0.5 APPENDIX

Section 0.5 contains Appendix N and O. These two documents were not circulated with the Serena Park DEIR.

APPENDIX N

Preliminary Hydrology Report

PRELIMINARY HYDROLOGY REPORT

For Property Located
East of Sunrise Way, North of Joyce Drive
East of Farrell Drive, and North of Verona Road
City of Palm Springs, California

PALM SPRINGS COUNTRY CLUB

TENTATIVE TRACT MAP NO. 36691

APN: 669-480-027
APN: 669-5900-066
APN: 501-190-011

PREPARED FOR:

Eric Taylor
1601 CARMEN DRIVE, SUITE 211
CAMARILLO, CA 93010
(805) 469-9510

January 20, 2013

Job No.: 2152

MSA CONSULTING, INC.
PLANNING ■ CIVIL ENGINEERING ■ LAND SURVEYING
34200 BOB HOPE DRIVE ■ RANCHO MIRAGE ■ CA 92270
TELEPHONE (760) 320-9811 ■ FAX (760) 323-7893

PROJECT DESCRIPTION

Project Description

The proposed Palm Springs Country Club project consist of a combination of 440 single family duplex and detached homes located on the former Palm Springs Country Club golf course parcels in the City of Palm Springs. The project is bordered to the northeast by the Whitewater Storm Channel; the northerly parcel surrounds the Golden Sands Mobile Home Park and is bordered to the north and west by the Four Seasons at Palm Springs Community. The southerly parcel surrounds the Whitewater Estates and Alexander Country Club Estates and is bordered to the west and the south by residential homes. The site is approximately 121 acres. The project is within a portion of the SW ¼ of Section 36, Township 3 South, Range 4 East and NE ¼ of Section 1 Township 4 South, Range 4 East, San Bernardino Base and Meridian (see Appendix A-Vicinity Map.)

EXISTING CONDITIONS

Flood Rate Map

The project area is covered by FIRM Panel Number 06065C1557G, effectively dated August 28, 2008, which illustrates the project area lies within Zone X, indicating *"areas of 0.2% annual chance flood; and areas protected by levees from 1% annual chance flood"* (see Appendix B – NFIP Flood Insurance Rate Map).

National Cooperative Soil Survey

The existing soil is categorized as hydrologic soil group A, as shown in Appendix C – USDA National Cooperative Soil Survey exhibits.

Existing Off-Site Flows

The existing Four Seasons at Palm Springs development, which borders the northerly parcel, conventionally drains away from the project site with storm water runoff being conveyed by a storm drain system which outlets into the Whitewater Strom Channel via an outflow structure adjacent to the project site boundary.

The Golden Sands Mobile Home Park, which is surrounded by the northerly parcel of the project site, generally drains from the northwest to the southeast. Because the site is surrounded by a block wall, storm water sheet flows toward the southeast corner, outlets through an opening in the block wall and convergences with the project site.

The existing Whitewater Estates and Alexander Country Club Estates, which are surrounded by the southerly parcel of the project site, generally drain from the northwest to the southeast as well. The Alexander Country Club Estates flow into a storm drain system which outlets into a retention basin on the easterly site boundary and a drywell system which borders the Whitewater Estates. The retention basin is sized to accept the incremental increase storm volume with excess flows overflowing onto the project site while the drywell is also sized to accept the incremental increase storm flow with excess flows sheet flowing into the adjacent Whitewater Estates to the south. The Whitewater Estates sheet flow from the northwest to the southeast and outlet the site via Whitewater Club Drive. Portions of the Whitewater Estates were found to drain directly toward the project site as indicated by the tributary drainage areas (see Appendix E – Existing Hydrologic Conditions Exhibit).

The remaining development surrounding the subject site generally drains away from the site onto existing offsite street sections.

Existing On-Site Flows

The topography of the project site is relatively flat and slightly undulating from its previous use as a golf course. The surface of the former golf course is comprised primarily of sandy soil and has been treated with dust control. Historically, storm water runoff would flow from the northwest corner of the project to the southeast corner and ultimately outlet the site via Whitewater Club Drive. The southerly parcel is bounded to the east by an existing levee and separates the southerly parcel from the Whitewater Storm Channel (see Appendix E – Existing Hydrologic Conditions Exhibit).

PROPOSED FLOOD CONTROL REQUIREMENTS

The drainage of this project site falls under the jurisdiction of the City of Palm Springs. Per the Master Drainage Plan for the City of Palm Springs, the incremental increase for the 100-year storm is required to be retained on-site and street and associated storm drain systems are required to be sized to convey the 100-year peak flow.

The site has been divided into twenty five (25) tributary areas each of which is associated with a corresponding detention basin. The basins have been sized to not only retain the incremental increase from the worst-case scenario 100 year storm event but the entire project's storm water volume achieved during a 100-year storm event. During the 100-year peak storm, the basins will hold the entire 100-year storm volume, but if the basin volume is exceeded due to excess flows, storm water will overflow to the next downstream basin and ultimately exit the site to the southeast via sheet flow. This overflow condition is consistent with the historic drainage pattern of the subject site.

HYDROLOGY ANALYSIS DESIGN CRITERIA

Storm runoff volumes for the 100-year event were obtained utilizing the Synthetic Unit Hydrograph Shortcut Method, as described in the RCFC&WCD *Hydrology Manual*. The Short-Cut method is useful for evaluating those areas less than 200 acres in area. Peak flow storm rates were analyzed using the RCFCD Rational Method for distinctive areas (A1, A2, B1, B2, D1, D2, E1 and E2) as well as typical areas (F1 and G1). Peak flow storm rates for similar areas (H1 through W1) were calculated by prorating the typical areas (F1 and G1) previously calculated using the Rational Method. Additionally, drainage areas C1 and Y1 were estimated based on existing site conditions. An approved hydrology report was referenced for offsite drainage area X1 and these tributary flow rates correspond accordingly. The hydrologic data used for the RCFCD Rational Method calculations are as follows:

Hydrologic Soil Group:

Soil Group A – Are those soils having high infiltration rates even when thoroughly wetted and consisting chiefly of deep, well to excessively drained sands or gravels.

Antecedent Moisture Condition:

AMC II – Moderate runoff potential, an intermediate condition. Per RCFC & WCD Hydrology Manual (Dated: April, 1978): "For the purposes of design hydrology using District methods, AMC II should normally be assumed for both the 10 year and 100 year frequency storm".

Land Use Classifications and Runoff Index Numbers:

Runoff Index Numbers were obtained from RCFCD Plate E-6.1 and are summarized below:
Existing Conditions - Open Brush Poor (RI = 62)
Proposed Conditions – Multi-Family Condominiums (RI = 32)

Percent of Impervious Cover (RCFCD Plate E-6.3):

Existing Conditions	5%
Buildings/Paving/Hardscape	100%
Multi-Family Condominiums	65%
Proposed Retention Basins	10%

Precipitation Depths:
Precipitation depths were obtained from NOAA Atlas 14, Volume 6 Version 2

2 Year 1 Hour Storm:	0.46 inches
100 Year 1 Hour Storm:	1.71 inches
100 Year 3 Hour Storm:	2.52 inches
100 Year 6 Hour Storm:	3.34 inches
100 Year 24 Hour Storm:	5.42 inches

Slope of Intensity Duration Curve: 0.51

Refer to Appendix D for NOAA Atlas Point Precipitation Frequency Estimates.

Site Infiltration:
No percolation tests were conducted on the project site, therefore, a conservative factor of 1 in/hr was used in the basin sizing calculations.

SUMMARY of SYNTHETIC UNIT (SHORTCUT METHOD) ANALYSES

The Shortcut Method of Synthetic Unit Hydrograph development is considered valid by RCFC&WCD if the tributary areas under study are less than 100 to 200 acres in size. Subsequently, the entire project site is less than 150 acres in size and is within the required size limit. The project area was subdivided into twenty five (25) distinct drainage areas; however, the synthetic unit analysis was calculated for two (2) large drainage areas: one for the northerly parcel and one for the southerly parcel. The northerly parcel will drain to Detention Basin No. 1 and the southerly parcel will drain to Detention Basin No. 2 (see Appendix E – RCFCD Synthetic Unit Hydrograph (Shortcut Method) Worksheets and Appendix H – Proposed Synthetic Unit Hydrograph Exhibit). For the incremental increase worksheets, all existing conditions were assumed to have a land use of “Open Brush – Poor”.

RCFCD RATIONAL METHOD ANALYSES

Peak flows for the project area and contributing off-site tributary areas were analyzed utilizing the RCFCD Rational Method and analyses are included in Appendix G.

STREET CAPACITY CALCULATIONS

Street capacities were analyzed utilizing Manning’s equation for open channel flow. In accordance with City of Palm Springs guidelines the 100-year storm shall be contained within the right-of-way (public utility and/or drainage easement) and the 10-year storm shall be contained within the curb lines. The majority of the proposed streets are 36-feet and 32-feet curb to curb with the exception being the “T-shaped” street sections located in the northerly parcel of the subject site which are 24-feet wide and have no curb. All proposed streets will have a minimum longitudinal slope of 0.50%.

For the 32-foot street section a minimum longitudinal slope of 0.50% was used in the analysis with the 100- and 10-year capacities being shown below:

100 Year Storm	54.70 cfs
10 Year Storm	19.39 cfs

For the 36-foot street section a minimum longitudinal slope of 0.50% was used in the analysis with the 100- and 10-year capacities being shown below:

100 Year Storm	61.16 cfs
10 Year Storm	21.39 cfs

STORM DRAIN CAPACITY CALCULATIONS

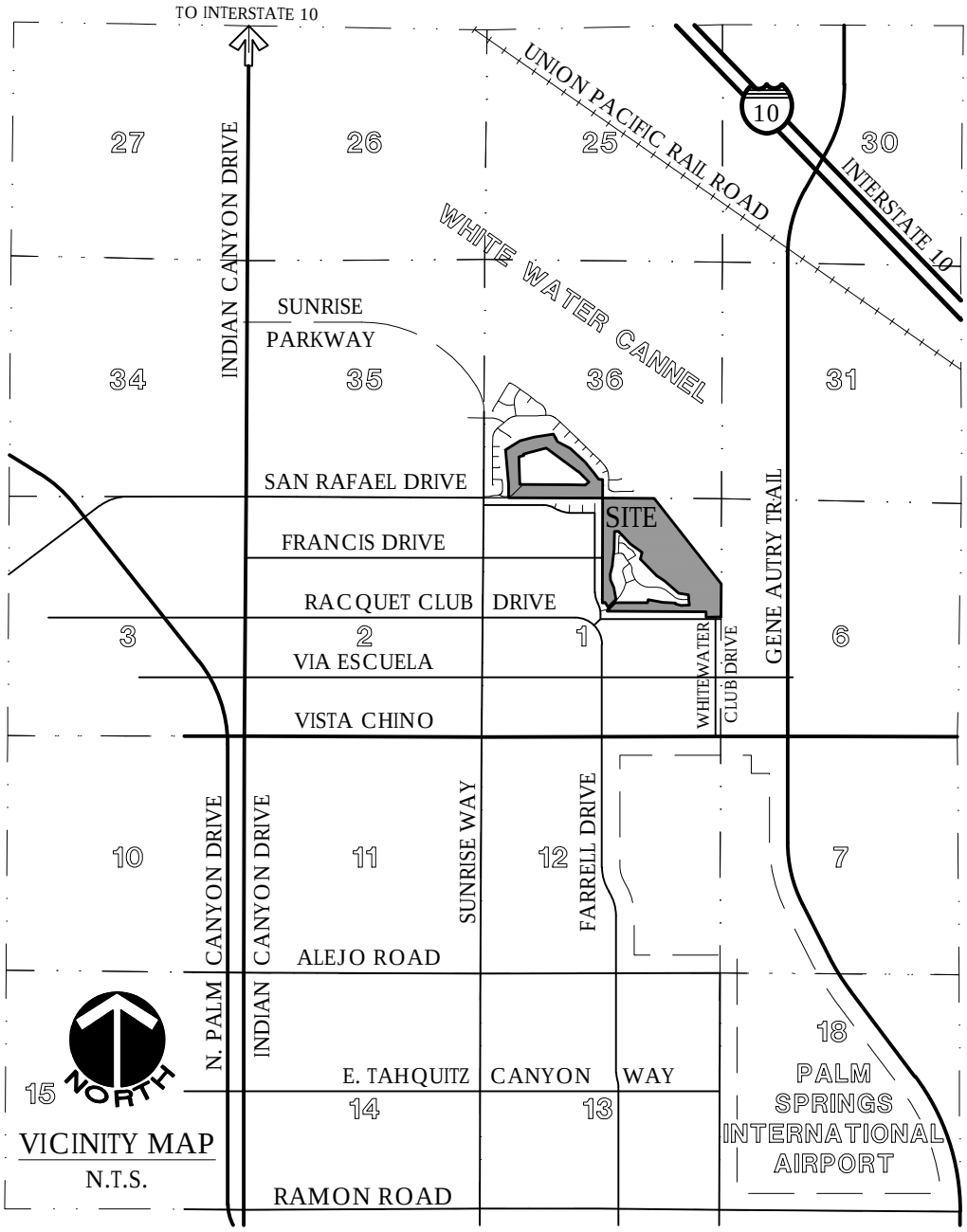
Storm drain sizes and capacities were estimated utilizing Manning's equation for full flow conditions in circular pipe. A worksheet for determining pipe size based on tributary flow rate and pipe slope is provided in Appendix I. All proposed storm drain pipes were estimated to have a minimum longitudinal slope of 0.50%. Storm drain pipe sizes and associated flow rates are shown on the preliminary grading plan provided in Appendix J.

RESULTS AND CONCLUSIONS

As the above summary confirms, the proposed basins provide sufficient storage to not only retain the project's incremental increase in flood volumes from the 100 year storm event (required by the City of Palm Springs Master Drainage Plan) but the project's 100 year storm event in its entirety. In addition the proposed street section, catch basins and storm drain systems are sized to sufficiently convey the 100-year peak flow to the retention basins.

The existing site drainage characteristics generally remain the same with the exception of the project's 100-year storm event being retained onsite. Excess flows associated with the non-project tributary areas (Golden Sands Mobile Home Park, Whitewater Estates and Alexander Country Club Estates) will exit the project site per historic conditions. It is therefore concluded that the proposed project meets the hydrologic conditions set forth by the City of Palm Springs and tributary storm water runoff will not adversely affect persons or properties onsite or existing downstream drainage facilities or developments.

APPENDIX A
Vicinity Map



VICINITY MAP

N.T.S.

APPENDIX B

NFIP Flood Insurance Rate Maps

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 1557G

FIRM

FLOOD INSURANCE RATE MAP

RIVERSIDE COUNTY, CALIFORNIA
AND INCORPORATED AREAS

PANEL 1557 OF 3805

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
AGUA CALIENTE BAND OF CAHUILLA INDIAN RESERVATION	060763	1557	G
PALM SPRINGS, CITY OF	060257	1557	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
06065C1557G

EFFECTIVE DATE
AUGUST 28, 2008

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

APPENDIX C

USDA NCSS Hydrologic Soils Map

Hydrologic Soil Group—Riverside County, Coachella Valley Area, California

Map Scale: 1:11,500 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 150 300 600 900

Feet: 0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- C
- C/D
- D
- Not rated or not available

Water Features

Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Riverside County, Coachella Valley Area, California
Survey Area Data: Version 5, Jun 1, 2012

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 2, 2010—Jun 3, 2010

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Riverside County, Coachella Valley Area, California (CA680)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
CdC	Carsitas gravelly sand, 0 to 9 percent slopes	A	317.8	58.1%
ChC	Carsitas cobbly sand, 2 to 9 percent slopes	A	6.8	1.3%
CkB	Carsitas fine sand, 0 to 5 percent slopes	A	168.9	30.9%
MaB	Myoma fine sand, 0 to 5 percent slopes	A	8.3	1.5%
RA	Riverwash		43.1	7.9%
W	Water		2.1	0.4%
Totals for Area of Interest			**547.1**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: *None Specified*

Tie-break Rule: Higher

APPENDIX D

NOAA Atlas 14 Precipitation Rates
Slope of Intensity Duration Curve Worksheet

NOAA Atlas 14, Volume 6, Version 2
Location name: Palm Springs, California, US*
Coordinates: 33.8592, -116.5189
Elevation: 517ft*
* source: Google Maps

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval(years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.084 (0.070-0.101)	0.127 (0.105-0.154)	0.189 (0.157-0.230)	0.243 (0.200-0.299)	0.325 (0.258-0.413)	0.393 (0.306-0.510)	0.469 (0.356-0.624)	0.553 (0.408-0.757)	0.678 (0.479-0.968)	0.786 (0.537-1.16)
10-min	0.120 (0.100-0.145)	0.182 (0.151-0.221)	0.271 (0.224-0.330)	0.349 (0.287-0.428)	0.466 (0.370-0.591)	0.564 (0.439-0.732)	0.672 (0.510-0.894)	0.792 (0.584-1.08)	0.972 (0.687-1.39)	1.13 (0.769-1.67)
15-min	0.145 (0.121-0.176)	0.220 (0.183-0.267)	0.327 (0.271-0.398)	0.422 (0.347-0.518)	0.563 (0.448-0.715)	0.682 (0.531-0.885)	0.812 (0.617-1.08)	0.958 (0.707-1.31)	1.18 (0.831-1.68)	1.36 (0.930-2.02)
30-min	0.212 (0.176-0.257)	0.321 (0.267-0.390)	0.478 (0.396-0.582)	0.616 (0.507-0.757)	0.822 (0.654-1.05)	0.996 (0.775-1.29)	1.19 (0.901-1.58)	1.40 (1.03-1.92)	1.72 (1.21-2.45)	1.99 (1.36-2.95)
60-min	0.305 (0.254-0.370)	0.463 (0.385-0.562)	0.689 (0.572-0.840)	0.889 (0.731-1.09)	1.19 (0.943-1.51)	1.44 (1.12-1.86)	1.71 (1.30-2.28)	2.02 (1.49-2.76)	2.48 (1.75-3.54)	2.87 (1.96-4.25)
2-hr	0.419 (0.349-0.508)	0.615 (0.511-0.746)	0.895 (0.742-1.09)	1.14 (0.939-1.40)	1.51 (1.20-1.92)	1.82 (1.41-2.36)	2.16 (1.64-2.87)	2.53 (1.87-3.46)	3.08 (2.18-4.40)	3.55 (2.43-5.25)
3-hr	0.502 (0.418-0.609)	0.732 (0.609-0.889)	1.06 (0.879-1.29)	1.35 (1.11-1.66)	1.78 (1.41-2.26)	2.13 (1.66-2.77)	2.52 (1.91-3.36)	2.95 (2.18-4.04)	3.59 (2.54-5.12)	4.12 (2.82-6.10)
6-hr	0.668 (0.556-0.810)	0.979 (0.815-1.19)	1.42 (1.18-1.73)	1.80 (1.48-2.22)	2.37 (1.88-3.01)	2.83 (2.21-3.68)	3.34 (2.54-4.44)	3.89 (2.87-5.33)	4.70 (3.33-6.72)	5.38 (3.67-7.96)
12-hr	0.820 (0.683-0.994)	1.25 (1.04-1.52)	1.85 (1.53-2.25)	2.35 (1.94-2.89)	3.09 (2.45-3.92)	3.68 (2.86-4.78)	4.32 (3.28-5.74)	5.00 (3.69-6.85)	5.98 (4.23-8.55)	6.79 (4.64-10.0)
24-hr	0.963 (0.852-1.11)	1.53 (1.35-1.77)	2.31 (2.03-2.67)	2.96 (2.59-3.45)	3.89 (3.29-4.68)	4.63 (3.85-5.69)	5.42 (4.39-6.82)	6.26 (4.94-8.09)	7.45 (5.65-10.0)	8.42 (6.18-11.7)
2-day	1.11 (0.983-1.28)	1.79 (1.59-2.07)	2.73 (2.41-3.16)	3.53 (3.09-4.12)	4.67 (3.96-5.63)	5.60 (4.65-6.88)	6.57 (5.33-8.27)	7.63 (6.02-9.86)	9.13 (6.92-12.3)	10.4 (7.59-14.4)
3-day	1.18 (1.05-1.36)	1.92 (1.70-2.21)	2.94 (2.59-3.40)	3.81 (3.34-4.45)	5.07 (4.30-6.11)	6.09 (5.06-7.49)	7.18 (5.83-9.04)	8.37 (6.60-10.8)	10.1 (7.63-13.5)	11.5 (8.40-16.0)
4-day	1.22 (1.08-1.41)	1.99 (1.76-2.29)	3.06 (2.70-3.54)	3.97 (3.48-4.64)	5.30 (4.49-6.38)	6.38 (5.30-7.84)	7.54 (6.11-9.48)	8.79 (6.94-11.4)	10.6 (8.04-14.3)	12.1 (8.87-16.8)
7-day	1.34 (1.19-1.54)	2.18 (1.93-2.51)	3.36 (2.96-3.89)	4.38 (3.83-5.11)	5.86 (4.96-7.05)	7.07 (5.87-8.69)	8.37 (6.79-10.5)	9.79 (7.72-12.7)	11.8 (8.97-15.9)	13.5 (9.92-18.8)
10-day	1.41 (1.25-1.63)	2.29 (2.03-2.64)	3.54 (3.12-4.09)	4.61 (4.04-5.38)	6.19 (5.24-7.45)	7.48 (6.21-9.19)	8.87 (7.19-11.2)	10.4 (8.19-13.4)	12.6 (9.54-16.9)	14.4 (10.6-20.1)
20-day	1.57 (1.39-1.80)	2.54 (2.25-2.94)	3.94 (3.48-4.56)	5.16 (4.51-6.02)	6.95 (5.89-8.37)	8.43 (7.00-10.4)	10.0 (8.13-12.6)	11.8 (9.29-15.2)	14.3 (10.9-19.3)	16.4 (12.0-22.9)
30-day	1.74 (1.54-2.01)	2.82 (2.50-3.26)	4.38 (3.86-5.07)	5.74 (5.02-6.70)	7.76 (6.57-9.34)	9.42 (7.82-11.6)	11.2 (9.11-14.1)	13.2 (10.4-17.1)	16.1 (12.2-21.6)	18.5 (13.5-25.7)
45-day	1.93 (1.71-2.22)	3.11 (2.75-3.59)	4.81 (4.25-5.57)	6.32 (5.53-7.37)	8.56 (7.25-10.3)	10.4 (8.66-12.8)	12.5 (10.1-15.7)	14.7 (11.6-19.0)	17.9 (13.6-24.1)	20.5 (15.1-28.6)
60-day	2.10 (1.86-2.42)	3.37 (2.98-3.89)	5.21 (4.60-6.03)	6.85 (5.99-7.99)	9.28 (7.86-11.2)	11.3 (9.40-13.9)	13.5 (11.0-17.0)	15.9 (12.6-20.6)	19.5 (14.8-26.2)	22.4 (16.4-31.1)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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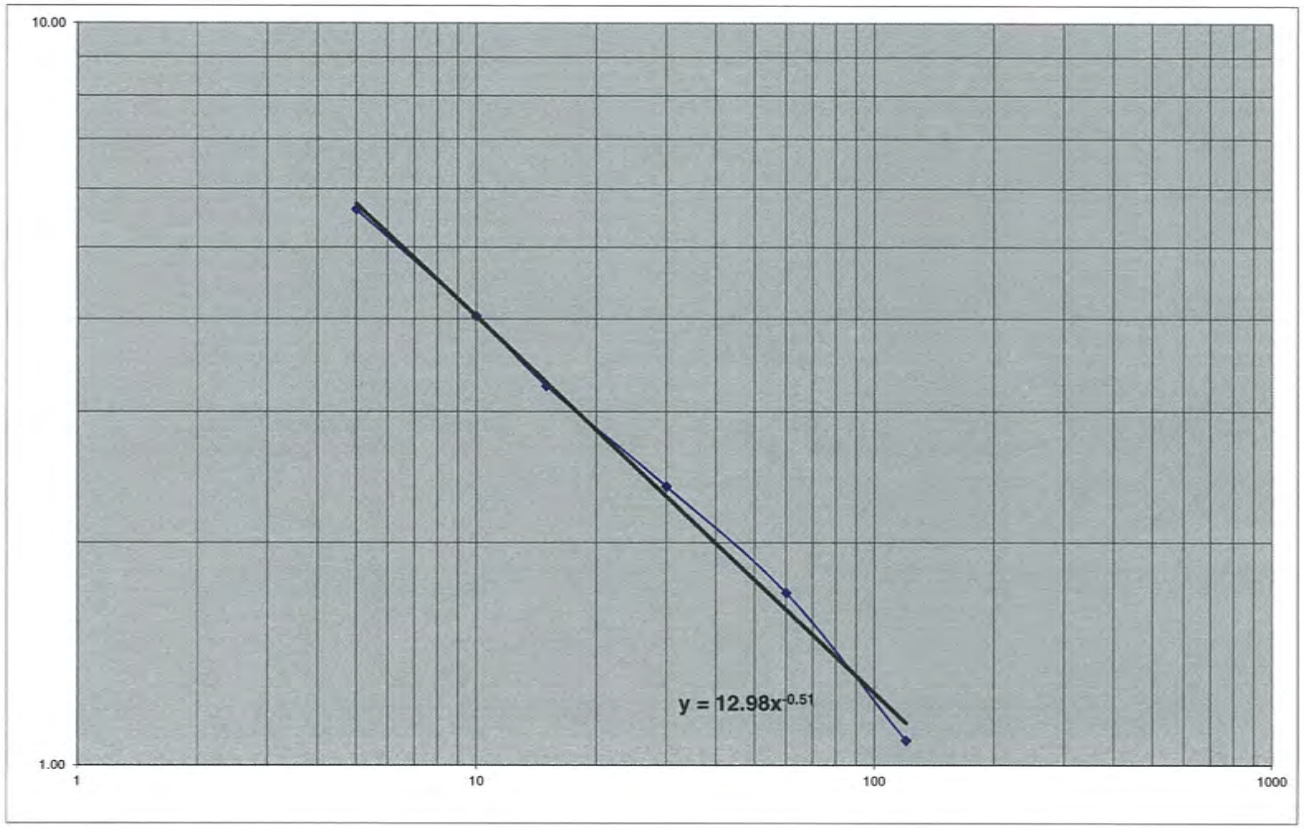
NOAA ATLAS 14 INTENSITY - DURATION WORKSHEET

PROJECT NAME	Palm Springs Country Club
PROJECT NUMBER	2152
STORM EVENT	100-Year
DATE:	December 10, 2013

DATA FROM NOAA ATLAS 14

MINUTES	RAINFALL INTENSITY (in/hr)	RAINFALL DEPTH (in)
5	5.63	0.47
10	4.03	0.67
15	3.25	0.81
30	2.38	1.19
60	1.71	1.71
120	1.08	2.16



INTENSITY VALUES FROM GRAPH

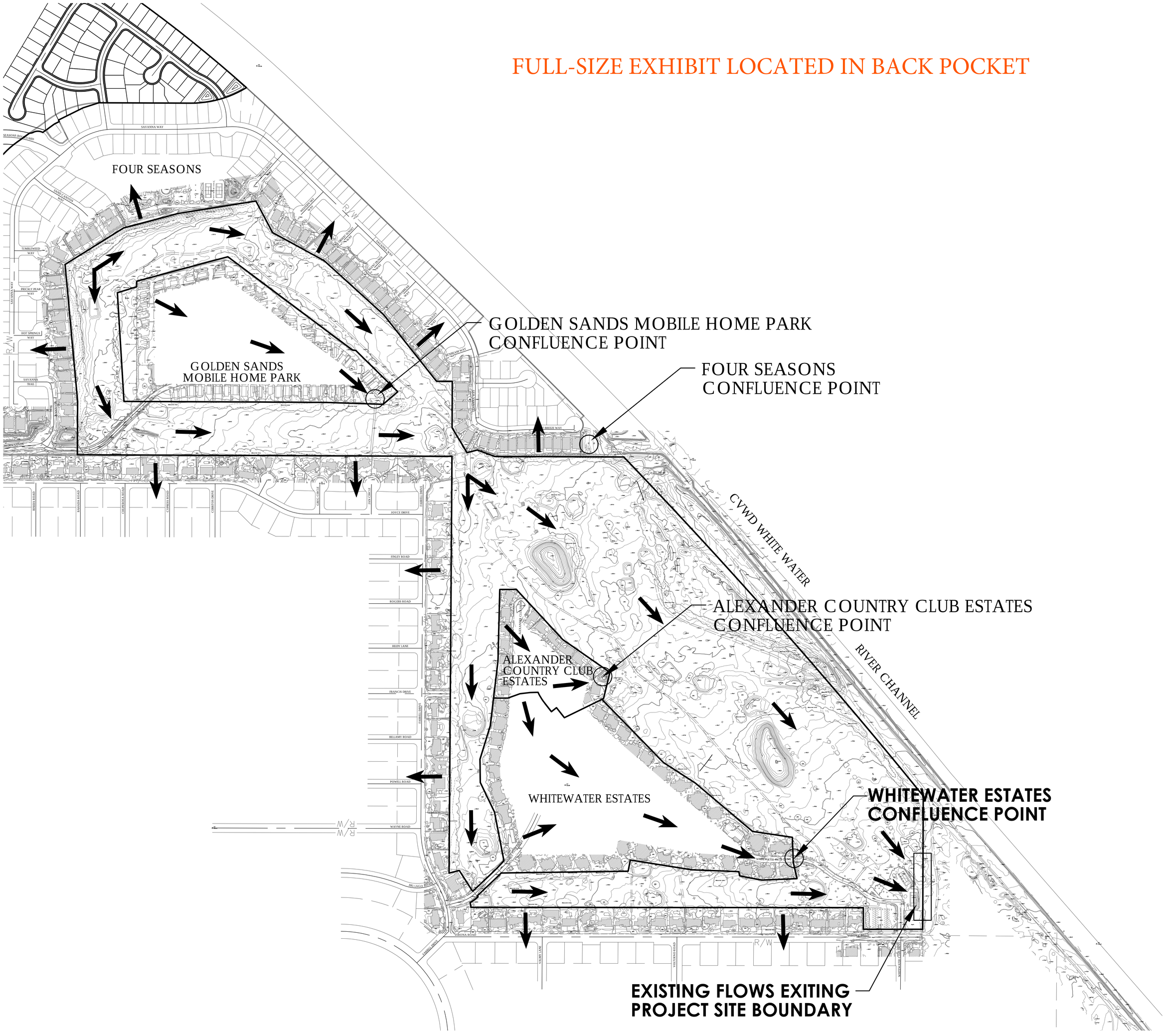
CONSTANT FROM GRAPH	12.98
EXPONENT FROM GRAPH	-0.51

MINUTES	RAINFALL INTENSITY (in/hr)	RAINFALL DEPTH (in)
5	5.71	0.48
10	4.01	0.67
15	3.26	0.82
20	2.82	0.94
25	2.51	1.05
30	2.29	1.15
35	2.12	1.24
40	1.98	1.32
45	1.86	1.40
50	1.77	1.47
55	1.68	1.54
60	1.61	1.61
65	1.54	1.67
70	1.49	1.73
75	1.44	1.79
80	1.39	1.85
85	1.35	1.91
90	1.31	1.96
95	1.27	2.01
100	1.24	2.07
105	1.21	2.12
110	1.18	2.16
115	1.15	2.21
120	1.13	2.26

APPENDIX E

Existing Hydrology Drainage Exhibit

FULL-SIZE EXHIBIT LOCATED IN BACK POCKET



NORTH

0' 200' 400' 600' 800'

SCALE 1"=200'

TENTATIVE TRACT NO. 36691

PALM SPRINGS COUNTRY CLUB
EXISTING HYDROLOGY DRAINAGE EXHIBIT

MSA CONSULTING, INC.
PLANNING ■ CIVIL ENGINEERING ■ LAND SURVEYING
34200 BOB HOPE DRIVE ■ RANCHO MIRAGE ■ CA 92270
TELEPHONE (760) 320-9811 ■ FAX (760) 323-7893

DESIGN BY	SHEET
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DRAWN BY	OF
NAB	1
CHECK BY	SHEETS
JAD	

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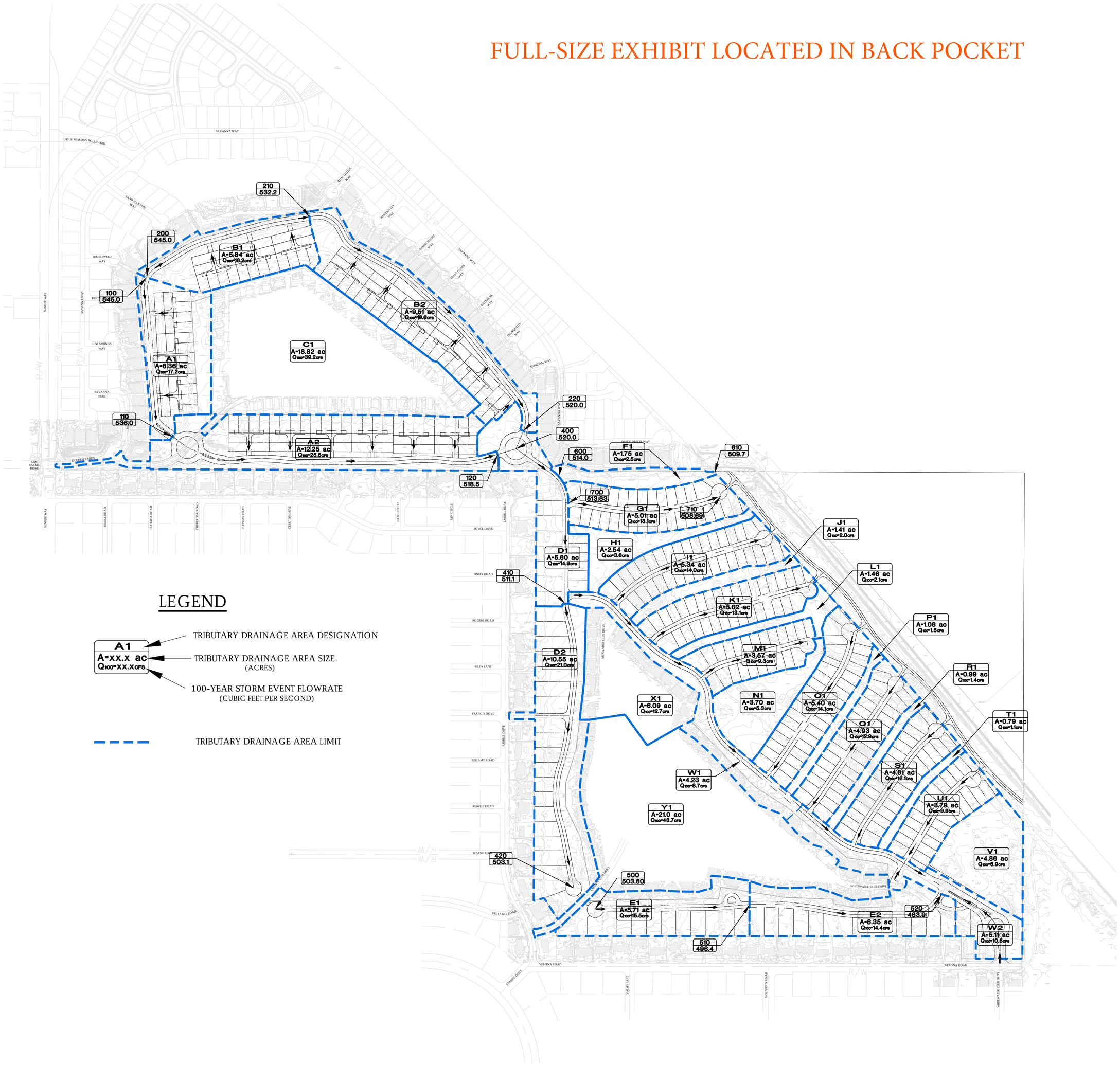
APPENDIX F

Preliminary Site Plan Hydrology Drainage Exhibit

FULL-SIZE EXHIBIT LOCATED IN BACK POCKET



LEGEND

A1
A=xx.x ac
Q100=xx.xcfs

TRIBUTARY DRAINAGE AREA DESIGNATION

TRIBUTARY DRAINAGE AREA SIZE (ACRES)

100-YEAR STORM EVENT FLOWRATE (CUBIC FEET PER SECOND)

TRIBUTARY DRAINAGE AREA LIMIT

NORTH

0' 200' 400' 600' 800'
SCALE 1"=200'

TENTATIVE TRACT NO. 36691

PALM SPRINGS COUNTRY CLUB
PRELIMINARY HYDROLOGY DRAINAGE EXHIBIT

MSA CONSULTING, INC.
PLANNING ■ CIVIL ENGINEERING ■ LAND SURVEYING
34200 BOB HOPE DRIVE ■ RANCHO MIRAGE ■ CA 92270
TELEPHONE (760) 320-9811 ■ FAX (760) 323-7893

DESIGN BY	SHEET
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CHECK BY JAD	1 SHEETS

