CEQA Drainage Report

Project Identification:

Helen Woodward Animal Center
6461 El Apajo Road
Rancho Santa Fe, CA 92067
Project Number: P04-059
Environmental Log Number: ER# 96-08-023B

Project Owner:

Helen Woodward Animal Center
6461 El Apajo Road
Rancho Santa Fe, CA 92067

Project Contractor: TBD

Prepared by:

RBF CONSULTING
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Contact Person: Kevin G. Vogelsang, RCE 41213

RBF JN 25-102814

Initial Preparation Date: August 3, 2007
Revision Date(s): January 18, 2008
March 26, 2008

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COUNTY OF SAN DIEGO

4th Review – Drainage Study – Helen Woodward Animal Center (March 19, 2008)

Item	Review Comments	Resolved		Note
		Yes	No	
1.	*Show all Tributary drainage basin areas, flowlengths, flowpaths, and elevations on the existing and proposed hydrology maps. Hydrology calculations cannot be verified with the information provided in the report.*	✓		All information now included on exhibits.
2.	*Onsite hydrology calculations are missing from the report. Include all calculations and show on-site drainage areas, flowpaths and elevations on existing hydrology map.*	✓		All calculations included. All information now included on exhibits.
3.	*Existing channel flow (node 116 to 121) appears to be reversed in the proposed condition (node 123 to 118). Please discuss in the narrative, the on-site flow changes from the existing condition. Provide more detail on maps for on-site flows.*	✓		Flow changes discussed in section 3.3 - Results. Maps made clearer to show on-site routing.
4.	*Proposed offsite area and channel flow (node 125 to node 123 – downstream elevation 31.3) does not agree with existing area and channel flow (node 125 to node 116 – downstream elevation 29.0), resulting in a 2 cfs difference. Please clarify discrepancy, as this is the same off-site area with no apparent project changes.*	✓		Elevations made to match at downstream end of offsite basin.
5.	*Clarify/discuss the reasons for the overall decrease in runoff (23.9 cfs), as shown in table 1, pg. 6, due to overall decrease in impervious surfaces?*	✓		After revisions, flows are near identical (as are C values).
6.	*Section 3.3 states the proposed development will decrease the impervious area on the site, however section 1.5 of the WQTR states an increase in impervious area of 6%, while table 1.1 shows a decrease of 7.6 percent. Verify all C values used and show composite C calculations for all drainage areas. Correct discrepancies in verbiage for both reports.*	✓		Discrepancies corrected. Composite C values included for existing and proposed in Tabs B and C.
7.	*The CEQA Drainage Report should include a detailed discussion of the results of the CEQA Floodplain Study. Include a map showing existing and proposed cross sections of floodplain with 100-year elevations, and proposed grading/building design. Demonstrate and discuss that the proposed facilities will be outside (1 ft above) the proposed water surface elevation of the floodplain.*	✓		Exhibit included in Tab D. Discussion included in section 2.6 – Floodplain Mapping.
8.	*The report should be signed and stamped by a registered engineer.*	✓		The document is now signed and stamped by the RCE.

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TECHNICAL APPENDIX

1 Introduction

This drainage report presents an analysis of the effects the proposed Helen Woodward Animal Center project might have on the *quantity* and *pattern* of storm water runoff in the local watershed. Storm water *quality* is addressed in the Water Quality Technical Report (WQTR) for the project, under separate cover from this document.

This report examines the existing and proposed hydrology of the site and nearby watershed and presents preliminary design of drainage facilities. The conclusions of the report are for planning purposes and do not present final design engineering recommendations for the project.

The proposed project involves the development of a site in the County of San Diego (see Exhibit A).

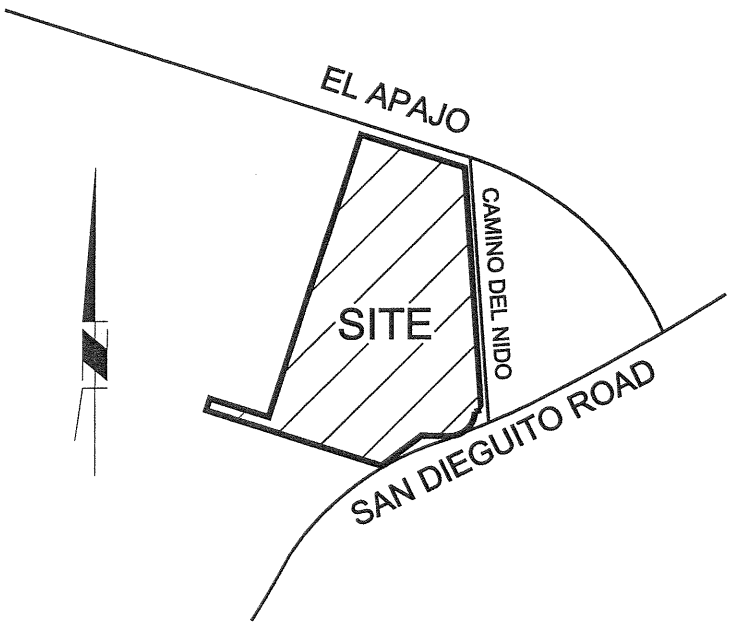


Exhibit A Location Map

2 Project Description

This section describes the project with respect to its location, the planned improvements, and places it within the context of the larger watershed.

2.1 PROJECT LOCATION

Helen Woodward Animal Center is located in Rancho Santa Fe, CA on El Apajo Road about 1000' northwest of the intersection of San Dieguito Road and El Apajo Road. Attachment A provides a location map for the project.

2.2 PROJECT DESCRIPTION

The project consists of the phased demolition, reconstruction, and renovation of the existing 120,710 square foot Helen Woodward Animal Center ("HWAC" or "the Center"), on its current Rancho Santa Fe site. The site is approximately 11.9 acres, and the phased rebuilding of the Center anticipates approximately 87,339 square feet of new building space, referred to as Building I, Building III, and the Therapeutic Riding Structure, and approximately 41,013 square feet of renovated space referred to as Building II. In addition, approximately 4,098 square feet of new horse stalls will be located adjacent to Building II and approximately 9,218 square feet of new horse stalls will be located adjacent to the Therapeutic Riding Structure. A variety of exterior site amenities are planned including horse grazing pastures, lunging pen, walking path, corrals, children's activity fields with pre-fabricated shade structure, animal play & exercise fields, mechanical and equipment storage yard, and waste storage. The design has changed from a Campus style plan in the original submittal, consisting of eight separate conditioned structures, to a more compact plan consisting of three conditioned structures, referred to as Building I, Building II, and Building III.

2.3 PROJECT ACTIVITIES

This project is the construction of a new animal center to place the existing center, and activities on the site will be typical of such development. The project is anticipated to generate significant animal waste products and will account for that in design.

2.4 EXISTING IMPROVEMENTS AND DRAINAGE PATTERNS

The existing topography for the majority of the site tends to slope toward the westerly area of the site. Slopes across the site vary from 1 to 3%. Flows enter the site along the western and northern boundaries and ultimately discharge in the southerly channel. A pump is used to lift storm water from the northwest corner of the site to the channel. The existing drainage map depicts the existing drainage patterns and is located in the Technical Appendix, Tab B.

