

HYDROLOGY STUDY

EL CAMINO MEMORIAL PARK SECRET CANYON EXPANSION

5600 Carroll Canyon Road
San Diego, CA 92121



December 2021

Prepared by:



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Seal Beach, CA 90740
714-656-0160

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Appendix B	Existing Condition Hydrology Map and Calculations
Appendix C	Proposed Condition Hydrology Map and Calculations

1.0 Project Overview

The proposed project will extend an existing cemetery road to the north over an existing creek bed. A bridge structure will be constructed to span the creek and the new road will extend approximately 450 feet to the north. A cul de sac will be constructed at the north end of the road. The project location is depicted in Figure 1 below.



FIGURE 1 – PROJECT LOCATION

2.0 Existing Drainage Condition

The existing site is an undeveloped hillside with slopes varying from 1.5:1 and flatter. Storm runoff currently sheet flows in the southwest and southeast directions to the existing creek beds on the west, south and east sides of the proposed project area.

3.0 Proposed Drainage Improvements

The new asphalt roadway will drain to two proposed catch basins. These basins will both connect to a roadside storm water quality biofiltration basin which will treat the first flush flows from the new roadway's impervious surface to remove sediment and potential pollutants. This treated runoff will outfall to the existing creek via an 18 inch pipe. A rip rap energy dissipater will be constructed at the downstream outfall location to slow down flows and prevent erosion before the outflows reach the existing creek bed. Storm flows on the east side of the proposed roadway will be intercepted by a graded eastern swale on the east edge of the project grading limits and which will be conveyed south to a release point at the southerly project grading limits just east of the bridge structure. A rip rap energy dissipater will be constructed at this outfall location to slow down flows and prevent erosion before the outflows reach the existing creek bed. The area to the west of the roadway will continue to flow overland to the existing creek bed.

These improvements are depicted on the project plans contained in Appendix A of this report.

4.0 Hydrology Results

The Existing Condition Hydrology Map and calculations for the project are contained in Appendix B of this report. The Proposed Condition Hydrology Map and Calculations are contained in Appendix C herein.

The downstream creek outfall at the southeast corner of the project area has a peak discharge of 7.07 cfs in a 10 year storm event and 9.10 cfs in a 50 year storm event for the existing condition.

With the proposed improvements, this downstream outfall will see increased outfalls of 7.48 cfs and 9.57 cfs in the 10 and 50 year storm events, respectively. This represents a modest increase in outflow of approximately 6% from the pre-project to post-project conditions.

5.0 Water Quality

All first flush runoff from the proposed roadway will be collected and treated with a Modular Wetlands biofiltration system prior to being released to the creek bed below. This proposed system is depicted in the project plans contained in Appendix A.

6.0 Conclusions

The construction of the new roadway and associated grading will increase overall flows to the existing creek bed by 0.41 cfs and 0.47 cfs in 10 year and 50 year storm events, respectively. This nominal increase in flow amounts to approximately 6%. In our professional opinion, this increase is negligible and does not warrant provision of on-site detention. All first flush runoff from the paved street surface will be treated with a biofiltration system before being released to the existing creek which flows westerly through the cemetery property where it ultimately discharges into two reservoirs/lakes where the water is stored and reused.

APPENDIX A PROJECT PLANS

AS NOTED BY ANY SOLICITORS, TEMPORARY EROSION AND SEDIMENT CONTROLS SHALL BE INSTALLED BY THE CONTRACTOR OF QUALIFIED PERSON(S) AS INDICATED BELOW:

1. ALL REQUIREMENTS OF THE CITY OF SAN DIEGO DEVELOPMENT MANUAL, STORM WATER STANDARDS MUST BE INCORPORATED INTO THE PROJECT'S CONSTRUCTION OF THE PROPOSED GRADING IMPROVEMENTS CONSISTENT WITH THE APPROVED STORM WATER POLLUTION PREVENTION PLAN (SWPPP) AND/OR BEST MANAGEMENT PRACTICES (BMPs). THE CONTRACTOR SHALL MAINTAIN A RECORD OF ALL BMPs AND APPLICABLE, THE STORM WATER QUALITY MANAGEMENT PLAN (SWQMP) FOR POST CONSTRUCTION TREATMENT AND CONTROL.
2. THE CONTRACTOR SHALL INSTALL AND MAINTAIN ALL STORM DRAIN INLETS, OUTLET PREVENTERS IN THE PUBLIC RIGHT-OF-WAY MAY BE TEMPORARILY REMOVED WHERE IT IS PRONE TO FLOODING PRIOR TO A RAIN EVENT AND REINSTITUTED AFTER RAIN IS OVER.
3. ALL CONSTRUCTION BMPs SHALL BE IN PLACE AT EACH WORKING DAY WHEN RAIN IS MINIMAL.

- [illegible]

1. ALL GROUND WATER EXTRACTION AND SIMILAR WASTE DISCHARGES TO SURFACE WATERS NOT TRIBUTARY TO THE SAN JACINTO BASIN ARE PROHIBITED UNLESS IT CAN BE DEMONSTRATED THAT THE OWNER HAS APPLIED AND OBTAINED AUTHORIZATION FROM THE STATE OF CALIFORNIA VIA AN OFFICIAL STATE ORDER (NO. 1994-2004) WHICH MEETS THE FOLLOWING CRITERIA:

A. THE EXTRACTED OR DISCHARGED WASTE MUST BE IN ACCORDANCE WITH THE TERMS, PROVISIONS AND CONDITIONS OF THE OFFICIAL STATE ORDER NO. 1994-2004 WHICH WAS GRANTED.

B. THE ESTIMATED MAXIMUM DISCHARGE RATES MUST NOT EXCEED THE LIMITS SET IN THE OFFICIAL "TOLERANCE LETTER" FROM THE REGIONAL BOARD OF WATER CONTROL AND SUBSEQUENT AUTHORIZATION HAS BEEN OBTAINED.

2. ALL GROUND WATER EXTRACTIONS AND SIMILAR WASTE DISCHARGES TO SURFACE WATERS TRIBUTARY TO THE SAN JACINTO BASIN ARE PROHIBITED UNLESS IT CAN BE DEMONSTRATED THAT THE OWNER HAS APPLIED AND OBTAINED AUTHORIZATION FROM THE STATE OF CALIFORNIA VIA AN OFFICIAL STATE ORDER (NO. 1994-2004) WHICH MEETS THE FOLLOWING CRITERIA:

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B. THE ESTIMATED MAXIMUM DISCHARGE RATES MUST NOT EXCEED THE LIMITS SET IN THE OFFICIAL "TOLERANCE LETTER" FROM THE REGIONAL BOARD OF WATER CONTROL AND SUBSEQUENT AUTHORIZATION HAS BEEN OBTAINED.

1. GRADING AS SHOWN ON THESE PLANS SHALL BE IN CONFORMANCE WITH CURRENT STANDARD SPECIFICATIONS AND CHAPTER 14, ARTICLE 2, DIVISION 1 OF THE SAN DIEGO MUNICIPAL CODE.
2. THE PLANT AND IRRIGATE ALL CUT AND FILL SLOPES AS REQUIRED BY ARTICLE 2, DIVISION 4, SECTION 142.04(1) OF THE SAN DIEGO LAND DEVELOPMENT CODE AND ACCORDING TO SECTION 10 OF THE LAND DEVELOPMENT MANUAL, LANDSCAPE STANDARDS.
3. GRADED, DISTURBED, OR ERODED AREAS THAT WILL NOT BE PERMANENTLY PLANTED, COVERED BY STRUCTURE, OR PLANTED FOR A PERIOD OVER 90 DAYS SHALL BE TEMPORARILY RE-VEGETATED WITH A NON-IRRIGATED HYPOXERIS MILD GRASS COVER, OR EQUIVALENT MATERIAL. SEE SHEET ____ FOR MIX AND SPECIFICATIONS.

1. ALL GROUND WATER EXTRACTION AND SIMILAR WASTE DISCHARGES TO SURFACE WATERS NOT TRIBUTARY TO THE SAN JACINTO BASIN ARE PROHIBITED UNLESS IT CAN BE DEMONSTRATED THAT THE OWNER HAS APPLIED AND OBTAINED AUTHORIZATION FROM THE STATE OF CALIFORNIA VIA AN OFFICIAL STATE ORDER (NO. 1994-2004) WHICH MEETS THE FOLLOWING CRITERIA:

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B. THE ESTIMATED MAXIMUM DISCHARGE RATES MUST NOT EXCEED THE LIMITS SET IN THE OFFICIAL "TOLERANCE LETTER" FROM THE REGIONAL BOARD OF WATER CONTROL AND SUBSEQUENT AUTHORIZATION HAS BEEN OBTAINED.