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APPENDIX G

RCFCD Rational Method Analyses

```
                    Riverside County Rational Hydrology Program

      CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
            Rational Hydrology Study        Date: 01/10/14
File:2152prelimhydro.out
      ----------------------------------------------------------------------
-
       *********   Hydrology Study Control Information **********

       English (in-lb) Units used in input data file

      ----------------------------------------------------------------------
-


      Program License Serial Number 6041

      ----------------------------------------------------------------------
-
      Rational Method Hydrology Program based on
      Riverside County Flood Control & Water Conservation District
      1978 hydrology manual

      Storm event (year) =  100.00 Antecedent Moisture Condition = 2

      2 year, 1 hour precipitation =  0.463(In.)
      100 year, 1 hour precipitation =  1.710(In.)

      Storm event year = 100.0
      Calculated rainfall intensity data:
      1 hour intensity =  1.710(In/Hr)
      Slope of intensity duration curve = 0.5100




      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station      100.000 to Point/Station      110.000
      **** INITIAL AREA EVALUATION ****
      ______________________________________________________________________
      Initial area flow distance =   912.000(Ft.)
      Top (of initial area) elevation =   545.000(Ft.)
      Bottom (of initial area) elevation =   536.000(Ft.)
      Difference in elevation =     9.000(Ft.)
      Slope =    0.00987  s(percent)=       0.99
      TC = k(0.370)*[(length^3)/(elevation change)]^0.2
      Initial area time of concentration =   14.235 min.
      Rainfall intensity =      3.562(In/Hr) for a   100.0 year storm
      CONDOMINIUM subarea type
      Runoff Coefficient = 0.760
      Decimal fraction soil group A = 1.000
      Decimal fraction soil group B = 0.000
      Decimal fraction soil group C = 0.000
      Decimal fraction soil group D = 0.000
      RI index for soil(AMC 2)  =  32.00
```

```
Pervious area fraction =  0.350; Impervious fraction =  0.650
Initial subarea runoff =     17.225(CFS)
Total initial stream area =        6.360(Ac.)
Pervious area fraction = 0.350


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      110.000 to Point/Station      120.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =   536.000(Ft.)
End of street segment elevation =   518.500(Ft.)
Length of street segment  =  1806.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =  15.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   3.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     30.050(CFS)
Depth of flow =   0.512(Ft.), Average velocity =   3.562(Ft/s)
Warning: depth of flow exceeds top of curb
Note:  depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property =    0.59(Ft.)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  18.000(Ft.)
Flow velocity =   3.56(Ft/s)
Travel time =    8.45 min.     TC =   22.68  min.
 Adding area flow to street
CONDOMINIUM subarea type
Runoff Coefficient = 0.742
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  32.00
Pervious area fraction =  0.350; Impervious fraction =  0.650
Rainfall intensity =      2.808(In/Hr) for a   100.0 year storm
Subarea runoff =     25.519(CFS) for     12.250(Ac.)
Total runoff =     42.744(CFS)      Total area =      18.610(Ac.)
Street flow at end of street =     42.744(CFS)
Half street flow at end of street =     21.372(CFS)
Depth of flow =   0.578(Ft.), Average velocity =   3.848(Ft/s)
Warning: depth of flow exceeds top of curb
Note:  depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property =    3.89(Ft.)
Flow width (from curb towards crown)=  18.000(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

```
Process from Point/Station      200.000 to Point/Station      210.000
**** INITIAL AREA EVALUATION ****
____________________________________________________________________
Initial area flow distance =   962.000(Ft.)
Top (of initial area) elevation =   545.000(Ft.)
Bottom (of initial area) elevation =   532.200(Ft.)
Difference in elevation =    12.800(Ft.)
Slope =    0.01331  s(percent)=       1.33
TC = k(0.370)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   13.698 min.
Rainfall intensity =      3.632(In/Hr) for a   100.0 year storm
CONDOMINIUM subarea type
Runoff Coefficient = 0.762
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  32.00
Pervious area fraction =  0.350; Impervious fraction =  0.650
Initial subarea runoff =     16.162(CFS)
Total initial stream area =        5.840(Ac.)
Pervious area fraction = 0.350


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      210.000 to Point/Station      220.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
____________________________________________________________________
Top of street segment elevation =   532.200(Ft.)
End of street segment elevation =   520.000(Ft.)
Length of street segment  =  1735.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =  15.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   3.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     26.002(CFS)
Depth of flow =   0.515(Ft.), Average velocity =   3.045(Ft/s)
Warning: depth of flow exceeds top of curb
Note:  depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property =    0.73(Ft.)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  18.000(Ft.)
Flow velocity =   3.04(Ft/s)
Travel time =    9.50 min.     TC =   23.20  min.
 Adding area flow to street
CONDOMINIUM subarea type
Runoff Coefficient = 0.741
Decimal fraction soil group A = 1.000
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Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  32.00
Pervious area fraction =  0.350; Impervious fraction =  0.650
Rainfall intensity =      2.777(In/Hr) for a   100.0 year storm
Subarea runoff =     19.563(CFS) for      9.510(Ac.)
Total runoff =     35.725(CFS)      Total area =      15.350(Ac.)
Street flow at end of street =     35.725(CFS)
Half street flow at end of street =     17.863(CFS)
Depth of flow =   0.574(Ft.), Average velocity =   3.264(Ft/s)
Warning: depth of flow exceeds top of curb
Note:  depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property =    3.71(Ft.)
Flow width (from curb towards crown)=  18.000(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      400.000 to Point/Station      410.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =   967.000(Ft.)
Top (of initial area) elevation =   520.000(Ft.)
Bottom (of initial area) elevation =   511.100(Ft.)
Difference in elevation =     8.900(Ft.)
Slope =    0.00920  s(percent)=       0.92
TC = k(0.370)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   14.777 min.
Rainfall intensity =      3.494(In/Hr) for a   100.0 year storm
CONDOMINIUM subarea type
Runoff Coefficient = 0.759
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  32.00
Pervious area fraction =  0.350; Impervious fraction =  0.650
Initial subarea runoff =     14.852(CFS)
Total initial stream area =        5.600(Ac.)
Pervious area fraction = 0.350


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      410.000 to Point/Station      420.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =   511.100(Ft.)
End of street segment elevation =   503.100(Ft.)
Length of street segment  =  1570.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =  15.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
```

```
Gutter width =   3.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     25.415(CFS)
Depth of flow =   0.540(Ft.), Average velocity =   2.671(Ft/s)
Warning: depth of flow exceeds top of curb
Note:  depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property =    2.00(Ft.)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  18.000(Ft.)
Flow velocity =   2.67(Ft/s)
Travel time =    9.80 min.     TC =   24.58  min.
 Adding area flow to street
CONDOMINIUM subarea type
Runoff Coefficient = 0.739
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  32.00
Pervious area fraction =  0.350; Impervious fraction =  0.650
Rainfall intensity =      2.696(In/Hr) for a   100.0 year storm
Subarea runoff =     21.007(CFS) for     10.550(Ac.)
Total runoff =     35.858(CFS)      Total area =      16.150(Ac.)
Street flow at end of street =     35.858(CFS)
Half street flow at end of street =     17.929(CFS)
Depth of flow =   0.607(Ft.), Average velocity =   2.884(Ft/s)
Warning: depth of flow exceeds top of curb
Note:  depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property =    5.36(Ft.)
Flow width (from curb towards crown)=  18.000(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      500.000 to Point/Station      510.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =   840.000(Ft.)
Top (of initial area) elevation =   503.600(Ft.)
Bottom (of initial area) elevation =   496.400(Ft.)
Difference in elevation =     7.200(Ft.)
Slope =    0.00857  s(percent)=       0.86
TC = k(0.370)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   14.168 min.
Rainfall intensity =      3.570(In/Hr) for a   100.0 year storm
CONDOMINIUM subarea type
Runoff Coefficient = 0.761
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  32.00
Pervious area fraction =  0.350; Impervious fraction =  0.650
Initial subarea runoff =     15.506(CFS)
Total initial stream area =        5.710(Ac.)
```

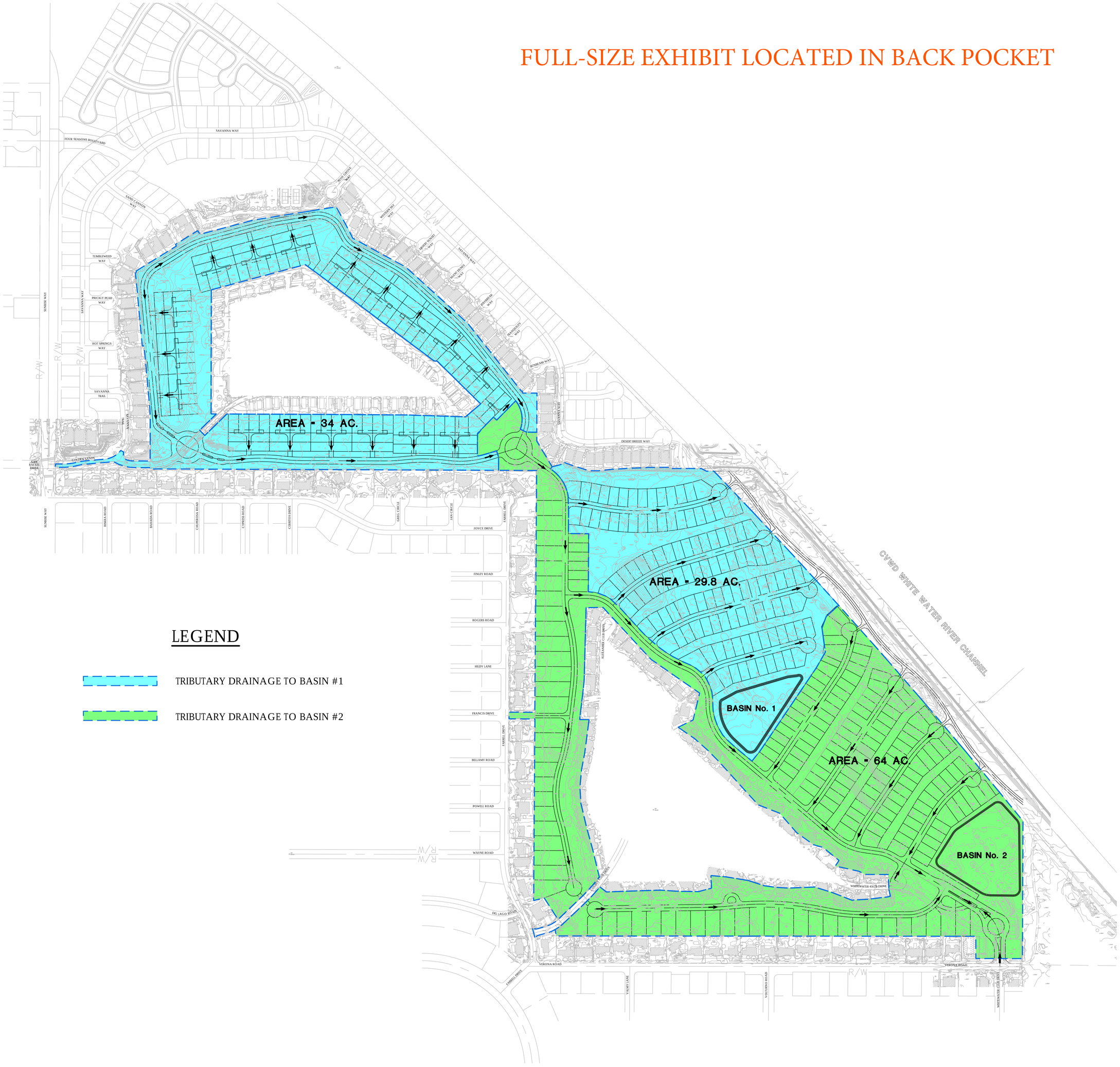
```
Pervious area fraction = 0.350


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      510.000 to Point/Station      520.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =   496.400(Ft.)
End of street segment elevation =   483.900(Ft.)
Length of street segment  =  1090.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =  15.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   3.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     22.803(CFS)
Depth of flow =   0.463(Ft.), Average velocity =   3.413(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  17.834(Ft.)
Flow velocity =   3.41(Ft/s)
Travel time =    5.32 min.     TC =   19.49  min.
 Adding area flow to street
CONDOMINIUM subarea type
Runoff Coefficient = 0.748
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  32.00
Pervious area fraction =  0.350; Impervious fraction =  0.650
Rainfall intensity =      3.034(In/Hr) for a   100.0 year storm
Subarea runoff =     14.410(CFS) for      6.350(Ac.)
Total runoff =     29.916(CFS)      Total area =      12.060(Ac.)
Street flow at end of street =     29.916(CFS)
Half street flow at end of street =     14.958(CFS)
Depth of flow =   0.497(Ft.), Average velocity =   3.788(Ft/s)
Note:  depth of flow exceeds top of street crown.
Flow width (from curb towards crown)=  18.000(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      600.000 to Point/Station      610.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =   853.000(Ft.)
Top (of initial area) elevation =   514.000(Ft.)
Bottom (of initial area) elevation =   509.700(Ft.)
Difference in elevation =     4.300(Ft.)
Slope =    0.00504  s(percent)=       0.50
```

