification (ETV)**. Data and information provided by Imbrium Systems to support the performance claim included the performance monitoring report prepared by University of Florida, Engineering School of Sustainable Infrastructure and Environment, and dated November 2011. This report is based on testing completed in accordance with the Technology Acceptance Reciprocity Partnership (TARP) Tier II Protocol (2003) and New Jersey Tier II Stormwater Test Requirements--Amendments to TARP Tier II Protocol (NJDEP, 2009).

What is ISO | 4034:20 | 6 Environmental management – Environmental technology verification (ETV)?

ISO 14034:2016 specifies principles, procedures and requirements for environmental technology verification (ETV), and was developed and published by the *International Organization for Standardization* (ISO). The objective of ETV is to provide credible, reliable and independent verification of the performance of environmental technologies. An environmental technology is a technology that either results in an environmental added value or measures parameters that indicate an environmental impact. Such technologies have an increasingly important role in addressing environmental challenges and achieving sustainable development.

For more information on the Jellyfish[®] Filter please contact:

Imbrium Systems, Inc. 407 Fairview Drive Whitby, ON LIN 3A9, Canada Tel: 416-960-9900 info@imbriumsystems.com For more information on ISO 14034:2016 / ETV please contact:

GLOBE Performance Solutions World Trade Centre 404 – 999 Canada Place Vancouver, BC V6C 3E2 Canada Tel: 604-695-5018 / Toll Free: 1-855-695-5018 etv@globeperformance.com

Limitation of verification

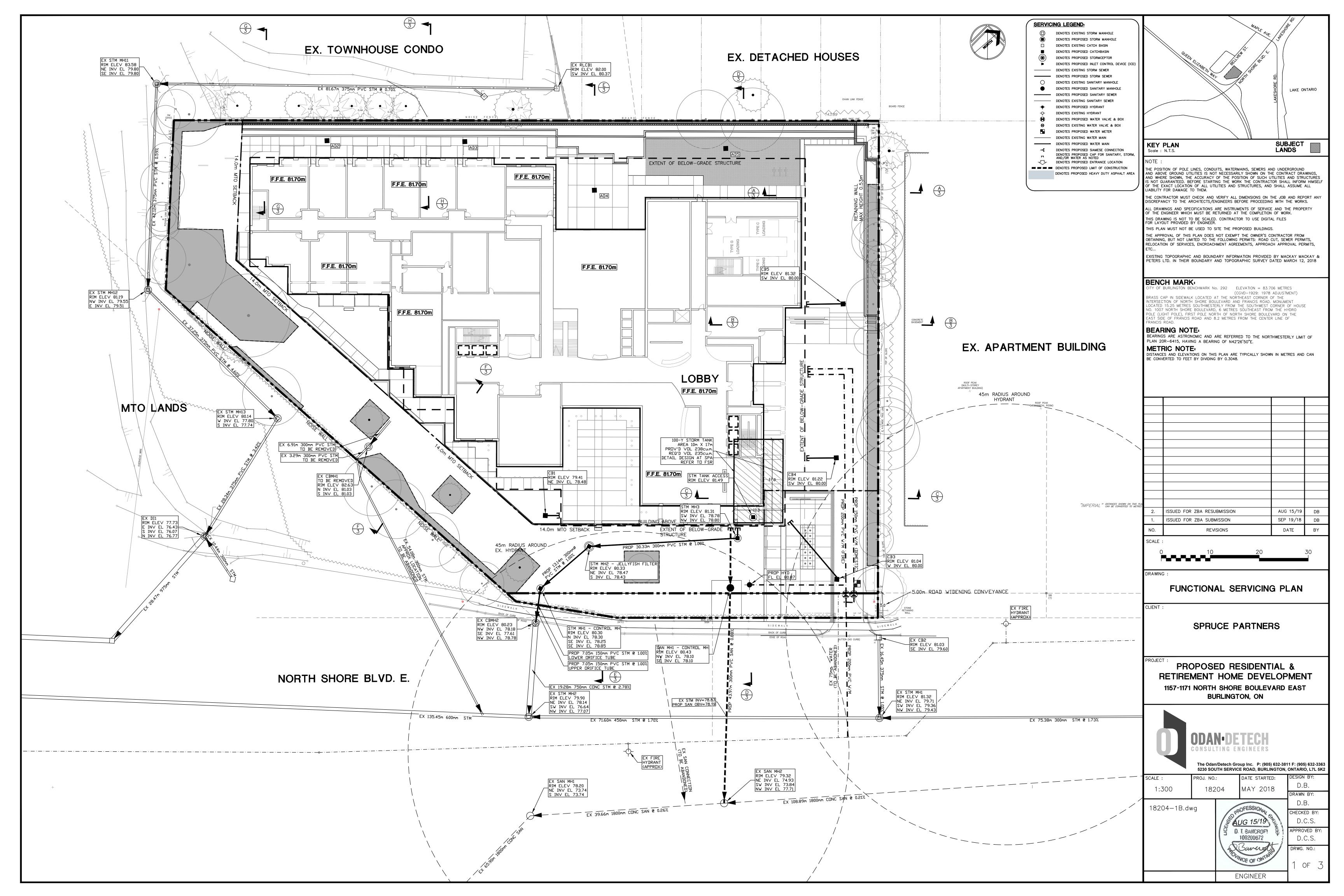
GLOBE Performance Solutions and the Verification Expert provide the verification services solely on the basis of the information supplied by the applicant or vendor and assume no liability thereafter. The responsibility for the information supplied remains solely with the applicant or vendor and the liability for the purchase, installation, and operation (whether consequential or otherwise) is not transferred to any other party as a result of the verification.

