GRD20-0021

Hydrology and Hydraulics

for

uilding&Safety: jtyean 3/27/2020

Approval: Project Final Hydrology and Hydraulics

Permits: GRD20-0021

Dana Point Harbor

Commercial Core Area Phase 2 Parking Structure

Dana Point, California February, 2020 County of Orange - OC Public Works OC Development Services

APPROVED

alterations to these plans without written permission from OC Public Works, OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law.

Hadi Tabatabaee BUILDING OFFICIAL

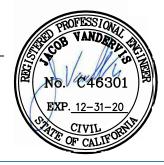
This Hydrology Study has been prepared by, and under the direction of, the undersigned, a duly Registered Civil Engineer in the State of California. Except as noted, the undersigned attests to the technical information contained herein, and has judged to be acceptable the qualifications of any technical specialists providing engineering data for this report, upon which findings, conclusions, and recommendations are based.

Jacob Vandervis, PE

Registered Civil Engineer No. <u>C46301</u>

Exp.: <u>12/31/20</u>

Prepared for:



Prepared by:







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SECTION 1 INTRODUCTION AND BACKGROUND

This Hydrology and Hydraulic Report (Report) serves as a basis of design for the proposed drainage system for the Dana Point Harbor (DPH) Commercial Core Area (CCA) Phase 2 Improvements in Dana Point (City), County of Orange (County), California. This study was prepared following the requirements set forth by the Orange County Hydrology Manual (OCHM), dated 1986, and its 1996 Addendum and the Orange County Local Drainage Manual (LDM), dated January 1996. Analysis of the existing drainage patterns and existing storm drainage capacity and overall site analysis can be found in the Master Plan of Drainage under Permit MB19-0039 and GRD19-0177, by TAIT & Associates, Inc. dated January 2020. Any plans and specification in this report are not for construction purposes; the contractor shall refer to final approved construction documents for plans and specifications.

DPH encompasses approximately 276.8 acres, owned by the County of Orange, and located in the southern portion of the City of Dana Point. This Report analyzed the Phase 2B Improvements which encompass an area of 6.9 acres which include proposed storm drain Line C2 (See Section 6 for detailed description) which is a proposed storm drain main lateral that will convey runoff from the project improvements to an existing 60-inch Reinforced Concrete Pipe (RCP) Line C that is located within the site.

DPH is bordered by the Pacific Ocean to the south, Dana Point Headlands and Old Cove Marine Preserve to the west, Doheny State Beach to the east and a variety of commercial, hotel, residential and public park uses to the north. The Interstate-5 freeway is located approximately two miles to the east and provides regional access to the Harbor. The City lies in the southwest portion of Orange County, in the State of California and it is part of the larger Southern California Region. It was incorporated on January 1st, 1989 and comprises of approximately 6.5 square miles. See Figure 1 Vicinity Map for project location.

The Dana Point Harbor Revitalization Plan has been in process since the late 1990's. Currently, the Revitalization Plan includes improvements to the Harbor's boat slips, retail center, boater facilities and parking, and storm water quality treatment. DPH is owned by the County of Orange and it is currently under a 66-year operating and maintenance lease agreement with the DPH Partners, LLC. and DPH Partners Drystack, LLC. which includes: Burnham Ward Properties, R.D. Olson Development and Bellwether Financial Group. Burnham Ward Properties will develop the Commercial Core Retail Area, R.D. Olson will develop the Hotel Area, and Bellwether Financial Group will develop the Marina portion and the Dry Stack Lease Area. The Phase 2B improvements are part of the CCA and are under Burnham Wards Properties responsibility.

Figure 2 DPH Study Area provides an overview of DPH and the CCA. The proposed improvements consist of Phase 2B which will include the construction of the parking structure and adjacent surface parking lots to the east and the south of the parking and improvements to Golden Lantern Street. Future improvements will include twelve commercial buildings and additional surface parking lots.

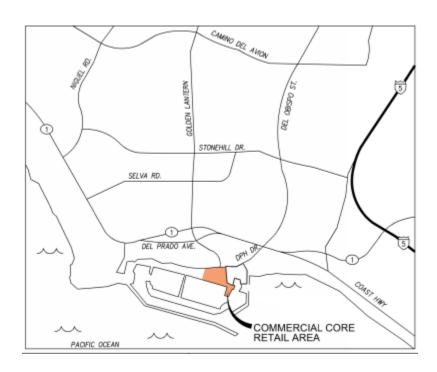


Figure 1 – Vicinity Map (Not To Scale)

SECTION 2 PROJECT DESCRIPTION

This Hydraulic and Hydrology Analysis studies the proposed Phase 2B of the Commercial Core Area (CCA) which is the first phase of construction development being completed by the DPH Partners, LLC, specifically by Burhan Ward as part of the DPH Revitalization Plan. For the DPH Revitalization Plan, the Environmental Impact Report (EIR) was approved in 2006, in November 18, 2014 the Coastal Development Plan was approved by the Coastal Commission and the City of Dana Point, in May 29, 2019 the Substantial Conformance to the 2014 CDP. The improvements for the CCA will be completed in separate phases as described in the CDP.

Phase 2B includes the construction of a 3-level Parking Structure a parking lot on the south and the needed improvements for vehicular and pedestrian access which after detailed analysis the design team determined best to complete the construction of Golden Lantern which was Phase 6 of the Substantial Conformance CDP. Thus Phase 2B includes the realignment of Golden Lantern Street located west of the parking structure will ultimately serve new buildings along the Harbor. The project stormwater runoff will sheet flow over the surface parking to catch basins and storm drain lines that convey runoff to the existing 60-inch RCP storm drain Line C. In the existing condition runoffs from a portion of this area sheet flow over the existing parking lot and are collected by Outlet 1 as described in the MPD prepared by Tait & Associates and Date January 2020. The drainage pattern change was made for two main reasons: the existing 18-inch RCP Line B located at the Drystack is under capacity, and to avoid drainage crossing the leasing boundary. The MPD analysis of Line C (60-inch RCP) determined that this storm drain has capacity for the increase in drainage area.

The MPD includes overall drainage analysis of the existing and ultimate proposed improvements of both the Commercial Core Area and Dry Stack Lease Areas. The Master Drainage Plan is processed under Orange County Public Works Rough Grading Permit GRD19-0177.

The overall site plan with phasing limits for Phase 2 is included in Figure 2. Phase 2 consist of Phase 2A for the rough grading for the parking structure area only and Phase 2B for the precise grading permit for the parking structure, paved surface parking around the structure, and realignment of Golden Lantern.

DAY DO A MARINA

BOOK TO REAL B

Figure 2 – Commercial Core Overall Site Plan / Phasing Plan

SECTION 3 HYDROLOGY DESIGN AND CRITERIA

3.1 Hydrology Criteria

The existing and proposed condition hydrology calculations were prepared in conformance with the Orange County Hydrology Manual (OCHM), dated 1986 and its Addendum No. 1, dated 1996. The hydrology analysis and small area hydrograph were prepared using the Advanced Engineer Software (AES), a computer software approved by the Orange County Flood Control District that follows the hydrology methodology and criteria from the OCHM. For this analysis drainage area delineations were prepared following existing topography and proposed contours for each analysis, flow paths, areas, and elevation were determined, as well as hydrology characteristics such as soil group and land use. The rational method for the existing and proposed conditions for the 10-year, 25-year and 100-year storm were prepared for the Phase 2 Improvements. Per the OCHM, the Antecedent Moisture Content (AMC) is II for the 10-year and 25-year storm event, and III for the 100-year storm event. Sections 4 and 5 provide detailed descriptions for the Existing Condition and Proposed Condition Hydrology analyses.

The OCHM uses the rational method to calculate peak runoff discharge from a drainage area. It utilizes the equation Q=CIA, where Q is discharge, I is intensity, and A is area. The RATSCX module of AES was used to analyze and route runoff through each subarea using elevations, slopes, flow lengths, soil group, land use and area inputs. The rational method analysis was prepared using the high confidence rainfall values as determined by the OCHM. The AES results provide peak discharge and time of concentration. The area being analyzed includes elevation below mean sea level which result in negative numbers. Due to limitations of AES for modeling purposes all elevations were raise by 1,000 to input into the models. Time of concentration and peak flow rates for the 10- and 100-year storm events were obtained.

3.2 Soil Group and Land Use

The OCHM utilizes Hydrologic Soil Groups to develop the rational method calculations. Soils are classified as Hydrologic Soil Groups A, B, C and D. The on-site consists of group D while the offsite consists of groups A, B, C, and D.

The DPH Commercial Core land use types consist mainly of commercial areas. The off-site drainage area to Storm Drain Line C includes the following classifications: commercial, 5-7 dwelling Units/acre, 8-10 dwelling Units/acre, 11+ dwelling Units/acre, apartments, condominiums, and public park land use.

3.3 Regional Hydrology

The Dana Point Harbor lies within the bounds of the Dana Point Coastal Streams Watershed, which includes a number of coastal drains that discharge to the Pacific Ocean through DPH.

Stormwater runoff from the site, sheet flows to different inlets that connect to underground storm drain lines that ultimately discharge to the Harbor through storm drain outlets located within the concrete stone revetment below the seawall.

The CCA includes the existing storm drain main Line C which is a 60-inch Reinforced Concrete Pipes (RCP) bisecting the CCA. Line C receives off-site runoffs from the City of Dana Point and discharge through Outlet 3 as described in the MPD. It receives stormwater runoff from a large off-site area consisting of residential and commercial developments within the City of Dana Point and north of Dana Point Harbor Drive. The MPD provides more detail for these off-site drainage areas. Stormwater runoff from the proposed project areas discharges directly to the Ocean via several County maintained and engineered storm drain systems or as stormwater runoff that sheet flows directly into the Ocean over the seawall.

SECTION 4 EXISTING AND PROPOSED CONDITION HYDROLOGY

The proposed condition hydrology analysis was prepared for Lateral Line C2 for the 10-year, 25-year, and 100-year storm events. Per the MPD, the area tributary to Outlet 3 is increasing and the area tributary to Outlet 1 is decreasing. This change results in adding approximately 5 acres of drainage to storm drain Line C that is accounted for in Lateral Line C2. Appendix A provides the Proposed Condition Hydrology Map, and Appendix B includes the AES Rational Method Results for the 10-year, 25-year, and 100-year storm events.

5.1 Existing Condition Hydrology

The MPD analyzed the existing condition hydrology and drainage patterns for Outlets 1 and 3. Outlet 1 is an existing 18-inch storm drain Line B located in the Dry Stack lease Area, and Outlet 3 is the existing 60-inch storm drain Line C located in the CCA. See Appendix F Section 4 of the Master Drainage Plan has more information regarding the existing project drainage patterns. The existing condition drainage will be altered due to the following:

- The existing 18-inch storm drain system in the Dry Stack Lease Area does not have sufficient capacity (Outlet 1)
- The leasing boundary change associated with the Dry Stack Lease Area and Commercial Core Retail Area.

5.2 Proposed Condition Hydrology

The proposed drainage for the Parking Structure Phase 2B area is designed for the ultimate condition of construction which includes Golden Lantern Street, proposed 3-level parking structure, paved parking area south of the parking structure and portions of buildings 6, 7 and 8. However, the boardwalk and the proposed buildings 6 to 8 will not be constructed as part of this phase.

The proposed drainage was divided into four main drainage areas as described below:

- Areas C2.1, C2.2, C2.4, C2.6, C2.10, C2.11
 These areas consist of parking lot, drive aisles, and future roof drains. The drainage areas are designed to flow to localized catch basin inlets and convey storm flow via storm drain system. All areas to be directed to an underground Stormsafe Filter to provide water quality treatment and contains an internal high flow bypass for higher storm events.
- Areas C2.3 and C2.5
 These areas will consist of the 3rd/upper level of the parking structure and skylights

openings of the parking structure. These areas will drain to localized inlets and trench drains and will be conveyed through the parking structure plumbing system. Plumbing system will connect directly to the proposed storm drain system and will be treated by the underground Stormsafe Filter.

Areas C2.8 and C9

These areas will consist of Golden Lantern Street drainage. Golden Lantern will be crowned at the median and adjacent sidewalk will slope towards the street. Street flows will be picked up by a curb opening Modular Wetland System (MWS) on each side of the street for water quality treatment. Catch basin inlets are added alongside the MWS for overflow events.

Areas C2.7

These areas will consist of the landscape areas alongside the north and west side of the parking structure. These flows will be captured by 6-inch and 12-inch atrium drains that convey back into stormdrain lateral C2 and will be treated by the underground Stormsafe Filter.

SECTION 5 HYDRAULIC DESIGN

5.1 Hydraulics Design Criteria

The project storm drain facilities include the on-site storm drain system, catch basin inlets, grated inlets to conform to the standards set forth in the Orange County Local Drainage Manual (LDM), dated 1996. The main line storm drain system, Line C2, was designed using the Water Surface Pressure Gradient (WSPGW), a software developed by the Los Angeles Flood Control District and approved by the County of Orange was utilized to calculate the Hydraulic Grade Line (HGL) for the proposed storm drain lines. WSPG uses the Bernoulli equation to calculate the HGL for each storm drain line utilizing the flow and boundary condition. All other storm drains sizes were designed using computer estimated pipe size model function within AES. The catch basin inlets that will be utilized for flood control purposes were designed to fully capture the 25-year storm events following the recommendation of the LDM. See Reference Plans in Appendix D of this report for detailed information and the location of proposed drainage facilities.

5.2 Storm Drain Design

As described in the MPD, the existing storm drain Outlet 3 was built under the seawall through the concrete stone revetment. Thus, the existing storm drain system is controlled downstream by the seawater elevation, which varies due to tidal influence. Seawater is expected to backflow into the storm drain system and is considered in the hydraulic calculations. The downstream surface water elevation is set to the Mean High Water (MHW) at 4.41-feet taken from the NOAA Tides/Water Levels for La Jolla Monitoring Station per the MPD.

Storm Drain Line C2 was designed using the flows obtained from the hydrology rational method analysis for the 10-year storm event. Line C2 will ultimately discharge to Line C but during the temporary condition will connect to the existing catch basin as seen in the storm drain in Appendix D. Water will pond inside manhole No. 2 until it reaches the invert of the existing catch basin and discharge to the existing Line C.

The HGL throughout the pipe is below the finished surface, and above the storm drain top throughout the entire system. This will cause the pipe to be under pressure in the higher storm events. Line C2-A, C2-B, and C2-C are proposed 15-inch High Density Polyethylene Pipe (HDPE) with water tight joints will be provided for the groundwater condition. Line C2 and Lateral C2-A were sized using WSPG to keep the HGL at least 3-feet below the finished surface to prevent backflow to the proposed Modular Wetland System (see WQMP for Water Quality Design Futures Details). Results are provided on Appendix C of this report.

5.3 Catch Basin Design

The catch basin were designed using the AES HYDRAULIC ELEMENTS I module, approved by the County of Orange. The catch basin design calculations are provided on Appendix E of this report and Appendix D include the locations of the catch basin structures. Majority of the site consists of Inlet Type I (Orange County Public Work (OCPW) Std. 1301) and Inlet Type III and IV were selected for catch basins No. 3 and 9 due to site plan constraints. All catch basins are designed to capture the ultimate condition 25-year storm event. All catch basins are located in a sump condition. Overflows for the 100-year storm will sheetflow over the existing parking lot and the seawall and into the harbor.

SECTION 6 DRAINAGE ANALYSIS RESULTS SUMMARY

This section summarizes the results for the hydrology and hydraulics analyses.

6.1 Hydrology Results

The Rational Method hydrology analysis was prepared for the 10-year, 25-year and 100-year storm events for the proposed conditions. The site has been designed with the connection to the existing Line C, which corresponds to Node 450 of the ultimate condition hydrology. The results summary for the Line C2 Rational Method hydrology analysis are provided in Table 1 below. Although the area tributary to Line C2 has decreased from the MPD, the peak discharge increased by 8.5% from the MPD which is in substantial conformance. This occurs due to the increase of time of concentration with a more detailed model compared to the models used in the MPD. No change in HGL occurred with the increase in stormwater flow.

Table 1: Proposed Detention Basin Summary

| Study | Study Area (AC) | | 25-Year (CFS) | 100-Year (CFS) | |
|----------|-----------------|-------|------------------|-------------------|--|
| Phase 2B | 6.9 | 20.22 | 24.19 | 31.19 | |
| MPD | 7.6 | 18.63 | | 28.85 | |

The results summary for the Outlet 3 Rational Method hydrology analysis are provided in Table 2 below. Peak discharge from the Ultimate Condition decreases in comparison to the calculations in the MPD designed. Future studies will include analysis of 100-year floodplain for protection for all habitable structures. Further phases of construction will include ultimate proposed hydrology and hydraulics analysis tributary to Outlet 3 and to Outlets 4 and 5 as described in the MPD.

Table 2 –Outlet 3 Rational Method Summary

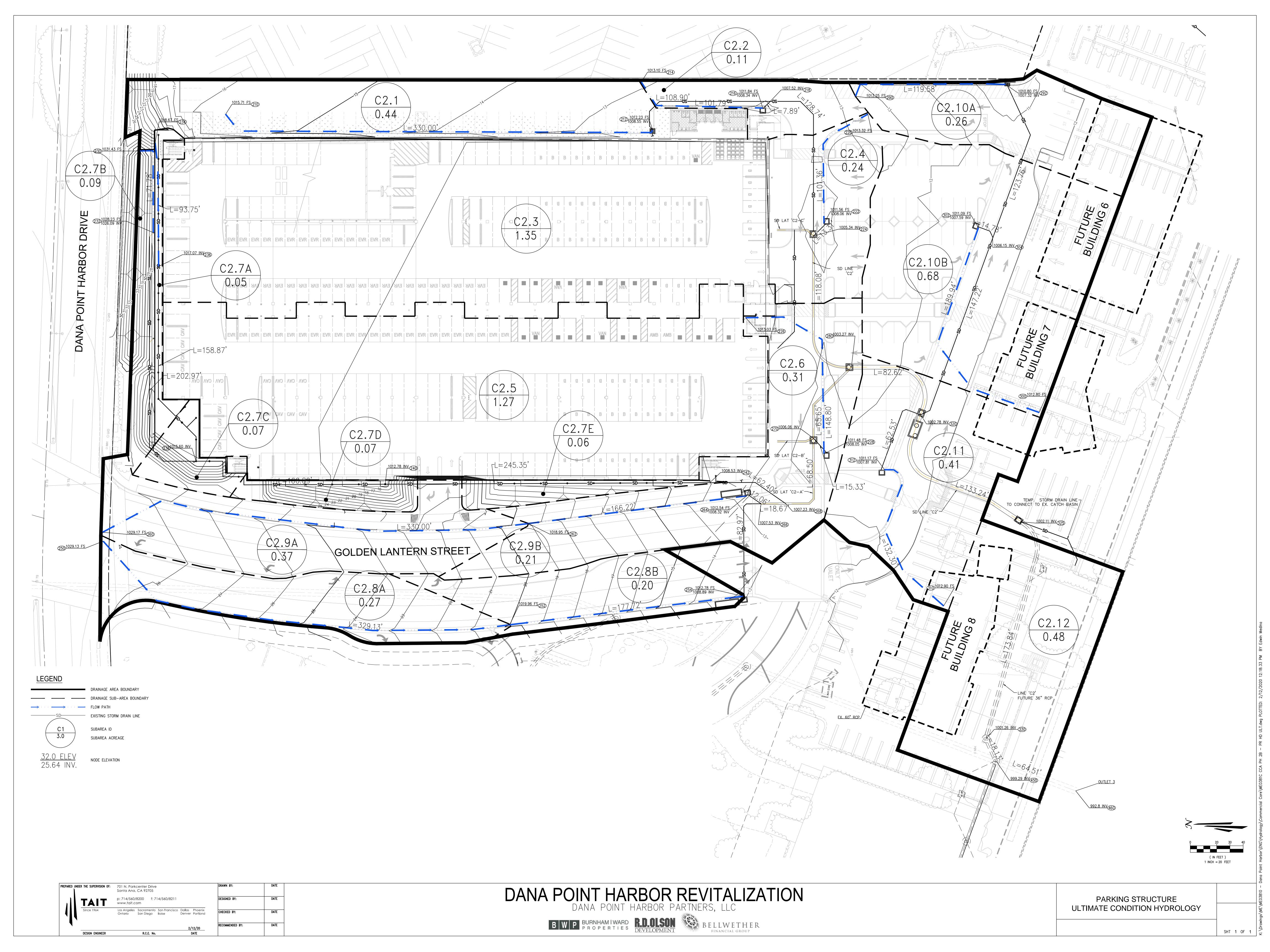
| Analysis | Area (AC) | 10-Year (CFS) | 100-Year (CFS) |
|---------------------------------|--------------|------------------|-------------------|
| Existing Condition | 252.7 | 356.50 | 575.64 |
| Phase 2B (Interim) Condition | 258.3 | 367.04 | 592.54 |
| Ultimate Condition | 259.4 | 370.49 | 598.04 |
| MPD | 259.4 | 374.28 | 602.02 |

TECHNICAL APPENDIX

TAIT JOB NO.ME03810 15

APPENDIX A - ULTIMATE CONDITION HYDROLOGY MAP

TAIT JOB NO.ME03810 16



APPENDIX B - ULTIMATE CONDITION HYDROLOGY RESULTS (AES)

TAIT JOB NO.ME03810 17

LINE C2

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION) (c) Copyright 1983-2016 Advanced Engineering Software (aes) Ver. 23.0 Release Date: 07/01/2016 License ID 1334

Analysis prepared by:

| * DANA POINT HARBOR COMMERCIAL CORE AREA - PHASE 2B * * RATIONAL METHOD PROPOSED CONDITION HYDROLOGY ULTIMATE OUTLET 3 * * 10-YEAR STORM EVENT EM * |
|---|
| FILE NAME: C2P10R.DAT TIME/DATE OF STUDY: 12:34 02/12/2020 |
| USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION: |
| *TIME-OF-CONCENTRATION MODEL* |
| USER SPECIFIED STORM EVENT(YEAR) = 10.00 SPECIFIED MINIMUM PIPE SIZE(INCH) = 6.00 SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90 *DATA BANK RAINFALL USED* *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD* |
| *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL** HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING MODEL** NO. (FT) (FT) SIDE / SIDE / WAY (FT) (FT) (FT) (FT) (FT) (FT) 1 30.0 20.0 0.1870.018/0.020 0.67 2.00 0.0313 0.167 0.0150 2 10.0 1.0 0.001/0.001/0.005 0.68 0.10 0.010 0.010 0.0080 |
| GLOBAL STREET FLOW-DEPTH CONSTRAINTS: 1. Relative Flow-Depth = 0.50 FEET |
| >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< |
| INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00 ELEVATION DATA: UPSTREAM(FEET) = 1015.71 DOWNSTREAM(FEET) = 1012.23 |
| Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.685 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.173 SUBAREA Tc AND LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS TC LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) COMMERCIAL D 0.44 0.20 0.100 75 7.69 SUBAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.20 SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.100 SUBAREA RUNOFF(CFS) = 1.25 TOTAL AREA(ACRES) = 0.44 PEAK FLOW RATE(CFS) = 1.25 |
| FLOW PROCESS FROM NODE 212.00 TO NODE 218.00 IS CODE = 31 |

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<

FLOW PROCESS FROM NODE 216.00 TO NODE 218.00 IS CODE = 31 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1008.34 DOWNSTREAM(FEET) = 1007.52 FLOW LENGTH(FEET) = 7.89 MANNING'S N = 0.012 DEFH OF FLOW IN 6.0 INCH BIED IS 1.9 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 7.51
ESTIMATED PIPE DIAMETER (INCH) = 6.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 0.40

PIPE TRAVEL TIME(MIN.) = 0.02 Tc(MIN.) = 5.02

LONGEST FLOWPATH FROM NODE 214.00 TO NODE 218.00 = 109.68 FEET.

>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<<

ESTIMATED PIPE DIAMETER (INCH) = 9.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 1.25
PIPE TRAVEL TIME(MIN.) = 0.44 Tc(MIN.) = 8.13
LONGEST FLOWPATH FROM NODE 210.00 TO NODE 218.00 =

PLOW LENGTH (FEET) = 108.90 MANNING'S N = 0.012
DEPTH OF FLOW IN 9.0 INCH PIPE IS 5.8 INCHES
PIPE-FLOW VELOCITY (FEET/SEC.) = 4.11

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<> TOTAL NUMBER OF STREAMS = 2 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 5.000 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 4.060 SUBAREA TO AND LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA

0.40

TIME OF CONCENTRATION(MIN.) = 8.13
RAINFALL INTENSITY(INCH/HR) = 3.07 AREA-AVERAGED Fm(INCH/HR) = 0.02 AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED PP(100.....,
AREA-AVERAGED AP = 0.10
EFFECTIVE STREAM AREA(ACRES) = 0
.44

PEAK FLOW RATE (CFS) AT CONFLUENCE =

SUBAREA RUNOFF (CFS) =

TOTAL AREA (ACRES) =

ELEVATION DATA: UPSTREAM(FEET) = 1008.55 DOWNSTREAM(FEET) = 1007.52

********************* FLOW PROCESS FROM NODE 218.00 TO NODE 218.00 IS CODE = 1

0.44

************************* FLOW PROCESS FROM NODE 214.00 TO NODE 216.00 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 101.79
ELEVATION DATA: UPSTREAM(FEET) = 1013.10 DOWNSTREAM(FEET) = 1011.84

LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
COMMERCIAL D 0.11 0.20 0.100 75 5.00
SUBARRA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
SUBARRA AVERAGE PERVIOUS ARRA FRACTION, Ap = 0.100

0.11 PEAK FLOW RATE(CFS) = ************************

FLOW PROCESS FROM NODE 218.00 TO NODE 218.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFIJIENCE<

>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES

TOTAL NUMBER OF STREAMS = 2 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE: TIME OF CONCENTRATION(MIN.) = 5.02
RAINFALL INTENSITY(INCH/HR) = 4.05 AREA-AVERAGED Fm(INCH/HR) = 0.02

```
AREA-AVERAGED Fp(INCH/HR) = 0.20
 AREA-AVERAGED Ap = 0.10

EFFECTIVE STREAM AREA(ACRES) = 0.11

TOTAL STREAM AREA(ACRES) = 0.11

PEAK FLOW RATE(CFS) AT CONFLUENCE =
                                                  0 40
  ** CONFLUENCE DATA **
               Q Tc Intensity Fp(Fm) Ap (CFS) (MIN.) (INCH/HR) (INCH/HR)
  STREAM
                                                                          HEADWATER
   NUMBER
                                                               (ACRES) NODE
                1.25 8.13 3.073 0.20(0.02) 0.10
0.40 5.02 4.051 0.20(0.02) 0.10
     1
                                                                     0.4
                                                                              210 00
  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR 2 STREAMS.
  ** PEAK FLOW RATE TABLE **
               \( \text{Q} \) TC \( \text{Intensity} \) Fp(Fm) \( \text{Ap} \) Ae \( \text{HEADWATER} \) (CFS) \( \text{MIN.} \) (INCH/HR) \( \text{INCH/HR} \) (30.20 \( 0.02 \) 0.10 \( 0.4 \) 214.00 \( 1.55 \) 8.13 \( 3.073 \) 0.20 \( 0.02 \) 0.10 \( 0.6 \) 210.00
  STREAM
  NUMBER
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 DRAK FILOW RATE (CRS) = 1.55 ToMIN.] = 8.13

EFFECTIVE AREA (ACRES) = 0.55 AREA-AVERAGED Fm(INCH/HR) = 0.02

AREA-AVERAGED Fp (INCH/HR) = 0.20 AREA-AVERAGED AP = 0.10
 TOTAL AREA (ACRES) = 0.6
LONGEST FLOWPATH FROM NODE 210.00 TO NODE 218.00 = 438.90 FEET.
*******************
 FLOW PROCESS FROM NODE 218.00 TO NODE 224.00 IS CODE = 31
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
  >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<<
 ELEVATION DATA: UPSTREAM(FEET) = 1007.52 DOWNSTREAM(FEET) = 1005.34
 FLOW LENGTH(FEET) = 128.74 MANNING'S N = 0.012
DEPTH OF FLOW IN 9.0 INCH PIPE IS 5.6 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 5.41
  ESTIMATED PIPE DIAMETER (INCH) = 9.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 1.55
PIPE TRAVEL TIME(MIN.) = 0.40 Tc(MIN.) = 8.52
 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 224.00 = 567.64 FEET.
FLOW PROCESS FROM NODE 224.00 TO NODE 224.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 8.52
RAINFALL INTENSITY(INCH/HR) = 2.99
 AREA-AVERAGED Fm(INCH/HR) = 0.02
AREA-AVERAGED Fp(INCH/HR) = 0.20
 AREA-AVERAGED FP(INCH,III.,
AREA-AVERAGED AP = 0.10
EFFECTIVE STREAM AREA(ACRES) = 0.55
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
********************
 FLOW PROCESS FROM NODE 220.00 TO NODE 222.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 INITIAL SUBAREA FLOW-LENGTH(FEET) = 101.36
ELEVATION DATA: UPSTREAM(FEET) = 1013.32 DOWNSTREAM(FEET) = 1011.56
  To = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) =
  * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 4.060
 SUBAREA TO AND LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA
       LAND USE
                              GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
                                                       Page 3
```

```
D 0.24 0.20 0.100 75 5.00 SUBARBA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20 SUBARBA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100 SUBARBA RUNOFF(CFS) = 0.87
 SUBAREA RUNOFF (CFS) = 0.87
TOTAL AREA (ACRES) = 0.24 PEAK FLOW RATE (CFS) =
******************************
 FLOW PROCESS FROM NODE 222.00 TO NODE 224.00 IS CODE = 31
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SURAREACCCC
  >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <>>>
 ELEVATION DATA: UPSTREAM(FEET) = 1008.06 DOWNSTREAM(FEET) = 1005.34 FLOW LENGTH(FEET) = 13.31 MANNING'S N = 0.012 DEPTH OF FLOW IN 6.0 INCH PIPE IS 2.4 INCHES PIPE-FLOW VELOCITY(FEET/SEC.) = 11.95 ESTIMATED PIPE DIAMETER(INCH) = 6.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 0.87
PIPE TRAVEL TIME(MIN.) = 0.02 Tc(MIN.) = 5.02
  LONGEST FLOWPATH FROM NODE 220.00 TO NODE 224.00 =
*************************
FLOW PROCESS FROM NODE 224.00 TO NODE 224.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
  TOTAL NUMBER OF STREAMS = 2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 5.02
RAINFALL INTENSITY (INCH/HR) = 4.05
AREA-AVERAGED Fm (INCH/HR) = 0.02
 AREA-AVERAGED FP(INCH/INC)
AREA-AVERAGED AP = 0.10
EFFECTIVE STREAM AREA(ACRES) = 0.24
  AREA-AVERAGED Fp(INCH/HR) = 0.20
  PEAK FLOW RATE (CFS) AT CONFLUENCE =
  ** CONFLUENCE DATA **
                           Tc Intensity Fp(Fm)
   STREAM
                 Q Tc Intensity Fp(Fm) Ap (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                                                HEADWATER
                                                                    (ACRES)
                                                                                NODE
                 1.42 5.42 3.876 0.20( 0.02) 0.10
1.55 8.52 2.990 0.20( 0.02) 0.10
0.87 5.02 4.051 0.20( 0.02) 0.10
                                                                          0.4
                                                                                    214.00
      1
                                                                           0.6
                                                                                     210.00
  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR 2 STREAMS.
  ** PEAK FLOW RATE TABLE **
   STREAM
                 Q Tc Intensity Fp(Fm) Ap (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                                                HEADWATER
                                                                    (ACRES)
   NUMBER
                                                                                  NODE
                 2.24 5.02 4.051 0.20(0.02) 0.10
2.25 5.42 3.876 0.20(0.02) 0.10
2.19 8.52 2.990 0.20(0.02) 0.10
                                                                          0.6
                                                                                     214.00
                                                                                     210.00
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 COMPOSITED CONFIDENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 2.25 Tc (MIN.) = 5.42

EFFECTIVE AREA (ACRES) = 0.62 AREA-AVERAGED FM (INCH/HR) = 0.02

AREA-AVERAGED AP = 0.10

TOTAL AREA (ACRES) = 0.8

LONGEST FLOWPATH FROM NODE 210.00 TO NODE 224.00 = 567.64 FEET.
FLOW PROCESS FROM NODE 224.00 TO NODE 224.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) =
  * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 3.876
  SUBAREA LOSS RATE DATA (AMC II):
  | DEVELOPMENT TYPE | SCS SOIL AREA | FP AP SCS | LAND USE | GROUP (ACRES) (INCH/HR) (DECIMAL) COMMERCIAL | D 1.27 0.20 0.100 75
  COMMERCIAL
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
```

| SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100 |
|---|
| SUBAREA AREA(ACRES) = 1.27 SUBAREA RUNOFF(CFS) = 4.41 EFFECTIVE AREA(ACRES) = 1.89 AREA-AVERAGED Fm(INCH/HR) = 0.02 AREA-AVERAGED Ap = 0.10 |
| EFFECTIVE AREA(ACRES) = 1.89 AREA-AVERAGED Fm(INCH/HR) = 0.02 |
| AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.10 |
| TOTAL AREA (ACRES) = 2.1 PEAK FLOW RATE (CFS) = 6.56 |
| |
| ** PEAK FLOW RATE TABLE ** |
| STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER |
| NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE |
| 1 6.76 5.02 4.051 0.20(0.02) 0.10 1.9 220.00 |
| 1 6.76 5.02 4.051 0.20(0.02) 0.10 1.9 220.00 2 6.56 5.42 3.876 0.20(0.02) 0.10 1.9 214.00 |
| 3 5.51 8.52 2.990 0.20(0.02) 0.10 2.1 210.00 |
| NEW PEAK FLOW DATA ARE: |
| NEW PEAK FLOW DATA ARE: PEAK FLOW RATE (CFS) = 6.76 Tc(MIN.) = 5.02 AREA-AVERAGED FM(INCH/HR) = 0.02 AREA-AVERAGED FP(INCH/HR) = 0.20 |
| AREA-AVERAGED Fm(INCH/HR) = 0.02 AREA-AVERAGED Fp(INCH/HR) = 0.20 |
| AREA-AVERAGED Ap = 0.10 EFFECTIVE AREA(ACRES) = 1.86 |
| |
| ******************* |
| FLOW PROCESS FROM NODE 224.00 TO NODE 224.00 IS CODE = 81 |
| |
| >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< |
| |
| MAINLINE Tc(MIN.) = 5.02 |
| * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 4.051 |
| SUBAREA LOSS RATE DATA(AMC II): |
| SUBAREA LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN COMMERCIAL D 0.08 0.20 0.100 75 |
| LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN |
| COMMERCIAL D 0.08 0.20 0.100 75 |
| SUBAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.20 |
| SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100 |
| SUBAREA AREA(ACRES) = 0.08 SUBAREA RUNOFF(CFS) = 0.29 EFFECTIVE AREA(ACRES) = 1.94 AREA-AVERAGED Fm(INCH/HR) = 0.02 AREA-AVERAGED AP = 0.10 |
| EFFECTIVE AREA(ACRES) = 1.94 AREA-AVERAGED Fm(INCH/HR) = 0.02 |
| AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.10 |
| TOTAL AREA (ACRES) = 2.1 PEAK FLOW RATE (CFS) = 7.05 |
| |
| ******************* |
| FLOW PROCESS FROM NODE 224.00 TO NODE 280.00 IS CODE = 31 |
| |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< |
| HATMA GAMPUMED DAMENAMED DEPRETER ANALY DEPARTURE BY ANY |
| >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< |
| >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< |
| >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< |
| >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH (FEET) = 118.08 MANNING'S N = 0.013 |
| >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH (FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 15.0 INCH PIPE IS 10.8 INCHES |
| >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH (FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 15.0 INCH PIPE IS 10.8 INCHES PIPE-FLOW VELDCITY (FEET/SEC.) = 7.45 |
| >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH (FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 15.0 INCH PIPE IS 10.8 INCHES PIPE-PLOW VELOCITY (FEET/SEC.) = 7.45 ESTIMATED PIPE DIAMETER (INCH) = 15.00 NUMBER OF PIPES = 1 |
| >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH (FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 15.0 INCH PIPE IS 10.8 INCHES PIPE-FLOW VELDCITY (FEET/SEC.) = 7.45 ESTIMATED PIPE DIAMETER (INCH) = 15.00 NUMBER OF PIPES = 1 PIPE-FLOW(FS) = 7.05 |
| >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH(FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 15.0 INCH PIPE IS 10.8 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 7.45 ESTIMATED PIPE DIAMETER (INCH) = 15.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 7.05 PIPE TRAVEL TIME (MIN.) = 0.26 Tc (MIN.) = 5.28 |
| >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH (FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 15.0 INCH PIPE IS 10.8 INCHES PIPE-FLOW VELDCITY (FEET/SEC.) = 7.45 ESTIMATED PIPE DIAMETER (INCH) = 15.00 NUMBER OF PIPES = 1 PIPE-FLOW(FS) = 7.05 |
| >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH (FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 15.0 INCH PIPE IS 10.8 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 7.45 ESTIMATED PIPE DIAMETER (INCH) = 15.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 7.05 PIPE TRAVEL TIME (MIN.) = 0.26 Tc (MIN.) = 5.28 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. |
| >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH (FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 15.0 INCH PIPE IS 10.8 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 7.45 ESTIMATED PIPE DIAMPTER (INCH) = 15.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 7.05 PIPE TRAVEL TIME(MIN.) = 0.26 TC(MIN.) = 5.28 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. |
| >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH(FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 15.0 INCH PIPE IS 10.8 INCHES PIPE-FLOW VELDCITY(PEET/SEC.) = 7.45 ESTIMATED PIPE DIAMETER(INCH) = 15.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 7.05 PIPE TRAVEL TIME (MIN.) = 0.26 TC (MIN.) = 5.28 LONGEST FLOWPATH FROM NODE 280.00 TO NODE 280.00 IS CODE = 10 |
| >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH (FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 15.0 INCH PIPE IS 10.8 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 7.45 ESTIMATED PIPE DIAMETER (INCH) = 15.00 NUMBER OF PIPES = 1 PIPE-FLOW (CFS) = 7.05 PIPE TRAVEL TIME (MIN.) = 0.26 Tc (MIN.) = 5.28 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. FLOW PROCESS FROM NODE 280.00 TO NODE 280.00 IS CODE = 10 |
| >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH(FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 15.0 INCH PIPE IS 10.8 INCHES PIPE-FLOW VELOCITY(FEET/SEC.) = 7.45 ESTIMATED PIPE DIAMETER(INCH) = 15.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 7.05 PIPE TRAVEL TIME(MIN.) = 0.26 Tc (MIN.) = 5.28 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 IS CODE = 10 FLOW PROCESS FROM NODE 280.00 TO NODE 280.00 IS CODE = 10 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<< |
| >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH (FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 15.0 INCH PIPE IS 10.8 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 7.45 ESTIMATED PIPE DIAMETER (INCH) = 15.00 NUMBER OF PIPES = 1 PIPE-FLOW (CFS) = 7.05 PIPE TRAVEL TIME (MIN.) = 0.26 Tc (MIN.) = 5.28 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. FLOW PROCESS FROM NODE 280.00 TO NODE 280.00 IS CODE = 10 |
| >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH(FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 15.0 INCH PIPE IS 10.8 INCHES PIPE-FLOW VELOCITY(FEET/SEC.) = 7.45 ESTIMATED PIPE DIAMETER(INCH) = 15.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 7.05 PIPE TRAVEL TIME (MIN.) = 0.26 Tc (MIN.) = 5.28 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. FLOW PROCESS FROM NODE 280.00 TO NODE 280.00 IS CODE = 10 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANN # 1 <<<< |
| >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH (FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 15.0 INCH PIPE IS 10.8 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 7.45 ESTIMATED PIPE DIAMETER (INCH) = 15.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 7.05 PIPE TRAVEL TIME (MIN.) = 0.26 Tc (MIN.) = 5.28 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. FLOW PROCESS FROM NODE 280.00 TO NODE 280.00 IS CODE = 10 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<< |
| >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH (FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 15.0 INCH PIPE IS 10.8 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 7.45 ESTIMATED PIPE DIAMETER (INCH) = 15.00 NUMBER OF PIPES = 1 PIPE-FLOW (CFS) = 7.05 PIPE TRAVEL TIME (MIN.) = 0.26 Tc (MIN.) = 5.28 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 IS CODE = 10 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<< |
| >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< Colspan="2">ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH (FEET) = 118.08 MANNING! SN = 0.013 DEPTH OF FLOW IN 15.0 INCH PIPE IS 10.8 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 7.45 ESTIMATED PIPE DIAMETER (INCH) = 15.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 7.05 PIPE TRAVEL TIME (MIN.) = 0.26 Tc (MIN.) = 5.28 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. FLOW PROCESS FROM NODE 280.00 TO NODE 280.00 IS CODE = 10 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<< |
| >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH (FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 15.0 INCH PIPE IS 10.8 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 7.45 ESTIMATED PIPE DIAMETER (INCH) = 15.00 NUMBER OF PIPES = 1 PIPE-FLOW (CFS) = 7.05 PIPE TRAVEL TIME (MIN.) = 0.26 Tc (MIN.) = 5.28 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. FLOW PROCESS FROM NODE 280.00 TO NODE 280.00 IS CODE = 10 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<< |
| >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH (FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF PLOW IN 15.0 INCH PIPE IS 10.8 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 7.45 ESTIMATED PIPE DIAMETER (INCH) = 15.00 NUMBER OF PIPES = 1 PIPE-FLOW (CPS) = 7.05 PIPE TRAVEL TIME (MIN.) = 0.26 Tc (MIN.) = 5.28 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. FLOW PROCESS FROM NODE 280.00 TO NODE 280.00 IS CODE = 10 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<< |
| >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH (FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 15.0 INCH PIPE IS 10.8 INCHES PIPE-FLOW VELOCITY (FEET/SC.) = 7.45 ESTIMATED PIPE DIAMETER (INCH) = 15.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 7.05 PIPE TRAVEL TIME (MIN.) = 0.26 Tc (MIN.) = 5.28 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. FLOW PROCESS FROM NODE 280.00 TO NODE 280.00 IS CODE = 10 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<< |
| >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH (FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 15.0 INCH PIPE IS 10.8 INCHES PIPE-FLOW VELOCITY (FEET/SC.) = 7.45 ESTIMATED PIPE DIAMETER (INCH) = 15.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 7.05 PIPE TRAVEL TIME (MIN.) = 0.26 Tc (MIN.) = 5.28 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. FLOW PROCESS FROM NODE 280.00 TO NODE 280.00 IS CODE = 10 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<< |
| >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH (FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 15.0 INCH PIPE IS 10.8 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 7.45 ESTIMATED PIPE DIAMETER (INCH) = 15.00 NUMBER OF PIPES = 1 PIPE-FLOW (CFS) = 7.05 PIPE TRAVEL TIME (MIN.) = 0.26 TC (MIN.) = 5.28 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 IS CODE = 10 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<-> FLOW PROCESS FROM NODE 234.00 TO NODE 236.00 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBARRA ANALYSIS<<<<>>>>>>RATIONAL METHOD INITIAL SUBARRA ANALYSIS<<<<>>>>>> VUSE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBARRA< |
| >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH (FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 15.0 INCH PIPE IS 10.8 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 7.45 ESTIMATED PIPE DIAMETER (INCH) = 15.00 NUMBER OF PIPES = 1 PIPE-FLOW (CPS) = 7.05 PIPE TRAVEL TIME (MIN.) = 0.26 Tc (MIN.) = 5.28 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. FLOW PROCESS FROM NODE 280.00 TO NODE 280.00 IS CODE = 10 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<> FLOW PROCESS FROM NODE 234.00 TO NODE 236.00 IS CODE = 21 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS <<<<> >VUSE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA INITIAL SUBAREA FLOW-LENGTH (FEET) = 93.75 ELEVATION DATA: UPSTREAM(FEET) = 1018.67 DOWNSTREAM(FEET) = 1017.07 |
| >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH (FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 15.0 INCH PIPE IS 10.8 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 7.45 ESTIMATED PIPE DIAMETER (INCH) = 15.00 NUMBER OF PIPES = 1 PIPE-FLOW (GFS) = 7.05 PIPE TRAVEL TIME (MIN.) = 0.26 Tc (MIN.) = 5.28 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. FLOW PROCESS FROM NODE 280.00 TO NODE 280.00 IS CODE = 10 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<< FLOW PROCESS FROM NODE 234.00 TO NODE 236.00 IS CODE = 21 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<>>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA |
| >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH (FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 15.0 INCH PIPE IS 10.8 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 7.45 ESTIMATED PIPE DIAMETER (INCH) = 15.00 NUMBER OF PIPES = 1 PIPE-FLOW (CFS) = 7.05 PIPE TRAVEL TIME (MIN.) = 0.26 TC (MIN.) = 5.28 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. FLOW PROCESS FROM NODE 280.00 TO NODE 280.00 IS CODE = 10 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<< >>>>>>>>>NA3 TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA SUBSTIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA CONSTREAM(FEET) = 93.75 ELEVATION DATA: UPSTREAM(FEET) = 1018.67 DOWNSTREAM(FEET) = 1017.07 TC = K*[(LENGTH** 3.00)/(ELEVATION CRANCE)]**0.20 SUBAREA ANALYSIS USED MINIMUM TC (MIN.) = 5.000 **10 YEAR BAINFALL UTENSITY (INCH/HID) = 4.060 |
| >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH (FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 15.0 INCH PIPE IS 10.8 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 7.45 ESTIMATED PIPE DIAMETER (INCH) = 15.00 NUMBER OF PIPES = 1 PIPE-FLOW (CFS) = 7.05 PIPE TRAVEL TIME (MIN.) = 0.26 TC (MIN.) = 5.28 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. FLOW PROCESS FROM NODE 280.00 TO NODE 280.00 IS CODE = 10 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<< >>>>>>>>>NA3 TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA SUBSTIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA CONSTREAM(FEET) = 93.75 ELEVATION DATA: UPSTREAM(FEET) = 1018.67 DOWNSTREAM(FEET) = 1017.07 TC = K*[(LENGTH** 3.00)/(ELEVATION CRANCE)]**0.20 SUBAREA ANALYSIS USED MINIMUM TC (MIN.) = 5.000 **10 YEAR BAINFALL UTENSITY (INCH/HID) = 4.060 |
| >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH (FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 15.0 INCH PIPE IS 10.8 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 7.45 ESTIMATED PIPE DIAMETER (INCH) = 15.00 NUMBER OF PIPES = 1 PIPE-FLOW (CFS) = 7.05 PIPE TRAVEL TIME (MIN.) = 0.26 TC (MIN.) = 5.28 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. FLOW PROCESS FROM NODE 280.00 TO NODE 280.00 IS CODE = 10 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<< >>>>>>>>>NA3 TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA SUBSTIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA CONSTREAM(FEET) = 93.75 ELEVATION DATA: UPSTREAM(FEET) = 1018.67 DOWNSTREAM(FEET) = 1017.07 TC = K*[(LENGTH** 3.00)/(ELEVATION CRANCE)]**0.20 SUBAREA ANALYSIS USED MINIMUM TC (MIN.) = 5.000 **10 YEAR BAINFALL UTENSITY (INCH/HID) = 4.060 |
| >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH (FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 15.0 INCH PIPE IS 10.8 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 7.45 ESTIMATED PIPE DIAMETER (INCH) = 15.00 NUMBER OF PIPES = 1 PIPE-FLOW (CFS) = 7.05 PIPE TRAVEL TIME (MIN.) = 0.26 TC (MIN.) = 5.28 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. FLOW PROCESS FROM NODE 280.00 TO NODE 280.00 IS CODE = 10 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<< >>>>>>>>>NA3 TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA SUBSTIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA CONSTREAM(FEET) = 93.75 ELEVATION DATA: UPSTREAM(FEET) = 1018.67 DOWNSTREAM(FEET) = 1017.07 TC = K*[(LENGTH** 3.00)/(ELEVATION CRANCE)]**0.20 SUBAREA ANALYSIS USED MINIMUM TC (MIN.) = 5.000 **10 YEAR BAINFALL UTENSITY (INCH/HID) = 4.060 |
| >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH (FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 15.0 INCH PIPE IS 10.8 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 7.45 ESTIMATED PIPE DIAMETER (INCH) = 15.00 NUMBER OF PIPES = 1 PIPE-FLOW (CFS) = 7.05 PIPE TRAVEL TIME (MIN.) = 0.26 TC (MIN.) = 5.28 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. FLOW PROCESS FROM NODE 280.00 TO NODE 280.00 IS CODE = 10 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<< >>>>>>>>>NA3 TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA SUBSTIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA CONSTREAM(FEET) = 93.75 ELEVATION DATA: UPSTREAM(FEET) = 1018.67 DOWNSTREAM(FEET) = 1017.07 TC = K*[(LENGTH** 3.00)/(ELEVATION CRANCE)]**0.20 SUBAREA ANALYSIS USED MINIMUM TC (MIN.) = 5.000 **10 YEAR BAINFALL UTENSITY (INCH/HID) = 4.060 |
| >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH (FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 15.0 INCH PIPE IS 10.8 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 7.45 ESTIMATED PIPE DIAMETER (INCH) = 15.00 NUMBER OF PIPES = 1 PIPE-FLOW (CFS) = 7.05 PIPE TRAVEL TIME (MIN.) = 0.26 TC (MIN.) = 5.28 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. FLOW PROCESS FROM NODE 280.00 TO NODE 280.00 IS CODE = 10 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<< >>>>>>>>>NA3 TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA SUBSTIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA CONSTREAM(FEET) = 93.75 ELEVATION DATA: UPSTREAM(FEET) = 1018.67 DOWNSTREAM(FEET) = 1017.07 TC = K*[(LENGTH** 3.00)/(ELEVATION CRANCE)]**0.20 SUBAREA ANALYSIS USED MINIMUM TC (MIN.) = 5.000 **10 YEAR BAINFALL UTENSITY (INCH/HID) = 4.060 |
| >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH(FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 15.0 INCH PIPE IS 10.8 INCHES PIPE-FLOW VELOCITY(PEET/SEC.) = 7.45 ESTIMATED PIPE DIAMETER (INCH) = 15.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 7.05 PIPE TRAVEL TIME (MIN.) = 0.26 Tc (MIN.) = 5.28 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 IS CODE = 10 |
| >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<> ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH(FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 15.0 INCH PIPE IS 10.8 INCHES PIPE-FLOW VELOCITY(FEET/SEC.) = 7.45 ESTIMATED PIPE DIAMETER(INCH) = 15.00 NUMBER OF PIPES = 1 PIPE-FLOW (CFS) = 7.05 PIPE TRAVEL TIME (MIN.) = 0.26 Tc (MIN.) = 5.28 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 IS CODE = 10 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<< |
| >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH(FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 15.0 INCH PIPE IS 10.8 INCHES PIPE-FLOW VELOCITY(PEET/SEC.) = 7.45 ESTIMATED PIPE DIAMETER (INCH) = 15.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 7.05 PIPE TRAVEL TIME (MIN.) = 0.26 Tc (MIN.) = 5.28 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 IS CODE = 10 |

SUBAREA RUNOFF(CFS) = 0.18

C2P10R

| TOTAL AREA (ACRES) = 0.05 PEAK FLOW RATE (CFS) = 0.18 |
|--|
| ****************** |
| FLOW PROCESS FROM NODE 236.00 TO NODE 238.00 IS CODE = 31 |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<>>>> >USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <>>>> |
| ELEVATION DATA: UPSTREAM(FEET) = 1017.07 DOWNSTREAM(FEET) = 1015.60 FLOW LENGTH (FEET) = 158.87 MANNING'S N = 0.012 DEPTH OF FLOW IN 6.0 INCH PIPE IS 2.4 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 2.51 ESTIMATED PIPE DIAMETER (INCH) = 6.00 NUMBER OF PIPES = 1 |
| PIPE-FLOW(CFS) = 0.18 PIPE TRAVEL TIME(MIN.) = 1.06 |
| LONGES1 FLOWPAIH FROM NODE |
| FLOW PROCESS FROM NODE 238.00 TO NODE 238.00 IS CODE = 1 |
| >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE |
| TIME OF CONCENTRATION(MIN.) = 6.06 RAINFALI INTENSITY (INCH/HR) = 3.64 AREA-AVERAGED Fm(INCH/HR) = 0.02 AREA-AVERAGED Fp = 0.10 EFFECTIVE STREAM AREA (ACRES) = 0.05 TOTAL STREAM AREA (ACRES) = 0.05 FEAK FLOW RATE(CFS) AT CONFLUENCE = 0.18 |
| ************************************** |
| >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< |
| TC = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 SUBAREA ANALYSIS USED MINIMUM TC(MIN.) = 5.000 **10 YEAR RAINFALL INTENSITY (INCH/HR) = 4.060 SUBAREA TC AND LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Pp Ap SCS TC LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN COMMERCIAL D 0.09 0.20 0.100 75 5. SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100 SUBAREA RUNOFF(CFS) = 0.33 TOTAL AREA(ACRES) = 0.09 PEAK FLOW RATE(CFS) = 0.33 |
| ************************************** |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA |
| >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<< |
| FLOW LENGTH (FEET) = 202.97 MANNING'S N = 0.012 DEPTH OF FLOW IN 6.0 INCH PIPE IS 2.0 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 5.54 GIVEN PIPE DIAMETER(INCH) = 6.00 NUMBER OF PIPES = 1 PIPE-FLOW (CFS) = 0.33 |
| PIPE TRAVEL TIME(MIN.) = 0.61 Tc(MIN.) = 5.61 LONGEST FLOWPATH FROM NODE 230.00 TO NODE 238.00 = 274.75 FEET |
| FLOW PROCESS FROM NODE 238.00 TO NODE 238.00 IS CODE = 1 |
| >>>>DESTABLE INDEPENDENT STREAM FOR CONFIDENCE//// |

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE

180

| TOTAL NUMBER OF STREAMS = 2 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE: |
|---|
| TIME OF CONCENTRATION(MIN.) = 5.61 RAINFALL INTENSITY(INCH/HR) = 3.80 ARRA_AURRAGED PM (INCH/HR) = 0.02 |
| AREA-AVERAGED Fm (INCH/HR) = 0.02 AREA-AVERAGED Fp (INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.10 |
| EFFECTIVE STREAM AREA(ACRES) = 0.09 TOTAL STREAM AREA(ACRES) = 0.09 PEAK FLOW RATE (CFS) AT CONFLUENCE = 0.33 |
| |
| ** CONFLUENCE DATA ** STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 0.18 6.06 3.638 0.20 (0.02) 0.10 0.1 234.00 2 0.33 5.61 3.800 0.20 (0.02) 0.10 0.1 230.00 |
| 1 0.18 6.06 3.638 0.20(0.02) 0.10 0.1 234.00 2 0.33 5.61 3.800 0.20(0.02) 0.10 0.1 230.00 |
| RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO CONFLUENCE FORMULA USED FOR 2 STREAMS. |
| ** PEAK FLOW RATE TABLE ** STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER |
| STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER |
| COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS: PEAK FLOW RATE (CFS) = 0.50 To(MIN.) = 5.61 EFFECTIVE AREA (ACRES) = 0.14 AREA-AVERAGED Fm(INCH/HR) = 0.02 AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED AP = 0.10 TOTAL AREA (ACRES) = 0.1 LONGEST FLOWPATH FROM NODE 230.00 TO NODE 238.00 = 274.75 FEET. |
| ************************************** |
| FLOW PROCESS FROM NODE 238.00 TO NODE 238.00 IS CODE = 81 |
| >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>> |
| MAINLINE TC(MIN.) = 5.61 |
| * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.800 |
| SUBARRA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN COMMERCIAL D 0.07 0.20 0.100 75 SUBARRA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.20 |
| LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN |
| SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20 |
| |
| EFFECTIVE AREA(ACRES) = 0.21 AREA-AVERAGED Fm(INCH/HR) = 0.02 |
| SUBARRA AREA (ACRES) = 0.07 SUBARRA RUNOFF (CFS) = 0.24 EFFECTIVE AREA (ACRES) = 0.21 AREA-AVERAGED Fm (INCH/HR) = 0.02 ARRA-AVERAGED p = 0.10 0.10 TOTAL AREA (ACRES) = 0.2 PEAK FLOW RATE (CFS) = 0.70 |
| FLOW PROCESS FROM NODE 238.00 TO NODE 240.00 IS CODE = 31 |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<>>> >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <>>> |
| ELEVATION DATA: UPSTREAM(FEET) = 1015.60 DOWNSTREAM(FEET) = 1012.78 FLOW LENGTH(FEET) = 160.89 MANNING'S N = 0.012 DEPTH OF FLOW IN 6.0 INCH PIPE IS 4.5 INCHES PIPE-FLOW VELOCITY(FEET/SEC.) = 4.42 ESTIMATED PIPE DIAMETER (INCH) = 6.00 NUMBER OF PIPES = 1 |
| PIPE-FLOW(CFS) = 0.70 PIPE TRAVEL TIME(MIN.) = 0.61 Tc(MIN.) = 6.22 |
| LONGEST FLOWPATH FROM NODE 230.00 TO NODE 240.00 = 435.64 FEET. |
| FLOW PROCESS FROM NODE 240.00 TO NODE 240.00 IS CODE = 81 |
| >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< |
| |

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* 10 YEAR RAINFALL INTENSITY (INCH/HR) = 3.583 SUBAREA LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
D 0.07 0.20 0.100 75 COMMERCIAL SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20 *********************************** FLOW PROCESS FROM NODE 240.00 TO NODE 242.00 IS CODE = 31 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1012.78 DOWNSTREAM(FEET) = 1008.53 PICON LENGTH(FEET) = 245.35 MANNING'S N = 0.012

DEPTH OF FLOW IN 9.0 INCH PIPE IS 3.9 INCHES

PIEE-FLOW VELOCITY (FEET/SEC.) = 4.76

ESTIMATED PIPE DIAMETER (INCH) = 9.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 0.89
PIPE TRAVEL TIME(MIN.) = 0.86 Tc(MIN.) = 7.08
LONGEST FLOWPATH FROM NODE 230.00 TO NODE 242.00 = ************************* FLOW PROCESS FROM NODE 242.00 TO NODE 242.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< -----MAINLINE Tc(MIN.) = 7.08
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.327
SUBAREA LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
D 0.06 0.20 0.100 75 COMMERCIAL D 0.06 0.20 0.100 75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA AREA (ACRES) = 0.06 SUBAREA RUNOFF(CFS) = 0.18
EFFECTIVE AREA (ACRES) = 0.34 AREA-AVERAGED Fm(INCH/HR) = 0.02
AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.10
TOTAL AREA (ACRES) = 0.3 PEAK FLOW RATE(CFS) = 1.00 ******************* FLOW PROCESS FROM NODE 242.00 TO NODE 268.00 IS CODE = 10 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<< ************************ FLOW PROCESS FROM NODE 250.00 TO NODE 252.00 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< INITIAL SUBAREA FLOW-LENGTH(FEET) = 329.13 ELEVATION DATA: UPSTREAM(FEET) = 1029.13 DOWNSTREAM(FEET) = 1019.96 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 6.322 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.549 SUBAREA To AND LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
D 0.27 0.20 0.100 75 6.32 COMMERCIAL SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100 SUBAREA RUNOFF(CFS) = 0.86 TOTAL AREA (ACRES) = 0.27 PEAK FLOW RATE(CFS) = ******************* FLOW PROCESS FROM NODE 252.00 TO NODE 254.00 IS CODE = 61

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>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
  >>>> (STANDARD CURB SECTION USED) <<<<
  UPSTREAM ELEVATION (FEET) = 1019.96 DOWNSTREAM ELEVATION (FEET) = 1012.78
  STREET LENGTH (FEET) = 177.72 CURB HEIGHT (INCHES) = 6.0
  STREET HALFWIDTH (FEET) = 38.00
  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 33.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.018
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
     STREET FLOW DEPTH(FEET) = 0.22
HALFSTREET FLOOD WIDTH(FEET) = 4.75
     AVERAGE FLOW VELOCITY (FEET/SEC.) =
  PRODUCT OF DEPTHAVELOCITY(FT*FT/SEC.) = 0.74
STREET FLOW TRAVEL TIME (MIN.) = 0.88 Tc (MIN.) = 7.21
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.292
 STREET FLOW TRAVEL ...

* 10 YEAR RAINFALL INTENSITY(INCH,...,

* 10 YEAR RAINFALL INTENSITY(INCH,...,

SUBARBA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS

**AND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

D 0.20 0.20 0.100 75

- '*MCH/HR) = 0.20
 | SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.120
| SUBAREA AREA (ACRES) = 0.20 | SUBAREA RUNOFF(CFS) = 0.59
| EFFECTIVE AREA (ACRES) = 0.47 | AREA-AVERAGED FM(INCH/HR) = 0.02
| AREA-AVERAGED FP(INCH/HR) = 0.20 | AREA-AVERAGED Ap = 0.10
| TOTAL AREA (ACRES) = 0.5 | PEAK FLOW RATE(CFS) = 1.38
  END OF SUBAREA STREET FLOW HYDRAULICS.
  DEPTH (FEET) = 0.23 HALFSTREET FLOOD WIDTH (FEET) = 5.35
  FLOW VELOCITY(FEET/SEC.) = 3.45 DEPTH*VELOCITY(FT*FT/SEC.) = 0.80 LONGEST FLOWPATH FROM NODE 250.00 TO NODE 254.00 = 506.85 FEE
*********************
 FLOW PROCESS FROM NODE 254.00 TO NODE 266.00 IS CODE = 31
  >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
  >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<<
 ELEVATION DATA: UPSTREAM(FEET) = 1008.89 DOWNSTREAM(FEET) = 1007.53
FLOW LENGTH(FEET) = 82.44 MANNING'S N = 0.012
DEPTH OF FLOW IN 9.0 INCH PIPE IS 5.2 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 5.25
ESTIMATED PIPE DIAMETER(INCH) = 9.00 NUMBER OF PIPES = 1
  PIPE-FLOW(CFS) = 1.38

PIPE TRAVEL TIME(MIN.) = 0.26 Tc(MIN.) = 7.47

LONGEST FLOWPATH FROM NODE 250.00 TO NODE 266.00 =
FLOW PROCESS FROM NODE 266.00 TO NODE 266.00 IS CODE = 1
  >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE
_____
  TOTAL NUMBER OF STREAMS = 2
  TOTAL NUMBER OF SIREARS - 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 7.47

RAINFALL INTENSITY(INCH/HR) = 3.23
 AREA-AVERAGED FM(INCH/HR) = 0.02
AREA-AVERAGED Fp(INCH/HR) = 0.20
AREA-AVERAGED AP = 0.10
EFFECTIVE STREAM AREA(ACRES) = 0
TOTAL STREAM AREA(ACRES) = 0.47
  PEAK FLOW RATE (CFS) AT CONFLUENCE =
******************
 FLOW PROCESS FROM NODE 260.00 TO NODE 262.00 IS CODE = 21
```

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< INITIAL SUBAREA FLOW-LENGTH (FEET) = 330.00 ELEVATION DATA: UPSTREAM (FEET) = 1029.17 DOWNSTREAM (FEET) = 1018.95 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 6.19
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.590 SUBAREA To AND LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS TC LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) COMMERCIAL D 0.37 0.20 SUBAREA AVERAGE PERVIOUS LOSS RATE, FD(INCH/HE) = 0.20 0.100 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100 SUBAREA RUNOFF (CFS) = 1.19 0 37 PEAK FLOW RATE (CES) = TOTAL AREA (ACRES) = *********************** FLOW PROCESS FROM NODE 262.00 TO NODE 264.00 IS CODE = 61 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< >>>> (STANDARD CURB SECTION USED) < < < < UPSTREAM ELEVATION(FEET) = 1018.95 DOWNSTREAM ELEVATION(FEET) = 1012.54 STREET LENGTH(FEET) = 166.22 CURB HEIGHT(INCHES) = 6.0 STREET HALPMIDTH(FEET) = 38.00 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 33.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.019 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0150 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH(FEET) = 0.24 HALFSTREET FLOOD WIDTH(FEET) = 5.68 AVERAGE FLOW VELOCITY(FEET/SEC.) = AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.44
PRODUCT OF DEPTHAVELOCITY (FT*FT/SEC.) = 0.82
STREET FLOW TRAVEL TIME (MIN.) = 0.80 TC(MIN.) = 7.00 10 YEAR RAINFALL INTENSITY (INCH/HR) = 3.347 SUBAREA LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN COMMERCIAL. COMMERCIAL D 0.21 0.20 0 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20 0.100 SUBARRA AVERAGE PERVIOUS LOSS RAIE, FP(INCH/HR) = 0.20
SUBARRA AVERAGE PERVIOUS AREA FRACTION, AP = 0.100
SUBARRA AREA (ACRES) = 0.21
SUBARRA RAEA (ACRES) = 0.58
AREA-AVERAGED FM(INCH/HR) = 0.02
AREA-AVERAGED AP = 0.10 PEAK FLOW RATE(CFS) = 0.6 1 74 TOTAL AREA (ACRES) = END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH (FEET) = 0.25 HALFSTREET FLOOD WIDTH (FEET) = 6.19
FLOW VELOCITY (FEET/SEC.) = 3.51 DEPTH*VELOCITY (FT*FT/SEC.) = 0.87
LONGEST FLOWPATH FROM NODE 260.00 TO NODE 264.00 = 496.22 FEE FLOW PROCESS FROM NODE 264.00 TO NODE 266.00 IS CODE = 31 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1008.32 DOWNSTREAM(FEET) = 1007.53 FLOW LENGTH(FEET) = 12.06 MANNING'S N = 0.012 DEPTH OF FLOW IN 9.0 INCH PIPE IS 4.0 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 9.31 ESTIMATED PIPE DIAMETER (INCH) = 9.00

PIPE-FLOW(CFS) =

1.74

Page 10

NUMBER OF PIPES = 1

| PIPE TRAVEL TIME(MIN.) = 0.02 Tc(MIN.) = 7.02 LONGEST FLOWPATH FROM NODE 260.00 TO NODE 266.00 = 508.28 FEET. |
|--|
| FLOW PROCESS FROM NODE 266.00 TO NODE 266.00 IS CODE = 1 |
| >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE< |
| TOTAL NUMBER OF STREAMS = 2 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE: TIME OF CONCENTRATION(MIN.) = 7.02 RAINFALL INTENSITY(INCH/HR) = 3.34 AREA-AVERAGED FM(INCH/HR) = 0.02 AREA-AVERAGED FF(INCH/HR) = 0.20 AREA-AVERAGED FP (INCH/HR) = 0.20 AREA-AVERAGED APP = 0.10 EFFECTIVE STREAM AREA(ACRES) = 0.58 TOTAL STREAM AREA(ACRES) = 0.58 PEAK FLOW RATE(CFS) AT CONFLUENCE = 1.74 |
| ** CONFLUENCE DATA ** STREAM Q TC Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 1.38 7.47 3.226 0.20(0.02) 0.10 0.5 250.00 2 1.74 7.02 3.342 0.20(0.02) 0.10 0.6 260.00 |
| RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO CONFLUENCE FORMULA USED FOR 2 STREAMS. |
| ** PEAK FLOW RATE TABLE ** STREAM Q TC Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 3.09 7.02 3.342 0.20(0.02) 0.10 1.0 260.00 2 3.06 7.47 3.226 0.20(0.02) 0.10 1.0 250.00 |
| COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS: |
| FLOW PROCESS FROM NODE 266.00 TO NODE 268.00 IS CODE = 31 |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<>>>> >USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <>>>> |
| ELEVATION DATA: UPSTREAM(FEET) = 1007.53 DOWNSTREAM(FEET) = 1007.23 FLOW LENGTH(FEET) = 18.67 MANNING'S N = 0.012 DEPTH OF FLOW IN 12.0 INCH PIPE IS 7.2 INCHES PIPE-FLOW VELOCITY(FEET/SEC.) = 6.32 ESTIMATED PIPE DIAMETER(INCH) = 12.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 3.09 PIPE TRAVEL TIME(MIN.) = 0.05 TC(MIN.) = 7.07 LONGEST FLOWPATH FROM NODE 250.00 TO NODE 268.00 = 607.96 FEET. |
| FLOW PROCESS FROM NODE 268.00 TO NODE 268.00 IS CODE = 11 |
| >>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY |
| ** MAIN STREAM CONFLUENCE DATA ** STREAM Q TC Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 3.09 7.07 3.328 0.20(0.02) 0.10 1.0 260.00 2 3.0.6 7.52 3.214 0.20(0.02) 0.10 1.0 250.00 LONGEST FLOWPATH FROM NODE 250.00 TO NODE 268.00 = 607.96 FEET. |
| ** MEMORY BANK # 2 CONFLUENCE DATA ** STREAM Q TC Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 1.00 7.08 3.327 0.20(0.02) 0.10 0.3 230.00 Page 11 |

2 0.98 7.53 3.210 0.20(0.02) 0.10 LONGEST FLOWPATH FROM NODE 230.00 TO NODE 268.00 = 234.00 680.99 FEET. ** PEAK FLOW RATE TABLE ** Q Tc Intensity Fp(Fm) (CFS) (MIN.) (INCH/HR) (INCH/HR) HEADWATER STREAM Ap NUMBER (ACRES) NODE 3.328 0.20(0.02) 0.10 3.327 0.20(0.02) 0.10 4.09 7.07 7.08 260.00 1.4 230.00 4.04 7.52 3.214 0.20(0.02) 0.10 250.00 4 4.03 7.53 TOTAL AREA(ACRES) = 3.210 0.20(0.02) 0.10 1.4 234.00 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS: COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 4.09 TC (MTN.) = 7.077

EFFECTIVE AREA (ACRES) = 1.36 AREA-AVERAGED Fm (INCH/HR) = 0.02

AREA-AVERAGED Fp (INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.10

TOTAL AREA (ACRES) = 1.4

LONGEST FLOWPATH FROM NODE 230.00 TO NODE 268.00 = 680.99 FEET. ************************ FLOW PROCESS FROM NODE 268.00 TO NODE 268.00 IS CODE = 12 >>>>CLEAR MEMORY BANK # 2 <<<<< ************************* FLOW PROCESS FROM NODE 268.00 TO NODE 270.00 IS CODE = 31 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1007.23 DOWNSTREAM(FEET) = 1006.06 ELEVATION DAIA: OFSTREAM(FREET) = 1007.23 DOWNSTREAM(FREET) = 1 FLOW LENGTH(FEET) = 68.50 MANNING'S N = 0.012

DEPTH OF FLOW IN 12.0 INCH PIPE IS 8.5 INCHES

PIPE-FLOW VELOCITY (FEET/SEC.) = 6.85

ESTIMATED PIPE DIAMETER (INCH) = 12.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 4.09 PIPE TRAVEL TIME(MIN.) = 0.17 Tc(MIN.) = 7.24 LONGEST FLOWPATH FROM NODE 230.00 TO NODE 270.00 = 749.49 FEET. **************************** FLOW PROCESS FROM NODE 270.00 TO NODE 270.00 IS CODE = 1 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<< < TOTAL NUMBER OF STREAMS = 2 TOTAL NORTHWEST OF THE TOTAL THE TOT AREA-AVERAGED Fm(INCH/HR) = 0.02 AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED PP(INCH/RH) - 0.20
AREA-AVERAGED Ap = 0.10
EFFECTIVE STREAM AREA(ACRES) = 1
TOTAL STREAM AREA(ACRES) = 1.39 PEAK FLOW RATE(CFS) AT CONFLUENCE = ************************** FLOW PROCESS FROM NODE 226.00 TO NODE 228.00 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< INITIAL SUBAREA FLOW-LENGTH(FEET) = 148.80 ELEVATION DATA: UPSTREAM(FEET) = 1013.03 DOWNSTREAM(FEET) = 1011.48 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 5.60210 YEAR RAINFALL INTENSITY (INCH/HR) = 3.803 SUBAREA TC AND LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)

COMMERCIAL

D 0.31 0.20 0.100 75 5.60

SUBAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.20 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100

C2P10R SUBAREA RUNOFF (CES) = 1.06

| SUBAREA RUN TOTAL AREA | IOFF (CFS) = (ACRES) = | 1.06 0.31 PE | AK FLOW RATE (| CFS) = | 1.06 |
|--|---|---|--|---|---|
| | | | | | |
| FLOW PROCES | S FROM NODE | 228.00 T | NODE 270 | | ************ |
| >>>>COMPUT | E PIPE-FLOW COMPUTER-EST | RAVEL TIME | THRU SUBAREA | <<<< SSURE FLOW) | <<<< |
| ELEVATION I FLOW LENGTH DEPTH OF FI PIPE-FLOW V ESTIMATED H PIPE-FLOW (C PIPE TRAVEI | DATA: UPSTREAM (FEET) = .OW IN 6.0 VELOCITY(FEET, IPE DIAMETER CFS) = . TIME(MIN.) = OWPATH FROM NO | 1(FEET) = : 5.33 MANN INCH PIPE I: (SEC.) = 10 (INCH) = : .06 = 0.02 | 1008.05 DOWN NING'S N = 0 S 3.0 INCHE D.64 6.00 NUMBE Tc(MIN.) = | ISTREAM (FEET 1.012 IS IR OF PIPES 5.63 |) = 1006.06 |
| | S FROM NODE | 270.00 T | | .00 IS CODE | ************ |
| >>>>AND CO | MPUTE VARIOUS | CONFLUENCE | ED STREAM VAL | UES<<<< | |
| CONFLUENCE TIME OF CON RAINFALL IN AREA-AVERAC AREA-AVERAC AREA-AVERAC EFFECTIVE S TOTAL STREA | CR OF STREAMS VALUES USED I ICENTRATION (M. ITENSITY (INCH/HI GED FM (INCH/HI GED FP (INCH/HI GED AP = 0.10 GTREAM AREA (ACRES) RATE (CFS) AT (GRAMM) | COR INDEPEND (N.) = 5 (HR) = 3. (k) = 0.02 (k) = 0.20 (c) = 0.20 (c) = 0.20 | .63 79 0.31 | 2 ARE: | |
| ** CONFIGE | ICE DATA ** | | | | |
| STREAM | Q Tc | Intensity | y Fp(Fm) | Ap Ae | HEADWATER ES) NODE |
| NUMBER | (CFS) (MIN |) (INCH/HR | (INCH/HR) | (ACR | ES) NODE |
| 1 | 4.09 7.2 | 4 3.284 | 0.20(0.02) | 0.10 | 1.4 260.00 |
| 1 1 1 | 4.09 7.2 | 14 3.203 | 0.20(0.02) | 0.10 | 1.4 250.00 |
| 1 | 4.04 7.1 | 0 3.173 | 0.20(0.02) | 0.10 | 1.4 230.00 |
| 2 | 1.06 5.0 | 3.794 | 0.20(0.02) | 0.10 | 1.4 260.00 1.4 230.00 1.4 250.00 1.4 234.00 0.3 226.00 |
| RAINFALL IN | TENSITY AND T | IME OF CON | CENTRATION RA | | |
| ** PEAK FLO | W RATE TABLE | ** | | | |
| STREAM | Q Tc | Intensity | y Fp(Fm) | Ap Ae | HEADWATER |
| NUMBER | (CFS) (MIN |) (INCH/HR | (INCH/HR) | (ACR | ES) NODE |
| 1 | 4.73 5.0 | 3.794 | 0.20(0.02) | 0.10 | 1.4 226.00 |
| 2 | 5.00 7.2 | 3.284 | 0.20(0.02) | 0.10 | 1.7 260.00 |
| 3 | 5.00 7.2 | 3.283 | 0.20(0.02) | 0.10 | 1.7 230.00 |
| 4 | 4.92 7.0 | 08 3.173 | 0.20(0.02) | 0.10 | HEADWATER ES) NODE 1.4 226.00 1.7 260.00 1.7 230.00 1.7 250.00 1.7 234.00 |
| COMPUTED CO PEAK FLOW F EFFECTIVE A AREA-AVERAC TOTAL AREA | ONFLUENCE EST: RATE(CFS) = REA(ACRES) = GED Fp(INCH/HI (ACRES) = OWPATH FROM NO | 5.00 1.67 R) = 0.20 1.7 | AS FOLLOWS: Tc(MIN.) = AREA-AVERA AREA-AVERAGE | | /HR) = 0.02 |
| | ************************************** | | | | ****** |
| | ON OF SUBAREA | | | | - 01 |
| | | | | | |
| MAINLINE TO * 10 YEAR SUBAREA LOS | (MIN.) = | .24 | | | |
| | | | | - | |

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100 SUBAREA AREA(ACRES) = 1.27 SUBAREA AREA(ACRES) = 3.73 SUBAREA AREA(ACRES) = 2.94 AREA-AVERAGED Fm(INCH/HR) = 0.02 AREA-AVERAGED Ap = 0.10 SUBAREA-AVERAGED AP 3.0 PEAK FLOW RATE(CFS) = TOTAL AREA (ACRES) = ** PEAK FLOW RATE TABLE ** Q Tc Intensity Fp(Fm) Ap (CFS) (MIN.) (INCH/HR) (INCH/HR) 8.95 5.63 3.794 0.20(0.02) 0.10 8.63 7.24 3.284 0.20(0.02) 0.10 8.63 7.24 3.283 0.20(0.02) 0.10 STREAM HEADWATER NUMBER (ACRES) NODE 2.6 260.00 2.9 3.173 0.20(0.02) 0.10 5 8.42 7.70 NEW PEAK FLOW DATA ARE: 3.170 0.20(0.02) 0.10 3.0 234.00 NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 8.95 Tc(MIN.) = 5.63
AREA-AVERAGED Fm(INCH/HR) = 0.20
AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.10 EFFECTIVE AREA(ACRES) = ******************* FLOW PROCESS FROM NODE 270.00 TO NODE 280.00 IS CODE = 31 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< _____ ELEVATION DATA: UPSTREAM(FEET) = 1006.06 DOWNSTREAM(FEET) = 1003.27 ELEVATION DAIA: UPSIREAM(FEET) = 1005.05 DOWNSTREAM(FEET) = 1 FLOW LENGTH(FEET) = 65.65 MANNING'S N = 0.012
DEPTH OF FLOW IN 15.0 INCH PIPE IS 8.8 INCHES
PIPE-FLOW VELOCITY (FEET/SEC.) = 11.89
ESTIMATED PIPE DIAMETER (INCH) = 15.00 NUMBER OF PIPES = 1 ESTIMATED FIFE DIAMETER (ARCH) - 10.00 PIEC. FLOW (CFS) = 8.95

PIPE FLOW (CFS) = 8.95

PIPE TRAVEL TIME (MIN.) = 0.09 Tc (MIN.) = 5.72

LONGEST FLOWPATH FROM NODE 230.00 TO NODE 280.00 = 815.14 FEET. FLOW PROCESS FROM NODE 280 00 TO NODE 280 00 TS CODE = 11 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY< ** MAIN STREAM CONFLUENCE DATA ** \(\text{TC} \) Intensity \(\text{Fp(Fm)} \) Ap (CFS) (MIN.) (INCH/HR) (INCH/HR) 8.95 \(5.72 \) 3 750 \(\cdot \) 2 750 \(\cdot \) STREAM HEADWATER NUMBER (ACRES) NODE 3.759 0.20(0.02) 0.10 226.00 5.72 7.33 2.6 8.63 3.260 0.20(0.02) 0.10 260.00 7.34 7.78 7.79 3.259 0.20(0.02) 0.10 230.00 3.152 0.20(0.02) 0.10 3.0 250.00 8.43 3.148 0.20(0.02) 0.10 3.0 234.00 LONGEST FLOWPATH FROM NODE 230.00 TO NODE 280.00 = 815.14 FEET. ** MEMORY BANK # 1 CONFLUENCE DATA ** Q Tc Intensity Fp(Fm)
(CFS) (MIN.) (INCH/HR) (INCH/HR) STREAM Ae HEADWATER (ACRES) NODE NUMBER 5.28 3.934 0.20(0.02) 0.10 220.00 6.84 5.69 3.771 0.20(0.02) 0.10 5.72 8.80 2.937 0.20(0.02) 0.10 214 00 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. ** PEAK FLOW RATE TABLE ** Tc Intensity Fp(Fm) Ap HEADWATER STREAM Q NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 15.71 5.28 3.934 0.20(0.02) 0.10 5.69 3.771 0.20(0.02) 0.10 4.6 214.00 15.78 3.759 0.20(0.02) 0.10 226.00 14.88 7.33 3.260 0.20(0.02) 0.10 3.259 0.20(0.02) 0.10 260.00 14.88 5.0 230.00 7.78 3.152 0.20(0.02) 0.10 14.50 7.79 3.148 0.20(0.02) 0.10 2.937 0.20(0.02) 0.10 234 00 13.57 8.80 210.00 TOTAL AREA(ACRES) =

15.78 Tc(MIN.) = 5.718

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) =

| C2P10R |
|--|
| EFFECTIVE AREA(ACRES) = 4.61 AREA-AVERAGED Fm(INCH/HR) = 0.02 AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.10 TOTAL AREA(ACRES) = 5.1 |
| LONGEST FLOWPATH FROM NODE 230.00 TO NODE 280.00 = 815.14 FEET. |
| ************************************** |
| >>>>CLEAR MEMORY BANK # 1 <<<< |
| |
| FLOW PROCESS FROM NODE 280.00 TO NODE 320.00 IS CODE = 41 |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<>>>>>>SUSING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) |
| ELEVATION DATA: UPSTREAM(FEET) = 1003.27 DOWNSTREAM(FEET) = 1002.78 FLOW LENGTH(FEET) = 22.62 MANING'S N = 0.013 DEPTH OF FLOW IN 36.0 INCH PIPE IS 14.1 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 6.15 GIVEN PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 15.78 PIPE TRAVEL TIME(MIN.) = 0.22 Tc(MIN.) = 5.94 LONGEST FLOWPATH FROM NODE 230.00 TO NODE 320.00 = 897.76 FEET. |
| FLOW PROCESS FROM NODE 320.00 TO NODE 320.00 IS CODE = 10 |
| >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<< |
| FLOW PROCESS FROM NODE 290.00 TO NODE 292.00 IS CODE = 21 |
| >>>>rational method initial subarea analysis<<<<>>>>setime-of-concentration nomograph for initial subarea<< |
| INITIAL SUBAREA FLOW-LENGTH(FEET) = 119.58 ELEVATION DATA: UPSTREAM(FEET) = 1013.25 DOWNSTREAM(FEET) = 1010.80 |
| TC = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 SUBAREA ANALYSIS USED MINIMUM TC (MIN.) = 5.000 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 4.060 SUBAREA TC AND LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA PD AD SCS TC LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) COMMERCIAL D 0.26 0.20 0.100 75 5.00 SUBAREA AVERAGE PERVIOUS LOSS RATE, FD(INCH/HR) = 0.20 SUBAREA AVERAGE PERVIOUS AREA FRACTION, AD = 0.100 SUBAREA RUNOFF (CFS) = 0.95 TOTAL AREA (ACRES) = 0.26 PEAK FLOW RATE (CFS) = 0.95 |
| ********************* |
| FLOW PROCESS FROM NODE 292.00 TO NODE 304.00 IS CODE = 31 |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< |
| ELEVATION DATA: UPSTREAM(FEET) = 1007.32 DOWNSTREAM(FEET) = 1006.15 FLOW LENGTH(FEET) = 123.76 MANNING'S N = 0.012 DEPTH OF FLOW IN 9.0 INCH PIPE IS 4.9 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 3.87 ESTIMATED PIPE DIAMETER (INCH) = 9.00 NUMBER OF PIPES = 1 PIPE-FLOW (CPS) = 0.95 PIPE TRAVEL TIME (MIN.) = 0.53 Tc (MIN.) = 5.53 LONGEST FLOWPATH FROM NODE 290.00 TO NODE 304.00 = 243.34 FEET. |
| FLOW PROCESS FROM NODE 304.00 TO NODE 304.00 IS CODE = 1 |
| >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE |
| TOTAL NUMBER OF STREAMS = 2 |
| Page 15 |

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CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE: TIME OF CONCENTRATION(MIN.) = 5.53
RAINFALL INTENSITY(INCH/HR) = 3.83
 AREA-AVERAGED Fm(INCH/HR) = 0.02
AREA-AVERAGED Fp(INCH/HR) = 0.20
  AREA-AVERAGED Ap = 0.10
 TOTAL STREAM AREA (ACRES) = 0.26
TOTAL STREAM AREA (ACRES) = 0.26
  PEAK FLOW RATE (CFS) AT CONFLUENCE =
************************
FLOW PROCESS FROM NODE 300.00 TO NODE 302.00 IS CODE = 21
  >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 INITIAL SUBAREA FLOW-LENGTH(FEET) = 189.94
ELEVATION DATA: UPSTREAM(FEET) = 1012.80 DOWNSTREAM(FEET) = 1011.09
 SUBAREA TC AND LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA
       LAND USE
                            GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 COMMERCIAL D 0.68 0.20 0.100 75 6.36 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA RUNOFF(CFS) = 2.15
                             2.15
0.68 PEAK FLOW RATE(CFS) =
  TOTAL AREA (ACRES) =
************************
 FLOW PROCESS FROM NODE 302.00 TO NODE 304.00 IS CODE = 31
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA
  >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<<
 ELEVATION DATA: UPSTREAM(FEET) = 1007.59 DOWNSTREAM(FEET) = 1006.15
 FLOW LENGTH(FEET) = 14.78 MANNING'S N = 0.012

DEPTH OF FLOW IN 9.0 INCH PIPE IS 4.0 INCHES

PIEE-FLOW VELOCITY (FEET/SEC.) = 11.38

ESTIMATED PIPE DIAMETER (INCH) = 9.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 2.15
PIPE TRAVEL TIME(MIN.) = 0.02 Tc(MIN.) = 6.38
LONGEST FLOWPATH FROM NODE 300.00 TO NODE 304.00 = 204.72 FEET.
****************************
FLOW PROCESS FROM NODE 304.00 TO NODE 304.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE << < <
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES
 TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 6.38
RAINFALL INTENSITY (INCH/HR) = 3.53
  AREA-AVERAGED Fm (INCH/HR) = 0.02
  AREA-AVERAGED Fp(INCH/HR) = 0.20
 AREA-AVERAGED PLING....,
AREA-AVERAGED Ap = 0.10
EFFECTIVE STREAM AREA(ACRES) = 0.68
  PEAK FLOW RATE (CFS) AT CONFLUENCE =
                                                 2.15
  ** CONFLUENCE DATA **
               Q Tc Intensity Fp(Fm) Ap
(CFS) (MIN.) (INCH/HR) (INCH/HR)
0.95 5.53 3.831 0.20( 0.02) 0.10
2.15 6.38 3.530 0.20( 0.02) 0.10
  STREAM
                                                                          HEADWATER
   NUMBER
                                                               (ACRES)
                                                                          NODE
290.00
                                                                    0.3
  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR 2 STREAMS.
  ** PEAK FLOW RATE TABLE **
  STREAM Q Tc Intensity Fp(Fm) Ap Ae
                                                                          HEADWATER
```

NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE

| NUMBER (CFS) 1 2 97 | (MIN.) (INCH/HR) | (INCH/HR) | 0 10 (ACRES |) NODE 8 290 00 |
|---|--|---|---|-----------------------------------|
| 2 3.02 | (MIN.) (INCH/HR) 5.53 3.831 6.38 3.530 | 0.20(0.02) | 0.10 0 | .9 300.00 |
| COMPUTED CONFLUEN PEAK FLOW RATE (CF EFFECTIVE AREA (AC AREA-AVERAGED FP (TOTAL AREA (ACRES) | CE ESTIMATES ARE F S) = 3.02 RES) = 0.94 INCH/HR) = 0.20 | AS FOLLOWS: Tc(MIN.) = AREA-AVERA AREA-AVERAGE | | R) = 0.02 |
| ************************************** | NODE 304.00 TO | NODE 320 | .00 IS CODE = | |
| >>>>USING COMPUT | -FLOW TRAVEL TIME ER-ESTIMATED PIPES | THRU SUBAREA SIZE (NON-PRE | <<<< SSURE FLOW) << | |
| DEPTH OF FLOW IN PIPE-FLOW VELOCIT ESTIMATED PIPE DI PIPE-FLOW(CFS) = PIPE TRAVEL TIME(| PSTREAM(FEET) = 1 = 147.22 MANN 12.0 INCH PIPE IS Y(FEET/SEC.) = 7 AMETER(INCH) = 12 | 1006.15 DOWN NING'S N = 0 6.3 INCHE 7.20 2.00 NUMBE | STREAM(FEET) .012 S R OF PIPES = | 1 |
| ************************************** | | NODE 320 | .00 IS CODE = | 1 |
| >>>>DESIGNATE IN TOTAL NUMBER OF S CONFLUENCE VALUES TIME OF CONCENTRA RAINFALL INTENSIT AREA-AVERAGED Fm(AREA-AVERAGED p) AREA-AVERAGED AP EFFECTIVE STREAM TOTAL STREAM AREA | DEPENDENT STREAM F TREAMS = 2 USED FOR INDEPENDENT TION(MIN.) = 6. Y(INCH/HR) = 3.4 INCH/HR) = 0.02 INCH/HR) = 0.20 | COR CONFLUENC DENT STREAM .72 .3 | E<<<< | |
| ************************************** | ************************************** | | | |
| | HOD INITIAL SUBARE CENTRATION NOMOGRA | APH FOR INITI | AL SUBAREA<< | |
| INITIAL SUBAREA F | LOW-LENGTH (FEET) = PSTREAM (FEET) = | 132.30 | | |
| SUBAREA ANALYSIS * 10 YEAR RAINFA SUBAREA TC AND LO DEVELOPMENT TYPE LAND USE COMMERCIAL SUBAREA AVERAGE P SUBAREA AVERAGE P | 3.00) / (ELEVATION USED MINIMUM Tc (M) LL INTENSITY (INCH, SS RATE DATA (AMC) / SCS SOIL GROUP (// D D ERVIOUS LOSS RATE, ERVIOUS AREA FRACTS) = 1.47 = 0.41 PER | (N.) = 5.1 (HR) = 4.010 II): AREA FP ACRES) (INCH 0.41 0 FP (INCH/HR) TION, AP = 0 | Ap /HR) (DECIMA .20 0.100 = 0.20 | SCS Tc L) CN (MIN.) 75 5.11 |
| | NODE 312.00 TO | NODE 320 | .00 IS CODE = | 31 |
| >>>>COMPUTE PIPE >>>>USING COMPUT | -FLOW TRAVEL TIME ER-ESTIMATED PIPES | THRU SUBAREA SIZE (NON-PRE | <<<< SSURE FLOW) << | <<< |
| FLOW LENGTH (FEET) | PSTREAM(FEET) = 1 = 62.53 MANN 9.0 INCH PIPE IS | 007.81 DOWN NING'S N = 0 3.6 INCHE 3.84 0.00 NUMBE | STREAM(FEET) .012 S | = 1003.78 |

*********************************** FLOW PROCESS FROM NODE 320.00 TO NODE 320.00 IS CODE = 1 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE << < < >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES ______ TOTAL NUMBER OF STREAMS = 2 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 5.23
RAINFALL INTENSITY(INCH/HR) = 3.96 AREA-AVERAGED Fm(INCH/HR) = 0.02 AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.10

EFFECTIVE STREAM AREA(ACRES) = 0.41

TOTAL STREAM AREA(ACRES) = 0.41 PEAK FLOW RATE (CFS) AT CONFLUENCE = ** CONFLUENCE DATA ** TC Intensity Fp(Fm) Ap (CFS) (MIN.) (INCH/HR) (INCH/HR) 2.97 5.88 3.701 0.20(0.02) 0.10 3.02 6.72 3.426 0.20(0.02) 0.10 1.47 5.23 3.958 0.20(0.02) 0.10 STREAM HEADWATER (ACRES) NUMBER NODE 290.00 300.00 310.00 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO CONFLUENCE FORMULA USED FOR 2 STREAMS. ** PEAK FLOW RATE TABLE ** Q Tc Intensity Fp(Fm) Ap (CFS) (MIN.) (INCH/HR) (INCH/HR) 4.30 5.23 3.958 0.20(0.02) 0.10 4.35 5.88 3.701 0.20(0.02) 0.10 STREAM (ACRES) NODE 1.2 310.00 NUMBER 1 4.30 6.72 3.426 0.20(0.02) 0.10 300.00 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS: LONGEST FLOWPATH FROM NODE 290.00 TO NODE 320.00 = 390.56 FEET. ******************* FLOW PROCESS FROM NODE 320.00 TO NODE 320.00 IS CODE = 11 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY _____ ** MAIN STREAM CONFLUENCE DATA ** Q Tc Intensity Fp(Fm) Ap (CFS) (MIN.) (INCH/HR) (INCH/HR) STREAM Ae HEADWATER (ACRES) NODE NUMBER 4.30 5.23 3.958 0.20(0.02) 0.10 4.35 5.88 3.701 0.20(0.02) 0.10 4.30 6.72 3.426 0.20(0.02) 0.10 310.00 1.3 290.00 1.4 300.00 LONGEST FLOWPATH FROM NODE 290.00 TO NODE 320.00 = 390.56 FEET. ** MEMORY BANK # 1 CONFLUENCE DATA ** Q Tc Intensity Fp(Fm) Ap (CFS) (MIN.) (INCH/HR) (INCH/HR) HEADWATER STREAM NUMBER (ACRES) NODE 15.71 3.841 0.20(0.02) 0.10 5.51 5.91 3.689 0.20(0.02) 0.10 4.6 214.00 15.78 3.677 0.20(0.02) 0.10 5.94 226.00 14.88 7.56 3.204 0.20(0.02) 0.10 3.202 0.20(0.02) 0.10 260.00 14.88 5.0 230.00 3.100 0.20(0.02) 0.10 8.01 14.50 8.02 3.097 0.20(0.02) 0.10 9.03 2.893 0.20(0.02) 0.10 234.00 13.57 5.1 210.00 897.76 FEET. LONGEST FLOWPATH FROM NODE 230.00 TO NODE 320.00 =

** PEAK FLOW RATE TABLE **

STREAM Q Tc Intensity Fp(Fm) Ap Ae

HEADWATER

```
NUMBER
              (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                         (ACRES)
                                                                    NODE
                               3.958 0.20(0.02) 0.10
3.841 0.20(0.02) 0.10
                                                                      310.00
              19.66
                      5.23
5.51
                                                              5.3
              20.03
              20.11
                       5.88
                               3.701 0.20(0.02) 0.10
3.689 0.20(0.02) 0.10
                                                                      290.00
              20.12
                       5.91
                                                                      214.00
              20.13
                       5.94
                               3.677 0.20(0.02) 0.10
                                                                      226.00
                       6.72
7.56
                               3.426 0.20(0.02) 0.10
3.204 0.20(0.02) 0.10
                                                                      300.00
              19.64
              18.90
              18.89
                       7.56
                               3.202 0.20(0.02) 0.10
                                                                      230.00
              18 40
                       8 01
                               3.100 0.20(0.02) 0.10
                                                              6 4
                                                                      250 00
              18.39
                      8.02
                               3.097 0.20(0.02) 0.10
                                                                      234.00
              17 20
                     9.03
                               2.893 0.20(0.02) 0.10
                                                                      210.00
    TOTAL AREA(ACRES) =
                                6.5
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE (CFS) = 20.13 TC (MIN.) = 5.942
EFFECTIVE AREA (ACRES) = 5.88 AREA-AVERAGED Fm(INCH/HR) = 0.02
 AREA-AVERAGED Fm(INCH/HR) AREA-AVERAGED Fm(INCH/HR) TOTAL AREA (ACRES) = 6.5
 LONGEST FLOWPATH FROM NODE 230.00 TO NODE 320.00 = 897.76 FEET.
**************************
 FLOW PROCESS FROM NODE 320.00 TO NODE 325.00 IS CODE = 41
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <<<<<
 ELEVATION DATA: UPSTREAM(FEET) = 1002.78 DOWNSTREAM(FEET) = 1002.11 FLOW LENGTH(FET) = 133.24 MANNING'S N = 0.013 DEPTH OF FLOW IN 36.0 INCH FIPE IS 16.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 6.18
GIVEN PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1
 **************************
 FLOW PROCESS FROM NODE 325.00 TO NODE 325.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 MAINLINE Tc(MIN.) = 6.30
    10 YEAR RAINFALL INTENSITY (INCH/HR) = 3.555
 SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp
      LAND USE
                         GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL D 0.48 0.20 0.100 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
 SUBARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBARRA AREA (ACRES) = 0.48
SUBARRA RUNOFF (CFS) = 1.53
EFFECTIUVE AREA (ACRES) = 6.36
AREA-AVERAGED FM (INCH/HR) = 0.02
AREA-AVERAGED FM (INCH/HR) = 0.02
                                   PEAK FLOW RATE(CFS) =
 TOTAL AREA (ACRES) =
                            6.9
*******************
 FLOW PROCESS FROM NODE 325.00 TO NODE 330.00 IS CODE = 41
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <<<<<
 ELEVATION DATA: UPSTREAM(FEET) = 1002.11 DOWNSTREAM(FEET) = 1001.26 FLOW LENGTH(FEET) = 173.84 MANNING'S N = 0.013 DEPTH OF FLOW IN 36.0 INCH FIPE IS 17.1 INCHES
 ************************
 FLOW PROCESS FROM NODE 330.00 TO NODE 450.00 IS CODE = 41
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <>>>
```

| | | | | | C2P10R | | |
|--|--|--|--|--|--------------------------------------|-----------------|-----------|
| FLOW LENG: DEPTH OF I PIPE-FLOW GIVEN PIPI PIPE-FLOW PIPE TRAVI | DATA: UP: TH(FEET): FLOW IN: VELOCITY E DIAMETE! (CFS) = EL TIME(M | STREAM(F = 18. 36.0 INC (FEET/SE R(INCH) 20.2 IN.) = | FEET) = 1 13 MANN CH PIPE IS EC.) = 18 = 36.00 22 0.02 | 001.26 DOWN ING'S N = 0 7.6 INCHE | STREAM .013 S PIPES 6.79 | (FEET) = = 1 | 999.29 |
| EFFECTIVE | A(ACRES) AREA(ACRI AGED Fp(II RATE(CFS | = ES) = NCH/HR)) = | 6.36 = 0.20 20.22 | TC(MIN.) = AREA-AVERAGE AREA-AVERAGE | D Fm(I | NCH/HR) = | 0.02 |
| | | | | Fp(Fm) | Δn | Δe | HEADWATER |
| NUMBER | (CFS) | (MTN.) | (INCH/HR) | (TNCH/HR) | | (ACRES) | NODE |
| 1 | 19.78 | 6.08 | 3.629 | 0.20(0.02) | 0.10 | 5.8 | 310.00 |
| 2 | 20.11 | 6.36 | 3.538 | 0.20(0.02) | 0.10 | 6.1 | 220.00 |
| 3 | 20.21 | 6.72 | 3.426 | 0.20(0.02) | 0.10 | 6.3 | 290.00 |
| 4 | 20.22 | 6.76 | 3.416 | 0.20(0.02) | 0.10 | 6.3 | 214.00 |
| 5 | 20.22 | 6.79 | 3.406 | 0.20(0.02) | 0.10 | 6.4 | 226.00 |
| | 19.71 | 7.58 | 3.199 | 0.20(0.02) | 0.10 | 6.6 | 300.00 |
| 7 | 19.04 | 8.42 | 3.011 | 0.20(0.02) | 0.10 | 6.8 | 260.00 |
| 8 | 19.04 | 8.43 | 3.010 | 0.20(0.02) | 0.10 | 6.8 | 230.00 |
| | | | | 0.20(0.02) | | | |
| | | | | 0.20(0.02) | | | |
| | | | | 0.20(0.02) | | | |
| | | | | | | | |

END OF RATIONAL METHOD ANALYSIS

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C2P25R

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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Analysis prepared by:

| * DANA POINT HARBOR COMMERCIAL CORE AREA - PHASE 2B * * RATIONAL METHOD PROPOSED CONDITION HYDROLOGY ULTIMATE OUTLET 3 * * 25-YEAR STORM EVENT EM * |
|---|
| FILE NAME: C2P25R.DAT TIME/DATE OF STUDY: 12:50 02/13/2020 |
| USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION: |
| *TIME-OF-CONCENTRATION MODEL* |
| USER SPECIFIED STORM EVENT(YEAR) = 25.00 SPECIFIED MINIMUM PIPE SIZE(INCH) = 6.00 SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90 *DATA BANK RAINFALL USED* *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD* |
| *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL** HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING MODEL** NO. (FT) (FT) SIDE / SIDE / WAY (FT) (FT) (FT) (FT) (FT) (FT) 1 30.0 20.0 0.1870.018/0.020 0.67 2.00 0.0312 0.167 0.0150 2 10.0 1.0 0.001/0.001/0.005 0.68 0.10 0.010 0.010 0.0080 |
| GLOBAL STREET FLOW-DEPTH CONSTRAINTS: 1. Relative Flow-Depth = 0.50 FEET |
| >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< |
| INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00 ELEVATION DATA: UPSTREAM(FEET) = 1015.71 DOWNSTREAM(FEET) = 1012.23 |
| Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.685 * 25 VEAR RAINFALL INTENSITY(INCH/HR) = 3.782 SUBAREA Tc AND LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS TC LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) COMMERCIAL D 0.44 0.20 0.100 75 7.69 SUBAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.20 SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.100 SUBAREA RUNOFF(CFS) = 1.49 TOTAL AREA(ACRES) = 0.44 PEAK FLOW RATE(CFS) = 1.49 |
| FLOW PROCESS FROM NODE 212.00 TO NODE 218.00 IS CODE = 31 |

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA

CONE IDENCE VALUES USED FOR INDEPENDENT TIME OF CONCENTRATION (MIN.) = 8.11 RAINFALL INTENSITY (INCH/HR) = 3.67 AREA-AVERAGED Fm (INCH/HR) = 0.02 AREA-AVERAGED Fp (INCH/HR) = 0.20 AREA-AVERAGED PP(100.....,
AREA-AVERAGED AP = 0.10
EFFECTIVE STREAM AREA(ACRES) = 0
.44 0.44 PEAK FLOW RATE (CFS) AT CONFLUENCE = ************************* FLOW PROCESS FROM NODE 214.00 TO NODE 216.00 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< INITIAL SUBAREA FLOW-LENGTH(FEET) = 101.79
ELEVATION DATA: UPSTREAM(FEET) = 1013.10 DOWNSTREAM(FEET) = 1011.84 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 5.000 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 4.824 SUBAREA TC AND LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
COMMERCIAL D 0.11 0.20 0.100 75 5.00
SUBARRA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
SUBARRA AVERAGE PERVIOUS ARRA FRACTION, Ap = 0.100 SUBAREA RUNOFF(CFS) = 0.48 TOTAL AREA(ACRES) = 0.11 PEAK FLOW RATE(CFS) = ******************** FLOW PROCESS FROM NODE 216.00 TO NODE 218.00 IS CODE = 31 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1008.34 DOWNSTREAM(FEET) = 1007.52 FLOW LENGTH(FEET) = 7.89 MANNING'S N = 0.012 DEFH OF FLOW IN 6.0 INCH PIEE IS 2.1 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 7.91
ESTIMATED PIPE DIAMETER (INCH) = 6.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 0.48

PIPE TRAVEL TIME(MIN.) = 0.02 Tc(MIN.) = 5.02

LONGEST FLOWPATH FROM NODE 214.00 TO NODE 218.00 = 109.68 FEET.