2.5 PROPOSED IMPROVEMENTS AND DRAINAGE PATTERNS

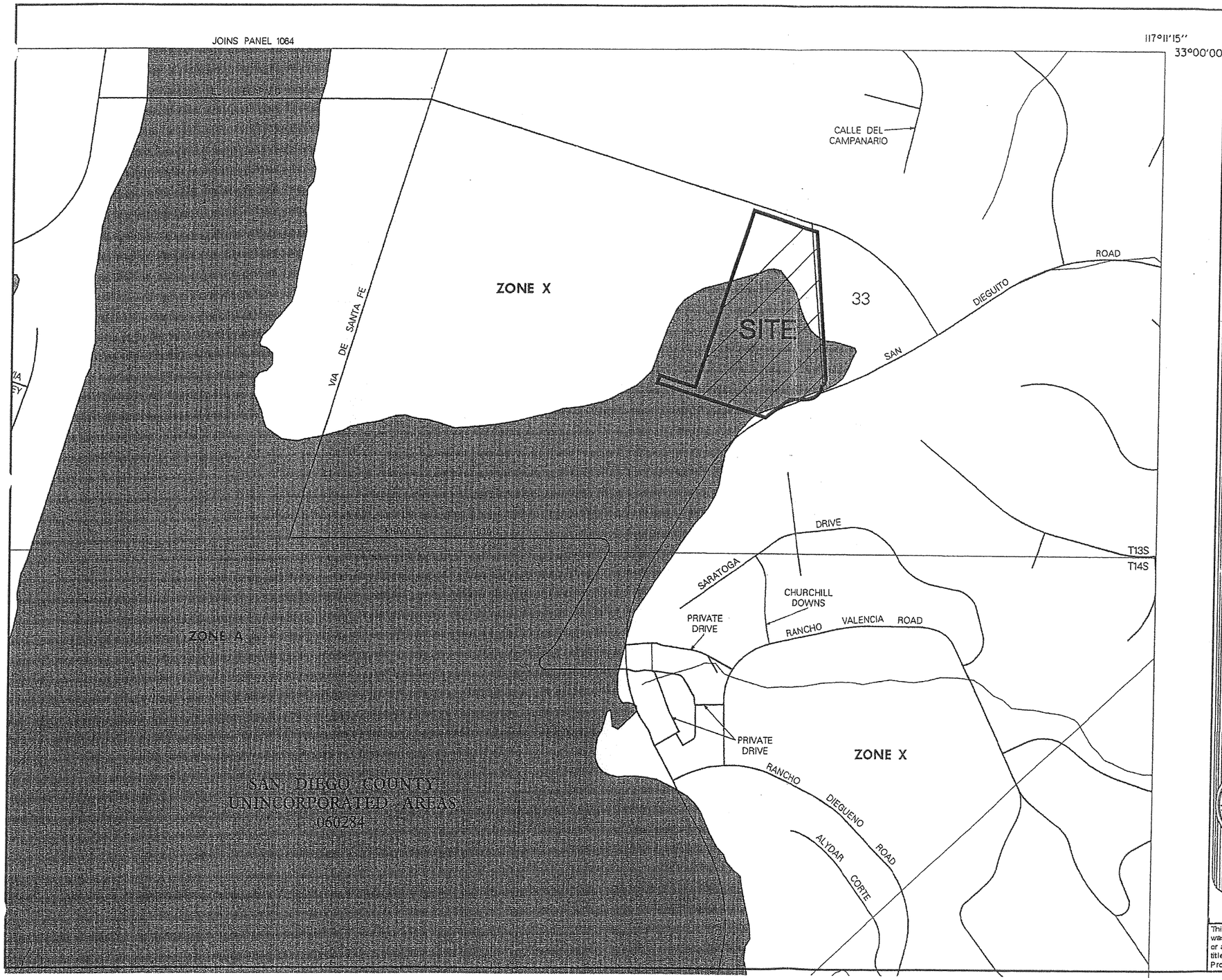
This report presents a preliminary design of drainage improvements. These designs are outlined below, and presented in the Technical Appendices Tabs B and C.

- *Detention Facilities.* Site specific detention facilities are not proposed at this time because the post development runoff conditions are lower than current development runoff. Some on-site detention may exist in final design, however, to accommodate an optimal size and configuration of storm water pumps.
- *Permanent Storm Water Quality Best Management Practices.* Storm water quality best management practices (BMPs) would be installed throughout the site. BMPs for the project site include disconnected impervious area, a vegetated swale, sand filter trenches and a sand filter treatment basin. The Water Quality Technical Report (WQTR) for the project, under separate cover from this report, discusses these BMPs in more detail.

2.6 FLOODPLAIN MAPPING

The Federal Emergency Management Agency (FEMA) categorizes the majority of the site as Zone A (no base flood elevations determined). The remainder of the site is Zone X (areas determined to be outside the 500-year floodplain). Exhibit B illustrates the FEMA floodplain mapping in the vicinity of the project site (FIRM Panel 06073C-1327F).

A separate HEC-RAS analysis has been performed as part of the Floodplain Analysis report to further define these limits especially as they relate to the proposed design. The analysis determined the floodplain at the site due to the flows in the channel along the southern side of the site. The results of the analysis are included in the Technical Appendices Tab D, and show the site and calculated floodplain. The results of the Floodplain Analysis report were used to ensure that all structures on the site have their finished floors a minimum of one foot above the water surface elevation of the floodplain.



APPROXIMATE SCALE IN FEET

500 0 500

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

SAN DIEGO COUNTY, CALIFORNIA AND INCORPORATED AREAS

PANEL 1327 OF 2375

(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
SAN DIEGO COUNTY, UNINCORPORATED AREAS	060284	1327	F
SAN DIEGO, CITY OF	060295	1327	F

MAP NUMBER
06073C1327 F

EFFECTIVE DATE:
JUNE 19, 1997

Federal Emergency Management Agency

3 Hydrologic Analysis

3.1 OBJECTIVE

The objective of this analysis is to determine the project's effect on the hydrology of the local watershed. The change in hydrology is measured using peak 100-year flows emanating from the project site.

3.2 METHOD

The analysis was performed by producing 2 separate hydrologic models, detailed as follows:

- **Existing Condition AES Model.** This model includes all existing drainage areas contributing to the one ultimate outfall location. The model, pertinent data and exhibits are contained in the Technical Appendix, Tab B.
- Basins for the Existing Condition model were delineated based upon a site reconnaissance, the El Apajo Master Drainage Plan, a flown topography map, and aerial photos. 5-foot topographic data obtained from San Diego County, 2-foot topographic data obtained as part of the project, as well as information gathered from aerial photographs.
- **Proposed Condition AES Model.** This model includes the developed condition area that ultimately drains to the proposed southerly channel. A complete HEC-RAS analysis will be completed upon the southerly channel within the final engineering phase. The hydrologic analyses were performed utilizing the Rational Method as outlined in the San Diego County Hydrology Manual (SDCHM, June 2003).
- Basins for the proposed condition models were delineated based on preliminary grading design.
- The "C" values used are based upon the coefficient runoff equation in section 3.1.2 of the SDCHM. These calculations are contained in Tabs B and C.

3.3 RESULTS

The proposed redevelopment would not significantly alter the impervious area on the site in the form of rooftops, deck, driveway, and parking. Water quality Best Management Practices will be provided to disconnect this impervious area to the maximum extent practical.

In the existing condition, flows from the northern part of the site, Node 116 (123 proposed) and Node 118 are routed in a grass channel to the south to Node 121, where they are then pumped to Node 100.

In the proposed condition, these flows are directed to the northwest corner of the site (Node 118) where a new pump facility will be placed to pump flows to their original discharge point at Node 100.

Pump sizes have not yet been determined. Underground storage and infiltration may be proposed to mitigate the accumulation of offsite flows. At the final design phase, calculations will be provided showing that the final selected system or combination of systems (underground storage and infiltration or overland pumping) is capable of safely conveying the 100-year design storm throughout the site. Table 1 displays the discharge comparison between the existing and proposed conditions, which includes onsite and offsite flows.

Table 1 - Discharge Comparison

ULTIMATE OUTFALL LOCATION	TRIBUTARY AREA (acre)	Tc (min)	Q_{100} (cfs)
Existing Condition Node 100	28.7	9.39	76.6
Proposed Condition Node 100	28.7	9.97	76.1

The results show how the proposed site (with the same overall runoff coefficient as existing) generates nearly the same flows as the existing site.

4 CEQA Summary

This section summarizes the results of the hydrology and drainage analysis in the context of CEQA significance guidelines.

4.1 DRAINAGE

4.1.1 Erosion and/or Sedimentation

Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on- or off-site?

No. The Proposed Project would not substantially alter existing drainage patterns of the site area in a manner that would result in substantial erosion or siltation. The project does not alter the course of a stream or river, and the project does not increase runoff at existing outfall locations.

- BMPs will be installed throughout the site to manage erosion and siltation.
- The detention basin design will contain sediment generated by runoff from the site.

4.1.2 Flooding

Does the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site?

No. The Proposed Project would not substantially alter existing drainage patterns of the site area in a manner that would result in flooding on- or off-site. The project does not alter the course of a stream or river, and the project does not substantially increase runoff at existing outfall locations.

- While some localized drainage diversion may occur to facilitate grading, these diversions are contained within the project limits. .
- The results of the analyses show a decrease in runoff from the site.

4.1.3 Drainage System Capacity

Does the project create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems?

No. The Proposed Project would not create or contribute to runoff water that would exceed the capacity of existing or planned storm water drainage systems.

- Hydrologic analysis indicates that there would be a decrease in total peak flows discharging from the project site.

4.2 FLOOD HAZARDS

4.2.1 Residential Flood Hazard

Would the project place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map, including County Floodplain Maps?

No. The Proposed Project would not locate any housing within the 100-year flood hazard area.

- The project does not propose any housing within the 100-year floodplain or other Special Flood Hazard Area (SFHA) designated by FEMA.

4.2.2 Flood Flow

Does the project place within a 100-year flood hazard area structures that would impede or redirect flood flows?

Yes, a detailed HEC-RAS analysis is currently being performed.

4.2.3 Flood Hazard

Does the project expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

No. The Proposed Project would not place any people or structures at significant risk of loss, injury, or death due to flooding. The project does not create an unreasonable hazard of flood or inundation to persons or property.

4.2.4 Other Hazards

Is the project at significant risk of inundation by seiche, tsunami, or mudflow?

No. The Proposed Project is not located within an area at risk of inundation by seiche (lake slosh) tsunami, or mud flow.

4.3 WAIVER AND RELEASE AGREEMENTS

The Proposed Projects effects on downstream flow characteristics are negligible and do not change flow characteristics significantly, either due to increase in flow or flood condition, diversion of flow, or flow concentration. Therefore, it is not necessary to obtain waiver and release agreements from any affected property owners.