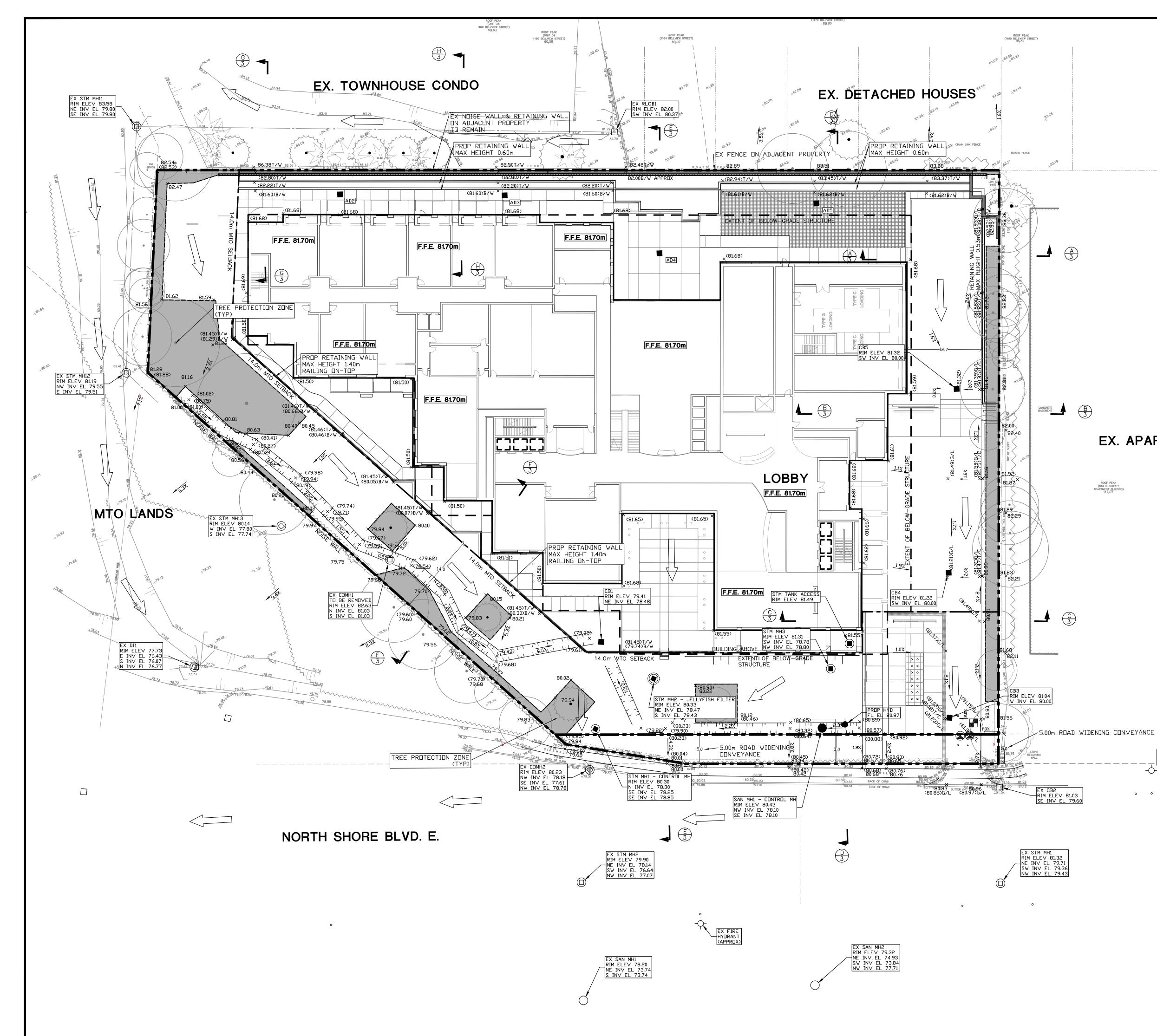
APPENDIX C

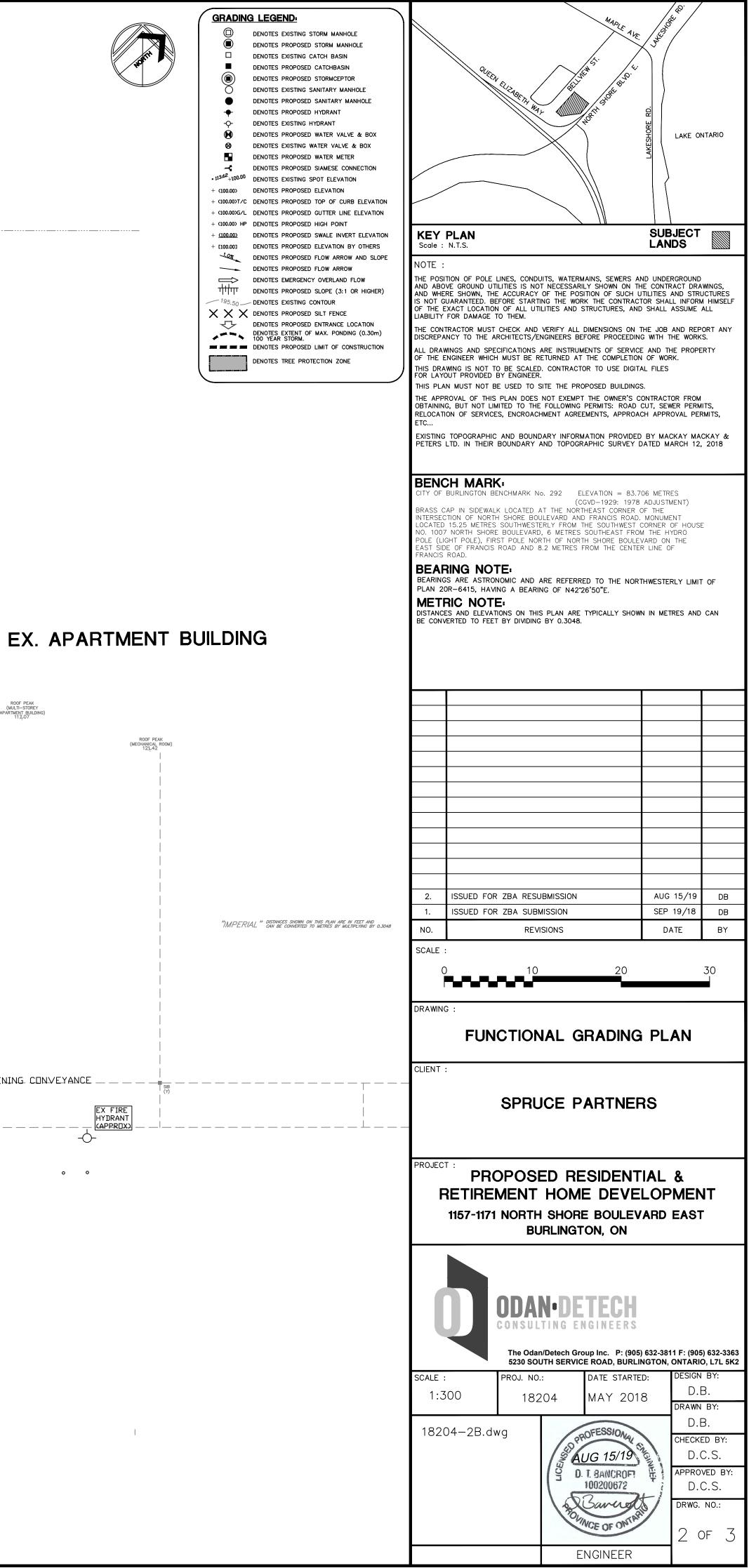
