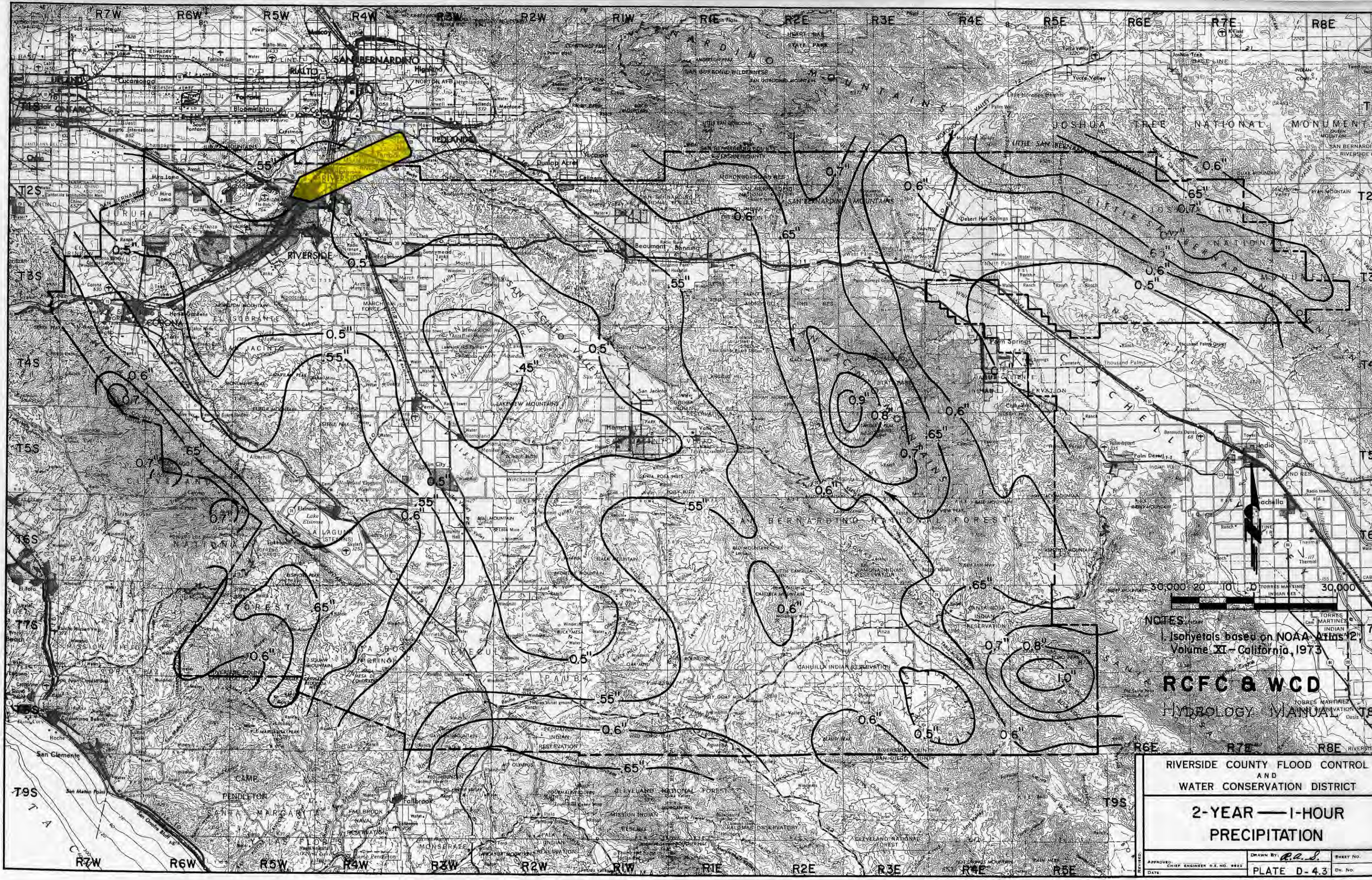
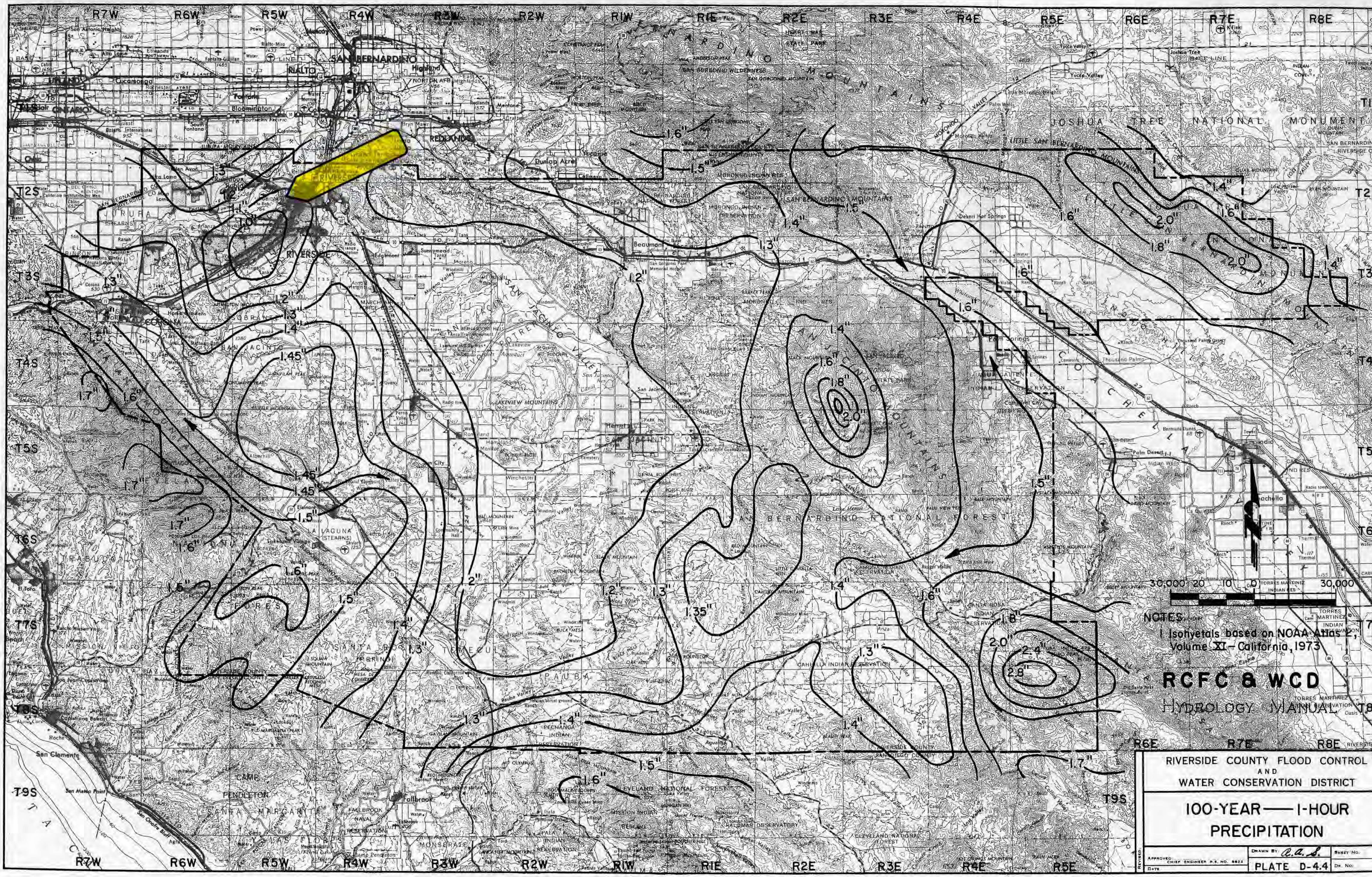