AT THE COMPLETION OF THE WORK SHOWN, THE FOLLOWING PLAN SHALL BE FOLLOWED TO ENSURE WATER QUALITY CONTROL IS MAINTAINED FOR THE LIFE OF THE PROJECT:

1. STABILIZATION: ALL PLANTED SLOPES AND OTHER VEGETATED AREAS SHALL BE INSPECTED PRIOR TO OCTOBER 1 OF EACH YEAR AND AFTER MAJOR RAINFALL EVENTS (MORE THAN 3/4 INCH) AND REPAIRED AND REPLANTED AS NEEDED UNTIL A NOTICE OF TERMINATION (NOT) IS FILED.
2. STRUCTURAL PRACTICES: GESSLING BASINS, DOWNSLOPE DITCHES, DOWNDRAINS, INLETS, GULLET PROTECTION MEASURES, AND OTHER PERMANENT WATER QUALITY AND SEDIMENT AND EROSION CONTROLS SHALL PRIOR TO OCTOBER 15 OF EACH YEAR AND AFTER MAJOR RAINFALL EVENTS (MORE THAN 3/4 INCH). REPAIRS AND REPLACEMENTS SHALL BE MADE AS NEEDED AND RECORDED IN THE MAINTENANCE LOG IN PERPETUITY.

3. OPERATION AND MAINTENANCE, FUNDING: POST-CONSTRUCTION MANAGEMENT MEASURES ARE THE RESPONSIBILITY OF THE DEVELOPER UNTIL THE TRANSFER OF RESPECTIVE SITES TO HOME BUILDERS, INDIVIDUAL OWNERS, HOMEOWNERS ASSOCIATIONS, SCHOOL DISTRICTS, OR LOCAL AGENCIES AND/OR GOVERNMENTS. AT THAT TIME, THE NEW OWNERS SHALL ASSUME RESPONSIBILITY FOR THEIR RESPECTIVE PORTIONS OF THE DEVELOPMENT.

1. THIS PROJECT IS SUBJECT TO MUNICIPAL CODE SECTION 4303 AND ORDER NO. R9-2013-0001 AS AMENDED BY R9-2015-0001 AND R9-2015-0100.

2. ALL WORK RELATED TO POST-CONSTRUCTION STORMWATER QUALITY SHALL BE IN ACCORDANCE WITH THE STORM WATER QUALITY MANAGEMENT PLAN ENTITLED, PROJECT NAME AND NUMBER, PROJECT APPLICANT PROJECT ADDRESS, PREPARED BY (COMPANY NAME), REPORT DATE.

3. POST-CONSTRUCTION BMPs ARE REQUIRED. SEE SHEETS (S)

ALL ON-SITE, PRIVATE IMPROVEMENTS SHOWN ON THIS DRAWING ARE FOR INFORMATION ONLY.

ALL ON-SITE, PRIVATE IMPROVEMENTS SHOWN ON THIS DRAWING ARE FOR INFORMATION ONLY. THE CITY ENGINEER'S APPROVAL OF THIS DRAWING, IN NO WAY CONSTITUTES AN APPROVAL OF SAID PRIVATE IMPROVEMENTS. A SEPARATE PERMIT FOR SUCH IMPROVEMENTS MAY BE REQUIRED.

LEGAL DESCRIPTION PER TITLE REPORT PREPARED BY CHICAGO TITLE COMPANY, ORDER NO. 830014981-U50, DATED JULY 01, 2008.

LEGAL DESCRIPTION PER TITLE REPORT PREPARED BY CHICAGO TITLE COMPANY, ORDER NO. 830014981-U50, DATED JULY 01, 2008.

PARCEL 1: LOT 1 OF EL CAMINO MEMORIAL PARK, IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO MAP THEREOF NO. 4719, FILED

EXCEPTING THEREFROM THOSE PORTIONS DESCRIBED IN STIPULATION FOR AMENDMENT AND ORDER THEREON OF THE SUPERIOR COURT OF THE STATE OF CALIFORNIA CASE NO. 304283 RECORDED FEBRUARY 8, 1972 AS RECORDER'S FILE #196 NO. 30667 OF OFFICIAL RECORDS.

ALSO EXCEPTING THEREFROM THAT PORTION OF LOT 1 OF EL CAMINO MEMORIAL PARK MAP NO. 4719 FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, ALL IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, DESCRIBED AS FOLLOWS:

[illegible]

- NORTH 27°14'00" EAST, 239.32 FEET, THENCE
NORTH 67°20'00" EAST, 387.00 FEET, THENCE
NORTH 82°50'00" EAST, 208.00 FEET, THENCE
SOUTH 52°31'00" EAST, 692.28 FEET, THENCE
NORTH 67°23'15" WEST, 1,914.47 FEET TO THE TRUE POINT OF BEGINNING.
- ALSO EXCEPTING THEREFROM THAT PORTION LYING IN LUSH MEWA BUSINESS PARK EAST 1/4, UNIT NO. 5, ACCORDING TO MAP THEREOF, NO. 12281, FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, DECEMBER 14, 1988.

AND ALSO EXCEPTING ALL OF THE OIL, GAS, ASPHALTUM AND OTHER HYDROCARBON SUBSTANCES IN, ON, OR UNDER, OR WHICH MAY HEREAFTER BE PRODUCED FROM THE FOLLOWING DESCRIBED LAND:

THE SOUTH HALF OF THE SOUTHEAST QUARTER OF SECTION 3, TOWNSHIP 15 SOUTH, RANGE 3 WEST, SAN BERNARDINO MERIDIAN, IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO THE OFFICIAL PLAT THEREOF, AS SAID RIGHTS WERE SET OUT IN DEED RECORDED NOVEMBER 10, 1950, RECORDED IN BOOK 3556, PAGE 197 OF OFFICIAL RECORDS.

AND ALSO EXCEPTING THEREFROM ALL OIL, GAS, ASPHALTUM AND OTHER HYDROCARBON SUBSTANCES THAT MAY BE PRODUCED, AND OTHER RIGHTS IN CONNECTION THEREWITH, IN OR UNDER THE FOLLOWING DESCRIBED LAND:

FILED THAT PORTION OF EL CAMINO MEMORIAL PARK, IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, AS SHOWN ON MAP NO. 4719, WAS IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, FEBRUARY 20, 1961, DESCRIBED AS FOLLOWS:

COMMENCING AT THE SOUTHEAST CORNER OF SAO EL CAMINO MEMORIAL PARK; THENCE ALONG THE FOLLOWING BEARINGS AND DISTANCES ACCORDING TO THE RECORD OF SURVEY MADE NO. 6388 AS SET FORTH IN ORDINANCE OF THE COUNTY RECORDER DECEMBER 27, 1951: NORTH 86°45'50" WEST 656.96 FEET; THENCE

NORTH 07°23'08" EAST, 51.00 FEET TO A POINT ON A 1368.41 FOOT RADIUS CURVE, CONCAVE NORTHEASTERLY, A RADIAL LINE THROUGH SAID POINT ON CURVE BEARS NORTH 07°23'08" EAST, SAID POINT ALSO BELONGS TO THE NORTHERLY LINE OF A STRIP OF LAND, 102.00 FEET WIDE RESERVED FOR FUTURE STREET AS SHOWN ON SAID RECORD OF SURVEY MAP NO. 59888 THENCE NORTHEASTERLY ALONG SAID CURVE AND SAID NORTHERLY LINE THROUGH A CENTRAL ANGLE OF 102.00 DEGREES TO A POINT ON SAID CURVE, CONCAVE NORTHEASTERLY, A RADIAL LINE THROUGH SAID POINT ON CURVE BEARS NORTH 07°23'08" EAST, 51.00 FEET TO A POINT ON A 1368.41 FOOT RADIUS CURVE, CONCAVE NORTHEASTERLY, A RADIAL LINE THROUGH SAID POINT ON CURVE

[illegible][illegible]