5 References

5.1 GENERAL REFERENCES

FEMA, 1997. FEMA. (June 17, 1997). Flood Insurance Study, San Diego County.

San Diego County, 2005. San Diego County Flood Control District (July 2005). Drainage Design Manual.

San Diego County, 2003. San Diego County Flood Control District. (June 2003). Hydrology Manual.

San Diego County, 1993. San Diego County Flood Control District. (April 1993). Hydrology Manual and Design and Procedure Manual. Ref. SFC P3055.

SCS, 1973. Soil Conservation Service. (December, 1973). Soil Survey, San Diego Area, California.

RBF CONSULTING

Certification

This CEQA Drainage Study has been prepared under the direction of the following Registered Civil Engineer. The Registered Civil Engineer attests to the technical information contained herein and the engineering data upon which recommendations, conclusions, and decisions are based. The plans and specifications in this CEQA Drainage Study are not for construction purposes; the contractor shall refer to final approved construction documents for plans and specifications.

Kevin G Vogelsang
RCE 41213

March 26, 2008

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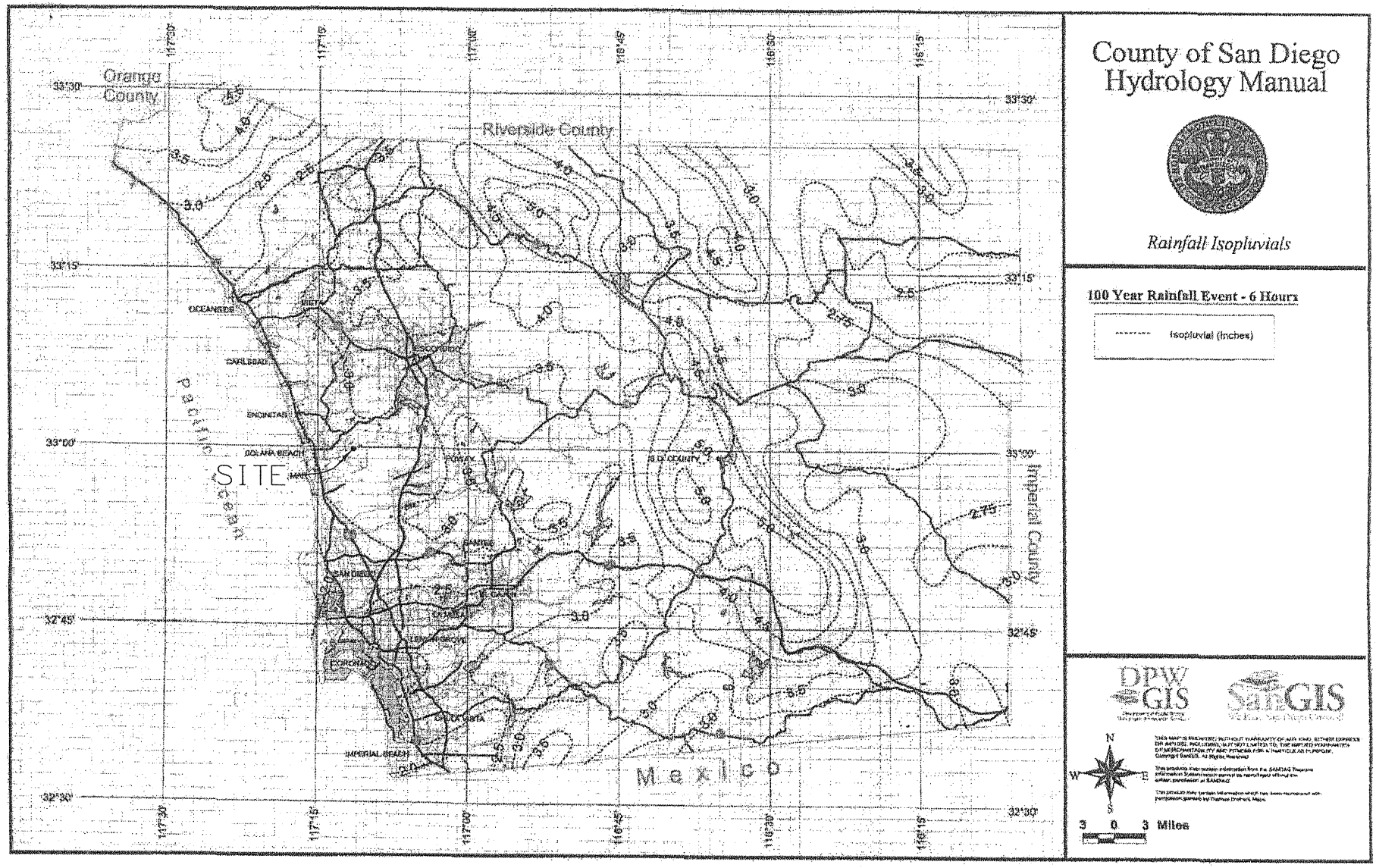
RBF JN 25-102814



County of San Diego Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 6 Hours

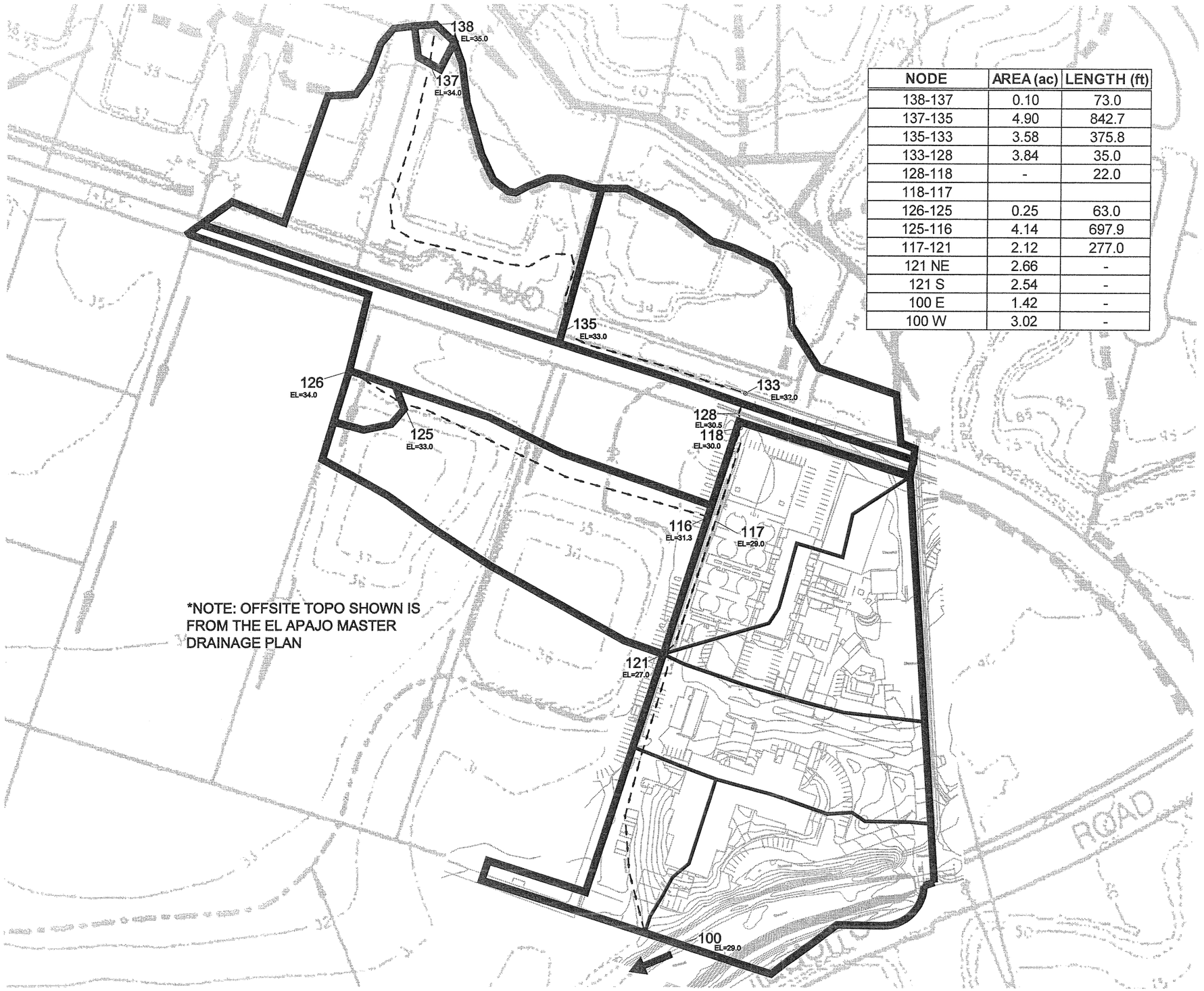
Isopluvial (Inches)