```
TC = k(0.710)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   30.418 min.
Rainfall intensity =      2.418(In/Hr) for a   100.0 year storm
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.580
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  50.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      2.455(CFS)
Total initial stream area =        1.750(Ac.)
Pervious area fraction = 1.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      700.000 to Point/Station      710.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =   841.000(Ft.)
Top (of initial area) elevation =   513.830(Ft.)
Bottom (of initial area) elevation =   508.690(Ft.)
Difference in elevation =     5.140(Ft.)
Slope =    0.00611  s(percent)=       0.61
TC = k(0.370)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   15.167 min.
Rainfall intensity =      3.448(In/Hr) for a   100.0 year storm
CONDOMINIUM subarea type
Runoff Coefficient = 0.758
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  32.00
Pervious area fraction =  0.350; Impervious fraction =  0.650
Initial subarea runoff =     13.094(CFS)
Total initial stream area =        5.010(Ac.)
Pervious area fraction = 0.350
End of computations, total study area =           68.93 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.367
Area averaged RI index number =  32.5
```

APPENDIX H

RCFCD Synthetic Unit Hydrograph (Shortcut Method) Worksheets
Synthetic Unit Hydrograph Exhibits

FULL-SIZE EXHIBIT LOCATED IN BACK POCKET



LEGEND

TRIBUTARY DRAINAGE TO BASIN #1

TRIBUTARY DRAINAGE TO BASIN #2

NORTH

0' 200' 400' 600' 800'

SCALE 1"=200'

TENTATIVE TRACT NO. 36691

PALM SPRINGS COUNTRY CLUB
SYNTHETIC UNIT HYDROGRAPH EXHIBIT

MSA CONSULTING, INC.
PLANNING ■ CIVIL ENGINEERING ■ LAND SURVEYING
34200 BOB HOPE DRIVE ■ RANCHO MIRAGE ■ CA 92270
TELEPHONE (760) 320-9811 ■ FAX (760) 323-7893

DESIGN BY	SHEET
NAB	1
DRAWN BY NAB	OF
CHECK BY JAD	1 SHEETS

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RCFCD SYNTHETIC UNIT HYDROGRAPH - SHORTCUT METHOD
INCREMENTAL INCREASE WORKSHEET
DATA INPUT SHEET

DATE:	January 17, 2014
WORKSHEET PREPARED BY:	NB
PROJECT NAME	PALM SPRINGS CC
PROJECT NUMBER	2152
CONCENTRATION POINT DESIGNATION	CATCH BASIN No. 1
AREA DESIGNATION	
AMC NUMBER	2

Low Loss Conditions: X=Existing; D=Developed; BS=Retention

EXISTING CONDITIONS

AREA DESIG	SOIL GROUP	TRIBUTARY AREAS	ACRES	LOW LOSS CONDITION	RI NUMBER	AMC II INFILTRATION RATE	IMPERVIOUS PERCENT
12	A	EXISTING OPEN BRUSH - POOR	63.76	X	62	0.45	0.05

PROPOSED CONDITIONS

AREA DESIG	SOIL GROUP	TRIBUTARY AREAS	ACRES	LOW LOSS CONDITION	RI NUMBER	AMC II INFILTRATION RATE	IMPERVIOUS PERCENT
6	A	MF - CONDIMINIUMS	63.76	D	32	0.74	0.65

	UNDEVELOPED	DEVELOPED
LENGTH OF WATERCOURSE (L)	5,040 ft	5,040 ft
LENGTH TO POINT OPPOSITE CENTROID (Lca)	2,520 ft	2,520 ft
ELEVATION OF HEADWATER	545.0 ft	545.0 ft
ELEVATION OF CONCENTRATION POINT	497.0 ft	497.0 ft
AVERAGE MANNINGS 'N' VALUE	0.05	0.02

STORM FREQUENCY (YEAR)	100
LOW LOSS RATE (Storm Events > 10 Years)	85%
POINT RAIN FROM NOAA ATLAS	**14**
1-HOUR	1.71 in
3-HOUR	2.52 in
6-HOUR	3.34 in
24-HOUR	5.42 in

BASIN CHARACTERISTICS:

ELEVATION	AREA
489.0 ft	90,228 sf
490.0 ft	94,100 sf
491.0 ft	98,029 sf
492.0 ft	102,015 sf
493.0 ft	106,060 sf

PERCOLATION RATE	1.0 in/hr
DRYWELL DATA	
NUMBER USED	0
PERCOLATION RATE	
LOWEST FLOWLINE ELEVATION	493.00 ft
LOWEST PAD ELEVATION	494.8 ft

RCFC & WCD HYDROLOGY MANUAL	SYNTHETIC UNIT HYDROGRAPH METHOD BASIC DATA CALCULATION FORM	PROJECT: PALM SPRINGS CC Job No.: 2152 BY: NB DATE: 1/17/14

PHYSICAL DATA

	UNDEVELOPED CONDITION	DEVELOPED CONDITION
[1] CONCENTRATION POINT	CATCH BASIN No. 1	CATCH BASIN No. 1
[2] AREA DESIGNATION		
[3] AREA - ACRES	63.76	63.76
[4] L-FEET	5040	5040
[5] L-MILES	0.955	0.955
[6] La-FEET	2520.00	2520.00
[7] La-MILES	0.477	0.477
[8] ELEVATION OF HEADWATER	545	545
[9] ELEVATION OF CONCENTRATION POINT	497	497
[10] H-FEET	48	48
[11] S-FEET/MILE	50.3	50.3
[12] S^0.5	7.09	7.09
[13] L*LCA/S^0.5	0.064	0.064
[14] AVERAGE MANNINGS 'N'	0.05	0.02
[15] LAG TIME-HOURS	0.42	0.17
[16] LAG TIME-MINUTES	25.4	10.1
[17] 100% OF LAG-MINUTES	25.4	10.1
[18] 200% OF LAG-MINUTES	50.7	20.3

RAINFALL DATA

[1] AMC	II
[2] FREQUENCY-YEARS	100
NOAA ATLAS	**14**
[3] STORM DURATION:	POINT RAIN
1-HOUR	1.71 in
3-HOUR	2.52 in
6-HOUR	3.34 in
24-HOUR	5.42 in

STORM EVENT SUMMARY

		UNDEVELOPED CONDITION				DEVELOPED CONDITION			
DURATION		1-HOUR	3-HOUR	6-HOUR	24-HOUR	1-HOUR	3-HOUR	6-HOUR	24-HOUR
EFFECTIVE RAIN	(in)	1.28	1.28	1.35	1.25	1.40	1.61	1.63	1.77
FLOOD VOLUME	(cu-ft)	296,313	296,694	312,797	289,544	324,701	372,967	378,254	410,036
	(acre-ft)	6.80	6.81	7.18	6.65	7.45	8.56	8.68	9.41
PEAK FLOW	(cfs)	N/A	131.79	116.67	23.60	N/A	139.68	124.56	30.39

STORM EVENT SUMMARY

DURATION		1-HOUR	3-HOUR	6-HOUR	24-HOUR
DEVELOPED CONDITION FLOOD VOLUME	(cu-ft)	324,701	372,967	378,254	**410,036**
TOTAL FLOOD VOLUME RETAINED	(cu-ft)	324,701	372,967	378,254	410,036
INCREMENTAL INCREASE IN FLOOD VOLUME	(cu-ft)	28,387	76,273	65,457	120,492
DIFFERENCE	(cu-ft)	296,313	296,694	312,797	289,544
TOTAL BASIN OUTFLOW	(cu-ft)	0	0	0	0
MAXIMUM WSEL	(ft)	492.27	**492.59**	492.46	492.03
DEPTH	(ft)	3.27	**3.59**	3.46	3.03
LOWEST FLOWLINE ELEVATION		493.00			
DIFFERENCE	(ft)	0.73	0.41	0.54	0.97
LOWEST PAD ELEVATION		494.80			
DIFFERENCE	(ft)	2.53	2.21	2.34	2.77
ESTIMATED TIME TO DEWATER BASIN Based on total Flood Volume & Average Percolation Rate	(days)	1.7	2.0	2.2	2.4

NOTE: PEAK FLOW FOR THE 1-HOUR STORM IS NOT REPRESENTATIVE. PER RCFCD THE 3-HOUR STORM PEAK DISCHARGES SHOULD NORMALLY COMPARE WELL WITH RATIONAL PEAKS.

RCFC & WCD HYDROLOGY MANUAL	SYNTHETIC UNIT HYDROGRAPH METHOD BASIC DATA CALCULATION FORM AMC II	PROJECT: PALM SPRINGS CC Job No.: 2152 BY: NB DATE: 1/17/14

AVERAGE ADJUSTED LOSS RATE - UNDEVELOPED CONDITIONS

SOIL GROUP [Plate C-1]	LAND USE	RI NUMBER [Plate E-6.1]	PERVIOUS AREA INFILTRATION RATE (in/hr) [Plate E-6.2]	DECIMAL PERCENT OF AREA IMPERVIOUS [Plate E-6.3]	ADJUSTED INFILTRATION RATE (in/hr)	AREA	AREA WEIGHTED AVERAGE	MAX AVERAGE ADJUSTED INFILTRATION RATE (in/hr)	LOW LOSS CONDITION	LOW LOSS RATE PER RCFC/2322 (in/hr)	MIN AVERAGE ADJUSTED INFILTRATION RATE (in/hr)
A	EXISTING OPEN BRUSH - POOR	62	0.45	5%	0.43	63.76	1.000	0.4298	UNDEVELOPED	0.9000	0.9000
					SUM	63.76	SUM	0.4298			0.9000

VARIABLE LOSS RATE CURVE (24-HOUR STORM ONLY)

Fm= 0.214875

C= 0.00398

Ft=C(24-(T/60))^1.55 = 0.00398 (24-(T/60))^1.55 + **0.21** in/hr

CONSTANT LOSS RATE (3 & 6 HOUR STORMS) = **0.4298** in/hr

LOW LOSS RATE = **0.8500** in/hr

Where:

T=Time in minutes. To get an average value for each unit time period, Use T=1/2 the unit time for the first time period, T=1 1/2 unit time for the second period, etc.

NOTE: Low loss rates established per RCFC/2322 (Dated: May-30-95)
For 2, 5 & 10 Year Storm Events
Undeveloped Condition: Low Loss = 90%
Developed Condition: Low Loss = 0.9 - (0.8 * %impervious)
Basin Site: Low Loss = 10%
For 100 Year Storm - Low Loss should be between 80% & 90% of the Rainfall Rate

RCFC & WCD HYDROLOGY MANUAL	SYNTHETIC UNIT HYDROGRAPH METHOD SHORTCUT METHOD UNDEVELOPED CONDITION 1-HOUR STORM	PROJECT: PALM SPRINGS CC Job No.: 2152 DATE BY: NB 1/17/14

UNIT HYDROGRAPH and EFFECTIVE RAIN CALCULATION FORM

DRAINAGE AREA-ACRES	63.76
UNIT TIME-MINUTES	5
LAG TIME - MINUTES	25.37
UNIT TIME-PERCENT OF LAG	19.7
TOTAL ADJUSTED STORM RAIN-INCHES	1.71
CONSTANT LOSS RATE-in/hr	0.43
LOW LOSS RATE - PERCENT	85%

Unit Time Period	Time Minutes	Time Hours	Pattern Percent (Plate E-5.9)	Storm Rain in/hr	Loss Rate in/hr Max	Loss Rate in/hr Low	Effective Rain in/hr	Flood Hydrograph Flow cfs
1	5	0.08	3.6	0.74	0.43	0.63	0.31	19.86
2	10	0.17	4.2	0.86	0.43	0.73	0.43	27.78
3	15	0.25	4.4	0.90	0.43	0.77	0.47	30.42
4	20	0.33	4.6	0.94	0.43	0.80	0.51	33.06
5	25	0.42	5.0	1.03	0.43	0.87	0.60	38.33
6	30	0.50	5.6	1.15	0.43	0.98	0.72	46.25
7	35	0.58	6.4	1.31	0.43	1.12	0.88	56.80
8	40	0.67	8.1	1.66	0.43	1.41	1.23	79.23
9	45	0.75	13.1	2.69	0.43	2.28	2.26	145.19
10	50	0.83	34.5	7.08	0.43	6.02	6.65	**427.52**
11	55	0.92	6.7	1.37	0.43	1.17	0.95	60.76
12	60	1.00	3.8	0.78	0.43	0.66	0.35	22.50

EFFECTIVE RAIN & FLOOD VOLUMES SUMMARY

EFFECTIVE RAIN (in)	1.28
FLOOD VOLUME (acft)	6.80
FLOOD VOLUME (cuft)	296,313
PEAK FLOW RATE (cfs)	427.52

RCFC & WCD HYDROLOGY MANUAL	SYNTHETIC UNIT HYDROGRAPH METHOD SHORTCUT METHOD UNDEVELOPED CONDITION 3-HOUR STORM	PROJECT: PALM SPRINGS CC Job No.: 2152 DATE BY: NB 1/17/14

UNIT HYDROGRAPH and EFFECTIVE RAIN CALCULATION FORM

DRAINAGE AREA-ACRES	63.76	
UNIT TIME-MINUTES	5	
LAG TIME - MINUTES	25.37	
UNIT TIME-PERCENT OF LAG	19.7	
TOTAL ADJUSTED STORM RAIN-INCHES	2.52	
CONSTANT LOSS RATE-in/hr		0.43
LOW LOSS RATE - PERCENT		85%

Unit Time Period	Time Minutes	Time Hours	Pattern Percent (Plate E-5.9)	Storm Rain in/hr	Loss Rate in/hr Max	Loss Rate in/hr Low	Effective Rain in/hr	Flood Hydrograph Flow cfs
1	5	0.08	1.3	0.39	0.43	0.33	0.06	3.79
2	10	0.17	1.3	0.39	0.43	0.33	0.06	3.79
3	15	0.25	1.1	0.33	0.43	0.28	0.05	3.21
4	20	0.33	1.5	0.45	0.43	0.39	0.02	1.53
5	25	0.42	1.5	0.45	0.43	0.39	0.02	1.53
6	30	0.50	1.8	0.54	0.43	0.46	0.11	7.37
7	35	0.58	1.5	0.45	0.43	0.39	0.02	1.53
8	40	0.67	1.8	0.54	0.43	0.46	0.11	7.37
9	45	0.75	1.8	0.54	0.43	0.46	0.11	7.37
10	50	0.83	1.5	0.45	0.43	0.39	0.02	1.53
11	55	0.92	1.6	0.48	0.43	0.41	0.05	3.48
12	60	1.00	1.8	0.54	0.43	0.46	0.11	7.37
13	65	1.08	2.2	0.67	0.43	0.57	0.24	15.14
14	70	1.17	2.2	0.67	0.43	0.57	0.24	15.14
15	75	1.25	2.2	0.67	0.43	0.57	0.24	15.14
16	80	1.33	2.0	0.60	0.43	0.51	0.18	11.25
17	85	1.42	2.6	0.79	0.43	0.67	0.36	22.92
18	90	1.50	2.7	0.82	0.43	0.69	0.39	24.86
19	95	1.58	2.4	0.73	0.43	0.62	0.30	19.03
20	100	1.67	2.7	0.82	0.43	0.69	0.39	24.86
21	105	1.75	3.3	1.00	0.43	0.85	0.57	36.53
22	110	1.83	3.1	0.94	0.43	0.80	0.51	32.64
23	115	1.92	2.9	0.88	0.43	0.75	0.45	28.75
24	120	2.00	3.0	0.91	0.43	0.77	0.48	30.70
25	125	2.08	3.1	0.94	0.43	0.80	0.51	32.64
26	130	2.17	4.2	1.27	0.43	1.08	0.84	54.03
27	135	2.25	5.0	1.51	0.43	1.29	1.08	69.58
28	140	2.33	3.5	1.06	0.43	0.90	0.63	40.42
29	145	2.42	6.8	2.06	0.43	1.75	1.63	104.57
30	150	2.50	7.3	2.21	0.43	1.88	1.78	114.30
31	155	2.58	8.2	2.48	0.43	2.11	2.05	**131.79**
32	160	2.67	5.9	1.78	0.43	1.52	1.35	87.08
33	165	2.75	2.0	0.60	0.43	0.51	0.18	11.25
34	170	2.83	1.8	0.54	0.43	0.46	0.11	7.37
35	175	2.92	1.8	0.54	0.43	0.46	0.11	7.37
36	180	3.00	0.6	0.18	0.43	0.15	0.03	1.75

EFFECTIVE RAIN & FLOOD VOLUMES SUMMARY

EFFECTIVE RAIN (in)	1.28
FLOOD VOLUME (acft)	6.81
FLOOD VOLUME (cuft)	296,694
PEAK FLOW RATE (cfs)	131.79

RCFC & WCD HYDROLOGY MANUAL	SYNTHETIC UNIT HYDROGRAPH METHOD SHORTCUT METHOD UNDEVELOPED CONDITION 6-HOUR STORM	PROJECT: PALM SPRINGS CC Job No.: 2152 DATE BY: NB 1/17/14

UNIT HYDROGRAPH and EFFECTIVE RAIN CALCULATION FORM

DRAINAGE AREA-ACRES	63.76
UNIT TIME-MINUTES	5
LAG TIME - MINUTES	25.37
UNIT TIME-PERCENT OF LAG	19.7
TOTAL ADJUSTED STORM RAIN-INCHES	3.34
CONSTANT LOSS RATE-in/hr	0.430
LOW LOSS RATE - PERCENT	85%

Unit Time Period	Time Minutes	Time Hours	Pattern Percent (Plate E-5.9)	Storm Rain in/hr	Loss Rate in/hr Max	Loss Rate in/hr Low	Effective Rain in/hr	Flood Hydrograph Flow cfs
1	5	0.08	0.5	0.200	0.43	0.17	0.03	1.93
2	10	0.17	0.6	0.240	0.43	0.20	0.04	2.32
3	15	0.25	0.6	0.240	0.43	0.20	0.04	2.32
4	20	0.33	0.6	0.240	0.43	0.20	0.04	2.32
5	25	0.42	0.6	0.240	0.43	0.20	0.04	2.32
6	30	0.50	0.7	0.281	0.43	0.24	0.04	2.71
7	35	0.58	0.7	0.281	0.43	0.24	0.04	2.71
8	40	0.67	0.7	0.281	0.43	0.24	0.04	2.71
9	45	0.75	0.7	0.281	0.43	0.24	0.04	2.71
10	50	0.83	0.7	0.281	0.43	0.24	0.04	2.71
11	55	0.92	0.7	0.281	0.43	0.24	0.04	2.71
12	60	1.00	0.8	0.321	0.43	0.27	0.05	3.09
13	65	1.08	0.8	0.321	0.43	0.27	0.05	3.09
14	70	1.17	0.8	0.321	0.43	0.27	0.05	3.09
15	75	1.25	0.8	0.321	0.43	0.27	0.05	3.09
16	80	1.33	0.8	0.321	0.43	0.27	0.05	3.09
17	85	1.42	0.8	0.321	0.43	0.27	0.05	3.09
18	90	1.50	0.8	0.321	0.43	0.27	0.05	3.09
19	95	1.58	0.8	0.321	0.43	0.27	0.05	3.09
20	100	1.67	0.8	0.321	0.43	0.27	0.05	3.09
21	105	1.75	0.8	0.321	0.43	0.27	0.05	3.09
22	110	1.83	0.8	0.321	0.43	0.27	0.05	3.09
23	115	1.92	0.8	0.321	0.43	0.27	0.05	3.09
24	120	2.00	0.9	0.361	0.43	0.31	0.05	3.48
25	125	2.08	0.8	0.321	0.43	0.27	0.05	3.09
26	130	2.17	0.9	0.361	0.43	0.31	0.05	3.48
27	135	2.25	0.9	0.361	0.43	0.31	0.05	3.48
28	140	2.33	0.9	0.361	0.43	0.31	0.05	3.48
29	145	2.42	0.9	0.361	0.43	0.31	0.05	3.48
30	150	2.50	0.9	0.361	0.43	0.31	0.05	3.48
31	155	2.58	0.9	0.361	0.43	0.31	0.05	3.48
32	160	2.67	0.9	0.361	0.43	0.31	0.05	3.48
33	165	2.75	1.0	0.401	0.43	0.34	0.06	3.87
34	170	2.83	1.0	0.401	0.43	0.34	0.06	3.87
35	175	2.92	1.0	0.401	0.43	0.34	0.06	3.87
36	180	3.00	1.0	0.401	0.43	0.34	0.06	3.87
37	185	3.08	1.0	0.401	0.43	0.34	0.06	3.87
38	190	3.17	1.1	0.441	0.43	0.37	0.01	0.72
39	195	3.25	1.1	0.441	0.43	0.37	0.01	0.72
40	200	3.33	1.1	0.441	0.43	0.37	0.01	0.72
41	205	3.42	1.2	0.481	0.43	0.41	0.05	3.29
42	210	3.50	1.3	0.521	0.43	0.44	0.09	5.87
43	215	3.58	1.4	0.561	0.43	0.48	0.13	8.45
44	220	3.67	1.4	0.561	0.43	0.48	0.13	8.45
45	225	3.75	1.5	0.601	0.43	0.51	0.17	11.02
46	230	3.83	1.5	0.601	0.43	0.51	0.17	11.02
47	235	3.92	1.6	0.641	0.43	0.55	0.21	13.60
48	240	4.00	1.6	0.641	0.43	0.55	0.21	13.60
49	245	4.08	1.7	0.681	0.43	0.58	0.25	16.18
50	250	4.17	1.8	0.721	0.43	0.61	0.29	18.75

RCFC & WCD HYDROLOGY MANUAL	SYNTHETIC UNIT HYDROGRAPH METHOD SHORTCUT METHOD UNDEVELOPED CONDITION 6-HOUR STORM	PROJECT: PALM SPRINGS CC Job No.: 2152 DATE BY: NB 1/17/14

UNIT HYDROGRAPH and EFFECTIVE RAIN CALCULATION FORM

DRAINAGE AREA-ACRES	63.76
UNIT TIME-MINUTES	5
LAG TIME - MINUTES	25.37
UNIT TIME-PERCENT OF LAG	19.7
TOTAL ADJUSTED STORM RAIN-INCHES	3.34
CONSTANT LOSS RATE-in/hr	0.430
LOW LOSS RATE - PERCENT	85%

Unit Time Period	Time Minutes	Time Hours	Pattern Percent (Plate E-5.9)	Storm Rain in/hr	Loss Rate in/hr Max	Loss Rate in/hr Low	Effective Rain in/hr	Flood Hydrograph Flow cfs
51	255	4.25	1.9	0.762	0.43	0.65	0.33	21.33
52	260	4.33	2.0	0.802	0.43	0.68	0.37	23.91
53	265	4.42	2.1	0.842	0.43	0.72	0.41	26.48
54	270	4.50	2.1	0.842	0.43	0.72	0.41	26.48
55	275	4.58	2.2	0.882	0.43	0.75	0.45	29.06
56	280	4.67	2.3	0.922	0.43	0.78	0.49	31.64
57	285	4.75	2.4	0.962	0.43	0.82	0.53	34.21
58	290	4.83	2.4	0.962	0.43	0.82	0.53	34.21
59	295	4.92	2.5	1.002	0.43	0.85	0.57	36.79
60	300	5.00	2.6	1.042	0.43	0.89	0.61	39.37
61	305	5.08	3.1	1.242	0.43	1.06	0.81	52.25
62	310	5.17	3.6	1.443	0.43	1.23	1.01	65.14
63	315	5.25	3.9	1.563	0.43	1.33	1.13	72.87
64	320	5.33	4.2	1.683	0.43	1.43	1.25	80.60
65	325	5.42	4.7	1.884	0.43	1.60	1.45	93.48
66	330	5.50	5.6	2.244	0.43	1.91	1.81	**116.67**
67	335	5.58	1.9	0.762	0.43	0.65	0.33	21.33
68	340	5.67	0.9	0.361	0.43	0.31	0.05	3.48
69	345	5.75	0.6	0.240	0.43	0.20	0.04	2.32
70	350	5.83	0.5	0.200	0.43	0.17	0.03	1.93
71	355	5.92	0.3	0.120	0.43	0.10	0.02	1.16
72	360	6.00	0.2	0.080	0.43	0.07	0.01	0.77

EFFECTIVE RAIN & FLOOD VOLUMES SUMMARY

EFFECTIVE RAIN (in)	1.35
FLOOD VOLUME (acft)	7.18
FLOOD VOLUME (cuft)	312,797
PEAK FLOW RATE (cfs)	116.67

RCFC & WCD HYDROLOGY MANUAL	SYNTHETIC UNIT HYDROGRAPH METHOD SHORTCUT METHOD UNDEVELOPED CONDITION 24-HOUR STORM	PROJECT: PALM SPRINGS CC Job No.: 2152 DATE: BY: NB 1/17/14

UNIT HYDROGRAPH and EFFECTIVE RAIN CALCULATION FORM

DRAINAGE AREA-ACRES	63.760	CONSTANT LOSS RATE-in/hr	n/a
UNIT TIME-MINUTES	15	VARIABLE LOSS RATE (AVG) in/hr	0.4298
LAG TIME - MINUTES	25.37	MINIMUM LOSS RATE (for var. loss) - in/hr	0.215
UNIT TIME-PERCENT OF LAG	59.1	LOW LOSS RATE - DECIMAL	0.85
TOTAL ADJUSTED STORM RAIN-INCHES	5.42	C	0.00398

Unit Time Period	Time Minutes	Time Hours	Pattern Percent (Plate E-5.9)	Storm Rain in/hr	Loss Rate in/hr Max	Loss Rate in/hr Low	Effective Rain in/hr	Flood Hydrograph Flow cfs
1	15	0.25	0.2	0.043	0.759	0.037	0.007	0.42
2	30	0.50	0.3	0.065	0.750	0.055	0.010	0.63
3	45	0.75	0.3	0.065	0.741	0.055	0.010	0.63
4	60	1.00	0.4	0.087	0.733	0.074	0.013	0.84
5	75	1.25	0.3	0.065	0.724	0.055	0.010	0.63
6	90	1.50	0.3	0.065	0.715	0.055	0.010	0.63
7	105	1.75	0.3	0.065	0.707	0.055	0.010	0.63
8	120	2.00	0.4	0.087	0.698	0.074	0.013	0.84
9	135	2.25	0.4	0.087	0.690	0.074	0.013	0.84
10	150	2.50	0.4	0.087	0.682	0.074	0.013	0.84
11	165	2.75	0.5	0.108	0.673	0.092	0.016	1.05
12	180	3.00	0.5	0.108	0.665	0.092	0.016	1.05
13	195	3.25	0.5	0.108	0.657	0.092	0.016	1.05
14	210	3.50	0.5	0.108	0.648	0.092	0.016	1.05
15	225	3.75	0.5	0.108	0.640	0.092	0.016	1.05
16	240	4.00	0.6	0.130	0.632	0.111	0.020	1.25
17	255	4.25	0.6	0.130	0.624	0.111	0.020	1.25
18	270	4.50	0.7	0.152	0.616	0.129	0.023	1.46
19	285	4.75	0.7	0.152	0.608	0.129	0.023	1.46
20	300	5.00	0.8	0.173	0.601	0.147	0.026	1.67
21	315	5.25	0.6	0.130	0.593	0.111	0.020	1.25
22	330	5.50	0.7	0.152	0.585	0.129	0.023	1.46
23	345	5.75	0.8	0.173	0.577	0.147	0.026	1.67
24	360	6.00	0.8	0.173	0.570	0.147	0.026	1.67
25	375	6.25	0.9	0.195	0.562	0.166	0.029	1.88
26	390	6.50	0.9	0.195	0.555	0.166	0.029	1.88
27	405	6.75	1.0	0.217	0.547	0.184	0.033	2.09
28	420	7.00	1.0	0.217	0.540	0.184	0.033	2.09
29	435	7.25	1.0	0.217	0.533	0.184	0.033	2.09
30	450	7.50	1.1	0.238	0.525	0.203	0.036	2.30
31	465	7.75	1.2	0.260	0.518	0.221	0.039	2.51
32	480	8.00	1.3	0.282	0.511	0.240	0.042	2.72
33	495	8.25	1.5	0.325	0.504	0.276	0.049	3.14
34	510	8.50	1.5	0.325	0.497	0.276	0.049	3.14
35	525	8.75	1.6	0.347	0.490	0.295	0.052	3.35
36	540	9.00	1.7	0.369	0.483	0.313	0.055	3.55
37	555	9.25	1.9	0.412	0.476	0.350	0.062	3.97
38	570	9.50	2.0	0.434	0.469	0.369	0.065	4.18
39	585	9.75	2.1	0.455	0.463	0.387	0.068	4.39
40	600	10.00	2.2	0.477	0.456	0.405	0.021	1.35
41	615	10.25	1.5	0.325	0.449	0.276	0.049	3.14
42	630	10.50	1.5	0.325	0.443	0.276	0.049	3.14
43	645	10.75	2.0	0.434	0.436	0.369	0.065	4.18
44	660	11.00	2.0	0.434	0.430	0.369	0.004	0.23
45	675	11.25	1.9	0.412	0.424	0.350	0.062	3.97
46	690	11.50	1.9	0.412	0.418	0.350	0.062	3.97
47	705	11.75	1.7	0.369	0.411	0.313	0.055	3.55
48	720	12.00	1.8	0.390	0.405	0.332	0.059	3.76
49	735	12.25	2.5	0.542	0.399	0.461	0.143	9.18
50	750	12.50	2.6	0.564	0.393	0.479	0.171	10.96
51	765	12.75	2.8	0.607	0.387	0.516	0.220	14.13
52	780	13.00	2.9	0.629	0.381	0.534	0.247	15.90
53	795	13.25	3.4	0.737	0.376	0.627	0.361	23.24
54	810	13.50	3.4	0.737	0.370	0.627	0.367	**23.60**
55	825	13.75	2.3	0.499	0.364	0.424	0.134	8.63
56	840	14.00	2.3	0.499	0.359	0.424	0.140	8.99
57	855	14.25	2.7	0.585	0.353	0.498	0.232	14.92
58	870	14.50	2.6	0.564	0.348	0.479	0.216	13.87
59	885	14.75	2.6	0.564	0.343	0.479	0.221	14.21
60	900	15.00	2.5	0.542	0.337	0.461	0.205	13.16
61	915	15.25	2.4	0.520	0.332	0.442	0.188	12.09

RCFC & WCD HYDROLOGY MANUAL	SYNTHETIC UNIT HYDROGRAPH METHOD SHORTCUT METHOD UNDEVELOPED CONDITION 24-HOUR STORM	PROJECT: PALM SPRINGS CC Job No.: 2152 DATE: BY: NB 1/17/14

UNIT HYDROGRAPH and EFFECTIVE RAIN CALCULATION FORM

DRAINAGE AREA-ACRES	63.760	CONSTANT LOSS RATE-in/hr	n/a
UNIT TIME-MINUTES	15	VARIABLE LOSS RATE (AVG) in/hr	0.4298
LAG TIME - MINUTES	25.37	MINIMUM LOSS RATE (for var. loss) - in/hr	0.215
UNIT TIME-PERCENT OF LAG	59.1	LOW LOSS RATE - DECIMAL	0.85
TOTAL ADJUSTED STORM RAIN-INCHES	5.42	C	0.00398

Unit Time Period	Time Minutes	Time Hours	Pattern Percent (Plate E-5.9)	Storm Rain in/hr	Loss Rate in/hr Max	Loss Rate in/hr Low	Effective Rain in/hr	Flood Hydrograph Flow cfs
62	930	15.50	2.3	0.499	0.327	0.424	0.172	11.03
63	945	15.75	1.9	0.412	0.322	0.350	0.090	5.77
64	960	16.00	1.9	0.412	0.317	0.350	0.095	6.09
65	975	16.25	0.4	0.087	0.312	0.074	0.013	0.84
66	990	16.50	0.4	0.087	0.308	0.074	0.013	0.84
67	1005	16.75	0.3	0.065	0.303	0.055	0.010	0.63
68	1020	17.00	0.3	0.065	0.298	0.055	0.010	0.63
69	1035	17.25	0.5	0.108	0.294	0.092	0.016	1.05
70	1050	17.50	0.5	0.108	0.289	0.092	0.016	1.05
71	1065	17.75	0.5	0.108	0.285	0.092	0.016	1.05
72	1080	18.00	0.4	0.087	0.281	0.074	0.013	0.84
73	1095	18.25	0.4	0.087	0.277	0.074	0.013	0.84
74	1110	18.50	0.4	0.087	0.273	0.074	0.013	0.84
75	1125	18.75	0.3	0.065	0.269	0.055	0.010	0.63
76	1140	19.00	0.2	0.043	0.265	0.037	0.007	0.42
77	1155	19.25	0.3	0.065	0.261	0.055	0.010	0.63
78	1170	19.50	0.4	0.087	0.258	0.074	0.013	0.84
79	1185	19.75	0.3	0.065	0.254	0.055	0.010	0.63
80	1200	20.00	0.2	0.043	0.251	0.037	0.007	0.42
81	1215	20.25	0.3	0.065	0.247	0.055	0.010	0.63
82	1230	20.50	0.3	0.065	0.244	0.055	0.010	0.63
83	1245	20.75	0.3	0.065	0.241	0.055	0.010	0.63
84	1260	21.00	0.2	0.043	0.238	0.037	0.007	0.42
85	1275	21.25	0.3	0.065	0.235	0.055	0.010	0.63
86	1290	21.50	0.2	0.043	0.233	0.037	0.007	0.42
87	1305	21.75	0.3	0.065	0.230	0.055	0.010	0.63
88	1320	22.00	0.2	0.043	0.228	0.037	0.007	0.42
89	1335	22.25	0.3	0.065	0.225	0.055	0.010	0.63
90	1350	22.50	0.2	0.043	0.223	0.037	0.007	0.42
91	1365	22.75	0.2	0.043	0.221	0.037	0.007	0.42
92	1380	23.00	0.2	0.043	0.220	0.037	0.007	0.42
93	1395	23.25	0.2	0.043	0.218	0.037	0.007	0.42
94	1410	23.50	0.2	0.043	0.217	0.037	0.007	0.42
95	1425	23.75	0.2	0.043	0.216	0.037	0.007	0.42
96	1440	24.00	0.2	0.043	0.215	0.037	0.007	0.42

EFFECTIVE RAIN & FLOOD VOLUMES SUMMARY

EFFECTIVE RAIN (in)	1.25
FLOOD VOLUME (acft)	6.65
FLOOD VOLUME (cuft)	289,544
PEAK FLOW (cfs)	23.60

RCFC & WCD HYDROLOGY MANUAL	SYNTHETIC UNIT HYDROGRAPH METHOD BASIC DATA CALCULATION FORM AMC II	PROJECT: PALM SPRINGS CC Job No.: 2152 BY: NB DATE: 1/17/14

AVERAGE ADJUSTED LOSS RATE - DEVELOPED CONDITIONS

SOIL GROUP [Plate C-1]	LAND USE	RI NUMBER [Plate E-6.1]	PERVIOUS AREA INFILTRATION RATE (in/hr) [Plate E-6.2]	DECIMAL PERCENT OF AREA IMPERVIOUS [Plate E-6.3]	ADJUSTED INFILTRATION RATE (in/hr)	AREA	AREA WEIGHTED AVERAGE	MAX AVERAGE ADJUSTED INFILTRATION RATE (in/hr)	LOW LOSS CONDITION	LOW LOSS RATE PER RCFC/2322 (in/hr)	MIN AVERAGE ADJUSTED INFILTRATION RATE (in/hr)
A	MF - CONDIMINIUMS	32	0.74	65%	0.31	63.76	1.000	0.3071	DEVELOPED	0.3800	0.3800
					SUM	63.76	SUM	0.3071			0.3800

VARIABLE LOSS RATE CURVE (24-HOUR STORM ONLY)

Fm= 0.15355

C= 0.00284

Ft=C(24-(T/60))^1.55 = 0.00284 (24-(T/60))^1.55 + **0.15** in/hr

CONSTANT LOSS RATE (3 & 6 HOUR STORMS) = **0.3071** in/hr

LOW LOSS RATE = **0.8500** in/hr

Where:

T=Time in minutes. To get an average value for each unit time period, Use T=1/2 the unit time for the first time period, T=1 1/2 unit time for the second period, etc.

NOTE: Low loss rates established per RCFC/2322 (Dated: May-30-95)
For Storms Less than the 100 Year Event
Undeveloped Condition: Low Loss = 90%
Developed Condition: Low Loss = 0.9 - (0.8 * %impervious)
Basin Site: Low Loss = 10%
For 100 Year Storm - Low Loss should be between 80% & 90% of the Rainfall Rate

RCFC & WCD HYDROLOGY MANUAL	SYNTHETIC UNIT HYDROGRAPH METHOD SHORTCUT METHOD DEVELOPED CONDITIONS 1-HOUR STORM	PROJECT: PALM SPRINGS CC Job No.: 2152 DATE BY: NB 1/17/14

UNIT HYDROGRAPH and EFFECTIVE RAIN CALCULATION FORM

DRAINAGE AREA-ACRES	63.76	
UNIT TIME-MINUTES	5	
LAG TIME - MINUTES	25.37	
UNIT TIME-PERCENT OF LAG	19.7	
TOTAL ADJUSTED STORM RAIN-INCHES	1.71	
CONSTANT LOSS RATE-in/hr		0.31
LOW LOSS RATE - PERCENT		85%

Unit Time Period	Time Minutes	Time Hours	Pattern Percent (Plate E-5.9)	Storm Rain in/hr	Loss Rate in/hr Max	Loss Rate in/hr Low	Effective Rain in/hr	Flood Hydrograph Flow cfs
1	5	0.08	3.6	0.74	0.31	0.63	0.43	27.75
2	10	0.17	4.2	0.86	0.31	0.73	0.55	35.67
3	15	0.25	4.4	0.90	0.31	0.77	0.60	38.30
4	20	0.33	4.6	0.94	0.31	0.80	0.64	40.94
5	25	0.42	5.0	1.03	0.31	0.87	0.72	46.22
6	30	0.50	5.6	1.15	0.31	0.98	0.84	54.13
7	35	0.58	6.4	1.31	0.31	1.12	1.01	64.69
8	40	0.67	8.1	1.66	0.31	1.41	1.36	87.12
9	45	0.75	13.1	2.69	0.31	2.28	2.38	153.08
10	50	0.83	34.5	7.08	0.31	6.02	6.77	**435.40**
11	55	0.92	6.7	1.37	0.31	1.17	1.07	68.65
12	60	1.00	3.8	0.78	0.31	0.66	0.47	30.39

EFFECTIVE RAIN & FLOOD VOLUMES SUMMARY

EFFECTIVE RAIN (in)	1.40
FLOOD VOLUME (acft)	7.45
FLOOD VOLUME (cuft)	324,701
PEAK FLOW RATE (cfs)	435.40

RCFC & WCD HYDROLOGY MANUAL	SYNTHETIC UNIT HYDROGRAPH METHOD SHORTCUT METHOD DEVELOPED CONDITIONS 3-HOUR STORM	PROJECT: PALM SPRINGS CC Job No.: 2152 DATE BY: NB 1/17/14

UNIT HYDROGRAPH and EFFECTIVE RAIN CALCULATION FORM

DRAINAGE AREA-ACRES	63.76	
UNIT TIME-MINUTES	5	
LAG TIME - MINUTES	10.15	
UNIT TIME-PERCENT OF LAG	49.3	
TOTAL ADJUSTED STORM RAIN-INCHES	2.52	
CONSTANT LOSS RATE-in/hr		0.31
LOW LOSS RATE - PERCENT		85%

Unit Time Period	Time Minutes	Time Hours	Pattern Percent (Plate E-5.9)	Storm Rain in/hr	Loss Rate in/hr Max	Loss Rate in/hr Low	Effective Rain in/hr	Flood Hydrograph Flow cfs
1	5	0.08	1.3	0.39	0.31	0.33	0.09	5.53
2	10	0.17	1.3	0.39	0.31	0.33	0.09	5.53
3	15	0.25	1.1	0.33	0.31	0.28	0.03	1.64
4	20	0.33	1.5	0.45	0.31	0.39	0.15	9.42
5	25	0.42	1.5	0.45	0.31	0.39	0.15	9.42
6	30	0.50	1.8	0.54	0.31	0.46	0.24	15.25
7	35	0.58	1.5	0.45	0.31	0.39	0.15	9.42
8	40	0.67	1.8	0.54	0.31	0.46	0.24	15.25
9	45	0.75	1.8	0.54	0.31	0.46	0.24	15.25
10	50	0.83	1.5	0.45	0.31	0.39	0.15	9.42
11	55	0.92	1.6	0.48	0.31	0.41	0.18	11.36
12	60	1.00	1.8	0.54	0.31	0.46	0.24	15.25
13	65	1.08	2.2	0.67	0.31	0.57	0.36	23.03
14	70	1.17	2.2	0.67	0.31	0.57	0.36	23.03
15	75	1.25	2.2	0.67	0.31	0.57	0.36	23.03
16	80	1.33	2.0	0.60	0.31	0.51	0.30	19.14
17	85	1.42	2.6	0.79	0.31	0.67	0.48	30.80
18	90	1.50	2.7	0.82	0.31	0.69	0.51	32.75
19	95	1.58	2.4	0.73	0.31	0.62	0.42	26.92
20	100	1.67	2.7	0.82	0.31	0.69	0.51	32.75
21	105	1.75	3.3	1.00	0.31	0.85	0.69	44.41
22	110	1.83	3.1	0.94	0.31	0.80	0.63	40.53
23	115	1.92	2.9	0.88	0.31	0.75	0.57	36.64
24	120	2.00	3.0	0.91	0.31	0.77	0.60	38.58
25	125	2.08	3.1	0.94	0.31	0.80	0.63	40.53
26	130	2.17	4.2	1.27	0.31	1.08	0.96	61.91
