

HYDROLOGY REPORT

PREPARED FOR:

BUILDRITE CONSTRUCTION
17510 PIONEER BLVD STE 203
ARTESIA, CA 90701

PROJECT SITE:

APN 0586-081-13
BENECIA TRAIL
YUCCA VALLEY, CA 92284
Date:
SEPTEMBER 13, 2025
Revised:



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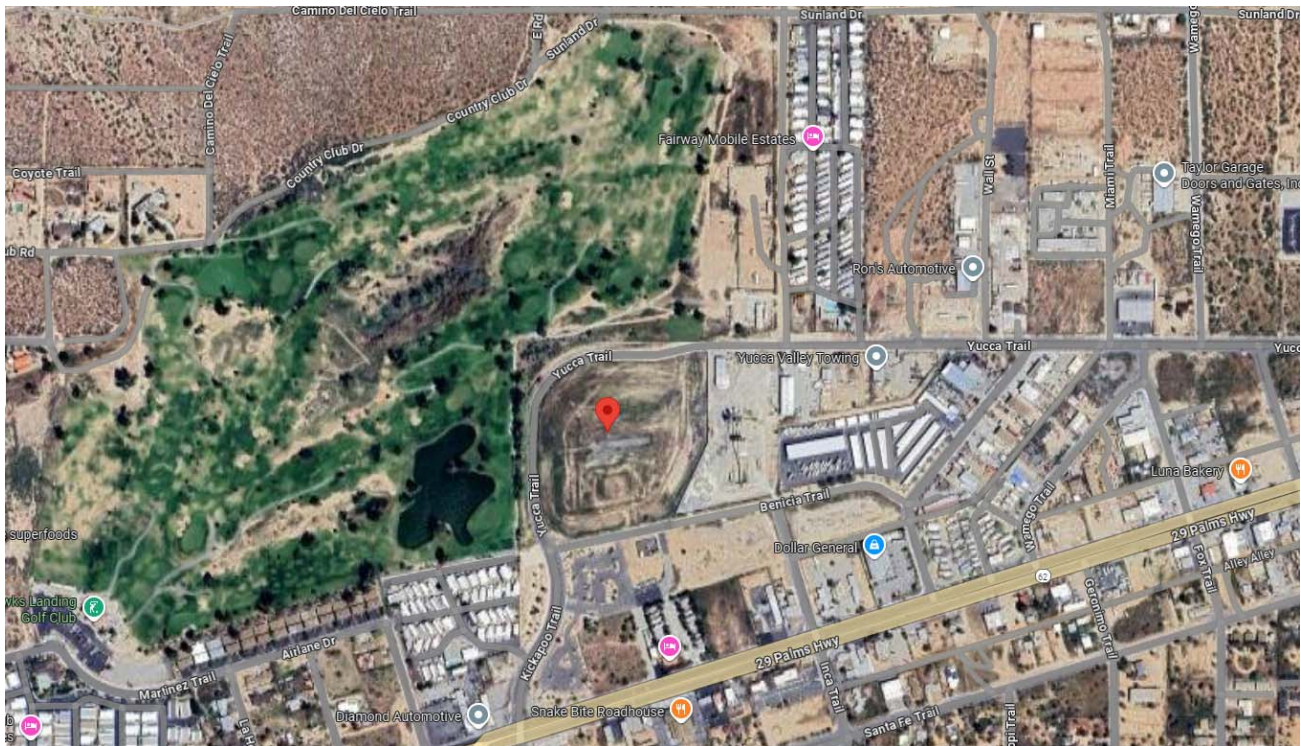
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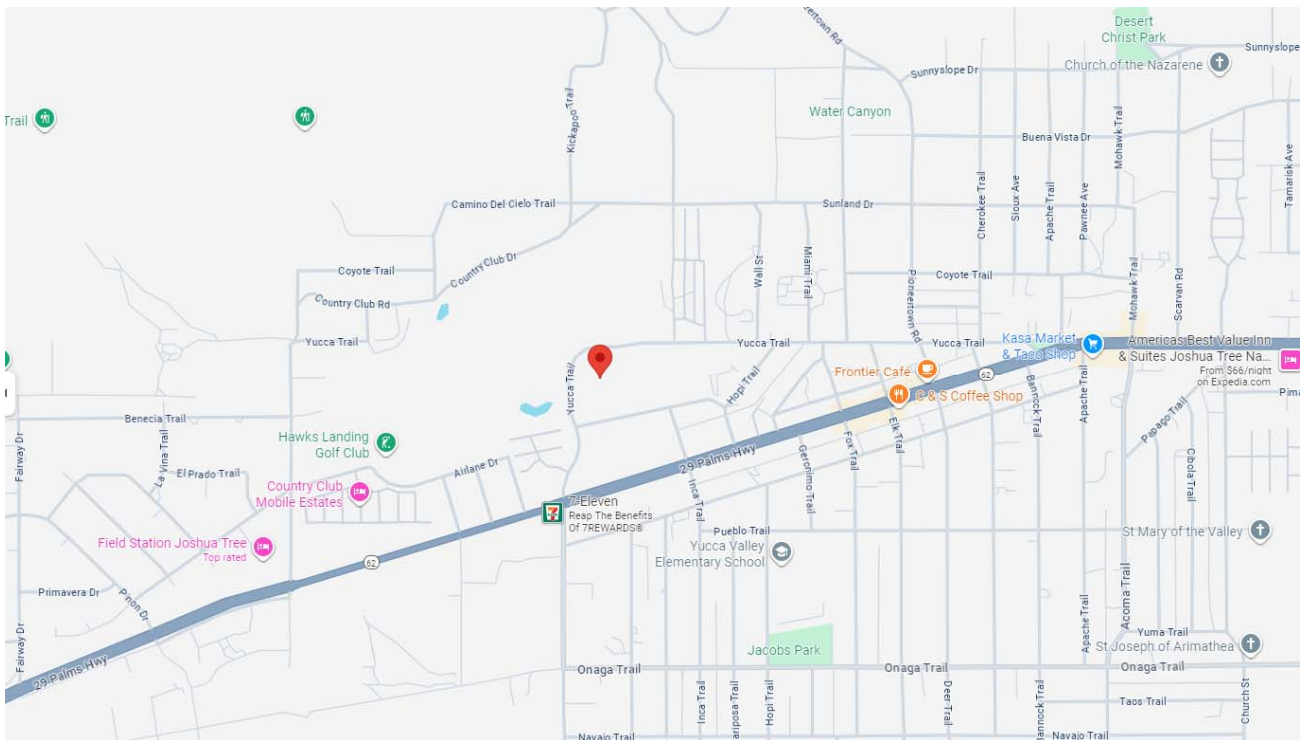
AERIAL MAP