DPW GIS

SanGIS

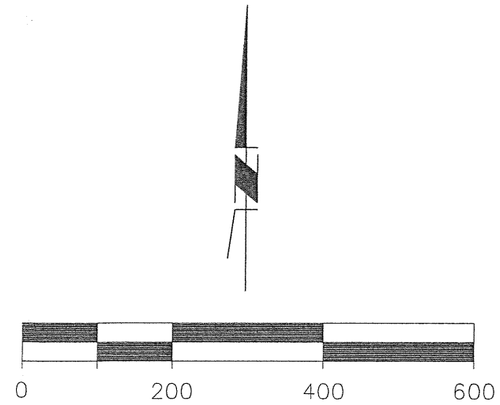
N W E S

3 0 3 Miles



*NOTE: OFFSITE TOPO SHOWN IS FROM THE EL APAJO MASTER DRAINAGE PLAN

NODE	AREA (ac)	LENGTH (ft)
138-137	0.10	73.0
137-135	4.90	842.7
135-133	3.58	375.8
133-128	3.84	35.0
128-118	-	22.0
118-117		
126-125	0.25	63.0
125-116	4.14	697.9
117-121	2.12	277.0
121 NE	2.66	-
121 S	2.54	-
100 E	1.42	-
100 W	3.02	-



LEGEND

- SUB-BASINS
- 100 NODE NUMBER
- ROUTING REACH
- ULTIMATE OUTFALL
- SITE BOUNDARY
- SITE TOPO

WOODWARD ANIMAL CENTER

EXISTING CONDITION DRAINAGE MAP

RBF CONSULTING
PLANNING ■ DESIGN ■ CONSTRUCTION
9755 CLAIREMONT MESA BOULEVARD, SUITE 100
SAN DIEGO, CALIFORNIA 92124-1324
858.614.5000 • FAX 858.614.5001 • www.RBF.com

PROJECT LOCATION
SAN DIEGO COUNTY, CA

DRAFTED BY	DATE	SCALE
ADB	3/08	1"=200'

RBF JOB NO.
25-102814

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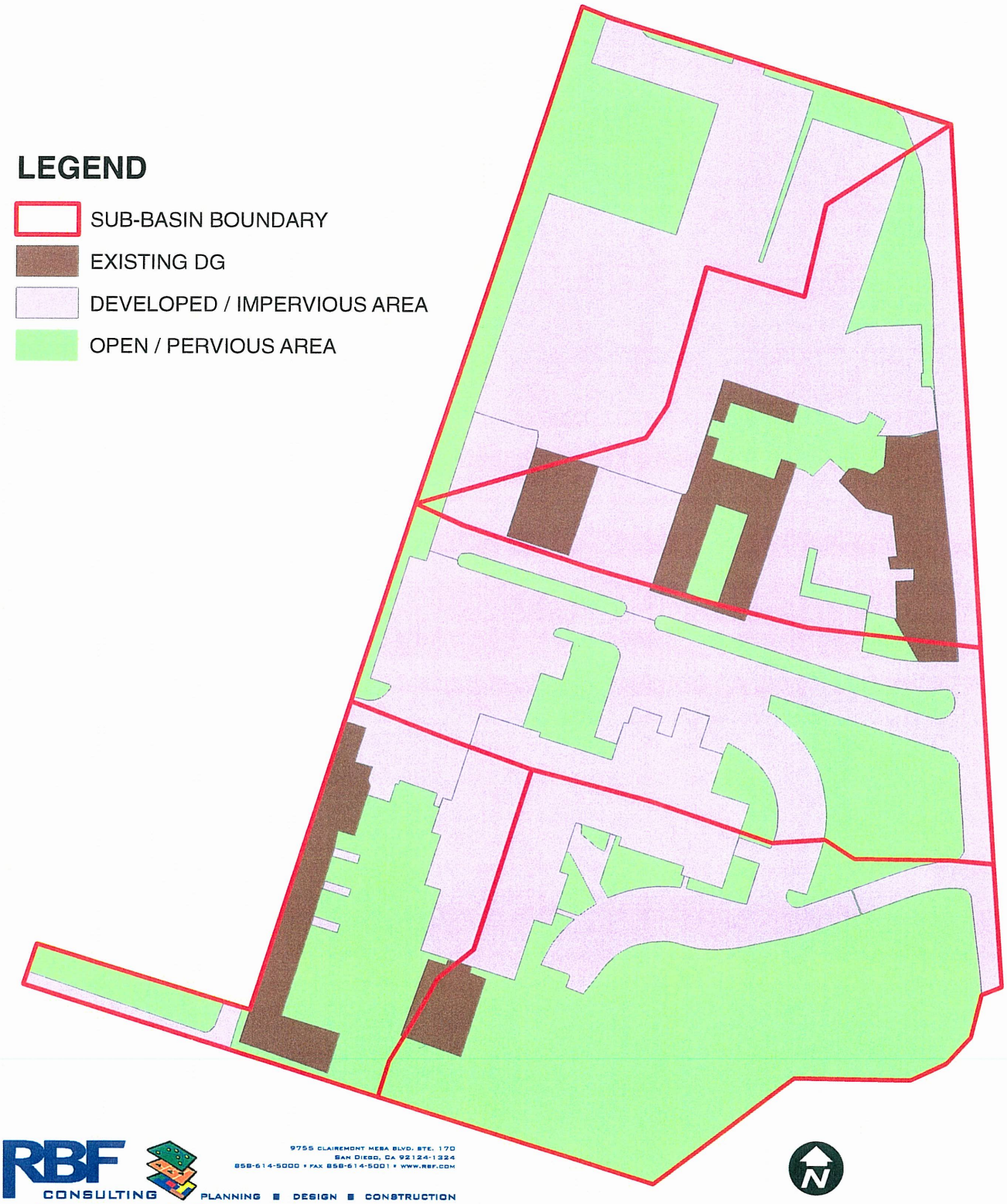
EXISTING CONDITION LAND USE MAP



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San Diego, CA 92124-1324
858-614-5000 • FAX 858-614-5001 • www.rbf.com
PLANNING ■ DESIGN ■ CONSTRUCTION
GIS

EXISTING CONDITION MODEL C - VALUE CALCULATION

NODE NUMBER	DG (ft^2)	DEV. AREA (ft^2)	TOTAL AREA (ft^2)	OPEN AREA (ft^2)	C
121 N	409	65086	96701	31206	**0.67**
121 E	26243	69439	116027	20345	**0.72**
121 S	1296	74242	110541	35003	**0.69**
100 E	3490	38890	131374	88994	**0.45**
100 W	11986	19651	61676	30039	**0.53**

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************************************************************************

          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                        2003,1985,1981 HYDROLOGY MANUAL
       (c) Copyright 1982-2006 Advanced Engineering Software (aes)
           Ver. 2.0 Release Date: 06/01/2005  License ID 1264

                        Analysis prepared by:

                            RBF Consulting
                          14725 Alton Parkway
                        Irvine, California  92618


------------------------------------------------------------------------
  FILE NAME: HWEX100.DAT
  TIME/DATE OF STUDY: 14:12 03/25/2008
------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =    2.800
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *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   15.0     10.0    0.018/0.018/0.020   0.50    1.50 0.0313 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.40 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  4.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

************************************************************************
  FLOW PROCESS FROM NODE    138.00 TO NODE    137.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
========================================================================
  USER-SPECIFIED RUNOFF COEFFICIENT = .2700
  S.C.S. CURVE NUMBER (AMC II) =  45
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    73.00
  UPSTREAM ELEVATION(FEET) =     35.00
  DOWNSTREAM ELEVATION(FEET) =     34.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =  11.494
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.313
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

************************************************************************
  FLOW PROCESS FROM NODE    137.00 TO NODE    135.00 IS CODE =  51
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     34.00  DOWNSTREAM(FEET) =     33.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   842.70   CHANNEL SLOPE =  0.0012
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.235
  USER-SPECIFIED RUNOFF COEFFICIENT = .2700
  S.C.S. CURVE NUMBER (AMC II) =  45
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      1.71
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   0.69
  AVERAGE FLOW DEPTH(FEET) =   0.40   TRAVEL TIME(MIN.) =  20.35
  Tc(MIN.) =  31.84
  SUBAREA AREA(ACRES) =     4.90       SUBAREA RUNOFF(CFS) =     2.96
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.270
  TOTAL AREA(ACRES) =      5.00         PEAK FLOW RATE(CFS) =       3.02

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.55   FLOW VELOCITY(FEET/SEC.) =   0.83
  LONGEST FLOWPATH FROM NODE    138.00 TO NODE    135.00 =   915.70 FEET.