Functional Servicing Plan

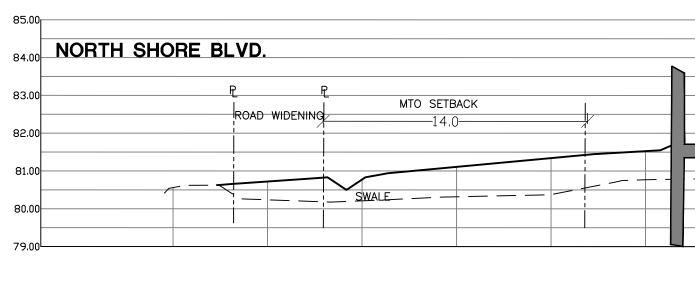
Functional Grading Plan

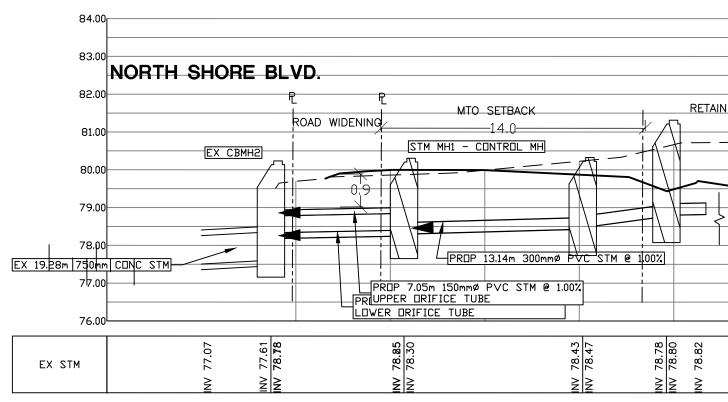
Functional Grading Sections

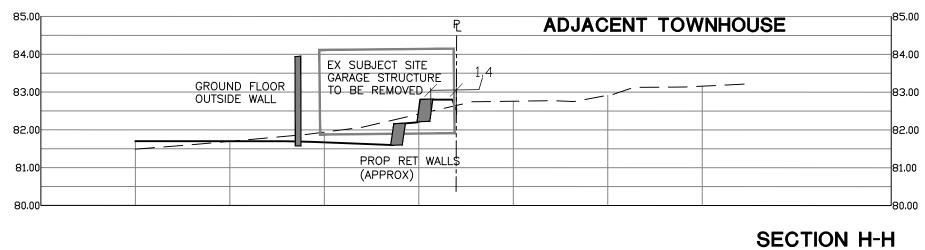