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VICINITY MAP



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1.0 INTRODUCTION

1.1 Introduction

This Hydrology Study for the proposed development of a 95 unit mobile home park, 5000 square foot clubhouse and roadway improvements, has been prepared to analyze the hydrologic characteristics of the existing and proposed project site. This report intends to present both the methodology and the calculations used for determining the runoff from the project site in both the pre-developed (existing) and post-developed (proposed) conditions, by the 100-year 1 hour storm event.

1.2 Existing Conditions

The property is geographically located at N33°7'10.92" W116°27'23.7594" within the City of Yucca Valley, and is bounded by Benecia Trail to the south, Kickapoo Trail to the west, Yucca Trail to the north, and an industrial development to the east, a sand and gravel facility. The site area is approximately 9.61 acres. In the existing condition there is approximately 418,612 SF (9.61 AC) of pervious barren land. The project site is located within the FEMA flood zone A, an area with a 1% annual chance of flooding, also known as a 100-year flood event.

In the existing condition the site generally slopes from east to west and southeast to northwest to the northwesterly property line. The majority of the site is gently sloped with a gradient of approximately 0.78 percent. There is a ± 5.42 feet of elevation differential across the overall subject site. The site does not receive any offsite storm water runoff.

See section 2.0 for a summary of the peak flow rates for each drainage area for the pre development condition. A Pre Development Hydrology Map showing the delineation of the existing drainage areas has been included in Attachments for reference.