27	135	2.25	5.0	1.51	0.31	1.29	1.20	77.46
28	140	2.33	3.5	1.06	0.31	0.90	0.75	48.30
29	145	2.42	6.8	2.06	0.31	1.75	1.75	112.46
30	150	2.50	7.3	2.21	0.31	1.88	1.90	122.18
31	155	2.58	8.2	2.48	0.31	2.11	2.17	**139.68**
32	160	2.67	5.9	1.78	0.31	1.52	1.48	94.96
33	165	2.75	2.0	0.60	0.31	0.51	0.30	19.14
34	170	2.83	1.8	0.54	0.31	0.46	0.24	15.25
35	175	2.92	1.8	0.54	0.31	0.46	0.24	15.25
36	180	3.00	0.6	0.18	0.31	0.15	0.03	1.75

EFFECTIVE RAIN & FLOOD VOLUMES SUMMARY

EFFECTIVE RAIN (in)	1.61
FLOOD VOLUME (acft)	8.56
FLOOD VOLUME (cuft)	372,967
PEAK FLOW RATE (cfs)	139.68

RCFC & WCD HYDROLOGY MANUAL	SYNTHETIC UNIT HYDROGRAPH METHOD SHORTCUT METHOD DEVELOPED CONDITIONS 6-HOUR STORM	PROJECT: PALM SPRINGS CC Job No.: 2152 DATE BY: NB 1/17/14

UNIT HYDROGRAPH and EFFECTIVE RAIN CALCULATION FORM

DRAINAGE AREA-ACRES	63.76
UNIT TIME-MINUTES	5
LAG TIME - MINUTES	10.15
UNIT TIME-PERCENT OF LAG	49.3
TOTAL ADJUSTED STORM RAIN-INCHES	3.34
CONSTANT LOSS RATE-in/hr	0.307
LOW LOSS RATE - PERCENT	85%

Unit Time Period	Time Minutes	Time Hours	Pattern Percent (Plate E-5.9)	Storm Rain in/hr	Loss Rate in/hr Max	Loss Rate in/hr Low	Effective Rain in/hr	Flood Hydrograph Flow cfs
1	5	0.08	0.5	0.200	0.31	0.17	0.03	1.93
2	10	0.17	0.6	0.240	0.31	0.20	0.04	2.32
3	15	0.25	0.6	0.240	0.31	0.20	0.04	2.32
4	20	0.33	0.6	0.240	0.31	0.20	0.04	2.32
5	25	0.42	0.6	0.240	0.31	0.20	0.04	2.32
6	30	0.50	0.7	0.281	0.31	0.24	0.04	2.71
7	35	0.58	0.7	0.281	0.31	0.24	0.04	2.71
8	40	0.67	0.7	0.281	0.31	0.24	0.04	2.71
9	45	0.75	0.7	0.281	0.31	0.24	0.04	2.71
10	50	0.83	0.7	0.281	0.31	0.24	0.04	2.71
11	55	0.92	0.7	0.281	0.31	0.24	0.04	2.71
12	60	1.00	0.8	0.321	0.31	0.27	0.01	0.87
13	65	1.08	0.8	0.321	0.31	0.27	0.01	0.87
14	70	1.17	0.8	0.321	0.31	0.27	0.01	0.87
15	75	1.25	0.8	0.321	0.31	0.27	0.01	0.87
16	80	1.33	0.8	0.321	0.31	0.27	0.01	0.87
17	85	1.42	0.8	0.321	0.31	0.27	0.01	0.87
18	90	1.50	0.8	0.321	0.31	0.27	0.01	0.87
19	95	1.58	0.8	0.321	0.31	0.27	0.01	0.87
20	100	1.67	0.8	0.321	0.31	0.27	0.01	0.87
21	105	1.75	0.8	0.321	0.31	0.27	0.01	0.87
22	110	1.83	0.8	0.321	0.31	0.27	0.01	0.87
23	115	1.92	0.8	0.321	0.31	0.27	0.01	0.87
24	120	2.00	0.9	0.361	0.31	0.31	0.05	3.45
25	125	2.08	0.8	0.321	0.31	0.27	0.01	0.87
26	130	2.17	0.9	0.361	0.31	0.31	0.05	3.45
27	135	2.25	0.9	0.361	0.31	0.31	0.05	3.45
28	140	2.33	0.9	0.361	0.31	0.31	0.05	3.45
29	145	2.42	0.9	0.361	0.31	0.31	0.05	3.45
30	150	2.50	0.9	0.361	0.31	0.31	0.05	3.45
31	155	2.58	0.9	0.361	0.31	0.31	0.05	3.45
32	160	2.67	0.9	0.361	0.31	0.31	0.05	3.45
33	165	2.75	1.0	0.401	0.31	0.34	0.09	6.02
34	170	2.83	1.0	0.401	0.31	0.34	0.09	6.02
35	175	2.92	1.0	0.401	0.31	0.34	0.09	6.02
36	180	3.00	1.0	0.401	0.31	0.34	0.09	6.02
37	185	3.08	1.0	0.401	0.31	0.34	0.09	6.02
38	190	3.17	1.1	0.441	0.31	0.37	0.13	8.60
39	195	3.25	1.1	0.441	0.31	0.37	0.13	8.60
40	200	3.33	1.1	0.441	0.31	0.37	0.13	8.60
41	205	3.42	1.2	0.481	0.31	0.41	0.17	11.18
42	210	3.50	1.3	0.521	0.31	0.44	0.21	13.75
43	215	3.58	1.4	0.561	0.31	0.48	0.25	16.33
44	220	3.67	1.4	0.561	0.31	0.48	0.25	16.33
45	225	3.75	1.5	0.601	0.31	0.51	0.29	18.91
46	230	3.83	1.5	0.601	0.31	0.51	0.29	18.91
47	235	3.92	1.6	0.641	0.31	0.55	0.33	21.48
48	240	4.00	1.6	0.641	0.31	0.55	0.33	21.48
49	245	4.08	1.7	0.681	0.31	0.58	0.37	24.06
50	250	4.17	1.8	0.721	0.31	0.61	0.41	26.64

RCFC & WCD HYDROLOGY MANUAL	SYNTHETIC UNIT HYDROGRAPH METHOD SHORTCUT METHOD DEVELOPED CONDITIONS 6-HOUR STORM	PROJECT: PALM SPRINGS CC Job No.: 2152 DATE BY: NB 1/17/14

UNIT HYDROGRAPH and EFFECTIVE RAIN CALCULATION FORM

DRAINAGE AREA-ACRES	63.76
UNIT TIME-MINUTES	5
LAG TIME - MINUTES	10.15
UNIT TIME-PERCENT OF LAG	49.3
TOTAL ADJUSTED STORM RAIN-INCHES	3.34
CONSTANT LOSS RATE-in/hr	0.307
LOW LOSS RATE - PERCENT	85%

Unit Time Period	Time Minutes	Time Hours	Pattern Percent (Plate E-5.9)	Storm Rain in/hr	Loss Rate in/hr Max	Loss Rate in/hr Low	Effective Rain in/hr	Flood Hydrograph Flow cfs
51	255	4.25	1.9	0.762	0.31	0.65	0.45	29.22
52	260	4.33	2.0	0.802	0.31	0.68	0.49	31.79
53	265	4.42	2.1	0.842	0.31	0.72	0.53	34.37
54	270	4.50	2.1	0.842	0.31	0.72	0.53	34.37
55	275	4.58	2.2	0.882	0.31	0.75	0.57	36.95
56	280	4.67	2.3	0.922	0.31	0.78	0.61	39.52
57	285	4.75	2.4	0.962	0.31	0.82	0.65	42.10
58	290	4.83	2.4	0.962	0.31	0.82	0.65	42.10
59	295	4.92	2.5	1.002	0.31	0.85	0.69	44.68
60	300	5.00	2.6	1.042	0.31	0.89	0.73	47.25
61	305	5.08	3.1	1.242	0.31	1.06	0.94	60.14
62	310	5.17	3.6	1.443	0.31	1.23	1.14	73.02
63	315	5.25	3.9	1.563	0.31	1.33	1.26	80.75
64	320	5.33	4.2	1.683	0.31	1.43	1.38	88.48
65	325	5.42	4.7	1.884	0.31	1.60	1.58	101.37
66	330	5.50	5.6	2.244	0.31	1.91	1.94	**124.56**
67	335	5.58	1.9	0.762	0.31	0.65	0.45	29.22
68	340	5.67	0.9	0.361	0.31	0.31	0.05	3.45
69	345	5.75	0.6	0.240	0.31	0.20	0.04	2.32
70	350	5.83	0.5	0.200	0.31	0.17	0.03	1.93
71	355	5.92	0.3	0.120	0.31	0.10	0.02	1.16
72	360	6.00	0.2	0.080	0.31	0.07	0.01	0.77

EFFECTIVE RAIN & FLOOD VOLUMES SUMMARY

EFFECTIVE RAIN (in)	1.63
FLOOD VOLUME (acft)	8.68
FLOOD VOLUME (cuft)	378,254
PEAK FLOW RATE (cfs)	124.56

RCFC & WCD HYDROLOGY MANUAL	SYNTHETIC UNIT HYDROGRAPH METHOD SHORTCUT METHOD DEVELOPED CONDITION 24-HOUR STORM	PROJECT: PALM SPRINGS CC Job No.: 2152 DATE: BY: NB 1/17/14

UNIT HYDROGRAPH and EFFECTIVE RAIN CALCULATION FORM

DRAINAGE AREA-ACRES	63.76	CONSTANT LOSS RATE-in/hr	n/a
UNIT TIME-MINUTES	15	VARIABLE LOSS RATE (AVG) in/hr	0.3071
LAG TIME - MINUTES	10.15	MINIMUM LOSS RATE (for var. loss) - in/hr	0.154
UNIT TIME-PERCENT OF LAG	147.8	LOW LOSS RATE - DECIMAL	0.85
TOTAL ADJUSTED STORM RAIN-INCHES	5.42	C	0.00284

Unit Time Period	Time Minutes	Time Hours	Pattern Percent (Plate E-5.9)	Storm Rain in/hr	Loss Rate in/hr Max	Loss Rate in/hr Low	Effective Rain in/hr	Flood Hydrograph Flow cfs
1	15	0.25	0.2	0.043	0.542	0.037	0.007	0.42
2	30	0.50	0.3	0.065	0.536	0.055	0.010	0.63
3	45	0.75	0.3	0.065	0.530	0.055	0.010	0.63
4	60	1.00	0.4	0.087	0.524	0.074	0.013	0.84
5	75	1.25	0.3	0.065	0.517	0.055	0.010	0.63
6	90	1.50	0.3	0.065	0.511	0.055	0.010	0.63
7	105	1.75	0.3	0.065	0.505	0.055	0.010	0.63
8	120	2.00	0.4	0.087	0.499	0.074	0.013	0.84
9	135	2.25	0.4	0.087	0.493	0.074	0.013	0.84
10	150	2.50	0.4	0.087	0.487	0.074	0.013	0.84
11	165	2.75	0.5	0.108	0.481	0.092	0.016	1.05
12	180	3.00	0.5	0.108	0.475	0.092	0.016	1.05
13	195	3.25	0.5	0.108	0.469	0.092	0.016	1.05
14	210	3.50	0.5	0.108	0.463	0.092	0.016	1.05
15	225	3.75	0.5	0.108	0.458	0.092	0.016	1.05
16	240	4.00	0.6	0.130	0.452	0.111	0.020	1.25
17	255	4.25	0.6	0.130	0.446	0.111	0.020	1.25
18	270	4.50	0.7	0.152	0.440	0.129	0.023	1.46
19	285	4.75	0.7	0.152	0.435	0.129	0.023	1.46
20	300	5.00	0.8	0.173	0.429	0.147	0.026	1.67
21	315	5.25	0.6	0.130	0.424	0.111	0.020	1.25
22	330	5.50	0.7	0.152	0.418	0.129	0.023	1.46
23	345	5.75	0.8	0.173	0.413	0.147	0.026	1.67
24	360	6.00	0.8	0.173	0.407	0.147	0.026	1.67
25	375	6.25	0.9	0.195	0.402	0.166	0.029	1.88
26	390	6.50	0.9	0.195	0.396	0.166	0.029	1.88
27	405	6.75	1.0	0.217	0.391	0.184	0.033	2.09
28	420	7.00	1.0	0.217	0.386	0.184	0.033	2.09
29	435	7.25	1.0	0.217	0.381	0.184	0.033	2.09
30	450	7.50	1.1	0.238	0.375	0.203	0.036	2.30
31	465	7.75	1.2	0.260	0.370	0.221	0.039	2.51
32	480	8.00	1.3	0.282	0.365	0.240	0.042	2.72
33	495	8.25	1.5	0.325	0.360	0.276	0.049	3.14
34	510	8.50	1.5	0.325	0.355	0.276	0.049	3.14
35	525	8.75	1.6	0.347	0.350	0.295	0.052	3.35
36	540	9.00	1.7	0.369	0.345	0.313	0.023	1.51
37	555	9.25	1.9	0.412	0.340	0.350	0.072	4.61
38	570	9.50	2.0	0.434	0.335	0.369	0.098	6.31
39	585	9.75	2.1	0.455	0.331	0.387	0.125	8.01
40	600	10.00	2.2	0.477	0.326	0.405	0.151	9.71
41	615	10.25	1.5	0.325	0.321	0.276	0.004	0.26
42	630	10.50	1.5	0.325	0.317	0.276	0.009	0.56
43	645	10.75	2.0	0.434	0.312	0.369	0.122	7.82
44	660	11.00	2.0	0.434	0.307	0.369	0.126	8.12
45	675	11.25	1.9	0.412	0.303	0.350	0.109	7.01
46	690	11.50	1.9	0.412	0.298	0.350	0.114	7.30
47	705	11.75	1.7	0.369	0.294	0.313	0.075	4.80
48	720	12.00	1.8	0.390	0.290	0.332	0.101	6.47
49	735	12.25	2.5	0.542	0.285	0.461	0.257	16.51
50	750	12.50	2.6	0.564	0.281	0.479	0.283	18.18
51	765	12.75	2.8	0.607	0.277	0.516	0.330	21.24
52	780	13.00	2.9	0.629	0.273	0.534	0.356	22.90
53	795	13.25	3.4	0.737	0.268	0.627	0.469	30.13
54	810	13.50	3.4	0.737	0.264	0.627	0.473	**30.39**
55	825	13.75	2.3	0.499	0.260	0.424	0.238	15.32
56	840	14.00	2.3	0.499	0.256	0.424	0.242	15.57
57	855	14.25	2.7	0.585	0.252	0.498	0.333	21.40
58	870	14.50	2.6	0.564	0.249	0.479	0.315	20.25
59	885	14.75	2.6	0.564	0.245	0.479	0.319	20.50
60	900	15.00	2.5	0.542	0.241	0.461	0.301	19.35
61	915	15.25	2.4	0.520	0.237	0.442	0.283	18.19

RCFC & WCD HYDROLOGY MANUAL	SYNTHETIC UNIT HYDROGRAPH METHOD SHORTCUT METHOD DEVELOPED CONDITION 24-HOUR STORM	PROJECT: PALM SPRINGS CC Job No.: 2152 DATE: BY: NB 1/17/14

UNIT HYDROGRAPH and EFFECTIVE RAIN CALCULATION FORM

DRAINAGE AREA-ACRES	63.76	CONSTANT LOSS RATE-in/hr	n/a
UNIT TIME-MINUTES	15	VARIABLE LOSS RATE (AVG) in/hr	0.3071
LAG TIME - MINUTES	10.15	MINIMUM LOSS RATE (for var. loss) - in/hr	0.154
UNIT TIME-PERCENT OF LAG	147.8	LOW LOSS RATE - DECIMAL	0.85
TOTAL ADJUSTED STORM RAIN-INCHES	5.42	C	0.00284

Unit Time Period	Time Minutes	Time Hours	Pattern Percent (Plate E-5.9)	Storm Rain in/hr	Loss Rate in/hr Max	Loss Rate in/hr Low	Effective Rain in/hr	Flood Hydrograph Flow cfs
62	930	15.50	2.3	0.499	0.234	0.424	0.265	17.03
63	945	15.75	1.9	0.412	0.230	0.350	0.182	11.68
64	960	16.00	1.9	0.412	0.227	0.350	0.185	11.91
65	975	16.25	0.4	0.087	0.223	0.074	0.013	0.84
66	990	16.50	0.4	0.087	0.220	0.074	0.013	0.84
67	1005	16.75	0.3	0.065	0.216	0.055	0.010	0.63
68	1020	17.00	0.3	0.065	0.213	0.055	0.010	0.63
69	1035	17.25	0.5	0.108	0.210	0.092	0.016	1.05
70	1050	17.50	0.5	0.108	0.207	0.092	0.016	1.05
71	1065	17.75	0.5	0.108	0.204	0.092	0.016	1.05
72	1080	18.00	0.4	0.087	0.201	0.074	0.013	0.84
73	1095	18.25	0.4	0.087	0.198	0.074	0.013	0.84
74	1110	18.50	0.4	0.087	0.195	0.074	0.013	0.84
75	1125	18.75	0.3	0.065	0.192	0.055	0.010	0.63
76	1140	19.00	0.2	0.043	0.189	0.037	0.007	0.42
77	1155	19.25	0.3	0.065	0.187	0.055	0.010	0.63
78	1170	19.50	0.4	0.087	0.184	0.074	0.013	0.84
79	1185	19.75	0.3	0.065	0.182	0.055	0.010	0.63
80	1200	20.00	0.2	0.043	0.179	0.037	0.007	0.42
81	1215	20.25	0.3	0.065	0.177	0.055	0.010	0.63
82	1230	20.50	0.3	0.065	0.174	0.055	0.010	0.63
83	1245	20.75	0.3	0.065	0.172	0.055	0.010	0.63
84	1260	21.00	0.2	0.043	0.170	0.037	0.007	0.42
85	1275	21.25	0.3	0.065	0.168	0.055	0.010	0.63
86	1290	21.50	0.2	0.043	0.166	0.037	0.007	0.42
87	1305	21.75	0.3	0.065	0.164	0.055	0.010	0.63
88	1320	22.00	0.2	0.043	0.163	0.037	0.007	0.42
89	1335	22.25	0.3	0.065	0.161	0.055	0.010	0.63
90	1350	22.50	0.2	0.043	0.160	0.037	0.007	0.42
91	1365	22.75	0.2	0.043	0.158	0.037	0.007	0.42
92	1380	23.00	0.2	0.043	0.157	0.037	0.007	0.42
93	1395	23.25	0.2	0.043	0.156	0.037	0.007	0.42
94	1410	23.50	0.2	0.043	0.155	0.037	0.007	0.42
95	1425	23.75	0.2	0.043	0.154	0.037	0.007	0.42
96	1440	24.00	0.2	0.043	0.154	0.037	0.007	0.42

EFFECTIVE RAIN & FLOOD VOLUMES SUMMARY

EFFECTIVE RAIN (in)	1.77
FLOOD VOLUME (acft)	9.41
FLOOD VOLUME (cuft)	410,036
PEAK FLOW (cfs)	30.39

RCFC & WCD
HYDROLOGY MANUAL

SYNTHETIC UNIT HYDROGRAPH METHOD

SHORTCUT METHOD

DEVELOPED CONDITIONS BASIN STAGE STORAGE - 1 HOUR STORM

DRAINAGE AREA-ACRES	63.76
UNIT TIME-MINUTES	5
LAG TIME - MINUTES	25.37
UNIT TIME-PERCENT OF LAG	19.7
TOTAL ADJUSTED STORM RAIN-INCHES	1.71

PROJECT:	PALM SPRINGS CC
DRAINAGE AREA	
CONCENTRATION POINT	CATCH BASIN No. 1
BASIN PERCOLATION RATE	1.0 in/hr
DRYWELLS	
NUMBER	0
DRYWELL PERCOLATION RATE	0.00 cfs

Unit Time Period	Time Minutes	Hours	Effective Rain in/hr	Flood Hydrograph Flow cfs	Volume In cu-ft	Basin Volume cu-ft	Basin Losses Percolation Area sf	Maximum Percolation cu-ft	Percolation Out cu-ft	Total in Basin cu-ft	ac-ft	Basin WSEL ft	Basin Outflow Volume Out cu-ft	Flow Out cfs
1	5	0.08	0.43	27.75	8,325	8,325	90,578	629	629	7,696	0.18	489.08	0	0.00
2	10	0.17	0.55	35.67	10,700	18,395	91,001	632	632	17,763	0.41	489.19	0	0.00
3	15	0.25	0.60	38.30	11,491	29,255	91,457	635	635	28,619	0.66	489.31	0	0.00
4	20	0.33	0.64	40.94	12,283	40,902	91,946	639	639	40,264	0.92	489.44	0	0.00
5	25	0.42	0.72	46.22	13,866	54,129	92,502	642	642	53,487	1.23	489.58	0	0.00
6	30	0.50	0.84	54.13	16,240	69,727	93,157	647	647	69,080	1.59	489.75	0	0.00
7	35	0.58	1.01	64.69	19,407	88,487	93,946	652	652	87,835	2.02	489.95	0	0.00
8	40	0.67	1.36	87.12	26,135	113,970	94,992	660	660	113,310	2.60	490.22	0	0.00
9	45	0.75	2.38	153.08	45,924	159,234	96,843	673	673	158,561	3.64	490.69	0	0.00
10	50	0.83	6.77	435.40	130,621	289,182	102,052	709	709	288,473	6.62	492.00	0	0.00
11	55	0.92	1.07	68.65	20,594	309,067	102,825	714	714	308,353	7.08	492.19	0	0.00
12	60	1.00	0.47	30.39	9,116	317,470	103,152	716	716	316,753	7.27	**492.27**	0	0.00

BASIN WORKSHEET SUMMARY

EFFECTIVE RAIN	1.40 in
FLOOD VOLUME	7.45 acft
	324,701 cuft
TOTAL VOLUME RETAINED	324,701 cuft
MAX WSEL	492.27 ft
PEAK FLOW RATE	435.40 cfs
AVERAGE PERCOLATION RATE	132.46 cf/min
TOTAL OUTFLOW	0 cuft
	0.00 cfs
MAXIMUM OUTFLOW	0 cuft
	0.00 cfs

RCFC & WCD
HYDROLOGY MANUAL

SYNTHETIC UNIT HYDROGRAPH METHOD

SHORTCUT METHOD

DEVELOPED CONDITIONS BASIN STAGE STORAGE - 3 HOUR STORM

DRAINAGE AREA-ACRES	63.76
UNIT TIME-MINUTES	5
LAG TIME - MINUTES	25.37
UNIT TIME-PERCENT OF LAG	19.7
TOTAL ADJUSTED STORM RAIN-INCHES	2.52

PROJECT:	PALM SPRINGS CC
DRAINAGE AREA	
CONCENTRATION POINT	CATCH BASIN No. 1
BASIN PERCOLATION RATE	1.0 in/hr
DRYWELLS	
NUMBER	0
DRYWELL PERCOLATION RATE	0.00 cfs

Unit Time Period	Time Minutes	Hours	Effective Rain in/hr	Flood Hydrograph Flow cfs	Volume In cu-ft	Basin Volume cu-ft	Basin Losses Percolation Area sf	Maximum Percolation cu-ft	Percolation Out cu-ft	Total in Basin cu-ft	ac-ft	Basin WSEL ft	Basin Outflow Volume Out cu-ft	Flow Out cfs
1	5	0.08	0.09	5.5	1,659	1,659	90,298	627	627	1,032	0.02	489.01	0	0.00
2	10	0.17	0.09	5.5	1,659	2,691	90,341	627	627	2,064	0.05	489.02	0	0.00
3	15	0.25	0.03	1.6	493	2,556	90,335	627	627	1,929	0.04	489.02	0	0.00
4	20	0.33	0.15	9.4	2,826	4,755	90,428	628	628	4,127	0.09	489.04	0	0.00
5	25	0.42	0.15	9.4	2,826	6,952	90,520	629	629	6,324	0.15	489.07	0	0.00
6	30	0.50	0.24	15.3	4,575	10,899	90,686	630	630	10,269	0.24	489.11	0	0.00
7	35	0.58	0.15	9.4	2,826	13,095	90,778	630	630	12,465	0.29	489.14	0	0.00
8	40	0.67	0.24	15.3	4,575	17,040	90,944	632	632	16,408	0.38	489.18	0	0.00
9	45	0.75	0.24	15.3	4,575	20,984	91,110	633	633	20,351	0.47	489.22	0	0.00
10	50	0.83	0.15	9.4	2,826	23,177	91,202	633	633	22,543	0.52	489.24	0	0.00
11	55	0.92	0.18	11.4	3,409	25,952	91,318	634	634	25,318	0.58	489.27	0	0.00
12	60	1.00	0.24	15.3	4,575	29,893	91,484	635	635	29,258	0.67	489.32	0	0.00
13	65	1.08	0.36	23.0	6,908	36,166	91,747	637	637	35,529	0.82	489.39	0	0.00
14	70	1.17	0.36	23.0	6,908	42,438	92,011	639	639	41,799	0.96	489.45	0	0.00
15	75	1.25	0.36	23.0	6,908	48,707	92,274	641	641	48,066	1.10	489.52	0	0.00
16	80	1.33	0.30	19.1	5,742	53,808	92,489	642	642	53,166	1.22	489.58	0	0.00
17	85	1.42	0.48	30.8	9,241	62,407	92,850	645	645	61,763	1.42	489.67	0	0.00
18	90	1.50	0.51	32.7	9,825	71,587	93,236	647	647	70,940	1.63	489.77	0	0.00
19	95	1.58	0.42	26.9	8,075	79,015	93,548	650	650	78,365	1.80	489.85	0	0.00
20	100	1.67	0.51	32.7	9,825	88,190	93,933	652	652	87,537	2.01	489.95	0	0.00
21	105	1.75	0.69	44.4	13,324	100,862	94,456	656	656	100,206	2.30	490.08	0	0.00
22	110	1.83	0.63	40.5	12,158	112,363	94,926	659	659	111,704	2.56	490.20	0	0.00
23	115	1.92	0.57	36.6	10,991	122,695	95,349	662	662	122,033	2.80	490.31	0	0.00
24	120	2.00	0.60	38.6	11,574	133,607	95,795	665	665	132,942	3.05	490.42	0	0.00
25	125	2.08	0.63	40.5	12,158	145,100	96,265	669	669	144,431	3.32	490.54	0	0.00
26	130	2.17	0.96	61.9	18,573	163,005	96,998	674	674	162,331	3.73	490.73	0	0.00
27	135	2.25	1.20	77.5	23,239	185,571	97,921	680	680	184,891	4.24	490.97	0	0.00
28	140	2.33	0.75	48.3	14,491	199,381	98,474	684	684	198,698	4.56	491.10	0	0.00
29	145	2.42	1.75	112.5	33,738	232,436	99,791	693	693	231,743	5.32	491.44	0	0.00
30	150	2.50	1.90	122.2	36,654	268,397	101,225	703	703	267,694	6.15	491.79	0	0.00
31	155	2.58	2.17	139.7	41,904	309,598	102,846	714	714	308,883	7.09	492.20	0	0.00
32	160	2.67	1.48	95.0	28,489	337,372	103,926	722	722	336,650	7.73	492.47	0	0.00
33	165	2.75	0.30	19.1	5,742	342,392	104,121	723	723	341,669	7.84	492.51	0	0.00
34	170	2.83	0.24	15.3	4,575	346,245	104,271	724	724	345,520	7.93	492.55	0	0.00
35	175	2.92	0.24	15.3	4,575	350,096	104,420	725	725	349,371	8.02	**492.59**	0	0.00
36	180	3.00	0.03	1.7	525	349,896	104,413	725	725	349,171	8.02	492.59	0	0.00

BASIN WORKSHEET SUMMARY

EFFECTIVE RAIN	1.61 in
FLOOD VOLUME	8.56 acft
	372,967 cuft
TOTAL VOLUME RETAINED	372,967 cuft
MAX WSEL	492.59 ft
PEAK FLOW RATE	139.68 cfs
AVERAGE PERCOLATION RATE	132.20 cf/min
TOTAL BASIN OUTFLOW	0 cuft
	0.00 cfs
MAXIMUM BASIN OUTFLOW	0 cuft
	0.00 cfs

RCFC & WCD
HYDROLOGY MANUAL

SYNTHETIC UNIT HYDROGRAPH METHOD

SHORTCUT METHOD

DEVELOPED CONDITION BASIN STAGE STORAGE - 6 HOUR STORM

PROJECT: PALM SPRINGS CC

1/17/14

DRAINAGE AREA-ACRES	63.76
UNIT TIME-MINUTES	5
LAG TIME - MINUTES	25.37
UNIT TIME-PERCENT OF LAG	19.7
TOTAL ADJUSTED STORM RAIN-INCHES	3.34

BASIN PERCOLATION RATE	1.0 in/hr
DRYWELLS	
NUMBER	0
DRYWELL PERCOLATION RATE	0.00 cfs

Unit Time Period	Time Minutes	Time Hours	Effective Rain in/hr	Flood Hydrograph Flow cfs	Volume In cu-ft	Basin Volume cu-ft	Basin Losses Percolation Area sf	Basin Losses Maximum Percolation cu-ft	Basin Losses Percolation Out cu-ft	Total in Basin cu-ft	Total in Basin ac-ft	Basin WSEL ft	Basin Outflow Volume Out cu-ft	Basin Outflow Flow Out cfs
1	5	0.08	0.03	1.93	580	580	90,252	627	580	0	0.00	489.00	0	0.00
2	10	0.17	0.04	2.32	696	696	90,257	627	627	69	0.00	489.00	0	0.00
3	15	0.25	0.04	2.32	696	765	90,260	627	627	138	0.00	489.00	0	0.00
4	20	0.33	0.04	2.32	696	834	90,263	627	627	207	0.00	489.00	0	0.00
5	25	0.42	0.04	2.32	696	903	90,266	627	627	276	0.01	489.00	0	0.00
6	30	0.50	0.04	2.71	812	1,087	90,274	627	627	460	0.01	489.00	0	0.00
7	35	0.58	0.04	2.71	812	1,272	90,281	627	627	645	0.01	489.01	0	0.00
8	40	0.67	0.04	2.71	812	1,457	90,289	627	627	830	0.02	489.01	0	0.00
9	45	0.75	0.04	2.71	812	1,642	90,297	627	627	1,015	0.02	489.01	0	0.00
10	50	0.83	0.04	2.71	812	1,826	90,305	627	627	1,199	0.03	489.01	0	0.00
11	55	0.92	0.04	2.71	812	2,011	90,312	627	627	1,384	0.03	489.02	0	0.00
12	60	1.00	0.01	0.87	261	1,645	90,297	627	627	1,018	0.02	489.01	0	0.00
13	65	1.08	0.01	0.87	261	1,279	90,282	627	627	652	0.01	489.01	0	0.00
14	70	1.17	0.01	0.87	261	913	90,266	627	627	286	0.01	489.00	0	0.00
15	75	1.25	0.01	0.87	261	547	90,251	627	547	0	0.00	489.00	0	0.00
16	80	1.33	0.01	0.87	261	261	90,239	627	261	0	0.00	489.00	0	0.00
17	85	1.42	0.01	0.87	261	261	90,239	627	261	0	0.00	489.00	0	0.00
18	90	1.50	0.01	0.87	261	261	90,239	627	261	0	0.00	489.00	0	0.00
19	95	1.58	0.01	0.87	261	261	90,239	627	261	0	0.00	489.00	0	0.00

RCFC & WCD
HYDROLOGY MANUAL

SYNTHETIC UNIT HYDROGRAPH METHOD

SHORTCUT METHOD

DEVELOPED CONDITION BASIN STAGE STORAGE - 6 HOUR STORM

PROJECT: PALM SPRINGS CC

1/17/14

DRAINAGE AREA-ACRES	63.76
UNIT TIME-MINUTES	5
LAG TIME - MINUTES	25.37
UNIT TIME-PERCENT OF LAG	19.7
TOTAL ADJUSTED STORM RAIN-INCHES	3.34

BASIN PERCOLATION RATE	1.0 in/hr
DRYWELLS	
NUMBER	0
DRYWELL PERCOLATION RATE	0.00 cfs

Unit Time Period	Time Minutes	Time Hours	Effective Rain in/hr	Flood Hydrograph Flow cfs	Volume In cu-ft	Basin Volume cu-ft	Basin Losses Percolation Area sf	Basin Losses Maximum Percolation cu-ft	Basin Losses Percolation Out cu-ft	Total in Basin cu-ft	Total in Basin ac-ft	Basin WSEL ft	Basin Outflow Volume Out cu-ft	Basin Outflow Flow Out cfs
20	100	1.67	0.01	0.87	261	261	90,239	627	261	0	0.00	489.00	0	0.00
21	105	1.75	0.01	0.87	261	261	90,239	627	261	0	0.00	489.00	0	0.00
22	110	1.83	0.01	0.87	261	261	90,239	627	261	0	0.00	489.00	0	0.00
23	115	1.92	0.01	0.87	261	261	90,239	627	261	0	0.00	489.00	0	0.00
24	120	2.00	0.05	3.45	1,034	1,034	90,271	627	627	407	0.01	489.00	0	0.00
25	125	2.08	0.01	0.87	261	668	90,256	627	627	42	0.00	489.00	0	0.00
26	130	2.17	0.05	3.45	1,034	1,076	90,273	627	627	449	0.01	489.00	0	0.00
27	135	2.25	0.05	3.45	1,034	1,483	90,290	627	627	856	0.02	489.01	0	0.00
28	140	2.33	0.05	3.45	1,034	1,890	90,307	627	627	1,263	0.03	489.01	0	0.00
29	145	2.42	0.05	3.45	1,034	2,297	90,324	627	627	1,670	0.04	489.02	0	0.00
30	150	2.50	0.05	3.45	1,034	2,704	90,342	627	627	2,077	0.05	489.02	0	0.00
31	155	2.58	0.05	3.45	1,034	3,111	90,359	627	627	2,484	0.06	489.03	0	0.00
32	160	2.67	0.05	3.45	1,034	3,518	90,376	628	628	2,890	0.07	489.03	0	0.00
33	165	2.75	0.09	6.02	1,807	4,698	90,425	628	628	4,070	0.09	489.04	0	0.00
34	170	2.83	0.09	6.02	1,807	5,877	90,475	628	628	5,248	0.12	489.06	0	0.00
35	175	2.92	0.09	6.02	1,807	7,056	90,524	629	629	6,427	0.15	489.07	0	0.00
36	180	3.00	0.09	6.02	1,807	8,234	90,574	629	629	7,605	0.17	489.08	0	0.00
37	185	3.08	0.09	6.02	1,807	9,413	90,623	629	629	8,783	0.20	489.10	0	0.00
38	190	3.17	0.13	8.60	2,580	11,364	90,705	630	630	10,734	0.25	489.12	0	0.00
39	195	3.25	0.13	8.60	2,580	13,314	90,787	630	630	12,683	0.29	489.14	0	0.00
40	200	3.33	0.13	8.60	2,580	15,264	90,869	631	631	14,633	0.34	489.16	0	0.00
41	205	3.42	0.17	11.18	3,353	17,986	90,984	632	632	17,354	0.40	489.19	0	0.00
42	210	3.50	0.21	13.75	4,126	21,481	91,130	633	633	20,848	0.48	489.23	0	0.00
43	215	3.58	0.25	16.33	4,899	25,747	91,310	634	634	25,113	0.58	489.27	0	0.00
44	220	3.67	0.25	16.33	4,899	30,012	91,489	635	635	29,377	0.67	489.32	0	0.00
45	225	3.75	0.29	18.91	5,672	35,050	91,700	637	637	34,413	0.79	489.37	0	0.00
46	230	3.83	0.29	18.91	5,672	40,085	91,912	638	638	39,447	0.91	489.43	0	0.00
47	235	3.92	0.33	21.48	6,445	45,892	92,156	640	640	45,252	1.04	489.49	0	0.00
48	240	4.00	0.33	21.48	6,445	51,698	92,400	642	642	51,056	1.17	489.55	0	0.00
49	245	4.08	0.37	24.06	7,219	58,275	92,676	644	644	57,631	1.32	489.63	0	0.00
50	250	4.17	0.41	26.64	7,992	65,623	92,985	646	646	64,977	1.49	489.71	0	0.00
51	255	4.25	0.45	29.22	8,765	73,742	93,326	648	648	73,094	1.68	489.79	0	0.00
52	260	4.33	0.49	31.79	9,538	82,631	93,700	651	651	81,980	1.88	489.89	0	0.00
53	265	4.42	0.53	34.37	10,311	92,291	94,105	654	654	91,638	2.10	489.99	0	0.00
54	270	4.50	0.53	34.37	10,311	101,948	94,500	656	656	101,292	2.33	490.10	0	0.00

RCFC & WCD
HYDROLOGY MANUAL

SYNTHETIC UNIT HYDROGRAPH METHOD

SHORTCUT METHOD

DEVELOPED CONDITION BASIN STAGE STORAGE - 6 HOUR STORM

PROJECT: PALM SPRINGS CC

1/17/14

DRAINAGE AREA-ACRES	63.76
UNIT TIME-MINUTES	5
LAG TIME - MINUTES	25.37
UNIT TIME-PERCENT OF LAG	19.7
TOTAL ADJUSTED STORM RAIN-INCHES	3.34

BASIN PERCOLATION RATE	1.0 in/hr
DRYWELLS	
NUMBER	0
DRYWELL PERCOLATION RATE	0.00 cfs

Unit Time Period	Time Minutes	Time Hours	Effective Rain in/hr	Flood Hydrograph Flow cfs	Volume In cu-ft	Basin Volume cu-ft	Basin Losses Percolation Area sf	Basin Losses Maximum Percolation cu-ft	Basin Losses Percolation Out cu-ft	Total in Basin cu-ft	Total in Basin ac-ft	Basin WSEL ft	Basin Outflow Volume Out cu-ft	Basin Outflow Flow Out cfs
55	275	4.58	0.57	36.95	11,084	112,376	94,927	659	659	111,717	2.56	490.20	0	0.00
56	280	4.67	0.61	39.52	11,857	123,573	95,385	662	662	122,911	2.82	490.32	0	0.00
57	285	4.75	0.65	42.10	12,630	135,541	95,874	666	666	134,875	3.10	490.44	0	0.00
58	290	4.83	0.65	42.10	12,630	147,505	96,364	669	669	146,836	3.37	490.57	0	0.00
59	295	4.92	0.69	44.68	13,403	160,239	96,884	673	673	159,566	3.66	490.70	0	0.00
60	300	5.00	0.73	47.25	14,176	173,742	97,437	677	677	173,065	3.97	490.84	0	0.00
61	305	5.08	0.94	60.14	18,041	191,106	98,144	682	682	190,425	4.37	491.02	0	0.00
62	310	5.17	1.14	73.02	21,906	212,331	98,990	687	687	211,643	4.86	491.23	0	0.00
63	315	5.25	1.26	80.75	24,225	235,869	99,928	694	694	235,175	5.40	491.47	0	0.00
64	320	5.33	1.38	88.48	26,545	261,720	100,959	701	701	261,018	5.99	491.73	0	0.00
65	325	5.42	1.58	101.37	30,410	291,428	102,140	709	709	290,719	6.67	492.02	0	0.00
66	330	5.50	1.94	124.56	37,367	328,086	103,565	719	719	327,367	7.52	492.38	0	0.00
67	335	5.58	0.45	29.22	8,765	336,132	103,878	721	721	335,410	7.70	492.45	0	0.00
68	340	5.67	0.05	3.45	1,034	336,444	103,890	721	721	335,723	7.71	**492.46**	0	0.00
69	345	5.75	0.04	2.32	696	336,419	103,889	721	721	335,697	7.71	492.46	0	0.00
70	350	5.83	0.03	1.93	580	336,277	103,883	721	721	335,556	7.70	492.45	0	0.00
71	355	5.92	0.02	1.16	348	335,903	103,869	721	721	335,182	7.69	492.45	0	0.00
72	360	6.00	0.01	0.77	232	335,414	103,850	721	721	334,693	7.68	492.45	0	0.00

BASIN WORKSHEET SUMMARY

EFFECTIVE RAIN	1.63 in
FLOOD VOLUME	8.67 acft
	377,674 cuft
TOTAL VOLUME RETAINED	377,674 cuft
MAX WSEL	492.46 ft
PEAK FLOW RATE	124.56 cfs
AVERAGE PERCOLATION RATE	121.00 cf/min
TOTAL OUTFLOW	0 cuft
	0.00 cfs
MAXIMUM OUTFLOW	0 cuft
	0.00 cfs

RCFC & WCD
HYDROLOGY MANUAL

SYNTHETIC UNIT HYDROGRAPH METHOD

SHORTCUT METHOD

DEVELOPED CONDITIONS BASIN STAGE STORAGE - 24 HOUR STORM

DRAINAGE AREA-ACRES	63.76
UNIT TIME-MINUTES	15
LAG TIME - MINUTES	25.37
UNIT TIME-PERCENT OF LAG	59.1
TOTAL ADJUSTED STORM RAIN-INCHES	5.42

PROJECT:	PALM SPRINGS CC
DRAINAGE AREA	
CONCENTRATION POINT	CATCH BASIN No. 1
BASIN PERCOLATION RATE	1.0 in/hr
DRYWELLS	
NUMBER	0
DRYWELL PERCOLATION RATE	0.00 cfs

Unit Time Period	Time Minutes	Time Hours	Effective Rain in/hr	Flood Hydrograph Flow cfs	Volume In cu-ft	Basin Volume cu-ft	Basin Losses Percolation Area sf	Basin Losses Maximum Percolation cu-ft	Basin Losses Percolation Out cu-ft	Total in Basin cu-ft	Total in Basin ac-ft	Basin WSEL ft	Basin Outflow Volume Out cu-ft	Basin Outflow Flow Out cfs