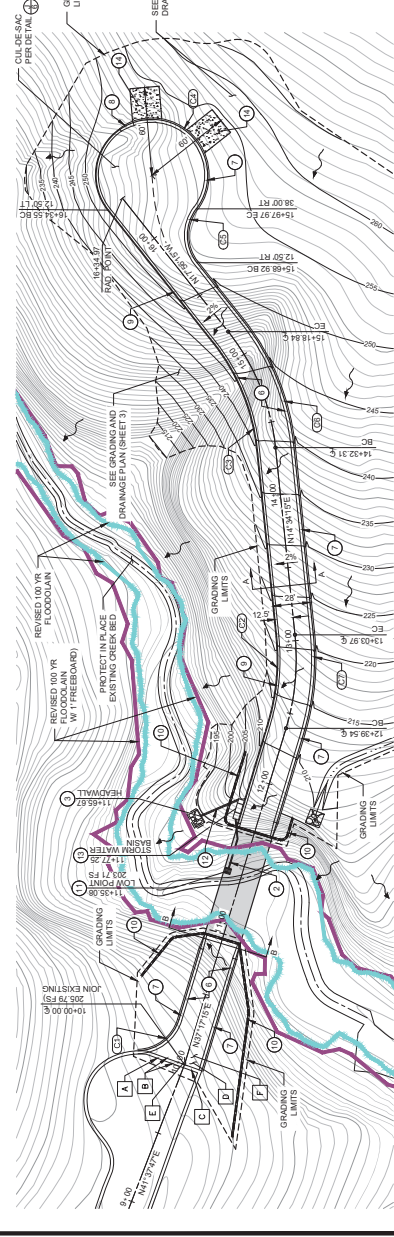
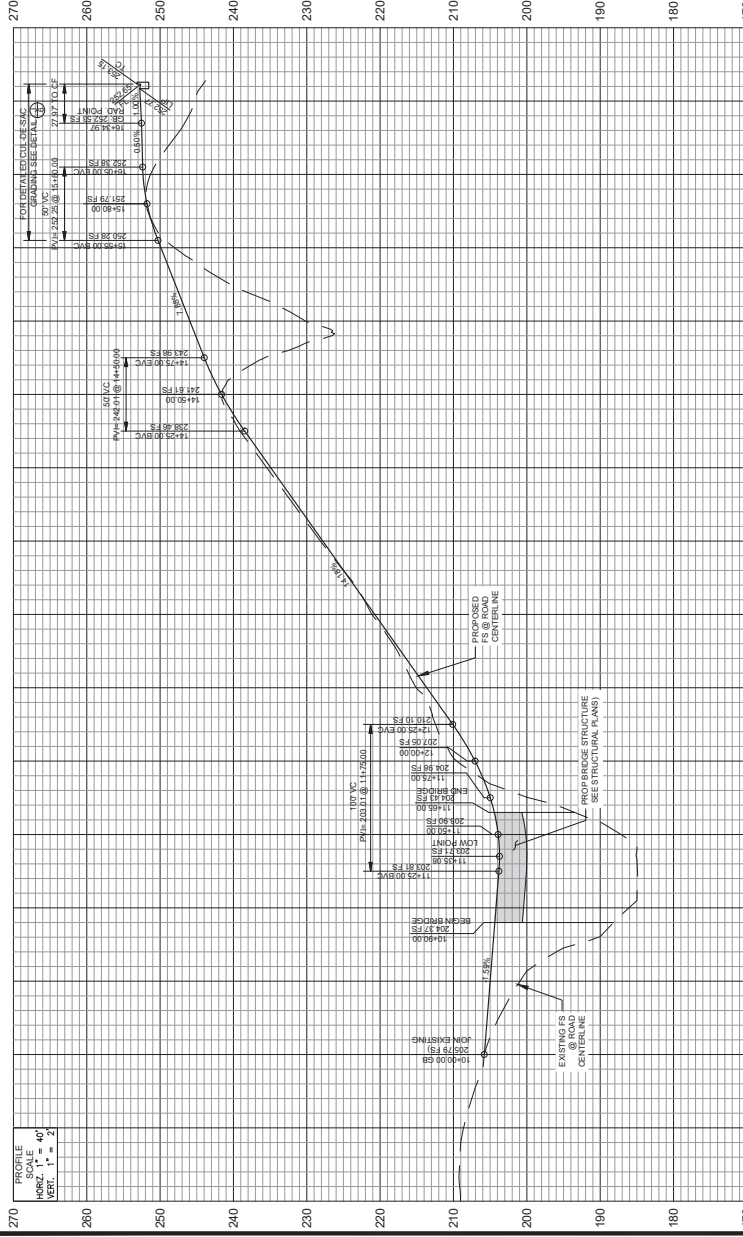
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RECORDER'S FILE NO. 163945.
CENTRAL ANGLE OF 04/07/02 AT AN ARC DISTANCE OF 111.64 FEET TO THE TRUE POINT OF BEGINNING, AS EXEMPTED IN DEED RECORDED OCTOBER 11, 1996.



NTS

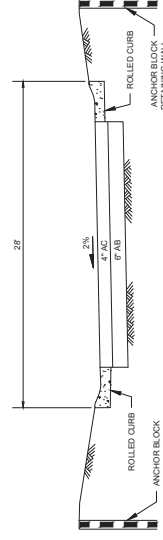
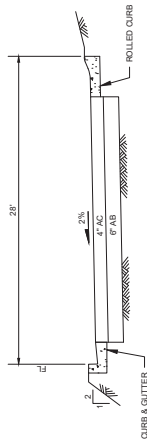
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GRAPHIC SCALE

ROADWAY
REMOVAL NOTES

CONSTRUCTION NOTES

- [illegible]

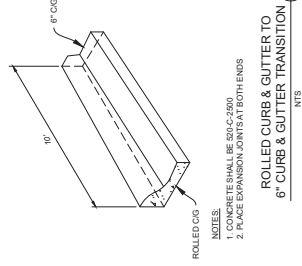
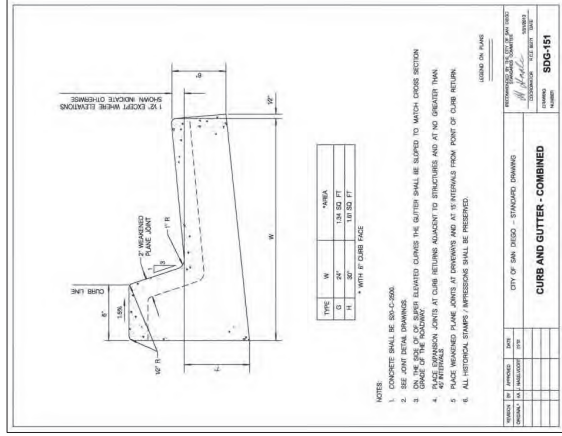


CURVE DATA TABLE				
CURVE #	DELTA	RADIUS	LENGTH	TANGENT
C1	71° 40' 31"	30.00'	37.53'	21.07'
C2	22° 43' 00"	150.00'	99.47'	301.3'
C3	32° 30' 30"	140.00'	79.43'	40.82'
C4	265° 49' 54"	30.00'	109.07'	48.79'
C5	75° 31' 19"	30.00'	39.54'	23.24'
C6	32° 43' 00"	165.00'	93.92'	48.11'
C7	22° 43' 00"	175.00'	69.93'	35.15'

NOTE: ALL IMPROVEMENTS SHALL BE PER
CURRENT CITY OF SAN DIEGO
STANDARDS FOR PUBLIC WORKS.

STREET PLAN AND PROFILE
EL CAMINO MEMORIAL PARK
SECRET CANYON EXPANSION AREA

[illegible]



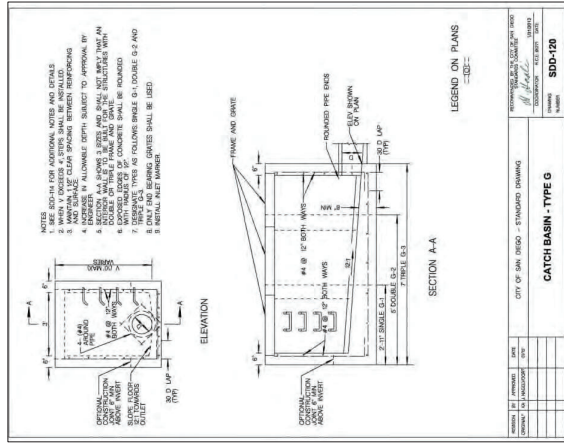
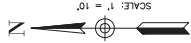
ROLLED CURB & GUTTER TO 6" CURB & GUTTER TRANSITION	NTS	F
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GRADING PLANS FOR CONSTRUCTION DETAILS EL CAMINO MEMORIAL PARK SECRET CANYON EXPANSION AREA	CITY OF SAN DIEGO, CALIFORNIA SOLIDWASTE SERVICES DEPARTMENT SHEET 0. OF 14 SHEETS		PROJECT NO. _____
	DATE _____		V.T.M. _____
	FOR CITY ENGINEER	APPROVED	
	BY _____	DATE _____	
45-BUILD			
CONTRACTOR	DATE SHIPPED		XXXXX-X-D
INSPECTOR	DATE COMPLETED		

Kruezer
Architecting
& Group

320 MAIN STREET
 UNIT D
 SEAL BEACH, CA 90740
 714-656-0160

GRAPHIC SCALE

 $\gamma - \gamma - D$

1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT MANUFACTURER.