1.3 Proposed Project

The project proposes 95 mobile home parcels, a 5,000 square foot clubhouse with a pool and spa, walkways and paved access roadways. In the proposed condition, storm water is directed away from proposed mobile homes, toward proposed swales between mobile home parcels, which flow toward rolled curbs and gutters directed to proposed catch basins, that connect through underground storm drain pipes which discharge at rip rap dispersal structures within a proposed 5,685 cubic yard volume retention infiltration basin, located at the northwest section of the site. Also storm water is directed away from the proposed clubhouse toward a proposed swale which runs westerly along the southerly side of the property, curves northerly and runs directly in the proposed retention infiltration basin. Storm water runoff from the mobile homes along the northerly and southerly property flow away from the mobile homes, to the adjacent property lines, collecting along a proposed 12" V-ditch which is directed toward catch basins, which also connect through underground storm drain pipes which discharge at said rip rap dispersal structures. The retention infiltration basin is sized to mitigate storm water runoff created by the proposed development. The proposed impermeable area is approximately 4.65 acres. The increase of impervious area, includes the proposed mobile homes, one covered parking space per

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mobile home, clubhouse, walkways, roadways and concrete V ditches. There is approximately 216,058 SF (4.96 AC) of pervious area, barren and landscaped.

See Section 2.0 for a summary of the peak flow rates for each drainage areas for the post development condition. A Post Development Hydrology Map showing the delineation of the ultimate drainage areas has been included in the Attachments for reference.

2.0 HYDROLOGY ANALYSIS

Hydrologic calculations were performed in accordance with San Bernardino County Hydrology Manual (August 1986) guidelines. The Hydrology Manual was used to determine the existing and proposed peak flows for the 100-year storm as well as the runoff volumes generated for a 100-year storm event. Figures and Tables below are referenced to that Manual. The previous pre-development use is vacant undeveloped land with pervious cover.

ON-SITE PEAK RUNOFF FLOWS

Table 1: Rational Method Peak Flow						
Tributary Area	DA-1	DA-2	DA-3	DA-4	DA-5	DA-6
Acreage, acres; Pre (Post)	- 0.52	- 0.48	- 0.4	- 0.27	- 0.2	- 0.37
Time of Concentration, Tc; Pre (Post)	- 7.3	- 7.5	- 6.4	- 5.9	- 6	- 6.55
100 year Pre- Develop. Runoff; Q ₁₀₀ (cfs)	-	-	-	-	-	-
100 year Post- Develop. Runoff; Q ₁₀₀ (cfs)	2.64	2.41	2.26	1.63	1.17	2.04
Tributary Area	DA-7	DA-8	DA-9	DA-10	DA-11	DA-12
Acreage, acres; Pre (Post)	- 0.24	- 0.1	- 0.32	- 0.29	- 0.22	- 0.03
Time of Concentration, Tc; Pre (Post)	- 5.25	- 5	- 6	- 7.2	- 6.5	- 7.3
100 year Pre- Develop. Runoff; Q ₁₀₀ (cfs)	-	-	-	-	-	-
100 year Post- Develop. Runoff; Q ₁₀₀ (cfs)	1.56	0.69	1.89	1.48	1.23	0.14

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Table 1: Rational Method Peak Flow (continued)						
Tributary Area	DA-13	DA-14	DA-15	DA-16	DA-17	DA-18
Acreage, acres; Pre (Post)	- 0.28	- 2.02	- 0.46	- 0.29	- 0.32	- 0.13
Time of Concentration, Tc; Pre (Post)	- 13.2	- 13.1	- 7.15	- 6	- 5.9	- 5.7
100 year Pre- Develop. Runoff; Q ₁₀₀ (cfs)	-	-	-	-	-	-
100 year Post- Develop. Runoff; Q ₁₀₀ (cfs)	0.8	5.92	2.34	1.69	1.93	0.79
Tributary Area	DA-19	DA-20	DA-21	DA-22	DA-23	DA-24
Acreage, acres; Pre (Post)	- 0.37	- 0.37	- 0.24	- 0.35	- 0.24	- 0.18
Time of Concentration, Tc; Pre (Post)	- 7	- 6.6	- 6.4	- 6.7	- 6.1	- 6
100 year Pre- Develop. Runoff; Q ₁₀₀ (cfs)	-	-	-	-	-	-
100 year Post- Develop. Runoff; Q ₁₀₀ (cfs)	1.92	2.01	1.37	1.89	1.39	1.1
Tributary Area	DA-25	DA-26	DA-27	DA-28	DA-29	Totals
Acreage, acres; Pre (Post)	- 0.38	- 0.1	- 0.2	- 0.14	- 0.14	9.61 9.61
Time of Concentration, Tc; Pre (Post)	- 7.3	- 7.5	- 6.4	- 5.9	- 6	19 -
100 year Pre- Develop. Runoff; Q ₁₀₀ (cfs)	-	-	-	-	-	23.61
100 year Post- Develop. Runoff; Q ₁₀₀ (cfs)	2.64	2.41	2.26	1.63	1.17	47.38