1	15	0.25	0.007	0.4	376	376	90,244	1,880	376	0	0.00	489.00	0	0.00
2	30	0.50	0.010	0.6	565	565	90,252	1,880	565	0	0.00	489.00	0	0.00
3	45	0.75	0.010	0.6	565	565	90,252	1,880	565	0	0.00	489.00	0	0.00
4	60	1.00	0.013	0.8	753	753	90,260	1,880	753	0	0.00	489.00	0	0.00
5	75	1.25	0.010	0.6	565	565	90,252	1,880	565	0	0.00	489.00	0	0.00
6	90	1.50	0.010	0.6	565	565	90,252	1,880	565	0	0.00	489.00	0	0.00
7	105	1.75	0.010	0.6	565	565	90,252	1,880	565	0	0.00	489.00	0	0.00
8	120	2.00	0.013	0.8	753	753	90,260	1,880	753	0	0.00	489.00	0	0.00
9	135	2.25	0.013	0.8	753	753	90,260	1,880	753	0	0.00	489.00	0	0.00
10	150	2.50	0.013	0.8	753	753	90,260	1,880	753	0	0.00	489.00	0	0.00
11	165	2.75	0.016	1.0	941	941	90,267	1,881	941	0	0.00	489.00	0	0.00
12	180	3.00	0.016	1.0	941	941	90,267	1,881	941	0	0.00	489.00	0	0.00
13	195	3.25	0.016	1.0	941	941	90,267	1,881	941	0	0.00	489.00	0	0.00
14	210	3.50	0.016	1.0	941	941	90,267	1,881	941	0	0.00	489.00	0	0.00
15	225	3.75	0.016	1.0	941	941	90,267	1,881	941	0	0.00	489.00	0	0.00
16	240	4.00	0.020	1.3	1,129	1,129	90,275	1,881	1,129	0	0.00	489.00	0	0.00
17	255	4.25	0.020	1.3	1,129	1,129	90,275	1,881	1,129	0	0.00	489.00	0	0.00
18	270	4.50	0.023	1.5	1,317	1,317	90,283	1,881	1,317	0	0.00	489.00	0	0.00
19	285	4.75	0.023	1.5	1,317	1,317	90,283	1,881	1,317	0	0.00	489.00	0	0.00
20	300	5.00	0.026	1.7	1,505	1,505	90,291	1,881	1,505	0	0.00	489.00	0	0.00
21	315	5.25	0.020	1.3	1,129	1,129	90,275	1,881	1,129	0	0.00	489.00	0	0.00
22	330	5.50	0.023	1.5	1,317	1,317	90,283	1,881	1,317	0	0.00	489.00	0	0.00
23	345	5.75	0.026	1.7	1,505	1,505	90,291	1,881	1,505	0	0.00	489.00	0	0.00
24	360	6.00	0.026	1.7	1,505	1,505	90,291	1,881	1,505	0	0.00	489.00	0	0.00
25	375	6.25	0.029	1.9	1,694	1,694	90,299	1,881	1,694	0	0.00	489.00	0	0.00
26	390	6.50	0.029	1.9	1,694	1,694	90,299	1,881	1,694	0	0.00	489.00	0	0.00
27	405	6.75	0.033	2.1	1,882	1,882	90,307	1,881	1,881	0	0.00	489.00	0	0.00
28	420	7.00	0.033	2.1	1,882	1,882	90,307	1,881	1,881	1	0.00	489.00	0	0.00
29	435	7.25	0.033	2.1	1,882	1,882	90,307	1,881	1,881	1	0.00	489.00	0	0.00
30	450	7.50	0.036	2.3	2,070	2,071	90,315	1,882	1,882	189	0.00	489.00	0	0.00
31	465	7.75	0.039	2.5	2,258	2,447	90,331	1,882	1,882	565	0.01	489.01	0	0.00
32	480	8.00	0.042	2.7	2,446	3,011	90,354	1,882	1,882	1,129	0.03	489.01	0	0.00
33	495	8.25	0.049	3.1	2,823	3,952	90,394	1,883	1,883	2,068	0.05	489.02	0	0.00
34	510	8.50	0.049	3.1	2,823	4,891	90,433	1,884	1,884	3,007	0.07	489.03	0	0.00
35	525	8.75	0.052	3.3	3,011	6,018	90,481	1,885	1,885	4,133	0.09	489.04	0	0.00
36	540	9.00	0.023	1.5	1,355	5,487	90,458	1,885	1,885	3,603	0.08	489.04	0	0.00
37	555	9.25	0.072	4.6	4,147	7,749	90,554	1,887	1,887	5,863	0.13	489.06	0	0.00
38	570	9.50	0.098	6.3	5,681	11,544	90,713	1,890	1,890	9,654	0.22	489.10	0	0.00
39	585	9.75	0.125	8.0	7,213	16,867	90,937	1,895	1,895	14,973	0.34	489.16	0	0.00
40	600	10.00	0.151	9.7	8,742	23,715	91,224	1,901	1,901	21,815	0.50	489.24	0	0.00
41	615	10.25	0.004	0.3	233	22,048	91,154	1,899	1,899	20,149	0.46	489.22	0	0.00
42	630	10.50	0.009	0.6	503	20,652	91,096	1,898	1,898	18,754	0.43	489.20	0	0.00
43	645	10.75	0.122	7.8	7,042	25,796	91,312	1,902	1,902	23,894	0.55	489.26	0	0.00
44	660	11.00	0.126	8.1	7,306	31,200	91,539	1,907	1,907	29,293	0.67	489.32	0	0.00
45	675	11.25	0.109	7.0	6,313	35,606	91,724	1,911	1,911	33,695	0.77	489.37	0	0.00

RCFC & WCD
HYDROLOGY MANUAL

SYNTHETIC UNIT HYDROGRAPH METHOD
SHORTCUT METHOD
DEVELOPED CONDITIONS BASIN STAGE STORAGE - 24 HOUR STORM

DRAINAGE AREA-ACRES	63.76
UNIT TIME-MINUTES	15
LAG TIME - MINUTES	25.37
UNIT TIME-PERCENT OF LAG	59.1
TOTAL ADJUSTED STORM RAIN-INCHES	5.42

PROJECT:	PALM SPRINGS CC
DRAINAGE AREA	
CONCENTRATION POINT	CATCH BASIN No. 1
BASIN PERCOLATION RATE	1.0 in/hr
DRYWELLS	
NUMBER	0
DRYWELL PERCOLATION RATE	0.00 cfs

Unit Time Period	Time Minutes	Time Hours	Effective Rain in/hr	Flood Hydrograph Flow cfs	Volume In cu-ft	Basin Volume cu-ft	Basin Losses Percolation Area sf	Basin Losses Maximum Percolation cu-ft	Basin Losses Percolation Out cu-ft	Total in Basin cu-ft	Total in Basin ac-ft	Basin WSEL ft	Basin Outflow Volume Out cu-ft	Basin Outflow Flow Out cfs
46	690	11.50	0.114	7.3	6,572	40,266	91,920	1,915	1,915	38,351	0.88	489.42	0	0.00
47	705	11.75	0.075	4.8	4,318	42,670	92,021	1,917	1,917	40,752	0.94	489.44	0	0.00
48	720	12.00	0.101	6.5	5,826	46,578	92,185	1,921	1,921	44,658	1.03	489.48	0	0.00
49	735	12.25	0.257	16.5	14,857	59,515	92,728	1,932	1,932	57,583	1.32	489.62	0	0.00
50	750	12.50	0.283	18.2	16,359	73,941	93,334	1,944	1,944	71,997	1.65	489.78	0	0.00
51	765	12.75	0.330	21.2	19,112	91,109	94,056	1,959	1,959	89,149	2.05	489.97	0	0.00
52	780	13.00	0.356	22.9	20,608	109,757	94,820	1,975	1,975	107,782	2.47	490.16	0	0.00
53	795	13.25	0.469	30.1	27,118	134,900	95,848	1,997	1,997	132,903	3.05	490.42	0	0.00
54	810	13.50	0.473	30.4	27,354	160,257	96,885	2,018	2,018	158,239	3.63	490.69	0	0.00
55	825	13.75	0.238	15.3	13,787	172,026	97,367	2,028	2,028	169,997	3.90	490.81	0	0.00
56	840	14.00	0.242	15.6	14,016	184,014	97,857	2,039	2,039	181,975	4.18	490.94	0	0.00
57	855	14.25	0.333	21.4	19,260	201,235	98,548	2,053	2,053	199,182	4.57	491.11	0	0.00
58	870	14.50	0.315	20.3	18,229	217,411	99,193	2,067	2,067	215,345	4.94	491.27	0	0.00
59	885	14.75	0.319	20.5	18,449	233,794	99,846	2,080	2,080	231,714	5.32	491.43	0	0.00
60	900	15.00	0.301	19.3	17,411	249,125	100,457	2,093	2,093	247,032	5.67	491.59	0	0.00
61	915	15.25	0.283	18.2	16,370	263,402	101,026	2,105	2,105	261,298	6.00	491.73	0	0.00
62	930	15.50	0.265	17.0	15,326	276,624	101,553	2,116	2,116	274,508	6.30	491.86	0	0.00
63	945	15.75	0.182	11.7	10,515	285,023	101,888	2,123	2,123	282,900	6.49	491.95	0	0.00
64	960	16.00	0.185	11.9	10,719	293,619	102,225	2,130	2,130	291,489	6.69	**492.03**	0	0.00
65	975	16.25	0.013	0.8	753	292,242	102,171	2,129	2,129	290,113	6.66	492.02	0	0.00
66	990	16.50	0.013	0.8	753	290,866	102,118	2,127	2,127	288,739	6.63	492.00	0	0.00
67	1005	16.75	0.010	0.6	565	289,303	102,057	2,126	2,126	287,177	6.59	491.99	0	0.00
68	1020	17.00	0.010	0.6	565	287,741	101,996	2,125	2,125	285,617	6.56	491.97	0	0.00
69	1035	17.25	0.016	1.0	941	286,557	101,949	2,124	2,124	284,433	6.53	491.96	0	0.00
70	1050	17.50	0.016	1.0	941	285,374	101,902	2,123	2,123	283,251	6.50	491.95	0	0.00
71	1065	17.75	0.016	1.0	941	284,192	101,854	2,122	2,122	282,070	6.48	491.94	0	0.00
72	1080	18.00	0.013	0.8	753	282,823	101,800	2,121	2,121	280,702	6.44	491.92	0	0.00
73	1095	18.25	0.013	0.8	753	281,455	101,745	2,120	2,120	279,335	6.41	491.91	0	0.00
74	1110	18.50	0.013	0.8	753	280,088	101,691	2,119	2,119	277,969	6.38	491.90	0	0.00
75	1125	18.75	0.010	0.6	565	278,534	101,629	2,117	2,117	276,416	6.35	491.88	0	0.00
76	1140	19.00	0.007	0.4	376	276,793	101,560	2,116	2,116	274,677	6.31	491.86	0	0.00
77	1155	19.25	0.010	0.6	565	275,241	101,498	2,115	2,115	273,127	6.27	491.85	0	0.00
78	1170	19.50	0.013	0.8	753	273,880	101,443	2,113	2,113	271,766	6.24	491.84	0	0.00
79	1185	19.75	0.010	0.6	565	272,331	101,382	2,112	2,112	270,219	6.20	491.82	0	0.00
80	1200	20.00	0.007	0.4	376	270,595	101,312	2,111	2,111	268,484	6.16	491.80	0	0.00
81	1215	20.25	0.010	0.6	565	269,049	101,251	2,109	2,109	266,939	6.13	491.79	0	0.00
82	1230	20.50	0.010	0.6	565	267,504	101,189	2,108	2,108	265,396	6.09	491.77	0	0.00
83	1245	20.75	0.010	0.6	565	265,960	101,128	2,107	2,107	263,853	6.06	491.76	0	0.00
84	1260	21.00	0.007	0.4	376	264,230	101,059	2,105	2,105	262,124	6.02	491.74	0	0.00
85	1275	21.25	0.010	0.6	565	262,689	100,997	2,104	2,104	260,585	5.98	491.72	0	0.00
86	1290	21.50	0.007	0.4	376	260,961	100,928	2,103	2,103	258,858	5.94	491.71	0	0.00
87	1305	21.75	0.010	0.6	565	259,423	100,867	2,101	2,101	257,321	5.91	491.69	0	0.00
88	1320	22.00	0.007	0.4	376	257,698	100,798	2,100	2,100	255,598	5.87	491.67	0	0.00
89	1335	22.25	0.010	0.6	565	256,162	100,737	2,099	2,099	254,064	5.83	491.66	0	0.00
90	1350	22.50	0.007	0.4	376	254,440	100,669	2,097	2,097	252,343	5.79	491.64	0	0.00

RCFC & WCD
HYDROLOGY MANUAL

SYNTHETIC UNIT HYDROGRAPH METHOD

SHORTCUT METHOD

DEVELOPED CONDITIONS BASIN STAGE STORAGE - 24 HOUR STORM

DRAINAGE AREA-ACRES	63.76
UNIT TIME-MINUTES	15
LAG TIME - MINUTES	25.37
UNIT TIME-PERCENT OF LAG	59.1
TOTAL ADJUSTED STORM RAIN-INCHES	5.42

PROJECT:	PALM SPRINGS CC
DRAINAGE AREA	
CONCENTRATION POINT	CATCH BASIN No. 1
BASIN PERCOLATION RATE	1.0 in/hr
DRYWELLS	
NUMBER	0
DRYWELL PERCOLATION RATE	0.00 cfs

Unit Time Period	Time Minutes	Time Hours	Effective Rain in/hr	Flood Hydrograph Flow cfs	Volume In cu-ft	Basin Volume cu-ft	Basin Losses Percolation Area sf	Basin Losses Maximum Percolation cu-ft	Basin Losses Percolation Out cu-ft	Total in Basin cu-ft	Total in Basin ac-ft	Basin WSEL ft	Basin Outflow Volume Out cu-ft	Basin Outflow Flow Out cfs
91	1365	22.75	0.007	0.4	376	252,719	100,600	2,096	2,096	250,623	5.75	491.62	0	0.00
92	1380	23.00	0.007	0.4	376	251,000	100,531	2,094	2,094	248,905	5.71	491.61	0	0.00
93	1395	23.25	0.007	0.4	376	249,282	100,463	2,093	2,093	247,189	5.67	491.59	0	0.00
94	1410	23.50	0.007	0.4	376	247,565	100,394	2,092	2,092	245,473	5.64	491.57	0	0.00
95	1425	23.75	0.007	0.4	376	245,850	100,326	2,090	2,090	243,760	5.60	491.56	0	0.00
96	1440	24.00	0.007	0.4	376	244,136	100,258	2,089	2,089	242,047	5.56	491.54	0	0.00

BASIN WORKSHEET SUMMARY

EFFECTIVE RAIN	1.77 in
FLOOD VOLUME	9.41 acft 410,036 cuft
TOTAL VOLUME RETAINED	410,036 cuft
MAX WSEL	492.03 ft
PEAK FLOW RATE	30.39 cfs
AVERAGE PERCOLATION RATE	116.66 cf/min
TOTAL OUTFLOW	0 cuft 0.00 cfs
MAXIMUM OUTFLOW	0 cuft 0.00 cfs

BASIN VOLUME WORKSHEET

PROECT PALM SPRINGS CC
JOB No. 2152

BASIN CHARACTERISTICS

CONTOUR ELEVATION	DEPTH		AREA		VOLUME		
	INCR (ft)	TOTAL (ft)	INCR (sf)	TOTAL (sf)	INCR (cuft)	TOTAL (cuft)	TOTAL (acre-ft)
489	0	0		90,228	0	0	0.00
490	1	1	3,872	94,100	92,157	92,157	2.12
491	1	2	3,929	98,029	96,058	188,215	4.32
492	1	3	3,987	102,015	100,015	288,230	6.62
493	1	4	4,044	106,060	104,031	392,261	9.01

WHERE: $$V = \frac{1}{3}(E_1 - E_2)\left(A_1 + A_2 + \sqrt{A_1 A_2}\right)$$

RCFCD SYNTHETIC UNIT HYDROGRAPH - SHORTCUT METHOD
INCREMENTAL INCREASE WORKSHEET
DATA INPUT SHEET

DATE:	January 17, 2014
WORKSHEET PREPARED BY:	NB
PROJECT NAME	PALM SPRINGS CC
PROJECT NUMBER	2152
CONCENTRATION POINT DESIGNATION	CATCH BASIN No. 2
AREA DESIGNATION	
AMC NUMBER	2

Low Loss Conditions: X=Existing; D=Developed; BS=Retention

EXISTING CONDITIONS

AREA DESIG	SOIL GROUP	TRIBUTARY AREAS	ACRES	LOW LOSS CONDITION	RI NUMBER	AMC II INFILTRATION RATE	IMPERVIOUS PERCENT
12	A	EXISTING OPEN BRUSH - POOR	63.98	X	62	0.45	0.05

PROPOSED CONDITIONS

AREA DESIG	SOIL GROUP	TRIBUTARY AREAS	ACRES	LOW LOSS CONDITION	RI NUMBER	AMC II INFILTRATION RATE	IMPERVIOUS PERCENT
6	A	MF - CONDIMINIUMS	63.98	D	32	0.74	0.65

	UNDEVELOPED	DEVELOPED
LENGTH OF WATERCOURSE (L)	3,896 ft	3,896 ft
LENGTH TO POINT OPPOSITE CENTROID (Lca)	1,948 ft	1,948 ft
ELEVATION OF HEADWATER	520.0 ft	520.0 ft
ELEVATION OF CONCENTRATION POINT	482.9 ft	482.9 ft
AVERAGE MANNINGS 'N' VALUE	0.05	0.02
STORM FREQUENCY (YEAR)	100	
LOW LOSS RATE (Storm Events > 10 Years)	85%	
POINT RAIN FROM NOAA ATLAS	**14**	
1-HOUR	1.71 in	
3-HOUR	2.52 in	
6-HOUR	3.34 in	
24-HOUR	5.42 in	

BASIN CHARACTERISTICS:

ELEVATION	AREA
482.0 ft	152,923 sf
483.0 ft	157,470 sf
484.0 ft	162,073 sf
485.0 ft	166,733 sf

PERCOLATION RATE	1.0 in/hr
DRYWELL DATA	
NUMBER USED	0
PERCOLATION RATE	
LOWEST FLOWLINE ELEVATION	485.00 ft
LOWEST PAD ELEVATION	486.2 ft

RCFC & WCD HYDROLOGY MANUAL	SYNTHETIC UNIT HYDROGRAPH METHOD BASIC DATA CALCULATION FORM	PROJECT: PALM SPRINGS CC Job No.: 2152 BY: NB DATE: 1/17/14

PHYSICAL DATA

	UNDEVELOPED CONDITION	DEVELOPED CONDITION
[1] CONCENTRATION POINT	CATCH BASIN No. 2	CATCH BASIN No. 2
[2] AREA DESIGNATION		
[3] AREA - ACRES	63.98	63.98
[4] L-FEET	3896	3896
[5] L-MILES	0.738	0.738
[6] La-FEET	1948.00	1948.00
[7] La-MILES	0.369	0.369
[8] ELEVATION OF HEADWATER	520	520
[9] ELEVATION OF CONCENTRATION POINT	482.86	482.86
[10] H-FEET	37.14	37.14
[11] S-FEET/MILE	50.3	50.3
[12] S^0.5	7.09	7.09
[13] L*LCA/S^0.5	0.038	0.038
[14] AVERAGE MANNINGS 'N'	0.05	0.02
[15] LAG TIME-HOURS	0.35	0.14
[16] LAG TIME-MINUTES	20.9	8.3
[17] 100% OF LAG-MINUTES	20.9	8.3
[18] 200% OF LAG-MINUTES	41.7	16.7

RAINFALL DATA

[1] AMC	II
[2] FREQUENCY-YEARS	100
NOAA ATLAS	**14**
[3] STORM DURATION:	POINT RAIN
1-HOUR	1.71 in
3-HOUR	2.52 in
6-HOUR	3.34 in
24-HOUR	5.42 in

STORM EVENT SUMMARY

		UNDEVELOPED CONDITION				DEVELOPED CONDITION			
DURATION		1-HOUR	3-HOUR	6-HOUR	24-HOUR	1-HOUR	3-HOUR	6-HOUR	24-HOUR
EFFECTIVE RAIN	(in)	1.28	1.28	1.35	1.25	1.40	1.61	1.63	1.77
FLOOD VOLUME	(cu-ft)	297,336	297,718	313,876	290,543	325,821	374,254	379,559	411,451
	(acre-ft)	6.83	6.83	7.21	6.67	7.48	8.59	8.71	9.45
PEAK FLOW	(cfs)	N/A	132.25	117.07	23.69	N/A	140.16	124.99	30.50

STORM EVENT SUMMARY

DURATION		1-HOUR	3-HOUR	6-HOUR	24-HOUR
DEVELOPED CONDITION FLOOD VOLUME	(cu-ft)	325,821	374,254	379,559	**411,451**
TOTAL FLOOD VOLUME RETAINED	(cu-ft)	325,821	374,254	379,559	411,451
INCREMENTAL INCREASE IN FLOOD VOLUME	(cu-ft)	28,485	76,536	65,683	120,908
DIFFERENCE	(cu-ft)	297,336	297,718	313,876	290,543
TOTAL BASIN OUTFLOW	(cu-ft)	0	0	0	0
MAXIMUM WSEL	(ft)	483.99	**484.13**	484.02	483.62
DEPTH	(ft)	1.99	**2.13**	2.02	1.62
LOWEST FLOWLINE ELEVATION		485.00			
DIFFERENCE	(ft)	1.01	0.87	0.98	1.38
LOWEST PAD ELEVATION		486.20			
DIFFERENCE	(ft)	2.21	2.07	2.18	2.58
ESTIMATED TIME TO DEWATER BASIN Based on total Flood Volume & Average Percolation Rate	(days)	1.0	1.2	1.5	1.7

NOTE: PEAK FLOW FOR THE 1-HOUR STORM IS NOT REPRESENTATIVE. PER RCFCD THE 3-HOUR STORM PEAK DISCHARGES SHOULD NORMALLY COMPARE WELL WITH RATIONAL PEAKS.

RCFC & WCD HYDROLOGY MANUAL	SYNTHETIC UNIT HYDROGRAPH METHOD BASIC DATA CALCULATION FORM AMC II	PROJECT: PALM SPRINGS CC Job No.: 2152 BY: NB DATE: 1/17/14

AVERAGE ADJUSTED LOSS RATE - UNDEVELOPED CONDITIONS

SOIL GROUP [Plate C-1]	LAND USE	RI NUMBER [Plate E-6.1]	PERVIOUS AREA INFILTRATION RATE (in/hr) [Plate E-6.2]	DECIMAL PERCENT OF AREA IMPERVIOUS [Plate E-6.3]	ADJUSTED INFILTRATION RATE (in/hr)	AREA	AREA WEIGHTED AVERAGE	MAX AVERAGE ADJUSTED INFILTRATION RATE (in/hr)	LOW LOSS CONDITION	LOW LOSS RATE PER RCFC/2322 (in/hr)	MIN AVERAGE ADJUSTED INFILTRATION RATE (in/hr)
A	EXISTING OPEN BRUSH - POOR	62	0.45	5%	0.43	63.98	1.000	0.4298	UNDEVELOPED	0.9000	0.9000
					SUM	63.98	SUM	0.4298			0.9000

VARIABLE LOSS RATE CURVE (24-HOUR STORM ONLY)

Fm= 0.214875

C= 0.00398

Ft=C(24-(T/60))^1.55 = 0.00398 (24-(T/60))^1.55 + **0.21** in/hr

CONSTANT LOSS RATE (3 & 6 HOUR STORMS) = **0.4298** in/hr

LOW LOSS RATE = **0.8500** in/hr

Where:

T=Time in minutes. To get an average value for each unit time period, Use T=1/2 the unit time for the first time period, T=1 1/2 unit time for the second period, etc.

NOTE: Low loss rates established per RCFC/2322 (Dated: May-30-95)
For 2, 5 & 10 Year Storm Events
Undeveloped Condition: Low Loss = 90%
Developed Condition: Low Loss = 0.9 - (0.8 * %impervious)
Basin Site: Low Loss = 10%
For 100 Year Storm - Low Loss should be between 80% & 90% of the Rainfall Rate

RCFC & WCD HYDROLOGY MANUAL	SYNTHETIC UNIT HYDROGRAPH METHOD SHORTCUT METHOD UNDEVELOPED CONDITION 1-HOUR STORM	PROJECT: PALM SPRINGS CC Job No.: 2152 DATE BY: NB 1/17/14

UNIT HYDROGRAPH and EFFECTIVE RAIN CALCULATION FORM

DRAINAGE AREA-ACRES	63.98	
UNIT TIME-MINUTES	5	
LAG TIME - MINUTES	20.86	
UNIT TIME-PERCENT OF LAG	24.0	
TOTAL ADJUSTED STORM RAIN-INCHES	1.71	
CONSTANT LOSS RATE-in/hr		0.43
LOW LOSS RATE - PERCENT		85%

Unit Time Period	Time Minutes	Time Hours	Pattern Percent (Plate E-5.9)	Storm Rain in/hr	Loss Rate in/hr Max	Loss Rate in/hr Low	Effective Rain in/hr	Flood Hydrograph Flow cfs
1	5	0.08	3.6	0.74	0.43	0.63	0.31	19.93
2	10	0.17	4.2	0.86	0.43	0.73	0.43	27.88
3	15	0.25	4.4	0.90	0.43	0.77	0.47	30.52
4	20	0.33	4.6	0.94	0.43	0.80	0.51	33.17
5	25	0.42	5.0	1.03	0.43	0.87	0.60	38.47
6	30	0.50	5.6	1.15	0.43	0.98	0.72	46.41
7	35	0.58	6.4	1.31	0.43	1.12	0.88	57.00
8	40	0.67	8.1	1.66	0.43	1.41	1.23	79.50
9	45	0.75	13.1	2.69	0.43	2.28	2.26	145.70
10	50	0.83	34.5	7.08	0.43	6.02	6.65	**428.99**
11	55	0.92	6.7	1.37	0.43	1.17	0.95	60.97
12	60	1.00	3.8	0.78	0.43	0.66	0.35	22.58

EFFECTIVE RAIN & FLOOD VOLUMES SUMMARY

EFFECTIVE RAIN (in)	1.28
FLOOD VOLUME (acft)	6.83
FLOOD VOLUME (cuft)	297,336
PEAK FLOW RATE (cfs)	428.99

RCFC & WCD HYDROLOGY MANUAL	SYNTHETIC UNIT HYDROGRAPH METHOD SHORTCUT METHOD UNDEVELOPED CONDITION 3-HOUR STORM	PROJECT: PALM SPRINGS CC Job No.: 2152 DATE BY: NB 1/17/14

UNIT HYDROGRAPH and EFFECTIVE RAIN CALCULATION FORM

DRAINAGE AREA-ACRES	63.98	
UNIT TIME-MINUTES	5	
LAG TIME - MINUTES	20.86	
UNIT TIME-PERCENT OF LAG	24.0	
TOTAL ADJUSTED STORM RAIN-INCHES	2.52	
CONSTANT LOSS RATE-in/hr		0.43
LOW LOSS RATE - PERCENT		85%

Unit Time Period	Time Minutes	Time Hours	Pattern Percent (Plate E-5.9)	Storm Rain in/hr	Loss Rate in/hr Max	Loss Rate in/hr Low	Effective Rain in/hr	Flood Hydrograph Flow cfs
1	5	0.08	1.3	0.39	0.43	0.33	0.06	3.80
2	10	0.17	1.3	0.39	0.43	0.33	0.06	3.80
3	15	0.25	1.1	0.33	0.43	0.28	0.05	3.22
4	20	0.33	1.5	0.45	0.43	0.39	0.02	1.54
5	25	0.42	1.5	0.45	0.43	0.39	0.02	1.54
6	30	0.50	1.8	0.54	0.43	0.46	0.11	7.39
7	35	0.58	1.5	0.45	0.43	0.39	0.02	1.54
8	40	0.67	1.8	0.54	0.43	0.46	0.11	7.39
9	45	0.75	1.8	0.54	0.43	0.46	0.11	7.39
10	50	0.83	1.5	0.45	0.43	0.39	0.02	1.54
11	55	0.92	1.6	0.48	0.43	0.41	0.05	3.49
12	60	1.00	1.8	0.54	0.43	0.46	0.11	7.39
13	65	1.08	2.2	0.67	0.43	0.57	0.24	15.19
14	70	1.17	2.2	0.67	0.43	0.57	0.24	15.19
15	75	1.25	2.2	0.67	0.43	0.57	0.24	15.19
16	80	1.33	2.0	0.60	0.43	0.51	0.18	11.29
17	85	1.42	2.6	0.79	0.43	0.67	0.36	23.00
18	90	1.50	2.7	0.82	0.43	0.69	0.39	24.95
19	95	1.58	2.4	0.73	0.43	0.62	0.30	19.10
20	100	1.67	2.7	0.82	0.43	0.69	0.39	24.95
21	105	1.75	3.3	1.00	0.43	0.85	0.57	36.65
22	110	1.83	3.1	0.94	0.43	0.80	0.51	32.75
23	115	1.92	2.9	0.88	0.43	0.75	0.45	28.85
24	120	2.00	3.0	0.91	0.43	0.77	0.48	30.80
25	125	2.08	3.1	0.94	0.43	0.80	0.51	32.75
26	130	2.17	4.2	1.27	0.43	1.08	0.84	54.21
27	135	2.25	5.0	1.51	0.43	1.29	1.08	69.82
28	140	2.33	3.5	1.06	0.43	0.90	0.63	40.56
29	145	2.42	6.8	2.06	0.43	1.75	1.63	104.94
30	150	2.50	7.3	2.21	0.43	1.88	1.78	114.69
31	155	2.58	8.2	2.48	0.43	2.11	2.05	**132.25**
32	160	2.67	5.9	1.78	0.43	1.52	1.35	87.38
33	165	2.75	2.0	0.60	0.43	0.51	0.18	11.29
34	170	2.83	1.8	0.54	0.43	0.46	0.11	7.39
35	175	2.92	1.8	0.54	0.43	0.46	0.11	7.39
36	180	3.00	0.6	0.18	0.43	0.15	0.03	1.76

EFFECTIVE RAIN & FLOOD VOLUMES SUMMARY

EFFECTIVE RAIN (in)	1.28
FLOOD VOLUME (acft)	6.83
FLOOD VOLUME (cuft)	297,718
PEAK FLOW RATE (cfs)	132.25

RCFC & WCD HYDROLOGY MANUAL	SYNTHETIC UNIT HYDROGRAPH METHOD SHORTCUT METHOD UNDEVELOPED CONDITION 6-HOUR STORM	PROJECT: PALM SPRINGS CC Job No.: 2152 DATE BY: NB 1/17/14

UNIT HYDROGRAPH and EFFECTIVE RAIN CALCULATION FORM

DRAINAGE AREA-ACRES	63.98
UNIT TIME-MINUTES	5
LAG TIME - MINUTES	20.86
UNIT TIME-PERCENT OF LAG	24.0
TOTAL ADJUSTED STORM RAIN-INCHES	3.34
CONSTANT LOSS RATE-in/hr	0.430
LOW LOSS RATE - PERCENT	85%

Unit Time Period	Time Minutes	Time Hours	Pattern Percent (Plate E-5.9)	Storm Rain in/hr	Loss Rate in/hr Max	Loss Rate in/hr Low	Effective Rain in/hr	Flood Hydrograph Flow cfs
1	5	0.08	0.5	0.200	0.43	0.17	0.03	1.94
2	10	0.17	0.6	0.240	0.43	0.20	0.04	2.33
3	15	0.25	0.6	0.240	0.43	0.20	0.04	2.33
4	20	0.33	0.6	0.240	0.43	0.20	0.04	2.33
5	25	0.42	0.6	0.240	0.43	0.20	0.04	2.33
6	30	0.50	0.7	0.281	0.43	0.24	0.04	2.71
7	35	0.58	0.7	0.281	0.43	0.24	0.04	2.71
8	40	0.67	0.7	0.281	0.43	0.24	0.04	2.71
9	45	0.75	0.7	0.281	0.43	0.24	0.04	2.71
10	50	0.83	0.7	0.281	0.43	0.24	0.04	2.71
11	55	0.92	0.7	0.281	0.43	0.24	0.04	2.71
12	60	1.00	0.8	0.321	0.43	0.27	0.05	3.10
13	65	1.08	0.8	0.321	0.43	0.27	0.05	3.10
14	70	1.17	0.8	0.321	0.43	0.27	0.05	3.10
15	75	1.25	0.8	0.321	0.43	0.27	0.05	3.10
16	80	1.33	0.8	0.321	0.43	0.27	0.05	3.10
17	85	1.42	0.8	0.321	0.43	0.27	0.05	3.10
18	90	1.50	0.8	0.321	0.43	0.27	0.05	3.10
19	95	1.58	0.8	0.321	0.43	0.27	0.05	3.10
20	100	1.67	0.8	0.321	0.43	0.27	0.05	3.10
21	105	1.75	0.8	0.321	0.43	0.27	0.05	3.10
22	110	1.83	0.8	0.321	0.43	0.27	0.05	3.10
23	115	1.92	0.8	0.321	0.43	0.27	0.05	3.10
24	120	2.00	0.9	0.361	0.43	0.31	0.05	3.49
25	125	2.08	0.8	0.321	0.43	0.27	0.05	3.10
26	130	2.17	0.9	0.361	0.43	0.31	0.05	3.49
27	135	2.25	0.9	0.361	0.43	0.31	0.05	3.49
28	140	2.33	0.9	0.361	0.43	0.31	0.05	3.49
29	145	2.42	0.9	0.361	0.43	0.31	0.05	3.49
30	150	2.50	0.9	0.361	0.43	0.31	0.05	3.49
31	155	2.58	0.9	0.361	0.43	0.31	0.05	3.49
32	160	2.67	0.9	0.361	0.43	0.31	0.05	3.49
33	165	2.75	1.0	0.401	0.43	0.34	0.06	3.88
34	170	2.83	1.0	0.401	0.43	0.34	0.06	3.88
35	175	2.92	1.0	0.401	0.43	0.34	0.06	3.88
36	180	3.00	1.0	0.401	0.43	0.34	0.06	3.88
37	185	3.08	1.0	0.401	0.43	0.34	0.06	3.88
38	190	3.17	1.1	0.441	0.43	0.37	0.01	0.72
39	195	3.25	1.1	0.441	0.43	0.37	0.01	0.72
40	200	3.33	1.1	0.441	0.43	0.37	0.01	0.72
41	205	3.42	1.2	0.481	0.43	0.41	0.05	3.30
42	210	3.50	1.3	0.521	0.43	0.44	0.09	5.89
43	215	3.58	1.4	0.561	0.43	0.48	0.13	8.48
44	220	3.67	1.4	0.561	0.43	0.48	0.13	8.48
45	225	3.75	1.5	0.601	0.43	0.51	0.17	11.06
46	230	3.83	1.5	0.601	0.43	0.51	0.17	11.06
47	235	3.92	1.6	0.641	0.43	0.55	0.21	13.65
48	240	4.00	1.6	0.641	0.43	0.55	0.21	13.65
49	245	4.08	1.7	0.681	0.43	0.58	0.25	16.23
50	250	4.17	1.8	0.721	0.43	0.61	0.29	18.82

RCFC & WCD HYDROLOGY MANUAL	SYNTHETIC UNIT HYDROGRAPH METHOD SHORTCUT METHOD UNDEVELOPED CONDITION 6-HOUR STORM	PROJECT: PALM SPRINGS CC Job No.: 2152 DATE BY: NB 1/17/14

UNIT HYDROGRAPH and EFFECTIVE RAIN CALCULATION FORM

DRAINAGE AREA-ACRES	63.98
UNIT TIME-MINUTES	5
LAG TIME - MINUTES	20.86
UNIT TIME-PERCENT OF LAG	24.0
TOTAL ADJUSTED STORM RAIN-INCHES	3.34
CONSTANT LOSS RATE-in/hr	0.430
LOW LOSS RATE - PERCENT	85%

Unit Time Period	Time Minutes	Time Hours	Pattern Percent (Plate E-5.9)	Storm Rain in/hr	Loss Rate in/hr Max	Loss Rate in/hr Low	Effective Rain in/hr	Flood Hydrograph Flow cfs
51	255	4.25	1.9	0.762	0.43	0.65	0.33	21.40
52	260	4.33	2.0	0.802	0.43	0.68	0.37	23.99
53	265	4.42	2.1	0.842	0.43	0.72	0.41	26.58
54	270	4.50	2.1	0.842	0.43	0.72	0.41	26.58
55	275	4.58	2.2	0.882	0.43	0.75	0.45	29.16
56	280	4.67	2.3	0.922	0.43	0.78	0.49	31.75
57	285	4.75	2.4	0.962	0.43	0.82	0.53	34.33
58	290	4.83	2.4	0.962	0.43	0.82	0.53	34.33
59	295	4.92	2.5	1.002	0.43	0.85	0.57	36.92
60	300	5.00	2.6	1.042	0.43	0.89	0.61	39.50
61	305	5.08	3.1	1.242	0.43	1.06	0.81	52.43
62	310	5.17	3.6	1.443	0.43	1.23	1.01	65.36
63	315	5.25	3.9	1.563	0.43	1.33	1.13	73.12
64	320	5.33	4.2	1.683	0.43	1.43	1.25	80.87
65	325	5.42	4.7	1.884	0.43	1.60	1.45	93.80
66	330	5.50	5.6	2.244	0.43	1.91	1.81	**117.07**
67	335	5.58	1.9	0.762	0.43	0.65	0.33	21.40
68	340	5.67	0.9	0.361	0.43	0.31	0.05	3.49
69	345	5.75	0.6	0.240	0.43	0.20	0.04	2.33
70	350	5.83	0.5	0.200	0.43	0.17	0.03	1.94
71	355	5.92	0.3	0.120	0.43	0.10	0.02	1.16
72	360	6.00	0.2	0.080	0.43	0.07	0.01	0.78

EFFECTIVE RAIN & FLOOD VOLUMES SUMMARY

EFFECTIVE RAIN (in)	1.35
FLOOD VOLUME (acft)	7.21
FLOOD VOLUME (cuft)	313,876
PEAK FLOW RATE (cfs)	117.07

RCFC & WCD HYDROLOGY MANUAL	SYNTHETIC UNIT HYDROGRAPH METHOD SHORTCUT METHOD UNDEVELOPED CONDITION 24-HOUR STORM	PROJECT: PALM SPRINGS CC Job No.: 2152 DATE: BY: NB 1/17/14

UNIT HYDROGRAPH and EFFECTIVE RAIN CALCULATION FORM

DRAINAGE AREA-ACRES	63.980	CONSTANT LOSS RATE-in/hr	n/a
UNIT TIME-MINUTES	15	VARIABLE LOSS RATE (AVG) in/hr	0.4298
LAG TIME - MINUTES	20.86	MINIMUM LOSS RATE (for var. loss) - in/hr	0.215
UNIT TIME-PERCENT OF LAG	71.9	LOW LOSS RATE - DECIMAL	0.85
TOTAL ADJUSTED STORM RAIN-INCHES	5.42	C	0.00398

Unit Time Period	Time Minutes	Time Hours	Pattern Percent (Plate E-5.9)	Storm Rain in/hr	Loss Rate in/hr Max	Loss Rate in/hr Low	Effective Rain in/hr	Flood Hydrograph Flow cfs
1	15	0.25	0.2	0.043	0.759	0.037	0.007	0.42
2	30	0.50	0.3	0.065	0.750	0.055	0.010	0.63
3	45	0.75	0.3	0.065	0.741	0.055	0.010	0.63
4	60	1.00	0.4	0.087	0.733	0.074	0.013	0.84
5	75	1.25	0.3	0.065	0.724	0.055	0.010	0.63
6	90	1.50	0.3	0.065	0.715	0.055	0.010	0.63
7	105	1.75	0.3	0.065	0.707	0.055	0.010	0.63
8	120	2.00	0.4	0.087	0.698	0.074	0.013	0.84
9	135	2.25	0.4	0.087	0.690	0.074	0.013	0.84
10	150	2.50	0.4	0.087	0.682	0.074	0.013	0.84
11	165	2.75	0.5	0.108	0.673	0.092	0.016	1.05
12	180	3.00	0.5	0.108	0.665	0.092	0.016	1.05
13	195	3.25	0.5	0.108	0.657	0.092	0.016	1.05
14	210	3.50	0.5	0.108	0.648	0.092	0.016	1.05
15	225	3.75	0.5	0.108	0.640	0.092	0.016	1.05
16	240	4.00	0.6	0.130	0.632	0.111	0.020	1.26
17	255	4.25	0.6	0.130	0.624	0.111	0.020	1.26
18	270	4.50	0.7	0.152	0.616	0.129	0.023	1.47
19	285	4.75	0.7	0.152	0.608	0.129	0.023	1.47
20	300	5.00	0.8	0.173	0.601	0.147	0.026	1.68
21	315	5.25	0.6	0.130	0.593	0.111	0.020	1.26
22	330	5.50	0.7	0.152	0.585	0.129	0.023	1.47
23	345	5.75	0.8	0.173	0.577	0.147	0.026	1.68
24	360	6.00	0.8	0.173	0.570	0.147	0.026	1.68
25	375	6.25	0.9	0.195	0.562	0.166	0.029	1.89
26	390	6.50	0.9	0.195	0.555	0.166	0.029	1.89
27	405	6.75	1.0	0.217	0.547	0.184	0.033	2.10
28	420	7.00	1.0	0.217	0.540	0.184	0.033	2.10
29	435	7.25	1.0	0.217	0.533	0.184	0.033	2.10
30	450	7.50	1.1	0.238	0.525	0.203	0.036	2.31
31	465	7.75	1.2	0.260	0.518	0.221	0.039	2.52
32	480	8.00	1.3	0.282	0.511	0.240	0.042	2.73
33	495	8.25	1.5	0.325	0.504	0.276	0.049	3.15
34	510	8.50	1.5	0.325	0.497	0.276	0.049	3.15