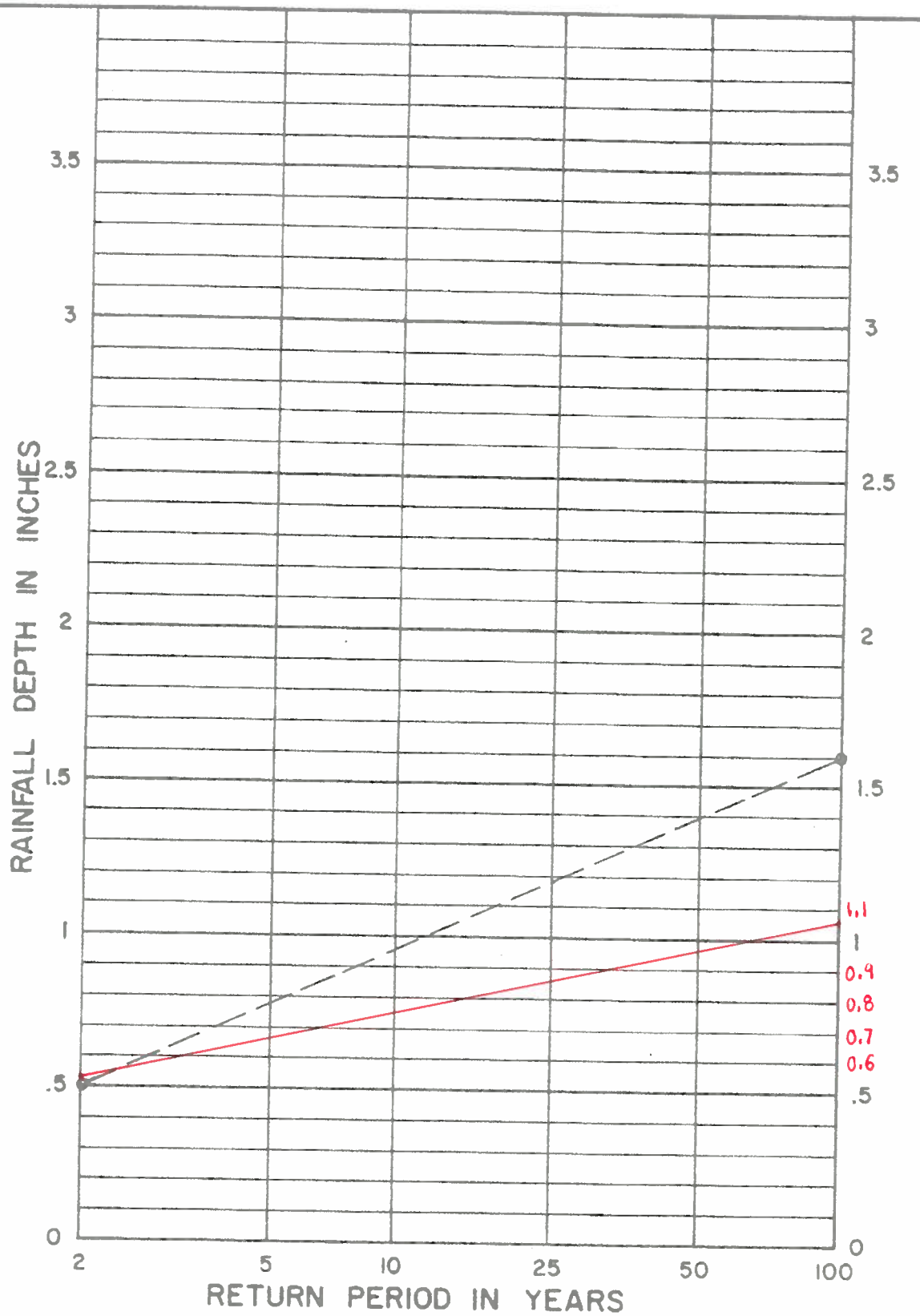
APPENDIX A