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:

TOTAL NUMBER OF STREAMS = 2

TIME OF CONCENTRATION(MIN.) = 5.02
RAINFALL INTENSITY(INCH/HR) = 4.81

AREA-AVERAGED Fm(INCH/HR) = 0.02

>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<<

ESTIMATED PIPE DIAMETER(INCH) = 9.00 NUMBER OF PIPES = 1 PIPEF-FLOW(CFS) = 1.49 PIPE TRAVEL TIME (MIN.) = 0.43 Tc (MIN.) = 8.11 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 218.00 = 438

PLOW LENGTH (FEET) = 108.90 MANNING'S N = 0.012
DEPTH OF FLOW IN 9.0 INCH PIPE IS 6.7 INCHES
PIPE-FLOW VELOCITY (FEET/SEC.) = 4.23

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<

ELEVATION DATA: UPSTREAM(FEET) = 1008.55 DOWNSTREAM(FEET) = 1007.52

C2

```
AREA-AVERAGED Fp(INCH/HR) = 0.20
 AREA-AVERAGED Ap = 0.10

EFFECTIVE STREAM AREA(ACRES) = 0.11

TOTAL STREAM AREA(ACRES) = 0.11

PEAK FLOW RATE(CFS) AT CONFLUENCE =
                                                    0.48
  ** CONFLUENCE DATA **
               CE DAIA **
Q Tc Intensity Fp(Fm) Ap
(CFS) (MIN.) (INCH/HR) (INCH/HR)
1.49 8.11 3.667 0.20( 0.02) 0.10
0.48 5.02 4.815 0.20( 0.02) 0.10
   STREAM
                                                                             HEADWATER
   NUMBER
                                                                  (ACRES) NODE
     1
                                                                         0.4
                                                                                  210 00
  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR 2 STREAMS.
  ** PEAK FLOW RATE TABLE **
                \( \text{Q} \) TC \( \text{Intensity} \) Fp(Fm) \( \text{Ap} \) Ae \( \text{HEADWATER} \) (CFS) \( \text{MIN.} \) (INCH/HR) \( \text{INCH/HR} \) (3.00 \( \text{Q} \) 0.01 \( \text{Q} \) 0.04 \( \text{214.00} \) 1.85 \( \text{8.11} \) 3.667 \( \text{0.20} \) (0.02) \( \text{0.10} \) 0.6 \( \text{210.00} \)
   STREAM
   NUMBER
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 DRAK FILOW RATE (CRS) = 1.85 ToMIN.] = 8.11

EFFECTIVE AREA (ACRES) = 0.55 AREA-AVERAGED Fm(INCH/HR) = 0.02

AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED AP = 0.10
 TOTAL AREA (ACRES) = 0.6
LONGEST FLOWPATH FROM NODE 210.00 TO NODE 218.00 = 438.90 FEET.
*******************
 FLOW PROCESS FROM NODE 218.00 TO NODE 224.00 IS CODE = 31
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
  >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<<
 ELEVATION DATA: UPSTREAM(FEET) = 1007.52 DOWNSTREAM(FEET) = 1005.34
 FLOW LENGTH(FEET) = 128.74 MANNING'S N = 0.012
DEPTH OF FLOW IN 9.0 INCH PIPE IS 6.3 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 5.61
  ESTIMATED PIPE DIAMETER (INCH) = 9.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 1.85
PIPE TRAVEL TIME(MIN.) = 0.38 Tc(MIN.) = 8.50
 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 224.00 = 567.64 FEET.
FLOW PROCESS FROM NODE 224.00 TO NODE 224.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 8.50
RAINFALL INTENSITY(INCH/HR) = 3.57
 AREA-AVERAGED Fm(INCH/HR) = 0.02
AREA-AVERAGED Fp(INCH/HR) = 0.20
 AREA-AVERAGED PP(INCH/III)
AREA-AVERAGED AP = 0.10
EFFECTIVE STREAM AREA (ACRES) = 0
0.55
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
********************
 FLOW PROCESS FROM NODE 220.00 TO NODE 222.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 INITIAL SUBAREA FLOW-LENGTH(FEET) = 101.36
ELEVATION DATA: UPSTREAM(FEET) = 1013.32 DOWNSTREAM(FEET) = 1011.56
  To = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) =
   25 YEAR RAINFALL INTENSITY (INCH/HR) = 4.824
 SUBAREA TO AND LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA
       LAND USE
                               GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
                                                          Page 3
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D 0.24 0.20 0.100 75 5.00 SUBARBA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20 SUBARBA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100 SUBARBA RUNOFF(CFS) = 1.04
 SUBAREA RUNOFF (CFS) = 1.04
TOTAL AREA (ACRES) = 0.24 PEAK FLOW RATE (CFS) =
******************************
 FLOW PROCESS FROM NODE 222.00 TO NODE 224.00 IS CODE = 31
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SURAREACCCC
  >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <>>>
 ELEVATION DATA: UPSTREAM(FEET) = 1008.06 DOWNSTREAM(FEET) = 1005.34 FLOW LENGTH(FEET) = 13.31 MANNING'S N = 0.012 DEPTH OF FLOW IN 6.0 INCH PIPE IS 2.6 INCHES PIPE-FLOW VELOCITY(FEET/SEC.) = 12.55 ESTIMATED PIPE DIAMETER(INCH) = 6.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 1.04
PIPE TRAVEL TIME(MIN.) = 0.02 Tc(MIN.) = 5.02
  LONGEST FLOWPATH FROM NODE 220.00 TO NODE 224.00 =
*************************
FLOW PROCESS FROM NODE 224.00 TO NODE 224.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
  TOTAL NUMBER OF STREAMS = 2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 5.02
RAINFALL INTENSITY (INCH/HR) = 4.81
AREA-AVERAGED Fm (INCH/HR) = 0.02
 AREA-AVERAGED FP(INCH/INC)
AREA-AVERAGED AP = 0.10
EFFECTIVE STREAM AREA(ACRES) = 0.24
  AREA-AVERAGED Fp(INCH/HR) = 0.20
  PEAK FLOW RATE (CFS) AT CONFLUENCE =
  ** CONFLUENCE DATA **
                 Q Tc Intensity Fp(Fm) Ap (CFS) (MIN.) (INCH/HR) (INCH/HR)
   STREAM
                                                                                HEADWATER
                                                                    (ACRES)
                                                                                NODE
                 1.69 5.41 4.615 0.20(0.02) 0.10
1.85 8.50 3.573 0.20(0.02) 0.10
1.04 5.02 4.814 0.20(0.02) 0.10
                                                                           0.4
                                                                                     214.00
      1
                                                                           0.6
                                                                                     210.00
  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR 2 STREAMS.
  ** PEAK FLOW RATE TABLE **
   STREAM
                 Q Tc Intensity Fp(Fm) Ap (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                                                HEADWATER
                                                                    (ACRES)
   NUMBER
                                                                                  NODE
                 2.67 5.02 4.814 0.20(0.02) 0.10
2.68 5.41 4.615 0.20(0.02) 0.10
2.62 8.50 3.573 0.20(0.02) 0.10
                                                                          0.6
                                                                                     214.00
                                                                                     210.00
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 COMPOTED CONFIDENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 2.68 Tc (MIN.) = 5.41

EFFECTIVE AREA (ACRES) = 0.62 AREA-AVERAGED Fm (INCH/HR) = 0.02

AREA-AVERAGED AP = 0.10

TOTAL AREA (ACRES) = 0.8

LONGEST FLOWPATH FROM NODE 210.00 TO NODE 224.00 = 567.64 FEET.
FLOW PROCESS FROM NODE 224.00 TO NODE 224.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) =
  * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 4.615
  SUBAREA LOSS RATE DATA(AMC II):
  | DEVELOPMENT TYPE | SCS SOIL AREA | FP AP SCS | LAND USE | GROUP (ACRES) (INCH/HR) (DECIMAL) COMMERCIAL | D 1.27 0.20 0.100 75
  COMMERCIAL
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
```

C2P25R SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100

| SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100 SUBAREA AREA(ACRES) = 1.27 SUBAREA RUNOFF(CFS) = 5.25 EFFECTIVE AREA(ACRES) = 1.89 AREA-AVERAGED Fm(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.10 |
|---|
| AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.10 TOTAL AREA(ACRES) = 2.1 PEAK FLOW RATE(CFS) = 7.82 |
| ** PEAK FLOW RATE TABLE ** STREAM Q TC Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 8.05 5.02 4.814 0.20(0.02) 0.10 1.9 220.00 2 7.82 5.41 4.615 0.20(0.02) 0.10 1.9 221.00 3 6.59 8.50 3.573 0.20(0.02) 0.10 2.1 210.00 NEW PEAK FLOW DATA ARE: PEAK FLOW RATE (CFS) = 8.05 Tc(MIN.) = 5.02 AREA-AVERAGED FM(INCH/HR) = 0.02 AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED FM (INCH/HR) = 0.10 AREA-AVERAGED FP (INCH/HR) = 1.86 |
| FLOW PROCESS FROM NODE 224.00 TO NODE 224.00 IS CODE = 81 |
| >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< |
| MAINLINE TC (MIN.) = 5.02 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 4.814 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN COMMERCIAL D 0.08 0.20 0.100 75 SUBAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.20 SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.100 SUBAREA AREA (ACRES) = 0.08 SUBAREA READ(FOFS) = 0.35 EFFECTIVE AREA (ACRES) = 1.94 AREA-AVERAGED FM (INCH/HR) = 0.02 AREA-AVERAGED FP(INCH/HR) = 0.20 AREA-AVERAGED AP = 0.10 TOTAL AREA (ACRES) = 2.1 PEAK FLOW RATE (CFS) = 8.39 |
| FLOW PROCESS FROM NODE 224.00 TO NODE 280.00 IS CODE = 31 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<> >>>>USD COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREACOME Compute Pipe Flow Flow |
| ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH(FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 18.0 INCH PIPE IS 10.4 INCHES PIPE-FLOW VELOCITY(FEET/SEC.) = 7.91 ESTIMATED PIPE DIAMSTER(INCH) = 18.00 NUMBER OF PIPES = 1 PIPE-FLOW (CFS) = 8.39 PIPE TRAVEL TIME(MIN.) = 0.25 Tc(MIN.) = 5.27 LONGEST FLOWFAIT FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. |
| FLOW PROCESS FROM NODE 280.00 TO NODE 280.00 IS CODE = 10 |
| >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<< |
| FLOW PROCESS FROM NODE 234.00 TO NODE 236.00 IS CODE = 21 |
| >>>>RATIONAL METHOD INITIAL SUBARRA ANALYSIS< |
| INITIAL SUBAREA FLOW-LENGTH(FEET) = 93.75 ELEVATION DATA: UPSTREAM(FEET) = 1018.67 DOWNSTREAM(FEET) = 1017.07 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 SUBAREA ANALYSIS USED MINHUM Tc(MIN.) = 5.000 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 4.824 SUBAREA TC AND LOSS RATE DATA(ANC II): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS TC LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) COMMERCIAL D 0.05 0.20 0.100 75 5.00 SUBAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.20 SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.100 Page 5 |

C2P25R

| CZPZ5R | |
|--|-------------------|
| SUBAREA RUNOFF(CFS) = 0.22 TOTAL AREA(ACRES) = 0.05 PEAK FLOW RATE(CFS) = 0.22 | |
| FLOW PROCESS FROM NODE 236.00 TO NODE 238.00 IS CODE = 31 | *** |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<>>>>>SING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) | |
| ELEVATION DATA: UPSTREAM(FEET) = 1017.07 DOWNSTREAM(FEET) = 1015.60 FLOW LENGTH(FEET) = 158.87 MANNING'S N = 0.012 DEPTH OF FLOW IN 6.0 INCH PIEF IS 2.6 INCHES FIPE-FLOW VELOCITY (FEET/SEC.) = 2.67 ESTIMATED PIEP DIAMETER (INCH) = 6.00 NUMBER OF PIPES = 1 FIPE-FLOW(CFS) = 0.22 FIPE TRAVEL TIME (MIN.) = 0.99 Tc (MIN.) = 5.99 LONGEST FLOWPATH FROM NODE 234.00 TO NODE 238.00 = 252.62 FEE | |
| ************************************** | *** |
| >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE< | |
| TIME OF CONCENTRATION(MIN.) = 5.99 RAINFALI LINTENSITY (INCE/HR) = 4.35 AREA-AVERAGED Fm(INCH/HR) = 0.02 AREA-AVERAGED fp(INCH/HR) = 0.20 AREA-AVERAGED AP 0.10 EFFECTIVE STREAM AREA(ACRES) = 0.05 TOTAL STREAM AREA(ACRES) = 0.05 PEAK FLOW RATE(CFS) AT CONFLUENCE = 0.22 | |
| FLOW PROCESS FROM NODE 230.00 TO NODE 232.00 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< | |
| >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< | |
| INITIAL SUBAREA FLOW-LENGTH(FEET) = 71.78 ELEVATION DATA: UPSTREAM(FEET) = 1031.43 DOWNSTREAM(FEET) = 1028.2 | 23 |
| Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 5.000 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 4.824 SUBAREA Tc AND LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SC SOIL AREA FP AP SCS TC LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MI COMMERCIAL D 0.09 0.20 0.100 75 5 SUBAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.20 SUBAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.100 SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.100 | : [N.) 5.00 |
| FLOW PROCESS FROM NODE 232.00 TO NODE 238.00 IS CODE = 41 | *** |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< | |
| >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <>>> | |
| ELEVATION DATA: UPSTREAM(FEET) = 1026.09 DOWNSTREAM(FEET) = 1015.60 FLOW LENGTH(FEET) = 202.97 MANNING'S N = 0.012 DEPTH OF FLOW IN 6.0 INCH PIFE IS 2.2 INCHES FIPE-FLOW VELOCITY(FEET/SEC.) = 5.79 GIVEN PIFE DIAMETER(INCH) = 6.00 NUMBER OF PIFES = 1 PIFE-FLOW(CFS) = 0.39 PIFE TRAVEL TIME (MITN.) = 0.58 To (MITN.) = 5.58 LONGEST FLOWPATH FROM NODE 230.00 TO NODE 238.00 = 274.75 FEE | |
| FLOW PROCESS FROM NODE 238.00 TO NODE 238.00 IS CODE = 1 | |
| >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE< | |

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE

C2P25F

| >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES | |
|--|-----|
| TOTAL NUMBER OF STREAMS = 2 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE: TIME OF CONCENTRATION (MIN.) = 5.58 | |
| RAINFALL INTENSITY (INCH/HR) = 4.53 AREA-AVERAGED Fm (INCH/HR) = 0.02 AREA-AVERAGED Fp (INCH/HR) = 0.20 | |
| AREA-AVERAGED Ap = 0.10 EFFECTIVE STREAM AREA(ACRES) = 0.09 TOTAL STREAM AREA(ACRES) = 0.09 PEAK FLOW RATE(CFS) AT CONFLUENCE = 0.39 | |
| ** CONFLUENCE DATA ** STREAM Q TC Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 0.22 5.99 4.354 0.20 (0.02) 0.10 0.1 234.(2 0.39 5.58 4.531 0.20 (0.02) 0.10 0.1 230.0 | ₹ |
| 1 0.22 5.99 4.354 0.20(0.02) 0.10 0.1 234.0 2 0.39 5.58 4.531 0.20(0.02) 0.10 0.1 230.0 | 00 |
| RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO CONFLUENCE FORMULA USED FOR 2 STREAMS. | |
| ** PEAK FLOW RATE TABLE ** STREAM Q TC Intensity Fp(Fm) Ap Ae HEADWATE! NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 0.60 5.58 4.531 0.20(0.02) 0.10 0.1 230.0 2 0.59 5.99 4.354 0.20(0.02) 0.10 0.1 230.0 | 2 |
| 1 0.60 5.58 4.531 0.20(0.02) 0.10 0.1 230.0 2 0.59 5.99 4.354 0.20(0.02) 0.10 0.1 234.0 | 00 |
| COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS: PEAK FLOW RATE (CFS) = 0.60 Tc (MIN.) = 5.58 EFFECTIVE AREA (ACRES) = 0.14 AREA-AVERAGED Fm (INCH/HR) = 0.02 AREA-AVERAGED Fp (INCH/HR) = 0.20 AREA-AVERAGED AP = 0.10 TOTAL AREA (ACRES) = 0.1 | |
| LONGEST FLOWPATH FROM NODE 230.00 TO NODE 238.00 = 274.75 FEET | · . |
| ************************************** | |
| >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< | |
| MAINLINE Tc(MIN.) = 5.58 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 4.531 | |
| SUBAREA LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LANDING GROUP (ACRES) (INCH/HR) (DECIMAL) CN | |
| DIEMA RATERAL HARBESTI (HARTHEN HA) 4.331 BUBARREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA FP/ AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN COMMERCIAL D 0.07 0.20 0.100 75 SUBARREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.20 | |
| SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100 SUBAREA AREA (ACRES) = 0.07 SUBAREA RUNOFF (CFS) = 0.28 EFFECTIVE AREA (ACRES) = 0.21 AREA-AVERAGED Fm(INCH/HR) = 0.02 AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.10 | |
| TOTAL AREA(ACRES) = 0.2 PEAK FLOW RATE(CFS) = 0.84 | |
| FLOW PROCESS FROM NODE 238.00 TO NODE 240.00 IS CODE = 31 | ** |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<>> >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<>>>> | |
| ELEVATION DATA: UPSTREAM(FEET) = 1015.60 DOWNSTREAM(FEET) = 1012.78 FLOW LENGTH(FEET) = 160.89 MANNING'S N = 0.012 DEPTH OF FLOW IN 9.0 INCH PIPE IS 3.8 INCHES | |
| PIPE-FLOW VELOCITY (FEET/SEC.) = 4.73 ESTIMATED PIPE DIAMETER (INCH) = 9.00 NUMBER OF PIPES = 1 | |
| PIPE-FLOW(CFS) = 0.84 PIPE TRAVEL TIME(MIN.) = 0.57 Tc(MIN.) = 6.15 LONGEST FLOWPATH FROM NODE 230.00 TO NODE 240.00 = 435.64 FEET | ۲. |
| *********************** | |
| FLOW PROCESS FROM NODE 240.00 TO NODE 240.00 IS CODE = 81 | *** |
| >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< | |
| | |

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* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 4.290 SUBAREA LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN D 0.07 0.20 0.100 75 COMMERCIAL SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20 *********************************** FLOW PROCESS FROM NODE 240.00 TO NODE 242.00 IS CODE = 31 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1012.78 DOWNSTREAM(FEET) = 1008.53 PICON LENGTH(FEET) = 245.35 MANNING'S N = 0.012

DEPTH OF FLOW IN 9.0 INCH PIPE IS 4.4 INCHES

PIEE-FLOW VELOCITY (FEET/SEC.) = 5.01

ESTIMATED PIPE DIAMETER (INCH) = 9.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 1.06 PIPE TRAVEL TIME(MIN.) = 0.82 Tc(MIN.) = 6.97 LONGEST FLOWPATH FROM NODE 230.00 TO NODE 242.00 = ************************* FLOW PROCESS FROM NODE 242.00 TO NODE 242.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< _____ MAINLINE TC(MIN.) = 6.97

* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 3.998
SUBAREA LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
D 0.06 0.20 0.100 75 COMMERCIAL D 0.06 0.20 0.100 75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA AREA (ACRES) = 0.06 SUBAREA RUNOFF(CFS) = 0.21
EFFECTIVE AREA (ACRES) = 0.34 AREA-AVERAGED Fm(INCH/HR) = 0.02
AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.10
TOTAL AREA (ACRES) = 0.3 PEAK FLOW RATE(CFS) = 1.21 ******************* FLOW PROCESS FROM NODE 242.00 TO NODE 268.00 IS CODE = 10 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<< ************************ FLOW PROCESS FROM NODE 250.00 TO NODE 252.00 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< INITIAL SUBAREA FLOW-LENGTH(FEET) = 329.13 ELEVATION DATA: UPSTREAM(FEET) = 1029.13 DOWNSTREAM(FEET) = 1019.96 SUBAREA To AND LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
D 0.27 0.20 0.100 75 6.32 COMMERCIAL SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100 SUBAREA RUNOFF(CFS) = 1.02 TOTAL AREA (ACRES) = 0.27 PEAK FLOW RATE(CFS) = ******************* FLOW PROCESS FROM NODE 252.00 TO NODE 254.00 IS CODE = 61

C2P25R

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>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
  >>>> (STANDARD CURB SECTION USED) <<<<
 UPSTREAM ELEVATION (FEET) = 1019.96 DOWNSTREAM ELEVATION (FEET) = 1012.78
  STREET LENGTH (FEET) = 177.72 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 38.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 33.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.018
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CES) =
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) = 0.23
HALFSTREET FLOOD WIDTH(FEET) = 5.35
    AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.42
 PRODUCT OF DEPTHAVELOCITY(FT*FT/SEC.) = 0.80
STREET FLOW TRAVEL TIME (MIN.) = 0.87 TC (MIN.) = 7.19
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 3.928
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
 | SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
| SUBAREA AREA (ACRES) = 0.20 | SUBAREA RUNOFF(CFS) = 0.70
| EFFECTIVE AREA (ACRES) = 0.47 | AREA—AVERAGED Fm(INCH/HR) = 0.02
| AREA—AVERAGED Fp(INCH/HR) = 0.20 | AREA—AVERAGED Ap = 0.10
| TOTAL AREA (ACRES) = 0.5 | PEAR FLOW RATE (CFS) = 1.65
 END OF SUBAREA STREET FLOW HYDRAULICS.
  DEPTH (FEET) = 0.24 HALFSTREET FLOOD WIDTH (FEET) = 6.00
 FLOW VELOCITY(FEET/SEC.) = 3.54 DEPTH*VELOCITY(FT*FT/SEC.) = 0.86
LONGEST FLOWPATH FROM NODE 250.00 TO NODE 254.00 = 506.85 FEE
*********************
 FLOW PROCESS FROM NODE 254.00 TO NODE 266.00 IS CODE = 31
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<<
 ELEVATION DATA: UPSTREAM(FEET) = 1008.89 DOWNSTREAM(FEET) = 1007.53
FLOW LENGTH(FEET) = 82.44 MANNING'S N = 0.012
DEPTH OF FLOW IN 9.0 INCH PIPE IS 5.8 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 5.44
ESTIMATED PIPE DIAMETER(INCH) = 9.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 1.65

PIPE TRAVEL TIME(MIN.) = 0.25 TC(MIN.) = 7.44

LONGEST FLOWPATH FROM NODE 250.00 TO NODE 266.00 =
FLOW PROCESS FROM NODE 266.00 TO NODE 266.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE
_____
 TOTAL NUMBER OF STREAMS = 2
 TOTAL NUMBER OF SIREARS - 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 7.44

RAINFALL INTENSITY(INCH/HR) = 3.85
 AREA-AVERAGED FM(INCH/HR) = 0.02
AREA-AVERAGED Fp(INCH/HR) = 0.20
AREA-AVERAGED AP = 0.10
EFFECTIVE STREAM AREA(ACRES) = 0
TOTAL STREAM AREA(ACRES) = 0.47
  PEAK FLOW RATE (CFS) AT CONFLUENCE =
******************
 FLOW PROCESS FROM NODE 260.00 TO NODE 262.00 IS CODE = 21
```

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< INITIAL SUBAREA FLOW-LENGTH (FEET) = 330.00 ELEVATION DATA: UPSTREAM (FEET) = 1029.17 DOWNSTREAM (FEET) = 1018.95 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 6.15
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 4.272 SUBAREA To AND LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS TC
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) COMMERCIAL D 0.37 0.20 SUBAREA AVERAGE PERVIOUS LOSS RATE, FD(INCH/HE) = 0.20 0.100 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100 SUBAREA RUNOFF (CFS) = 1.42 0 37 PEAK FLOW RATE (CES) = TOTAL AREA(ACRES) = *********************** FLOW PROCESS FROM NODE 262.00 TO NODE 264.00 IS CODE = 61 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< >>>> (STANDARD CURB SECTION USED) < < < < UPSTREAM ELEVATION(FEET) = 1018.95 DOWNSTREAM ELEVATION(FEET) = 1012.54 STREET LENGTH(FEET) = 166.22 CURB HEIGHT(INCHES) = 6.0 STREET HALPMIDTH(FEET) = 38.00 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 33.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.019 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0150 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH(FEET) = 0.25 HALFSTREET FLOOD WIDTH(FEET) = 6.32 AVERAGE FLOW VELOCITY(FEET/SEC.) = PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.51
TREET FLOW TRAVEL TIME(MIN \ - 2.50 STREET FLOW TRAVEL TIME (MIN.) = 0.79 Tc (MIN.) = 6.98 25 YEAR RAINFALL INTENSITY (INCH/HR) = 3.992 SUBAREA LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN COMMERCIAL. COMMERCIAL D 0.21 0.20 0 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20 0.100 SUBARRA AVERAGE PERVIOUS AREA FRACTION, AP = 0.100
SUBARRA AVERAGE PERVIOUS AREA FRACTION, AP = 0.100
SUBARRA AREA (ACRES) = 0.21
SUBARREA RUDOFF (CFS) = 0.75
EFFECTIVE AREA (ACRES) = 0.58
AREA-AVERAGED FM(INCH/HR) = 0.02
AREA-AVERAGED AP = 0.10 PEAK FLOW RATE(CFS) = 0.6 2 07 TOTAL AREA (ACRES) = ************************ FLOW PROCESS FROM NODE 264.00 TO NODE 266.00 IS CODE = 31 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1008.32 DOWNSTREAM(FEET) = 1007.53 FLOW LENGTH(FEET) = 12.06 MANNING'S N = 0.012 DEPTH OF FLOW IN 9.0 INCH PIPE IS 4.4 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 9.72 ESTIMATED PIPE DIAMETER (INCH) = 9.00 NUMBER OF PIPES = 1

PIPE-FLOW(CFS) =

2.07

C2P25R

| PIPE TRAVEL TIME(MIN.) = 0.02 Tc(MIN.) = 7.01 LONGEST FLOWPATH FROM NODE 260.00 TO NODE 266.00 = 508.28 FEET. |
|--|
| FLOW PROCESS FROM NODE 266.00 TO NODE 266.00 IS CODE = 1 |
| >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE< |
| TOTAL NUMBER OF STREAMS = 2 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE: TIME OF CONCENTRATION (MIN.) = 7.01 RAINFALL INTENSITY (INCH/HR) = 3.99 AREA-AVERAGED FM (INCH/HR) = 0.02 AREA-AVERAGED FD (INCH/HR) = 0.20 AREA-AVERAGED FD = 0.10 EFFECTIVE STREAM AREA (ACRES) = 0.58 TOTAL STREAM AREA (ACRES) = 0.58 PEAK FLOW RATE (CFS) AT CONFLUENCE = 2.07 |
| ** CONFLUENCE DATA ** STREAM Q TC Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 1.65 7.44 3.852 0.20(0.02) 0.10 0.5 250.00 2 2.07 7.01 3.986 0.20(0.02) 0.10 0.6 260.00 |
| RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO CONFLUENCE FORMULA USED FOR 2 STREAMS. |
| ** PEAK FLOW RATE TABLE ** STREAM Q TC Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 3.68 7.01 3.986 0.20(0.02) 0.10 1.0 260.00 2 3.66 7.44 3.852 0.20(0.02) 0.10 1.0 250.00 |
| COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS: $ \begin{array}{lllllllllllllllllllllllllllllllllll$ |
| FLOW PROCESS FROM NODE 266.00 TO NODE 268.00 IS CODE = 31 |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<>>> >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <>>>> |
| ELEVATION DATA: UPSTREAM(FEET) = 1007.53 DOWNSTREAM(FEET) = 1007.23 FLOW LENGTH(FEET) = 18.67 MANNING'S N = 0.012 DEPTH OF FLOW IN 12.0 INCH PIPE IS 8.1 INCHES PIPE-FLOW VELOCITY(FEET/SEC.) = 6.56 ESTIMATED PIPE DIAMSTER(INCH) = 12.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 3.68 PIPE TRAVEL TIME(MIN.) = 0.05 Tc(MIN.) = 7.05 LONGEST FLOWPATH FROM NODE 250.00 TO NODE 268.00 = 607.96 FEET. |
| FLOW PROCESS FROM NODE 268.00 TO NODE 268.00 IS CODE = 11 |
| >>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY |
| ** MAIN STREAM CONFLUENCE DATA ** STREAM Q TC Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 3.68 7.05 3.970 0.20(0.02) 0.10 1.0 260.00 2 3.66 7.49 3.838 0.20(0.02) 0.10 1.0 250.00 LONGEST FLOWPATH FROM NODE 250.00 TO NODE 268.00 = 607.96 FEET. |
| ** MEMORY BANK # 2 CONFLUENCE DATA ** STREAM Q TC Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 1.21 6.97 3.998 0.20(0.02) 0.10 0.3 230.00 Page 11 |

```
2 1.18 7.39 3.868 0.20(0.02) 0.10
LONGEST FLOWPATH FROM NODE 230.00 TO NODE 268.00 =
                                                                                  234.00
                                                                             680.99 FEET.
  ** PEAK FLOW RATE TABLE **
                           Tc Intensity Fp(Fm)
                                                                               HEADWATER
   STREAM
                  0
                                                            Ap
                (CFS) (MIN.) (INCH/HR) (INCH/HR)
   NUMBER
                                                                    (ACRES)
                                                                                  NODE
                                     3.998 0.20(0.02) 0.10
3.970 0.20(0.02) 0.10
                 4.87
                         6.97
7.05
                                                                                    230.00
                                                                          1.3
                                                                                    260.00
                  4.84
                         7.39
                                     3.868 0.20(0.02) 0.10
                                                                                    234.00
   4 4.83 7.49
TOTAL AREA(ACRES) =
                                    3.838 0.20(0.02) 0.10
                                                                          1.4
                                                                                    250.00
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 4.88 TC(MTN.) = 7.053

EFFECTIVE AREA (ACRES) = 1.36 AREA-AVERAGED Fm (INCH/HR) = 0.02

AREA-AVERAGED Fp (INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.10

TOTAL AREA (ACRES) = 1.4

LONGEST FLOWPATH FROM NODE 230.00 TO NODE 268.00 = 680.99 FEET.
************************
FLOW PROCESS FROM NODE 268.00 TO NODE 268.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 2 <<<<<
*************************
 FLOW PROCESS FROM NODE 268.00 TO NODE 270.00 IS CODE = 31
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<<
 ELEVATION DATA: UPSTREAM(FEET) = 1007.23 DOWNSTREAM(FEET) = 1006.06
 ELEVATION DAIA: OFSIREAM(FREI) = 1007.23 DOWNSIREAM(FREI) = 1 FLOW LENGTH(FEET) = 68.50 MANNING'S N = 0.012

DEPTH OF FLOW IN 15.0 INCH PIPE IS 8.0 INCHES

PIPE-FLOW VELOCITY (FEET/SEC.) = 7.28

ESTIMATED PIPE DIAMETER(INCH) = 15.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 4.88
PIPE TRAVEL TIME(MIN.) = 0.16 Tc(MIN.) = 7.21
  LONGEST FLOWPATH FROM NODE 230.00 TO NODE 270.00 = 749.49 FEET.
****************************
 FLOW PROCESS FROM NODE 270.00 TO NODE 270.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<< <
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 7.21
RAINFALL INTENSITY(INCH/HR) = 3.92
 AREA-AVERAGED Fm(INCH/HR) = 0.02
AREA-AVERAGED Fp(INCH/HR) = 0.20
 AREA-AVERAGED PP(INCH/RH) - 0.20
AREA-AVERAGED Ap = 0.10
EFFECTIVE STREAM AREA(ACRES) = 1
TOTAL STREAM AREA(ACRES) = 1.39
  PEAK FLOW RATE(CFS) AT CONFLUENCE =
************************
 FLOW PROCESS FROM NODE 226.00 TO NODE 228.00 IS CODE = 21
  >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 INITIAL SUBAREA FLOW-LENGTH(FEET) = 148.80
ELEVATION DATA: UPSTREAM(FEET) = 1013.03 DOWNSTREAM(FEET) = 1011.48
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 5.602
    25 YEAR RAINFALL INTENSITY (INCH/HR) = 4.523
 SUBAREA TC AND LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA
                               GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)

0 0.31 0.20 0.100 75 5.60
       LAND USE
 COMMERCIAL D 0.31 0.20 0.100 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
```

C2P25R SUBAREA RUNOFF(CFS) = 1.26

| TOTAL AREA(| ACRES) = | 0.31 PEAK FLOW RATE(CFS) = 1.26 |
|---|--|--|
| | | ************ |
| FLOW PROCES | S FROM NODE | 228.00 TO NODE 270.00 IS CODE = 31 |
| >>>>USING | COMPUTER-ESTI | TRAVEL TIME THRU SUBAREA<>>> IMATED PIPESIZE (NON-PRESSURE FLOW) |
| | | M(FEET) = 1008.05 DOWNSTREAM(FEET) = 1006.06 |
| FLOW LENGTH DEPTH OF FL PIPE-FLOW V | (FEET) = 1 OW IN 6.0 I ELOCITY(FEET/ | 15.33 MANNING'S N = 0.012 INCH PIPE IS 3.4 INCHES /SEC.) = 11.07 (INCH) = 6.00 NUMBER OF PIPES = 1 |
| DIDE BLOUIS | max : | 1.26 |
| LONGEST FLO | TIME(MIN.) = WPATH FROM NO | = 0.02 Tc(MIN.) = 5.63 DDE 226.00 TO NODE 270.00 = 164.13 FEET. |
| ****** | ****** | ************* |
| | | 270.00 TO NODE 270.00 IS CODE = 1 |
| >>>>DESIGN >>>>AND CO | ATE INDEPENDE MPUTE VARIOUS | ENT STREAM FOR CONFLUENCE< |
| | R OF STREAMS | = 2 |
| CONFLUENCE | VALUES USED F | FOR INDEPENDENT STREAM 2 ARE: |
| TIME OF CON | CENTRATION (MI TENSITY (INCH/ | IN.) = 5.63 /HR) = 4.51 |
| AREA-AVERAG | ED Fm (INCH/HR | R) = 0.02 |
| AREA-AVERAG | ED Fp(INCH/HR ED Ap = 0.10 | R) = 0.20 |
| EFFECTIVE S | TREAM AREA(AC | CRES) = 0.31 |
| TOTAL STREA | M AREA (ACRES) | CRES) = 0.31) = 0.31 |
| PEAK FLOW R | ATE(CFS) AT C | CONFLUENCE = 1.26 |
| ** CONFLUEN | CE DATA ** | Totalian Day (Day) |
| NUMBER | (CFS) (MIN. | .) (INCH/HR) (INCH/HR) AP AE HEADWAIER .) (INCH/HR) (INCH/HR) (ACRES) NODE |
| 1 | 4.87 7.1 | 12 3.948 0.20(0.02) 0.10 1.3 230.00 |
| 1 | 4.88 7.2 | 21 3.921 0.20(0.02) 0.10 1.4 260.00 |
| 1 | 4.83 7.6 | 64 3.794 0.20(0.02) 0.10 1.4 250.00 |
| 2 | 1.26 5.6 | Intensity Fp(Fm) Ap |
| | | TIME OF CONCENTRATION RATIO FOR 2 STREAMS. |
| ** PEAK FLO | W RATE TABLE | ** |
| STREAM | Q Tc | Intensity Fp(Fm) Ap Ae HEADWATER |
| NUMBER 1 | (CFS) (MIN. 5.65 5.6 | 63 4.512 0.20(0.02) 0.10 1.4 226.00 |
| 2 | 5.97 7.1 | 12 3.948 0.20(0.02) 0.10 1.7 230.00 |
| 3 | 5.97 7.2 | 21 3.921 0.20(0.02) 0.10 1.7 260.00 |
| 5 | 5.88 7.6 | Intensity Fp(Fm) Ap Ae HEADWATER |
| | | IMATES ARE AS FOLLOWS: 5.97 |
| AREA-AVERAG TOTAL AREA(| ED Fp(INCH/HF ACRES) = WDATH FROM NO | R) = 0.20 AREA-AVERAGED Ap = 0.10 1.7 DDE 230.00 TO NODE 270.00 = 749.49 FEET. |
| | | |
| | | 270.00 TO NODE 270.00 IS CODE = 81 |
| | | A TO MAINLINE PEAK FLOW< |
| | | |
| MAINLINE To | (MIN.) = 7 | |
| MAINLINE TO * 25 YEAR | (MIN.) = 7 RAINFALL INTE | ENSITY(INCH/HR) = 3.921 |
| MAINLINE TO * 25 YEAR | (MIN.) = 7 RAINFALL INTE | ENSITY(INCH/HR) = 3.921 |

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100 SUBAREA AREA(ACRES) = 1.27 SUBAREA AREA(ACRES) = 2.94 AREA-AVERAGED Fm(INCH/HR) = 0.02 AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.10 3.0 PEAK FLOW RATE(CFS) = TOTAL AREA (ACRES) = ** PEAK FLOW RATE TABLE ** STREAM Q Tc Intensity Fp(Fm) Ap (CFS) (MIN.) (INCH/HR) (INCH/HR) 10.69 5.63 4.512 0.20(0.02) 0.10 HEADWATER NUMBER (ACRES) NODE 2.6 10.35 7.12 3.948 0.20(0.02) 0.10 7.21 3.921 0.20(0.02) 0.10 230.00 2.9 10.32 3.822 0.20(0.02) 0.10 7.64 3.794 0.20(0.02) 0.10 10.09 3.0 250.00 NEW PEAK FLOW DATA ARE: PEAK FLOW RATE(CFS) = NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 10.69 Tc(MIN.) = 5.63
AREA-AVERAGED Fm(INCH/HR) = 0.20
AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.10 EFFECTIVE AREA(ACRES) = ******************* FLOW PROCESS FROM NODE 270.00 TO NODE 280.00 IS CODE = 31 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< _____ ELEVATION DATA: UPSTREAM(FEET) = 1006.06 DOWNSTREAM(FEET) = 1003.27 ELEVATION DAIA: UPSIREAM(FEET) = 1005.05 DOWNSTREAM(FEET) = 1 FLOW LENGTH(FEET) = 65.65 MANNING'S N = 0.012
DEPTH OF FLOW IN 15.0 INCH PIPE IS 10.0 INCHES
PIPE-FLOW VELOCITY (FEET/SEC.) = 12.33
ESTIMATED PIPE DIAMETER(INCH) = 15.00 NUMBER OF PIPES = 1 ESTIMATED FIFE DIMENSION (TOO.)

PIPEF-FLOW (CFS) = 10.69

PIPE TRAVEL TIME (MIN.) = 0.09 Tc (MIN.) = 5.71

LONGEST FLOWPATH FROM NODE 230.00 TO NODE 280.00 = 815.14 FEET. FLOW PROCESS FROM NODE 280 00 TO NODE 280 00 TS CODE = 11 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY< ** MAIN STREAM CONFLUENCE DATA ** Q TC Intensity Fp(Fm) Ap (CFS) (MIN.) (INCH/HR) (INCH/HR) 10.69 5.71 4 472 0000 STREAM HEADWATER NUMBER (ACRES) NODE 4.473 0.20(0.02) 0.10 226.00 5.71 7.21 2.6 10.35 3.920 0.20(0.02) 0.10 230.00 10.32 7.30 10.14 7.63 10.09 7.73 3.894 0.20(0.02) 0.10 3.796 0.20(0.02) 0.10 260.00 3.0 234.00 3.769 0.20(0.02) 0.10 3.0 LONGEST FLOWPATH FROM NODE 230.00 TO NODE 280.00 = 815.14 FEET. ** MEMORY BANK # 1 CONFLUENCE DATA ** Q Tc Intensity Fp(Fm)
(CFS) (MIN.) (INCH/HR) (INCH/HR) STREAM Ae HEADWATER (ACRES) NODE NUMBER 5.27 4.684 0.20(0.02) 0.10 220.00 214.00 8.16 5.66 4.498 0.20(0.02) 0.10 6.84 8.76 3.511 0.20(0.02) 0.10 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. ** PEAK FLOW RATE TABLE ** Tc Intensity Fp(Fm) Ap HEADWATER STREAM NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 5.27 4.684 0.20(0.02) 0.10 18.80 5.66 4.498 0.20(0.02) 0.10 4.6 214.00 4.473 0.20(0.02) 0.10 18.82 5.71 226.00 17.84 7.21 3.920 0.20(0.02) 0.10 3.894 0.20(0.02) 0.10 230.00 17.78 260.00 5.0 7.63 3.796 0.20(0.02) 0.10 234.00 17.36 7.73 3.769 0.20(0.02) 0.10 3.511 0.20(0.02) 0.10 250.00 8.76 16.24 210.00 TOTAL AREA(ACRES) =

18.82 Tc(MIN.) = 5.714

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) =

EFFECTIVE AREA(ACRES) = 4.62 AREA-AVERAGED Fm(INCH/HR) = 0.02

| EFFECTIVE AREA(ACRES) = 4.62 AREA-AVERAGED Fm(INCH/HR) = 0.02 AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.10 TOTAL AREA(ACRES) = 5.1 |
|--|
| LONGEST FLOWPATH FROM NODE 230.00 TO NODE 280.00 = 815.14 FEET. |
| FLOW PROCESS FROM NODE 280.00 TO NODE 280.00 IS CODE = 12 |
| >>>>CLEAR MEMORY BANK # 1 <<<< |
| ******************* |
| FLOW PROCESS FROM NODE 280.00 TO NODE 320.00 IS CODE = 41 |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< |
| ELEVATION DATA: UPSTREAM(FEET) = 1003.27 DOWNSTREAM(FEET) = 1002.78 FLOW LENGTH (FEET) = 82.62 MANNING'S N = 0.013 DEPTH OF FLOW IN 36.0 INCH PIPE IS 15.5 INCHES FIPE-FLOW VELOCITY (FEET/SEC.) = 6.45 GIVEN PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1 FIPE-FLOW (CFS) = 18.82 FIPE TRAVEL TIME (MIN.) = 0.21 Tc (MIN.) = 5.93 LONGEST FLOWPATH FROM NODE 230.00 TO NODE 320.00 = 897.76 FEET. |
| FLOW PROCESS FROM NODE 320.00 TO NODE 320.00 IS CODE = 10 |
| >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<< |
| |
| FLOW PROCESS FROM NODE 290.00 TO NODE 292.00 IS CODE = 21 |
| >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<>>>> TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<> |
| TAXABLE AND DE TAXABLE PROPERTY OF THE PROPERT |
| INITIAL SUBAREA FLOW-LENGTH(FEET) = 119.58 ELEVATION DATA: UPSTREAM(FEET) = 1013.25 DOWNSTREAM(FEET) = 1010.80 |
| TC = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 TC = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 SUBAREA ANALYSIS USED MINIMUM TC(MIN.) = 5.000 * 25 YEAR RAINFALL INTERNSITY(INCH/HR) = 4.824 SUBAREA TC AND LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS TC LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) COMMERCIAL D 0.26 0.20 0.100 75 5.00 SUBAREA AVERAGE PERVIOUS LOSS RATE, FPC(INCH/HR) = 0.20 SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.100 SUBAREA RUNOFF(CFS) = 1.12 TOTAL AREA(ACRES) = 0.26 PEAK FLOW RATE(CFS) = 1.12 |
| TC = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 TC = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 SUBARBA ANALYSIS USED MINIMUM TC(MIN.) = 5.000 * 25 YEAR RAINFALL INTERSITY(INCH/HR) = 4.824 SUBARBA TC AND LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL ARBA FP AP SCS TC LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) COMMERCIAL 0.20 0.100 75 5.00 SUBARBA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.20 SUBARBA AVERAGE PERVIOUS ARBA FRACTION, AP = 0.100 SUBARBA RUNOFF(CFS) = 1.12 TOTAL ARBA (ACRES) = 0.26 PEAK FLOW RATE(CFS) = 1.12 |
| TC = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 TC = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 * 25 YEAR RAINFALL INTERNSITY(INCH/HR) = 4.824 SUBAREA TC AND LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS TC LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) COMMERCIAL D 0.26 0.20 0.100 75 5.00 SUBAREA AVERAGE PERVIOUS LOSS RATE, FP (INCH/HR) = 0.20 SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.100 SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 1.12 **TOTAL AREA (ACRES) = 0.26 PEAK FLOW RATE (CFS) = 1.12 **FLOW PROCESS FROM NODE 292.00 TO NODE 304.00 IS CODE = 31 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA - **>>>>SCOMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA - **>>>>SUBING COMPUTER-ESTIMATED PIPESIZE (NON-PERSSURE FLOW)<**<> |
| TC = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 TC = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 * 25 YEAR RAINFALL INTERNSITY(INCH/HR) = 5.000 * 25 YEAR RAINFALL INTERNSITY(INCH/HR) = 4.824 SUBAREA TC AND LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS TC LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) COMMERCIAL 0.26 0.20 0.100 75 5.00 SUBAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.20 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100 SUBAREA RUNOFF (CFS) = 1.12 TOTAL AREA (ACRES) = 0.26 PEAK FLOW RATE (CFS) = 1.12 FLOW PROCESS FROM NODE 292.00 TO NODE 304.00 IS CODE = 31 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< |
| TC = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 TC = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 4.824 SUBAREA TC AND LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS TC LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) COMMERCIAL D 0.26 0.20 0.100 75 5.00 SUBAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.20 SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.100 SUBAREA RUNOFF(CFS) = 1.12 TOTAL AREA (ACRES) = 0.26 PEAK FLOW RATE (CFS) = 1.12 *** FLOW PROCESS FROM NODE 292.00 TO NODE 304.00 IS CODE = 31 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA (SCC) ELEVATION DATA: UPSTREAM (FEET) = 1007.32 DOWNSTREAM (FEET) = 1006.15 FLOW LENGTH (FEET) = 123.76 MANNING'S N = 0.012 DEPTH OF FLOW IN 9.0 INCH PIPE IS 5.4 INCHES FIPE-FLOW VELOCITY (FEET/SEC) = 4.02 ESTIMATED FIPE DIAMETER (INCH) = 9.00 NUMBER OF PIPES = 1 PIPE-FLOW (CFS) = 1.12 PIPE TRAVEL TIME (MIN.) = 0.51 TC (MIN.) = 5.51 LONGEST FLOWPATH FROM NODE 290.00 TO NODE 304.00 = 243.34 FEET. |
| TC = K*((LENGTH** 3.00)/(ELEVATION CHANGE))**0.20 TC = K*((LENGTH** 3.00)/(ELEVATION CHANGE))**0.20 * 25 YEAR RAINFALL INTERNSITY(INCH/HR) = 4.824 SUBAREA TO AND LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS TC LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) COMMERCIAL D 0.26 0.20 0.100 75 5.00 SUBAREA AVERAGE PERVIOUS LOSS RATE, FP_(INCH/HR) = 0.20 SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.100 SUBAREA RUNOFF (CFS) = 1.12 TOTAL AREA (ACRES) = 0.26 PEAK FLOW RATE (CFS) = 1.12 **FLOW PROCESS FROM NODE 292.00 TO NODE 304.00 IS CODE = 31 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<*** >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)** **ELEVATION DATA: UPSTREAM (FEET) = 1007.32 DOWNSTREAM (FEET) = 1006.15 **FLOW LENGTH (FEET) = 12.3.76 MANNING'S N = 0.012 DEPTH OF FLOW IN 9.0 INCH PIPE IS 5.4 INCHES **FIPE-FLOW VELOCITY (FEET/SEC.) = 4.02 **ESTIMATED PIPE DIMBATER (INCH) = 9.00 NUMBER OF PIPES = 1 **FIPE TRAVEL TIME (MIN.) = 0.51 **LONGEST FLOWPATH FROM NODE 290.00 TO NODE 304.00 IS CODE = 1 **PIPE TRAVEL TIME (MIN.) = 0.51 **LONGEST FLOWPATH FROM NODE 304.00 TO NODE 304.00 IS CODE = 1 **>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<*** |
| TC = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 TC = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 4.824 SUBAREA TO AND LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS TC LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) COMMERCIAL D 0.26 0.20 0.100 75 5.00 SUBAREA AVERAGE PERVIOUS LOSS RATE, FP (INCH/HR) = 0.20 SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.100 SUBAREA RUNOFF (CFS) = 1.12 TOTAL AREA (ACRES) = 0.26 FEAK FLOW RATE (CFS) = 1.12 *** FLOW PROCESS FROM NODE 292.00 TO NODE 304.00 IS CODE = 31 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<>>>>SUSMING COMPUTER-ESTIMATED PIPESIE (NON-PRESSURE FLOW)<<<<-> ELEVATION DATA: UPSTREAM (FEET) = 1007.32 DOWNSTREAM (FEET) = 1006.15 FLOW LENGTH (FEET) = 123.76 MANNING'S N = 0.012 DEPTH OF FLOW IN 9.0 INCH PIPE IS 5.4 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 4.02 ESTIMATED PIPE DIAMETER (INCH) = 9.00 NUMBER OF PIPES = 1 PIPE-FLOW (CFS) = 1.12 FIED TRAVEL TIME (MIN.) = 0.51 TC (MIN.) = 5.51 LONGEST FLOWPATH FROM NODE 290.00 TO NODE 304.00 IS CODE = 1 FLOW PROCESS FROM NODE 304.00 TO NODE 304.00 IS CODE = 1 |

```
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 5.51
RAINFALL INTENSITY(INCH/HR) = 4.56
 AREA-AVERAGED Fm(INCH/HR) = 0.02
AREA-AVERAGED Fp(INCH/HR) = 0.20
  AREA-AVERAGED Ap = 0.10
 TOTAL STREAM AREA (ACRES) = 0.26
TOTAL STREAM AREA (ACRES) = 0.26
  PEAK FLOW RATE (CFS) AT CONFLUENCE =
**************************
FLOW PROCESS FROM NODE 300.00 TO NODE 302.00 IS CODE = 21
  >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 INITIAL SUBAREA FLOW-LENGTH(FEET) = 189.94
ELEVATION DATA: UPSTREAM(FEET) = 1012.80 DOWNSTREAM(FEET) = 1011.09
  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM To(MIN.) = 6.36
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 4.210
 SUBAREA TC AND LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA
       LAND USE
                             GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 COMMERCIAL D 0.68 0.20 0.100 75 6.36 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA RUNOFF (CFS) = 2.56
TOTAL AREA (ACRES) = 0.68 PEAK FLOW RATE (CFS) =
*********************
 FLOW PROCESS FROM NODE 302.00 TO NODE 304.00 IS CODE = 31
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA
  >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<<
 ELEVATION DATA: UPSTREAM(FEET) = 1007.59 DOWNSTREAM(FEET) = 1006.15
 FLOW LENGTH(FEET) = 14.78 MANNING'S N = 0.012

DEPTH OF FLOW IN 9.0 INCH PIPE IS 4.4 INCHES

PIEE-FLOW VELOCITY (FEET/SEC.) = 11.92

ESTIMATED PIEE DIAMETER (INCH) = 9.00 NUMBER OF PIPES = 1
 ****************************
FLOW PROCESS FROM NODE 304.00 TO NODE 304.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE << < <
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES
 TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 6.38
RAINFALL INTENSITY (INCH/HR) = 4.20
AREA-AVERAGED Fm(INCH/HR) = U.UZ
AREA-AVERAGED Fp(INCH/HR) = 0.20
AREA-AVERAGED Ap = 0.10
EFFECTIVE STREAM AREA(ACRES) = 0.68

**COMMAI STREAM AREA(ACRES) = 0.68
  PEAK FLOW RATE (CFS) AT CONFLUENCE =
                                                   2.56
  ** CONFLUENCE DATA **
                Q Tc Intensity Fp(Fm) Ap
(CFS) (MIN.) (INCH/HR) (INCH/HR)
1.12 5.51 4.564 0.20( 0.02) 0.10
2.56 6.38 4.202 0.20( 0.02) 0.10
  STREAM
                                                                             HEADWATER
   NUMBER
                                                                  (ACRES)
                                                                             NODE
290.00
     1
                                                                       0.3
  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR 2 STREAMS.
  ** PEAK FLOW RATE TABLE **
  STREAM Q Tc Intensity Fp(Fm) Ap Ae
                                                                            HEADWATER
```

C2P25R

| NUMBER | (CFS) | (MIN.) | (INCH/HR) | (INCH | /HR) | | (ACRE | S) 1 | NODE |
|--|---|---|---|---|---|--------------------------------|----------------------|-----------------------|----------------------------|
| 1 2 | 3.53 | 5.51 | 4.564 4.202 | 0.20(| 0.02) | 0.10 | | 0.8 | 290.00 |
| COMPUTED O | NIET HENG | D DOTTMA | | C BOLL | OFFICE - | | | | |
| PEAK FLOW I EFFECTIVE I AREA-AVERA TOTAL AREA | AREA(ACR GED Fp(I | , ES) = NCH/HR) : | 0.94 | AREA-A | -AVERAC /ERAGEI | GED Fm | (INCH/ | HR) = | 0.02 |
| TOTAL AREA LONGEST FLO | (ACRES) OWPATH F | = ROM NODE | 290.0 | 0 TO N | ODE | 304.00 |) = | 243. | 34 FEET. |
| FLOW PROCE | SS FROM | NODE | | NODE | 320. | | CODE | = 31 | ****** |
| >>>>COMPU | TE PIPE- COMPUTE | FLOW TRA | /EL TIME FED PIPES | THRU S | JBAREA< | <<<< SSURE E | FLOW) < | <<<< | |
| ELEVATION FLOW LENGT! DEPTH OF F: PIPE-FLOW (FIPE-FLOW (FIPE TRAVE: LONGEST FLO | DATA: UP H(FEET) LOW IN /ELOCITY PIPE DIA CFS) = L TIME(M | STREAM (F) = 147.: 12.0 INC (FEET/SE) METER (INC 3.6 IN.) = | EET) = 1 22 MANN H PIPE IS C.) = 7 CH) = 12 0 0.33 | 006.15 ING'S 1 7.0 .52 .00 | DOWNS N = 0. INCHES NUMBER | STREAM .012 S R OF Pl | (FEET) | 1 | 02.78 |
| | | | | | | | | | |
| FLOW PROCE | SS FROM | NODE : | 320.00 TO | NODE | 320. | .00 IS | CODE | = 1 | |
| >>>>DESIG | | | | | | | | | |
| TOTAL NUMBI CONFLUENCE TIME OF COI RAINFALL II AREA-AVERAI AREA-AVERAI EFFECTIVE: TOTAL STREI PEAK FLOW I | VALUES NCENTRAT NTENSITY GED Fm(I GED Fp(I GED Ap = STREAM A AM AREA(| USED FOR ION (MIN. (INCH/HR NCH/HR): NCH/HR): 0.10 REA (ACRE: ACRES) = | INDEPEND = 6. = 4.0 = 0.02 = 0.20 S) = | 71 8 0.94 94 | 3.60 | L ARE: | | | |
| FLOW PROCE | SS FROM | NODE | 310.00 TO | NODE | 312. | .00 IS | CODE | = 21 | |
| >>>>RATION | -OF-CONC | ENTRATIO | NOMOGRA | PH FOR | INITIA | AL SUBA | | | |
| INITIAL SUI | BAREA FL | OW-LENGT | H(FEET) = | 132 | .30 | | | | |
| TC = K*[(Li SUBAREA AN. * 25 YEAR SUBAREA TC DEVELOPME! LAND ! COMMERCIAL SUBAREA AV! SUBAREA AV! SUBAREA RU! TOTAL AREA | ALYSIS U RAINFAL AND LOS NT TYPE/ JSE ERAGE PE ERAGE PE NOFF(CFS | SED MINII L INTENS: S RATE D: SC: GI RVIOUS LO RVIOUS AI) = | MUM Tc(MI ITY(INCH/ ATA(AMC S SOIL ROUP (A D DSS RATE, REA FRACT 1.75 | N.) = HR) = II): AREA CRES) 0.41 Fp(ING ION, A | 5.10 4.766 Fp (INCH) 0. CH/HR) 0 = 0. | /HR) .20 = 0.2 | (DECIM 0.10 20 | SC: AL) C1 0 7: | 3 Tc N (MIN.) 5 5.11 |
| ************************************** | | | | | | | | | ****** |
| >>>>COMPU | TE PIPE- | FLOW TRA | /EL TIME | THRU S | JBAREA | <<<< | | | |
| ELEVATION DEFLOW LENGTH OF F. PIPE-FLOW ESTIMATED | DATA: UP H(FEET) LOW IN | STREAM(FI = 62.1 9.0 INC | EET) = 1 53 MANN H PIPE IS | 007.81 ING'S 1 | DOWNS N = 0. INCHES | STREAM | (FEET) | = 100 |)3.78 |

*********************************** FLOW PROCESS FROM NODE 320.00 TO NODE 320.00 IS CODE = 1 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE << < < >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES _____ TOTAL NUMBER OF STREAMS = 2 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 5.22
RAINFALL INTENSITY(INCH/HR) = 4.71 AREA-AVERAGED Fm(INCH/HR) = 0.02 AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.10

EFFECTIVE STREAM AREA(ACRES) = 0.41

TOTAL STREAM AREA(ACRES) = 0.41 PEAK FLOW RATE (CFS) AT CONFLUENCE = ** CONFLUENCE DATA ** CFS) (MIN.) (INCH/HR) (INCH/HR) Ap (CFS) (MIN.) (INCH/HR) (INCH/HR) (INCH/HR) 3.53 5.84 4.417 0.20(0.02) 0.10 3.60 6.71 4.085 0.20(0.02) 0.10 1.75 5.22 4.708 0.20(0.02) 0.10 STREAM HEADWATER (ACRES) NUMBER NODE 290.00 300.00 310.00 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO CONFLUENCE FORMULA USED FOR 2 STREAMS. ** PEAK FLOW RATE TABLE ** \(\text{VARIE TABLE } \)
\(\text{V} \)
\(\text{TC} \)
\(\text{Intensity} \)
\(\text{Fp(Fm)} \)
\(\text{Ap} \)
\(\text{Ap} \)
\(\text{AeCES} \)
\(\text{NODE} \)
\(\text{CFS} \)
\(\text{NODE} \)
\(\text{S1.2} \)
\(\text{5.12} \)
\(\text{5.22} \)
\(\text{4.708} \)
\(\text{0.20} \)
\(\text{0.00} \)
\(\text{0.00} \)
\(\text{0.10} \)
\(\text{1.3} \)
\(\text{290.00} \)
\(\text{1.3} \)
\(\text{290.00} \) STREAM NUMBER 1 5.12 6.71 4.085 0.20(0.02) 0.10 300 00 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS: LONGEST FLOWPATH FROM NODE 290.00 TO NODE 320.00 = 390.56 FEET. ********************* FLOW PROCESS FROM NODE 320.00 TO NODE 320.00 IS CODE = 11 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY _____ ** MAIN STREAM CONFLUENCE DATA ** Q Tc Intensity Fp(Fm) Ap (CFS) (MIN.) (INCH/HR) (INCH/HR) STREAM Ae HEADWATER (ACRES) NODE NUMBER 1.2 310.00 1.3 290.00 1.4 300.00 390.56 FEET. ** MEMORY BANK # 1 CONFLUENCE DATA ** Q Tc Intensity Fp(Fm) Ap Ae HEADWATER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE STREAM NUMBER 5.48 4.580 0.20(0.02) 0.10 5.87 4.405 0.20(0.02) 0.10 18.80 4.6 214.00 5.93 4.381 0.20(0.02) 0.10 7.43 3.855 0.20(0.02) 0.10 7.52 3.830 0.20(0.02) 0.10 18.82 226.00 17.84 230.00 17.78 5.0 260.00 7.85 3.736 0.20(0.02) 0.10 17.36 7.95 3.710 0.20(0.02) 0.10 16.24 8.98 3.462 0.20(0.02) 0.10 250.00 210.00 5.1 LONGEST FLOWPATH FROM NODE 230.00 TO NODE 320.00 = 897.76 FEET. ** PEAK FLOW RATE TABLE **

STREAM Q To Intensity Fp(Fm) Ap Ae HEADWATER

```
NUMBER
             (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                        (ACRES)
                                                                   NODE
                              4.708 0.20(0.02) 0.10
4.580 0.20(0.02) 0.10
                                                                     310.00
             23.44
                      5.22
                                                             5.3
             23.85
             23.96
                      5.84
                              4.417 0.20(0.02) 0.10
4.405 0.20(0.02) 0.10
                                                                     290.00
             23.97
                      5.87
                                                             5.8
                                                                     214.00
             23.99
                      5.93
                              4.381 0.20(0.02) 0.10
                                                                     226.00
             23.43
                              4.085 0.20(0.02) 0.10
3.855 0.20(0.02) 0.10
                                                                     300.00
                      6.71
                      7.43
             22.58
                      7.52
                              3.830 0.20(0.02) 0.10
                                                                     260.00
                      7.85
7.95
             22 14
                              3.736 0.20(0.02) 0.10
                                                             6 4
                                                                     234 00
             22.01
                              3.710 0.20(0.02) 0.10
                                                                     250.00
             20.57
                     8.98
                              3.462 0.20(0.02) 0.10
                                                                     210.00
    TOTAL AREA(ACRES) =
                               6.5
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE (CFS) = 23.99 TC (MIN.) = 5.928
EFFECTIVE AREA (ACRES) = 5.89 AREA-AVERAGED Fm (INCH/HR) = 0.02
 AREA-AVERAGED Fm(INCH/HR) AREA-AVERAGED Fm(INCH/HR) TOTAL AREA (ACRES) = 6.5 AREA-AVERAGED AP = 0.10
 LONGEST FLOWPATH FROM NODE 230.00 TO NODE 320.00 = 897.76 FEET.
***************************
 FLOW PROCESS FROM NODE 320.00 TO NODE 325.00 IS CODE = 41
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <<<<<
 ELEVATION DATA: UPSTREAM(FEET) = 1002.78 DOWNSTREAM(FEET) = 1002.11 FLOW LENGTH(FEET) = 133.24 MANNING'S N = 0.013 DEFTH OF FLOW IN 36.0 INCH FIPE IS 18.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 6.45

GIVEN PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1
 **************************
 FLOW PROCESS FROM NODE 325.00 TO NODE 325.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 MAINLINE Tc(MIN.) = 6.27
    25 YEAR RAINFALL INTENSITY (INCH/HR) = 4.243
 SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp
      LAND USE
                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL D 0.48 0.20 0.100 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
 SUBARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBARRA AREA (ACRES) = 0.48
SUBARRA RUNOFF (CFS) = 1.82
EFFECTIUVE AREA (ACRES) = 6.37
AREA-AVERAGED Fm (INCH/HR) = 0.02
AREA-AVERAGED Fm (INCH/HR) = 0.02
                                   PEAK FLOW RATE(CFS) =
 TOTAL AREA (ACRES) =
                            6.9
*******************
 FLOW PROCESS FROM NODE 325.00 TO NODE 330.00 IS CODE = 41
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <<<<<
 ELEVATION DATA: UPSTREAM(FEET) = 1002.11 DOWNSTREAM(FEET) = 1001.26
 FLOW LENGTH(FEET) = 173.84 MANNING'S N = 0.013
DEPTH OF FLOW IN 36.0 INCH PIPE IS 19.0 INCHES
 ************************
 FLOW PROCESS FROM NODE 330.00 TO NODE 450.00 IS CODE = 41
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <>>>
```

C2P25R

| CZPZ5R | | | | | | | | | |
|--|---|--|--------------------------------|---|---|-----------------|----------------------|--|--|
| FLOW LENG DEPTH OF PIPE-FLOW GIVEN PIF PIPE-FLOW PIPE TRAV LONGEST F | TH(FEET) FLOW IN VELOCITY E DIAMETE (CFS) = VEL TIME(M 'LOWPATH F | = 18.36.0 INC (FEET/SER (INCH) 24.3 IIN.) = PROM NODE | 0.02 E 230.0 | 001.26 D ING'S N = 8.3 IN .70 NUMBER TC(MIN.) 0 TO NODE | OWNSTREAM 0.013 CHES OF PIPES = 6.74 450.0 | = 1 0 = 122 | 999.29 2.97 FEET. | | |
| END OF ST TOTAL ARE EFFECTIVE AREA-AVEF PEAK FLOW | CUDY SUMMA CA (ACRES) C AREA (ACR RAGED Fp(I I RATE(CFS | ES) = NCH/HR) | 6.9 6.37 = 0.20 24.19 | TC (MIN.) AREA-AVER | = 6 AGED Fm(I | .74 NCH/HR)= | | | |
| | LOW RATE | | | | | | | | |
| STREAM | Q | Tc | Intensity | Fp(Fm) | Ap | Ae | HEADWATER NODE | | |
| NUMBER | (CFS) | (MIN.) | (INCH/HR) | (INCH/HR |) | (ACRES) | NODE | | |
| 1 | 23.67 | 6.04 | 4.336 | 0.20(0. | 02) 0.10 | 5.8 | 310.00 | | |
| 2 | 24.05 | 6.29 | 4.235 | 0.20(0. | 02) 0.10 | 6.1 | 220.00 | | |
| | | | | | | | 290.00 | | |
| | | | | | | | 214.00 | | |
| 5 | 24.19 | 6.74 | 4.074 | 0.20(0. | 02) 0.10 | 6.4 | 226.00 | | |
| | | | | | | | 300.00 | | |
| 7 | 22.91 | 8.25 | 3.632 | 0.20(0. | 02) 0.10 | 6.8 | 230.00 | | |
| | | | | | | | 260.00 | | |
| | | | | | | | 234.00 | | |
| | | | | | | | 250.00 | | |
| | | | | | . , | | 210.00 | | |
| | | | | | | | | | |

END OF RATIONAL METHOD ANALYSIS

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RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION) (c) Copyright 1983-2016 Advanced Engineering Software (aes) Ver. 23.0 Release Date: 07/01/2016 License ID 1334

Analysis prepared by:

| * DANA POINT HARBOR COMMERCIAL CORE AREA - PHASE 2B * * RATIONAL METHOD PROPOSED CONDITION HYDROLOGY ULTIMATE OUTLET 3 * * 100-YEAR STORM EVENT EM * | | | | | | | | | |
|---|--|--|--|--|--|--|--|--|--|
| FILE NAME: C2POOR.DAT TIME/DATE OF STUDY: 14:31 02/13/2020 | | | | | | | | | |
| USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION: | | | | | | | | | |
| *TIME-OF-CONCENTRATION MODEL* | | | | | | | | | |
| USER SPECIFIED STORM EVENT(YEAR) = 100.00 SPECIFIED MINIMUM PIPE SIZE(INCH) = 6.00 SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90 *DATA BANK RAINFALL USED* *ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD* | | | | | | | | | |
| *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL** HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING MODEL** NO. (FT) (FT) SIDE / SIDE / WAY (FT) (FT) (FT) (FT) (FT) (FT) 1 30.0 20.0 0.1870.018/0.020 0.67 2.00 0.0313 0.167 0.0150 2 10.0 1.0 0.001/0.001/0.005 0.68 0.10 0.010 0.010 0.0080 | | | | | | | | | |
| GLOBAL STREET FLOW-DEPTH CONSTRAINTS: 1. Relative Flow-Depth = 0.50 FEET | | | | | | | | | |
| >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< | | | | | | | | | |
| INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00 ELEVATION DATA: UPSTREAM(FEET) = 1015.71 DOWNSTREAM(FEET) = 1012.23 | | | | | | | | | |
| Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.685 **100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.836 SUBAREA Tc AND LOSS RATE DATA(AMC III): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS TC LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) COMMERCIAL D 0.44 0.20 0.100 91 7.69 SUBAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.20 SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.100 SUBAREA RUNOFF(CFS) = 1.91 TOTAL AREA(ACRES) = 0.44 PEAK FLOW RATE(CFS) = 1.91 | | | | | | | | | |
| FLOW PROCESS FROM NODE 212.00 TO NODE 218.00 IS CODE = 31 | | | | | | | | | |

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA

SUBAREA RUNOFF(CFS) = 0.61

TOTAL AREA (ACRES) = 0.11 PEAK FLOW RATE(CFS) = 0.61

FLOW PROCESS FROM NODE 216.00 TO NODE 218.00 IS CODE = 31

>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1008.34 DOWNSTREAM(FEET) = 1007.52

FLOW LEGRITH(FEET) = 7.89 MANNING'S N = 0.012

DEFTH OF FLOW IN 6.0 INCH PIPE IS 2.4 INCHES

PIPE-FLOW VELOCITY (FEET/SEC.) = 8.49

ESTIMATED PIPE DIAMETER (INCH) = 6.00 NUMBER OF PIPES = 1

PIPE-FLOW (CFS) = 0.61

PIPE TRAVEL TIME (MIN.) = 0.02 TC (MIN.) = 5.02

LONGEST FLOWPATH FROM NODE 218.00 = 109.68 FEET.

>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<<

ESTIMATED PIPE DIAMETER(INCH) = 12.00 NUMBER OF PIPES = 1 PIPEF-FLOW(CFS) = 1.91 PIPE TRAVEL TIME(MIN.) = 0.39 Tc (MIN.) = 8.08 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 218.00 = 438

FLOW LENGTH(FEET) = 108.90 MANNING'S N = 0.012
DEPTH OF FLOW IN 12.0 INCH PIPE IS 6.2 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 4.61

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<

TC = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 SUBAREA AWALYSIS USED MINIMUM TC(MIN.) = 5.000 *100 YEAR RAINFALL HITENSITY(INCH/HR) = 6.187 SUBAREA TC AND LOSS RATE DATA(AMC 1II): DEVELOPMENT TYPE/ SCS SOIL AREA Fp

TIME OF CONCENTRATION(MIN.) = 8.08
RAINFALL INTENSITY(INCH/HR) = 4.70
AREA-AVERAGED FM(INCH/HR) = 0.02
AREA-AVERAGED FP(INCH/HR) = 0.20
AREA-AVERAGED AP = 0.10
EFFECTIVE STREAM AREA(ACRES) = 0.40

PEAK FLOW RATE (CFS) AT CONFLUENCE =

ELEVATION DATA: UPSTREAM(FEET) = 1008.55 DOWNSTREAM(FEET) = 1007.52

0.44

FLOW PROCESS FROM NODE 214.00 TO NODE 216.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<>>>
>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 101.79
ELEVATION DATA: UPSTREAM(FEET) = 1013.10 DOWNSTREAM(FEET) = 1011.84

LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
COMMERCIAL D 0.11 0.20 0.100 91 5.00
SUBARRA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
SUBARRA AVERAGE PERVIOUS ARRA FRACTION, Ap = 0.100

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<>>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<->>>>TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION (MIN.) = 5.02
RAINFALL INTENSITY (INCH/HR) = 6.18
AREA-AVERAGED FM (INCH/HR) = 0.02

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AREA-AVERAGED Fp(INCH/HR) = 0.20
 AREA-AVERAGED Ap = 0.10

EFFECTIVE STREAM AREA(ACRES) = 0.11

TOTAL STREAM AREA(ACRES) = 0.11

PEAK FLOW RATE(CFS) AT CONFLUENCE =
                                                 0.61
  ** CONFLUENCE DATA **
               Q Tc Intensity Fp(Fm) Ap
(CFS) (MIN.) (INCH/HR) (INCH/HR)
1.91 8.08 4.700 0.20( 0.02) 0.10
0.61 5.02 6.176 0.20( 0.02) 0.10
  STREAM
                                                                         HEADWATER
   NUMBER
                                                               (ACRES) NODE
     1
                                                                     0.4
                                                                             210 00
  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR 2 STREAMS.
  ** PEAK FLOW RATE TABLE **
               Q TC Intensity Fp(Fm) Ap Ae HEADWATER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 2.17 5.02 6.176 0.20(0.02) 0.10 0.4 214.00 2.37 8.08 4.700 0.20(0.02) 0.10 0.6 210.00
  STREAM
  NUMBER
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 DRAK FILOW RATE (CRS) = 2.37 TOMIN., = 8.08

EFFECTIVE AREA (ACRES) = 0.55 AREA-AVERAGED Fm(INCH/HR) = 0.02

AREA-AVERAGED Fp (INCH/HR) = 0.20 AREA-AVERAGED AP = 0.10
 TOTAL AREA (ACRES) = 0.6
LONGEST FLOWPATH FROM NODE 210.00 TO NODE 218.00 = 438.90 FEET.
*******************
 FLOW PROCESS FROM NODE 218.00 TO NODE 224.00 IS CODE = 31
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
  >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<<
 ELEVATION DATA: UPSTREAM(FEET) = 1007.52 DOWNSTREAM(FEET) = 1005.34
 FLOW LENGTH(FEET) = 128.74 MANNING'S N = 0.012
DEPTH OF FLOW IN 12.0 INCH PIPE IS 6.0 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 6.06
 ESTIMATED PIPE DIAMETER (INCH) = 12.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 2.37
PIPE TRAVEL TIME(MIN.) = 0.35 Tc(MIN.) = 8.43
 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 224.00 = 567.64 FEET.
FLOW PROCESS FROM NODE 224.00 TO NODE 224.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 8.43
RAINFALL INTENSITY(INCH/HR) = 4.59
 AREA-AVERAGED Fm(INCH/HR) = 0.02
AREA-AVERAGED Fp(INCH/HR) = 0.20
 AREA-AVERAGED PP(INGE, III.,
AREA-AVERAGED AP = 0.10
EFFECTIVE STREAM AREA (ACRES) = 0.55
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
*******************
 FLOW PROCESS FROM NODE 220.00 TO NODE 222.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 INITIAL SUBAREA FLOW-LENGTH(FEET) = 101.36
ELEVATION DATA: UPSTREAM(FEET) = 1013.32 DOWNSTREAM(FEET) = 1011.56
  To = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 5.000
  * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 6.187
 SUBAREA TC AND LOSS RATE DATA (AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA
       LAND USE
                              GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
                                                       Page 3
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D 0.24 0.20 0.100 91 5.00 SUBARBA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20 SUBARBA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100 SUBARBA RUNOFF(CFS) = 1.37
 SUBAREA RUNOFF (CFS) = 1.33
TOTAL AREA (ACRES) = 0.24 PEAK FLOW RATE (CFS) =
******************************
 FLOW PROCESS FROM NODE 222.00 TO NODE 224.00 IS CODE = 31
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SURAREACCCC
  >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <>>>
 ELEVATION DATA: UPSTREAM(FEET) = 1008.06 DOWNSTREAM(FEET) = 1005.34 FLOW LENGTH(FEET) = 13.31 MANNING'S N = 0.012 DEPTH OF FLOW IN 6.0 INCH PIPEI S 3.0 INCHES PIPE-FLOW VELOCITY(FEET/SEC.) = 13.36 ESTIMATED PIPE DIAMETER(INCH) = 6.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 1.33
PIPE TRAVEL TIME(MIN.) = 0.02 Tc(MIN.) = 5.02
  LONGEST FLOWPATH FROM NODE 220.00 TO NODE 224.00 =
*************************
FLOW PROCESS FROM NODE 224.00 TO NODE 224.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
  TOTAL NUMBER OF STREAMS = 2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 5.02
RAINFALL INTENSITY (INCH/HR) = 6.18
AREA-AVERAGED Fm (INCH/HR) = 0.02
 AREA-AVERAGED FP(INCH/INC)
AREA-AVERAGED AP = 0.10
EFFECTIVE STREAM AREA(ACRES) = 0.24
  AREA-AVERAGED Fp(INCH/HR) = 0.20
  PEAK FLOW RATE (CFS) AT CONFLUENCE =
  ** CONFLUENCE DATA **
                Q Tc Intensity Fp(Fm) Ap (CFS) (MIN.) (INCH/HR) (INCH/HR)
   STREAM
                                                                              HEADWATER
                                                                   (ACRES)
                                                                               NODE
                 2.17 5.39 5.926 0.20( 0.02) 0.10
2.37 8.43 4.586 0.20( 0.02) 0.10
1.33 5.02 6.176 0.20( 0.02) 0.10
                                                                         0.4
                                                                                   214.00
      1
                                                                          0.6
                                                                                   210.00
  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR 2 STREAMS.
  ** PEAK FLOW RATE TABLE **
   STREAM
                Q Tc Intensity Fp(Fm) Ap (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                                               HEADWATER
                                                                   (ACRES)
   NUMBER
                                                                                 NODE
                 3.43 5.02 6.176 0.20(0.02) 0.10
3.45 5.39 5.926 0.20(0.02) 0.10
                                                                         0.6
                                                                                   214.00
                         8.43 4.586 0.20(0.02) 0.10
                                                                                   210.00
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 COMPOTED CONFIDENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 3.45 Tc (MIN.) = 5.39

EFFECTIVE AREA (ACRES) = 0.62 AREA-AVERAGED FM (INCH/HR) = 0.02

AREA-AVERAGED AP = 0.10

TOTAL AREA (ACRES) = 0.8

LONGEST FLOWPATH FROM NODE 210.00 TO NODE 224.00 = 567.64 FEET.
FLOW PROCESS FROM NODE 224.00 TO NODE 224.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) =
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.926
  SUBAREA LOSS RATE DATA(AMC III):
  | DEVELOPMENT TYPE | SCS SOIL AREA | FP AP SCS | LAND USE | GROUP (ACRES) (INCH/HR) (DECIMAL) COMMERCIAL | D 1.27 0.20 0.100 91
  COMMERCIAL
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
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| CZPOUR |
|---|
| SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100 |
| SUBAREA AREA(ACRES) = 1.27 SUBAREA RUNOFF(CFS) = 6.75 EFFECTIVE AREA(ACRES) = 1.89 AREA-AVERAGED Fm(INCH/HR) = 0.02 AREA-AVERAGED AP = 0.10 |
| EFFECTIVE AREA(ACRES) = 1.89 AREA-AVERAGED Fm(INCH/HR) = 0.02 |
| AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.10 |
| TOTAL AREA (ACRES) = 2.1 PEAK FLOW RATE (CFS) = 10.06 |
| |
| ** PEAK FLOW RATE TABLE ** |
| STREAM O To Intensity Fp(Fm) Ap Ae HEADWATER |
| NUMBER (CFS) (MTN.) (TNCH/HR) (TNCH/HR) (ACRES) NODE |
| 1 10.34 5.02 6.176 0.20(0.02) 0.10 1.9 220.00 |
| 2 10.06 5 30 5 926 0.20(0.02) 0.10 1.9 214.00 |
| 3 8 47 8 43 4 586 0.20(0.02) 0.10 2.1 210.00 |
| TREAM Q TC Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 10.34 5.02 6.176 0.20(0.02) 0.10 1.9 220.00 2 10.06 5.39 5.926 0.20(0.02) 0.10 1.9 214.00 3 8.47 8.43 4.586 0.20(0.02) 0.10 2.1 210.00 NEW PEAK FLOW DATA ARE: |
| NEW PEAK FLOW DATA ARE: PEAK FLOW RATE(CFS) = 10.34 Tc(MIN.) = 5.02 AREA-AVERAGED FM(INCH/HR) = 0.02 AREA-AVERAGED FP(INCH/HR) = 0.20 |
| AREA-AVERAGED Fm(INCH/HR) = 0.02 AREA-AVERAGED Fm(INCH/HR) = 0.20 |
| AREA-AVERAGED Ap = 0.10 EFFECTIVE AREA(ACRES) = 1.87 |
| * |
| ********************** |
| FLOW PROCESS FROM NODE 224.00 TO NODE 224.00 IS CODE = 81 |
| |
| >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< |
| |
| MAINLINE Tc(MIN.) = 5.02 |
| * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 6.176 |
| SUBAREA LOSS RATE DATA(AMC III): |
| DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS |
| LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN |
| COMMERCIAL D 0.08 0.20 0.100 91 |
| SUBAREA LOSS RATE DATA(AMC III): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN COMMERCIAL D 0.08 0.20 0.100 91 SUBAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.20 |
| |
| SUBAREA AREA(ACRES) = 0.08 SUBAREA RUNOFF(CFS) = 0.44 |
| EFFECTIVE AREA(ACRES) = 1.95 AREA-AVERAGED Fm(INCH/HR) = 0.02 |
| SUBAREA AVERAGED FERVIOUS AREA FRACTION, AP = 0.100 SUBAREA AREA (ACRES) = 0.08 SUBAREA RUNOFF(CFS) = 0.44 EFFECTIVE AREA (ACRES) = 1.95 AREA-AVERAGED Fm (INCH/HR) = 0.02 AREA-AVERAGED Fp (INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.10 |
| TOTAL AREA(ACRES) = 2.1 PEAK FLOW RATE(CFS) = 10.78 |
| |
| ******************* |
| |
| FLOW PROCESS FROM NODE 224.00 TO NODE 280.00 IS CODE = 31 |
| |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<>>> >>>SUSING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<>>> >>>SUSING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<>>> ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH(FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 18.0 INCH PIPE IS 12.4 INCHES |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<>>> >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<>>> ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH (FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 18.0 INCH PIPE IS 12.4 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 8.33 ESTIMATED PIPE DIAMETER (INCH) = 18.00 NUMBER OF PIPES = 1 |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<>>>> ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LEGRIF (FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 18.0 INCH PIPE IS 12.4 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 8.33 ESTIMATED PIPE DIAMETER (INCH) = 18.00 NUMBER OF PIPES = 1 PIPE-FLOW (FS) = 110.78 |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<>>> >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<>>> ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH (FEET) = 118.08 MANNING'S N = 0.013 BEPTH OF FLOW IN 18.0 INCH PIPE IS 12.4 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 8.33 ESTIMATED PIPE DIAMPTER (INCH) = 18.00 NUMBER OF PIPES = 1 PIPE-FLOW (CPS) = 10.78 PIPE TRAVEL TIME (MIN.) = 0.24 TC (MIN.) = 5.25 |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<>>>> ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LEGRIF (FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 18.0 INCH PIPE IS 12.4 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 8.33 ESTIMATED PIPE DIAMETER (INCH) = 18.00 NUMBER OF PIPES = 1 PIPE-FLOW (FS) = 110.78 |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<>>> >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<>>> ELEVATION DATA: UBSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH(FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 18.0 INCH PIPE IS 12.4 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 8.33 ESTIMATED PIPE DIAMETER (INCH) = 18.00 NUMBER OF PIPES = 1 PIPE-FLOW (CFS) = 10.78 PIPE TRAVEL TIME (MIN.) = 0.24 Tc (MIN.) = 5.25 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<>>> >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<>>> ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH(FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 18.0 INCH PIPE IS 12.4 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 8.33 ESTIMATED PIPE DIAMSTER(INCH) = 18.00 NUMBER OF PIPES = 1 PIPE-FLOW (CFS) = 10.78 PIPE TRAVEL TIME(MIN.) = 0.24 TC(MIN.) = 5.25 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<>>> >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<>>> ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH (FEET) = 118.08 MANNING'S N = 0.013 DEFTH OF PLOW IN 18.0 INCH PIPE IS 12.4 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 8.33 ESTIMATED PIPE DIAMETER (INCH) = 18.00 NUMBER OF PIPES = 1 PIPE-FLOW (CFS) = 10.78 PIPE TRAVEL TIME (MIN.) = 0.24 Tc (MIN.) = 5.25 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<>>> >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<>>>> ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH(FEET) = 118.08 MANING'S N = 0.013 DEPTH OF FLOW IN 18.0 INCH PIPE IS 12.4 INCHES PIPE-FLOW VELOCITY(FEET/SEC.) = 8.33 ESTIMATED PIPE DIAMSTER(INCH) = 18.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 10.78 PIPE TRAVEL TIME(MIN.) = 0.24 TC(MIN.) = 5.25 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<>>> >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<>>> ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH (FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF PLOW IN 18.0 INCH PIPE IS 12.4 INCHES PIPE-FLOW VELDCITY (FEET/SEC.) = 8.33 ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1 PIPE-FLOW (CPS) = 10.78 PIPE TRAVEL TIME (MIN.) = 0.24 TC (MIN.) = 5.25 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. FLOW PROCESS FROM NODE 280.00 TO NODE 280.00 IS CODE = 10 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<< |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<>>> >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<>>>> ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH(FEET) = 118.08 MANING'S N = 0.013 DEPTH OF FLOW IN 18.0 INCH PIPE IS 12.4 INCHES PIPE-FLOW VELOCITY(FEET/SEC.) = 8.33 ESTIMATED PIPE DIAMSTER(INCH) = 18.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 10.78 PIPE TRAVEL TIME(MIN.) = 0.24 TC(MIN.) = 5.25 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<>>>>>SUSING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<>>>> ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH (FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF PLOW IN 18.0 INCH PIPE IS 12.4 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 8.33 ESTIMATED PIPE DIAMETER (INCH) = 18.00 NUMBER OF PIPES = 1 PIPE-FLOW (CPS) = 10.78 PIPE TRAVEL TIME (MIN.) = 0.24 TC (MIN.) = 5.25 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. FLOW PROCESS FROM NODE 280.00 TO NODE 280.00 IS CODE = 10 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<< |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<>>> >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<>>>> ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH (FEET) = 118.08 MANNING'S N = 0.013 BEPTH OF FLOW IN 18.0 INCH PIPE IS 12.4 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 8.33 ESTIMATED PIPE DIAMPTER (INCH) = 18.00 NUMBER OF PIPES = 1 PIPE-FLOW (CFS) = 10.78 PIPE TRAVEL TIME (MIN.) = 0.24 Tc (MIN.) = 5.25 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. FLOW PROCESS FROM NODE 280.00 TO NODE 280.00 IS CODE = 10 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<< |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<>>> >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<>>>> ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LEGRITH(FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF PLOW IN 18.0 INCH PIPE IS 12.4 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 8.33 ESTIMATED PIPE DIAMETER (INCH) = 18.00 NUMBER OF PIPES = 1 PIPE-FLOW (CFS) = 10.78 PIPE TRAVEL TIME (MIN.) = 0.24 Tc (MIN.) = 5.25 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. FLOW PROCESS FROM NODE 280.00 TO NODE 280.00 IS CODE = 10 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<< |
| >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH(FEET) = 118.08 MANNING'S N = 0.013 BEPTH OF FLOW IN 18.0 INCH PIPE IS 12.4 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 8.33 ESTIMATED PIPE DIAMPTER (INCH) = 18.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 10.78 PIPE TRAVEL TIME (MIN.) = 0.24 Tc (MIN.) = 5.25 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. FLOW PROCESS FROM NODE 280.00 TO NODE 280.00 IS CODE = 10 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<< |
| >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<>>>>>SUSING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<>>>> ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LEGRITH(FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF PLOW IN 18.0 INCH PIPE IS 12.4 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 8.33 ESTIMATED PIPE DIAMETER (INCH) = 18.00 NUMBER OF PIPES = 1 PIPE-FLOW (FES) = 10.78 PIPE TRAVEL TIME (MIN.) = 0.24 Tc (MIN.) = 5.25 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. FLOW PROCESS FROM NODE 280.00 TO NODE 280.00 IS CODE = 10 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<> FLOW PROCESS FROM NODE 234.00 TO NODE 236.00 IS CODE = 21 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<>>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> |
| >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<>>>>>COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH(FEET) = 118.08 MANNING'S N = 0.013 BEPTH OF FLOW IN 18.0 INCH PIPE IS 12.4 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 8.33 ESTIMATED PIPE DIAMPETER (INCH) = 18.00 NUMBER OF PIPES = 1 PIPE-FLOW (CFS) = 10.78 PIPE TRAVEL TIME (MIN.) = 0.24 Tc (MIN.) = 5.25 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. FLOW PROCESS FROM NODE 280.00 TO NODE 280.00 IS CODE = 10 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<> FLOW PROCESS FROM NODE 234.00 TO NODE 236.00 IS CODE = 21 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<>>>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA< |
| >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<>>>>>SUSING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<>>>> ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LEGRITH(FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF PLOW IN 18.0 INCH PIPE IS 12.4 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 8.33 ESTIMATED PIPE DIAMETER (INCH) = 18.00 NUMBER OF PIPES = 1 PIPE-FLOW (CFS) = 10.78 PIPE TRAVEL TIME (MIN.) = 0.24 TC (MIN.) = 5.25 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. FLOW PROCESS FROM NODE 280.00 TO NODE 280.00 IS CODE = 10 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<> FLOW PROCESS FROM NODE 234.00 TO NODE 236.00 IS CODE = 21 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<>>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA< |
| >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<>>>>>COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH(FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 18.0 INCH PIPE IS 12.4 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 8.33 ESTIMATED PIPE DIAMPETER (INCH) = 18.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 10.78 PIPE TRAVEL TIME (MIN.) = 0.24 Tc (MIN.) = 5.25 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. FLOW PROCESS FROM NODE 280.00 TO NODE 280.00 IS CODE = 10 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<> FLOW PROCESS FROM NODE 234.00 TO NODE 236.00 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<< |
| >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<>>>>>SUSING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<>>>> ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LEGRITH(FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF PLOW IN 18.0 INCH PIPE IS 12.4 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 8.33 ESTIMATED PIPE DIAMETER (INCH) = 18.00 NUMBER OF PIPES = 1 PIPE-FLOW (CFS) = 10.78 PIPE TRAVEL TIME (MIN.) = 0.24 TC (MIN.) = 5.25 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. FLOW PROCESS FROM NODE 280.00 TO NODE 280.00 IS CODE = 10 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<> FLOW PROCESS FROM NODE 234.00 TO NODE 236.00 IS CODE = 21 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<>>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA< |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH(FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 18.0 INCH PIPE IS 12.4 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 8.33 ESTIMATED PIPE DIAMETER (INCH) = 18.00 NUMBER OF PIPES = 1 PIPE-FLOW (CFS) = 10.78 PIPE TRAVEL TIME (MIN.) = 0.24 TC (MIN.) = 5.25 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. FLOW PROCESS FROM NODE 280.00 TO NODE 280.00 IS CODE = 10 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<>>>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<>>>>>SUSE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA INITIAL SUBAREA FLOW-LENGTH (FEET) = 93.75 ELEVATION DATA: UPSTREAM(FEET) = 1018.67 DOWNSTREAM(FEET) = 1017.07 |
| >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<>>>> ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LEGRITH (FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 18.0 INCH PIPE IS 12.4 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 8.33 ESTIMATED PIPE DIAMETER (INCH) = 18.00 NUMBER OF PIPES = 1 PIPE-FLOW (CFS) = 10.78 PIPE TRAVEL TIME (MIN.) = 0.24 TC (MIN.) = 5.25 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. FLOW PROCESS FROM NODE 280.00 TO NODE 280.00 IS CODE = 10 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<< |
| >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH (FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF PLOW IN 18.0 INCH PIPE IS 12.4 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 8.33 ESTIMATED PIPE DIAMETER (INCH) = 18.00 NUMBER OF PIPES = 1 PIPE-FLOW (CFS) = 10.78 PIPE TRAVEL TIME (MIN.) = 0.24 Tc (MIN.) = 5.25 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. FLOW PROCESS FROM NODE 280.00 TO NODE 280.00 IS CODE = 10 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<> FLOW PROCESS FROM NODE 234.00 TO NODE 236.00 IS CODE = 21 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<>>>VUSE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA< INITIAL SUBAREA FLOW-LENGTH (FEET) = 93.75 DOWNSTREAM (FEET) = 1017.07 TC = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 SUBAREA ANALYSIS SUBM MINUM TC (MIN.) = 5.000 |
| >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<>>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)> ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LEGRIF(HEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 18.0 INCH PIPE IS 12.4 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 8.33 ESTIMATED PIPE DIAMETER (INCH) = 18.00 NUMBER OF PIPES = 1 PIPE-FLOW (CFS) = 10.78 PIPE TRAVEL TIME (MIN.) = 0.24 TC (MIN.) = 5.25 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. FLOW PROCESS FROM NODE 280.00 TO NODE 280.00 IS CODE = 10 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<< FLOW PROCESS FROM NODE 234.00 TO NODE 236.00 IS CODE = 21 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<>>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA |
| >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<>>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)> ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LEGRIF(HEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 18.0 INCH PIPE IS 12.4 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 8.33 ESTIMATED PIPE DIAMETER (INCH) = 18.00 NUMBER OF PIPES = 1 PIPE-FLOW (CFS) = 10.78 PIPE TRAVEL TIME (MIN.) = 0.24 TC (MIN.) = 5.25 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. FLOW PROCESS FROM NODE 280.00 TO NODE 280.00 IS CODE = 10 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<< FLOW PROCESS FROM NODE 234.00 TO NODE 236.00 IS CODE = 21 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<>>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA |
| >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<>>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)> ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LEGRIF(HEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 18.0 INCH PIPE IS 12.4 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 8.33 ESTIMATED PIPE DIAMETER (INCH) = 18.00 NUMBER OF PIPES = 1 PIPE-FLOW (CFS) = 10.78 PIPE TRAVEL TIME (MIN.) = 0.24 TC (MIN.) = 5.25 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. FLOW PROCESS FROM NODE 280.00 TO NODE 280.00 IS CODE = 10 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<< FLOW PROCESS FROM NODE 234.00 TO NODE 236.00 IS CODE = 21 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<>>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA |
| >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<>>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)> ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LEGRIF(HEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 18.0 INCH PIPE IS 12.4 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 8.33 ESTIMATED PIPE DIAMETER (INCH) = 18.00 NUMBER OF PIPES = 1 PIPE-FLOW (CFS) = 10.78 PIPE TRAVEL TIME (MIN.) = 0.24 TC (MIN.) = 5.25 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. FLOW PROCESS FROM NODE 280.00 TO NODE 280.00 IS CODE = 10 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<< FLOW PROCESS FROM NODE 234.00 TO NODE 236.00 IS CODE = 21 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<>>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA |
| >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<>>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)> ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LEGRIF(HEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 18.0 INCH PIPE IS 12.4 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 8.33 ESTIMATED PIPE DIAMETER (INCH) = 18.00 NUMBER OF PIPES = 1 PIPE-FLOW (CFS) = 10.78 PIPE TRAVEL TIME (MIN.) = 0.24 TC (MIN.) = 5.25 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. FLOW PROCESS FROM NODE 280.00 TO NODE 280.00 IS CODE = 10 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<< FLOW PROCESS FROM NODE 234.00 TO NODE 236.00 IS CODE = 21 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<>>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA |
| >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<>>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<>>>> ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LENGTH(FEET) = 118.08 MANNING'S N = 0.013 DEPTH OF PLOW IN 18.0 INCH PIPE IS 12.4 INCHES PIPE-FLOW VELOCITY (FEET/SEC) = 8.33 ESTIMATED PIPE DIAMETER (INCH) = 18.00 NUMBER OF PIPES = 1 PIPE-FLOW (CFS) = 10.78 PIPE FLOW (CFS) = 10.78 PIPE TRAVEL TIME (MIN.) = 0.24 Tc (MIN.) = 5.25 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. FLOW PROCESS FROM NODE 280.00 TO NODE 280.00 IS CODE = 10 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<>>>VASCESS FROM NODE 234.00 TO NODE 236.00 IS CODE = 21 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<>>VUSE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA< |
| >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<>>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)> ELEVATION DATA: UPSTREAM(FEET) = 1005.34 DOWNSTREAM(FEET) = 1003.27 FLOW LEGRIF(HEET) = 118.08 MANNING'S N = 0.013 DEPTH OF FLOW IN 18.0 INCH PIPE IS 12.4 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 8.33 ESTIMATED PIPE DIAMETER (INCH) = 18.00 NUMBER OF PIPES = 1 PIPE-FLOW (CFS) = 10.78 PIPE TRAVEL TIME (MIN.) = 0.24 TC (MIN.) = 5.25 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. FLOW PROCESS FROM NODE 280.00 TO NODE 280.00 IS CODE = 10 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<< FLOW PROCESS FROM NODE 234.00 TO NODE 236.00 IS CODE = 21 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<>>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA |

SUBAREA RUNOFF(CFS) = 0.28
TOTAL AREA(ACRES) = 0.05 PEAK FLOW RATE(CFS) = ************************** FLOW PROCESS FROM NODE 236.00 TO NODE 238.00 IS CODE = 31 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< ELEVATION DATA: UPSTREAM(FEET) = 1017.07 DOWNSTREAM(FEET) = 1015.60 FLOW LENGTH(FEET) = 158.67 MANNING'S N = 0.012 DEPTH OF FLOW IN 6.0 INCH FIPE IS 3.0 INCHES PIEE-FLOW VELOCITY(FEET/SEC.) = 2.81 ESTIMATED FIPE DIAMSTER (INCH) = 6.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 0.28

PIPE TRAVEL TIME(MIN.) = 0.94 Tc (MIN.) = 5.94

LONGEST FLOWPATH FROM NODE 234.00 TO NODE 238.00 = ********************* FLOW PROCESS FROM NODE 238.00 TO NODE 238.00 IS CODE = 1 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE _____ TOTAL NUMBER OF STREAMS = 2 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE: TIME OF CONCENTRATION(MIN.) = 5.94
RAINFALL INTENSITY(INCH/HR) = 5.61 AREA-AVERAGED FM(INCH/HR) = 0.02
AREA-AVERAGED Fp(INCH/HR) = 0.20
AREA-AVERAGED AP = 0.10
EFFECTIVE STREAM AREA(ACRES) = 0.10
TOTAL STREAM AREA(ACRES) = 0.05 PEAK FLOW RATE (CFS) AT CONFLUENCE = ****************************** FLOW PROCESS FROM NODE 230.00 TO NODE 232.00 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< INITIAL SUBAREA FLOW-LENGTH (FEET) = 71.78 ELEVATION DATA: UPSTREAM(FEET) = 1031.43 DOWNSTREAM(FEET) = 1028.23 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 5.000 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 6.187 SUBAREA TO AND LOSS RATE DATA (AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) COMMERCIAL COMMERCIAL D 0.09 0.20 0.100 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100 SUBAREA RUNOFF (CFS) = 0.50
TOTAL AREA (ACRES) = 0.09 PEAK FLOW RATE (CFS) = 0.50 ********************* FLOW PROCESS FROM NODE 232.00 TO NODE 238.00 IS CODE = 41 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <>>> · ELEVATION DATA: UPSTREAM(FEET) = 1026.09 DOWNSTREAM(FEET) = 1015.60 ELEVATION DATA: UPSTREAM(FEET) = 1026.09 DOWNSTREAM(FEET) = 1015.60 FLOW LENGTH(FEET) = 202.97 MANNING'S N = 0.012 DEPTH OF FLOW IN 6.0 INCH PIPE IS 2.6 INCHES PIPE-FLOW VELOCITY(FEET/SEC.) = 6.25 GIVEN PIPE DIAMETER(INCH) = 6.00 NUMBER OF PIPES = 1 FIPE-FLOW(CFS) = 0.50 FIPE TRAVEL TIME (MIN.) = 0.54 TC (MIN.) = 5.54 LONGEST FLOWPATH FROM NODE 230.00 TO NODE 238.00 = 274.75 FEET. *********************** FLOW PROCESS FROM NODE 238.00 TO NODE 238.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<< <

| | OMPUTE VARIOUS CONFLUENC | |
|--|---|--|
| TOTAL NUMBE CONFLUENCE TIME OF CON RAINFALL IN AREA-AVERAGE | ER OF STREAMS = 2 VALUES USED FOR INDEPEN ICENTRATION(MIN.) = 5 ITENSITY(INCH/HR) = 5. SED FM(INCH/HR) = 0.02 | 5.54 |
| AREA-AVERAC | GED Fp(INCH/HR) = 0.20 GED Ap = 0.10 STREAM AREA(ACRES) = AM AREA(ACRES) = | 0.09 |
| PEAK FLOW F | RATE (CFS) AT CONFLUENCE | = 0.50 |
| ** CONFLUEN STREAM NUMBER 1 | Q TC Intensit (CFS) (MIN.) (INCH/HR 0.28 5.94 5.605 | Ly Fp(Fm) Ap Ae HEADWATER (ACRES) NODE (0.02) 0.10 0.1 234.00 0.20 (0.02) 0.10 0.1 230.00 |
| RAINFALL IN | VITENSITY AND TIME OF CON FORMULA USED FOR 2 STR | ICENTRATION RATIO |
| ** DEAU EL | NU DATE TABLE ** | |
| STREAM NUMBER | Q Tc Intensit (CFS) (MIN.) (INCH/HF | Ty Fp(Fm) Ap Ae HEADWATER (1) (INCH/HR) (ACRES) NODE 8 0.20(0.02) 0.10 0.1 230.00 6 0.20(0.02) 0.10 0.1 234.00 |
| 2 | 0.76 5.94 5.605 | 6 0.20(0.02) 0.10 0.1 234.00 |
| PEAK FLOW F EFFECTIVE A AREA-AVERAGE | ONFLUENCE ESTIMATES ARE RATE(CFS) = 0.77 AREA(ACRES) = 0.14 GED Fp(INCH/HR) = 0.20 | AS FOLLOWS: Tc (MIN.) = 5.54 i AREA-AVERAGED Fm(INCH/HR) = 0.02 AREA-AVERAGED Ap = 0.10 |
| TOTAL AREA | (ACRES) = 0.1 | 00 TO NODE 238.00 = 274.75 FEET. |
| | | ************************************** |
| | | |
| | | NE PEAK FLOW< |
| * 100 YEAR | c(MIN.) = 5.54 RAINFALL INTENSITY(INCH SS RATE DATA(AMC III): | |
| DEVELOPMEN | NT TYPE/ SCS SOIL | AREA FD AD SCS (ACRES) (INCH/HR) (DECIMAL) CN 0.07 0.20 0.100 91 FD(INCH/HR) = 0.20 |
| COMMERCIAL | D GROUP (| 0.07 0.20 0.100 91 |
| | | |
| SUBAREA ARE | (ACRES) = 0.07 | SUBAREA RUNOFF(CFS) = 0.37 AREA-AVERAGED Fm(INCH/HR) = 0.02 AREA-AVERAGED Ap = 0.10 |
| AREA-AVERAC | GED Fp(INCH/HR) = 0.20 (ACRES) = 0.2 | AREA-AVERAGED Ap = 0.10 PEAK FLOW RATE (CFS) = 1.08 |
| | | ********* |
| | | O NODE 240.00 IS CODE = 31 |
| >>>>USING | | THRU SUBAREA< |
| ELEVATION I FLOW LENGTH DEPTH OF FI | DATA: UPSTREAM(FEET) = H(FEET) = 160.89 MAN LOW IN 9.0 INCH PIPE I | 1015.60 DOWNSTREAM(FEET) = 1012.78 INING'S N = 0.012 IN 4.4 INCHES |
| PIPE-FLOW \ | FELOCITY (FEET/SEC.) = | 5.04 9.00 NUMBER OF PIPES - 1 |
| PIPE-FLOW(C | PELOCITY (FEET/SEC.) = 1PIPE DIAMETER (INCH) = 1.08 L TIME (MIN.) = 0.53 WPATH FROM NODE 230. | 5.04 9.00 NUMBER OF PIPES = 1 TG(MIN.) = 6.07 00 TO NODE 240.00 = 435.64 FEET. |
| PIPE-FLOW(C PIPE TRAVEI LONGEST FLO | CFS) = 1.08 . TIME(MIN.) = 0.53 DWPATH FROM NODE 230. | Tc(MIN.) = 6.07 |
| PIPE-FLOW (C PIPE TRAVEI LONGEST FLO ************************************ | FS) = 1.08 | TC(MIN.) = 6.07 00 TO NODE 240.00 = 435.64 FEET. |
| PIPE-FLOW(C PIPE TRAVEI LONGEST FLO FLOW PROCES >>>>ADDITE | FS) = 1.08 | Tc(MIN.) = 6.07 00 TO NODE 240.00 = 435.64 FEET. |

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* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 5.535 SUBAREA LOSS RATE DATA(AMC III): DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN D 0.07 0.20 0.100 91 COMMERCIAL SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20 *********************************** FLOW PROCESS FROM NODE 240.00 TO NODE 242.00 IS CODE = 31 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1012.78 DOWNSTREAM(FEET) = 1008.53 PIPE-FLOW(CFS) = 1.37

PIPE TRAVEL TIME(MIN.) = 0.77 Tc(MIN.) = 6.84

LONGEST FLOWPATH FROM NODE 230.00 TO NODE 242.00 = ************************* FLOW PROCESS FROM NODE 242.00 TO NODE 242.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< -----MAINLINE Tc(MIN.) = 6.84 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.170 SUBAREA LOSS RATE DATA(AMC III): DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
D 0.06 0.20 0.100 91 COMMERCIAL D 0.06 0.20 0.100 91
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA AREA (ACRES) = 0.06 SUBAREA RUNOFF(CFS) = 0.28
EFFECTIVE AREA (ACRES) = 0.34 AREA-AVERAGED Fm(INCH/HR) = 0.02
AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.10
TOTAL AREA (ACRES) = 0.3 PEAK FLOW RATE(CFS) = 1.56 ******************* FLOW PROCESS FROM NODE 242.00 TO NODE 268.00 IS CODE = 10 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<< ************************ FLOW PROCESS FROM NODE 250.00 TO NODE 252.00 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< INITIAL SUBAREA FLOW-LENGTH (FEET) = 329.13 ELEVATION DATA: UPSTREAM (FEET) = 1029.13 DOWNSTREAM (FEET) = 1019.96 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 6.322 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.409 SUBAREA To AND LOSS RATE DATA (AMC III): SCS SOIL AREA DEVELOPMENT TYPE/ LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
D 0.27 0.20 0.100 91 6.32 COMMERCIAL SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100 SUBAREA RUNOFF(CFS) = 1.31 TOTAL AREA (ACRES) = 0.27 PEAK FLOW RATE(CFS) = ******************* FLOW PROCESS FROM NODE 252.00 TO NODE 254.00 IS CODE = 61

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>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
  >>>> (STANDARD CURB SECTION USED) <<<<
 UPSTREAM ELEVATION (FEET) = 1019.96 DOWNSTREAM ELEVATION (FEET) = 1012.78
  STREET LENGTH (FEET) = 177.72 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 38.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 33.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.018
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CES) =
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) = 0.25
HALFSTREET FLOOD WIDTH(FEET) = 6.26
    AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.56
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.88
STREET FLOW TRAVEL TIME(MIN.) = 0.83 Tc(MIN.) = 7.15
STREET FLOW TRAVEL ...
* 100 YEAR RAINFALL INTENSITY(INCH,...,
* SUBARBA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS

* AND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

D 0.20 0.20 0.100 91
 END OF SUBAREA STREET FLOW HYDRAULICS.
  DEPTH (FEET) = 0.26 HALFSTREET FLOOD WIDTH (FEET) = 6.97
 FLOW VELOCITY(FEET/SEC.) = 3.66 DEPTH*VELOCITY(FT*FT/SEC.) = 0.96 LONGEST FLOWPATH FROM NODE 250.00 TO NODE 254.00 = 506.85 FEE
*********************
 FLOW PROCESS FROM NODE 254.00 TO NODE 266.00 IS CODE = 31
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<<
 ELEVATION DATA: UPSTREAM(FEET) = 1008.89 DOWNSTREAM(FEET) = 1007.53
FLOW LENGTH(FEET) = 82.44 MANNING'S N = 0.012
DEPTH OF FLOW IN 9.0 INCH PIPE IS 7.2 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 5.64
ESTIMATED PIPE DIAMETER(INCH) = 9.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 2.12

PIPE TRAVEL TIME(MIN.) = 0.24  Tc(MIN.) = 7.40

LONGEST FLOWPATH FROM NODE 250.00 TO NODE 266.00 =
FLOW PROCESS FROM NODE 266.00 TO NODE 266.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE
_____
 TOTAL NUMBER OF STREAMS = 2
 TOTAL NUMBER OF SIREARS - 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 7.40

RAINFALL INTENSITY(INCH/HR) = 4.94
 RAINFALL INICASIII(INCH/HR) = 0.92
AREA-AVERAGED FM(INCH/HR) = 0.02
AREA-AVERAGED Fp(INCH/HR) = 0.20
AREA-AVERAGED Ap = 0.10
EFFECTIVE STREAM AREA(ACRES) = 0
TOTAL STREAM AREA(ACRES) = 0.47
  PEAK FLOW RATE(CFS) AT CONFLUENCE =
******************
 FLOW PROCESS FROM NODE 260.00 TO NODE 262.00 IS CODE = 21
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>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< INITIAL SUBAREA FLOW-LENGTH (FEET) = 330.00 ELEVATION DATA: UPSTREAM (FEET) = 1029.17 DOWNSTREAM (FEET) = 1018.95 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20SUBAREA ANALYSIS USED MINIMUM TC(MIN.) = 6.19
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.472 SUBAREA To AND LOSS RATE DATA (AMC III): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS TC
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) COMMERCIAL D 0.37 0.20 SUBAREA AVERAGE PERVIOUS LOSS RATE, FD(INCH/HE) = 0.20 0.100 91 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100 SUBAREA RUNOFF (CFS) = 1.82 0 37 PEAK FLOW RATE(CES) = TOTAL AREA(ACRES) = *********************** FLOW PROCESS FROM NODE 262.00 TO NODE 264.00 IS CODE = 61 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< >>>> (STANDARD CURB SECTION USED) < < < < UPSTREAM ELEVATION(FEET) = 1018.95 DOWNSTREAM ELEVATION(FEET) = 1012.54 STREET LENGTH(FEET) = 166.22 CURB HEIGHT(INCHES) = 6.0 STREET HALPMIDTH(FEET) = 38.00 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 33.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.019 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0150 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH(FEET) = 0.27 HALFSTREET FLOOD WIDTH(FEET) = 7.16 AVERAGE FLOW VELOCITY(FEET/SEC.) = PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.72

TREET FLOW TRAVEL TIME(MIN \ - 2.77 STREET FLOW TRAVEL TIME (MIN.) = 0.74 Tc (MIN.) = 6.94 100 YEAR RAINFALL INTENSITY (INCH/HR) = 5.127 SUBAREA LOSS RATE DATA (AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN COMMERCIAL. COMMERCIAL D 0.21 0.20 0 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20 0.100 SUBARRA AVERAGE PERVIOUS LOSS RAIE, FP(INCH/HR) = 0.20
SUBARRA AVERAGE PERVIOUS AREA FRACTION, AP = 0.100
SUBARRA AREA (ACRES) = 0.21
SUBARRA RUDOFF(CFS) = 0.97
EFFECTIVE AREA (ACRES) = 0.58
AREA-AVERAGED Fm(INCH/HR) = 0.02
AREA-AVERAGED AP = 0.10 PEAK FLOW RATE (CFS) = 0.6 2 67 TOTAL AREA (ACRES) = END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH (FEET) = 0.28 HALFSTREET FLOOD WIDTH (FEET) = 7.74
FLOW VELOCITY (FEET/SEC.) = 3.81 DEPTH*VELOCITY (FT*FT/SEC.) =
LONGEST FLOWPATH FROM NODE 260.00 TO NODE 264.00 = 496 ************************ FLOW PROCESS FROM NODE 264.00 TO NODE 266.00 IS CODE = 31 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1008.32 DOWNSTREAM(FEET) = 1007.53 FLOW LENGTH(FEET) = 12.06 MANNING'S N = 0.012 DEPTH OF FLOW IN 9.0 INCH PIPE IS 5.1 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 10.34 ESTIMATED PIPE DIAMETER (INCH) = 9.00 NUMBER OF PIPES = 1

PIPE-FLOW(CFS) =

2.67

C2P00R
PIPE TRAVEL TIME (MIN.) = 0.02 Tc (MIN.) = 6.96

| PIPE TRAVEL TIME(MIN.) = 0.02 Tc(MIN.) = 6.96 LONGEST FLOWPATH FROM NODE 260.00 TO NODE 266.00 = 508.28 FEET. |
|--|
| ************************************** |
| >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE< |
| TOTAL NUMBER OF STREAMS = 2 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE: TIME OF CONCENTRATION (MIN.) = 6.96 RAINFALL INTENSITY (INCH/HR) = 5.12 AREA-AVERAGED FM (INCH/HR) = 0.02 AREA-AVERAGED FP (INCH/HR) = 0.20 AREA-AVERAGED FP (INCH/HR) = 0.20 EFFECTIVE STREAM AREA (ACRES) = 0.58 TOTAL STREAM AREA (ACRES) = 0.58 TOTAL STREAM AREA (ACRES) = 0.58 PEAK FLOW RATE(CES) AT CONFLUENCE = 2.67 |
| ** CONFLUENCE DATA ** STREAM Q TC Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 2.12 7.40 4.943 0.20(0.02) 0.10 0.5 250.00 2 2.67 6.96 5.119 0.20(0.02) 0.10 0.6 260.00 |
| RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO CONFLUENCE FORMULA USED FOR 2 STREAMS. |
| ** PEAK FLOW RATE TABLE ** STREAM Q TC Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 4.73 6.96 5.119 0.20(0.02) 0.10 1.0 260.00 2 4.70 7.40 4.943 0.20(0.02) 0.10 1.0 250.00 |
| COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS: PEAK FLOW RATE (CFS) = 4.73 Tc (MIN.) = 6.96 EFFECTIVE AREA (ACRES) = 1.02 AREA-AVERAGED Fm (INCH/HR) = 0.02 AREA-AVERAGED Fp (INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.10 TOTAL AREA (ACRES) = 1.0 LONGEST FLOWPATH FROM NODE 250.00 TO NODE 266.00 = 589.29 FEET. |
| FLOW PROCESS FROM NODE 266.00 TO NODE 268.00 IS CODE = 31 |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<>>>> >USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <>>> |
| ELEVATION DATA: UPSTREAM(FEET) = 1007.53 DOWNSTREAM(FEET) = 1007.23 FLOW LENGTH (FEET) = 18.67 MANNING'S N = 0.012 DEPTH OF FLOW IN 15.0 INCH PIPE IS 8.0 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 7.06 ESTIMATED PIPE DIAMETER (INCH) = 15.00 NUMBER OF PIPES = 1 PIPE-FLOW (CFS) = 4.73 PIPE TRAVEL TIME (MIN.) = 0.04 Tc (MIN.) = 7.00 LONGEST FLOWPATH FROM NODE 250.00 TO NODE 268.00 = 607.96 FEET. |
| |
| FLOW PROCESS FROM NODE 268.00 TO NODE 268.00 IS CODE = 11 |
| >>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY< |
| ** MAIN STREAM CONFLUENCE DATA ** STREAM O TC Intensity Fp(Fm) Ap Ae HEADHATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 4.73 7.00 5.101 0.20(0.02) 0.10 1.0 260.00 2 4.70 7.44 4.926 0.20(0.02) 0.10 1.0 250.00 LONGEST FLOWPATH FROM NODE 250.00 TO NODE 268.00 = 607.96 FEET. |
| ** MEMORY BANK # 2 CONFLUENCE DATA ** STREAM Q TC Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 1.56 6.84 5.170 0.20(0.02) 0.10 0.3 230.00 Page 11 |

2 1.52 7.25 5.001 0.20(0.02) 0.10 LONGEST FLOWPATH FROM NODE 230.00 TO NODE 268.00 = 234.00 680.99 FEET. ** PEAK FLOW RATE TABLE ** Tc Intensity Fp(Fm) HEADWATER STREAM 0 Ap (CFS) (MIN.) (INCH/HR) (INCH/HR) NUMBER (ACRES) NODE 5.170 0.20(0.02) 0.10 5.101 0.20(0.02) 0.10 6.25 6.84 7.00 230.00 1.3 260.00 7.25 5.001 0.20(0.02) 0.10 234.00 4 6.20 7.44 TOTAL AREA(ACRES) = 4.926 0.20(0.02) 0.10 1.4 250.00 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS: COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 6.28 TC (MTN.) = 7.004

EFFECTIVE AREA (ACRES) = 1.36 AREA-AVERAGED Fm (INCH/HR) = 0.02

AREA-AVERAGED Fp (INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.10

TOTAL AREA (ACRES) = 1.4

LONGEST FLOWPATH FROM NODE 230.00 TO NODE 268.00 = 680.99 FEET. ************************ FLOW PROCESS FROM NODE 268.00 TO NODE 268.00 IS CODE = 12 >>>>CLEAR MEMORY BANK # 2 <<<<< ************************* FLOW PROCESS FROM NODE 268.00 TO NODE 270.00 IS CODE = 31 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1007.23 DOWNSTREAM(FEET) = 1006.06 PLOW LENGTH (FEET) = 68.50 MANNING'S N = 0.012
DEPTH OF FLOW IN 15.0 INCH PIPE IS 9.5 INCHES
PIPE-FLOW VELOCITY (FEET/SEC.) = 7.70 ESTIMATED PIPE DIAMETER (INCH) = 15.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 6.28 PIPE TRAVEL TIME(MIN.) = 0.15 Tc(MIN.) = 7.15 LONGEST FLOWPATH FROM NODE 230.00 TO NODE 270.00 = 749.49 FEET. *************************** FLOW PROCESS FROM NODE 270.00 TO NODE 270.00 IS CODE = 1 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<< < TOTAL NUMBER OF STREAMS = 2 TOWN NORTHWEST OF THE TOWN THE TOWN THE TOWN THE TOWN THE THE TIME OF CONCENTRATION (MIN.) = 7.15

RAINFALL INTENSITY (INCH/HR) = 5.04 AREA-AVERAGED Fm(INCH/HR) = 0.02 AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.10
EFFECTIVE STREAM AREA(ACRES) = 1
TOTAL STREAM AREA(ACRES) = 1.39 PEAK FLOW RATE(CFS) AT CONFLUENCE = ************************** FLOW PROCESS FROM NODE 226.00 TO NODE 228.00 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< INITIAL SUBAREA FLOW-LENGTH(FEET) = 148.80 ELEVATION DATA: UPSTREAM(FEET) = 1013.03 DOWNSTREAM(FEET) = 1011.48 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 5.602* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.797 SUBAREA TC AND LOSS RATE DATA(AMC III): DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) COMMERCIAL D 0.31 0.20 0.100 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100

C2P00R SUBAREA RUNOFF(CFS) = 1.61

| TOTAL AREA(| OFF(CFS) = ACRES) = | 0.31 PE | AK FLOW P | ATE (CF | FS) = | 1.6 | 1 |
|--|--|-----------------------------|---------------------|-----------------------------|----------------|-------------------------|-----------------|
| ***** | | | | | | | |
| FLOW PROCES | S FROM NODE | 228.00 TO | NODE | 270.0 | 00 IS | CODE = | 31 |
| >>>>COMPUT | E PIPE-FLOW COMPUTER-EST | TRAVEL TIME IMATED PIPES | THRU SUB | AREA<< | <<< SURE F | LOW) <<<< | < |
| ELEVATION D | | | | | | | |
| FLOW LENGTH DEPTH OF FLO PIPE-FLOW VI | (FEET) = OW IN 6.0 | 15.33 MANN INCH PIPE IS | NING'S N 3 4.0 I | = 0.0 | 12 | reel) - | 1006.06 |
| ESTIMATED P | IPE DIAMETER | (INCH) = 6 | 5.00 N | UMBER | OF PI | PES = | 1 |
| ESTIMATED P: PIPE-FLOW(CI PIPE TRAVEL LONGEST FLO | TIME(MIN.) WPATH FROM N | = 0.02 ODE 226.0 | Tc(MIN.) | = E 2 | 5.62 270.00 | = 1 | 64.13 FEET. |
| ***** | | | | | | | ***** |
| | S FROM NODE | 270.00 TO | NODE | 270.0 | 00 IS | CODE = | 1 |
| | ATE INDEPEND MPUTE VARIOU | S CONFLUENCE | ED STREAM | VALUE | ES<<< | | |
| | R OF STREAMS | | | | | | |
| CONFLUENCE ' | VALUES USED | FOR INDEPEND | | AM 2 | ARE: | | |
| TIME OF CON | CENTRATION (M TENSITY (INCH | IN.) = 5. /HR) = 5.7 | . 62 78 | | | | |
| AREA-AVERAG | ED Fm(INCH/H | R) = 0.02 | | | | | |
| AREA-AVERAG | ED Fp(INCH/H | R) = 0.20 | | | | | |
| AREA-AVERAGE EFFECTIVE S' | ED Ap = 0.1 TREAM AREA(A | U CRES) = | 0.31 | | | | |
| TOTAL STREAM | TREAM AREA(A M AREA(ACRES |) = 0. | .31 | | | | |
| PEAK FLOW R | ATE (CFS) AT | CONFLUENCE = | : 1 | .61 | | | |
| ** CONFLUEN | CE DATA ** | Intensity | , Fn/Fm | 1) | Δn | λe | HEADWATER |
| NUMBER | (CFS) (MIN | .) (INCH/HR) | (INCH/H | IR) | ···p | (ACRES) | NODE |
| 1 | 6.25 6. | 99 5.107 | 0.20(0 | .02) 0 | 0.10 | 1.3 | 230.00 |
| 1 | 6.28 7. | 15 5.040 | 0.20(0 | .02) 0 | 0.10 | 1.4 | 260.00 |
| 1 | 6.20 7. | 59 4.871 | 0.20(0 | .02) 0 | 0.10 | 1.4 | 250.00 |
| 2 | CE DATA ** Q TC (CFS) (MIN 6.25 6. 6.28 7. 6.24 7. 6.20 7. 1.61 5. | 62 5.784 | 0.20(0 | .02) 0 | 0.10 | 0.3 | 226.00 |
| | TENSITY AND FORMULA USED | | | N RATI | 0 | | |
| | | | | | | | |
| ** PEAK FLO | N KATE TABLE | Intensity | z Fp(Fm | 1) | An | Ae | HEADWATER |
| NUMBER | (CFS) (MIN | .) (INCH/HR) | (INCH/H | IR) | | (ACRES) | NODE |
| 1 | 7.31 5. | 62 5.784 | 0.20(0 | .02) 0 | 0.10 | 1.4 | 226.00 |
| 2 | 7.67 6. | 99 5.107 | 0.20(0 | .02) 0 | 0.10 | 1.6 | 230.00 |
| 4 | 7.61 7. | 40 4.944 | 0.20(0 | .02) 0 | 0.10 | 1.7 | 234.00 |
| 5 | Q TC (CFS) (MIN 7.31 5. 7.67 6. 7.68 7. 7.61 7. 7.55 7. | 59 4.871 | 0.20(0 | .02) 0 | .10 | 1.7 | 250.00 |
| | METHENCE DOT | TMATEC ADE 7 | C POLLOW | | | | |
| TOTAL AREA(| ACRES) = | 1.7 | | | | | |
| | WPATH FROM N | | | | | | |
| | | 270.00 TO | NODE | 270.0 | 00 IS | CODE = | 81 |
| FLOW PROCES | | | NE PEAK F | LOW<<< | <<< | | |
| FLOW PROCES: | ON OF SUBARE | | | | | | |
| FLOW PROCES: >>>>ADDITION MAINLINE TC * 100 YEAR 1 | ON OF SUBARE ==================================== | 7.15 ENSITY(INCH/ | | | | | |
| FLOW PROCES: >>>>ADDITION MAINLINE TC * 100 YEAR I | ON OF SUBARE (MIN.) = RAINFALL INT | 7.15 ENSITY(INCH/ | /HR) = 5 | .040 | | l'n | ene |
| FLOW PROCES: >>>>ADDITION MAINLINE TC * 100 YEAR I | ON OF SUBARE (MIN.) = RAINFALL INT | 7.15 ENSITY(INCH/ | /HR) = 5 | .040 | | Ap DECIMAL) | SCS CN |
| FLOW PROCES: >>>>ADDITION MAINLINE TC * 100 YEAR I | ON OF SUBARE ==================================== | 7.15 ENSITY(INCH/ | /HR) = 5 | .040 Fp INCH/H 0.2 | | Ap DECIMAL) 0.100 | SCS CN 91 |

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100 SUBAREA AREA(ACRES) = 1.27 SUBAREA AREA(ACRES) = 5.74 EFFECTIVE AREA(ACRES) = 2.94 AREA-AVERAGED Fm(INCH/HR) = 0.02 AREA-AVERAGED Ap = 0.10 SUBAREA-AVERAGED 3.0 PEAK FLOW RATE(CFS) = TOTAL AREA (ACRES) = ** PEAK FLOW RATE TABLE ** STREAM Q Tc Intensity Fp(Fm) Ap (CFS) (MIN.) (INCH/HR) (INCH/HR) HEADWATER 5.784 0.20(0.02) 0.10 NUMBER (ACRES) NODE 5.62 2.7 5.107 0.20(0.02) 0.10 5.040 0.20(0.02) 0.10 13.35 6.99 7.15 230.00 13.28 2.9 13.11 7.40 4.944 0.20(0.02) 0.10 7.59 4.871 0.20(0.02) 0.10 12.97 3.0 250.00 NEW PEAK FLOW DATA ARE: PEAK FLOW RATE(CFS) = NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 13.77 Tc(MIN.) = 5.62
AREA-AVERAGED Fm(INCH/HR) = 0.20
AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.10 EFFECTIVE AREA(ACRES) = ******************* FLOW PROCESS FROM NODE 270.00 TO NODE 280.00 IS CODE = 31 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ______ ELEVATION DATA: UPSTREAM(FEET) = 1006.06 DOWNSTREAM(FEET) = 1003.27 ELEVATION DAIA: UPSIREAM(FEET) = 1005.05 DOWNSTREAM(FEET) = 1 FLOW LENGTH(FEET) = 65.65 MANNING'S N = 0.012

DEPTH OF FLOW IN 18.0 INCH PIPE IS 10.2 INCHES

PIPE-FLOW VELOCITY (FEET/SEC.) = 13.26

ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 13.77 PIPE TRAVEL TIME (MIN.) = 0.08 Tc (MIN.) = 5.71
LONGEST FLOWPATH FROM NODE 230.00 TO NODE 280.00 = 815.14 FEET. FLOW PROCESS FROM NODE 280 00 TO NODE 280 00 TS CODE = 11 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY< ** MAIN STREAM CONFLUENCE DATA ** V Tc Intensity Fp(Fm) Ap (CFS) (MIN.) (INCH/HR) (INCH/HR) 13.77 5.71 5.72 0.00 STREAM HEADWATER NUMBER (ACRES) NODE 5.736 0.20(0.02) 0.10 226.00 5.71 7.08 2.7 13.35 5.071 0.20(0.02) 0.10 230.00 13.28 7.24 5.006 0.20(0.02) 0.10 13.11 7.48 4.911 0.20(0.02) 0.10 12.97 7.68 4.839 0.20(0.02) 0.10 2.9 260.00 234.00 3.0 LONGEST FLOWPATH FROM NODE 230.00 TO NODE 280.00 = 815.14 FEET. ** MEMORY BANK # 1 CONFLUENCE DATA ** Q Tc Intensity Fp(Fm)
(CFS) (MIN.) (INCH/HR) (INCH/HR) STREAM Ae HEADWATER (ACRES) NODE NUMBER 6.015 0.20(0.02) 0.10 220.00 214.00 10.49 5.63 5.781 0.20(0.02) 0.10 8.79 8.68 4.511 0.20(0.02) 0.10 LONGEST FLOWPATH FROM NODE 210.00 TO NODE 280.00 = 685.72 FEET. ** PEAK FLOW RATE TABLE ** Tc Intensity Fp(Fm) Ap HEADWATER STREAM Q NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 24.08 5.25 6.015 0.20(0.02) 0.10 24.18 5.63 5.781 0.20(0.02) 0.10 4.6 214.00 5.736 0.20(0.02) 0.10 24.21 5.71 226.00 23.03 7.08 5.071 0.20(0.02) 0.10 230.00 7.24 5.006 0.20(0.02) 0.10 260.00 22.88 5.0 7.48 22.56 4.911 0.20(0.02) 0.10 234.00 22.32 7.68 4.839 0.20(0.02) 0.10 250.00 8.68 20.88 4.511 0.20(0.02) 0.10 210.00 TOTAL AREA(ACRES) =

24.21 Tc(MIN.) = 5.707

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) =

| EFFECTIVE AREA (ACRES) = 4.63 AREA-AVERAGED Fm (TNCH/HR) = 0.02 AREA-AVERAGED Fp (INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.10 TOTAL AREA (ACRES) = 5.1 LONGEST FLOWPATH FROM NODE 230.00 TO NODE 280.00 = 815.14 FEET. |
|---|
| FLOW PROCESS FROM NODE 280.00 TO NODE 280.00 IS CODE = 12 |
| >>>>CLEAR MEMORY BANK # 1 <<<< |
| FLOW PROCESS FROM NODE 280.00 TO NODE 320.00 IS CODE = 41 |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< |
| ELEVATION DATA: UPSTREAM(FEET) = 1003.27 DOWNSTREAM(FEET) = 1002.78 FLOW LENGTH(FEET) = 82.62 MANNING'S N = 0.013 DEPTH OF FLOW IN 36.0 INCH FIPE IS 17.9 INCHES PIPE-FLOW VELOCITY(FEET/SEC.) = 6.88 GIVEN PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 24.21 PIPE TRAVEL TIME (MIN.) = 0.20 Tc (MIN.) = 5.91 LONGEST FLOWPATH FROM NODE 230.00 TO NODE 320.00 = 897.76 FEET. |
| FLOW PROCESS FROM NODE 320.00 TO NODE 320.00 IS CODE = 10 |
| >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<< |
| FLOW PROCESS FROM NODE 290.00 TO NODE 292.00 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<< >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< |
| INITIAL SUBAREA FLOW-LENGTH(FEET) = 119.58 ELEVATION DATA: UPSTREAM(FEET) = 1013.25 DOWNSTREAM(FEET) = 1010.80 |
| TC = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 5.000 **100 YEAR RAINFALL INTENSITY (INCH/MR) = 6.187 SUBAREA TC AND LOSS RATE DATA (AMC III): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS TC LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) COMMERCIAL D 0.26 0.20 0.100 91 5.00 SUBAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.20 SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.100 SUBAREA RUNOFF(CFS) = 1.44 TOTAL AREA (ACRES) = 0.26 PEAK FLOW RATE (CFS) = 1.44 |
| FLOW PROCESS FROM NODE 292.00 TO NODE 304.00 IS CODE = 31 |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<< >>>>SUSING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <>>> |
| ELEVATION DATA: UPSTREAM(FEET) = 1007.32 DOWNSTREAM(FEET) = 1006.15 FLOW LENGTH(FEET) = 123.76 MANNING'S N = 0.012 DEPTH OF FLOW IN 9.0 INCH FIPE IS 6.5 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 4.22 ESTIMATED PIPE DIAMETER (INCH) = 9.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 1.44 PIPE TRAVEL TIME (MIN.) = 0.49 TC (MIN.) = 5.49 LONGEST FLOWPATH FROM NODE 290.00 TO NODE 304.00 = 243.34 FEET. |
| FLOW PROCESS FROM NODE 304.00 TO NODE 304.00 IS CODE = 1 |
| >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE |
| TOTAL NUMBER OF STREAMS = 2 Page 15 |

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CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE: TIME OF CONCENTRATION(MIN.) = 5.49
RAINFALL INTENSITY(INCH/HR) = 5.86
 AREA-AVERAGED Fm(INCH/HR) = 0.02
AREA-AVERAGED Fp(INCH/HR) = 0.20
  AREA-AVERAGED Ap = 0.10
 TOTAL STREAM AREA (ACRES) = 0.26
TOTAL STREAM AREA (ACRES) = 0.26
  PEAK FLOW RATE (CFS) AT CONFLUENCE =
************************
FLOW PROCESS FROM NODE 300.00 TO NODE 302.00 IS CODE = 21
  >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 INITIAL SUBAREA FLOW-LENGTH(FEET) = 189.94
ELEVATION DATA: UPSTREAM(FEET) = 1012.80 DOWNSTREAM(FEET) = 1011.09
  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 6.36
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.391
 SUBAREA TC AND LOSS RATE DATA (AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA
       LAND USE
                             GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 COMMERCIAL D 0.68 0.20 0.100 91 6.36 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100 SUBAREA RUNOFF(CFS) = 3.29
  TOTAL AREA (ACRES) =
                              0.68 PEAK FLOW RATE(CFS) =
************************
 FLOW PROCESS FROM NODE 302.00 TO NODE 304.00 IS CODE = 31
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA
  >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<<
 ELEVATION DATA: UPSTREAM(FEET) = 1007.59 DOWNSTREAM(FEET) = 1006.15
 FLOW LENGTH(FEET) = 14.78 MANNING'S N = 0.012

DEPTH OF FLOW IN 9.0 INCH PIPE IS 5.1 INCHES

PIEE-FLOW VELOCITY (FEET/SEC.) = 12.66

ESTIMATED PIPE DIAMETER (INCH) = 9.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 3.29
PIPE TRAVEL TIME(MIN.) = 0.02 Tc(MIN.) = 6.38
LONGEST FLOWPATH FROM NODE 300.00 TO NODE 304.00 = 204.72 FEET.
***************************
FLOW PROCESS FROM NODE 304.00 TO NODE 304.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE << < <
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES
 TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION(MIN.) = 6.38
RAINFALL INTENSITY(INCH/HR) = 5.38
  AREA-AVERAGED Fm (INCH/HR) = 0.02
  AREA-AVERAGED Fp(INCH/HR) = 0.20
 AREA-AVERAGED PLING....,
AREA-AVERAGED Ap = 0.10
EFFECTIVE STREAM AREA(ACRES) = 0.68
  PEAK FLOW RATE (CFS) AT CONFLUENCE =
                                                  3.29
  ** CONFLUENCE DATA **
               Q Tc Intensity Fp(Fm) Ap
(CFS) (MIN.) (INCH/HR) (INCH/HR)
1.44 5.49 5.865 0.20( 0.02) 0.10
3.29 6.38 5.381 0.20( 0.02) 0.10
  STREAM
                                                                            HEADWATER
   NUMBER
                                                                 (ACRES)
                                                                            NODE
290.00
     1
                                                                      0.3
  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR 2 STREAMS.
  ** PEAK FLOW RATE TABLE **
  STREAM Q Tc Intensity Fp(Fm) Ap Ae
                                                                            HEADWATER
                                                       Page 16
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| NUMBER | NUMBER | (CFS) | (MIN.) | (INCH/HR) | (INCH | /HR) | | (ACRES) | NOD | E |
|--|--|---|--|---|---|---|--------------------------------|--------------------------|----------|----------------------|
| COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS: PEAK FLOW RATE (CFS) = 4.61 TC(MIN.) = 6.38 EFFECTIVE AREA (ACRES) = 0.94 AREA-AVERAGED FM(INCH/HR) = 0.02 AREA-AVERAGED EP(INCH/HR) = 0.20 AREA-AVERAGED AP = 0.10 TOTAL AREA (ACRES) = 0.39 LONGEST FLOWFARH FROM NODE 290.00 TO NODE 304.00 = 243.34 FEET. FLOW PROCESS FROM NODE 304.00 TO NODE 320.00 IS CODE = 31 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRE SUBBAREA< >>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> | 1 2 | 4.53 | 5.49 6.38 | 5.865 | 0.20(| 0.02) | 0.10 | 0.8 | 2 | 90.00 |
| LONGEST FLOWPATH FROM NODE | COMPLITED CO | ONFLUENC | E ESTIMAT | res are a | S FOLL | าพร | | | | |
| FLOW PROCESS FROM NODE | TOTAL AREA | (ACRES) | = | 0.9 | | | | | | |
| Note | | | | | | | | | | |
| SUBJECT STREAM FEET 1006.15 | FLOW PROCE | SS FROM | NODE 3 | 304.00 TO | NODE | 320 | .00 IS | CODE = 3 | | |
| ELEVATION DATA: UPSTREAM (FEET) = 1006.15 DOWNSTREAM (FEET) = 1002.78 FLOW LENGTH (FEET) = 147.22 MANNING'S N = 0.012 DEPTH OF FLOW IN 12.0 INCH PIPE IS 8.4 INCHES PIEP-FLOW VELOCITY (FEET/SEC.) = 7.89 ESTIMATED PIPE DIAMSTER (INCH) = 12.00 NUMBER OF PIPES = 1 PIEPE TRAVEL TIME (MIN.) = 0.31 TC (MIN.) = 6.69 LONGEST FLOWBATH FROM NODE 290.00 TO NODE 320.00 = 390.56 FEET. **FLOW PROCESS FROM NODE 320.00 TO NODE 320.00 IS CODE = 1 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<*** TOTAL NUMBER OF STREAMS = 2 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE: TIME OF CONCENTRATION (MIN.) = 6.69 RAINFALL INTENSITY (INCH/HR) = 5.24 ARBEA-AVERAGED FP (INCH/HR) = 0.02 ARBEA-AVERAGED FP (INCH/HR) = 0.94 PEAK FLOW RATE (CFS) AT CONFLUENCE = 4.61 **FLOW PROCESS FROM NODE 310.00 TO NODE 312.00 IS CODE = 21 >>>>RAINFALL INTENSITY (INCH/HR) = 0.94 PEAK FLOW RATE (CFS) AT CONFLUENCE = 4.61 **FLOW PROCESS FROM NODE 310.00 TO NODE 312.00 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBARRA ANALYSIS <*** >>VSUBS TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBARRA ** INITIAL SUBARRA FLOW-LENGTH (FEET) = 132.30 ELEVATION DATA: UPSTREAM(FEET) = 1012.90 DOWNSTREAM (FEET) = 1011.17 TC = K** (LENGTH** 3.00) / (ELEVATION CHANGE)]**0.20 SUBARRA ANALYSIS USED MINHUM TC (MIN.) = 5.107 ** 100 YEAR RAINFALL INTENSITY (INCH/HR) = 6.112 SUBARRA TC AND LOSS RATE DATA (ANC III): DEVELOPMENT TYPE / SCS SOIL AREA FPA CON SUBARRA AVERAGE PERVIOUS LOSS RATE, FPI (INCH/HR) = 0.20 SUBARRA ROUND'F (CFS) = 2.25 TOTAL AREA (ACRES) = 0.41 PEAK FLOW RATE (CFS) = 2.25 TOTAL AREA (ACRES) = 0.41 PEAK FLOW RATE (CFS) = 2.25 TOTAL AREA (ACRES) = 0.41 PEAK FLOW RATE (CFS) = 2.25 TOTAL AREA (ACRES) = 0.41 PEAK FLOW RATE (CFS) = 2.25 TOTAL AREA (ACRES) = 0.41 PEAK FLOW RATE (CFS) = 2.25 TOTAL AREA (ACRES) = 0.41 PEAK FLOW RATE (CFS) = 1003.78 FLOW PROCESS FROM NODE 312.00 TO NODE 320.00 IS CODE = 31 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBARRA<** ELEVATION DATA: UPSTREAM (FEET) = 1007.81 DOWNSTREAM (FEET) = 1003.78 FLOW PROCE | >>>>USING | COMPUTE | R-ESTIMAT | TED PIPES | IZE (N | ON-PRE | SSURE I | | | |
| FLOW PROCESS FROM NODE 320.00 TO NODE 320.00 IS CODE = 1 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE< CCC TOTAL NUMBER OF STREAMS = 2 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE: TIME OF CONCENTRATION (MIN.) = 6.69 RAINFALL INTENSITY (INCH/HR) = 5.24 AREA-AVERAGED FD (INCH/HR) = 0.02 AREA-AVERAGED FD (INCH/HR) = 0.02 AREA-AVERAGED FD (INCH/HR) = 0.94 TOTAL STREAM AREA (ACRES) = 0.94 PEAK FLOW RATE (CFS) AT CONFLUENCE = 4.61 FLOW PROCESS FROM NODE 310.00 TO NODE 312.00 IS CODE = 21 >>>>RAINFALL METHOD INITIAL SUBAREA ANALYSIS< >>VUSE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA< INITIAL SUBAREA FLOW-LENGTH (FEET) = 132.30 ELEVATION DATA: UPSTREAM (FEET) = 1012.30 DOWNSTREAM (FEET) = 1011.17 TC = K* ([LENGTH** 3.00) / (ELEVATION CHANGE)]**0.20 SUBAREA ANALYSIS USED MINHUM TC (MIN.) = 5.107 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 6.112 SUBAREA TC ADD LOSS RATE DATA (ANC III): DEVELOPMENT TYPE/ SCS SOIL AREA FD AP SCS TC LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) COMMERCIAL D 0.41 0.20 0.100 91 5.11 SUBAREA AVERAGE PERVIOUS LOSS RATE, FD (INCH/HR) = 0.20 SUBAREA RONOFF (CFS) = 2.25 TOTAL AREA (ACRES) = 0.41 PEAK FLOW RATE (CFS) = 2.25 TOTAL AREA (ACRES) = 0.41 PEAK FLOW RATE (CFS) = 2.25 TOTAL AREA (ACRES) = 0.41 PEAK FLOW RATE (CFS) = 2.25 TOTAL AREA (ACRES) = 0.41 PEAK FLOW RATE (CFS) = 2.25 TOTAL AREA (ACRES) = 0.41 PEAK FLOW RATE (CFS) = 2.25 TOTAL AREA (ACRES) = 0.41 PEAK FLOW RATE (CFS) = 2.25 TOTAL AREA (ACRES) = 0.41 PEAK FLOW RATE (CFS) = 1003.78 FLOW PROCESS FROM NODE 312.00 TO NODE 320.00 IS CODE = 31 >>>>COMMETCIAL D 0.010 PIPES IS (NON-PRESSURE FLOW) <<< | ELEVATION I FLOW LENGTI DEPTH OF F: PIPE-FLOW ' ESTIMATED I PIPE-FLOW(PIPE TRAVE | DATA: UP: H(FEET): LOW IN /ELOCITY PIPE DIA CFS) = L TIME(M | STREAM (FE = 147.2 12.0 INCH (FEET/SEC METER (INC 4.61 IN.) = | EET) = 1 22 MANN H PIPE IS C.) = 7 CH) = 12 | 006.15 ING'S 1 8.4 .89 .00 | DOWN: N = 0 INCHE: NUMBE: | STREAM .012 S R OF P: | (FEET) = | 1002. | 78 |
| TOTAL NUMBER OF STREAMS = 2 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE: TIME OF CONCENTRATION(MIN.) = 6.69 RAINFALL INTENSITY (INCH/HR) = 5.24 ARREA-AVERAGED FD (INCH/HR) = 0.02 ARREA-AVERAGED FD (INCH/HR) = 0.20 ARREA-AVERAGED FD (INCH/HR) = 0.94 TOTAL STREAM AREA (ACRES) = 0.94 PEAK FLOW RATE (CFS) AT CONFLUENCE = 4.61 **FLOW PROCESS FROM NODE 310.00 TO NODE 312.00 IS CODE = 21 **SYNDATIONAL METHOD INITIAL SUBAREA ANALYSIS<*** **SUBSE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<** INITIAL SUBAREA FLOW-LENGTH (FEET) = 132.30 ELEVATION DATA: UPSTREAM (FEET) = 1012.90 DOWNSTREAM (FEET) = 1011.17 TC = K** (LENGTH** 3.00) / (ELEVATION CHANGE)]**0.20 SUBAREA ANALYSIS USED MINHUM Tc (MIN.) = 5.107 ** 100 YEAR RAINFALL INTENSITY (INCH/HR) = 6.112 SUBAREA TC ADD LOSS RATE DATA (ANC III): DEVELOPMENT TYPE/ SCS SOIL AREA FD AP SCS TC LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) COMMECIAL D 0.41 0.20 0.100 91 5.11 SUBAREA AVERAGE PERVIOUS LOSS RATE, FD (INCH/HR) = 0.20 SUBAREA RONOFF (CFS) = 2.25 TOTAL AREA (ACRES) = 0.41 PEAK FLOW RATE (CFS) = 2.25 TOTAL AREA (ACRES) = 0.41 PEAK FLOW RATE (CFS) = 2.25 **TOTAL AREA (ACRES) = 0.41 PEAK FLOW RATE (CFS) = 2.25 **TOTAL AREA (ACRES) = 0.41 PEAK FLOW RATE (CFS) = 2.25 **TOTAL AREA (ACRES) = 0.41 PEAK FLOW RATE (CFS) = 2.25 **TOTAL AREA (ACRES) = 0.41 PEAK FLOW RATE (CFS) = 2.25 **TOTAL AREA (ACRES) = 0.41 PEAK FLOW RATE (CFS) = 2.25 **TOTAL AREA (ACRES) = 0.41 PEAK FLOW RATE (CFS) = 1003.78 **FLOW PROCESS FROM NODE 312.00 TO NODE 320.00 IS CODE = 31 ***>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<**** ***>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) **** ***ELEVATION DATA: UPSTREAM (FEET) = 1007.81 DOWNSTREAM (FEET) = 1003.78 **FLOW LENGTH (FEET) = 6.2.53 MANING'S N = 0.012 **DEPTH OF FLOW IN 9.0 INCH PIPE IS 4.6 INCHES ***PIPE-FLOW VELOCITY (FEET)/SC.) = 9.85 ***ESTIMATED PIPE SIDMETER (INCH) = 9.00 NUMBER OF PIPES = 1 | FLOW PROCES | SS FROM | NODE 3 | 320.00 TO | NODE | 320 | .00 IS | CODE = | 1 | |
| TOTAL NUMBER OF STREAMS = 2 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE: TIME OF CONCENTRATION(MIN.) = 6.69 RAINFALL INTENSITY (INCH/HR) = 5.24 AREA-AVERAGED FM (INCH/HR) = 0.02 AREA-AVERAGED FM (INCH/HR) = 0.20 AREA-AVERAGED FM (INCH/HR) = 0.94 TOTAL STREAM AREA (ACRES) = 0.94 TOTAL STREAM AREA (ACRES) = 0.94 PEAK FLOW RATE (CFS) AT CONFLUENCE = 4.61 **FLOW PROCESS FROM NODE 310.00 TO NODE 312.00 IS CODE = 21 **>>>>RAITIONAL METHOD INITIAL SUBAREA ANALYSIS<*** >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<** INITIAL SUBAREA FLOW-LENGTH (FEET) = 132.30 ELEVATION DATA: UPSTREAM(FEET) = 1012.90 DOWNSTREAM(FEET) = 1011.17 TC = K* ((LENGTH** 3.00) / (ELEVATION CHANGE))**0.20 SUBAREA ANALYSIS USED MINIMUM TC (MIN.) = 5.107 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 6.112 SUBAREA TE AND LOSS RATE DATA (ANC III): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS TC LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) COMMERCIAL D 0.41 0.20 0.100 91 5.11 SUBAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.20 SUBAREA RONOFF (CFS) = 2.25 TOTAL AREA (ACRES) = 0.41 PEAK FLOW RATE (CFS) = 2.25 TOTAL AREA (ACRES) = 0.41 PEAK FLOW RATE (CFS) = 2.25 TOTAL AREA (ACRES) = 0.41 PEAK FLOW RATE (CFS) = 2.25 TOTAL AREA (ACRES) = 0.41 PEAK FLOW RATE (CFS) = 2.25 TOTAL AREA (ACRES) = 0.41 PEAK FLOW RATE (CFS) = 1003.78 FLOW PROCESS FROM NODE 312.00 TO NODE 320.00 IS CODE = 31 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<< >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<< | >>>>DESIG | NATE IND | EPENDENT | STREAM F | OR CON | FLUENC | E<<<< | | | |
| FLOW PROCESS FROM NODE 310.00 TO NODE 312.00 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<>>>> >>>>> TATIONAL METHOD INITIAL SUBAREA ANALYSIS<>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> | TOTAL NUMBI CONFLUENCE TIME OF COI RAINFALL II AREA-AVERAI AREA-AVERAI AREA-AVERAI EFFECTIVE : TOTAL STRE. | ER OF ST: VALUES NCENTRAT NTENSITY GED Fm(II GED Fp(II GED Ap = STREAM A: AM AREA(. | REAMS = USED FOR ION (MIN.) (INCH/HR) NCH/HR) = NCH/HR) = 0.10 REA (ACRES ACRES) = | 2 INDEPEND = 6. = 5.2 = 0.02 = 0.20 | ENT ST 69 4 0.94 | REAM | | | | |
| >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<> >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA< | FLOW PROCE | SS FROM | NODE 3 | 310.00 TO | NODE | 312 | .00 IS | CODE = 2 | 21 | |
| INITIAL SUBAREA FLOW-LENGTH (FEET) = 132.30 ELEVATION DATA: UPSTREAM(FEET) = 1012.90 DOWNSTREAM(FEET) = 1011.17 TC = K* [(LENGTH** 3.00) / (ELEVATION CHANGE)]**0.20 SUBARRA AWALYSIS USED MINIMUM TC (MIN.) = 5.107 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 6.112 SUBARRA TC AND LOSS RATE DATA (ANC III): DEVELOPMENT TYPE/ SCS SOIL AREA FP AD SCS TC LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) COMMERCIAL D 0.41 0.20 0.100 91 5.11 SUBARRA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.20 SUBARRA RUNOFF (CFS) = 2.25 TOTAL AREA (ACRES) = 0.41 PEAK FLOW RATE (CFS) = 2.25 FLOW PROCESS FROM NODE 312.00 TO NODE 320.00 IS CODE = 31 ->>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<-> ELEVATION DATA: UPSTREAM (FEET) = 1007.81 DOWNSTREAM (FEET) = 1003.78 FLOW LENGTH (FEET) = 62.53 MANING'S N = 0.012 DEPTH OF FLOW IN 9.0 INCH PITES IS 4.6 INCHES PIEP-FLOW VELOCITY (FEET/SEC.) = 9.85 ESTIMATED PIPE ISMETER (NCH) = 9.00 NUMBER OF PIPES = 1 | >>USE TIME | -OF-CONC | ENTRATION | NOMOGRA | PH FOR | INITI | AL SUB | | | |
| SUBAREA ANALYSIS USED MINIMUM TC(MIN.) = 5.107 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 6.112 SUBAREA TC AND LOSS RATE DATA (AMC III): DEVELOPMENT TYPE/ SCS SOIL AREA FD AD SCS TC LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) COMMERCIAL D 0.41 0.20 0.100 91 5.11 SUBAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.20 SUBAREA AVERAGE PERVIOUS AREA FRACTION, AD = 0.100 SUBAREA ROMOFF (CFS) = 2.25 TOTAL AREA (ACRES) = 0.41 PEAK FLOW RATE (CFS) = 2.25 FLOW PROCESS FROM NODE 312.00 TO NODE 320.00 IS CODE = 31 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<>>>>>USTANDEA SUBAREA AVERAGE PERVIOUS AREA FRACTION, AD = 0.102 ELEVATION DATA: UPSTREAM (FEET) = 1007.81 DOWNSTREAM (FEET) = 1003.78 FLOW LEWGTH (FEET) = 62.53 MANNING'S N = 0.012 DEPTH OF FLOW IN 9.0 INCH PIPE IS 4.6 INCHES PIEDE-FLOW VELOCITY (FEET/SEC.) = 9.85 ESTIMATED PIPE DIAMETER (INCH) = 9.00 NUMBER OF PIPES = 1 | INITIAL SU | BAREA FL | OW-LENGTH | H(FEET) = | 132 | .30 | | | | |
| FLOW PROCESS FROM NODE 312.00 TO NODE 320.00 IS CODE = 31 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<< >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<< ELEVATION DATA: UPSTREAM(FEET) = 1007.81 DOWNSTREAM(FEET) = 1003.78 FLOW LENGTH(FEET) = 62.53 MANNING'S N = 0.012 DEPTH OF FLOW IN 9.0 INCH PIPE IS 4.6 INCHES PIPE-FLOW VELOCITY(FEET/SEC.) = 9.85 ESTIMATED PIPE DIAMETER (INCH) = 9.00 NUMBER OF PIPES = 1 | SUBAREA AN. * 100 YEAR SUBAREA TC DEVELOPME! LAND 1 COMMERCIAL SUBAREA AVI SUBAREA RVI SUBAREA RVI | ALYSIS U RAINFAL AND LOS NT TYPE/ JSE ERAGE PE: ERAGE PE: NOFF(CFS | SED MINIM L INTENSI S RATE DA SCS GF RVIOUS LC RVIOUS AF) = | MUM Tc(MI TTY(INCH/ ATA(AMC I S SOIL ROUP (A D DSS RATE, REA FRACT 2.25 | N.) = HR) = II): AREA CRES) 0.41 Fp(ING ION, A | 5.1 6.112 Fp (INCH 0 CH/HR) p = 0 | /HR) .20 = 0.2 | (DECIMAL) 0.100 20 | CN 91 | Tc (MIN.) 5.11 |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<>>>>>DSING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<>>> ELEVATION DATA: UPSTREAM(FEET) = 1007.81 DOWNSTREAM(FEET) = 1003.78 FLOW LENGTH(FEET) = 62.53 MANNING'S N = 0.012 DEPTH OF FLOW IN 9.0 INCH PIPE IS 4.6 INCHES PIPE-FLOW VELOCITY(FEET/SEC.) = 9.85 ESTIMATED PIPE DIAMPETER(INCH) = 9.00 NUMBER OF PIPES = 1 | | | | | | | | | | ***** |
| >>>>JOSING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<> ELEVATION DATA: UPSTREAM (FEET) = 1007.81 DOWNSTREAM (FEET) = 1003.78 FLOW LENGTH (FEET) = 62.53 MANNING'S N = 0.012 DEPTH OF FLOW IN 9.0 INCH PIPE IS 4.6 INCHES PIPE-PLOW VELOCITY (FEET/SEC.) = 9.85 ESTIMATED PIPE DIAMPETER (INCH) = 9.00 NUMBER OF PIPES = 1 | | | | | | | | | | |
| ELEVATION DATA: UPSTREAM(FEET) = 1007.81 DOWNSTREAM(FEET) = 1003.78 FLOW LENGTH(FEET) = 62.53 MANNING'S N = 0.012 DEPTH OF FLOW IN 9.0 INCH PIPE IS 4.6 INCHES PIPE-FLOW VELOCITY(FEET/SEC.) = 9.85 ESTIMATED PIPE DIAMETER(INCH) = 9.00 NUMBER OF PIPES = 1 | >>>>USING | COMPUTE | R-ESTIMAT | TED PIPES | IZE (N | ON-PRE | SSURE I | | | |
| | ELEVATION I FLOW LENGTI DEPTH OF F | DATA: UP: H(FEET): LOW IN | STREAM (FE = 62.5 9.0 INCH | EET) = 1 33 MANN 4 PIPE IS | 007.81 ING'S 1 | DOWN: N = 0 INCHE: NUMBE | STREAM .012 S R OF PI | (FEET) = | 1003. | |

PIPE-FLOW(CFS) = 2.25 PIPE TRAVEL TIME(MIN.) = 0.11 Tc(MIN.) = 5.21 LONGEST FLOWPATH FROM NODE 310.00 TO NODE 320.00 = *********************************** FLOW PROCESS FROM NODE 320.00 TO NODE 320.00 IS CODE = 1 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE << < < >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES ______ TOTAL NUMBER OF STREAMS = 2 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 5.21
RAINFALL INTENSITY(INCH/HR) = 6.04 AREA-AVERAGED Fm(INCH/HR) = 0.02 AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.10

EFFECTIVE STREAM AREA(ACRES) = 0.41

TOTAL STREAM AREA(ACRES) = 0.41 PEAK FLOW RATE (CFS) AT CONFLUENCE = ** CONFLUENCE DATA ** CFS) (MIN.) (INCH/HR) (INCH/HR) Ap (CFS) (MIN.) (INCH/HR) (INCH/HR) (1.53 5.80 5.682 0.20(0.02) 0.10 4.61 6.69 5.236 0.20(0.02) 0.10 2.25 5.21 6.041 0.20(0.02) 0.10 STREAM HEADWATER (ACRES) NUMBER NODE 290.00 300.00 310.00 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO CONFLUENCE FORMULA USED FOR 2 STREAMS. ** PEAK FLOW RATE TABLE ** \(\text{VARIE FABLE } \) \(\text{V} \) \(\text{TC} \) \(\text{Intensity} \) \(\text{Fp(Fm)} \) \(\text{Ap} \) \(\text{Ap} \) \(\text{Ae} \) \(\text{HEADWATER} \) \(\text{(CFS)} \) \(\text{(MIN.)} \) \(\text{(INCH/HR)} \) \(\text{(INCH/HR)} \) \(\text{(INCH/HR)} \) \(\text{(ACRES)} \) \(\text{NODE} \) \(\text{6.657} \) \(\text{5.68} \) \(\text{6.02} \) \(\text{0.02} \) \(\text{0.10} \) \(\text{1.2} \) \(\text{310.00} \) \(\text{6.64} \) \(\text{5.80} \) \(\text{5.682} \) \(\text{0.20} \) \(\text{0.02} \) \(\text{0.10} \) \(\text{1.1} \) \(\text{3.200.00} \) STREAM NUMBER 1 6.56 6.69 5.236 0.20(0.02) 0.10 300 00 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS: LONGEST FLOWPATH FROM NODE 290.00 TO NODE 320.00 = 390.56 FEET. ********************* FLOW PROCESS FROM NODE 320.00 TO NODE 320.00 IS CODE = 11 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY _____ ** MAIN STREAM CONFLUENCE DATA ** Q Tc Intensity Fp(Fm) Ap (CFS) (MIN.) (INCH/HR) (INCH/HR) STREAM Ae HEADWATER (ACRES) NODE NUMBER 6.57 5.21 6.041 0.20(0.02) 0.10 6.64 5.80 5.682 0.20(0.02) 0.10 6.56 6.69 5.236 0.20(0.02) 0.10 1.2 310.00 1.3 290.00 1.4 300.00 LONGEST FLOWPATH FROM NODE 290.00 TO NODE 320.00 = 390.56 FEET. ** MEMORY BANK # 1 CONFLUENCE DATA ** Q Tc Intensity Fp(Fm) Ap Ae HEADWATER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE STREAM NUMBER 5.45 5.887 0.20(0.02) 0.10 5.83 5.667 0.20(0.02) 0.10 24.08 24.18 4.6 214.00 5.624 0.20(0.02) 0.10 24.21 5.91 226.00 23.03 7.28 4.990 0.20(0.02) 0.10 7.44 4.927 0.20(0.02) 0.10 230.00 260.00 22.88 5.0 7.69 4.836 0.20(0.02) 0.10 22.56 22.32 7.88 4.767 0.20(0.02) 0.10 20.88 8.89 4.450 0.20(0.02) 0.10 250.00 210.00 5.1 LONGEST FLOWPATH FROM NODE 230.00 TO NODE 320.00 = 897.76 FEET.

STREAM Q To Intensity Fp(Fm) Ap Ae HEADWATER

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** PEAK FLOW RATE TABLE **