************************************************************************
  FLOW PROCESS FROM NODE    135.00 TO NODE    133.00 IS CODE =  62
------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
========================================================================
  UPSTREAM ELEVATION(FEET) =   33.00  DOWNSTREAM ELEVATION(FEET) =   32.00
  STREET LENGTH(FEET) =   375.80   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 15.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  10.00
  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) =       4.00
```

```
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.36
    HALFSTREET FLOOD WIDTH(FEET) =   12.85
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.25
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.45
  STREET FLOW TRAVEL TIME(MIN.) =   5.01   Tc(MIN.) =  36.85
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.034
  USER-SPECIFIED RUNOFF COEFFICIENT = .2700
  S.C.S. CURVE NUMBER (AMC II) =  45
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.270
  SUBAREA AREA(ACRES) =     3.58      SUBAREA RUNOFF(CFS) =     1.97
  TOTAL AREA(ACRES) =      8.58        PEAK FLOW RATE(CFS) =       4.71

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.38   HALFSTREET FLOOD WIDTH(FEET) =  13.79
  FLOW VELOCITY(FEET/SEC.) =  1.29   DEPTH*VELOCITY(FT*FT/SEC.) =   0.49
  LONGEST FLOWPATH FROM NODE    138.00 TO NODE    133.00 =  1291.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    133.00 TO NODE    128.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    31.00  DOWNSTREAM(FEET) =    30.50
  FLOW LENGTH(FEET) =    35.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.47
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      4.71
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =  36.94
  LONGEST FLOWPATH FROM NODE    138.00 TO NODE    128.00 =  1326.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    128.00 TO NODE    128.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.031
  USER-SPECIFIED RUNOFF COEFFICIENT = .8000
  S.C.S. CURVE NUMBER (AMC II) =  89
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4339
  SUBAREA AREA(ACRES) =     3.84   SUBAREA RUNOFF(CFS) =     6.24
  TOTAL AREA(ACRES) =     12.42   TOTAL RUNOFF(CFS) =   10.94
  TC(MIN.) =  36.94

****************************************************************************
  FLOW PROCESS FROM NODE    128.00 TO NODE    118.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    30.50  DOWNSTREAM(FEET) =    30.00
  FLOW LENGTH(FEET) =    22.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.48
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     10.94
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =  36.98
  LONGEST FLOWPATH FROM NODE    138.00 TO NODE    118.00 =  1348.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    118.00 TO NODE    117.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     30.00  DOWNSTREAM(FEET) =     29.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   158.58   CHANNEL SLOPE =  0.0063
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.985
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .6700
  S.C.S. CURVE NUMBER (AMC II) =  89
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     11.01
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.02
  AVERAGE FLOW DEPTH(FEET) =   0.75   TRAVEL TIME(MIN.) =   1.31
  Tc(MIN.) =  38.29
  SUBAREA AREA(ACRES) =     0.10      SUBAREA RUNOFF(CFS) =     0.14
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.436
  TOTAL AREA(ACRES) =     12.52        PEAK FLOW RATE(CFS) =      10.94

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.75   FLOW VELOCITY(FEET/SEC.) =   2.00
  LONGEST FLOWPATH FROM NODE    138.00 TO NODE    117.00 =  1507.08 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    117.00 TO NODE    117.00 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.) =  38.29
  RAINFALL INTENSITY(INCH/HR) =   1.98
  TOTAL STREAM AREA(ACRES) =    12.52
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.94

****************************************************************************
  FLOW PROCESS FROM NODE    126.00 TO NODE    125.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  USER-SPECIFIED RUNOFF COEFFICIENT = .8000
```

```
 S.C.S. CURVE NUMBER (AMC II) =  89
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    63.00
 UPSTREAM ELEVATION(FEET) =     34.00
 DOWNSTREAM ELEVATION(FEET) =     33.00
 ELEVATION DIFFERENCE(FEET) =      1.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.674
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.377
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      1.48
 TOTAL AREA(ACRES) =      0.25   TOTAL RUNOFF(CFS) =      1.48

****************************************************************************
 FLOW PROCESS FROM NODE    125.00 TO NODE    116.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =     33.00  DOWNSTREAM(FEET) =     31.30
 CHANNEL LENGTH THRU SUBAREA(FEET) =   697.90   CHANNEL SLOPE =  0.0024
 CHANNEL BASE(FEET) =    6.00   "Z" FACTOR =   4.000
 MANNING'S FACTOR = 0.017   MAXIMUM DEPTH(FEET) =   2.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.237
 USER-SPECIFIED RUNOFF COEFFICIENT = .8000
 S.C.S. CURVE NUMBER (AMC II) =  89
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     10.39
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.41
 AVERAGE FLOW DEPTH(FEET) =   0.53   TRAVEL TIME(MIN.) =   4.83
 Tc(MIN.) =   8.51
 SUBAREA AREA(ACRES) =     4.14       SUBAREA RUNOFF(CFS) =   17.34
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.800
 TOTAL AREA(ACRES) =      4.39         PEAK FLOW RATE(CFS) =     18.39

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.72   FLOW VELOCITY(FEET/SEC.) =   2.87
 LONGEST FLOWPATH FROM NODE    126.00 TO NODE    116.00 =   760.90 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    117.00 TO NODE    117.00 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.) =   8.51
 RAINFALL INTENSITY(INCH/HR) =   5.24
 TOTAL STREAM AREA(ACRES) =     4.39
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     18.39

 ** CONFLUENCE DATA **
 STREAM     RUNOFF      Tc       INTENSITY      AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
    1       10.94    38.29        1.985        12.52
    2       18.39     8.51        5.237         4.39

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

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc       INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
    1       20.82     8.51        5.237
    2       17.91    38.29        1.985

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     20.82   Tc(MIN.) =    8.51
 TOTAL AREA(ACRES) =     16.91
 LONGEST FLOWPATH FROM NODE    138.00 TO NODE    117.00 =  1507.08 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    117.00 TO NODE    121.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =     29.00  DOWNSTREAM(FEET) =     27.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   277.00   CHANNEL SLOPE =  0.0072
 CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   5.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.740
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .6700
 S.C.S. CURVE NUMBER (AMC II) =  89
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     24.17
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.25
 AVERAGE FLOW DEPTH(FEET) =   0.95   TRAVEL TIME(MIN.) =   1.42
 Tc(MIN.) =   9.93
 SUBAREA AREA(ACRES) =     2.12       SUBAREA RUNOFF(CFS) =    6.72
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.546
 TOTAL AREA(ACRES) =     19.03         PEAK FLOW RATE(CFS) =      49.23

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.37   FLOW VELOCITY(FEET/SEC.) =   3.95
 LONGEST FLOWPATH FROM NODE    138.00 TO NODE    121.00 =  1784.08 FEET.

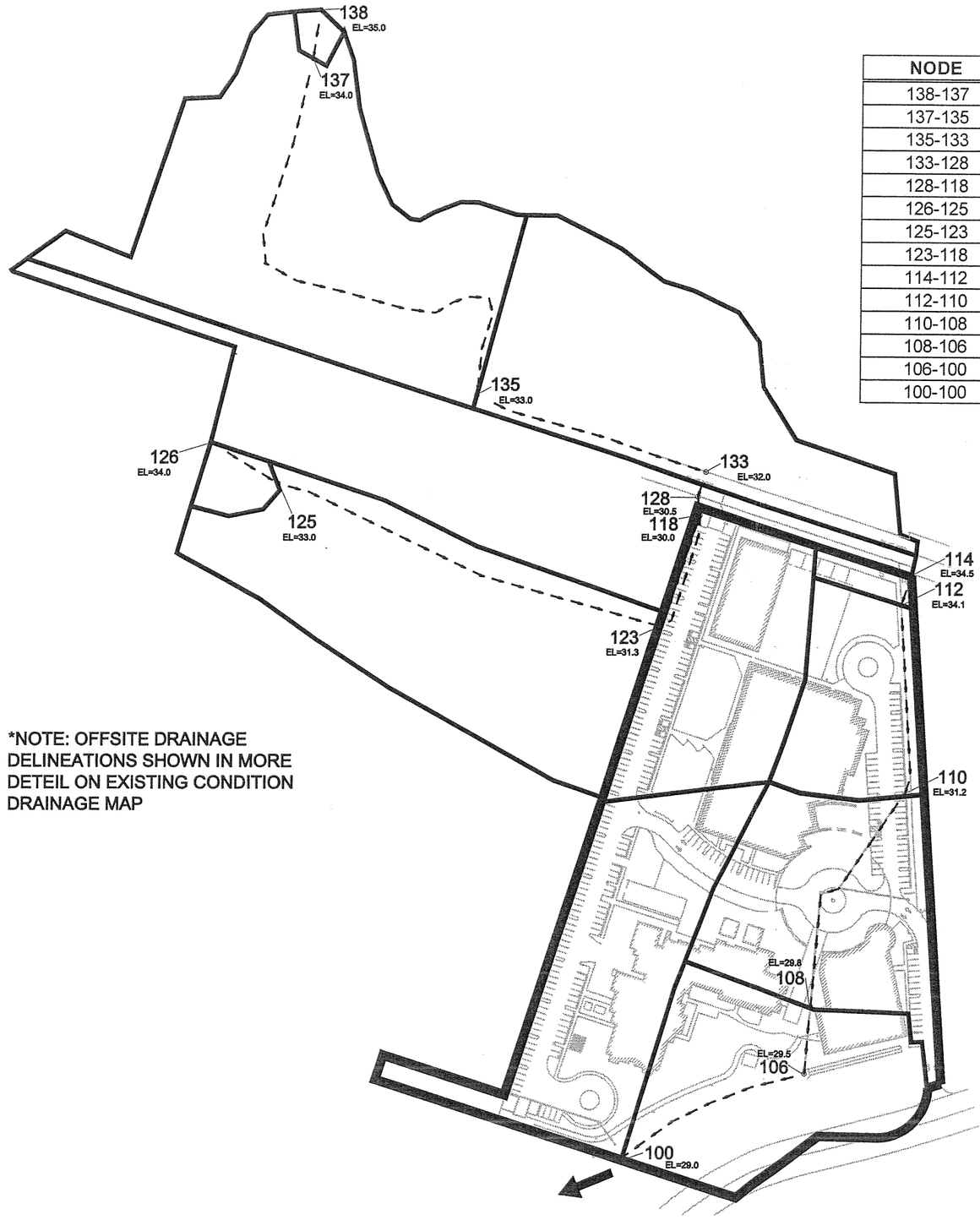
****************************************************************************
 FLOW PROCESS FROM NODE    121.00 TO NODE    121.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.740
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .7200
 S.C.S. CURVE NUMBER (AMC II) =  89
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.5672
 SUBAREA AREA(ACRES) =     2.66   SUBAREA RUNOFF(CFS) =     9.09
```