Mount Rubidoux Park Hydrologic Parameters


R7W
R6W
R5W
R4W
R3W
R2W
R1W
R1E
R2E
R3E
R4E
R5E
R6E
R7E
R8E
T1S
T2S
T3S
T4S
T5S
T6S
T7S
T8S
T9S
SAN BERNARDINO MOUNTAINS
JOSHUA TREE NATIONAL MONUMENT
SAN BERNARDINO NATIONAL FOREST
SAN JACINTO MOUNTAINS
SAN JACINTO WILDERNESS
SAN GORGONIO WILDERNESS
SAN JACINTO PEAK
SAN GORGONIO MOUNTAIN
SAN BERNARDINO
RIALTO
RIVERSIDE
REDLANDS
CORONA
Palm Springs
Desert Hot Springs
Beaumont
Banning
Hemet
San Jacinto
Fallbrook
San Clemente
Indio
Thermal
.55"
.6"
.65"
.7"
.5"
.45"
.9"
1.0"
0.8"
30,000 20 10 0 30,000
NOTES
1. Isohyetals based on NOAA Atlas 2, Volume XI – California, 1973
RCFC & WCD
HYDROLOGY MANUAL
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
2-YEAR — 1-HOUR PRECIPITATION
APPROVED: CHIEF ENGINEER R.E. NO. 9822
DATE
DRAWN BY: A.A.S.
PLATE D-4.3
SHEET NO.
DR. NO.
REVISED


NOTES:
1. Isohyetals based on NOAA Atlas 2, Volume XI - California, 1973
RCFC & WCD
HYDROLOGY MANUAL
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
100-YEAR — 1-HOUR PRECIPITATION
PLATE D-4.4
JOSHUA TREE NATIONAL MONUMENT
SAN BERNARDINO MOUNTAINS
SAN JACINTO MOUNTAINS
SAN BERNARDINO NATIONAL FOREST
CLEVELAND NATIONAL FOREST
RIVERSIDE
SAN BERNARDINO
REDLANDS
CORONA
PALM SPRINGS
INDIO
30,000 20 10 0 30,000



NOTE:

1. For intermediate return periods plot 2-year and 100-year one hour values from maps, then connect points and read value for desired return period. For example given 2-year one hour = .50" and 100-year one hour = 1.60", 25-year one hour = 1.18"

Reference: NOAA Atlas 2, Volume XI - California, 1973.

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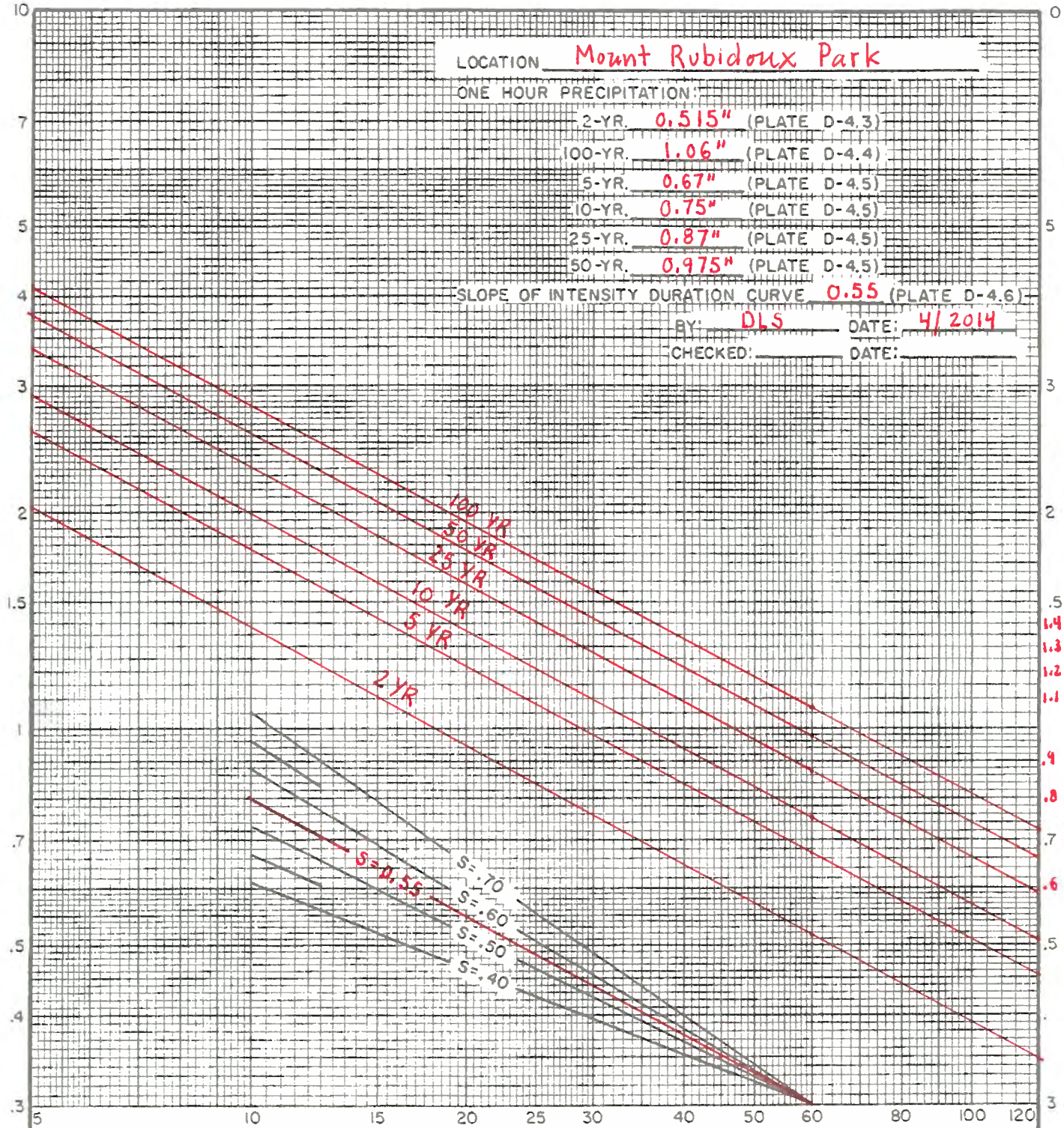
HYDROLOGY MANUAL