35	525	8.75	1.6	0.347	0.490	0.295	0.052	3.36
36	540	9.00	1.7	0.369	0.483	0.313	0.055	3.57
37	555	9.25	1.9	0.412	0.476	0.350	0.062	3.99
38	570	9.50	2.0	0.434	0.469	0.369	0.065	4.20
39	585	9.75	2.1	0.455	0.463	0.387	0.068	4.41
40	600	10.00	2.2	0.477	0.456	0.405	0.021	1.35
41	615	10.25	1.5	0.325	0.449	0.276	0.049	3.15
42	630	10.50	1.5	0.325	0.443	0.276	0.049	3.15
43	645	10.75	2.0	0.434	0.436	0.369	0.065	4.20
44	660	11.00	2.0	0.434	0.430	0.369	0.004	0.23
45	675	11.25	1.9	0.412	0.424	0.350	0.062	3.99
46	690	11.50	1.9	0.412	0.418	0.350	0.062	3.99
47	705	11.75	1.7	0.369	0.411	0.313	0.055	3.57
48	720	12.00	1.8	0.390	0.405	0.332	0.059	3.78
49	735	12.25	2.5	0.542	0.399	0.461	0.143	9.22
50	750	12.50	2.6	0.564	0.393	0.479	0.171	11.00
51	765	12.75	2.8	0.607	0.387	0.516	0.220	14.18
52	780	13.00	2.9	0.629	0.381	0.534	0.247	15.95
53	795	13.25	3.4	0.737	0.376	0.627	0.361	23.32
54	810	13.50	3.4	0.737	0.370	0.627	0.367	**23.69**
55	825	13.75	2.3	0.499	0.364	0.424	0.134	8.66
56	840	14.00	2.3	0.499	0.359	0.424	0.140	9.02
57	855	14.25	2.7	0.585	0.353	0.498	0.232	14.97
58	870	14.50	2.6	0.564	0.348	0.479	0.216	13.92
59	885	14.75	2.6	0.564	0.343	0.479	0.221	14.26
60	900	15.00	2.5	0.542	0.337	0.461	0.205	13.20
61	915	15.25	2.4	0.520	0.332	0.442	0.188	12.14

RCFC & WCD HYDROLOGY MANUAL	SYNTHETIC UNIT HYDROGRAPH METHOD SHORTCUT METHOD UNDEVELOPED CONDITION 24-HOUR STORM	PROJECT: PALM SPRINGS CC Job No.: 2152 DATE: BY: NB 1/17/14

UNIT HYDROGRAPH and EFFECTIVE RAIN CALCULATION FORM

DRAINAGE AREA-ACRES	63.980	CONSTANT LOSS RATE-in/hr	n/a
UNIT TIME-MINUTES	15	VARIABLE LOSS RATE (AVG) in/hr	0.4298
LAG TIME - MINUTES	20.86	MINIMUM LOSS RATE (for var. loss) - in/hr	0.215
UNIT TIME-PERCENT OF LAG	71.9	LOW LOSS RATE - DECIMAL	0.85
TOTAL ADJUSTED STORM RAIN-INCHES	5.42	C	0.00398

Unit Time Period	Time Minutes	Time Hours	Pattern Percent (Plate E-5.9)	Storm Rain in/hr	Loss Rate in/hr Max	Loss Rate in/hr Low	Effective Rain in/hr	Flood Hydrograph Flow cfs
62	930	15.50	2.3	0.499	0.327	0.424	0.172	11.06
63	945	15.75	1.9	0.412	0.322	0.350	0.090	5.79
64	960	16.00	1.9	0.412	0.317	0.350	0.095	6.11
65	975	16.25	0.4	0.087	0.312	0.074	0.013	0.84
66	990	16.50	0.4	0.087	0.308	0.074	0.013	0.84
67	1005	16.75	0.3	0.065	0.303	0.055	0.010	0.63
68	1020	17.00	0.3	0.065	0.298	0.055	0.010	0.63
69	1035	17.25	0.5	0.108	0.294	0.092	0.016	1.05
70	1050	17.50	0.5	0.108	0.289	0.092	0.016	1.05
71	1065	17.75	0.5	0.108	0.285	0.092	0.016	1.05
72	1080	18.00	0.4	0.087	0.281	0.074	0.013	0.84
73	1095	18.25	0.4	0.087	0.277	0.074	0.013	0.84
74	1110	18.50	0.4	0.087	0.273	0.074	0.013	0.84
75	1125	18.75	0.3	0.065	0.269	0.055	0.010	0.63
76	1140	19.00	0.2	0.043	0.265	0.037	0.007	0.42
77	1155	19.25	0.3	0.065	0.261	0.055	0.010	0.63
78	1170	19.50	0.4	0.087	0.258	0.074	0.013	0.84
79	1185	19.75	0.3	0.065	0.254	0.055	0.010	0.63
80	1200	20.00	0.2	0.043	0.251	0.037	0.007	0.42
81	1215	20.25	0.3	0.065	0.247	0.055	0.010	0.63
82	1230	20.50	0.3	0.065	0.244	0.055	0.010	0.63
83	1245	20.75	0.3	0.065	0.241	0.055	0.010	0.63
84	1260	21.00	0.2	0.043	0.238	0.037	0.007	0.42
85	1275	21.25	0.3	0.065	0.235	0.055	0.010	0.63
86	1290	21.50	0.2	0.043	0.233	0.037	0.007	0.42
87	1305	21.75	0.3	0.065	0.230	0.055	0.010	0.63
88	1320	22.00	0.2	0.043	0.228	0.037	0.007	0.42
89	1335	22.25	0.3	0.065	0.225	0.055	0.010	0.63
90	1350	22.50	0.2	0.043	0.223	0.037	0.007	0.42
91	1365	22.75	0.2	0.043	0.221	0.037	0.007	0.42
92	1380	23.00	0.2	0.043	0.220	0.037	0.007	0.42
93	1395	23.25	0.2	0.043	0.218	0.037	0.007	0.42
94	1410	23.50	0.2	0.043	0.217	0.037	0.007	0.42
95	1425	23.75	0.2	0.043	0.216	0.037	0.007	0.42
96	1440	24.00	0.2	0.043	0.215	0.037	0.007	0.42

EFFECTIVE RAIN & FLOOD VOLUMES SUMMARY

EFFECTIVE RAIN (in)	1.25
FLOOD VOLUME (acft)	6.67
FLOOD VOLUME (cuft)	290,543
PEAK FLOW (cfs)	23.69

RCFC & WCD HYDROLOGY MANUAL	SYNTHETIC UNIT HYDROGRAPH METHOD BASIC DATA CALCULATION FORM AMC II	PROJECT: PALM SPRINGS CC Job No.: 2152 BY: NB DATE: 1/17/14

AVERAGE ADJUSTED LOSS RATE - DEVELOPED CONDITIONS

SOIL GROUP [Plate C-1]	LAND USE	RI NUMBER [Plate E-6.1]	PERVIOUS AREA INFILTRATION RATE (in/hr) [Plate E-6.2]	DECIMAL PERCENT OF AREA IMPERVIOUS [Plate E-6.3]	ADJUSTED INFILTRATION RATE (in/hr)	AREA	AREA WEIGHTED AVERAGE	MAX AVERAGE ADJUSTED INFILTRATION RATE (in/hr)	LOW LOSS CONDITION	LOW LOSS RATE PER RCFC/2322 (in/hr)	MIN AVERAGE ADJUSTED INFILTRATION RATE (in/hr)
A	MF - CONDIMINIUMS	32	0.74	65%	0.31	63.98	1.000	0.3071	DEVELOPED	0.3800	0.3800
					SUM	63.98	SUM	0.3071			0.3800

VARIABLE LOSS RATE CURVE (24-HOUR STORM ONLY)

Fm= 0.15355

C= 0.00284

Ft=C(24-(T/60))^1.55 = 0.00284 (24-(T/60))^1.55 + **0.15** in/hr

CONSTANT LOSS RATE (3 & 6 HOUR STORMS) = **0.3071** in/hr

LOW LOSS RATE = **0.8500** in/hr

Where:

T=Time in minutes. To get an average value for each unit time period, Use T=1/2 the unit time for the first time period, T=1 1/2 unit time for the second period, etc.

NOTE: Low loss rates established per RCFC/2322 (Dated: May-30-95)
For Storms Less than the 100 Year Event
Undeveloped Condition: Low Loss = 90%
Developed Condition: Low Loss = 0.9 - (0.8 * %impervious)
Basin Site: Low Loss = 10%
For 100 Year Storm - Low Loss should be between 80% & 90% of the Rainfall Rate

RCFC & WCD HYDROLOGY MANUAL	SYNTHETIC UNIT HYDROGRAPH METHOD SHORTCUT METHOD DEVELOPED CONDITIONS 1-HOUR STORM	PROJECT: PALM SPRINGS CC Job No.: 2152 DATE BY: NB 1/17/14

UNIT HYDROGRAPH and EFFECTIVE RAIN CALCULATION FORM

DRAINAGE AREA-ACRES	63.98	
UNIT TIME-MINUTES	5	
LAG TIME - MINUTES	20.86	
UNIT TIME-PERCENT OF LAG	24.0	
TOTAL ADJUSTED STORM RAIN-INCHES	1.71	
CONSTANT LOSS RATE-in/hr		0.31
LOW LOSS RATE - PERCENT		85%

Unit Time Period	Time Minutes	Time Hours	Pattern Percent (Plate E-5.9)	Storm Rain in/hr	Loss Rate in/hr Max	Loss Rate in/hr Low	Effective Rain in/hr	Flood Hydrograph Flow cfs
1	5	0.08	3.6	0.74	0.31	0.63	0.43	27.85
2	10	0.17	4.2	0.86	0.31	0.73	0.55	35.79
3	15	0.25	4.4	0.90	0.31	0.77	0.60	38.44
4	20	0.33	4.6	0.94	0.31	0.80	0.64	41.08
5	25	0.42	5.0	1.03	0.31	0.87	0.72	46.38
6	30	0.50	5.6	1.15	0.31	0.98	0.84	54.32
7	35	0.58	6.4	1.31	0.31	1.12	1.01	64.91
8	40	0.67	8.1	1.66	0.31	1.41	1.36	87.42
9	45	0.75	13.1	2.69	0.31	2.28	2.38	153.61
10	50	0.83	34.5	7.08	0.31	6.02	6.77	**436.90**
11	55	0.92	6.7	1.37	0.31	1.17	1.07	68.88
12	60	1.00	3.8	0.78	0.31	0.66	0.47	30.49

EFFECTIVE RAIN & FLOOD VOLUMES SUMMARY

EFFECTIVE RAIN (in)	1.40
FLOOD VOLUME (acft)	7.48
FLOOD VOLUME (cuft)	325,821
PEAK FLOW RATE (cfs)	436.90

RCFC & WCD HYDROLOGY MANUAL	SYNTHETIC UNIT HYDROGRAPH METHOD SHORTCUT METHOD DEVELOPED CONDITIONS 3-HOUR STORM	PROJECT: PALM SPRINGS CC Job No.: 2152 DATE BY: NB 1/17/14

UNIT HYDROGRAPH and EFFECTIVE RAIN CALCULATION FORM

DRAINAGE AREA-ACRES	63.98	
UNIT TIME-MINUTES	5	
LAG TIME - MINUTES	8.34	
UNIT TIME-PERCENT OF LAG	59.9	
TOTAL ADJUSTED STORM RAIN-INCHES	2.52	
CONSTANT LOSS RATE-in/hr		0.31
LOW LOSS RATE - PERCENT		85%

Unit Time Period	Time Minutes	Time Hours	Pattern Percent (Plate E-5.9)	Storm Rain in/hr	Loss Rate in/hr Max	Loss Rate in/hr Low	Effective Rain in/hr	Flood Hydrograph Flow cfs
1	5	0.08	1.3	0.39	0.31	0.33	0.09	5.55
2	10	0.17	1.3	0.39	0.31	0.33	0.09	5.55
3	15	0.25	1.1	0.33	0.31	0.28	0.03	1.65
4	20	0.33	1.5	0.45	0.31	0.39	0.15	9.45
5	25	0.42	1.5	0.45	0.31	0.39	0.15	9.45
6	30	0.50	1.8	0.54	0.31	0.46	0.24	15.30
7	35	0.58	1.5	0.45	0.31	0.39	0.15	9.45
8	40	0.67	1.8	0.54	0.31	0.46	0.24	15.30
9	45	0.75	1.8	0.54	0.31	0.46	0.24	15.30
10	50	0.83	1.5	0.45	0.31	0.39	0.15	9.45
11	55	0.92	1.6	0.48	0.31	0.41	0.18	11.40
12	60	1.00	1.8	0.54	0.31	0.46	0.24	15.30
13	65	1.08	2.2	0.67	0.31	0.57	0.36	23.11
14	70	1.17	2.2	0.67	0.31	0.57	0.36	23.11
15	75	1.25	2.2	0.67	0.31	0.57	0.36	23.11
16	80	1.33	2.0	0.60	0.31	0.51	0.30	19.21
17	85	1.42	2.6	0.79	0.31	0.67	0.48	30.91
18	90	1.50	2.7	0.82	0.31	0.69	0.51	32.86
19	95	1.58	2.4	0.73	0.31	0.62	0.42	27.01
20	100	1.67	2.7	0.82	0.31	0.69	0.51	32.86
21	105	1.75	3.3	1.00	0.31	0.85	0.69	44.57
22	110	1.83	3.1	0.94	0.31	0.80	0.63	40.67
23	115	1.92	2.9	0.88	0.31	0.75	0.57	36.76
24	120	2.00	3.0	0.91	0.31	0.77	0.60	38.71
25	125	2.08	3.1	0.94	0.31	0.80	0.63	40.67
26	130	2.17	4.2	1.27	0.31	1.08	0.96	62.13
27	135	2.25	5.0	1.51	0.31	1.29	1.20	77.73
28	140	2.33	3.5	1.06	0.31	0.90	0.75	48.47
29	145	2.42	6.8	2.06	0.31	1.75	1.75	112.85
30	150	2.50	7.3	2.21	0.31	1.88	1.90	122.60
31	155	2.58	8.2	2.48	0.31	2.11	2.17	**140.16**
32	160	2.67	5.9	1.78	0.31	1.52	1.48	95.29
33	165	2.75	2.0	0.60	0.31	0.51	0.30	19.21
34	170	2.83	1.8	0.54	0.31	0.46	0.24	15.30
35	175	2.92	1.8	0.54	0.31	0.46	0.24	15.30
36	180	3.00	0.6	0.18	0.31	0.15	0.03	1.76

EFFECTIVE RAIN & FLOOD VOLUMES SUMMARY

EFFECTIVE RAIN (in)	1.61
FLOOD VOLUME (acft)	8.59
FLOOD VOLUME (cuft)	374,254
PEAK FLOW RATE (cfs)	140.16

RCFC & WCD HYDROLOGY MANUAL	SYNTHETIC UNIT HYDROGRAPH METHOD SHORTCUT METHOD DEVELOPED CONDITIONS 6-HOUR STORM	PROJECT: PALM SPRINGS CC Job No.: 2152 DATE BY: NB 1/17/14

UNIT HYDROGRAPH and EFFECTIVE RAIN CALCULATION FORM

DRAINAGE AREA-ACRES	63.98
UNIT TIME-MINUTES	5
LAG TIME - MINUTES	8.34
UNIT TIME-PERCENT OF LAG	59.9
TOTAL ADJUSTED STORM RAIN-INCHES	3.34
CONSTANT LOSS RATE-in/hr	0.307
LOW LOSS RATE - PERCENT	85%

Unit Time Period	Time Minutes	Time Hours	Pattern Percent (Plate E-5.9)	Storm Rain in/hr	Loss Rate in/hr Max	Loss Rate in/hr Low	Effective Rain in/hr	Flood Hydrograph Flow cfs
1	5	0.08	0.5	0.200	0.31	0.17	0.03	1.94
2	10	0.17	0.6	0.240	0.31	0.20	0.04	2.33
3	15	0.25	0.6	0.240	0.31	0.20	0.04	2.33
4	20	0.33	0.6	0.240	0.31	0.20	0.04	2.33
5	25	0.42	0.6	0.240	0.31	0.20	0.04	2.33
6	30	0.50	0.7	0.281	0.31	0.24	0.04	2.71
7	35	0.58	0.7	0.281	0.31	0.24	0.04	2.71
8	40	0.67	0.7	0.281	0.31	0.24	0.04	2.71
9	45	0.75	0.7	0.281	0.31	0.24	0.04	2.71
10	50	0.83	0.7	0.281	0.31	0.24	0.04	2.71
11	55	0.92	0.7	0.281	0.31	0.24	0.04	2.71
12	60	1.00	0.8	0.321	0.31	0.27	0.01	0.87
13	65	1.08	0.8	0.321	0.31	0.27	0.01	0.87
14	70	1.17	0.8	0.321	0.31	0.27	0.01	0.87
15	75	1.25	0.8	0.321	0.31	0.27	0.01	0.87
16	80	1.33	0.8	0.321	0.31	0.27	0.01	0.87
17	85	1.42	0.8	0.321	0.31	0.27	0.01	0.87
18	90	1.50	0.8	0.321	0.31	0.27	0.01	0.87
19	95	1.58	0.8	0.321	0.31	0.27	0.01	0.87
20	100	1.67	0.8	0.321	0.31	0.27	0.01	0.87
21	105	1.75	0.8	0.321	0.31	0.27	0.01	0.87
22	110	1.83	0.8	0.321	0.31	0.27	0.01	0.87
23	115	1.92	0.8	0.321	0.31	0.27	0.01	0.87
24	120	2.00	0.9	0.361	0.31	0.31	0.05	3.46
25	125	2.08	0.8	0.321	0.31	0.27	0.01	0.87
26	130	2.17	0.9	0.361	0.31	0.31	0.05	3.46
27	135	2.25	0.9	0.361	0.31	0.31	0.05	3.46
28	140	2.33	0.9	0.361	0.31	0.31	0.05	3.46
29	145	2.42	0.9	0.361	0.31	0.31	0.05	3.46
30	150	2.50	0.9	0.361	0.31	0.31	0.05	3.46
31	155	2.58	0.9	0.361	0.31	0.31	0.05	3.46
32	160	2.67	0.9	0.361	0.31	0.31	0.05	3.46
33	165	2.75	1.0	0.401	0.31	0.34	0.09	6.04
34	170	2.83	1.0	0.401	0.31	0.34	0.09	6.04
35	175	2.92	1.0	0.401	0.31	0.34	0.09	6.04
36	180	3.00	1.0	0.401	0.31	0.34	0.09	6.04
37	185	3.08	1.0	0.401	0.31	0.34	0.09	6.04
38	190	3.17	1.1	0.441	0.31	0.37	0.13	8.63
39	195	3.25	1.1	0.441	0.31	0.37	0.13	8.63
40	200	3.33	1.1	0.441	0.31	0.37	0.13	8.63
41	205	3.42	1.2	0.481	0.31	0.41	0.17	11.22
42	210	3.50	1.3	0.521	0.31	0.44	0.21	13.80
43	215	3.58	1.4	0.561	0.31	0.48	0.25	16.39
44	220	3.67	1.4	0.561	0.31	0.48	0.25	16.39
45	225	3.75	1.5	0.601	0.31	0.51	0.29	18.97
46	230	3.83	1.5	0.601	0.31	0.51	0.29	18.97
47	235	3.92	1.6	0.641	0.31	0.55	0.33	21.56
48	240	4.00	1.6	0.641	0.31	0.55	0.33	21.56
49	245	4.08	1.7	0.681	0.31	0.58	0.37	24.14
50	250	4.17	1.8	0.721	0.31	0.61	0.41	26.73

RCFC & WCD HYDROLOGY MANUAL	SYNTHETIC UNIT HYDROGRAPH METHOD SHORTCUT METHOD DEVELOPED CONDITIONS 6-HOUR STORM	PROJECT: PALM SPRINGS CC Job No.: 2152 DATE BY: NB 1/17/14

UNIT HYDROGRAPH and EFFECTIVE RAIN CALCULATION FORM

DRAINAGE AREA-ACRES	63.98
UNIT TIME-MINUTES	5
LAG TIME - MINUTES	8.34
UNIT TIME-PERCENT OF LAG	59.9
TOTAL ADJUSTED STORM RAIN-INCHES	3.34
CONSTANT LOSS RATE-in/hr	0.307
LOW LOSS RATE - PERCENT	85%

Unit Time Period	Time Minutes	Time Hours	Pattern Percent (Plate E-5.9)	Storm Rain in/hr	Loss Rate in/hr Max	Loss Rate in/hr Low	Effective Rain in/hr	Flood Hydrograph Flow cfs
51	255	4.25	1.9	0.762	0.31	0.65	0.45	29.32
52	260	4.33	2.0	0.802	0.31	0.68	0.49	31.90
53	265	4.42	2.1	0.842	0.31	0.72	0.53	34.49
54	270	4.50	2.1	0.842	0.31	0.72	0.53	34.49
55	275	4.58	2.2	0.882	0.31	0.75	0.57	37.07
56	280	4.67	2.3	0.922	0.31	0.78	0.61	39.66
57	285	4.75	2.4	0.962	0.31	0.82	0.65	42.24
58	290	4.83	2.4	0.962	0.31	0.82	0.65	42.24
59	295	4.92	2.5	1.002	0.31	0.85	0.69	44.83
60	300	5.00	2.6	1.042	0.31	0.89	0.73	47.42
61	305	5.08	3.1	1.242	0.31	1.06	0.94	60.34
62	310	5.17	3.6	1.443	0.31	1.23	1.14	73.27
63	315	5.25	3.9	1.563	0.31	1.33	1.26	81.03
64	320	5.33	4.2	1.683	0.31	1.43	1.38	88.79
65	325	5.42	4.7	1.884	0.31	1.60	1.58	101.72
66	330	5.50	5.6	2.244	0.31	1.91	1.94	**124.99**
67	335	5.58	1.9	0.762	0.31	0.65	0.45	29.32
68	340	5.67	0.9	0.361	0.31	0.31	0.05	3.46
69	345	5.75	0.6	0.240	0.31	0.20	0.04	2.33
70	350	5.83	0.5	0.200	0.31	0.17	0.03	1.94
71	355	5.92	0.3	0.120	0.31	0.10	0.02	1.16
72	360	6.00	0.2	0.080	0.31	0.07	0.01	0.78

EFFECTIVE RAIN & FLOOD VOLUMES SUMMARY

EFFECTIVE RAIN (in)	1.63
FLOOD VOLUME (acft)	8.71
FLOOD VOLUME (cuft)	379,559
PEAK FLOW RATE (cfs)	124.99

RCFC & WCD HYDROLOGY MANUAL	SYNTHETIC UNIT HYDROGRAPH METHOD SHORTCUT METHOD DEVELOPED CONDITION 24-HOUR STORM	PROJECT: PALM SPRINGS CC Job No.: 2152 DATE: BY: NB 1/17/14

UNIT HYDROGRAPH and EFFECTIVE RAIN CALCULATION FORM

DRAINAGE AREA-ACRES	63.98	CONSTANT LOSS RATE-in/hr	n/a
UNIT TIME-MINUTES	15	VARIABLE LOSS RATE (AVG) in/hr	0.3071
LAG TIME - MINUTES	8.34	MINIMUM LOSS RATE (for var. loss) - in/hr	0.154
UNIT TIME-PERCENT OF LAG	179.8	LOW LOSS RATE - DECIMAL	0.85
TOTAL ADJUSTED STORM RAIN-INCHES	5.42	C	0.00284

Unit Time Period	Time Minutes	Time Hours	Pattern Percent (Plate E-5.9)	Storm Rain in/hr	Loss Rate in/hr Max	Loss Rate in/hr Low	Effective Rain in/hr	Flood Hydrograph Flow cfs
1	15	0.25	0.2	0.043	0.542	0.037	0.007	0.42
2	30	0.50	0.3	0.065	0.536	0.055	0.010	0.63
3	45	0.75	0.3	0.065	0.530	0.055	0.010	0.63
4	60	1.00	0.4	0.087	0.524	0.074	0.013	0.84
5	75	1.25	0.3	0.065	0.517	0.055	0.010	0.63
6	90	1.50	0.3	0.065	0.511	0.055	0.010	0.63
7	105	1.75	0.3	0.065	0.505	0.055	0.010	0.63
8	120	2.00	0.4	0.087	0.499	0.074	0.013	0.84
9	135	2.25	0.4	0.087	0.493	0.074	0.013	0.84
10	150	2.50	0.4	0.087	0.487	0.074	0.013	0.84
11	165	2.75	0.5	0.108	0.481	0.092	0.016	1.05
12	180	3.00	0.5	0.108	0.475	0.092	0.016	1.05
13	195	3.25	0.5	0.108	0.469	0.092	0.016	1.05
14	210	3.50	0.5	0.108	0.463	0.092	0.016	1.05
15	225	3.75	0.5	0.108	0.458	0.092	0.016	1.05
16	240	4.00	0.6	0.130	0.452	0.111	0.020	1.26
17	255	4.25	0.6	0.130	0.446	0.111	0.020	1.26
18	270	4.50	0.7	0.152	0.440	0.129	0.023	1.47
19	285	4.75	0.7	0.152	0.435	0.129	0.023	1.47
20	300	5.00	0.8	0.173	0.429	0.147	0.026	1.68
21	315	5.25	0.6	0.130	0.424	0.111	0.020	1.26
22	330	5.50	0.7	0.152	0.418	0.129	0.023	1.47
23	345	5.75	0.8	0.173	0.413	0.147	0.026	1.68
24	360	6.00	0.8	0.173	0.407	0.147	0.026	1.68
25	375	6.25	0.9	0.195	0.402	0.166	0.029	1.89
26	390	6.50	0.9	0.195	0.396	0.166	0.029	1.89
27	405	6.75	1.0	0.217	0.391	0.184	0.033	2.10
28	420	7.00	1.0	0.217	0.386	0.184	0.033	2.10
29	435	7.25	1.0	0.217	0.381	0.184	0.033	2.10
30	450	7.50	1.1	0.238	0.375	0.203	0.036	2.31
31	465	7.75	1.2	0.260	0.370	0.221	0.039	2.52
32	480	8.00	1.3	0.282	0.365	0.240	0.042	2.73
33	495	8.25	1.5	0.325	0.360	0.276	0.049	3.15
34	510	8.50	1.5	0.325	0.355	0.276	0.049	3.15
35	525	8.75	1.6	0.347	0.350	0.295	0.052	3.36
36	540	9.00	1.7	0.369	0.345	0.313	0.023	1.51
37	555	9.25	1.9	0.412	0.340	0.350	0.072	4.62
38	570	9.50	2.0	0.434	0.335	0.369	0.098	6.33
39	585	9.75	2.1	0.455	0.331	0.387	0.125	8.04
40	600	10.00	2.2	0.477	0.326	0.405	0.151	9.75
41	615	10.25	1.5	0.325	0.321	0.276	0.004	0.26
42	630	10.50	1.5	0.325	0.317	0.276	0.009	0.56
43	645	10.75	2.0	0.434	0.312	0.369	0.122	7.85
44	660	11.00	2.0	0.434	0.307	0.369	0.126	8.15
45	675	11.25	1.9	0.412	0.303	0.350	0.109	7.04
46	690	11.50	1.9	0.412	0.298	0.350	0.114	7.33
47	705	11.75	1.7	0.369	0.294	0.313	0.075	4.81
48	720	12.00	1.8	0.390	0.290	0.332	0.101	6.50
49	735	12.25	2.5	0.542	0.285	0.461	0.257	16.56
50	750	12.50	2.6	0.564	0.281	0.479	0.283	18.24
51	765	12.75	2.8	0.607	0.277	0.516	0.330	21.31
52	780	13.00	2.9	0.629	0.273	0.534	0.356	22.98
53	795	13.25	3.4	0.737	0.268	0.627	0.469	30.24
54	810	13.50	3.4	0.737	0.264	0.627	0.473	**30.50**
55	825	13.75	2.3	0.499	0.260	0.424	0.238	15.37
56	840	14.00	2.3	0.499	0.256	0.424	0.242	15.63
57	855	14.25	2.7	0.585	0.252	0.498	0.333	21.47
58	870	14.50	2.6	0.564	0.249	0.479	0.315	20.32
59	885	14.75	2.6	0.564	0.245	0.479	0.319	20.57
60	900	15.00	2.5	0.542	0.241	0.461	0.301	19.41
61	915	15.25	2.4	0.520	0.237	0.442	0.283	18.25

RCFC & WCD HYDROLOGY MANUAL	SYNTHETIC UNIT HYDROGRAPH METHOD SHORTCUT METHOD DEVELOPED CONDITION 24-HOUR STORM	PROJECT: PALM SPRINGS CC Job No.: 2152 DATE: BY: NB 1/17/14

UNIT HYDROGRAPH and EFFECTIVE RAIN CALCULATION FORM

DRAINAGE AREA-ACRES	63.98	CONSTANT LOSS RATE-in/hr	n/a
UNIT TIME-MINUTES	15	VARIABLE LOSS RATE (AVG) in/hr	0.3071
LAG TIME - MINUTES	8.34	MINIMUM LOSS RATE (for var. loss) - in/hr	0.154
UNIT TIME-PERCENT OF LAG	179.8	LOW LOSS RATE - DECIMAL	0.85
TOTAL ADJUSTED STORM RAIN-INCHES	5.42	C	0.00284

Unit Time Period	Time Minutes	Time Hours	Pattern Percent (Plate E-5.9)	Storm Rain in/hr	Loss Rate in/hr Max	Loss Rate in/hr Low	Effective Rain in/hr	Flood Hydrograph Flow cfs
62	930	15.50	2.3	0.499	0.234	0.424	0.265	17.09
63	945	15.75	1.9	0.412	0.230	0.350	0.182	11.72
64	960	16.00	1.9	0.412	0.227	0.350	0.185	11.95
65	975	16.25	0.4	0.087	0.223	0.074	0.013	0.84
66	990	16.50	0.4	0.087	0.220	0.074	0.013	0.84
67	1005	16.75	0.3	0.065	0.216	0.055	0.010	0.63
68	1020	17.00	0.3	0.065	0.213	0.055	0.010	0.63
69	1035	17.25	0.5	0.108	0.210	0.092	0.016	1.05
70	1050	17.50	0.5	0.108	0.207	0.092	0.016	1.05
71	1065	17.75	0.5	0.108	0.204	0.092	0.016	1.05
72	1080	18.00	0.4	0.087	0.201	0.074	0.013	0.84
73	1095	18.25	0.4	0.087	0.198	0.074	0.013	0.84
74	1110	18.50	0.4	0.087	0.195	0.074	0.013	0.84
75	1125	18.75	0.3	0.065	0.192	0.055	0.010	0.63
76	1140	19.00	0.2	0.043	0.189	0.037	0.007	0.42
77	1155	19.25	0.3	0.065	0.187	0.055	0.010	0.63
78	1170	19.50	0.4	0.087	0.184	0.074	0.013	0.84
79	1185	19.75	0.3	0.065	0.182	0.055	0.010	0.63
80	1200	20.00	0.2	0.043	0.179	0.037	0.007	0.42
81	1215	20.25	0.3	0.065	0.177	0.055	0.010	0.63
82	1230	20.50	0.3	0.065	0.174	0.055	0.010	0.63
83	1245	20.75	0.3	0.065	0.172	0.055	0.010	0.63
84	1260	21.00	0.2	0.043	0.170	0.037	0.007	0.42
85	1275	21.25	0.3	0.065	0.168	0.055	0.010	0.63
86	1290	21.50	0.2	0.043	0.166	0.037	0.007	0.42
87	1305	21.75	0.3	0.065	0.164	0.055	0.010	0.63
88	1320	22.00	0.2	0.043	0.163	0.037	0.007	0.42
89	1335	22.25	0.3	0.065	0.161	0.055	0.010	0.63
90	1350	22.50	0.2	0.043	0.160	0.037	0.007	0.42
91	1365	22.75	0.2	0.043	0.158	0.037	0.007	0.42
92	1380	23.00	0.2	0.043	0.157	0.037	0.007	0.42
93	1395	23.25	0.2	0.043	0.156	0.037	0.007	0.42
94	1410	23.50	0.2	0.043	0.155	0.037	0.007	0.42
95	1425	23.75	0.2	0.043	0.154	0.037	0.007	0.42
96	1440	24.00	0.2	0.043	0.154	0.037	0.007	0.42

EFFECTIVE RAIN & FLOOD VOLUMES SUMMARY

EFFECTIVE RAIN (in)	1.77
FLOOD VOLUME (acft)	9.45
FLOOD VOLUME (cuft)	411,451
PEAK FLOW (cfs)	30.50

RCFC & WCD
HYDROLOGY MANUAL

SYNTHETIC UNIT HYDROGRAPH METHOD

SHORTCUT METHOD

DEVELOPED CONDITIONS BASIN STAGE STORAGE - 1 HOUR STORM

DRAINAGE AREA-ACRES	63.98
UNIT TIME-MINUTES	5
LAG TIME - MINUTES	20.86
UNIT TIME-PERCENT OF LAG	24.0
TOTAL ADJUSTED STORM RAIN-INCHES	1.71

PROJECT:	PALM SPRINGS CC
DRAINAGE AREA	
CONCENTRATION POINT	CATCH BASIN No. 2
BASIN PERCOLATION RATE	1.0 in/hr
DRYWELLS	
NUMBER	0
DRYWELL PERCOLATION RATE	0.00 cfs

Unit Time Period	Time Minutes	Hours	Effective Rain in/hr	Flood Hydrograph Flow cfs	Volume In cu-ft	Basin Volume cu-ft	Basin Losses Percolation Area sf	Maximum Percolation cu-ft	Percolation Out cu-ft	Total in Basin cu-ft	ac-ft	Basin WSEL ft	Basin Outflow Volume Out cu-ft	Flow Out cfs
1	5	0.08	0.43	27.85	8,354	8,354	153,168	1,064	1,064	7,290	0.17	482.05	0	0.00
2	10	0.17	0.55	35.79	10,736	18,026	153,451	1,066	1,066	16,961	0.39	482.11	0	0.00
3	15	0.25	0.60	38.44	11,531	28,491	153,758	1,068	1,068	27,424	0.63	482.18	0	0.00
4	20	0.33	0.64	41.08	12,325	39,749	154,087	1,070	1,070	38,679	0.89	482.25	0	0.00
5	25	0.42	0.72	46.38	13,914	52,592	154,464	1,073	1,073	51,520	1.18	482.33	0	0.00
6	30	0.50	0.84	54.32	16,296	67,816	154,910	1,076	1,076	66,740	1.53	482.43	0	0.00
7	35	0.58	1.01	64.91	19,474	86,214	155,449	1,080	1,080	85,134	1.95	482.55	0	0.00
8	40	0.67	1.36	87.42	26,225	111,360	156,185	1,085	1,085	110,275	2.53	482.71	0	0.00
9	45	0.75	2.38	153.61	46,082	156,357	157,503	1,094	1,094	155,264	3.56	483.00	0	0.00
10	50	0.83	6.77	436.90	131,071	286,335	161,248	1,120	1,120	285,215	6.55	483.81	0	0.00
11	55	0.92	1.07	68.88	20,665	305,880	161,811	1,124	1,124	304,756	7.00	483.94	0	0.00
12	60	1.00	0.47	30.49	9,148	313,904	162,043	1,125	1,125	312,779	7.18	**483.99**	0	0.00

BASIN WORKSHEET SUMMARY

EFFECTIVE RAIN	1.40 in
FLOOD VOLUME	7.48 acft
	325,821 cuft
TOTAL VOLUME RETAINED	325,821 cuft
MAX WSEL	483.99 ft
PEAK FLOW RATE	436.90 cfs
AVERAGE PERCOLATION RATE	217.37 cf/min
TOTAL OUTFLOW	0 cuft
	0.00 cfs
MAXIMUM OUTFLOW	0 cuft
	0.00 cfs

RCFC & WCD
HYDROLOGY MANUAL

SYNTHETIC UNIT HYDROGRAPH METHOD

SHORTCUT METHOD

DEVELOPED CONDITIONS BASIN STAGE STORAGE - 3 HOUR STORM

DRAINAGE AREA-ACRES	63.98
UNIT TIME-MINUTES	5
LAG TIME - MINUTES	20.86
UNIT TIME-PERCENT OF LAG	24.0
TOTAL ADJUSTED STORM RAIN-INCHES	2.52

PROJECT:	PALM SPRINGS CC
DRAINAGE AREA	
CONCENTRATION POINT	CATCH BASIN No. 2
BASIN PERCOLATION RATE	1.0 in/hr
DRYWELLS	
NUMBER	0
DRYWELL PERCOLATION RATE	0.00 cfs

Unit Time Period	Time Minutes	Hours	Effective Rain in/hr	Flood Hydrograph Flow cfs	Volume In cu-ft	Basin Volume cu-ft	Basin Losses Percolation Area sf	Maximum Percolation cu-ft	Percolation Out cu-ft	Total in Basin cu-ft	ac-ft	Basin WSEL ft	Basin Outflow Volume Out cu-ft	Flow Out cfs
1	5	0.08	0.09	5.5	1,665	1,665	152,972	1,062	1,062	603	0.01	482.00	0	0.00
2	10	0.17	0.09	5.5	1,665	2,267	152,989	1,062	1,062	1,205	0.03	482.01	0	0.00
3	15	0.25	0.03	1.6	494	1,699	152,973	1,062	1,062	637	0.01	482.00	0	0.00
4	20	0.33	0.15	9.5	2,835	3,472	153,025	1,063	1,063	2,410	0.06	482.02	0	0.00
5	25	0.42	0.15	9.5	2,835	5,245	153,077	1,063	1,063	4,182	0.10	482.03	0	0.00
6	30	0.50	0.24	15.3	4,591	8,773	153,180	1,064	1,064	7,709	0.18	482.05	0	0.00
7	35	0.58	0.15	9.5	2,835	10,545	153,232	1,064	1,064	9,481	0.22	482.06	0	0.00
8	40	0.67	0.24	15.3	4,591	14,072	153,335	1,065	1,065	13,007	0.30	482.08	0	0.00
9	45	0.75	0.24	15.3	4,591	17,598	153,438	1,066	1,066	16,533	0.38	482.11	0	0.00
10	50	0.83	0.15	9.5	2,835	19,368	153,490	1,066	1,066	18,302	0.42	482.12	0	0.00
11	55	0.92	0.18	11.4	3,421	21,723	153,559	1,066	1,066	20,656	0.47	482.13	0	0.00
12	60	1.00	0.24	15.3	4,591	25,247	153,663	1,067	1,067	24,180	0.56	482.16	0	0.00
13	65	1.08	0.36	23.1	6,932	31,113	153,834	1,068	1,068	30,044	0.69	482.19	0	0.00
14	70	1.17	0.36	23.1	6,932	36,976	154,006	1,069	1,069	35,907	0.82	482.23	0	0.00
15	75	1.25	0.36	23.1	6,932	42,839	154,178	1,071	1,071	41,769	0.96	482.27	0	0.00
16	80	1.33	0.30	19.2	5,762	47,530	154,315	1,072	1,072	46,459	1.07	482.30	0	0.00
17	85	1.42	0.48	30.9	9,273	55,732	154,556	1,073	1,073	54,659	1.25	482.35	0	0.00
18	90	1.50	0.51	32.9	9,859	64,517	154,813	1,075	1,075	63,442	1.46	482.41	0	0.00
19	95	1.58	0.42	27.0	8,103	71,545	155,019	1,077	1,077	70,468	1.62	482.45	0	0.00
20	100	1.67	0.51	32.9	9,859	80,327	155,276	1,078	1,078	79,249	1.82	482.51	0	0.00
21	105	1.75	0.69	44.6	13,370	92,619	155,636	1,081	1,081	91,538	2.10	482.59	0	0.00
22	110	1.83	0.63	40.7	12,200	103,737	155,962	1,083	1,083	102,654	2.36	482.66	0	0.00
23	115	1.92	0.57	36.8	11,029	113,684	156,254	1,085	1,085	112,598	2.58	482.73	0	0.00
24	120	2.00	0.60	38.7	11,614	124,213	156,562	1,087	1,087	123,126	2.83	482.79	0	0.00
25	125	2.08	0.63	40.7	12,200	135,325	156,888	1,089	1,089	134,236	3.08	482.86	0	0.00
26	130	2.17	0.96	62.1	18,638	152,873	157,402	1,093	1,093	151,780	3.48	482.98	0	0.00
27	135	2.25	1.20	77.7	23,320	175,100	158,043	1,098	1,098	174,002	3.99	483.12	0	0.00
28	140	2.33	0.75	48.5	14,541	188,543	158,431	1,100	1,100	187,443	4.30	483.20	0	0.00
29	145	2.42	1.75	112.8	33,854	221,297	159,374	1,107	1,107	220,190	5.05	483.41	0	0.00
30	150	2.50	1.90	122.6	36,781	256,971	160,402	1,114	1,114	255,857	5.87	483.63	0	0.00
31	155	2.58	2.17	140.2	42,048	297,905	161,582	1,122	1,122	296,783	6.81	483.89	0	0.00
32	160	2.67	1.48	95.3	28,587	325,370	162,368	1,128	1,128	324,243	7.44	484.06	0	0.00
33	165	2.75	0.30	19.2	5,762	330,005	162,499	1,128	1,128	328,876	7.55	484.08	0	0.00
34	170	2.83	0.24	15.3	4,591	333,467	162,598	1,129	1,129	332,338	7.63	484.11	0	0.00
35	175	2.92	0.24	15.3	4,591	336,929	162,696	1,130	1,130	335,799	7.71	**484.13**	0	0.00
36	180	3.00	0.03	1.8	527	336,326	162,679	1,130	1,130	335,196	7.70	484.12	0	0.00

BASIN WORKSHEET SUMMARY

EFFECTIVE RAIN	1.61 in
FLOOD VOLUME	8.59 acft
	374,254 cuft
TOTAL VOLUME RETAINED	374,254 cuft
MAX WSEL	484.13 ft
PEAK FLOW RATE	140.16 cfs
AVERAGE PERCOLATION RATE	216.99 cf/min
TOTAL BASIN OUTFLOW	0 cuft
	0.00 cfs
MAXIMUM BASIN OUTFLOW	0 cuft
	0.00 cfs

RCFC & WCD
HYDROLOGY MANUAL

SYNTHETIC UNIT HYDROGRAPH METHOD

SHORTCUT METHOD

DEVELOPED CONDITION BASIN STAGE STORAGE - 6 HOUR STORM

PROJECT: PALM SPRINGS CC

1/17/14

DRAINAGE AREA-ACRES	63.98
UNIT TIME-MINUTES	5
LAG TIME - MINUTES	20.86