```
 TOTAL AREA(ACRES) =     21.69   TOTAL RUNOFF(CFS) =   58.32
 TC(MIN.) =   9.93

****************************************************************************
 FLOW PROCESS FROM NODE    121.00 TO NODE    121.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.740
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .6900
 S.C.S. CURVE NUMBER (AMC II) =  89
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.5801
 SUBAREA AREA(ACRES) =     2.54   SUBAREA RUNOFF(CFS) =    8.30
 TOTAL AREA(ACRES) =     24.23   TOTAL RUNOFF(CFS) =   66.62
 TC(MIN.) =   9.93

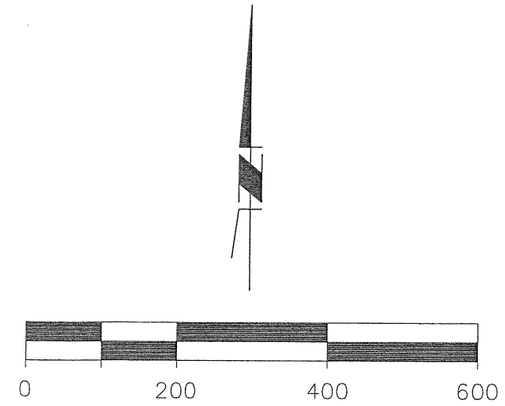
****************************************************************************
 FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.740
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5300
 S.C.S. CURVE NUMBER (AMC II) =  89
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.5773
 SUBAREA AREA(ACRES) =     1.42   SUBAREA RUNOFF(CFS) =    3.56
 TOTAL AREA(ACRES) =     25.65   TOTAL RUNOFF(CFS) =   70.18
 TC(MIN.) =   9.93

****************************************************************************
 FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.740
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .4500
 S.C.S. CURVE NUMBER (AMC II) =  89
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.5639
 SUBAREA AREA(ACRES) =     3.02   SUBAREA RUNOFF(CFS) =    6.43
 TOTAL AREA(ACRES) =     28.66   TOTAL RUNOFF(CFS) =   76.61
 TC(MIN.) =   9.93
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)      =     28.66  TC(MIN.) =      9.93
 PEAK FLOW RATE(CFS)    =     76.61
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```



NODE	AREA (ac)	LENGTH (ft)
138-137	0.10	73.0
137-135	4.90	842.7
135-133	3.58	375.8
133-128	3.84	35.0
128-118	-	22.0
126-125	0.25	63.0
125-123	4.14	697.9
123-118	-	192.4
114-112	2.29	50.0
112-110	0.18	300.0
110-108	1.40	383.6
108-106	2.43	100.0
106-100	2.53	319.2
100-100	2.81	-

*NOTE: OFFSITE DRAINAGE DELINEATIONS SHOWN IN MORE DETEIL ON EXISTING CONDITION DRAINAGE MAP



LEGEND

- SUB-BASINS
- 100 NODE NUMBER
- ROUTING REACH
- ULTIMATE OUTFALL
- SITE BOUNDARY
- SITE

WOODWARD ANIMAL CENTER

PROPOSED CONDITION DRAINAGE MAP

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9755 CLAIREMONT MESA BOULEVARD, SUITE 100
SAN DIEGO, CALIFORNIA 92124-1324
858.614.5000 ▪ FAX 858.614.5001 ▪ www.RBF.com

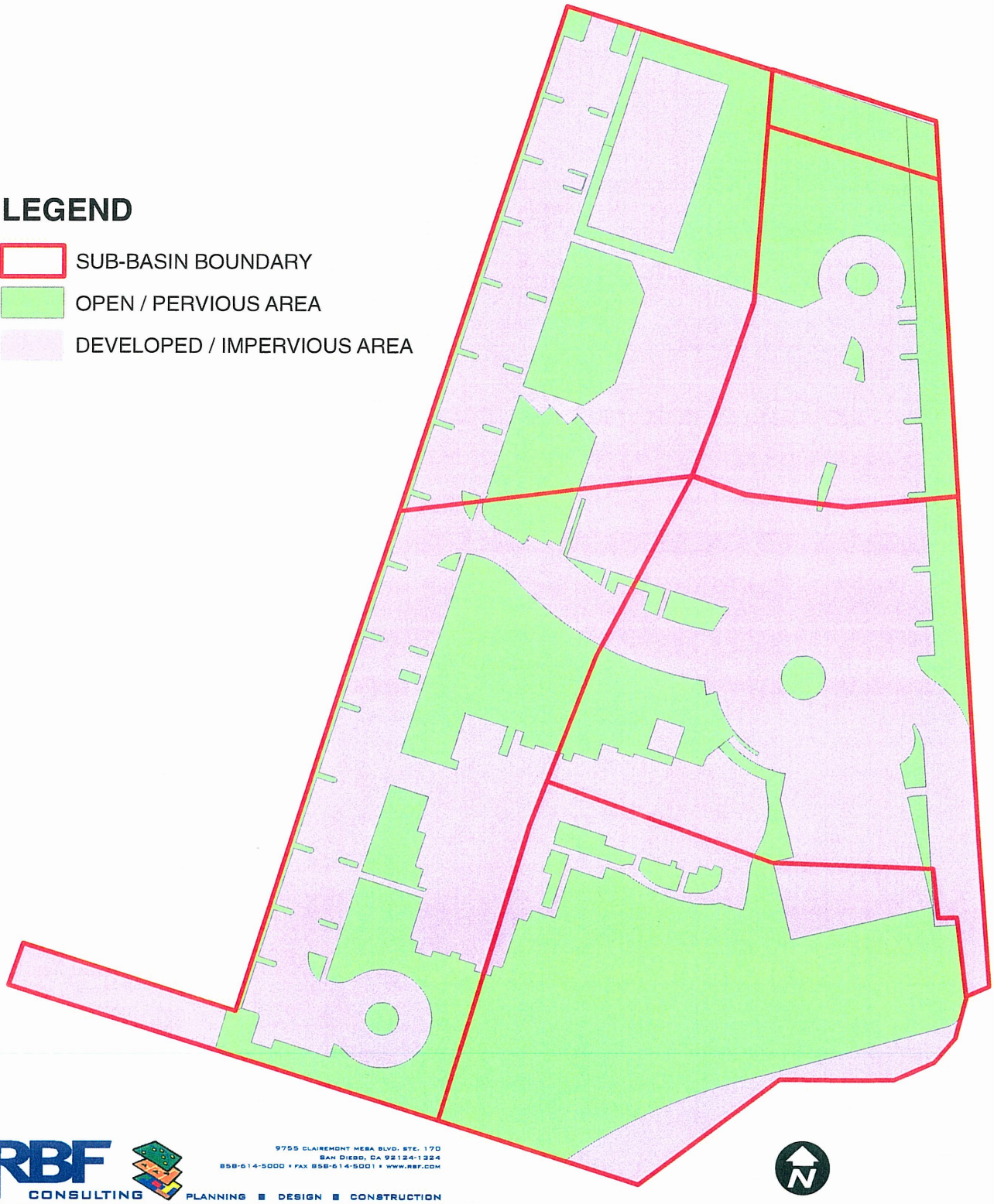
PROJECT LOCATION
SAN DIEGO COUNTY, CA

DRAFTED BY	DATE	SCALE
ADB	3/08	1"=200'