RAINFALL DEPTH VERSUS RETURN PERIOD FOR PARTIAL DURATION SERIES

PLATE D-4.5



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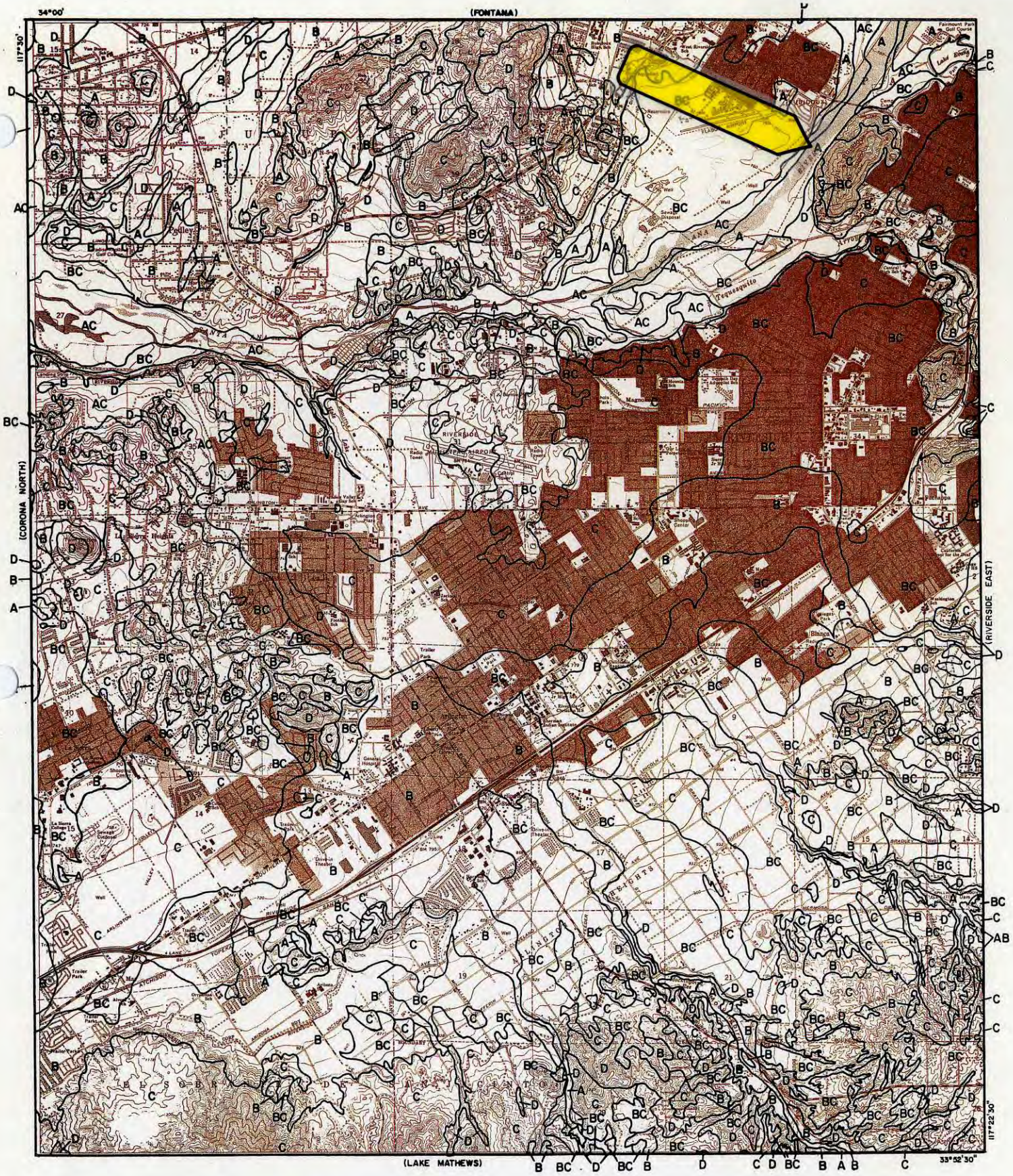
HYDROLOGY MANUAL

INTENSITY – DURATION CURVES CALCULATION SHEET

PLATE D-4.7



LEGEND

—— SOILS GROUP BOUNDARY

A SOILS GROUP DESIGNATION

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HYDROLOGY MANUAL

0 FEET 5000

HYDROLOGIC SOILS GROUP MAP FOR RIVERSIDE—WEST

PLATE C-1.15

COVER TYPE DESCRIPTIONS

NATURAL COVERS -

Barren - Areas with 15 percent or less of the ground surface covered by plants or litter. It includes rockland, eroded land, and shaped or graded land. Barren land does not include fallow land.