```
NUMBER
              (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                        (ACRES)
                                                                  NODE
                              6.041 0.20(0.02) 0.10
5.887 0.20(0.02) 0.10
                                                                     310.00
              30.19
                      5.21
                                                            5.4
              30.68
                                                                     220.00
              30.81
                      5.80
                              5.682 0.20(0.02) 0.10
5.667 0.20(0.02) 0.10
                                                                     290.00
              30.81
                      5.83
                                                             5.8
                                                                     214.00
              30.84
                      5.91
                               5.624 0.20(0.02) 0.10
                                                                     226.00
             30.10
29.28
                              5.236 0.20(0.02) 0.10
4.990 0.20(0.02) 0.10
                                                                     300.00
                      6.69
                      7.28
             29.05
                      7.44
                              4.927 0.20(0.02) 0.10
                                                                     260.00
                      7.69
7.88
             28 62
                              4.836 0.20(0.02) 0.10
                                                             6 4
                                                                     234 00
             28.28
                              4.767 0.20(0.02) 0.10
                                                                     250.00
             26.45
                     8.89
                              4.450 0.20(0.02) 0.10
                                                                     210.00
    TOTAL AREA(ACRES) =
                               6.5
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE (CFS) = 30.84 TC(MIN.) = 5.907
EFFECTIVE AREA (ACRES) = 5.90 AREA-AVERAGED Fm(INCH/HR) = 0.02
 AREA-AVERAGED Fm(INCH/HR) AREA-AVERAGED Fm(INCH/HR) TOTAL AREA (ACRES) = 6.5
 LONGEST FLOWPATH FROM NODE 230.00 TO NODE 320.00 = 897.76 FEET.
***************************
 FLOW PROCESS FROM NODE 320.00 TO NODE 325.00 IS CODE = 41
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <<<<<
 ELEVATION DATA: UPSTREAM(FEET) = 1002.78 DOWNSTREAM(FEET) = 1002.11 FLOW LENGTH(FEET) = 133.24 MANNING'S N = 0.013 DEPTH OF FLOW IN 36.0 INCH FIPE IS 21.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 6.84
GIVEN PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1
 **************************
 FLOW PROCESS FROM NODE 325.00 TO NODE 325.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
 MAINI.INE TC(MIN) = 6.23
  * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 5.454
 SUBAREA LOSS RATE DATA (AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp
      LAND USE
                         GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL D 0.48 0.20 0.100 91 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
 SUBARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBARRA AREA (ACRES) = 0.48
SUBARRA RUNOFF (CFS) = 2.35
EFFECTIUVE AREA (ACRES) = 6.38
AREA-AVERAGED Fm (INCH/HR) = 0.02
AREA-AVERAGED Fm (INCH/HR) = 0.02
                                   PEAK FLOW RATE(CFS) =
 TOTAL AREA (ACRES) =
                            6.9
*******************
 FLOW PROCESS FROM NODE 325.00 TO NODE 330.00 IS CODE = 41
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <<<<<
 ELEVATION DATA: UPSTREAM(FEET) = 1002.11 DOWNSTREAM(FEET) = 1001.26
 FLOW LENGTH(FEET) = 173.84 MANNING'S N = 0.013
DEPTH OF FLOW IN 36.0 INCH PIPE IS 22.3 INCHES
 ************************
 FLOW PROCESS FROM NODE 330.00 TO NODE 450.00 IS CODE = 41
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <>>>
```

| C2POOR | | | | | | | | | |
|--|--|---|--|-------------------------------------|--|---|-------------------|-------------------|--|
| ELEVATION FLOW LENG DEPTH OF ! PIPE-FLOW GIVEN PIPE PIPE-FLOW PIPE TRAVI | DATA: UP IH (FEET) FLOW IN VELOCITY E DIAMETE (CFS) = EL TIME (M LOWPATH F | STREAM (F = 18. 36.0 ING (FEET/SE R(INCH) 31.1 IN.) = ROM NODE | TEET) = 1 13 MANN CH PIPE IS CC.) = 21 = 36.00 19 0.01 | 001.26 ING'S N 9.4 .21 NUME Tc(MIN. | DOWN: = 0 INCHE: BER OF) = | STREAM .013 S PIPES 6.67 450.0 | (FEET) = 1 0 = 12 | 22.97 FEET. | |
| END OF ST TOTAL ARE: EFFECTIVE AREA-AVER: PEAK FLOW | UDY SUMMA A (ACRES) AREA (ACR AGED FP(I RATE(CFS | RY: = ES) = NCH/HR)) = | 6.9 6.38 = 0.20 31.19 | TC (MIN AREA-AV | I.) = /ERAGE | 6 Fm(I | .67 NCH/HR)= | | |
| | | | | Fp (F | m) | An | Ae | HEADWATER | |
| NUMBER | (CFS) | (MIN.) | (INCH/HR) | (INCH/ | HR) | | (ACRES) | HEADWATER NODE | |
| 1 | 30.59 | 5.98 | 5.583 | 0.20(| 0.02) | 0.10 | 5.8 | 310.00 | |
| 2 | 31.02 | 6.22 | 5.460 | 0.20(| 0.02) | 0.10 | 6.1 | 220.00 | |
| 3 | 31.17 | 6.57 | 5.292 | 0.20(| 0.02) | 0.10 | 6.3 | 290.00 | |
| | | | | | | | | 214.00 | |
| | | | 5.244 | | | | | | |
| 6 | 30.39 | 7.46 | 4.919 | 0.20(| 0.02) | 0.10 | 6.7 | 300.00 | |
| 7 | 29.64 | 8.05 | 4.709 | 0.20(| 0.02) | 0.10 | 6.8 | 230.00 | |
| 8 | 29.43 | 8.22 | 4.655 | 0.20(| 0.02) | 0.10 | 6.8 | 260.00 | |
| 9 | 29.03 | 8.47 | 4.576 | 0.20(| 0.02) | 0.10 | 6.9 | 234.00 250.00 | |
| | | | | | | | | | |
| 11 | | | | | , | | | 210.00 | |
| | | | | | | | | | |

END OF RATIONAL METHOD ANALYSIS

OUTLET 3 INTERIM

3E10R

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION) (c) Convright 1983-2016 Advanced Engineering Software (aes)

Ver. 23.0 Release Date: 07/01/2016 License ID 1334

Analysis prepared by:

| * DANA POINT HARBOR COMMERCIAL CORE AREA - Phase 2B Interim * RATIONAL METHOD EXISTING CONDITION HYDROLOGY OUTLET 3 * 10-YEAR STORM EVENT EM | | | | | | | | | |
|---|--|--|--|--|--|--|--|--|--|
| FILE NAME: 3E10R.DAT TIME/DATE OF STUDY: 15:14 02/13/2020 | | | | | | | | | |
| USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION: | | | | | | | | | |
| *TIME-OF-CONCENTRATION MODEL* | | | | | | | | | |
| USER SPECIFIED STORM EVENT(YEAR) = 10.00 SPECIFIED MINIMUM PIPE SIZE(INCH) = 12.00 SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90 *DATA BANK RAINFALL USED* *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD* | | | | | | | | | |
| *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL* HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING WIDTH CROSSFALL IN- / OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR NO. (FT) (FT) SIDE / SIDE/ WAY (FT) (FT) (FT) (FT) (n) | | | | | | | | | |
| 1 30.0 20.0 0.018/0.018/0.020 0.67 2.00 0.0313 0.167 0.0150 2 30.0 25.0 0.017/0.017/0.017 0.67 1.50 0.0313 0.167 0.0150 3 50.0 45.0 0.017/0.017/0.017 0.67 2.00 0.0313 0.167 0.0150 | | | | | | | | | |
| GLOBAL STREET FLOW-DEPTH CONSTRAINTS: 1. Relative Flow-Depth = 0.50 FEET as (Maximum Allowable Street Flow Depth) - (Top-of-Curb) 2. (Depth)* (Velocity) Constraint = 6.0 (FT*FT/S) *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.* *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED | | | | | | | | | |
| FLOW PROCESS FROM NODE 100.00 TO NODE 101.00 IS CODE = 21 | | | | | | | | | |
| >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<>>> >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< | | | | | | | | | |
| INITIAL SUBAREA FLOW-LENGTH(FEET) = 326.73 ELEVATION DATA: UPSTREAM(FEET) = 1332.32 DOWNSTREAM(FEET) = 1331.94 | | | | | | | | | |
| TC = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 SUBAREA ANALYSIS USED MINIMUM TC(MIN.) = 15.223 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.145 SUBAREA TC AND LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS TC LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) | | | | | | | | | |
| "5-7 DWELLINGS/ACRE" B 0.21 0.30 0.500 56 15.22 | | | | | | | | | |
| RESIDENTIAL "5-7 DWELLINGS/ACRE" D 1.55 0.20 0.500 75 15.22 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.500 SUBAREA RUNOFF(CFS) = 3.23 TOTAL AREA(ACRES) = 1.76 PEAK FLOW RATE(CFS) = 3.23 | | | | | | | | | |
| | | | | | | | | | |

Page 1

*********************** FLOW PROCESS FROM NODE 101.00 TO NODE 102.00 IS CODE = 62 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA >>>> (STREET TABLE SECTION # 2 USED) <<<< UPSTREAM ELEVATION(FEET) = 1331.94 DOWNSTREAM ELEVATION(FEET) = 1328.22 STREET LENGTH(FEET) = 177.44 CURB HEIGHT(INCHES) = 8.0 STREET HALPWIDTH(FEET) = 30.00 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 25.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.017 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.017 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.017 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0150 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0150 **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH(FEET) = 0.28 HALFSTREET FLOOD WIDTH (FEET) = 8.56
AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.72
PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 0.75 STREET FLOW TRAVEL TIME (MIN.) = 1.09 Tc (MIN.) = 16.31 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.062 SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "5-7 DWELLINGS/ACRE" D 0.93 0.500 "5-7 DWELLINGS/ACRE" D 0.93 0.20 0.500 75
SUBAREA AVERAGE PERVIOUS LOSS RATE, FD[INCH/HR] = 0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.500
SUBAREA AREA[ACRES] = 0.93 SUBAREA RUNOFF[CFS] = 1.64
EFFECTIVE AREA[ACRES] = 2.69 AREA-AVERAGED Fm[INCH/HR] = 0.10
AREA-AVERAGED Fp[INCH/HR] = 0.21 AREA-AVERAGED Ap = 0.50

TOTAL AREA[ACRES] = 2.7 PEAK FLOW RATE(CFS) = 4.74 END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH(FEET) = 0.29 HALFSTREET FLOOD WIDTH(FEET) = 9.15 FLOW VELOCITY (FEET/SEC.) = 2.84 DEPTH*VELOCITY (FT*FT/SEC.) = 0.81 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 102.00 = 504.17 FEE ********************* FLOW PROCESS FROM NODE 102.00 TO NODE 103.00 IS CODE = 41 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <> ELEVATION DATA: UPSTREAM(FEET) = 1328.22 DOWNSTREAM(FEET) = 1260.18

FLOW LENGTH(FEET) = 960.76 MANNING'S N = 0.013

DEPTH OF FLOW IN 18.0 INCH PIPE IS 5.2 INCHES

PIPE-FLOW VELOCITY(FEET/SEC.) = 11.35

GIVEN PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1

PIPE-FLOW(CFS) = 4.74

PIPE TRAVEL TIME(MIN.) = 1.41 TC(MIN.) = 17.72 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 103.00 = 1464.93 FEET. *************************** FLOW PROCESS FROM NODE 103.00 TO NODE 103.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< -----MAINLINE Tc(MIN.) = 17.72 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.966 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "5-7 DWELLINGS/ACRE" COMMERCIAL D 0.54 0.20 (
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.462

SUBAREA AREA(ACRES) = 5.63 SUBAREA RUNOFF(CFS) = 9.49

| SUBAREA AREA (ACRES) = 5 EFFECTIVE AREA (ACRES) = AREA-AVERAGED Fp(INCH/HR) | 5.63 | SUBAREA | RUNOFF (CFS |) = 9.4 | 9 |
|---|---|----------------|--------------------|-----------------------|------------|
| AREA-AVERAGED FD (INCH/HR) | = 0.20 | AREA-AVE | ERAGED Fm (| 1NCH/HR) = 0.47 | 0.10 |
| TOTAL AREA (ACRES) = | 8.3 | PEAK E | FLOW RATE (C | FS) = | 14.00 |
| ********* | | | | | |
| FLOW PROCESS FROM NODE | | | | | |
| >>>>COMPUTE PIPE-FLOW TRA >>>>USING USER-SPECIFIED | | | | | |
| | | | | | |
| ELEVATION DATA: UPSTREAM(F FLOW LENGTH(FEET) = 775. | FEET) = | 1260.18 | DOWNSTREAM | (FEET) = | 1245.52 |
| ASSUME FULL-FLOWING PIPELI | | NING.2 N | = 0.013 | | |
| PIPE-FLOW VELOCITY (FEET/SE | | | | | |
| PIPE FLOW VELOCITY = (TOTA GIVEN PIPE DIAMETER (INCH) | = 18.00)/ | NUMBE | ER OF PIPES | AREA) | |
| PTPE-FLOW(CFS) = 14.0 | 1() | | | | |
| PIPE TRAVEL TIME (MIN.) = LONGEST FLOWPATH FROM NODE | 1.63 1.00. | Tc (MIN.) | = 19.35 E 105.0 | 0 = 224 | 0.01 FEET. |
| ******** | | | | | |
| FLOW PROCESS FROM NODE | 105.00 T | O NODE | 105.00 IS | CODE = 8 | 1 |
| >>>>ADDITION OF SUBAREA 1 | | | | | |
| | | | | | |
| MAINLINE Tc(MIN.) = 19.3 * 10 YEAR RAINFALL INTENS | SITY(INCH | /HR) = 1 | 1.869 | | |
| CUDADES TOCC DAME DAME (SMC | TT1. | | | | |
| DEVELOPMENT TYPE/ SC | CS SOIL | AREA ACRES) | Fp (TNCH/HR) | Ap (DECIMAL) | SCS |
| DEVELOPMENT TYPE/ SC LAND USE (RESIDENTIAL | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | ionab, | (211011) 1111) | (55011115) | 0.11 |
| "5-7 DWELLINGS/ACRE" COMMERCIAL | D | 3.73 | 0.20 | 0.500 | 75 |
| SUBAREA AVERAGE PERVIOUS I | LOSS RATE | , Fp(INC | 1/HR) = 0. | 20 | 73 |
| SUBAREA AVERAGE PERVIOUS A | AREA FRAC | TION An | = 0 441 | | |
| SUBAREA AREA(ACRES) = 4 EFFECTIVE AREA(ACRES) = | 12.70 | AREA-AV | /ERAGED Fm (|) = /.U INCH/HR) = | 0.09 |
| AREA-AVERAGED Fp(INCH/HR) | = 0.20 | AREA-AVE | ERAGED Ap = | 0.46 | |
| TOTAL AREA (ACRES) = | 12.7 | PEAK E | FLOW RATE (C | FS) = | 20.30 |
| ******** | | | | | |
| FLOW PROCESS FROM NODE | | | | | |
| >>>>COMPUTE PIPE-FLOW TRA | | | | | |
| >>>>USING USER-SPECIFIED | | | | | |
| ELEVATION DATA: UPSTREAM(F | FEET) = | 1245.52 | DOWNSTREAM | | |
| FLOW LENGTH (FEET) = 98. DEPTH OF FLOW IN 24.0 INC | | | | | |
| PIPE-FLOW VELOCITY (FEET/SE | $(C_{-}) = 1$ | 4 63 | | | |
| GIVEN PIPE DIAMETER (INCH) | = 24.00 | NUMBE | ER OF PIPES | = 1 | |
| PIPE-FLOW(CFS) = 20.3 PIPE TRAVEL TIME(MIN.) = | | | | | |
| LONGEST FLOWPATH FROM NODE | | | | 0 = 233 | 8.56 FEET. |
| ******* | ****** | ***** | ****** | ****** | ****** |
| FLOW PROCESS FROM NODE | | | | | |
| >>>>ADDITION OF SUBAREA 1 | O MAINLI | NE PEAK E | LOW<<< | | |
| MAINLINE Tc(MIN.) = 19.4 | 16 | | | | |
| * 10 YEAR RAINFALL INTENS | SITY (INCH | | 1.863 | | |
| SUBAREA LOSS RATE DATA (AMO DEVELOPMENT TYPE/ SO | S SOIL | AREA | Fp | Ap | scs |
| DEVELOPMENT TYPE/ SC LAND USE (RESIDENTIAL | GROUP (| ACRES) | (INCH/HR) | (DECIMAL) | CN |
| RESIDENTIAL "5-7 DWELLINGS/ACRE" | | | 0.30 | | |
| RESIDENTIAL | | | | | |
| "5-7 DWELLINGS/ACRE" RESIDENTIAL | С | 1.16 | 0.25 | 0.500 | 69 |
| | | | | | |

0.100

0.100

0.25

0.20

"5-7 DWELLINGS/ACRE" COMMERCIAL

COMMERCIAL

PUBLIC PARK C 0.70 0.25 0 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.23 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.481 SUBAREA AREA(ACRES) = 19.69 SUBAREA RUNOFF(CFS) = 31.07 EFFECTIVE AREA(ACRES) = 32.39 AREA-AVERAGED Fm(INCH/HR) = 0.10 AREA-AVERAGED AP = 0.47 TOTAL AREA (ACRES) = 32.4 PEAK FLOW RATE(CFS) = ********************** FLOW PROCESS FROM NODE 107.00 TO NODE 107.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>> MAINLINE Tc(MIN.) = 19.46 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.863 SUBAREA LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE PUBLIC PARK GROUP (ACRES) (INCH/HR) (DECIMAL) CN D 0.53 0.20 0.850 75 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20 | SUBARRA AVERAGE PERVIOUS LOSS RAIL, 2F(IN-H/HR) = 0.20 | SUBARRA AREA (ACRES) = 0.53 | SUBARRA AREA (ACRES) = 0.53 | SUBARRA AREA (ACRES) = 32.92 | AREA-AVERAGED F(INCH/HR) = 0.10 | AREA-AVERAGED F(INCH/HR) = 0.22 | AREA-AVERAGED AP = 0.48 | TOTAL AREA (ACRES) = 32.9 | FEAR FILOW RATE(FS) = 52.11 ********************** FLOW PROCESS FROM NODE 107.00 TO NODE 109.00 IS CODE = 41 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <>>> ELEVATION DATA: UPSTREAM(FEET) = 1240.60 DOWNSTREAM(FEET) = 1239.01 FLOW LENGTH(FEET) = 81.43 MANNING'S N = 0.013 ASSUME FULL-FLOWING PIPELINE PIPE-FLOW VELOCITY (FEET/SEC.) = 16.59 PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
GIVEN PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 52.11
PIPE TRAVEL TIME(MIN.) = 0.08 Tc(MIN.) = 19.55
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 109.00 = 2419.99 FEET. ************************* FLOW PROCESS FROM NODE 109.00 TO NODE 109.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< MAINLINE Tc (MIN.) = 19.55 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.859 SUBAREA LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN COMMERCIAL 0.52 0.25 0.100 69 C D COMMERCIAL 75 CONDOMINIUMS CONDOMINITIMS D 10 74 0.20 0 350 0.07 0.20 ********************** FLOW PROCESS FROM NODE 109.00 TO NODE 111.00 IS CODE = 41 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <>>> ELEVATION DATA: UPSTREAM(FEET) = 1239.07 DOWNSTREAM(FEET) = 1210.33 FLOW LENGTH(FEET) = 407.01 MANNING'S N = 0.013 DEFH OF FLOW IN 33.0 INCH PIEE IS 17.5 INCHES

PIPE-FLOW VELOCITY (FEET/SEC.) = 22.99

GIVEN PIPE DIAMETER (INCH) = 33.00 NUMBER OF PIPES = 1

PIPE-FLOW(CFS) = 73.43 PIPE TRAVEL TIME(MIN.) = 0.30 Tc(MIN.) = 19.84 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 111.00 = 2827.00 FEET.

FLOW PROCESS FROM NODE 111.00 TO NODE 111.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<

______ MAINLINE Tc (MIN.) = * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.843 SUBAREA LOSS RATE DATA(AMC II): SCS SOIL AREA DEVELOPMENT TYPE/ GROUP (ACRES) (INCH/HR) (DECIMAL) CN
D 0.69 0.20 0.100 75
D 0.09 0.20 0.350 75 LAND USE CONDOMINIUMS PIIRT.TC PARK 0.85 0.20 0.850 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20 SUBARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.505
SUBARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.505
SUBARRA AREA (ACRES) = 1.63
SUBARRA RUDOFF (CFS) = 2.56
EFFECTIUVE AREA (ACRES) = 47.85
AREA-AVERAGED TM (INCH/HR) = 0.09
AREA-AVERAGED Ap = 0.44 TOTAL AREA (ACRES) = 47.8 PEAK FLOW RATE (CFS) =

FLOW PROCESS FROM NODE 111.00 TO NODE 113.00 IS CODE = 41

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<

>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <<<<

ELEVATION DATA: UPSTREAM(FEET) = 1210.33 DOWNSTREAM(FEET) = 1210.00 FLOW LENGTH (FEET) = 18.70 MANNING'S N = 0.013
DEPTH OF FLOW IN 36.0 INCH PIPE IS 26.6 INCHES
PIPE-FLOW VELOCITY (FEET/SEC.) = 13.45 GIVEN PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1 PIPE-FLOW (CFS) = 75.32 PIPE TRAVEL TIME (MIN.) = 0.02 Tc(MIN.) = 19.86 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 113.00 = 2845.70 FEET.

FLOW PROCESS FROM NODE 113.00 TO NODE 113.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<

MAINLINE Tc (MIN.) = 19.86

10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.842 SUBAREA LOSS RATE DATA(AMC II):

TOTAL AREA (ACRES) =

SCS SOIL AREA DEVELOPMENT TYPE/ LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
D 13.30 0.20 0.350 75 CONDOMINIUMS 3.90 0.20 0.850 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20 SUBARRA AVERAGE FERVIOUS LOSS RATE, FP(INCH/HR) = 0.20 SUBARRA AVERAGE FROTION, Ap = 0.463 SUBARRA AREA (ACRES) = 17.20 SUBARRA RUDOFF(CFS) = 27.07 EFFECTIVE AREA (ACRES) = 65.05 AREA-AVERAGED FM(INCH/HR) = 0.09 AREA-AVERAGED Ap = 0.44

******************* FLOW PROCESS FROM NODE 113.00 TO NODE 119.00 IS CODE = 41

65.1 PEAK FLOW RATE(CFS) =

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1210.00 DOWNSTREAM(FEET) = 1159.95 FLOW LENGTH(FEET) = 1078.02 MANNING'S N = 0.013 DEPTH OF FLOW IN 36.0 INCH FIEE IS 23.3 INCHES PIPE-FLOW VELOCITY(FEET/SEC.) = 21.17
GIVEN PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 102.34
PIPE TRAVEL TIME(MIN.) = 0.85 Tc(MIN.) = 20.71
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 119.00 = 3923.72 FEET.

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************************* FLOW PROCESS FROM NODE 119.00 TO NODE 119.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>> MAINLINE Tc(MIN.) = 20.71 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.798 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "11+ DWELLINGS/ACRE" 1.51 0.25 0.200 69 RESIDENTIAL "11+ DWELLINGS/ACRE" 5.27 COMMERCIAL D 0.27 0.20 0 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21 0.100 SUBAREA AVERAGE EPRVIOUS AREA FRACTION, Ap = 0.196 s
SUBAREA AREA (ACRES) = 7.05 SUBAREA RUNOFF(CFS) = 11.15 EFFECTIVE AREA (ACRES) = 72.10 AREA-AVERAGED FM(INCH/HR) = 0.09 AREA-AVERAGED Fp(INCH/HR) = 0.21 AREA-AVERAGED Ap = 0.42 TOTAL AREA(ACRES) = 72.1 PEAK FLOW RATE(CFS) = PEAK FLOW RATE(CFS) = ******************** FLOW PROCESS FROM NODE 119.00 TO NODE 119.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>> MAINLINE TC (MIN.) = 20.71 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.798 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "11+ DWELLINGS/ACRE" 1.27 0.25 0.200 69 RESIDENTIAL 0.200 "11+ DWELLINGS/ACRE" 3.23 0.20 COMMERCIAL. D 0 27 0.20 0 100 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21 SUBARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.194 S
SUBARRA AREA (ACRES) = 4.77 SUBAREA RUNOFF (CFS) = 7.54
EFFECTIVE AREA (ACRES) = 76.87 AREA-AVERAGED FM(INCH/HR) = 0.09
AREA-AVERAGED FP(INCH/HR) = 0.21 AREA-AVERAGED Ap = 0.41
TOTAL AREA (ACRES) = 76.9 PEAK FLOW RATE (CFS) = 118.47 ***************** FLOW PROCESS FROM NODE 119.00 TO NODE 119.00 IS CODE = 1 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<>>>> TOTAL NUMBER OF STREAMS = 2 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE: TIME OF CONCENTRATION (MIN.) = 20.71
RAINFALL INTENSITY (INCH/HR) = 1.80 AREA-AVERAGED Fm(INCH/HR) = 0.09 AREA-AVERAGED Fp(INCH/HR) = 0.21 PEAK FLOW RATE (CFS) AT CONFLUENCE = 118.47 ************************* FLOW PROCESS FROM NODE 200.00 TO NODE 201.00 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< INITIAL SUBAREA FLOW-LENGTH (FEET) = 331.01 ELEVATION DATA: UPSTREAM(FEET) = 1332.00 DOWNSTREAM(FEET) = 1330.74 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 SUBARRA ANALYSIS USED MINIMUM Tc(MIN.) = 11.172
* 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.561
SUBARRA TC AND LOSS RATE DATA (AMC II):
DELPTIONENT TYPE?

SCS SOIL AREA

Fp Page 6

DEVELOPMENT TYPE/

Ap SCS Tc

3E10R

| LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) CONDOMINIUMS D 1.42 0.20 0.350 75 11.17 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.350 SUBAREA RUNOFF(CFS) = 3.18 TOTAL AREA (ACRES) = 1.42 PEAK FLOW RATE (CFS) = 3.18 | |
|---|--|
| FLOW PROCESS FROM NODE 201.00 TO NODE 203.00 IS CODE = 62 | |
| >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< | |
| UPSTREAM ELEVATION(FEET) = 1330.74 DOWNSTREAM ELEVATION(FEET) = 1308.01 STREET LENGTH(FEET) = 789.61 CURB HEIGHT(INCHES) = 8.0 STREET HALFWIDTH(FEET) = 50.00 | |
| DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 45.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.017 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.017 | |
| SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1 STREET PARKWAY CROSSFALL(DECIMAL) = 0.017 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0150 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0150 | |
| **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9.92 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPHIF(FET) = 0.42 HALFSTREET FLOOD WIDTH (FEET) = 15.33 AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.52 PRODUCT OF DEPHAVELOCITY (FT*FT/SEC.) = 1.92 STREET FLOW TRAVEL TIME (MIN.) = 2.91 TC (MIN.) = 14.08 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.243 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL | |
| "8-10 DWELLINGS/ACRE" D 1.91 0.20 0.400 75 | |
| END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH(FEET) = 0.48 HALFSTREET FLOOD WIDTH(FEET) = 18.84 FLOW VELOCITY(FET/SEC.) = 5.05 DEPTH*VELOCITY(FT*FT/SEC.) = 2.45 LONGEST FLOWPATH FROM NODE 200.00 TO NODE 203.00 = 1120.62 FEET. | |
| FLOW PROCESS FROM NODE 203.00 TO NODE 205.00 IS CODE = 62 | |
| >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< | |
| UPSTREAM ELEVATION(FEET) = 1308.01 DOWNSTREAM ELEVATION(FEET) = 1245.00 STREET LENGTH(FEET) = 901.07 CURB HEIGHT(INCHES) = 8.0 STREET HALFWIDTH(FEET) = 30.00 | |
| DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 20.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.018 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.018 | |
| SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0150 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 | |
| **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 27.50 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH(FEET) = 0.50 | |
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HALFSTREET FLOOD WIDTH(FEET) = 18.87 AVERAGE FLOW VELOCITY(FEET/SEC.) = 8.15 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = STREET FLOW TRAVEL TIME (MIN.) = 1.84 Tc (MIN.) = 15.92 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.090 SUBAREA LOSS RATE DATA(AMC II): SCS SOIL AREA FP AP SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "8-10 DWELLINGS/ACRE" D 0.07 0.20 0 400 COMMERCIAL 0.73 0.20 0.100 CONDOMINIUMS D D 11.58 0.20 0.350 75 75 PUBLIC PARK 0.20 0.850 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.336 SUBAREA AREA (ACRES) = 12.39 SUBAREA RUNOFF(CFS) = 22.56 EFFECTIVE AREA (ACRES) = 20.69 AREA-AVERAGED Fm (INCH/HR) = SUBAREA RUNOFF(CFS) = 22.56

AREA-AVERAGED FM (INCH/HR) = 0.07

AREA-AVERAGED FM (INCH/HR) = 0.07

TOTAL AREA (ACRES) = 20.7

AREA-AVERAGED FM (INCH/HR) = 0.07

AREA-AVERAGED FM (INCH/HR) = 0.70

AREA-AVERAGED FM (INCH/HR) = 0 END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH(FEET) = 0.54 HALFSTREET FLOOD WIDTH(FEET) = 21.37 FLOW VELOCITY (FEET/SEC.) = 8.81 DEPTH*VELOCITY (FT*FT/SEC.) = 4.80 LONGEST FLOWPATH FROM NODE 200.00 TO NODE 205.00 = 2021.69 FEET. ********************** FLOW PROCESS FROM NODE 205.00 TO NODE 206.00 IS CODE = 41 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <> ELEVATION DATA: UPSTREAM(FEET) = 1245.00 DOWNSTREAM(FEET) = 1229.65 FLOW LENGTH (FEET) = 135.30 MANNING'S N = 0.013
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY (FEET/SEC.) = 21.30 PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
GIVEN PIPE DIAMETER (INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW (CFS) = 37.64
PIPE TRAVEL TIME (MIN.) = 0.11 TC (MIN.) = 16.03
PIPE TRAVEL TIME (MIN.) = 0.11 TC (MIN.) = 206.00 = 2156.99 FEET. ********************** FLOW PROCESS FROM NODE 206.00 TO NODE 210.00 IS CODE = 62 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< >>>> (STREET TABLE SECTION # 1 USED) <<<< UPSTREAM ELEVATION (FEET) = 1229.65 DOWNSTREAM ELEVATION (FEET) = 1166.68
STREET LENGTH (FEET) = 1205.30 CURB HEIGHT (INCHES) = 8.0
STREET HALFWIDTH (FEET) = 30.00 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.018
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.018 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0150 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH(FEET) = 0.50 HALFSTREET FLOOD WIDTH(FEET) = 19.02 HALFSTREET FLOOD WIDLIN(FEEL) = 19.02

AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.08

PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 3.56

STREET FLOW TRAVEL TIME (MIN.) = 2.84 TC (MIN.) = 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.897 SUBAREA LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "11+ DWELLINGS/ACRE" С 3.38 0.25 0.200

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RESIDENTIAL

"11+ DWELLINGS/ACRE" 9.23 0.20 0.200 COMMERCIAL 0.42 0.20 0.100 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21 ******************* FLOW PROCESS FROM NODE 210.00 TO NODE 119.00 IS CODE = 41 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SURAREACCCC >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <> ELEVATION DATA: UPSTREAM(FEET) = 1166.68 DOWNSTREAM(FEET) = 1159.95 FLOW LENGTH (FEET) = 307.60 MANNING'S N = 0.013 ASSUME FULL-FLOWING PIPELINE PIPE-FLOW VELOCITY (FEET/SEC.) = 17.76 PIPE FLOW VELOCITY = (TOTAL FLOW) / (PIPE CROSS SECTION AREA) GIVEN PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1
PIPE-PLOW(CFS) = 55.78
PIPE TRAVEL TIME (MIN.) = 0.29 Tc (MIN.) = 19.15
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 119.00 = 3669.89 FEET. ************************ FLOW PROCESS FROM NODE 119.00 TO NODE 119.00 IS CODE = 1 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE< TOTAL NUMBER OF STREAMS = 2 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE: TIME OF CONCENTRATION(MIN.) = 19.15
RAINFALL INTENSITY(INCH/HR) = 1.88 AREA-AVERAGED Fm(INCH/HR) = 0.06 AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED rp(1000, ...,
AREA-AVERAGED Ap = 0.29
EFFECTIVE STREAM AREA(ACRES) = 33.72 PEAK FLOW RATE (CFS) AT CONFLUENCE = ** CONFLUENCE DATA ** STREAM Intensity Fp(Fm) (CFS) (MIN.) (INCH/HR) (INCH/HR) 118.47 20.71 1.798 0.21(0.09) 0.41 NUMBER (ACRES) NODE 100.00 76.9 55.78 19.15 1.880 0.20(0.06) 0.29 200.00 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO CONFLUENCE FORMULA USED FOR 2 STREAMS. ** PEAK FLOW RATE TABLE ** STREAM Q Tc Intensity Fp(Fm) (CFS) (MIN.) (INCH/HR) (INCH/HR) HEADWATER Ap (ACRES) NUMBER NODE 170.61 19.15 1.880 0.21(0.08) 0.37 171.73 20.71 1.798 0.21(0.08) 0.37 104.8 110.6 100.00 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS: PEAK FLOW RATE (CFS) = 171.73 Tc(MIN.) = 20.71

EFFECTIVE AREA (ACRES) = 110.59 AREA-AVERAGED Fm(INCH/HR) = 0.08 AREA-AVERAGED Fp(INCH/HR) = 0.21 AREA-AVERAGED Ap = 0.37

110.6

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<

LONGEST FLOWPATH FROM NODE 100.00 TO NODE 119.00 = 3923.72 FEET.

TOTAL AREA (ACRES) =

>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <

ELEVATION DATA: UPSTREAM(FEET) = 1159.95 DOWNSTREAM(FEET) = 1150.00 FLOW LENGTH(FEET) = 321.11 MANNING'S N = 0.013 DEPTH OF FLOW IN 54.0 INCH PIPE IS 27.7 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 20.88 GIVEN PIPE DIAMETER(INCH) = 54.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 171.73
PIPE TRAVEL TIME(MIN.) = 0.26 Tc(MIN.) = 20.97
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 121.00 = 4244.83 FEET. FLOW PROCESS FROM NODE 121.00 TO NODE 121.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< MAINLINE Tc(MIN.) = 20.97 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.785 SUBAREA LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "11+ DWELLINGS/ACRE" 6.04 0.25 RESIDENTIAL "11+ DWELLINGS/ACRE" 8.06 0.20 0.200 75 COMMERCIAL 0.97 0.25 0.100 COMMERCIAL 1.54 0.20 0.100 75 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.22 ************************ FLOW PROCESS FROM NODE 121.00 TO NODE 123.00 IS CODE = 41 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBARRACCCC >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1150.00 DOWNSTREAM(FEET) = 1140.00 FLOW LENGTH(FEET) = 798.79 MANNING'S N = 0.013 DEPTH OF FLOW IN 60.0 INCH PIPE IS 37.3 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 15.28
GIVEN PIPE DIAMETER (INCH) = 60.00 NUMBER OF PIPES = 1 196.08 PIPE-FLOW(CFS) = PIPE TRAVEL TIME (MIN.) = 0.87 Tc (MIN.) = 21.84 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 123.00 = 5043.62 FEET. ********************** FLOW PROCESS FROM NODE 123.00 TO NODE 123.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< MAINLINE Tc(MIN.) = 21.84 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.744 SUBAREA LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL '11+ DWELLINGS/ACRE" 0.25 RESIDENTIAL "11+ DWELLINGS/ACRE" 17.92 0.20 0.200 APARTMENTS 4.46 0.25 0.200 APARTMENTS D 0.69 0.20 0.200 75 COMMERCIAL 0.78 0.25 0.100 COMMERCIAL SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.22 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.192 SUBAREA AREA(ACRES) = 32.52 SUBAREA RUNOFF(CFS) = 49.82
EFFECTIVE AREA(ACRES) = 159.72 AREA-AVERAGED Fm(INCH/HR) = 0.07 AREA-AVERAGED Fp(INCH/HR) = 0.21 AREA-AVERAGED Ap = 0.31 TOTAL AREA(ACRES) = 159.7 PEAK FLOW RATE(CFS) =

** PEAK FLOW RATE TABLE **

3E10R

| | | | | 3 | SEIUK | | |
|-------------|--|--------------|----------|----------|-------------------------------|------------|-------------|
| STREAM | Q Tc | Intensity | Fp(F | m) | Ap | Ae | HEADWATER |
| NUMBER | (CFS) (MIN. |) (INCH/HR) | (INCH/ | HR) | | (ACRES) | NODE |
| 1 | Q Tc (CFS) (MIN. 243.02 20.2 241.18 21.8 LOW DATA ARE: | 8 1.820 | 0.21(| 0.07) | 0.31 | 153.9 | 200.00 |
| 2 | 241.18 21.8 | 4 1.744 | 0.21(| 0.07) | 0.31 | 159.7 | 100.00 |
| NEW PEAK F | LOW DATA ARE: RATE(CFS) = | | | | | | |
| PEAK FLOW | RATE (CFS) = | 243.02 To | c(MIN.) | = 2 | 20.28 | | |
| AREA-AVERA | GED Fm(INCH/HR |) = 0.07 i | AREA-AV | ERAGED |) Fp(IN | ICH/HR) = | 0.21 |
| AREA-AVERA | GED Ap = 0.31 | EFFECTIVE | AREA (A | CRES) | = | 153.93 | |
| | | | | | | | |
| | ****** | | | | | | |
| | SS FROM NODE | | | | | | |
| | | | | | | | |
| >>>>COMPO | TE PIPE-FLOW TO USER-SPECIFIED | RAVEL TIME . | INKU SU | DAKEAS | . < < < < | | |
| | | | | | | | |
| | DATA: UPSTREAM | | | | | | |
| | 'H(FEET) = 57 | | | | | , | 1122.00 |
| | LOW IN 51.0 II | | | | | | |
| PIPE-FLOW | VELOCITY (FEET/ | SEC.) = 22 | .38 | | | | |
| | DIAMETER (INCH | | | BER OF | PIPES | = 1 | |
| PTPE-FLOW(| CFS) = 243 | . 02 | | | | | |
| PIPE TRAVE | L TIME (MIN.) = | 0.43 | Tc (MIN. |) = | 20.71 | | |
| LONGEST FL | OWPATH FROM NO | DE 100.0 | O TO NO | DE | 129.00 | 56 | 23.40 FEET. |
| | | | | | | | |
| | ****** | | | | | | |
| FLOW PROCE | SS FROM NODE | 129.00 TO | NODE | 129. | 00 IS | CODE = | 31 |
| | | | | | | | |
| | ION OF SUBAREA | | | | | | |
| | | | | | | | |
| | c(MIN.) = 20 RAINFALL INTE | | TD) | 1 700 | | | |
| CIIBADEA IO | CC DATE DATA (A) | MC TT). | nk) - | 1.750 | | | |
| DEVELOPME | NT TVDE/ | ece enti | ADEA | Fn | | λn | ece |
| T.AND | HSE. | GROUP (A | TRES) | (TNCH/ | HR) (| DECIMAL) | CN |
| RESIDENTIA | RAINFALL INTEL SS RATE DATA (AI ENT TYPE/ USE L LINGS/ACRE" ERAGE PERVIOUS | 011001 (11 | J.(110) | (111011) | , | ,DECTIFIE, | |
| "11+ DWELL | INGS/ACRE" | С | 2.85 | 0. | 25 | 0.200 | 69 |
| COMMERCIAL | | č | 0.56 | 0. | 25 | 0.100 | 69 |
| SUBAREA AV | ERAGE PERVIOUS | LOSS RATE, | Fp(INC | H/HR) | = 0.2 | :5 | |
| | | | | | | | |
| SUBAREA AR | EA(ACRES) = | 3.41 | SUBAREA | RUNOF | F (CFS) | = 5. | 38 |
| EFFECTIVE | AREA (ACRES) = | 157.34 | AREA-A | VERAGE | ED Fm(I | NCH/HR) | = 0.07 |
| AREA-AVERA | EA(ACRES) = AREA(ACRES) = GED Fp(INCH/HR (ACRES) = |) = 0.21 i | AREA-AV | ERAGED |) Ap = | 0.31 | |
| TOTAL AREA | (ACRES) = | 163.1 | PEAK | FLOW F | RATE (CF | 'S) = | 245.37 |
| | ****** | | | | e also also also also also al | | |
| | | | | | | | |
| | SS FROM NODE | | | | | | |
| | ION OF SUBAREA | | | | | | |
| | TON OF SUBAREA | | | | | | |
| | c(MIN.) = 20 | | | | | | |
| | | | HR) = | 1.798 | | | |
| SUBAREA LO | RAINFALL INTE SS RATE DATA(AI INT TYPE/ USE L | MC II): | , | | | | |
| DEVELOPME | NT TYPE/ | SCS SOIL I | AREA | Fp | | Ap | SCS |
| LAND | USE | GROUP (A | CRES) | (INCH/ | 'HR) (| DECIMAL) | CN |
| RESIDENTIA | L | | | | | | |
| "11+ DWELL | L INGS/ACRE" | C | 2.54 | 0. | 25 | 0.200 | 69 |
| COMMERCIAL | | C | 0.97 | 0. | .25 | 0.100 | 69 |
| SUBAREA AV | ERAGE PERVIOUS | LOSS RATE, | Fp(INC | H/HR) | = 0.2 | :5 | |
| SUBAREA AV | ERAGE PERVIOUS | AREA FRACT | ION, Ap |) = 0. | 172 | _ | |
| SUBAKEA AK | EA (ACRES) = AREA (ACRES) = | 3.51 | SUBAREA | RUNOF | T (CFS) | = 5. | 0.06 |
| EFFECTIVE | AREA (ACRES) = | 160.85 | AKEA-A | VERAGE | SD Fm(I | NCH/HR) | = 0.06 |
| TOTAL ADEA | GED Fp(INCH/HR (ACRES) = | 166 6 | AKEA-AV | ERAGEL | AP = | 0.31 | 250.91 |
| IUIAL AREA | (ACRES) - | 100.0 | FEAR | I LOW F | MIE (CE | 3) - | 230.91 |
| ******* | ****** | ******* | ***** | ***** | ***** | ****** | ***** |
| | SS FROM NODE | | | | | | |
| | | | | | | | |
| >>>>DESIG | NATE INDEPENDE | NT STREAM FO | OR CONF | LUENCE | .<<<< | | |
| | | | | | | | |
| | ER OF STREAMS | | | | | | |
| CONFLUENCE | VALUES USED F | OR INDEPEND | ENT STR | REAM 1 | ARE: | | |
| TIME OF CO | NCENTRATION (MI | N.) = 20. | 71 | | | | |
| RAINFALL I | NTENSITY (INCH/ | HR) = 1.8 | 0 | | | | |
| AREA-AVERA | GED Fm(INCH/HR |) = 0.06 | | | | | |
| | | | | Do | oro 11 | | |

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AREA-AVERAGED Fp(INCH/HR) = 0.21 AREA-AVERAGED pp = 0.31

EFFECTIVE STREAM AREA (ACRES) = 160.85

TOTAL STREAM AREA (ACRES) = 166.64

PEAK FLOW RATE (CFS) AT CONFLUENCE = 25 ************************* FLOW PROCESS FROM NODE 300.00 TO NODE 301.00 IS CODE = 21 >>>>RATTONAL METHOD INITIAL SUBARRA ANALYSIS (*** >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< INITIAL SUBAREA FLOW-LENGTH (FEET) = 320.55 ELEVATION DATA: UPSTREAM(FEET) = 1163.74 DOWNSTREAM(FEET) = 1148.43 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 5.61 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.798 SUBAREA TC AND LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS TC GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) LAND USE RESIDENTIAL 0.29 "11+ DWELLINGS/ACRE" COMMERCIAL C 1.36 0.25 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25 0.100 69 5.62 SUBARBA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.118 SUBARBA RUNOFF(CFS) = 5.60 TOTAL AREA(ACRES) = 1.65 PEAK FLOW RATE(CFS) = ******************** FLOW PROCESS FROM NODE 301.00 TO NODE 302.00 IS CODE = 62 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA >>>> (STREET TABLE SECTION # 3 USED) <<<< UPSTREAM ELEVATION(FEET) = 1148.43 DOWNSTREAM ELEVATION(FEET) = 1141.94 STREET LENGTH(FEET) = 235.77 CURB HEIGHT(INCHES) = 8.0 STREET HALPWIDTH(FEET) = 50.00 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 45.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.017 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.017 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.017 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0150 **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH(FEET) = 0.39 STREET FLOW DEPTH(FEET) = 0.39

HALFSTREET FLOOW DUTDH(FEET) = 13.04

AVERAGE FLOW VELOCITY(FEET/SEC.) = 4.05

PRODUCT OF DEPTHAVELOCITY(FT*FT/SEC.) = 1.56

STREET FLOW TRAVEL TIME(MIN.) = 0.97

TC(MIN.) =

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.467 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL 0.47 "11+ DWELLINGS/ACRE" C TOTAL AREA (ACRES) = PEAK FLOW RATE(CFS) = 6.6 END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH(FEET) = 0.43 FALFSTREET FLOOM WIDTH(FEET) = 15.68
FLOW VELOCITY(FEET/SEC.) = 4.49 DEPTH-VELOCITY(FTF/SEC.) = 556

| 3E10R |
|---|
| FLOW PROCESS FROM NODE 302.00 TO NODE 303.00 IS CODE = 41 |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<>>> >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <>>>> |
| ELEVATION DATA: UPSTREAM(FEET) = 1141.94 DOWNSTREAM(FEET) = 1122.13 FLOW LENGTH(FEET) = 454.31 MANNING'S N = 0.013 DEPTH OF FLOW IN 36.0 INCH PIPE IS 10.5 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 11.99 GIVEN PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 20.52 PIPE TRAVEL TIME (MIN.) = 0.89 To (MIN.) = 7.48 LONGEST FLOWPATH FROM NODE 300.00 TO NODE 303.00 = 1199.63 FEET. |
| ************************************** |
| |
| >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< |
| MAINLINE TC(MIN.) = 7.48 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.223 SUBARRA LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA FD AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL |
| Total area (acres) = 12.2 Deak Flow Rate (cfs) = 35.01 |
| FLOW PROCESS FROM NODE 303.00 TO NODE 129.00 IS CODE = 41 |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<>>>> >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) |
| ELEVATION DATA: UPSTREAM(FEET) = 1122.13 DOWNSTREAM(FEET) = 1122.00 FLOW LENGTH(FEET) = 81.38 MANING'S N = 0.013 DEPTH OF FLOW IN 48.0 INCH PIPE IS 28.0 INCHES PIPE-FLOW VELOCITY(FEET/SEC.) = 4.60 GIVEN PIPE DIAMETER(INCH) = 48.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 35.01 PIPE TRAVEL TIME(MIN.) = 0.29 TC(MIN.) = 7.77 LONGEST FLOWPATH FROM NODE 300.00 TO NODE 129.00 = 1281.01 FEET. |
| FLOW PROCESS FROM NODE 129.00 TO NODE 129.00 IS CODE = 1 |
| >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE< |
| TOTAL NUMBER OF STREAMS = 2 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE: TIME OF CONCENTRATION (MIN.) = 7.77 RAINFALL INTENSITY (INCH/HR) = 3.15 AREA-AVERAGED FM (INCH/HR) = 0.03 AREA-AVERAGED FD (INCH/HR) = 0.25 AREA-AVERAGED FD = 0.13 EFFECTIVE STREAM AREA (ACRES) = 12.19 TOTAL STREAM AREA (ACRES) = 12.19 PEAK FLOW RATE (CFS) AT CONFLUENCE = 35.01 |
| ** CONFLUENCE DATA ** STREAM Q TC Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 250.91 20.71 1.798 0.21(0.06) 0.31 160.9 200.00 1 248.85 22.27 1.725 0.21(0.07) 0.31 166.6 100.00 2 35.01 7.77 3.152 0.25(0.03) 0.13 12.2 300.00 |

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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO

CONFLUENCE FORMULA USED FOR 2 STREAMS.

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** PEAK FLOW RATE TABLE **
                          Tc Intensity Fp(Fm)
                                                                              HEADWATER
   STREAM
                  0
                                                           Ap
                (CFS) (MIN.) (INCH/HR) (INCH/HR)
   NUMBER
                                                                   (ACRES)
                                                                                NODE
                                   3.152 0.21(0.06) 0.28
1.798 0.21(0.06) 0.29
               202.77
270.73
                        7.77
20.71
                                                                       72.6
                                                                                  300.00
                                                                                   200.00
               267.84 22.27
                                    1.725 0.21(0.06) 0.30
                                                                                   100.00
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) = 270.73 Tc(MIN.) = 20.71

EFFECTIVE AREA(ACRES) = 173.04 AREA-AVERAGED Fm(INCH/HR) = 0.06
 AREA-AVERGED FROM NOBE 178.8

AREA-AVERGED AP 0.29

TOTAL AREA (ACRES) = 178.8

LONGEST FLOWFATH FROM NOBE 100.00 TO NOBE 129.00 = 5623.40 FEET.
*********************
 FLOW PROCESS FROM NODE 129.00 TO NODE 131.00 IS CODE = 41
  >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
  >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <>
.
 ELEVATION DATA: UPSTREAM(FEET) = 1105.04 DOWNSTREAM(FEET) = 1103.76 FLOW LENGTH(FEET) = 35.44 MANNING'S N = 0.013 DEPTH OF FLOW IN 66.0 INCH PIPE IS 30.9 INCHES PIPE-FLOW VELOCITY(FEET/SEC.) = 24.77 GIVEN PIPE DIAMETER(INCH) = 66.00 NUMBER OF PIPES = 1 DIDEP_DIAMETER(INCH) = 270.73
 PIPE-FLOW(CES) = 270.73
PIPE TRAVEL TIME(MIN.) = 0.02 Tc(MIN.) = 20.74
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 131.00 = 5658.84 FEET.
***********************
 FLOW PROCESS FROM NODE 131.00 TO NODE 131.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
              -----
 MAINLINE Tc(MIN.) = 20.74
  * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.797
 SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA
                              GROUP (ACRES) (INCH/HR) (DECIMAL) CN
C 1.86 0.25 0.100 69
D 0.14 0.20 0.100 75
      LAND USE
  COMMERCIAL
  COMMERCIAL
 COMMERCIAL D 0.14 0.20 0.100 75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA AREA (ACRES) = 2.00 SUBAREA RUNOFF (CFS) = 3.19
EFFECTIVE AREA (ACRES) = 175.04 AREA-AVERAGED Fm(INCH/HR) = 0.06
AREA-AVERAGED Fp(INCH/HR) = 0.21 AREA-AVERAGED Ap = 0.29
  TOTAL AREA(ACRES) = 180.8 PEAK FLOW RATE(CFS) =
************************
FLOW PROCESS FROM NODE 131.00 TO NODE 133.00 IS CODE = 41
  >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <<<<<
 ELEVATION DATA: UPSTREAM(FEET) = 1103.76 DOWNSTREAM(FEET) = 1101.65 FLOW LENGTH(FEET) = 503.15 MANNING'S N = 0.013 ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY (FEET/SEC.) = 11.50
  PIPE FLOW VELOCITY = (TOTAL FLOW) / (PIPE CROSS SECTION AREA)
  GIVEN PIPE DIAMETER (INCH) = 66.00 NUMBER OF PIPES =
 PIPE-FLOW(CFS) = 273.30
PIPE TRAVEL TIME (MIN.) = 0.73 Tc(MIN.) = 21.47
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 133.00 = 6161.99 FEET.
**********************
 FLOW PROCESS FROM NODE 133.00 TO NODE 133.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 MAINLINE Tc(MIN.) = 21.47
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.762
```

SUBAREA LOSS RATE DATA(AMC II):

| DEVELOPMENT TYPE / | AMC II): |
|--|---|
| LAND USE | AMC II): SCS SOIL AREA FP AP SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN C 1.00 0.25 0.100 69 D 0.87 0.20 0.100 75 |
| COMMERCIAL | C 1.00 0.25 0.100 69 |
| COMMERCIAL | D 0.87 0.20 0.100 75 |
| SUBAREA AVERAGE PERVIOU | S LOSS RATE, Fp(INCH/HR) = 0.23 |
| SUBAREA AVERAGE PERVIOU | S AREA FRACTION, Ap = 0.100 |
| EFFECTIVE AREA (ACRES) = | 1.87 SUBAREA RUNOFF(CFS) = 2.93 176.91 AREA-AVERAGED Fm(INCH/HR) = 0.06 |
| AREA-AVERAGED Fp(INCH/H | R) = 0.21 AREA-AVERAGED Ap = 0.29 |
| TOTAL AREA (ACRES) = | R) = 0.21 AREA-AVERAGED Ap = 0.29 182.7 PEAK FLOW RATE(CFS) = 273.30 |
| NOTE: PEAK FLOW RATE DE | FAULTED TO UPSTREAM VALUE |
| FLOW PROCESS FROM NODE | 133.00 TO NODE 135.00 IS CODE = 41 |
| | TRAVEL TIME THRU SUBAREA |
| >>>>USING USER-SPECIFI | ED PIPESIZE (EXISTING ELEMENT) < < < < |
| ELEVATION DATA: UPSTREA | M(FEET) = 1101.65 DOWNSTREAM(FEET) = 1101.33 |
| FLOW LENGTH (FEET) = | 60.37 MANNING'S N = 0.013 |
| ASSUME FULL-FLOWING PIP PIPE-FLOW VELOCITY (FEET | |
| | OTAL FLOW) / (PIPE CROSS SECTION AREA) |
| GIVEN PIPE DIAMETER (INC | H) = 66.00 NUMBER OF PIPES = 1 |
| PTPE-FLOW(CFS) = 27 | 3 30 |
| PIPE TRAVEL TIME (MIN.) | = 0.09 Tc(MIN.) = 21.55 |
| LONGEST FLOWPATH FROM N | ODE 100.00 TO NODE 135.00 = 6222.36 FEET. |
| FLOW PROCESS FROM NODE | 135.00 TO NODE 135.00 IS CODE = 81 |
| >>>>ADDITION OF SUBARE | A TO MAINLINE PEAK FLOW< |
| MAINLINE Tc (MIN.) = 2 | |
| * 10 YEAR RAINFALL INT | ENSITY(INCH/HR) = 1.757 |
| SUBAREA LOSS RATE DATA(| AMC II): |
| DEVELOPMENT TYPE/ | SCS SOIL AREA FP AP SCS |
| COMMERCIAL | ARC 11): SCS SOIL AREA FP AD SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN C 0.36 0.25 0.100 69 D 0.44 0.20 0.100 75 |
| COMMERCIAL | D 0.44 0.20 0.100 75 |
| SUBAREA AVERAGE PERVIOU | S LOSS RATE, FP(INCH/HR) = 0.22 |
| SUBAREA AVERAGE PERVIOU | S AREA FRACTION. Ap = 0.100 |
| SUBAREA AREA(ACRES) = | 0.80 SUBAREA RUNOFF (CFS) = 1.25 |
| ADEA AVERACED Ex (INCH/H | 1//./1 AREA-AVERAGED FM(INCH/HR) = 0.06 |
| TOTAL AREA(ACRES) = | 0.80 SUBAREA RUNOFF(CFS) = 1.25 1777.71 AREA-AVERAGED Fm(INCH/HR) = 0.06 R) = 0.21 AREA-AVERAGED Ap = 0.29 183.5 PEAK FLOW RATE(CFS) = 273.30 |
| NOTE: PEAK FLOW RATE DE | FAULTED TO UPSTREAM VALUE |
| | |
| | ************************************** |
| | |
| >>>>COMPUTE PIPE-FLOW | TRAVEL TIME THRU SUBAREA< |
| | |
| >>>>USING USER-SPECIFI | ED PIPESIZE (EXISTING ELEMENT) <>> |
| >>>>USING USER-SPECIFI | ED PIPESIZE (EXISTING ELEMENT) <<<< |
| >>>>USING USER-SPECIFI ELEVATION DATA: UPSTREA | ED PIPESIZE (EXISTING ELEMENT) <<<<< |
| >>>>USING USER-SPECIFI ELEVATION DATA: UPSTREA FLOW LENGTH (FEET) = 4 ASSUME FULL-FLOWING PIP | ED PIPESIZE (EXISTING ELEMENT) <<<<> |
| >>>>USING USER-SPECIFI ELEVATION DATA: UPSTREA FLOW LENGTH (FEET) = 4 ASSUME FULL-FLOWING PIP PIPE-FLOW VELOCITY (FEET | ED PIPESIZE (EXISTING ELEMENT)< |
| >>>>USING USER-SPECIFI ELEVATION DATA: UPSTREA FLOW LENGTH(FEET) = 4 ASSUME FULL-FLOWING PIP PIPE-FLOW VELOCITY(FEET PIPE FLOW VELOCITY = (T | ED PIPESIZE (EXISTING ELEMENT)< M(FEET) = 1101.33 DOWNSTREAM(FEET) = 1098.66 08.71 MANNING'S N = 0.013 ELINE /SEC.) = 11.50 OTAL FLOW) / (PIPE CROSS SECTION AREA) |
| >>>> SING USER-SPECIFI ELEVATION DATA: UPSTREA FLOW LENGTH(FEET) = 4 ASSUME FULL-FLOWING PIP PIPE-FLOW VELOCITY (FEET PIPE FLOW VELOCITY (FGIVEN PIPE DIAMETER (INC | ED PIPESIZE (EXISTING ELEMENT) <<<<> M(FEET) = 1101.33 DOWNSTREAM(FEET) = 1098.66 08.71 MANNING'S N = 0.013 ELINE /SEC.) = 11.50 OTAL FLOW) / (PIPE CROSS SECTION AREA) H) = 66.00 NUMBER OF PIPES = 1 |
| >>>> SING USER-SPECIFI ELEVATION DATA: UPSTREA FLOW LENGTH(FEET) = 4 ASSUME FULL-FLOWING PIP PIPE-FLOW VELOCITY (FEET PIPE FLOW VELOCITY (FGIVEN PIPE DIAMETER (INC | ED PIPESIZE (EXISTING ELEMENT) <<<<> M(FEET) = 1101.33 DOWNSTREAM(FEET) = 1098.66 08.71 MANNING'S N = 0.013 ELINE /SEC.) = 11.50 OTAL FLOW) / (PIPE CROSS SECTION AREA) H) = 66.00 NUMBER OF PIPES = 1 |
| >>>> SING USER-SPECIFI ELEVATION DATA: UPSTREA FLOW LENGTH(FEET) = 4 ASSUME FULL-FLOWING PIP PIPE-FLOW VELOCITY (FEET PIPE FLOW VELOCITY (FGIVEN PIPE DIAMETER (INC | ED PIPESIZE (EXISTING ELEMENT) <<<<> M(FEET) = 1101.33 DOWNSTREAM(FEET) = 1098.66 08.71 MANNING'S N = 0.013 ELINE /SEC.) = 11.50 OTAL FLOW) / (PIPE CROSS SECTION AREA) H) = 66.00 NUMBER OF PIPES = 1 3.30 = 0.59 Tc(MIN.) = 22.15 |
| >>>> SING USER-SPECIFI ELEVATION DATA: UPSTREA FLOW LENGTH (FEET) = 4 ASSUME FULL-FLOWING PIP FIPE-FLOW VELOCITY (FEET FIPE FILOW VELOCITY = (T GIVEN PIPE DIAMETER (INC. PIPE-FLOW (CFS) = 27 FIPE TRAVEL TIME (MIN.) LONGEST FLOWPATH FROM N | ED PIPESIZE (EXISTING ELEMENT)< |
| >>>>SING USER-SPECIFI ELEVATION DATA: UPSTREA FLOW LENGTH (FEET) = 4 ASSUME FULL-FLOWING PIP PIPE-FLOW VELOCITY (FEET PIPE FLOW VELOCITY = (T GIVEN PIPE DIAMETER (INC PIPE-FLOW (CFS) = 27 PIPE TRAVEL TIME (MIN.) LONGEST FLOWPATH FROM N | ED PIPESIZE (EXISTING ELEMENT) <<<<> M(FEET) = 1101.33 DOWNSTREAM(FEET) = 1098.66 08.71 MANNING'S N = 0.013 ELINE /SEC.) = 11.50 OTAL FLOW) / (PIPE CROSS SECTION AREA) H) = 66.00 NUMBER OF PIPES = 1 3.30 = 0.59 Tc(MIN.) = 22.15 |
| >>>>SING USER-SPECIFI ELEVATION DATA: UPSTREA FLOW LENGTH (FEET) = 4 ASSUME FULL-FLOWING PIP FIPE-FLOW VELOCITY (FEET PIPE FLOW VELOCITY (FEET PIPE FLOW VELOCITY = (T GIVEN PIPE DIAMETER (INC PIPE-FLOW (CFS) = 27 PIPE TRAVEL TIME (MIN.). LONGEST FLOWPATH FROM N FLOW PROCESS FROM NODE | ED PIPESIZE (EXISTING ELEMENT) <<<<> M(FEET) = 1101.33 DOWNSTREAM(FEET) = 1098.66 08.71 MANNING'S N = 0.013 ELINE /SEC.) = 11.50 OTAL FLOW) / (PIPE CROSS SECTION AREA) H) = 66.00 NUMBER OF PIPES = 1 3.30 = 0.59 Tc(MIN.) = 22.15 ODE 100.00 TO NODE 137.00 = 6631.07 FEET. |
| >>>>SING USER-SPECIFI ELEVATION DATA: UPSTREA PLOW LENGTH (FEET) = 4 ASSUME FULL-FLOWING PIP PIEP-FLOW VELOCITY (FEET PIEP FLOW VELOCITY = (T GIVEN PIPE DIAMETER (INC. PIPE-FLOW (CFS) = 27 PIPE TRAVEL TIME (MIN.) LONGEST FLOWPATH FROM N FLOW PROCESS FROM NODE >>>>>ADDITION OF SUBARE | ED PIPESIZE (EXISTING ELEMENT)< |
| >>>>SING USER-SPECIFI ELEVATION DATA: UPSTREA PLOW LENGTH (FEET) = 4 ASSUME FULL-FLOWING PIP PIEP-FLOW VELOCITY (FEET PIEP FIOW VELOCITY = (T GIVEN PIPE DIAMETER (INC. PIPE-FLOW (CFS) = 27 PIPE TRAVEL TIME (MIN.) LONGEST FLOWPATH FROM N FLOW PROCESS FROM NODE >>>>>ADDITION OF SUBARE MAINLINE TC (MIN.) = 2 | ED PIPESIZE (EXISTING ELEMENT)< |
| >>>>SING USER-SPECIFI ELEVATION DATA: UPSTREA FLOW LENGTH (FEET) = 4 ASSUME FULL-FLOWING PIP PIPE-FLOW VELOCITY (FEET PIPE FLOW VELOCITY (FEET PIPE FLOW VELOCITY = (T GIVEN PIPE DIAMETER (INC PIPE-FLOW (CFS) = 27 PIPE TRAVEL TITME (MIN.) LONGEST FLOWPATH FROM N ***FLOW PROCESS FROM NODE >>>>ADDITION OF SUBARE MAINLINE TC(MIN.) = 2 **10 YEAR RAINFALL INT | ED PIFESIZE (EXISTING ELEMENT) <<<< |
| >>>>SING USER-SPECIFI ELEVATION DATA: UPSTREA PLOW LENGTH (FEET) = 4 ASSUME FULL-FLOWING PIP PIEP-FLOW VELOCITY (FEET PIEP FIOW VELOCITY = (T GIVEN PIPE DIAMETER (INC. PIPE-FLOW (CFS) = 27 PIPE TRAVEL TIME (MIN.) LONGEST FLOWPATH FROM N FLOW PROCESS FROM NODE >>>>ADDITION OF SUBARE MAINLINE TC (MIN.) = 2 * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA(| ED PIPESIZE (EXISTING ELEMENT) <<<< |
| >>>>SING USER-SPECIFI ELEVATION DATA: UPSTREA FLOW LENGTH (FEET) = 4 ASSUME FULL-FLOWING PIP PIPE-FLOW VELOCITY (FEET PIPE FLOW VELOCITY (FEET PIPE FLOW VELOCITY = (T GIVEN PIPE DIAMETER (INC PIPE-FLOW (CFS) = 27 PIPE TRAVEL TITME (MIN.) LONGEST FLOWPATH FROM N ***FLOW PROCESS FROM NODE >>>>ADDITION OF SUBARE MAINLINE TC(MIN.) = 2 **10 YEAR RAINFALL INT | ED PIPESIZE (EXISTING ELEMENT)< |

LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN COMMERCIAL C D 4.06 0.25 0.100 0.20 0.100 COMMERCIAL ******************** FLOW PROCESS FROM NODE 137.00 TO NODE 141.00 IS CODE = 41 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <>>> ELEVATION DATA: UPSTREAM(FEET) = 1098.66 DOWNSTREAM(FEET) = 1093.99 FLOW LENGTH(FEET) = 318.57 MANNING'S N = 0.013 DEPTH OF FLOW IN 66.0 INCH PIPE IS 41.2 INCHES PIPE-FLOW VELOCITY(FEET/SEC.) = 17.63 GIVEN PIPE DIAMETER(INCH) = 66.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 274.83 PIPE TRAVEL TIME(MIN.) = 0.30 Tc(MIN.) = 22.45

LONGEST FLOWPATH FROM NODE 100.00 TO NODE 141.00 = 6949.64 FEET. ********************** FLOW PROCESS FROM NODE 141.00 TO NODE 141.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>> MAINLINE Tc (MIN.) = 22.45 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.717 SUBAREA LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIA VERAGE PERVIOUS LOSS RATE, FP (INCH/HR) = 0.25
SUBARRA AVERAGE PERVIOUS AREA FRACTION, AP = 0.100
SUBARRA AREA (ACRES) = 5.78
SUBARRA AREA (ACRES) = 5.78
SUBARRA AREA (ACRES) = 188.63
AREA-AVERAGED FM (INCH/HR) = 0.06
AREA-AVERAGED FP (INCH/HR) = 0.21
AREA-AVERAGED AP = 0.28 TOTAL AREA(ACRES) = 194.4 PEAK FLOW RATE(CFS) = FLOW PROCESS FROM NODE 141.00 TO NODE 141.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< -----MAINLINE Tc(MIN.) = 22.45 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.717 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA GROUP (ACRES) (INCH/HR) (DECIMAL) CN LAND USE RESIDENTIAL COMMERCIAL C 0.87 0.25 0.400 COMMERCIAL C 0.68 0.25 0.100 SUBARRA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25 SUBARRA AVERAGE PERVIOUS ARRA PRACTICAL C FLOW PROCESS FROM NODE 141.00 TO NODE 145.00 IS CODE = 41 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <> ELEVATION DATA: UPSTREAM(FEET) = 1093.99 DOWNSTREAM(FEET) = 1076.30 ELEVATION DAIA: UPSIREAM(FEET) = 1093.99 DOWNSIREAM(FEET)
FLOW LENGTH(FEET) = 504.72 MANNING'S N = 0.013
DEPTH OF FLOW IN 60.0 INCH PIPE IS 34.0 INCHES
PIPE-FLOW VELOCITY (FEET/SEC.) = 24.75
GIVEN PIPE DIAMETER(INCH) = 60.00 NUMBER OF PIPES = 1

3E1

| 3E10R |
|--|
| PIPE-FLOW(CFS) = 283.74 PIPE TRAVEL TIME(MIN.) = 0.34 Tc(MIN.) = 22.79 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 145.00 = 7454.36 FEET. |
| LONGEST FLOWPATH FROM NODE 100.00 TO NODE 145.00 = 7454.36 FEET. |
| ************************************** |
| >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< |
| |
| MAINLINE Tc(MIN.) = 22.79 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.702 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS |
| DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN COMMERCIAL C 0.71 0.25 0.100 69 COMMERCIAL D 0.32 0.20 0.100 75 |
| SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.23 SUBAREA AVERAGE PERVIOUS AREA FRACTION. Ap = 0.100 |
| SUBAREA AREA (ACRES) = 1.03 SUBAREA RUNOFF(CFS) = 1.56 EFFECTIVE AREA (ACRES) = 191.21 AREA-AVERAGED Fm(INCH/HR) = 0.06 AREA-AVERAGED Fp(INCH/HR) = 0.21 AREA-AVERAGED Ap = 0.28 TOTAL AREA (ACRES) = 197.0 PEAK FLOW RATE (CFS) = 283.74 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE |
| |
| FLOW PROCESS FROM NODE 145.00 TO NODE 145.00 IS CODE = 81 |
| >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< |
| MAINLINE TC(MIN.) = 22.79 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.702 |
| DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS |
| CONDOMINIUMS C 1.02 0.25 0.350 69 CONDOMINIUMS D 4.41 0.20 0.350 75 |
| SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21 SUBAREA AVERAGE PERVIOUS AREA FRACTION An = 0.350 |
| SUBAREA AREA (ACRES) = 5.43 SUBAREA RUNOFF (CFS) = 7.96 EFFECTIVE AREA (ACRES) = 196.64 AREA-AVERAGED Fm (INCH/HR) = 0.06 AREA-AVERAGED Fp (INCH/HR) = 0.21 AREA-AVERAGED Ap = 0.28 TOTAL AREA (ACRES) = 202.4 PEAK FLOW RATE (CFS) = 290.74 |
| ***************** |
| FLOW PROCESS FROM NODE 145.00 TO NODE 149.00 IS CODE = 41 |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<> >>>>SUSING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)< |
| ELEVATION DATA: UPSTREAM(FEET) = 1076.30 DOWNSTREAM(FEET) = 1053.58 FLOW LENGTH(FEET) = 289.89 MANNING'S N = 0.013 DEPTH OF FLOW IN 60.0 INCH PIPE IS 27.1 INCHES |
| PIPE-FLOW VELOCITY (FEET/SEC.) = 33.70 GIVEN PIPE DIAMETER (INCH) = 60.00 NUMBER OF PIPES = 1 PIPE-FLOW (CFS) = 290.74 |
| FIFE-FLOW (CFS) = 290.14 Tc(MIN.) = 22.93 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 149.00 = 7744.25 FEET. |
| FLOW PROCESS FROM NODE 149.00 TO NODE 149.00 IS CODE = 81 |
| >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< |
| MAINLINE Tc(MIN.) = 22.93 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.696 |
| - 10 IBAR KANNARDI INIENSITI(IKHCHAR) = 1.536 SUBARRA LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN CONDOMINIUMS C 4.75 0.25 0.350 69 CONDOMINIUMS D 1.68 0.20 0.350 75 |
| LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN CONDOMINIUMS C 4.75 0.25 0.350 69 CONDOMINIUMS D 1.68 0.20 0.350 75 |
| SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.24 SUBAREA AVERAGE PERVIOUS AREA FRACTION Ap = 0.350 |
| SUBAREA AREA (ACRES) = 6.43 SUBAREA RUNOFF(CFS) = 9.34 EFFECTIVE AREA (ACRES) = 203.07 AREA-AVERAGED Fm(INCH/HR) = 0.06 |
| Page 17 |

AREA-AVERAGED Fp(INCH/HR) = 0.21 AREA-AVERAGED Ap = 0.28 TOTAL AREA(ACRES) = 208.9 PEAK FLOW RATE(CFS) = TOTAL AREA (ACRES) = 208.9 *********************** FLOW PROCESS FROM NODE 149.00 TO NODE 149.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< MAINLINE TC(MIN.) = 22.93
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.696 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA SCS SOIL AREA Fp Ap SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN LAND USE COMMERCIAL С 0.25 0.100 PUBLIC PARK PUBLIC PARK 0.62 0.25 0.850 0.20 75 0.850 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

 SUBARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.564

 SUBARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.564

 SUBARRA AREA (ACRES) = 1.05
 SUBAREA RUNOFF (CFS) = 1.47

 EFFECTIVE AREA (ACRES) = 204.12
 AREA-AVERAGED FM (INCH/HR) = 0.06

 AREA-AVERAGED FP (INCH/HR) = 0.22
 AREA-AVERAGED AP = 0.28

 TOTAL AREA (ACRES) = 209.9
 PEAK FLOW RATE (CFS) = 300.46

 **************************** FLOW PROCESS FROM NODE 149.00 TO NODE 151.00 IS CODE = 41 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <>>> ELEVATION DATA: UPSTREAM(FEET) = 1053.58 DOWNSTREAM(FEET) = 1023.54 FLOW LENGTH(FEET) = 305.05 MANNING'S N = 0.013 DEPTH OF FLOW IN 60.0 INCH PIPE IS 25.9 INCHES *********************** FLOW PROCESS FROM NODE 151.00 TO NODE 151.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< MAINLINE TC(MIN.) = 23.07
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.690 SUBAREA LOSS RATE DATA(AMC II): SCS SOIL AREA FP AP SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE COMMERCIAL C 0.41 0.25 0.100 COMMERCIAL D 1.11 0.20 (
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21 0.100 SUBARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBARRA AREA (ACRES) = 1.52
SUBARRA RUNOFF (CFS) = 2.28
EFFECTIVE AREA (ACRES) = 205.64
AREA-AVERAGED FM (INCH/HR) = 0.06
AREA-AVERAGED AP = 0.28 211.4 PEAK FLOW RATE(CFS) = TOTAL AREA (ACRES) = *********************** FLOW PROCESS FROM NODE 151.00 TO NODE 153.00 IS CODE = 41 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <> ELEVATION DATA: UPSTREAM(FEET) = 1023.54 DOWNSTREAM(FEET) = 1007.62 FLOW LENGTH(FEET) = 210.38 MANNING'S N = 0.013 DEPTH OF FLOW IN 60.0 INCH PIPE IS 28.0 INCHES PIPE-FLOW VELOCITY(FEET/SEC.) = 33.58 GIVEN PIPE DIAMETER (INCH) = 60.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 301.68 PIPE TRAVEL TIME(MIN.) = 0.10 Tc(MIN.) = 23.17 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 153.00 = 8259.68 FEET. **************************

FLOW PROCESS FROM NODE 153.00 TO NODE 153.00 IS CODE = 81

3E10R

| >>>>ADDITION OF SUBAREA | | | | | |
|--|--|--|--|---|---|
| | | | | | |
| MAINLINE Tc(MIN.) = 2: * 10 YEAR RAINFALL INTE | PMCTTV/TN | CH/HR) = | 1.686 | | |
| DEVELOPMENT TYPE/ | AMC II): | ADEA | Fn | a. | 000 |
| SUBAREA LOSS RATE DATA (I DEVELOPMENT TYPE/ LAND USE COMMERCIAL PUBLIC PARK SUBAREA AVERAGE PERVIOUS | CDULID | (ACDES) | (TNCU/UD) | (DECIMAL) | CN |
| COMMERCIAI. | D | 0.85 | 0.20 | 0 100 | 75 |
| PIIBLIC PARK | D | 2 01 | 0.20 | 0.250 | 75 |
| SUBAREA AVERAGE PERVIOUS | S LOSS RA | TE. Fp(IN | CH/HR) = 0 | .20 | , , |
| SUBAREA AVERAGE PERVIOUS | S AREA FR | ACTION, A | 0.627 | | |
| SUBAREA AREA(ACRES) = | 2.86 | SUBARE | A RUNOFF (CF | S) = 4. | 02 |
| EFFECTIVE AREA(ACRES) = | 208.5 | 0 AREA- | AVERAGED Fm | (INCH/HR) | = 0.06 |
| AREA-AVERAGED Fp(INCH/H | R) = 0.2 | 1 AREA-A | VERAGED Ap | = 0.29 | |
| SUBAREA AREA (ACRES) = EFFECTIVE AREA (ACRES) = AREA-AVERAGED Fp(INCH/HI TOTAL AREA (ACRES) = | 214.3 | PEAK | FLOW RATE (| CFS) = | 304.89 |
| ****** | ****** | ***** | ****** | ****** | ***** |
| FLOW PROCESS FROM NODE | | TO NODE | | S CODE = | |
| >>>>ADDITION OF SUBAREA | | | | | |
| MAINLINE Tc (MIN.) = 23 | 3.17 | | | | |
| * 10 YEAR RAINFALL INT | | | 1.686 | | |
| SUBAREA LOSS RATE DATA(A | AMC II): | | _ | | |
| DEVELOPMENT TYPE/ | SCS SOIL | AREA | Fp | Ap | SCS |
| DEVELOPMENT TYPE/ LAND USE COMMERCIAL | GROUP | (ACRES) | (INCH/HR) | (DECIMAL) | CN 7E |
| SUBAREA AVERAGE PERVIOUS | e toee by | TE En/IN | 0.20 "U/UD\ = 0 | 20 | 13 |
| SUBAREA AVERAGE PERVIOUS | | | | .20 | |
| SUBAREA AREA (ACRES) = | 0.27 | SUBARE | A RUNOFF (CF | s) = 0. | 40 |
| EFFECTIVE AREA(ACRES) = | 208.7 | 7 AREA- | AVERAGED Fm | (INCH/HR) | = 0.06 |
| SUBAREA AREA (ACRES) = EFFECTIVE AREA (ACRES) = AREA-AVERAGED Fp(INCH/H | R) = 0.2 | 1 AREA-A | /ERAGED Ap | = 0.28 | |
| TOTAL AREA (ACRES) = | 214.6 | PEAK | FLOW RATE (| CFS) = | 305.29 |
| ************************************** | | | | | |
| | | | | | |
| >>>>ADDITION OF SUBAREA | | LINE PEAK | FLOW< | | |
| | | | | | |
| | | | | | |
| MAINLINE TC(MIN.) = 2: | 3.17 | CH/HD) - | 1 606 | | |
| MAINLINE TC(MIN.) = 2: | 3.17 | CH/HD) - | 1 606 | | |
| MAINLINE TC(MIN.) = 2: | 3.17 | CH/HD) - | 1 606 | | |
| MAINLINE TC(MIN.) = 2: * 10 YEAR RAINFALL INTE SUBAREA LOSS RATE DATA(1 DEVELOPMENT TYPE/ LAND USE | 3.17 | CH/HD) - | 1 606 | | |
| MAINLINE TC(MIN.) = 2: * 10 YEAR RAINFALL INTI SUBAREA LOSS RATE DATA(I DEVELOPMENT TYPE/ LAND USE RESIDENTIAL | 3.17 ENSITY(IN AMC II): SCS SOIL GROUP | CH/HR) = AREA (ACRES) | 1.686 Fp (INCH/HR) | Ap (DECIMAL) | SCS CN |
| MAINLINE TC(MIN.) = 2: * 10 YEAR RAINFALL INTI SUBAREA LOSS RATE DATA (I DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" | 3.17 | CH/HD) - | 1.686 Fp (INCH/HR) | | |
| MAINLINE TC(MIN.) = 2: * 10 YEAR RAINFALL INIT SUBAREA LOSS RATE DATA(I DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL | 3.17 ENSITY(ING AMC II): SCS SOIL GROUP C | CH/HR) = AREA (ACRES) 5.30 | 1.686 Fp (INCH/HR) 0.25 | Ap (DECIMAL) 0.500 | SCS CN |
| MAINLINE TC (MIN.) = 2: 10 YEAR RAINFALL INTI SUBAREA LOSS RATE DATA () DEVELOPMENT TYPE/ ESTAND USE RESIDENTIAL "S-7 DWELLINGS/ACRE" RESIDENTIAL "5-7 DWELLINGS/ACRE" | 3.17 ENSITY(IN AMC II): SCS SOIL GROUP | CH/HR) = AREA (ACRES) | 1.686 Fp (INCH/HR) 0.25 | Ap (DECIMAL) | SCS CN |
| MAINLINE TC (MIN.) = 2: 10 YEAR RAINFALL INTI SUBAREA LOSS RATE DATA (2 DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL | 3.17 ENSITY(ING AMC II): SCS SOIL GROUP C D | CH/HR) = AREA (ACRES) 5.30 0.58 | 1.686 Fp (INCH/HR) 0.25 | Ap (DECIMAL) 0.500 0.500 | SCS CN 69 75 |
| MAINLINE TC (MIN.) = 2: 10 YEAR RAINFALL INTI SUBAREA LOSS RATE DATA (2 DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL | 3.17 ENSITY(ING AMC II): SCS SOIL GROUP C D | CH/HR) = AREA (ACRES) 5.30 0.58 9.75 | 1.686 Fp (INCH/HR) 0.25 0.20 0.25 | Ap (DECIMAL) 0.500 0.500 0.400 | SCS CN |
| MAINLINE TC (MIN.) = 2: 10 YEAR RAINFALL INTI SUBAREA LOSS RATE DATA (2 DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL | 3.17 ENSITY(ING AMC II): SCS SOIL GROUP C D | CH/HR) = AREA (ACRES) 5.30 0.58 9.75 | 1.686 Fp (INCH/HR) 0.25 0.20 0.25 | Ap (DECIMAL) 0.500 0.500 0.400 | SCS CN 69 75 |
| MAINLINE TC (MIN.) = 2: 10 YEAR RAINFALL INTI SUBAREA LOSS RATE DATA (2 DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL | 3.17 ENSITY(ING AMC II): SCS SOIL GROUP C D | CH/HR) = AREA (ACRES) 5.30 0.58 9.75 | 1.686 Fp (INCH/HR) 0.25 0.20 0.25 | Ap (DECIMAL) 0.500 0.500 0.400 | SCS CN 69 75 |
| MAINLINE TC (MIN.) = 2: " 10 YEAR RAINFALL INTI SUBAREA LOSS RATE DATA (2 DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINOS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" APARTMENTS | 3.17 ENSITY(ING AMC II): SCS SOIL GROUP C D C D C | CH/HR) = AREA (ACRES) 5.30 0.58 9.75 | 1.686 Fp (INCH/HR) 0.25 0.20 0.25 | Ap (DECIMAL) 0.500 0.500 0.400 | SCS CN 69 75 69 75 |
| MAINLINE TC (MIN.) = 2: 10 YEAR RAINFALL INTI SUBAREA LOSS RATE DATA() DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "S-7 DWELLINGS/ACRE" RESIDENTIAL "S-7 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" APARTMENTS COMMERCIAL | 3.17 ENSITY(INN AMC II): SCS SOIL GROUP C D C D C C | CH/HR) = AREA (ACRES) 5.30 0.58 9.75 1.01 2.16 2.28 | 1.686 Fp (INCH/HR) 0.25 0.20 0.25 0.20 0.25 0.20 | Ap (DECIMAL) 0.500 0.500 0.400 0.400 0.200 0.100 | SCS CN 69 75 69 |
| MAINLINE TC (MIN.) = 2: 10 YEAR RAINFALL INTI SUBAREA LOSS RATE DATA() DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" APARTMENTS COMMERCIAL SUBAREA AVERAGE PERVIOUS SUBAREA AVERAGE PERVIOUS | 3.17 ENSITY(INN AMC II): SCS SOIL GROUP C D C C C S LOSS RA'S AREA FR | CH/HR) = AREA (ACRES) 5.30 0.58 9.75 1.01 2.16 2.28 TE, FP(INN, A | 1.686 Fp (INCH/HR) 0.25 0.20 0.25 0.20 0.25 0.25 0.25 0.25 0.27 0.29 (0.375) | Ap (DECIMAL) 0.500 0.500 0.400 0.400 0.200 0.100 | SCS CN 69 75 69 75 69 |
| MAINLINE TC (MIN.) = 2: 10 YEAR RAINFALL INTI SUBAREA LOSS RATE DATA() DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" APARTMENTS COMMERCIAL SUBAREA AVERAGE PERVIOUS SUBAREA AVERAGE PERVIOUS | 3.17 ENSITY(INN AMC II): SCS SOIL GROUP C D C C C S LOSS RA'S AREA FR | CH/HR) = AREA (ACRES) 5.30 0.58 9.75 1.01 2.16 2.28 TE, FP(INN, A | 1.686 Fp (INCH/HR) 0.25 0.20 0.25 0.20 0.25 0.25 0.25 0.25 0.27 0.29 (0.375) | Ap (DECIMAL) 0.500 0.500 0.400 0.400 0.200 0.100 | SCS CN 69 75 69 75 69 |
| MAINLINE TC (MIN.) = 2: 10 YEAR RAINFALL INTI SUBARRA LOSS RATE DATA() DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "3-7 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" APARIMENTS COMMERCIAL SUBAREA AVERAGE PERVIOUS | 3.17 ENSITY(IN: ENSITY(IN: SCS SOIL GROUP C D C C C S LOSS RA'S AREA FR. 21.08 229.8 | CH/HR) = AREA (ACRES) 5.30 0.58 9.75 1.01 2.16 2.28 TE, FP(INIACTION, A) SUBAREL 5 AREA—; | 1.686 Fp (INCH/HR) 0.25 0.20 0.25 0.20 0.25 0.25 0.25 0.25 0.25 0.25 0.25 0.27 A RUNOFF (CF | Ap (DECIMAL) 0.500 0.500 0.400 0.400 0.200 0.100 .25 S) = 30. | SCS CN 69 75 69 75 69 |
| MAINLINE TC (MIN.) = 2: 10 YEAR RAINFALL INTI SUBAREA LOSS RATE DATA (A DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" APARTMENTS COMMERCIAL SUBAREA AVERAGE PERVIOUS SUBAREA AVERAGE PERVIOUS SUBAREA AVERAGE PERVIOUS SUBAREA AREA (ACRES) = EFFECTIVE AREA (ACRES) = EFFECTIVE AREA (ACRES) = AREA-AVERAGED FOINCH/HI | 3.17 ENSITY (IN: ENSITY (IN: SCS SOIL GROUP C D C D C C S LOSS RA'S S AREA FR. 21.08 22.9.8 R) = 0.2. | CH/HR) = AREA (ACRES) 5.30 0.58 9.75 1.01 2.16 2.28 TE, Fp(INA ACTION, A ₁ SUBARE, SUBARE, 2 AREA-A' | 1.686 Fp (INCH/HR) 0.25 0.20 0.25 0.25 0.25 0.25 0.47 0.25 0.48 0.49 0.4 | Ap (DECIMAL) 0.500 0.500 0.400 0.200 0.1100 .25 S) = 30. (INCH/HR) = 0.29 | SCS CN 69 75 69 75 69 |
| MAINLINE TC (MIN.) = 2: 10 YEAR RAINFALL INTI SUBAREA LOSS RATE DATA() DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" APARTMENTS COMMERCIAL SUBARRA AVERAGE PERVIOUS SUBARRA AVERAGE PERVIOUS | 3.17 ENSITY (IN: ENSITY (IN: SCS SOIL GROUP C D C D C C S LOSS RA'S S AREA FR. 21.08 22.9.8 R) = 0.2. | CH/HR) = AREA (ACRES) 5.30 0.58 9.75 1.01 2.16 2.28 TE, Fp(INA ACTION, A ₁ SUBARE, SUBARE, 2 AREA-A' | 1.686 Fp (INCH/HR) 0.25 0.20 0.25 0.25 0.25 0.25 0.47 0.25 0.48 0.49 0.4 | Ap (DECIMAL) 0.500 0.500 0.400 0.200 0.1100 .25 S) = 30. (INCH/HR) = 0.29 | SCS CN 69 75 69 75 69 |
| MAINLINE TC (MIN.) = 2: 10 YEAR RAINFALL INTI SUBAREA LOSS RATE DATA (I DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" APARTMENTS COMMERCIAL SUBAREA AVERAGE PERVIOUS SUBAREA AVERAGE PERVIOUS SUBAREA AVERAGE PERVIOUS SUBAREA AREA (ACRES) = EFFECTIVE AREA (ACRES) = EFFECTIVE AREA (ACRES) = AREA-AUSTRAGED FOINCH/HI TOTAL AREA (ACRES) = | 3.17 ENSITY(IN: ENSITY(IN: SCS SOIL GROUP C D C C C C C S LOSS RA'S S AREA FR. 21.08 229.8 R) = 0.2.235.6 | CH/HR) = AREA (ACRES) 5.30 0.58 9.75 1.01 2.16 2.26 2.16 2.28 ACATION, A; ACTION, A; ACTION, A; PEAK | 1.686 Fp (INCH/HR) 0.25 0.20 0.25 0.25 0.25 0.25 0.45 0.25 0.25 0.47 A RUNOFF (CF AVERAGED Fm VERAGED Fm FFLOW RATE (| Ap (DECIMAL) 0.500 0.500 0.400 0.200 0.100 .25 S) = 30. (INCH/HR) = 0.29 CFS) = | SCS CN 69 75 69 75 69 69 24 = 0.06 |
| MAINLINE TC (MIN.) = 2: 10 YEAR RAINFALL INTI SUBAREA LOSS RATE DATA(I DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" APARTMENTS COMMERCIAL SUBAREA AVERAGE PERVIOUS | 3.17 ENSITY (IN: AMC II): SCS SOIL GROUP C D C C S LOSS RA'S ARRA FR. 21.08 229.8 R) = 0.2: 235.6 | CH/HR) = AREA (ACRES) 5.30 0.58 9.75 1.01 2.16 2.28 TF, Pp(INIO, ACTION, A) ACTION, A) AREA-A' PEAK | 1.686 Fp (INCH/HR) 0.25 0.20 0.25 0.25 0.25 0.25 0.25 A RUNOFF (CF WERAGED Ap FLOW RATE (| Ap (DECIMAL) 0.500 0.500 0.400 0.200 0.100 .25 S) = 30. (INCH/HR) = 0.29 CFS) = | SCS CN 69 75 69 75 69 69 24 = 0.06 335.53 |
| MAINLINE TC (MIN.) = 2: 10 YEAR RAINFALL INTI SUBAREA LOSS RATE DATA (I DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" APARTMENTS COMMERCIAL SUBAREA AVERAGE PERVIOUS SUBAREA AVERAGE PERVIOUS SUBAREA AVERAGE PERVIOUS SUBAREA AREA (ACRES) = EFFECTIVE AREA (ACRES) = EFFECTIVE AREA (ACRES) = AREA-AVERAGED FG (INCH/HI TOTAL AREA (ACRES) = | 3.17 SENSITY(IN: MMC II): SCS SOIL GROUP C D C C D C C S LOSS RAEA FR. 21.08 229.8 R) = 0.2. 235.6 | CH/HR) = AREA (ACRES) 5.30 0.58 9.75 1.01 2.16 2.28 TE, FP(INACTION, A) SUBARE, SAREA-A' PEAK TO NODE TO NODE | 1.686 Fp (INCH/HR) 0.25 0.20 0.25 0.25 0.25 0.25 0.25 WERAGED FM FERAGED FM FERAGED FM FILLOW RATE (*********************************** | Ap (DECIMAL) 0.500 0.500 0.400 0.200 0.100 .25 S) = 30. (INCH/HR) = 0.29 FFS) = | SCS CN 69 75 69 75 69 69 335.53 |
| MAINLINE TC (MIN.) = 2: 10 YEAR RAINFALL INTI SUBAREA LOSS RATE DATA() DEVELOPMENT TYPE/ LAID USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" APARTMENTS COMMERCIAL SUBARBA AVERAGE PERVIOUS FEFECTIVE AREA (ACRES) = EFFECTIVE AREA (ACRES) = FFFECTIVE AREA (ACRES) = FFFECTIVE AREA (ACRES) = FFFECTIVE AREA (ACRES) = FIFECTIVE AREA (ACRES) = | 3.17 ENSITY (IN: SCS SOIL GROUP C D C C C S LOSS RA: S AREA FR. 21.08 225.6 | CH/HR) = AREA (ACRES) 5.30 0.58 9.75 1.01 2.16 2.28 TF, FP(INACTION, A) ACTION, A) AREA2 2 AREA2 2 AREA2 TO NODE TO NODE | 1.686 Fp (INCH/HR) 0.25 0.20 0.25 0.25 0.25 0.25 0.25 CH/HR) = 0.375 A RUNOFF (CF WVERAGED Fm FERAGED Fm FLOW RATE (| Ap (DECIMAL) 0.500 0.500 0.400 0.200 0.100 .25 S) = 30. (INCH/HR) = 0.29 CFS) = | SCS CN 69 75 69 75 69 69 335.53 |
| MAINLINE TC(MIN.) = 2: 10 YEAR RAINFALL INTI SUBARRA LOSS RATE DATA(I DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" APARTMENTS COMMERCIAL SUBARBA AVERAGE PERVIOUSUBARBA AVERAGE PERVIOUSUBA AVERAGE PERVIOUSUBA AVERAGE PERVIOUSUBA AVERAGE PERVIOUSUBA AVERAGE PERVIOUSUBA AVERAGE PERVIOUSU | 3.17 SCSNSITY(INAMC II): SCS SOIL GROUP C C D C C C C S S S S S S S S S S S S S | CH/HR) = AREA (ACRES) 5.30 0.58 9.75 1.01 2.16 2.28 TF, FP(INACTION, A) ACTION, A) AREA2 2 AREA2 2 AREA2 TO NODE TO NODE | 1.686 Fp (INCH/HR) 0.25 0.20 0.25 0.25 0.25 0.25 0.25 CH/HR) = 0.375 A RUNOFF (CF WVERAGED Fm FERAGED Fm FLOW RATE (| Ap (DECIMAL) 0.500 0.500 0.400 0.200 0.100 .25 S) = 30. (INCH/HR) = 0.29 CFS) = | SCS CN 69 75 69 75 69 69 335.53 |
| MAINLINE TC(MIN.) = 2: 10 YEAR RAINFALL INTI SUBAREA LOSS RATE DATA (I DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" APARTMENTS COMMERCIAL SUBAREA AVERAGE PERVIOUS SUBAREA AVERAGE PERVIOUS SUBAREA AVERAGE PERVIOUS SUBAREA AVERAGE PERVIOUS FOR AREA-AVERAGE PERVIOUS FOR AVERTAL PERVIOUS F | 3.17 ENSITY (IN. MANC II): SCS SOIL GROUP C D C C C S LOSS RA: S AREA FR. 21.08 R) = 0.2. 255.6 | CH/HR) = AREA (ACRES) 5.30 0.58 9.75 1.01 2.16 2.28 TE, Pp(INA CACTION, A) SUBARE 5 AREA2 2 AREA-A2 PEAK TO NODE LINE PEAK | 1.686 Fp (INCH/HR) 0.25 0.20 0.25 0.25 0.25 0.25 0.40 0.375 A RUNOFF (CF AVERAGED Fm FERAGED Fm FILOW RATE (| Ap (DECIMAL) 0.500 0.500 0.400 0.200 0.100 .25 S) = 30. (INCH/HR) = 0.29 CFS) = | SCS CN 69 75 69 75 69 69 335.53 |
| MAINLINE TC(MIN.) = 2: 10 YEAR RAINFALL INTI SUBARRA LOSS RATE DATA(I DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" APARTMENTS COMMERCIAL SUBARRA AVERAGE PERVIOUS FOR TOTAL AREA (ACRES) = EFFECTIVE AREA (ACRES) = ARRA-AVERAGED FP (INCH/HI TOTAL AREA (ACRES) = FILOW PROCESS FROM NODE >>>>ADDITTON OF SUBAREA MAINLINE TC(MIN.) = 2: MAINLINE TC(MIN.) = 2: **10 YEAR BAINFAIL INTI | 3.17 SCS SOIL GROUP C C D C C C C C S LOSS RAEA FR. 21.08 229.8 R) = 0.2: 235.6 | CH/HR) = AREA (ACRES) 5.30 0.58 9.75 1.01 2.16 2.28 T.F. FP(INACTION, A) SUBARE. 5 AREA-A' PEAK TO NODE LINE PEAK | 1.686 FD (INCH/HR) 0.25 0.20 0.25 0.20 0.25 0.25 CH/HR) = 0 0 = 0.375 A RUNOFF(CF VVERAGED Ap FLOW RATE (************************************ | Ap (DECIMAL) 0.500 0.500 0.400 0.200 0.100 0.25 S) = 30. (INCH/HR) = 0.29 CFS) = | SCS CN 69 75 69 75 69 69 24 = 0.06 335.53 |
| MAINLINE TC (MIN.) = 2: 10 YEAR RAINFALL INTI SUBAREA LOSS RATE DATA(I DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "3-7 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" APARTMENTS COMMERCIAL SUBAREA AVERAGE PERVIOUS FLOW PROCESS FROM NODE >>>>ADDITION OF SUBAREA MAINLINE TC (MIN.) = 2: **10 YEAR BAINFALL INTI | 3.17 SCS SOIL GROUP C C D C C C C C S LOSS RAEA FR. 21.08 229.8 R) = 0.2: 235.6 | CH/HR) = AREA (ACRES) 5.30 0.58 9.75 1.01 2.16 2.28 T.F. FP(INACTION, A) SUBARE. 5 AREA-A' PEAK TO NODE LINE PEAK | 1.686 FD (INCH/HR) 0.25 0.20 0.25 0.20 0.25 0.25 CH/HR) = 0 0 = 0.375 A RUNOFF(CF VVERAGED Ap FLOW RATE (************************************ | Ap (DECIMAL) 0.500 0.500 0.400 0.200 0.100 0.25 S) = 30. (INCH/HR) = 0.29 CFS) = | SCS CN 69 75 69 75 69 69 24 = 0.06 335.53 |
| MAINLINE TC (MIN.) = 2: 10 YEAR RAINFALL INTI SUBAREA LOSS RATE DATA(I DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "3-7 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" APARTMENTS COMMERCIAL SUBAREA AVERAGE PERVIOUS FLOW PROCESS FROM NODE >>>>ADDITION OF SUBAREA MAINLINE TC (MIN.) = 2: **10 YEAR BAINFALL INTI | 3.17 SCS SOIL GROUP C C D C C C C C S LOSS RAEA FR. 21.08 229.8 R) = 0.2: 235.6 | CH/HR) = AREA (ACRES) 5.30 0.58 9.75 1.01 2.16 2.28 T.F. FP(INACTION, A) SUBARE. 5 AREA-A' PEAK TO NODE LINE PEAK | 1.686 FD (INCH/HR) 0.25 0.20 0.25 0.20 0.25 0.25 CH/HR) = 0 0 = 0.375 A RUNOFF(CF VVERAGED Ap FLOW RATE (************************************ | Ap (DECIMAL) 0.500 0.500 0.400 0.200 0.100 0.25 S) = 30. (INCH/HR) = 0.29 CFS) = | SCS CN 69 75 69 75 69 69 24 = 0.06 335.53 |
| MAINLINE TC(MIN.) = 2: 10 YEAR RAINFALL INTI SUBARRA LOSS RATE DATA(I DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" APARTMENTS COMMERCIAL SUBARRA AVERAGE PERVIOUS FOR TOTAL AREA (ACRES) = EFFECTIVE AREA (ACRES) = ARRA-AVERAGED FP (INCH/HI TOTAL AREA (ACRES) = FILOW PROCESS FROM NODE >>>>ADDITTON OF SUBAREA MAINLINE TC(MIN.) = 2: MAINLINE TC(MIN.) = 2: **10 YEAR BAINFALL INTI | 3.17 SCS SOIL GROUP C C D C C C C C S LOSS RAEA FR. 21.08 229.8 R) = 0.2: 235.6 | CH/HR) = AREA (ACRES) 5.30 0.58 9.75 1.01 2.16 2.28 T.F. FP(INACTION, A) SUBARE. 5 AREA-A' PEAK TO NODE LINE PEAK | 1.686 FD (INCH/HR) 0.25 0.20 0.25 0.20 0.25 0.25 CH/HR) = 0 0 = 0.375 A RUNOFF(CF VVERAGED Ap FLOW RATE (************************************ | Ap (DECIMAL) 0.500 0.500 0.400 0.200 0.100 0.25 S) = 30. (INCH/HR) = 0.29 CFS) = | SCS CN 69 75 69 75 69 69 24 = 0.06 335.53 |
| MAINLINE TC(MIN.) = 2: 10 YEAR RAINFALL INTI SUBARRA LOSS RATE DATA(I DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" APARTMENTS COMMERCIAL SUBARRA AVERAGE PERVIOUS FOR TOTAL AREA (ACRES) = EFFECTIVE AREA (ACRES) = ARRA-AVERAGED FP (INCH/HI TOTAL AREA (ACRES) = FILOW PROCESS FROM NODE >>>>ADDITTON OF SUBAREA MAINLINE TC(MIN.) = 2: MAINLINE TC(MIN.) = 2: **10 YEAR BAINFALL INTI | 3.17 SCS SOIL GROUP C C D C C C C C S LOSS RAEA FR. 21.08 229.8 R) = 0.2: 235.6 | CH/HR) = AREA (ACRES) 5.30 0.58 9.75 1.01 2.16 2.28 T.F. FP(INACTION, A) SUBARE. 5 AREA-A' PEAK TO NODE LINE PEAK | 1.686 FD (INCH/HR) 0.25 0.20 0.25 0.20 0.25 0.25 CH/HR) = 0 0 = 0.375 A RUNOFF(CF VVERAGED Ap FLOW RATE (************************************ | Ap (DECIMAL) 0.500 0.500 0.400 0.200 0.100 0.25 S) = 30. (INCH/HR) = 0.29 CFS) = | SCS CN 69 75 69 75 69 69 24 = 0.06 335.53 |
| MAINLINE TC(MIN.) = 2: 10 YEAR RAINFALL INTI SUBAREA LOSS RATE DATA (I DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" APARTMENTS COMMERCIAL SUBAREA AVERAGE PERVIOUS SUBAREA AVERAGE PERVIOUS SUBAREA AVERAGE PERVIOUS SUBAREA AVERAGE PERVIOUS FOR AREA-AVERAGE PERVIOUS FOR AVERTAL PERVIOUS F | 3.17 SCS SOIL GROUP C C D C C C C C S LOSS RAEA FR. 21.08 229.8 R) = 0.2: 235.6 | CH/HR) = AREA (ACRES) 5.30 0.58 9.75 1.01 2.16 2.28 T.F. FP(INACTION, A) SUBARE. 5 AREA-A' PEAK TO NODE LINE PEAK | 1.686 FD (INCH/HR) 0.25 0.20 0.25 0.20 0.25 0.25 CH/HR) = 0 0 = 0.375 A RUNOFF(CF VVERAGED Ap FLOW RATE (************************************ | Ap (DECIMAL) 0.500 0.400 0.200 0.100 0.25 S) = 30. (INCH/MP) = 0.29 CFS) = | SCS CN 69 75 69 75 69 69 24 = 0.06 335.53 |