UNIT TIME-PERCENT OF LAG	24.0
TOTAL ADJUSTED STORM RAIN-INCHES	3.34

BASIN PERCOLATION RATE	1.0 in/hr
DRYWELLS	
NUMBER	0
DRYWELL PERCOLATION RATE	0.00 cfs

Unit Time Period	Time Minutes	Time Hours	Effective Rain in/hr	Flood Hydrograph Flow cfs	Volume In cu-ft	Basin Volume cu-ft	Basin Losses Percolation Area sf	Basin Losses Maximum Percolation cu-ft	Basin Losses Percolation Out cu-ft	Total in Basin cu-ft	Total in Basin ac-ft	Basin WSEL ft	Basin Outflow Volume Out cu-ft	Basin Outflow Flow Out cfs
1	5	0.08	0.03	1.94	582	582	152,940	1,062	582	0	0.00	482.00	0	0.00
2	10	0.17	0.04	2.33	698	698	152,943	1,062	698	0	0.00	482.00	0	0.00
3	15	0.25	0.04	2.33	698	698	152,943	1,062	698	0	0.00	482.00	0	0.00
4	20	0.33	0.04	2.33	698	698	152,943	1,062	698	0	0.00	482.00	0	0.00
5	25	0.42	0.04	2.33	698	698	152,943	1,062	698	0	0.00	482.00	0	0.00
6	30	0.50	0.04	2.71	814	814	152,947	1,062	814	0	0.00	482.00	0	0.00
7	35	0.58	0.04	2.71	814	814	152,947	1,062	814	0	0.00	482.00	0	0.00
8	40	0.67	0.04	2.71	814	814	152,947	1,062	814	0	0.00	482.00	0	0.00
9	45	0.75	0.04	2.71	814	814	152,947	1,062	814	0	0.00	482.00	0	0.00
10	50	0.83	0.04	2.71	814	814	152,947	1,062	814	0	0.00	482.00	0	0.00
11	55	0.92	0.04	2.71	814	814	152,947	1,062	814	0	0.00	482.00	0	0.00
12	60	1.00	0.01	0.87	262	262	152,931	1,062	262	0	0.00	482.00	0	0.00
13	65	1.08	0.01	0.87	262	262	152,931	1,062	262	0	0.00	482.00	0	0.00
14	70	1.17	0.01	0.87	262	262	152,931	1,062	262	0	0.00	482.00	0	0.00
15	75	1.25	0.01	0.87	262	262	152,931	1,062	262	0	0.00	482.00	0	0.00
16	80	1.33	0.01	0.87	262	262	152,931	1,062	262	0	0.00	482.00	0	0.00
17	85	1.42	0.01	0.87	262	262	152,931	1,062	262	0	0.00	482.00	0	0.00
18	90	1.50	0.01	0.87	262	262	152,931	1,062	262	0	0.00	482.00	0	0.00
19	95	1.58	0.01	0.87	262	262	152,931	1,062	262	0	0.00	482.00	0	0.00

RCFC & WCD
HYDROLOGY MANUAL

SYNTHETIC UNIT HYDROGRAPH METHOD

SHORTCUT METHOD

DEVELOPED CONDITION BASIN STAGE STORAGE - 6 HOUR STORM

PROJECT: PALM SPRINGS CC

1/17/14

DRAINAGE AREA-ACRES	63.98
UNIT TIME-MINUTES	5
LAG TIME - MINUTES	20.86
UNIT TIME-PERCENT OF LAG	24.0
TOTAL ADJUSTED STORM RAIN-INCHES	3.34

BASIN PERCOLATION RATE	1.0 in/hr
DRYWELLS	
NUMBER	0
DRYWELL PERCOLATION RATE	0.00 cfs

Unit Time Period	Time Minutes	Time Hours	Effective Rain in/hr	Flood Hydrograph Flow cfs	Volume In cu-ft	Basin Volume cu-ft	Basin Losses Percolation Area sf	Basin Losses Maximum Percolation cu-ft	Basin Losses Percolation Out cu-ft	Total in Basin cu-ft	Total in Basin ac-ft	Basin WSEL ft	Basin Outflow Volume Out cu-ft	Basin Outflow Flow Out cfs
20	100	1.67	0.01	0.87	262	262	152,931	1,062	262	0	0.00	482.00	0	0.00
21	105	1.75	0.01	0.87	262	262	152,931	1,062	262	0	0.00	482.00	0	0.00
22	110	1.83	0.01	0.87	262	262	152,931	1,062	262	0	0.00	482.00	0	0.00
23	115	1.92	0.01	0.87	262	262	152,931	1,062	262	0	0.00	482.00	0	0.00
24	120	2.00	0.05	3.46	1,038	1,038	152,953	1,062	1,038	0	0.00	482.00	0	0.00
25	125	2.08	0.01	0.87	262	262	152,931	1,062	262	0	0.00	482.00	0	0.00
26	130	2.17	0.05	3.46	1,038	1,038	152,953	1,062	1,038	0	0.00	482.00	0	0.00
27	135	2.25	0.05	3.46	1,038	1,038	152,953	1,062	1,038	0	0.00	482.00	0	0.00
28	140	2.33	0.05	3.46	1,038	1,038	152,953	1,062	1,038	0	0.00	482.00	0	0.00
29	145	2.42	0.05	3.46	1,038	1,038	152,953	1,062	1,038	0	0.00	482.00	0	0.00
30	150	2.50	0.05	3.46	1,038	1,038	152,953	1,062	1,038	0	0.00	482.00	0	0.00
31	155	2.58	0.05	3.46	1,038	1,038	152,953	1,062	1,038	0	0.00	482.00	0	0.00
32	160	2.67	0.05	3.46	1,038	1,038	152,953	1,062	1,038	0	0.00	482.00	0	0.00
33	165	2.75	0.09	6.04	1,813	1,813	152,976	1,062	1,062	751	0.02	482.00	0	0.00
34	170	2.83	0.09	6.04	1,813	2,565	152,998	1,062	1,062	1,502	0.03	482.01	0	0.00
35	175	2.92	0.09	6.04	1,813	3,316	153,020	1,063	1,063	2,253	0.05	482.01	0	0.00
36	180	3.00	0.09	6.04	1,813	4,066	153,042	1,063	1,063	3,004	0.07	482.02	0	0.00
37	185	3.08	0.09	6.04	1,813	4,817	153,064	1,063	1,063	3,754	0.09	482.02	0	0.00
38	190	3.17	0.13	8.63	2,589	6,343	153,109	1,063	1,063	5,280	0.12	482.03	0	0.00
39	195	3.25	0.13	8.63	2,589	7,869	153,153	1,064	1,064	6,806	0.16	482.04	0	0.00
40	200	3.33	0.13	8.63	2,589	9,395	153,198	1,064	1,064	8,331	0.19	482.05	0	0.00
41	205	3.42	0.17	11.22	3,365	11,696	153,266	1,064	1,064	10,632	0.24	482.07	0	0.00
42	210	3.50	0.21	13.80	4,141	14,772	153,356	1,065	1,065	13,707	0.31	482.09	0	0.00
43	215	3.58	0.25	16.39	4,916	18,623	153,469	1,066	1,066	17,558	0.40	482.11	0	0.00
44	220	3.67	0.25	16.39	4,916	22,474	153,581	1,067	1,067	21,408	0.49	482.14	0	0.00
45	225	3.75	0.29	18.97	5,692	27,100	153,717	1,067	1,067	26,032	0.60	482.17	0	0.00
46	230	3.83	0.29	18.97	5,692	31,724	153,852	1,068	1,068	30,656	0.70	482.20	0	0.00
47	235	3.92	0.33	21.56	6,468	37,123	154,011	1,070	1,070	36,054	0.83	482.23	0	0.00
48	240	4.00	0.33	21.56	6,468	42,522	154,169	1,071	1,071	41,451	0.95	482.27	0	0.00
49	245	4.08	0.37	24.14	7,243	48,694	154,350	1,072	1,072	47,623	1.09	482.31	0	0.00
50	250	4.17	0.41	26.73	8,019	55,642	154,553	1,073	1,073	54,568	1.25	482.35	0	0.00
51	255	4.25	0.45	29.32	8,795	63,363	154,779	1,075	1,075	62,288	1.43	482.40	0	0.00
52	260	4.33	0.49	31.90	9,571	71,859	155,028	1,077	1,077	70,782	1.62	482.46	0	0.00
53	265	4.42	0.53	34.49	10,346	81,129	155,300	1,078	1,078	80,050	1.84	482.52	0	0.00
54	270	4.50	0.53	34.49	10,346	90,396	155,571	1,080	1,080	89,316	2.05	482.58	0	0.00

RCFC & WCD
HYDROLOGY MANUAL

SYNTHETIC UNIT HYDROGRAPH METHOD

SHORTCUT METHOD

DEVELOPED CONDITION BASIN STAGE STORAGE - 6 HOUR STORM

PROJECT: PALM SPRINGS CC

1/17/14

DRAINAGE AREA-ACRES	63.98
UNIT TIME-MINUTES	5
LAG TIME - MINUTES	20.86
UNIT TIME-PERCENT OF LAG	24.0
TOTAL ADJUSTED STORM RAIN-INCHES	3.34

BASIN PERCOLATION RATE	1.0 in/hr
DRYWELLS	
NUMBER	0
DRYWELL PERCOLATION RATE	0.00 cfs

Unit Time Period	Time Minutes	Time Hours	Effective Rain in/hr	Flood Hydrograph Flow cfs	Volume In cu-ft	Basin Volume cu-ft	Basin Losses Percolation Area sf	Basin Losses Maximum Percolation cu-ft	Basin Losses Percolation Out cu-ft	Total in Basin cu-ft	Total in Basin ac-ft	Basin WSEL ft	Basin Outflow Volume Out cu-ft	Basin Outflow Flow Out cfs
55	275	4.58	0.57	37.07	11,122	100,438	155,866	1,082	1,082	99,356	2.28	482.64	0	0.00
56	280	4.67	0.61	39.66	11,898	111,253	156,182	1,085	1,085	110,169	2.53	482.71	0	0.00
57	285	4.75	0.65	42.24	12,673	122,842	156,522	1,087	1,087	121,755	2.80	482.78	0	0.00
58	290	4.83	0.65	42.24	12,673	134,429	156,861	1,089	1,089	133,339	3.06	482.86	0	0.00
59	295	4.92	0.69	44.83	13,449	146,788	157,223	1,092	1,092	145,697	3.34	482.94	0	0.00
60	300	5.00	0.73	47.42	14,225	159,921	157,606	1,094	1,094	158,827	3.65	483.02	0	0.00
61	305	5.08	0.94	60.34	18,103	176,930	158,096	1,098	1,098	175,832	4.04	483.13	0	0.00
62	310	5.17	1.14	73.27	21,982	197,814	158,698	1,102	1,102	196,712	4.52	483.26	0	0.00
63	315	5.25	1.26	81.03	24,309	221,021	159,366	1,107	1,107	219,915	5.05	483.41	0	0.00
64	320	5.33	1.38	88.79	26,636	246,551	160,102	1,112	1,112	245,439	5.63	483.56	0	0.00
65	325	5.42	1.58	101.72	30,515	275,954	160,949	1,118	1,118	274,836	6.31	483.75	0	0.00
66	330	5.50	1.94	124.99	37,496	312,332	161,997	1,125	1,125	311,207	7.14	483.98	0	0.00
67	335	5.58	0.45	29.32	8,795	320,002	162,216	1,126	1,126	318,875	7.32	**484.02**	0	0.00
68	340	5.67	0.05	3.46	1,038	319,913	162,213	1,126	1,126	318,787	7.32	484.02	0	0.00
69	345	5.75	0.04	2.33	698	319,485	162,201	1,126	1,126	318,358	7.31	484.02	0	0.00
70	350	5.83	0.03	1.94	582	318,940	162,186	1,126	1,126	317,814	7.30	484.02	0	0.00
71	355	5.92	0.02	1.16	349	318,163	162,164	1,126	1,126	317,037	7.28	484.01	0	0.00
72	360	6.00	0.01	0.78	233	317,270	162,138	1,126	1,126	316,144	7.26	484.01	0	0.00

BASIN WORKSHEET SUMMARY

EFFECTIVE RAIN	1.63 in
FLOOD VOLUME	8.70 acft
	378,977 cuft
TOTAL VOLUME RETAINED	378,977 cuft
MAX WSEL	484.02 ft
PEAK FLOW RATE	124.99 cfs
AVERAGE PERCOLATION RATE	176.15 cf/min
TOTAL OUTFLOW	0 cuft
	0.00 cfs
MAXIMUM OUTFLOW	0 cuft
	0.00 cfs

RCFC & WCD
HYDROLOGY MANUAL

SYNTHETIC UNIT HYDROGRAPH METHOD

SHORTCUT METHOD

DEVELOPED CONDITIONS BASIN STAGE STORAGE - 24 HOUR STORM

DRAINAGE AREA-ACRES	63.98
UNIT TIME-MINUTES	15
LAG TIME - MINUTES	20.86
UNIT TIME-PERCENT OF LAG	71.9
TOTAL ADJUSTED STORM RAIN-INCHES	5.42

PROJECT:	PALM SPRINGS CC
DRAINAGE AREA	
CONCENTRATION POINT	CATCH BASIN No. 2
BASIN PERCOLATION RATE	1.0 in/hr
DRYWELLS	
NUMBER	0
DRYWELL PERCOLATION RATE	0.00 cfs

Unit Time Period	Time Minutes	Time Hours	Effective Rain in/hr	Flood Hydrograph Flow cfs	Volume In cu-ft	Basin Volume cu-ft	Basin Losses Percolation Area sf	Basin Losses Maximum Percolation cu-ft	Basin Losses Percolation Out cu-ft	Total in Basin cu-ft	Total in Basin ac-ft	Basin WSEL ft	Basin Outflow Volume Out cu-ft	Basin Outflow Flow Out cfs
1	15	0.25	0.007	0.4	378	378	152,934	3,186	378	0	0.00	482.00	0	0.00
2	30	0.50	0.010	0.6	566	566	152,939	3,186	566	0	0.00	482.00	0	0.00
3	45	0.75	0.010	0.6	566	566	152,939	3,186	566	0	0.00	482.00	0	0.00
4	60	1.00	0.013	0.8	755	755	152,945	3,186	755	0	0.00	482.00	0	0.00
5	75	1.25	0.010	0.6	566	566	152,939	3,186	566	0	0.00	482.00	0	0.00
6	90	1.50	0.010	0.6	566	566	152,939	3,186	566	0	0.00	482.00	0	0.00
7	105	1.75	0.010	0.6	566	566	152,939	3,186	566	0	0.00	482.00	0	0.00
8	120	2.00	0.013	0.8	755	755	152,945	3,186	755	0	0.00	482.00	0	0.00
9	135	2.25	0.013	0.8	755	755	152,945	3,186	755	0	0.00	482.00	0	0.00
10	150	2.50	0.013	0.8	755	755	152,945	3,186	755	0	0.00	482.00	0	0.00
11	165	2.75	0.016	1.0	944	944	152,951	3,186	944	0	0.00	482.00	0	0.00
12	180	3.00	0.016	1.0	944	944	152,951	3,186	944	0	0.00	482.00	0	0.00
13	195	3.25	0.016	1.0	944	944	152,951	3,186	944	0	0.00	482.00	0	0.00
14	210	3.50	0.016	1.0	944	944	152,951	3,186	944	0	0.00	482.00	0	0.00
15	225	3.75	0.016	1.0	944	944	152,951	3,186	944	0	0.00	482.00	0	0.00
16	240	4.00	0.020	1.3	1,133	1,133	152,956	3,187	1,133	0	0.00	482.00	0	0.00
17	255	4.25	0.020	1.3	1,133	1,133	152,956	3,187	1,133	0	0.00	482.00	0	0.00
18	270	4.50	0.023	1.5	1,322	1,322	152,962	3,187	1,322	0	0.00	482.00	0	0.00
19	285	4.75	0.023	1.5	1,322	1,322	152,962	3,187	1,322	0	0.00	482.00	0	0.00
20	300	5.00	0.026	1.7	1,511	1,511	152,967	3,187	1,511	0	0.00	482.00	0	0.00
21	315	5.25	0.020	1.3	1,133	1,133	152,956	3,187	1,133	0	0.00	482.00	0	0.00
22	330	5.50	0.023	1.5	1,322	1,322	152,962	3,187	1,322	0	0.00	482.00	0	0.00
23	345	5.75	0.026	1.7	1,511	1,511	152,967	3,187	1,511	0	0.00	482.00	0	0.00
24	360	6.00	0.026	1.7	1,511	1,511	152,967	3,187	1,511	0	0.00	482.00	0	0.00
25	375	6.25	0.029	1.9	1,699	1,699	152,973	3,187	1,699	0	0.00	482.00	0	0.00
26	390	6.50	0.029	1.9	1,699	1,699	152,973	3,187	1,699	0	0.00	482.00	0	0.00
27	405	6.75	0.033	2.1	1,888	1,888	152,978	3,187	1,888	0	0.00	482.00	0	0.00
28	420	7.00	0.033	2.1	1,888	1,888	152,978	3,187	1,888	0	0.00	482.00	0	0.00
29	435	7.25	0.033	2.1	1,888	1,888	152,978	3,187	1,888	0	0.00	482.00	0	0.00
30	450	7.50	0.036	2.3	2,077	2,077	152,984	3,187	2,077	0	0.00	482.00	0	0.00
31	465	7.75	0.039	2.5	2,266	2,266	152,989	3,187	2,266	0	0.00	482.00	0	0.00
32	480	8.00	0.042	2.7	2,455	2,455	152,995	3,187	2,455	0	0.00	482.00	0	0.00
33	495	8.25	0.049	3.1	2,832	2,832	153,006	3,188	2,832	0	0.00	482.00	0	0.00
34	510	8.50	0.049	3.1	2,832	2,832	153,006	3,188	2,832	0	0.00	482.00	0	0.00
35	525	8.75	0.052	3.4	3,021	3,021	153,011	3,188	3,021	0	0.00	482.00	0	0.00
36	540	9.00	0.023	1.5	1,360	1,360	152,963	3,187	1,360	0	0.00	482.00	0	0.00
37	555	9.25	0.072	4.6	4,161	4,161	153,045	3,188	3,188	972	0.02	482.01	0	0.00
38	570	9.50	0.098	6.3	5,701	6,673	153,118	3,190	3,190	3,483	0.08	482.02	0	0.00
39	585	9.75	0.125	8.0	7,238	10,721	153,237	3,192	3,192	7,529	0.17	482.05	0	0.00
40	600	10.00	0.151	9.7	8,773	16,301	153,400	3,196	3,196	13,105	0.30	482.08	0	0.00
41	615	10.25	0.004	0.3	234	13,339	153,314	3,194	3,194	10,145	0.23	482.07	0	0.00
42	630	10.50	0.009	0.6	505	10,650	153,235	3,192	3,192	7,458	0.17	482.05	0	0.00
43	645	10.75	0.122	7.9	7,066	14,524	153,348	3,195	3,195	11,329	0.26	482.07	0	0.00
44	660	11.00	0.126	8.1	7,331	18,661	153,470	3,197	3,197	15,463	0.35	482.10	0	0.00
45	675	11.25	0.109	7.0	6,335	21,798	153,562	3,199	3,199	18,599	0.43	482.12	0	0.00

RCFC & WCD
HYDROLOGY MANUAL

SYNTHETIC UNIT HYDROGRAPH METHOD

SHORTCUT METHOD

DEVELOPED CONDITIONS BASIN STAGE STORAGE - 24 HOUR STORM

DRAINAGE AREA-ACRES	63.98
UNIT TIME-MINUTES	15
LAG TIME - MINUTES	20.86
UNIT TIME-PERCENT OF LAG	71.9
TOTAL ADJUSTED STORM RAIN-INCHES	5.42

PROJECT:	PALM SPRINGS CC
DRAINAGE AREA	
CONCENTRATION POINT	CATCH BASIN No. 2
BASIN PERCOLATION RATE	1.0 in/hr
DRYWELLS	
NUMBER	0
DRYWELL PERCOLATION RATE	0.00 cfs

Unit Time Period	Time Minutes	Time Hours	Effective Rain in/hr	Flood Hydrograph Flow cfs	Volume In cu-ft	Basin Volume cu-ft	Basin Losses Percolation Area sf	Basin Losses Maximum Percolation cu-ft	Basin Losses Percolation Out cu-ft	Total in Basin cu-ft	Total in Basin ac-ft	Basin WSEL ft	Basin Outflow Volume Out cu-ft	Basin Outflow Flow Out cfs
46	690	11.50	0.114	7.3	6,594	25,193	153,661	3,201	3,201	21,992	0.50	482.14	0	0.00
47	705	11.75	0.075	4.8	4,333	26,325	153,694	3,202	3,202	23,123	0.53	482.15	0	0.00
48	720	12.00	0.101	6.5	5,846	28,969	153,772	3,204	3,204	25,765	0.59	482.17	0	0.00
49	735	12.25	0.257	16.6	14,908	40,674	154,115	3,211	3,211	37,463	0.86	482.24	0	0.00
50	750	12.50	0.283	18.2	16,415	53,878	154,501	3,219	3,219	50,659	1.16	482.33	0	0.00
51	765	12.75	0.330	21.3	19,178	69,837	154,969	3,229	3,229	66,608	1.53	482.43	0	0.00
52	780	13.00	0.356	23.0	20,679	87,287	155,480	3,239	3,239	84,048	1.93	482.54	0	0.00
53	795	13.25	0.469	30.2	27,212	111,260	156,183	3,254	3,254	108,006	2.48	482.70	0	0.00
54	810	13.50	0.473	30.5	27,448	135,454	156,891	3,269	3,269	132,186	3.03	482.85	0	0.00
55	825	13.75	0.238	15.4	13,835	146,020	157,201	3,275	3,275	142,745	3.28	482.92	0	0.00
56	840	14.00	0.242	15.6	14,065	156,810	157,516	3,282	3,282	153,529	3.52	482.99	0	0.00
57	855	14.25	0.333	21.5	19,327	172,855	157,979	3,291	3,291	169,564	3.89	483.09	0	0.00
58	870	14.50	0.315	20.3	18,292	187,856	158,411	3,300	3,300	184,556	4.24	483.18	0	0.00
59	885	14.75	0.319	20.6	18,513	203,069	158,849	3,309	3,309	199,759	4.59	483.28	0	0.00
60	900	15.00	0.301	19.4	17,471	217,231	159,257	3,318	3,318	213,913	4.91	483.37	0	0.00
61	915	15.25	0.283	18.3	16,427	230,340	159,635	3,326	3,326	227,014	5.21	483.45	0	0.00
62	930	15.50	0.265	17.1	15,379	242,393	159,982	3,333	3,333	239,060	5.49	483.52	0	0.00
63	945	15.75	0.182	11.7	10,551	249,611	160,190	3,337	3,337	246,274	5.65	483.57	0	0.00
64	960	16.00	0.185	12.0	10,756	257,029	160,404	3,342	3,342	253,688	5.82	**483.62**	0	0.00
65	975	16.25	0.013	0.8	755	254,443	160,329	3,340	3,340	251,103	5.76	483.60	0	0.00
66	990	16.50	0.013	0.8	755	251,858	160,255	3,339	3,339	248,519	5.71	483.58	0	0.00
67	1005	16.75	0.010	0.6	566	249,086	160,175	3,337	3,337	245,749	5.64	483.57	0	0.00
68	1020	17.00	0.010	0.6	566	246,315	160,095	3,335	3,335	242,980	5.58	483.55	0	0.00
69	1035	17.25	0.016	1.0	944	243,924	160,026	3,334	3,334	240,590	5.52	483.53	0	0.00
70	1050	17.50	0.016	1.0	944	241,534	159,957	3,332	3,332	238,202	5.47	483.52	0	0.00
71	1065	17.75	0.016	1.0	944	239,146	159,889	3,331	3,331	235,815	5.41	483.50	0	0.00
72	1080	18.00	0.013	0.8	755	236,570	159,814	3,329	3,329	233,241	5.35	483.49	0	0.00
73	1095	18.25	0.013	0.8	755	233,996	159,740	3,328	3,328	230,668	5.30	483.47	0	0.00
74	1110	18.50	0.013	0.8	755	231,423	159,666	3,326	3,326	228,097	5.24	483.46	0	0.00
75	1125	18.75	0.010	0.6	566	228,663	159,587	3,325	3,325	225,339	5.17	483.44	0	0.00
76	1140	19.00	0.007	0.4	378	225,716	159,502	3,323	3,323	222,393	5.11	483.42	0	0.00
77	1155	19.25	0.010	0.6	566	222,960	159,422	3,321	3,321	219,638	5.04	483.40	0	0.00
78	1170	19.50	0.013	0.8	755	220,394	159,348	3,320	3,320	217,074	4.98	483.39	0	0.00
79	1185	19.75	0.010	0.6	566	217,640	159,269	3,318	3,318	214,322	4.92	483.37	0	0.00
80	1200	20.00	0.007	0.4	378	214,700	159,184	3,316	3,316	211,384	4.85	483.35	0	0.00
81	1215	20.25	0.010	0.6	566	211,950	159,105	3,315	3,315	208,635	4.79	483.33	0	0.00
82	1230	20.50	0.010	0.6	566	209,202	159,026	3,313	3,313	205,889	4.73	483.32	0	0.00
83	1245	20.75	0.010	0.6	566	206,455	158,947	3,311	3,311	203,144	4.66	483.30	0	0.00
84	1260	21.00	0.007	0.4	378	203,521	158,862	3,310	3,310	200,212	4.60	483.28	0	0.00
85	1275	21.25	0.010	0.6	566	200,778	158,783	3,308	3,308	197,470	4.53	483.26	0	0.00
86	1290	21.50	0.007	0.4	378	197,848	158,699	3,306	3,306	194,542	4.47	483.25	0	0.00
87	1305	21.75	0.010	0.6	566	195,108	158,620	3,305	3,305	191,804	4.40	483.23	0	0.00
88	1320	22.00	0.007	0.4	378	192,181	158,535	3,303	3,303	188,878	4.34	483.21	0	0.00
89	1335	22.25	0.010	0.6	566	189,445	158,457	3,301	3,301	186,144	4.27	483.19	0	0.00
90	1350	22.50	0.007	0.4	378	186,521	158,372	3,299	3,299	183,222	4.21	483.18	0	0.00

RCFC & WCD
HYDROLOGY MANUAL

SYNTHETIC UNIT HYDROGRAPH METHOD
SHORTCUT METHOD
DEVELOPED CONDITIONS BASIN STAGE STORAGE - 24 HOUR STORM

DRAINAGE AREA-ACRES	63.98
UNIT TIME-MINUTES	15
LAG TIME - MINUTES	20.86
UNIT TIME-PERCENT OF LAG	71.9
TOTAL ADJUSTED STORM RAIN-INCHES	5.42

PROJECT:	PALM SPRINGS CC
DRAINAGE AREA	
CONCENTRATION POINT	CATCH BASIN No. 2
BASIN PERCOLATION RATE	1.0 in/hr
DRYWELLS	
NUMBER	0
DRYWELL PERCOLATION RATE	0.00 cfs

Unit Time Period	Time Minutes	Time Hours	Effective Rain in/hr	Flood Hydrograph Flow cfs	Volume In cu-ft	Basin Volume cu-ft	Basin Losses Percolation Area sf	Basin Losses Maximum Percolation cu-ft	Basin Losses Percolation Out cu-ft	Total in Basin cu-ft	Total in Basin ac-ft	Basin WSEL ft	Basin Outflow Volume Out cu-ft	Basin Outflow Flow Out cfs
91	1365	22.75	0.007	0.4	378	183,600	158,288	3,298	3,298	180,302	4.14	483.16	0	0.00
92	1380	23.00	0.007	0.4	378	180,680	158,204	3,296	3,296	177,384	4.07	483.14	0	0.00
93	1395	23.25	0.007	0.4	378	177,761	158,120	3,294	3,294	174,467	4.01	483.12	0	0.00
94	1410	23.50	0.007	0.4	378	174,845	158,036	3,292	3,292	171,552	3.94	483.10	0	0.00
95	1425	23.75	0.007	0.4	378	171,930	157,952	3,291	3,291	168,639	3.87	483.08	0	0.00
96	1440	24.00	0.007	0.4	378	169,017	157,868	3,289	3,289	165,728	3.80	483.07	0	0.00

BASIN WORKSHEET SUMMARY

EFFECTIVE RAIN	1.77 in
FLOOD VOLUME	9.45 acft 411,451 cuft
TOTAL VOLUME RETAINED	411,451 cuft
MAX WSEL	483.62 ft
PEAK FLOW RATE	30.50 cfs
AVERAGE PERCOLATION RATE	170.64 cf/min
TOTAL OUTFLOW	0 cuft 0.00 cfs
MAXIMUM OUTFLOW	0 cuft 0.00 cfs

BASIN VOLUME WORKSHEET

PROECT PALM SPRINGS CC
JOB No. 2152

BASIN CHARACTERISTICS

CONTOUR ELEVATION	DEPTH		AREA		VOLUME		
	INCR (ft)	TOTAL (ft)	INCR (sf)	TOTAL (sf)	INCR (cuft)	TOTAL (cuft)	TOTAL (acre-ft)
482	0	0		152,923	0	0	0.00
483	1	1	4,547	157,470	155,191	155,191	3.56
484	1	2	4,603	162,073	159,766	314,956	7.23
485	1	3	4,660	166,733	164,397	479,354	11.00

WHERE: $$V = \frac{1}{3}(E_1 - E_2)\left(A_1 + A_2 + \sqrt{A_1 A_2}\right)$$

APPENDIX I

Storm Drain Pipe Diameter Worksheet

Diameters of Pipes in Inches, from the Manning Formula with n=0.013 (Rounded Up to Common Pipe Sizes)

Q	PIPE SLOPE																												
(cfs)	0.1%	0.2%	0.3%	0.4%	0.5%	0.6%	0.7%	0.8%	0.9%	1.0%	1.1%	1.2%	1.3%	1.4%	1.5%	1.6%	1.7%	1.8%	1.9%	2.0%	2.5%	3.0%	4.0%	5.0%	6.0%	7.0%	8.0%	9.0%	10.0%
0.1	6	6	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
0.2	8	6	6	6	6	6	6	6	6	6	6	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
0.3	8	8	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	4	4	4	4	4	4	4	4	4
0.4	12	8	8	8	8	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	4	4	4	4	4	4
0.5	12	8	8	8	8	8	8	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	4	4	4	4
0.6	12	12	8	8	8	8	8	8	8	8	8	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	4
0.7	12	12	12	8	8	8	8	8	8	8	8	8	8	8	8	6	6	6	6	6	6	6	6	6	6	6	6	6	6
0.8	12	12	12	12	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	6	6	6	6	6	6	6	6
0.9	12	12	12	12	12	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	6	6	6	6	6	6	6
1.0	12	12	12	12	12	12	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	6	6	6	6	6	6
1.1	12	12	12	12	12	12	12	12	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	6	6	6	6	6	6
1.2	15	12	12	12	12	12	12	12	12	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	6	6	6	6	6
1.3	15	12	12	12	12	12	12	12	12	12	12	8	8	8	8	8	8	8	8	8	8	8	8	8	6	6	6	6	6
1.4	15	12	12	12	12	12	12	12	12	12	12	12	12	8	8	8	8	8	8	8	8	8	8	8	8	6	6	6	6
1.5	15	12	12	12	12	12	12	12	12	12	12	12	12	12	12	8	8	8	8	8	8	8	8	8	8	8	6	6	6
1.6	15	15	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	8	8	8	8	8	8	8	8	8	8	6	6
1.7	15	15	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	8	8	8	8	8	8	8	8	8	6
1.8	15	15	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	8	8	8	8	8	8	8	8	8
1.9	15	15	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	8	8	8	8	8	8	8	8	8
2.0	15	15	15	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	8	8	8	8	8	8	8	8
2.1	18	15	15	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	8	8	8	8	8	8	8
2.2	18	15	15	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	8	8	8	8	8	8	8
2.3	18	15	15	15	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	8	8	8	8	8	8	8
2.4	18	15	15	15	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	8	8	8	8	8	8	8
2.5	18	15	15	15	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	8	8	8	8	8	8
2.6	18	15	15	15	15	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	8	8	8	8	8	8
2.7	18	15	15	15	15	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	8	8	8	8	8
2.8	18	15	15	15	15	15	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	8	8	8	8	8
2.9	18	18	15	15	15	15	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	8	8	8	8	8
3.0	18	18	15	15	15	15	15	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	8	8	8	8
3.1	18	18	15	15	15	15	15	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	8	8	8	8
3.2	18	18	15	15	15	15	15	15	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	8	8	8
3.3	18	18	15	15	15	15	15	15	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	8	8	8
3.4	24	18	15	15	15	15	15	15	15	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	8	8	8
3.5	24	18	15	15	15	15	15	15	15	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	8	8
3.6	24	18	18	15	15	15	15	15	15	15	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	8	8
3.7	24	18	18	15	15	15	15	15	15	15	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	8
3.8	24	18	18	15	15	15	15	15	15	15	15	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	8
3.9	24	18	18	15	15	15	15	15	15	15	15	15	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
4.0	24	18	18	15	15	15	15	15	15	15	15	15	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
4.1	24	18	18	18	15	15	15	15	15	15	15	15	15	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
4.2	24	18	18	18	15	15	15	15	15	15	15	15	15	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
4.3	24	18	18	18	15	15	15	15	15	15	15	15	15	15	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
4.4	24	18	18	18	15	15	15	15	15	15	15	15	15	15	15	12	12	12	12	12	12	12	12	12	12	12	12	12	12
4.5	24	18	18	18	15	15	15	15	15	15	15	15	15	15	15	12	12	12	12	12	12	12	12	12	12	12	12	12	12
4.6	24	18	18	18	18	15	15	15	15	15	15	15	15	15	15	15	12	12	12	12	12	12	12	12	12	12	12	12	12
4.7	24	24	18	18	18	15	15	15	15	15	15	15	15	15	15	15	15	12	12	12	12	12	12	12	12	12	12	12	12
4.8	24	24	18	18	18	15	15	15	15	15	15	15	15	15	15	15	15	15	12	12	12	12	12	12	12	12	12	12	12
4.9	24	24	18	18	18	15	15	15	15	15	15	15	15	15	15	15	15	15	15	12	12	12	12	12	12	12	12	12	12
5.0	24	24	18	18	18	18	15	15	15	15	15	15	15	15	15	15	15	15	15	12	12	12	12	12	12	12	12	12	12
5.1	24	24	18	18	18	18	15	15	15	15	15	15	15	15	15	15	15	15	15	15	12	12	12	12	12	12	12	12	12
5.2	24	24	18	18	18	18	15	15	15	15	15	15	15	15	15	15	15	15	15	15	12	12	12	12	12	12	12	12	12
5.3	24	24	18	18	18	18	15	15	15	15	15	15	15	15	15	15	15	15	15	15	12	12	12	12	12	12	12	12	12
5.4	24	24	18	18	18	18	15	15	15	15	15	15	15	15	15	15	15	15	15	15	12	12	12	12	12	12	12	12	12
5.5	24	24	18	18	18	18	18	15	15	15	15	15	15	15	15	15	15	15	15	15	12	12	12	12	12	12	12	12	12
5.6	24	24	18	18	18	18	18	15	15	15	15	15	15	15	15	15	15	15	15	15	12	12	12	12	12	12	12	12	12
5.7	24	24	18	18	18	18	18	15	15	15	15	15	15	15	15	15	15	15	15	15	15	12	12	12	12	12	12	12	12
5.8	24	24	24	18	18	18	18	18	15	15	15	15	15	15	15	15	15	15	15	15	15	12	12	12	12	12	12	12	12
5.9	24	24	24	18	18	18	18	18	15	15	15	15	15	15	15	15	15	15	15	15	15	12	12	12	12	12	12	12	12
6.0	24	24	24	18	18	18	18	18	15	15	15	15	15	15	15	15	15	15	15	15	15	12	12	12	12	12	12	12	12
6.1	24	24	24	18	18	18	18	18	15	15	15	15	15	15	15	15	15	15	15	15	15	12	12	12	12	12	12	12	12
6.2	24	24	24	18	18	18	18	18	18	15	15	15	15	15	15	15	15	15	15	15	15	15	12	12	12	12	12	12	12
6.3	24	24	24	18	18	18	18	18	18	15	15	15	15	15	15	15	15	15	15	15	15	15	12	12	12	12	12	12	12
6.4	24	24	24	18	18	18	18	18	18	15	15	15	15	15	15	15	15	15	15	15	15	15	12	12	12	12	12	12	12
6.5	24	24	24	18	18	18	18	18	18	18	15	15	15	15	15	15	15	15	15	15	15	15	12	12	12	12	12	12	12
6.6	24	24	24	18	18	18	18	18	18	18	15	15	15	15	15	15	15	15	15	15	15	15	12	12	12	12	12	12	12
6.7	24	24	24	24	18	18	18	18	18	18	15	15	15	15	15	15	15	15	15	15	15	15	12	12	12	12	12	12	12
6.8	24	24	24	24	18	18	18	18	18	18	18	15	15	15	15	15	15	15	15	15	15	15	12	12	12	12	12	12	12

Diameters of Pipes in Inches, from the Manning Formula with n=0.013 (Rounded Up to Common Pipe Sizes)

Q	PIPE SLOPE																												
(cfs)	0.1%	0.2%	0.3%	0.4%	0.5%	0.6%	0.7%	0.8%	0.9%	1.0%	1.1%	1.2%	1.3%	1.4%	1.5%	1.6%	1.7%	1.8%	1.9%	2.0%	2.5%	3.0%	4.0%	5.0%	6.0%	7.0%	8.0%	9.0%	10.0%