Chaparral, Broadleaf - Areas on which the principal vegetation consists of evergreen shrubs with broad, hard, stiff leaves such as manzonita, ceanothus and scrub oak. The brush cover is usually dense or moderately dense.

Chaparral, Narrowleaf - Land on which the principal vegetation consists of diffusely branched evergreen shrubs with fine needle-like leaves such as chamise and redshank. The shrubs are usually widely spaced and low in growth. If the narrowleaf chaparral shrubs are dense and high; the land should be included with broadleaf chaparral cover.

Grass, Annual - Land on which the principal vegetation consists of annual grasses and weeds such as annual bromes, wild barley, soft chess, ryegrass and filaree.

Grass, Perennial - Areas on which the principal vegetation consists of perennial grass, either native or introduced, and which grows under normal dryland conditions. Examples are Stipa or needle grass, Harding grass and wheat grass. It does not include irrigated and meadow grasses.

Meadow - Land areas with seasonally high water table, often called cienegas. Principal vegetation consists of sod-forming grasses interspersed with other plants.

Open Brush - Principal vegetation consists of soft wood shrubs, usually grayish in color. Examples include California buckwheat, California sagebrush, black sage, white sage and purple sage. It also includes vegetation on desert facing slopes where broadleaf chaparral predominate in an open shrub cover.

Woodland - Areas on which coniferous or broadleaf trees predominate. The crown or canopy density, the amount of ground surface shaded at high noon, is at least 50 percent. Open areas may have a cover of annual or perennial grasses or of brush. Plant cover under the trees is usually sparse because of leaf or needle litter accumulation.

Woodland, Grass - Areas with an open cover of broadleaf or coniferous trees usually live oak and pines, with the intervening ground space occupied by annual grasses or weeds. The trees may occur singly or in small clumps. Canopy density, the amount of ground surface shaded at high noon, is from 20 to 50 percent.

URBAN COVERS -

Residential or Commercial Landscaping - The pervious portions of commercial establishments, single and multiple family dwellings, trailer parks and schools where the predominant land cover is lawn, shrubbery and trees.

RUNOFF INDEX NUMBERS OF HYDROLOGIC SOIL-COVER COMPLEXES FOR PERVIOUS AREAS-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group A	B	C	D
NATURAL COVERS -					
Barren (Rockland, eroded and graded land)		78	86	91	93
Chaparrel, Broadleaf (Manzonita, ceanothus and scrub oak)	Poor	53	70	80	85
	Fair	40	63	75	81
	Good	31	57	71	78
Chaparrel, Narrowleaf (Chamise and redshank)	Poor	71	82	88	91
	Fair	55	72	81	86
Grass, Annual or Perennial	Poor	67	78	86	89
	Fair	50	69	79	84
	Good	38	61	74	80
Meadows or Cienegas (Areas with seasonally high water table, principal vegetation is sod forming grass)	Poor	63	77	85	88
	Fair	51	70	80	84
	Good	30	58	72	78
Open Brush (Soft wood shrubs - buckwheat, sage, etc.)	Poor	62	76	84	88
	Fair	46	66	77	83
	Good	41	63	75	81
Woodland (Coniferous or broadleaf trees predominate. Canopy density is at least 50 percent)	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	28	55	70	77
Woodland, Grass (Coniferous or broadleaf trees with canopy density from 20 to 50 percent)	Poor	57	73	82	86
	Fair	44	65	77	82
	Good	33	58	72	79
URBAN COVERS -					
Residential or Commercial Landscaping (Lawn, shrubs, etc.)	Good	32	56	69	75
Turf (Irrigated and mowed grass)	Poor	58	74	83	87
	Fair	44	65	77	82
	Good	33	58	72	79
AGRICULTURAL COVERS -					
Fallow (Land plowed but not tilled or seeded)		76	85	90	92

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RUNOFF INDEX NUMBERS FOR PERVIOUS AREA

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HYDROLOGY MANUAL

RUNOFF COEFFICIENT CURVE DATA

RUNOFF COEFFICIENTS FOR RI INDEX NO. = 76

IMPERVIOUS PERCENT	INTENSITY - INCHES/HOUR										
	.0	.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	5.0	6.0
0.	.00	.49	.63	.70	.74	.77	.79	.80	.81	.83	.84
5.	.04	.51	.65	.71	.75	.78	.79	.81	.82	.83	.84
10.	.09	.53	.66	.72	.76	.78	.80	.81	.82	.84	.85
15.	.13	.55	.67	.73	.77	.79	.81	.82	.83	.84	.85
20.	.18	.57	.69	.74	.77	.80	.81	.82	.83	.84	.85
25.	.22	.59	.70	.75	.78	.80	.82	.83	.84	.85	.86
30.	.27	.61	.71	.76	.79	.81	.82	.83	.84	.85	.86
35.	.31	.63	.73	.77	.80	.82	.83	.84	.84	.85	.86
40.	.36	.65	.74	.78	.81	.82	.83	.84	.85	.86	.86
45.	.40	.67	.75	.79	.81	.83	.84	.85	.85	.86	.87
50.	.45	.69	.77	.80	.82	.84	.84	.85	.86	.87	.87
55.	.49	.71	.78	.81	.83	.84	.85	.86	.86	.87	.87
60.	.54	.74	.79	.82	.84	.85	.86	.86	.87	.87	.88
65.	.58	.76	.81	.83	.85	.85	.86	.87	.87	.88	.88
70.	.63	.78	.82	.84	.85	.86	.87	.87	.87	.88	.88
75.	.67	.80	.83	.85	.86	.87	.87	.88	.88	.88	.89
80.	.72	.82	.85	.86	.87	.87	.88	.88	.88	.89	.89
85.	.76	.84	.86	.87	.88	.88	.88	.89	.89	.89	.89
90.	.81	.86	.87	.88	.88	.89	.89	.89	.89	.89	.89
95.	.86	.88	.89	.89	.89	.89	.89	.90	.90	.90	.90
100.	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90