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- NTS
-
- HOF



MWS-L-4-13-C
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL (MOD)

PROFILE
SCALE
VERT. 1" = 5'
HORIZ. 1" = 10'

EL CAMINO MEMORIAL PARK - SECRET CANYON EXPANSION AREA

GRADING PLANS FOR
GRADING CROSS SECTIONS
EL CAMINO MEMORIAL PARK
SECRET CANYON EXPANSION AREA
CITY OF SAN DIEGO, CALIFORNIA
DEVELOPMENT SERVICES DEPARTMENT
SHEET 8 OF 14 SHEETS

FOR CITY REVIEW	BY	DATE	THROW
DESCRIPTION	BY	DATE	THROW
AS-BUILT	BY	DATE	THROW
INSPECTION	BY	DATE	THROW

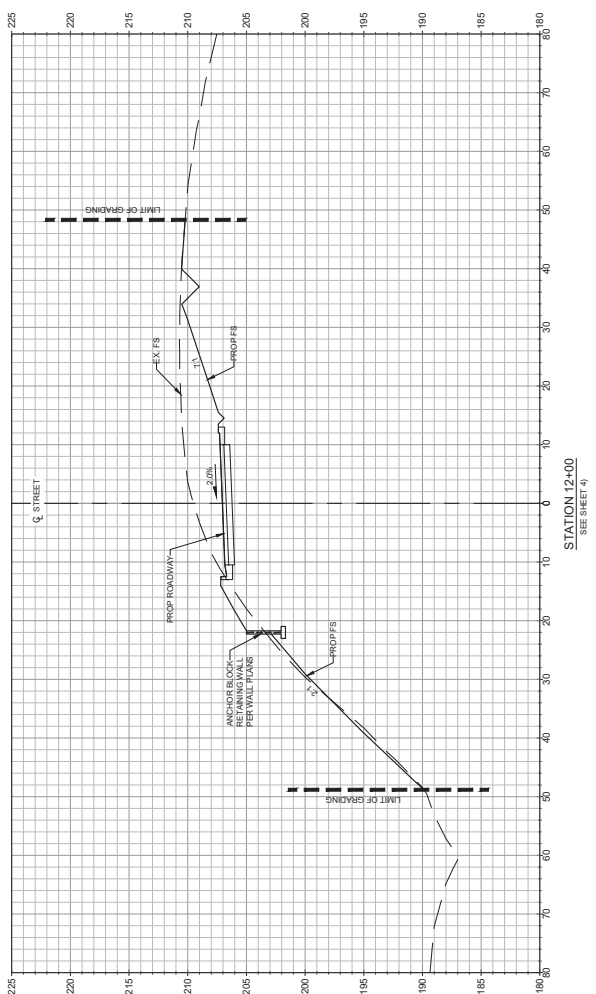
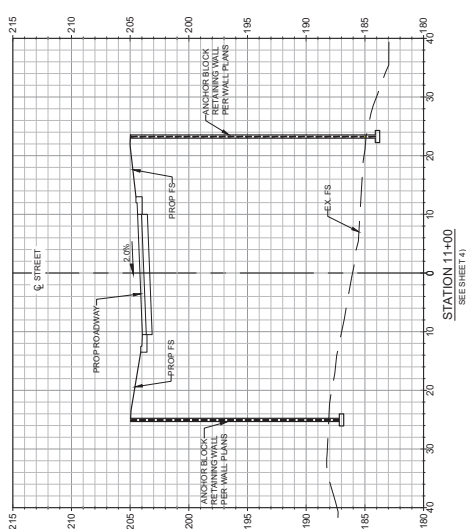
PROJECT NO. _____
V174 _____
XXXXX-X-D

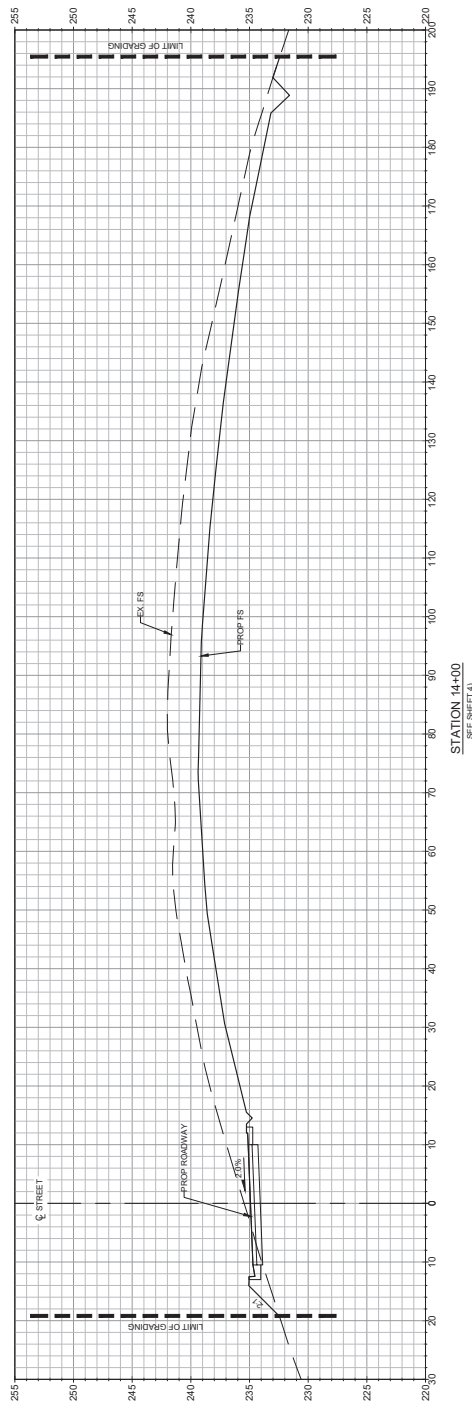
320 MAIN STREET
UNIT D
SEAL BEACH, CA 90740
714-556-0160

K
Group

PROFESSIONAL ENGINEER
NO. 14207
EXPIRATION DATE 8-31-24

GRAPHIC SCALE
40 20 0 40 80

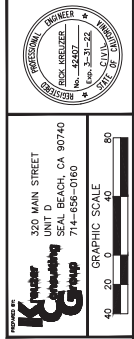




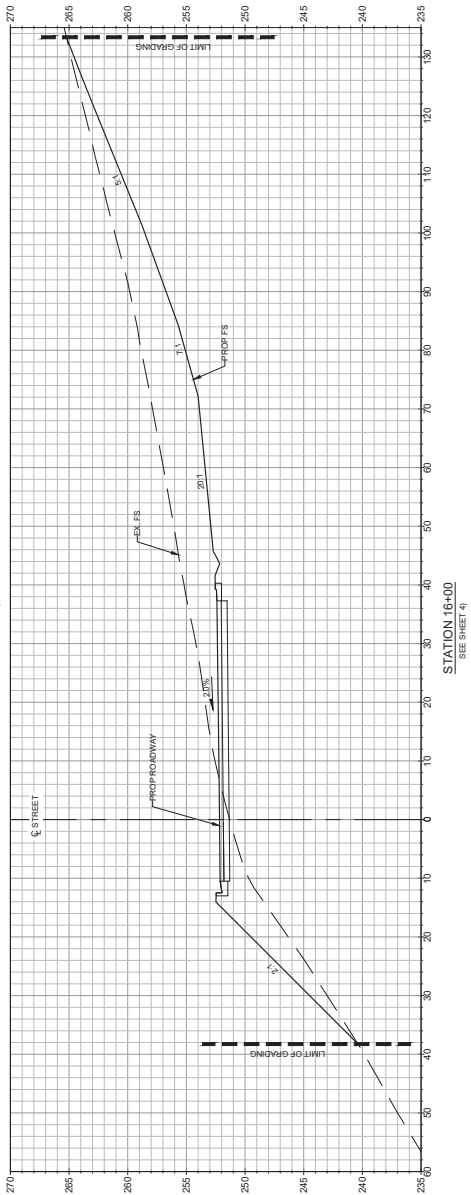
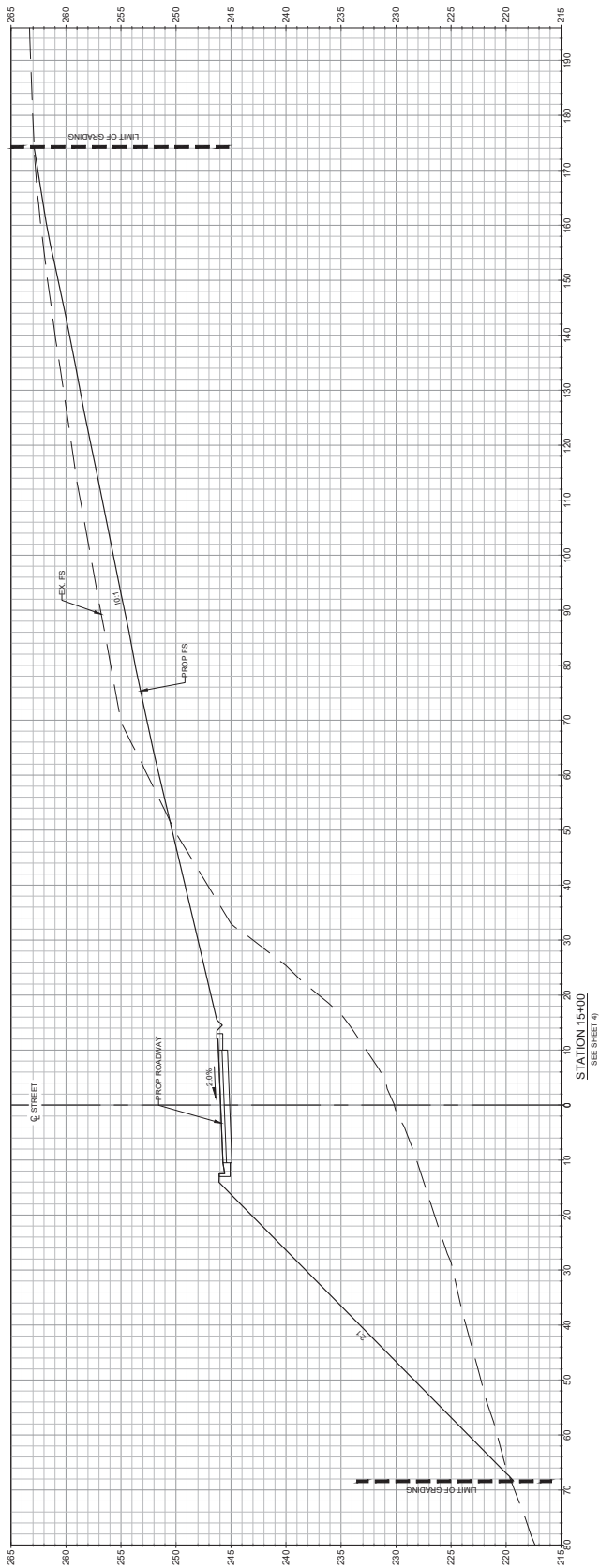
PROFILE
SCALE
VERT. 1" = 5'
HORIZ. 1" = 10'