6.9	24	24	24	24	18	18	18	18	18	18	18	15	15	15	15	15	15	15	15	15	15	15	12	12	12	12	12	12	12
7.0	24	24	24	24	18	18	18	18	18	18	18	15	15	15	15	15	15	15	15	15	15	15	12	12	12	12	12	12	12
7.1	24	24	24	24	18	18	18	18	18	18	18	18	15	15	15	15	15	15	15	15	15	15	12	12	12	12	12	12	12
7.2	30	24	24	24	18	18	18	18	18	18	18	18	15	15	15	15	15	15	15	15	15	15	15	12	12	12	12	12	12
7.3	30	24	24	24	18	18	18	18	18	18	18	18	15	15	15	15	15	15	15	15	15	15	15	12	12	12	12	12	12
7.4	30	24	24	24	18	18	18	18	18	18	18	18	18	15	15	15	15	15	15	15	15	15	15	12	12	12	12	12	12
7.5	30	24	24	24	24	18	18	18	18	18	18	18	18	15	15	15	15	15	15	15	15	15	15	12	12	12	12	12	12
7.6	30	24	24	24	24	18	18	18	18	18	18	18	18	15	15	15	15	15	15	15	15	15	15	12	12	12	12	12	12
7.7	30	24	24	24	24	18	18	18	18	18	18	18	18	18	15	15	15	15	15	15	15	15	15	12	12	12	12	12	12
7.8	30	24	24	24	24	18	18	18	18	18	18	18	18	18	15	15	15	15	15	15	15	15	15	12	12	12	12	12	12
7.9	30	24	24	24	24	18	18	18	18	18	18	18	18	18	15	15	15	15	15	15	15	15	15	12	12	12	12	12	12
8.0	30	24	24	24	24	18	18	18	18	18	18	18	18	18	18	15	15	15	15	15	15	15	15	15	12	12	12	12	12
8.1	30	24	24	24	24	18	18	18	18	18	18	18	18	18	18	15	15	15	15	15	15	15	15	15	12	12	12	12	12
8.2	30	24	24	24	24	24	18	18	18	18	18	18	18	18	18	18	15	15	15	15	15	15	15	15	12	12	12	12	12
8.3	30	24	24	24	24	24	18	18	18	18	18	18	18	18	18	18	15	15	15	15	15	15	15	15	12	12	12	12	12
8.4	30	24	24	24	24	24	18	18	18	18	18	18	18	18	18	18	15	15	15	15	15	15	15	15	12	12	12	12	12
8.5	30	24	24	24	24	24	18	18	18	18	18	18	18	18	18	18	18	15	15	15	15	15	15	15	12	12	12	12	12
8.6	30	24	24	24	24	24	18	18	18	18	18	18	18	18	18	18	18	15	15	15	15	15	15	15	12	12	12	12	12
8.7	30	24	24	24	24	24	18	18	18	18	18	18	18	18	18	18	18	18	15	15	15	15	15	15	12	12	12	12	12
8.8	30	24	24	24	24	24	24	18	18	18	18	18	18	18	18	18	18	18	15	15	15	15	15	15	15	12	12	12	12
8.9	30	24	24	24	24	24	24	18	18	18	18	18	18	18	18	18	18	18	18	15	15	15	15	15	15	12	12	12	12
9.0	30	24	24	24	24	24	24	18	18	18	18	18	18	18	18	18	18	18	18	15	15	15	15	15	15	12	12	12	12
9.1	30	24	24	24	24	24	24	18	18	18	18	18	18	18	18	18	18	18	18	15	15	15	15	15	15	12	12	12	12
9.2	30	24	24	24	24	24	24	18	18	18	18	18	18	18	18	18	18	18	18	18	15	15	15	15	15	12	12	12	12
9.3	30	24	24	24	24	24	24	18	18	18	18	18	18	18	18	18	18	18	18	18	15	15	15	15	15	12	12	12	12
9.4	30	24	24	24	24	24	24	24	18	18	18	18	18	18	18	18	18	18	18	18	15	15	15	15	15	12	12	12	12
9.5	30	24	24	24	24	24	24	24	18	18	18	18	18	18	18	18	18	18	18	18	15	15	15	15	15	15	12	12	12
9.6	30	24	24	24	24	24	24	24	18	18	18	18	18	18	18	18	18	18	18	18	15	15	15	15	15	15	12	12	12
9.7	30	24	24	24	24	24	24	24	18	18	18	18	18	18	18	18	18	18	18	18	15	15	15	15	15	15	12	12	12
9.8	30	24	24	24	24	24	24	24	18	18	18	18	18	18	18	18	18	18	18	18	15	15	15	15	15	15	12	12	12
9.9	30	24	24	24	24	24	24	24	18	18	18	18	18	18	18	18	18	18	18	18	15	15	15	15	15	15	12	12	12
10.0	30	24	24	24	24	24	24	24	24	18	18	18	18	18	18	18	18	18	18	18	15	15	15	15	15	15	12	12	12
11.0	30	30	24	24	24	24	24	24	24	24	18	18	18	18	18	18	18	18	18	18	18	15	15	15	15	15	15	15	12
12.0	30	30	24	24	24	24	24	24	24	24	24	24	24	18	18	18	18	18	18	18	18	18	15	15	15	15	15	15	15
13.0	36	30	30	24	24	24	24	24	24	24	24	24	24	24	24	18	18	18	18	18	18	18	15	15	15	15	15	15	15
14.0	36	30	30	24	24	24	24	24	24	24	24	24	24	24	24	24	24	18	18	18	18	18	18	15	15	15	15	15	15
15.0	36	30	30	30	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	18	18	18	18	15	15	15	15	15
16.0	36	30	30	30	30	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	18	18	18	18	18	15	15	15	15
17.0	36	30	30	30	30	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	18	18	18	18	15	15	15	15
18.0	36	30	30	30	30	30	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	18	18	18	18	18	15	15	15
19.0	36	36	30	30	30	30	30	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	18	18	18	18	18	15	15
20.0	36	36	30	30	30	30	30	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	18	18	18	18	18	18	15
21.0	36	36	30	30	30	30	30	30	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	18	18	18	18	18	18
22.0	42	36	30	30	30	30	30	30	30	24	24	24	24	24	24	24	24	24	24	24	24	24	24	18	18	18	18	18	18
23.0	42	36	36	30	30	30	30	30	30	30	24	24	24	24	24	24	24	24	24	24	24	24	24	18	18	18	18	18	18
24.0	42	36	36	30	30	30	30	30	30	30	30	24	24	24	24	24	24	24	24	24	24	24	24	24	18	18	18	18	18
25.0	42	36	36	30	30	30	30	30	30	30	30	30	24	24	24	24	24	24	24	24	24	24	24	24	18	18	18	18	18
26.0	42	36	36	36	30	30	30	30	30	30	30	30	30	24	24	24	24	24	24	24	24	24	24	24	24	18	18	18	18
27.0	42	36	36	36	30	30	30	30	30	30	30	30	30	30	24	24	24	24	24	24	24	24	24	24	24	18	18	18	18
28.0	42	36	36	36	30	30	30	30	30	30	30	30	30	30	30	24	24	24	24	24	24	24	24	24	24	24	18	18	18
29.0	42	36	36	36	36	30	30	30	30	30	30	30	30	30	30	30	24	24	24	24	24	24	24	24	24	24	18	18	18
30.0	42	42	36	36	36	30	30	30	30	30	30	30	30	30	30	30	30	24	24	24	24	24	24	24	24	24	24	18	18
31.0	42	42	36	36	36	30	30	30	30	30	30	30	30	30	30	30	30	30	24	24	24	24	24	24	24	24	24	18	18
32.0	48	42	36	36	36	36	30	30	30	30	30	30	30	30	30	30	30	30	30	30	24	24	24	24	24	24	24	24	18
33.0	48	42	36	36	36	36	30	30	30	30	30	30	30	30	30	30	30	30	30	30	24	24	24	24	24	24	24	24	18
34.0	48	42	36	36	36	36	30	30	30	30	30	30	30	30	30	30	30	30	30	30	24	24	24	24	24	24	24	24	24
35.0	48	42	36	36	36	36	36	30	30	30	30	30	30	30	30	30	30	30	30	30	24	24	24	24	24	24	24	24	24
36.0	48	42	36	36	36	36	36	30	30	30	30	30	30	30	30	30	30	30	30	30	30	24	24	24	24	24	24	24	24
37.0	48	42	42	36	36	36	36	36	30	30	30	30	30	30	30	30	30	30	30	30	30	24	24	24	24	24	24	24	24
38.0	48	42	42	36	36	36	36	36	30	30	30	30	30	30	30	30	30	30	30	30	30	24	24	24	24	24	24	24	24
39.0	48	42	42	36	36	36	36	36	36	30	30	30	30	30	30	30	30	30	30	30	30	24	24	24	24	24	24	24	24
40.0	48	42	42	36	36	36	36	36	36	30	30	30	30	30	30	30	30	30	30	30	30	30	24	24	24	24	24	24	24
41.0	48	42	42	36	36	36	36	36	36	36	30	30	30	30	30	30	30	30	30	30	30	30	24	24	24	24	24	24	24
42.0	48	42	42	36	36	36	36	36	36	36	30	30	30	30	30	30	30	30	30	30	30	30	24	24	24	24	24	24	24
43.0	48	42	42	42	36	36	36	36	36	36	36	30	30	30	30	30	30	30	30	30	30	30	24	24	24	24	24	24	24
44.0	48	42	42	42	36	36	36	36	36	36	36	30	30	30	30	30	30	30	30	30	30	30	24	24	24	24	24	24	24
45.0	48	48	42	42	36	36	36	36	36	36	36	36	30	30	30	30	30	30	30	30	30	30	24	24	24	24	24	24	24
46.0	54	48	42	42	36	36	36	36	36	36	36	36	30	30	30	30	30	30	30	30	30	30	30	24	24	24	24	24	24

Diameters of Pipes in Inches, from the Manning Formula with n=0.013 (Rounded Up to Common Pipe Sizes)

Q	PIPE SLOPE																												
(cfs)	0.1%	0.2%	0.3%	0.4%	0.5%	0.6%	0.7%	0.8%	0.9%	1.0%	1.1%	1.2%	1.3%	1.4%	1.5%	1.6%	1.7%	1.8%	1.9%	2.0%	2.5%	3.0%	4.0%	5.0%	6.0%	7.0%	8.0%	9.0%	10.0%
47.0	54	48	42	42	36	36	36	36	36	36	36	36	36	30	30	30	30	30	30	30	30	30	30	24	24	24	24	24	24
48.0	54	48	42	42	42	36	36	36	36	36	36	36	36	30	30	30	30	30	30	30	30	30	30	24	24	24	24	24	24
49.0	54	48	42	42	42	36	36	36	36	36	36	36	36	36	30	30	30	30	30	30	30	30	30	24	24	24	24	24	24
50.0	54	48	42	42	42	36	36	36	36	36	36	36	36	36	30	30	30	30	30	30	30	30	30	24	24	24	24	24	24
55.0	54	48	42	42	42	42	36	36	36	36	36	36	36	36	36	36	36	36	30	30	30	30	30	30	24	24	24	24	24
60.0	54	48	48	42	42	42	42	42	36	36	36	36	36	36	36	36	36	36	36	36	30	30	30	30	30	30	24	24	24
65.0	60	54	48	48	42	42	42	42	42	36	36	36	36	36	36	36	36	36	36	36	36	30	30	30	30	30	30	24	24
70.0	60	54	48	48	42	42	42	42	42	42	42	36	36	36	36	36	36	36	36	36	36	30	30	30	30	30	30	30	24
75.0	60	54	48	48	48	42	42	42	42	42	42	42	36	36	36	36	36	36	36	36	36	36	30	30	30	30	30	30	30
80.0	60	54	54	48	48	48	42	42	42	42	42	42	42	42	36	36	36	36	36	36	36	36	30	30	30	30	30	30	30
85.0	66	54	54	48	48	48	48	42	42	42	42	42	42	42	42	42	36	36	36	36	36	36	36	30	30	30	30	30	30
90.0	66	60	54	48	48	48	48	48	42	42	42	42	42	42	42	42	42	42	36	36	36	36	36	30	30	30	30	30	30
95.0	66	60	54	54	48	48	48	48	42	42	42	42	42	42	42	42	42	42	42	42	36	36	36	36	30	30	30	30	30
100.0	66	60	54	54	48	48	48	48	48	42	42	42	42	42	42	42	42	42	42	42	36	36	36	36	30	30	30	30	30
105.0	66	60	54	54	54	48	48	48	48	48	42	42	42	42	42	42	42	42	42	42	36	36	36	36	36	30	30	30	30
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APPENDIX J

Preliminary Grading Plans

FULL-SIZE EXHIBIT LOCATED IN BACK POCKET

NORTH PORTION OF SUBDIVISION

SEE SHEET 2 OF 2 FOR SOUTH PORTION OF SUBDIVISION

0' 100' 200' 300' 400'

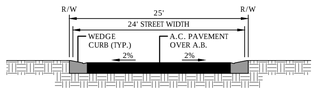
SCALE 1"=100'

LEGEND

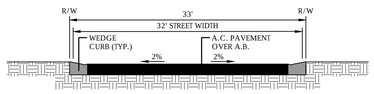
- 679.3 EXISTING SPOT ELEVATIONS
- EXISTING CONTOURS
- PROPOSED STORM DRAIN
- EXISTING EASEMENT
- EXISTING LOT LINE
- EXISTING EDGE OF PAVEMENT
- EXISTING RIGHT OF WAY
- TENTATIVE TRACT MAP BOUNDARY
- PROPOSED AND EXISTING CENTER LINE
- PROPOSED CURB
- PROPOSED EASEMENT
- PROPOSED LOT LINE
- PROPOSED RIGHT OF WAY

ABBREVIATIONS

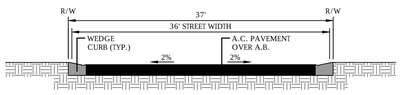
(E)	EAST
(N)	NORTH
(S)	SOUTH
(W)	WEST
A.C.	ASPHALT CONCRETE
AC	ACREAGE
APN	ASSESSORS PARCEL NUMBER
BNDRY	BOUNDARY
BP	BUSINESS PARK
CC	COMMUNITY COMMERCIAL
C/L	CENTERLINE
C&G	CURB AND GUTTER
E/P	EDGE OF PAVEMENT
ESMT.	EASEMENT
EX.	EXISTING
I-BP	INDUSTRIAL - BUSINESS PARK
MAX.	MAXIMUM
M.B.	MAP BOOK
MIN.	MINIMUM
NO.	NUMBER
N.T.S.	NOT TO SCALE
O/H	OVERHEAD
OS/PP	OPEN SPACE / PARKS
PE	PAD ELEVATION
P/L	PROPERTY LINE
P.R.-5	PLANNED RESIDENTIAL
PROP.	PROPOSED
P.U.E.	PUBLIC UTILITY EASEMENT
R	RADIUS
R-L	LOW DENSITY (RESIDENTIAL)
R/W	RIGHT OF WAY
SF	SQUARE FEET
S.I.	SERVICE INDUSTRIAL
STD.	STANDARD
TYP.	TYPICAL
TP	TOP OF PAVEMENT



FRANCIS DRIVE
EMERGENCY ACCESS ONLY
(PRIVATE ROAD)
N.T.S.



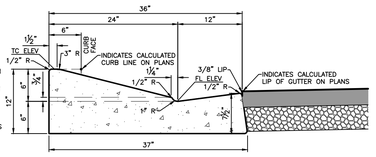
STREETS "B" AND "K"
(PRIVATE ROAD)
N.T.S.



STREETS "A", "C"-"J", "L"-"O"
(PRIVATE ROAD)
N.T.S.

NOTES:

1. ALL CONCRETE SHALL BE 560-C-3250 WITH TYPE "V" CEMENT OR PER CITY/COUNTY STANDARD.
2. CURB FACE ALIGNMENT SHALL BE AS SPECIFIED ON PLANS.
3. WEAKENED PLANE JOINT EVERY 10' O.C.
4. EXPANSION PAPER REQUIRED EVERY 50', AT THE TOPS OF DRIVEWAY X'S AND AT ECR'S AND BCR'S.



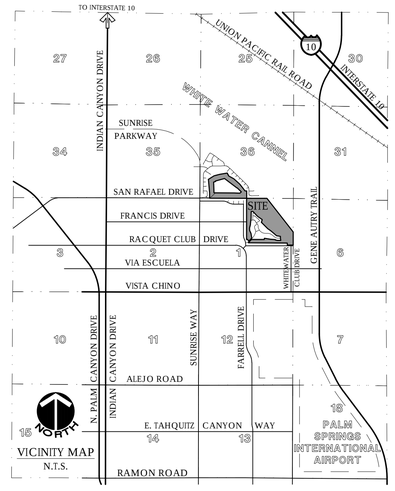
DETAIL X
WEDGE CURB
N.T.S.

ESTIMATED EARTHWORK QUANTITIES

	CUT (CY)	FILL (CY)
RAW QUANTITIES	232,882	142,402
OVER EXCAVATION–PADS	308,013	308,013
OVER EXCAVATION–PAVEMENT AREAS	71,671	71,671

EARTHWORK ANALYSIS FACTORS

THE FOLLOWING FACTORS WERE USED IN THE PREPARATION OF THE EARTHWORK ANALYSIS:
SHRINKAGE: 5.0% (AVERAGE VALUE)
SUBSIDENCE: 0.2'
OVER–EXCAVATION DEPTH:
BUILDING PAD – MINIMUM OF 3 FEET BELOW THE EXISTING GROUND OR 2 FEET BELOW BOTTOM OF FOOTINGS, WHICHEVER IS DEEPER, AND SHOULD EXTEND 5' BEYOND THE OUTER EDGE OF EXTERIOR FOOTINGS.
PAVEMENT AREAS – MINIMUM OF 2 FEET BELOW THE EXISTING GROUND OR FINISHED GROUND, WHICHEVER IS DEEPER.
ALL OF THE FACTORS WERE OBTAINED FROM GEOTECHNICAL REPORT FILE NO. 1095–02, PREPARED BY EARTH SYSTEMS SOUTHWEST, DATED AUGUST 5, 2013.
NOTE: MSA CONSULTING, INC. MAKES NO REPRESENTATION CONCERNING THE ESTIMATED QUANTITIES ON THESE PLANS OTHER THAN ALL SUCH FIGURES, INCLUDING ALL EARTHWORK NUMBERS, ARE PRELIMINARY ESTIMATES PREPARED FOR PERMIT PURPOSES ONLY. THE ENGINEER SHALL NOT BE RESPONSIBLE FOR ANY DEVIATIONS BETWEEN ESTIMATED QUANTITIES AND ACTUAL QUANTITIES AT THE TIME OF CONSTRUCTION.



VICINITY MAP
N.T.S.

TENTATIVE TRACT NO. 36691

PALM SPRINGS COUNTRY CLUB
PRELIMINARY GRADING & DRAINAGE PLAN

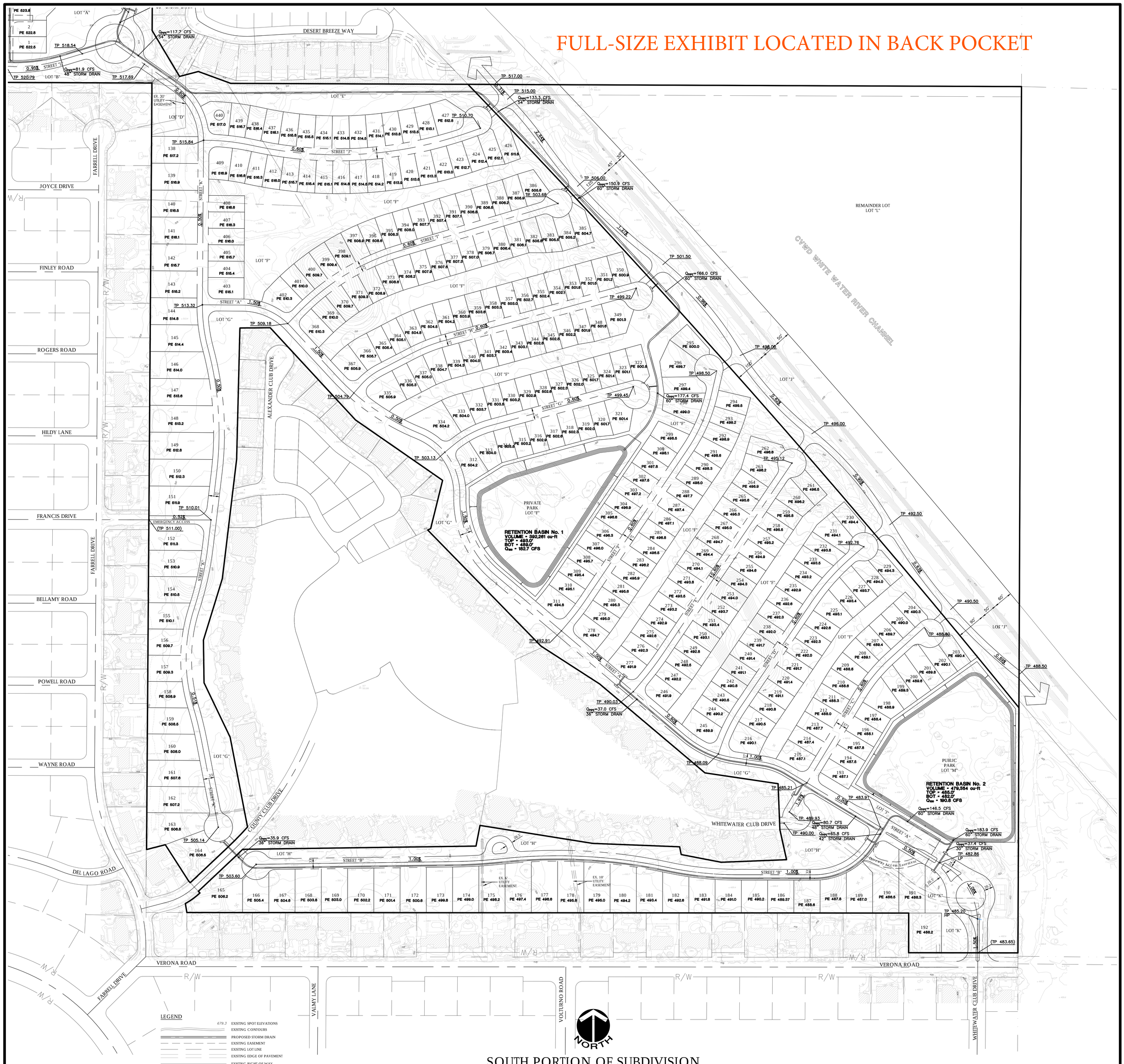
EXHIBIT DATE: JANUARY 16, 2014

MSA CONSULTING, INC.
PLANNING ■ CIVIL ENGINEERING ■ LAND SURVEYING
34200 BOB HOPE DRIVE ■ RANCHO MIRAGE ■ CA 92270
TELEPHONE (760) 320-9811 ■ FAX (760) 323-7893

DESIGN BY	SHEET
NAB	1
DRAWN BY NAB	OF
CHECK BY JAD	2 SHEETS

R:\2152\ACAD\Grading\Preliminary\2152 PRELIMINARY GRADING Exhibit.dwg, 1/17/2014 10:04:21 AM, mbeas, MSA Consulting, Inc.

FULL-SIZE EXHIBIT LOCATED IN BACK POCKET



LEGEND

- 679.3 EXISTING SPOT ELEVATIONS
- EXISTING CONTOURS
- PROPOSED STORM DRAIN
- EXISTING EASEMENT
- EXISTING LOT LINE
- EXISTING EDGE OF PAVEMENT
- EXISTING RIGHT OF WAY
- TENTATIVE TRACT MAP BOUNDARY
- PROPOSED AND EXISTING CENTER LINE
- PROPOSED CURB
- PROPOSED EASEMENT
- PROPOSED LOT LINE
- PROPOSED RIGHT OF WAY

SOUTH PORTION OF SUBDIVISION

SEE SHEET 1 OF 2 FOR NORTH PORTION OF SUBDIVISION

0' 100' 200' 300' 400'

SCALE 1"=100'

EXHIBIT DATE: JANUARY 16, 2014

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DESIGN BY	SHEET
NAB	2
DRAWN BY NAB	OF
CHECK BY JAD	2 SHEETS

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APPENDIX O

RCFC DESIGN AND CONSTRUCTION REPORT FOR 2014

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

Public Budget Hearing – Zone 6

Wednesday, January 28, 2015

AGENDA

1. Receive requests from interested parties for projects for Fiscal Year 2015-2016.
2. Oral communication from the audience.
3. Chief Engineer's Report of Zone Activities.

Zone 6

Report to the Zone Commissioners
Design and Construction Projects
for Calendar Year 2014
By Dusty Williams, General Manager-Chief Engineer
January 2015

GENERAL:

District-wide New Project Construction - Throughout the District (all Zones) during Calendar Year 2014, the District issued Notices of Completion for four capital projects totaling about four million dollars. However, as Calendar Year 2014 closes, we have seven projects underway totaling almost 32 million dollars in construction contracts. Calendar Year 2015 will be another blockbuster year and is slated for an additional forty million dollars in construction contract activity. During 2014, the District also issued Notices of Completion for six developer- and City-built projects with a total value of over 12 million dollars.

Water Conservation Activities
District-wide - Over the course of this past year, District staff met with regional water agencies in an effort to understand the use and condition of local groundwater basins and to promote joint stormwater recharge projects. The data collected from this effort fed the launch of our Stormwater and Water Conservation Geodatabase system (rivco.permitrack.com) and 12 groundwater fact sheets intended to further facilitate joint-use stormwater management planning and projects. The Geodatabase system is also designed to assist the cities, County and developers with addressing flood control and National Pollutant Discharge Elimination System (NPDES) stormwater quality requirements.

District facility operations – The District is in the process of evaluating the operation of its existing dams, debris basins and detention basins to determine if groundwater recharge potential can be enhanced. Ongoing actions include excavating sinuous low flow paths for dry weather and small storm flows, excavating small retention ponds within basin footprints and increased frequency of cleaning and scarification of basin inverts

Desert Hot Springs Master Drainage Plan – The proposed Desert Hot Springs Master Drainage Plan will be one of the first District Master Drainage Plans to proactively incorporate recharge and water quality basins. Basin locations were selected based on discussions with Mission Springs Water District and the City of Desert Hot Springs.

This project was awarded to PACE and consists of developing a master drainage plan to address the flooding issues in the western portion of the City of Desert Hot Springs. The area is situated within an alluvial fan created by historical flows from Morongo Wash, Mission Creek and Garnet Wash. The proposed plan addresses the existing flood hazards in the area and incorporates the community's great goals and objectives, including water quality/conservation, habitat conservation, recreational opportunities and economic development. The engineering work for the plan has been completed and we are currently working on the preparation of Draft EIR. We expect to circulate the Draft EIR for public review in April 2015 and follow with formal adoption of plan by City Council and District Board in summer 2015.

STATUS SUMMARY OF THE CURRENT YEAR CAPITAL PROJECTS (BUDGETED FY 2014/2015):

- **Desert Hot Springs MDP Line E-5, Stage 1 (6-8-00035-01)** - The City of Desert Hot Springs requested the District to fund this project in early FY 2012/2013. The Line E-5 project will consist of an underground storm drain system to be constructed in 8th Street from approximately Mesquite Avenue and extending westerly to outlet into the District's existing Line E near West Drive. In November 2012, the District and the City entered into an agreement where the District would fund the City's design and construction contract administration efforts. The District will assume operation and maintenance once the facility is complete. To date the District has reviewed the 30% plans and provided comments to the City. Sixty percent (60%) plans were submitted to the District for review in December 2015.

- **Desert Hot Springs Pierson Dam (6-8-00036-00)** - This project would consist of an earthen dam that would provide immediate and substantial relief from flooding for the existing and most densely populated area of the city of Desert Hot Springs. The City had previously conditioned a developer to build the functional equivalent to the Dam as part of their proposed development, however, due in part to the economic downturn those plans were not realized. Meetings with the City in 2013 and 2014 revealed that developer interest in the site has returned. Initially, the City indicated that it would condition any developer of the site to build the basin planned by the first developer. The new potential developer is investigating some form of cost sharing with the District due to the offsite benefit that would be conferred. Accordingly, the District is taking a wait-and-see approach while continuing to work with the City on alternate projects such as Desert Hot Springs MDP Line E-5, Stage 1.

- **<u>Palm Springs Line 41, Stage 3 (6-8-00160-03)</u>** – The proposed project consists of the construction, operation, and maintenance of approximately 6,000 lineal feet of storm drain ranging in pipe diameter size from 48" to 108", collection structures, appurtenances, and a detention basin. The project alignment begins at the upstream terminus of Palm Springs Line 41, Stage 2 and generally extends westward along East Palm Canyon Drive and Gene Autry Trail to Matthew Drive, where a detention basin is proposed on a vacant parcel (APN 681-170-066), and thence, continuing to Cherokee Way (see Figure 1).

Figure 1. Palm Springs MDP Line 41, Stage 3 - Underground Storm Drain with Detention Basin

Although the existing downstream Stage 2 storm drain was only designed to provide protection from the 10-year flood, the City of Palm Springs and the City of Cathedral City requested in 2005, that the existing FEMA 'Zone A' 100-year floodplain be removed as part of this Stage 3 project. In 2011, right of way was acquired through eminent domain for $4 million, for the construction of a detention basin that, when added to the Stage 3 system, would allow removal of the 100-year floodplain.

During the subsequent development of the 30% design plans, additional constraints in the downstream Stage 2 system were discovered that further reduced the capacity of the overall system. Consequently, various alternatives are now being analyzed to assess whether the goal of fully removing the 100-year floodplain can still be accomplished. Once the preferred alternative is determined, preparation of 30% design plans will resume.

The detention basin footprint has also been identified to be critical habitat for the endangered Casey's June Beetle. Onsite and offsite mitigation measures for impacts within the basin footprint have been proposed in the December 11, 2013 submittal of the 404 Permit application. The District is currently compiling project-related documents for the Army Corps of Engineers to reply to comments received from the U.S. Fish and Wildlife Service.

The detention basin footprint has also been determined by the USFWS to be critical habitat for the endangered Casey's June Beetle. Onsite and offsite mitigation measures for impacts within the basin footprint have been proposed in the December 11, 2013 submittal of the 404 Permit application.

As of December 2013, the remaining estimated project cost is $7.2 million ($4 million has already been spent to acquire basin right of way), which is a reduction from the previous year's cost of $8.3 million, due to a decrease in unit costs. This cost includes a construction cost of approximately $6.8 million and additional easement cost of approximately $400,000. The maximum reasonable expenditure by the District within the five-year capital improvement plan timeframe is approximately $5 million, so there remains a $2.2 million shortfall. This $2.2 million is expected to be covered by the local benefitting owners/developers and/or the District once sufficient additional funding can be accumulated.

- **Palm Springs Lines 43 and 43A (6-8-00163-01)** - This underground storm drain (shown in orange) will start at North Cathedral Canyon Channel and extend southwesterly in Perez Road crossing East Palm Canyon Drive (Highway 111) and westerly along the southerly edge of the City's redevelopment area to the outlet of the Eagle Canyon Dam (currently under construction). Lateral 43A (shown in blue) will be constructed through the Jessup auto dealership and connect to Line 43 southerly of Highway 111 on Perez Road. This project will work in concert with Line 41 and Eagle Canyon Dam to provide flood protection to property along Highway 111 from Golf Club Drive to Auto Park Road. Albert A Webb Associates is the design engineering consultant for this project.

  This project will install approximately 2,400 linear feet of pre-cast reinforced concrete box ranging in size from 5-foot wide by 4-foot high box to a 14-foot wide by 4.5-foot high box. The project also includes 1,800 linear feet of reinforced concrete pipe ranging from 30-inches to 66-inches. The project was advertised July 29, 2014. Granite Construction was awarded the contract at $4,995,874.00. Construction is expected to begin at the end of April 2015 and expected to be complete by January 2016.

- **<u>Eagle Canyon Dam (6-8-00190-01)</u>** - This project is on the border of Palm Springs and Cathedral City and is currently under construction. The reservoir and outlet works are operational and the rock cladding is nearly 100% installed. The dam provides 100-year flood protection now. The contractor, Hal Hays Construction Inc., is currently working on the emergency spillway (more on that below) and finishing minor elements.

  The project is moving forward successfully despite the issues that have impacted the schedule. The site clean-up portion of the contract came in less expensive than anticipated at roughly $1.5 million but the effort took more time than expected. The alluvial materials in the foundation were found to be less dense than the geotechnical investigations projected. This required additional depth of excavation for the foundation and more time. Additionally, the project required modifications to assure long-term stability of exposed rock cut slopes at the spillway. The original geotechnical investigation performed for the project concluded that the cut slopes in the spillway would be stable under static and seismic conditions. However, in one area, the joints and foliation in the rock were found to be more extensive than expected and oriented such that seismic loading could cause rock fall onto the right side of the spillway. The District, in consultation with our onsite geotechnical consultant, has determined that the most efficient remedy is additional concrete lining bolstered by rock bolts (also known as tie-backs). The approved plans and specifications did not include specialized work of this nature. The design of the modification coupled with the time it took for the State Department of Safety of Dams to approve the modification, has delayed the completion of the project. At press time the project is scheduled to be completed in spring of 2015.

Eagle Canyon Dam - mid-December 2014

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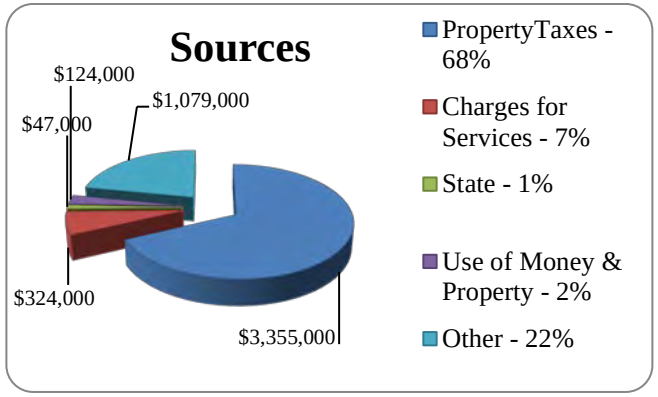
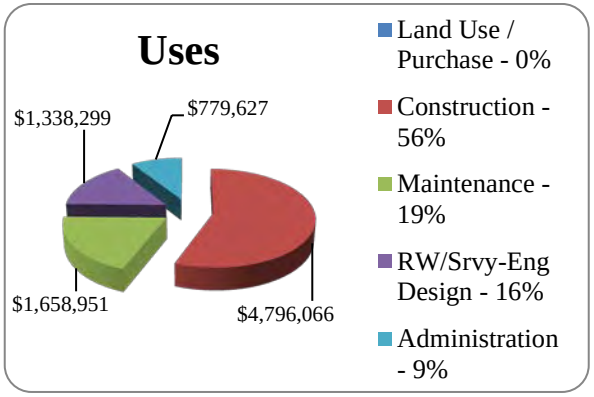
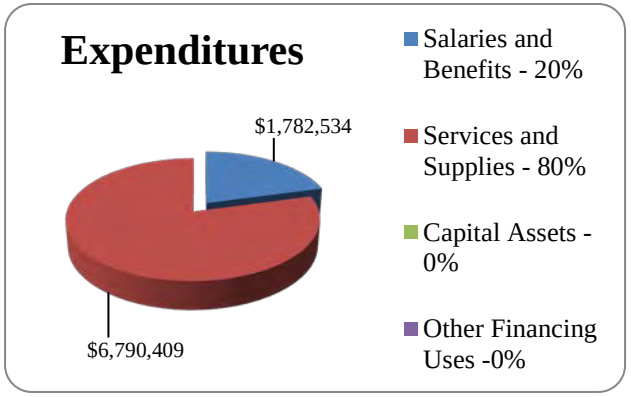
Riverside County Flood Control and Water Conservation District

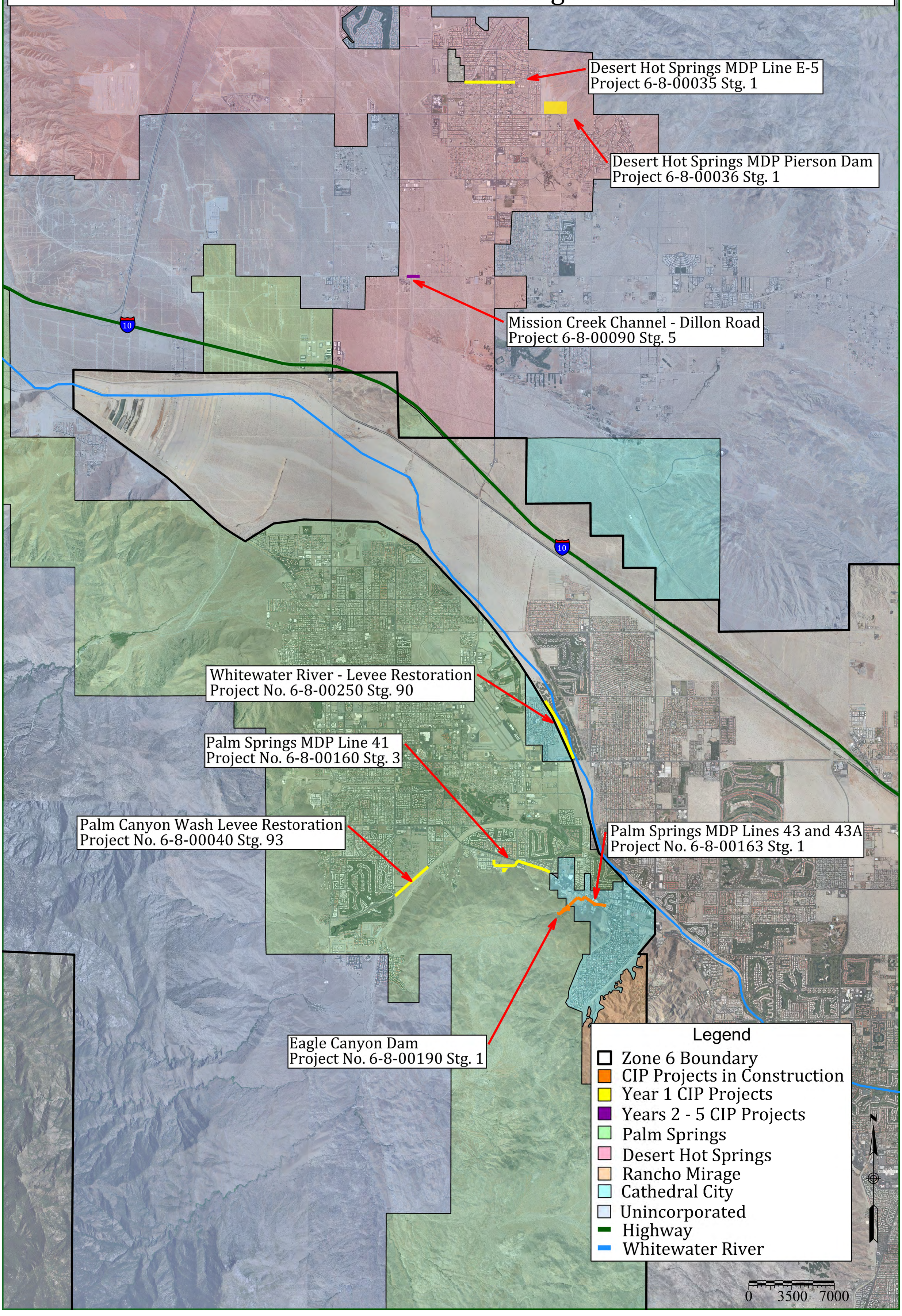
Zone 6 – Financial Information







Tax Revenue – 5 Year History

Account	Description	6/30/2010	6/30/2011	6/30/2012	6/30/2013	6/30/2014
700020	Property Tax Current Secured	$ 3,337,844	$ 3,113,221	$ 2,985,995	$ 3,020,247	$ 3,133,430
701020	Property Tax Current Unsecured	164,879	150,663	149,309	141,410	152,658
703000	Property Tax Prior Unsecured	7,882	11,173	10,743	7,262	11,289
704000	Property Tax Current Supplemental	-	8,968	4,328	15,956	39,613
705000	Property Tax Prior Supplemental	48,248	24,370	22,348	19,999	18,147
	Subtotal Property Tax Revenue	**3,558,853**	**3,308,495**	**3,172,723**	**3,204,874**	**3,355,137**
752800	CA-Homeowners Tax Relief	51,326	50,683	49,330	48,668	46,964
781660	Redevelopment Pass Thru	661,437	590,751	590,946	807,816	1,079,216
	Total Zone Tax Revenue	**$ 4,271,616**	**$ 3,949,929**	**$ 3,812,999**	**$ 4,061,358**	**$ 4,481,317**

Design and Construction Proposed Budget and Five CIP Projects: Zone 6
Fiscal Years 2014-2015 Through 2018-2019