RUNOFF COEFFICIENTS FOR RI INDEX NO. = 78

IMPERVIOUS PERCENT	INTENSITY - INCHES/HOUR										
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0.	.00	.51	.65	.72	.76	.78	.80	.81	.82	.84	.85
5.	.04	.53	.67	.73	.76	.79	.80	.82	.83	.84	.85
10.	.09	.55	.68	.74	.77	.79	.81	.82	.83	.84	.85
15.	.13	.57	.69	.75	.78	.80	.81	.83	.83	.85	.85
20.	.18	.59	.70	.76	.79	.81	.82	.83	.84	.85	.86
25.	.22	.61	.72	.76	.79	.81	.82	.83	.84	.85	.86
30.	.27	.63	.73	.77	.80	.82	.83	.84	.85	.86	.86
35.	.31	.65	.74	.78	.81	.82	.83	.84	.85	.86	.87
40.	.36	.67	.75	.79	.81	.83	.84	.85	.85	.86	.87
45.	.40	.69	.76	.80	.82	.84	.84	.85	.86	.87	.87
50.	.45	.71	.78	.81	.83	.84	.85	.86	.86	.87	.87
55.	.49	.73	.79	.82	.84	.85	.85	.86	.87	.87	.88
60.	.54	.75	.80	.83	.84	.85	.86	.87	.87	.87	.88
65.	.58	.76	.81	.84	.85	.86	.86	.87	.87	.88	.88
70.	.63	.78	.83	.85	.86	.86	.87	.87	.88	.88	.88
75.	.67	.80	.84	.85	.86	.87	.87	.88	.88	.88	.89
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85.	.76	.84	.86	.87	.88	.88	.88	.89	.89	.89	.89
90.	.81	.86	.88	.88	.89	.89	.89	.89	.89	.89	.89
95.	.86	.88	.89	.89	.89	.89	.89	.90	.90	.90	.90
100.	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90

RUNOFF COEFFICIENTS FOR RI INDEX NO. = 80

IMPERVIOUS PERCENT	INTENSITY - INCHES/HOUR										
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0.	.00	.54	.67	.74	.77	.79	.81	.82	.83	.84	.85
5.	.04	.56	.69	.74	.78	.80	.81	.83	.83	.85	.86
10.	.09	.58	.70	.75	.78	.80	.82	.83	.84	.85	.86
15.	.13	.59	.71	.76	.79	.81	.82	.83	.84	.85	.86
20.	.18	.61	.72	.77	.80	.82	.83	.84	.84	.86	.86
25.	.22	.63	.73	.78	.80	.82	.83	.84	.85	.86	.86
30.	.27	.65	.74	.79	.81	.83	.84	.85	.85	.86	.87
35.	.31	.67	.75	.79	.82	.83	.84	.85	.86	.86	.87
40.	.36	.68	.76	.80	.82	.84	.85	.85	.86	.87	.87
45.	.40	.70	.78	.81	.83	.84	.85	.86	.86	.87	.87
50.	.45	.72	.79	.82	.84	.85	.86	.86	.87	.87	.88
55.	.49	.74	.80	.83	.84	.85	.86	.86	.87	.87	.88
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85.	.76	.85	.87	.88	.88	.88	.89	.89	.89	.89	.89
90.	.81	.86	.88	.88	.89	.89	.89	.89	.89	.89	.90
95.	.86	.88	.89	.89	.89	.89	.90	.90	.90	.90	.90
100.	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90