RBF JOB NO.
25-102814

H:\PDATA\25102814\Cadd\Stormwater\EXHIBITS\DR-PR-02.dwg 03/25/08 - 3:32pm ABARRY

PROPOSED CONDITION LAND USE MAP



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PROPOSED CONDITION MODEL C - VALUE CALCULATION

NODE NUMBER	OPEN AREA (ft^2)	TOTAL AREA (ft^2)	DEV. AREA (ft^2)	C
123 TO 118	36606	99799	63193	**0.64**
114 TO 112	7445	8038	593	**0.25**
112 TO 110	25978	60738	34760	**0.62**
110 TO 108	22924	110787	87863	**0.77**
108 TO 100	81270	110223	28953	**0.42**
100 TO 100	51686	127422	75736	**0.64**

```
****************************************************************************

          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                        2003,1985,1981 HYDROLOGY MANUAL
       (c) Copyright 1982-2006 Advanced Engineering Software (aes)
           Ver. 2.0 Release Date: 06/01/2005  License ID 1264

                        Analysis prepared by:

                            RBF Consulting
                          14725 Alton Parkway
                        Irvine, California  92618


----------------------------------------------------------------------------
  FILE NAME: HWAC100.DAT
  TIME/DATE OF STUDY: 15:46 03/25/2008
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =    2.800
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *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   15.0     10.0    0.018/0.018/0.020   0.50    1.50 0.0313 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.40 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  4.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE     138.00 TO NODE     137.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  USER-SPECIFIED RUNOFF COEFFICIENT = .2700
  S.C.S. CURVE NUMBER (AMC II) =  45
  INITIAL SUBAREA FLOW-LENGTH(FEET) =     73.00
  UPSTREAM ELEVATION(FEET) =      35.00
  DOWNSTREAM ELEVATION(FEET) =      34.00
  ELEVATION DIFFERENCE(FEET) =       1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =   11.494
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.313
  SUBAREA RUNOFF(CFS) =       0.12
  TOTAL AREA(ACRES) =       0.10   TOTAL RUNOFF(CFS) =       0.12

****************************************************************************
  FLOW PROCESS FROM NODE     137.00 TO NODE     135.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =      34.00  DOWNSTREAM(FEET) =      33.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   842.70   CHANNEL SLOPE =  0.0012
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =    2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.235
  USER-SPECIFIED RUNOFF COEFFICIENT = .2700
  S.C.S. CURVE NUMBER (AMC II) =  45
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.71
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   0.69
  AVERAGE FLOW DEPTH(FEET) =   0.40   TRAVEL TIME(MIN.) =  20.35
  Tc(MIN.) =  31.84
  SUBAREA AREA(ACRES) =      4.90       SUBAREA RUNOFF(CFS) =     2.96
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.270
  TOTAL AREA(ACRES) =       5.00          PEAK FLOW RATE(CFS) =       3.02

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.55   FLOW VELOCITY(FEET/SEC.) =   0.83
  LONGEST FLOWPATH FROM NODE     138.00 TO NODE     135.00 =   915.70 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     135.00 TO NODE     133.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =   33.00  DOWNSTREAM ELEVATION(FEET) =   32.00
  STREET LENGTH(FEET) =   375.80   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 15.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  10.00
  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) =       4.00
```

```
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.36
   HALFSTREET FLOOD WIDTH(FEET) =   12.85
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.25
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.45
 STREET FLOW TRAVEL TIME(MIN.) =   5.01   Tc(MIN.) =  36.85
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.034
 USER-SPECIFIED RUNOFF COEFFICIENT = .2700
 S.C.S. CURVE NUMBER (AMC II) =  45
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.270
 SUBAREA AREA(ACRES) =     3.58      SUBAREA RUNOFF(CFS) =     1.97
 TOTAL AREA(ACRES) =      8.58        PEAK FLOW RATE(CFS) =       4.71

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.38   HALFSTREET FLOOD WIDTH(FEET) =  13.79
 FLOW VELOCITY(FEET/SEC.) =  1.29   DEPTH*VELOCITY(FT*FT/SEC.) =   0.49
 LONGEST FLOWPATH FROM NODE    138.00 TO NODE    133.00 =  1291.50 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    133.00 TO NODE    128.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    31.00  DOWNSTREAM(FEET) =    30.50
 FLOW LENGTH(FEET) =    35.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.47
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      4.71
 PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =  36.94
 LONGEST FLOWPATH FROM NODE    138.00 TO NODE    128.00 =  1326.50 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    128.00 TO NODE    128.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.031
 USER-SPECIFIED RUNOFF COEFFICIENT = .8000
 S.C.S. CURVE NUMBER (AMC II) =  89
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4339
 SUBAREA AREA(ACRES) =     3.84   SUBAREA RUNOFF(CFS) =     6.24
 TOTAL AREA(ACRES) =     12.42   TOTAL RUNOFF(CFS) =   10.94
 TC(MIN.) =  36.94

****************************************************************************
 FLOW PROCESS FROM NODE    128.00 TO NODE    118.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    30.50  DOWNSTREAM(FEET) =    30.00
 FLOW LENGTH(FEET) =    22.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   9.48
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     10.94
 PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =  36.98
 LONGEST FLOWPATH FROM NODE    138.00 TO NODE    118.00 =  1348.50 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    118.00 TO NODE    118.00 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.) =  36.98
 RAINFALL INTENSITY(INCH/HR) =   2.03
 TOTAL STREAM AREA(ACRES) =    12.42
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.94

****************************************************************************
 FLOW PROCESS FROM NODE    126.00 TO NODE    125.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 USER-SPECIFIED RUNOFF COEFFICIENT = .8000
 S.C.S. CURVE NUMBER (AMC II) =  89
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    63.00
 UPSTREAM ELEVATION(FEET) =     34.00
 DOWNSTREAM ELEVATION(FEET) =     33.00
 ELEVATION DIFFERENCE(FEET) =      1.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.674
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.377
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      1.48
 TOTAL AREA(ACRES) =      0.25   TOTAL RUNOFF(CFS) =      1.48

****************************************************************************
 FLOW PROCESS FROM NODE    125.00 TO NODE    123.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =     33.00  DOWNSTREAM(FEET) =     31.30
 CHANNEL LENGTH THRU SUBAREA(FEET) =   697.90   CHANNEL SLOPE =  0.0024
 CHANNEL BASE(FEET) =     6.00   "Z" FACTOR =   4.000
 MANNING'S FACTOR = 0.017   MAXIMUM DEPTH(FEET) =   2.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.237
 USER-SPECIFIED RUNOFF COEFFICIENT = .8000
 S.C.S. CURVE NUMBER (AMC II) =  89
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     10.39
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.41
```

```
 AVERAGE FLOW DEPTH(FEET) =   0.53   TRAVEL TIME(MIN.) =   4.83
 Tc(MIN.) =   8.51
 SUBAREA AREA(ACRES) =     4.14       SUBAREA RUNOFF(CFS) =   17.34
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.800
 TOTAL AREA(ACRES) =      4.39         PEAK FLOW RATE(CFS) =      18.39

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.72   FLOW VELOCITY(FEET/SEC.) =   2.87
 LONGEST FLOWPATH FROM NODE    126.00 TO NODE    123.00 =   760.90 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    123.00 TO NODE    118.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =     31.30  DOWNSTREAM(FEET) =     30.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   192.40   CHANNEL SLOPE =  0.0068
 CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =    3.000
 MANNING'S FACTOR = 0.045   MAXIMUM DEPTH(FEET) =    4.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.728