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ON-SITE PEAK RUNOFF VOLUMES

Table 2: Estimated Storm Runoff Volumes						
Tributary Area	DA-1	DA-2	DA-3	DA-4	DA-5	DA-6
Acreage, (Pre Development) Acres	-	-	-	-	-	-
Acreage, (Post Development) Acres	0.52	0.48	0.4	0.27	0.2	0.37
100 year Pre-Develop. Volume V ₁₀₀ (Ac-ft)	-	-	-	-	-	-
100 year Post-Develop. Volume V ₁₀₀ (Ac-ft)	0.121	0.112	0.093	0.063	0.047	0.086
Tributary Area	DA-7	DA-8	DA-9	DA-10	DA-11	DA-12
Acreage, (Pre Development) Acres	-	-	-	-	-	-
Acreage, (Post Development) Acres	0.24	0.1	0.32	0.29	0.22	0.03
100 year Pre-Develop. Volume V ₁₀₀ (Ac-ft)	-	-	-	-	-	-
100 year Post-Develop. Volume V ₁₀₀ (Ac-ft)	0.056	0.023	0.075	0.068	0.051	0.007
Tributary Area	DA-13	DA-14	DA-15	DA-16	DA-17	DA-18
Acreage, (Pre Development) Acres	-	-	-	-	-	-
Acreage, (Post Development) Acres	0.28	2.02	0.46	0.29	0.32	0.13
100 year Pre-Develop. Volume V ₁₀₀ (Ac-ft)	-	-	-	-	-	-
100 year Post-Develop. Volume V ₁₀₀ (Ac-ft)	0.065	0.471	0.107	0.068	0.075	0.030
Tributary Area	DA-19	DA-20	DA-21	DA-22	DA-23	DA-24
Acreage, (Pre Development) Acres	-	-	-	-	-	-
Acreage, (Post Development) Acres	0.37	0.37	0.24	0.35	0.24	0.18
100 year Pre-Develop. Volume V ₁₀₀ (Ac-ft)	-	-	-	-	-	-
100 year Post-Develop. Volume V ₁₀₀ (Ac-ft)	0.086	0.086	0.056	0.082	0.056	0.042
Tributary Area	DA-25	DA-26	DA-27	DA-28	DA-29	Totals
Acreage, (Pre Development) Acres	-	-	-	-	-	9.61
Acreage, (Post Development) Acres	0.38	0.1	0.2	0.14	0.14	9.61
100 year Pre-Develop. Volume V ₁₀₀ (Ac-ft)	-	-	-	-	-	1.945
100 year Post-Develop. Volume V ₁₀₀ (Ac-ft)	0.089	0.023	0.047	0.033	0.033	2.252

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24-hr Precipitation Depth (inches) P_{24} (100 yr)	5.34
CN (AMC II) Pre Development	86
CN (AMC II) Post Development	56
CN (AMC I) Pre Development	71.6
CN (AMC I) Post Development	36
CN (AMC III) Pre Development	97.2
CN (AMC III) Post Development	75.8

RUNOFF SUMMARY				
Storm Event	V_{pre} (ac-ft)	V_{post} (ac-ft)	Change in Volume (ac-ft)	Change in Volume (cf)
100-yr	1.945	2.252	0.307	13372.92

3.0 CONCLUSIONS

The existing peak runoff flow from the project area was calculated to be 23.61 cfs, for the 100-year 1-hour storm event. The proposed peak runoff flow from the project area after improvements was calculated to be 47.38 cfs, for the 100-year 1-hour storm event.