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PUBLIC PARK D 0.67 0.20 0.850 75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.24
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.486
 SUBAREA AREA(ACRES) = 9.65 SUBAREA RUNOFF(CFS) = 13.63 EFFECTIVE AREA(ACRES) = 239.50 AREA-AVERAGED Fm(INCH/HR) = 0.07 AREA-AVERAGED AP = 0.30
  TOTAL AREA(ACRES) =
                              245.3
                                              PEAK FLOW RATE(CFS) =
***************************
 FLOW PROCESS FROM NODE 153.00 TO NODE 155.00 IS CODE = 41
  >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <>
 ELEVATION DATA: UPSTREAM(FEET) = 1007.62 DOWNSTREAM(FEET) = 1004.25 FLOW LENGTH(FEET) = 568.89 MANNING'S N = 0.013
  ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 17.78
PIPE FLOW VELOCITY = (TOTAL FLOW) / (PIPE CROSS SECTION AREA)
 GIVEN PIPE DIAMETER(INCH) = 60.00 NUMBER OF PIPES = 1
PIPE-PLOW(CFS) = 349.17
PIPE TRAVEL TIME (MIN.) = 0.53 Tc (MIN.) = 23.71
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 155.00 = 8828.57 FEET.
FLOW PROCESS FROM NODE 155.00 TO NODE 155.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE
  TOTAL NUMBER OF STREAMS = 2
 TOTAL NUMBER OF SIREARS - 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:

TIME OF CONCENTRATION(MIN.) = 23.71

RAINFALL INTENSITY(INCH/HR) = 1.66
 ARRA-AVERAGED Fm(INCH/HK) = 0.07
AREA-AVERAGED Fp(INCH/HK) = 0.22
ARRA-AVERAGED Ap = 0.30
EFFECTIVE STREAM AREA(ACRES) = 239.
TOTAL STREAM AREA(ACRES) = 245.29
                                           239 50
  PEAK FLOW RATE (CFS) AT CONFLUENCE =
***************************
 FLOW PROCESS FROM NODE 400.00 TO NODE 401.00 IS CODE = 21
  >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 INITIAL SUBAREA FLOW-LENGTH(FEET) = 295.31
ELEVATION DATA: UPSTREAM(FEET) = 1025.50 DOWNSTREAM(FEET) = 1017.82
  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 6.137
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.610
 SUBAREA TC AND LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA
                                                     Fp
       LAND USE
                               GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
  COMMERCIAL.
                               C 0.15 0.25
D 0.73 0.20
                                                                    0.100
0.100
                                                                               69
  COMMERCIAL
 SUBARBA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.21
SUBARBA AVERAGE PERVIOUS ARBA FRACTION, Ap = 0.100
SUBARBA RUNOFF(CFS) = 2.84
TOTAL ARBA (ACRES) = 0.88 PEAK FLOW RATE(CFS) =
FLOW PROCESS FROM NODE 401.00 TO NODE 403.00 IS CODE = 31
  >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<<
 ELEVATION DATA: UPSTREAM(FEET) = 1017.82 DOWNSTREAM(FEET) = 1017.71 FLOW LENGTH(FEET) = 249.58 MANNING'S N = 0.013
  DEPTH OF FLOW IN 21.0 INCH PIPE IS 15.6 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 1.48
ESTIMATED PIPE DIAMETER (INCH) = 21.00
                                                     NUMBER OF PIPES = 1
  PIPE-FLOW(CFS) =
                             2.84
```

3E10R PIPE TRAVEL TIME (MIN.) = 2.81 Tc (MIN.) = 8.94

| DONGEST FEOWERIN FROM N | = 2.81 Tc(MIN.) = 8.94 ODE 400.00 TO NODE 403.00 = 544.89 FEET. |
|--|--|
| | |
| | ************************************** |
| | |
| | A TO MAINLINE PEAK FLOW< |
| MAINLINE Tc (MIN.) = | 8.94 |
| * 10 YEAR RAINFALL INT | ENSITY(INCH/HR) = 2.909 |
| SUBAREA LOSS RATE DATA(| AMC II): |
| DEVELOPMENT TYPE/ | SCS SOIL AREA FP AP SCS |
| COMMEDITAL | C 0.27 0.25 0.100 69 |
| COMMERCIAL COMMERCIAL | ARCE 117: SCS SOIL AREA PP AP SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN C 0.27 0.25 0.100 69 D 0.80 0.20 0.100 75 |
| SUBAREA AVERAGE PERVIOUS | S LOSS RATE, Fp(INCH/HR) = 0.21 |
| SUBAREA AVERAGE PERVIOUS | S AREA FRACTION, Ap = 0.100 |
| SUBAREA AREA(ACRES) = | 1.07 SUBAREA RUNOFF (CFS) = 2.78 |
| EFFECTIVE AREA (ACRES) = | 1.07 SUBARBA RUNOFF (CFS) = 2.78 1.95 AREA-AVERAGED Fm(INCH/HR) = 0.02 R) = 0.21 AREA-AVERAGED Ap = 0.10 |
| TOTAL AREA(ACRES) = | 2.0 PEAK FLOW RATE(CFS) = 5.07 |
| ****** | *********** |
| | 403.00 TO NODE 405.00 IS CODE = 31 |
| | |
| >>>>COMPUTE PIPE-FLOW ' | TRAVEL TIME THRU SUBAREA |
| | IMATED PIPESIZE (NON-PRESSURE FLOW) < |
| | M(FEET) = 1017.71 DOWNSTREAM(FEET) = 1016.04 |
| | 47.50 MANNING'S N = 0.013 |
| DEPTH OF FLOW IN 18.0 | INCH PIPE IS 10.3 INCHES |
| PIPE-FLOW VELOCITY (FEET | /SEC.) = 4.88 |
| ESTIMATED PIPE DIAMETER | (INCH) = 18.00 NUMBER OF PIPES = 1 |
| PIPE-FLOW(CFS) = | = 0.85 Tc(MIN.) = 9.79 |
| | ODE 400.00 TO NODE 405.00 = 792.39 FEET. |
| | |
| | ************************************** |
| | A TO MAINLINE PEAK FLOW< |
| | A 10 MAINLINE PEAR FLOW< |
| MAINLINE Tc (MIN.) = | 9.79 |
| | |
| * 10 YEAR RAINFALL INT | |
| * 10 YEAR RAINFALL INT | 3140 771 |
| * 10 YEAR RAINFALL INT | 3140 771 |
| * 10 YEAR RAINFALL INT | 3140 771 |
| * 10 YEAR RAINFALL INT | 3140 771 |
| * 10 YEAR RAINFALL INT | 3140 771 |
| * 10 YEAR RAINFALL INT: SUBAREA LOSS RATE DATA(; DEVELOPMENT TYPE/ LAND USE COMMERCIAL COMMERCIAL SUBAREA AVERAGE PERVIOU: SIBAREA AVERAGE PERVIOUS | AMC II): SCS SOIL AREA FP AP SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN C 0.50 0.25 0.100 69 D 2.45 0.20 0.100 75 S LOSS RATE, FP(INCH/HR) = 0.21 |
| * 10 YEAR RAINFALL INT: SUBAREA LOSS RATE DATA(; DEVELOPMENT TYPE/ LAND USE COMMERCIAL COMMERCIAL SUBAREA AVERAGE PERVIOU: SIBAREA AVERAGE PERVIOUS | AMC II): SCS SOIL AREA FP AP SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN C 0.50 0.25 0.100 69 D 2.45 0.20 0.100 75 S LOSS RATE, FP(INCH/HR) = 0.21 |
| * 10 YEAR RAINFALL INTI SUBAREA LOSS RATE DATA() DEVELOPMENT TYPE/ LAND USE COMMERCIAL COMMERCIAL SUBAREA AVERAGE PERVIOU: SUBAREA AVERAGE PERVIOU: SUBAREA AREA(GRES) = EFFECTIVE AREA (GRES) = | AMC II): SCS SOIL AREA FP AP SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN C 0.50 0.25 0.100 69 D S LAS 0.20 0.100 75 S LOSS RATE, FP(INCH/HR) = 0.21 S AREA FRACTION, AP = 0.100 2.95 SUBAREA RUNOFF (CFS) = 7.28 4.90 AREA-AVERAGED Fm(INCH/HR) = 0.02 |
| * 10 YEAR RAINFALL INTI SUBAREA LOSS RATE DATA(, DEVELOPMENT TYPE/ LAND USE COMMERCIAL SUBAREA AVERAGE PERVIOU: SUBAREA AVERAGE PERVIOU: SUBAREA AREA (ACRES) = EFFECTIVE AREA (ACRES) = AREA-AVERAGED F9 (INCH/HI | AMC II): SCS SOIL AREA FP Ap SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN C 0.50 0.25 0.100 69 D 2.45 0.20 0.100 75 S LOSS RATE, FP(INCH/HR) = 0.21 S AREA FRACTION, Ap = 0.100 2.95 SUBAREA RUNOFF(CFS) = 7.28 4.90 AREA-AVERAGED Fm(INCH/HR) = 0.02 R) = 0.21 AREA-AVERAGED p = 0.10 |
| * 10 YEAR RAINFALL INTI SUBAREA LOSS RATE DATA(I DEVELOPMENT TYPE/ LAND USE COMMERCIAL COMMERCIAL SUBAREA AVERAGE PERVIOU: SUBAREA AVERAGE PERVIOU: SUBAREA AKEA(GCRES) = EFFECTIVE AREA(GCRES) = | AMC II): SCS SOIL AREA FP AP SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN C 0.50 0.25 0.100 69 D 2.45 0.20 0.100 75 S LOSS RATE, FP(INCH/HR) = 0.21 S AREA FRACTION, AP = 0.100 2.95 SUBAREA RUNOFF(CFS) = 7.28 4.90 AREA-AVERAGED Fm (INCH/HR) = 0.02 R) = 0.21 AREA-AVERAGED p = 0.10 |
| * 10 YEAR RAINFALL INTI SUBAREA LOSS RATE DATA (DEVELOPMENT TYPE/ LAND USE COMMERCIAL SUBAREA AVERAGE PERVIOU: SUBAREA AVERAGE PERVIOU: SUBAREA AREA (ACRES) = EFFECTIVE AREA (ACRES) = AREA-AVERAGED F9 (INCH/HI TOTAL AREA (ACRES) = | AMC II): SCS SOIL AREA FP AP SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN C 0.50 0.25 0.100 69 D 2.45 0.20 0.100 75 S LOSS RATE, FP(INCH/HR) = 0.21 S AREA FRACTION, AP = 0.100 2.95 SUBAREA RUNOFF(CFS) = 7.28 4.90 AREA-AVERAGED Fm(INCH/HR) = 0.02 R] = 0.21 AREA-AVERAGED AP = 0.10 4.9 PEAK FLOW RATE(CFS) = 12.09 |
| * 10 YEAR RAINFALL INTI SUBAREA LOSS RATE DATA(DEVELOPMENT TYPE/ LAND USE COMMERCIAL COMMERCIAL SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU SUBAREA AREA (ACRES) = EFFECTIVE AREA (ACRES) = AREA-AVERAGED FD (INCH/HI TOTAL AREA (ACRES) = | AMC II): SCS SOIL AREA FP AP SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN C 0.50 0.25 0.100 69 D 2.45 0.20 0.100 75 S LOSS RATE, FP(INCH/HR) = 0.21 S AREA FRACTION, AP = 0.100 2.95 SUBAREA RUNOFF(CFS) = 7.28 4.90 AREA-AVERAGED Fm (INCH/HR) = 0.02 R) = 0.21 AREA-AVERAGED pp = 0.10 |
| * 10 YEAR RAINFALL INTI SUBAREA LOSS RATE DATA(DEVELOPMENT TYPE/ LAND USE COMMERCIAL COMMERCIAL SUBAREA AVERAGE PERVIOU: SUBAREA AVERAGE PERVIOU: SUBAREA AREA (ACRES) = EFFECTIVE AREA (ACRES) = AREA-AVERAGED FP (INCH/HI TOTAL AREA (ACRES) = | AMC II): SCS SOIL AREA FP AP SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN C 0.50 0.25 0.100 69 D 2.45 0.20 0.100 75 S LOSS RATE, FP (INCH/HR) = 0.21 S AREA FRACTION, AP = 0.100 2.95 SUBAREA RUNOFF (CFS) = 7.28 4.90 AREA-AVERAGED FM (INCH/HR) = 0.02 R) = 0.21 AREA-AVERAGED AP = 0.10 4.90 PEAK FLOW RATE (CFS) = 12.09 |
| * 10 YEAR RAINFALL INTI SUBAREA LOSS RATE DATA(DEVELOPMENT TYPE/ LAND USE COMMERCIAL COMMERCIAL COMMERCIAL SUBAREA AVERAGE PERVIOU: SUBAREA AVERAGE PERVIOU: SUBAREA AREA (ACRES) = EFFECTIVE AREA (ACRES) = AREA-AVERAGED FP (INCH/HI TOTAL AREA (ACRES) = **FLOW PROCESS FROM NODE >>>>>COMPUTE PIPE-FLOW: >>>>>COMPUTE PIPE-FLOW: | AMC II): SCS SOIL AREA FD AP SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN C 0.50 0.25 0.100 69 D 2.45 0.20 0.100 75 S LOSS RATE, FP(INCH/HR) = 0.21 S AREA FRACTION, AP = 0.100 2.95 SUBARREA RUNOFF(CFS) = 7.28 4.90 AREA-AVERAGED Fm(INCH/HR) = 0.02 R) = 0.21 AREA-AVERAGED AP = 0.10 4.9 PEAK FLOW RATE (CFS) = 12.09 405.00 TO NODE 155.00 IS CODE = 31 TRAVEL TIME THRU SUBAREA<<<<< |
| * 10 YEAR RAINFALL INTI SUBAREA LOSS RATE DATA(DEVELOPMENT TYPE/ LAND USE COMMERCIAL SUBAREA AVERAGE PERVIOU: SUBAREA AVERAGE PERVIOU: SUBAREA AVERAGE PERVIOU: SUBAREA AREA(ACRES) = EFFECTIVE AREA(ACRES) = AREA-AVERAGED FP(INCH/HI TOTAL AREA(ACRES) = FLOW PROCESS FROM NODE >>>>COMPUTE PIPE-FLOW >>>>SUSING COMPUTER-EST | AMC II): SCS SOIL AREA FP AP SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN C 0.50 0.25 0.100 69 D S LAS 0.20 0.100 75 S AREA FRACTION, AP = 0.100 2.95 SUBAREA RUNOFF (CFS) = 7.28 4.90 AREA-AVERAGED FM (INCH/HR) = 0.02 R) = 0.21 AREA-AVERAGED AP = 0.10 4.9 PEAK FLOW RATE (CFS) = 12.09 **TRAVEL TIME THRU SUBAREA<*** IMATED PIPESIZE (NON-PRESSURE FLOW) *** IMATED PIPESIZE (NON-PRESSURE FLOW) *** **CINCTURE THRU SUBAREA*** **CINCTURE THRU SUBAREA** **CINCTURE THRU SUBAREA* **CINCTURE THRU SUBA |
| * 10 YEAR RAINFALL INTI SUBAREA LOSS RATE DATA(DEVELOPMENT TYPE/ LAND USE COMMERCIAL COMMERCIAL SUBAREA AVERAGE PERVIOU: SUBAREA AVERAGE PERVIOU: SUBAREA AREA (ACRES) = EFFECTIVE AREA (ACRES) = AREA-AVERAGED FP (INCH/HI TOTAL AREA (ACRES) = **FLOW PROCESS FROM NODE >>>>COMPUTE PIPE-FLOW: >>>>>COMPUTE PIPE-FLOW: ELEVATION DATA: UPSTREAL | AMC II): SCS SOIL AREA FD AP SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN C 0.50 0.25 0.100 69 D 2.45 0.20 0.100 75 S LOSS RATE, FP(INCH/HR) = 0.21 S AREA FRACTION, AP = 0.100 2.95 SUBAREA RUNOFF(CFS) = 7.28 4.90 AREA-AVERAGED FM(INCH/HR) = 0.02 R) = 0.21 AREA-AVERAGED AP = 0.10 4.9 PEAK FLOW RATE (CFS) = 12.09 405.00 TO NODE 155.00 IS CODE = 31 TRAVEL TIME THRU SUBAREA<<<<< |
| * 10 YEAR RAINFALL INTI SUBAREA LOSS RATE DATA(DEVELOPMENT TYPE/ LAND USE COMMERCIAL SUBAREA AVERAGE PERVIOU FEFFECTIVE AREA (ACRES) = AREA-AVERAGED PP (INCH/HI TOTAL AREA (ACRES) = FLOW PROCESS FROM NODE >>>>COMPUTE PIPE-FLOW >>>>USING COMPUTER-EST ELEVATION DATA: UPSTREAD FLOW LENGTH (FEET) = | AMC II): SCS SOIL AREA FP AP SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN C 0.50 0.25 0.100 69 D S LAS RATE, FP (INCH/HR) = 0.21 S AREA FRACTION, AP = 0.100 2.95 SUBAREA RUNOFF(CFS) = 7.28 4.90 AREA-AVERAGED FM (INCH/HR) = 0.02 R) = 0.21 AREA-AVERAGED AP = 0.10 4.9 PEAK FLOW RATE (CFS) = 12.09 **TRAVEL TIME THRU SUBAREA<*** IMATED PIPESIZE (NON-PRESSURE FLOW) *** M(FEET) = 1016.04 DOWNSTREAM (FEET) = 1014.57 96.59 MANINING'S N = 0.013 |
| * 10 YEAR RAINFALL INTI SUBAREA LOSS RATE DATA(DEVELOPMENT TYPE/ LAND USE COMMERCIAL SUBAREA AVERAGE PERVIOU: FLOW PROCESS FROM NODE >>>>COMPUTE PIPE-FLOW >>>>USING COMPUTER-EST. ELLEVATION DATA: UPSTREAL FLOW LENGTH (FEET) = DEPTH OF FLOW IN 18.0 | AMC II): SCS SOIL AREA FP AP SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN C 0.50 0.25 0.100 69 D S 2.45 0.20 0.100 75 S AREA FRACTION, AP = 0.100 2.95 SUBAREA RUNOFF (CFS) = 7.28 4.90 AREA-AVERAGED FM (INCH/HR) = 0.02 R) = 0.21 AREA-AVERAGED AP = 0.10 4.9 PEAK FLOW RATE (CFS) = 12.09 405.00 TO NODE 155.00 IS CODE = 31 TRAVEL TIME THRU SUBAREA<<<<< |
| * 10 YEAR RAINFALL INTI SUBAREA LOSS RATE DATA(DEVELOPMENT TYPE/ LAND USE COMMERCIAL SUBAREA AVERAGE PERVIOUS SUBAREA AVERAGE PERVIOUS SUBAREA AREA (ACRES) = EFFECTIVE AREA (ACRES) = AREA-AVERAGED FP (INCH/HI TOTAL AREA (ACRES) = *********************************** | AMC II): SCS SOIL AREA FD AP SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN C 0.50 0.25 0.100 69 D 2.45 0.20 0.100 75 S LOSS RATE, FP(INCH/HR) = 0.21 S AREA FRACTION, AP = 0.100 2.95 SUBAREA RUNOFF(CFS) = 7.28 4.90 AREA-AVERAGED Fm(INCH/HR) = 0.02 R) = 0.21 AREA-AVERAGED AP = 0.10 4.90 PEAK FLOW RATE (CFS) = 12.09 405.00 TO NODE 155.00 IS CODE = 31 TRAVEL TIME THRU SUBAREA<<<<< |
| * 10 YEAR RAINFALL INTI SUBAREA LOSS RATE DATA(DEVELOPMENT TYPE/ LAND USE COMMERCIAL SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU SUBAREA AREA (ACRES) = EFFECTIVE AREA (ACRES) = AREA-AVERAGED FP (INCH/HI TOTAL AREA (ACRES) = FLOW PROCESS FROM NODE >>>>COMPUTE PIPE-FLOW >>>>USING COMPUTER-EST ELEVATION DATA: UPSTREAL FLOW LENGTH (FEET) = DEPTH OF FLOW IN 18.0 PIPE-FLOW VELOCITY (FEET ESTIMATED PIPE DIAMETER ESTIMATED PIPE DIAMETER | AMC II): SCS SOIL AREA FP AP SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN C 0.50 0.25 0.100 69 D 2.45 0.20 0.100 75 S LOSS RATE, FPG(INCH/HR) = 0.21 S AREA FRACTION, AP = 0.100 2.95 SUBAREA RUNOFF(CFS) = 7.28 4.90 AREA-AVERAGED FM(INCH/HR) = 0.02 R) = 0.21 AREA-AVERAGED AP = 0.10 4.9 PEAK FLOW RATE (CFS) = 12.09 405.00 TO NODE 155.00 IS CODE = 31 TRAVEL TIME THRU SUBAREA<<-> IMATED PIPESIZE (NON-PRESSURE FLOW)<-> IMATED FIPESIZE (NON-PRESSURE FLOW)<-> IMATED FIPE IS 14.5 INCHES /SEC.) = 7.93 (INCH) = 18.00 NUMBER OF PIPES = 1 2.09 |
| * 10 YEAR RAINFALL INTI SUBAREA LOSS RATE DATA(DEVELOPMENT TYPE/ LAND USE COMMERCIAL SUBAREA AVERAGE PERVIOUS SUBAREA AVERAGE PERVIOUS SUBAREA AREA (ACRES) = EFFECTIVE AREA (ACRES) = AREA-AVERAGED FP (INCH/HI TOTAL AREA (ACRES) = *********************************** | AMC II): SCS SOIL AREA FD AP SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN C 0.50 0.25 0.100 69 D 2.45 0.20 0.100 75 S LOSS RATE, PP(INCH/HR) = 0.21 S AREA FRACTION, AP = 0.100 2.95 SUBAREA RUNOFF(CFS) = 7.28 4.90 AREA-AVERAGED Fm(INCH/HR) = 0.02 R) = 0.21 AREA-AVERAGED AP = 0.10 4.90 PEAK FLOW RATE (CFS) = 12.09 405.00 TO NODE 155.00 IS CODE = 31 TRAVEL TIME THRU SUBAREA<<<<<> IMATED PIPESIZE (NON-PRESSURE FLOW)<<<<> MMFEET) = 1016.04 DOWNSTREAM(FEET) = 1014.57 96.59 MANNING'S N = 0.013 INCH PIPE IS 14.5 INCHES (SEC.) = 7.93 (INCH) = 18.00 NUMBER OF PIPES = 1 |

FLOW PROCESS FROM NODE 155.00 TO NODE 155.00 IS CODE = 1

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>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE< TOTAL NUMBER OF STREAMS = 2 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE: TIME OF CONCENTRATION (MIN.) = 9.99
RAINFALL INTENSITY (INCH/HR) = 2.73
AREA-AVERAGED Fm (INCH/HR) = 0.02 AREA-AVERAGED Fp(INCH/HR) = 0.21 AREA-AVERAGED Ap = 0.10 EFFECTIVE STREAM AREA(ACRES) = 4.90 TOTAL STREAM AREA(ACRES) = PEAK FLOW RATE (CFS) AT CONFLUENCE = ** CONFLUENCE DATA ** Q Tc Intensity Fp(Fm) HEADWATER STREAM Ap NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 323.47 11.08 2.573 0.23(0.07) 0.30 349.17 23.71 1.664 0.22(0.07) 0.30 300 00 1 139 0 239.5 200.00 343.72 25.29 1.604 0.22(0.07) 0.30 12.09 9.99 2.730 0.21(0.02) 0.10 343.72 100.00 4.9 400.00 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO CONFLUENCE FORMULA USED FOR 2 STREAMS. ** PEAK FLOW RATE TABLE ** Q Tc Intensity Fp(Fm) Ap (CFS) (MIN.) (INCH/HR) (INCH/HR) 322.02 9.99 2.730 0.23(0.07) 0.29 STREAM HEADWATER NUMBER (ACRES) NODE 400.00 1 2 130.2 334.85 11.08 2.573 0.23(0.07) 0.29 143.9 300.00 356.50 23.71 1.664 0.22(0.07) 0.30 350.78 25.29 1.604 0.22(0.07) 0.30 244.4 200.00 250.2 100.00 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 356.50 Tc (MIN.) = 23.71
EFFECTIVE AREA (ACRES) = 244.40 AREA-AVERAGED Fm(INCH/HR) = 0.07
AREA-AVERAGED Fp(INCH/HR) = 0.22 AREA-AVERAGED Ap = 0.30
TOTAL AREA (ACRES) = 250.2 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 155.00 = 8828.57 FEET. *************************** FLOW PROCESS FROM NODE 155.00 TO NODE 158.00 IS CODE = 41 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <>>> ELEVATION DATA: UPSTREAM(FEET) = 1004.25 DOWNSTREAM(FEET) = 1002.32 FLOW LENGTH (FEET) = 180.04 MANNING'S N = 0.013 ASSUME FULL-FLOWING PIPELINE ASSUME FULL-FLOWING FIFELINE PIPE-FLOW VELOCITY (FEET/SEC.) = 18.16 PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA) FIPE FLOW VELOCITY = (IOTAL FLOW)/(PIPE CROSS SECTION ARRA)
GIVEN PIPE DIAMETER(INCH) = 60.00 NUMBER OF PIPES = 1
PIPE-PLOW(CFS) = 356.50
PIPE TRAVEL TIME (MIN.) = 0.17 Tc (MIN.) = 23.87
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 158.00 = 9008.61 FEET. *********************** FLOW PROCESS FROM NODE 158.00 TO NODE 158.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< _____ MAINLINE Tc(MIN.) = 23.87 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.658 SUBAREA LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN D 1.19 0.20 0.100 75 COMMERCIAL SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20 | SUBARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.102 | SUBARRA AKEA(ACRES) = 1.19 | SUBARRA RUNOFF(CFS) = 1.75 | EFFECTIVE AREA (ACRES) = 245.59 | AREA-AVERAGED Fm(INCH/HR) = 0.06 | AREA-AVERAGED Fp(INCH/HR) = 0.22 | AREA-AVERAGED Ap = 0.30 | AREA-AVER

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
Page 22

| 3E10R | 3E10R |
|--|--|
| FLOW PROCESS FROM NODE 158.00 TO NODE 158.00 IS CODE = 15.1 | COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS: PEAR FLOW RATE (CFS) = 367.04 Tc (MIN.) = 23.871 EFFFCTIVE AREA (ACRES) = 25.53 AREA-AVERAGED Fm (INCH/HR) = 0.06 AREA-AVERAGED Fp (INCH/HR) = 0.22 AREA-AVERAGED Ap = 0.28 |
| >>>>DEFINE MEMORY BANK # 1 <<<< | TOTAL AREA (ACRES) = 258.3 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 158.00 = 9008.61 FEET. |
| PEAK FLOWRATE TABLE FILE NAME: c2p10r.DNA MEMORY BANK # 1 DEFINED AS FOLLOWS: STREAM Q TC Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (ACRES) NODE | FLOW PROCESS FROM NODE 158.00 TO NODE 160.00 IS CODE = 41 |
| 1 19.78 6.08 0.20(0.02) 0.10 5.8 310.00 2 20.11 6.36 0.20(0.02) 0.10 6.1 220.00 3 20.21 6.72 0.20(0.02) 0.10 6.3 290.00 | >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<>> >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)< |
| $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | ELEVATION DATA: UPSTREAM(FEET) = 1002.32 DOWNSTREAM(FEET) = 992.80 FLOW LENGTH(FEET) = 106.27 MANNINGS N = 0.013 DEPTH OF FLOW IN 60.0 INCH PIPE IS 29.9 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 37.59 GIVEN PIPE DIAMETER (INCH) = 60.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 367.04 PIPE TRAVEL TIME (MIN.) = 0.05 Tc (MIN.) = 23.92 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 160.00 = 9114.88 FEET. |
| FLOW PROCESS FROM NODE 158.00 TO NODE 158.00 IS CODE = 11 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY< | END OF STUDY SUMMARY: TOTAL AREA (ACRES) = 258.3 TC(MIN.) = 23.92 EFFECTIVE AREA (ACRES) = 252.53 AREA-AVERAGED Fm(INCH/HR) = 0.06 AREA-AVERAGED Fp(INCH/HR) = 0.22 AREA-AVERAGED Ap = 0.291 PEAK FLOW RATE (CFS) = 367.04 |
| ** MAIN STREAM CONFLUENCE DATA ** STREAM Q TC Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) 1 322.02 10.17 2.702 0.23 (0.06) 0.29 131.4 400.00 2 334.85 11.26 2.550 0.23 (0.07) 0.29 145.1 300.00 3 356.50 23.87 1.658 0.22 (0.06) 0.30 245.6 200.00 4 350.78 25.46 1.597 0.22 (0.07) 0.30 245.6 200.00 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 158.00 = 9008.61 FEET. ** MEMORY BANK # 1 CONFLUENCE DATA ** STREAM Q TC Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) 1 19.78 6.08 3.629 0.20 (0.02) 0.10 5.8 310.00 2 2 0.11 6.36 3.538 0.20 (0.02) 0.10 5.8 310.00 3 3 0.21 6.72 3.426 0.20 (0.02) 0.10 6.3 2290.00 4 2 0.22 6.79 3.406 0.20 (0.02) 0.10 6.3 214.00 5 2 0.22 6.79 3.406 0.20 (0.02) 0.10 6.3 214.00 5 2 0.22 6.79 3.406 0.20 (0.02) 0.10 6.3 214.00 5 2 0.22 6.79 3.406 0.20 (0.02) 0.10 6.3 224.00 6 19.71 7.58 3.199 0.20 (0.02) 0.10 6.4 226.00 6 19.71 7.58 3.199 0.20 (0.02) 0.10 6.8 230.00 7 19.04 8.42 3.011 0.20 (0.02) 0.10 6.8 230.00 9 18.59 8.88 2.922 0.20 (0.02) 0.10 6.8 230.00 10 18.58 8.89 2.919 0.20 (0.02) 0.10 6.9 255.00 10 18.58 8.89 2.919 0.20 (0.02) 0.10 6.9 234.00 11 17.53 9.91 2.742 0.20 (0.02) 0.10 6.9 235.00 LONGEST FLOWPATH FROM NODE 230.00 TO NODE 158.00 = 1222.97 FEET. | ** PEAK FLOW RATE TABLE ** STREAM Q TC Intensity Fp(Fm) Ap Ae HEADWATER (ACRES) NODE 1 279.87 6.13 3.612 0.22(0.06) 0.28 84.3 310.00 2 285.08 6.41 3.522 0.22(0.06) 0.28 88.2 220.00 3 291.45 6.77 3.411 0.22(0.06) 0.28 93.2 290.00 4 292.03 6.81 3.401 0.22(0.06) 0.28 93.2 290.00 5 292.57 6.84 3.392 0.22(0.06) 0.28 94.1 226.00 6 304.74 7.63 3.187 0.22(0.06) 0.28 94.1 226.00 7 316.83 8.47 3.001 0.22(0.06) 0.28 115.6 260.00 8 316.91 8.48 3.000 0.22(0.06) 0.28 115.6 260.00 9 322.93 8.92 2.913 0.22(0.06) 0.28 115.7 230.00 9 322.93 8.92 2.913 0.22(0.06) 0.28 121.7 234.00 10 323.11 8.94 2.910 0.22(0.06) 0.28 121.7 234.00 11 336.12 9.96 2.735 0.22(0.06) 0.28 135.0 210.00 12 339.29 10.22 2.695 0.22(0.06) 0.28 138.3 400.00 13 351.14 11.31 2.543 0.22(0.06) 0.28 152.0 300.00 14 367.04 23.92 16.556 0.22(0.06) 0.29 252.5 200.00 15 360.94 25.51 1.596 0.22(0.06) 0.29 252.5 200.00 |
| ** PEAK FLOW RATE TABLE ** STREAM Q TC Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 279.87 6.08 3.629 0.22(0.06) 0.28 84.3 310.00 2 285.08 6.36 3.538 0.22(0.06) 0.28 88.2 220.00 3 291.45 6.72 3.426 0.22(0.06) 0.28 93.2 220.00 4 292.03 6.76 3.416 0.22(0.06) 0.28 93.2 220.00 5 292.57 6.79 3.406 0.22(0.06) 0.28 93.6 214.00 6 304.74 7.58 3.199 0.22(0.06) 0.28 94.1 226.00 7 316.83 8.42 3.011 0.22(0.06) 0.28 115.6 260.00 8 316.91 8.43 3.010 0.22(0.06) 0.28 115.7 230.00 9 322.93 8.88 2.992 0.22(0.06) 0.28 115.7 230.00 10 323.11 8.89 2.919 0.22(0.06) 0.28 121.7 234.00 11 336.12 9.91 2.742 0.22(0.06) 0.28 135.0 210.00 12 339.29 10.17 2.702 0.22(0.06) 0.28 138.3 400.00 | |

14 367.04 23.87 15 360.94 25.46 TOTAL AREA(ACRES) =

339.29 10.17 351.14 11.26

2.702 0.22(0.06) 0.28 2.702 0.22(0.06) 0.28 2.550 0.22(0.06) 0.28 1.658 0.22(0.06) 0.29 1.597 0.22(0.06) 0.29 258.3

138.3 152.0

252.5 258.3

400.00

200.00

Page 23 Page 24 3E00R

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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Ver. 23.0 Release Date: 07/01/2016 License ID 1334

Analysis prepared by:

| * DANA POINT HARBOR COMMERCIAL CORE AREA - Phase 2B Interim * RATIONAL METHOD EXISTING CONDITION HYDROLOGY OUTLET 3 * 100-YEAR STORM EVENT EM | | | | | | |
|--|--|--|--|--|--|--|
| FILE NAME: 3E00R.DAT TIME/DATE OF STUDY: 16:09 02/13/2020 | | | | | | |
| USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION: | | | | | | |
| *TIME-OF-CONCENTRATION MODEL* | | | | | | |
| USER SPECIFIED STORM EVENT(YEAR) = 100.00 SPECIFIED MINIMUM PIPE SIZE(INCH) = 12.00 SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90 *DATA BANK RAINFALL USED* *ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD* | | | | | | |
| *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL* HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING WIDTH CROSSFALL IN- / OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR NO. (FT) (FT) SIDE / SIDE/ WAY (FT) (FT) (FT) (FT) (PT) (n) | | | | | | |
| 1 30.0 20.0 0.018/0.018/0.020 0.67 2.00 0.0312 0.167 0.0150 2 30.0 25.0 0.017/0.017/0.017 0.67 1.50 0.0312 0.125 0.0150 3 50.0 45.0 0.017/0.017/0.017 0.67 2.00 0.0312 0.167 0.0150 | | | | | | |
| GLOBAL STREET FLOW-DEPTH CONSTRAINTS: 1. Relative Flow-Depth = 0.50 FEET as (Maximum Allowable Street Flow Depth) - (Top-of-Curb) 2. (Depth)*(Velocity) Constraint = 6.0 (FT*FT/S) *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.* *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED | | | | | | |
| FLOW PROCESS FROM NODE 100.00 TO NODE 101.00 IS CODE = 21 | | | | | | |
| >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<>>> >>> TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< | | | | | | |
| INITIAL SUBAREA FLOW-LENGTH(FEET) = 326.73 ELEVATION DATA: UPSTREAM(FEET) = 1332.32 DOWNSTREAM(FEET) = 1331.94 | | | | | | |
| TC = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 15.223 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.269 SUBAREA TC AND LOSS RATE DATA (AMC III): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS TC LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) | | | | | | |
| "5-7 DWELLINGS/ACRE" B 0.21 0.30 0.500 76 15.22 | | | | | | |
| RESIDENTIAL D 1.55 0.20 0.500 91 15.22 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.500 SUBAREA RUNOFF(CFS) = 5.01 TOTAL AREA (ACRES) = 1.76 PEAK FLOW RATE(CFS) = 5.01 | | | | | | |
| | | | | | | |

Page 1

************************ FLOW PROCESS FROM NODE 101.00 TO NODE 102.00 IS CODE = 62 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA >>>> (STREET TABLE SECTION # 2 USED) <<<< UPSTREAM ELEVATION(FEET) = 1331.94 DOWNSTREAM ELEVATION(FEET) = 1328.22 STREET LENGTH(FEET) = 177.44 CURB HEIGHT(INCHES) = 8.0 STREET HALPWIDTH(FEET) = 30.00 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 25.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.017 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.017 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.017 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0150 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0150 **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH(FEET) = 0.31 AVERAGE FLOW VELOCITY(FEET) = 10.42
AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.01
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.93 STREET FLOW TRAVEL TIME (MIN.) = 0.98 Tc (MIN.) = 16.21 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.154 SUBAREA LOSS RATE DATA(AMC III): DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "5-7 DWELLINGS/ACRE" D 0.93 "5-7 DWELLINGS/ACRE" D 0.93 0.20 0.500 91
SUBAREA AVERAGE PERVIOUS LOSS RATE, FD[INCH/HR] = 0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.500
SUBAREA AREA[ACRES] = 0.93 SUBAREA RUNOFF[CFS] = 2.56
EFFECTIVE AREA[ACRES] = 2.59 AREA-AVERAGED Fm[INCH/HR] = 0.10
AREA-AVERAGED Fp[INCH/HR] = 0.21 AREA-AVERAGED Ap = 0.50

TOTAL AREA[ACRES] = 2.7 PEAK FLOW RATE(CFS) = 7.38 END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH(FEET) = 0.32 HALFSTREET FLOOD WIDTH(FEET) = 11.10 FLOW VELOCITY (FEET/SEC.) = 3.16 DEPTH*VELOCITY (FT*FT/SEC.) = 1.01 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 102.00 = 504.17 FEE ********************* FLOW PROCESS FROM NODE 102.00 TO NODE 103.00 IS CODE = 41 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <> ELEVATION DATA: UPSTREAM(FEET) = 1328.22 DOWNSTREAM(FEET) = 1260.18
FLOW LENGTH(FEET) = 960.76 MANNING'S N = 0.013
DEPTH OF FLOW IN 18.0 INCH PIPE IS 6.5 INCHES
PIPE-FLOW VELOCITY (PEET/SEC.) = 12.86
GIVEN PIPE DIAMETER (INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW (FES) = 7 38 PIPE-FLOW(CFS) = 7.38 PIPE TRAVEL TIME(MIN.) = 1.25 Tc(MIN.) = 17.45 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 103.00 = 1464.93 FEET. *************************** FLOW PROCESS FROM NODE 103.00 TO NODE 103.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< _____ MAINLINE Tc (MIN.) = 17.45 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.023 SUBAREA LOSS RATE DATA (AMC III): DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "5-7 DWELLINGS/ACRE" COMMERCIAL D 0.54 0.20 (
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.462

3E00R SUBAREA AREA(ACRES) = 5.63 SUBAREA RUNOFF(CFS) = 14.85

| SUBAREA AREA (ACRES) = 5.63 SUBAREA RUNOFF (CFS) = 14.85 EFFECTIVE AREA (ACRES) = 8.32 AREA-AVERAGED Fm (INCH/HR) = 0.10 AREA-AVERAGED Fm (INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.47 TOTAL AREA (ACRES) = 8.3 PEAK FLOW RATE (CFS) = 21.92 |
|---|
| ******************** |
| FLOW PROCESS FROM NODE 103.00 TO NODE 105.00 IS CODE = 41 |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<>> >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)< |
| ELEVATION DATA: UESTREAM(FEET) = 1260.18 DOWNSTREAM(FEET) = 1245.52 FLOW LENGTH (FEET) = 775.08 MANNING'S N = 0.013 ASSUME FULL-FLOWING PIPELINE PIPE-FLOW VELOCITY (FEET/SEC.) = 12.40 PIPE FLOW VELOCITY = (TOTAL FLOW) / (PIPE CROSS SECTION AREA) GIVEN PIPE DAMETER (INCH) = 18.00 NUMBER OF PIPES = 1 PIPE-FLOW (CFS) = 21.92 PIPE TRAVEL TIME (MIN.) = 1.04 Tc (MIN.) = 18.49 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 105.00 = 2240.01 FEET. |
| FLOW PROCESS FROM NODE 105.00 TO NODE 105.00 IS CODE = 81 |
| >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< |
| MAINLINE TC(MIN.) = 18.49 * 100 YEAR RAINFALL INTERSITY(INCH/HR) = 2.924 SUBAREA LOSS RATE DATA(AMC III): DEVELOPMENT TYPE/ SCS SOIL AREA FD AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "5-7 DWBLLINGS/ACRE" D 3.73 0.20 0.500 91 COMMERCIAL D 0.0100 91 SUBAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.20 SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.441 SUBAREA AVERAGED FROM A PROMISSION AND A PROMISSION |
| FLOW PROCESS FROM NODE 105.00 TO NODE 107.00 IS CODE = 41 |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<>> >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)< |
| ELEVATION DATA: UPSTREAM(FEET) = 1245.52 DOWNSTREAM(FEET) = 1240.60 FLOW LENGTH (FEET) = 98.55 MANNING'S N = 0.013 DEPTH OF FLOW IN 24.0 INCH PIPE IS 14.4 INCHES PIPEFLOW VELOCITY (FEET/SEC.) = 16.38 GIVEN PIPE DAMETER (INCH) = 24.00 NUMBER OF PIPES = 1 PIPEFLOW (CFS) = 32.36 PIPE TRAVEL TIME (MIN.) = 0.10 TC (MIN.) = 18.59 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 107.00 = 2338.56 FEET. |
| FLOW PROCESS FROM NODE 107.00 TO NODE 107.00 IS CODE = 81 |
| >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< |
| MAINLINE To(MIN.) = 18.59 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.915 SUBARRA LOSS RATE DATA(AMC III): DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "5-7 DWELLINGS/ACRE" B 4.20 0.30 0.500 76 |
| DESTREMENTAL |

1.16

12.06

0.25

0.25

0.20

Page 3

86

91

0.500

0.500

0.100

0.100

RESIDENTIAL

RESIDENTIAL
"5-7 DWELLINGS/ACRE"

COMMERCIAL

COMMERCIAL

"5-7 DWELLINGS/ACRE"

PUBLIC PARK C 0.70 0.25 0 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.23 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.481 0.850 86 SUBAREA AREA(ACRES) = 19.69 SUBAREA RUNOFF(CFS) = 49.71 EFFECTIVE AREA(ACRES) = 32.39 AREA-AVERAGED Fm(INCH/HR) = 0.10 AREA-AVERAGED AP = 0.47 TOTAL AREA(ACRES) = 32.4 PEAK FLOW RATE(CFS) = ********************** FLOW PROCESS FROM NODE 107.00 TO NODE 107.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< MAINLINE Tc(MIN.) = 18.59 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.915 SUBAREA LOSS RATE DATA(AMC III): DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE PUBLIC PARK GROUP (ACRES) (INCH/HR) (DECIMAL) CN D 0.53 0.20 0.850 91 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20 SUBARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.850
SUBARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.850
SUBARRA AREA (ACRES) = 0.53
SUBARRA ANDA (ACRES) = 1.31
EFFECTIUE AREA (ACRES) = 32.92
AREA-AVERAGED Fm (INCH/HR) = 0.10
AREA-AVERAGED Fp (INCH/HR) = 0.22
AREA-AVERAGED Ap = 0.48 TOTAL AREA (ACRES) = 32.9 PEAK FLOW RATE (CFS) = ********************* FLOW PROCESS FROM NODE 107.00 TO NODE 109.00 IS CODE = 41 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <>>> ELEVATION DATA: UPSTREAM(FEET) = 1240.60 DOWNSTREAM(FEET) = 1239.01 FLOW LENGTH(FEET) = 81.43 MANNING'S N = 0.013 ASSUME FULL-FLOWING PIPELINE PIPE-FLOW VELOCITY (FEET/SEC.) = 26.51 PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
GIVEN PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 83.28
PIPE TRAVEL TIME(MIN.) = 0.05 Tc(MIN.) = 18.64
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 109.00 = 2419.99 FEET. **************************** FLOW PROCESS FROM NODE 109.00 TO NODE 109.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< MAINLINE Tc(MIN.) = 18.64 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.911 SUBAREA LOSS RATE DATA(AMC III): DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN COMMERCIAL 0.52 0.25 0.100 86 C D COMMERCIAL 91 CONDOMINIUMS CONDOMENTIAMS D 10 74 0.20 0 350 0.07 0.20 SUBARRA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.20
SUBARRA AVERAGE PERVIOUS ARRA FRACTION, Ap = 0.325
SUBARRA ARRA (ACRES) = 13.30
SUBARRA ARRA (ACRES) = 36.25
EFFECTIVE ARRA (ACRES) = 46.22
ARRA-AVERAGED Fm(INCH/HR) = 0.09
ARRA-AVERAGED Ap = 0.43 TOTAL AREA (ACRES) = 46.2 PEAK FLOW RATE(CFS) = ********************* FLOW PROCESS FROM NODE 109.00 TO NODE 111.00 IS CODE = 41 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <>>> ELEVATION DATA: UPSTREAM(FEET) = 1239.07 DOWNSTREAM(FEET) = 1210.33 FLOW LENGTH(FEET) = 407.01 MANNING'S N = 0.013 DEFH OF FLOW IN 33.0 INCH PIEF IS 24.0 INCHES

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PIPE-FLOW VELOCITY (FEET/SEC.) = 25.32

GIVEN PIPE DIAMETER(INCH) = 33.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 117.19

| PIPE-FLOW(CFS) = 117.19 PIPE TRAVEL TIME(MIN.) = 0.27 Tc(MIN.) = 18.91 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 111.00 = 2827.00 FEET. |
|--|
| ******************** |
| FLOW PROCESS FROM NODE 111.00 TO NODE 111.00 IS CODE = 81 |
| >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< |
| MAINLINE TC (MIN.) = 18.91 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.887 SUBARRA LOSS RATE DATA (AMC III): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN COMMERCIAL D 0.69 0.20 0.100 91 CONDOMINIUMS D 0.09 0.20 0.350 91 PUBLIC PARK D 0.20 0.850 91 SUBARRA AVERAGE PERVIOUS LOSS RATE, FP (INCH/HR) = 0.20 SUBARRA AVERAGE PERVIOUS LOSS RATE, FP (INCH/HR) = 0.505 |
| SUBAREA AREA (ACRES) 1.63 SUBAREA RUNOFF (CFS) 4.09 EFFECTIVE AREA (ACRES) 47.85 AREA-AVERAGED Fm (INCH/HR) 0.09 AREA-AVERAGED Fp (INCH/HR) 0.21 AREA-AVERAGED Ap = 0.44 TOTAL AREA (ACRES) 47.8 PEAK FLOW RATE (CFS) 120.29 |
| |
| FLOW PROCESS FROM NODE 111.00 TO NODE 113.00 IS CODE = 41 |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<>>>> >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <>>>> |
| ELEVATION DATA: UPSTREAM(FEET) = 1210.33 DOWNSTREAM(FEET) = 1210.00 FLOW LENGTH(FEET) = 18.70 MANNING'S N = 0.013 ASSUME FULL-FLOWING PIPELINE PIPE-PLOW VELOCITY (FEET/SEC.) = 17.02 PIPE FLOW VELOCITY (TOTAL FLOW)/(PIPE CROSS SECTION AREA) GIVEN PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 120.29 PIPE TRAVEL TIME (MIN.) = 0.02 TC(MIN.) = 18.93 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 113.00 = 2845.70 FEET. |
| ************************************** |
| >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< |
| MAINLINE TC (MIN.) = 18.93 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.885 SUBARRA LOSS RATE DATA (AMC III): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN CONDOMINIUMS D 13.30 0.20 0.350 91 PUBLIC PARK D 3.90 0.20 0.850 91 SUBARRA AVERAGE PERVIOUS LOSS RATE, FP (INCH/HR) = 0.20 SUBARRA AVERAGE PERVIOUS LOSS RATE, FP (INCH/HR) = 0.20 |
| SUBAREA AREA (ACRES) = 17.20 SUBAREA RUNOFF(CFS) = 43.23 EFFECTIVE AREA (ACRES) = 65.05 AREA-AVERAGED Fm(INCH/HR) = 0.09 AREA-AVERAGED Ap = 0.44 TOTAL AREA (ACRES) = 65.1 PEAK FLOW RATE (CFS) = 163.45 |
| ************************************** |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<>>>> >>>>SING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) |
| ELEVATION DATA: UPSTREAM(FEET) = 1210.00 DOWNSTREAM(FEET) = 1159.95 FLOW LENGTH(FEET) = 1078.02 MANNING'S N = 0.013 ASSUME FULL-FLOWING PIPELINE PIPE-FLOW VELOCITY(FEET/SEC.) = 23.12 |

PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
GIVEN PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1
PIPE-FLOW (CFS) = 163.45

PIPE TRAVEL TIME (MIN.) = 0.78 Tc(MIN.) = 19.71

LONGEST FLOWPATH FROM NODE 100.00 TO NODE 119.00 = 3923.72 FEET. *************************** FLOW PROCESS FROM NODE 119.00 TO NODE 119.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< _____ MAINLINE Tc(MIN.) = 19.71 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.820 SUBAREA LOSS RATE DATA(AMC III): DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL '11+ DWELLINGS/ACRE" C 1.51 0.25 0.200 86 RESIDENTIAL. "11+ DWELLINGS/ACRE" D 5.27 0.20 0.200 COMMERCIAL 0.27 0.20 0.100 SUBAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.21 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.196 SUBARRA AREA (ACRES) = 7.05 SUBAREA RUNOFF (CFS) = 17.63 EFFECTIVE AREA (ACRES) = 72.10 AREA-AVERAGED Fm(INCH/HR) = 0.09 AREA-AVERAGED Fp(INCH/HR) = 0.21 AREA-AVERAGED AP = 0.42 TOTAL AREA (ACRES) = 72.1 PEAK FLOW RATE(CFS) = FLOW PROCESS FROM NODE 119.00 TO NODE 119.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< MAINLINE Tc(MIN.) = 19.71 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.820 SUBAREA LOSS RATE DATA (AMC III): DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "11+ DWELLINGS/ACRE" С 1.27 0.25 0.200 86 RESIDENTIAL. "11+ DWELLINGS/ACRE" D 3.23 0.20 COMMERCIAL D 0.27 0.20 0.100 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.194 SUBAREA AREA(ACRES) = 4.75 SUBAREA RUNOFF(CFS) = 11.93 EFFECTIVE AREA(ACRES) = 76.87 AREA-AVERAGED Fm(INCH/HR) = 0.09 AREA-AVERAGED AP = 0.41 76.9 TOTAL AREA (ACRES) = PEAK FLOW RATE (CFS) = *************************** FLOW PROCESS FROM NODE 119.00 TO NODE 119.00 IS CODE = 1 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<< < TOTAL NUMBER OF STREAMS = 2 TOWN NORTHWEST OF THE TOWN TOWN THE TOWN THE TOWN TOWN THE THE TOWN TOWN THE TOWN TH $\Delta REA - \Delta VERAGED Em (INCH/HR) = 0.09$ AREA-AVERAGED Fp(INCH/HR) = 0.21 AREA-AVERAGED FP(INCH/HR,
AREA-AVERAGED AP = 0.41
EFFECTIVE STREAM AREA(ACRES) = 76

76.87 76.87 PEAK FLOW RATE (CFS) AT CONFLUENCE = FLOW PROCESS FROM NODE 200.00 TO NODE 201.00 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< INITIAL SUBAREA FLOW-LENGTH(FEET) = 331.01 ELEVATION DATA: UPSTREAM(FEET) = 1332.00 DOWNSTREAM(FEET) = 1330.74

SUBARRA ANALYSIS USED MINIMUM TC(MIN.) = 11.172
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.903
Page

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20

```
SUBAREA To AND LOSS RATE DATA (AMC III):
                         SCS SOIL AREA
  DEVELOPMENT TYPE/
                             GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 CONDOMINIUMS D 1.42 0.20 C SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
                                                               0.350 91
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.350
                            4.90
1.42 PEAK FLOW RATE(CFS) =
 SUBAREA RUNOFF (CFS) =
 TOTAL AREA(ACRES) =
***********************
 FLOW PROCESS FROM NODE 201.00 TO NODE 203.00 IS CODE = 62
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 3 USED) <<<<
 UPSTREAM ELEVATION(FEET) = 1330.74 DOWNSTREAM ELEVATION(FEET) = 1308.01
 STREET LENGTH(FEET) = 789.61 CURB HEIGHT(INCHES) = 8.0
STREET HALFWIDTH(FEET) = 50.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 45.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.017
OUTSIDE STREET CROSSFALL (DECIMAL) = 0.017
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.017
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0150
    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.48
HALFSTREET FLOOD WIDTH(FEET) = 18.40
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.01
PRODUCT OF DEPTHAVELOCITY (FT*FT/SEC.) = 2.39
STREET FLOW TRAVEL TIME (MIN.) = 2.63 Tc (MIN.) =
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.459
 SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA
       LAND USE
                             GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL.
  "8-10 DWELLINGS/ACRE" D
                                          1.91
 CONDOMINIUMS
                               D
                                          4.97
                                                     0.20
                                                                          91
                                                                0.350
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.364
SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.364
SUBAREA AREA (ACRES) = 6.88
SUBAREA RUNOFF (CFS) = 20.96
EFFECTIVE AREA (ACRES) = 8.30
AREA-AVERAGED FM (INCH/HR) = 0.20
AREA-AVERAGED AP = 0.36
                                           AREA-AVERAGED Fm(INCH/HR) = 0.07
                                            PEAK FLOW RATE (CFS) =
                                                                           25.30
 TOTAL AREA (ACRES) =
                               8.3
 END OF SUBAREA STREET FLOW HYDRAULICS.
 DEPTH (FEET) = 0.55 HALFSTREET FLOOD WIDTH (FEET) = 22.45
 FLOW VELOCITY (FEET/SEC.) = 5.65 DEPTH*VELOCITY (FT*FT/SEC.)
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 203.00 = 1
                                                                     1120.62 FEET.
FLOW PROCESS FROM NODE 203.00 TO NODE 205.00 IS CODE = 62
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 1 USED) <<<<<
 UPSTREAM ELEVATION(FEET) = 1308.01 DOWNSTREAM ELEVATION(FEET) = 1245.00 STREET LENGTH(FEET) = 901.07 CURB HEIGHT(INCHES) = 8.0 STREET HALPWIDTH(FEET) = 30.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.018
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.018
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
```

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH (FEET) = 0.57 HALFSTREET FLOOD WIDTH(FEET) = 22.54 AVERAGE FLOW VELOCITY (FEET/SEC.) = 9.09 PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 5 14 STREET FLOW TRAVEL TIME (MIN.) = 1.65 Tc (MIN.) = 15.45 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.242 SUBAREA LOSS RATE DATA (AMC III): DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "8-10 DWELLINGS/ACRE" D 0 400 91 COMMERCIAL D 0.73 0.20 0.100 91 CONDOMINIUMS 11.58 PUBLIC PARK D 0.01 0.20 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20 0.850 91 END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH(FEET) = 0.62 HALFSTREET FLOOD WIDTH(FEET) = 25.51
FLOW VELOCITY(FEET/SEC.) = 9.84 DEPTH*VELOCITY(FT*FT/SEC.) = 6.08 LONGEST FLOWPATH FROM NODE 200.00 TO NODE 205.00 = 2021.69 FEET. ************************* FLOW PROCESS FROM NODE 205.00 TO NODE 206.00 IS CODE = 41 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< ELEVATION DATA: UPSTREAM(FEET) = 1245.00 DOWNSTREAM(FEET) = 1229.65 FLOW LENGTH(FEET) = 135.30 MANNING'S N = 0.013 ASSUME FULL-FLOWING PIPELINE PIPE-FLOW VELOCITY (FEET/SEC.) = 33.43 PIPE FLOW VELOCITY = (TOTAL FLOW) / (PIPE CROSS SECTION AREA) GIVEN PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 59.07
PIPE TRAVEL TIME (MIN.) = 0.07 Tc(MIN.) = 15.52 LONGEST FLOWPATH FROM NODE 200.00 TO NODE 206.00 = 2156.99 FEET. FLOW PROCESS FROM NODE 206.00 TO NODE 210.00 IS CODE = 62 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA >>>> (STREET TABLE SECTION # 1 USED) <<<<< UPSTREAM ELEVATION (FEET) = 1229.65 DOWNSTREAM ELEVATION (FEET) = 1166.68 STREET LENGTH (FEET) = 1205.30 CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 30.00 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00 INSIDE STREET CROSSFALL (DECIMAL) = 0.018
OUTSIDE STREET CROSSFALL (DECIMAL) = 0.018 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0150 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH(FEET) = 0.57 HALFSTREET FLOOD WIDTH(FEET) = 22.77 AVERAGE FLOW VELOCITY(FEET/SEC.) = PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = STREET FLOW TRAVEL TIME (MIN.) = 2.54 Tc (MIN.) = 18.06 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.964 SUBAREA LOSS RATE DATA(AMC III): SCS SOIL AREA DEVELOPMENT TYPE/ LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

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RESIDENTIAL

| | | | 3E00R | | |
|---|--------------------------|-----------------------|-------------------------|-------------------|----------------|
| DECIDENTAL | | 3.38 | 0.25 | 0.200 | 86 |
| RESIDENTIAL "11+ DWELLINGS/ACRE" COMMERCIAL SUBAREA AVERAGE PERVIOUS 1 | D D | 9.23 0.42 | 0.20 0.20 | 0.200 0.100 | 91 91 |
| | | | | | |
| SUBAREA AVERAGE FERVIOUS Z SUBAREA AVERA (ACRES) = 1: EFFECTIVE AREA (ACRES) = AREA-AVERAGED FP(INCH/HR) TOTAL AREA (ACRES) = | 3.03 | SUBAREA RU | NOFF (CFS) | = 34.2 | :7 |
| EFFECTIVE AREA (ACRES) = AREA-AVERAGED Fp(INCH/HR) | = 0.20 | AREA-AVERA | RAGED Fm (AGED Ap = | (INCH/HR) 0.29 | = 0.06 |
| TOTAL AREA (ACRES) = | 33.7 | PEAK FI | OW RATE (C | CFS) = | 88.17 |
| END OF SUBAREA STREET FLOW DEPTH(FEET) = 0.59 HALFS | W HYDRAULI | CS: | IDDA) - C | 14 10 | |
| FLOW VELOCITY (FEET/SEC.) = | = 8.19 | DEPTH*VELC | CITY (FT*F | T/SEC.) = | 4.86 |
| LONGEST FLOWPATH FROM NODE | 200.0 | 0 TO NODE | 210.00 | 336 | 2.29 FEET. |
| ************************************** | 210.00 TO | NODE 1 | | CODE = 4 | |
| >>>>COMPUTE PIPE-FLOW TRA | AVEL TIME PIPESIZE | THRU SUBAR | REA<<<< ELEMENT) < | :<<< | |
| ELEVATION DATA: UPSTREAM(| FEET) = 1 | 166.68 DC | WNSTREAM (| | |
| FLOW LENGTH (FEET) = 307 ASSUME FULL-FLOWING PIPEL: | INE | | 0.013 | | |
| PIPE-FLOW VELOCITY (FEET/SI PIPE FLOW VELOCITY = (TOTAL | EC.) = 28 | 1.07 | SECTION | ADEAL | |
| GIVEN PIPE DIAMETER (INCH) | = 24.00 | NUMBER | OF PIPES | = 1 | |
| PIPE-FLOW(CFS) = 88.3 PIPE TRAVEL TIME(MIN.) = LONGEST FLOWPATH FROM NODI | 0.18 | Tc(MIN.) = | 18.24 | | |
| | | | | | |
| ************************************** | 119.00 TC | NODE 1 | 19.00 IS | CODE = | 1 |
| >>>>DESIGNATE INDEPENDENT >>>>AND COMPUTE VARIOUS (| CONFLUENCE | OR CONFLUE | NCE<<<< | << | |
| TOTAL NUMBER OF STREAMS = | 2 | | | | |
| CONFLUENCE VALUES USED FOR TIME OF CONCENTRATION (MIN | R INDEPEND .) = $18.$ | ENT STREAM | 1 2 ARE: | | |
| TIME OF CONCENTRATION (MIN RAINFALL INTENSITY (INCH/HI AREA-AVERAGED Fm (INCH/HR) | R) = 2.9 | 5 | | | |
| AREA-AVERAGED Fp(INCH/HR) | = 0.20 | | | | |
| AREA-AVERAGED Ap = 0.29 EFFECTIVE STREAM AREA(ACRI | ES) = | 33.72 | | | |
| EFFECTIVE STREAM AREA (ACRE TOTAL STREAM AREA (ACRES) = PEAK FLOW RATE (CFS) AT COI | = 33. NFLUENCE = | 72 88.1 | .7 | | |
| ** CONFIDENCE DATA ** | | | | | |
| STREAM Q TC NUMBER (CFS) (MIN.) 1 189.15 19.71 2 88.17 18.24 | Intensity | Fp(Fm) | Ap | Ae | HEADWATER |
| NUMBER (CFS) (MIN.) 1 189.15 19.71 | (INCH/HR) 2.820 | (INCH/HR) 0.21(0.0 | 9) 0.41 | (ACRES) 76.9 | NODE 100.00 |
| 2 88.17 18.24 | 2.947 | 0.20(0.0 | 06) 0.29 | 33.7 | 200.00 |
| RAINFALL INTENSITY AND TIME CONFLUENCE FORMULA USED FOR | ME OF CONC OR 2 STRE | ENTRATION | RATIO | | |
| ** PEAK FLOW RATE TABLE ** | * | - (-) | | | |
| ** PEAK FLOW RATE TABLE *: STREAM Q TC NUMBER (CFS) (MIN.) 1 271.44 18.24 2 273.44 19.71 | (INCH/HR) | (INCH/HR) | Ap | Ae (ACRES) | NODE NODE |
| 1 271.44 18.24 2 273.44 19.71 | 2.947 | 0.21(0.0 | 0.37 0.37 | 104.9 110.6 | 200.00 |
| | | | | | |
| COMPUTED CONFLUENCE ESTIM PEAK FLOW RATE (CFS) = EFFECTIVE AREA (ACRES) = AREA-AVERAGED Fp (INCH/HR) TOTAL AREA (ACRES) = LONGECT FLOWING HOLD | 273.44 | Tc (MIN.) | = 19.7 | 71 | |
| EFFECTIVE AREA (ACRES) = AREA-AVERAGED Fp(INCH/HR) | 110.59 | AREA-AVERA | RAGED Fm(AGED Ap = | (INCH/HR) 0.37 | = 0.08 |
| TOTAL AREA (ACRES) = : | 110.6 3 100 0 | O TO NODE | 119.00 |) = 392 | 3.72 FEET. |
| ************ | | | | | |
| FLOW PROCESS FROM NODE | 119.00 TO | NODE 1 | 21.00 IS | CODE = 4 | 1 |
| | | | Page 9 | | |

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>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<>>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)< ELEVATION DATA: UPSTREAM(FEET) = 1159.95 DOWNSTREAM(FEET) = 1150.00 FLOW LENGTH(FEET) = 321.11 MANNING'S N = 0.013 DEPTH OF FLOW IN 54.0 INCH FIPE IS 37.6 INCHES

DEFIN OF ELOW X 53.0 NGR FIFE 13 37.0 NGRS PIPE-FLOW VELOCITY (FEBT/SEC.) = 23.10 NGRS PIPE 16 GIVEN PIPE DIABETER (INCH) = 54.00 NUMBER OF PIPES = 1 PIPE-FLOW (CFS) = 273.44 PIPE TRAVEL TIME (MIN.) = 0.23 TC (MIN.) = 19.94 LONGEST FLOWBATH FROM NODE 100.00 TO NODE 121.00 =

**************************** FLOW PROCESS FROM NODE 121.00 TO NODE 121.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<

MAINI.INE TC(MIN) = 19.94* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.801 SUBAREA LOSS RATE DATA(AMC III): AREA DEVELOPMENT TYPE/ SCS SOTE GROUP (ACRES) (INCH/HR) RESIDENTIAL "11+ DWELLINGS/ACRE" С 6.04 0.25 0.200 86 RESIDENTIAL 8.06 0.20 "11+ DWELLINGS/ACRE" D C 0.200 0.100 COMMERCIAL 86 COMMERCIAL D 1.54 0.20 (
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.22 0.100 91 | SUBARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.185 |
| SUBARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.185 |
| SUBARRA AREA (ACRES) = 16.61 |
| SUBARRA ANDA (ACRES) = 127.20 |
| AREA-AVERAGED F(INCH/HR) = 0.07 |
| AREA-AVERAGED P(INCH/HR) = 0.21 |
| AREA-AVERAGED Ap = 0.35 |
| TOTAL AREA (ACRES) = 127.2 |
| PEAR FLOW RATE (CFS) = 312.33 |
| SUBARRA AVERAGED AP = 0.35 |

*********************** FLOW PROCESS FROM NODE 121.00 TO NODE 123.00 IS CODE = 41

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<

ELEVATION DATA: UPSTREAM(FEET) = 1150.00 DOWNSTREAM(FEET) = 1140.00 FLOW LENGTH(FEET) = 798.79 MANNING'S N = 0.013 ASSUME FULL-FLOWING PIPELINE PIPE-FLOW VELOCITY (FEET/SEC.) = 15.91

PIPE FLOW VELOCITY = (TOTAL FLOW) / (PIPE CROSS SECTION AREA)

GIVEN PIPE DIAMETER(INCH) = 60.00 NUMBER OF PIPES = 1
PIPE-PLOW(CFS) = 312.33
PIPE TRAVEL TIME (MIN.) = 0.84 Tc (MIN.) = 20.78
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 123.00 = 5043.62 FEET.

*********************** FLOW PROCESS FROM NODE 123.00 TO NODE 123.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<

MAINLINE Tc(MIN.) = 20.78 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.736 SUBAREA LOSS RATE DATA (AMC III): DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR)

(DECIMAL) CN RESIDENTIAL "11+ DWELLINGS/ACRE" 0.25 0.200 RESIDENTIAL "11+ DWELLINGS/ACRE" 17.92 0.20 0.200 APARTMENTS APARTMENTS 4.46 0.25 0.200 D 0.20 91 0.78 COMMERCIAL D 1.88 0.20 (
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.22 0.100 91

SUBARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.192
SUBARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.192
SUBARRA AREA (ACRES) = 32.52
SUBARRA ANEA (ACRES) = 159.72
AREA-AVERAGED FM(INCH/HR) = 0.07
AREA-AVERAGED FP (INCH/HR) = 0.21
AREA-AVERAGED Ap = 0.31

| TOTAL AREA(ACRES) = 159.7 PEAR | 3E00R (FLOW RATE(CFS) = 383.70 |
|---|--|
| ** DEAK BION DATE TABLE ** | |
| STREAM Q Tc Intensity Fp | Fm) AP AE HEADWATER |
| NEW PEAK FLOW DATA ARE: PEAK FLOW RATE (CFS) = 386.28 TC(MIN. AREA-AVERAGED FM (INCH/HR) = 0.07 AREA-4 AREA-AVERAGED Ap = 0.31 EFFECTIVE AREA |) = 19.31 AVERAGED Fp(INCH/HR) = 0.21 |
| ************************************** | 129.00 IS CODE = 41 |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU S | SUBAREA<<<< TING ELEMENT) <<<< |
| ELEVATION DATA: UPSTREAM(FEET) = 1140.00 FLOW LEMGTH(FEET) = 579.78 MANNING'S ASSUME FULL-FLOWING PIPELINE PIPE-FLOW VELOCITY (FEET/SEC.) = 27.23 PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE of SIVEN PIPE DIAMETER (INCH) = 51.00 NU PIPE-FLOW (CFS) = 366.28 PIPE TRAVEL TIME (MIN.) = 0.35 TC (MIN LONGEST FLOWPATH FROM NODE 100.00 TO NOT NOT NOT NOT NOT NOT NOT NOT NOT | D DOWNSTREAM(FEET) = 1122.00 N = 0.013 CROSS SECTION AREA) (BER OF PIPES = 1 |
| ************************************** | 129.00 IS CODE = 81 |
| >>>>ADDITION OF SUBAREA TO MAINLINE PEAR | T FLOW< |
| MAINLINE TC(MIN.) = 19.67 *IOO YEAR RAINFALL INTENSITY(INCH/HR) = SUBARRA LOSS RATE DATA(AMC III): DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) RESIDENTIAL "11+ DWELLINGS/ACRE" C 2.85 COMMERCIAL C 0.56 SUBARRA AVERAGE PERVIOUS LOSS RATE, FOI SUBARRA AVERAGE PERVIOUS AREA FRACTION, / SUBARRA AREA (ACRES) = 3.41 SUBARRA AREA (ACRES) = 157.42 AREA- AREA-AVERAGED FP(INCH/HR) = 0.21 AREA- TOTAL AREA (ACRES) = 163.1 PEAR | 2.823 Fp Ap SCS (INCH/HR) (DECIMAL) CN 0.25 0.200 86 0.25 0.100 86 ICH/HR) = 0.25 pp = 0.184 iA RUNOFF (CFS) = 8.52 AVERAGED FG (INCH/HR) = 0.07 |
| ************************************** | |
| >>>>ADDITION OF SUBAREA TO MAINLINE PEAR | FLOW<<<< |
| MAINLINE TC(MIN.) = 19.67 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = SUBAREA LOSS RATE DATA(AMC III); DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) DESILEPRITAL | 2.823 |
| LAND USE GROUP (ACRES) RESIDENTIAL "11+ DWELLINGS/ACRE" C 2.54 COMMERCIAL C 0.97 SUBABEA AMERICE DEPUTOUS LOSS PARE | (INCH/HR) (DECIMAL) CN 0.25 0.200 86 0.25 0.100 86 |
| SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(IN SUBAREA AVERAGE PERVIOUS AREA FRACTION, / SUBAREA AREA(ACRES) = 3.51 SUBARE EFFECTIVE AREA(ACRES) = 160.93 AREA- | m = 0.172 |
| EFFECTIVE AREA(ACRES) = 160.93 AREA- AREA-AVERAGED Fp(INCH/HR) = 0.21 AREA-I TOTAL AREA(ACRES) = 166.6 PEAR | -AVERAGED Fm(INCH/HR) = 0.06 AVERAGED Ap = 0.31 C FLOW RATE(CFS) = 399.48 |
| ************************************** | 129.00 IS CODE = 1 |
| >>>>DESIGNATE INDEPENDENT STREAM FOR CON | |

TOTAL NUMBER OF STREAMS = 2

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CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE: TIME OF CONCENTRATION(MIN.) = 19.67
RAINFALL INTENSITY(INCH/HR) = 2.82 AREA-AVERAGED Fm(INCH/HR) = 0.06 AREA-AVERAGED Fp(INCH/HR) = 0.21 AREA-AVERAGED PP (INCH/HK) = 0.21
AREA-AVERAGED AP = 0.31
EFFECTIVE STREAM AREA (ACRES) = 160
TOTAL STREAM AREA (ACRES) = 166.64
PEAK FLOW RATE (CFS) AT CONFLUENCE = ************************** FLOW PROCESS FROM NODE 300.00 TO NODE 301.00 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< INITIAL SUBAREA FLOW-LENGTH (FEET) = 320.55 ELEVATION DATA: UPSTREAM (FEET) = 1163.74 DOWNSTREAM (FEET) = 1148.43 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20TC = K*[(LENGIH** 5.00)/(ELEVATION CHANGE)] 5.20 SUBAREA ANALYSIS USED MINIMUM TC (MIN.) = 5.616 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 5.789 SUBAREA To AND LOSS RATE DATA(AMC III): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) RESIDENTIAL. RESIDENTIAL "11+ DWELLINGS/ACRE" C 0.29 0.25 0.200 COMMERCIAL C 1.36 0.25 0.100 SUBARRA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25 SUBARRA AVERAGE PERVIOUS ARRA FRACTION, Ap = 0.118 SUBAREA RUNOFF(CFS) = 8.55 TOTAL AREA(ACRES) = 1.65 PEAK FLOW RATE(CFS) = ********************** FLOW PROCESS FROM NODE 301.00 TO NODE 302.00 IS CODE = 62 >>>>COMPLIE STREET FLOW TRAVEL TIME THRU SUBAREACCCC >>>> (STREET TABLE SECTION # 3 USED) <<<< UPSTREAM ELEVATION(FEET) = 1148.43 DOWNSTREAM ELEVATION(FEET) = 1141.94 STREET LENGTH(FEET) = 235.77 CURB HEIGHT(INCHES) = 8.0 STREET HALFWIDTH(FEET) = 50.00 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 45.00 INSIDE STREET CROSSFALL (DECIMAL) = 0.017 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.017 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STRUCTIED NUMBER OF HALFSIELDS CARRIENG ROWDF = STREET PARKWAY (ROSSPALL(DECIMAL) = 0.017

Manning's FRICTION FACTOR for Streetflow Section (curb-to-curb) = 0.0150

Manning's FRICTION FACTOR for Back-of-Malk Flow Section = 0.0150 **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH(FEET) = 0.43
HALFSTREET FLOOD WIDTH(FEET) = 15.68
AVERAGE FLOW VELOCITY(FEET/SEC.) = 4.47 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.93
STREET FLOW TRAVEL TIME(MIN.) = 0.88 Tc(MIN.) = * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.326 6.49 SUBAREA LOSS RATE DATA (AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "11+ DWELLINGS/ACRE" C 0.47 "11+ DWELLINGS/ACRE" C 0.47 0.25 0.200 86 COMMERCIAL C 4.51 0.25 0.100 86 SUBARRA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25 SUBARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.109 SUBARRA AREA (ACRES) = 4.98 SUBARRA ER AUNOFF(CFS) = 23.75 SEFECTIVE AREA (ACRES) = 6.63 AREA-AVERAGED Fm(INCH/HR) = 0.03 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.11 STOTAL AREA (ACRES) = 6.6 PEAK FLOW RATE(CFS) = 31.62

END OF SUBAREA STREET FLOW HYDRAULICS:

3E00R DEPTH(FEET) = 0.48 HALFSTREET FLOOD WIDTH(FEET) = 18.75

| DEPTH(FEET) = 0.48 HALFSTREET FLOOD WIDTH(FEET) = 18.75 FLOW VELOCITY(FEET/SEC.) = 4.96 DEPTH-VELOCITY(FT+FT/SEC.) = LONGEST FLOWPATH FROM NODE 300.00 TO NODE 302.00 = 556 | 2.40 .32 FEET. |
|---|-------------------|
| FLOW PROCESS FROM NODE 302.00 TO NODE 303.00 IS CODE = 41 | |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<>>>> >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) | |
| ELEVATION DATA: UPSTREAM(FEET) = 1141.94 DOWNSTREAM(FEET) = 1 FLOW LENGTH(FEET) = 643.31 MANNING'S N = 0.013 DEPTH OF FLOW IN 36.0 INCH PIPE IS 13.1 INCHES PIPE-FLOW VELOCITY(FEET/SEC.) = 13.54 GIVEN PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 31.62 PIPE-FLOW(CFS) = 31.62 PIPE TRAVELT TIME (MIN.) = 0.79 TC (MIN.) = 7.29 LONGEST FLOWPATH FROM NODE 300.00 TO NODE 303.00 = 1199 | 122.13 |
| ************************************** | |
| >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< | |
| MAINLINE TC (MIN.) = 7.29 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 4.986 SUBAREA LOSS RATE DATA (AMC III): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP S LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) RESIDENTIAL "11+ DWELLINGS/ACRE" C 2.51 0.25 0.200 COMMERCIAL C 3.05 0.25 0.100 SUBAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.25 SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.145 SUBAREA AREA (ACRES) = 5.66 SUBAREA RUNDFF(CFS) = 24.77 EFFECTIVE AREA (ACRES) = 12.19 AREA-AVERAGED FM (INCH/HR) = AREA-AVERAGED FP (INCH/HR) = 0.25 AREA-AVERAGED FP (INCH/HR) = 10.25 AREA-AVERAGED | 86 86 |
| FLOW PROCESS FROM NODE 303.00 TO NODE 129.00 IS CODE = 41 | |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< | |
| ELEVATION DATA: UPSTREAM(FEET) = 1122.13 DOWNSTREAM(FEET) = 1 FLOW LENGTH(FEET) = 81.38 MANNING'S N = 0.013 DEPTH OF FLOW IN 48.0 INCH PIPE IS 39.3 INCHES PIPE-FLOW VELOCITY(FEET/SEC.) = 4.94 GIVEN PIPE DIAMETER(INCH) = 48.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 54.36 PIPE TRAVEL TIME(MIN.) = 0.27 TC(MIN.) = 7.56 LONGEST FLOWPATH FROM NODE 300.00 TO NODE 129.00 = 1281 | 122.00 |
| FLOW PROCESS FROM NODE 129.00 TO NODE 129.00 IS CODE = 1 | |
| >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE< >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES< TOTAL NUMBER OF STREAMS = 2 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE: TIME OF CONCENTRATION(MIN.) = 7.56 RAINFALL INTENSITY(INCH/HR) = 4.88 AREA-AVERAGED FM (INCH/HR) = 0.03 AREA-AVERAGED FP (INCH/HR) = 0.25 AREA-AVERAGED FP (INCH/HR) = 0.25 AREA-AVERAGED AP 0.13 EFFECTIVE STREAM AREA (ACRES) = 12.19 TOTAL STREAM AREA (ACRES) = 12.19 PEAK FLOW RATE(CFS) AT CONFLUENCE = 54.36 | |

** CONFLUENCE DATA **
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
Page 13

| | | | | | | 3E00R | | | |
|---|---------------------|-------------------------|-------------------|------------|---------|---------|-----------------------|---|---|
| 1 | 399.48 | 19.67 | 2.823 | 0.21(| 0.06) | 0.31 | 160.9 | 200.00 100.00 300.00 | |
| 2 | 54.36 | 7.56 | 4.882 | 0.21(| 0.07) | 0.31 | 12.2 | 300.00 | |
| | | | | | | | | | |
| RAINFALL I | | | | | ION RA | TIO | | | |
| | | | | | | | | | |
| ** PEAK FI | OW RATE | TABLE ** | ntensitu | Fn (1 | rm) | Δn | Δο | HEADWATER | |
| NUMBER | (CFS) | (MIN.) (| INCH/HR) | (INCH | /HR) | пp | (ACRES) | NODE | |
| 1 | 322.58 | 7.56 | 4.882 | 0.21(| 0.06) | 0.28 | 74.1 | 300.00 | |
| 3 | 426.48 | 21.13 | 2.709 | 0.21(| 0.06) | 0.29 | 178.8 | HEADWATER NODE 300.00 200.00 100.00 | |
| | | | | | | | | | |
| PEAK FLOW | BATE (CES | E = ESTIMATE $A = A$ | ES ARE A 30.76 | S FOLLO | JWS: | 19. | 67 | | |
| EFFECTIVE | AREA (ACR | ES) = | 173.12 | AREA- | -AVERA | GED Fm | (INCH/HR) | = 0.06 | |
| COMPUTED OF PEAK FLOW EFFECTIVE AREA-AVERATOTAL AREA | GED Fp(II | NCH/HR) = = 178 | 0.21 | AREA-A | /ERAGE | D Ap = | 0.29 | | |
| LONGEST FI | OWPATH F | ROM NODE | 100.0 | 0 TO N | DDE | 129.0 | 0 = 562 | 23.40 FEET. | |
| | | | | | | | | ******* | |
| FLOW PROCE | | | | | | | | | |
| >>>> COMPU | | | | | | | | | - |
| >>>>USING | | | | | | | | | |
| | | | | | | | | | |
| ELEVATION FLOW LENGT DEPTH OF F | H(FEET) | STREAM (FEI = 35.44 | 51) = 1 1 MANN | ING'S 1 | 1 = 0 | .013 | (FEET) = | 1103.76 | |
| DEPTH OF F | LOW IN | 66.0 INCH | PIPE IS | 41.1 | INCHE | S | | | |
| PIPE-FLOW GIVEN PIPE | VELOCITY DIAMETE | (FEET/SEC. R(INCH) = | .) = 27 66.00 | .67 NUM | BER OF | PIPES | = 1 | | |
| PIPE-FLOW | CFS) = | 430.76 | | | | | _ | | |
| PIPE TRAVE | L TIME (M | IN.) = (| 100 0 | Tc (MIN | .) = | 19.69 | n = 561 | 58.84 FEET. | |
| | | | | | | | | | |
| *********** FLOW PROCE | | | | | | | | *********** R1 | è |
| | | | | | | | | | |
| >>>>ADDIT | | | | | | | | | |
| MAINLINE T | c(MIN.) | = 19.69 | | | | | | | |
| * 100 YEAR SUBAREA LO | | | | | | | | | |
| DEVELOPME LAND COMMERCIAL COMMERCIAL | NT TYPE/ | SCS | SOIL | AREA | Fp | | Ap | SCS | |
| LAND | USE | GRO | OUP (A | CRES) | (INCH | /HR) | (DECIMAL) | CN | |
| COMMERCIAL | | (| 2 | 0.14 | 0 | .25 | 0.100 | 86 91 | |
| SUBAREA AV | ERAGE PE | RVIOUS LOS | SS RATE, | Fp(IN | CH/HR) | = 0. | 25 | | |
| SUBAREA AV | ERAGE PE | RVIOUS ARE | EA FRACT | ION, A | 0 = 0 | .100 | | | |
| EFFECTIVE | AREA (ACRES |) = 2.0 ES) = 2 | 175.12 | AREA- | A RUNU. | ED Fm (|) = 5.0 TNCH/HR) = | = 0.06 | |
| AREA-AVERA | GED Fp(I | NCH/HR) = | 0.21 | AREA-A | /ERAGE | D Ap = | 0.29 | | |
| SUBAREA AV SUBAREA AF EFFECTIVE AREA-AVERA TOTAL AREA | (ACRES) | = 180 | 0.8 | PEAK | FLOW | RATE (C | FS) = | 434.86 | |
| ****** | ***** | ***** | ****** | ***** | ***** | ***** | ***** | ****** | ķ |
| FLOW PROCE | | | | | | | | 41 | |
| >>>>COMPU | | | | | | | | | |
| >>>>USING | USER-SP | ECIFIED P | IPESIZE | (EXIST | ING EL | EMENT) | <<<< | | |
| ELEVATION | DATA: UP: | STREAM (FE | ET) = 1 | 103.76 | DOWN | STREAM | (FEET) = | 1101.65 | |
| ELEVATION FLOW LENGT ASSUME FUL | H(FEET) | = 503.15 | 5 MANN | ING'S | 1 = 0 | .013 | (/ | | |
| ASSUME FUI PIPE-FLOW | L-FLOWIN | G PIPELINE | E 10 | 20 | | | | | |
| PIPE FLOW | VELOCITY | = (TOTAL | FLOW) / (| PIPE CI | ROSS S | ECTION | AREA) | | |
| GIVEN PIPE PIPE-FLOW(| DIAMETE | R(INCH) = | 66.00 | NUM | BER OF | PIPES | = 1 | | |
| PIPE-FLOW | CFS) = | 434.86 | 1.46 | To (MIN | ١ - | 20 15 | | | |
| LONGEST FI | OWPATH F | ROM NODE | 100.0 | 0 TO N | DDE | 133.0 | 0 = 616 | 51.99 FEET. | |
| | | | | | | | | ****** | |
| | | | | | | | | | ۰ |
| FLOW PROCE | SS FROM 1 | NODE 13 | 33.00 TO | NODE | 133 | .00 IS | CODE = 8 | 31 | |
| FLOW PROCE | SS FROM I | NODE 13 | 33.00 TO | NODE | 133 | .00 IS | CODE = 8 | | |

| 3E00R |
|--|
| >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< |
| MAINLINE TC(MIN.) = 20.15 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.784 SUBARPA LOSS PATE DATA (AMC 111). |
| DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ARRES) (INCH/HR) (DECIMAL) CN COMMERCIAL C 1.00 0.25 0.100 86 COMMERCIAL D 0.87 0.20 0.100 91 SUBAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.23 |
| SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100 SUBAREA RABEA (ACRES) = 1.87 SUBAREA RUNOFF(CFS) = 4.65 EFFECTIVE AREA (ACRES) = 176.99 AREA-AVERAGED Fm (INCH/HR) = 0.06 AREA-AVERAGED Fp (INCH/HR) = 0.21 AREA-AVERAGED Ap = 0.29 TOTAL AREA (ACRES) = 182.7 PEAK FLOW RATE (CFS) = 434.86 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE |
| FLOW PROCESS FROM NODE 133.00 TO NODE 135.00 IS CODE = 41 |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<>>>>>SING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) |
| ELEVATION DATA: UPSTREAM(FEET) = 1101.65 DOWNSTREAM(FEET) = 1101.33 FLOW LENGTH(FEET) = 60.37 MANNING'S N = 0.013 ASSUME FULL-FLOWING PIPELINE PIPE-FLOW VELOCITY (FEET/SEC.) = 18.30 PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA) GIVEN PIPE DIAMETER(INCH) = 66.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 434.86 PIPE TRAVEL TIME(MIN.) = 0.05 Tc(MIN.) = 20.20 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 135.00 = 6222.36 FEET. |
| FLOW PROCESS FROM NODE 135.00 TO NODE 135.00 IS CODE = 81 |
| >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< |
| MAINLINE TC(MIN.) = 20.20 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.780 SUBAREA LOSS RATE DATA(ANC III): DEVELOPMENT TYPE/ SCS SOIL AREA FD AD SCS |
| SUBAREA LOSS RATE DATA(ANC III): DEVELOPMENT TYPE/ SCS SOIL AREA PD AD SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN COMMERCIAL C 0.36 0.25 0.100 86 COMMERCIAL C 0.040 0.20 0.100 91 SUBAREA AVERAGE PERVIOUS LOSS RATE, FD (INCH/HR) = 0.22 SUBAREA AVERAGE PERVIOUS AREA FRACTION, AD = 0.100 SUBAREA AKEA (ACRES) = 0.80 SUBAREA RUNOFF (CFS) = 1.99 EFFECTIVE AREA (ACRES) = 177.79 AREA-AVERAGED FM (INCH/HR) = 0.06 AREA-AVERAGED FD (INCH/HR) = 0.21 AREA-AVERAGED FM (INCH/HR) = 0.07 TOTAL AREA (ACRES) = 183.5 PEAK FLOW RATE (CFS) = 434.98 |
| *************************************** |
| FLOW PROCESS FROM NODE 135.00 TO NODE 137.00 IS CODE = 41 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBARRA< |
| >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <<<< |
| ELEVATION DATA: UPSTREAM(FEET) = 1101.33 DOWNSTREAM(FEET) = 1098.66 FLOW LENGTH(FEET) = 408.71 MANNING'S N = 0.013 ASSUME FULL-FLOWING PIPELINE PIPE-FLOW VELOCITY (FEET/SEC.) = 18.31 PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA) GIVEN PIPE DIAMETER(INCH) = 66.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 434.98 PIPE TRAVEL TIME(MIN.) = 0.37 Tc(MIN.) = 20.57 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 137.00 = 6631.07 FEET. |
| FLOW PROCESS FROM NODE 137.00 TO NODE 137.00 IS CODE = 81 |
| >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< |
| MAINLINE Tc(MIN.) = 20.57 |

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* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.751 SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA GROUP (ACRES) (INCH/HR) (DECIMAL) CN
C 4.06 0.25 0.100 86
D 1.08 0.20 0.100 91 LAND USE COMMERCIAL COMMERCIAL SUBARRA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.24
SUBARRA AVERAGE PERVIOUS ARRA FRACTION, Ap = 0.100
SUBARRA ARRA(ACRES) = 5.14
SUBARRA ARRA(ACRES) = 182.93
ARRA-AVERAGED Fm(INCH/HR) = 0.21
ARRA-AVERAGED Fm(INCH/HR) = 0.21
ARRA-AVERAGED Ap = 0.28 TOTAL AREA (ACRES) = 188.6 PEAK FLOW RATE (CFS) = ************************** FLOW PROCESS FROM NODE 137.00 TO NODE 141.00 IS CODE = 41 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>>>HSING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <<<<< ELEVATION DATA: UPSTREAM(FEET) = 1098.66 DOWNSTREAM(FEET) = 1093.99 FLOW LENGTH(FEET) = 318.57 MANNING'S N = 0.013 ASSUME FULL-FLOWING PIPELIME PIPE-FLOW VELOCITY (FEET/SEC.) = 18.64 PIPE FLOW VELOCITY = (TOTAL FLOW) / (PIPE CROSS SECTION AREA) GIVEN PIPE DIAMETER (INCH) = 66.00 NUMBER OF PIPES = PIPE-FLOW(CFS) = 442.97 PIPE TRAVEL TIME(MIN.) = 0.28 Tc(MIN.) = 20.86 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 141.00 = 6949.64 FEET. ************************** FLOW PROCESS FROM NODE 141.00 TO NODE 141.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< MAINLINE Tc(MIN.) = 20.86 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.729 SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN COMMERCIAL C 5.78 0.25 0.100 86 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25 SUBARRA AVERAGE ERVIOUS AREA FRACTION, Ap = 0.100
SUBARRA AREA (ACRES) = 5.78
SUBARRA AREA (ACRES) = 188.71
AREA-AVERAGED F(INCH/HR) = 0.21
AREA-AVERAGED AP = 0.28
TOTAL AREA (ACRES) = 194.4
PEAR FLOW RATE (CFS) = 453.48 ******************** FLOW PROCESS FROM NODE 141.00 TO NODE 141.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< MAINLINE Tc(MIN.) = 20.86 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.729 SUBAREA LOSS RATE DATA(AMC III): DEVELOPMENT TYPE/ SCS SOIL AREA Fn GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL RESIDENTIAL "8-10 DWELLINGS/ACRE" C 0.87 0.25 0.400 86 COMMERCIAL C 0.68 0.25 0.100 86 SUBARRA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.25 SUBARRA AVERAGE PERVIOUS ARRA FRACTION, Ap = 0.268 SUBARRA ARRA (ACRES) = 1.55 SUBARRA RARBA (ACRES) = 1.55 SUBARRA RARBA (ACRES) = 1.50 0.26 ARRA-AVERAGED Fm(INCH/HR) = 0.06 ARRA-AVERAGED Ap = 0.28 TOTAL ARRA (ACRES) = 196.0 PEAK FLOW RATE (CFS) = 457.20 ******************** FLOW PROCESS FROM NODE 141.00 TO NODE 145.00 IS CODE = 41 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <>>> ELEVATION DATA: UPSTREAM(FEET) = 1093.99 DOWNSTREAM(FEET) = 1076.30

FLOW LENGTH(FEET) = 504.72 MANNING'S N = 0.013 DEPTH OF FLOW IN 60.0 INCH PIPE IS 48.6 INCHES PIPE-FLOW VELOCITY(FEET/SEC.) = 26.86

GIVEN PIPE DIAMETER (INCH) = 60.00 NUMBER OF PIPES = 1
PIPE-FLOW (CPS) = 457.20
PIPE TRAVEL TIME (MIN.) = 0.31 Tc (MIN.) = 21.17

LONGEST FLOWPATH FROM NODE 100.00 TO NODE 145.00 = 7454.36 FEET.

FLOW PROCESS FROM NODE 145.00 TO NODE 145.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<

* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.706

SUBAREA LOSS RATE DATA (AMC III): DEVELOPMENT TYPE/ SCS SOIL AREA

LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN C 0.71 0.25 0.100 86 COMMERCIAL 0.32 0.20 0.100 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.23 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100

SUBAREA AREA(ACRES) = 1.03 SUBAREA RUNOFF(CFS) = 2.49 EFFECTIVE AREA(ACRES) = 191.29 AREA-AVERAGED Fm(INCH/HR) = 0.06 AREA-AVERAGED AP = 0.28

TOTAL AREA (ACRES) = 197.0 PEAK FLOW RATE(CFS) = NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

******************* FLOW PROCESS FROM NODE 145.00 TO NODE 145.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<

 $MAINIJINE\ Tc(MIN.) = 21.17$ * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.706

SUBAREA LOSS RATE DATA(AMC III): DEVELOPMENT TYPE/ SCS SOIL AREA GROUP (ACRES) (INCH/HR) (DECIMAL) CN CONDOMINIUMS C 1.02 0.25 0.350 CONDOMENTUMS 4.41 0.20 0.350

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21 SUBARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.350
SUBARRA AREA (ACRES) = 5.43
SUBARRA RAEA (ACRES) = 5.43
SUBARRA ROMOFF (CFS) = 12.87
EFFECTIUVE AREA (ACRES) = 196.72
AREA-AVERAGED FM(INCH/HR) = 0.21
AREA-AVERAGED Ap = 0.28

TOTAL AREA (ACRES) = 202.4 PEAK FLOW RATE(CFS) =

******************* FLOW PROCESS FROM NODE 145.00 TO NODE 149.00 IS CODE = 41

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1076.30 DOWNSTREAM(FEET) = 1053.58 FLOW LENGTH (FEET) = 289.89 MANNING'S N = 0.013 DEPTH OF FLOW IN 60.0 INCH PIPE IS 36.2 INCHES

PIPE-FLOW VELOCITY (FEET/SEC.) = 37.85

GIVEN PIPE DIAMETER (INCH) = 60.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 468.57
PIPE TRAVEL TIME (MIN.) = 0.13 Tc (MIN.) = 21.30
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 149.00 = 7744.25 FEET.

FLOW PROCESS FROM NODE 149.00 TO NODE 149.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< _____

MAINLINE Tc (MIN.) = 21.30 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.697 SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ SCS SOIL (ACRES) (INCH/HR) (DECIMAL) CN 4.75 0.25 0.350 86 LAND USE GROUP CONDOMINIUMS CONDOMINIUMS 1.68 0.20 0.350 91 Page 17

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.24 SUBARRA AVERAGE PERVIOUS ARBA FRACTION, Ap = 0.350
SUBARRA AVERAGE PERVIOUS ARBA FRACTION, Ap = 0.350
SUBARRA ARBA (ACRES) = 6.43
SUBARRA RIBA (ACRES) = 6.43
SUBARRA RIBA (ACRES) = 15.13
EFFECTIVE ARBA (ACRES) = 203.15
ARBA-AVERAGED FM (INCH/HR) = 0.06
ARBA-AVERAGED AP = 0.28

TOTAL AREA (ACRES) = 208.9 PEAK FLOW RATE(CFS) =

******************** FLOW PROCESS FROM NODE 149.00 TO NODE 149.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>

MAINLINE Tc(MIN.) = 21.30

100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.697

SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN 0.40 COMMERCIAL. C 0.25 0.100 0.25 0.850 86 PUBLIC PARK 0.03 0.20 0.850 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.564 SUBAREA AREA(ACRES) = 1.05
SUBAREA RUNOFF(CFS) = 2.42
EFFECTIVE AREA(ACRES) = 204.20
AREA-AVERAGED Fm(INCH/HR) = 0.02
AREA-AVERAGED AP = 0.28 TOTAL AREA (ACRES) = 209.9 PEAK FLOW RATE(CFS) =

*********************** FLOW PROCESS FROM NODE 149.00 TO NODE 151.00 IS CODE = 41

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<

ELEVATION DATA: UPSTREAM(FEET) = 1053.58 DOWNSTREAM(FEET) = 1023.54 FLOW LENGTH(FEET) = 305.05 MANNING'S N = 0.013 DEPTH OF FLOW IN 60.0 INCH PIPE IS 34.4 INCHES PIPE-FLOW VELOCITY(FEET/SEC.) = 41.66
GIVEN PIPE DIAMETER(INCH) = 60.00 NUMBER OF PIPES = 1

| SIVER | STATE | STAT

************************* FLOW PROCESS FROM NODE 151.00 TO NODE 151.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<

MAINLINE To (MIN.) = 21.42100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.688

SUBAREA LOSS RATE DATA(AMC III): DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN COMMERCIAL C 0.41 D 1.11 0.25 0.100 0.20 0.100 COMMERCIAL

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21

FLOW PROCESS FROM NODE 151.00 TO NODE 153.00 IS CODE = 41

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <>>>

ELEVATION DATA: UPSTREAM(FEET) = 1023.54 DOWNSTREAM(FEET) = 1007.62

FLOW LENGTH (FEET) = 210.38 MANNING'S N = 0.013 DEPTH OF FLOW IN 60.0 INCH PIPE IS 37.5 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 37.63

GIVEN PIPE DIAMETER (INCH) = 60.00 PIPE-FLOW (CFS) = 486.50 NUMBER OF PIPES = 1

PIPE TRAVEL TIME (MIN.) = 0.09 Tc (MIN.) = 21.52

| LONGEST FLOWPATH FROM NO | DE 100 | .00 TO NO | DDE 153. | 00 = 82 | 59.68 FEET. |
|--|--|---|--|---|---|
| ******* | ***** | ***** | ****** | ***** | ***** |
| FLOW PROCESS FROM NODE | | | | | |
| >>>>ADDITION OF SUBAREA | TO MAINL | INE PEAK | FLOW< | | |
| MAINLINE Tc (MIN.) = 21 | | | | | |
| | | H/HR) = | 2.681 | | |
| * 100 YEAR RAINFALL INTE SUBAREA LOSS RATE DATA(A DEVELOPMENT TYPE/ LAND USE COMMERCIAL PUBLIC PARK SUBAREA AVERAGE PERVIOUS | MC III): | | | | |
| DEVELOPMENT TYPE/ | SCS SOIL | AREA | Fp | Ap | SCS |
| COMMERCIAL | D | 0.85 | 0.20 | 0.100 | 91 |
| PUBLIC PARK | D | 2.01 | 0.20 | 0.850 | 91 |
| | | | | .20 | |
| SUBAREA AVERAGE PERVIOUS | AREA FRA | CTION, A | 0.627 | | |
| SUBAREA AREA(ACRES) = EFFECTIVE AREA(ACRES) = | 2.86 | AREA-1 | A RUNOFF (CF | S) = 6. (INCH/HR) | 58 = 0.06 |
| SUBAREA AREA(ACRES) = EFFECTIVE AREA(ACRES) = AREA-AVERAGED Fp(INCH/HR | .) = 0.21 | AREA-AV | /ERAGED Ap | = 0.29 | 0.00 |
| TOTAL AREA (ACRES) = | 214.3 | PEAK | FLOW RATE (| CFS) = | 491.84 |
| ****** | ***** | ***** | ****** | ***** | ***** |
| FLOW PROCESS FROM NODE | | | | | 81 |
| >>>>ADDITION OF SUBAREA | | | | | |
| | | | | | |
| MAINLINE Tc(MIN.) = 21 * 100 YEAR RAINFALL INTE | | U/UD) - | 2 681 | | |
| CUBADEA TOCC DATE DATA (A | MC TTT) · | | | | |
| DEVELOPMENT TYPE/ LAND USE COMMERCIAL SUBAREA AVERAGE PERVIOUS | SCS SOIL | AREA | Fp | Ap | SCS |
| LAND USE | GROUP | (ACRES) | (INCH/HR) | (DECIMAL) | CN |
| COMMERCIAL | D TOSS DAT | 0.27 F Fr(TN) | 0.20 | 0.100 | 91 |
| SUBAREA AVERAGE PERVIOUS | AREA FRA | CTION. A | 0.100 | .20 | |
| SUBAREA AREA(ACRES) = | 0.27 | SUBARE | A RUNOFF (CF | S) = 0. | 65 |
| EFFECTIVE AREA(ACRES) = | 208.85 | AREA-A | AVERAGED Fm | (INCH/HR) | = 0.06 |
| SUBAREA AVERAGE PERVIOUS SUBAREA AREA (ACRES) = EFFECTIVE AREA (ACRES) = AREA-AVERAGED Fp(INCH/HR TOTAL AREA (ACRES) = | .) = 0.21 | AREA-AV | /ERAGED Ap | = 0.28 | 402 40 |
| IOIAL AREA(ACRES) - | | | | | |
| | | | | | |
| ****** | ****** | ***** | ****** | ****** | ****** |
| ************************************** | ******** | ******* TO NODE | ********* 153.00 I | ******** S CODE = | ****** |
| ************************************** | ******** 153.00 TO MAINL | ******* TO NODE | ********* 153.00 I FLOW<<<< | ******** S CODE = | ******** 81 |
| ************************************** | ******** 153.00 TO MAINL | ******* TO NODE | ********* 153.00 I FLOW<<<< | ******** S CODE = | ******** 81 |
| FLOW PROCESS FROM NODE >>>>ADDITION OF SUBAREA MAINLINE TC(MIN.) = 21 | ******** 153.00 TO MAINL | ******** TO NODEINE PEAK | ********* 153.00 I FLOW< | ******** S CODE = | ******** 81 |
| FLOW PROCESS FROM NODE >>>>ADDITION OF SUBAREA MAINLINE TC(MIN.) = 21 * 100 YEAR RAINFALL INTE | ******** 153.00 TO MAINL 52 NSITY(INC | ******** TO NODEINE PEAK = | ********* 153.00 I FLOW<>>> | ******** S CODE = | ********* |
| FLOW PROCESS FROM NODE >>>>ADDITION OF SUBAREA MAINLINE TC(MIN.) = 21 * 100 YEAR RAINFALL INTE | ******** 153.00 TO MAINL 52 NSITY(INC | ******** TO NODEINE PEAK = | ********* 153.00 I FLOW<>>> | ******** S CODE = | ********* |
| FLOW PROCESS FROM NODE >>>>ADDITION OF SUBARREA MAINLINE TO (MIN.) = 2.2. * 100 YEAR RAINFALL INTE SUBAREA LOSS RATE DATA (A DEVELOPMENT TYPE/ LAND USE | ******** 153.00 TO MAINL 52 NSITY(INC | ******** TO NODEINE PEAK = | ********* 153.00 I FLOW<>>> | ******** S CODE = | ********* |
| FLOW PROCESS FROM NODE >>>> ADDITION OF SUBAREA MAINLINE TC(MIN.) = 2: 100 YBAR RAINFALL INTE SUBAREA LOSS RATE DATA (A DEVELOPMENT TYPE/ LAND USE RESIDENTIAL | ******** 153.00 TO MAINL 52 NSITY(INC MC III): SCS SOIL GROUP | ******* TO NODE INE PEAK H/HR) = AREA (ACRES) | 153.00 I FLOW<<<< 2.681 Fp (INCH/HR) | ********* S CODE = | ************************************** |
| FLOW PROCESS FROM NODE >>>> ADDITION OF SUBAREA MAINLINE TC(MIN.) = 21 ** 100 'YBAR RAINFALL INTE SUBAREA LOSS RATE DATA (A DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL | ******** 153.00 TO MAINL52 NSITY(INC MCI III): SCS SOIL GROUP C | ******* TO NODE INE PEAK H/HR) = AREA (ACRES) | ********* 153.00 I FLOW<>>> | ********* S CODE = | ************************************** |
| FLOW PROCESS FROM NODE >>>>ADDITION OF SUBARRE MAINLINE TC (MIN.) = 22 **100 YEAR RAINFALL INTE SUBARRA LOSS RATE DATA(A DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "5-7 DEPLINGS/ACRE" | ******** 153.00 TO MAINL52 NSITY(INC MCI III): SCS SOIL GROUP C | ******* TO NODEINE PEAK H/HR) = AREA (ACRES) 5.30 | 153.00 I FLOW<<<< 2.681 Fp (INCH/HR) | ********* S CODE = | ************************************** |
| FLOW PROCESS FROM NODE >>>> ADDITION OF SUBAREA MAINLINE TC(MIN.) = 2: * 100 'VBAR RAINFALL INTE SUBAREA LOSS RATE DATA (A DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL | ******** 153.00 TO MAINL52 NSITY (INC MC III): SCS SOIL GROUP C D | ******** TO NODE INE PEAK H/HR) = AREA (ACRES) 5.30 0.58 | 153.00 I FLOW<<<< 2.681 Fp (INCH/HR) 0.25 0.20 | ********* S CODE = | ************************************** |
| FLOW PROCESS FROM NODE >>>> ADDITION OF SUBAREA MAINLINE TC(MIN.) = 2. **100 YEAR RAINFALL INTE SUBAREA LOSS RATE DATA(A DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" | ******** 153.00 TO MAINL52 NSITY (INC MC III): SCS SOIL GROUP C D | ******** TO NODE INE PEAK H/HR) = AREA (ACRES) 5.30 0.58 9.75 | 153.00 I FLOW<<<< 2.681 Fp (INCH/HR) 0.25 0.20 0.25 | ********* S CODE = Ap (DECIMAL) 0.500 0.500 0.400 | ************************************** |
| FLOW PROCESS FROM NODE >>>> ADDITION OF SUBAREA MAINLINE TC(MIN.) = 2: **100 YEAR RAINFALL INTE SUBAREA LOSS RATE DATA (A DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" | ******** 153.00 TO MAINL TO MAINL SCS SOIL GROUP C D C | ******** TO NODE INE PEAK H/HR) = AREA (ACRES) 5.30 0.58 9.75 | 153.00 I FLOW<<<< 2.681 Fp (INCH/HR) 0.25 0.20 0.25 | ********* S CODE = Ap (DECIMAL) 0.500 0.500 0.400 | SCS CN 86 91 86 |
| FLOW PROCESS FROM NODE >>>> ADDITION OF SUBAREA MAINLINE TC(MIN.) = 2. **100 YEAR RAINFALL INTE SUBAREA LOSS RATE DATA(A DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" | ******** 153.00 TO MAINL TO MAINL SCS SOIL GROUP C D C | ******** TO NODE INE PEAK H/HR) = AREA (ACRES) 5.30 0.58 9.75 | 153.00 I FLOW<<<< 2.681 Fp (INCH/HR) 0.25 0.20 0.25 | ********* S CODE = Ap (DECIMAL) 0.500 0.500 0.400 | SCS CN 86 91 86 |
| FLOW PROCESS FROM NODE >>>>ADDITION OF SUBARRA MAINLINE TC (MIN.) = 22 **100 YEAR RAINFALL INTE SUBARRA LOSS RATE DATA (A DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" APARTMENTS APARTMENTS COMMODIAL | ******** 153.00 TO MAINL 52 NSITY(INC MC III): SCS SOIL GROUP C D C | ********* TO NODE INE PEAK H/HR) = AREA (ACRES) 5.30 0.58 9.75 1.01 2.16 | 153.00 I FLOW<<<< 2.681 Fp (INCH/HR) 0.25 0.20 0.25 0.20 0.25 | ********* S CODE = | ************************************** |
| FLOW PROCESS FROM NODE >>>>ADDITION OF SUBARRE MAINLINE TO (MIN.) = 2.2. * 100 YEAR RAINFALL INTE SUBAREA LOSS RATE DATA (A DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" APARTMENTS COMMERCIAL SUBAREA AVERAGE PERVIOUS SUBAREA AVERAGE PERVIOUS | 153.00 TO MAINL 52 NSITY(INC MC III): SCS SOIL GROUP C D C D C LOSS RAT | ******** TO NODE | 153.00 I | ********* S CODE = | ************************************** |
| FLOW PROCESS FROM NODE >>>>ADDITION OF SUBARRA MAINLINE TC (MIN.) = 22 **100 YEAR RAINFALL INTE SUBARRA LOSS RATE DATA (A DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DEBLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" APARTMENTS COMMERCIAL SUBARRA AVERGE PERVIOUS SUBARRA AVERGE PERVIOUS SUBARRA AVERGE PERVIOUS | 153.00 TO MAINL 52 NSITY (INC MC III): SCS SOIL GROUP C D C LOSS RAT | ******** TO NODE INE PEAK H/HR) = AREA (ACRES) 5.30 0.58 9.75 1.01 2.16 2.28 E, Fp(ICTION IN | 153.00 I FLOW<<<< 2.681 Fp (INCH/HR) 0.25 0.20 0.25 0.25 0.25 0.24 HR) = 0 375 | Ap (DECIMAL) 0.500 0.500 0.400 0.200 0.100 | SCS CN 86 91 86 91 86 86 86 |
| FLOW PROCESS FROM NODE >>>>ADDITION OF SUBARRA MAINLINE TC (MIN.) = 22 **100 YEAR RAINFALL INTE SUBARRA LOSS RATE DATA (A DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DEBLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" APARTMENTS COMMERCIAL SUBARRA AVERGE PERVIOUS SUBARRA AVERGE PERVIOUS SUBARRA AVERGE PERVIOUS | 153.00 TO MAINL 52 NSITY (INC MC III): SCS SOIL GROUP C D C LOSS RAT | ******** TO NODE INE PEAK H/HR) = AREA (ACRES) 5.30 0.58 9.75 1.01 2.16 2.28 E, Fp(ICTION IN | 153.00 I FLOW<<<< 2.681 Fp (INCH/HR) 0.25 0.20 0.25 0.25 0.25 0.24 HR) = 0 375 | Ap (DECIMAL) 0.500 0.500 0.400 0.200 0.100 | SCS CN 86 91 86 91 86 86 86 |
| FLOW PROCESS FROM NODE >>>> ADDITION OF SUBARRE MAINLINE TC (MIN.) = 2.2 ** 100 YEAR RAINFALL INTE SUBAREA LOSS RATE DATA (A DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL SUDAREA AVERAGE PERVIOUS SUBAREA AVERAGE PERVIOUS SUBAREA AREA (ACRES) = EFFECTIVE AREA (ACRES) = EFFECTIVE AREA (ACRES) = | 153.00 TO MAINL SSC SOIL GROUP C D C C LOSS RAT AREA FFA 21.08 229.93) = 0.22 | ******** TO NODE | 153.00 I | Ap (DECIMAL) 0.500 0.500 0.400 0.200 0.100 .25 S) = 49. (INCH/HR) = 0.29 | SCS CN 86 91 86 91 86 86 81 22 |
| FLOW PROCESS FROM NODE >>>>ADDITION OF SUBARRE MAINLINE TO (MIN.) = 2.2. * 100 YEAR RAINFALL INTE SUBAREA LOSS RATE DATA (A DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" APARTMENTS COMMERCIAL SUBAREA AVERAGE PERVIOUS SUBAREA AVERAGE PERVIOUS | 153.00 TO MAINL SSC SOIL GROUP C D C C LOSS RAT AREA FFA 21.08 229.93) = 0.22 | ******** TO NODE | 153.00 I | Ap (DECIMAL) 0.500 0.500 0.400 0.200 0.100 .25 S) = 49. (INCH/HR) = 0.29 | SCS CN 86 91 86 91 86 86 81 22 |
| FLOW PROCESS FROM NODE >>>> ADDITION OF SUBARRE MAINLINE TC (MIN.) = 2.2 ** 100 YEAR RAINFALL INTE SUBAREA LOSS RATE DATA (A DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL SUDAREA AVERAGE PERVIOUS SUBAREA AVERAGE PERVIOUS SUBAREA AREA (ACRES) = EFFECTIVE AREA (ACRES) = EFFECTIVE AREA (ACRES) = | 153.00 | ******** TO NODE | 153.00 I FLOW<<<< 2.681 Fp (INCH/HR) 0.25 0.20 0.25 0.25 0.25 0.25 CH/HR) = 0.375 A RUNOFF (CF WVERAGED Fm FLOW RATE (| Ap (DECIMAL) 0.500 0.500 0.400 0.200 0.100 .25 S) = 49. (INCH/HR) = 0.29 CFS) = | SCS CN 86 91 86 91 86 86 12 = 0.06 541.61 |
| FLOW PROCESS FROM NODE >>>>ADDITION OF SUBARRE MAINLINE TC (MIN.) = 2.2 **100 YEAR RAINFAL INTE SUBAREA LOSS RATE DATA (A DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" APARTMENTS COMMERCIAL SUBAREA AVERAGE PERVIOUS SUBAREA AVERAGED FO (INCH/HR TOTAL AREA (ACRES) = FFFECTIVE AREA (ACRES) = | 153.00 | ******** TO NODE | 153.00 I FLOW<<<< 2.681 Fp (INCH/HR) 0.25 0.20 0.25 0.25 0.25 0.25 CH/HR) = 0 D = 0.375 A RUNOFF (CF VERAGED Ap FLOW RATE (| Ap (DECIMAL) 0.500 0.500 0.400 0.200 0.100 0.25 S) = 49. (INCH/HR) = 0.29 CFS) = | SCS CN 86 91 86 91 86 86 86 86 86 86 86 86 86 86 86 86 86 |
| FLOW PROCESS FROM NODE >>>>ADDITION OF SUBAREA MAINLINE TC(MIN.) = 21 ** 100 YEAR RAINFALL INTE SUBAREA LOSS RATE DATA (A DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" AFARTMENTS COMMERCIAL SUBAREA AVERAGE PERVIOUS SUBAREA AVERAGE PERVIOUS SUBAREA AVERAGE PERVIOUS SUBAREA AREA(ACRES) = AREA-AVERAGED PE(INCH/HE TOTAL AREA(ACRES) = FLOW PROCESS FROM NODE | 153.00 TO MAINL .52 NSITY (INC MC III): SCSS SOIL GROUP C D C LOSS RAT AREA FFA 2.29.93) = 0.22 235.6 | TO NODE INE PEAK H/HR) = AREA (ACRES) 5.30 0.58 9.75 1.01 2.16 2.28 E, Fp(INCTION, A) SUBAREA AREA-A' PEAK TO NODE | 153.00 I FLOW<<<< 2.681 Fp (INCH/HR) 0.25 0.20 0.25 0.20 0.25 0.25 0.25 0.27 A RUNOFF (CF VERAGED Ap TERAGED Ap FLOW RATE (F | Ap (DECIMAL) 0.500 0.500 0.400 0.200 0.100 0.25 S) = 49. (INCH/HR) = 0.29 CFS) = | SCS CN 86 91 86 91 86 86 86 86 86 86 86 86 86 86 86 86 86 |
| FLOW PROCESS FROM NODE >>>>ADDITION OF SUBAREA MAINLINE TC(MIN.) = 2: **100 YEAR RAINFALL INTE SUBAREA LOSS RATE DATA (A DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" AFARTMENTS COMMERCIAL SUBAREA AVERAGE PERVIOUS SUBAREA AVERAGE PERVIOUS SUBAREA AREA (ACRES) = AREA-AVERAGED FP (INCH/HE TOTAL AREA (ACRES) = FLOW PROCESS FROM NODE >>>>>ADDITION OF SUBAREA | 153.00 TO MAINL .52 NSITY(INC MC III): SCSC SOIL GROUP C D C D C LOSS RAT AREA FFA 229.93) = 0.22 235.6 | ******** TO NODE AREA (ACRES) 5.30 0.58 9.75 1.01 2.16 2.28 E, FP(INCTION, AREA-A' AREA-A' TO NODE | 153.00 I FLOW<<<< 2.681 Fp (INCH/HR) 0.25 0.20 0.25 0.25 0.25 0.25 A RUNOFF (CF VERAGED Ap FLOW RATE (153.00 I FLOW<<<<< | Ap (DECIMAL) 0.500 0.500 0.400 0.200 0.100 0.20 0.100 0.25 S) = 49. (TINCH/HR) = 0.29 CFS) = | SCS CN 86 91 86 86 86 86 86 86 86 86 86 86 86 86 86 |
| FLOW PROCESS FROM NODE >>>>ADDITION OF SUBAREA MAINLINE TC (MIN.) = 2.2 **100 YEAR RAINFALL INTE SUBAREA LOSS RATE DATA (A DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" APARTMENTS COMMERCIAL SUBAREA AVERAGE PERVIOUS FOMMERCIAL SUBAREA AVERAGE PERVIOUS SUBAREA AVERAGE PERVIOUS FOMMERCIAL FOM PROCESS FROM NODE >>>>ADDITION OF SUBAREA MAINLINE TC (MIN.) = 21 | 153.00 TO MAINL 52 SCS SOIL GROUP C D C LOSS RATA 22.93 22.93 153.00 TO MAINL | ******** TO NODE INE PEAK AREA (ACRES) 5.30 0.58 9.75 1.01 2.16 2.28 E, FP(INCTION, AREA-AN AREA-AN AREA-AN FEAK *********************************** | 153.00 I FLOW<<<< 2.681 Fp (INCH/HR) 0.25 0.20 0.25 0.25 0.25 0.25 A RUNOFF (CF VERAGED Ap FLOW RATE (153.00 I FLOW<<<< | Ap (DECIMAL) 0.500 0.500 0.400 0.200 0.100 0.20 0.100 0.25 S) = 49. (TINCH/HR) = 0.29 CFS) = | SCS CN 86 91 86 86 86 86 86 86 86 86 86 86 86 86 86 |
| FLOW PROCESS FROM NODE >>>>ADDITION OF SUBAREA MAINLINE TC(MIN.) = 2: **100 YEAR RAINFALL INTE SUBAREA LOSS RATE DATA (A DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" AFARTMENTS COMMERCIAL SUBAREA AVERAGE PERVIOUS SUBAREA AVERAGE PERVIOUS SUBAREA AREA (ACRES) = AREA-AVERAGED FP (INCH/HE TOTAL AREA (ACRES) = FLOW PROCESS FROM NODE >>>>>ADDITION OF SUBAREA | 153.00 TO MAINL SE NO C C C C C C C C C C C C C C C C C C | TO NODE AREA (ACRES) 5.30 0.58 9.75 1.01 2.16 2.28 E. FP(INN CTION, AB SEARA TO NODE INE PEAK H/HR) = | 153.00 I FLOW<<<< 2.681 Fp (INCH/HR) 0.25 0.20 0.25 0.25 0.25 0.25 A RUNOFF (CF VERAGED Ap FLOW RATE (153.00 I FLOW<<<< | Ap (DECIMAL) 0.500 0.500 0.400 0.200 0.100 0.20 0.100 0.25 S) = 49. (TINCH/HR) = 0.29 CFS) = | SCS CN 86 91 86 86 86 86 86 86 86 86 86 86 86 86 86 |

SCS SOIL AREA FP AP SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN 4 50 0.20 0.100 91 DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE COMMERCIAL PUBLIC PARK 4.30 0.25 0.850 PUBLIC PARK 0.20 0.850 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.24 **************************** FLOW PROCESS FROM NODE 153.00 TO NODE 155.00 IS CODE = 41 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <>>> ELEVATION DATA: UPSTREAM(FEET) = 1007.62 DOWNSTREAM(FEET) = 1004.25 FLOW LENGTH(FEET) = 568.89 MANNING'S N = 0.013 ASSUME FULL-FLOWING PIPELINE PIPE-FLOW VELOCITY (FEET/SEC.) = 28.72 | PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA) | GIVEN PIPE DIAMETER (INCH) = 60.00 | NUMBER OF PIPES = 1 | PIPE-FLOW (CFS) = 563.89 | To (MIN.) = 21.85 | PIPE TRAVEL TIME (MIN.) = 0.33 | To (MIN.) = 21.85 | COMBERT FLOWPATH FROM NODE | 155.00 = 8828.57 FEET. ************************** FLOW PROCESS FROM NODE 155.00 TO NODE 155.00 IS CODE = 1 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE TOTAL NUMBER OF STREAMS = 2 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE: TIME OF CONCENTRATION(MIN.) = 21.85
RAINFALL INTENSITY(INCH/HR) = 2.66
AREA-AVERAGED Fm(INCH/HR) = 0.07 AREA-AVERAGED Fp(INCH/HR) = 0.22 AREA-AVERAGED FP(IR/RK) = 0.22
AREA-AVERAGED AP = 0.30
EFFECTIVE STREAM AREA(ACRES) = 239
TOTAL STREAM AREA(ACRES) = 245.29
PEAK FLOW RATE(CFS) AT CONFLUENCE = ******************** FLOW PROCESS FROM NODE 400.00 TO NODE 401.00 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< INITIAL SUBAREA FLOW-LENGTH (FEET) = 295.31 ELEVATION DATA: UPSTREAM(FEET) = 1025.50 DOWNSTREAM(FEET) = 1017.82 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 6.13 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.502 SUBAREA To AND LOSS RATE DATA (AMC III): DEVELOPMENT TYPE/ SCS SOIL AREA GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
C 0.15 0.25 0.100 86 6.14 LAND USE COMMERCIAL C 0.73 COMMERCIAL 0.20 0.100 91 6.14 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100 SUBAREA RUNOFF (CFS) = 4.34 TOTAL AREA (ACRES) = 0.88 PEAK FLOW RATE(CFS) = ********************** FLOW PROCESS FROM NODE 401.00 TO NODE 403.00 IS CODE = 31 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1017.82 DOWNSTREAM(FEET) = 1017.71 FLOW LENGTH (FEET) = 249.58 MANNING'S N = 0.013

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DEPTH OF FLOW IN 24.0 INCH PIPE IS 18.9 INCHES PIPE-FLOW VELOCITY(FEET/SEC.) = 1.63 ESTIMATED PIPE DIAMETER(INCH) = 24.00 NUMBER (
                                                    NUMBER OF PIPES = 1
 PIPE-FLOW (CFS) = 4.34

PIPE TRAVEL TIME (MIN.) = 2.54 TC (MIN.) = 8.68

LONGEST FLOWPATH FROM NODE 400.00 TO NODE 403.00 =
*******************
 FLOW PROCESS FROM NODE 403.00 TO NODE 403.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
  MAINLINE Tc(MIN.) = 8.68
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.510
 SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA
       LAND USE
                               GROUP (ACRES) (INCH/HR) (DECIMAL) CN
  COMMERCIAL.
                              C 0.27
D 0.80
                                                    0.25
0.20
                                                                0.100
0.100
 SUBARRA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21
SUBARRA AVERAGE PERVIOUS ARRA FRACTION, Ap = 0.100
SUBARRA ARRA(ACRES) = 1.07
SUBARRA ARRA(ACRES) = 4.32
EFFECTIVE ARRA (ACRES) = 1.95
ARRA-AVERAGED Fm(INCH/HR) = 0.02
ARRA-AVERAGED Ap = 0.10
                               2.0 PEAK FLOW RATE(CFS) =
*******************
 FLOW PROCESS FROM NODE 403.00 TO NODE 405.00 IS CODE = 31
  >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
  >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<<
  ELEVATION DATA: UPSTREAM(FEET) = 1017.71 DOWNSTREAM(FEET) = 1016.04
 FLOW LENGTH (FEET) = 247.50 MANNING'S N = 0.013
DEPTH OF FLOW IN 18.0 INCH PIPE IS 14.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 5.27
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW (CFS) = 7.88
 PIPE-FLOW (CFS) = 7.88

PIPE TRAVEL TIME (MIN.) = 0.78 Tc (MIN.) = 9.46

LONGEST FLOWPATH FROM NODE 400.00 TO NODE 405.00 =
                                                                          792.39 FEET.
************************
 FLOW PROCESS FROM NODE 405.00 TO NODE 405.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
              .....
 MAINLINE TC(MIN.) = 9.46
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.293
  SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                    0.25 0.100
  COMMERCIAL
                               C 0.50
  COMMERCIAL
                                             2.45
                                                         0.20
                                                                    0.100 91
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21
 SUBARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBARRA AREA (ACRES) = 2.95
SUBARRA RUNOFF (CFS) = 11.34
EFFECTIUVE AREA (ACRES) = 4.90
AREA-AVERAGED Fm (INCH/HR) = 0.02
AREA-AVERAGED Fm (INCH/HR) = 0.02
                                            PEAK FLOW RATE (CFS) =
  TOTAL AREA (ACRES) =
                                  4.9
******************
 FLOW PROCESS FROM NODE 405.00 TO NODE 155.00 IS CODE = 31
  >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
  >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<<
 ELEVATION DATA: UPSTREAM(FEET) = 1016.04 DOWNSTREAM(FEET) = 1014.57 FLOW LENGTH(FEET) = 96.59 MANNING'S N = 0.013 DEPTH OF FLOW IN 24.0 INCH PIPE IS 15.0 INCHES PIPE-FLOW VELOCITY(FEET/SEC.) = 9.15
  ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 18.84
PIPE TRAVEL TIME(MIN.) = 0.18 Tc(MIN.) = 9.64
```