GRADING PLANS FOR
GRADING CROSS SECTIONS
EL CAMINO MEMORIAL PARK
SECRET CANYON EXPANSION AREA

CITY OF SAN DIEGO, CALIFORNIA DEVELOPMENT SERVICES DEPARTMENT SHEET 9 OF 14 SHEETS						PROJECT NO. _____	
<u>FOR CITY INSPECTION</u>				<u>DIST.</u>	<u>V/LM</u>		
<u>DESCRIPTION</u>	<u>BY</u>	<u>APPROVED</u>	<u>DATE</u>	<u>PLANNED</u>			
AS-BUILTS							
CONTRACTOR		DATE STARTED					
INSPECTOR		DATE COMPLETED					
				XXXX-X-D			



PROFILE
SCALE
VERT. 1" = 5'
HORIZ. 1" = 10'



GRADING PLANS FOR
GRADING CROSS SECTIONS
EL CAMINO MEMORIAL PARK
SECRET CANYON EXPANSION AREA
CITY OF SAN DIEGO, CALIFORNIA
DEVELOPMENT SERVICES DEPARTMENT
SHEET 10 OF 14 SHEETS

FOR CITY REVIEW	DATE	BY	DATE	APPROVED	DATE	PROJECT NO.
DESCRIPTION						
DESIGNED						
CHECKED						
INVESTIGATOR						
DATE STARTED						
DATE COMPLETED						

XXXXX-X-D

320 MAIN STREET
UNIT D
SEAL BEACH, CA 90740
714-556-0160

K
K&G
Group

PROFESSIONAL ENGINEER
MICHAEL J. KLEINER
No. 14207
Exp. 8-31-24

GRAPHIC SCALE
40 20 0 40 80



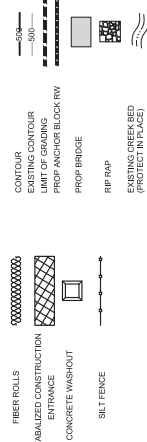
EROSION CONTROL
CONSTRUCTION NOTES

- ① CONSTRUCT FIBER ROLL PER SE-5 ON SHEET 12
- ② CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE/EXIT PER TC-1 ON SHEET 12
- ③ CONSTRUCT CONCRETE WASHOUT PER WM-8 ON SHEET 112
- ④ CONSTRUCT SILT FENCE PER SE-1 ON SHEET 12

EROSION CONTROL
GENERAL NOTES

- 1.) ALL GRADED, DISTURBED OR ERODED AREAS THAT WILL NOT BE PERMANENTLY PAVED OR COVERED BY STRUCTURES SHALL BE PERMANENTLY REVEGETATED AND BARRIAGED AS SHOWN IN TABLE 14.2 APF AND IN ACCORDANCE WITH THE FOLLOWING SCHEDULE: REVEGETATION SHALL BE COMPLETED BY 12/04/11. ALL REQUIRED REVEGETATION AND EROSION CONTROL SHALL BE COMPLETED WITHIN 90 CALENDAR DAYS OF THE COMPLETION OF GRADING OR DISTURBANCE.
- 2.) GRADED, DISTURBED, OR ERODED AREAS TO BE TREATED WITH AN INTERMEDIATE HYDROSEED MIX SHALL RECEIVE AN INTERMEDIATE TACKIFIER AS NEEDED BETWEEN APRIL 2 AND AUGUST 31 FOR DUST-EROSION CONTROL. WITH SUBSEQUENT RAINFALL, THE TACKIFIER SHALL BE WASHED AWAY DURING THEIR RAINY SEASON (OCTOBER 1 AND APRIL 1).

LEGEND



SCALE: 1" = 40'

GRADING PLANS FOR

EROSION CONTROL PLAN

EL CAMINO MEMORIAL PARK

SECRET CANYON EXPANSION AREA

CITY OF SAN DIEGO, CALIFORNIA
LAND SURVEY

SHEET 11 OF 14 SHEETS

PROJECT NO. _____

V.T.M. _____

FOR CITY REVIEW	DATE	APPROVED	DATE	TIMED

AS-BUILT _____

CONTRACTOR _____

INSPECTOR _____

DATE STARTED _____

DATE COMPLETED _____

XXXXX-X-D

SCALE: 1" = 40'

320 MAIN STREET

UNIT D

SEAL BEACH, CA 90740

714-656-0160

GRAPHIC SCALE

320 MAIN STREET

UNIT D

SEAL BEACH, CA 90740

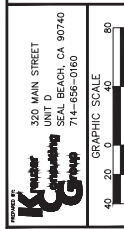
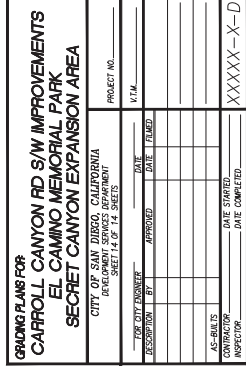
714-656-0160

REGISTERED PROFESSIONAL ENGINEER

NO. 2332-52

EXPIRATION DATE 12/31/2017

RENEWED DATE 12/31/2017



SCALE: 1" = 40'

- ① PROTECT IN PLACE.
- ② CONSTRUCT 6" CURB AND GUTTER PER CITY OF SAN DIEGO STD. DWG. SDG-151.
- ③ REMOVE EXISTING IMPROVEMENTS AND CONSTRUCT CURB RAMP, TYPE D, PER CITY OF SAN DIEGO STD. DWG. SDG-136.
- ④ CONSTRUCT 5.5' WIDE SIDEWALK PER CITY OF SAN DIEGO STD. DWG. SDG-155.
- ⑤ CLEAN, GRUBBAND AND GRADE TO JOIN EXISTING.
- ⑥ NOTCH SIDEWALK TO PROVIDE 4" CLEAR SIDEWALK BETWEEN POWER POLE AND GUY WIRE.

— 245 — — EXISTING CONTOUR
 — 205 — — PROPOSED MAJOR CONTOUR (5')
 — — — — PROPOSED GRADING LIMITS
 [Shaded Area] — PROPOSED SIDEWALK
 [Trapezoidal Shape] — PROPOSED CURB RAMP

APPENDIX B
EXISTING CONDITION HYDROLOGY MAP
AND CALCULATIONS

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
 Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
 2003,1985,1981 HYDROLOGY MANUAL
 (c) Copyright 1982-2012 Advanced Engineering Software (aes)
 Ver. 18.2 Release Date: 05/08/2012 License ID 1627

Analysis prepared by:

***** DESCRIPTION OF STUDY *****
 * EL CAMINO MEMORIAL PARK - SECRET CANYON EXPANSION *
 * EXISTING CONDITION HYDROLOGY MAP *
 * 10 YEAR STORM *

FILE NAME: ELCAMEX.DAT
 TIME/DATE OF STUDY: 15:21 12/22/2020

 USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

1981 SAN DIEGO HYDROLOGY MANUAL RAINFALL INFORMATION USED

USER SPECIFIED STORM EVENT(YEAR) = 10.00
 SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00
 SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
 RAINFALL-INTENSITY ADJUSTMENT FACTOR = 1.000
 SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
 NOTE: ONLY PEAK CONFLUENCE VALUES CONSIDERED
 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

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

1. Relative Flow-Depth = 0.00 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.*

 FLOW PROCESS FROM NODE 1.00 TO NODE 2.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
 =====

OPEN BRUSH FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) = 83
 NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
 WITH 10-MIN. ADDED = 11.78(MIN.)
 INITIAL SUBAREA FLOW-LENGTH(FEET) = 520.00
 UPSTREAM ELEVATION(FEET) = 300.00
 DOWNSTREAM ELEVATION(FEET) = 195.00
 ELEVATION DIFFERENCE(FEET) = 105.00
 NATURAL WATERSHED TIME OF CONCENTRATION = 11.78
 10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.402
 SUBAREA RUNOFF(CFS) = 2.05
 TOTAL AREA(ACRES) = 1.90 TOTAL RUNOFF(CFS) = 2.05

 FLOW PROCESS FROM NODE 2.00 TO NODE 3.00 IS CODE = 52

>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 195.00 DOWNSTREAM(FEET) = 183.00
 CHANNEL LENGTH THRU SUBAREA(FEET) = 300.00 CHANNEL SLOPE = 0.0400
 CHANNEL FLOW THRU SUBAREA(CFS) = 2.05
 FLOW VELOCITY(FEET/SEC) = 3.46 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) = 1.44 Tc(MIN.) = 13.23
 LONGEST FLOWPATH FROM NODE 1.00 TO NODE 3.00 = 820.00 FEET.