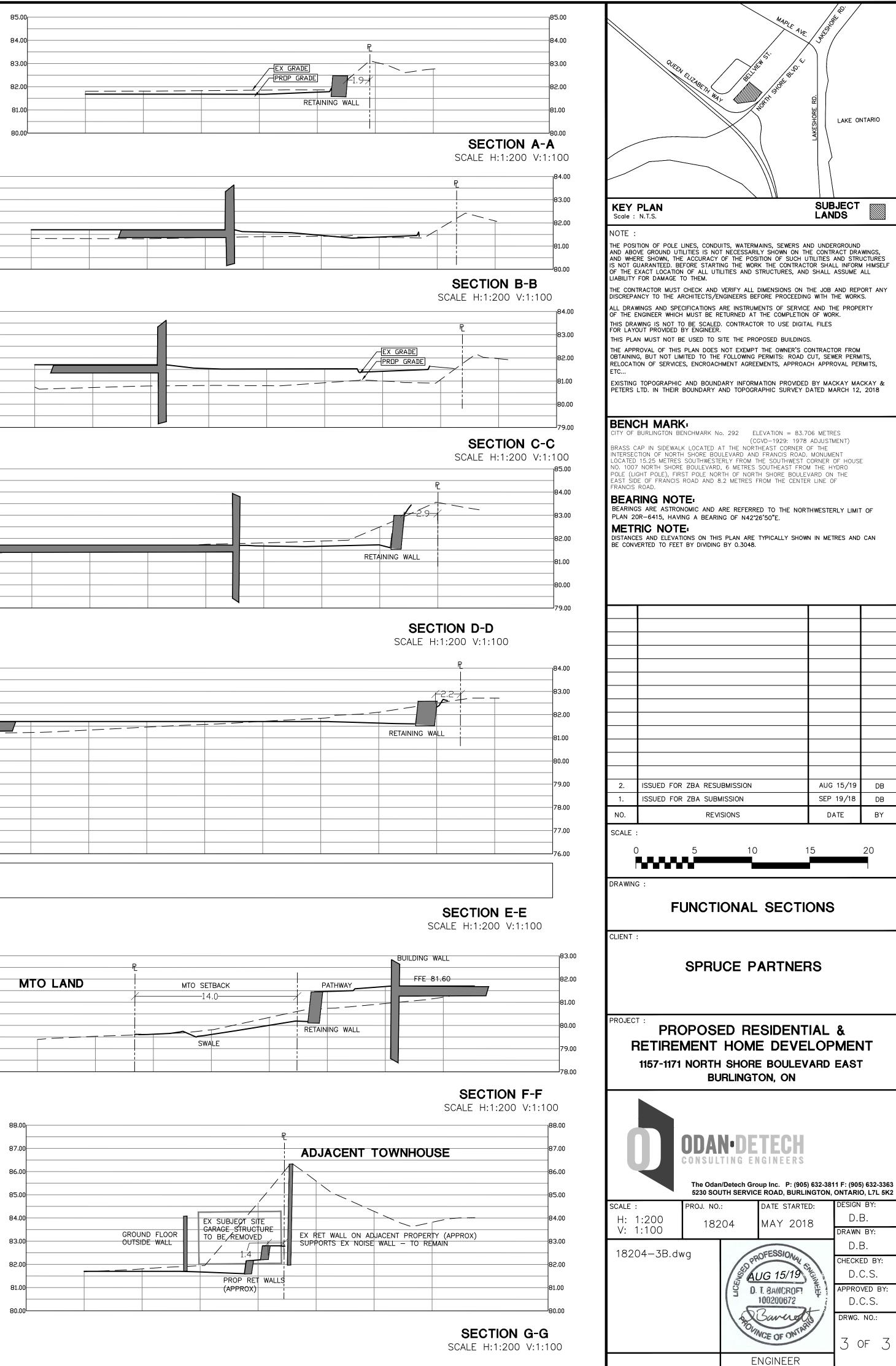


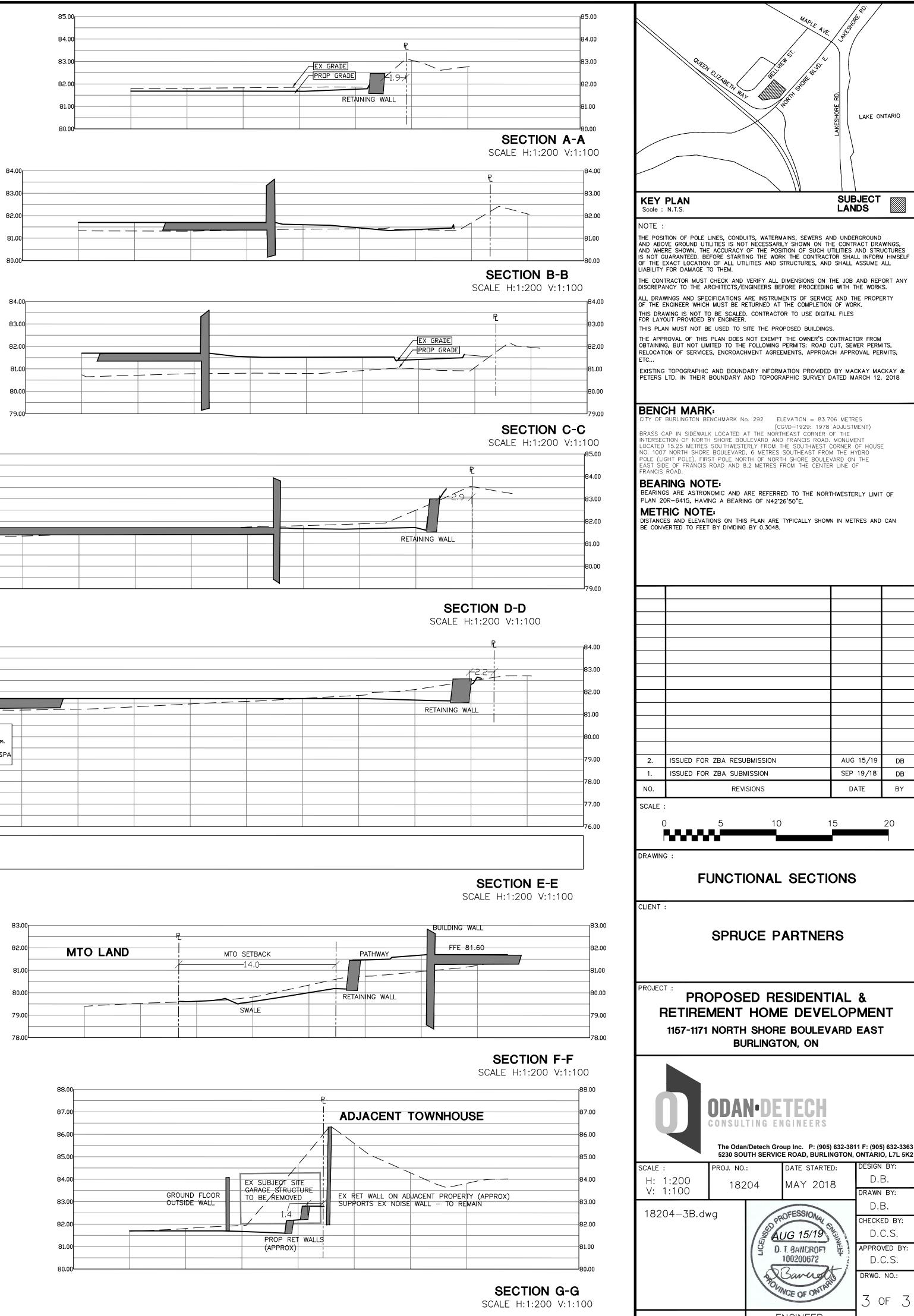