LONGEST FLOWPATH FROM NODE 400.00 TO NODE 155.00 =

888.98 FEET.

31

| | | | | | | | CODE = | 1 |
|--|---|--|--|---|---------------------------------|--|---------------------|---|
| >>>>DESI | GNATE IND | EPENDENT ARIOUS C | STREAM F | OR CONFI | LUENCI M VAL | E<<<< UES<<< | << | |
| TOTAL NUM CONFLUENC TIME OF CORAINFALL AREA-AVER AREA-AVER AREA-AVER EFFECTIVE TOTAL STR PEAK FLOW | BER OF ST E VALUES ONCENTRAT INTENSITY AGED Fm(I AGED Fp(I | REAMS = USED FOR ION (MIN. (INCH/HR NCH/HR) | 2 INDEPEND) = 9.) = 4.2 = 0.02 = 0.21 | ENT STRI 64 5 | EAM : | | | |
| | | | | | | | | |
| STREAM NUMBER | Q (CFS) | Tc (MIN.) | Intensity (INCH/HR) | Fp(Fi | m) HR) | Ap | Ae (ACRES) | HEADWATER NODE 300.00 200.00 100.00 400.00 |
| 1 | 525.97 | 10.08 | 4.140 | 0.23(| 0.07) | 0.30 | 140.5 | 300.00 |
| 1 | 555.12 | 23.33 | 2.558 | 0.22(| 0.07) | 0.30 | 239.6 | 100.00 |
| 2 | 18.84 | 9.64 | 4.247 | 0.21(| 0.02) | 0.10 | 4.9 | 400.00 |
| RAINFALL CONFLUENC | | | | | ON RA | TIO | | |
| ** PEAK F | LOW RATE | TABLE ** | | | | | | |
| NUMBER | (CFS) | (MIN.) | (INCH/HR) | (INCH/ | m) HR) | Ар | (ACRES) | NODE |
| 1 | 535.10 | 9.64 | 4.247 | 0.23(| 0.07) | 0.29 | 139.3 | 400.00 |
| 3 | 544.33 | 21.85 | 2.658 | 0.23(| 0.07) | 0.29 | 244.5 | 200.00 |
| 4 | 566.43 | 23.33 | 2.560 | 0.22(| 0.07) | 0.30 | 250.2 | HEADWATER NODE 400.00 300.00 200.00 100.00 |
| | A(ACRES) LOWPATH F | ROM NODE | 100.0 | 0 TO NO | DE | 155.0 | 0 = 882 | 28.57 FEET. |
| FLOW PROC | | | | | | | | |
| >>>>COMP | JTE PIPE- G USER-SP | FLOW TRA | VEL TIME PIPESIZE | THRU SUI | BAREA NG EL | <<<<< EMENT) | <<<< | |
| ELEVATION FLOW LENG ASSUME FU PIPE-FLOW PIPE FLOW GIVEN PIP PIPE-FLOW PIPE TRAVI LONGEST F | DATA: UP IH (FEET) LL-FLOWIN VELOCITY VELOCITY E DIAMETE (CFS) = EL TIME (M | STREAM(F: = 180. G PIPELII (FEET/SE: = (TOTA: R(INCH): 575.6 IN.) = | EET) = 1 04 MANN NE C.) = 29 L FLOW)/(= 60.00 4 | O04.25 ING'S N .32 PIPE CRO NUMBI | DOWN: = 0 OSS SI ER OF | STREAM .013 ECTION PIPES 21.95 | (FEET) = AREA) = 1 | 1002.32 D8.61 FEET. |
| ******** | | | | | | | | ********* |
| | | | | | | | | |
| MAINLINE | rc(MIN.) | = 21.9 | ======= 5 | | | | | |
| * 100 YEA SUBAREA L DEVELOPM LAND COMMERCIA | R RAINFAL DSS RATE ENT TYPE/ | L INTENS DATA (AMC SC | ITY(INCH/ III): S SOIL | HR) = : | 2.651 Fp | /UD) | Ap | SCS |
| COMMERCIA SUBAREA A | | G. | (M | 1 10 | , 224017. | / | (LECTION) | 0.1 |

| AREA-AVE TOTAL AF NOTE: PE | ERAGED Fp() REA(ACRES) EAK FLOW RA | NCH/HR) = : TE DEFA | = 0.22 . 251.4 JLTED TO U | AREA-AVEF PEAK FI PSTREAM V | RAGED Ap = LOW RATE(C VALUE | | 575.64 |
|--|---|--|--|--|--|--|---|
| FLOW PRO | | NODE | 158.00 TO | NODE | 158.00 IS | ********* CODE = 15 | .1 |
| >>>>DEF | FINE MEMORY | BANK # | 1 <<<<< | | | | |
| | | | | | | | |
| MEMORY F | BANK # 1 D | EFINED A | AS FOLLOWS | : | | HEADWATER NODE 310.0 220.0 290.0 214.0 226.0 300.0 230.0 260.0 234.0 250.0 210.0 | |
| STREAM | Q | Tc | Fp(Fm) | Ap | Ae | HEADWATER | |
| NUMBER | (CFS) | (MIN.) | (INCH/HR) | | (ACRES) | NODE | |
| 1 | 30.59 | 5.98 | 0.20(0. | 02) 0.10 | 5.8 | 310.0 | 0 |
| 2 | 31.02 | 6.22 | 0.20(0. | 02) 0.10 | 6.1 | 220.0 | 0 |
| 3 | 31.17 | 6.57 | 0.20(0. | 02) 0.10 | 6.3 | 290.0 | 0 |
| 5 | 31.19 | 6.67 | 0.20(0. | 02) 0.10 | 6.4 | 226.0 | 0 |
| 6 | 30.39 | 7.46 | 0.20(0. | 02) 0.10 | 6.7 | 300.0 | 0 |
| 7 | 29.64 | 8.05 | 0.20(0. | 02) 0.10 | 6.8 | 230.0 | 0 |
| 8 | 29.43 | 8.22 | 0.20(0. | 02) 0.10 | 6.8 | 260.0 | 0 |
| 10 | 29.03 | 8.47 | 0.20(0. | 02) 0.10 | 6.9 | 234.0 | 0 |
| 11 | 20.73 | 9 68 | 0.20(0. | 02) 0.10 | 6.9 | 210.0 | 0 |
| TOTAL | AREA (ACRES | () = | 6.9 | 02, 0.10 | 0.5 | 210.0 | |
| | | | | | | | |
| FLOW PRO | OCESS FROM | NODE | 158.00 TO | NODE | 158.00 IS | ************************************** | 1 |
| | | | | | | MEMORY<<< | |
| COP | | | NE # 1 W11: | | | | ` ======== |
| | | | | | | | |
| ** MAIN | STREAM CON | FLUENCE | DATA ** | | | | |
| STREAM | Q | Tc | Intensity | Fp(Fm) | Ap | Ae | HEADWATER |
| | | | | | | | |
| NUMBER | (CFS) | (MIN.) | (INCH/HR) | (INCH/HE | R) | (ACRES) | NODE |
| NUMBER 1 | (CFS) 535.10 | (MIN.) 9.75 | (INCH/HR) 4.220 | (INCH/HF 0.23(0. | R) .07) 0.29 | (ACRES) 140.5 | NODE 400.00 |
| 1 2 3 | (CFS) 535.10 544.33 575.64 | (MIN.) 9.75 10.19 21.95 | (INCH/HR) 4.220 4.115 2.651 | (INCH/HE 0.23(0. 0.23(0. | R) .07) 0.29 .07) 0.29 | (ACRES) 140.5 146.6 245.7 | NODE 400.00 300.00 |
| 1 2 3 4 | (CFS) 535.10 544.33 575.64 566.43 | (MIN.) 9.75 10.19 21.95 23.43 | (INCH/HR) 4.220 4.115 2.651 2.553 | (INCH/HE 0.23(0. 0.23(0. 0.22(0. 0.22(0. | R) .07) 0.29 .07) 0.29 .07) 0.30 .07) 0.30 | (ACRES) 140.5 146.6 245.7 251.4 | NODE 400.00 300.00 200.00 |
| 1 2 3 4 LONGEST | (CFS) 535.10 544.33 575.64 566.43 FLOWPATH E | (MIN.) 9.75 10.19 21.95 23.43 ROM NOD | (INCH/HR) 4.220 4.115 2.651 2.553 E 100.0 | (INCH/HE 0.23(0. 0.23(0. 0.22(0. 0.22(0. 0.10 TO NODE | R) .07) 0.29 .07) 0.29 .07) 0.30 .07) 0.30 E 158.0 | (ACRES) 140.5 146.6 245.7 251.4 0 = 900 | NODE 400.00 300.00 200.00 100.00 8.61 FEET. |
| 1 2 3 4 LONGEST | (CFS) 535.10 544.33 575.64 566.43 FLOWPATH F | (MIN.) 9.75 10.19 21.95 23.43 ROM NODI | (INCH/HR) 4.220 4.115 2.651 2.553 E 100.0 | (INCH/HE 0.23(0. 0.23(0. 0.22(0. 0.22(0. 0 TO NODE | R) .07) 0.29 .07) 0.29 .07) 0.30 .07) 0.30 E 158.0 | Ae (ACRES) 140.5 146.6 245.7 251.4 0 = 900 | NODE 400.00 300.00 200.00 100.00 8.61 FEET. |
| 1 2 3 4 LONGEST ** MEMOF | (CFS) 535.10 544.33 575.64 566.43 FLOWPATH F | (MIN.) 9.75 10.19 21.95 23.43 ROM NODI | (INCH/HR) 4.220 4.115 2.651 2.553 E 100.0 | (INCH/HF 0.23(0. 0.23(0. 0.22(0. 0.22(0. 0 TO NODE | R) .07) 0.29 .07) 0.29 .07) 0.30 .07) 0.30 E 158.0 | (ACRES) 140.5 146.6 245.7 251.4 0 = 900 | NODE 400.00 300.00 200.00 100.00 8.61 FEET. |
| 1 2 3 4 LONGEST ** MEMOF STREAM | (CFS) 535.10 544.33 575.64 566.43 FLOWPATH F | (MIN.) 9.75 10.19 21.95 23.43 ROM NOD | (INCH/HR) 4.220 4.115 2.651 2.553 E 100.0 JENCE DATA Intensity | (INCH/HF 0.23(0. 0.23(0. 0.22(0. 0.22(0. 0 TO NODE ** | R) .07) 0.29 .07) 0.29 .07) 0.30 .07) 0.30 E 158.0 | (ACRES) 140.5 146.6 245.7 251.4 0 = 900 | NODE 400.00 300.00 200.00 100.00 8.61 FEET. |
| LONGEST ** MEMOF STREAM NUMBER | (CFS) 535.10 544.33 575.64 566.43 FLOWPATH F Q (CFS) | (MIN.) 9.75 10.19 21.95 23.43 ROM NODI 1 CONFLI TC (MIN.) | (INCH/HR) 4.220 4.115 2.651 2.553 E 100.0 JENCE DATA Intensity (INCH/HR) 5.583 | (INCH/HF 0.23(0. 0.23(0. 0.22(0. 0.22(0. 0 TO NODE ** Fp(Fm) (INCH/HF | R) .07) 0.29 .07) 0.29 .07) 0.30 .07) 0.30 E 158.0 Ap | (ACRES) 140.5 146.6 245.7 251.4 0 = 900 Ae (ACRES) | NODE 400.00 300.00 200.00 100.00 8.61 FEET. HEADWATER NODE 310.00 |
| NUMBER 1 2 3 4 LONGEST ** MEMOF STREAM NUMBER 1 2 | (CFS) 535.10 544.33 575.64 566.43 FLOWPATH F RY BANK # Q (CFS) 30.59 31.02 | (MIN.) 9.75 10.19 21.95 23.43 ROM NOD! 1 CONFL Tc (MIN.) 5.98 6.22 | (INCH/HR) 4.220 4.115 2.651 2.553 E 100.0 JENCE DATA Intensity (INCH/HR) 5.583 5.460 | (INCH/HF 0.23(0. 0.23(0. 0.22(0. 0.22(0. 0 TO NODE ** Fp(Fm) (INCH/HF 0.20(0. | R) .07) 0.29 .07) 0.29 .07) 0.30 .07) 0.30 E 158.0 Ap R) .02) 0.10 | (ACRES) 140.5 146.6 245.7 251.4 0 = 900 Ae (ACRES) 5.8 6.1 | NODE 400.00 300.00 200.00 100.00 8.61 FEET. HEADWATER NODE 310.00 220.00 |
| NUMBER 1 2 3 4 LONGEST ** MEMOF STREAM NUMBER 1 2 3 | (CFS) 535.10 544.33 575.64 566.43 FLOWPATH F Q (CFS) 30.59 31.02 31.17 | (MIN.) 9.75 10.19 21.95 23.43 ROM NOD! 1 CONFLI Tc (MIN.) 5.98 6.22 6.57 | (INCH/HR) 4.220 4.115 2.651 2.553 E 100.0 JENCE DATA Intensity (INCH/HR) 5.583 5.460 5.292 | (INCH/HE 0.23(0. 0.23(0. 0.22(0. 0.22(0. 0.22(0. 0.10 NODE ** Fp(Fm) (INCH/HE 0.20(0. 0.20(0. | R) .07) 0.29 .07) 0.29 .07) 0.30 .07) 0.30 E 158.0 Ap R) .02) 0.10 .02) 0.10 .02) 0.10 | (ACRES) 140.5 146.6 245.7 251.4 0 = 900 Ae (ACRES) 5.8 6.1 6.3 | NODE 400.00 300.00 200.00 100.00 8.61 FEET. HEADWATER NODE 310.00 220.00 290.00 |
| ** MEMOF STREAM NUMBER 1 2 3 4 LONGEST | (CFS) 535.10 544.33 575.64 566.43 FLOWPATH F RY BANK # Q (CFS) 30.59 31.02 31.17 31.18 | (MIN.) 9.75 10.19 21.95 23.43 PROM NOD! 1 CONFL! TC (MIN.) 5.98 6.22 6.57 6.60 | (INCH/HR) 4.220 4.115 2.651 2.553 E 100.0 JENCE DATA Intensity (INCH/HR) 5.583 5.460 5.292 5.279 | (INCH/HE 0.23(0. 0.23(0. 0.22(0. 0.22(0. 0.22(0. 0.20(0. 0.20(0. 0.20(0. 0.20(0. 0.20(0. 0.20(0. 0.20(0. | R) .07) 0.29 .07) 0.29 .07) 0.30 .07) 0.30 .07) 0.30 E 158.0 Ap R) .02) 0.10 .02) 0.10 .02) 0.10 .02) 0.10 | (ACRES) 140.5 146.6 245.7 251.4 0 = 900 Ae (ACRES) 5.8 6.1 6.3 6.3 | NODE 400.00 300.00 200.00 100.00 8.61 FEET. HEADWATER NODE 310.00 220.00 290.00 |
| ** MEMOF STREAM NUMBER 1 2 3 4 5 | (CFS) 535.10 544.33 575.64 566.43 FLOWPATH F Q (CFS) 30.59 31.02 31.17 31.18 31.19 | (MIN.) 9.75 10.19 21.95 23.43 ROM NOD! 1 CONFLI TC (MIN.) 5.98 6.22 6.57 6.60 6.67 | (INCH/HR) 4.220 4.115 2.651 100.0 JENCE DATA Intensity (INCH/HR) 5.583 5.460 5.292 5.279 5.244 | (INCH/HE 0.23 (0. 0.23 (0. 0.22 (0. 0.22 (0. 0.22 (0. 0.20 (0. 0.20 (0. 0.20 (0. 0.20 (0. 0.20 (0. 0.20 (0. 0.20 (0. | R) .07) 0.29 .07) 0.29 .07) 0.30 .07) 0.30 E 158.0 Ap R) .02) 0.10 .02) 0.10 .02) 0.10 .02) 0.10 .02) 0.10 | (ACRES) 140.5 146.6 245.7 251.4 0 = 900 Ae (ACRES) 5.8 6.1 6.3 6.3 | NODE 400.00 300.00 200.00 100.00 8.61 FEET. HEADWATER NODE 310.00 220.00 290.00 214.00 226.00 |
| ** MEMOF STREAM NUMBER 1 2 3 4 5 6 | (CFS) 535.10 544.33 575.64 566.43 FLOWPATH F RY BANK # Q (CFS) 30.59 31.02 31.17 31.18 31.19 30.39 | (MIN.) 9.75 10.19 21.95 23.43 PROM NODD 1 CONFLI TC (MIN.) 5.98 6.22 6.57 6.60 6.67 | (INCH/HR) 4.220 4.115 2.651 100.0 JENCE DATA Intensity (INCH/HR) 5.583 5.460 5.292 5.279 5.244 4.919 | (INCH/HE 0.23 (0. 0.23 (0. 0.22 (0. 0.22 (0. 0.22 (0. 0.20 (0. 0.20 (0. 0.20 (0. 0.20 (0. 0.20 (0. 0.20 (0. 0.20 (0. 0.20 (0. 0.20 (0. 0.20 (0. 0.20 (0. | R) | (ACRES) 140.5 146.6 245.7 251.4 0 = 900 Ae (ACRES) 5.8 6.1 6.3 6.3 6.4 6.7 | NODE 400.00 300.00 200.00 100.00 8.61 FEET. HEADWATER NODE 310.00 220.00 220.00 214.00 320.00 |
| ** MEMOF STREAM NUMBER 1 2 3 4 5 6 7 8 | (CFS) 535.10 544.33 575.64 566.43 FLOWPATH F RY BANK # Q (CFS) 30.59 31.02 31.17 31.18 31.19 30.39 29.64 | (MIN.) 9.75 10.19 21.95 23.43 ROM NODI 1 CONFLI Tc (MIN.) 5.98 6.22 6.57 6.60 6.67 7.46 8.05 | (INCH/HR) 4.220 4.115 2.651 2.553 E 100.0 JENCE DATA Intensity (INCH/HR) 5.583 5.460 5.292 5.279 5.244 4.919 4.709 4.655 | (INCH/HE 0.23 (0. 0.23 (0. 0.22 (0. 0.22 (0. 0.22 (0. 0.20 (0. 0.20 (0. 0.20 (0. 0.20 (0. 0.20 (0. 0.20 (0. 0.20 (0. 0.20 (0. 0.20 (0. 0.20 (0. 0.20 (0. | R) (07) 0.29 (07) 0.29 (07) 0.30 (07) 0.30 E 158.0 Ap R) (02) 0.10 (02) 0.10 (02) 0.10 (02) 0.10 (02) 0.10 (02) 0.10 (02) 0.10 (02) 0.10 (02) 0.10 (02) 0.10 (02) 0.10 (02) 0.10 | (ACRES) 140.5 146.6 245.7 251.4 0 = 900 Ae (ACRES) 5.8 6.1 6.3 6.3 6.3 6.7 6.8 | NODE 400.00 300.00 200.00 100.00 8.61 FEET. HEADWATER NODE 310.00 220.00 214.00 226.00 300.00 230.00 |
| ** MEMOF STREAM NUMBER 1 1 2 3 4 5 6 7 8 9 | (CFS) 535.10 544.33 575.64 566.43 FLOWPATH F RY BANK # Q (CFS) 30.59 31.02 31.17 31.18 31.19 30.39 29.64 29.43 29.03 | (MIN.) 9.75 10.19 21.95 23.43 ROM NODI 1 CONFLI TC (MIN.) 5.98 6.22 6.57 6.60 6.67 7.46 8.05 8.22 8.47 | (INCH/HR) 4.220 4.115 2.651 2.553 E 100.0 JENCE DATA Intensity (INCH/HR) 5.583 5.460 5.292 5.279 5.244 4.919 4.709 4.655 4.576 | (INCH/HE | R) (07) 0.29 (07) 0.29 (07) 0.30 (07) 0.30 E 158.0 Ap (08) Ap (00) 0.10 (00) 0.10 (00) 0.10 (00) 0.10 (00) 0.10 (00) 0.10 (00) 0.10 (00) 0.10 (00) 0.10 (00) 0.10 (00) 0.10 (00) 0.10 (00) 0.10 (00) 0.10 (00) 0.10 (00) 0.10 | (ACRES) 140.5 146.6 245.7 251.4 0 = 900 Ae (ACRES) 5.8 6.1 6.3 6.3 6.3 6.4 6.7 6.8 6.8 | NODE 400.00 300.00 200.00 100.00 8.61 FEET. HEADWATER NODE 310.00 220.00 229.00 214.00 236.00 300.00 230.00 234.00 |
| ** MEMOF STREAM NUMBER 1 2 3 4 LONGEST ** MEMOF STREAM NUMBER 1 2 3 4 4 5 6 7 8 9 9 | (CFS) 535.10 544.33 575.64 566.43 FLOWPATH F RY BANK # Q (CFS) 30.59 31.02 31.17 31.18 31.19 30.39 29.64 29.43 29.03 28.73 | (MIN.) 9.755 10.19 21.95 23.43 ROM NODI 1 CONFLI TC (MIN.) 5.98 6.22 6.57 6.60 6.67 7.46 8.05 8.22 8.47 | (INCH/HR) 4.220 4.115 2.651 2.553 E 100.0 JENCE DATA Intensity (INCH/HR) 5.583 5.460 5.292 5.279 4.709 4.655 4.576 4.516 | (INCH/HE 0.23 (0.23 (0.23 (0.23 (0.22 (0.022 (0.02 (| R) (0.29 (0.7) (0.29 (0.7) (0.30 (0.7) (0.30 (0.7) (0.30 (0.7) (0.30 (0.7) (0.30 (0.7) (0. | (ACRES) 140.5 146.6 245.7 251.4 0 = 900 Ae (ACRES) 5.8 6.1 6.3 6.3 6.3 6.4 6.7 6.8 6.9 | NODE 400.00 300.00 200.00 100.00 8.61 FEET. HEADWATER NODE 220.00 220.00 214.00 230.00 230.00 230.00 234.00 |
| ** MEMOF STREAM NUMBER 1 2 3 4 4 5 5 6 7 8 8 9 10 11 | (CFS) 535.10 544.33 575.64 566.43 FLOWPATH F RY BANK # Q (CFS) 30.59 31.02 31.17 31.18 31.19 30.39 29.64 29.43 29.03 28.73 27.09 | (MIN.) 9.75 10.19 21.95 23.43 PROM NODI 1 CONFLI TC (MIN.) 5.98 6.22 6.57 6.60 6.67 7.46 8.05 8.22 8.47 8.66 9.68 | (INCH/HR) 4.220 4.115 2.651 2.553 100.0 JENCE DATA Intensity (INCH/HR) 5.583 5.460 5.292 5.279 5.244 4.919 4.709 4.655 4.576 4.516 | (INCH/HE | (A) | (ACRES) 140.5 146.6 245.7 251.4 0 = 900 Ae (ACRES) 5.8 6.1 6.3 6.3 6.4 6.8 6.8 6.9 6.9 | NODE 400.00 200.00 100.00 8.61 FEET. HEADWATER NODE 310.00 220.00 229.00 214.00 230.00 230.00 244.00 230.00 234.00 234.00 250.00 210.00 |
| ************************************** | (CFS) 535.10 544.33 575.64 566.43 FLOWPATH F RY BANK # Q (CFS) 31.02 31.17 31.18 31.19 30.39 29.64 29.43 29.03 28.73 27.09 FLOWPATH F | (MIN.) 9.755 10.19 21.95 23.43 ROM NODI 1 CONFLI TC (MIN.) 5.98 6.22 6.57 6.60 6.67 7.46 8.05 8.22 8.47 8.66 9.68 | (INCH/HR) 4.220 4.115 2.651 2.651 2.553 E 100.0 JENCE DATA Intensity (INCH/HR) 5.583 5.460 5.292 5.294 4.919 4.709 4.655 4.576 4.516 4.238 E 2330.0 | (INCH/HE | R) (N) (N) (N) (N) (N) (N) (N) (N) (N) (N | (ACRES) 140.5 140.5 146.6 245.7 251.4 0 = 900 Ae (ACRES) 5.8 6.1 6.3 6.3 6.3 6.4 6.7 6.8 6.9 6.9 6.9 | NODE 400.00 300.00 200.00 8.61 FEET. HEADWATER NODE 310.00 220.00 220.00 226.00 230.00 230.00 230.00 250.00 |
| ** MEMOF STREAM NUMBER 1 2 3 4 5 6 7 8 9 10 11 LONGEST | Q (CFS) 30.59 31.02 31.17 31.18 31.19 30.39 29.64 29.43 29.03 28.73 27.09 FLOWPATH F | 1 CONFLITC (MIN.) 5.98 6.22 6.57 6.60 6.67 7.46 8.05 8.22 8.47 8.66 9.68 | JENCE DATA Intensity (INCH/HR) 5.583 5.460 5.292 5.279 5.244 4.919 4.709 4.655 4.576 4.516 4.238 230.0 | ** Fp(Fm) (INCH/HH | Ap Ap (0.2) 0.10 (0.2) 0.20 (0.2) 0.10 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) | Ae (ACRES) 5.8 6.1 6.3 6.4 6.7 6.8 6.8 6.9 6.9 0 = 122 | HEADWATER NODE 310.00 220.00 2290.00 214.00 226.00 300.00 230.00 260.00 234.00 250.00 210.00 |
| ** MEMOF STREAM NUMBER 1 2 3 4 5 6 7 8 9 10 11 LONGEST | Q (CFS) 30.59 31.02 31.17 31.18 31.19 30.39 29.64 29.43 29.03 28.73 27.09 FLOWPATH F | 1 CONFLITC (MIN.) 5.98 6.22 6.57 6.60 6.67 7.46 8.05 8.22 8.47 8.66 9.68 | JENCE DATA Intensity (INCH/HR) 5.583 5.460 5.292 5.279 5.244 4.919 4.709 4.655 4.576 4.516 4.238 230.0 | ** Fp(Fm) (INCH/HH | Ap Ap (0.2) 0.10 (0.2) 0.20 (0.2) 0.10 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) | Ae (ACRES) 5.8 6.1 6.3 6.4 6.7 6.8 6.8 6.9 6.9 0 = 122 | HEADWATER NODE 310.00 220.00 2290.00 214.00 226.00 300.00 260.00 234.00 250.00 210.00 2.97 FEET. |
| ** MEMOF STREAM NUMBER 1 2 3 4 5 6 7 8 9 10 11 LONGEST | Q (CFS) 30.59 31.02 31.17 31.18 31.19 30.39 29.64 29.43 29.03 28.73 27.09 FLOWPATH F | 1 CONFLITC (MIN.) 5.98 6.22 6.57 6.60 6.67 7.46 8.05 8.22 8.47 8.66 9.68 | JENCE DATA Intensity (INCH/HR) 5.583 5.460 5.292 5.279 5.244 4.919 4.709 4.655 4.576 4.516 4.238 230.0 | ** Fp(Fm) (INCH/HH | Ap Ap (0.2) 0.10 (0.2) 0.20 (0.2) 0.10 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) | Ae (ACRES) 5.8 6.1 6.3 6.4 6.7 6.8 6.8 6.9 6.9 0 = 122 | HEADWATER NODE 310.00 220.00 2290.00 214.00 226.00 300.00 260.00 234.00 250.00 210.00 2.97 FEET. |
| ** MEMOF STREAM NUMBER 1 2 3 4 5 6 7 8 9 10 11 LONGEST | Q (CFS) 30.59 31.02 31.17 31.18 31.19 30.39 29.64 29.43 29.03 28.73 27.09 FLOWPATH F | 1 CONFLITC (MIN.) 5.98 6.22 6.57 6.60 6.67 7.46 8.05 8.22 8.47 8.66 9.68 | JENCE DATA Intensity (INCH/HR) 5.583 5.460 5.292 5.279 5.244 4.919 4.709 4.655 4.576 4.516 4.238 230.0 | ** Fp(Fm) (INCH/HH | Ap Ap (0.2) 0.10 (0.2) 0.20 (0.2) 0.10 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) | Ae (ACRES) 5.8 6.1 6.3 6.4 6.7 6.8 6.8 6.9 6.9 0 = 122 | HEADWATER NODE 310.00 220.00 2290.00 214.00 226.00 300.00 260.00 234.00 250.00 210.00 2.97 FEET. |
| ** MEMOF STREAM NUMBER 1 2 3 4 5 6 7 8 9 10 11 LONGEST | Q (CFS) 30.59 31.02 31.17 31.18 31.19 30.39 29.64 29.43 29.03 28.73 27.09 FLOWPATH F | 1 CONFLITC (MIN.) 5.98 6.22 6.57 6.60 6.67 7.46 8.05 8.22 8.47 8.66 9.68 | JENCE DATA Intensity (INCH/HR) 5.583 5.460 5.292 5.279 5.244 4.919 4.709 4.655 4.576 4.516 4.238 230.0 | ** Fp(Fm) (INCH/HH | Ap Ap (0.2) 0.10 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) | Ae (ACRES) 5.8 6.1 6.3 6.4 6.7 6.8 6.8 6.9 6.9 0 = 122 | HEADWATER NODE 310.00 220.00 2290.00 214.00 226.00 300.00 260.00 234.00 250.00 210.00 2.97 FEET. |
| ** MEMOF STREAM NUMBER 1 2 3 4 5 6 7 8 9 10 11 LONGEST | Q (CFS) 30.59 31.02 31.17 31.18 31.19 30.39 29.64 29.43 29.03 28.73 27.09 FLOWPATH F | 1 CONFLITC (MIN.) 5.98 6.22 6.57 6.60 6.67 7.46 8.05 8.22 8.47 8.66 9.68 | JENCE DATA Intensity (INCH/HR) 5.583 5.460 5.292 5.279 5.244 4.919 4.709 4.655 4.576 4.516 4.238 230.0 | ** Fp(Fm) (INCH/HH | Ap Ap (0.2) 0.10 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) | Ae (ACRES) 5.8 6.1 6.3 6.4 6.7 6.8 6.8 6.9 6.9 0 = 122 | HEADWATER NODE 310.00 220.00 2290.00 214.00 226.00 300.00 260.00 234.00 250.00 210.00 2.97 FEET. |
| ** MEMOF STREAM NUMBER 1 2 3 4 5 6 7 8 9 10 11 LONGEST | Q (CFS) 30.59 31.02 31.17 31.18 31.19 30.39 29.64 29.43 29.03 28.73 27.09 FLOWPATH F | 1 CONFLITC (MIN.) 5.98 6.22 6.57 6.60 6.67 7.46 8.05 8.22 8.47 8.66 9.68 | JENCE DATA Intensity (INCH/HR) 5.583 5.460 5.292 5.279 5.244 4.919 4.709 4.655 4.576 4.516 4.238 230.0 | ** Fp(Fm) (INCH/HH | Ap Ap (0.2) 0.10 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) | Ae (ACRES) 5.8 6.1 6.3 6.4 6.7 6.8 6.8 6.9 6.9 0 = 122 | HEADWATER NODE 310.00 220.00 2290.00 214.00 226.00 300.00 260.00 234.00 250.00 210.00 2.97 FEET. |
| ** MEMOF STREAM NUMBER 1 2 3 4 5 6 7 8 9 10 11 LONGEST | Q (CFS) 30.59 31.02 31.17 31.18 31.19 30.39 29.64 29.43 29.03 28.73 27.09 FLOWPATH F | 1 CONFLITC (MIN.) 5.98 6.22 6.57 6.60 6.67 7.46 8.05 8.22 8.47 8.66 9.68 | JENCE DATA Intensity (INCH/HR) 5.583 5.460 5.292 5.279 5.244 4.919 4.709 4.655 4.576 4.516 4.238 230.0 | ** Fp(Fm) (INCH/HH | Ap Ap (0.2) 0.10 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) | Ae (ACRES) 5.8 6.1 6.3 6.4 6.7 6.8 6.8 6.9 6.9 0 = 122 | HEADWATER NODE 310.00 220.00 2290.00 214.00 226.00 300.00 260.00 234.00 250.00 210.00 2.97 FEET. |
| ** MEMOF STREAM NUMBER 1 2 3 4 5 6 7 8 9 10 11 LONGEST | Q (CFS) 30.59 31.02 31.17 31.18 31.19 30.39 29.64 29.43 29.03 28.73 27.09 FLOWPATH F | 1 CONFLITC (MIN.) 5.98 6.22 6.57 6.60 6.67 7.46 8.05 8.22 8.47 8.66 9.68 | JENCE DATA Intensity (INCH/HR) 5.583 5.460 5.292 5.279 5.244 4.919 4.709 4.655 4.576 4.516 4.238 230.0 | ** Fp(Fm) (INCH/HH | Ap Ap (0.2) 0.10 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) | Ae (ACRES) 5.8 6.1 6.3 6.4 6.7 6.8 6.8 6.9 6.9 0 = 122 | HEADWATER NODE 310.00 220.00 2290.00 214.00 226.00 300.00 260.00 234.00 250.00 210.00 2.97 FEET. |
| ** MEMOF STREAM NUMBER 1 2 3 4 5 6 7 8 9 10 11 LONGEST | Q (CFS) 30.59 31.02 31.17 31.18 31.19 30.39 29.64 29.43 29.03 28.73 27.09 FLOWPATH F | 1 CONFLITC (MIN.) 5.98 6.22 6.57 6.60 6.67 7.46 8.05 8.22 8.47 8.66 9.68 | JENCE DATA Intensity (INCH/HR) 5.583 5.460 5.292 5.279 5.244 4.919 4.709 4.655 4.576 4.516 4.238 230.0 | ** Fp(Fm) (INCH/HH | Ap Ap (0.2) 0.10 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) | Ae (ACRES) 5.8 6.1 6.3 6.4 6.7 6.8 6.8 6.9 6.9 0 = 122 | HEADWATER NODE 310.00 220.00 2290.00 214.00 226.00 300.00 260.00 234.00 250.00 210.00 2.97 FEET. |
| ** MEMOF STREAM NUMBER 1 2 3 4 5 6 7 8 9 10 11 LONGEST | Q (CFS) 30.59 31.02 31.17 31.18 31.19 30.39 29.64 29.43 29.03 28.73 27.09 FLOWPATH F | 1 CONFLITC (MIN.) 5.98 6.22 6.57 6.60 6.67 7.46 8.05 8.22 8.47 8.66 9.68 | JENCE DATA Intensity (INCH/HR) 5.583 5.460 5.292 5.279 5.244 4.919 4.709 4.655 4.576 4.516 4.238 230.0 | ** Fp(Fm) (INCH/HH | Ap Ap (0.2) 0.10 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) 0.20 (0.2) | Ae (ACRES) 5.8 6.1 6.3 6.4 6.7 6.8 6.8 6.9 6.9 0 = 122 | HEADWATER NODE 310.00 220.00 2290.00 214.00 226.00 300.00 260.00 234.00 250.00 210.00 2.97 FEET. |
| ** MEMOF STREAM NUMBER 1 2 3 4 5 6 7 8 9 10 11 LONGEST | Q (CFS) 30.59 31.02 31.17 31.18 31.19 30.39 29.64 29.43 29.03 28.73 27.09 FLOWPATH F | 1 CONFLITC (MIN.) 5.98 6.22 6.57 6.60 6.67 7.46 8.05 8.22 8.47 8.66 9.68 | JENCE DATA Intensity (INCH/HR) 5.583 5.460 5.292 5.279 5.244 4.919 4.709 4.655 4.576 4.516 4.238 230.0 | ** Fp(Fm) (INCH/HH | Ap Ap (0.02) 0.10 | Ae (ACRES) 5.8 6.1 6.3 6.4 6.7 6.8 6.8 6.9 6.9 0 = 122 | HEADWATER NODE 310.00 220.00 2290.00 214.00 226.00 300.00 260.00 234.00 250.00 210.00 2.97 FEET. |
| ** MEMOF STREAM NUMBER 1 2 3 4 5 6 7 8 9 10 11 LONGEST | Q (CFS) 30.59 31.02 31.17 31.18 31.19 30.39 29.64 29.43 29.03 28.73 27.09 FLOWPATH F | 1 CONFLITC (MIN.) 5.98 6.22 6.57 6.60 6.67 7.46 8.05 8.22 8.47 8.66 9.68 | JENCE DATA Intensity (INCH/HR) 5.583 5.460 5.292 5.279 5.244 4.919 4.709 4.655 4.576 4.516 4.238 230.0 | ** Fp(Fm) (INCH/HH | Ap Ap (0.02) 0.10 | Ae (ACRES) 5.8 6.1 6.3 6.4 6.7 6.8 6.8 6.9 6.9 0 = 122 | HEADWATER NODE 310.00 220.00 2290.00 214.00 226.00 300.00 260.00 234.00 250.00 210.00 2.97 FEET. |
| ** MEMOF STREAM NUMBER 1 2 3 4 5 6 7 8 9 10 11 LONGEST | Q (CFS) 30.59 31.02 31.17 31.18 31.19 30.39 29.64 29.43 29.03 28.73 27.09 FLOWPATH F | 1 CONFLITC (MIN.) 5.98 6.22 6.57 6.60 6.67 7.46 8.05 8.22 8.47 8.66 9.68 | JENCE DATA Intensity (INCH/HR) 5.583 5.460 5.292 5.279 5.244 4.919 4.709 4.655 4.576 4.516 4.238 230.0 | ** Fp(Fm) (INCH/HH | Ap Ap (0.02) 0.10 | (ACRES) 140.5 146.6 245.7 251.4 0 = 900 Ae (ACRES) 5.8 6.1 6.3 6.3 6.3 6.4 6.7 6.8 6.9 6.9 0 = 122 Ae (ACRES) 100.9 110.1 122.8 122.2 128.8 131.7 146.4 1453.5 | HEADWATER NODE 310.00 220.00 2290.00 214.00 226.00 300.00 260.00 234.00 250.00 210.00 2.97 FEET. |

| 14 15 TOTAL A | 592.54 582.70 REA (ACRES | 21.95 23.43 | 2.651 2.553 258.3 | 0.22(0.06) 0.22(0.06) | 3E00R 0.29 0.29 | 252.6 258.3 | 200.00 |
|--|---|---|---|--|--|--|---|
| PEAK FLOW EFFECTIVE AREA-AVER TOTAL ARE LONGEST F | RATE (CFS AREA (ACR AGED Fp(I A (ACRES) LOWPATH F |) = ES) = NCH/HR) = = 2 ROM NODE | 592.54 252.61 = 0.22 58.3 100.0 | S FOLLOWS: Tc (MIN.) = AREA-AVERAGE AREA-AVERAGE 0 TO NODE | D Ap = | 0.28 | 08.61 FEET. |
| FLOW PROC | ESS FROM | NODE | 158.00 TO | NODE 160 | .00 IS | CODE = 4 | 11 |
| >>>>USIN | G USER-SP | ECIFIED : | PIPESIZE | THRU SUBAREA (EXISTING EL | EMENT) | <<<< | |
| FLOW LENG DEPTH OF PIPE-FLOW GIVEN PIP PIPE-FLOW PIPE TRAV LONGEST F | TH (FEET) FLOW IN VELOCITY E DIAMETE (CFS) = EL TIME (M LOWPATH F | = 106. 60.0 INC (FEET/SE R(INCH) 592.5 IN.) = ROM NODE | 27 MANN H PIPE IS C.) = 41 = 60.00 4 0.04 100.0 | 002.32 DOWN ING'S N = 0 40.6 INCHE .85 NUMBER OF TC(MIN.) = 0 TO NODE | .013 S PIPES 21.99 160.0 | = 1 0 = 911 | 4.88 FEET. |
| END OF ST TOTAL ARE EFFECTIVE | UDY SUMMA A(ACRES) AREA(ACR AGED Fp(I | RY: = ES) = NCH/HR) | 258.3 252.61 = 0.22 | TC(MIN.) = AREA-AVERAGE AREA-AVERAGE | 21 D Fm(I | .99 NCH/HR)= | |
| ** PEAK F STREAM NUMBER 1 2 3 4 5 6 7 8 9 10 11 12 13 | Q (CFS) 466.62 474.25 484.63 485.44 487.69 508.76 523.59 527.56 533.41 537.99 560.54 562.08 570.63 | TC (MIN.) 6.03 6.26 6.61 6.64 6.72 7.50 8.10 8.26 8.51 8.71 9.72 9.79 10.23 21.99 | Intensity (INCH/HR) 5.559 5.437 5.272 5.259 5.225 4.903 4.694 4.641 4.563 4.503 4.227 4.209 2.648 | Fp(Fm) (INCH/HR) 0.22(0.06) | Ap 0.28 0.28 0.28 0.28 0.28 0.28 0.28 0.28 | Ae (ACRES) 92.0 95.7 100.9 101.4 102.5 114.1 122.8 125.2 128.8 131.7 146.4 147.4 153.5 252.6 | HEADWATER NODE 310.00 220.00 290.00 214.00 226.00 230.00 230.00 234.00 250.00 400.00 300.00 300.00 200.00 200.00 200.00 200.00 200.00 200.00 200.00 |
| | | | | 0.22(0.06) | 0.29 | 258.3 | 100.00 |
| THE OF DA | TICALL ME | THOD AND | TVOTO | | | | |

END OF RATIONAL METHOD ANALYSIS

OUTLET 3 ULTIMATE

3P10ROV

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
(c) CODVIGNT 1983-2016 Advanced Engineering Software (aes)

Ver. 23.0 Release Date: 07/01/2016 License ID 1334

Analysis prepared by:

| * DANA POINT HARBOR CO * RATIONAL METHOD ULTI * 10-YEAR STORM EVENT | **** DESCRIPTION OF STUDY ************************************ | * * * |
|---|--|-------------|
| FILE NAME: 3P10ROV.D. TIME/DATE OF STUDY: | | |
| USER SPECIFIED HYDRO | LOGY AND HYDRAULIC MODEL INFORMATION: | |
| | *TIME-OF-CONCENTRATION MODEL* | _ |
| SPECIFIED MINIMUM PI SPECIFIED PERCENT OF *DATA BANK RAINFALL | EVENT (YEAR) = 10.00 PE SIZE(INCH) = 12.00 GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.90 USED* CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD* | |
| HALF- CROWN TO WIDTH CROSSFALL NO. (FT) (FT) | -SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL* STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNIN IN- / OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR SIDE / SIDE/ WAY (FT) (FT) (FT) (FT) (n) | 2 |
| 1 30.0 20.0 2 30.0 25.0 3 50.0 45.0 | 0.018/0.018/0.020 0.67 2.00 0.0312 0.167 0.0150 0.017/0.017/0.017 0.67 1.50 0.0312 0.125 0.0150 0.017/0.017/0.017 0.67 2.00 0.0312 0.167 0.0150 |) |
| 2. (Depth) * (Veloci *SIZE PIPE WITH A FL OR EQUAL TO THE UPS | | |
| FLOW PROCESS FROM NO | ************************************** | |
| >>>>RATIONAL METHOD >>USE TIME-OF-CONCEN | INITIAL SUBAREA ANALYSIS< | |
| INITIAL SUBAREA FLOW | | - |
| SUBAREA ANALYSIS USE * 10 YEAR RAINFALL | SCS SOIL AREA FD AD SCS To | .) |
| RESIDENTIAL "5-7 DWELLINGS/ACRE" | B 0.21 0.30 0.500 56 15.2 | |
| SUBAREA AVERAGE PERV | D 1.55 0.20 0.500 75 15.2 IOUS LOSS RATE, Fp(INCH/HR) = 0.21 IOUS AREA FRACTION, Ap = 0.500 = 3.23 1.76 PEAK FLOW RATE(CFS) = 3.23 | !2 |

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************************ FLOW PROCESS FROM NODE 101.00 TO NODE 102.00 IS CODE = 62 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA >>>> (STREET TABLE SECTION # 2 USED) <<<< UPSTREAM ELEVATION(FEET) = 1331.94 DOWNSTREAM ELEVATION(FEET) = 1328.22 STREET LENGTH(FEET) = 177.44 CURB HEIGHT(INCHES) = 8.0 STREET HALPWIDTH(FEET) = 30.00 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 25.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.017 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.017 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.017 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0150 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0150 **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH(FEET) = 0.28 HALFSTREET FLOOD WIDTH (FEET) = 8.56
AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.72
PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 0.75 STREET FLOW TRAVEL TIME (MIN.) = 1.09 Tc (MIN.) = 16.31 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.062 SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "5-7 DWELLINGS/ACRE" D 0.93 "5-7 DWELLINGS/ACRE" D 0.93 0.20 0.500 75
SUBAREA AVERAGE PERVIOUS LOSS RATE, FD[INCH/HR] = 0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.500
SUBAREA AREA[ACRES] = 0.93 SUBAREA RUNOFF[CFS] = 1.64
EFFECTIVE AREA[ACRES] = 2.69 AREA-AVERAGED Fm[INCH/HR] = 0.10
AREA-AVERAGED Fp[INCH/HR] = 0.21 AREA-AVERAGED Ap = 0.50

TOTAL AREA[ACRES] = 2.7 PEAK FLOW RATE(CFS) = 4.74 END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH(FEET) = 0.29 HALFSTREET FLOOD WIDTH(FEET) = 9.15 FLOW VELOCITY (FEET/SEC.) = 2.84 DEPTH*VELOCITY (FT*FT/SEC.) = 0.81 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 102.00 = 504.17 FEE ********************* FLOW PROCESS FROM NODE 102.00 TO NODE 103.00 IS CODE = 41 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <> ELEVATION DATA: UPSTREAM(FEET) = 1328.22 DOWNSTREAM(FEET) = 1260.18 FLOW LENGTH(FEET) = 960.76 MANNING'S N = 0.013 DEPTH OF FLOW IN 18.0 INCH PIPE IS 5.2 INCHES PIPE-FLOW VELOCITY(FEET/SEC.) = 11.35 GIVEN PIPE DIAMETER (INCH) = 18.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 4.74 PIPE TRAVEL TIME (MIN.) = 1.41 TC(MIN.) = 17.72 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 103.00 = 1464.93 FEET. *************************** FLOW PROCESS FROM NODE 103.00 TO NODE 103.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< -----MAINLINE Tc(MIN.) = 17.72 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.966 SUBAREA LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "5-7 DWELLINGS/ACRE" COMMERCIAL D 0.54 0.20 (
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.462

3P10ROV
SUBAREA AREA(ACRES) = 5.63 SUBAREA RUNOFF(CFS) = 9.49

| SUBAREA AREA(ACRES) = EFFECTIVE AREA(ACRES) = AREA-AVERAGED Fp(INCH/H | 5.63 8.32 | AREA- | A RUNOFF (CF AVERAGED Fm | S) = 9. (INCH/HR) | 49 = 0.10 |
|---|--|---|--|--------------------------------|-----------------------|
| TOTAL AREA (ACRES) = | 8.3 | PEAK | FLOW RATE (| CFS) = | 14.00 |
| ************************************** | 103.00 | TO NODE | 105.00 I | S CODE = | |
| >>>>COMPUTE PIPE-FLOW >>>>USING USER-SPECIFI | TRAVEL TIM ED PIPESIZ | E THRU S | JBAREA<<<< ING ELEMENT |) <<<< | |
| ELEVATION DATA: UPSTREA FLOW LENGTH (FEET) = 7 ASSUME FULL-FLOWING PIP PIPE-FLOW VELOCITY (FEET PIPE FLOW VELOCITY = (I GIVEN PIPE DIAMETER (INC PIPE-FLOW (CFS) = 1 PIPE TRAVEL TIME (MIN.) | M(FEET) = 75.08 MA ELINE /SEC.) = OTAL FLOW) H) = 18.0 4.00 = 1.63 | 1260.18 NNING'S 1 7.92 /(PIPE CI 0 NUMI | DOWNSTREAN = 0.013 ROSS SECTION BER OF PIPE .) = 19.3 | M(FEET) = N AREA) S = 1 | 1245.52 |
| LONGEST FLOWPATH FROM N | | | | | 40.01 FEET. |
| FLOW PROCESS FROM NODE | 105.00 | TO NODE | 105.00 I | S CODE = | 81 |
| >>>>ADDITION OF SUBARE | | | | | |
| MAINLINE TC(MIN.) = 1 * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA(DEVELOPMENT TYPE/ LAND USE RESIDENTIAL. | 9.35 ENSITY(INC | H/HR) = | 1.869 | | |
| | | | | | |
| "5-7 DWELLINGS/ACRE" COMMERCIAL | D . | 0.65 | 0.20 | 0.100 | 75 |
| SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU SUBAREA AREA (ACRES) = EFFECTIVE AREA (ACRES) = AREA-AVERAGED Fp (INCH/H TOTAL AREA (ACRES) = | S AREA FRA 4.38 12.70 R) = 0.20 | CTION, A SUBARE AREA-A AREA-A | D = 0.441 A RUNOFF(CF AVERAGED Fm JERAGED Ap | S) = 7. (INCH/HR) = 0.46 | 02 = 0.09 20.30 |
| ************************************** | 105.00 | TO NODE | 107.00 I | S CODE = | 41 |
| >>>>COMPUTE PIPE-FLOW >>>>USING USER-SPECIFI | TRAVEL TIM ED PIPESIZ | E THRU S | JBAREA<<<< ING ELEMENT |) <<<< | |
| ELEVATION DATA: UPSTREA FLOW LENGTH(FEET) = DEPHH OF FLOW IN 24.0 PIPE-FLOW VELOCITY(FEET GIVEN PIPE DIAMETER(INC PIPE-FLOW(CFS) = 2 PIPE TRAVEL TIME(MIN.) LONGEST FLOWPATH FROM N | M(FEET) = 98.55 MA INCH PIPE /SEC.) = H) = 24.0 0.30 = 0.11 | 1245.52 NNING'S 1 IS 10.9 14.63 0 NUM | DOWNSTREAN = 0.013 INCHES BER OF PIPE .) = 19.4 | M(FEET) = S = 1 | |
| ************************************** | 107.00 | TO NODE | 107.00 I | S CODE = | |
| >>>>ADDITION OF SUBARE | A TO MAINL | INE PEAK | FLOW< | | |
| MAINLINE Tc(MIN.) = 1 * 10 YEAR RAINFALL INT | 9.46 ENSITY(INC | H/HR) = | 1.863 | | |
| DEVELOPMENT TYPE/ LAND USE | SCS SOIL GROUP | AREA (ACRES) | Fp (INCH/HR) | Ap (DECIMAL) | SCS CN |
| "5-7 DWELLINGS/ACRE" | В | 4.20 | | 0.500 | 56 |
| RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL | С | 1.16 | 0.25 | 0.500 | 69 |
| "5-7 DWELLINGS/ACRE" COMMERCIAL | D C | 12.06 | 0.20 0.25 | 0.500 | 75 69 |
| 0010000000 | | | | | |

0.97

0.20 0.100 75

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COMMERCIAL

PUBLIC PARK C 0.70 0.25 0.850 SUBARBA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.23 SUBARBA AVERAGE PERVIOUS ARBA FRACTION, Ap = 0.481 SUBAREA AREA(ACRES) = 19.69 SUBAREA RUNOFF(CFS) = 31.07 EFFECTIVE AREA(ACRES) = 32.39 AREA-AVERAGED Fm(INCH/HR) = 0.10 AREA-AVERAGED AP = 0.47 TOTAL AREA (ACRES) = 32.4 PEAK FLOW RATE(CFS) = ********************** FLOW PROCESS FROM NODE 107.00 TO NODE 107.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< MAINLINE Tc(MIN.) = 19.46 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.863 SUBAREA LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE PUBLIC PARK GROUP (ACRES) (INCH/HR) (DECIMAL) CN D 0.53 0.20 0.850 75 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20 | SUBARRA AVERAGE PERVIOUS LOSS RAIL, 2F(IN-H/HR) = 0.20 | SUBARRA AREA (ACRES) = 0.53 | SUBARRA AREA (ACRES) = 0.53 | SUBARRA AREA (ACRES) = 32.92 | AREA-AVERAGED F(INCH/HR) = 0.10 | AREA-AVERAGED F(INCH/HR) = 0.22 | AREA-AVERAGED AP = 0.48 | TOTAL AREA (ACRES) = 32.9 | FEAR FILOW RATE(FS) = 52.11 ********************** FLOW PROCESS FROM NODE 107.00 TO NODE 109.00 IS CODE = 41 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <>>> ELEVATION DATA: UPSTREAM(FEET) = 1240.60 DOWNSTREAM(FEET) = 1239.01 FLOW LENGTH(FEET) = 81.43 MANNING'S N = 0.013 ASSUME FULL-FLOWING PIPELINE PIPE-FLOW VELOCITY (FEET/SEC.) = 16.59 PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
GIVEN PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 52.11
PIPE TRAVEL TIME(MIN.) = 0.08 Tc(MIN.) = 19.55
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 109.00 = 2419.99 FEET. ***************************** FLOW PROCESS FROM NODE 109.00 TO NODE 109.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< MAINLINE Tc (MIN.) = 19.55 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.859 SUBAREA LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN COMMERCIAL 0.52 0.25 0.100 69 C D COMMERCIAL 75 CONDOMINIUMS CONDOMINITIMS D 10 74 0.20 0 350 0.07 0.20 ********************** FLOW PROCESS FROM NODE 109.00 TO NODE 111.00 IS CODE = 41 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <>>> ELEVATION DATA: UPSTREAM(FEET) = 1239.07 DOWNSTREAM(FEET) = 1210.33 FLOW LENGTH(FEET) = 407.01 MANNING'S N = 0.013 DEPTH OF FLOW IN 33.0 INCH PIEE IS 17.5 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 22.99

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| 3P10ROV |
|---|
| GIVEN PIPE DIAMETER(INCH) = 33.00 NUMBER OF PIPES = 1 |
| PIPE-FLOW(CFS) = 73.43 |
| PIPE TRAVEL TIME (MIN.) = 0.30 Tc (MIN.) = 19.84 |
| LONGEST FLOWPATH FROM NODE 100.00 TO NODE 111.00 = 2827.00 FEET. |
| ****************** |
| FLOW PROCESS FROM NODE 111.00 TO NODE 111.00 IS CODE = 81 |
| 11.00 1 NOELS 1 NOR NODE 111.00 10 NODE 111.00 10 CODE - 01 |
| >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>> |
| |
| MAINLINE Tc(MIN.) = 19.84 |
| * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.843 |
| SUBAREA LOSS RATE DATA (AMC II): |
| DEVELOPMENT TYPE |
| LAND USE GROUP (ACRES) (INCH/RR) (DECIMAL) CN |
| CONDOMINIUMS D 0.09 0.20 0.350 75 |
| PUBLIC PARK D 0.85 0.20 0.850 75 |
| SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20 |
| |
| SUBAREA AREA (ACRES) = 1.63 SUBAREA RUNOFF (CFS) = 2.56 EFFECTIVE AREA (ACRES) = 47.85 AREA-AVERAGED Fm(INCH/HR) = 0.21 AREA-AVERAGED Ap = 0.44 |
| EFFECTIVE AREA(ACRES) = 47.85 AREA-AVERAGED Fm(INCH/HR) = 0.09 |
| AREA-AVERAGED Fp(INCH/HR) = 0.21 AREA-AVERAGED Ap = 0.44 |
| TOTAL AREA(ACRES) = 47.8 PEAK FLOW RATE(CFS) = 75.32 |
| ****************** |
| FLOW PROCESS FROM NODE 111.00 TO NODE 113.00 IS CODE = 41 |
| |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< |
| >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <>>> |
| |
| ELEVATION DATA: UPSTREAM(FEET) = 1210.33 DOWNSTREAM(FEET) = 1210.00 |
| FLOW LENGTH (FEET) = 18.70 MANNING'S N = 0.013 DEPTH OF FLOW IN 36.0 INCH PIPE IS 26.6 INCHES |
| PIPE-FLOW VELOCITY (FEET/SEC.) = 13.45 |
| GIVEN PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1 |
| GIVEN TITE BIANDIEK (INCH) - 50.00 NOMBER OF TITES - 1 |
| |
| PIPE-FLOW(CFS) = 75.32 PIPE TRAVEL TIME(MIN.) = 0.02 Tc(MIN.) = 19.86 |
| FIPE-FLOW(CFS) = '75.32 FIPE TRAVEL TIME(MIN.) = 0.02 Tc(MIN.) = 19.86 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 113.00 = 2845.70 FEET. |
| PIPE TRAVEL TIME (MIN.) = 0.02 Tc (MIN.) = 19.86 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 113.00 = 2845.70 FEET. |
| PIPE TRAVEL TIME(MIN.) = 0.02 Tc(MIN.) = 19.86 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 113.00 = 2845.70 FEET. |
| FIPE TRAVEL TIME(MIN.) = 0.02 |
| FIPE TRAVEL TIME(MIN.) = 0.02 Tc(MIN.) = 19.86 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 113.00 = 2845.70 FEET. FLOW PROCESS FROM NODE 113.00 TO NODE 113.00 IS CODE = 81 |
| FIFE TRAVEL TIME(MIN.) = 0.02 Tc(MIN.) = 19.86 LONGEST FLOWPARH FROM NODE 100.00 TO NODE 113.00 = 2845.70 FEET. FLOW PROCESS FROM NODE 113.00 TO NODE 113.00 IS CODE = 81 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<< |
| PIPE TRAVEL TIME(MIN.) = 0.02 Tc(MIN.) = 19.86 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 113.00 = 2845.70 FEET. FLOW PROCESS FROM NODE 113.00 TO NODE 113.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<< |
| FIFE TRAVEL TIME(MIN.) = 0.02 |
| PIFE TRAVEL TIME(MIN.) = 0.02 |
| FIFE TRAVEL TIME(MIN.) = 0.02 Tc (MIN.) = 19.86 LONGEST FLOWPATH FROM NODE 113.00 TO NODE 113.00 = 2845.70 FEET. FLOW PROCESS FROM NODE 113.00 TO NODE 113.00 IS CODE = 81 >>>>ADDITION OF SUBARRA TO MAINLINE PEAK FLOW<<<<> MAINLINE TC (MIN.) = 19.86 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.842 SUBARRA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN CONDOMINIUMS D 13.30 0.20 0.350 75 SUBARRA AVERAGE PERVIOUS LOSS RATE, FP (INCH/HR) = 0.20 SUBARRA AVERAGE PERVIOUS AREA FRACTION, AP = 0.463 SUBARRA AVERAGE PERVIOUS AREA FRACTION, AP = 0.463 SUBARRA AVERAGED FP (INCH/HR) = 0.20 SUBARRA AVERAGED FP (INCH/HR) = 0.20 AREA-AVERAGED FM (INCH/HR) = 0.09 AREA-AVERAGED FM (INCH/HR) = 0.21 AREA-AVERAGED FM (INCH/HR) = 0.23 FLOW PROCESS FROM NODE 113.00 TO NODE 119.00 IS CODE = 41 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBARRA<<<<>>>>>SUBING USER-SPECTIFED PIPESIZE (EXISTING ELEMENT)<<<<>>>>>>SUBARDA (USER-SPECTIFED PIPESIZE (EXISTING ELEMENT)<<<<>>>>>SUBARDA (USER-SPECTIFED PIPESIZE (EXISTING ELEMENT)<<<<>>>>>SUBARDA (USER-SPECTIFED PIPESIZE (EXISTING ELEMENT)<<<<>>>>>SUBARDA (USER-SPECTIFED PIPESIZE (EXISTING ELEMENT)<<<<>>>>>>SUBARDA (USER-SPECTIFED PIPESIZE (EXISTING ELEMENT)<<<<>>>>>>SUBARDA (USER-SPECTIFED PIPESIZE (EXISTING ELEMENT)<<<<>>>>>>SUBARDA (USER-SPECTIFED PIPESIZE (EXISTING ELEMENT)<<<<>>>>>>>>>>>>>>>>>SUBARDA (USER-SPECTIFED PIPESIZE (EXISTING ELEMENT)<<<<>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> |
| FIFE TRAVEL TIME(MIN.) = 0.02 |

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************************ FLOW PROCESS FROM NODE 119.00 TO NODE 119.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>> MAINLINE TC(MIN.) = 20.71 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.798 SUBAREA LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA FP GROUP (ACRES) (INCH/HR) (DECIMAL) CN LAND USE RESIDENTIAL "11+ DWELLINGS/ACRE" RESIDENTIAL C 1.51 0.25 0.200 69 "11+ DWELLINGS/ACRE" D 5.27 0.20 0
COMMERCIAL D 0.27 0.20 0
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21 0.100 SUBARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.121
SUBARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.196
SUBARRA AREA (ACRES) = 7.05
SUBARRA ANDA (ACRES) = 11.15
EFFECTIVE AREA (ACRES) = 72.10
AREA-AVERAGED FM (INCH/HR) = 0.09
AREA-AVERAGED AP = 0.42
TOTAL AREA (ACRES) = 72.1
PEAK FLOW RATE (CFS) = 110.93 *********************** FLOW PROCESS FROM NODE 119.00 TO NODE 119.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>> MAINLINE Tc (MIN.) = 20.71 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.798 SUBAREA LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA SCS SOIL AREA FP AP SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN LAND USE RESIDENTIAL "11+ DWELLINGS/ACRE" C 1.27 0.25 0.200 69 RESIDENTIAL 0.200 D 3.23 "11+ DWELLINGS/ACRE" 0.20 COMMERCIAL D 0.27 0.20 0. SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21 0.100 75
 SUBARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.194

 SUBARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.194

 SUBARRA AREA (ACRES) = 76.87

 AREA-AVERAGED F(INCH/HR) = 0.21

 AREA-AVERAGED AP = 0.41

 TOTAL AREA (ACRES) = 76.87

 AREA-AVERAGED AP = 0.41

 TOTAL AREA (ACRES) = 16.87
 ********************* FLOW PROCESS FROM NODE 119.00 TO NODE 119.00 IS CODE = 1 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<< TOTAL NUMBER OF STREAMS = 2 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE: TIME OF CONCENTRATION (MIN.) = 20.71
RAINFALL INTENSITY (INCH/HR) = 1.80
AREA-AVERAGED Fm (INCH/HR) = 0.09 AREA-AVERAGED Fp(INCH/HR) = 0.21 PEAK FLOW RATE (CFS) AT CONFLUENCE = 118.47 ******************** FLOW PROCESS FROM NODE 200.00 TO NODE 201.00 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< INITIAL SUBAREA FLOW-LENGTH (FEET) = 331.01 ELEVATION DATA: UPSTREAM(FEET) = 1332.00 DOWNSTREAM(FEET) = 1330.74 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 SUBAREA ANALYSIS USED MINIMUM TC (MIN.) = 11.172
* 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.561
SUBAREA TC AND LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc

3P10ROV
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)

| CROOP (ACRES) (INCH/HR) (DECLEMA) CW (MIN.) CONDOMINIUMS D 1.42 0.20 0.350 75 11.17 SUBAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.20 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.350 SUBAREA RUNOFF(CFS) = 3.18 TOTAL AREA (ACRES) = 1.42 PEAK FLOW RATE(CFS) = 3.18 |
|--|
| FLOW PROCESS FROM NODE 201.00 TO NODE 203.00 IS CODE = 62 |
| >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< |
| UPSTREAM ELEVATION(FEET) = 1330.74 DOWNSTREAM ELEVATION(FEET) = 1308.01 STREET LENGTH(FEET) = 789.61 CURB HEIGHT(INCHES) = 8.0 STREET HALFWIDTH(FEET) = 50.00 |
| DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 45.00 INSIDE STREET CROSSFALL (DECIMAL) = 0.017 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.017 |
| SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1 STREET PARKWAY CROSSFALL(DECIMAL) = 0.017 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0150 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0150 |
| **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9.92 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH (FEET) = 0.42 HALFSTREET FLOW DEPTH (FEET) = 15.33 AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.52 FRODUCT OF DEPTHAVELOCITY (FT*FT/SEC.) = 1.92 STREET FLOW TRAVEL TIME (MIN.) = 2.91 10 YEAR TAINFALL INTENSITY (INCH/HR) = 2.243 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA FPD LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "8-10 DEBULINGS/ACRE" D 1.91 0.20 0.400 75 CONDOMINIUMS D 1.91 0.20 0.350 75 SUBAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.20 SUBAREA AVERAGE FERVIOUS AREA FRACTION, Ap = 0.364 SUBAREA AVERAGE SERVIOUS AREA FRACTION, Ap = 0.364 EFFECTIVE AREA (ACRES) = 8.30 AREA-AVERAGED FP (INCH/HR) = 0.07 AREA-AVERAGED FP (INCH/HR) = 0.20 AREA-AVERAGED FP (INCH/HR) = 0.07 |
| AREA-AVERAGED FP(INCH/HR) = 0.20 AREA-AVERAGED AP = 0.36 TOTAL AREA (ACRES) = 8.3 PEAK FLOW RATE (CFS) = 16.22 END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH (FEET) = 0.48 HALFSTREET FLOOD WIDTH (FEET) = 18.84 FLOW VELOCITY (FEET/SEC.) = 5.05 DEPTH-VELOCITY (FT-FT/SEC.) = 2.45 LONGEST FLOWPATH FROM NODE 200.00 TO NODE 203.00 = 1120.62 FEET. |
| FLOW PROCESS FROM NODE 203.00 TO NODE 205.00 IS CODE = 62 |
| >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< |
| UPSTREAM ELEVATION(FEET) = 1308.01 DOWNSTREAM ELEVATION(FEET) = 1245.00 STREET LENGTH(FEET) = 901.07 CURB HEIGHT(INCHES) = 8.0 STREET HALFWIDTH(FEET) = 30.00 |
| DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00 INSIDE STREET CROSSFALL (DECIMAL) = 0.018 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.018 |
| SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1 STREET PARKMAY CROSSFALL(DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0150 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 |
| **TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 27.50 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH (FEET) = 0.50 Page 7 |
| |

HALFSTREET FLOOD WIDTH(FEET) = 18.87 AVERAGE FLOW VELOCITY(FEET/SEC.) = 8.15 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = STREET FLOW TRAVEL TIME (MIN.) = 1.84 Tc (MIN.) = 15.92 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.090 SUBAREA LOSS RATE DATA(AMC II): SCS SOIL AREA FP AP SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "8-10 DWELLINGS/ACRE" D 0.07 0.20 0 400 COMMERCIAL 0.73 0.20 0.100 CONDOMINIUMS D D 11.58 0.20 0.350 75 75 PUBLIC PARK 0.20 0.850 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.336 SUBAREA AREA (ACRES) = 12.39 SUBAREA RUNOFF(CFS) = 22.56 EFFECTIVE AREA (ACRES) = 20.69 AREA-AVERAGED Fm (INCH/HR) = SUBAREA RUNOFF(CFS) = 22.56

AREA-AVERAGED FM (INCH/HR) = 0.07

AREA-AVERAGED FM (INCH/HR) = 0.07

TOTAL AREA (ACRES) = 20.7

AREA-AVERAGED FM (INCH/HR) = 0.07

AREA-AVERAGED FM (INCH/HR) = 0.70

AREA-AVERAGED FM (INCH/HR) = 0 END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH(FEET) = 0.54 HALFSTREET FLOOD WIDTH(FEET) = 21.37 FLOW VELOCITY (FEET/SEC.) = 8.81 DEPTH*VELOCITY (FT*FT/SEC.) = 4.80 LONGEST FLOWPATH FROM NODE 200.00 TO NODE 205.00 = 2021.69 FEET. ********************* FLOW PROCESS FROM NODE 205.00 TO NODE 206.00 IS CODE = 41 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <> ELEVATION DATA: UPSTREAM(FEET) = 1245.00 DOWNSTREAM(FEET) = 1229.65 FLOW LENGTH (FEET) = 135.30 MANNING'S N = 0.013
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY (FEET/SEC.) = 21.30 PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
GIVEN PIPE DIAMETER (INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW (CFS) = 37.64
PIPE TRAVEL TIME (MIN.) = 0.11 TC (MIN.) = 16.03
PIPE TRAVEL TIME (MIN.) = 0.11 TC (MIN.) = 206.00 = 2156.99 FEET. *********************** FLOW PROCESS FROM NODE 206.00 TO NODE 210.00 IS CODE = 62 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< >>>> (STREET TABLE SECTION # 1 USED) <<<< UPSTREAM ELEVATION(FEET) = 1229.65 DOWNSTREAM ELEVATION(FEET) = 1166.68
STREET LENGTH(FEET) = 1205.30 CURB HEIGHT(INCHES) = 8.0
STREET HALFWIDTH(FEET) = 30.00 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.018
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.018 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0150 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH(FEET) = 0.50 HALFSTREET FLOOD WIDTH(FEET) = 19.02 HALFSTREET FLOOD WIDLIN(FEEL) = 19.02

AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.08

PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 3.56

STREET FLOW TRAVEL TIME (MIN.) = 2.84 TC (MIN.) = 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.897 SUBAREA LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

3P10ROV

Page 8

3.38

0.25

0.200

C

RESIDENTIAL "11+ DWELLINGS/ACRE"

RESIDENTIAL

"11+ DWELLINGS/ACRE" 9.23 0.20 0.200 COMMERCIAL 0.42 0.20 0.100 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21

*********************** FLOW PROCESS FROM NODE 210.00 TO NODE 119.00 IS CODE = 41

>>>>COMPLIE PIPE-FLOW TRAVEL TIME THRU SURAREACCCC >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <>

ELEVATION DATA: UPSTREAM(FEET) = 1166.68 DOWNSTREAM(FEET) = 1159.95 FLOW LENGTH (FEET) = 307.60 MANNING'S N = 0.013 ASSUME FULL-FLOWING PIPELINE PIPE-FLOW VELOCITY (FEET/SEC.) = 17.76 PIPE FLOW VELOCITY = (TOTAL FLOW) / (PIPE CROSS SECTION AREA) GIVEN PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1
PIPE-PLOW(CFS) = 55.78
PIPE TRAVEL TIME (MIN.) = 0.29 Tc (MIN.) = 19.15
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 119.00 = 3669.89 FEET.

************************* FLOW PROCESS FROM NODE 119.00 TO NODE 119.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<

TOTAL NUMBER OF STREAMS = 2 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE: TIME OF CONCENTRATION(MIN.) = 19.15 RAINFALL INTENSITY(INCH/HR) = 1.88 AREA-AVERAGED Fm(INCH/HR) = 0.06 AREA-AVERAGED FM(INCH/HR) = 0.20
AREA-AVERAGED Ap = 0.29
EFFECTIVE STREAM AREA(ACRES) = 33.72

PEAK FLOW RATE (CFS) AT CONFLUENCE =

** CONFLUENCE DATA **

Q Tc Intensity Fp(Fm) Ap (CFS) (MIN.) (INCH/HR) (INCH/HR) 118.47 20.71 1.798 0.21(0.09) 0.41 STREAM NUMBER (ACRES) NODE 76.9 100.00 55.78 19.15 1.880 0.20(0.06) 0.29

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO

CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

Q Tc Intensity Fp(Fm) Ap (CFS) (MIN.) (INCH/HR) (INCH/HR) 170.61 19.15 1.880 0.21(0.08) 0.37 171.73 20.71 1.798 0.21(0.08) 0.37 STREAM (ACRES) NODE 104.8 200 NUMBER 110.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

COMPOSED CONFIDENCE ESTIMATES ARE AFFOLIONS. = 20.71

EFFECTIVE AREA (ACRES) = 171.73 To(MIN) = 20.71

EFFECTIVE AREA (ACRES) = 110.59 AREA-AVERAGED Fm(INCH/HR) = 0.08

AREA-AVERAGED Fp(INCH/HR) = 0.21 AREA-AVERAGED AP = 0.37 TOTAL AREA(ACRES) = 110.6

LONGEST FLOWPATH FROM NODE 100.00 TO NODE 119.00 = 3923.72 FEET.

FLOW PROCESS FROM NODE 119.00 TO NODE 121.00 IS CODE = 41

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <>>>

| | | | 3P10R0 | | |
|--|--|--|--|---|----------------------|
| ELEVATION DATA: UPSTREA FLOW LENGTH(FEET) = 3 | AM(FEET) = | 1159.95 | DOWNSTREA | M(FEET) = | 1150.00 |
| DEPTH OF FLOW IN 54.0 PIPE-FLOW VELOCITY (FEET GIVEN PIPE DIAMETER (INC | INCH PIPE 1 | IS 27.7 I | NCHES | S = 1 | |
| PIPE-FLOW(CFS) = 17 PIPE TRAVEL TIME(MIN.) | 71.73 | | | | |
| LONGEST FLOWPATH FROM 1 | | | | 00 = 42 | 44.83 FEE |
| FLOW PROCESS FROM NODE | 121.00 7 | O NODE | | S CODE = | |
| >>>>ADDITION OF SUBARE | | | | | |
| MAINLINE TC(MIN.) = 2 * 10 YEAR RAINFALL INT | 20.97 TENSITY(INCH | | | | |
| SUBAREA LOSS RATE DATA | (AMC II): | ADEA | En | 7 m | 000 |
| DEVELOPMENT TYPE/ LAND USE RESIDENTIAL | GROUP | (ACRES) | INCH/HR) | (DECIMAL) | CN |
| "11+ DWELLINGS/ACRE" | C | 6.04 | 0.25 | 0.200 | 69 |
| RESIDENTIAL "11+ DWELLINGS/ACRE" COMMERCIAL | D | 8.06 | 0.20 | 0.200 | 75 |
| COMMERCIAL COMMERCIAL | C D | 0.97 | 0.25 | 0.200 0.100 0.100 | 69 |
| COMMERCIAL SUBAREA AVERAGE PERVIOU | | Fp(INCH | I/HR) = 0 | .22 | /5 |
| SUBAREA AVERAGE PERVIOU | IS AREA FRAC | TTON. An | = 0.185 | | 0.0 |
| SUBAREA AREA(ACRES) = EFFECTIVE AREA(ACRES) = AREA-AVERAGED Fp(INCH/F | = 127.20 | AREA-AV | ERAGED Fm | S) = 26. (TNCH/HR) | = 0.07 |
| AREA-AVERAGED Fp(INCH/ | HR) = 0.21 | AREA-AVE | RAGED Ap | = 0.35 | |
| TOTAL AREA (ACRES) = | 127.2 | PEAK E | LOW RATE (| CFS) = | 196.08 |
| FLOW PROCESS FROM NODE >>>>COMPUTE PIPE-FLOW >>>>USING USER-SPECIF | TRAVEL TIME | E THRU SUE E (EXISTIN | BAREA< |) <<<< | |
| ELEVATION DATA: UPSTREE FLOW LENGTH (FEET) = ' DEPTH OF FLOW IN 60.0 PIPE-FLOW VELOCITY (FEET GIVEN PIPE DIAMETER (INC.) PIPE-FLOW (CFS) = 12 PIPE TRAVEL TIME (MIN.) LONGEST FLOWPATH FROM 12 | 798.79 MAN INCH PIPE I I/SEC.) = I CH) = 60.00 96.08 = 0.87 | NNING'S N IS 37.3 I L5.28 NUMBE Tc(MIN.) | = 0.013 NCHES CR OF PIPE = 21.8 | S = 1 | 1140.00 43.62 FEE |
| ************************************** | 123.00 1 | O NODE | 123.00 I | S CODE = | 81 |
| >>>>ADDITION OF SUBARE | | | | | |
| MAINLINE Tc(MIN.) = 2 * 10 YEAR RAINFALL INT | 21.84 TENSITY(INCH | I/HR) = 1 | .744 | | |
| SUBAREA LOSS RATE DATA DEVELOPMENT TYPE/ LAND USE | SCS SOIL | AREA | Fp | Ap | SCS |
| LAND USE RESIDENTIAL | GROUP | (ACRES) | INCH/HR) | (DECIMAL) | CN |
| "11+ DWELLINGS/ACRE" RESIDENTIAL | | | | 0.200 | |
| "11+ DWELLINGS/ACRE" | D | 17.92 | 0.20 | 0.200 0.200 0.200 0.100 0.100 | 75 |
| APARTMENTS APARTMENTS | C D | 4.46 | 0.25 | 0.200 | 69 75 |
| COMMERCIAL | c | 0.78 | 0.25 | 0.100 | 69 |
| COMMERCIAL | D | 1.88 | 0.20 | 0.100 | 75 |
| SUBAREA AVERAGE PERVIOUS SUBAREA AVERAGE PERVIOU | IC ADEA EDAC | TTON An | — 0 102 | | |
| SUBAREA AREA(ACRES) = | 32.52 | SUBAREA | RUNOFF (CF | s) = 49. | 82 |
| SUBAREA AREA (ACRES) = EFFECTIVE AREA (ACRES) = AREA-AVERAGED Fp (INCH/F | = 159.72 | AREA-AV | ERAGED Fm | (INCH/HR) | = 0.07 |
| AREA-AVERAGED Fp(INCH/F TOTAL AREA(ACRES) = | HR) = 0.21 159.7 | AREA-AVE PEAK E | RAGED Ap LOW RATE(| = 0.31 CFS) = | 241.18 |
| ** PEAK FLOW RATE TABLE | ≅ ** | | | | |
| | | | Page 1 | 0 | |

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| STREAM Q TC Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MMIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 243.02 20.28 1.820 2.1(0.07) 0.31 153.9 200.00 2 241.18 21.84 1.744 0.21(0.07) 0.31 159.7 100.00 NEW PEAK FLOW DATA ARE: PEAK FLOW RATE (CFS) = 243.02 Tc(MIN.) = 20.28 AREA-AVERAGED FM(INCH/HR) = 0.07 AREA-AVERAGED FF(INCH/HR) = AREA-AVERAGED AP = 0.31 EFFECTIVE AREA (ACRES) = 153.93 |
|---|
| FLOW PROCESS FROM NODE 123.00 TO NODE 129.00 IS CODE = 41 |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<>>> >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) |
| ELEVATION DATA: UPSTREAM(FEET) = 1140.00 DOWNSTREAM(FEET) = 1122.00 FLOW LENGTH(FEET) = 579.78 MANNING'S N = 0.013 DEPTH OF FLOW IN 51.0 INCH PIPE IS 36.5 INCHES PIPE-FLOW VELOCITY(FEET/SEC.) = 22.38 GIVEN PIPE DIAMETER(INCH) = 51.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 243.02 PIPE TRAVEL TIME (MIN.) = 0.43 TC(MIN.) = 20.71 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 129.00 = 5623.40 FEET. |
| ************************************** |
| >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< |
| MAINLINE TC(MIN.) = 20.71 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.798 SUBAREA LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "11+ DWELLINGS/ACRE" C 2.85 0.25 0.200 69 COMMERCIAL C 0.56 0.25 0.100 69 SUBAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.25 |
| SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.184 SUBAREA AREA (ACRES) = 3.41 SUBAREA RUNOFF (CFS) = 5.38 EFFECTIVE AREA (ACRES) = 157.34 AREA-AVERAGED Fm(INCH/HR) = 0.07 AREA-AVERAGED Fp(INCH/HR) = 0.21 AREA-AVERAGED Ap = 0.31 TOTAL AREA (ACRES) = 163.1 PEAK FLOW RATE (CFS) = 245.37 |
| FLOW PROCESS FROM NODE 129.00 TO NODE 129.00 IS CODE = 81 |
| >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< |
| MAINLINE TC(MIN.) = 20.71 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.798 SUBAREA LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN |
| Total area (acres) = 166.6 C 2.54 0.25 0.200 69 C 2.54 0.25 0.200 69 C 2.54 0.25 0.100 69 C 2.55 0.100 69 |
| ************************************** |
| >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE< |

AREA-AVERAGED Fp(INCH/HR) = 0.21 AREA-AVERAGED P = 0.31

EFFECTIVE STREAM AREA(ACRES) = 166.64

TOTAL STREAM AREA(ACRES) = 166.64

PEAK FLOW RATE(CFS) AT CONFLUENCE = 25 **************************** FLOW PROCESS FROM NODE 300.00 TO NODE 301.00 IS CODE = 21 >>>>RATTONAL METHOD INITIAL SUBARRA ANALYSIS (*** >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< INITIAL SUBAREA FLOW-LENGTH (FEET) = 320.55 ELEVATION DATA: UPSTREAM(FEET) = 1163.74 DOWNSTREAM(FEET) = 1148.43 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 SUBAREA ANALYSIS USED MINIMUM TC(MIN.) = 5.61(
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.798
SUBAREA TC AND LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS TC LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) RESIDENTIAL 0.29 0.25 "11+ DWELLINGS/ACRE" COMMERCIAL C 1.36 0.25 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25 0.100 69 5.62 SUBARBA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.118 SUBARBA RUNOFF(CFS) = 5.60 TOTAL AREA(ACRES) = 1.65 PEAK FLOW RATE(CFS) = ******************** FLOW PROCESS FROM NODE 301.00 TO NODE 302.00 IS CODE = 62 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA >>>> (STREET TABLE SECTION # 3 USED) <<<< UPSTREAM ELEVATION(FEET) = 1148.43 DOWNSTREAM ELEVATION(FEET) = 1141.94 STREET LENGTH (FEET) = 235.77 CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 50.00 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 45.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.017 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.017 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.017 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0150 **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH(FEET) = 0.39 STREET FLOW DEPTH(FEET) = 0.39

HALFSTREET FLOOW DUTDH(FEET) = 13.04

AVERAGE FLOW VELOCITY(FEET/SEC.) = 4.05

PRODUCT OF DEPTHAVELOCITY(FT*FT/SEC.) = 1.56

STREET FLOW TRAVEL TIME(MIN.) = 0.97

TC(MIN.) =

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.467 SUBAREA LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL 0.47 "11+ DWELLINGS/ACRE" С COMMERCIA COMPARCIA COMPAR TOTAL AREA (ACRES) = 6.6 PEAK FLOW RATE(CFS) = END OF SUBAREA STREET FLOW HYDRAULICS: END OF SUBAREA SIRELI FLOW HIDRADILES:
DEPTH(FEET) = 0.43 HALFSTREET FLOOW WIDTH(FEET) = 15.68
FLOW VELOCITY(FET/SEC.) = 4.49 DEPTH-VELOCITY(FTFT/SEC.) =
556
500.00 TO NODE 302.00 = 556

3P10ROV

| 3P10ROV |
|---|
| FLOW PROCESS FROM NODE 302.00 TO NODE 303.00 IS CODE = 41 |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<>>>> >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) |
| ELEVATION DATA: UPSTREAM(FEET) = 1141.94 DOWNSTREAM(FEET) = 1122.13 FLOW LENGTH(FEET) = 643.31 MANING'S N = 0.013 DEPTH OF FLOW IN 36.0 INCH PIPE IS 10.5 INCHES PIPE-FLOW VELOCITY(FEET/SEC.) = 11.99 GIVEN PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 20.52 PIPE TRAVEL TIME (MIN.) = 0.89 Tc(MIN.) = 7.48 LONGEST FLOWPATH FROM NODE 300.00 TO NODE 303.00 = 1199.63 FEET. |
| FLOW PROCESS FROM NODE 303.00 TO NODE 303.00 IS CODE = 81 |
| >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< |
| MAINLINE TC (MIN.) = 7.48 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 3.223 SUBARBA LOSR RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL **11+ DMELLINGS/ACRE** C 2.51 0.25 0.200 69 COMMERCIAL C 3.05 0.25 0.100 69 SUBARBA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.25 SUBARBA AVERAGE PERVIOUS AREA FRACTION, AP = 0.145 SUBARBA AVERAGE PERVIOUS AREA FRACTION, AP = 0.145 SUBARBA AKEA(ACRES) = 5.56 SUBARBA RUNOFF(CFS) = 15.95 EFFECTIVE ARBA (ACRES) = 12.19 ARBA-AVERAGED FM(INCH/HR) = 0.03 ARBA-AVERAGED FM(INCH/HR) = 0.25 ARBA-AVERAGED FM(INCH/HR) = 0.03 ARBA-AVERAGED FM(INCH/HR) = 0.25 PEAK FLOW RATE (CFS) = 35.01 **FLOW PROCESS FROM NODE 303.00 TO NODE 129.00 IS CODE = 41 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBARBA<**C< |
| FLOW PROCESS FROM NODE 129.00 TO NODE 129.00 IS CODE = 1 |
| >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE< |
| TOTAL NUMBER OF STREAMS = 2 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE: TIME OF CONCENTRATION (MIN.) = 7.77 RAINFALL INTENSITY (INCH/HR) = 0.03 AREA-AVERAGED FP (INCH/HR) = 0.25 AREA-AVERAGED FP (INCH/HR) = 0.25 AREA-AVERAGED FP (INCH/HR) = 0.13 EFFECTIVE STREAM AREA (ACRES) = 12.19 TOTAL STREAM AREA (ACRES) = 12.19 PEAK FLOW RATE (CFS) AT CONFLUENCE = 35.01 ** CONFLUENCE DATA ** STREAM Q T C INTENSITY FP (FM) AP AE HEADWATER (ACRES) NODE NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 248.85 22.27 1.725 0.21 (0.07) 0.31 160.9 200.00 2 35.01 7.77 3.152 0.25 (0.03) 0.13 12.2 300.00 |

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3P10R

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO CONFLUENCE FORMULA USED FOR 2 STREAMS.

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** PEAK FLOW RATE TABLE **
                           Tc Intensity Fp(Fm)
                                                                               HEADWATER
   STREAM
                  0
                                                            Ap
                (CFS) (MIN.) (INCH/HR) (INCH/HR)
   NUMBER
                                                                    (ACRES)
                                                                                  NODE
                                   3.152 0.21(0.06) 0.28
1.798 0.21(0.06) 0.29
               202.77
270.73
                        7.77
20.71
                                                                         72.6
                                                                                    300.00
               267.84 22.27
                                     1.725 0.21(0.06) 0.30
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) = 270.73 Tc(MIN.) = 20.71

EFFECTIVE AREA(ACRES) = 173.04 AREA-AVERAGED Fm(INCH/HR) = 0.06
 AREA-AVERGED FROM NOBE 178.8

AREA-AVERGED AP 0.29

TOTAL AREA (ACRES) = 178.8

LONGEST FLOWFATH FROM NOBE 100.00 TO NOBE 129.00 = 5623.40 FEET.
********************
 FLOW PROCESS FROM NODE 129.00 TO NODE 131.00 IS CODE = 41
  >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
  >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <>
.
 ELEVATION DATA: UPSTREAM(FEET) = 1105.04 DOWNSTREAM(FEET) = 1103.76 FLOW LENGTH(FEET) = 35.44 MANNING'S N = 0.013 DEPTH OF FLOW IN 66.0 INCH PIPE IS 30.9 INCHES PIPE-FLOW VELOCITY(FEET/SEC.) = 24.77 GIVEN PIPE DIAMETER(INCH) = 66.00 NUMBER OF PIPES = 1 DIDEP_DIAMETER(INCH) = 270.73
 PIPE-FLOW(CES) = 270.73
PIPE TRAVEL TIME(MIN.) = 0.02 Tc(MIN.) = 20.74
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 131.00 = 5658.84 FEET.
***********************
 FLOW PROCESS FROM NODE 131.00 TO NODE 131.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
               _____
 MAINLINE Tc(MIN.) = 20.74
  * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.797
 SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA
                               GROUP (ACRES) (INCH/HR) (DECIMAL) CN
C 1.86 0.25 0.100 69
D 0.14 0.20 0.100 75
       LAND USE
  COMMERCIAL
  COMMERCIAL
 COMMERCIAL D 0.14 0.20 0.100 75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA AREA (ACRES) = 2.00 SUBAREA RUNOFF (CFS) = 3.19
EFFECTIVE AREA (ACRES) = 175.04 AREA-AVERAGED Fm(INCH/HR) = 0.06
AREA-AVERAGED Fp(INCH/HR) = 0.21 AREA-AVERAGED Ap = 0.29
  TOTAL AREA(ACRES) = 180.8 PEAK FLOW RATE(CFS) =
************************
FLOW PROCESS FROM NODE 131.00 TO NODE 133.00 IS CODE = 41
  >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <<<<<
 ELEVATION DATA: UPSTREAM(FEET) = 1103.76 DOWNSTREAM(FEET) = 1101.65 FLOW LENGTH(FEET) = 503.15 MANNING'S N = 0.013 ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY (FEET/SEC.) = 11.50
  PIPE FLOW VELOCITY = (TOTAL FLOW) / (PIPE CROSS SECTION AREA)
 GIVEN PIPE DIAMETER(INCH) = 66.00 NUMBER OF PIPES = 1

FIFE-FLOW(CFS) = 273.30

FIFE TRAVEL TIME (MIN.) = 0.73 Tc (MIN.) = 21.47

LONGEST FLOWPATH FROM NODE 100.00 TO NODE 133.00 = 6161.99 FEET.
***********************
 FLOW PROCESS FROM NODE 133.00 TO NODE 133.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 MAINLINE Tc(MIN.) = 21.47
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.762
                                                          Page 14
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SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
      LAND USE
                         GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL
                          C
D
                                    1.00
                                            0.25 0.100
 COMMERCIAL
                                                0.20
                                                         0.100
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.23
 SUBARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBARRA AREA (ACRES) = 1.87
SUBARRA RIBA (ACRES) = 2.93
EFFECTIVE AREA (ACRES) = 176.91
AREA-AVERAGED FM(INCH/HR) = 0.06
AREA-AVERAGED FM(INCH/HR) = 0.21
AREA-AVERAGED Ap = 0.29
TOTAL AREA (ACRES) = 182.7
PEAK FLOW RATE (CFFS) = 273.30
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
********************
 FLOW PROCESS FROM NODE 133.00 TO NODE 135.00 IS CODE = 41
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <<<<<
 ELEVATION DATA: UPSTREAM(FEET) = 1101.65 DOWNSTREAM(FEET) = 1101.33
 FLOW LENGTH(FEET) = 60.37 MANNING'S N = 0.013 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 11.50
 PIPE FLOW VELOCITY = (TOTAL FLOW) / (PIPE CROSS SECTION AREA)
 GIVEN PIPE DIAMETER (INCH) = 66.00 NUMBER OF PIPES =
 PIPE-FLOW(CFS) = 273.30
PIPE TRAVEL TIME(MIN.) = 0.09 Tc(MIN.) = 21.55
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 135.00 = 6222.36 FEET.
FLOW PROCESS FROM NODE 135.00 TO NODE 135.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 MAINLINE Tc(MIN.) = 21.55
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.757
 SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA
      LAND USE
                          GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL
                                0.36 0.25
0.44 0.20
                         C
D
                                                         0.100
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
**********************
 FLOW PROCESS FROM NODE 135.00 TO NODE 137.00 IS CODE = 41
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <<<<
 ELEVATION DATA: UPSTREAM(FEET) = 1101 33 DOWNSTREAM(FEET) = 1098 66
 FLOW LENGTH (FEET) = 408.71 MANNING'S N = 0.013
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 11.50
 PIPE FLOW VELOCITY = (TOTAL FLOW) / (PIPE CROSS SECTION AREA)
 GIVEN PIPE DIAMETER (INCH) = 66.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 273.30

PIPE TRAVEL TIME(MIN.) = 0.59 Tc(MIN.) = 22.15

LONGEST FLOWPATH FROM NODE 100.00 TO NODE 137.00 =
                                                            6631.07 FEET.
*************************
 FLOW PROCESS FROM NODE 137.00 TO NODE 137.00 TS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
            _____
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.730
SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                         SCS SOIL AREA
                                               Fp
                                                Page 15
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LAND USE
                                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
  COMMERCIAL
                                     C
D
                                                  4.06
                                                               0.25 0.100
0.20 0.100
                                                  1.08
                                                                0.20
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.24
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100

        SUBARRA AVERAGE PERVICUS AKEA FRACTION, AP = 0.100

        SUBARRA AREA (ACRES) = 5.14
        SUBARRA REAR (ACRES) = 7.89

        EFFECTIVE AREA (ACRES) = 182.85
        AREA-AVERAGED Fm (INCH/HR) = 0.06

        AREA-AVERAGED Fp (INCH/HR) = 0.21
        AREA-AVERAGED Ap = 0.28

        TOTAL AREA (ACRES) = 188.6
        PEAK FLOW RATE (CFS) = 274.83

***********************
 FLOW PROCESS FROM NODE 137.00 TO NODE 141.00 IS CODE = 41
  >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
  >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <<<<<
  ELEVATION DATA: UPSTREAM(FEET) = 1098.66 DOWNSTREAM(FEET) = 1093.99
  FLOW LENGTH(FEET) = 318.57 MANNING'S N = 0.013
DEPTH OF FLOW IN 66.0 INCH PIPE IS 41.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 17.63

GIVEN PIPE DIAMETER(INCH) = 66.00 NUMBER OF PIPES = 1

PIPE-FLOW(CFS) = 274.83
  PIPE TRAVEL TIME (MIN.) = 0.30 Tc (MIN.) = 22.45
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 141.00 = 6949.64 FEET.
*******************
 FLOW PROCESS FROM NODE 141.00 TO NODE 141.00 IS CODE = 81
  >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 MAINLINE Tc (MIN.) = 22.45

* 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.717
  SUBAREA LOSS RATE DATA(AMC II):
   DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
  COMMERCIAL C 5.78 0.25 0.
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
                                                                            0.100

        SUBAREA AREA(ACRES) = 5.78
        SUBAREA RUNOFF(CFS) = 8.80

        EFFECTIVE AREA(ACRES) = 188.63
        AREA-AVERAGED Fm(INCH/HR) = 0.06

        AREA-AVERAGED Fp(INCH/HR) = 0.21
        AREA-AVERAGED AP = 0.28

  TOTAL AREA(ACRES) = 194.4
                                                   PEAK FLOW RATE (CFS) =
FLOW PROCESS FROM NODE 141.00 TO NODE 141.00 IS CODE = 81
  >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
       MAINLINE Tc(MIN.) = 22.45
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.717
  SUBAREA LOSS RATE DATA(AMC II):
   DEVELOPMENT TYPE/
                                SCS SOIL AREA
                                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
        LAND USE
  RESIDENTIAL
   "8-10 DWELLINGS/ACRE"
  COMMERCIAL C 0.87 0.25 C
SUBARRA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBARRA AVERAGE DEDUTAGE AND FORWARD
                                                                           0.100
 SUBARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.268
SUBARRA AREA (ACRES) = 1.55
SUBARRA RAEA (ACRES) = 1.55
SUBARRA RAEA (ACRES) = 190.18
AREA-AVERAGED Fm(INCH/HR) = 0.06
AREA-AVERAGED Fm(INCH/HR) = 0.21
AREA-AVERAGED Ap = 0.28
  TOTAL AREA (ACRES) =
                                   196.0
                                                   PEAK FLOW RATE(CFS) =
 FLOW PROCESS FROM NODE 141.00 TO NODE 145.00 IS CODE = 41
  >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
  >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <>
  ELEVATION DATA: UPSTREAM(FEET) = 1093.99 DOWNSTREAM(FEET) = 1076.30
 ELEVATION DAIA: DESIREAM(FEET) = 1093.99 DUMNSIREAM(FEET) FLOW LENGTH(FEET) = 504.72 MANNING'S N = 0.013
DEPTH OF FLOW IN 60.0 INCH PIPE IS 34.0 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 24.75
GIVEN PIPE DIAMETER(INCH) = 60.00 NUMBER OF PIPES = 1
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|--|
| PIPE-FLOW(CFS) = 283.74 PIPE TRAVEL TIME(MIN.) = 0.34 Tc(MIN.) = 22.79 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 145.00 = 7454.36 FEET. |
| ************************************** |
| >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW |
| MAINLINE TC (MIN.) = 22.79 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.702 SUBARRA LOSR RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA FD AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN COMMERCIAL C 0.71 0.25 0.100 69 COMMERCIAL C 0.32 0.20 0.100 75 SUBARRA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.23 SUBARRA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.23 SUBARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100 SUBARRA AVERAGED PERVIOUS AREA FRACTION, AP = 0.100 SUBARRA AVERAGED PERVIOUS AREA FRACTION, AP = 0.20 SUBARRA AVERAGED PERVIOUS AREA FRACTION AREA—AVERAGED PERVIOUS, AREA TOTAL AREA (ACRES) = 10.21 AREA—AVERAGED AP = 0.28 TOTAL AREA (ACRES) = DEAK FLOW RATE (CFS) = 283.74 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE |
| ************************************** |
| >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< |
| MAINLINE TC (MIN.) = 22.79 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.702 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA FD AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN CONDOMINIOMS C 1.02 0.25 0.350 69 CONDOMINIOMS D 4.41 0.20 0.350 75 SUBAREA AVERAGE PERVIOUS LOSS RATE, FP (INCH/HR) = 0.21 SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.350 SUBAREA AREA (ACRES) = 5.43 SUBAREA RUNDFF (CFS) = 7.96 EFFECTIVE AREA (ACRES) = 196.64 AREA-AVERAGED FM (INCH/HR) = 0.06 AREA-AVERAGED FF (INCH/HR) = 0.21 AREA-AVERAGED AP = 0.28 TOTAL AREA (ACRES) = 202.4 PEAK FLOW RATE (CFS) = 290.74 |
| FLOW PROCESS FROM NODE 145.00 TO NODE 149.00 IS CODE = 41 |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<>>> >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) |
| ELEVATION DATA: UPSTREAM(FEET) = 1076.30 DOWNSTREAM(FEET) = 1053.58 FLOW LENGTH (FEET) = 289.89 MANNING'S N = 0.013 DEPTH OF FLOW IN 60.0 INCH PIPE IS 27.1 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 33.70 GIVEN PIPE DIAMETER(INCH) = 60.00 NUMBER OF PIPES = 1 PIPE-FLOW (CFS) = 290.74 PIPE TRAVEL TIME (MIN.) = 0.14 TC(MIN.) = 22.93 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 149.00 = 7744.25 FEET. |
| FLOW PROCESS FROM NODE 149.00 TO NODE 149.00 IS CODE = 81 |
| >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< |
| MAINLINE TC (MIN.) = 22.93 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.696 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN CONDOMINIUMS C 4.75 0.25 0.350 69 CONDOMINIUMS D 1.68 0.20 0.350 75 SUBAREA AVERAGE PERVIOUS LOSS RATE, FP (INCH/HR) = 0.24 SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.350 SUBAREA AREA (ACRES) = 6.43 SUBAREA RONOFF (CFS) = 9.34 EFFECTIVE AREA (ACRES) = 203.07 AREA-AVERAGED Fm (INCH/HR) = 0.066 Page 17 |

AREA-AVERAGED Fp(INCH/HR) = 0.21 AREA-AVERAGED Ap = 0.28 TOTAL AREA(ACRES) = 208.9 PEAK FLOW RATE(CFS) = *********************** FLOW PROCESS FROM NODE 149.00 TO NODE 149.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< MAINLINE TC(MIN.) = 22.93
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.696 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA SCS SOIL AREA Fp Ap SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN LAND USE COMMERCIAL С 0.25 0.100 PUBLIC PARK PUBLIC PARK 0.62 0.25 0.850 0.20 75 0.850 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

 SUBARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.564

 SUBARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.564

 SUBARRA AREA (ACRES) = 1.05
 SUBAREA RUNOFF (CFS) = 1.47

 EFFECTIVE AREA (ACRES) = 204.12
 AREA-AVERAGED FM (INCH/HR) = 0.06

 AREA-AVERAGED FP (INCH/HR) = 0.22
 AREA-AVERAGED AP = 0.28

 TOTAL AREA (ACRES) = 209.9
 PEAK FLOW RATE (CFS) = 300.46

 ***************************** FLOW PROCESS FROM NODE 149.00 TO NODE 151.00 IS CODE = 41 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <>>> ELEVATION DATA: UPSTREAM(FEET) = 1053.58 DOWNSTREAM(FEET) = 1023.54 FLOW LENGTH(FEET) = 305.05 MANNING'S N = 0.013 DEPTH OF FLOW IN 60.0 INCH PIPE IS 25.9 INCHES *********************** FLOW PROCESS FROM NODE 151.00 TO NODE 151.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>> MAINLINE TC(MIN.) = 23.07
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.690 SUBAREA LOSS RATE DATA(AMC II): SCS SOIL AREA FP AP SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE SUBARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBARRA AREA (ACRES) = 1.52
SUBARRA RUNOFF (CFS) = 2.28
EFFECTIVE AREA (ACRES) = 205.64
AREA-AVERAGED FM (INCH/HR) = 0.06
AREA-AVERAGED AP = 0.28 211 4 PEAK FLOW RATE(CFS) = TOTAL AREA (ACRES) = *********************** FLOW PROCESS FROM NODE 151.00 TO NODE 153.00 IS CODE = 41 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <> ELEVATION DATA: UPSTREAM(FEET) = 1023.54 DOWNSTREAM(FEET) = 1007.62 FLOW LENGTH(FEET) = 210.38 MANNING'S N = 0.013 DEPTH OF FLOW IN 60.0 INCH PIPE IS 28.0 INCHES PIPE-FLOW VELOCITY(FEET/SEC.) = 33.58 GIVEN PIPE DIAMETER (INCH) = 60.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 301.68 PIPE TRAVEL TIME(MIN.) = 0.10 Tc(MIN.) = 23.17 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 153.00 = 8259.68 FEET. ****************************