FLOW PROCESS FROM NODE 3.00 TO NODE 3.00 IS CODE = 81

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

=====

10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.262
 OPEN BRUSH FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) = 83
 SUBAREA AREA(ACRES) = 1.09 SUBAREA RUNOFF(CFS) = 1.11
 TOTAL AREA(ACRES) = 3.0 TOTAL RUNOFF(CFS) = 3.16
 TC(MIN.) = 13.23

FLOW PROCESS FROM NODE 3.00 TO NODE 4.00 IS CODE = 52

>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 183.00 DOWNSTREAM(FEET) = 180.00
 CHANNEL LENGTH THRU SUBAREA(FEET) = 200.00 CHANNEL SLOPE = 0.0150
 CHANNEL FLOW THRU SUBAREA(CFS) = 3.16
 FLOW VELOCITY(FEET/SEC) = 2.33 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) = 1.43 Tc(MIN.) = 14.66
 LONGEST FLOWPATH FROM NODE 1.00 TO NODE 4.00 = 1020.00 FEET.

FLOW PROCESS FROM NODE 4.00 TO NODE 4.00 IS CODE = 81

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

=====

10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.147
 OPEN BRUSH FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) = 83
 SUBAREA AREA(ACRES) = 4.04 SUBAREA RUNOFF(CFS) = 3.90
 TOTAL AREA(ACRES) = 7.0 TOTAL RUNOFF(CFS) = 7.07
 TC(MIN.) = 14.66

=====

END OF STUDY SUMMARY:
 TOTAL AREA(ACRES) = 7.0 TC(MIN.) = 14.66
 PEAK FLOW RATE(CFS) = 7.07

=====

END OF RATIONAL METHOD ANALYSIS

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
 Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
 2003,1985,1981 HYDROLOGY MANUAL
 (c) Copyright 1982-2012 Advanced Engineering Software (aes)
 Ver. 18.2 Release Date: 05/08/2012 License ID 1627

Analysis prepared by:

***** DESCRIPTION OF STUDY *****
 * EL CAMINO MEMORIAL PARK - SECRET CANYON EXPANSION *
 * EXISTING CONDITION HYDROLOGY MAP *
 * 50 YEAR STORM *

FILE NAME: ELCAMEX.DAT
 TIME/DATE OF STUDY: 15:25 12/22/2020

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

=====

1981 SAN DIEGO HYDROLOGY MANUAL RAINFALL INFORMATION USED

USER SPECIFIED STORM EVENT(YEAR) = 50.00
 SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00
 SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
 RAINFALL-INTENSITY ADJUSTMENT FACTOR = 1.000
 SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
 NOTE: ONLY PEAK CONFLUENCE VALUES CONSIDERED
 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
---	------	------	-------------------	------	------	--------	-------	--------

=====

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

1. Relative Flow-Depth = 0.00 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.*

FLOW PROCESS FROM NODE 1.00 TO NODE 2.00 IS CODE = 21

=====

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<

=====

OPEN BRUSH FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) = 83
 NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
 WITH 10-MIN. ADDED = 11.78(MIN.)
 INITIAL SUBAREA FLOW-LENGTH(FEET) = 520.00
 UPSTREAM ELEVATION(FEET) = 300.00
 DOWNSTREAM ELEVATION(FEET) = 195.00
 ELEVATION DIFFERENCE(FEET) = 105.00
 NATURAL WATERSHED TIME OF CONCENTRATION = 11.78
 50 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.059
 SUBAREA RUNOFF(CFS) = 2.62
 TOTAL AREA(ACRES) = 1.90 TOTAL RUNOFF(CFS) = 2.62

=====

FLOW PROCESS FROM NODE 2.00 TO NODE 3.00 IS CODE = 52

=====

>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 195.00 DOWNSTREAM(FEET) = 183.00
 CHANNEL LENGTH THRU SUBAREA(FEET) = 300.00 CHANNEL SLOPE = 0.0400
 CHANNEL FLOW THRU SUBAREA(CFS) = 2.62
 FLOW VELOCITY(FEET/SEC) = 3.64 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) = 1.37 Tc(MIN.) = 13.16
 LONGEST FLOWPATH FROM NODE 1.00 TO NODE 3.00 = 820.00 FEET.

FLOW PROCESS FROM NODE 3.00 TO NODE 3.00 IS CODE = 81

=====

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

=====

50 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.932
 OPEN BRUSH FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) = 83
 SUBAREA AREA(ACRES) = 1.09 SUBAREA RUNOFF(CFS) = 1.44
 TOTAL AREA(ACRES) = 3.0 TOTAL RUNOFF(CFS) = 4.05
 TC(MIN.) = 13.16

FLOW PROCESS FROM NODE 3.00 TO NODE 4.00 IS CODE = 52

=====

>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 183.00 DOWNSTREAM(FEET) = 180.00
 CHANNEL LENGTH THRU SUBAREA(FEET) = 200.00 CHANNEL SLOPE = 0.0150
 CHANNEL FLOW THRU SUBAREA(CFS) = 4.05
 FLOW VELOCITY(FEET/SEC) = 2.46 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) = 1.35 Tc(MIN.) = 14.51
 LONGEST FLOWPATH FROM NODE 1.00 TO NODE 4.00 = 1020.00 FEET.

FLOW PROCESS FROM NODE 4.00 TO NODE 4.00 IS CODE = 81

=====

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

=====

50 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.776
 OPEN BRUSH FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) = 83
 SUBAREA AREA(ACRES) = 4.04 SUBAREA RUNOFF(CFS) = 5.05
 TOTAL AREA(ACRES) = 7.0 TOTAL RUNOFF(CFS) = 9.10
 TC(MIN.) = 14.51

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 7.0 TC(MIN.) = 14.51
 PEAK FLOW RATE(CFS) = 9.10

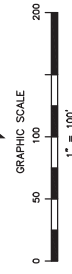
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=====

END OF RATIONAL METHOD ANALYSIS

=====

APPENDIX C
PROPOSED CONDITION HYDROLOGY MAP
AND CALCULATIONs



DESIGNED BY : MH/RK	SCALE : AS SHOWN
DRAWN BY : MH	DATE : 12/22/20
CHECKED BY : RK	DATE : 12/22/20
APPROVED BY : RK	DATE : 12/22/20

[illegible]

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
 Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
 2003, 1985, 1981 HYDROLOGY MANUAL
 (c) Copyright 1982-2012 Advanced Engineering Software (aes)
 Ver. 18.2 Release Date: 05/08/2012 License ID 1627

Analysis prepared by:

***** DESCRIPTION OF STUDY *****
 * EL CAMINO MEMORIAL PARK - SECRET CANYON EXPANSION
 * PROPOSED CONDITION HYDROLOGY CALCULTAIONS
 * 10 YEAR STORM

FILE NAME: ECPROP.DAT
 TIME/DATE OF STUDY: 15:08 12/22/2020

 USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

1981 SAN DIEGO HYDROLOGY MANUAL RAINFALL INFORMATION USED

USER SPECIFIED STORM EVENT(YEAR) = 10.00
 SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00
 SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
 RAINFALL-INTENSITY ADJUSTMENT FACTOR = 1.000
 SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
 NOTE: ONLY PEAK CONFLUENCE VALUES CONSIDERED
 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

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

1. Relative Flow-Depth = 0.00 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.*

 FLOW PROCESS FROM NODE 1.00 TO NODE 2.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
 =====

USER-SPECIFIED RUNOFF COEFFICIENT = .4500
 S.C.S. CURVE NUMBER (AMC II) = 83
 NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
 WITH 10-MIN. ADDED = 11.12(MIN.)
 INITIAL SUBAREA FLOW-LENGTH(FEET) = 300.00
 UPSTREAM ELEVATION(FEET) = 263.00
 DOWNSTREAM ELEVATION(FEET) = 195.00
 ELEVATION DIFFERENCE(FEET) = 68.00
 NATURAL WATERSHED TIME OF CONCENTRATION = 11.12
 10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.468
 SUBAREA RUNOFF(CFS) = 0.60
 TOTAL AREA(ACRES) = 0.54 TOTAL RUNOFF(CFS) = 0.60

 FLOW PROCESS FROM NODE 2.00 TO NODE 3.00 IS CODE = 52

>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

```

=====
ELEVATION DATA: UPSTREAM(FEET) = 195.00 DOWNSTREAM(FEET) = 192.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 300.00 CHANNEL SLOPE = 0.0100
NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
CHANNEL FLOW THRU SUBAREA(CFS) = 0.60
FLOW VELOCITY(FEET/SEC) = 1.50 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 3.33 Tc(MIN.) = 14.45
LONGEST FLOWPATH FROM NODE 1.00 TO NODE 3.00 = 600.00 FEET.