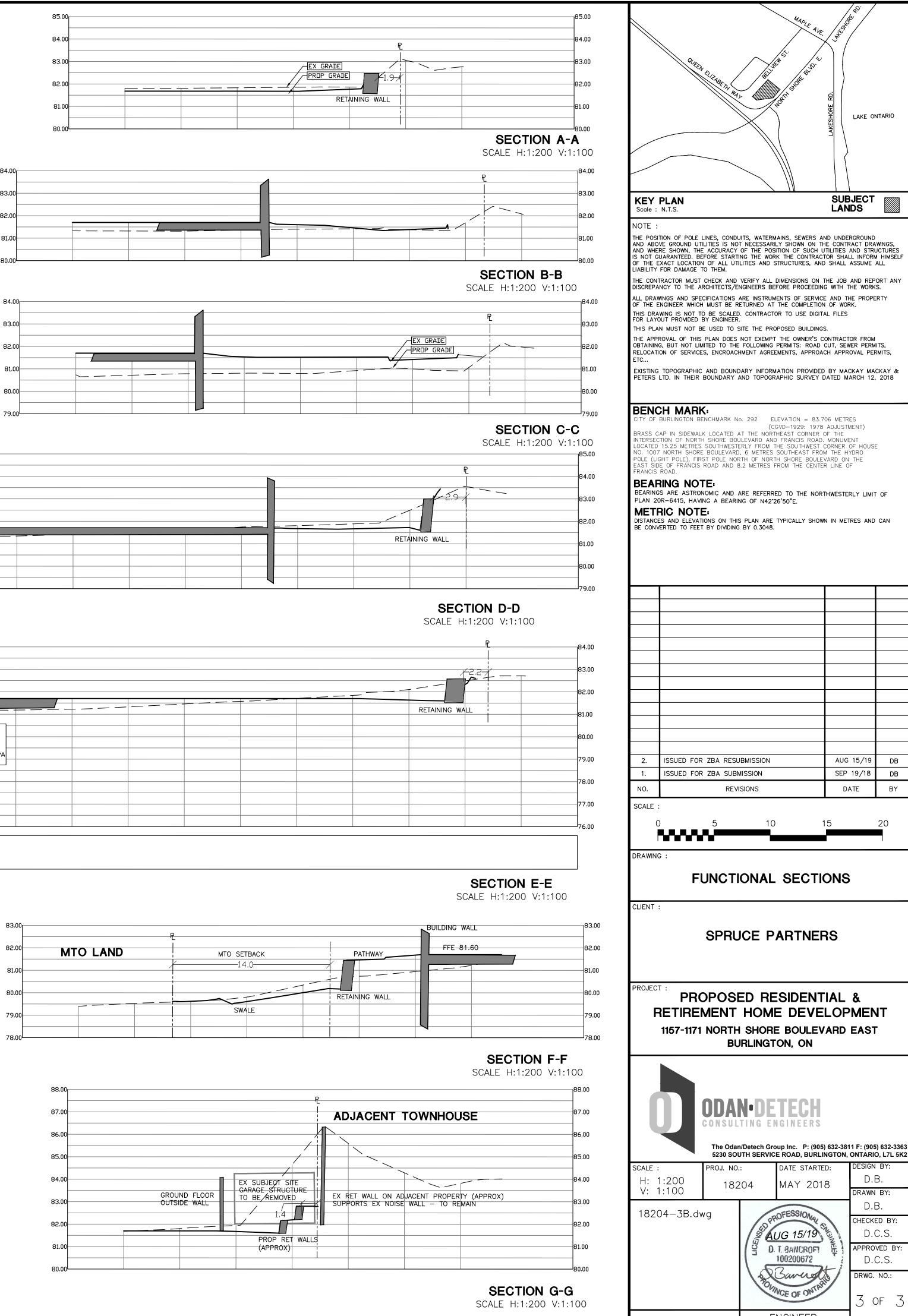




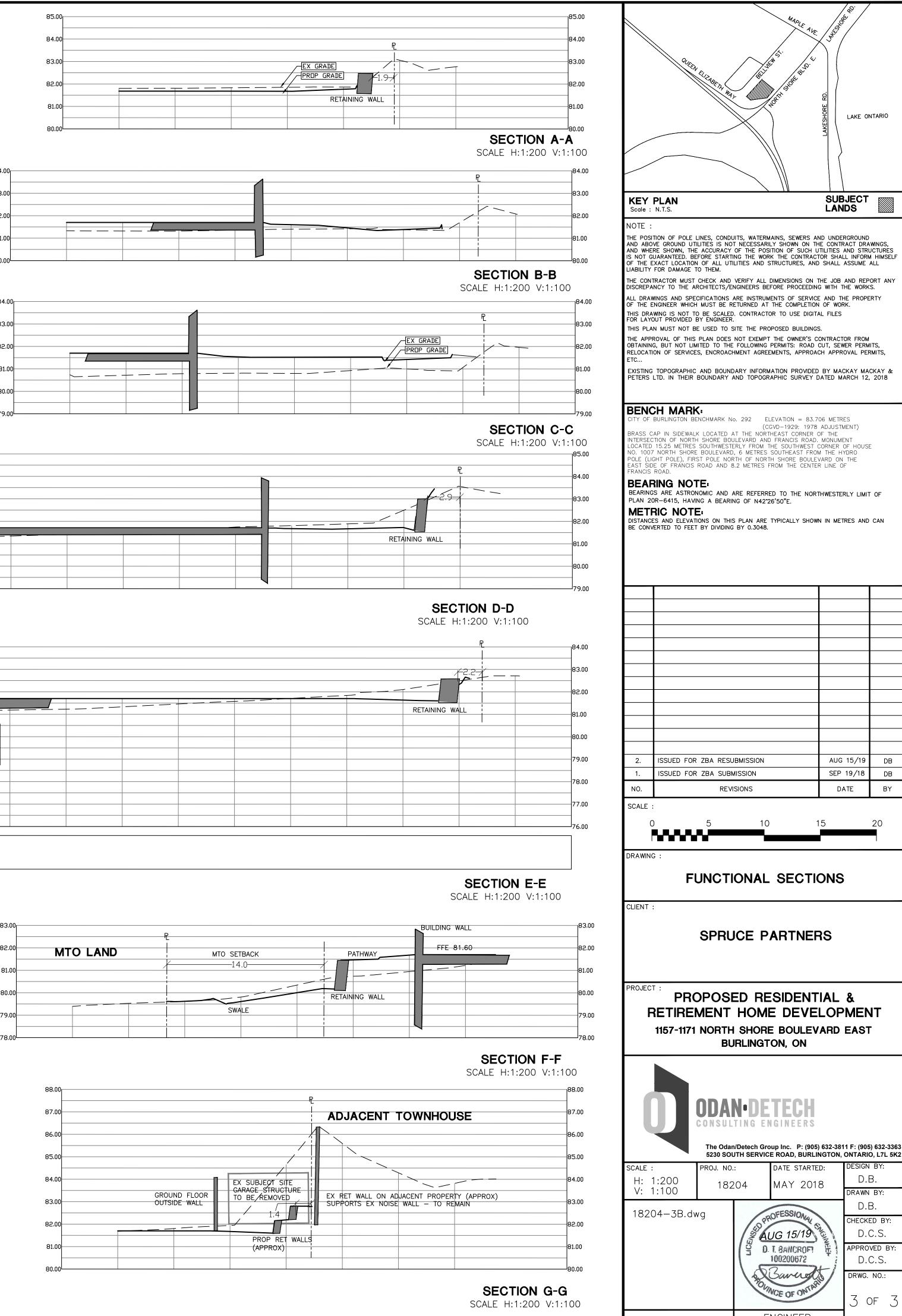