FLOW PROCESS FROM NODE 153.00 TO NODE 153.00 IS CODE = 81

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|--|--|--|--|---|---|
| | | | | | |
| >>>>ADDITION OF SUBARE | | | | | |
| MAINLINE Tc(MIN.) = 2 | | | ====== | | |
| * 10 YEAR RAINFALL INT | 3.1/ DNGTTV/TN | OH /HP) | 1 606 | | |
| | | | | | |
| SUBAREA LOSS RATE DATA (. DEVELOPMENT TYPE/ LAND USE COMMERCIAL PUBLIC PARK SUBAREA AVERAGE PERVIOU | MMC II). | 3003 | D | 3 | 000 |
| DEVELOPMENT TIPE/ | SCS SUIL | AREA | (TNOU/UD) | AP | SUS |
| LAND USE | GROUP | (ACRES) | (INCH/HR) | (DECIMAL) |) CN |
| COMMERCIAL | D | 0.85 | 0.20 | 0.100 | 75 |
| PUBLIC PARK | D | 2.01 | 0.20 | 0.850 | 75 |
| SUBAREA AVERAGE PERVIOU | S LOSS RA | TE, Fp(IN | CH/HR) = 0 | .20 | |
| SUBAREA AVERAGE PERVIOU | S AREA FR | ACTION, A | p = 0.627 | | |
| SUBAREA AREA(ACRES) = | 2.86 | SUBARE | A RUNOFF (CF | S) = 4 | .02 |
| EFFECTIVE AREA (ACRES) = | 208.5 | 0 AREA- | AVERAGED Fm | (INCH/HR) | = 0.06 |
| AREA-AVERAGED Fp(INCH/H | R) = 0.2 | 1 AREA-A | VERAGED Ap | = 0.29 | |
| SUBAREA AVERAGE PERVIOU SUBAREA AREA(ACRES) = EFFECTIVE AREA(ACRES) = AREA-AVERAGED Fp(INCH/H. TOTAL AREA(ACRES) = | 214.3 | PEAK | FLOW RATE (| CFS) = | 304.89 |
| | | | | | |
| ******* | | | | | |
| FLOW PROCESS FROM NODE | | | | | |
| | | | | | |
| >>>>ADDITION OF SUBARE | | | | | |
| | | | | | |
| MAINLINE Tc(MIN.) = 2 | 3.17 | | | | |
| * 10 YEAR RAINFALL INT | ENSITY(IN | CH/HR) = | 1.686 | | |
| SUBAREA LOSS RATE DATA(| AMC II): | | | | |
| DEVELOPMENT TYPE/ LAND USE COMMERCIAL SUBAREA AVERAGE PERVIOU | SCS SOIL | AREA | Fp | Ap | SCS |
| LAND USE | GROUP | (ACRES) | (INCH/HR) | (DECIMAL) |) CN |
| COMMERCIAL | D | 0.27 | 0.20 | 0.100 | 75 |
| SUBAREA AVERAGE PERVIOU | S LOSS RA | TE, Fp(IN | CH/HR) = 0 | .20 | |
| | | | | | |
| SUBAREA AREA(ACRES) = | 0.27 | SUBARE | A RUNOFF (CF | S) = 0 | .40 |
| EFFECTIVE AREA (ACRES) = | 208.7 | 7 AREA- | AVERAGED Fm | (TNCH/HR) | = 0.06 |
| APEN-AVERAGED EN (INCH/H | D) = 0 2 | 1 APEA_A | VEDAGED An | - 0 28 | |
| SUBAREA AREA (ACRES) = EFFECTIVE AREA (ACRES) = AREA-AVERAGED Fp(INCH/H. TOTAL AREA(ACRES) = | 214 6 | DEVR | FIOW DATE | CESI - | 305 29 |
| TOTAL AREA (ACRES) - | 214.0 | LIMI | THOW RAIL(| CIS) - | 303.23 |
| ******* | ****** | ****** | ******* | ****** | ****** |
| FLOW PROCESS FROM NODE | | | | | |
| | | TO NODE | 133.00 1 | 3 CODE = | 01 |
| | | | | | |
| ANNADDITION OF CURADE | A TO MATN | TIME DEAD | ET OW//// | | |
| >>>>ADDITION OF SUBARE | | | | | |
| | | | | | |
| MAINLINE Tc(MIN.) = 2 | 3.17 | | | | |
| MAINLINE Tc(MIN.) = 2 * 10 YEAR RAINFALL INT | ======= 3.17 ENSITY(IN | ======= CH/HR) = | | | |
| MAINLINE TC (MIN.) = 2 * 10 YEAR RAINFALL INT | 3.17 ENSITY(IN | CH/HR) = | 1.686 | | |
| MAINLINE TC (MIN.) = 2 * 10 YEAR RAINFALL INT | 3.17 ENSITY(IN | CH/HR) = | 1.686 | | |
| MAINLINE TC(MIN.) = 2 * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA(. DEVELOPMENT TYPE/ LAND USE | 3.17 ENSITY(IN | CH/HR) = | 1.686 | | |
| MAINLINE Tc (MIN.) = 2 * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA (DEVELOPMENT TYPE/ LAND USE RESIDENTIAL | 3.17 ENSITY(IN AMC II): SCS SOIL GROUP | CH/HR) = AREA (ACRES) | 1.686 Fp (INCH/HR) | Ap (DECIMAL) | SCS) CN |
| MAINLINE Tc(MIN.) = 2 * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA(. DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" | 3.17 ENSITY(IN AMC II): SCS SOIL GROUP | CH/HR) = AREA (ACRES) | 1.686 Fp (INCH/HR) | | SCS) CN |
| MAINLINE TC(MIN.) = 2 * 10 YEAR PAINFALL INT SUBAREA LOSS RATE DATA(. DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL | 3.17 ENSITY(IN | CH/HR) = AREA (ACRES) | 1.686 Fp (INCH/HR) | Ap (DECIMAL) | SCS) CN |
| MAINLINE TC(MIN.) = 2 * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA(. DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "5-7 DWELLINGS/ACRE" | 3.17 ENSITY(IN AMC II): SCS SOIL GROUP | CH/HR) = AREA (ACRES) | 1.686 Fp (INCH/HR) 0.25 | Ap (DECIMAL) | SCS CN |
| MAINLINE TC(MIN.) = 2 * 10 YEAR PAINFALL INT SUBAREA LOSS RATE DATA(. DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL | 3.17 ENSITY(IN AMC II): SCS SOIL GROUP | CH/HR) = AREA (ACRES) 5.30 | 1.686 Fp (INCH/HR) 0.25 | Ap (DECIMAL) | SCS CN |
| MAINLINE TC(MIN.) = 2 * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA(. DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "5-7 DWELLINGS/ACRE" | 3.17 ENSITY(IN AMC II): SCS SOIL GROUP | CH/HR) = AREA (ACRES) 5.30 | 1.686 Fp (INCH/HR) 0.25 | Ap (DECIMAL) | SCS CN 69 |
| MAINLINE TC(MIN.) = 2 * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA(. DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" | 3.17 ENSITY(IN AMC II): SCS SOIL GROUP C D | CH/HR) = AREA (ACRES) 5.30 0.58 9.75 | 1.686 Fp (INCH/HR) 0.25 0.20 0.25 | Ap (DECIMAL) 0.500 0.500 0.400 | SCS CN 69 75 |
| MAINLINE TC(MIN.) = 2 * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA(. DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" | 3.17 ENSITY(IN AMC II): SCS SOIL GROUP C D | CH/HR) = AREA (ACRES) 5.30 0.58 9.75 | 1.686 Fp (INCH/HR) 0.25 0.20 0.25 | Ap (DECIMAL) 0.500 0.500 0.400 | SCS CN 69 75 |
| MAINLINE TC(MIN.) = 2 * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA(. DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" | 3.17 ENSITY(IN AMC II): SCS SOIL GROUP C D | CH/HR) = AREA (ACRES) 5.30 0.58 9.75 | 1.686 Fp (INCH/HR) 0.25 0.20 0.25 | Ap (DECIMAL) 0.500 0.500 0.400 | SCS CN 69 75 |
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| MAINLINE TC(MIN.) = 2 * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA(. DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" | 3.17 ENSITY(IN AMC II): SCS SOIL GROUP C D | CH/HR) = AREA (ACRES) 5.30 0.58 9.75 | 1.686 Fp (INCH/HR) 0.25 0.20 0.25 | Ap (DECIMAL) 0.500 0.500 0.400 | SCS CN 69 75 |
| MAINLINE TC(MIN.) = 2 * 10 YEAR RAINFALL INT SUBARBA LOSS RATE DATA(. DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" APANTMENTS COMMERCIAL SUBARBA AVERAGE PERVIOU | A STATE OF THE STATE OF T | CH/HR) = AREA (ACRES) 5.30 0.58 9.75 1.01 2.16 2.28 TE, FP(IN | 1.686 Fp (INCH/HR) 0.25 0.20 0.25 0.25 0.25 CH/HR) = 0 | Ap (DECIMAL) 0.500 0.500 0.400 | SCS CN 69 75 |
| MAINLINE TC(MIN.) = 2 * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA(. DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" APARTMENTS COMMERCIAL SUBAREA AVERAGE PERVIOU | S. LOS RA | CH/HR) = AREA (ACRES) 5.30 0.58 9.75 1.01 2.16 2.28 TE, FP(IN | 1.686 Fp (INCH/HR) 0.25 0.20 0.25 0.20 0.25 0.20 0.25 0.20 0.25 CH/HR) = 0 | Ap (DECIMAL) 0.500 0.500 0.400 0.200 0.100 | SCS CN 69 75 69 75 69 |
| MAINLINE TC(MIN.) = 2 * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA(. DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" APARTMENTS COMMERCIAL SUBAREA AVERAGE PERVIOU | S. LOS RA | CH/HR) = AREA (ACRES) 5.30 0.58 9.75 1.01 2.16 2.28 TE, FP(IN | 1.686 Fp (INCH/HR) 0.25 0.20 0.25 0.20 0.25 0.20 0.25 0.20 0.25 0.20 0.25 0.20 | Ap (DECIMAL) 0.500 0.500 0.400 0.200 0.100 | SCS CN 69 75 69 75 69 |
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| MAINLINE TC(MIN.) = 2 * 10 YEAR RAINFALL INT SUBARBA LOSS RATE DATA(. DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" APANTMENTS COMMERCIAL SUBARBA AVERAGE PERVIOU | S. LOS RA | CH/HR) = AREA (ACRES) 5.30 0.58 9.75 1.01 2.16 2.28 TE, FP(IN | 1.686 Fp (INCH/HR) 0.25 0.20 0.25 0.20 0.25 0.20 0.25 0.20 0.25 0.20 0.25 0.20 | Ap (DECIMAL) 0.500 0.500 0.400 0.200 0.100 | SCS CN 69 75 69 75 69 |
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| MAINLINE TC(MIN.) = 2 * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA(. DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "6-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" APARTMENTS COMMERCIAL SUBAREA AVERAGE PERVIOU FOR TOTAL AREA (ACRES) = AREA-AVERAGED FD (INCH/H TOTAL AREA (ACRES) = | 3.17 ENSITY(IN AMC II): SCS SOIL GROUP C D C C C C C S LOSS RA S AREA 21.08 229.8 R) = 0.2 235.6 | CH/HR) = AREA (ACRES) 5.30 0.58 9.75 1.01 2.16 2.28 TE, FP(IN) ACTION, A SUBARE 5 AREA-2 PEAK | 1.686 Fp (INCH/HR) 0.25 0.20 0.25 0.25 0.25 CH/HR) = 0 p = 0.375 A RUNOFF (CF AVERAGED AP FLOW RATE (| Ap (DECIMAL) 0.500 0.500 0.400 0.200 0.100 .25 S) = 30 (INCH/HR) = 0.29 CFS) = | SCS CN 69 75 69 75 69 69 24 = 0.06 335.53 |
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| MAINLINE TC(MIN.) = 2 * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA(. DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" APARTMENTS COMMERCIAL SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU SUBAREA AREA (ACRES) = EFFECTIVE AREA (ACRES) = EFFECTIVE AREA (ACRES) = FLOW PROCESS FROM NODE >>>>ADDITION OF SUBAREA MAINLINE TC(MIN.) = 2 | 3.17 ENSITY(IN AMC 11): SCS SOIL GROUP C D C C D C C C S LOSS RA S ARRA P 21.08 229.8 R 1235.6 | CH/HR) = AREA (ACRES) 5.30 0.58 9.75 1.01 2.16 2.28 TE, FP(IN) ACTION, A AEA-A PEAK TO NODE TO NODE TO NODE LINE PEAK | 1.686 FP (INCH/HR) 0.25 0.20 0.25 0.25 0.25 CH/HR) = 0 p = 0.375 A RUNOFF (CF AVERAGED Fn VERAGED Fn VERAGED Fn FLOW RATE (| Ap (DECIMAL) 0.500 0.500 0.400 0.200 0.200 0.205 (INCH/HR) = 0.29 CFS) = 30 | SCS CN 69 75 69 75 69 69 335.53 |
| MAINLINE TC(MIN.) = 2 * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA(. DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" APARTMENTS COMMERCIAL SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU SUBAREA AREA (ACRES) = EFFECTIVE AREA (ACRES) = EFFECTIVE AREA (ACRES) = FLOW PROCESS FROM NODE >>>>ADDITION OF SUBAREA MAINLINE TC(MIN.) = 2 | 3.17 ENSITY(IN AMC 11): SCS SOIL GROUP C D C C D C C C S LOSS RA S ARRA P 21.08 229.8 R 1235.6 | CH/HR) = AREA (ACRES) 5.30 0.58 9.75 1.01 2.16 2.28 TE, FP(IN) ACTION, A AEA-A PEAK TO NODE TO NODE TO NODE LINE PEAK | 1.686 FP (INCH/HR) 0.25 0.20 0.25 0.25 0.25 CH/HR) = 0 p = 0.375 A RUNOFF (CF AVERAGED Fn VERAGED Fn VERAGED Fn FLOW RATE (| Ap (DECIMAL) 0.500 0.500 0.400 0.200 0.200 0.205 (INCH/HR) = 0.29 CFS) = 30 | SCS CN 69 75 69 75 69 69 335.53 |
| MAINLINE TC(MIN.) = 2 * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA(.) DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL "6-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" APARTMENTS COMMERCIAL SUBAREA AVERAGE PERVIOU SUBAREA FORMANDE FLOW PROCESS FROM NODE | 3.17 ENSITY(IN AMC 11): SCS SOIL GROUP C D C C D C C C S LOSS RA S ARRA P 21.08 229.8 R 1235.6 | CH/HR) = AREA (ACRES) 5.30 0.58 9.75 1.01 2.16 2.28 TE, FP(IN) ACTION, A AEA-A PEAK TO NODE TO NODE TO NODE LINE PEAK | 1.686 FP (INCH/HR) 0.25 0.20 0.25 0.25 0.25 CH/HR) = 0 p = 0.375 A RUNOFF (CF AVERAGED Fn VERAGED Fn VERAGED Fn FLOW RATE (| Ap (DECIMAL) 0.500 0.500 0.400 0.200 0.200 0.205 (INCH/HR) = 0.29 CFS) = 30 | SCS CN 69 75 69 75 69 69 335.53 |

PUBLIC PARK D 0.67 0.20 0.850 75 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.24 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.464 SUBAREA AREA (ACRES) = 10.25 SUBAREA RUNOFF(CFS) = 14.53 EFFECTIVE AREA (ACRES) = 240.10 AREA-AVERAGED Fm(INCH/HR) = 0.07 AREA-AVERAGED Ap = 0.30 TOTAL AREA (ACRES) = 245.9 PEAK FLOW RATE(CFS) = ************************* FLOW PROCESS FROM NODE 153.00 TO NODE 154.00 IS CODE = 41 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <> ELEVATION DATA: UPSTREAM(FEET) = 1007.62 DOWNSTREAM(FEET) = 1006.10 FLOW LENGTH(FEET) = 446.62 MANNING'S N = 0.013 ASSUME FULL-FLOWING PIPELINE PIPE-FLOW VELOCITY (FEET/SEC.) = 17.83
PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA) GIVEN PIPE DIAMETER(INCH) = 60.00 NUMBER OF PIPES = 1
PIPE-PLOW(CFS) = 350.07
PIPE TRAVEL TIME (MIN.) = 0.42 Tc (MIN.) = 23.59
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 154.00 = 8706.30 FEET. FLOW PROCESS FROM NODE 154.00 TO NODE 154.00 IS CODE = 15.1 >>>>DEFINE MEMORY BANK # 1 <<<<< PEAK FLOWRATE TABLE FILE NAME: 3p10rc1.DNA MEMORY BANK # 1 DEFINED AS FOLLOWS: HEADWATER STREAM O Tc Fp(Fm) Ap (CFS) (MIN.) (INCH/HR) NUMBER (ACRES) NODE 6.10 7.37 0.20(0.02) 0.10 6.17 7.75 0.20(0.02) 0.10 2.0 40.00 30.00 3 6.13 8.32 0.20(0.02) 0.10 4 6.13 8.33 0.20(0.02) 0.10 TOTAL AREA(ACRES) = 2.2 2 2 15.00 ******************* FLOW PROCESS FROM NODE 154.00 TO NODE 154.00 IS CODE = 11 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY< ** MAIN STREAM CONFLUENCE DATA ** Ap STREAM Q Tc Intensity Fp(Fm)
(CFS) (MIN.) (INCH/HR) (INCH/HR) HEADWATER (ACRES) NODE NUMBER 324.89 10.96 2.590 0.23(0.07) 0.30 350.07 23.59 1.669 0.22(0.07) 0.30 344.58 25.17 1.608 0.22(0.07) 0.30 139.6 240.1 200.00 245.9 100.00 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 154.00 = 8706.30 FEET. ** MEMORY BANK # 1 CONFLUENCE DATA ** Q Tc Intensity Fp(Fm) Ap (CFS) (MIN.) (INCH/HR) (INCH/HR) 6.10 7.37 3.251 0.20(0.02) 0.10 STREAM HEADWATER (ACRES) NODE NUMBER 2.0 6.17 7.75 3.159 0.20(0.02) 0.10 2.1 30.00 6.13 8.32 3.031 0.20(0.02) 0.10 3.031 0.20(0.02) 0.10 5.00 6.13 8.33 LONGEST FLOWPATH FROM NODE 585.84 FEET. 15.00 TO NODE 154.00 = ** PEAK FLOW RATE TABLE ** STREAM 0 Tc Intensity Fp(Fm) Ap HEADWATER (CFS) (MIN.) (INCH/HR) (INCH/HR) NUMBER (ACRES) NODE 281.83 7.37 3.251 0.23(0.07) 0.29 95.9 40.00 287.68 3.159 0.23(0.07) 0.29 100.8 30.00 296.15 8.32 3.031 0.23(0.07) 0.29 108.2 296.21 330.12 8.33 10.96 3.031 0.23(0.07) 0.29 2.590 0.23(0.07) 0.29 108.3 15.00 300.00 23.59 1.669 0.22(0.07) 0.30 347.82 25.17 1.608 0.22(0.07) 0.30 248.1 100.00 248.1 TOTAL AREA(ACRES) =

3P10

| | 10ROV |
|---|------------------------|
| COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS: | |
| PEAK FLOW RATE (CFS) = 353.42 Tc(MIN.) = EFFECTIVE AREA(ACRES) = 242.26 AREA-AVERAGED | 23.590 |
| EFFECTIVE AREA(ACRES) = 242.26 AREA-AVERAGED | Fm(INCH/HR) = 0.07 |
| AREA-AVERAGED Fp(INCH/HR) = 0.23 AREA-AVERAGED TOTAL AREA(ACRES) = 248.1 | Ap = 0.29 |
| LONGEST FLOWPATH FROM NODE 100.00 TO NODE | 154 00 - 9706 30 FFFT |
| LONGEST FLOWPATH FROM NODE 100.00 TO NODE | 154.00 = 8706.30 FEE1. |
| ******** | ****** |
| FLOW PROCESS FROM NODE 154.00 TO NODE 154. | 00 TS CODE = 12 |
| | |
| >>>>CLEAR MEMORY BANK # 1 <<<<< | |
| | |
| | |
| ************* | |
| FLOW PROCESS FROM NODE 154.00 TO NODE 155. | |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< | |
| >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELE | |
| | |
| ELEVATION DATA: UPSTREAM(FEET) = 1006.00 DOWNS | |
| FLOW LENGTH (FEET) = 122.27 MANNING'S N = 0. | |
| ASSUME FULL-FLOWING PIPELINE | 013 |
| PIPE-FLOW VELOCITY (FEET/SEC.) = 18.00 | |
| PIPE FLOW VELOCITY = (TOTAL FLOW) / (PIPE CROSS SE | CTION AREA) |
| GIVEN PIPE DIAMETER(INCH) = 60.00 NUMBER OF | PIPES = 1 |
| DTDE_ETOW(CES) = 353 42 | |
| PIPE TRAVEL TIME (MIN.) = 0.11 Tc (MIN.) = | 23.70 |
| LONGEST FLOWPATH FROM NODE 100.00 TO NODE | 155.00 = 8828.57 FEET. |
| ********** | |
| FLOW PROCESS FROM NODE 155.00 TO NODE 155. | |
| FLOW PROCESS FROM NODE 155.00 TO NODE 155. | |
| >>>>DEFINE MEMORY BANK # 1 <<<< | |
| | |
| DEAK ELOMDATE TABLE ELLE NAME: 3510563 DNA | |
| MEMORY BANK # 1 DEFINED AS FOLLOWS: | |
| STREAM Q To Fp(Fm) Ap A | e HEADWATER |
| NUMBER (CFS) (MIN.) (INCH/HR) (ACF | ES) NODE |
| 1 6.75 5.84 0.20(0.02) 0.10 | 2.0 95.00 |
| 2 6.56 7.10 0.20(0.02) 0.10 | 2.2 80.00 |
| MEMORY BANK # 1 DEFINED AS FOLLOWS: STREAM Q TC FP(Fm) Ap ACCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC | 2.2 70.00 |
| TOTAL AREA(ACRES) = 2.2 | |
| *********** | |
| FLOW PROCESS FROM NODE 155.00 TO NODE 155. | |
| | |
| >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-ST | REAM MEMORY |
| | |
| | |
| ** MAIN STREAM CONFLUENCE DATA ** STREAM (CFS) (MIN.) (INCH/HR) (INCH/HR) 1 281.83 7.51 3.215 0.23(0.07) 2 287.68 7.89 3.127 0.23(0.07) 3 296.15 8.46 3.003 0.23(0.07) 4 296.21 8.46 3.003 0.23(0.07) 5 330.12 11.08 2.573 0.23(0.07) 6 353.42 23.70 1.664 0.22(0.07) 7 347.82 25.29 1.604 0.22(0.07) LONGEST FLOWPATH FROM NODE 100.00 TO NODE | |
| STREAM Q Tc Intensity Fp(Fm) | Ap Ae HEADWATER |
| NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) | (ACRES) NODE |
| 1 281.83 7.51 3.215 0.23(0.07) | 0.29 95.9 40.00 |
| 2 287.68 7.89 3.127 0.23(0.07) | 0.29 100.8 30.00 |
| 3 296.15 8.46 3.003 0.23(0.07) | 0.29 108.2 5.00 |
| 4 296.21 8.46 3.003 0.23(0.07) | 0.29 108.3 15.00 |
| 5 350.12 11.08 2.573 0.23(0.07) | 0.29 141.6 300.00 |
| 7 347 82 25 29 1 604 0 22 (0.07) | 0.30 242.3 200.00 |
| LONGEST FLOWPATH FROM NODE 100.00 TO NODE | 155.00 = 8828.57 FEET. |
| | |
| ** MEMORY BANK # 1 CONFLUENCE DATA ** | |
| STREAM Q Tc Intensity Fp(Fm) | Ap Ae HEADWATER |
| STREAM Q TC Intensity Fp(Fm) NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) | (ACRES) NODE |
| 1 6.75 5.84 3.712 0.20(0.02) | 0.10 2.0 95.00 |
| 2 6.56 7.10 3.322 0.20(0.02) | 0.10 2.2 80.00 |
| 3 6.41 7.77 3.153 0.20(0.02) | 0.10 2.2 70.00 |
| 1 6.75 5.84 3.712 0.20(0.02) 2 6.56 7.10 3.322 0.20(0.02) 3 6.41 7.77 3.153 0.20(0.02) LONGEST FLOWPATH FROM NODE 70.00 TO NODE | 155.00 = 774.26 FEET. |
| | |
| ** PEAK FLOW RATE TABLE ** | An an Heanwaren |
| NUMBER (CES) (MIN) (INCU/UD) (INCU/UD) | AP AS HEADWATER |
| STREAM Q Tc Intensity Fp(Fm) | 0.29 76.6 95.00 |
| 2 281.82 7.10 3.322 0.23(0.06) | 0.29 92.8 80.00 |
| Pa | ige 21 |
| | - |
| | |

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7.51
7.77
7.89
                        288.30
                                                          3.215 0.23( 0.06) 0.29
                                                                                                                                       40.00
                        292.29
                                                          3.153 0.23(0.06) 0.29
                                                                                                                 101.5
103.0
                                                                                                                                        70.00
                                                          3.127 0.23(0.06) 0.29
                        302.26
                                          8.46
                                                         3.003 0.23( 0.07) 0.29
3.003 0.23( 0.07) 0.29
                                                                                                                 110.5
                                                                                                                                       5.00
15.00
                         302.31
                                          8.46
                                                                                                                 110.5
                         335.34
                                        11.08
                                                          2.573 0.23( 0.07) 0.29
                                                                                                                 144.0
                                                                                                                                      300.00
                        356.79 23.70
351.05 25.29
                                                         1.664 0.22(0.07) 0.30
1.604 0.22(0.07) 0.30
                                                                                                                 244.5
250.3
                                                                                                                                     200.00
                                                                                                                                     100.00
       TOTAL AREA(ACRES) =
                                                        250.3
   COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE (CFS) = 356.79 Tc (MIN.) = 23.703
EFFECTIVE AREA (ACRES) = 244.51 AREA-AVERAGED Fm (INCH/HR) = 0.07
  AREA-AVERAGED Fp(INCH/HR) = 0.23 AREA-AVERAGED Ap = 0.29 TOTAL AREA(ACRES) = 250.3
   LONGEST FLOWPATH FROM NODE 100.00 TO NODE 155.00 = 8828.57 FEET.
************************
  FLOW PROCESS FROM NODE 155.00 TO NODE 158.00 IS CODE = 41
  >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA
   >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <>>>
_____
  ELEVATION DATA: UPSTREAM(FEET) = 1004.60 DOWNSTREAM(FEET) = 1001.69
   FLOW LENGTH(FEET) = 202.60 MANNING'S N = 0.013
  ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY (FEET/SEC.) = 18.17
  PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
GIVEN PIPE DIAMETER (INCH) = 60.00 NUMBER OF PIPES = 1
PIPE-FLOW (CFS) = 356.79
PIPE TRAVEL TIME (MIN.) = 0.19 TC (MIN.) = 23.89
PIPE TRAVEL TIME (MIN.) = 0.10 TC (MIN.) = 23.80
PIPE TRAVEL TIME (MIN.) = 0.10 TC (MIN.) = 23.80
PIPE TRAVEL TIME (MIN.) = 0.10 TC (MIN.) = 23.80
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PIPE TRAVEL TIME (MIN.) = 0.10 TC (MIN.) = 23.80
PIPE TRAVEL TIME (MIN.) = 0.10 TC (MIN
**********************
 FLOW PROCESS FROM NODE 158.00 TO NODE 450.00 IS CODE = 41
  >>>>COMPLIE PIPE-FLOW TRAVEL TIME THRU SUBAREACCCC
  >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <>
 ELEVATION DATA: UPSTREAM(FEET) = 1001.69 DOWNSTREAM(FEET) = 997.40 FLOW LENGTH(FEET) = 30.38 MANNING'S N = 0.013 DEPTH OF FLOW IN 60.0 INCH PIPE IS 25.8 INCHES PIPE-PLOW VELOCITY (FEET/SEC.) = 44.18 GIVEN PIPE DIAMETER (INCH) = 60.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 356.79
  PIPE TRAVEL TIME (MIN.) = 0.01 Tc (MIN.) = 23.90
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 450.00 = 9061.55 FEET.
***************************
 FLOW PROCESS FROM NODE 450.00 TO NODE 450.00 IS CODE = 12
   >>>>CLEAR MEMORY BANK # 2 <<<<<
  ***MEMORY BANK # 2 IS EMPTY - PROCESS IGNORED.***
********************
 FLOW PROCESS FROM NODE 450.00 TO NODE 450.00 IS CODE = 15.1
  >>>>DEFINE MEMORY BANK # 2 <<<<<
  PEAK FLOWRATE TABLE FILE NAME: C2P10R.DNA
  MEMORY BANK # 2 DEFINED AS FOLLOWS:
STREAM Q TC Fp(Fm) Ap
NUMBER (CFS) (MIN.) (INCH/HR)
                                                                                                           HEADWATER
                                                                                      (ACRES)
                                                                                                            NODE
                                        6.08 0.20 ( 0.02) 0.10
6.36 0.20 ( 0.02) 0.10
6.72 0.20 ( 0.02) 0.10
                                                                                                                   310.00
                          19.78
                                                                                                                   220.00
                                                                                                                   290.00
                          20.21
                                                                                                    6.3
                                          6.76 0.20(0.02) 0.10
                                                                                                    6.3
                          20.22
19.71
                                          6.79 0.20(0.02) 0.10
7.58 0.20(0.02) 0.10
                                                                                                   6.4
                                                                                                                   226.00
                                                                                                                   300.00
                                          8.42 0.20(0.02) 0.10
8.43 0.20(0.02) 0.10
8.88 0.20(0.02) 0.10
                                                                                                    6.8
                                                                                                                   260.00
                          19.04
18.59
                                                                                                   6.8
                                                                                                                  230.00
        10
                                           8.89 0.20(0.02) 0.10
                                                                                                                   234.00
                                                                                            Page 22
```

17.53 9.91 0.20(0.02) 0.10 6.9 210 00

| | | | | 02) 0.10 | 6.9 | 210.0 | 0.0 |
|----------|---------------|----------|------------|--|---------|-----------|-------------|
| TOTAL | AREA (ACRES) |) = | 6.9 | | | | |
| | | | | | | | |
| | | | | ******* | | | |
| | | | | NODE 450 | | | |
| | | | | | | | |
| >>>>COI | NFLUENCE MEN | MORY BAN | NK # 2 WIT | H THE MAIN-S | TREAM 1 | MEMORY<<< | << |
| | | | | | | | |
| | | | | | | | |
| ** MAIN | STREAM CONF | FLUENCE | DATA ** | Fp(Fm) (INCH/HR) 0.23(0.06) 0.23(0.06) 0.23(0.06) 0.23(0.06) 0.23(0.06) 0.23(0.07) 0.23(0.07) 0.23(0.07) 0.23(0.07) 0.22(0.07) 0.22(0.07) 0 TO NODE | | | |
| STREAM | Q | Tc | Intensity | Fp(Fm) | Ap | Ae | HEADWATER |
| NUMBER | (CFS) | (MIN.) | (INCH/HR) | (INCH/HR) | | (ACRES) | NODE |
| 1 | 260.66 | 6.05 | 3.638 | 0.23(0.06) | 0.29 | 76.6 | 95.00 |
| 2 | 281.82 | 7.30 | 3.267 | 0.23(0.06) | 0.29 | 92.8 | 80.00 |
| 3 | 288.30 | 7.72 | 3.165 | 0.23(0.06) | 0.29 | 98.1 | 40.00 |
| 4 | 292.29 | 7.98 | 3.106 | 0.23(0.06) | 0.29 | 101.5 | 70.00 |
| 5 | 294.03 | 8.09 | 3.080 | 0.23(0.06) | 0.29 | 103.0 | 30.00 |
| 6 | 302 26 | 8 69 | 2 957 | 0 23 (0 07) | 0 29 | 110 5 | 5 00 |
| 7 | 302.20 | 8 69 | 2 957 | 0.23(0.07) | 0.29 | 110.5 | 15.00 |
| , | 335 34 | 11 29 | 2 546 | 0.23(0.07) | 0.20 | 144.0 | 300.00 |
| 0 | 353.34 | 22 00 | 1 656 | 0.23(0.07) | 0.25 | 244.0 | 200.00 |
| 10 | 251 05 | 25.90 | 1.030 | 0.22(0.07) | 0.30 | 244.3 | 100.00 |
| 10 | 331.03 | 23.43 | 1.350 | 0.22(0.07) | 450.00 | 230.3 | 100.00 |
| LONGEST | FLOWPATH FI | ROM NODE | 100.0 | U TO NODE | 450.0 |) = 90 | 51.55 FEET. |
| | " | | | | | | |
| ** MEMO | RY BANK # 2 | 2 CONFLU | JENCE DATA | ** Fp(Fm) (INCH/HR) 0.20(0.02) 0.20(0.02) 0.20(0.02) 0.20(0.02) 0.20(0.02) 0.20(0.02) 0.20(0.02) 0.20(0.02) 0.20(0.02) 0.20(0.02) 0.20(0.02) 0.20(0.02) 0.20(0.02) 0.20(0.02) 0.20(0.02) 0.20(0.02) 0.20(0.02) 0.20(0.02) | | | |
| STREAM | Q | Tc | Intensity | Fp(Fm) | Ap | Ae | HEADWATER |
| NUMBER | (CFS) | (MIN.) | (INCH/HR) | (INCH/HR) | | (ACRES) | NODE |
| 1 | 19.78 | 6.08 | 3.629 | 0.20(0.02) | 0.10 | 5.8 | 310.00 |
| 2 | 20.11 | 6.36 | 3.538 | 0.20(0.02) | 0.10 | 6.1 | 220.00 |
| 3 | 20.21 | 6.72 | 3.426 | 0.20(0.02) | 0.10 | 6.3 | 290.00 |
| 4 | 20.22 | 6.76 | 3.416 | 0.20(0.02) | 0.10 | 6.3 | 214.00 |
| 5 | 20.22 | 6.79 | 3.406 | 0.20(0.02) | 0.10 | 6.4 | 226.00 |
| 6 | 19.71 | 7.58 | 3.199 | 0.20(0.02) | 0.10 | 6.6 | 300.00 |
| 7 | 19.04 | 8.42 | 3.011 | 0.20(0.02) | 0.10 | 6.8 | 260.00 |
| 8 | 19.04 | 8.43 | 3.010 | 0.20(0.02) | 0.10 | 6.8 | 230.00 |
| q. | 18 59 | 8 88 | 2 922 | 0.20(0.02) | 0 10 | 6.9 | 250 00 |
| 10 | 18 58 | 8 89 | 2 919 | 0.20(0.02) | 0.10 | 6.9 | 234.00 |
| 11 | 17.50 | 0.03 | 2.713 | 0.20(0.02) | 0.10 | 6.0 | 210.00 |
| TONGROU | DIOMDARU DI | DOM NODE | 2.742 | 0.20(0.02) | 450.0 | 0.5 | 210.00 |
| LONGEST | FLOWFAIR FI | KOM NODE | 230.0 | U IO NODE | 450.00 | J - 12. | 62.5/ FEE1. |
| ** DEAR | FLOW RATE ? | PADID ** | | | | | |
| ^^ PEAK | FLOW RAIE . | IABLE | | | | | |
| STREAM | (0000) | TC | intensity | Fp(Fm) | Ар | Ae | HEADWATER |
| NUMBER | (CFS) | (MIN.) | (INCH/HR) | (INCH/HR) | | (ACRES) | NODE |
| 1 | 280.41 | 6.05 | 3.638 | 0.22(0.06) | 0.27 | 82.4 | 95.00 |
| 2 | 280.86 | 6.08 | 3.629 | 0.22(0.06) | 0.27 | 82.7 | 310.00 |
| 3 | 285.89 | 6.36 | 3.538 | 0.22(0.06) | 0.27 | 86.6 | 220.00 |
| 4 | 292.21 | 6.72 | 3.426 | 0.22(0.06) | 0.27 | 91.6 | 290.00 |
| 5 | 292.80 | 6.76 | 3.416 | 0.22(0.06) | 0.27 | 92.1 | 214.00 |
| 6 | 293.36 | 6.79 | 3.406 | 0.22(0.06) | 0.27 | 92.5 | 226.00 |
| 7 | 301.71 | 7.30 | 3.267 | 0.22(0.06) | 0.28 | 99.3 | 80.00 |
| 8 | 305.79 | 7.58 | 3.199 | 0.22(0.06) | 0.28 | 102.9 | 300.00 |
| 9 | 307.90 | 7.72 | 3.165 | 0.22(0.06) | 0.28 | 104.8 | 40.00 |
| 10 | 311.68 | 7.98 | 3.106 | 0.22(0.06) | 0.28 | 108.3 | 70.00 |
| 11 | 313.33 | 8.09 | 3.080 | 0.22(0.06) | 0.28 | 109.8 | 30.00 |
| 12 | 317.59 | 8.42 | 3.011 | 0.22(0.06) | 0.28 | 113.9 | 260.00 |
| 13 | 317.66 | 8 43 | 3 010 | 0.22(0.00) | 0.28 | 114 0 | 230.00 |
| 1.4 | 321.03 | 8 69 | 2 957 | 0.22(0.00) | 0.20 | 117.3 | 5 00 |
| 16 | 221.00 | 0.00 | 2.557 | 0.22(0.00) | 0.20 | 117.5 | 15.00 |
| 1.0 | 321.00 | 0.09 | 2.937 | 0.22(0.06) | 0.20 | 117.4 | 15.00 |
| 10 | 323.20 | 0.00 | 2.922 | 0.22(0.06) | 0.28 | 119.7 | 250.00 |
| 17 | 323.30 | 0.09 | 2.919 | 0.22(0.06) | 0.28 | 119.9 | 234.00 |
| 18 | 335.37 | 9.91 | 2.742 | 0.22(0.06) | 0.28 | 133.2 | 210.00 |
| 19 | 351.60 | 11.29 | 2.546 | 0.22(0.06) | 0.28 | 151.0 | 300.00 |
| 20 | 367.32 | 23.90 | 1.656 | 0.22(0.06) | 0.29 | 251.5 | 200.00 |
| 21 | 361.20 | 25.49 | 1.596 | 0.22(0.06) | 0.29 | 257.2 | 100.00 |
| TOTAL | AREA (ACRES) |) = | 257.2 | | | | |
| | | | | Fp(Fm) (INCH/HR) 0.22 (0.06) | | | |
| COMPUTE | CONFLUENCE | E ESTIMA | ATES ARE A | S FOLLOWS: | | | |
| PEAK FLO | OW RATE (CFS) |) = | 367.32 | Tc(MIN.) = | 23.90 | 0 | |
| EFFECTI | VE AREA (ACRI | ES) = | 251.45 | Tc(MIN.) = AREA-AVERAGE AREA-AVERAGE | D Fm(I | NCH/HR) = | 0.06 |
| AREA-AV | ERAGED Fp(T) | NCH/HR) | = 0.22 | AREA-AVERAGE | D Ap = | 0.28 | |
| TOTAL A | REA (ACRES) = | = 3 | 257.2 | | | | |
| LONGEST | FLOWPATH F | ROM NODE | 100 0 | 0 TO NODE | 450.0 | 0 = 90 | 61.55 FEET |
| 20110201 | | | | 0 11000 | 100.0 | | |

FLOW PROCESS FROM NODE 450.00 TO NODE 450.00 IS CODE = 12 >>>>CLEAR MEMORY BANK # 3 <<<<< ***MEMORY BANK # 3 IS EMPTY - PROCESS IGNORED.*** **************************** FLOW PROCESS FROM NODE 450.00 TO NODE 450.00 IS CODE = 15.1 >>>>DEFINE MEMORY BANK # 3 <<<<< PEAK FLOWRATE TABLE FILE NAME: 3p10rc4.DNA MEMORY BANK # 3 DEFINED AS FOLLOWS: To FP(Fm) Ap Ae HEADWATER (CFS) (MIN.) (INCH/HR) (ACRES) NODE 5.84 7.95 0.20(0.02) 0.10 2.1 150.00 NUMBER 1 2 TOTAL AREA(ACRES) = 2.1 *********************** FLOW PROCESS FROM NODE 450.00 TO NODE 450.00 IS CODE = 11 >>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY< ** MAIN STREAM CONFLUENCE DATA ** Q Tc Intensity Fp(Fm) Ap (CFS) (MIN.) (INCH/HR) (INCH/HR) 280.41 6.05 3.638 0.22(0.06) 0.27 STREAM HEADWATER NUMBER (ACRES) NODE 95.00 280.41 82.4 3.629 0.22(0.06) 0.27 6.08 82.7 3.538 0.22(0.06) 0.27 3.426 0.22(0.06) 0.27 285.89 6.36 6.72 86.6 220.00 292.21 91.6 292.80 3.416 0.22(0.06) 0.27 92.1 293.36 6.79 7.30 3.406 0.22(0.06) 0.27 3.267 0.22(0.06) 0.28 92.5 226.00 301.71 80.00 305.79 7.58 3.199 0.22(0.06) 0.28 300.00 7.72 7.98 307 90 3.165 0.22(0.06) 0.28 104 8 40 00 311.68 3.106 0.22(0.06) 0.28 108.3 70.00 11 12 13 313.33 8.09 3.080 0.22(0.06) 0.28 109.8 30.00 317.59 8.42 3.011 0.22(0.06) 0.28 113.9 260.00 317.66 8.43 3.010 0.22(0.06) 0.28 117.3 117.4 14 15 321.03 8.69 2.957 0.22(0.06) 0.28 5.00 2.957 0.22(0.06) 0.28 321.08 8.69 15.00 323.20 8.88 2.922 0.22(0.06) 0.28 119.7 250.00 17 323.36 8.89 2.919 0.22(0.06) 0.28 119.9 234.00 335.37 2.742 0.22(0.06) 0.28 133.2 18 9.91 210.00 19 351.60 11.29 2.546 0.22(0.06) 0.28 151.0 300.00 2.0 367.32 23.90 1.656 0.22(0.06) 0.29 251.5 200.00 1.596 0.22(0.06) 0.29 361.20 25.49 257.2 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 450.00 = 9061.55 FEET. ** MEMORY BANK # 3 CONFLUENCE DATA ** Q Tc Intensity Fp(Fm) Ap (CFS) (MIN.) (INCH/HR) (INCH/HR) STREAM Ae HEADWATER (ACRES) NODE NUMBER 5.84 7.95 3.111 0.20(0.02) 0.10 5.64 8.83 2.930 0.20(0.02) 0.10 2.1 160.00 150 00 LONGEST FLOWPATH FROM NODE 150.00 TO NODE 450.00 = ** PEAK FLOW RATE TABLE ** Q Tc Intensity Fp(Fm) Ap (CFS) (MIN.) (INCH/HR) (INCH/HR) NODE 95.00 NUMBER (ACRES) 285.61 3.638 0.22(0.06) 0.27 84.0 6.05 286.07 6.08 3.629 0.22(0.06) 0.27 310.00 291.20 6.36 3.538 0.22(0.06) 0.27 88.3 220.00 3.426 0.22(0.06) 0.27 93.4 297.65 6.72 290.00 298.25 6.76 3.416 0.22(0.06) 0.27 93.8 214.00 3.406 0.22(0.06) 0.27 94.3 298.82 226.00 7.30 3.267 0.22(0.06) 0.27 101.2 311.51 7.58 7.72 3.199 0.22(0.06) 0.27 3.165 0.22(0.06) 0.27 104.9 300.00 106.8 40.00 313.66 317.16 3.111 0.22(0.06) 0.27 110.0 3.106 0.22(0.06) 0.27 3.080 0.22(0.06) 0.27 70.00 11 12 317.52 7.98 110.3

111.9

116.1

260.00

319.14

323.32

8.42

3.011 0.22(0.06) 0.27

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13

```
323.39
                                       3.010 0.22( 0.06) 0.27
                                                                                         230.00
      15
16
                326.70
                             8.69
                                       2.957
                                                0.22(0.06) 0.27
                                                                            119.5
                                                                                          5.00
15.00
                 326.75
                             8.69
                                                0.22( 0.06) 0.27
      17
18
                328.35
                             8.83
                                       2.930 0.22( 0.06) 0.27
                                                                            121.3
                                                                                          150.00
                328.83
                             8.88
                                       2.922 0.22(0.06) 0.28
                                                                            121.9
                                                                                          250.00
      19
                 328.98
                             8.89
                                       2.919 0.22( 0.06) 0.28
                                                                                          234.00
                           9.91
11.29
                                       2.742 0.22(0.06) 0.28
2.546 0.22(0.06) 0.28
                                                                                         210.00
      20
21
                340.65
                                                                            135.4
                 356.50
                                                                            153.1
      22
                370.49
                           23.90
                                       1.656 0.22(0.06) 0.29
                                                                            253.6
                                                                                         200.00
     23
                364.26 25.49
                                       1.596 0.22( 0.06) 0.29
                                                                            259.4
                                                                                         100.00
     TOTAL AREA(ACRES) =
                                      259.4
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 COMPOSED CONTROL ENGINEER AS A FULLOWS 23.900

EFFECTIVE AREA (ACRES) = 370.49 TG(MIN.) = 23.900

EFFECTIVE AREA (ACRES) = 253.59 AREA -AVERAGED Fm(INCH/HR) = 0.06

AREA -AVERAGED Fp(INCH/HR) = 0.22 AREA -AVERAGED Ap = 0.28
 TOTAL AREA (ACRES) = 259.4
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 450.00 = 9061.55 FEET.
**********************
 FLOW PROCESS FROM NODE 450.00 TO NODE 460.00 IS CODE = 41
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<>>>>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)
 ELEVATION DATA: UPSTREAM(FEET) = 997.40 DOWNSTREAM(FEET) = 992.80 FLOW LENGTH (FEET) = 47.05 MANNING'S N = 0.013 DEPTH OF FLOW IN 60.0 INCH PIPE IS 29.3 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 38.93 GIVEN PIPE DIAMMETER (INCH) = 60.00 NUMBER OF PIPES = 1 PIPE-FLOW (CFS) = 370.49 FIPE TRAVEL TIME (MIN.) = 0.02 TC (MIN.) = 23.92 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 460.00 = 9108.60 FEET.
             END OF STUDY SUMMARY:
 END OF SIGNIF SUMMARY:

TOTAL AREA (ACRES) = 259.4 TC (MIN.) = 23.92

EFFECTIVE AREA (ACRES) = 253.59 AREA—AVERAGED Fm (INCH/HR) = 0.06

AREA—AVERAGED Fp (INCH/HR) = 0.22 AREA—AVERAGED Ap = 0.290

PEAK FLOW RATE (CFS) = 370.49
  ** PEAK FLOW RATE TABLE **
                 Q Tc Intensity Fp(Fm) Ap (CFS) (MIN.) (INCH/HR) (INCH/HR)
   STREAM
                                                                                    HEADWATER
   NUMBER
                                                                       (ACRES) NODE
                                       3.630 0.22(0.06) 0.27
                                                                                          95.00
                285.61
                           6.08
                                                                             84.0
                                       3.622 0.22(0.06) 0.27
                286.07
                             6.10
                                                                             84.3
                                                                                         310.00
                291.20
                                       3.531 0.22(0.06) 0.27
                                                                             88.3
                                                                                         220.00
                             6.38
                297.65
                             6.75
                                       3.419 0.22(0.06) 0.27
3.409 0.22(0.06) 0.27
                                                                             93.4
                                                                                         290.00
                298.25
                                                                                         214.00
                                       3.400 0.22(0.06) 0.27
                298.82
                             6.81
                                                                                         226.00
                                       3.262 0.22(0.06) 0.27
3.194 0.22(0.06) 0.27
                307.34
311.51
                             7.33
7.60
                                                                            101.2
104.9
                                                                                         80.00
                 313.66
                                       3.160 0.22( 0.06) 0.27
                                                                                           40.00
      10
11
                317.16
317.52
                             7.97
8.00
                                       3.107 0.22(0.06) 0.27
3.101 0.22(0.06) 0.27
                                                                            110.0
                                                                                         160.00
      12
13
14
                 319.14
                             8.11
                                       3.076 0.22( 0.06) 0.27
                                                                                           30.00
                323 32
                             8 44
                                       3.007 0.22(0.06) 0.27
                                                                            116 1
                                                                                         260 00
                 323.39
                             8.45
                                       3.006 0.22(0.06) 0.27
                                                                            116.1
                                                                                          230.00
      15
16
17
18
                 326.70
                             8.71
                                        2.953 0.22( 0.06) 0.27
                 326.75
                             8.72
                                       2.953 0.22(0.06) 0.27
                                                                            119.5
                                                                                           15.00
                 328.35
                             8.85
                                        2.926 0.22(0.06) 0.27
                328.83
                             8.90
                                       2.918 0.22(0.06) 0.28
                                                                            121.9
                                                                                         250.00
      19
                                       2.916 0.22(0.06) 0.28
                328.98
                             8.91
                                                                            122.1
                                                                                         234.00
      20
21
                 340.65
                             9.93
                                       2.739 0.22( 0.06) 0.28
                                                                            135.4
                                                                                         210.00
                356.50
                           11.31
                                       2.543 0.22(0.06) 0.28
                                                                            153.1
                                                                                         300.00
                                       1.656 0.22(0.06) 0.29
      22
                 370.49
                            23.92
                                                                                          200.00
                                                                            253.6
      23
                            25.51
                                       1.596 0.22(0.06) 0.29
```

END OF RATIONAL METHOD ANALYSIS

3P00ROV

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)

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Analysis prepared by:

| * DANA POINT HARBOR COMMERCIAL CORE AREA - PHASE 2B * RATIONAL METHOD ULTIMATE CONDITION OVERALL LINE C * 100-YEAR STORM EVENT EM | |
|---|--|
| FILE NAME: 3P00ROV.DAT TIME/DATE OF STUDY: 16:34 02/13/2020 | |
| USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION: | |
| *TIME-OF-CONCENTRATION MODEL* | |
| USER SPECIFIED STORM EVENT(YEAR) = 100.00 SPECIFIED MINIMUM PIPE SIZE(INCH) = 12.00 SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90 *DATA BANK RAINFALL USED* *ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD* | |
| *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPFFLOW AND STREETFLOW MODEL* HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING WIDTH CROSSFALL IN- / OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR NO. (FT) (FT) SIDE / SIDE/ WAY (FT) (FT) (FT) (FT) (n) | |
| 1 30.0 20.0 0.018/0.018/0.020 0.67 2.00 0.0312 0.167 0.0150 2 30.0 25.0 0.017/0.017/0.017 0.67 1.50 0.0312 0.125 0.0150 3 50.0 45.0 0.017/0.017/0.017 0.67 2.00 0.0312 0.167 0.0150 | |
| GLOBAL STREET FLOW-DEPTH CONSTRAINTS: 1. Relative Flow-Depth = 0.50 FEET as (Maximum Allowable Street Flow Depth) - (Top-of-Curb) 2. (Depth)*(Velocity) Constraint = 6.0 (FT*FT/S) *SIZE FIER WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE URSTREAM TRIBUTARY FIFE.* *USER-SPECIFIED MINIMM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED | |
| FLOW PROCESS FROM NODE 100.00 TO NODE 101.00 IS CODE = 21 | |
| >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< | |
| INITIAL SUBAREA FLOW-LENGTH(FEET) = 326.73 ELEVATION DATA: UPSTREAM(FEET) = 1332.32 DOWNSTREAM(FEET) = 1331.94 | |
| TC = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 SUBAREA ANALYSIS USED MINIMUM TC(MIN.) = 15.223 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.269 SUBAREA TC AND LOSS RATE DATA (AMC III): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS TC LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) RESIDENTIAL | |
| ***S-7 DWELLINGS/ACRE** B | |
| Total indicato, - 1.70 IBM FBOW MIE(CEO, - 5.01 | |

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************************ FLOW PROCESS FROM NODE 101.00 TO NODE 102.00 IS CODE = 62 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA >>>> (STREET TABLE SECTION # 2 USED) <<<< UPSTREAM ELEVATION(FEET) = 1331.94 DOWNSTREAM ELEVATION(FEET) = 1328.22 STREET LENGTH(FEET) = 177.44 CURB HEIGHT(INCHES) = 8.0 STREET HALPWIDTH(FEET) = 30.00 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 25.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.017 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.017 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.017 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0150 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0150 **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH(FEET) = 0.31 AVERAGE FLOW VELOCITY(FEET) = 10.42
AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.01
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.93 STREET FLOW TRAVEL TIME (MIN.) = 0.98 Tc (MIN.) = 16.21 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.154 SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "5-7 DWELLINGS/ACRE" D 0.93 0.500 "5-7 DWELLINGS/ACRE" D 0.93 0.20 0.500 91
SUBARRA AVERAGE PERVIOUS LOSS RATE, FD[INCH/HR] = 0.20
SUBARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.500
SUBARRA AREA (ACRES) = 0.93 SUBARRA RUNOFF (CFS) = 2.56
EFFECTIVE AREA (ACRES) = 2.59 AREA-AVERAGED Fm(INCH/HR) = 0.10
AREA-AVERAGED Fp[INCH/HR] = 0.21 AREA-AVERAGED Ap = 0.50
TOTAL AREA (ACRES) = 2.7 PEAK FLOW RATE (CFS) = 7.38 END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH(FEET) = 0.32 HALFSTREET FLOOD WIDTH(FEET) = 11.10 FLOW VELOCITY (FEET/SEC.) = 3.16 DEPTH*VELOCITY (FT*FT/SEC.) = 1.01 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 102.00 = 504.17 FEE ******************** FLOW PROCESS FROM NODE 102.00 TO NODE 103.00 IS CODE = 41 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <<<< ELEVATION DATA: UPSTREAM(FEET) = 1328.22 DOWNSTREAM(FEET) = 1260.18
FLOW LENGTH(FEET) = 960.76 MANNING'S N = 0.013
DEPTH OF FLOW IN 18.0 INCH PIPE IS 6.5 INCHES
PIPE-FLOW VELOCITY (PEET/SEC.) = 12.86
GIVEN PIPE DIAMETER (INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW (FES) = 7 38 PIPE-FLOW(CFS) = 7.38 PIPE TRAVEL TIME(MIN.) = 1.25 Tc(MIN.) = 17.45 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 103.00 = 1464.93 FEET. *************************** FLOW PROCESS FROM NODE 103.00 TO NODE 103.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< _____ MAINLINE Tc (MIN.) = 17.45 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.023 SUBAREA LOSS RATE DATA (AMC III): DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "5-7 DWELLINGS/ACRE" COMMERCIAL D 0.54 0.20 (
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20 0.100 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.462

3P00ROV
SUBAREA AREA(ACRES) = 5.63 SUBAREA RUNOFF(CFS) = 14.85

| EFFECTIVE AREA(ACRES) = AREA-AVERAGED Fp(INCH/HR | 8.32 | AREA-A | VERAGED Fm | (INCH/HR) | = 0.10 |
|---|------------------------|------------------------|---------------------------|-----------------|-------------|
| TOTAL AREA(ACRES) = | 8.3 | PEAK | FLOW RATE (| CFS) = | 21.92 |
| ****** | | | | | |
| FLOW PROCESS FROM NODE | 103.00 | TO NODE | 105.00 1 | | 41 |
| >>>>COMPUTE PIPE-FLOW T >>>>USING USER-SPECIFIE | D PIPESIZ | E (EXISTI | NG ELEMENT | <<<< | |
| ELEVATION DATA: UPSTREAM FLOW LENGTH(FEET) = 77 | (FEET) = | 1260.18 | DOWNSTREAM | 4(FEET) = | 1245.52 |
| ASSUME FULL-FLOWING PIPE PIPE-FLOW VELOCITY (FEET/ PIPE FLOW VELOCITY = (TO | SEC.) = | | OSS SECTION | J AREA) | |
| GIVEN PIPE DIAMETER (INCH PIPE-FLOW (CFS) = 21 PIPE TRAVEL TIME (MIN.) = |) = 18.0 | 0 NUME | ER OF PIPES | 3 = 1 | |
| LONGEST FLOWPATH FROM NO | | | | | 40.01 FEET. |
| ******* | | | | | |
| FLOW PROCESS FROM NODE | | | | | |
| >>>>ADDITION OF SUBAREA | | | | | |
| MAINLINE Tc(MIN.) = 18 * 100 YEAR RAINFALL INTE | .49 | | | | |
| SUBAREA LOSS RATE DATA(A | MC III): | | | | |
| DEVELOPMENT TYPE/ LAND USE | SCS SOIL GROUP | AREA (ACRES) | Fp (INCH/HR) | Ap (DECIMAL) | SCS CN |
| RESIDENTIAL "5-7 DWELLINGS/ACRE" | D | 3.73 | 0.20 | 0.500 | 91 |
| "5-7 DWELLINGS/ACRE" COMMERCIAL SUBAREA AVERAGE PERVIOUS | D LOSS RAT | 0.65 E En(INC | 0.20 H/HR) = 0 | 0.100 | 91 |
| | | | | | |
| SUBAREA AREA (ACRES) = EFFECTIVE AREA (ACRES) = | 12.70 | SUBAREA AREA-A | RUNOFF (CFS VERAGED Fm | (TNCH/HR) | 18 |
| AREA-AVERAGED FP(INCH/HR |) = 0.20 | AREA-AV | ERAGED AP = | = 0.46 | |
| TOTAL AREA (ACRES) = | 12.7 | PEAK | FLOW RATE(| CFS) = | 32.36 |
| ************************************** | 105.00 | TO NODE | 107.00 IS | S CODE = | 41 |
| >>>>COMPUTE PIPE-FLOW T >>>>USING USER-SPECIFIE | RAVEL TIM D PIPESIZ | E THRU SU E (EXISTI | BAREA<<<< NG ELEMENT) | <<<< | |
| ELEVATION DATA: UPSTREAM | (FEET) = | 1245.52 | DOWNSTREAM | | |
| FLOW LENGTH (FEET) = 9 DEPTH OF FLOW IN 24.0 I | | | | | |
| PIPE-FLOW VELOCITY (FEET/ | SEC.) = | 16.38 | | | |
| GIVEN PIPE DIAMETER (INCH PIPE-FLOW (CFS) = 32 |) = 24.0 .36 | 0 NUME | ER OF PIPES | 3 = 1 | |
| PIPE TRAVEL TIME (MIN.) = LONGEST FLOWPATH FROM NO | 0.10 | Tc(MIN. |) = 18.59 DE 107.0 | 9 00 = 23 | 38.56 FEET. |
| ************************************** | 107.00 | TO NODE | 107.00 IS | S CODE = | 81 |
| >>>>ADDITION OF SUBAREA | | | | | |
| MAINLINE Tc(MIN.) = 18 | | | | | |
| * 100 YEAR RAINFALL INTE | NSITY(INC | | | | |
| DEVELOPMENT TYPE/ LAND USE | SCS SOIL | AREA | Fp | Ap | SCS |
| | | | | 0.500 | |
| "5-7 DWELLINGS/ACRE" RESIDENTIAL | В | | | | 76 |
| "5-7 DWELLINGS/ACRE" RESIDENTIAL | С | 1.16 | | 0.500 | 86 |
| "5-7 DWELLINGS/ACRE" | D | 12.06 | 0.20 | 0.500 | 91 |

COMMERCIAL

0.100

0.100

0.20

Page 3

PUBLIC PARK C 0.70 0.25 0.850 86 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp[INCH/HR] = 0.23 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.481 SUBAREA AREA(ACRES) = 19.69 SUBAREA RUNOFF(CFS) = 49.71 EFFECTIVE AREA(ACRES) = 32.39 AREA-AVERAGED Fm(INCH/HR) = 0.10 AREA-AVERAGED AP = 0.47 TOTAL AREA (ACRES) = 32.4 PEAK FLOW RATE(CFS) = ********************** FLOW PROCESS FROM NODE 107.00 TO NODE 107.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< MAINLINE Tc(MIN.) = 18.59 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.915 SUBAREA LOSS RATE DATA(AMC III): DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE PUBLIC PARK GROUP (ACRES) (INCH/HR) (DECIMAL) CN D 0.53 0.20 0.850 91 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20 | SUBARRA AVERAGE PERVIOUS ARBA FRACTION, AP = 0.820 | SUBARRA ARBA (ACRES) = 0.53 | SUBARRA ARBA (ACRES) = 0.53 | SUBARRA ARBA (ACRES) = 32.92 | ARBA-AVERAGED FM(INCH/HR) = 0.10 | ARBA-AVERAGED FM(INCH/HR) = 0.22 | ARBA-AVERAGED AP = 0.48 | TOTAL ARBA (ACRES) = 32.9 | FEAR FILOW RATE(FS) = 83.28 ********************** FLOW PROCESS FROM NODE 107.00 TO NODE 109.00 IS CODE = 41 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <>>> ELEVATION DATA: UPSTREAM(FEET) = 1240.60 DOWNSTREAM(FEET) = 1239.01 FLOW LENGTH(FEET) = 81.43 MANNING'S N = 0.013 ASSUME FULL-FLOWING PIPELINE PIPE-FLOW VELOCITY (FEET/SEC.) = 26.51 PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
GIVEN PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 83.28
PIPE TRAVEL TIME(MIN.) = 0.05 Tc(MIN.) = 18.64
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 109.00 = 2419.99 FEET. ***************************** FLOW PROCESS FROM NODE 109.00 TO NODE 109.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< MAINLINE Tc(MIN.) = 18.64 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.911 SUBAREA LOSS RATE DATA(AMC III): DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN COMMERCIAL 0.52 0.25 0.100 86 C D COMMERCIAL 91 CONDOMINIUMS CONDOMENTIAMS D 10.74 0.20 0 350 0.07 0.20 ********************** FLOW PROCESS FROM NODE 109.00 TO NODE 111.00 IS CODE = 41 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <>>> ELEVATION DATA: UPSTREAM(FEET) = 1239.07 DOWNSTREAM(FEET) = 1210.33 FLOW LENGTH(FEET) = 407.01 MANNING'S N = 0.013 DEFH OF FLOW IN 33.0 INCH PIEF IS 24.0 INCHES

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PIPE-FLOW VELOCITY (FEET/SEC.) = 25.32

GIVEN PIPE DIAMETER (INCH) = 33.00 NUMBER OF PIPES = 1
PIPE-FLOW (CFS) = 117.19

| | NODE 100.00 TO NODE 111.00 = 2827.00 FEET. |
|--|--|
| FLOW PROCESS FROM NODE | 111.00 TO NODE 111.00 IS CODE = 81 |
| >>>>ADDITION OF SUBAR | REA TO MAINLINE PEAK FLOW< |
| MAINLINE Tc(MIN.) = * 100 YEAR RAINFALL IN | ITENSITY (INCH/HR) = 2.887 |
| SUBAREA AVERAGE PERVIC SUBAREA AREA(ACRES) = EFFECTIVE AREA(ACRES) AREA-AVERAGED Fp(INCH/ | JUS LOSS RATE, Fp(INCH/HR) = 0.20 JUS AREA FRACTION, Ap = 0.505 1.63 SUBAREA RUNOFF(CFS) = 4.09 4.7.85 AREA-AVERAGED Fm(INCH/HR) = 0.09 HR) = 0.21 AREA-AVERAGED Ap = 0.44 47.8 PEAK FLOW RATE(CFS) = 120.29 |
| FLOW PROCESS FROM NODE | E 111.00 TO NODE 113.00 IS CODE = 41 |
| >>>>COMPUTE PIPE-FLOW >>>>USING USER-SPECIF | N TRAVEL TIME THRU SUBAREA< |
| GIVEN PIPE DIAMETER(IN PIPE-FLOW(CFS) = 1 PIPE TRAVEL TIME(MIN.) LONGEST FLOWPATH FROM | (TOTAL FLOW) / (PIPE CROSS SECTION AREA) ICH) = 36.00 NUMBER OF PIPES = 1 |
| | REA TO MAINLINE PEAK FLOW< |
| MAINLINE Tc(MIN.) = | ITENSITY(INCH/HR) = 2.885 \(\lambda MC III): SCS SOIL AREA FP AP SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN |
| PUBLIC PARK SUBAREA AVERAGE PERVIC SUBAREA AVERAGE PERVIC SUBAREA AREA (ACRES) = EFFECTIVE AREA (ACRES) | D 13.30 0.20 0.350 91 D 3.90 0.20 0.850 91 DUS LOSS RATE, Fp(INCH/HR) = 0.20 DUS LOSS RATE, Fp(INCH/HR) = 0.20 SUBARBA RENOTION, Ap = 0.463 17.20 SUBARBA RUNOFF(CFS) = 43.23 = 65.05 AREA-AVERAGED Fm(INCH/HR) = 0.09 HR) = 0.21 AREA-AVERAGED Ap = 0.44 65.1 PEAK FLOW RATE(CFS) = 163.45 |
| PUBLIC PARK SUBAREA AVERAGE PERVIC SUBAREA AVERAGE PERVIC SUBAREA AREA (ACRES) = EFFECTIVE AREA (ACRES) AREA-AVERAGED FP (INCH/ TOTAL AREA (ACRES) = | D 3.90 0.20 0.850 91 DUS LOSS RATE, FP(INCH/HR) = 0.20 DUS AREA FRACTION, Ap = 0.463 17.20 SUBAREA RUNOFF(CFS) = 43.23 = 65.05 AREA-AVERAGED Fm(INCH/HR) = 0.09 (HR) = 0.21 AREA-AVERAGED Ap = 0.44 65.1 PEAK FLOW RATE(CFS) = 163.45 |
| PUBLIC PARK SUBARRA AVERAGE PERVIC SUBARRA AVERAGE PERVIC SUBARRA ARRA (ACRES) = EFFECTIVE AREA (ACRES) TOTAL AREA (ACRES) FLOW PROCESS FROM NODE >>>>>COMPUTE PIPE-FLOW >>>>>COMPUTE PIPE-FLOW >>>>>TRISTING USER-SPECTIF | D 3.90 0.20 0.850 91 DUS LOSS RATE, FP(INCH/HR) = 0.20 DUS AREA FRACTION, Ap = 0.463 17.20 SUBARREA RUNOFF(CFS) = 43.23 = 65.05 AREA-AVERAGED FM(INCH/HR) = 0.09 HR) = 0.21 AREA-AVERAGED Ap = 0.44 65.1 PEAK FLOW RATE (CFS) = 163.45 E 113.00 TO NODE 119.00 IS CODE = 41 V TRAVEL TIME THRU SUBARREA<<<< |
| PUBLIC PARK SUBARRA AVERAGE PERVIC SUBARRA AVERAGE PERVIC SUBARRA ARRA (ACRES) = FFPECTIVE AREA (ACRES) AREA-AVERAGED FP (INCH, TOTAL AREA (ACRES) = FLOW PROCESS FROM NODE >>>>COMPUTE PIPE-FLOW >>>>SING USER-SPECTF ELEVATION DATA: UPSTRE FLOW LENGTH (FPET) = 1 ASSUME FULL-FLOWING PI PIPE-FLOW VELOCITY (FCE GIVEN PIPE DIAMETER (IN FIPE-FLOW VELOCITY (FCE GIVEN PIPE DIAMETER (IN FIPE-FLOW (FCS) = 1 | D 3.90 0.20 0.850 91 DUS LOSS RATE, FP(INCH/HR) = 0.20 DUS AREA FRACTION, Ap = 0.463 17.20 SUBAREA RUNOFF(CFS) = 43.23 = 65.05 AREA-AVERAGED Fm(INCH/HR) = 0.09 HR) = 0.21 AREA-AVERAGED Ap = 0.44 65.1 PEAK FLOW RATE(CFS) = 163.45 ***PROVINGE OF THE STATE OF T |

LONGEST FLOWPATH FROM NODE 100.00 TO NODE 3P00ROV 119.00 = 3923.72 FEET.

*************************** FLOW PROCESS FROM NODE 119.00 TO NODE 119.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< MAINLINE Tc(MIN.) = 19.71 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.820 SUBAREA LOSS RATE DATA(AMC III): DEVELOPMENT TYPE/ SCS SOIL AREA GROUP (ACRES) (INCH/HR) (DECIMAL) CN LAND USE RESIDENTIAL '11+ DWELLINGS/ACRE" С 1.51 0.25 0.200 86 RESIDENTIAL. "11+ DWELLINGS/ACRE" D 5.27 0.20 0.200 COMMERCIAL 0.27 0.20 0.100 SUBAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.21 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.196 SUBARRA AREA (ACRES) = 7.05 SUBAREA RUNOFF (CFS) = 17.63 EFFECTIVE AREA (ACRES) = 72.10 AREA-AVERAGED Fm(INCH/HR) = 0.09 AREA-AVERAGED Fp(INCH/HR) = 0.21 AREA-AVERAGED AP = 0.42 TOTAL AREA (ACRES) = 72.1 PEAK FLOW RATE(CFS) = FLOW PROCESS FROM NODE 119.00 TO NODE 119.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< MAINLINE Tc(MIN.) = 19.71 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.820 SUBAREA LOSS RATE DATA (AMC III): DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "11+ DWELLINGS/ACRE" C 1.27 0.25 0.200 RESIDENTIAL. "11+ DWELLINGS/ACRE" D 3.23 0.20 COMMERCIAL D 0.27 0.20 0.100 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.194 SUBAREA AREA(ACRES) = 4.75 SUBAREA RUNOFF(CFS) = 11.93 EFFECTIVE AREA(ACRES) = 76.87 AREA-AVERAGED Fm(INCH/HR) = 0.21 AREA-AVERAGED AP = 0.41 76.9 TOTAL AREA (ACRES) = PEAK FLOW RATE(CFS) = *************************** FLOW PROCESS FROM NODE 119.00 TO NODE 119.00 IS CODE = 1 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<< TOTAL NUMBER OF STREAMS = 2 TOWN NORTHWEST OF THE TOWN TOWN THE TOWN TOWN THE TOWN THE THE TOWN TOWN THE TOWN TH AREA-AVERAGED Em(INCH/HR) = 0.09 AREA-AVERAGED Fp(INCH/HR) = 0.21 AREA-AVERAGED FP(INCH/HR,
AREA-AVERAGED AP = 0.41
EFFECTIVE STREAM AREA(ACRES) = 76

76.87 76.87 PEAK FLOW RATE (CFS) AT CONFLUENCE = FLOW PROCESS FROM NODE 200.00 TO NODE 201.00 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< INITIAL SUBAREA FLOW-LENGTH(FEET) = 331.01 ELEVATION DATA: UPSTREAM(FEET) = 1332.00 DOWNSTREAM(FEET) = 1330.74 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.172 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.903

3P00ROV SUBAREA To AND LOSS RATE DATA(AMC III):

| DEVELOPMENT TYPE/ LAND USE CONDOMINIUMS SUBAREA AVERAGE PERVIOUS SUBAREA AVERAGE PERVIOUS SUBAREA RUNOFF (CFS) = TOTAL AREA (ACRES) = | AREA FRACTION. A | m = 0.350 | | Tc (MIN.) 11.17 |
|--|--|--|------------------------------|-----------------------|
| TOTAL AREA(ACRES) = ******************* FLOW PROCESS FROM NODE | ****** | ****** | ****** | ***** |
| >>>>COMPUTE STREET FLOW | TRAVEL TIME THRU | J SUBAREA< | | |
| >>>> (STREET TABLE SECTION | | | | |
| UPSTREAM ELEVATION (FEET) STREET LENGTH (FEET) = STREET HALFWIDTH (FEET) = | 789.61 CURB HE | GHT (INCHES) = | 8.0 | 8.01 |
| DISTANCE FROM CROWN TO CO INSIDE STREET CROSSFALL (I OUTSIDE STREET CROSSFALL | DECIMAL) = 0.017 | | 00 | |
| SPECIFIED NUMBER OF HALF: STREET PARKWAY CROSSFALL Manning's FRICTION FACTOR Manning's FRICTION FACTOR | (DECIMAL) = 0.0 R for Streetflow |)17 Section(curb-to | o-curb) = 0 = 0.0150 | .0150 |
| **TRAVEL TIME COMPUTED STREETFLOW MODEL RESUL! STREET FLOW DEPTH(FEET HALFSTREET FLOOD WIDTH AVERAGE FLOW VELOCITY() PRODUCT OF DEPTH&VELOC STREET FLOW TRAVEL TIME() * 100 YEAR RAINFALL INTE SUBAREA LOSS RATE DATA(A) DEVELOPMENT TYPE/ LAND USE ESIDENTIAL | TS USING ESTIMATE) (PEET) = 0.48 (PEET) = 18.40 FEET/SEC.) = 5 ITY(FT*FT/SEC.) = MIN.) = 2.63 NSITY(INCH/HR) = MC III): SCS SOIL AREA GROUP (ACRES) | CD FLOW: 5.01 2.39 TC(MIN.) = 13 3.459 Fp (INCH/HR) (DE | 3.80 Ap SCS CCIMAL) CN | |
| RESIDENTIAL "8-10 DWELLINGS/ACRE" CONDOMINIUMS SUBAREA AVERAGE PERVIOUS SUBAREA AVERAGE PERVIOUS SUBAREA AREA (ACRES) = EFFECTIVE AREA (ACRES) = AREA-AVERAGED FP (INCH/HR. TOTAL AREA (ACRES) = | D 1.91 D 4.97 LOSS RATE, FP(IN | 0.20 (0.20 (ICH/HR) = 0.20 |).400 91).350 91 | 07 |
| END OF SUBAREA STREET FLO DEPTH(FEET) = 0.55 HALI FLOW VELOCITY(FEET/SEC.) LONGEST FLOWPATH FROM NOI | FSTREET FLOOD WIE = 5.65 DEPTH* DE 200.00 TO N | VELOCITY(FT*FT/ | SEC.) = 3. = 1120.62 | |
| ************************************** | 203.00 TO NODE | 205.00 IS CO | DDE = 62 | ***** |
| >>>>COMPUTE STREET FLOW >>>> (STREET TABLE SECTION | ON # 1 USED) <<< | < | | |
| UPSTREAM ELEVATION (FEET) STREET LENGTH (FEET) = STREET HALFWIDTH (FEET) = | = 1308.01 DOWNS | TREAM ELEVATION | I(FEET) = 124 | |
| DISTANCE FROM CROWN TO CO INSIDE STREET CROSSFALL (I OUTSIDE STREET CROSSFALL | DECIMAL) = 0.018 | | 00 | |
| SPECIFIED NUMBER OF HALF: STREET PARKWAY CROSSFALL Manning's FRICTION FACTOR Manning's FRICTION FACTOR | (DECIMAL) = 0.0 R for Streetflow |)20 Section(curb-to | o-curb) = 0 = 0.0200 | .0150 |
| **TRAVEL TIME COMPUTED | USING ESTIMATED | FLOW(CFS) = Page 7 | 43.00 | |

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH(FEET) = 0.57 HALFSTREET FLOOD WIDTH(FEET) = 22.54 AVERAGE FLOW VELOCITY (FEET/SEC.) = 9.09 PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 5.14 STREET FLOW TRAVEL TIME (MIN.) = 1.65 Tc (MIN.) = 15.45 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.242 SUBAREA LOSS RATE DATA(AMC III): DEVELOPMENT TYPE/ SCS SOIL AREA GROUP (ACRES) (INCH/HR) (DECIMAL) CN LAND USE RESIDENTIAL "8-10 DWELLINGS/ACRE" D 0.20 0 400 91 COMMERCIAL D 0.73 0.20 0.100 91 CONDOMINIUMS 11.58 PUBLIC PARK D 0.01 0.20 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20 0.850 91 | SUBARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.35
| SUBARRA AREA (ACRES) = 12.39 | SUBARRA RUNOFF(CFS) = 35.40 |
| EFFECTIVE ARRA (ACRES) = 20.9 | AREA-AVERAGED FM (INCH/HR) = 0.07
| AREA-AVERAGED Fp (INCH/HR) = 0.20 | AREA-AVERAGED AP = 0.35 |
| TOTAL AREA (ACRES) = 20.7 | FEAR FLOW RATE (CFS) = 59.07 END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.62 HALFSTREET FLOOD WIDTH(FEET) = 25.51
FLOW VELOCITY(FEET/SEC.) = 9.84 DEPTH-VELOCITY(FT*FT/SEC.) = 6.08 LONGEST FLOWPATH FROM NODE 200.00 TO NODE 205.00 = 2021.69 FEET. *************************** FLOW PROCESS FROM NODE 205.00 TO NODE 206.00 IS CODE = 41 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<>>>>>>SUSING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) ELEVATION DATA: UPSTREAM(FEET) = 1245.00 DOWNSTREAM(FEET) = 1229.65 FLOW LENGTH(FEET) = 135.30 MANNING'S N = 0.013 ASSUME FULL-FLOWING PIPELINE PIPE-FLOW VELOCITY (FEET/SEC.) = 33.43
PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA) GIVEN PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-PLOW(CFS) = 59.07
PIPE TRAVEL TIME (MIN.) = 0.07 Tc (MIN.) = 15.52
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 206.00 = 2156.99 FEET. FLOW PROCESS FROM NODE 206.00 TO NODE 210.00 IS CODE = 62 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA >>>> (STREET TABLE SECTION # 1 USED) <<<<< UPSTREAM ELEVATION(FEET) = 1229.65 DOWNSTREAM ELEVATION(FEET) = 1166.68 STREET LENGTH(FEET) = 1205.30 CURB HEIGHT(INCHES) = 8.0 STREET HALFWIDTH (FEET) = 30.00 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00 INSIDE STREET CROSSFALL (DECIMAL) = 0.018
OUTSIDE STREET CROSSFALL (DECIMAL) = 0.018 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0150 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH(FEET) = 0.57 HALFSTREET FLOOD WIDTH(FEET) = 22.77
AVERAGE FLOW VELOCITY(FEET/SEC.) = 7.90 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = STREET FLOW TRAVEL TIME (MIN.) = 2.54 Tc (MIN.) = 18.06 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.964 SUBAREA LOSS RATE DATA(AMC III): SCS SOIL AREA FP AP SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN DEVELOPMENT TYPE/

LAND USE RESIDENTIAL

| | | | 3P00ROV | | |
|---|---|--|------------------------------------|--|--------------------|
| "11+ DWELLINGS/ACRE" RESIDENTIAL | | | | 0.200 | |
| "11+ DWELLINGS/ACRE" COMMERCIAL SUBAREA AVERAGE PERVIOUS SUBAREA AVERAGE PERVIOUS | AREA FRACT | TON An = | 0 197 | | |
| SUBAREA AREA (ACRES) = EFFECTIVE AREA (ACRES) = AREA-AVERAGED Fp(INCH/HR TOTAL AREA (ACRES) = | 13.03 33.72) = 0.20 | SUBAREA RUI AREA-AVERA | NOFF(CFS) RAGED Fm(GED Ap = | = 34.2 INCH/HR) 0.29 | 7 = 0.06 |
| | | | OW RAIE (C | rs) = | 00.17 |
| END OF SUBAREA STREET FLO DEPTH(FEET) = 0.59 HALL FLOW VELOCITY(FEET/SEC.) LONGEST FLOWPATH FROM NO | FSTREET FLO | OOD WIDTH (F | EET) = 2 CITY(FT*F 210.00 | 4.10 T/SEC.) = = 336 | 4.86 2.29 FEET. |
| ************************************** | 210.00 TO | NODE 1 | 19.00 IS | CODE = 4 | 1 |
| >>>>COMPUTE PIPE-FLOW TO SHEET STATES TO SHE | D PIPESIZE | (EXISTING | ELEMENT) < | | |
| ELEVATION DATA: UPSTREAM FLOW LENGTH(FEET) = 30 ASSUME FULL-FLOWING PIPE: | (FEET) = 1 7.60 MANN LINE | 166.68 DO | WNSTREAM (| | |
| PIPE-FLOW VELOCITY (FEET/: PIPE FLOW VELOCITY = (TO' GIVEN PIPE DIAMETER (INCH PIPE-FLOW (CFS) = 88 | TAL FLOW) /) = 24.00 | (PIPE CROSS NUMBER | OF PIPES | | |
| PIPE-FLOW(CFS) = 88 PIPE TRAVEL TIME(MIN.) = LONGEST FLOWPATH FROM NO | 0.18 | Tc(MIN.) = 00 TO NODE | 18.24 119.00 | = 366 | 9.89 FEET. |
| ************************************** | 119.00 TO | NODE 1 | | CODE = | |
| >>>>DESIGNATE INDEPENDED >>>>AND COMPUTE VARIOUS | NT STREAM E | OR CONFLUE | NCE<<<< ALUES<<< | < | |
| TOTAL NUMBER OF STREAMS CONFLUENCE VALUES USED FT TIME OF CONCENTRATION (MIL RAINFALL INTENSITY (INCH./ AREA-AVERAGED FP (INCH./ HR AREA-AVERAGED FP (INCH./ HR AREA-AVERAGED AP = 0.29 EFFECTIVE STREAM AREA (ACRES) FEAK FLOW RATE (ACRES) FEAK FLOW RATE (CFS) AT CU | = 2 DR INDEPEND N.) = 18. HR) = 2.5) = 0.06) = 0.20 RES) = 33. | DENT STREAM 24 95 33.72 | 2 ARE: | | |
| ** CONFLUENCE DATA ** | | | | | |
| STREAM Q TC NUMBER (CFS) (MIN. | Intensity (INCH/HR) | (INCH/HR) | Ap | Ae (ACRES) | NODE |
| STREAM Q TC NUMBER (CFS) (MIN. 1 189.15 19.7 2 88.17 18.2 | 1 2.820 4 2.947 | 0.21(0.0 | 9) 0.41 6) 0.29 | 76.9 33.7 | 100.00 200.00 |
| RAINFALL INTENSITY AND TO | IME OF CONC | CENTRATION : | | | |
| ** PEAK FLOW RATE TABLE STREAM Q TC NUMBER (CFS) (MIN. 1 271.44 18.2 2 273.44 19.7 | ** Intensity (INCH/HR) | Fp(Fm) | Ap | Ae (ACRES) | HEADWATER NODE |
| 1 271.44 18.2 2 273.44 19.7 | 4 2.947 1 2.820 | 0.21(0.0 | 8) 0.37 8) 0.37 | 104.9 110.6 | 200.00 |
| COMPUTED CONFLUENCE ESTIFE PEAK FLOW RATE(CFS) = EFFECTIVE AREA (ACRES) = AREA-AVERAGED FP(INCH/HR TOTAL AREA (ACRES) = LONGEST FLOWPATH FROM NO | MATES ARE A 273.44 110.59) = 0.21 | AS FOLLOWS: Tc(MIN.): AREA-AVERA | = 19.7 RAGED Fm(GED Ap = | 1 INCH/HR) 0.37 | = 0.08 |
| | | 0 TO NODE | 119,00 | = 392 | 3.72 FEET. |
| ******* | DE 100.0 | 00 TO NODE | | | |
| ************************************** | DE 100.0 ********************************** | ********** NODE 1: | ******* 21.00 IS | ************************************** | ******** |

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3P00ROV >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<

| >>>>COMPUTE PIPE-FLOW T >>>>USING USER-SPECIFIE | D PIPESI2 | E (EXISTI | NG ELEMENT | | | |
|--|---|--|--|-------------------------|--------------|------|
| ELEVATION DATA: UPSTREAM FLOW LENGTH (FEET) = 32 DEPTH OF FLOW IN 54.0 I PIPE-FLOW VELOCITY (FEET/ GIVEN PIPE DIAMETER (INCH | (FEET) = 1.11 MA NCH PIPE SEC.) =) = 54.0 | 1159.95 ANNING'S N IS 37.6 23.10 | DOWNSTREAM I = 0.013 INCHES | M(FEET) = | | |
| PIPE-FLOW(CFS) = 273 PIPE TRAVEL TIME(MIN.) = LONGEST FLOWPATH FROM NO | 0.23 | Tc(MIN. |) = 19.94 DDE 121.0 | 400 = 42 | 44.83 FE | EET. |
| ************************************** | 121.00 | TO NODE | 121.00 I | S CODE = | 81 | **** |
| >>>>ADDITION OF SUBAREA | TO MAINI | LINE PEAK | FLOW< | | | |
| MAINLINE TC(MIN.) = 19 * 100 YEAR RAINFALL INTE | .94 NSITY(INC | CH/HR) = | 2.801 | | | |
| SUBAREA LOSS RATE DATA(A DEVELOPMENT TYPE/ LAND USE RESIDENTIAL | SCS SOIL GROUP | AREA (ACRES) | Fp (INCH/HR) | Ap (DECIMAL) | SCS | |
| "11+ DWELLINGS/ACRE" RESIDENTIAL | С | 6.04 | 0.25 | 0.200 | 86 | |
| "11+ DWELLINGS/ACRE" COMMERCIAL COMMERCIAL | D | 8.06 | 0.20 | 0.200 | 91 | |
| COMMERCIAL COMMERCIAL | D | 1 54 | 0.25 | 0.100 | 91 | |
| SUBAREA AVERAGE PERVIOUS | LOSS RAT | CE, Fp(INC | CH/HR) = 0 | .22 | | |
| SUBAREA AVERAGE PERVIOUS | AREA FRA | ACTION, Ap | = 0.185 | | 0.5 | |
| SUBAREA AREA(ACRES) = EFFECTIVE AREA(ACRES) = | 10.61 | SUBAREA AREA-A | VERAGED Em | (TNCH/HR) | 26 = 0.07 | |
| SUBAREA AREA(ACRES) = EFFECTIVE AREA(ACRES) = AREA-AVERAGED Fp(INCH/HR |) = 0.21 | AREA-AV | ERAGED Ap : | = 0.35 | 0.07 | |
| TOTAL AREA (ACRES) = | 127.2 | PEAK | FLOW RATE (| CFS) = | 312.33 | |
| ************************************** | 121.00 | TO NODE | 123.00 I | S CODE = | | **** |
| >>>>COMPUTE PIPE-FLOW T | RAVEL TIN D PIPESIZ | ME THRU SU ME (EXISTI | NG ELEMENT |) <<<< | | |
| ELEVATION DATA: UPSTREAM FLOW LENGTH (FEET) = 79 ASSUME FULL-FLOWING PIPE PIPE-FLOW VELOCITY (FEET/ PIPE FLOW VELOCITY = (TO GIVEN PIPE DIAMETER (INCH PIPE-FLOW (CFS) = 312 | (FEET) = 8.79 MF LINE SEC.) = TAL FLOW)) = 60.0 | 1150.00 ANNING'S N 15.91 /(PIPE CF 00 NUME | DOWNSTREAM I = 0.013 ROSS SECTION SER OF PIPES | M(FEET) = N AREA) S = 1 | | |
| PIPE-FLOW(CFS) = 312 PIPE TRAVEL TIME(MIN.) = LONGEST FLOWPATH FROM NO | DE 100 | 0.00 TO NO | DE 123.0 | 00 = 50 | | |
| ************************************** | 123.00 | TO NODE | 123.00 I | S CODE = | 81 | |
| >>>>ADDITION OF SUBAREA | | | | | | |
| MAINLINE TC(MIN.) = 20 | .78 | (ren.) | 0.706 | | | |
| * 100 YEAR RAINFALL INTE | NSITY(ING | CH/HR) = | 2.736 | | | |
| DEVELOPMENT TYPE/ | SCS SOIL | AREA | Fp | Ap | SCS | |
| SUBAREA LOSS RATE DATA(A DEVELOPMENT TYPE/ LAND USE | GROUP | (ACRES) | (INCH/HR) | (DECIMAL) | CN | |
| RESIDENTIAL | | | | | | |
| "11+ DWELLINGS/ACRE" RESIDENTIAL "11+ DWELLINGS/ACRE" APARTMENTS APARTMENTS | C | 6.79 | 0.25 | 0.200 | 86 | |
| "11+ DWELLINGS/ACRE" | D | 17.92 | 0.20 | 0.200 | 91 | |
| APARTMENTS | C | 4.46 | 0.25 | 0.200 | 86 | |
| COMMERCIAL | С | 0.69 | 0.20 | 0.200 | 91 86 | |
| COMMERCIAL COMMERCIAL SUBAREA AVERAGE PERVIOUS | D | 1.88 | 0.20 0.25 0.20 0.25 0.20 | 0.100 | 91 | |
| | LOSS RAT | E, Fp(INC | CH/HR) = 0 | .22 | | |
| SUBAREA AVERAGE PERVIOUS | AREA FRA | ACTION, Ap | = 0.192 | 70 | 0.4 | |
| SUBAREA AREA(ACRES) = EFFECTIVE AREA(ACRES) = AREA-AVERAGED FP(INCH/HR | 159.72) = 0.21 | SUBAREA 2 AREA-A 1 AREA-AV | RUNOFF(CF: VERAGED Fm ERAGED Ap : Page 10 | = 0.31 | = 0.07 | |
| | | | - 490 11 | - | | |

| | 3P00ROV |
|-----|---|
| | TOTAL AREA (ACRES) = 159.7 PEAK FLOW RATE (CFS) = 383.70 |
| | ** PEAK FLOW RATE TABLE ** STREAM Q TC Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 386.28 19.31 2.852 0.21(0.07) 0.31 154.0 200.00 2 383.70 20.78 2.736 0.21(0.07) 0.31 159.7 100.00 NEW PEAK FLOW DATA ARE: FEAK FLOW DATA ARE: FEAK FLOW RATE (CFS) = 386.28 Tc(MIN.) = 19.31 AREA-AVERAGED Fm(INCH/HR) = 0.07 AREA-AVERAGED Fp(INCH/HR) = 0.21 AREA-AVERAGED AP = 0.31 EFFECTIVE AREA (ACRES) = 154.01 |
| | FLOW PROCESS FROM NODE 123.00 TO NODE 129.00 IS CODE = 41 |
| | >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<>>> >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) |
| | ELEVATION DATA: UPSTREAM(FEET) = 1140.00 DOWNSTREAM(FEET) = 1122.00 FLOW LENGTH(FEET) = 579.78 MANNING'S N = 0.013 ASSUME FULL-FLOWING PIPELINE PIPE-FLOW VELOCITY(FEET/SEC.) = 27.23 PIPE FLOW VELOCITY(TOTAL FLOW)/(PIPE CROSS SECTION AREA) GIVEN PIPE DIAMETER(INCH) = 51.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 386.28 PIPE TRAVEL TIME(MIN.) = 0.35 TC(MIN.) = 19.67 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 129.00 = 5623.40 FEET. |
| | ************************************** |
| | >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< |
| | MAINLINE To (MIN.) = 19.67 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.823 SUBAREA LOSS RATE DATA (AMC III): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL **11+ DWELLINGS/ACRE** C 2.85 0.25 0.200 86 COMMERCIAL C 0.56 0.25 0.100 86 SUBAREA AVERAGE PERVIOUS LOSS RATE, FP (INCH/HR) = 0.25 SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.184 SUBAREA AREA (ACRES) = 3.41 SUBAREA ROMOFF (CFS) = 8.52 EFFECTIVE AREA (ACRES) = 157.42 AREA-AVERAGED FM (INCH/HR) = 0.07 AREA-AVERAGED FP (INCH/HR) = 0.21 TOTAL AREA (ACRES) = 163.1 PEAR FLOW RATE (CFS) = 390.70 |
| * * | FLOW PROCESS FROM NODE 129.00 TO NODE 129.00 IS CODE = 81 |
| | >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< |
| | MAINLINE To (MIN.) = 19.67 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.823 SUBAREA LOSS RATE DATA (AMC III): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "11+ DWELLINGS/ACRE" C 2.54 0.25 0.200 86 COMMERCIAL C 0.97 0.25 0.100 86 SUBAREA AVERAGE PERVIOUS LOSS RATE, FP (INCH/HR) = 0.25 SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.172 SUBAREA AREA (ACRES) = 3.51 SUBAREA RUNOFF (CFS) = 8.78 SEFFECTIVE AREA (ACRES) = 160.93 AREA-AVERAGED FM (INCH/HR) = 0.06 AREA-AVERAGED FP (INCH/HR) = 0.21 AREA-AVERAGED FM (INCH/HR) = 0.06 AREA-AVERAGED FP (INCH/HR) = 0.21 AREA-AVERAGED FP 0.31 TOTAL AREA (ACRES) = 166.6 PEAK FLOW RATE (CFS) = 399.48 |
| | FLOW PROCESS FROM NODE 129.00 TO NODE 129.00 IS CODE = 1 |
| | >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE |
| | TOTAL NUMBER OF STREAMS = 2 |

TOTAL NUMBER OF STREAMS = 2

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CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE: TIME OF CONCENTRATION(MIN.) = 19.67
RAINFALL INTENSITY(INCH/HR) = 2.82 AREA-AVERAGED Fm(INCH/HR) = 0.06 AREA-AVERAGED Fp(INCH/HR) = 0.21 AREA-AVERAGED PP (INCH/HK) = 0.21
AREA-AVERAGED AP = 0.31
EFFECTIVE STREAM AREA (ACRES) = 160
TOTAL STREAM AREA (ACRES) = 166.64
PEAK FLOW RATE (CFS) AT CONFLUENCE = *************************** FLOW PROCESS FROM NODE 300.00 TO NODE 301.00 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< INITIAL SUBAREA FLOW-LENGTH(FEET) = 320.55 ELEVATION DATA: UPSTREAM(FEET) = 1163.74 DOWNSTREAM(FEET) = 1148.43 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 5.616 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.789SUBAREA TC AND LOSS RATE DATA (AMC III): DEVELOPMENT TYPE/ SCS SOIL AREA SCS SOIL AREA Fρ LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) RESIDENTIAL
"11+ DWELLINGS/ACRE" C 0.29 0.25 0.200
COMMERCIAL C 1.36 0.25 0.100
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.118 SUBAREA RUNOFF (CFS) = 8.55

TOTAL AREA (ACRES) = 1.65 PEAK FLOW RATE (CFS) = ********************** FLOW PROCESS FROM NODE 301.00 TO NODE 302.00 IS CODE = 62 >>>>COMPLIE STREET FLOW TRAVEL TIME THRU SUBAREACCCC >>>> (STREET TABLE SECTION # 3 USED) <<<< UPSTREAM ELEVATION(FEET) = 1148.43 DOWNSTREAM ELEVATION(FEET) = 1141.94 STREET LENGTH(FEET) = 235.77 CURB HEIGHT(INCHES) = 8.0 STREET HALFWIDTH(FEET) = 50.00 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 45.00 INSIDE STREET CROSSFALL (DECIMAL) = 0.017 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.017 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STRUCTIED NUMBER OF HALFSIELDS CARRIENG ROWDF = STREET PARKWAY (ROSSPALL (DECIMAL) = 0.017
Manning's FRICTION FACTOR for Streetflow Section (curb-to-curb) = 0.0150
Manning's FRICTION FACTOR for Back-of-Malk Flow Section = 0.0150 **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH(FEET) = 0.43
HALFSTREET FLOOD WIDTH(FEET) = 15.68
AVERAGE FLOW VELOCITY(FEET/SEC.) = 4.47 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.93
STREET FLOW TRAVEL TIME(MIN.) = 0.88 Tc(MIN.) = * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.326 6.49 SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "11+ DWELLINGS/ACRE" С 0.47 "11+ DWELLINGS/ACRE" C 0.47 0.25 0.200 86 COMMERCIAL C 4.51 0.25 0.100 86 SUBARRA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25 SUBARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.109 SUBARRA AREA (ACRES) = 4.98 SUBARRA ER AUNOFF(CFS) = 23.75 SEFECTIVE AREA (ACRES) = 6.63 AREA-AVERAGED Fm(INCH/HR) = 0.03 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.11 STOTAL AREA (ACRES) = 6.6 PEAK FLOW RATE(CFS) = 31.62

END OF SUBAREA STREET FLOW HYDRAULICS:

SPOOROV
DEPTH(FEET) = 0.48 HALFSTREET FLOOD WIDTH(FEET) = 18.75
FLOW VELOCITY(FEET/SEC.) = 4.96 DEPTH-VELOCITY(FT-FT/SEC.) = 2.40

| FLOW VELOCITY (FEET/SEC.) = 4.96 DEPTH*VELOCITY (FT*FT/SEC.) = 2.40 LONGEST FLOWPATH FROM NODE 300.00 TO NODE 302.00 = 556.32 FEET. |
|---|
| FLOW PROCESS FROM NODE 302.00 TO NODE 303.00 IS CODE = 41 |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< |
| ELEVATION DATA: UPSTREAM(FEET) = 1141.94 DOWNSTREAM(FEET) = 1122.13 FLOW LENGTH (FEET) = 643.31 MANNING'S N = 0.013 DEPTH OF FLOW IN 36.0 INCH PIPE IS 13.1 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 13.54 GIVEN PIPE DIAMSTER (INCH) = 36.00 NUMBER OF PIPES = 1 PIPE-FLOW (CFS) = 31.62 PIPE TRAVEL TIME (MIN.) = 0.79 Tc (MIN.) = 7.29 LONGEST FLOWPATH FROM NODE 300.00 TO NODE 303.00 = 1199.63 FEET. |
| FLOW PROCESS FROM NODE 303.00 TO NODE 303.00 IS CODE = 81 |
| >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< |
| MAINLINE TC (MIN.) = 7.29 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 4.986 SUBAREA LOSS RATE DATA (AMC III): DEVELOPMENT TYPE / SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL *11+ DNELLINGS/ACRE* C 2.51 0.25 0.200 86 COMMERCIAL C 3.05 0.25 0.100 86 SUBAREA AVERAGE PERVIOUS LOSS RATE, FP (INCH/HR) = 0.25 SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.145 SUBAREA AREA (ACRES) = 5.6 SUBAREA READ F(CFS) = 24.77 EFFECTIVE AREA (ACRES) = 12.19 AREA-AVERAGED FM (INCH/HR) = 0.03 AREA-AVERAGED FO (INCH/HR) = 0.25 AREA-AVERAGED AP = 0.13 TOTAL AREA (ACRES) = 12.2 PEAK FLOW RATE (CFS) = 54.36 |
| FLOW PROCESS FROM NODE 303.00 TO NODE 129.00 IS CODE = 41 |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<>>> >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<>>>> |
| ELEVATION DATA: UPSTREAM(FEET) = 1122.13 DOWNSTREAM(FEET) = 1122.00 FLOW LENGTH(FEET) = 81.38 MANNING'S N = 0.013 DEPTH OF FLOW IN 48.0 INCH PIPE IS 39.3 INCHES PIPE-FLOW VELOCITY(FEET/SEC.) = 4.94 GIVEN PIPE DIAMETER (INCH) = 48.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 54.36 PIPE TRAVEL TIME(MIN.) = 0.27 Tc(MIN.) = 7.56 LONGEST FLOWPATH FROM NODE 300.00 TO NODE 129.00 = 1281.01 FEET. |
| FLOW PROCESS FROM NODE 129.00 TO NODE 129.00 IS CODE = 1 |
| >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE< |

** CONFLUENCE DATA **
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
Page 13

| 1 | 399.48 | 19.67 | 2.823 | 0.21(| 0.06) | 0.31 | 160.9 | 200.00 |
|---|--|--|---|--|---|---|---|----------------------------|
| 1 2 | 399.48 396.47 54.36 | 21.13 | 2.709 | 0.21(| 0.07) | 0.31 | 166.6 | 100.00 |
| 2 | 54.36 | 7.56 | 4.882 | 0.25(| 0.03) | 0.13 | 12.2 | 300.00 |
| RAINFALL CONFLUENC | INTENSITY CE FORMULA | AND TIME USED FOR | OF CONC 2 STRE | ENTRAT: AMS. | ION RA | TIO | | |
| ** PEAK E | LOW RATE T | ABLE ** | | | | | | |
| STREAM | (CFS) 322.58 430.76 426.48 | Tc Ir | ntensity | Fp(I | m) | Ap | Ae | HEADWATER |
| NUMBER 1 | (CFS) 322.58 | (MIN.) (1 7.56 | 4.882 | 0.21(| (HR) 0.06) | 0.28 | (ACRES) 74.1 | NODE 300.00 |
| 2 | 430.76 | 19.67 | 2.823 | 0.21(| 0.06) | 0.29 | 173.1 | 200.00 |
| 3 | 426.48 | 21.13 | 2.709 | 0.21(| 0.06) | 0.30 | 178.8 | 100.00 |
| COMPUTED PEAK FLOW | CONFLUENCE V RATE (CFS) E AREA (ACRE RAGED Fp (IN | ESTIMATE = 43 | ES ARE A | S FOLLO | OWS: N.) = | 19.6 | 57 | |
| AREA-AVER | E AREA (ACRE RAGED Fp(IN | S) = CH/HR) = | 0.21 | -AREA AREA | -AVERAC /ERAGEI | GED Fm (DAp = | INCH/HR) : 0.29 | = 0.06 |
| TOTAL ARE | SA(ACRES) = | 1/6 | 3.8 | | | | | |
| LONGEST E | LOWPATH FR | OM NODE | 100.0 | 0 TO NO | DDE | 129.00 | 562 | 3.40 FEET. |
| | CESS FROM N | ODE 12 | 29.00 TO | NODE | | .00 IS | | |
| | UTE PIPE-F | | | | | | | |
| >>>>USIN | NG USER-SPE | CIFIED PI | IPESIZE | (EXIST | ING ELI | EMENT) < | | |
| ELEVATION FLOW LENG | DATA: UPS TH(FEET) = | TREAM (FEE 35.44 | ET) = 1 1 MANN | 105.04 ING'S 1 | DOWNS N = 0 | STREAM | | |
| | FLOW IN 6 | | | | INCHES | S | | |
| GIVEN PIE | PE DIAMETER V(CFS) = | (INCH) = | 66.00 | NUME | BER OF | PIPES | = 1 | |
| PIPE-FLOW | V(CFS) = | 430.76 | 0.00 | To (MIN | ١ - | 10 60 | | |
| LONGEST E | /EL TIME(MI FLOWPATH FR | OM NODE | 100.0 | 0 TO NO | DDE | 131.00 | = 565 | 8.84 FEET. |
| ****** | ***** | ****** | ****** | ***** | ***** | ****** | ***** | ****** |
| | CESS FROM N | | | | | | CODE = 8 | 1 |
| | TION OF SU | | | | | | | |
| MATNITHE | Tc (MIN.) = | | | | | | | |
| + 100 1177 | | TAIMPALOTO | / / | HR) = | 2.821 | | | |
| SUBAREA I | AR RAINFALL JOSS RATE D MENT TYPE/ USE AL | ATA (AMC) | III): | AREA | Fn | | Δn | scs |
| LANI | USE | GRO | OUP (A | CRES) | (INCH | /HR) | DECIMAL) | CN |
| COMMERCIA | AL. | (| | 1.86 | 0 | .25 | 0.100 | 86 |
| SUBAREA A | AVERAGE PER | VIOUS LOS | SS RATE, | Fp(IN | CH/HR) | = 0.2 | 15 | 91 |
| CIIDADEA 7 | WEDNCE DED | TATORIC ADE | TOACT | TON AY | - n | 100 | | |
| EFFECTIVE | AREA (ACRES) AREA (ACRE | = 2.0 S) = 1 | 175.12 | AREA- | A KUNOI AVERAGI | FF (CFS) | = 5.U. NCH/HR) = | 0.06 |
| AREA-AVE | RAGED Fp(IN EA(ACRES) = | CH/HR) = | 0.21 | AREA-AV | /ERAGEI | D Ap = | 0.29 | |
| TOTAL ARE | EA(ACRES) = | 180 | 0.8 | PEAK | | | | 434.86 |
| | , | | | | 1 2011 1 | MIL (CI | <i>5</i> , | |
| | ***** | ****** | ****** | ***** | ***** | ***** | ***** | ****** |
| FLOW PROC | *********** CESS FROM N | **********ODE 13 | ****** 31.00 TO | ****** | 133 | ****** .00 IS | ************************************** | 1 |
| FLOW PROC >>>>COME >>>>>USIN | CESS FROM N PUTE PIPE-F | ********* ODE 13 LOW TRAVE | ******* 31.00 TO EL TIME [PESIZE | NODE THRU SU | 133 JBAREA | ****** .00 IS <<<<< | ************************************** | 1 |
| FLOW PROC | CESS FROM N PUTE PIPE-F | ********* ODE 13 LOW TRAVE | ******* 31.00 TO EL TIME IPESIZE | NODE THRU SU | 133 JBAREA | ****** .00 IS <<<<< EMENT)< | ************************************** | 1 |
| FLOW PROC | CESS FROM N PUTE PIPE-F IG USER-SPE DATA: UPS GTH(FEET) = | ******** ODE 13 LOW TRAVE CIFIED P1 TREAM(FEE 503.15 | ******** 31.00 TO EL TIME IPESIZE ET) = 1 5 MANN | ****** NODE THRU SU (EXIST: | 133 JBAREA ING ELI | ****** .00 IS <<<< EMENT)< | ************************************** | 1 |
| FLOW PROC >>>>COME >>>>USIN ==================================== | CESS FROM N PUTE PIPE-F NG USER-SPE TO DATA: UPS STH (FEET) = JLL-FLOWING VELOCITY(| ********* ODE 13 LOW TRAVE CIFIED PI TREAM (FEE 503.15 PIPELINE FEET/SEC. | ********* 31.00 TO EL TIME IPESIZE ET) = 1 5 MANN E | NODE THRU SU (EXIST: 103.76 ING'S N | JBAREA- ING ELI DOWNS V = 0 | ******* .00 IS <<<< EMENT)< EMENT)< STREAM | ********* CODE = 4 | 1 |
| FLOW PROC >>>>COME >>>>USIN ELEVATION FLOW LENG ASSUME FLOW PIPE-FLOW PIPE FLOW | CESS FROM N UTE PIPE-F NG USER-SPE I DATA: UPS STH(FEET) = LLL-FLOWING W VELOCITY(V VELOCITY | ********* ODE 13 LOW TRAVE CIFIED PI TREAM (FEE 503.15 PIPELINE FEET/SEC = (TOTAL | 31.00 TO EL TIME EPESIZE ET) = 1 5 MANN E .) = 18 FLOW)/(| NODE THRU SU (EXIST: 103.76 ING'S NOBEL COMPLETE COMPLICATE COMPLETE COMPLICATE COMPLETE COMP | JBAREA- ING ELI DOWNS V = 0 | ****** .00 IS <<<< EMENT)< EMENT)< .013 | ************************************** | 1 |
| FLOW PROC | CESS FROM N PUTE PIPE-F IG USER-SPE I DATA: UPS ITH (FEET) = JLL-FLOWING I VELOCITY VELOCITY E DIAMETER | TREAM (FEE 503.15 PIPELINE FEET/SEC. = (TOTAL (INCH) = | 31.00 TO EL TIME [PESIZE ==================================== | NODE THRU SU (EXIST: 103.76 ING'S N .30 PIPE CE | JBAREA- ING ELI DOWNS N = 0 | ****** .00 IS <<<< EMENT)< EMENT) .013 | ********* CODE = 4 FEET) = : AREA) = 1 | 1 1101.65 |
| FLOW PROC | CESS FROM N PUTE PIPE-F IG USER-SPE I DATA: UPS ITH (FEET) = JLL-FLOWING I VELOCITY VELOCITY E DIAMETER | TREAM (FEE 503.15 PIPELINE FEET/SEC. = (TOTAL (INCH) = | 31.00 TO EL TIME [PESIZE ==================================== | NODE THRU SU (EXIST: 103.76 ING'S N .30 PIPE CE | JBAREA- ING ELI DOWNS N = 0 | ****** .00 IS <<<< EMENT)< EMENT) .013 | ********* CODE = 4 FEET) = : AREA) = 1 | 1 1101.65 |
| FLOW PROC | CESS FROM N PUTE PIPE-F NG USER-SPE STH (FEET) = LLL-FLOWING VELOCITY (VELOC | TREAM (FEE 503.15 PIPELINE FEET/SEC. = (TOTAL (INCH) = | 31.00 TO EL TIME [PESIZE ==================================== | NODE THRU SU (EXIST: 103.76 ING'S N .30 PIPE CE | JBAREA- ING ELI DOWNS N = 0 | ****** .00 IS <<<< EMENT)< EMENT) .013 | ********* CODE = 4 FEET) = : AREA) = 1 | 1 1101.65 |
| FLOW PROC >>>>COME >>>>USIN ELEVATION FLOW LENG ASSUME PI PIPE-FLOW GIVEN PIF PIPE-FLOW PIPE TRAY LONGEST E | CESS FROM N | ******** ODE 13 LOW TRAVE CIFIED P1 TREAM(FEF 503.15 PIPELINE FEET/SEC. = (TOTAL (INCH) = 434.86 N.) = (OM NODE | ###################################### | NODE THRU SU (EXIST: 103.76 ING'S 1 .30 PIPE CH NUMN TC (MIN O TO NO | JBAREA- ING ELL DOWNN N = 0 ROSS SH BER OF | ********* .00 IS .00 IS .00 IS .013 STREAM .013 ECTION PIPES 20.15 133.00 | ********** CODE = 4 FEET) = AREA) = 1 = 616. | 1 1101.65 1.99 FEET. |
| FLOW PROC >>>>COME >>>>USIN ELEVATION FLOW LENG ASSUME PT PIPE-FLOW PIPE FLOW GIVEN PIF PIPE-FLOW PIPE TRAIL LONGEST I | CESS FROM NO- LUTE PIPE-F IG USER-SPE IN DATA: UPS STH(FEET) = ILL-FLOWING IV VELOCITY IV | ********** ODE 13 LOW TRAVE CIFIED P1 TREAM (FEF 503.15 FIPELINE FEET/SEC. = (TOTAL (INCH) = 434.86 N.) = (0 M NODE *********************************** | ###################################### | NODE THRU SU (EXIST: 103.76 ING'S 1 .30 PIPE CE NUMI TC (MIN. 0 TO NO ******** NODE | JBAREA- ING ELL DOWNS N = 0 ROSS SI BER OF .) = DDE | ******** .00 IS | ********* CODE = 4 | 1 1101.65 1.99 FEET. |

3P00ROV

| 3POOROV >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< |
|--|
| MAINLINE TC(MIN.) = 20.15 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.784 SUBAREA LOSS RATE DATA(AMC III): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN COMMERCIAL C 1.00 0.25 0.100 86 COMMERCIAL D 0.87 0.20 0.100 91 |
| SUBAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.23 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100 SUBAREA AREA(ACRES) = 1.87 SUBAREA RADEA(FORS) = 1.87 SUBAREA RADEA(FORS) = 4.65 EFFECTIVE AREA(ACRES) = 176.99 AREA-AVERAGED FP(INCH/HR) = 0.01 AREA-AVERAGED AP = 0.29 TOTAL AREA(ACRES) = 182.7 PEAK FLOW RATE (CFS) = 434.86 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE |
| FLOW PROCESS FROM NODE 133.00 TO NODE 135.00 IS CODE = 41 |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< |
| ELEVATION DATA: UPSTREAM(FEET) = 1101.65 DOWNSTREAM(FEET) = 1101.33 FLOW LENGTH(FEET) = 60.37 MANNING'S N = 0.013 ASSUME FULL-FLOWING PIPELINE PIPE-FLOW VELOCITY (FEET/SEC.) = 18.30 PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA) GIVEN PIPE DIAMETER(INCH) = 66.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 434.86 PIPE TRAVEL TIME (MIN.) = 0.05 Tc (MIN.) = 20.20 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 135.00 = 6222.36 FEET. |
| ************************************** |
| >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< |
| MAINLINE TC(MIN.) = 20.20 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.780 SUBAREA LOSS RATE DATA(AMC III): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN COMMERCIAL C 0.36 0.25 0.100 86 COMMERCIAL D 0.44 0.20 0.100 91 SUBAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.22 SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.100 SUBAREA AREA(ACRES) = 0.80 SUBAREA RUNOFF(CFS) = 1.99 EFFECTIVE AREA(ACRES) = 1777.79 AREA-AVERAGED FM(INCH/HR) = 0.06 AREA-AVERAGED FP(INCH/HR) = 0.21 AREA-AVERAGED AP = 0.29 TOTAL AREA(ACRES) = 183.5 PEAK FLOW RATE(CFS) = 434.98 |
| FLOW PROCESS FROM NODE 135.00 TO NODE 137.00 IS CODE = 41 |
| >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< |
| ELEVATION DATA: UPSTREAM(FEET) = 1101.33 DOWNSTREAM(FEET) = 1098.66 FLOW LENGTH(FEET) = 408.71 MANNING'S N = 0.013 ASSUME FULL-FLOWING PIPELINE PIPE-FLOW VELOCITY (FEET/SEC.) = 18.31 PIPE FLOW VELOCITY = (TOTAL FLOW) / (PIPE CROSS SECTION AREA) GIVEN PIPE DIAMETER (INCH) = 66.00 NUMBER OF PIPES = 1 PIPE-FLOW(CFS) = 434.98 PIPE TRAVEL TIME (MIN.) = 0.37 Tc(MIN.) = 20.57 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 137.00 = 6631.07 FEET. |
| FLOW PROCESS FROM NODE 137.00 TO NODE 137.00 IS CODE = 81 |
| >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< |
| MAINLINE Tc(MIN.) = 20.57 |

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* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.751 SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA GROUP (ACRES) (INCH/HR) (DECIMAL) CN
C 4.06 0.25 0.100 86
D 1.08 0.20 0.100 91 LAND USE COMMERCIAL COMMERCIAL SUBARRA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.24
SUBARRA AVERAGE PERVIOUS ARRA FRACTION, Ap = 0.100
SUBARRA ARRA(ACRES) = 5.14
SUBARRA ARRA(ACRES) = 182.93
ARRA-AVERAGED Fm(INCH/HR) = 0.21
ARRA-AVERAGED Fm(INCH/HR) = 0.21
ARRA-AVERAGED Ap = 0.28 TOTAL AREA (ACRES) = 188.6 PEAK FLOW RATE (CFS) = ************************* FLOW PROCESS FROM NODE 137.00 TO NODE 141.00 IS CODE = 41 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <<<<< ELEVATION DATA: UPSTREAM(FEET) = 1098.66 DOWNSTREAM(FEET) = 1093.99 FLOW LENGTH(FEET) = 318.57 MANNING'S N = 0.013 ASSUME FULL-FLOWING PIPELIME PIPE-FLOW VELOCITY (FEET/SEC.) = 18.64
PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA) GIVEN PIPE DIAMETER (INCH) = 66.00 NUMBER OF PIPES = PIPE-FLOW(CFS) = 442.97 PIPE TRAVEL TIME(MIN.) = 0.28 Tc(MIN.) = 20.86 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 141.00 = 6949.64 FEET. *************************** FLOW PROCESS FROM NODE 141.00 TO NODE 141.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< MAINLINE Tc(MIN.) = 20.86 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.729 SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN COMMERCIAL C 5.78 0.25 0.100 86 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25 SUBARRA AVERAGE ERVIOUS AREA FRACTION, Ap = 0.100
SUBARRA AREA (ACRES) = 5.78
SUBARRA AREA (ACRES) = 188.71
AREA-AVERAGED F(INCH/HR) = 0.21
AREA-AVERAGED AP = 0.28
TOTAL AREA (ACRES) = 194.4
PEAR FLOW RATE (CFS) = 453.48 ******************** FLOW PROCESS FROM NODE 141.00 TO NODE 141.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< ____ MAINLINE Tc(MIN.) = 20.86 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.729 SUBAREA LOSS RATE DATA(AMC III): DEVELOPMENT TYPE/ SCS SOIL AREA Fp GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL RESIDENTIAL "8-10 DWELLINGS/ACRE" C 0.87 0.25 0.400 86 COMMERCIAL C 0.68 0.25 0.100 86 SUBARRA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.25 SUBARRA AVERAGE PERVIOUS ARRA FRACTION, Ap = 0.268 SUBARRA ARRA (ACRES) = 1.55 SUBARRA RARBA (ACRES) = 1.55 SUBARRA RARBA (ACRES) = 1.50 0.26 ARRA-AVERAGED Fm(INCH/HR) = 0.06 ARRA-AVERAGED Ap = 0.28 TOTAL ARRA (ACRES) = 196.0 PEAK FLOW RATE (CFS) = 457.20 ******************** FLOW PROCESS FROM NODE 141.00 TO NODE 145.00 IS CODE = 41 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <>>>

ELEVATION DATA: UPSTREAM(FEET) = 1093.99 DOWNSTREAM(FEET) = 1076.30

3P0

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FLOW LENGTH(FEET) = 504.72 MANNING'S N = 0.013
DEPTH OF FLOW IN 60.0 INCH PIPE IS 48.6 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 26.86
 GIVEN PIPE DIAMETER (INCH) = 60.00 NUMBER OF PIPES = 1
PIPE-FLOW (CPS) = 457.20
PIPE TRAVEL TIME (MIN.) = 0.31 Tc (MIN.) = 21.17
 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 145.00 = 7454.36 FEET.
******************************
 FLOW PROCESS FROM NODE 145.00 TO NODE 145.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.706
 SUBAREA LOSS RATE DATA (AMC III):
  DEVELOPMENT TYPE/
                        SCS SOIL AREA
      LAND USE
                           GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                           C
                                     0.71 0.25 0.100 86
 COMMERCIAL
                                        0.32
                                                   0.20
                                                            0.100
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.23
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA(ACRES) = 1.03 SUBAREA RUNOFF(CFS) = 2.49 EFFECTIVE AREA(ACRES) = 191.29 AREA-AVERAGED Fm(INCH/HR) = 0.06 AREA-AVERAGED AP = 0.28
 TOTAL AREA (ACRES) = 197.0
                                       PEAK FLOW RATE(CFS) =
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
*******************
 FLOW PROCESS FROM NODE 145.00 TO NODE 145.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 MAINIJINE\ Tc(MIN.) = 21.17
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.706
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                          GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 CONDOMINIUMS
                         C
                                        1.02
                                              0.25
                                                            0.350
 CONDOMENTUMS
                                        4.41
                                                   0.20
                                                            0.350
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21
 SUBARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.350
SUBARRA AREA (ACRES) = 5.43
SUBARRA RAEA (ACRES) = 5.43
SUBARRA ROMOFF (CFS) = 12.87
EFFECTIUVE AREA (ACRES) = 196.72
AREA-AVERAGED FM(INCH/HR) = 0.21
AREA-AVERAGED Ap = 0.28
 TOTAL AREA (ACRES) =
                           202.4
                                      PEAK FLOW RATE(CFS) =
*******************
 FLOW PROCESS FROM NODE 145.00 TO NODE 149.00 IS CODE = 41
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <>>>>
 ELEVATION DATA: UPSTREAM(FEET) = 1076.30 DOWNSTREAM(FEET) = 1053.58
 FLOW LENGTH (FEET) = 289.89 MANNING'S N = 0.013
DEPTH OF FLOW IN 60.0 INCH PIPE IS 36.2 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 37.85
 GIVEN PIPE DIAMETER (INCH) = 60.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 468.57
PIPE TRAVEL TIME (MIN.) = 0.13 Tc (MIN.) = 21.30
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 149.00 = 7744.25 FEET.
FLOW PROCESS FROM NODE 149.00 TO NODE 149.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
            ......
 MAINLINE Tc (MIN.) = 21.30
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.697
SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/
                           SCS SOIL
                                     (ACRES) (INCH/HR) (DECIMAL) CN
4.75 0.25 0.350 86
      LAND USE
                            GROUP
 CONDOMINIUMS
 CONDOMINIUMS
                                        1.68
                                                   0.20
                                                            0.350
                                                                      91
                                                   Page 17
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SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.24
  SUBARRA AVERAGE FERVIOUS ARBA FRACTION, Ap = 0.350
SUBARRA ARBA (ACRES) = 6.43
SUBARRA ARBA (ACRES) = 203.15
ARBA-AVERAGED FM (INCH/HR) = 0.06
ARBA-AVERAGED FM (INCH/HR) = 0.21
ARBA-AVERAGED Ap = 0.28
   TOTAL AREA (ACRES) =
                                              208.9
                                                                 PEAK FLOW RATE (CFS) =
********************
  FLOW PROCESS FROM NODE 149.00 TO NODE 149.00 IS CODE = 81
   >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
  MAINLINE Tc(MIN.) = 21.30
     100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.697
  SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA
           LAND USE
                                                GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                              0.40
   COMMERCIAL.
                                                 C
                                                                                0.25 0.100
0.25 0.850
                                                                                                                        86
   PUBLIC PARK
                                                                    0.03
                                                                                       0.20
                                                                                                        0.850
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.564
  SUBAREA AREA(ACRES) = 1.05
SUBAREA RUNOFF(CFS) = 2.42
EFFECTIVE AREA(ACRES) = 204.20
AREA-AVERAGED Fm(INCH/HR) = 0.02
AREA-AVERAGED AP = 0.28
   TOTAL AREA (ACRES) =
                                             209.9
                                                                   PEAK FLOW RATE(CFS) =
***********************
 FLOW PROCESS FROM NODE 149.00 TO NODE 151.00 IS CODE = 41
  >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
  ELEVATION DATA: UPSTREAM(FEET) = 1053.58 DOWNSTREAM(FEET) = 1023.54 FLOW LENGTH(FEET) = 305.05 MANNING'S N = 0.013
   DEPTH OF FLOW IN 60.0 INCH PIPE IS 34.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 41.66
GIVEN PIPE DIAMETER(INCH) = 60.00 NUMBER OF PIPES = 1
   | SIVER | STATE | STAT
*************************
  FLOW PROCESS FROM NODE 151.00 TO NODE 151.00 IS CODE = 81
  >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
  MAINLINE To (MIN.) = 21.42
     100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.688
  SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA
           LAND USE
                                               GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   COMMERCIAL
                                               C 0.41
D 1.11
                                                                               0.25 0.100
0.20 0.100
   COMMERCIAL
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21
  *****************************
  FLOW PROCESS FROM NODE 151.00 TO NODE 153.00 IS CODE = 41
   >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
   >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <>>>
 ELEVATION DATA: UPSTREAM(FEET) = 1023.54 DOWNSTREAM(FEET) = 1007.62
  FLOW LENGTH (FEET) = 210.38 MANNING'S N = 0.013 DEPTH OF FLOW IN 60.0 INCH PIPE IS 37.5 INCHES
   PIPE-FLOW VELOCITY (FEET/SEC.) = 37.63
  GIVEN PIPE DIAMETER (INCH) = 60.00
PIPE-FLOW (CFS) = 486.50
                                                                       NUMBER OF PIPES = 1
```