RUNOFF COEFFICIENTS FOR RI INDEX NO. = 82

IMPERVIOUS PERCENT	INTENSITY - INCHES/HOUR										
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0.	.00	.57	.70	.75	.79	.81	.82	.83	.84	.85	.86
5.	.04	.58	.71	.76	.79	.81	.82	.83	.84	.85	.86
10.	.09	.60	.72	.77	.80	.82	.83	.84	.84	.86	.86
15.	.13	.62	.73	.78	.80	.82	.83	.84	.85	.86	.86
20.	.18	.63	.74	.78	.81	.82	.84	.84	.85	.86	.87
25.	.22	.65	.75	.79	.81	.83	.84	.85	.85	.86	.87
30.	.27	.67	.76	.80	.82	.83	.84	.85	.86	.87	.87
35.	.31	.68	.77	.80	.83	.84	.85	.85	.86	.87	.87
40.	.36	.70	.78	.81	.83	.84	.85	.86	.86	.87	.87
45.	.40	.72	.79	.82	.84	.85	.86	.86	.87	.87	.88
50.	.45	.73	.80	.83	.84	.85	.86	.87	.87	.88	.88
55.	.49	.75	.81	.83	.85	.86	.86	.87	.87	.88	.88
60.	.54	.77	.82	.84	.85	.86	.87	.87	.88	.88	.88
65.	.58	.78	.83	.85	.86	.87	.87	.88	.88	.88	.89
70.	.63	.80	.84	.86	.87	.87	.88	.88	.88	.89	.89
75.	.67	.82	.85	.86	.87	.88	.88	.88	.88	.89	.89
80.	.72	.83	.86	.87	.88	.88	.88	.89	.89	.89	.89
85.	.76	.85	.87	.88	.88	.89	.89	.89	.89	.89	.89
90.	.81	.87	.88	.89	.89	.89	.89	.89	.89	.90	.90
95.	.86	.88	.89	.89	.89	.90	.90	.90	.90	.90	.90
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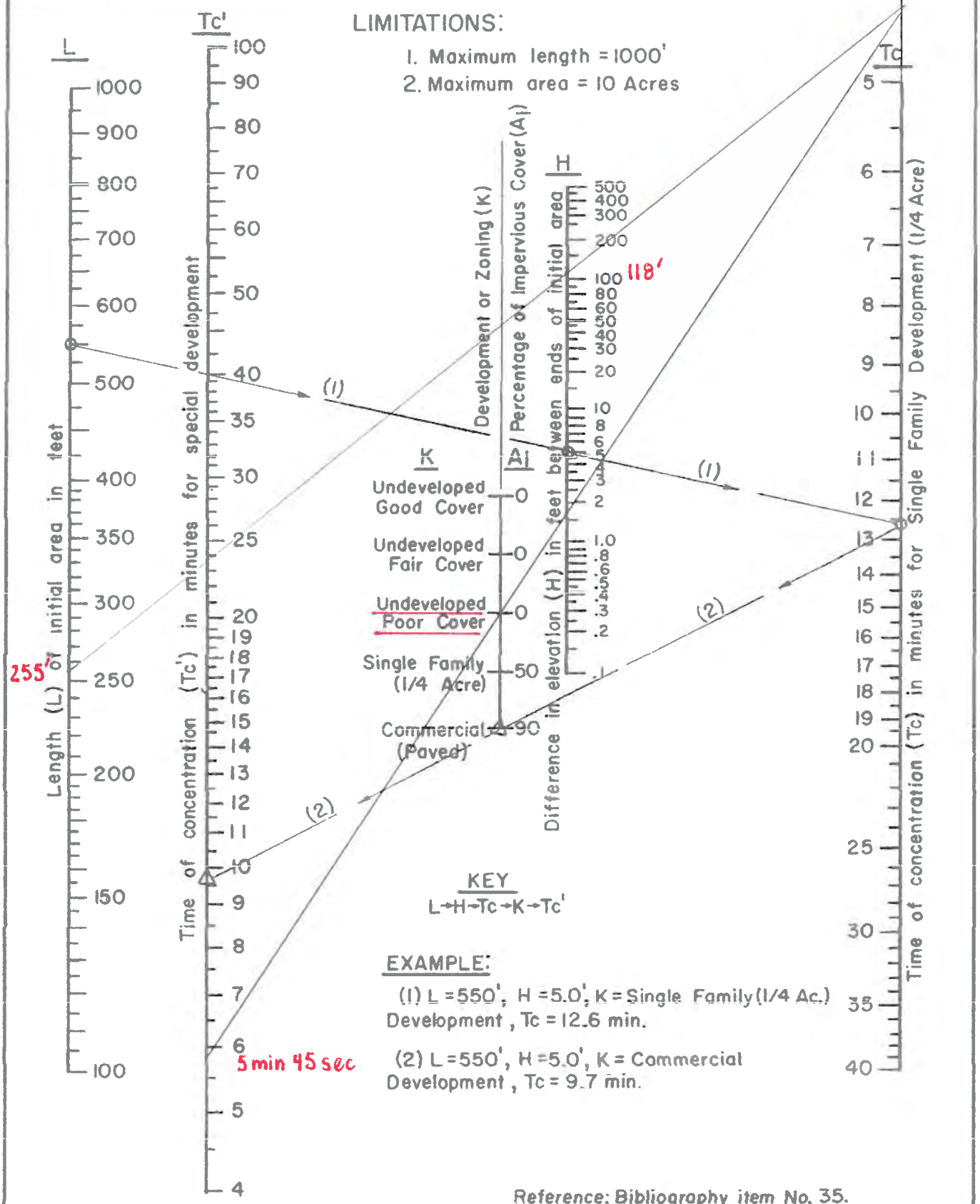
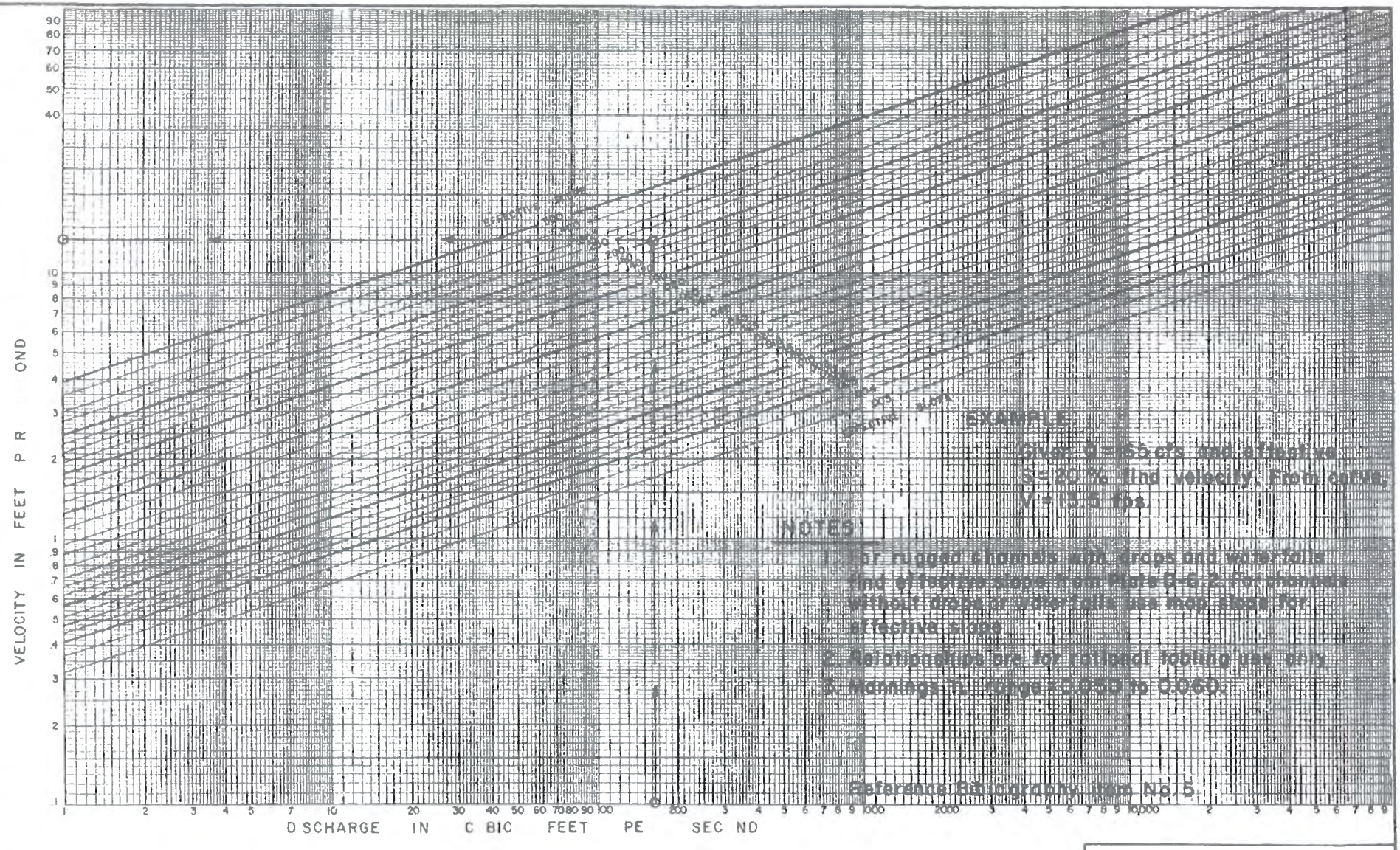