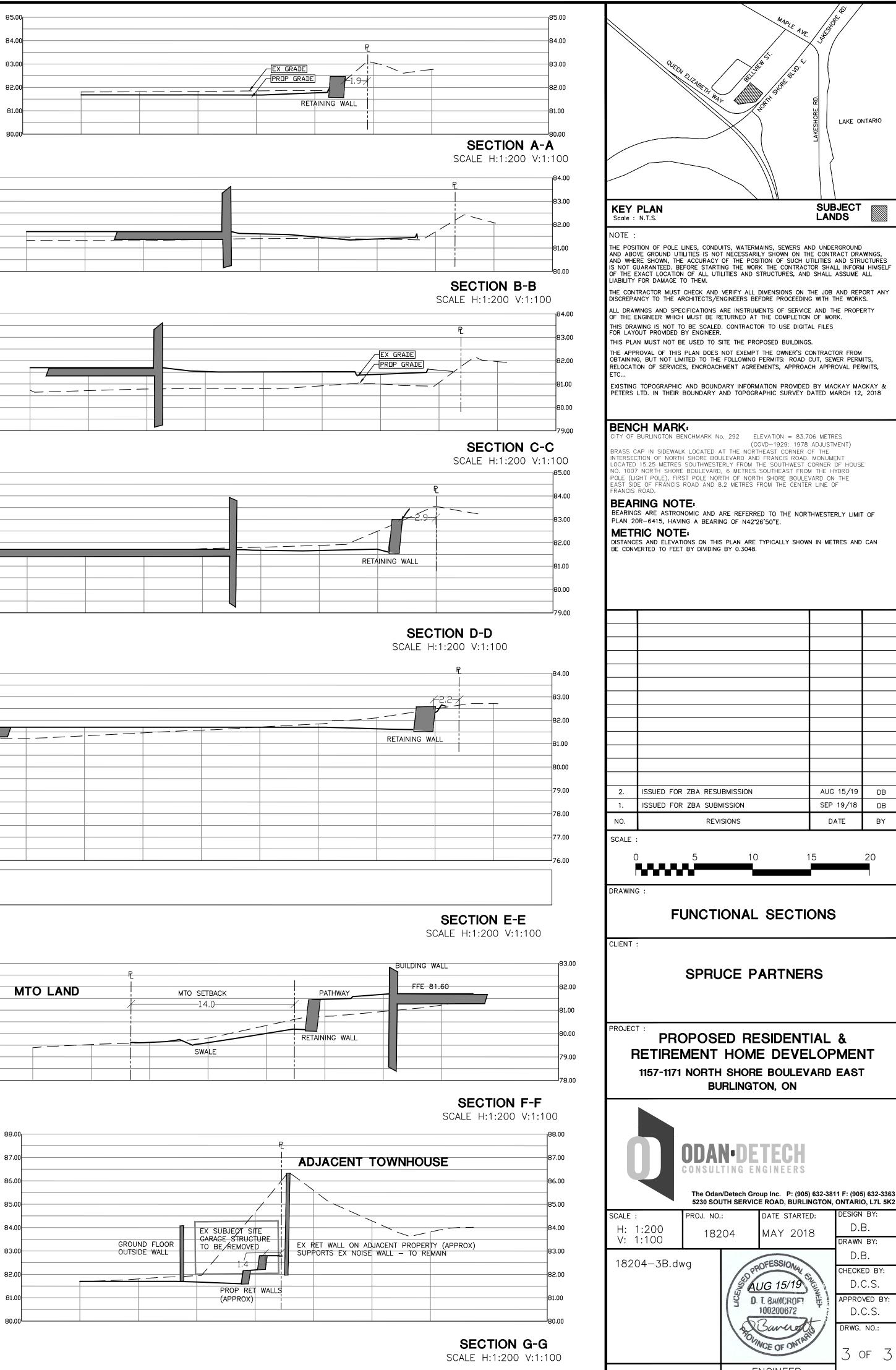






| 100-Y STORM TANK AREA 10m X 17m PRDV'D VDL 238cu.m. REQ'D VDL 235cu.m. DETAIL DESIGN AT SPA REFER TD FSR | | |
|---|--|--|





SCALE H:1:200 V:1:100