PIPE TRAVEL TIME (MIN.) = 0.09 Tc (MIN.) = 21.52

3P00ROV LONGEST FLOWPATH FROM NODE 100.00 TO NODE 153.00 = 8259.68 FEET.

| LONGEST FLOWPATH FROM N | ODE 10 | 0.00 TO N | IODE 153. | 00 = 8 | 259.68 FEET. |
|---|------------------------------|--|--|-------------------------|-------------------|
| ****** | ****** | ****** | ******* | ****** | ***** |
| FLOW PROCESS FROM NODE | 153.00 | TO NODE | 153.00 I | S CODE = | |
| >>>>ADDITION OF SUBARE | A TO MAIN | LINE PEAR | FLOW<<<< | | |
| MAINLINE TO (MIN.) = 2 * 100 YEAR RAINFALL INT SUBAREA LOSS RATE DATA (. DEVELOPMENT TYPE/ LAND USE COMMERCIAL PUBLIC PARK SUBAREA AVERAGE PERVIOU | 1.52 | ICH/HD) = | 2 681 | | |
| COMMERCIAL | D | 0.85 | 0.20 | 0.100 | 91 |
| PUBLIC PARK SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU SUBAREA AREA(ACRES) = EFFECTIVE AREA(ACRES) = AREA-AVERAGED FP(INCH/H. TOTAL AREA(ACRES) = | 2.86 208.5 R) = 0.2 | SUBARE SUBARE SUBAREA- SUBAREA- | A RUNOFF(CF AVERAGED Fm VERAGED Ap | (INCH/HR) = 0.29 | |
| ******* | | | | | ***** |
| FLOW PROCESS FROM NODE | 153.00 | TO NODE | 153.00 I | S CODE = | |
| >>>>ADDITION OF SUBARE | | | | | |
| MAINLINE Tc(MIN.) = 2 * 100 YEAR RAINFALL INT | 1.52 ENSITY(IN | ICH/HR) = | 2.681 | | |
| DEVELOPMENT TYPE/ LAND USE COMMERCIAL SUBAREA AVERAGE PERVIOU | GROUP D S LOSS R | AREA (ACRES) 0.27 ATE, Fp(IN | Fp (INCH/HR) 0.20 ICH/HR) = 0 | AP (DECIMAL 0.100 | SCS) CN 91 |
| SUBAREA AVERAGE PERVIOU SUBAREA AREA (ACRES) = EFFECTIVE AREA (ACRES) = AREA-AVERAGED FP(INCH/H TOTAL AREA (ACRES) = | | | | | |
| ************************************** | 153.00 | ************************************** | ********** 153.00 I | ***** | ***** |
| >>>>ADDITION OF SUBARE | A TO MAIN | LINE PEAR | FLOW< | | |
| MAINLINE Tc(MIN.) = 2 * 100 YEAR RAINFALL INT | 1.52 | | | | |
| SUBAREA LOSS RATE DATA (| AMC TITI | | | | |
| DEVELOPMENT TYPE/ LAND USE RESIDENTIAL | SCS SOII GROUP | (ACRES) | Fp (INCH/HR) | Ap (DECIMAL | SCS) CN |
| "5-7 DWELLINGS/ACRE" | С | 5.30 | 0.25 | 0.500 | 86 |
| RESIDENTIAL "5-7 DWELLINGS/ACRE" | D | 0.58 | 0.20 | 0.500 | 91 |
| RESIDENTIAL "8-10 DWELLINGS/ACRE" | | | 0.25 | | |
| RESIDENTIAL "8-10 DWELLINGS/ACRE" | D | 1.01 | 0.20 | 0.400 | 91 |
| APARTMENTS | C | 2.16 | 0.25 | 0.200 | 86 |
| RESIDENTIAL "8-10 DWELLINGS/ACRE" APARTMENTS COMMERCIAL SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU | C S LOSS RA | 2.28 ATE, Fp(IN | 0.25 ICH/HR) = 0 | 0.100 | 86 |
| SUBAREA AVERAGE PERVIOU SUBAREA AREA(ACRES) = | 21.08 | SUBARE | A RUNOFF (CF | (S) = 49 | .12 |
| SUBAREA AREA (ACRES) = EFFECTIVE AREA (ACRES) = AREA-AVERAGED FP (INCH/H. TOTAL AREA (ACRES) = | R) = 0.2 235.6 | 2 AREA-A PEAR | VERAGED Ap | = 0.29 CFS) = | 541.61 |
| ************************************** | 153.00 | TO NODE | 153.00 I | | |
| >>>>ADDITION OF SUBARE | | | | | |
| MAINLINE Tc(MIN.) = 2 * 100 YEAR RAINFALL INT | ======= 1.52 ENSITY(IN | ICH/HR) = | | ====== | |
| SUBAREA LOSS RATE DATA (| AMC III): | | | | |
| | | | Page 1 | 9 | |

| DEVELOPMENT TYPE/ LAND USE COMMERCIAL PUBLIC PARK PUBLIC PARK SUBAREA AVERAGE PERVIOUS | SCS SOIL AREA Fr | PUUROV An SCS |
|---|--|---|
| LAND USE | GROUP (ACRES) (INC | /HR) (DECIMAL) CN |
| COMMERCIAL | D 5.28 0 | .20 0.100 91 |
| PUBLIC PARK | C 4.30 C | .25 0.850 86 |
| PUBLIC PARK | D 0.67 (| .20 0.850 91 |
| SUBAREA AVERAGE PERVIOUS SUBAREA AVERAGE PERVIOUS | LOSS RATE, FP(INCH/HR) | = 0.24 |
| SUBAREA AVERAGE PERVIOUS SUBAREA AREA (ACRES) = | 10 25 SUBAREA RUNG | FF(CFS) = 23 71 |
| SUBAREA AREA(ACRES) = EFFECTIVE AREA(ACRES) = | 240.18 AREA-AVERAG | ED Fm(INCH/HR) = 0.07 |
| AREA-AVERAGED Fp (INCH/H | R) = 0.22 AREA-AVERAGE | D A p = 0.30 |
| TOTAL AREA (ACRES) = | 245.9 PEAK FLOW | RATE(CFS) = 565.32 |
| | | ******* |
| FLOW PROCESS FROM NODE | | |
| | | |
| >>>>COMPUTE PIPE-FLOW ? | RAVEL TIME THRU SUBAREA | .<<<< |
| >>>>USING USER-SPECIFIE | | |
| | | (amprant (prom) |
| ELEVATION DATA: UPSTREAM | I(FEET) = IUU/.62 DOWN | O12 |
| FLOW LENGTH (FEET) = 44 ASSUME FULL-FLOWING PIPE | FITTE MANNING'S N = C | .013 |
| PIPE-FLOW VELOCITY (FEET, | (SEC.) = 28.79 | |
| PIPE FLOW VELOCITY = (TO | | ECTION AREA) |
| GIVEN PIPE DIAMETER (INC | H) = 60.00 NUMBER OF | PIPES = 1 |
| PIPE-FLOW(CFS) = 565 | 5.32 | |
| PIPE TRAVEL TIME (MIN.) = | = 0.26 Tc(MIN.) = | 21.77 |
| LONGEST FLOWPATH FROM NO | DDE 100.00 TO NODE | 154.00 = 8706.30 FEET. |
| ******* | ******* | ******** |
| FLOW PROCESS FROM NODE | 154.00 TO NODE 154 | .00 IS CODE = 15.1 |
| | | |
| >>>>DEFINE MEMORY BANK | | |
| DEAK DIOMDAME MADIE DILI | NAME - SPOODGI DNA | |
| MEMORY BANK # 1 DEFINE | AS FOLLOWS: | |
| STREAM Q Tc | Fp(Fm) Ap | Ae HEADWATER |
| NUMBER (CFS) (MIN.) | (INCH/HR) (AC | RES) NODE |
| 1 9.34 7.3 | 33 0.20(0.02) 0.10 | 2.0 40.00 |
| 2 9.44 /. | 22 0 20 (0 .02) 0 .10 | 2.1 30.00 |
| FEAR FLOWRRIE TABLE FILE MEMORY BANK # 1 DEFINE STREAM Q TC NUMBER (CFS) (MIN.) 1 9.34 7.1 2 9.44 7.3 3 9.38 8.1 4 9.38 8.1 TOTAL AREA (ARES) = | 23 0.20(0.02) 0.10 | 2.2 15.00 |
| TOTAL AREA (ACRES) = | 2.2 | |
| | | |
| FLOW PROCESS FROM NODE | | ***************** |
| FLOW PROCESS FROM NODE | | .00 IS CODE = II |
| >>>>CONFLUENCE MEMORY I | BANK # 1 WITH THE MAIN-S | TREAM MEMORY< |
| | | |
| | | |
| ** MAIN STREAM CONFLUENC | CE DATA ** | An an HEADWATED |
| NUMBER (CES) (MIN |) (INCH/HR) (INCH/HR) | (ACRES) NODE |
| 1 528.24 10.0 | 0 4.159 0.23(0.07) | 0.30 141.1 300.00 |
| 2 565.32 21. | 77 2.663 0.22(0.07) | 0.30 240.2 200.00 |
| 3 556 50 23 3 | | |
| | 26 2.564 0.22(0.07) | 0.30 245.9 100.00 |
| LONGEST FLOWPATH FROM NO | DDE 100.00 TO NODE | 0.30 245.9 100.00 154.00 = 8706.30 FEET. |
| LONGEST FLOWPATH FROM NO | 26 2.564 0.22(0.07) DE 100.00 TO NODE | Ap Ae HEADWATER (ACRES) NODE 0.30 141.1 300.00 0.30 240.2 200.00 0.30 245.9 100.00 154.00 = 8706.30 FEET. |
| LONGEST FLOWPATH FROM NO ** MEMORY BANK # 1 CONF | DDE 100.00 TO NODE CLUENCE DATA ** | 0.30 245.9 100.00 154.00 = 8706.30 FEET. |
| LONGEST FLOWPATH FROM NO ** MEMORY BANK # 1 CONE STREAM Q TO NUMBER (CFS) (MIN | DDE 100.00 TO NODE FLUENCE DATA ** Intensity Fp(Fm) () (INCH/HR) (INCH/HR) | 0.30 245.9 100.00 154.00 = 8706.30 FEET. Ap Ae HEADWATER (ACRES) NODE |
| LONGEST FLOWPATH FROM NO ** MEMORY BANK # 1 CONI STREAM Q TC NUMBER (CFS) (MIN. 1 9.34 7.: | DDE 100.00 TO NODE FLUENCE DATA ** Intensity Fp(Fm) (INCH/HR) (INCH/HR) 4.970 0.20(0.02) | 0.30 245.9 100.00 154.00 = 8706.30 FEET. Ap Ae HEADWATER (ACRES) NODE 0.10 2.0 40.00 |
| LONGEST FLOWPATH FROM NO ** MEMORY BANK # 1 CONI STREAM Q TC NUMBER (CFS) (MIN 1 9.34 7.: 2 9.44 7.: | 2.564 0.22(0.07) DDE 100.00 TO NODE PLUENCE DATA ** Intensity Fp(Fm) .) (INCH/HR) (INCH/HR) 4.970 0.20(0.02) 0 4.832 0.20(0.02) | 0.30 245.9 100.00 154.00 = 8706.30 FEET. Ap Ae HEADWATER (ACRES) NODE 0.10 2.0 40.00 0.10 2.1 30.00 |
| LONGEST FLOWPATH FROM NO ** MEMORY BANK # 1 CONI STREAM Q TC NUMBER (CFS) (MIN 1 9.34 7.: 2 9.44 7.: 3 9.38 8.: | Z.156 0.22(0.07) DDE 100.00 TO NODE **LUENCE DATA ** Intensity Fp(Fm) 1, (INCH/HR) (INCH/HR) 33 4.970 0.20(0.02) 4.832 0.20(0.02) 4.832 0.20(0.02) 4.653 0.20(0.02) | 0.30 245.9 100.00 154.00 = 8706.30 FEET. Ap Ae HEADWATER (ACRES) NODE 0.10 2.0 40.00 0.10 2.1 30.00 0.10 2.2 5.00 |
| LONGEST FLOWPATH FROM NO ** MEMORY BANK # 1 CONIN STREAM OF TO NUMBER (CFS) (MIN 1 9.34 7. 2 9.44 7. 3 9.38 8.2 4 9.38 8.2 | Z.554 0.22 (0.07) DDE 100.00 TO NODE PLUENCE DATA ** Intensity Fp(Fm) 13 4.970 0.20(0.02) 10 4.832 0.20(0.02) 22 4.653 0.20(0.02) 23 4.650 0.20(0.02) | 0.30 245.9 100.00 154.00 = 8706.30 FEET. Ap Ae HEADWATER (ACRES) NODE 0.10 2.0 40.00 0.10 2.1 30.00 0.10 2.2 5.00 0.10 2.2 15.00 |
| LONGEST FLOWPATH FROM NO ** MEMORY BANK # 1 CONI STREAM Q TO NUMBER (CFS) (MIN 1 9.34 7. 2 9.44 7. 3 9.38 8. 4 9.38 8. LONGEST FLOWPATH FROM NO | Z.554 0.22(0.07) DDE 100.00 TO NODE PLUENCE DATA ** Intensity Fp(Fm) 1, (INCH/HR) (INCH/HR) 33 4.970 0.20(0.02) 10 4.832 0.20(0.02) 12 4.653 0.20(0.02) 23 4.650 0.20(0.02) DDE 15.00 TO NODE | 0.30 245.9 100.00 154.00 = 8706.30 FEET. Ap Ae HEADWATER (ACRES) NODE 0.10 2.1 30.00 0.10 2.2 5.00 0.10 2.2 15.00 154.00 = 585.84 FEET. |
| ** MEMORY BANK # 1 CONI STREAM O TO NUMBER (CFS) (MIN. 1 9.34 7. 2 9.44 7. 3 9.38 8.2 4 9.38 8.2 LONGEST FLOWPATH FROM NO. | TLUENCE DATA ** Intensity Fp(Fm) .) (INCH/HR) (INCH/HR) .33 | Ap Ae HEADWATER 0.10 2.0 40.00 0.10 2.1 30.00 0.10 2.2 5.00 0.10 2.2 5.00 154.00 = 585.84 FEET. |
| ** MEMORY BANK # 1 CONI STREAM O TO NUMBER (CFS) (MIN. 1 9.34 7. 2 9.44 7. 3 9.38 8.2 4 9.38 8.2 LONGEST FLOWPATH FROM NO. | TLUENCE DATA ** Intensity Fp(Fm) .) (INCH/HR) (INCH/HR) .33 | Ap Ae HEADWATER 0.10 2.0 40.00 0.10 2.1 30.00 0.10 2.2 5.00 0.10 2.2 5.00 154.00 = 585.84 FEET. |
| ** MEMORY BANK # 1 CONI STREAM O TO NUMBER (CFS) (MIN. 1 9.34 7. 2 9.44 7. 3 9.38 8.2 4 9.38 8.2 LONGEST FLOWPATH FROM NO. | TLUENCE DATA ** Intensity Fp(Fm) .) (INCH/HR) (INCH/HR) .33 | Ap Ae HEADWATER 0.10 2.0 40.00 0.10 2.1 30.00 0.10 2.2 5.00 0.10 2.2 5.00 154.00 = 585.84 FEET. |
| ** MEMORY BANK # 1 CONI STREAM O TO NUMBER (CFS) (MIN. 1 9.34 7. 2 9.44 7. 3 9.38 8.2 4 9.38 8.2 LONGEST FLOWPATH FROM NO. | TLUENCE DATA ** Intensity Fp(Fm) .) (INCH/HR) (INCH/HR) .33 | Ap Ae HEADWATER 0.10 2.0 40.00 0.10 2.1 30.00 0.10 2.2 5.00 0.10 2.2 5.00 154.00 = 585.84 FEET. |
| ** MEMORY BANK # 1 CONI STREAM O TO NUMBER (CFS) (MIN. 1 9.34 7. 2 9.44 7. 3 9.38 8.2 4 9.38 8.2 LONGEST FLOWPATH FROM NO. | TLUENCE DATA ** Intensity Fp(Fm) .) (INCH/HR) (INCH/HR) .33 | Ap Ae HEADWATER 0.10 2.0 40.00 0.10 2.1 30.00 0.10 2.2 5.00 0.10 2.2 5.00 154.00 = 585.84 FEET. |
| ** MEMORY BANK # 1 CONI STREAM O TO NUMBER (CFS) (MIN. 1 9.34 7. 2 9.44 7. 3 9.38 8.2 4 9.38 8.2 LONGEST FLOWPATH FROM NO. | TLUENCE DATA ** Intensity Fp(Fm) .) (INCH/HR) (INCH/HR) .33 | Ap Ae HEADWATER 0.10 2.0 40.00 0.10 2.1 30.00 0.10 2.2 5.00 0.10 2.2 5.00 154.00 = 585.84 FEET. |
| ** MEMORY BANK # 1 CONI STREAM O TO NUMBER (CFS) (MIN. 1 9.34 7. 2 9.44 7. 3 9.38 8.2 4 9.38 8.2 LONGEST FLOWPATH FROM NO. | TLUENCE DATA ** Intensity Fp(Fm) .) (INCH/HR) (INCH/HR) .33 | Ap Ae HEADWATER 0.10 2.0 40.00 0.10 2.1 30.00 0.10 2.2 5.00 0.10 2.2 5.00 154.00 = 585.84 FEET. |
| ** MEMORY BANK # 1 CONI STREAM O TO NUMBER (CFS) (MIN. 1 9.34 7. 2 9.44 7. 3 9.38 8.2 4 9.38 8.2 LONGEST FLOWPATH FROM NO. | TILENCE DATA ** Intensity Fp(Fm)) (INCH/HR) (INCH/HR) (10 4.870 0.20 (0.02) (12 4.653 0.20 (0.02) (13 4.650 0.20 (0.02) DE 15.00 TO NODE ** Intensity Fp(Fm)) (INCH/HR) (INCH/HR) (13 4.650 0.23 (0.07) (14 8.32 0.23 (0.07) (12 4.653 0.23 (0.07) (13 4.970 0.23 (0.07) (14 8.32 0.23 (0.07) (15 0.07) (16 0.07) (17 0.07) (17 0.07) (18 0.0 | 0.30 245.9 100.00 154.00 = 8706.30 FEET. Ap Ae HEADWATER (ACRES) NODE 0.10 2.1 30.00 0.10 2.2 5.00 0.10 2.2 15.00 154.00 = 585.84 FEET. Ap Ae HEADWATER (ACRES) NODE 0.29 110.7 30.00 0.29 118.2 5.00 0.29 118.3 15.00 0.29 143.3 300.00 age 20 |

570.68 21.77 2.663 0.22(0.07) 0.30 561.65 23.26 2.564 0.22(0.07) 0.30 242.3 200.00 100.00 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS: COMPOSED CONFIDENCE SITURDINES ARE FOLLOWS: 21.774

EFFECTIVE AREA (ACRES) = 570.68 TC(MIN.) 21.774

EFFECTIVE AREA (ACRES) = 242.34 AREA-AVERAGED Fm (INCH/HR) = 0.07

AREA-AVERAGED Fp (INCH/HR) = 0.23 AREA-AVERAGED Ap = 0.29 TOTAL AREA (ACRES) = 248.1 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 154.00 = 8706.30 FEET. ************************** FLOW PROCESS FROM NODE 154.00 TO NODE 154.00 IS CODE = 12 >>>>CLEAR MEMORY BANK # 1 <<<<< ******************** FLOW PROCESS FROM NODE 154.00 TO NODE 155.00 IS CODE = 41 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <<<< _____ ELEVATION DATA: UPSTREAM(FEET) = 1006.00 DOWNSTREAM(FEET) = 1004.60 FLOW LENGTH (FEET) = 122.27 MANNING'S N = 0.013 ASSUME FULL-FLOWING PIPELINE PIPE-FLOW VELOCITY (FEET/SEC.) = 29.06 PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
GIVEN PIPE DIAMETER(INCH) = 60.00 NUMBER OF PIPES = 1 ************************ FLOW PROCESS FROM NODE 155.00 TO NODE 155.00 IS CODE = 15.1 >>>>DEFINE MEMORY BANK # 1 <<<<< PEAK FLOWRATE TABLE FILE NAME: 3P00RC3.DNA PEAR FLOWRATE TABLE FILE NAME: SPOURCS.DNA
MEMORY BARNK # 1 DEFINED AS FOLLOWS:
STREAM Q TC Fp(Fm) Ap
NUMBER (CFS) (MIN.) (INCH/HR)
1 10.41 5.80 0.20(0.02) 0.10
2 10.13 6.98 0.20(0.02) 0.10
3 9.91 7.59 0.20(0.02) 0.10
TOTAL AREA(ACRES) = 2.2 (ACRES) 2.0 2.2 NODE 95.00 2.2 70.00 ******************* FLOW PROCESS FROM NODE 155.00 TO NODE 155.00 IS CODE = 11 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY ** MAIN STREAM CONFLUENCE DATA ** Q Tc Intensity Fp(Fm) Ap (CFS) (MIN.) (INCH/HR) (INCH/HR) 473.12 7.41 4.937 0.23(0.07) 0.29 Ae HEADWATER (ACRES) NODE STREAM NUMBER 473.12 105.4 4.803 0.23(0.07) 0.29 4.627 0.23(0.07) 0.29 4.624 0.23(0.07) 0.29 482.84 110.7 30.00 496.05 8.30 118.2 5.00 118.3 8.31 536.62 10.08 4.141 0.23(0.07) 0.29 2.658 0.22(0.07) 0.30 143.3 300.00 570.68 21.84 242.3 200.00 561.65 23.33 2.560 0.22(0.07) 0.30 248.1 100.00 TO NODE 155.00 = 8828.57 FEET. LONGEST FLOWPATH FROM NODE ** MEMORY BANK # 1 CONFLUENCE DATA ** Q Tc Intensity Fp(Fm) Ap Ae HEADWATER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE STREAM NUMBER 5.681 0.20(0.02) 0.10 5.111 0.20(0.02) 0.10 10.41 5.80 10.13 6.98 9.91 7.59 2.0 95.00 2.2 80.00 4.871 0.20(0.02) 0.10 70.00 TO NODE 155.00 = LONGEST FLOWPATH FROM NODE 774.26 FEET.

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** PEAK FLOW RATE TABLE **

| | | | | | 31 | 00ROV | | |
|--------------------------------------|---|--|--|--|-------------|---|--------------------------------------|---|
| STREAM | Q | Tc | Intensity | Fp (Fn | n) | Ap | Ae | HEADWATER NODE 95.00 80.00 40.00 70.00 |
| NUMBER | (CFS) | (MIN.) | (INCH/HR) | (INCH/F | IR) | | (ACRES) | NODE |
| 1 | 437.30 | 5.80 | 5.681 | 0.23(| 0.06) | 0.29 | 84.5 | 95.00 80.00 40.00 |
| 2 | 471.43 | 6.98 | 5.111 | 0.23(| 0.07) | 0.29 | 101.4 | 80.00 |
| 4 | 483.10 | 7 59 | 4.937 | 0.23(| 0.07) | 0.29 | 1107.6 | 70.00 |
| 5 | 492.61 505.47 505.69 | 7.78 | 4.803 | 0.23(| 0.07) | 0.29 | 112.9 | 30.00 5.00 15.00 300.00 200.00 |
| c | 505.47 | 8.30 | 4.627 | 0.23(| 0.07) | 0.29 | 120.4 | 5.00 |
| 7 | 505.69 | 8.31 | 4.624 | 0.23(| 0.07) | 0.29 | 120.5 | 15.00 |
| 8 | 545.04 | 10.08 | 4.141 | 0.23(| 0.07) | 0.29 | 145.5 | 300.00 |
| 9 | 576.07 | 21.84 | 2.658 | 0.22(| 0.07) | 0.30 | 244.6 | 200.00 |
| 10 | 505.69 545.04 576.07 566.84 REA (ACRES) | 23.33 | 2.560 | 0.22(| 0.07) | 0.30 | 250.3 | 100.00 |
| TOTAL A | NEA (ACKES) | , – | 230.3 | | | | | |
| COMPUTED (| CONFLUENCE | E ESTIMA | TES ARE A | S FOLLOW | NS: | | | |
| COMPUTED (PEAK FLOW EFFECTIVE | RATE (CFS) |) = | 576.07 | Tc (MIN.) | = | 21.844 | 1 | |
| EFFECTIVE | AREA (ACRE | ES) = | 244.59 | AREA-AVE | ERAGEI | Fm(IN | NCH/HR) = | 0.07 |
| AREA-AVER | AGED Fp(IN | NCH/HR) | = 0.23 | AREA-AVE | ERAGEI | Ap = | 0.29 | |
| TOTAL AREA | | | | | _ | | | |
| LONGEST F | LOWPATH FF | ROM NODE | 100.0 | U TO NOI | DΕ | 155.00 |) = 88 | 28.57 FEET. |
| ******* | ******* | ***** | ****** | ****** | **** | ***** | ****** | ******* |
| FLOW PROCE | ESS FROM N | NODE | 155.00 TO | NODE | 158 | .00 IS | CODE = | 41 |
| | | | | | | | | |
| >>>>COMP1 | | | | | | | | |
| >>>>USIN | | | | | | | | |
| ELEVATION | | | | | | | | 1001 69 |
| FLOW LENG | | | | | | | (FEE1) - | 1001.09 |
| ASSUME FU | | | | 1110 0 11 | | .015 | | |
| PIPE-FLOW | | | | .34 | | | | |
| PIPE FLOW | VELOCITY | = (TOTA | L FLOW) / (| PIPE CRO | | | | |
| GIVEN PIP | | | | NUMBE | ER OF | PIPES | = 1 | |
| PIPE-FLOW | (CFS) = | 576.0 | 7 | m (1477) | | 01 06 | | |
| PIPE TRAVI | EL TIME (MI | IN.) = | 0.12 | TC (MIN.) | = | 21.96 | | 21 17 pppm |
| LUNGESI F. | LOWPAIN FF | ROM NODE | 100.0 | U IO NOL |)E | 158.00 |) = 90 | 31.17 FEET. |
| | | | | | | | | ******* |
| FLOW PROCE | ESS FROM N | | | | | | | |
| >>>>COMP1 | JTE PIPE-E | FLOW TRA | VEL TIME | THRU SUE | BAREA | <<<< | | |
| >>>>USIN | | | | | | | | |
| | | | | | | | | 007.40 |
| ELEVATION FLOW LENG | DATA: UPS | STREAM(F | 38 MANN | TNG'S N | - O | 013 | (FEET) = | 997.40 |
| DEPTH OF I | | | | | | | | |
| PIPE-FLOW | | | | | | - | | |
| GIVEN PIPI | E DIAMETER | R(INCH) | = 60.00 | NUMBE | ER OF | PIPES | = 1 | |
| PIPE-FLOW | (CFS) = | 576.0 | 7 | | | | | |
| PIPE TRAVI | EL TIME (M) | IN.) = | 0.01 | Tc (MIN.) | = | 21.97 | | |
| LONGEST F | LOWPATH FF | ROM NODE | 100.0 | U TO NOI | Œ | 450.00 |) = 90 | 61.55 FEET. |
| ****** | ****** | ***** | ****** | ****** | **** | ***** | ****** | ******* |
| FLOW PROCI | | | | | | | | |
| | | | | | | | | |
| >>>>CLEA | | | | | | | | |
| | | | | | | | | |
| ***MEMORY | BANK # 2 | 2 IS EMP | TY - PROC | ESS IGNO | DRED. | *** | | |
| | | | | | | | | ******* |
| FLOW PROCI | | | | | | | | |
| | | | | | | | | |
| >>>>DEFI | | | | | | | | |
| | | | | | | | | |
| PEAK FLOW | | | | | | | | |
| MEMORY BAI | NK # 2 DE | EFINED A | S FOLLOWS | : | | | | |
| STREAM | Q | TC | Fp (Fm) | Ap | 13.00 | Ae | HEADWATE | R |
| NUMBER | | (MIN.) | (INCH/HR) | | (ACI | KES) | NODE | 0.0 |
| 1 | (CFS) | 5 00 | 0 20 / 0 | | | | | |
| 1 2 | 30.59 31.02 | 5.98 | 0.20(0. | 02) 0.10 02) n 10 |) | 6 1 | 31U. 220 | 00 |
| 1 2 3 | 30.59 31.02 31.17 | 5.98 6.22 6.57 | 0.20(0. | 02) 0.10 02) 0.10 02) 0.10 |) | 6.1 | 220. 290. | 00 |
| 1 2 3 4 | 30.59 31.02 31.17 31.18 | 5.98 6.22 6.57 6.60 | 0.20(0. 0.20(0. 0.20(0. | 02) 0.10 02) 0.10 02) 0.10 02) 0.10 |))) | 6.1 6.3 6.3 | 220. 290. 214. | 00 00 00 |
| 1 2 3 4 5 | 30.59 31.02 31.17 31.18 31.19 | 5.98 6.22 6.57 6.60 6.67 | 0.20(0.00000000000000000000000000000000 | 02) 0.10 02) 0.10 02) 0.10 02) 0.10 02) 0.10 |) | 6.1 6.3 6.3 | 220. 290. 214. 226. | 00 00 00 00 |
| 1 2 3 4 5 | NK # 2 DF Q (CFS) 6 30.59 31.02 31.17 31.18 31.19 30.39 | 5.98 6.22 6.57 6.60 6.67 7.46 | 0.20(0.0 0.20(0.0 0.20(0.0 0.20(0.0 0.20(0.0 | 02) 0.10 02) 0.10 02) 0.10 02) 0.10 02) 0.10 02) 0.10 |) | 6.1 6.3 6.3 6.4 6.7 age 22 | 220. 290. 214. 226. 300. | 00 00 00 00 00 |

7 29.64 8.05 0.20(0.02) 0.10 8 29.43 8.22 0.20(0.02) 0.10 9 29.03 8.47 0.20(0.02) 0.10 10 28.73 8.66 0.20(0.02) 0.10 11 27.09 9.68 0.20(0.02) 0.10 TOTAL AREA (ACRES) = 6.9 230.00 260.00 234.00 250.00 210.00 6.8 6.8 6.9 6.9

| | OCESS FROM N | | 450.00 TO | | | | CODE = 1 | .1 |
|------------------|------------------|---------------|------------------------|---------|--------|---------|-----------------|-------------------|
| >>>>CO1 | NFLUENCE MEM | ORY BAN | NK # 2 WITH | H THE I | MAIN-S | TREAM I | MEMORY<<< | < |
| | | | | | | | | |
| | STREAM CONF | | | | | | | |
| STREAM NUMBER | Q (CFS) | TC | Intensity (INCH/HR) | | | Ap | Ae (ACRES) | HEADWATER NODE |
| 1 | 437.30 | 5.97 | 5.592 | | | 0.29 | 84.5 | 95.00 |
| 2 | 471.43 | 7.13 | 5.049 | | | | 101.4 | 80.00 |
| 3 | 483.10 | 7.56 | 4.882 | 0.23(| 0.07) | 0.29 | 107.6 | 40.00 |
| 4 | 487.73 | 7.74 | | | | | 110.2 | 70.00 |
| 5 | 492.61 | 7.92 | 4.752 | | | | 112.9 | 30.00 |
| 6 | 505.47 | 8.44 | | | | | | 5.00 |
| 7 8 | 505.69 | 8.45 10.21 | | | | | | 15.00 |
| 9 | 545.04 576.07 | 21.97 | 4.110 2.649 | | 0.07) | | | 300.00 200.00 |
| 10 | 566.84 | 23.45 | | | 0.07) | | | 100.00 |
| | FLOWPATH FR | | | TO N | | | | 1.55 FEET. |
| | | | | | | | | |
| | | | JENCE DATA | | | | | |
| STREAM NUMBER | | TC | Intensity (INCH/HR) | | | Ap | Ae (ACRES) | HEADWATER NODE |
| 1 | 30.59 | 5.98 | 5.583 | | | 0.10 | 5.8 | |
| 2 | 31.02 | 6.22 | 5.460 | | | | | |
| 3 | 31.17 | 6.57 | | | 0.02) | | 6.3 | 290.00 |
| 4 | 31.18 | 6.60 | 5.279 | | | | 6.3 | 214.00 |
| 5 | 31.19 | 6.67 | | | | | 6.4 | 226.00 |
| 6 | 30.39 | 7.46 | 4.919 | | | | | |
| 7 | 29.64 | 8.05 | | | | | | |
| 8 | 29.43 | 8.22 | | | | | | |
| 10 | 29.03 28.73 | 8.47 | | | | | 6.9 | |
| 11 | 27.09 | 9.68 | 4.238 | | | | | |
| LONGEST | FLOWPATH FR | OM NODE | 230.00 | TO N | ODE . | 450.0 | | 2.97 FEET. |
| | | | | | | | | |
| | FLOW RATE T | | | | | | | |
| STREAM | | Tc | Intensity | | Fm) | Ap | | HEADWATER |
| NUMBER 1 | (CFS) 467.85 | 5.97 | (INCH/HR) 5.592 | | 0.06) | 0 20 | (ACRES) 90.4 | NODE 95.00 |
| 2 | 468.40 | 5.98 | | | | | 90.4 | |
| 3 | 475.79 | 6.22 | 5.460 | | | | 94.3 | 220.00 |
| 4 | 486.11 | 6.57 | 5.292 | 0.22(| 0.06) | 0.28 | 99.6 | 290.00 |
| 5 | 486.93 | 6.60 | 5.279 | 0.22(| 0.06) | 0.28 | 100.0 | 214.00 |
| 6 | 489.22 | 6.67 | | | | | | 226.00 |
| 7 | 502.16 | 7.13 | | | | | 108.0 | 80.00 |
| 8 | 510.76 | 7.46 | 4.919 | | | | | 300.00 |
| 9 10 | 513.36 517.78 | 7.56 | 4.882 4.818 | | | | 114.3 116.9 | 40.00 70.00 |
| 11 | 522.42 | 7.92 | | | | | 119.7 | 30.00 |
| 12 | 525.43 | 8.05 | 4.709 | | | | | 230.00 |
| 13 | 529.27 | 8.22 | 4.655 | | | | | 260.00 |
| 14 | 534.53 | 8.44 | 4.582 | 0.22(| 0.06) | 0.28 | 127.3 | 5.00 |
| 15 | 534.74 | 8.45 | 4.580 | | | | | 15.00 |
| 16 | 534.98 | 8.47 | 4.576 | | | | 127.6 | 234.00 |
| 17 | 539.10 | 8.66 | 4.516 | | | | | 250.00 |
| 18 19 | 560.24 571.31 | 9.68 | 4.238 4.110 | | 0.06) | | | 210.00 300.00 |
| 20 | 592.95 | 21.97 | | | | | | 200.00 |
| 21 | 583.10 | 23.45 | 2.552 | | 0.06) | | | 100.00 |
| | AREA (ACRES) | | 257.2 | (| , | | | |

TOTAL AREA (ACAGE),

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAR FLOW RATE (CFS) = 592.95 Tc (MIN.) = 21.969
EFFECTIVE AREA (ACRES) = 251.53 AREA-AVERAGED Fm (INCH/HR) = 0.06
AREA-AVERAGED Fp (INCH/HR) = 0.22 AREA-AVERAGED Ap = 0.28
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3P00ROV

| | | | | 3. | PUUROV | | |
|--------------|-------------------|--------------------|-------------|--|---------|-------------|---------------|
| TOTAL ARE | | | | | 450.00 | | |
| LONGEST F | LOWPATH F | ROM NODE | 100.00 | O TO NODE | 450.00 |) = 904 | ol.55 FEET. |
| ******* | ****** | ****** | ******* | ****** | ***** | ***** | ******* |
| | | | | NODE 450 | | | |
| | | | | | | | |
| >>>>CLEA | R MEMORY | BANK # 3 | 3 <<<<< | | | | |
| | | | | | | | |
| ***MEMORY | BANK # | 3 IS EME | PTY - PROCI | ESS IGNORED. | *** | | |
| | | | | ****** | | | |
| | | | | NODE 450 | | | |
| | | | | NODE 450 | | | |
| | | | 3 <<<<< | | | | |
| | | | | | | | |
| PEAK FLOW | RATE TABL | E FILE N | NAME: 3P001 | RC4.DNA | | | |
| MEMORY BA | NK # 3 D | EFINED A | AS FOLLOWS | Ap (AC | | | |
| STREAM | Q | Tc | Fp(Fm) | Ap . | Ae | HEADWATER | 3 |
| NUMBER | (CFS) | (MIN.) | (INCH/HR) | (AC | RES) | NODE | |
| 1 | 9.03 | 7.77 | 0.20(0.0 | 0.10 | 2.1 | 160.0 | 00 |
| Z TOTAT A | 8.71 REA(ACRES | 8.65 | 2.1 | J2) 0.10 | 2.1 | 150.0 | JU |
| IUIAL A | REA (ACRES | .) = | 2.1 | | | | |
| ****** | ****** | ****** | ******* | ****** | ***** | ****** | ****** |
| FLOW PROC | ESS FROM | NODE | 450.00 TO | NODE 450 | .00 IS | CODE = | 11 |
| | | | | | | | |
| >>>>CONF | LUENCE ME | MORY BAN | NK # 3 WITH | H THE MAIN-S | TREAM N | MEMORY<< | << |
| | | | | | | | |
| | | | | | | | |
| ** MAIN S | TREAM CON | FLUENCE | DATA ** | D (D) | 3 | 3 - | HES DATE THE |
| STREAM | (CDC) | TC | intensity | rp (rm) | Ар | Ae | HEADWATER |
| NUMBER | (CFS) | (MIN.) | (INCH/HR) | (INCH/HK) | 0 00 | (ACRES) | NODE OF OO |
| 7 | 467.85 | 5.97 | 5.592 | 0.22(0.06) | 0.28 | 90.4 | 210 00 |
| 3 | 400.40 | 6 22 | 5.363 | 0.22(0.06) | 0.20 | 90.0 | 220.00 |
| 4 | 496 11 | 6.57 | 5 292 | 0.22(0.00) | 0.20 | 99.6 | 290.00 |
| 5 | 486 93 | 6.60 | 5 279 | 0.22(0.00) | 0.20 | 100.0 | 214 00 |
| 6 | 489.22 | 6.67 | 5.244 | 0.22(0.06) | 0.28 | 101.2 | 226.00 |
| 7 | 502.16 | 7.13 | 5.049 | 0.22(0.06) | 0.28 | 108.0 | 80.00 |
| 8 | 510.76 | 7.46 | 4.919 | 0.22(0.06) | 0.28 | 112.8 | 300.00 |
| 9 | 513.36 | 7.56 | 4.882 | 0.22(0.06) | 0.28 | 114.3 | 40.00 |
| 10 | 517.78 | 7.74 | 4.818 | 0.22(0.06) | 0.28 | 116.9 | 70.00 |
| 11 | 522.42 | 7.92 | 4.752 | 0.22(0.06) | 0.28 | 119.7 | 30.00 |
| 12 | 525.43 | 8.05 | 4.709 | 0.22(0.06) | 0.28 | 121.6 | 230.00 |
| 13 | 529.27 | 8.22 | 4.655 | 0.22(0.06) | 0.28 | 124.0 | 260.00 |
| 14 | 534.53 | 8.44 | 4.582 | 0.22(0.06) | 0.28 | 127.3 | 5.00 |
| 15 | 534.74 | 8.45 | 4.580 | 0.22(0.06) | 0.28 | 127.4 | 15.00 |
| 16 | 534.98 | 8.47 | 4.576 | 0.22(0.06) | 0.28 | 127.6 | 234.00 |
| 17 | 539.10 | 8.66 | 4.516 | 0.22(0.06) | 0.28 | 130.4 | 250.00 |
| 18 | 560.24 | 9.68 | 4.238 | 0.22(0.06) | 0.28 | 144.9 | 210.00 |
| 19 | 5/1.31 | 10.21 | 4.110 | 0.22(0.06) | 0.28 | 152.5 | 300.00 |
| 20 | 592.95 | 21.97 | 2.649 | Fp(Fm) (INCH/HR) 0.22(0.06) | 0.29 | 251.5 | 200.00 |
| IONGEST F | JOJ.IU | ZJ.45 IOOM MOD! | 2.552 | 0.22(0.06) | 450 00 | 25/.2 | 100.00 |
| HONGEST I | DOWLAIN I | NOM NODE | 100.0 | J TO NODE | 450.00 | , – , , , , | J1.JJ ILLI. |
| ** MEMORY | BANK # | 3 CONFID | JENCE DATA | ** | | | |
| STREAM | 0 | Tc | Intensity | Fp(Fm) | Aρ | Ae | HEADWATER |
| NUMBER | (CFS) | (MIN.) | (INCH/HR) | (INCH/HR) | | (ACRES) | NODE |
| 1 | 9.03 | 7.77 | 4.807 | 0.20(0.02) | 0.10 | 2.1 | 160.00 |
| 2 | 8.71 | 8.65 | 4.519 | ** Fp(Fm) (INCH/HR) 0.20(0.02) 0.20(0.02) TO NODE | 0.10 | 2.1 | 150.00 |
| LONGEST F | LOWPATH F | ROM NODE | 150.00 | TO NODE | 450.00 |) = 6 | 70.70 FEET. |
| | | | | | | | |
| ** PEAK F | LOW RATE | TABLE ** | * | | | | |
| STREAM | Q | Tc | Intensity | Fp(Fm) | Ap | Ae | HEADWATER |
| NUMBER | (CFS) | (MIN.) | (INCH/HR) | (INCH/HR) | | (ACRES) | NODE |
| 1 | 475.93 | 5.97 | 5.592 | 0.22(0.06) | 0.27 | 92.0 | 95.00 |
| 2 | 476.48 | 5.98 | 5.583 | 0.22(0.06) | 0.27 | 92.2 | 310.00 |
| 3 | 484.01 | 6.22 | 5.460 | 0.22(0.06) | 0.27 | 96.0 | 220.00 |
| 4 | 494.52 | 6.57 | 5.292 | 0.22(0.06) | 0.27 | 101.3 | 290.00 |
| 5 | 493.36 | 6.00 | 5.2/9 | 0.22(0.06) | 0.27 | 102.8 | 214.00 |
| 7 | 497.08 510 87 | 7 12 | 5.244 | 0.22(0.06) | 0.27 | 103.0 | 220.00 |
| , 8 | 519.67 | 7 46 | 4.919 | Fp(Fm) (INCH/HR) 0.22(0.06) 0.22(0.06) 0.22(0.06) 0.22(0.06) 0.22(0.06) 0.22(0.06) 0.22(0.06) 0.22(0.06) 0.22(0.06) | 0.27 | 114 0 | 300.00 |
| 9 | 522.29 | 7.56 | 4.882 | 0.22(0.06) | 0.27 | 116 3 | 40.00 |
| - | 522.25 | ,.50 | | D D | age 24 | 110.5 | 10.00 |
| | | | | E. | -ye 24 | | |

```
10
11
12
              526.79
                                  4.818 0.22( 0.06) 0.28
              527.58
                                  4.807 0.22(0.06) 0.28
                                                                 119.5
                                                                            160.00
              531.39
                                         0.22( 0.06) 0.28
                                                                             30.00
     13
14
15
              534.36
                         8.05
                                  4.709 0.22( 0.06) 0.28
                                                                 123.7
                                                                            230.00
              538.14
                         8.22
                                  4.655 0.22(0.06) 0.28
                                                                 126.1
                                                                            260.00
              543.32
                         8.44
                                  4.582 0.22( 0.06) 0.28
     16
17
18
                        8.45
                                 4.580 0.22(0.06) 0.28
4.576 0.22(0.06) 0.28
                                                                 129.5
129.7
              543.52
                                                                             15.00
                                                                            234.00
              543.76
              547.57
                         8.65
                                  4.519 0.22( 0.06) 0.28
                                                                 132.4
                                                                            150.00
     19
              547 80
                         8 66
                                  4.516 0.22(0.06) 0.28
                                                                 132 5
                                                                            250 00
                         9.68
                                  4.238 0.22(0.06) 0.28
                                                                            210.00
                                 4.110 0.22(0.06) 0.28
2.649 0.22(0.06) 0.29
     21
              579.23 10.21
598.04 21.97
                                                                 154.6
                                                                            300.00
     22
                                                                            200.00
                                                                 253.7
              588.00 23.45
                                 2.552 0.22( 0.06) 0.29
                                                                            100.00
    TOTAL AREA (ACRES) =
                                259.4
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE (CFS) = 598.04 Tc (MIN.) = 21.969
EFFECTIVE AREA (ACRES) = 253.67 AREA-AVERAGED Fm (INCH/HR) = 0.06
 AREA-AVERAGED Fp(INCH/HR) = 0.22 AREA-AVERAGED Ap = 0.28
                            259.4
  TOTAL AREA (ACRES) =
  LONGEST FLOWPATH FROM NODE 100.00 TO NODE 450.00 = 9061.55 FEET.
********************
 FLOW PROCESS FROM NODE 450.00 TO NODE 460.00 IS CODE = 41
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT) <<<<
 ELEVATION DATA: UPSTREAM(FEET) = 997.40 DOWNSTREAM(FEET) = 992.80
 FLOW LENGTH (FEET) = 47.05 MANNING'S N = 0.013
DEPTH OF FLOW IN 60.0 INCH PIPE IS 39.6 INCHES
 PIEE-FLOW VELOCITY(FEET/SEC.) = 43.45
GIVEN PIPE DIAMETER(INCH) = 60.00 NUMBER OF PIPES = 1
PIEE-FLOW (CFS) = 598.04
 PIPE-FLOW(CFS) = 598.04

PIPE TRAVEL TIME(MIN.) = 0.02 Tc(MIN.) = 21.99

LONGST FLOWPATH FROM NODE 100.00 TO NODE 460.00 = 9108.60 FEET.
 END OF STUDY SUMMARY:
                                 259.4 TC(MIN.) =
 TOTAL AREA(ACRES) = 259.4 TC(MIN.) = 21.99
EFFECTIVE AREA(ACRES) = 253.67 AREA-AVERAGED Fm(INCH/HR) = 0.06
 AREA-AVERAGED Fp(INCH/HR) = 0.22 AREA-AVERAGED Ap = 0.290 PEAK FLOW RATE(CFS) = 598.04
  ** PEAK FLOW RATE TABLE **
               Q Tc Intensity Fp(Fm) Ap
(CFS) (MIN.) (INCH/HR) (INCH/HR)
475.93 5.98 5.582 0.22(0.06) 0.27
   STREAM
                                                                       HEADWATER
   NUMBER
                                                             (ACRES)
                                                                       NODE
95.00
              475.93
                                                                  92.0
                                  5.573 0.22(0.06) 0.27
              476.48
                         6.00
              484.01
494.52
                         6.24
                                 5.450 0.22(0.06) 0.27
5.284 0.22(0.06) 0.27
                                                                 96.0
101.3
                                                                            220.00
                         6.59
                         6.61
                                  5.271 0.22(0.06) 0.27
                                                                 101.8
                         6.69
7.15
                                 5.236 0.22(0.06) 0.27
5.041 0.22(0.06) 0.27
              497.68
                                                                 103.0
                                                                            226.00
                                                                 109.9
                                                                             80.00
              510.87
                         7.48
                                  4.912 0.22( 0.06) 0.27
                                                                            300.00
              522 29
                         7.58
                                  4.875 0.22(0.06) 0.27
                                                                 116 3
                                                                             40 00
              526.79
                         7.76
                                  4.811 0.22(0.06) 0.28
                                                                              70.00
                                                                 119.0
              527.58
                         7.79
                                  4.800 0.22( 0.06) 0.28
                                                                            160.00
     11
12
13
14
15
              531.39
                         7.94
                                  4.746 0.22(0.06) 0.28
                                                                 121.8
                                                                             30.00
                                  4.702 0.22( 0.06) 0.28
              538.14
                         8.24
                                  4.649 0.22(0.06) 0.28
                                                                 126.1
                                                                            260.00
                                  4.577 0.22(0.06) 0.28
              543.32
                         8.46
                                                                 129.4
                                                                              5.00
     16
17
              543.52
                         8.47
                                  4.574 0.22(0.06) 0.28
              543.76
                         8.48
                                  4.570 0.22(0.06) 0.28
                                                                 129.7
                                                                            234.00
              547.57
                                  4.514 0.22(0.06) 0.28
                                                                            150.00
                         8.67
                                                                 132.4
              547.80
                         8.68
                                 4.510 0.22(0.06) 0.28
4.233 0.22(0.06) 0.28
                                                                 132.5
                                                                            250.00
     20
              568.40
                        9.70
                                                                 147.1
                                                                            210.00
                                  4.106 0.22(0.06) 0.28
              579.23 10.23
                                                                            300.00
     22
              598 04
                       21.99
                                 2.648 0.22( 0.06) 0.29
                                                                 253 7
                                                                            200.00
     23
              588.00 23.47
                                                                 259.4
                                 2.551 0.22(0.06) 0.29
                                                                            100.00
```

END OF RATIONAL METHOD ANALYSIS

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3P00ROV

APPENDIX C - HYDRAULIC (WSPGW) RESULTS

TAIT JOB NO.ME03810 18

C2P10H

| | | | | | | | C2P10H | | | | | | |
|----------------------------|-------------------------|------------------------------|---|---|---|--|--|----------------|---------------|---|---|---|---|
| FILE: 0 | C2P10H | .WSW | | | WSPG | W - EDIT | LISTING - Ver | sion 14.0 | 7 | Date: | 2-12-202 | 20 Time: 5: | 54:40 |
| | | | | WA | TER SURFAC | CE PROFILE | - CHANNEL DEF | 'INITION L | ISTING | | | PAGE | 1 |
| CARD | SECT | CHN | NO OF AVE | PIER HEIGHT | 1 BASE | ZL ZF | R INV Y(1) | Y(2) Y | (3) Y(4) | Y(5) Y(6) | Y(7) | Y(8) Y(9) | Y(10) |
| CODE | NO | TYPE | PIER/PIP WI | DTH DIAMET | ER WIDTH | | DROP | | | | | | |
| | | | | | | | | | | | | | |
| CD | 1 | 4 | 1 | 4.000 | | | | | | | | | |
| CD | 2 | 4 | 1 | 3.000 | | | | | | | | | |
| CD | 3 | 4 | 1 | 2.000 | | | | | | | | | |
| | | | | | | | | | | | | | |
| CD | 4 | 4 | 1 | 1.000 | | | | | | | | | |
| CD | 5 | 4 | 1 | .830 | | | | | | | | | |
| CD | 6 | 4 | 1 | 1.250 | | | | | | | | | |
| CD | 7 | 4 | 1 | 1.500 | | | | | | | | | |
| CD | 8 | 4 | 1 | .500 | | | | | | | | | |
| | | | | | | WSPG | 7 W | | | | | PAGE NO |) 1 |
| | | | W | ATER SURFACE | PROFILE - | | | | | | | | |
| HEADING | G LINE | NO 1 | | | | | | | | | | | |
| IID/ID IIV | O DIND | 110 1 | 10 | DANA DOTNT L | INDDOD COM | MEDCINI COE | RE PARKING STE | ווכידווסבי אסו | מכ עמ גם | | | | |
| IIDA D TAI | C T T N ID | NO O | TO | DANA POINT F | IARBOR COM | MERCIAL COR | KE PARKING SIF | COCTORE AR | LA PR ZD | | | | |
| HEADIN | G LINE | NO Z | 15 - | | | | | | | | | | |
| | | | | PROPOSED STO | ORM DRAIN I | LATERAL C2 | | | | | | | |
| HEADIN | G LINE | NO 3 | IS - | | | | | | | | | | |
| | | | | 10-YEAR STOR | RM - MHW CO | ONDITION WS | SE=4.41 | | | | | | |
| | | | | | | WSPG | ∍ W | | | | | PAGE NO | 2 |
| | | | W | ATER SURFACE | PROFILE - | ELEMENT CA | ARD LISTING | | | | | | |
| ELEMEI | NT NO | 1 IS | A SYSTEM O | UTLET * | * | * | | | | | | | |
| | | | U/S DATA | | INVERT S | SECT | | | W | S ELEV | | | |
| | | | 0,0 211111 | 1000.000 | 714 | 2 | | | •• | 6.290 | | | |
| ים גי ידודי | יזים ייניס | ייואייואיי | CONTRATMED A | | | | TER THAN THE F | DEVIOUS T | ים דם ייסיייי | | | | |
| | | | | N INVERI ELEV | WILCH WAS | * | LEK IDAN IDE F | KEVIOUS II | NAEKI ETE | / -WARNING | | | |
| ELEME | NI NO | 2 13 | S A REACH | | | | | | | | | | |
| | | | U/S DATA | | | SECT | N | | | RADIUS | ANGLE | ANG PT | |
| | | | | 1015.130 | 1.360 | 2 | .013 | | | .000 | .000 | .000 | 0 |
| ELEME | NT NO | 3 I | A JUNCTION | * | * | * * | + | * | | * | | * | |
| | | | | | | | | | | | | | |
| | | | U/S DATA | STATION | INVERT S | SECT LAT-1 | LAT-2 N | Q3 | Q4 | INVERT-3 IN | IVERT-4 | PHI 3 PHI 4 | 1 |
| | | | U/S DATA | | | | | - | | | | | |
| | | | U/S DATA | STATION 1021.130 | INVERT S | | | Q3 .000 | .000 | .000 | .000 | .000 | .000 |
| | | | U/S DATA | | | | | - | | .000 RADIUS | .000 ANGLE | | |
| ET EMEI | NT NO | <i>1</i> T | | 1021.130 | 1.460 | 2 0 | | - | | .000 | .000 | | |
| ELEME | NT NO | 4 IS | S A REACH | 1021.130 | 1.460 | 2 0 | 0 .013 | - | | .000 RADIUS .000 | .000 ANGLE .000 | .000 | .000 |
| ELEME | NT NO | 4 IS | | 1021.130 * STATION | 1.460 * INVERT S | 2 0 * SECT | 0 .013 N | - | | .000 RADIUS .000 RADIUS | .000 ANGLE .000 ANGLE | .000 | .000 MAN H |
| | | | S A REACH U/S DATA | * STATION 1021.430 | 1.460 * INVERT 5 | 2 0 | 0 .013 | - | | .000 RADIUS .000 | .000 ANGLE .000 | .000 | .000 |
| ELEME! | | | S A REACH U/S DATA S A REACH | * STATION 1021.430 * | 1.460 * INVERT 5 1.460 * | 2 0 * SECT 2 * | 0 .013 N .013 | - | | .000 RADIUS .000 RADIUS .000 | .000 ANGLE .000 ANGLE .000 | .000 ANG PT 39.727 | .000 MAN H 0 |
| | | | S A REACH U/S DATA | * STATION 1021.430 * | 1.460 * INVERT 5 1.460 * INVERT 5 | 2 0 * BECT 2 * BECT | 0 .013 N .013 | - | | .000 RADIUS .000 RADIUS .000 RADIUS | .000 ANGLE .000 ANGLE .000 | .000 ANG PT 39.727 ANG PT | MAN HOMAN H |
| | | | S A REACH U/S DATA S A REACH | * STATION 1021.430 * | 1.460 * INVERT 5 1.460 * | 2 0 * SECT 2 * | 0 .013 N .013 | - | | .000 RADIUS .000 RADIUS .000 | .000 ANGLE .000 ANGLE .000 | .000 ANG PT 39.727 | .000 MAN H 0 |
| | NT NO | 5 IS | S A REACH U/S DATA S A REACH | * STATION 1021.430 * STATION | 1.460 * INVERT 5 1.460 * INVERT 5 | 2 0 * BECT 2 * BECT | 0 .013 N .013 | - | | .000 RADIUS .000 RADIUS .000 RADIUS | .000 ANGLE .000 ANGLE .000 | .000 ANG PT 39.727 ANG PT | MAN HOMAN H |
| ELEME | NT NO | 5 IS | S A REACH U/S DATA S A REACH U/S DATA | * STATION 1021.430 * STATION 1161.130 * | 1.460 * INVERT 5 1.460 * INVERT 5 2.160 | 2 0 * SECT 2 * SECT 2 * | 0 .013 N .013 | - | | .000 RADIUS .000 RADIUS .000 RADIUS | .000 ANGLE .000 ANGLE .000 | .000 ANG PT 39.727 ANG PT | MAN H 0 MAN H 0 |
| ELEME | NT NO | 5 IS | S A REACH U/S DATA S A REACH U/S DATA S A REACH | * STATION 1021.430 * STATION 1161.130 * STATION | 1.460 * INVERT 5 1.460 * INVERT 5 2.160 * INVERT 5 | 2 0 * SECT 2 * SECT 2 * SECT | 0 .013 N .013 N .013 | - | | .000 RADIUS .000 RADIUS .000 RADIUS .000 RADIUS .000 RADIUS | .000 ANGLE .000 ANGLE .000 ANGLE | .000 ANG PT 39.727 ANG PT .000 | MAN H 0 MAN H 0 MAN H |
| ELEME) | NT NO | 5 IS | S A REACH U/S DATA S A REACH U/S DATA S A REACH U/S DATA | * STATION 1021.430 * STATION 1161.130 * | 1.460 * INVERT 5 1.460 * INVERT 5 2.160 * | 2 0 * SECT 2 * SECT 2 * | 0 .013 N .013 N .013 | - | | .000 RADIUS .000 RADIUS .000 RADIUS .000 | .000 ANGLE .000 ANGLE .000 ANGLE | .000 ANG PT 39.727 ANG PT .000 | MAN H 0 MAN H 0 |
| ELEME | NT NO | 5 IS | S A REACH U/S DATA S A REACH U/S DATA A REACH U/S DATA S A REACH | * STATION 1021.430 * STATION 1161.130 * STATION 1189.320 * | 1.460 * INVERT 1.460 * INVERT 2.160 * INVERT 2.300 * INVERT 2.300 | 2 0 * SECT 2 * SECT 2 * SECT 2 * * * | 0 .013 N .013 N .013 | - | | .000 RADIUS .000 RADIUS .000 RADIUS .000 RADIUS .22.500 | .000 ANGLE .000 ANGLE .000 ANGLE .000 ANGLE -71.786 | .000 ANG PT 39.727 ANG PT .000 ANG PT .000 | MAN H 0 MAN H 0 MAN H 0 |
| ELEME) | NT NO | 5 IS | S A REACH U/S DATA S A REACH U/S DATA S A REACH U/S DATA | * STATION 1021.430 * STATION 1161.130 * STATION 1189.320 * STATION | 1.460 * INVERT 1.460 * INVERT 2.160 * INVERT 2.300 * INVERT 5 | 2 0 * BECT 2 * BECT 2 * BECT 2 * BECT | 0 .013 N .013 N .013 N .013 | - | | .000 RADIUS .000 RADIUS .000 RADIUS .000 RADIUS 22.500 RADIUS | .000 ANGLE .000 ANGLE .000 ANGLE -71.786 ANGLE | ANG PT 39.727 ANG PT .000 ANG PT .000 | MAN H 0 MAN H 0 MAN H 0 MAN H |
| ELEME) | NT NO | 5 IS 6 IS 7 IS | S A REACH U/S DATA | * STATION 1021.430 * STATION 1161.130 * STATION 1189.320 * STATION 1191.980 | 1.460 * INVERT 5 1.460 * INVERT 5 2.160 * INVERT 2.300 * INVERT 5 2.310 | 2 0 * BECT 2 | 0 .013 N .013 N .013 | .000 | | .000 RADIUS .000 RADIUS .000 RADIUS .000 RADIUS 22.500 RADIUS .000 | .000 ANGLE .000 ANGLE .000 ANGLE .000 ANGLE -71.786 | ANG PT 39.727 ANG PT .000 ANG PT .000 ANG PT .000 | MAN H 0 MAN H 0 MAN H 0 |
| ELEME) | NT NO | 5 IS 6 IS 7 IS | S A REACH U/S DATA S A REACH | * STATION 1021.430 * STATION 1161.130 * STATION 1189.320 * STATION 1191.980 * | 1.460 * INVERT 1.460 * INVERT 2.160 * INVERT 2.300 * INVERT 2.310 * INVERT 2.310 | 2 0 * SECT 2 * SECT 2 * SECT 2 * * * * * * * * * * * * * * * * * * | 0 .013 N .013 N .013 N .013 | * | .000 | .000 RADIUS .000 RADIUS .000 RADIUS .000 RADIUS 22.500 RADIUS .000 * | .000 ANGLE .000 ANGLE .000 ANGLE .71.786 ANGLE .000 | ANG PT 39.727 ANG PT .000 ANG PT .000 ANG PT .000 | MAN H 0 MAN H 0 MAN H 0 MAN H 0 |
| ELEME) | NT NO | 5 IS 6 IS 7 IS | S A REACH U/S DATA | * STATION 1021.430 * STATION 1161.130 * STATION 1189.320 * STATION 1191.980 * STATION | 1.460 * INVERT 5 1.460 * INVERT 5 2.160 * INVERT 2.300 * INVERT 2.310 * INVERT 5 1.460 | * SECT 2 * SECT 4 SECT 5 SECT 4 SECT 4 SECT 5 SECT 6 SECT 6 SECT 6 SECT 7 SECT 8 SECT 7 SECT 8 SE | 0 .013 N .013 N .013 N .013 N .013 | * Q3 | .000 | .000 RADIUS .000 RADIUS .000 RADIUS .000 RADIUS 22.500 RADIUS .000 * INVERT-3 IN | .000 ANGLE .000 ANGLE .000 ANGLE .71.786 ANGLE .000 | .000 ANG PT 39.727 ANG PT .000 ANG PT .000 ANG PT .000 | MAN H 0 MAN H 0 MAN H 0 MAN H 0 |
| ELEME) | NT NO | 5 IS 6 IS 7 IS | S A REACH U/S DATA S A REACH | * STATION 1021.430 * STATION 1161.130 * STATION 1189.320 * STATION 1191.980 * | 1.460 * INVERT 1.460 * INVERT 2.160 * INVERT 2.300 * INVERT 2.310 * INVERT 2.310 | 2 0 * SECT 2 * SECT 2 * SECT 2 * * * * * * * * * * * * * * * * * * | 0 .013 N .013 N .013 N .013 | * | .000 | .000 RADIUS .000 RADIUS .000 RADIUS .000 RADIUS 22.500 RADIUS .000 * | .000 ANGLE .000 ANGLE .000 ANGLE .71.786 ANGLE .000 | ANG PT 39.727 ANG PT .000 ANG PT .000 ANG PT .000 | MAN H 0 MAN H 0 MAN H 0 MAN H 0 |
| ELEME) | NT NO | 5 IS 6 IS 7 IS | S A REACH U/S DATA S A REACH | * STATION 1021.430 * STATION 1161.130 * STATION 1189.320 * STATION 1191.980 * STATION | 1.460 * INVERT 5 1.460 * INVERT 5 2.160 * INVERT 2.300 * INVERT 2.310 * INVERT 5 1.460 | * SECT 2 * SECT 4 SECT 5 SECT 4 SECT 4 SECT 5 SECT 6 SECT 6 SECT 6 SECT 7 SECT 8 SECT 7 SECT 8 SE | 0 .013 N .013 N .013 N .013 N .013 | * Q3 | .000 | .000 RADIUS .000 RADIUS .000 RADIUS .000 RADIUS 22.500 RADIUS .000 * INVERT-3 IN | .000 ANGLE .000 ANGLE .000 ANGLE .71.786 ANGLE .000 | .000 ANG PT 39.727 ANG PT .000 ANG PT .000 ANG PT .000 | MAN H 0 MAN H 0 MAN H 0 MAN H 0 |
| ELEME) | NT NO | 5 IS 6 IS 7 IS | S A REACH U/S DATA S A REACH | * STATION 1021.430 * STATION 1161.130 * STATION 1189.320 * STATION 1191.980 * STATION | 1.460 * INVERT 5 1.460 * INVERT 5 2.160 * INVERT 2.300 * INVERT 2.310 * INVERT 5 1.460 | * SECT 2 * SECT 4 SECT 5 SECT 4 SECT 4 SECT 5 SECT 6 SECT 6 SECT 6 SECT 7 SECT 8 SECT 7 SECT 8 SE | 0 .013 N .013 N .013 N .013 N .013 | * Q3 | .000 | .000 RADIUS .000 RADIUS .000 RADIUS .000 RADIUS 22.500 RADIUS .000 * INVERT-3 IN .000 | .000 ANGLE .000 ANGLE .000 ANGLE -71.786 ANGLE .000 IVERT-4 1 | .000 ANG PT 39.727 ANG PT .000 ANG PT .000 ANG PT .000 | MAN H 0 MAN H 0 MAN H 0 MAN H 0 |
| ELEME! ELEME! ELEME! | NT NO NT NO NT NO | 5 I: 6 I: 7 I: 8 I: | S A REACH U/S DATA S A JUNCTION U/S DATA | * STATION 1021.430 * STATION 1161.130 * STATION 1189.320 * STATION 1191.980 * STATION | 1.460 * INVERT 5 1.460 * INVERT 5 2.160 * INVERT 2.300 * INVERT 2.310 * INVERT 5 1.460 | * SECT 2 * SECT 4 SECT 5 SECT 4 SECT 4 SECT 5 SECT 6 SECT 6 SECT 6 SECT 7 SECT 8 SECT 7 SECT 8 SE | 0 .013 N .013 N .013 N .013 N .013 | * Q3 | .000 | .000 RADIUS .000 RADIUS .000 RADIUS .000 RADIUS 22.500 RADIUS .000 * INVERT-3 IN .000 RADIUS | .000 ANGLE .000 ANGLE .000 ANGLE .000 ANGLE -71.786 ANGLE .000 | .000 ANG PT 39.727 ANG PT .000 ANG PT .000 ANG PT .000 | MAN H 0 MAN H 0 MAN H 0 MAN H 0 |
| ELEME) | NT NO NT NO NT NO | 5 I: 6 I: 7 I: 8 I: | S A REACH U/S DATA S A JUNCTION U/S DATA | * STATION 1021.430 * STATION 1161.130 * STATION 1189.320 * STATION 1191.980 * STATION 1196.610 | 1.460 * INVERT 1.460 * INVERT 2.160 * INVERT 2.300 * INVERT 2.310 * INVERT 2.410 | 2 0 * BECT 2 * BECT 2 * BECT 2 * SECT 2 * * * * * * * * * * * * * * * * * * | 0 .013 N .013 N .013 N .013 N .013 LAT-2 N .013 | * Q3 | .000 | .000 RADIUS .000 RADIUS .000 RADIUS .000 RADIUS 22.500 RADIUS .000 * INVERT-3 IN .000 RADIUS .000 RADIUS .000 | .000 ANGLE .000 ANGLE .000 ANGLE -71.786 ANGLE .000 IVERT-4 1 .000 ANGLE .000 | ANG PT 39.727 ANG PT .000 ANG PT .000 ANG PT .000 ANG PT .000 | MAN H 0 .000 |
| ELEME! ELEME! ELEME! | NT NO NT NO NT NO | 5 I: 6 I: 7 I: 8 I: | S A REACH U/S DATA S A JUNCTION U/S DATA | * STATION 1021.430 * STATION 1161.130 * STATION 1189.320 * STATION 1191.980 * STATION 1196.610 * STATION | 1.460 * INVERT 1.460 * INVERT 2.160 * INVERT 2.300 * INVERT 2.310 * INVERT 2.410 * INVERT 2.410 | 2 0 * SECT 2 * SECT 2 * SECT 2 * SECT 2 * SECT 0 * SECT LAT-1 2 0 | 0 .013 N .013 N .013 N .013 N .013 LAT-2 N .013 | * Q3 | .000 | .000 RADIUS .000 RADIUS .000 RADIUS .000 RADIUS 22.500 RADIUS .000 * INVERT-3 IN .000 RADIUS .000 RADIUS .000 RADIUS .000 RADIUS | .000 ANGLE .000 ANGLE .000 ANGLE .000 ANGLE -71.786 ANGLE .000 IVERT-4 .000 ANGLE .000 ANGLE | ANG PT 39.727 ANG PT .000 ANG PT .000 ANG PT .000 ANG PT .000 | MAN H O MAN H |
| ELEME! ELEME! | NT NO NT NO NT NO NT NO | 5 I: 6 I: 7 I: 8 I: 9 I: | S A REACH U/S DATA S A JUNCTION U/S DATA | * STATION 1021.430 * STATION 1161.130 * STATION 1189.320 * STATION 1191.980 * STATION 1196.610 | 1.460 * INVERT 1.460 * INVERT 2.160 * INVERT 2.300 * INVERT 2.310 * INVERT 2.410 | 2 0 * BECT 2 * BECT 2 * BECT 2 * SECT 2 * * * * * * * * * * * * * * * * * * | 0 .013 N .013 N .013 N .013 N .013 LAT-2 N .013 | * Q3 | .000 | .000 RADIUS .000 RADIUS .000 RADIUS .000 RADIUS 22.500 RADIUS .000 * INVERT-3 IN .000 RADIUS .000 RADIUS .000 | .000 ANGLE .000 ANGLE .000 ANGLE -71.786 ANGLE .000 IVERT-4 1 .000 ANGLE .000 | ANG PT 39.727 ANG PT .000 ANG PT .000 ANG PT .000 ANG PT .000 | MAN H 0 .000 |

| | | | | | C2P1 | ОН | | | | | | |
|--------------|--------------------------|---------------|-----------|----------|-------------|----------|-------------|------------------|-------------|-----------|------------|-----------------|
| | U/S DAT | A STATION | INVERT | SECT | | N | | | RADIUS | ANGLE | ANG PT | MAN H |
| | | 1224.530 | 2.550 | 2 | | .013 | | | 22.505 | -13.417 | .000 | 0 |
| | | | | | S P G W | | | | | | PAGE NO |) 3 |
| | | WATER SURFACE | | | | TING | | | | | | |
| ELEMENT NO | 11 IS A REACH | * | * | | | | | | | | | |
| | U/S DAT | A STATION | INVERT | | | N 012 | | | RADIUS | ANGLE | ANG PT | |
| ELEMENT NO | 10 TO A DEAGU | 1269.610 | 2.770 | 2 * | | .013 | | | .000 | .000 | .000 | 0 |
| ELEMENI NO | 12 IS A REACH U/S DAT | | INVERT | | | N | | | RADIUS | ANGLE | ANG PT | мам ц |
| | U/S DAI | 1304.880 | 2.950 | 2 | | .013 | | | 22.500 | 89.814 | .000 | MAN n |
| FI.FMFNT NO | 13 IS A REACH | 1304.000 | 2.930 | | | .013 | | | 22.500 | 09.014 | .000 | U |
| DDDITDIT NO | U/S DAT | | INVERT | SECT | | N | | | RADIUS | ANGLE | ANG PT | MAN H |
| | 0/0 5111 | 1306.880 | 2.960 | 2 | | .013 | | | .000 | .000 | .000 | 0 |
| ELEMENT NO | 14 IS A TRANSIT | | * | | | .013 | | | •000 | .000 | •000 | Ü |
| EDDIDINI NO | | A STATION | INVERT | SECT | | N | | | RADIUS | ANGLE | | |
| | 0,0 2111 | 1320.220 | 2.960 | 2 | | .013 | | | .000 | .000 | | |
| THE ABOVE EL | EMENT CONTAINED | | | | GREATER THA | | PREVIOUS I | NVERT ELEV | | | | |
| | | * | * | | | | | | | | | |
| | U/S DAT | A STATION | INVERT | SECT | | N | | | RADIUS | ANGLE | ANG PT | MAN H |
| | | 1324.060 | 2.980 | 2 | | .013 | | | .000 | .000 | .000 | 0 |
| ELEMENT NO | 16 IS A JUNCTIO | .v * | * | * | * | | | | * | | * | |
| | U/S DAT | A STATION | INVERT | SECT | LAT-1 LAT-2 | N | Q3 | Q4 | INVERT-3 II | NVERT-4 P | HI 3 PHI 4 | |
| | | 1328.720 | 3.080 | 2 | 4 5 | .013 | 3.022 | 1.318 | 4.980 | 5.150 | 45.000 -9 | 0.000 |
| | | | | | | | | | RADIUS | ANGLE | | |
| | | | | | | | | | .000 | .000 | | |
| ELEMENT NO | 17 IS A REACH | * | * | * | | | | | | | | |
| | U/S DAT | A STATION | INVERT | SECT | | N | | | RADIUS | ANGLE | ANG PT | MAN H |
| | | 1331.380 | 3.090 | 2 | | .013 | | | .000 | .000 | .000 | 0 |
| ELEMENT NO | 18 IS A REACH | * | * | | | | | | | | | |
| | U/S DAT | | INVERT | | | N | | | RADIUS | ANGLE | ANG PT | |
| | | 1374.560 | 3.310 | 2 | | .013 | | | 22.498 | -109.965 | .000 | 0 |
| ELEMENT NO | 19 IS A REACH | * | * | | | | | | | | | |
| | U/S DAT | | INVERT | | | N | | | RADIUS | ANGLE | ANG PT | |
| | | 1407.340 | 3.470 | 2 | | .013 | | | .000 | .000 | .000 | 0 |
| ELEMENT NO | 20 IS A JUNCTIO | | * | | * | | * | 0.4 | * | | * | |
| | U/S DAT | | INVERT | | LAT-1 LAT-2 | N | Q3 | Q4 | | | HI 3 PHI 4 | |
| | | 1411.340 | 4.970 | 7 | 6 0 | .013 | 8.700 | .000 | 5.220 | | -45.500 | .000 |
| | | | | | | | | | RADIUS | ANGLE | | |
| | | | | 747 | SPGW | | | | .000 | .000 | PAGE NO |) 4 |
| | | WATER SURFACE | DDOFTIF | | | TING | | | | | FAGE NO | / '1 |
| FIEMENT NO | | WAIER SURFACE | | * * | | IING | | | | | | |
| ELEMENT NO | U/S DAT | | INVERT | | | N | | | RADIUS | ANGLE | ANG PT | н идм |
| | 0/5 DAI | 1414.000 | 4.980 | 7 | | .013 | | | .000 | .000 | .000 | 0 |
| FI.FMFNT NO | 22 IS A REACH | * | * | - | | .013 | | | .000 | .000 | .000 | O |
| DDDFIDINI NO | U/S DAT | | INVERT | | | N | | | RADIUS | ANGLE | ANG PT | мам н |
| | U/J DAI | 1449.350 | 5.160 | 7 | | .013 | | | 22.504 | 90.000 | .000 | 0 |
| ELEMENT NO | 23 IS A REACH | * | * | | | .010 | | | 22.504 | 50.000 | • 5 6 6 | J |
| | U/S DAT | A STATION | INVERT | SECT | | N | | | RADIUS | ANGLE | ANG PT | MAN H |
| | 0, 0 Bill | 1466.610 | 5.250 | 7 | | .013 | | | .000 | .000 | .000 | 0 |
| ELEMENT NO | 24 IS A JUNCTIO | | * | | * | 3 | * | | * | | * | - |
| | U/S DAT | | INVERT | SECT | LAT-1 LAT-2 | N | Q3 | Q4 | INVERT-3 II | NVERT-4 P | HI 3 PHI 4 | |
| | | 1466.910 | 5.250 | 7 | 8 0 | .013 | .277 | .000 | 6.000 | | -45.000 | .000 |
| | | | | | | | | | RADIUS | ANGLE | | |
| | | | | | | | | | .000 | .000 | | |
| THE ADOME ET | EMENT CONTAINED | AN THURDT ETE | W HOTCH W | ואכ אוחד | CDEATED THA | M THE | DDENTAILS T | אוווים דום אוווי | / _WADNING | | | |

THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING

C2P10H

| THE ABOVE ELEME | NT CONTAINED AN | INVERT ELEV | WHICH W | AS NOT | GREATER | THAN T | E PREVIOUS | INVERT ELE | V -WARNING | | | |
|-----------------|-----------------|-------------|---------|--------|-----------|--------|------------|------------|-------------|-----------|----------|--------|
| ELEMENT NO 25 | IS A REACH | * | * | * | | | | | | | | |
| | U/S DATA | STATION | INVERT | SECT | | N | | | RADIUS | ANGLE | ANG PT | MAN H |
| | | 1525.410 | 5.540 | 7 | | .03 | .3 | | .000 | .000 | .000 | 0 |
| ELEMENT NO 26 | IS A JUNCTION | * | * | * | * | | * | | * | | * | |
| | U/S DATA | STATION | INVERT | SECT : | LAT-1 LAT | r-2 N | Q3 | Q4 | INVERT-3 IN | IVERT-4 P | HI 3 PHI | 4 |
| | | 1529.430 | 6.210 | 5 | 8 | 6 .03 | .3 .83 | 0 4.393 | 6.340 | 6.090 | 45.000 - | 44.700 |
| | | | | | | | | | RADIUS | ANGLE | | |
| | | | | | | | | | 25.592 | 9.000 | | |
| ELEMENT NO 27 | IS A SYSTEM HEA | DWORKS | | * | | | * | | | | | |
| | U/S DATA | STATION | INVERT | SECT | | | | M | S ELEV | | | |
| | | 1529.430 | 6.210 | 5 | | | | | 6.210 | | | |

↑ FILE: C2P10H.WSW W S P G W - CIVILDESIGN Version 14.07 PAGE 1

Date: 2-12-2020 Time: 5:54:44

Program Package Serial Number: 7132

WATER SURFACE PROFILE LISTING

DANA POINT HARBOR COMMERCIAL CORE PARKING STRUCTURE AREA PH 2B PROPOSED STORM DRAIN LATERAL C2

10-YEAR STORM - MHW CONDITION WSE=4.41

| 10-1EAR 510RM - MIN CONDITION W5E-4.41 ********************************** | | | | | | | | | | | | | | | |
|--|-----------------------|------------|----------------------------|--|--|---|--------------------------------|---------------|-------------------|-----------------------|------------------|-----------------|------------|--------------|------------|
| Station | Invert Elev | Depth (FT) | Water Elev | Q (CFS) | Vel (FPS) | Vel Head | Energy Grd.El. | Super Elev | Critical Depth | Flow Top Width | Height/ DiaFT | Base Wt or I.D. | ZL | No Wt | |
| L/Elem ****** | Ch Slope ****** | ***** | ***** | ***** | ****** | SF Ave | HF ****** | SE Dpth | Froude N | Norm Dp | "N" | X-Fall ***** | ZR **** | Type **** | |
| 1000.000 | 714 - | 7.004 | 6.290 | 20.09 | 2.84 | .13 | 6.42 | .00 | l 1.44 | .00 | 3.000 | .000 | .00 | 1 | .0 |
| 15.130 | .1371 | 1 1 | | I | l | .0009 | .01 | 7.00 | .00 | .58 | .013 | .00 | .00 | PIPE | |
| 1015.130 | 1.360 | 4.944 | 6.304 | 20.09 | 2.84 | .13 | 6.43 | .00 | 1.44 | .00 | 3.000 | .000 | .00 | 1 | .0 |
| JUNCT STR | .0167 | | | | | .0009 | .01 | 4.94 | .00 | | .013 | .00 | .00 | PIPE | |
| 1021.130 | 1.460 | 4.849 | 6.309 | 20.09 | 2.84 | .13 | 6.43 | .00 | 1.44 | .00 | 3.000 | .000 | .00 | 1 | .0 |
| .300 | .0000 | | | - | | .0009 | .00 | 4.85 | .00 | .00 | .013 | .00 | .00 | PIPE | |
| 1021.430 | 1.460 | 4.866 | 6.326 | 20.09 | 2.84 | .13 | 6.45 | .00 | 1.44 | .00 | 3.000 | .000 | .00 | 1 | .0 |
| 139.700 | .0050 | | | - | | .0009 | .13 | 4.87 | .00 | 1.37 | .013 | .00 | .00 | PIPE | |
| 1161.130 | 2.160 | 4.293 | 6.453 | 20.09 | 2.84 | .13 | 6.58 | .00 | 1.44 | .00 | 3.000 | .000 | .00 | 1 | .0 |
| 28.190 | .0050 | | | | | .0009 | .03 | .00 | .00 | 1.37 | .013 | .00 | .00 | PIPE | |
| 1189.320 | 2.300 | 4.201 | 6.501 | 20.09 | 2.84 | .13 | 6.63 | .00 | 1.44 | .00 | 3.000 | .000 | .00 | 1 | .0 |
| 2.660 | .0038 | | | - | | .0009 | .00 | 4.20 | .00 | 1.48 | .013 | .00 | .00 | PIPE | |
| 1191.980 | 2.310 | 4.193 | 6.503 | 20.09 | 2.84 | .13 | 6.63 | .00 | 1.44 | .00 | 3.000 | .000 | .00 | 1 | .0 |
| JUNCT STR | .0216 | | | - | | .0009 | .00 | 4.19 | .00 | | .013 | .00 | .00 | PIPE | |
| 1196.610 | 2.410 | 4.097 | 6.507 | 20.09 | 2.84 | .13 | 6.63 | .00 | 1.44 | .00 | 3.000 | .000 | .00 | 1 | .0 |
| 22.650 | .0049 | | - | - | | .0009 | .02 | 4.10 | .00 | 1.38 | .013 | .00 | .00 | PIPE | |
| 1219.260 | 2.520 | 4.008 | 6.528 | 20.09 | l 2.84 ll | .13 | 6.65 | .00 | 1.44 | .00 | 3.000 | .000 | .00 | 1 | .0 |
| 5.270 | .0057 | | _ | | D C W | .0009 | .00 SIGN Versio | .00 | .00 | 1.32 | .013 | .00 | .00 | PIPE PAGE | 2 |
| T FILE: CZE | FIOH.WSW | | A POINT HAI ROPOSED STO | Package Se RBOR COMMER DRM DRAIN I | erial Num WATER RCIAL COF LATERAL (| nber: 713 SURFACE RE PARKII C2 | 32 PROFILE L NG STRUCTUI | ISTING | РН 2В | 1 | Date: 2-1 | 12-2020 | Time: | | _ |
| ******* | ********* Invert | ******** | ***** | FORM - MHW ********* | ********* Vel | N WSE=4 ******* Vel | ***** | ****** | ******** | ******** Flow Top | ******** | ******* | ***** | ***** | r** - h |
| | THAT | Depth | Water | Q | l neT | vет | Energy | Super | CTICICAL | lt TOM TOD | uerdiic/ | Dase Wt | l . | INO ME | ,11 |

| | C2P10H Station Elev (FT) Elev (CFS) (FPS) Head Grd.El. Elev Depth Width DiaFT or I.D. ZL Prs/Pip | | | | | | | | | | | | | | |
|-----------------------|--|-----------------|---------|-------------------|-----------|----------------------|--------------------|----------------------|----------|----------------------|-----------|------------------|------------|---------------|----|
| Station | Elev | (FT) | Elev | (CFS) | (FPS) | Head | Grd.El. | Elev | Depth | Width | DiaFT | or I.D. | ZL | Prs/P | ip |
| L/Elem ***** | Ch Slope | ***** | ***** | ***** | ***** | SF Ave ***** | HF | SE Dpth ***** | Froude N | Norm Dp ***** | - "N" | X-Fall ****** | ZR **** | Type | |
| 1224.530 | 2.550 | 3.992 | 6.542 | 20.09 | 2.84 | .13 | 6.67 | .00 | 1.44 | .00 | 3.000 | .000 | .00 | 1 _ | .0 |
| 45.080 | .0049 | | - - | - | | .0009 | .04 | 3.99 | .00 | 1.38 | .013 | .00 | ı | PIPE | |
| 1269.610 | 2.770 | 3.813 | 6.583 | 20.09 | 2.84 | .13 | 6.71 | .00 | 1.44 | .00 | 3.000 | .000 | .00 | 1 - | .0 |
| 35.270 | .0051 | ' ' | | ' | | .0009 | .03 | .00 | .00 | 1.36 | .013 | .00 | .00 | PIPE | |
| 1304.880 | 2.950 | ' 3.690' | 6.640 | 20.09 | 2.84 | .13 | 6.77 | .00 | 1.44 | .00 | 3.000 | .000 | .00 | ' 1 - | .0 |
| 2.000 | .0050 | | · | · | | .0009 | .00 | 3.69 | .00 | 1.37 | .013 | .00 | .00 | PIPE | |
| 1306.880 | 2.960 | 3.682 | 6.642 | 20.09 | 2.84 | ı | 6.77 | .00 | | .00 | 3.000 | .000 | .00 | 1 - | .0 |
| TRANS STR | .0000 | 1 1 | | | | .0009 | .01 | 3.68 | .00 | ı | .013 | .00 | .00 | PIPE | |
| 1320.220 | 2.960 | 3.694 | 6.654 | 20.09 | 2.84 | .13 | 6.78 | .00 | 1.44 | .00 | 3.000 | .000 | .00 - | l 1 l – | .0 |
| 3.840 | .0052 | ' ' | | ' | | .0009 | .00 | 3.69 | .00 | 1.35 | .013 | .00 | | PIPE | |
| 1324.060 | 2.980 | ' 3.678' | 6.658 | 20.09 | 2.84 | .13 | 6.78 | .00 | 1.44 | .00 | 3.000 | .000 | .00 - | ' 1 - | .0 |
| JUNCT STR | .0215 | | · | · | | .0007 | .00 | 3.68 | .00 | | .013 | .00 | .00 | PIPE | |
| 1328.720 | | 3.642 | 6.722 | 15.75 | 2.23 | .08 | 6.80 | .00 | 1.27 | .00 | 1 | .000 | ı | 1 | .0 |
| 2.660 | .0038 | | | | | .0006 | .00 | 3.64 | .00 | 1.29 | .013 | .00 | | PIPE | |
| 1331.380 | 3.090 | 3.633 | 6.723 | 15.75 | 2.23 | .08 | 1 | .00 | | .00 - | 3.000 | .000 | ı | - | .0 |
| 43.180 | .0051 | | | | | .0006 | .02 | .00 | .00 | 1.19 | .013 | .00 | | PIPE | |
| 1374.560 | | 3.454 | 6.764 | 15.75 | 2.23 | ı | 6.84 | .00 | | | | .000 | | - | .0 |
| 32.780 ♠ FILE: C2H | .0049 | | | WS | P G W - | .0006 | .02 SIGN Versio | 3.45 on 14.07 | .00 | 1.20 | .013 | .00 | | PIPE | 3 |
| T FILE: CZI | TOU.WSW | | Program | W S Package Se | | | | JII 14.U/ | | | | | | AGL | 3 |
| | | | | | | | PROFILE L | ISTING | | | Date: 2-1 | 12-2020 | Time: | 5:54:4 | 4 |

DANA POINT HARBOR COMMERCIAL CORE PARKING STRUCTURE AREA PH 2B

PROPOSED STORM DRAIN LATERAL C2

10-YEAR STORM - MHW CONDITION WSE=4.41

| *************************************** | | | | | | | | | | | | | | ***** |
|---|----------|-------|-------|--------|-------|--------|---------|---------|----------|----------|---------|---------|------|---------|
| | Invert | Depth | Water | Q | Vel | Vel | Energy | Super | Critical | Flow Top | Height/ | Base Wt | | No Wth |
| Station | Elev | (FT) | Elev | (CFS) | (FPS) | Head | Grd.El. | Elev | Depth | Width | DiaFT | or I.D. | ZL | Prs/Pip |
| - | | | | | | | | | | | | | | |
| L/Elem | Ch Slope | | | | · | SF Ave | HF | SE Dpth | Froude N | Norm Dp | "N" | X-Fall | ZR | Type Ch |
| ****** | ***** | ***** | ***** | ****** | ***** | ***** | ***** | ***** | ****** | ****** | ***** | ***** | **** | ***** |
| | | | | | | | | | | | | | | İ |
| 1407.340 | 3.470 | 3.312 | 6.782 | 15.75 | 2.23 | .08 | 6.86 | .00 | 1.27 | .00 | 3.000 | .000 | .00 | 1 .0 |
| -1 | | | | | | | | | | | | | - | - |
| JUNCT STR | .3750 | | | | | .0025 | .01 | 3.31 | .00 | • | .013 | .00 | .00 | PIPE |

| | C2P10H | | | | | | | | | | | | | | |
|---------------|--------|----------------|--------------|-------------|-------------|---------------------|-----------|---------|------|------|-----------|------|-----|-------------|----|
| 1411.340 | 4.970 | 1.653 | 6.623 | 7.05 | 3.99 | .25 | 6.87 | .00 | 1.03 | .00 | 1.500 | .000 | .00 | 1 | .0 |
| 2.660 | .0038 | - | - - | - - | - - | - - | .01 | 1.65 | .00 | 1.50 | .013 | .00 | .00 | - PIPE | |
| 1414.000 | 4.980 | 1.655 - | 6.635 - - | 7.05 | 3.99 | .25 | 6.88 | .00 | 1.03 | .00 | 1.500 | .000 | .00 | 1 | .0 |
| 35.350 | .0051 | - | -1- | -1- | - - | .0045 | .16 | .00 | .00 | 1.16 | .013 | .00 | .00 | PIPE | |
| 1449.350 | 5.160 | 1.683 | 6.843 - - | 7.05 | 3.99 | .25 | 7.09 | .00 | 1.03 | .00 | 1.500 | .000 | .00 | 1 | .0 |
| 17.260 | .0052 | - | -1- | -1- | -1- | .0045 | .08 | 1.68 | .00 | 1.14 | .013 | .00 | .00 | PIPE | |
| 1466.610 | 5.250 | 1.671 | 6.921 - - | 7.05 | 3.99 | .25 | 7.17 | 00 | 1.03 | .00 | 1.500 | .000 | .00 | 1 | .0 |
| JUNCT STR | .0000 | - | -1- | -1- | -1- | .0043 | .00 | 1.67 | .00 | — | .013 | .00 | .00 | PIPE | |
| 1466.910 | 5.250 | 1.705 | 6.955 - - | 6.77 | 3.83 | .23 | 7.18 | .00 | 1.01 | .00 | 1.500 | .000 | .00 | 1 | .0 |
| 58.500 | .0050 | - | -1- | -1- | -1- | .0042 | .24 | 1.71 | .00 | 1.13 | .013 | .00 | .00 | PIPE | |
| 1525.410 | 5.540 | 1.659 - | 7.199 - - | 6.77 | 3.83 | .23 | 7.43 | .00 | 1.01 | .00 | 1.500 | .000 | .00 | 1 | .0 |
| JUNCT STR | .1667 | | | ı | ı | .0046 tion Analy | .02 | .00 | .00 | | .013 | .00 | .00 | PIPE | |
| 1529.430 - | 6.210 | 1.219 - | 7.429 - - | 1.55 - - | 2.86 - - | .13 - - | 7.56 - | .00 | .56 | .00 | .830 | .000 | .00 | - | .0 |

U/S DATA STATION INVERT SECT

ELEMENT NO 11 IS A SYSTEM HEADWORKS

1152.820 7.600 1

| FILE: C2AP10 | H.WSW | | WSPGW | / - EDIT I | C2AP10H | Version | 14.07 | | Date: | 2-12-202 | 0 Time: 7: | 2:21 |
|----------------------|--------------------------|---------------------------|--------------------|-------------------|------------------|--------------|--------|------------|-------------------|----------------|----------------------|------------|
| 1122. 0211110 | | WAT | TER SURFACE | | | | | | 2400. | 2 12 202 | PAGE | 1 |
| CARD SECT CODE NO | CHN NO OF AVE | PIER HEIGHT TH DIAMETE | 1 BASE ER WIDTH | ZL ZR | INV : | 7(1) Y(2 |) Y (3 | 3) Y(4) | Y(5) Y(6) | Y(7) Y | (8) Y(9) | Y(10) |
| | • | | | | | | | | | | | |
| CD 1 | 4 1 | 1.250 | | | | | | | | | | |
| CD 2 | 4 1 | .830 | | WSPG | TaT | | | | | | PAGE NO |) 1 |
| | WΑ | TER SURFACE E | PROFILE - T | | | | | | | | PAGE NC | , 1 |
| HEADING LINE | NO 1 IS - | DANA POINT HA | | | | STRUCTUR | E AREA | A PH 2B | | | | |
| HEADING LINE | NO 2 IS - | | | | | | | | | | | |
| | | PROPOSED STOR | RM DRAIN LA | TERAL C2-A | A | | | | | | | |
| HEADING LINE | | 10 VEAD CEODS | A MULTI CON | IDITETON MOI | . 4 41 | | | | | | | |
| | | 10-YEAR STORN | 1 - MHW CON | W S P G | | | | | | | PAGE NO |) 2 |
| | WA | TER SURFACE E | PROFILE - E | | | 3 | | | | | THOE NO | , 2 |
| ELEMENT NO | 1 IS A SYSTEM OU | | * | | | | | | | | | |
| | U/S DATA | STATION | INVERT SE | | | | | W | S ELEV | | | |
| | | 1002.830 | | 1 | | | | | 6.800 | | | |
| ELEMENT NO | 2 IS A REACH U/S DATA | * STATION | * INVERT SE | * | N | | | | RADIUS | ANGLE | ANG PT | MANI II |
| | U/S DATA | 1040.540 | | 1 | . 0 | | | | .000 | | -45.000 | MAN n 0 |
| ELEMENT NO | 3 IS A REACH | * | * | * | • 0 | | | | .000 | .000 | 49.000 | O |
| | U/S DATA | STATION | INVERT SE | CT | N | | | | RADIUS | ANGLE | ANG PT | MAN H |
| | | 1065.150 | 6.200 | 1 | .0 | 12 | | | .000 | .000 | .000 | 0 |
| ELEMENT NO | 4 IS A JUNCTION | * | * | * * | | | * | | * | | * | |
| | U/S DATA | STATION | | CT LAT-1 I | | | 000 | ~ | INVERT-3 IN | | | |
| | | 1069.150 | 6.300 | 1 2 | 1 .0 | | 908 | 3.722 | 7.930 RADIUS | 7.510 ANGLE | 67.700 -4 | 2.300 |
| | | | | | | | | | .000 | .000 | | |
| ELEMENT NO | 5 IS A REACH | * | * | * | | | | | •000 | • • • • • | | |
| | U/S DATA | STATION | INVERT SE | CT | N | | | | RADIUS | ANGLE | ANG PT | MAN H |
| | | 1069.350 | | 1 | .0 | L2 | | | .000 | .000 | 280 | 0 |
| ELEMENT NO | 6 IS A REACH | * | * | | | | | | | | | |
| | U/S DATA | STATION 1111.500 | INVERT SE | CT 1 | N . 0 | | | | RADIUS .000 | ANGLE .000 | ANG PT 45.000 | MAN H O |
| ELEMENT NO | 7 IS A REACH | * | 6.96U * | * | • 0 | LZ | | | .000 | .000 | 45.000 | U |
| ELEMENT NO | U/S DATA | STATION | INVERT SE | | N | | | | RADIUS | ANGLE | ANG PT | MAN H |
| | 0/0 211111 | 1116.480 | | 1 | . 0 | | | | .000 | .000 | 45.000 | 0 |
| ELEMENT NO | 8 IS A REACH | * | * | * | | | | | | | | |
| | U/S DATA | STATION | INVERT SE | | N | | | | RADIUS | ANGLE | ANG PT | |
| | | 1134.150 | 7.310 | 1 * * | . 0 | | * | | .000 | .000 | .000 | 0 |
| ELEMENT NO | 9 IS A JUNCTION | * | | | 7 T O N | | * | 0.4 | | 77DT 4 D | * 2 Dil 1 | |
| | U/S DATA | STATION 1134.200 | INVERT SE | CT LAT-1 I 1 2 | CAT-2 N 0 .0: | _ | 990 | Q4 .000 | INVERT-3 IN 7.520 | | ні з Рні 4 45.000 | .000 |
| | | 1134.200 | 7.510 | 1 2 | 0 .0. | | J J U | .000 | RADIUS | ANGLE | 43.000 | .000 |
| | | | | | | | | | .000 | .000 | | |
| | EMENT CONTAINED AN | | | | | | | | | | | |
| THE ABOVE EL | EMENT CONTAINED AN | INVERT ELEV | WHICH WAS | | | HE PREVIO | US INV | JERT ELEV | -WARNING | | | _ |
| | | men aunera - | | WSPG | | , | | | | | PAGE NO |) 3 |
| ELEWENT NO | WA 10 IS A REACH | TER SURFACE E | PROFILE - E | | KD LISTIN | j | | | | | | |
| EPENENI NO | IU IS A REACH | | | | N | | | | DILLUKA | ANGIE | ANC DT | мли п |

Page 1

N .012

ANG PT MAN H

.000 0

RADIUS

.000

ANGLE

.000

C2AP10H

U/S DATA STATION INVERT SECT

W S ELEV 1152.820 7.600 1 7.600

C2AP10H

PAGE 1

Date: 2-12-2020 Time: 7: 2:25

♠ FILE: C2AP10H.WSW W S P G W - CIVILDESIGN Version 14.07

Program Package Serial Number: 7132

WATER SURFACE PROFILE LISTING

DANA POINT HARBOR COMMERCIAL CORE PARKING STRUCTURE AREA PH 2B PROPOSED STORM DRAIN LATERAL C2-A

10-YEAR STORM - MHW CONDITION WSE=4.41

| ***** | **** | ***** | 10-1EAR 5 | : | CONDITIO | /N WSE-4 | • 4 | ***** | ***** | **** | ***** | ***** | **** | ***** | ** |
|---|------------------------|----------------------|------------------------|--|-------------------|--|------------------------|--------------------|-----------------------|-----------------------|---------------------|---------------------|------------|-----------------|-----------|
| Station_ | Invert Elev | Depth (FT) | Water Elev | Q (CFS) | Vel (FPS) | Vel Head | Energy Grd.El. | Super Elev | Critical Depth | Flow Top Width | Height/ DiaFT | Base Wt or I.D. | ZL_ | No Wt | |
| L/Elem ****** | Ch Slope | ***** | ***** | ***** | ****** | SF Ave | HF ****** | SE Dpth | Froude N | Norm Dp | "N" | X-Fall ***** | ZR **** | Type | |
| 1002.830 | 5.220 | 1.580 | 6.800 | 8.70 | 7.09 | .78 | 7.58 | .00 - | 1.14 | .00 | 1.250 | .000 | .00 | 1 | .0 |
| 37.710 | .0156 | - | — | — | | .0155 | .58 | 1.58 | .00 | 1.02 | .012 | .00 | 1 | PIPE | |
| 1040.540 | 5.810 | 1.689 | 7.499 | 8.70 | 7.09 | .78 | 8.28 | .00 | 1.14 | .00 | 1.250 | .000 | .00 | 1 | .0 |
| 24.610 | .0158 | l | | | | .0155 | .38 | 1.69 | .00 | 1.01 | .012 | .00 | .00 | PIPE | |
| 1065.150 | 6.200 | 1.679 | 7.879 | 8.70 | 7.09 | .78 | 8.66 | .00 | 1.14 | .00 | 1.250 | .000 | .00 | 1 | .0 |
| JUNCT STR | .0250 | l | | | | .0094 | .04 | 1.68 | .00 | I I | .012 | .00 | .00 | PIPE | |
| 1069.150 | 6.300 | 2.836 | 9.136 | 4.07 | 3.32 | .17 | 9.31 | .00 | .82 | .00 | 1.250 | .000 | .00 | 1 - | .0 |
| .200 | .0000 | | | | ' ' ! | .0034 | .00 | 2.84 | .00 | .00 | .012 | .00 | .00 | PIPE | |
| 1069.350 | 6.300 | 2.837 | 9.137 | 4.07 | 3.32 | .17 | 9.31 | .00 | .82 | .00 | 1.250 | .000 | .00 | 1 - | .0 |
| 42.150 | .0157 | | | | ' ' ! | .0034 | .14 | 2.84 | .00 | .60 | .012 | .00 | .00 | PIPE | |
| 1111.500 | 6.960 | 2.345 | 9.305 | 4.07 | 3.32 | .17 | 9.48 | .00 | .82 | .00 | 1.250 | .000 | .00 | 1 - | .0 |
| 4.980 | .0161 | | | | ' ' | .0034 | .02 | 2.34 | .00 | .59 | .012 | .00 | .00 | PIPE | |
| 1116.480 | 7.040 | 2.307 | 9.347 | 4.07 | 3.32 | .17 | 9.52 | .00 | .82 | .00 | 1.250 | .000 | .00 | 1 - | .0 |
| 17.670 | .0153 | ' ' | | | ' | .0034 | .06 I | 2.31 | .00 | .60 | .012 | .00 | .00 | PIPE | |
| 1134.150 | 7.310 | 2.097 | 9.407 | 4.07 | 3.32 | .17 | 9.58 | .00 | .82 | .00 | 1.250 | .000 | .00 | 1 | .0 |
| JUNCT STR | .0000 | ' | | | ' ' | .0027 | .00 | 2.10 | .00 | ' | .012 | .00 | .00 | PIPE | |
| 1134.200 | 7.310 | 2.210 | 9.520 | 3.08 | 2.51 | .10 | 9.62 | .00 | ' .71 | .00 | 1.250 | .000 | .00 | 1 | .0 |
| 18.620 ♠ FILE: C2 | .0156 AP10H.WSW | 1 | Dwagnam | | | | .04 SIGN Versio | 2.21 on 14.07 | .00 | .51 | .012 | .00 | | PIPE PAGE | 2 |
| Program Package Serial Number: 7132 WATER SURFACE PROFILE LISTING DANA POINT HARBOR COMMERCIAL CORE PARKING STRUCTURE AREA PH 2B PROPOSED STORM DRAIN LATERAL C2-A 10-YEAR STORM - MHW CONDITION WSE=4.41 | | | | | | | | | | | | :5 | | | |
| ***** | ********** Invert | ********* Depth | *********** Water | ************************************** | ******** Vel | ************************************** | ********** Energy | ******* Super | ******** Critical | ******** Flow Top | ******* Height/ | ******* Base Wt | ***** | ***** No Wt | :** :h |
| | | | | | | | | | | | | | | | |

Page 1

| | | | | | | С | 2AP10H | | | | | | | |
|-----------------|----------|-----------|--------|-------|----------|---------------------|----------|---------|----------|---------|-------|---------------------|------------|---------|
| Station | Elev | (FT) | Elev | (CFS) | (FPS) | Head | Grd.El. | Elev | Depth | Width | DiaFT | or I.D. | ZL | Prs/Pip |
| L/Elem ***** | Ch Slope | ***** | ****** | ***** | | SF Ave ***** | HF | SE Dpth | Froude N | Norm Dp | - "N" | X-Fall ***** | ZR **** | Type Ch |
| 1152.820 | 7.600 | 1.956 | 1 | 3.08 | 2.51 | 10 | 9.65 | .00 | .71 | .00 | 1.250 | .000 | .00 | 1 .0 |

C2BP10H

U/S DATA STATION INVERT SECT 1027.790 8.000 1

| FILE: C2BP10 |)H.WSW | | WSPG | W - EDIT | LISTING | - Vers | sion 14 | .07 | | | Date: | 2-13-2 | 020 | Time: 9 | : 7:16 |
|---------------|---------------|----------------|------------|-------------|-----------|---------|---------|--------|------|--------|-------|--------|------|-----------|------------|
| | | W | ATER SURFA | CE PROFILE | - CHANNE | EL DEFI | NITION | LISTI | NG | | | | | PAGE | 1 |
| CARD SECT | | AVE PIER HEIGH | T 1 BASE | ZL ZF | R INV | Y(1) | Y(2) | Y(3) | Y(4) | Y(5) | Y(6) | Y(7) | Y(8) | Y(9) | Y(10) |
| CODE NO | TYPE PIER/PIE | WIDTH DIAME | TER WIDTH | | DROP | | | | | | | | | | |
| CD 1 | 4 1 | 1.250 | | | | | | | | | | | | | |
| CD I | 4 1 | 1.230 | | WSPO | W F | | | | | | | | | PAGE NO | 0 1 |
| | | WATER SURFACE | PROFILE - | | | 3 | | | | | | | | 11102 111 | _ |
| HEADING LINE | E NO 1 IS - | | | | | | | | | | | | | | |
| | | DANA POINT | HARBOR COM | MERCIAL COR | RE PARKII | NG STRU | JCTURE | AREA P | H 2B | | | | | | |
| HEADING LINE | E NO 2 IS - | | | | | | | | | | | | | | |
| | | PROPOSED ST | ORM DRAIN | LATERAL C2- | -B | | | | | | | | | | |
| HEADING LINE | E NO 3 IS - | 40 | | | | | | | | | | | | | |
| | | 10-YEAR STO | RM - MHW C | | | | | | | | | | | PAGE NO | 0 2 |
| | | WATER SURFACE | DDOETIE _ | WSP C | | INC | | | | | | | | PAGE NO | <i>J</i> 2 |
| ELEMENT NO | 1 IS A SYSTE | | * | * | AND LIST. | LNG | | | | | | | | | |
| DDDIIDIVI IVO | U/S D | | INVERT | SECT | | | | | W | S ELEV | , | | | | |
| | -, - | 1002.160 | | 1 | | | | | | 9.13 | 0 | | | | |
| ELEMENT NO | 2 IS A REACH | * | * | * | | | | | | | | | | | |
| | U/S D | ATA STATION | INVERT | SECT | | N | | | | RA | DIUS | ANGI | E | ANG PT | MAN H |
| | | 1006.310 | | 1 | | .012 | | | | | 000 | .000 | 2 | 2.506 | 0 |
| ELEMENT NO | 3 IS A REACH | | * | * | | | | | | | | | | | |
| | U/S D | | INVERT | | | N | | | | | DIUS | ANGI | | ANG PT | MAN H |
| | | 1027.790 | 8.000 | 1 | | .012 | | | | • | 000 | .000 | ' | .000 | 0 |
| ELEMENT NO | 4 IS A SYSTE | | | | | | | | | | | | | | |

W S ELEV 8.000

W S P G W - CIVILDESIGN Version 14.07

Program Package Serial Number: 7132

WATER SURFACE PROFILE LISTING

PAGE 1

Date: 2-13-2020 Time: 9: 7:19

DANA POINT HARBOR COMMERCIAL CORE PARKING STRUCTURE AREA PH 2B PROPOSED STORM DRAIN LATERAL C2-B

10-YEAR STORM - MHW CONDITION WSE=4.41

| *************************************** | | | | | | | | | | | | ***** | | |
|---|------------|--------|-------|--------|----------------|--------|----------|---------|-------------|----------|-------------------|---------|---------|----------|
| | Invert | Depth | Water | Q | Vel | Vel | Energy | 1 - | 1 | Flow Top | | | | No Wth |
| Station | Elev | (FT) | Elev | (CFS) | (FPS) | Head | Grd.El. | Elev | Depth | Width | DiaFT | or I.D. | ZL _ | Prs/Pip |
| L/Elem | Ch Slope | | | | | SF Ave | HF | SE Dpth | Froude N | Norm Dp | "N" | X-Fall | ZR | Type Ch |
| ***** | ****** | ***** | ***** | ***** | ****** | ***** | ***** | ***** | ****** | ****** | ***** | ***** | **** | ***** |
| 1002.160 | 6.300 | 2.830 | 9.130 | 3.72 | 3.03 | .14 | 9.27 | .00 | .78 | .00 | 1.250 - | .000 | .00 | 1 .0 |
| 4.150 | .0651 | l I | | l I | I I | .0028 | .01 | 2.83 | .00 | .39 | .012 | .00 | .00 | PIPE |
| 1006.310 | 6.570 | 2.582 | 9.152 | 3.72 | 3.03 | .14 | 9.30 | .00 | .78 | .00 | 1.250 | .000 | .00 | 1 .0 |
| 20.901 | .0666 I | l I | | | | .0028 | .06 | 2.58 | .00 | .39 | .012 | .00 | .00 | PIPE |
| 1027.211 | 7.961 | 1.250 | 9.211 | 3.72 | 3.03 | .14 | 9.35 | .00 | .78 | .00 | 1.250 | .000 | .00 | 1 .0 |
| .579 | .0666 | | | ' | ' ' | .0026 | .00 | 1.25 | .00 | .39 | .012 | .00 | .00 | PIPE |
| 1027.790 | 8.000 | 1.210 | 9.210 | 3.72 | ' 3.06 | .15 | 9.36 | .00 | .78 | .44 | ' 1.250 | .000 | .00 | 1 .0 |

Page 1

C2CP10H

U/S DATA STATION INVERT SECT 1029.390 8.000 1

| FILE: | C2CP10 | H.WSW | | | | | WSPG | - W | EDIT I | TSTING | - Vers | sion 14 | . 07 | | | Date: | 2-13-2 | 020 | Time: 9 | :35:21 | |
|--------|--------|-------|-------|----------|---------|-----------|-------------------------|---------|--------|---------|---------|---------|--------|------|--------|-------|--------|-------|---------|--------|--|
| | 020110 | | | | | | | | | CHANNE | | | | | | zacc. | 2 10 2 | 020 | PAGE | | |
| CARD | SECT | CHN | NO | OF AVE | PIER | HEIGHT 1 | | ZL | ZR | INV | | | | | Y(5) | Y(6) | Y(7) | Y(8) | | | |
| CODE | NO | TYPE | PIE | R/PIP WI | DTH | DIAMETER | WIDTH | | | DROP | ` , | ` , | (-, | ` , | (- / | (- / | ` , | (- , | (-, | , -, | |
| | | | | | | | | | | | | | | | | | | | | | |
| CD | 1 | 4 | 1 | L | 1 | .250 | | | | | | | | | | | | | | | |
| | | | | | | | | W | SPG | W | | | | | | | | | PAGE NO |) 1 | |
| | | | | W | ATER SU | JRFACE PR | OFILE - | TITLE | CARD | LISTING | ; | | | | | | | | | | |
| HEADIN | G LINE | NO 1 | IS - | _ | | | | | | | | | | | | | | | | | |
| | | | | | DANA P | OINT HAR | BOR COM | MERCIA | L CORE | PARKIN | IG STRU | JCTURE | AREA P | H 2B | | | | | | | |
| HEADIN | G LINE | NO 2 | IS - | - | | | | | | | | | | | | | | | | | |
| | | | | | PROPOS | SED STORM | DRAIN | LATERA | L C2-C | | | | | | | | | | | | |
| HEADIN | G LINE | ио з | IS - | - | | | | | | | | | | | | | | | | | |
| | | | | | 10-YEA | AR STORM | MHW C | CONDITI | ON WSE | =4.41 | | | | | | | | | | | |
| | | | | | | | | | S P G | | | | | | | | | | PAGE NO | 2 | |
| | | | | | | JRFACE PR | OFILE - | ELEME | NT CAR | D LISTI | NG | | | | | | | | | | |
| ELEME | ON THE | 1 I: | | SYSTEM O | | * | * | * | | | | | | | | | | | | | |
| | | | Ţ | J/S DATA | | | NVERT | | | | | | | W | S ELEV | | | | | | |
| | | | | | | | 5.790 | 1 | | | | | | | 7.43 | 30 | | | | | |
| ELEME | INT NO | 2 I: | | REACH | | * | * | * | | | | | | | | | | | | | |
| | | | Ţ | J/S DATA | | | | SECT | | | N | | | | | ADIUS | ANGL | | ANG PT | | |
| | | _ | | | | | 6.090 | 1 | | • | 012 | | | | | .000 | .000 | -4 | 5.000 | 0 | |
| ELEME | INT NO | 3 I: | | REACH | | * | * | * | | | | | | | | | | | | | |
| | | | Ţ | J/S DATA | | | NVERT | | | | N | | | | | ADIUS | ANGL | | ANG PT | | |
| | | 4 - | | | | | 8.000 | 1 | | • | 012 | | | | | .000 | .000 | | .000 | 0 | |
| ELEME | ON THE | 4 I: | 3 A S | SYSTEM H | EADWORK | S | | * | | | | * | | | | | | | | | |

W S ELEV 8.000

C2CP10H

PAGE 1

Date: 2-13-2020 Time: 9:35:24

W S P G W - CIVILDESIGN Version 14.07

Program Package Serial Number: 7132

WATER SURFACE PROFILE LISTING

DANA POINT HARBOR COMMERCIAL CORE PARKING STRUCTURE AREA PH 2B PROPOSED STORM DRAIN LATERAL C2-C

10-YEAR STORM - MHW CONDITION WSE=4.41

♠ FILE: C2CP10H.WSW

| ************************************** | | | | | | | | | | | | | | | |
|---|--------------------|---------------|---------------|------------|------------------|-------------------|---------------------|-----------------|-------------------|-------------------|------------------|-----------------|------------|--------------|----|
| Station_ | Invert Elev | Depth (FT) | Water Elev | Q (CFS) | Vel (FPS) | Vel Head | Energy Grd.El. | Super Elev | Critical Depth | Flow Top Width | Height/ DiaFT | Base Wt | ZL _ | No Wt | |
| L/Elem ****** | Ch Slope | ***** | ***** | ***** | ****** | SF Ave | HF ****** | SE Dpth | Froude N | Norm Dp | "N" | X-Fall ***** | ZR **** | Type | |
| 1002.840 | 5.790 | 1.640 | 7.430 | 4.39 | 3.58 | .20 | 7.63 | .00 | .85 - | .00 | 1.250 | .000 | .00 | 1 | .0 |
| 1.325 | | | | | I I | .0039 | .01 | 1.64 | .00 | .40 | .012 | .00 | .00 | PIPE | |
| 1004.165 | 5.900 | 1.545 | 7.446 | 4.39 | 3.58 | .20 | 7.64 | .00 | .85 | .00 | 1.250 | .000 | .00 | 1 - | .0 |
| HYDRAULIC | 1 | l | | | l | | I I | ! ! | I I | ! ! | ! ! | I I | I I | 1 | |
| 1004.165 | 5.900 | .438 | 6.338 | 4.39 | 11.46 | 2.04 | 8.38 | .00 | .85 | 1.19 | 1.250 | .000 | .00 | 1 | .0 |
| 2.285 | .0831 | | | | I I | .0546 | .12 | .44 | 3.56 | .40 | .012 | .00 | .00 | PIPE | |
| 1006.450 | 6.090 | .447 | 6.537 | 4.39 | - 11.14 | 1.93 | 8.46 | .00 | .85 | 1.20 | 1.250 | .000 | .00 | 1 - | .0 |
| .040 | .0833 | | | | ' | .0525 | .00 | .45 | 3.42 | .40 | .012 | .00 | .00 | PIPE | |
| 1006.490 | 6.093 | .447 | 6.540 | 4.39 | ' 11.14 | 1.93 | 8.47 | .00 | .85 | 1.20 | 1.250 | .000 | .00 | 1 - | .0 |
| 4.682 | .0833 | | | | ' | .0493 | .23 | .45 | 3.42 | .40 | .012 | .00 | .00 | PIPE | |
| 1011.172 | 6.483 | .463 | 6.946 | 4.39 | 10.62 | 1.75 | 8.70 | .00 | .85 | ' 1.21 | 1.250 | .000 | .00 | 1 - | .0 |
| 3.559 | .0833 | ' | | | ' ' | .0432 | .15 | .46 | 3.20 | .40 | .012 | .00 | .00 | PIPE | |
| 1014.731 | 6.779 | .480 | 7.259 | 4.39 | ' 10.13 | 1.59 | 8.85 | .00 | .85 | 1.22 | 1.250 | .000 | .00 | 1 - | .0 |
| 2.810 | .0833 | ' | ' | | ' ' | .0379 | ' .11 | .48 | 2.99 | .40 | .012 | .00 | .00 | PIPE | |
| 1017.541 | 7.013 | .497 | 7.511 | 4.39 | ' 9.66 | 1.45 | ' 8.96 | .00 | .85 | 1.22 | 1.250 | .000 | .00 | 1 - | .0 |
| 2.270 | .0833 | | | | I | .0333 | .08 | .50 | 2.79 | .40 | .012 | .00 | .00 | PIPE | |
| 1019.812 | 7.203 | .515 | 7.718 | 4.39 | 9.21 | 1.32 | 9.03 | .00 | .85 | 1.23 | 1.250 | .000 | .00 | 1 - | .0 |
| 1.864 ♠ FILE: C20 | .0833 CP10H.WSW | | | W S | PGW- | .0292 CIVILDES | .05 SIGN Version | .52 on 14.07 | 2.61 | .40 | .012 | .00 | | PIPE PAGE | 2 |
| Program Package Serial Number: 7132 WATER SURFACE PROFILE LISTING Dana POINT HARBOR COMMERCIAL CORE PARKING STRUCTURE AREA PH 2B PROPOSED STORM DRAIN LATERAL C2-C 10-YEAR STORM - MHW CONDITION WSE=4.41 | | | | | | | | | | | | 24 | | | |
| ************************************** | | | | | | | | | | | | r** :h | | | |