The existing runoff volumes from the project area was calculated to be 1.945 Ac-ft, for the 100-year 24-hour storm event. The proposed runoff volume based on the project improvements was calculated to be 2.252 Ac-ft (3,633 CY), for the 100-year 24-hour storm event. Post-development condition has a greater runoff volume than the pre-development condition, with the difference between pre and post development volume being 0.307 Ac-ft, for the 100-year 24-hour storm event. Please refer to Table 2. Post development condition for the 100-year storm event is 15.78% higher than the pre-development condition. The difference in volume between the pre and post development is 495 CY. The proposed 5,685 CY capacity, retention infiltration basin is adequate to receive the difference in volume between the pre and post development and existing runoff volume, total of 3,633 CY. In the event the 100-year design storm volume is exceeded and the capacity of the retention infiltration basin is exceeded, the basin will overflow to a storm drain with outlet to offsite curb and gutter, near the northwesterly property line along Kickapoo Trail. The retention infiltration basin was oversized due to the site being located within Flood Zone A, with high risk of flooding. The basin has the capability of receiving additional runoff from exceeded 100-year storm events and flooding, from off-site, an additional 2,052 CY. Also, the earth excavated from this basin will be utilized to build up the mobile home site areas, in order to comply with the Base Flood Elevation, without importing any earth to avoid raising the Base Flood Elevation, and minimizing the height of the proposed raised foundations for the mobile homes.

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4.0 ATTACHMENTS

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Flow and Volume Calculation (100-year)

Peak Runoff Flow Calculations

$$Q = CIA$$

Where:

Q = runoff in cubic feet per second (cfs) from a given area.

C = Coefficient of Runoff

$$= 0.90(a_i + [(1 - F_p)a_p/I])$$

I = the time-averaged rainfall intensity per Intensity-Duration Curves Calculation Sheet – corresponding to the T_c, storm year=100, 1 hour rainfall=1.34 in.

A = Drainage area (acres)

F_p = infiltration rate for pervious areas (inches/hour)

a_i = ratio of impervious area to total area (decimal fraction)

a_p = ratio of pervious area to total area (decimal fraction)

PRE-DEVELOPMENT						
Drainage Area	A (acres)	Soils Group	Coefficient C	TC (min)	I _{TC-2YR} (In/hr)	Q (cfs)
TOTAL	9.61	B	0.819	19	3.00	23.61
TOTAL						23.61

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POST-DEVELOPMENT						
Drainage Area	A (acres)	Soils Group	Coefficient C	TC (min)	I _{TC-100YR} (In/hr)	Q (cfs)
1	0.52	B	0.847	7.30	6.00	2.64
2	0.48	B	0.846	7.50	5.94	2.41
3	0.40	B	0.855	6.40	6.60	2.26
4	0.27	B	0.870	5.90	6.95	1.63
5	0.20	B	0.863	6.00	6.80	1.17
6	0.37	B	0.853	6.55	6.45	2.04
7	0.24	B	0.865	5.25	7.50	1.56
8	0.10	B	0.882	5.00	7.80	0.69
9	0.32	B	0.868	6.00	6.80	1.89
10	0.29	B	0.850	7.20	6.00	1.48
11	0.22	B	0.863	6.50	6.50	1.23
12	0.03	B	0.796	7.30	6.00	0.14
13	0.28	B	0.736	13.20	3.90	0.80
14	2.02	B	0.751	13.10	3.90	5.92
15	0.46	B	0.847	7.15	6.00	2.34
16	0.29	B	0.859	6.00	6.80	1.69
17	0.32	B	0.868	5.90	6.95	1.93
18	0.13	B	0.852	5.70	7.10	0.79
19	0.37	B	0.852	7.00	6.10	1.92
20	0.37	B	0.849	6.60	6.40	2.01
21	0.24	B	0.866	6.40	6.60	1.37
22	0.35	B	0.858	6.70	6.30	1.89
23	0.24	B	0.863	6.10	6.70	1.39
24	0.18	B	0.895	6.00	6.80	1.10
25	0.38	B	0.851	7.00	6.10	1.97
26	0.10	B	0.882	5.10	7.70	0.68
27	0.20	B	0.735	13.40	3.85	0.57
28	0.14	B	0.889	5.75	7.20	0.90
29	0.14	B	0.893	5.00	7.80	0.98
TOTAL						47.38

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Runoff Volume Calculations

$$V = \frac{Y \cdot A \cdot P_{24}}{12}$$

Where:

V = Volume in acre-ft

Y = 24-hour storm runoff yield factor for subarea A

$$= \frac{(P_{24} - I_a)^2}{(P_{24} - I_a + S)P_{24}}$$

P₂₄ = 24-hour storm rainfall from NOAA Precipitation Frequency Server (in.)