Reference: Bibliography item No. 35.

RCFC & WCD
HYDROLOGY MANUAL

TIME OF CONCENTRATION FOR INITIAL SUBAREA

PLATE D-3



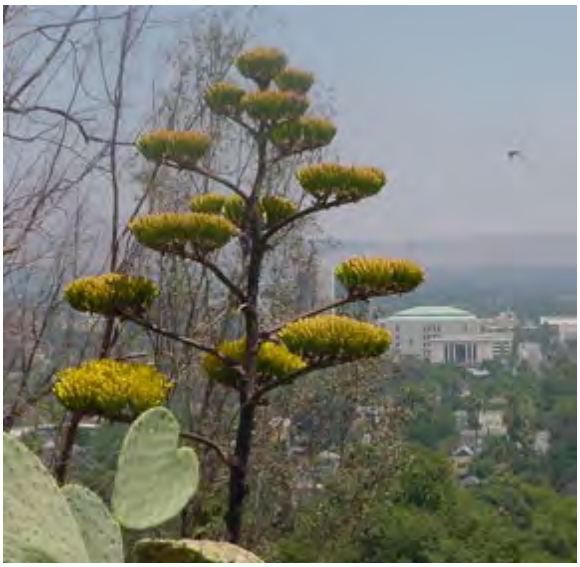
RCFC & WCD HYDROLOGY MANUAL

VELOCITY - DISCHARGE - SLOPE RELATIONSHIPS
NATURAL MOUNTAIN CHANNELS

PLATE D-6.3

Plants

Vegetation on Mount Rubidioux



The natural vegetation on the mountain is coastal sage scrub; no significant chaparral elements are present. Coastal sage scrub is a vegetation type of relatively dry sites in lowland California and is characterized by the dominance of low, 1 m tall subwoody shrubs that are deciduous during the long summer dry season. This community occupies sites where there is insufficient soils moisture during the summer months to support the evergreen leaves of chaparral.

Historically the spaces between the shrubs were filled by a profusion of annual wildflowers during the spring. During the present century there has been a massive invasion of the Riverside area by introduced Mediterranean annual grasses. Accompanying these grasses have been numerous other weeds of coastal sage scrub vegetation and Native wildflowers. Noteworthy is the rapid decline of white sage (Salvia apiana), which was as late as the 1920's, one of the dominant species in the area, but may have been completely eliminated from Mt. Rubidioux.

The abundance of these weedy Mediterranean grasses contributes greatly to the frequent fires caused by human actions. There have been proposals to use controlled burns to our advantage to allow the opportunity for native plant material to re-establish itself.

While there has been relatively little intentional alteration of the natural vegetation of the Mountain, there has been virtually no active management to maintain the natural vegetation either.

Sources:
Natural Resource Management Plan
Mount Rubidioux Park
City of Riverside
Riverside, Ca
1994

^ Back to top