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .6200
 S.C.S. CURVE NUMBER (AMC II) =  89
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     18.41
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.19
 AVERAGE FLOW DEPTH(FEET) =   1.03   TRAVEL TIME(MIN.) =   1.46
 Tc(MIN.) =   9.97
 SUBAREA AREA(ACRES) =     0.01       SUBAREA RUNOFF(CFS) =    0.03
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.800
 TOTAL AREA(ACRES) =      4.40         PEAK FLOW RATE(CFS) =      18.39

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.03   FLOW VELOCITY(FEET/SEC.) =   2.19
 LONGEST FLOWPATH FROM NODE    126.00 TO NODE    118.00 =   953.30 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    118.00 TO NODE    118.00 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.) =   9.97
 RAINFALL INTENSITY(INCH/HR) =   4.73
 TOTAL STREAM AREA(ACRES) =     4.40
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     18.39

 ** CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY      AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
    1       10.94    36.98        2.030         12.42
    2       18.39     9.97        4.728          4.40

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

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc       INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
    1       21.34     9.97       4.728
    2       18.84    36.98       2.030

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    21.34   Tc(MIN.) =    9.97
 TOTAL AREA(ACRES) =     16.82
 LONGEST FLOWPATH FROM NODE    138.00 TO NODE    118.00 =  1348.50 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    118.00 TO NODE    118.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.728
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .6400
 S.C.S. CURVE NUMBER (AMC II) =  89
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.5427
 SUBAREA AREA(ACRES) =    2.28   SUBAREA RUNOFF(CFS) =    6.90
 TOTAL AREA(ACRES) =     19.10   TOTAL RUNOFF(CFS) =   49.01
 TC(MIN.) =   9.97

****************************************************************************
 FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 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.) =   9.97
 RAINFALL INTENSITY(INCH/HR) =   4.73
 TOTAL STREAM AREA(ACRES) =    19.10
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     49.01

****************************************************************************
 FLOW PROCESS FROM NODE    114.00 TO NODE    112.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =  89
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
 UPSTREAM ELEVATION(FEET) =     34.50
 DOWNSTREAM ELEVATION(FEET) =     34.10
```

```
 ELEVATION DIFFERENCE(FEET) =      0.40
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =   11.654
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.274
 SUBAREA RUNOFF(CFS) =      0.19
 TOTAL AREA(ACRES) =      0.18   TOTAL RUNOFF(CFS) =      0.19

****************************************************************************
 FLOW PROCESS FROM NODE    112.00 TO NODE    110.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =     34.10  DOWNSTREAM(FEET) =     31.20
 CHANNEL LENGTH THRU SUBAREA(FEET) =   297.00   CHANNEL SLOPE =  0.0098
 CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   5.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.598
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .6200
 S.C.S. CURVE NUMBER (AMC II) =  89
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      1.70
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.39
 AVERAGE FLOW DEPTH(FEET) =   0.22   TRAVEL TIME(MIN.) =   3.57
 Tc(MIN.) =  15.22
 SUBAREA AREA(ACRES) =     1.40       SUBAREA RUNOFF(CFS) =     3.12
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.578
 TOTAL AREA(ACRES) =      1.58         PEAK FLOW RATE(CFS) =       3.28

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.32   FLOW VELOCITY(FEET/SEC.) =   1.75
 LONGEST FLOWPATH FROM NODE    114.00 TO NODE    110.00 =   347.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    110.00 TO NODE    108.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =     31.20  DOWNSTREAM(FEET) =     29.80
 FLOW LENGTH(FEET) =   383.60   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   3.55
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      3.28
 PIPE TRAVEL TIME(MIN.) =   1.80    Tc(MIN.) =  17.02
 LONGEST FLOWPATH FROM NODE    114.00 TO NODE    108.00 =   730.60 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    108.00 TO NODE    108.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.348
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .7700
 S.C.S. CURVE NUMBER (AMC II) =  89
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.6963
 SUBAREA AREA(ACRES) =     2.54   SUBAREA RUNOFF(CFS) =     6.55
 TOTAL AREA(ACRES) =      4.12   TOTAL RUNOFF(CFS) =     9.60
 TC(MIN.) =  17.02

****************************************************************************
 FLOW PROCESS FROM NODE    108.00 TO NODE    106.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =     29.80  DOWNSTREAM(FEET) =     29.50
 FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.27
 ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      9.60
 PIPE TRAVEL TIME(MIN.) =   0.39    Tc(MIN.) =  17.41
 LONGEST FLOWPATH FROM NODE    114.00 TO NODE    106.00 =   830.60 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    106.00 TO NODE    100.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =     29.50  DOWNSTREAM(FEET) =     29.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   319.20   CHANNEL SLOPE =  0.0016
 CHANNEL BASE(FEET) =    8.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.045   MAXIMUM DEPTH(FEET) =   4.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.805
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .4200
 S.C.S. CURVE NUMBER (AMC II) =  89
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     11.10
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.07
 AVERAGE FLOW DEPTH(FEET) =   0.96   TRAVEL TIME(MIN.) =   4.98
 Tc(MIN.) =  22.40
 SUBAREA AREA(ACRES) =     2.53       SUBAREA RUNOFF(CFS) =     2.98
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.591
 TOTAL AREA(ACRES) =      6.65         PEAK FLOW RATE(CFS) =      11.03

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.95   FLOW VELOCITY(FEET/SEC.) =   1.07
 LONGEST FLOWPATH FROM NODE    114.00 TO NODE    100.00 =  1149.80 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 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.) =  22.40
  RAINFALL INTENSITY(INCH/HR) =   2.80
  TOTAL STREAM AREA(ACRES) =     6.65
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.03

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
      1       49.01     9.97        4.728        19.10
      2       11.03    22.40        2.805         6.65

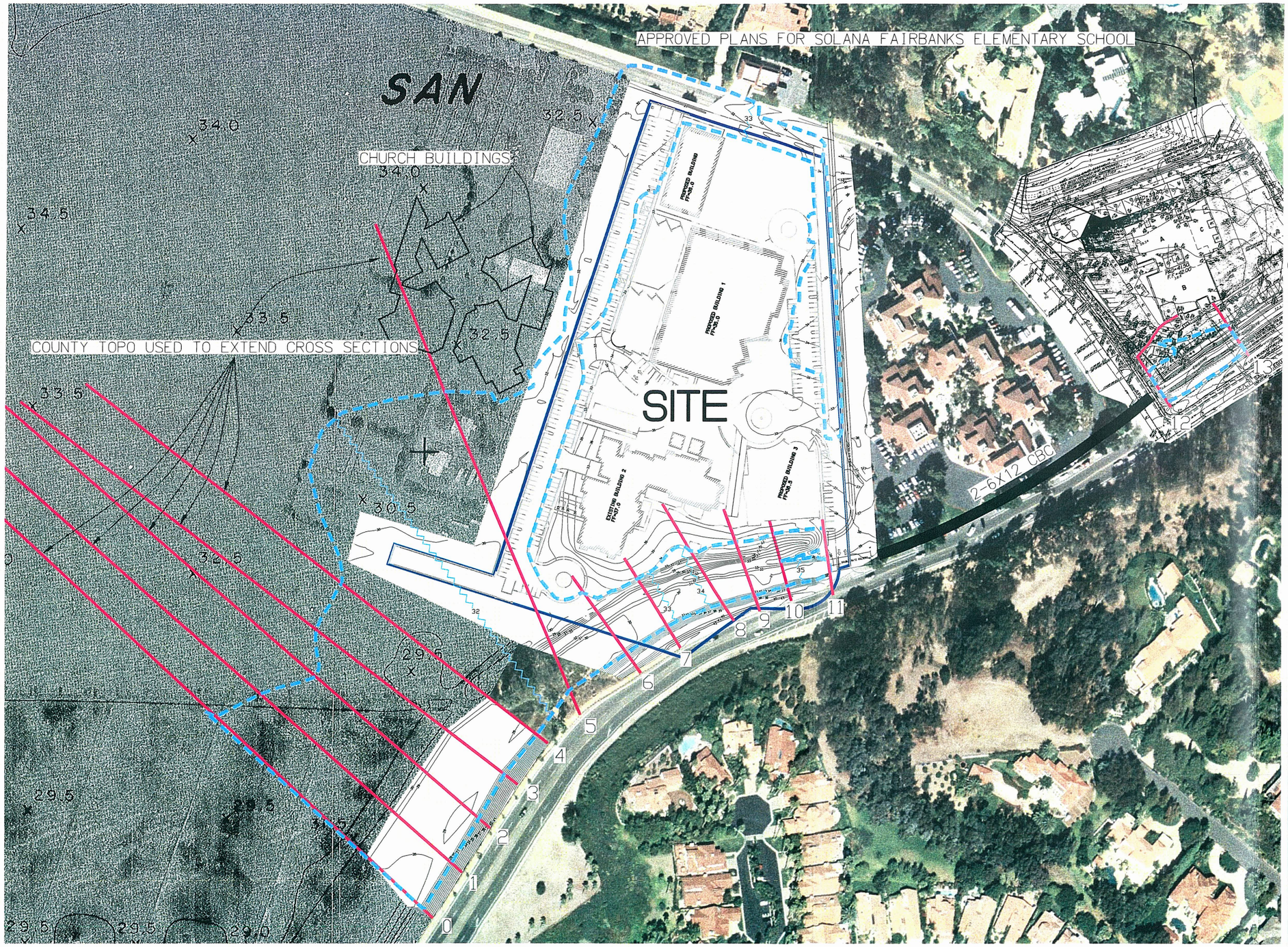
  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       53.92     9.97        4.728
      2       40.10    22.40        2.805

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     53.92   Tc(MIN.) =    9.97
  TOTAL AREA(ACRES) =     25.75
  LONGEST FLOWPATH FROM NODE    138.00 TO NODE    100.00 =  1348.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.728
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .6400
  S.C.S. CURVE NUMBER (AMC II) =  89
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5636
  SUBAREA AREA(ACRES) =    2.81   SUBAREA RUNOFF(CFS) =    8.50
  TOTAL AREA(ACRES) =     28.56   TOTAL RUNOFF(CFS) =   76.10
  TC(MIN.) =   9.97
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     28.56  TC(MIN.) =      9.97
  PEAK FLOW RATE(CFS)   =     76.10
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS

```



0 200 400 600

LEGEND

- SITE BOUNDARY
- SITE PLAN
- CONTOUR
- CROSS SECTION
- LIMIT OF INUNDATION
- 32 WATER SURFACE CONTOUR

NOTES:
NATURAL AREAS OF CROSS SECTIONS BASED UPON SURVEY POINTS, NOT DISPLAYED CONTOURS.

WOODWARD CENTER

PROPOSED CONDITION INUNDATION MAP

RBF CONSULTING
PLANNING ■ DESIGN ■ CONSTRUCTION
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PROJECT LOCATION
SAN DIEGO COUNTY, CA

DRAFTED BY	DATE	SCALE
ADB	3/08	1"=200'

RBF JOB NO.
25-102814

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