I_a = initial abstraction

$$= 0.2S$$

$$S = \frac{1000}{CN} - 10$$

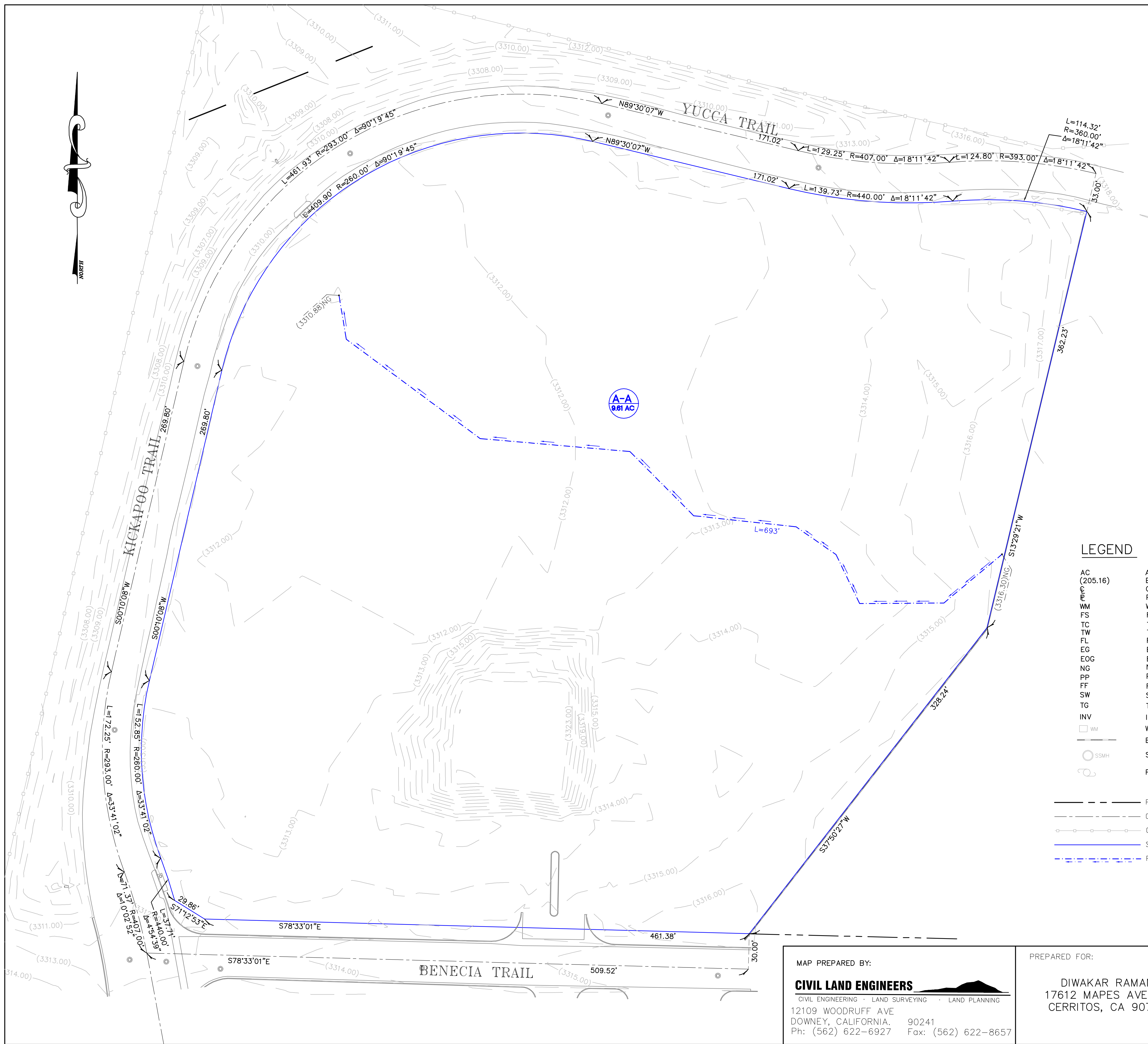
A = Drainage area in acres

PRE-DEVELOPMENT									
Drainage Area	A (acres)	Soils Group	CN AMC II	CN AMC I	S	I _a	P ₂₄	Y	V (Ac-ft)
TOTAL	9.61	B	86	71.6	3.97	0.79	5.34	0.45	1.945
TOTAL									1.945