```

```

*****
FLOW PROCESS FROM NODE 3.00 TO NODE 3.00 IS CODE = 81

```

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

```

=====
10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.164
USER-SPECIFIED RUNOFF COEFFICIENT = .4500
S.C.S. CURVE NUMBER (AMC II) = 83
SUBAREA AREA(ACRES) = 0.81 SUBAREA RUNOFF(CFS) = 0.79
TOTAL AREA(ACRES) = 1.4 TOTAL RUNOFF(CFS) = 1.39
TC(MIN.) = 14.45

```

```

*****
FLOW PROCESS FROM NODE 3.00 TO NODE 3.00 IS CODE = 10

```

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<

```

*****
FLOW PROCESS FROM NODE 3.10 TO NODE 3.00 IS CODE = 21

```

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

```

=====
USER-SPECIFIED RUNOFF COEFFICIENT = .9500
S.C.S. CURVE NUMBER (AMC II) = 92
NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
WITH 10-MIN. ADDED = 12.31(MIN.)
INITIAL SUBAREA FLOW-LENGTH(FEET) = 500.00
UPSTREAM ELEVATION(FEET) = 252.00
DOWNSTREAM ELEVATION(FEET) = 204.00
ELEVATION DIFFERENCE(FEET) = 48.00
NATURAL WATERSHED TIME OF CONCENTRATION = 12.31
10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.349
SUBAREA RUNOFF(CFS) = 1.36
TOTAL AREA(ACRES) = 0.61 TOTAL RUNOFF(CFS) = 1.36

```

```

*****
FLOW PROCESS FROM NODE 3.00 TO NODE 3.00 IS CODE = 11

```

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

** MAIN STREAM CONFLUENCE DATA **

```

STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 1.36 12.31 2.349 0.61
LONGEST FLOWPATH FROM NODE 3.10 TO NODE 3.00 = 500.00 FEET.

```

** MEMORY BANK # 1 CONFLUENCE DATA **

```

STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 1.39 14.45 2.164 1.35
LONGEST FLOWPATH FROM NODE 1.00 TO NODE 3.00 = 600.00 FEET.

```

** PEAK FLOW RATE TABLE **

```

STREAM RUNOFF Tc INTENSITY
NUMBER (CFS) (MIN.) (INCH/HOUR)
1 2.64 12.31 2.349
2 2.64 14.45 2.164

```

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 2.64 Tc(MIN.) = 14.45

TOTAL AREA(ACRES) = 2.0

FLOW PROCESS FROM NODE 3.00 TO NODE 3.50 IS CODE = 52

>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 192.00 DOWNSTREAM(FEET) = 190.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 150.00 CHANNEL SLOPE = 0.0133
CHANNEL FLOW THRU SUBAREA(CFS) = 2.64
FLOW VELOCITY(FEET/SEC) = 2.11 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 1.19 Tc(MIN.) = 15.64
LONGEST FLOWPATH FROM NODE 1.00 TO NODE 3.50 = 750.00 FEET.

FLOW PROCESS FROM NODE 3.50 TO NODE 3.50 IS CODE = 10

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<

FLOW PROCESS FROM NODE 3.40 TO NODE 3.50 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

=====

USER-SPECIFIED RUNOFF COEFFICIENT = .4500
S.C.S. CURVE NUMBER (AMC II) = 80
NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
WITH 10-MIN. ADDED = 12.39(MIN.)
INITIAL SUBAREA FLOW-LENGTH(FEET) = 680.00
UPSTREAM ELEVATION(FEET) = 300.00
DOWNSTREAM ELEVATION(FEET) = 190.00
ELEVATION DIFFERENCE(FEET) = 110.00
NATURAL WATERSHED TIME OF CONCENTRATION = 12.39
10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.341
SUBAREA RUNOFF(CFS) = 2.50
TOTAL AREA(ACRES) = 2.37 TOTAL RUNOFF(CFS) = 2.50

FLOW PROCESS FROM NODE 3.50 TO NODE 3.50 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	2.50	12.39	2.341	2.37

LONGEST FLOWPATH FROM NODE 3.40 TO NODE 3.50 = 680.00 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	2.64	15.64	2.082	1.96

LONGEST FLOWPATH FROM NODE 1.00 TO NODE 3.50 = 750.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)
1	4.85	12.39	2.341
2	4.86	15.64	2.082

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 4.86 Tc(MIN.) = 15.64

TOTAL AREA(ACRES) = 4.3


```

*****
ECP10.RES
*****
FLOW PROCESS FROM NODE 3.50 TO NODE 4.00 IS CODE = 52
=====
>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 190.00 DOWNSTREAM(FEET) = 188.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 200.00 CHANNEL SLOPE = 0.0100
CHANNEL FLOW THRU SUBAREA(CFS) = 4.86
FLOW VELOCITY(FEET/SEC) = 2.10 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 1.59 Tc(MIN.) = 17.23
LONGEST FLOWPATH FROM NODE 1.00 TO NODE 4.00 = 950.00 FEET.
=====
FLOW PROCESS FROM NODE 4.00 TO NODE 4.00 IS CODE = 10
=====
>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<
=====
*****
FLOW PROCESS FROM NODE 4.00 TO NODE 4.00 IS CODE = 21
=====
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
=====
USER-SPECIFIED RUNOFF COEFFICIENT = .4500
S.C.S. CURVE NUMBER (AMC II) = 83
NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
WITH 10-MIN. ADDED = 13.28(MIN.)
INITIAL SUBAREA FLOW-LENGTH(FEET) = 900.00
UPSTREAM ELEVATION(FEET) = 300.00
DOWNSTREAM ELEVATION(FEET) = 188.00
ELEVATION DIFFERENCE(FEET) = 112.00
NATURAL WATERSHED TIME OF CONCENTRATION = 13.28
10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.258
SUBAREA RUNOFF(CFS) = 2.98
TOTAL AREA(ACRES) = 2.93 TOTAL RUNOFF(CFS) = 2.98
=====
FLOW PROCESS FROM NODE 4.00 TO NODE 4.00 IS CODE = 11
=====
>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<
=====
** MAIN STREAM CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 2.98 13.28 2.258 2.93
LONGEST FLOWPATH FROM NODE 4.00 TO NODE 4.00 = 900.00 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 4.86 17.23 1.988 4.33
LONGEST FLOWPATH FROM NODE 1.00 TO NODE 4.00 = 950.00 FEET.

** PEAK FLOW RATE TABLE **
STREAM RUNOFF Tc INTENSITY
NUMBER (CFS) (MIN.) (INCH/HOUR)
1 7.26 13.28 2.258
2 7.48 17.23 1.988

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 7.48 Tc(MIN.) = 17.23
TOTAL AREA(ACRES) = 7.3
=====
END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 7.3 TC(MIN.) = 17.23
PEAK FLOW RATE(CFS) = 7.48
=====

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RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
 Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
 2003,1985,1981 HYDROLOGY MANUAL
 (c) Copyright 1982-2012 Advanced Engineering Software (aes)
 Ver. 18.2 Release Date: 05/08/2012 License ID 1627

Analysis prepared by:

***** DESCRIPTION OF STUDY *****
 * EL CAMINO MEMORIAL PARK - SECRET CANYON EXPANSION
 * PROPOSED CONDITION HYDROLOGY CALCULTAIONS
 * 50 YEAR STORM

FILE NAME: ECPROP.DAT
 TIME/DATE OF STUDY: 15:12 12/22/2020

 USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

1981 SAN DIEGO HYDROLOGY MANUAL RAINFALL INFORMATION USED

USER SPECIFIED STORM EVENT(YEAR) = 50.00
 SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00
 SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
 RAINFALL-INTENSITY ADJUSTMENT FACTOR = 1.000
 SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
 NOTE: ONLY PEAK CONFLUENCE VALUES CONSIDERED
 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
 =====

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

1. Relative Flow-Depth = 0.00 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.*

 FLOW PROCESS FROM NODE 1.00 TO NODE 2.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 =====

USER-SPECIFIED RUNOFF COEFFICIENT = .4500
 S.C.S. CURVE NUMBER (AMC II) = 83
 NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
 WITH 10-MIN. ADDED = 11.12(MIN.)
 INITIAL SUBAREA FLOW-LENGTH(FEET) = 300.00
 UPSTREAM ELEVATION(FEET) = 263.00
 DOWNSTREAM ELEVATION(FEET) = 195.00
 ELEVATION DIFFERENCE(FEET) = 68.00
 NATURAL WATERSHED TIME OF CONCENTRATION = 11.12
 50 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.119
 SUBAREA RUNOFF(CFS) = 0.76
 TOTAL AREA(ACRES) = 0.54 TOTAL RUNOFF(CFS) = 0.76

 FLOW PROCESS FROM NODE 2.00 TO NODE 3.00 IS CODE = 52

>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

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=====
ELEVATION DATA: UPSTREAM(FEET) = 195.00 DOWNSTREAM(FEET) = 192.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 300.00 CHANNEL SLOPE = 0.0100
NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
CHANNEL FLOW THRU SUBAREA(CFS) = 0.76
FLOW VELOCITY(FEET/SEC) = 1.50 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 3.33 Tc(MIN.) = 14.45
LONGEST FLOWPATH FROM NODE 1.00 TO NODE 3.00 = 600.00 FEET.
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*****
FLOW PROCESS FROM NODE 3.00 TO NODE 3.00 IS CODE = 81
=====

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

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=====
50 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.783
USER-SPECIFIED RUNOFF COEFFICIENT = .4500
S.C.S. CURVE NUMBER (AMC II) = 83
SUBAREA AREA(ACRES) = 0.81 SUBAREA RUNOFF(CFS) = 1.01
TOTAL AREA(ACRES) = 1.4 TOTAL RUNOFF(CFS) = 1.77
TC(MIN.) = 14.45
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*****
FLOW PROCESS FROM NODE 3.00 TO NODE 3.00 IS CODE = 10
=====