Page 1

C2CP10H Width Station Elev (FT) Elev (CFS) (FPS) Head Grd.El. Elev Depth |Dia.-FT|or I.D.| $_{\rm ZL}$ Prs/Pip SF Ave "N" L/Elem Ch Slope HF SE Dpth Froude N Norm Dp X-Fall Type Ch ***** .534 .000 1021.676 7.358 9.09 1.250 7.892 4.39 8.78 1.20 .00 .85 1.24 .00 1 .0 .0833 .0256 .04 2.43 .40 .012 .00 .00 PIPE 1.546 .53 1023.222 7.486 .554 8.040 4.39 8.37 1.09 9.13 .00 .85 1.24 1.250 .000 .00 1 . 0 .0833 .0225 .03 .55 .40 .012 1.289 2.27 .00 .00 PTPE 1024.511 7.594 .574 8.168 4.39 7.98 .99 9.16 .00 .85 1.25 1.250 .000 .00 1 .57 .00 1.078 .0833 .0198 .02 2.12 .40 .012 .00 PIPE 1025.589 7.684 .596 8.279 4.39 7.61 .90 9.18 .00 .85 1.25 1.250 .000 .00 1 . 0 .0833 .0174 .02 1.97 .012 .00 .898 .60 .40 .00 PIPE 1026.488 7.758 .619 8.377 4.39 7.25 .82 9.19 .00 .85 1.25 1.250 .000 .00 1 .747 .0833 .01 .40 .0154 .62 1.84 .012 .00 .00 PIPE 1027.234 7.821 .74 9.21 1.25 .642 8.463 4.39 6.92 .00 .85 1.250 .000 .00 1 .012 .00 .612 .0833 .0135 .01 .64 1.71 .40 .00 PIPE 1027.846 .000 7.871 .667 8.538 4.39 6.60 9.21 .85 1.25 .68 .00 1.250 .00 1 . 0 - | .0833 .0119 .01 .012 .00 .00 .495 .67 1.59 .40 PIPE 6.29 .000 1028.341 7.913 .693 8.606 4.39 .61 9.22 .00 .85 1.24 1.250 .00 1 .0 .389 .0833 .0105 .00 .69 1.48 .40 .012 .00 .00 PIPE 1028.730 7.945 .721 8.666 4.39 6.00 .56 9.22 .00 .85 1.24 1.250 .000 .00 1 .293 .0833 .0093 .00 .72 1.37 .40 .012 .00 .00 PIPE ♠ FILE: C2CP10H.WSW W S P G W - CIVILDESIGN Version 14.07 PAGE 3 Program Package Serial Number: 7132 Date: 2-13-2020 Time: 9:35:24

WATER SURFACE PROFILE LISTING

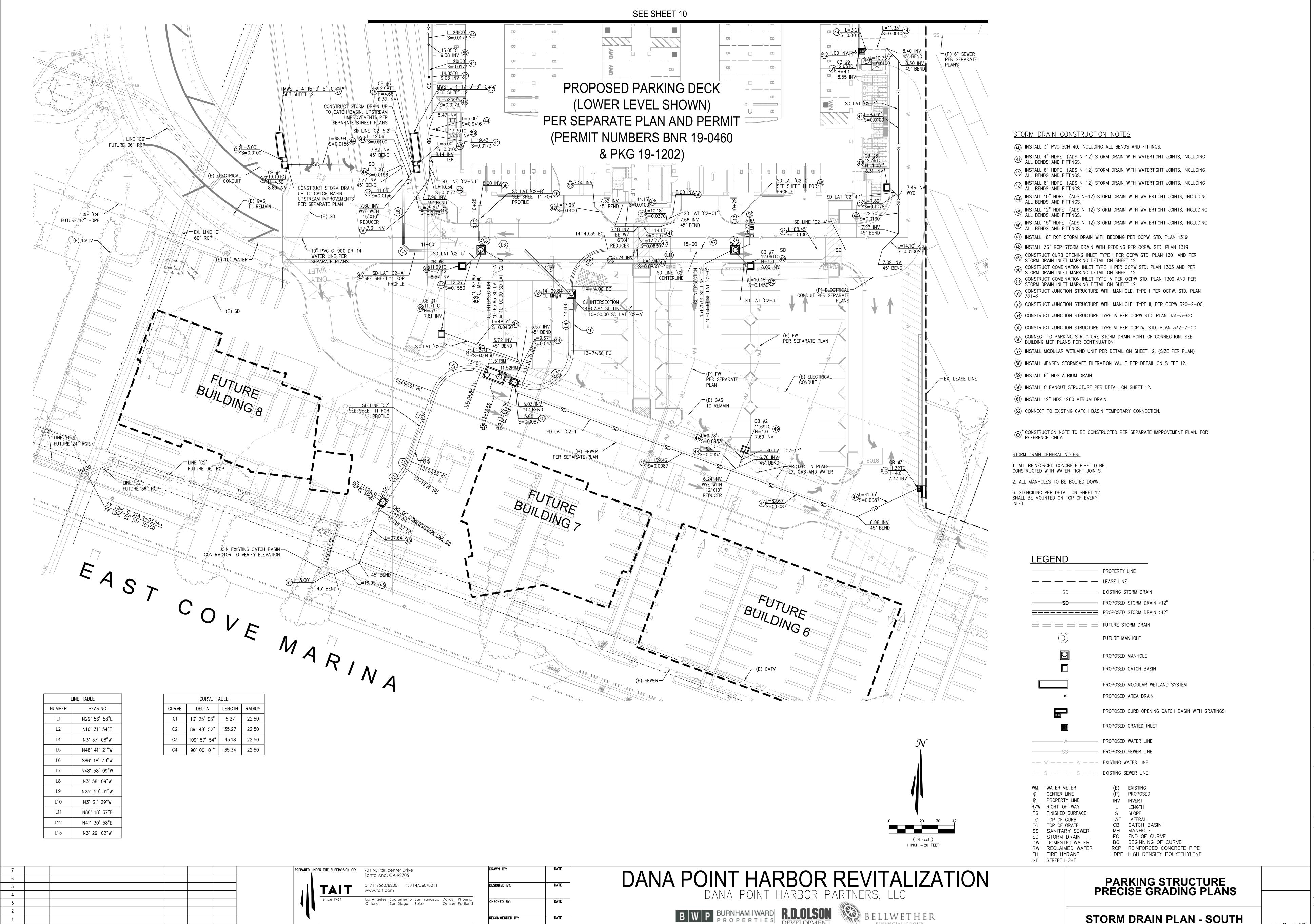
DANA POINT HARBOR COMMERCIAL CORE PARKING STRUCTURE AREA PH 2B PROPOSED STORM DRAIN LATERAL C2-C

10-YEAR STORM - MHW CONDITION WSE=4.41

| *************************************** | | | | | | | | | | | | | ***** | * | |
|---|----------|-------|--------|-------|--------|--------|---------|---------|----------|----------|---------|---------|-------|---------|---|
| | Invert | Depth | Water | Q | Vel | Vel | Energy | Super | Critical | Flow Top | Height/ | Base Wt | | No Wth | |
| Station | Elev | (FT) | Elev | (CFS) | (FPS) | Head | Grd.El. | Elev | Depth | Width | DiaFT | or I.D. | ZL | Prs/Pij | р |
| - | | | | | | | | | | | | | | | |
| L/Elem | Ch Slope | | | | | SF Ave | HF | SE Dpth | Froude N | Norm Dp | "N" | X-Fall | ZR | Type Cl | h |
| ****** | ****** | ***** | ****** | ***** | ****** | ***** | ***** | ***** | ****** | ****** | ***** | ***** | **** | **** | * |
| | | | | | | | | | | | | | | | |
| 1029.023 | 7.969 | .750 | 8.719 | 4.39 | 5.72 | .51 | 9.23 | .00 | .85 | 1.22 | 1.250 | .000 | .00 | 1 . | 0 |
| _ | | | | | | | | | | | | | - | - | |
| .204 | .0833 | | | | | .0082 | .00 | .75 | 1.27 | .40 | .012 | .00 | .00 | PIPE | |

| C2CP10H | | | | | | | | | | | | | | | |
|----------|-------|-------|-------|------|------|-------|------|-----|------|------|-------|------|-----|------|----|
| | | | | | | | | | | | | | | | |
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| - | - | - - | - - | - - | - | - - | - | · | | | | | - | - | |
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| .041 | .0833 | | | | | .0065 | .00 | .81 | 1.09 | .40 | .012 | .00 | .00 | PIPE | |
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| - - | - | - - | - - | - - | - | - - | - | · | | | | | - | - | |

APPENDIX D - STORM DRAIN PLAN AND PROFILES



NO. DATE

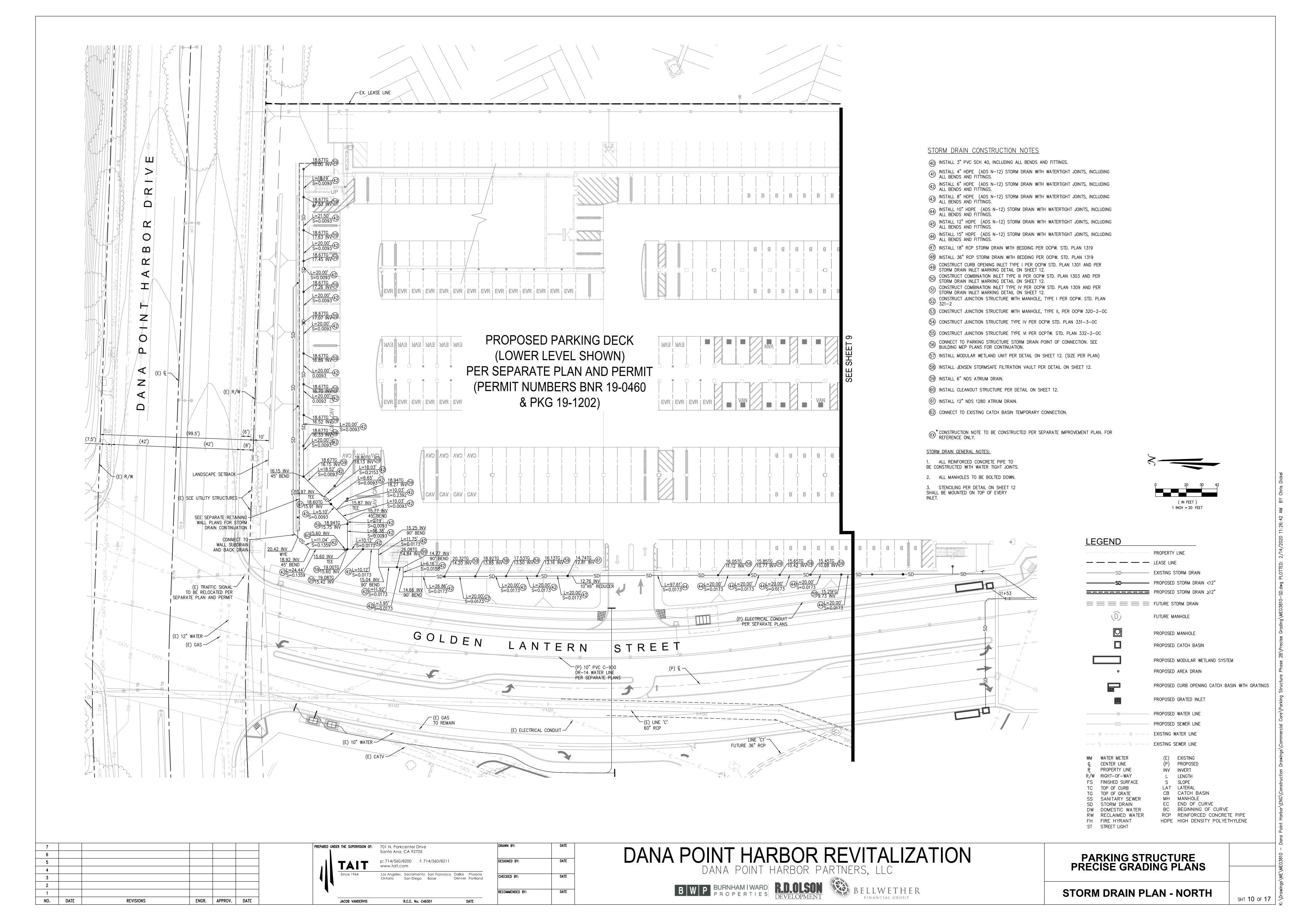
REVISIONS

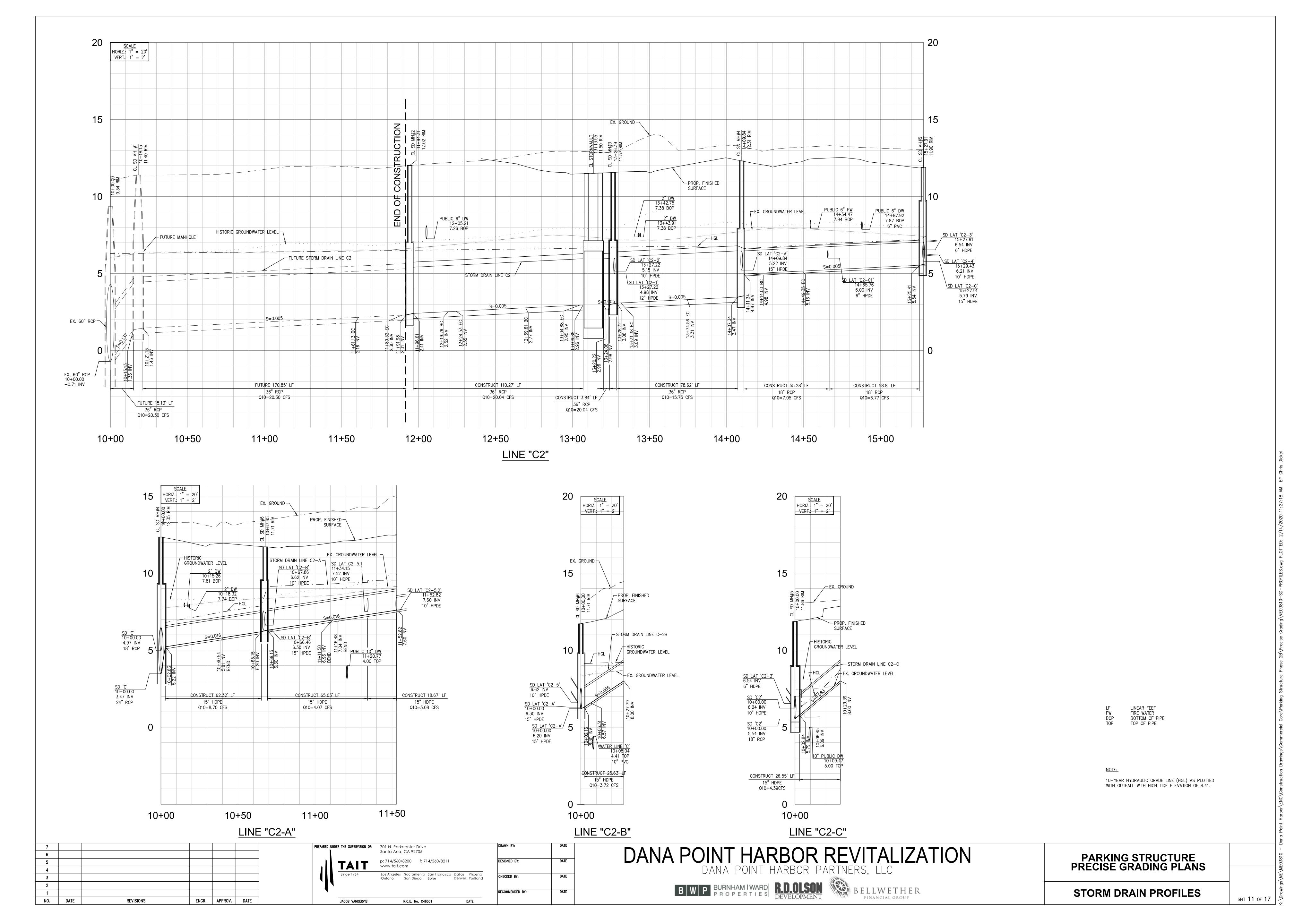
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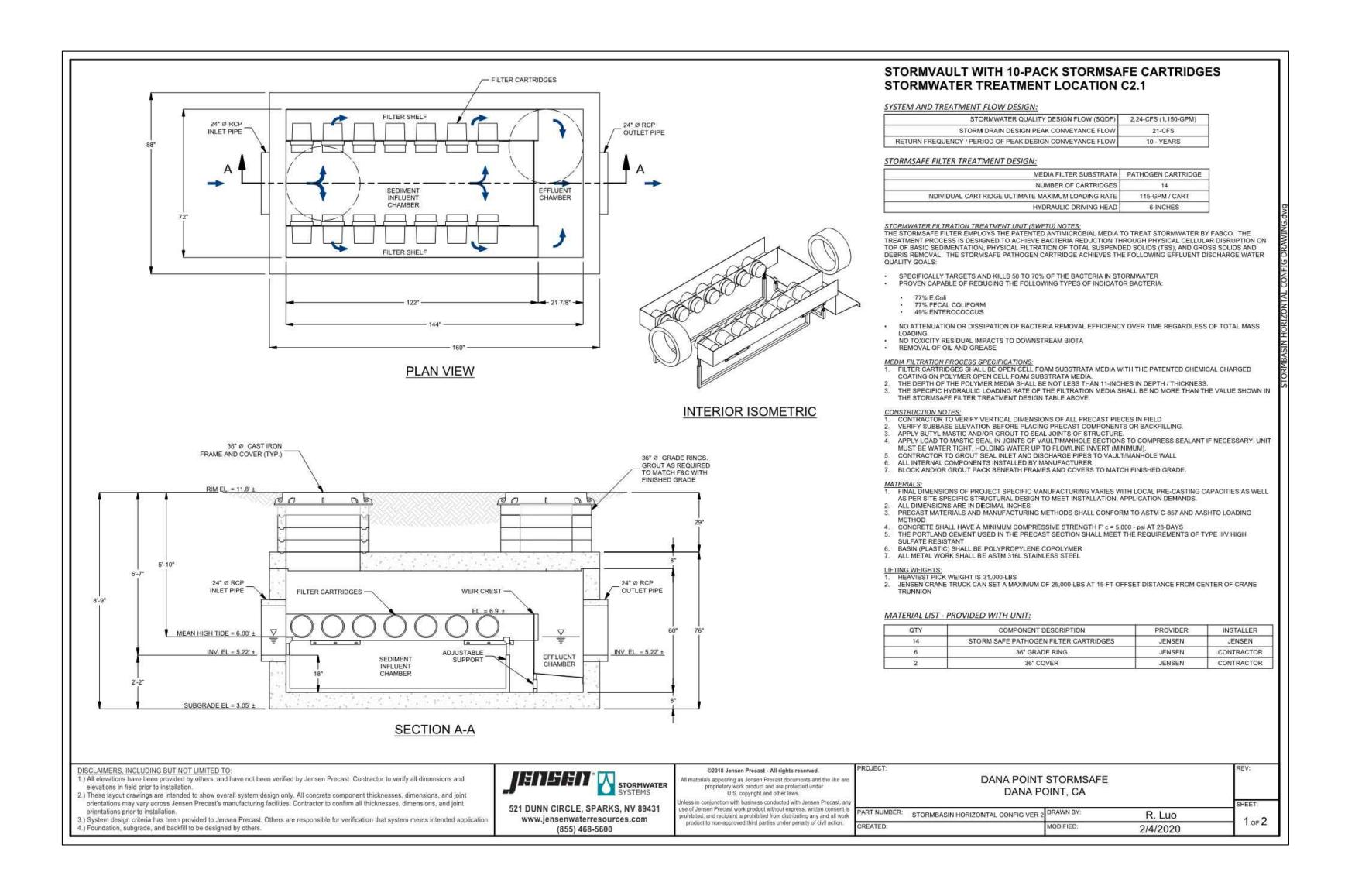
JACOB VANDERVIS

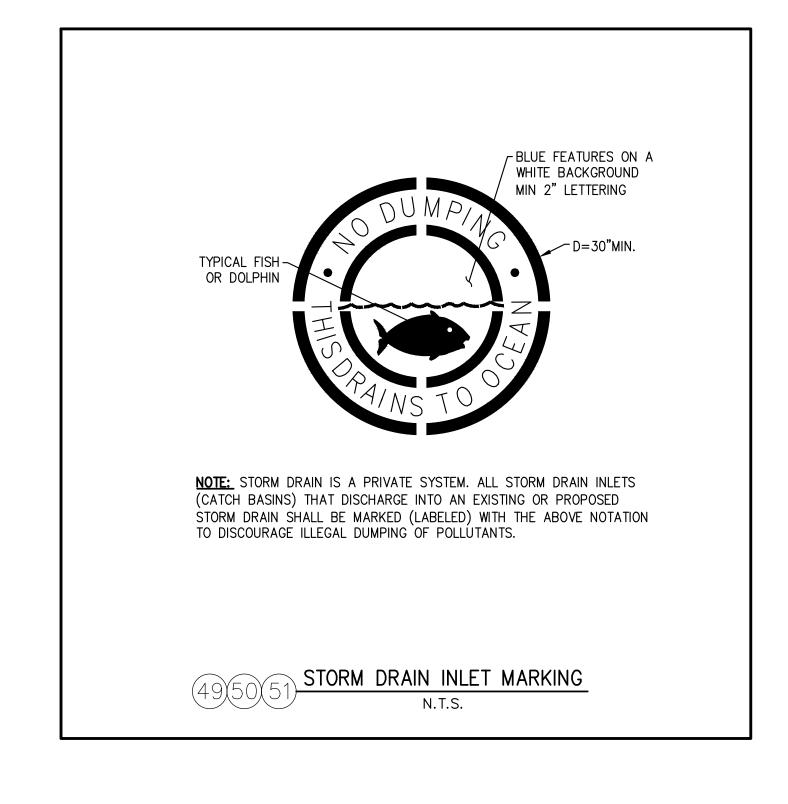
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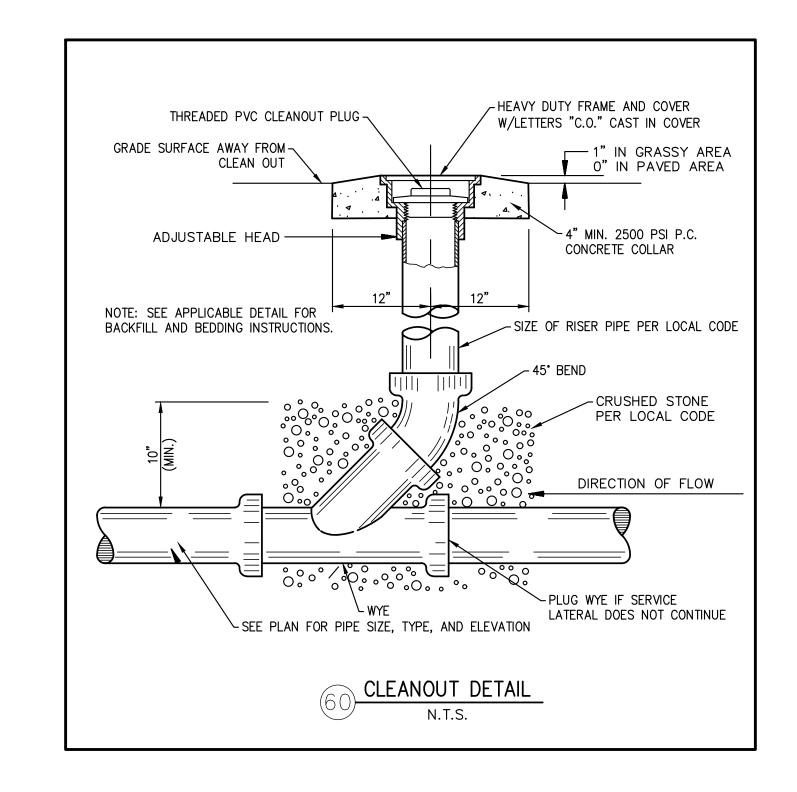
SHT 9 OF 17

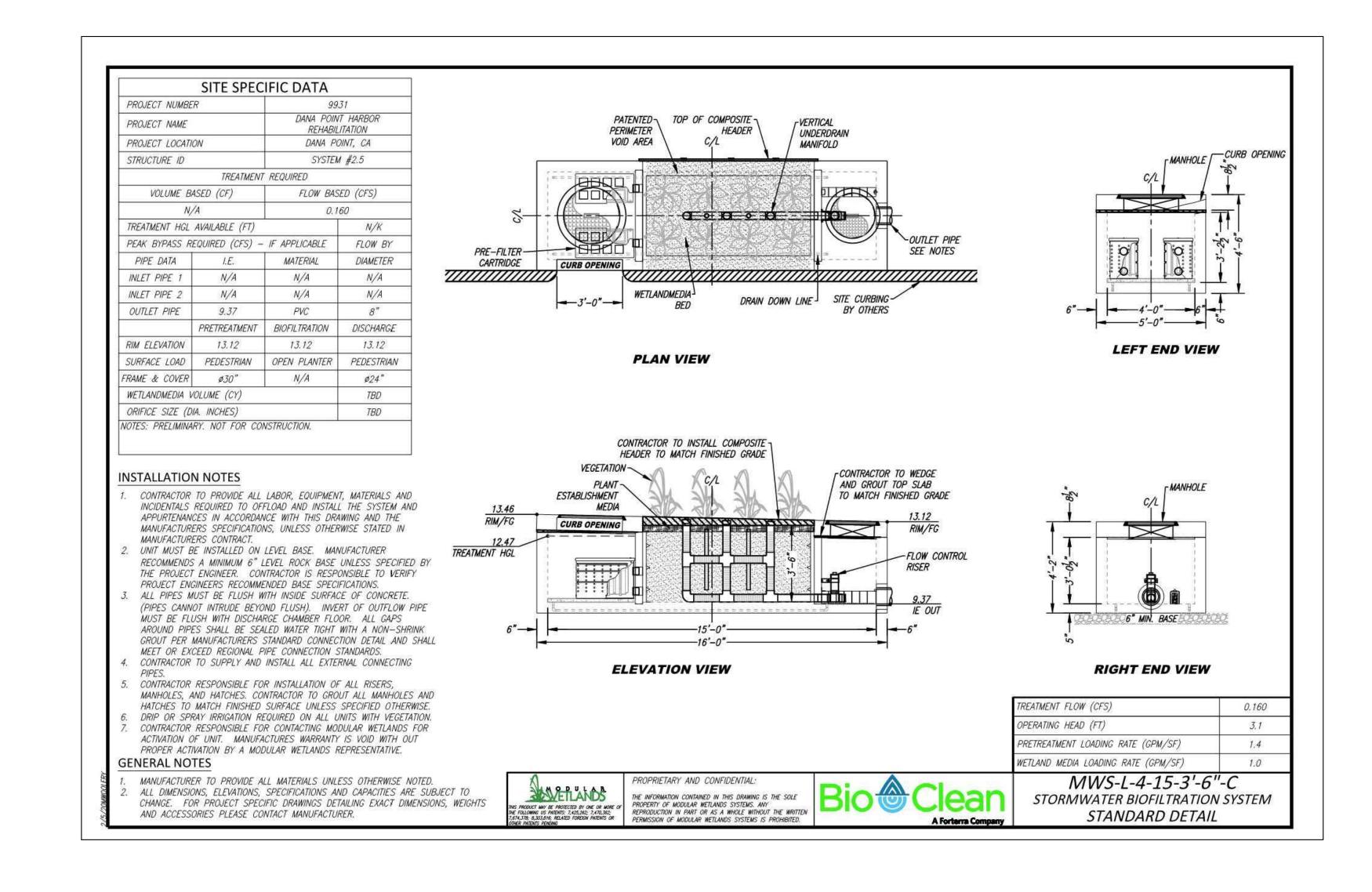


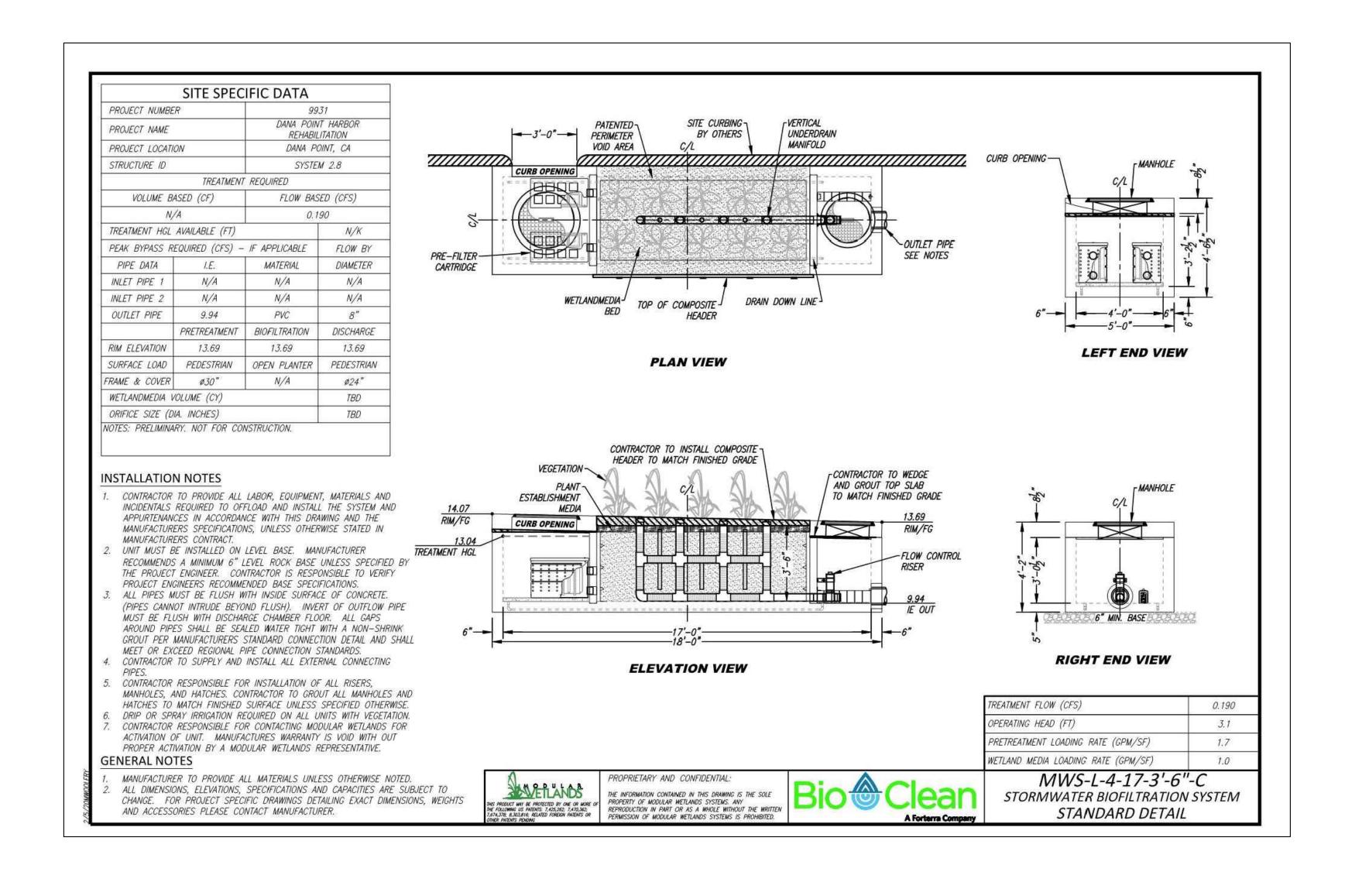


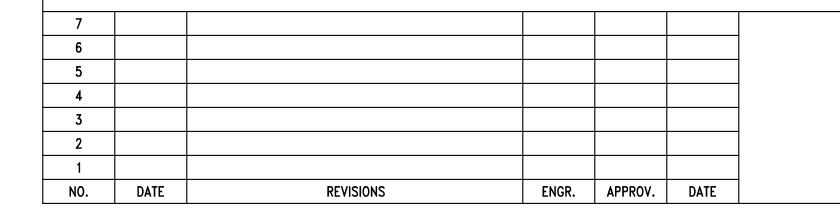














DANA POINT HARBOR REVITALIZATION

DANA POINT HARBOR PARTNERS, LLC

B W P BURNHAMIWARD





PARKING STRUCTURE PRECISE GRADING PLANS

STORM DRAIN DETAILS

SHT **12** OF **17**

APPENDIX E - CATCH BASIN SIZING

```
HYDRAULIC ELEMENTS - I PROGRAM PACKAGE

(C) Copyright 1982-2016 Advanced Engineering Software (aes)

Ver. 23.0 Release Date: 07/01/2016 License ID 1334
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Analysis prepared by:

```
TIME/DATE OF STUDY: 11:12 02/05/2020
Problem Descriptions:
 CB No. 9
 Area C2.1
********************
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   Public Roads nomograph plots for flowby basins and sump basins.
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   BASIN OPENING (FEET) = 0.50
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DEPTH OF WATER (FEET) = 0.50

hele1.tmp

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| Problem Descriptions: CB No. 4 Area C2.8 |
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| Problem Descriptions: CB No. 5 Area C2.9 |
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| Problem Descriptions: CB No. 3 Area C2.10A |
| ************************************** |

1.60

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Page 3

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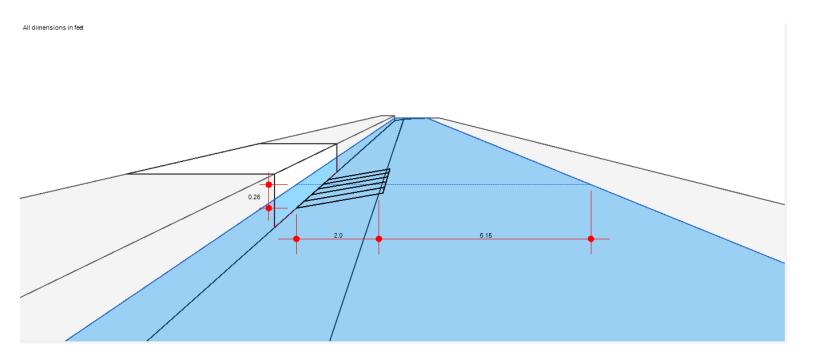
Inlet Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc.

Monday, Feb 10 2020

CB No. 9

| Grate Inlet | | Calculations | |
|--------------------|---------|---------------------|---------|
| Location | = Sag | Compute by: | Known Q |
| Curb Length (ft) | = -0- | Q (cfs) | = 1.51 |
| Throat Height (in) | = -0- | | |
| Grate Area (sqft) | = 2.57 | Highlighted | |
| Grate Width (ft) | = 2.10 | Q Total (cfs) | = 1.51 |
| Grate Length (ft) | = 2.45 | Q Capt (cfs) | = 1.51 |
| | | Q Bypass (cfs) | = -0- |
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| Slope, Sw (ft/ft) | = 0.080 | Efficiency (%) | = 100 |
| Slope, Sx (ft/ft) | = 0.020 | Gutter Spread (ft) | = 7.15 |
| Local Depr (in) | = -0- | Gutter Vel (ft/s) | = -0- |
| Gutter Width (ft) | = 2.00 | Bypass Spread (ft) | = -0- |
| Gutter Slope (%) | = -0- | Bypass Depth (in) | = -0- |
| Gutter n-value | = 0.013 | | |
| | | | |



APPENDIX F - MASTER PLAN OF DRAINAGE

Master Plan of Drainage

for

Dana Point Harbor

Commercial Core Retail & Dry Stack Lease Areas

Permit No. GRD19-0177

Dana Point, California
January, 2020

This Hydrology Study has been prepared by, and under the direction of, the undersigned, a duly Registered Civil Engineer in the State of California. Except as noted, the undersigned attests to the technical information contained herein, and has judged to be acceptable the qualifications of any technical specialists providing engineering data for this pepert, upon which findings, conclusions, and recommendations are based.

Jacob Vandervis, PE

Registered Civil Engineer No. C46301

Exp.: 12/31/20

Prepared for:



Prepared by:







Dana Point Harbor Partners, LLC & Dana Point Harbor Partner Dry Stack, LLC

1100 Newport Center Drive, Suite 200 Newport Beach, CA 92660



Tait & Associates, Inc.

701 N. Parkcenter Drive Santa Ana, CA 92705 (714) 560-8200

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ABBREVIATIONS

AES: Advanced Engineer Software BMP: Best Management Practices

CCA: Commercial Core Area

CCRA: Commercial Core Retail Area CDP: Coastal Development Plan

DPH: Dana Point Harbor DSA: Dry Stack Lease Area

DMA: Drainage Management Area

HGL: Hydraulic Grade Line LDM: Local Drainage Manual

NRCS: National Resources Conservation Service

OCHM: Orange County Hydrology Manual WQMP: Water Quality Management Plan

WQ: Water Quality

i

TAIT JOB NO.ME03810

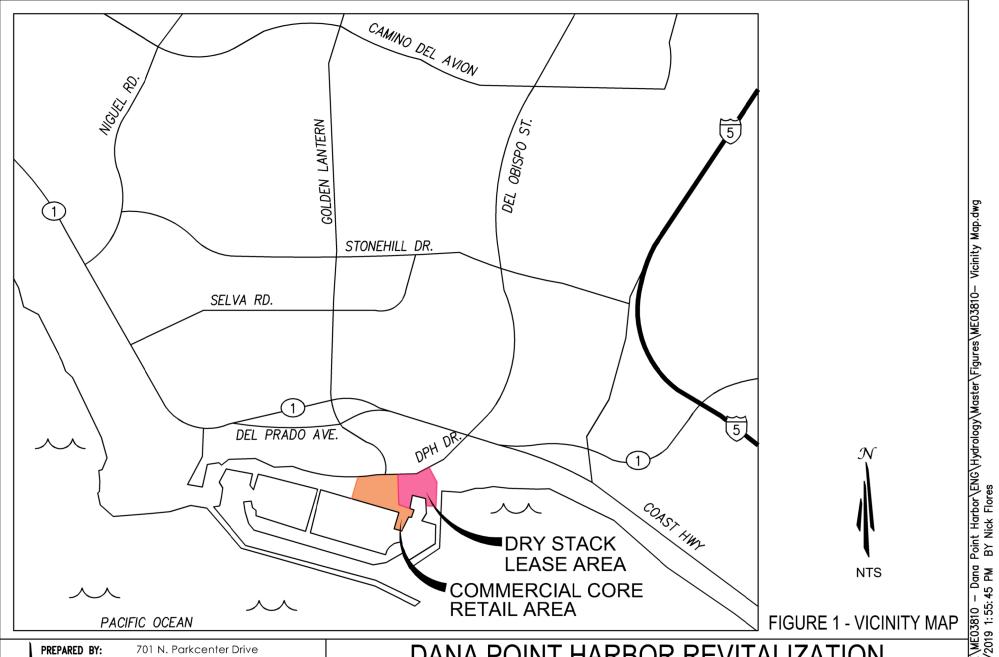
SECTION 1 INTRODUCTION AND BACKGROUND

The Master Plan of Drainage (MPD) study provides a storm water runoff management program analysis and drainage design for the proposed Dana Point Harbor (DPH or Harbor) Revitalization Project for the Commercial Core Area (CCA) approved under Coastal Development Plan (CDP) 13-0018(1), which includes the Commercial Core Retail Area (CCRA) and the Dry Stack Lease Area (DSA). The analysis on this study incorporates hydrology and hydraulic design of the storm drain system for flood control and water quality treatment purposes. This MPD analyses the existing drainage patterns and provides preliminary proposed condition calculations for the CCA. It determines the existing storm drainage capacity, preliminary location of proposed inlets and storm drain systems. In addition, this Report outlines a program for future Water Quality Best Management Practices (BMPs) designed to meet the South Orange County regulations. The MPD will serve as a guideline for future studies to be prepared for final construction documents for the CCRA and DSA. The recommendations of this MPD will reduce potential hydrologic impacts to the appropriate levels as described in this document. This study was prepared following the requirements set forth by the Orange County Hydrology Manual (OCHM), dated 1986, and its 1996 Addendum and the Orange County Local Drainage Manual (LDM), dated January 1996.

DPH encompasses approximately 276.8 acres, owned by the County of Orange (County), and located in the southern portion of the City of Dana Point (City). The proposed CCA improvements within DPH constitute approximately 30 acres. DPH is bordered by the Pacific Ocean to the south, Dana Point Headlands and Old Cove Marine Preserve to the west, Doheny State Beach to the east and a variety of commercial, hotel, residential and public park uses to the north. The Interstate-5 freeway is located approximately two miles to the east and provides regional access to the Harbor. The City lies in the southwest portion of Orange County, in the State of California and it is part of the larger Southern California Region. It was incorporated on January 1st, 1989 and comprises of approximately 6.5 square miles. See Figure 1 Vicinity Map for project location.

The Dana Point Harbor Revitalization Plan has been in process since the late 1990's. The project goal is to improve the Harbor's boat slips, retail center, boater facilities and parking, and storm water quality treatment. The Dana Point Harbor is owned by the County of Orange and it is currently under a 66-year operating and maintenance lease agreement with the DPH Partners, LLC. and DPH Partners Drystack, LLC. which includes: Burnham Ward Properties, R.D. Olson Development and Bellwether Financial Group. Burnham Ward Properties will develop the Commercial Core Retail Area, R.D. Olson will develop the Hotel Area, and Bellwether Financial Group will develop the Marina portion and the Dry Stack Lease Area.

TAIT JOB NO.ME03810





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DANA POINT HARBOR REVITALIZATION

DANA POINT HARBOR PARTNERS, LLC



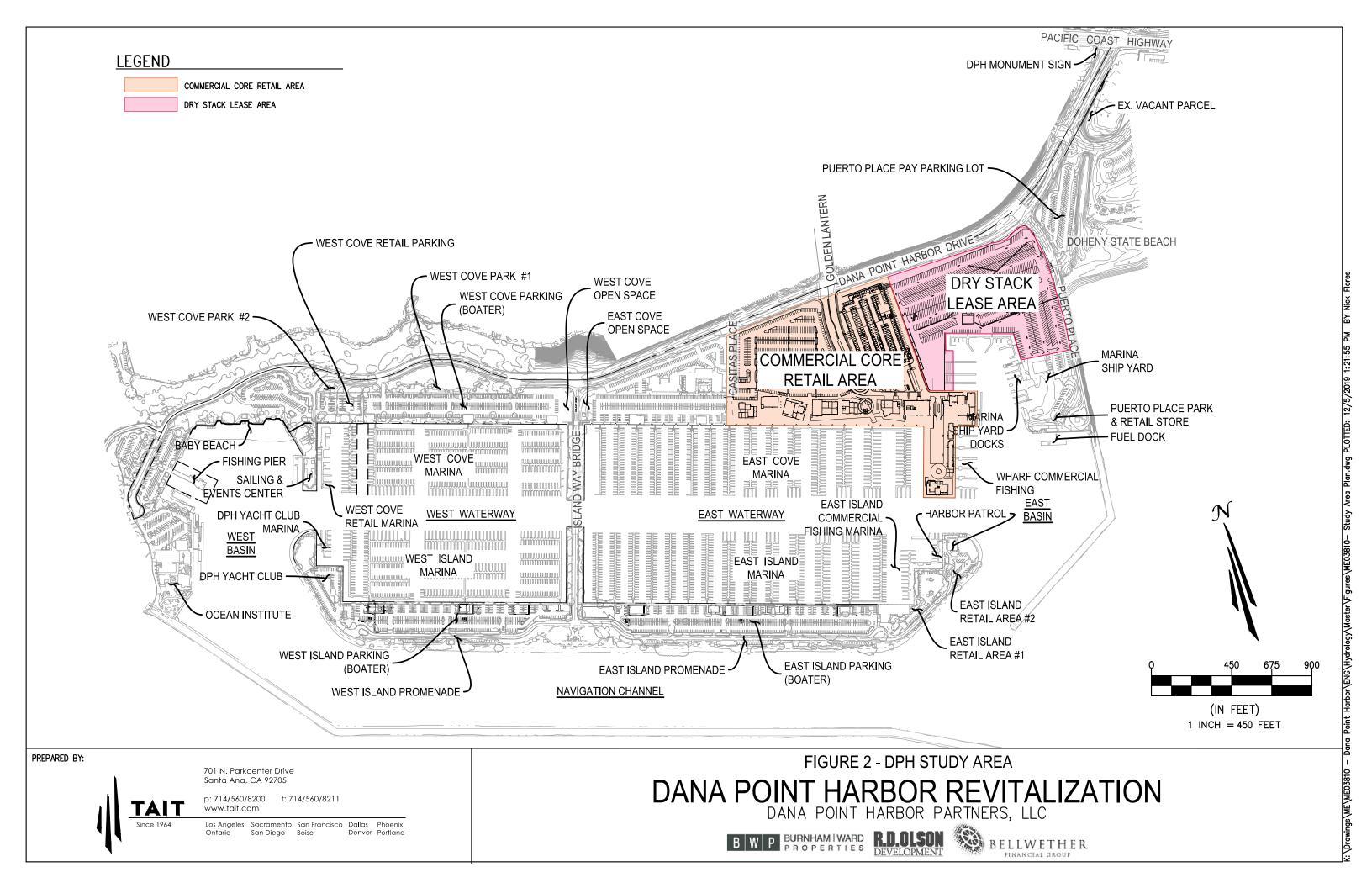




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Figure 2 DPH Study Area provides an overview of DPH and the CCA. The CCRAA portion of the Harbor will include twelve commercial buildings, surface parking lots, and a 3-level parking structure. The Dry Stack Lease Area incorporates pavement improvements to the existing parking lot, removal of Embarcadero Place and improvements to the existing Boater Services Building. The CCA encompasses the northeast portion of DPH with Casitas Place to the west and Puerto Place to the east, the East Cove Marina and to the south and Dana Point Harbor Drive to the north.

The Environmental Impact Report (EIR), dated 2006, outlined multiple Planning Areas for the DPH Revitalization. The improvements discussed in this MPD are Planning Areas PA-1 and PA-2 of the EIR. PA -1 is the CCRA and PA-2 is the DSA. The proposed development will comply with all of the Project Design Features (PDF), Standard Conditions of Approval (SCA), and Mitigation Measures (MM) outlined in the EIR. Exhibit B of the EIR describes all the PDFs, MMs and SCAs and it is provided in *Appendix E*. This Report will comply with PDF 4.4-1, SCA 4.4-8, SCA 4.4-9, SCA 4.4-10, SCA 4.4-11, MM 4.1-1a, MM 4.3-13, MM 4.4-1, MM 4.4-2, MM 4.4-3, MM4.7-6, and MM 4.8-11.



SECTION 2 PROJECT DESCRIPTION

Dana Point Harbor (DPH) was constructed between the late 1960's and early 1970's by the County of Orange and the United States Army Corps of Engineers. In the late 1990's the County began planning for the Revitalization of DPH, in 2006 the Environmental Impact Report (EIR) was approved, in November 18, 2014 the CDP was approved by the Coastal Commission and the City of Dana Point, in May 29, 2019 the Substantial Conformance to the 2014 CDP was approved and detailed planning has occurred since then. At this time, the CCRA of the DPH Revitalization Plan is under construction documents and design for Phase 2B which is the construction of a 3-level Parking Structure. See Section 2.3 below for the current Construction Phasing Plan for the CCRA. The initial construction phase for the DSA is entitled under the same EIR and CDP for the CCRA and is currently in the preliminary design phase. The ultimate redevelopment of the DSA will be subject to additional Coastal Commission and City of Dana Point Local Coastal Plan approval. As part of the DPH Revitalization project Bellwether Financial Group is managing the redevelopment of the DSA and Burnham Ward is redeveloping the CCRA. Appendix M provides the proposed improvement plans for the CCRA and DSA, Sections 2.1 and 2.2 below provide a detailed description of each site, and Figure 3 is the Proposed Commercial Core Area Site Plan.

2.1 Dry Stack Lease Area

The DSA is located on the eastern portion of DPH, between Puerto Place and the CCRA 3-level parking structure. It encompasses approximately 12 acres, consisting of asphalt paved surfaces for vehicle parking, boat storage, an access roadway (Embarcadero Place), a boat launch ramp, a boater services building, and several underground existing wet and dry utilities including a sewer lift station. The initial construction project (interim condition) proposed improvements include the removal of Embarcadero Place and reconfiguration of the existing parking areas. The ultimate proposed improvements will consists of one 6,000-square foot (sf) two-story Boater Service and Dry Storage Office Building, boat wash stations connected to the sewer public system, potential relocation of existing sewer lift station, a reconfigured day-use auto and trailer parking lot, and dry storage facility for long term land storage of boats. No boat maintenance operations other than exterior cleaning will occur within the DSA.

2.2 Commercial Core Retail Area

The CCRA is located on the eastern portion of DPH, between Casitas Place and the DSA, immediately north of the East Cove Marina boater boat slips. It encompasses approximately 20 acres. The existing site consist of surface parking lots, retail buildings, restaurants, a portion of dry boat storage, the Dana Wharf Area and the Catalina Express. The retail and restaurant buildings are surrounded by concrete walkways and some small landscape areas. The proposed

improvements include new retail and restaurant buildings along the waterfront with an ocean front boardwalk, multiple paved surface parking lots, a 3-level parking structure, newly landscaped areas, renovation to the existing Dana Wharf and its existing buildings, and the realignment of Golden Lantern Street. The proposed 3-level parking structure is located in an area where several existing surface parking lots are located.

2.3 Construction Phasing

The CCRA Construction Phasing is currently at Phase 2B. The DSA will be built independently and will not include phasing. Detailed description of each phase including storm drain installation and the DSA construction plan is detailed below. Figure 4 is the storm drain system construction phasing.

CCRA Construction Phases

Phase 1 and Phase 2A have been completed and consisted of:

- Phase 1: Public street improvements to Puerto Place and Casitas Place at Dana Point Harbor Drive, and improvements to Dana Point Harbor Drive.
- Phase 2A: Parking lot restriping within the Dry Stack Lease Area.

Phase 2B to 6 consist of:

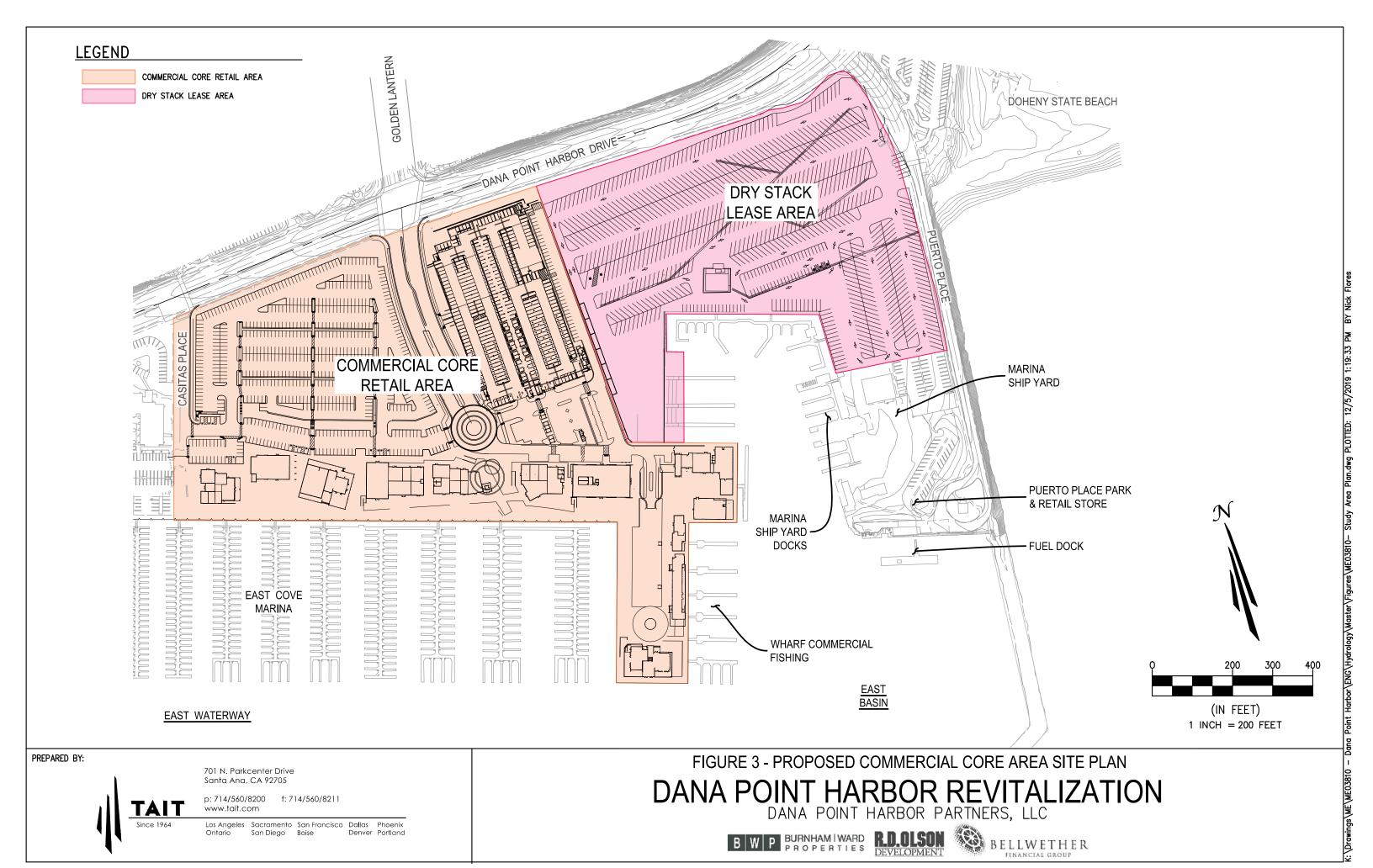
• Phase 2B: Rough grading, precise grading and construction of the Parking Structure within the CCRA. Precise grading operations will include the partial realignment of Golden Lantern. For the rough grading portion of the work all stormwater will be kept on-site in proposed temporary desilting basins, then cleaned and pumped via a proposed temporary pump system that will discharge to the nearest storm drain inlet. Construction activities will follow the requirements under the rough grading Stormwater Pollution Prevention Plan (SWPPP).
During the precise grading activities and the construction of the parking structure

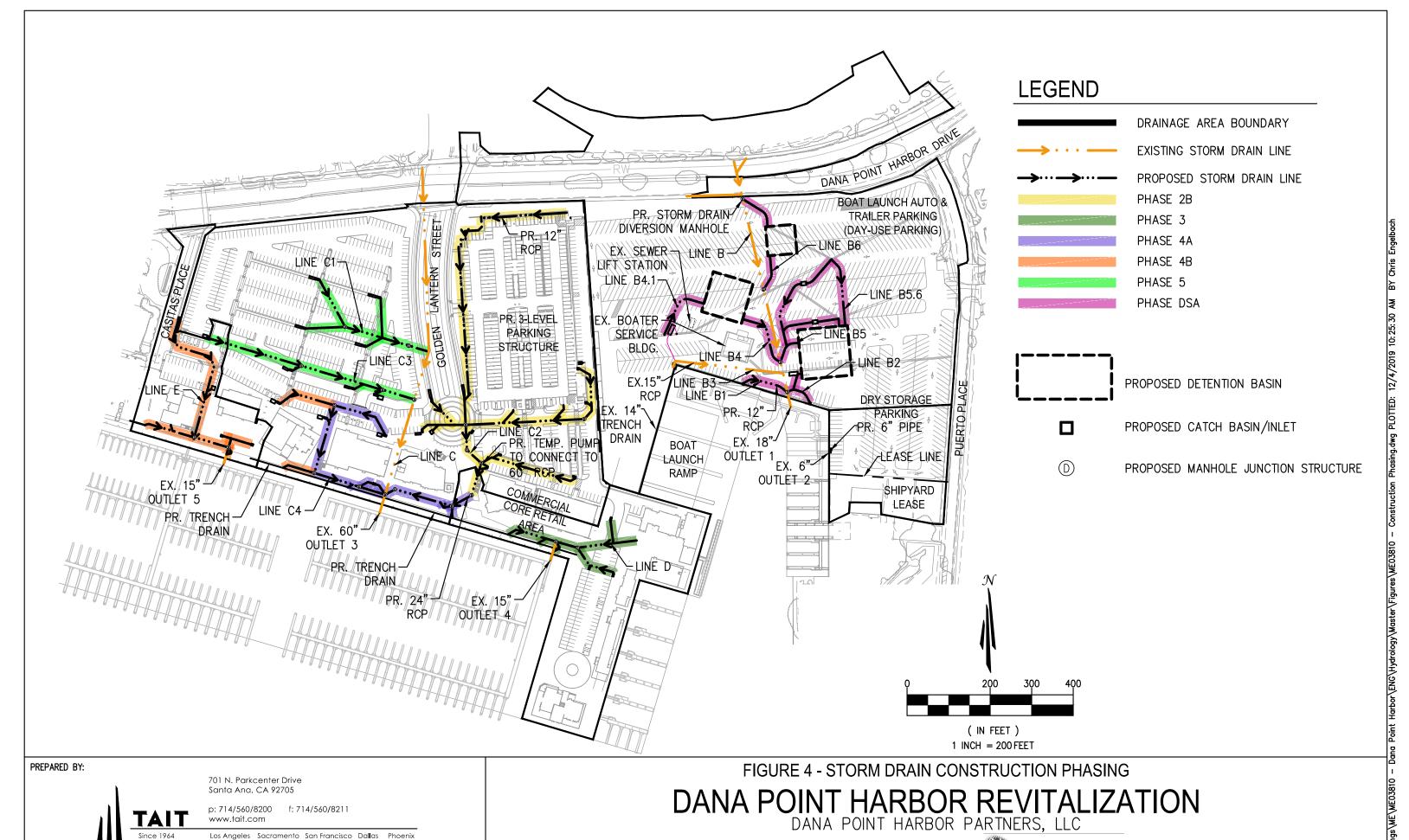
portions of the ultimate storm drain system for the CCRA will be installed. However, the storm drain line that connects to the existing main Line C (as described in Sections 4, 5 and 6) will not be built due to conflicts with an existing Boater Services Building that must remain until the parking structure is completed. Temporary pumps will be placed to pump stormwater and discharge to the nearest storm drain inlet or manhole. This temporary condition is expected to last until the removal of the existing Boater Services Building, which is part of the initial construction activities for Phase 4A. A duration of 6 to 12 months is anticipated at this time.

- Phase 3: Redevelopment and remodeling of the existing buildings at Dana Wharf, and completion of improvements to Golden Lantern. This phase includes ultimate build out of the storm drain system that will serve Dana Wharf within the CCRA.
- Phase 4A: Buildings 6 to 9, adjacent surface parking and waterfront boardwalk area immediately adjacent to buildings. This phase includes ultimate build out of the storm drain system that will serve the Phase 2B storm drain improvements, and the removal of the temporary storm drain pumps installed as part of Phase 2B. The storm drain system will connect to main Line C.
- Phase 4B: Buildings 10, 11 and 12 adjacent surface parking and waterfront boardwalk area immediately adjacent to buildings. This phase includes ultimate build out of the main components of the CCRA storm drain system.
- Phase 5: Demolition of remaining on-site buildings and construction of surface parking lot areas remaining. At this stage the complete storm drain system for the CCRA is completed.
- Phase 6: completion of the CCRA landscaping and signing improvements.

DSA Construction

The DSA is currently entitled under the CDP to reconfigure the existing Dry Storage, the Day Use Auto and Trailer parking lots, remove Embarcadero Place, and construct a new sewer lift station. The ultimate built out will include a proposed Dry Storage Building and a Boater Services Office Building, which are not part of the current entitlements and will be subject to a separate Coastal Development Permit. For this MPD the interim condition of the DSA is being utilized. In this interim condition, Embarcadero Place is removed, the existing parking lot is reconfigured and regraded, and the existing Boater Services Building remains. The proposed storm drain system as laid out and designed in this MPD is planned to accommodate the ultimate "built-out" condition.





San Diego

B W P BURNHAMIWARD PROPERTIES DEVELOPMENT



SECTION 3 HYDROLOGY DESIGN AND CRITERIA

3.1 Hydrology Criteria

The existing and proposed condition hydrology calculations were prepared in conformance with the Orange County Hydrology Manual (OCHM), dated 1986 and its Addendum No. 1, dated 1996. The hydrology analysis and small area hydrograph were prepared using the Advanced Engineer Software (AES), a computer software approved by the Orange County Flood Control District that follows the hydrology methodology and criteria from the OCHM. For this analysis drainage area delineations were prepared following existing topography and proposed contours for each analysis, flow paths, areas, and elevation were determined, as well as hydrology characteristics such as soil group and land use. The rational method for the existing and proposed conditions for the 10-year and 100-year storm were prepared for the CCRA and DSA. The Small Area Hydrograph analysis was prepared for the 10-year and 100-year storm events for the DSA for basin design and analysis purposes. Per the OCHM, the Antecedent Moisture Content (AMC) is II for the 10-year storm event, and III for the 100-year storm event. Sections 4 and 5 provide detailed descriptions for the Existing Condition and Proposed Condition Hydrology analyses.

3.1.1 Rational Method

The OCHM uses the rational method to calculate peak runoff discharge from a drainage area. It utilizes the equation Q=CIA, where Q is discharge, I is intensity, and A is area. The RATSCX module of AES was used to analyze and route runoff through each subarea using elevations, slopes, flow lengths, soil group, land use and area inputs. The rational method analysis was prepared using the high confidence rainfall values as determined by the OCHM. The AES results provide peak discharge and time of concentration. The area being analyzed includes elevation below mean sea level which result in negative numbers. Due to limitations of AES for modeling purposes all elevations were raise by 1,000 to input into the models. Time of concentration and peak flow rates for the 10- and 100-year storm events were obtained.

3.1.2 Small Area Hydrograph

The Small Area Hydrograph (SAH) was prepared to analyze the proposed underground detention basins for the DSA. The SAH analyzes the basins' ability to reduce peak flow runoff for flood control purposes. Per the OCHM the SAH applies to watersheds smaller than 640 acres. This analysis was prepared using the FLOODSCX module of AES, which utilizes the time of concentration obtained from the rational method, the rainfall depth, the total tributary area and the loss rates (F_m and \bar{Y}) to calculate the watershed hydrograph. The hydrograph is then routed through the proposed basin using the stage-storage-discharge table and the outflow discharge hydrograph is obtained. The small area hydrograph was run for the 10-year and 100-

TAIT JOB NO.ME03810

year storm events to analyze the capacity of the proposed basins and the flow through the storm drain system. The basin calculations and design are describe further in Section 5.1.1 of this report.

3.2 Soil Group and Land Use

3.2.2 Land Use

The DPH Commercial Core land use types consist mainly of commercial areas. The off-site drainage area to Storm Drain Line C includes the following classifications: commercial, 5-7 dwelling Units/acre, 8-10 dwelling Units/acre, 11+ dwelling Units/acre, apartments, condominiums, and public park land use. The delineation and determination for the off-site area land use types follows the Dana Point Harbor general land use plan and aerial imagery. Figure 6 is the Land Use Map.

Shapefiles were obtained for the Soil Types from NRCS and created for the Land Use in ArcGIS. Hydrology Boundaries were imported into ArcGIS, and the areas were overlaid and intersected to develop the off-site hydrology.

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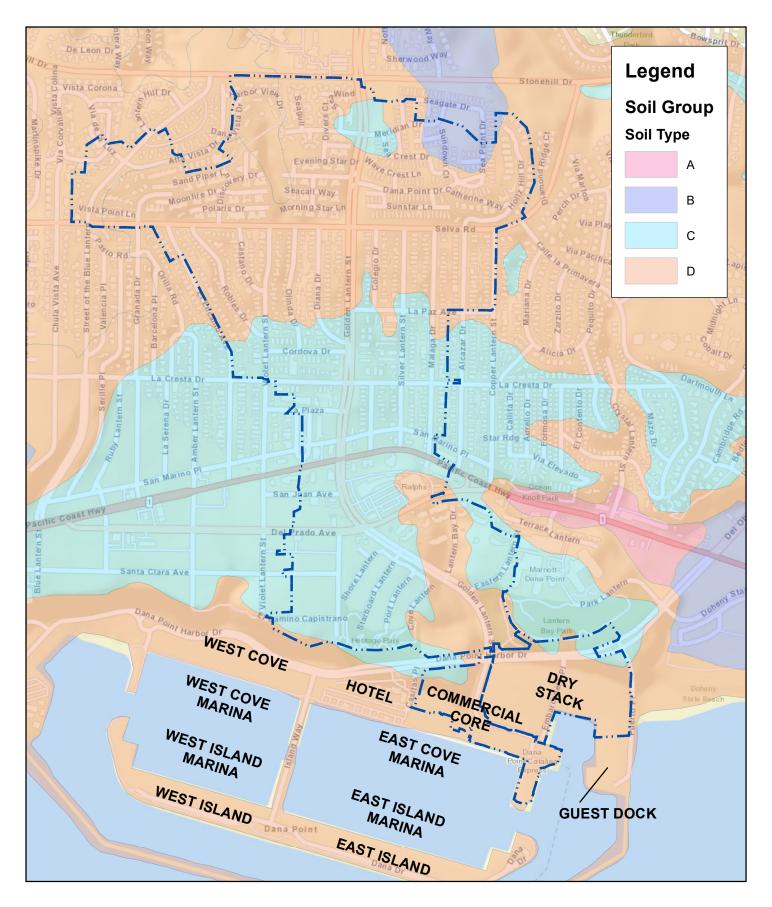
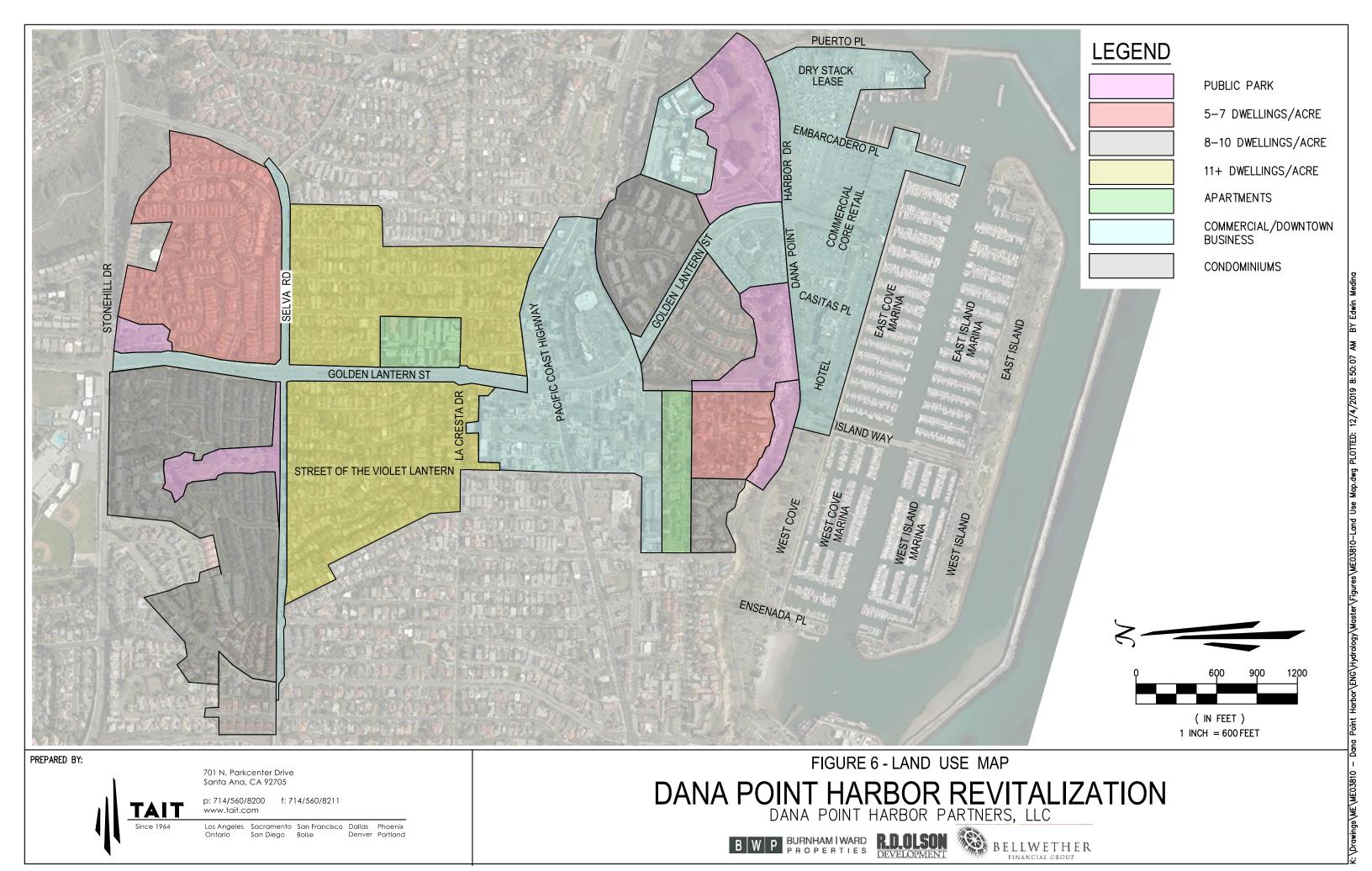




Figure 5 - Soil Group Map



3.2.1 Soil Group

DPH is underlaid by artificial fills and marine deposits which overlay bedrock of the Capistrano Formation. The artificial fill materials consist of alternating layers of clayey sands, silty sands, sands, sandy clays, and sandy silts. The granular sands were found to be medium dense to dense and the fine-grained clay and silt materials were found to be predominantly firm to very firm. Marine deposit materials consist of wet, loose to medium dense, silty sands to sands. The Capistrano Formation bedrock consist of hard to very hard, fine to coarse-grained, massive sandstones with occasional beds of moderately hard to hard, gray to very dark gray claystones and siltstones.

The OCHM utilizes Hydrologic Soil Groups to develop the rational method calculations. Soils are classified as Hydrologic Soil Groups A, B, C and D. Soil group A is defined as a low runoff potential, group B has moderate infiltration rates, group C has slow infiltration rates, and group D has high runoff potential. The DPH Soil Groups were obtained from the National Resources Conservation Service (NRCS) online web soils tool. The majority of the on-site consists of groups C and D while the off-site consists of groups A, B, C, and D. Figure 5 is the Soils Group Map which includes the Soils Groups utilized for the project on-site and off-site drainage areas.

3.3 Regional Hydrology

DPH is located within the Dana Point Hydrologic Subarea of the San Juan Creek Hydrologic Unit, which is a part of the San Diego Basin. The Dana Point Harbor lies within the bounds of the Dana Point Coastal Streams Watershed, which drains to the Pacific Ocean. The almost fully developed watershed is 6 square miles and includes the cities of Dana Point, Laguna Beach Laguna Niguel and San Juan Capistrano. Included in the watershed are a number of coastal drains that discharge to the Pacific Ocean through DPH. Stormwater runoff from the site, sheet flows to different inlets that connect to underground storm drain lines that ultimately discharge to the Harbor through storm drain outlets located within the concrete stone revetment below the seawall.

The CCA includes the existing storm drain main Lines B and C which are 18- and 60-inch Reinforced Concrete Pipes (RCP), respectively. Line B bisects the DSA, while Line C bisects the CCRA. Both Line B and Line C receive off-site runoffs from the City of Dana Point. These lines discharge through Outlets 1 and 3 respectively. Line B receives a small portion of runoff from the bluffs north of the DSA and Line C receives stormwater runoff from a large off-site area consisting of residential and commercial developments within the City of Dana Point and north of Dana Point Harbor Drive. Section 4 provides more detail for these off-site drainage areas. Stormwater runoff from the proposed project areas discharges directly to the Ocean via several

County maintained and engineered storm drain systems or as stormwater runoff that sheet flows directly into the Ocean over the seawall.

SECTION 4 EXISTING CONDITION HYDROLOGY

The area being analyzed on this report consists of approximately 30 acres within the Dana Point Harbor. In the existing condition, some stormwater runoff sheet flows over the seawall, while the majority of the site's runoff is conveyed via curb opening catch basins and grated inlets into the existing County storm drain systems. There are five existing storm drain systems that service the study area: one 18-inch outlet under the seawall and one 6-inch outlet through the seawall at the southern edge of the DSA and three outlets (two 15-inch, and one 60-inch) under the seawall at the southern edge in the CCRA. These Outlets were built through the concrete stone revetment located under the existing seawall. The 6-inch outlet is a perforation found during a field visit that does not have documented as-builts, and its located 2.2-feet below the top of the sewall. Drainage areas to each outlet were delineated to obtain peak discharges for the 10-year and 100-year storm events. Hydrology maps of the existing condition that were utilized for this study are included on *Appendix A*, and the AES Rational Method Results are included in Appendix C. Figure 7 Existing Condition Drainage Areas highlights the drainage area tributary to each outlet and exhibits the existing storm drain. The sections below provide drainage area descriptions to each outlet and Table 1 is the Peak Flow Summary.

4.1 Dry Stack Lease Area Outlets

• Outlet 1- Storm Drain Line B

Outlet 1 is located southeast of Embarcadero Place and outlets to the ocean under the seawall through the concrete stone revetment. In the existing condition, approximately 20.1 acres are tributary to this outlet: 15.7acres on-site and 4.4acres off-site. Existing Storm Drain Line B an 18-inch RCP as shown in the Dana Point Harbor as-builts (*Appendix K*) connects and discharges through this outlet. The off-site drainage area to Outlet 1 consist of a portion of Dana Point Harbor Drive, Puerto Place, Heritage Park and the bluffs north of Dana Point Harbor Drive. The off-site subareas encompass approximately 4.37acres. The on-site drainage area consists of dry boater storage parking and a Boater Services Building that sheet flow to existing catch basins and a 14-inch wide trench drain. The 14-inch trench drain is located at the top of the boater launch ramp and receives runoff from the boater parking lot. The existing trench drain has capacity to capture the 10-year storm event flows, higher year storm event flows will by-pass the trench drain and sheet flow directly into the Ocean (*Appendix N* provides the analysis for the trench drain capacity). The 10-year and 100-year storm event peak discharge to this outlet are 48.46 cubic feet second (cfs) and 76.15cfs respectively.

• Outlet 2

Outlet 2 is located through the eastern seawall face in the DSA. In the existing condition, approximately 1.7 acres are tributary to this Outlet which connects to a 26-inch by 26-inch grated inlet. Stormwater discharges through a 6-inch PVC pipe perforation at the seawall approximately 2-feet below top of seawall. The off-site drainage area tributary to Outlet 2 consists of a portion of the adjacent Shipyard Lease Area. Stormwater from the off-site area sheet flows under an existing chain link fence into a V-Gutter, and ultimately is conveyed to the grated inlet. The on-site drainage area includes a portion of the existing dry boater storage parking. The 10-year and 100-year storm event peak discharge to this outlet are 4.75cfs and 7.29cfs respectively.

4.2 Commercial Core Retail Area Outlets

Outlet 3 –Storm Drain Line C

Outlet 3 is located in the eastern portion of the East Cove Marina and outlets to the ocean under the seawall through the concrete stone revetment. Storm Drain Line C is an existing 60-inch RCP that connects to Outlet 3 as shown in the Dana Point Harbor asbuilts (*Appendix K*). In the existing condition, approximately 245 acres are tributary to this outlet. The majority of the tributary area (approximately 237 acres) is off-site with existing RCP storm drain lines that range from 33-inch to 60-inch. *Appendix A* provides the off-site existing condition hydrology map for Outlet 3. The total on-site drainage (Subarea H) has a tributary area of 7.75 acres, and consists of: paved parking lots, commercial buildings, walkways, restaurants, retail spaces and Golden Lantern Street. Stormwater runoff from these areas sheet flow through the parking lot, are collected via storm drain inlets, and connect to the existing 60-inch RCP via storm drain laterals. Stormwater runoff that is not collected through the existing inlets will sheet flow over the existing boardwalk into the Ocean. The 10-year and 100-year storm event peak discharges to this outlet are 356.23cfs and 575.46cfs respectively.

Outlet 4

Outlet 4 is located below the south facing seawall for the East Cove Marina, immediately adjacent to the west seawall of Dana Wharf. In the existing condition, approximately 3.40 acres are tributary to this outlet via an existing 15-inch RCP storm drain line (see asbuilts in *Appendix K*). The drainage area consists of Dana Wharf parking lot, building areas, and the parking lot north of the Dana Wharf. Stormwater is collected via grated and curb opening catch basins. The 10-year and 100-year storm event peak discharge to this outlet are 9.06cfs and 13.84cfs respectively.

Outlet 5

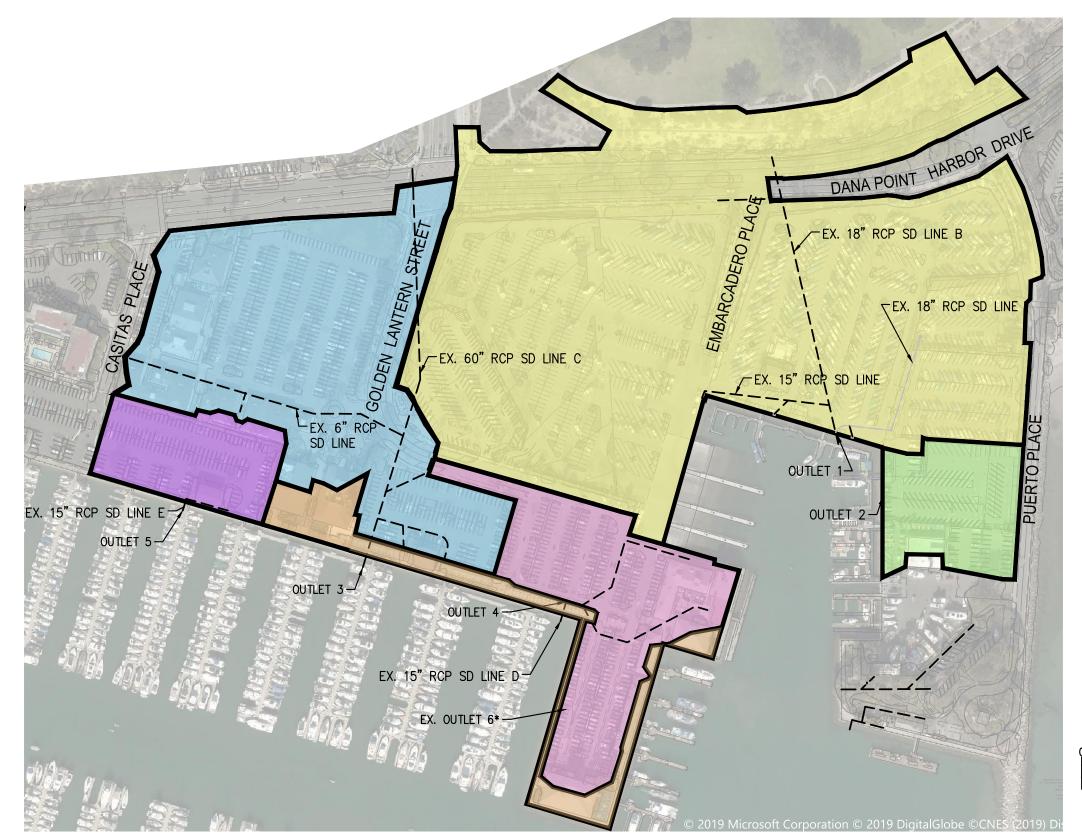
Outlet 5 is located in the center of the East Cove Marina, west of Outlet 3. In the existing condition, approximately 1.55 acres are tributary to this outlet via an existing 15-inch RCP storm drain system (see as-builts in *Appendix K*). The drainage area consists of the eastern portion of the East Marina parking lot and a boater services building. The 10-year and 100-year storm event peak discharge to this outlet are 4.98 cfs and 7.61 cfs respectively.

Outlet 6 - Direct Discharge to the Ocean

Portions of DPH sheet flow directly to the Ocean over the seawall. These areas along the seawall include the boardwalk, patio eating area, and roof runoff from adjacent buildings along Dana Wharf. This drainage area includes approximately 0.44 acres and has 10-year and 100- year storm event peak discharge of 1.6 cfs and 2.44 cfs respectively.

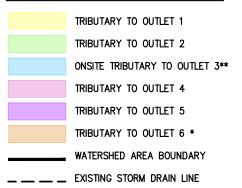
Table 1: Existing Condition and Peak Flows Summary

| Outlet | Area (AC) | 10-year peak (cfs) | 100 year peak (cfs) |
|--------|-----------|-----------------------|------------------------|
| 1 | 20.1 | 48.46 | 76.15 |
| 2 | 1.7 | 4.75 | 7.29 |
| 3 | 252.75 | 356.23 | 575.46 |
| 4 | 3.4 | 9.06 | 13.84 |
| 5 | 1.55 | 4.98 | 7.61 |
| 6 | 0.44 | 1.6 | 2.44 |



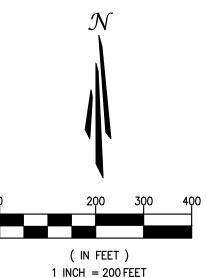
| OUTLETS EXISTING CONDITIONS | | | | | | |
|-----------------------------|----------|----------------------|------------------------|--|--|--|
| OUTLET | AREA(AC) | 10-YEAR PEAK(CFS) | 100 YEAR PEAK (CFS) | | | |
| 1 | 20.1 | 48.46 | 76.15 | | | |
| 2 | 1.7 | 4.75 | 7.29 | | | |
| 3 | 252.75 | 356.23 | 575.46 | | | |
| 4 | 3.4 | 9.06 | 13.84 | | | |
| 5 | 1.55 | 4.98 | 7.61 | | | |
| 6 | 0.44 | 1.6 | 2.44 | | | |
| | | | | | | |

LEGEND



NOTES

- SHEET FLOW DIRECTLY TO HARBOR ONLY ON-SITE TRIBUTARY AREA TO OUTLET 3 SHOWN



PREPARED BY:

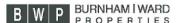
701 N. Parkcenter Drive Santa Ana, CA 92705

p: 714/560/8200 f: 714/560/8211

Los Angeles Sacramento San Francisco Dallas Phoenix

FIGURE 7 - EXISTING CONDITION DRAINAGE AREAS

DANA POINT HARBOR REVITALIZATION DANA POINT HARBOR PARTNERS, LLC







SECTION 5 PROPOSED CONDITION HYDROLOGY

The proposed condition hydrology analysis was prepared for Outlets 1, 2, 3, 4, 5 and 6 for the 10-year and 100-year storm events. The proposed condition drainage design follows existing condition drainage patterns except within Drainage Areas to Outlets 1 and 3 were proposed changes include increasing the area tributary to Outlet 3 (CCRA) and decreasing the area tributary to Outlet 1 (DSA). This change occurs for two reasons:

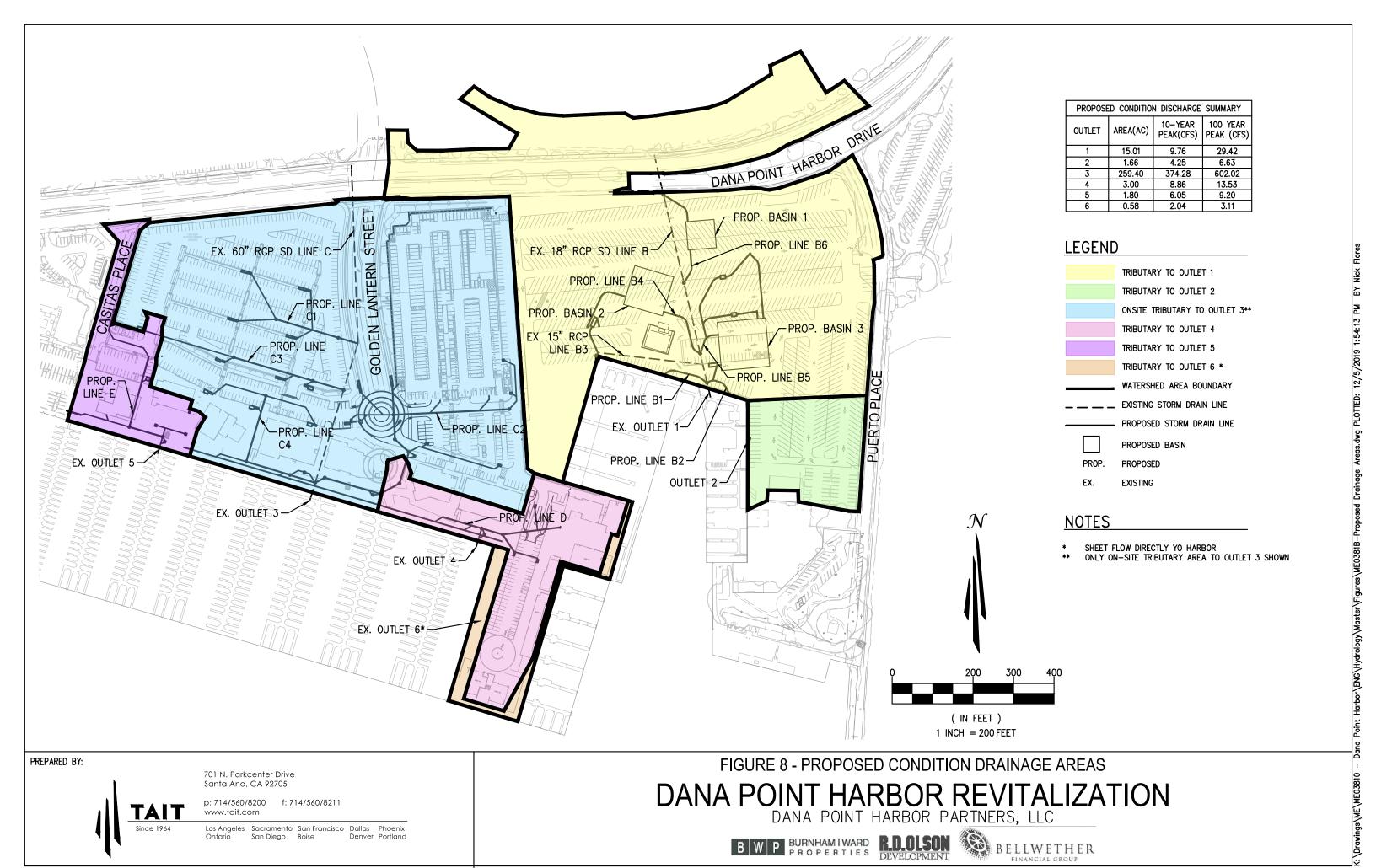
- 1. The existing 18-inch RCP storm drain Line B that is tributary to Outlet 1 (see Section 6 for detailed description) is under capacity.
- 2. The leasing boundary changes associated with the DSA and CCRA sites result in modifications to the existing parking lot area where the proposed 3-level parking structure will be constructed as part of the CCRA.

This change results in adding approximately 5 acres of drainage area to storm drain Line C. In the DSA, proposed detention basins are planned to reduce potential flooding and relieve storm drain flow through Line B (Section 5.1.1 provides Basin Design details). *Appendix B* provides the proposed condition hydrology maps, and *Appendix D* includes the AES RM and SAH Results for the 10- and 100-year storm events. Figure 8 includes a map with the overall drainage areas contributing to each of the existing Outlets in the proposed condition. The sections below provide drainage area descriptions for each Outlet and Table 8 lists a peak flow summary for the proposed condition.

5.1 Dry Stack Lease Area

Outlet 1 - Storm Drain Line B (18-inch RCP)

Existing Outlet 1 will remain. Existing off-site drainage will continue to drain to Line B. In the proposed condition, three on-site detention basins will provide relief to Line B which was determined to be under capacity per the existing condition analysis (See Section 6.6). To better accommodate on-site stormwater runoff, a proposed diversion manhole will be constructed to divert off-site flows to Detention Basin 1, and Detentions Basin 2 and 3 are designed to receive on-site stormwater runoff. These three basins will detain runoff and slowly release it via a controlled outlets to Line B (Section 5.1.1 discusses the proposed detention basin analysis design). In the proposed condition, stormwater runoff from the proposed day-use, trailer and vehicle parking will sheet flows and be collected through several proposed 4-foot wide concrete gutters that will direct water to proposed inlets. These inlets will connect to proposed storm drain lines that ultimately will connect to Line B.



5.2 Commercial Core Retail Area

The proposed drainage for the CCRA consist of three main watershed boundaries that drain to Outlets 3, 4 and 5 under the seawall and an small area that sheet flows over the seawall around the Dana Wharf.

Outlet 3 (60-inch RCP) – Storm Drain Lateral C1 to C4

Existing Outlet 3 will remain located in the eastern portion of the East Cove Marina. In the proposed condition, four main laterals are being proposed that convey runoff to Line C and separate connections to Line C are proposed. Laterals C1 and C3 consist of surface pavement runoff from the northern parking areas between Casitas Place and Golden Lantern Street. Runoff from the parking lot will be collected at low points where stormwater will be treated via biofiltration and collected into the storm drain system. Lateral C2 receives runoff from Golden Lantern Street, the proposed 3-level parking structure, the surface paved parking area south of the parking structure, buildings 6 and 7 roofs, and building 8 with portions of the boardwalk south of building 8. Lateral C4 collects runoff for paved surfaced parking in front of building 11, building 9 and 10 roofs, and portions of the boardwalk south of building 9 and 10. The total on-site has a tributary area of 14.1 acres to the existing 60-inch storm drain system. A summary of the areas contributing and peak flows for each of the proposed laterals connecting to Line C is listed below on Table 7.

Table 7: Storm Drain Line C Proposed Condition Peak Flow Summary

| Lateral Name | Area (AC) | 10-Year Peak Discharge (cfs) | 100-Year Peak Discharge (cfs) |
|-----------------|-----------|---------------------------------|----------------------------------|
| Lateral C1 | 2.2 | 6.17 | 9.44 |
| Lateral C2 | 7.6 | 18.63 | 28.85 |
| Lateral C3 | 2.2 | 6.75 | 10.41 |
| Lateral C4 | 2.1 | 5.84 | 9.03 |

As described in Section 4, a large off-site areas from the City of Dana Point contributes to Line C. In the proposed condition, the total area tributary to Line C is 259.4 acres (which includes an additional 6.65 acres), and the 10-year and 100-year storm events peak discharge are 374.28cfs and 602.02cfs, respectively. There is an increase of 18.05cfs and 26.56cfs for the 10-year and 100-year storm events peak discharge, respectively. Approximately 5% increase in peak discharge for the 10-year, and 4.6% for the 100-year storm event. A discussion regarding the capacity and hydraulic design of Line C is provided in Section 6.

• Outlet 4 – Storm Drain Line D (15-inch RCP)

Existing Outlet 4 will remain located northeast of the East Cove Marina, immediately adjacent to the Dana Wharf and directly south of proposed Building 6. In the proposed condition, Outlet 4 receives runoff from the boardwalk south of Building 6 and 7 and the redeveloped Dana Wharf. Approximately 3.0 acres are tributary to a proposed storm drain system that discharges into the existing 15-inch outlet. The 10-year and 100-year peak discharge to this Outlet are 8.86cfs and 13.53cfs, respectively. This is a reduction from the existing peak flows at this outlet of 0.2cfs for the 10-year and 0.31cfs for the 100-year storm event.

• Outlet 5 – Storm Drain Line E (15-inch RCP)

Existing Outlet 5 will remain located center of the East Cove Marina and southwest of the CCRA. In the proposed condition, Outlet 5 receives runoff from Casitas Place, Building 12, southern portion of Building 11 roof, and the boardwalk south of Buildings 11 and 12. Approximately 1.8 acres are tributary to a proposed storm drain system that discharges into the existing 15-inch RCP outlet. The 10-year and 100-year peak discharge to this outlet are 6.05cfs and 9.26cfs, respectively. This is a small increase from the existing condition peak flows at this outlet of 0.25cfs for the 10-year and 1.65cfs for the 100-year storm events.

Outlet 6 – Direct Discharge to the Ocean

It is anticipated that several small areas surrounding the buildings along Dana Wharf will directly discharge stormwater runoff into the harbor via flow over the existing seawall. This area (Drainage Area Outlet 6) consists of 0.58acres with 10year peak flows of 2.04cfs and 3.11cfs for the 100 year storm event.

Table 8: Proposed Condition Peak Flows Summary

| Outlet | Area (AC) | 10 Year peak (cfs) | 100 Year Peak (cfs) | |
|--------------------------------------|------------|--------------------|-------------------------|--|
| 1 | 15.0 | 38.14 | 58.93 | |
| 2 | 1.69 | | | |
| 3 | 259.4 | 374.28 | 602.02 | |
| 4 | 3.0 | 8.86 | 13.53 | |
| 5 | 1.8 | 6.05 | 9.2 | |
| 6* | 0.58 | 2.04 | 3.11 | |
| *Sheet flow directly into the Ocean. | | | | |

SECTION 6 HYDRAULIC DESIGN

6.1 Hydraulic Criteria and Methodology

This MPD analyzed the hydraulic capacity of the existing storm drain systems for both the existing and proposed conditions, the new proposed storm drain system, surface flooding capacity, and the water quality (low-flow) storm drain system. The DPH proposed storm drain facilities include on-site storm drains systems, curb-side and grated inlets, Bioclean Modular Wetland Units (MWS), Jensen StormSafe Filters, underground detention basins, and diversion structures. The MPD provides preliminary hydraulic calculations for the proposed storm drain system main lines, analyses site drainage design, and sets a basis for future storm drain design for each construction phase of the Dana Point Harbor Revitalization Project. The construction phasing is detailed in Section 6 of this report. The MPD hydraulic calculations follow the criteria and requirements set forth by the Orange County Local Drainage Manual (LDM), dated January 1996. Per Chapter 1 of the LDM protection levels for proposed development follow the criteria below:

- Structures: provide 100-year storm event protection for all habitable structures.
- General Criteria: storm drains with tributary areas of less than 640 acres are to be
 designed for a minimum of a 10-year storm event below top of curb, using a
 combination of street and storm drain flow. In sump conditions, catch basins and the
 connecting storm drain should be design for a 25-year storm event.
- Hydraulic Grade Line (HGL) Freeboard: a design HGL of at least 0.5-feet below the street gutter flow line shall be provided within catch basins where the entire system is being design. For preliminary studies the HGL of the storm drain mainline shall be at least 2-feet below the street gutter flow line. This MPD does not include inlet design. Future studies to be provided at each phase of construction, shall include catch basin sizing following this criteria.

All proposed storm drain main lines for the DPH CCA should be design for the 10-year storm event. The CCA is in a flow by condition, since flows will pond up to the top of curb and sheet flow through walkways and into the Ocean. The proposed inlets should be sized using the 25-year storm event discharge. The CCA is not in a sump condition, due to being immediately adjacent to the Ocean with sufficient clearance from the top of the wall to the sea water level.

The Water Surface Pressure Gradient (WSPGW), a software developed by the Los Angeles County Flood Control District and approved by the County of Orange was utilized to calculate the HGL for the existing and proposed storm drain lines. WSPG uses the Bernoulli equation to calculate the HGL for each storm drain line utilizing the flow and the boundary conditions.

DPH is located immediately adjacent to the Ocean, all existing storm drain outlets were built under the seawall through the concrete stone revetment (excluding Outlet 2). The Outlet inverts are below mean sea level, with the exception of Outlet 2 which is approximately 2.2-feet below the top of the seawall. Thus, all storm drain systems are controlled downstream by the seawater elevation, which varies due to tidal influence. Section 6.2 describes the sea level conditions at DPH. Seawater is expected to backflow into the storm drain system, as it does in the existing condition, and it is considered in the hydraulic calculations by setting the downstream surface water elevation at the appropriate elevation for each analysis prepared:

- Mean High Water (MHW) 10-year storm event: this analysis is used as the basis for storm drain line design.
- Mean High-High Water (MHHW) plus 2-feet 10-year storm event: this analysis is the considered the worst condition analysis. It includes the Sea Level Rise Condition
- Mean High Water (MHW) 100-year storm event.

These analyses were prepared for the CCRA storm drain Lines C, C1, C2, C3, C4, D and E and for the DSA storm drain Lines B, B1, B2, B3, B4, B4.1, B5, B5.1, and B6. Section 6.6 describes the results of this analysis.

6.1.1 Future Hydraulic Analysis

Future Hydrology and Hydraulic Basis of Design Reports for each construction phase of the DPH CCA Revitalization project, shall follow the MPD hydraulic design criteria and overall drainage plan, and will include the following additional analyses:

- Design of storm drain inlet based on the 25-year storm event.
- Surface flooding analysis for the 100-year storm event MHHW
 downstream condition. TAIT suggests the use of a modeling tool such as
 XP-SWMMM be used to understand and analyze the flow of water above
 the top of curb through the surface and into the ocean.
- Protection of all structures from the anticipated 100-year storm event flows by setting finished floor pads above the flooding elevation and providing adequate flow pathways between proposed buildings.
- Design by-pass structures to divert low-flows for water quality treatment and stormwater conveyance through the storm drain main lines.

6.2 Sea Level Rise

DPH storm water runoff discharges are influenced by the sea water levels. Tidal changes occur throughout the day, with the moon cycles and due to tectonic forces. The majority of the project areas' storm drain outlets are located below the mean sea water level (estimated to be +2.5-feet for DPH) causing the storm drain system to incur in sea water intrusion which limits the hydraulic capacity of the storm drain lines. In order to determine sea water levels the NOAA Tides/Water Levels for La Jolla Monitoring Station were obtained (see *Appendix G*). The datum change between La Jolla Monitoring Station and NAVD88 is -0.19-feet. Per NOAA the following are the calculated tidal water levels averages to be used for design:

- Mean Sea Level (MSL) is at 2.73'-0.19' = 2.54-feet.
- Mean High Water (MHW) is at 4.6'-0.19' = 4.41-feet.
- Mean High-High Water (MHHW) is at 5.32'-0.19' = 5.13'.

The United States Army Corps of Engineers and California State Agencies have issued general guidance provisions to incorporate sea level rise into the design of federal or state agency coastal projects. Per the Dana Point Harbor Revitalization Preliminary Shoreline Management Plan, prepared by Project Dimensions and dated March 2014 (*Appendix O*) Ocean water levels in South Orange County are influenced by the global climatic oscillations. The sea level rise for southern California areas locate south of Cape Mendocino, are projected to rise 2- to 12-inches by 2030, 5- to 24-inches by 2050 and 17- to 66-inches by 2100. Per the State of California Sea-Level Rise Guidance probabilistic projections for the height of sea level rise depend on the greenhouse gas emission projections. Up to 2050 using different emission scenarios there are minor result differences, and after 2050 different emission scenarios result in significant sea level rise. For projects with a life span to 2050 under a high-emission scenario the State recommends the use of low projection sea level rise at 1.1-feet, medium risk projection at 1.9-feet, and extreme risk projection at 2.7-feet.

For this MPD and for future Hydrology and Hydraulic Basis of Design Analysis for the DPH CCA the downstream condition using the MHHW plus 2-feet to account for sea level rise will be analyzed. This would set the sea level for MHHW at 7.13-feet. This is a conservative approach analysis considering that there is a level of uncertainty in sea level rise projections. It is important to note that the existing DPH was built approximately 50-years ago, and planning for Revitalization has been under way for the last 20-years. Thus, it is expected and anticipated that throughout the life-span of the project (anticipated to be the entire 66-year D&M Lease Term) some future improvements will occur to DPH as additional analysis of sea rise impacts are undertaken.

6.3 100-Year Flood Analysis

Currently the proposed building finish floor elevations for new buildings within the CCRA (Buildings 6-12) are set at 12.5-feet elevation. This elevation is 3-feet above the top of the existing seawall which is at 9.5-feet on average (based on TAIT Field Surveys). Future analysis should determine ponding above finish surface and properly design flowpaths for stormwater to sheet flow in between the proposed buildings, through the boardwalk and into the ocean. For this MPD an exhibit is provided in *Appendix P* that delineates the areas in which 100-year ponding may occur, anticipates flowpaths and corridors through the buildings, and sheet flows over the existing seawall are outlined. This analysis is based on an assumed level for the 100-year storm event flows with a MHHW level (5.13-feet), plus 2-feet (sea level rise projection) of 7.13-feet.

It should be noted that County Maintenance Staff have not recorded any flooding issues at DPH throughout its current life span. The Laguna Beach Audubon rain gage data was obtained from the Orange County website. This rain gage is the closest to DPH with records since 1928. The highest rain event recorded was in December 6, 1997 with a total rain depth of 5.5-inches, which per the OCHM is considered a 100-year storm event. The NOAA tidal records for the La Jolla station for the same date, measured the highest sea level at 5.07-feet and the day after at 5.62-feet. No damages to structures or flooding issues were recorded during that storm event or that year. The rain season of 1997- 1998 was an El Nino season with some of the highest ever recorded rainfall.

6.4 Groundwater Influences

Per the Seismic Hazard Zone Report for the Dana Point Quadrangle, dated 2001, the historical high groundwater elevation at DPH is located 5-feet below ground surface (bgs). Per the Geotechnical Findings and Preliminary Geotechnical Design Considerations and Recommendations Dana Point Harbor Revitalization, prepared by GMU Geotechnical Inc., dated December 2018, the existing groundwater at the CCA was found between approximately 3- to 15-feet bgs. In addition, at the Harbor groundwater elevations fluctuate with tidal variations. *Appendix I* provides a figure that depicts anticipated groundwater level across the CCA based on recent geotechnical borings for DPH. During final design of the proposed storm drain system design considerations shall be considered for any infrastructure that will be located within groundwater (which shall include the use of water tight joints and concrete pipe.

6.6 Hydraulic Results

6.6.1 Dry Stack Lease Area

Storm Drain Line B

Storm Drain Line B is an existing 18-inch RCP that begins north of Dana Point Harbor Drive and extends into DPH. It crosses the street east of Embarcadero place and runs under the paved surface parking areas. Two laterals (15-inch and 18-inch) connect to Line B at the southern end. This connection was observed during a recent TAIT field visit and record documents on these lines are not available. Line B discharges to the Ocean through Outlet 1 (at approximately elevation -4.3). In the existing condition, this storm drain line is under capacity based on the calculated existing 10-year stormwater runoff flow.

In the proposed condition, the existing connections at the southern end will remain. Two new laterals will connect to this line under the surface parking areas. Immediately south of Dana Point Harbor Drive a new diversion storm drain manhole is proposed to divert flow to a proposed underground detention basin. Flows from this Detention Basin will be slowly released back to Line B. The WSPG analysis was prepared for the existing and proposed conditions and the results are provided in *Appendix F*, the storm drain profiles including the HGL show that with the proposed diversion and the three proposed detention basins, Line B will not be under pressure and the HGL will be within the existing 18-inch storm drain pipe. Additional proposed laterals B1, B2, B3, B4, B4,1, B5, B5,1 and B6 were analyzed to determine the HGL at these proposed lateral connections. All proposed storm drain lines were found to have sufficient capacity. For the 100-year MHW analysis it is noted that the HGL is above the storm drain pipe at some locations and the resulting ponding of stormwater will result in stormwater runoff overflowing the existing seawall directly into the Ocean.

• Storm Drain Line A

Storm drain Line A is a new proposed short storm drain lateral line that will connect at a proposed grated inlet to the existing storm drain for Outlet 1. Flows will be collected via a grated inlet and will discharge to the Ocean via an existing 6-inch perforation through the seawall. Future studies, will analyze the feasibility to use a pump system to serve a low flow treatment configuration. All overflows exceeding the required treatment volume and the capacity of the 6-inch outlet pipe will pond and flow over the proposed grated inlet and into the Ocean following the existing condition drainage patterns.

6.6.2 Commercial Core Area

• Storm Drain Line C

Storm drain Line C consists of the existing 60-inch RCP line that crosses the Harbor at the Commercial Retail Area (CCRA) and discharges at Outlet 3. The 10-year and 100year storm event discharge for the existing and proposed condition were analyzed and presented herein. The sizes and slopes of the existing Line C used on this study were determined based on as-built plans and field verifications where possible (using the opening at the existing storm drain manholes and catch basins within the Harbor were dip to obtained existing invert information). There are four main laterals that are proposed to connect to the existing Line C. These laterals vary in size from 12-inch to 44inch RCP (pipe material was assumed for these laterals and all proposed storm drain laterals). The existing invert elevation of the main Line C is at 7.2 below sea level (-7.2). Since the MHW was used as a downstream control for the 10-year storm event, pressure flow is prevalent in the existing line. The proposed storm drain laterals were design to connect to Line C at different elevations to allow 3-feet to 4-feet between the 10-year Hydraulic Gradient Line (HGL) and the proposed ground surface elevation. There are a few locations at the upstream end of Lateral C-2 and along the boardwalk for Laterals C-2 and C-4 where only a 2-foot minimum separation could be obtained between the proposed surface elevation and the 10-year HGL. Appendix H includes the storm drain profiles plotted with the HGL profile obtained from WSPGW. The 100-year storm event discharge with analyzed with the MHHW as the downstream control. The results of this study indicates that flooding will occur during a 100-year storm event. As a result, the grading design for the CCRA will incorporate where necessary provisions for swales and stormwater conveyance around the proposed buildings to protect buildings from a 100-year storm event. The runoff conveyance systems around the building will allow surface discharge to the Harbor over the seawall.

• Storm Drain Line D

Storm drain Line D is a proposed 15-inch RCP line extension to the existing 15-inch RCP line that discharges runoff from the Dana Wharf Area to the Harbor at Outlet 4. The existing outlet is located south of proposed Building 6. The anticipated invert elevation based on as-built plans for this outlet is at 3-feet. Elevations of the Dana Wharf area range from 7- to 10-feet and the downstream water surface elevation for the hydraulic calculations was set at MHW. The 10-year HGL in the proposed condition remains 2.5-feet to 4-feet below the proposed ground surface. The 100-year HGL exceeds the ground surface elevation by a maximum of 12-inches.

SECTION 7 WATER QUALITY DESIGN

The DPH Revitalization project will incorporate Water Quality Management Practices following the guidelines set forth in the South Orange County Technical Guidance Document (TGD), dated September 2017, which complies with the San Diego Regional Water Quality Board requirements. All Water Quality (WQ) design and analysis provided in this MPD is preliminary and will serve as a guideline for final storm drain design and preparation of the Water Quality Management Plan.

Per Section 2.3.5.1 TGD priority projects are categorically exempted from hydromodification requirements where the project discharges to: "Existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean". All DPH stormwater runoff discharges directly to the Pacific Ocean. Thus this project is exempt from Hydromodification. Figure 9 is a copy of the Dana Point Exemption Map taken from the TGD.

7.1 Receiving Waters and Pollutants of Concern

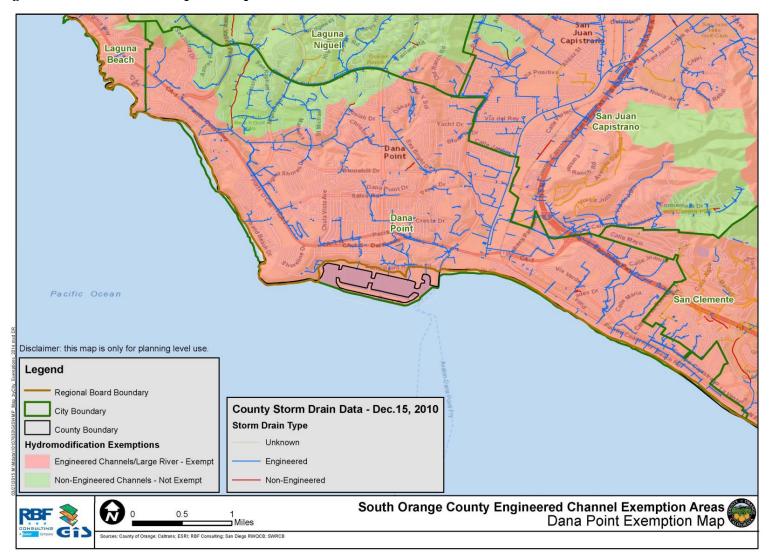
The receiving water body for the project is the Pacific Ocean Shoreline, Dana Point Harbor. Per The California State Water Board website the 2014/2016 303d listed impairments are: Indicator Bacteria, Dissolved Oxygen, Toxicity and Zinc.

Per Table 2-4 Anticipated and Potential Pollutants Generated by Land Use Type of the TGD the following are the Pollutants of Concern for DPH:

- Suspended Solid/ Sediments.
- Nutrients.
- Heavy Metals.
- Pathogens (Bacteria/ Virus).
- Pesticides, Oil & Grease.
- Toxic Organic Compounds.
- Trash & Debris.

Within the CCRA the portion adjacent to the seawall along the boardwalk and in landscape/seating areas, the only anticipated pollutants are Trash & Debris, sediments, Bacteria & Viruses and Pesticides. Heavy Metals and Oil & Grease will not be anticipated in these areas since these areas will be separated from the automobile and boat related parking areas of the project. Only the parking structure, surface parking lots and the DSA are expected to generate all of the pollutants as listed above.

Figure F-2: Dana Point Exemption Map



TAKEN FROM SOUTH ORANGE COUNTY TECHNICAL GUIDANCE DOCUMENT

FIGURE 9 - DANA POINT HYDROMODIFICATION EXEMPTION MAP

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7.2 Low Impact BMP Selection and Design

In accordance with Section 2.5 of the TGD Low Impact Development (LID) Best Management Practices (BMP's) must be selected and size to maximized volume retention and pollutant retention according to a specific hierarchy. Below is a description for selection criteria and analyses of BMP's for the DPH project proposed for this MPD. Final analysis, design and a WQMP shall be completed for the CCRA and the DSA separately.

- Capture and retain the DCV (Design Captured Volume from a 24-hr 85th percentile storm event) and drawdown within 48hr or less following the end of the precipitation.
 In order to capture and retain runoff, infiltration rates of the existing soil and the depth of groundwater will need to be considered. Infiltration for the project has been determined unfeasible by GMU Geotechnical Engineering due to the following reasons:
 - Percolation testing results indicated existing soil infiltration rates vary from 0.10 to 0.32in/hr. Based on this the percolation field testing does not meet the minimum requirements of 0.6in/hr (unfactored) to fully infiltrate the DCV volume.
 - Groundwater depths as described on Section 6.4 of this MPD ranges from 3-feet
 10-feet bgs for the vast majority of the project area.
 - The site Hydrologic Soil Group is classified as D, which tends to yield very low percolation rates.

Based on the above presented information, it is not feasible to comply with the retention requirements since infiltration is not adequate for DPH.

- 2. Harvest and Use feasibility shall be analyzed (Section 4.2.3 of TGD), and implement Harvest and Use BMP (Section 4.3 of the TGD).
 Based on the current Site Plans for the redevelopment of DPH and the CCA, there will not be enough landscaped areas to utilize a Harvest and Use BMP. In addition, South Coast Water District has installed existing a recycled water line on Dana Point Harbor Drive and is requiring the use of recycled water possible for proposed landscape areas within the CCA. Therefore, Harvest and Use for the CCA was determined to be a non-feasible BMP.
- 3. Select and Size Biotreatment Systems.
 - The use of biofiltration basins may not be feasible due to of the proximity to the ocean. Biofiltration basins are designed to utilize a discharge point located approximately 3.75-feet or more below the top of the basin with a basin ponding depth of anywhere from 6-inches to 18-inches. The finished surface in the vicinity of the seawall are approximately

10-feet (the area between the buildings and the seawall is the lowest finished surface for stormwater capture). The basin outlet would need to be located at an approximate elevation of 5 to to 5.5-feet and the MHW for the project is at 4.41-feet. In a preliminary analysis, it was noted that the HGL in storm drain Lines B and C would be too high to provide sufficient clearance between the receiving pipe HGL and the biofiltration systems. Therefore, based on the anticipated water surface and HGL within the proposed CCA storm drain systems, the use of biofiltration basins was found to be infeasible and it is not recommended for this project.

4. Maximize volume and pollutant retention through the incorporation of all of the applicable Hydrologic Sources of Control (HSC) and use biofiltration BMPs. The project has identified the proposed use of Bioclean Modular Wetlands System, Jensen StormSafe or Bioclean Kraken Filter, which are proprietary devices with high pollutant removal efficiency for the CCA proposed Water Quality Treatment BMPs. Technical information and performance information for these proposed BMP's is provided in *Appendix J* of this MPD. Per Appendix J of the TGD, flow through systems such as MWS have been deemed acceptable if sized to treat 150% of the flow-based calculated treatment flows. These systems will be all designed following the procedure outlined on Appendix E.3.5.4: Worksheet for Using the Flow-Based Compact Biofiltration with Supplemental Retention Method for Sizing Compact Biofiltration BMPs - Worksheet 9: Flow-Based Compact Biofiltration with Supplemental Retention Method. Preliminary calculations are provided in *Appendix J* and the Proposed Storm Drain Plan on *Appendix H* includes a plan layout of the proposed BMPs.

Biofiltration in the form of MWS has been selected as the main BMP to meet the WQ requirements and target the pollutants of concern for the project where feasible. StormSafe or Kraken Filters will be utilized for areas where MWS are not feasible due to sites constraints as described below:

- When the HGL elevation of the proposed storm drain system is above the bottom of the MWS units. Under this condition, flows could by-pass the unit and untreated water would discharge to the Harbor.
- At locations adjacent to the Harbor biofitration BMP's could have seawater backing into the storm drain systems which could affect the plants health and limit the type of plans that can be utilized in the MWS units.
- There are some locations where it is physically not possible to connect the MWS to the existing storm drain system due to existing invert elevations.

Drainage Management Areas (DMAs) at locations near the seawall specifically the boardwalk, the buildings along the southern border of the CCRA, the Dana Wharf, the parking structure, areas along the DSA seawall, and the proposed parking lot shall use filter systems such as Jensen StormSafe or Bioclean Kraken Filter due to high groundwater conditions and the stormdrain systems' HGL. These devices will be designed to treat the required water quality flows to the maximum extent possible. Where determined to be feasible in final design proposed filter systems may be replaced with MWS.

Table 9 includes a summary of each DMA and the proposed BMP for each area for both the CCRA and the DSA.

7.3 Commercial Core Retail Area

The Drainage Management Areas within the Commercial Core Retail Area encompasses 18.97 acres. It was divided into 38 DMA's for this study (Figure shows the Proposed DMA Areas for the CCRA). Within the CCRA, 8.5 acres will be treated with MWS biofiltration while the remaining 10.47 acres are proposed to be treated with StormSafe or Kraken filters. Where possible the roof drains for the proposed buildings will be treated with MWS that will be placed partially above ground to increase biofiltration WQ treatment, see detailed description below.

DMA F consist of 0.56 acres in the Dana Wharf area. Due to the existing conditions of this area and proximity to the Harbor it is unfeasible to collect runoff and provide treatment prior to discharge over the seawall. This small DMA will not be treated and will remain as it is in the existing condition.

7.4 Dry Stack Lease Area

The Dry Stack Lease Area encompasses 12 acres. It was divided into 8 DMA's for this study. 7.41 acres will be treated with MWS biofiltration while the remaining 4.35 acres are proposed to be treated with StormSafe or Kraken filters. DMA D1 and D2 of the DSA consist of 2.66 acres that currently drain to a grated inlet that discharges through a perforation on the seawall only about 2.3-feet below the top of wall. Due to the existing conditions of this area and proximity to the Harbor it is unfeasible to collect runoff and provide treatment prior to discharge. A new grated inlet is proposed at this location to connect to the existing perforation. This new inlet shall include filtration inserts to provide WQ treatment to the maximum extent possible. During final design the feasibility of a pump to provide a more advanced WQ treatment will be analyzed.

7.5 Proprietary Devices - Structural BMPs

7.5.1 Modular Wetlands Systems

Modular Wetland Systems is a proprietary biofiltration BMP's that uses horizontal flow allowing for a smaller footprint. This BMP includes a pretreatment chamber that includes separation and pre-filter cartridges. In this chamber sediments and hydrocarbons are removed from runoff before entering the bio-filtration chamber, reducing maintenance and improving performance. The MWS system meets the TAPE testing criteria as required for proprietary systems as outlined in the TGD Appendix J.

7.5.2 Stormsafe

The StormSafe Filter is proprietary media filtration BMP that has been tested and utilized in Harbor storm water programs. It has demonstrated significant effectiveness in reducing bacteria in storm water. This system also removes other pollutants of concern typical of media filtration type BMPs's. This specific media filtration BMP was selected due to its ability to remove nutrients and bacteria.

7.5.3 Kraken Filters

The Kraken Filter is a WQ treatment BMP system that utilizes an advanced membrane filtration that provides a high level of removals for total suspended solids (TSS), phosphorus, nutrients, metals, trash, and hydrocarbons. The Kraken (membrane) Filter cartridge provides high flow rates, while the system can operate at a low loading rate to ensure maximum performance, minimum maintenance, and minimal clogging.

SECTION 8 Conclusion, Final Remarks and Future Studies

The Dana Point Harbor Revitalization Plan proposes the redevelopment of certain areas within the existing Harbor. This study investigates the Commercial Core Area (CCA) which includes the Commercial Core Retail Area (CCRA) and the Dry Stack Lease Area (DSA) and provides analyses for this Master Plan of Drainage for the CCA. The analysis in this study includes hydrology and hydraulic design of the storm drain systems for flood control and water quality treatment purposes. This MPD analyzes the existing drainage patterns and provides calculations for a proposed condition for the CCA. The existing and proposed condition 10-year and 100-year storm events was analyzed for the ultimate condition, and a preliminary plan for storm drain construction was developed and presented herein to incorporate different construction phases. A 100-year flood analysis was also completed and drainage patterns were delineated to ensure all proposed building structure to be protected for the 100-year storm event in a Mean High-High Water condition following County of Orange requirements and guidelines. A preliminary Water Quality Treatment Program was developed, and a path for future studies was discussed in this report.

8.1 Future Studies

This Section summarizes studies that may be included with final design for each phase of construction as applicable.

- 1. Prepare the proposed condition 25-year storm event hydrology analysis to size proposed drainage inlet openings.
- 2. Analyze 100-year MHHW at the proposed storm drain main line, and surface flooding analysis for this condition. Tait suggests the use of a modeling tool such as XP-SWMMM to understand and analyze the flow of water above the top of curb through the surface and into the ocean.
- 3. Develop details to provide structure protection from the 100-year flood by setting finished floor pads above the flooding elevation and provide methods to convey flow around buildings of proposed stormwater.
- 4. Finalize design of proposed stormwater by-pass structures to divert low-flows for water quality treatment and stormwater conveyance through the proposed storm drain main lines.
- 5. Determine final sizes and location of proprietary BMPs.
- 6. Prepare Final Project WQMP for the Commercial Core Retail Area and Dry Stack Lease Area (considering Phasing as necessary).