```

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<

```

*****
FLOW PROCESS FROM NODE 3.10 TO NODE 3.00 IS CODE = 21
=====

```

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

```

=====
USER-SPECIFIED RUNOFF COEFFICIENT = .9500
S.C.S. CURVE NUMBER (AMC II) = 92
NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
WITH 10-MIN. ADDED = 12.31(MIN.)
INITIAL SUBAREA FLOW-LENGTH(FEET) = 500.00
UPSTREAM ELEVATION(FEET) = 252.00
DOWNSTREAM ELEVATION(FEET) = 204.00
ELEVATION DIFFERENCE(FEET) = 48.00
NATURAL WATERSHED TIME OF CONCENTRATION = 12.31
50 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.013
SUBAREA RUNOFF(CFS) = 1.75
TOTAL AREA(ACRES) = 0.61 TOTAL RUNOFF(CFS) = 1.75
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*****
FLOW PROCESS FROM NODE 3.00 TO NODE 3.00 IS CODE = 11
=====

```

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

** MAIN STREAM CONFLUENCE DATA **

```

STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 1.75 12.31 3.013 0.61
LONGEST FLOWPATH FROM NODE 3.10 TO NODE 3.00 = 500.00 FEET.

```

** MEMORY BANK # 1 CONFLUENCE DATA **

```

STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 1.77 14.45 2.783 1.35
LONGEST FLOWPATH FROM NODE 1.00 TO NODE 3.00 = 600.00 FEET.

```

** PEAK FLOW RATE TABLE **

```

STREAM RUNOFF Tc INTENSITY
NUMBER (CFS) (MIN.) (INCH/HOUR)
1 3.38 12.31 3.013
2 3.39 14.45 2.783

```


COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 3.39 Tc(MIN.) = 14.45

TOTAL AREA(ACRES) = 2.0

FLOW PROCESS FROM NODE 3.00 TO NODE 3.50 IS CODE = 52

>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) =	192.00	DOWNSTREAM(FEET) =	190.00
CHANNEL LENGTH THRU SUBAREA(FEET) =	150.00	CHANNEL SLOPE =	0.0133
CHANNEL FLOW THRU SUBAREA(CFS) =	3.39		
FLOW VELOCITY(FEET/SEC) =	2.23	(PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)	
TRAVEL TIME(MIN.) =	1.12	Tc(MIN.) =	15.57
LONGEST FLOWPATH FROM NODE	1.00 TO NODE	3.50 =	750.00 FEET.

FLOW PROCESS FROM NODE 3.50 TO NODE 3.50 IS CODE = 10

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<

FLOW PROCESS FROM NODE 3.40 TO NODE 3.50 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

=====

USER-SPECIFIED RUNOFF COEFFICIENT =	.4500
S.C.S. CURVE NUMBER (AMC II) =	80
NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)	
WITH 10-MIN. ADDED =	12.39(MIN.)
INITIAL SUBAREA FLOW-LENGTH(FEET) =	680.00
UPSTREAM ELEVATION(FEET) =	300.00
DOWNSTREAM ELEVATION(FEET) =	190.00
ELEVATION DIFFERENCE(FEET) =	110.00
NATURAL WATERSHED TIME OF CONCENTRATION =	12.39
50 YEAR RAINFALL INTENSITY(INCH/HOUR) =	3.005
SUBAREA RUNOFF(CFS) =	3.20
TOTAL AREA(ACRES) =	2.37
TOTAL RUNOFF(CFS) =	3.20

FLOW PROCESS FROM NODE 3.50 TO NODE 3.50 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	3.20	12.39	3.005	2.37

LONGEST FLOWPATH FROM NODE 3.40 TO NODE 3.50 = 680.00 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	3.39	15.57	2.668	1.96

LONGEST FLOWPATH FROM NODE 1.00 TO NODE 3.50 = 750.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)
1	6.21	12.39	3.005
2	6.23	15.57	2.668

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 6.23 Tc(MIN.) = 15.57

TOTAL AREA(ACRES) = 4.3

 FLOW PROCESS FROM NODE 3.50 TO NODE 4.00 IS CODE = 52
 =====

>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
 >>>>TRAVELTIME THRU SUBAREA<<<<<
 =====

ELEVATION DATA: UPSTREAM(FEET) = 190.00 DOWNSTREAM(FEET) = 188.00
 CHANNEL LENGTH THRU SUBAREA(FEET) = 200.00 CHANNEL SLOPE = 0.0100
 CHANNEL FLOW THRU SUBAREA(CFS) = 6.23
 FLOW VELOCITY(FEET/SEC) = 2.22 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) = 1.50 Tc(MIN.) = 17.07
 LONGEST FLOWPATH FROM NODE 1.00 TO NODE 4.00 = 950.00 FEET.
 =====

 FLOW PROCESS FROM NODE 4.00 TO NODE 4.00 IS CODE = 10
 =====

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
 =====

 FLOW PROCESS FROM NODE 4.00 TO NODE 4.00 IS CODE = 21
 =====

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 =====

USER-SPECIFIED RUNOFF COEFFICIENT = .4500
 S.C.S. CURVE NUMBER (AMC II) = 83
 NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
 WITH 10-MIN. ADDED = 13.28(MIN.)
 INITIAL SUBAREA FLOW-LENGTH(FEET) = 900.00
 UPSTREAM ELEVATION(FEET) = 300.00
 DOWNSTREAM ELEVATION(FEET) = 188.00
 ELEVATION DIFFERENCE(FEET) = 112.00
 NATURAL WATERSHED TIME OF CONCENTRATION = 13.28
 50 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.918
 SUBAREA RUNOFF(CFS) = 3.85
 TOTAL AREA(ACRES) = 2.93 TOTAL RUNOFF(CFS) = 3.85
 =====

 FLOW PROCESS FROM NODE 4.00 TO NODE 4.00 IS CODE = 11
 =====

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
 =====

** MAIN STREAM CONFLUENCE DATA **
 STREAM RUNOFF Tc INTENSITY AREA
 NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
 1 3.85 13.28 2.918 2.93
 LONGEST FLOWPATH FROM NODE 4.00 TO NODE 4.00 = 900.00 FEET.
 =====

** MEMORY BANK # 3 CONFLUENCE DATA **
 STREAM RUNOFF Tc INTENSITY AREA
 NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
 1 6.23 17.07 2.535 4.33
 LONGEST FLOWPATH FROM NODE 1.00 TO NODE 4.00 = 950.00 FEET,
 =====

** PEAK FLOW RATE TABLE **
 STREAM RUNOFF Tc INTENSITY
 NUMBER (CFS) (MIN.) (INCH/HOUR)
 1 9.26 13.28 2.918
 2 9.57 17.07 2.535
 =====

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) = 9.57 Tc(MIN.) = 17.07
 TOTAL AREA(ACRES) = 7.3
 =====

END OF STUDY SUMMARY:
 TOTAL AREA(ACRES) = 7.3 TC(MIN.) = 17.07
 PEAK FLOW RATE(CFS) = 9.57
 =====