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POST-DEVELOPMENT									
Drainage Area	A (acres)	Soils Group	CN AMC II	CN AMC III	S	I _a	P ₂₄	Y	V (Ac-ft)
1	0.52	B	56	75.8	3.19	0.64	5.34	0.52	0.121
2	0.48	B	56	75.8	3.19	0.64	5.34	0.52	0.112
3	0.40	B	56	75.8	3.19	0.64	5.34	0.52	0.093
4	0.27	B	56	75.8	3.19	0.64	5.34	0.52	0.063
5	0.20	B	56	75.8	3.19	0.64	5.34	0.52	0.047
6	0.37	B	56	75.8	3.19	0.64	5.34	0.52	0.086
7	0.24	B	56	75.8	3.19	0.64	5.34	0.52	0.056
8	0.10	B	56	75.8	3.19	0.64	5.34	0.52	0.023
9	0.32	B	56	75.8	3.19	0.64	5.34	0.52	0.075
10	0.29	B	56	75.8	3.19	0.64	5.34	0.52	0.068
11	0.22	B	56	75.8	3.19	0.64	5.34	0.52	0.051
12	0.03	B	56	75.8	3.19	0.64	5.34	0.52	0.007
13	0.28	B	56	75.8	3.19	0.64	5.34	0.52	0.065
14	2.02	B	56	75.8	3.19	0.64	5.34	0.52	0.471
15	0.46	B	56	75.8	3.19	0.64	5.34	0.52	0.107
16	0.29	B	56	75.8	3.19	0.64	5.34	0.52	0.068
17	0.32	B	56	75.8	3.19	0.64	5.34	0.52	0.075
18	0.13	B	56	75.8	3.19	0.64	5.34	0.52	0.030
19	0.37	B	56	75.8	3.19	0.64	5.34	0.52	0.086
20	0.37	B	56	75.8	3.19	0.64	5.34	0.52	0.086
21	0.24	B	56	75.8	3.19	0.64	5.34	0.52	0.056
22	0.35	B	56	75.8	3.19	0.64	5.34	0.52	0.082
23	0.24	B	56	75.8	3.19	0.64	5.34	0.52	0.056
24	0.18	B	56	75.8	3.19	0.64	5.34	0.52	0.042
25	0.38	B	56	75.8	3.19	0.64	5.34	0.52	0.089
26	0.10	B	56	75.8	3.19	0.64	5.34	0.52	0.023
27	0.20	B	56	75.8	3.19	0.64	5.34	0.52	0.047
28	0.14	B	56	75.8	3.19	0.64	5.34	0.52	0.033
29	0.14	B	56	75.8	3.19	0.64	5.34	0.52	0.033
TOTAL									2.252

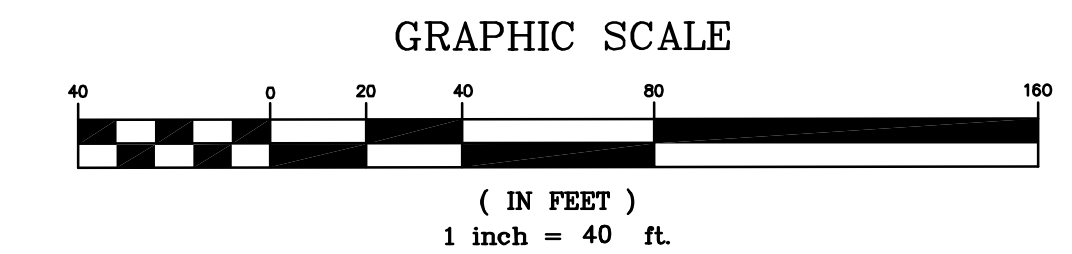


PRE-DEVELOPMENT						
Drainage Area	A (acres)	Soils Group	Coefficient C	TC (min)	I _{TC-2YR} (In/hr)	Q (cfs)
TOTAL	9.61	B	0.819	19	3.00	23.61
TOTAL						23.61

PRE-DEVELOPMENT						
Drainage Area	A (acres)	Soils Group	Coefficient C	TC (min)	I _{TC-2YR} (In/hr)	Q (cfs)
TOTAL	9.61	B	0.819	19	3.00	23.61
TOTAL						23.61

LEGEND

- AC (205.16) ASPHALT CONCRETE
- EXISTING ELEVATION
- CENTER LINE
- PROPERTY LINE
- WM WATER METER
- FS FINISH SURFACE
- TC TOP OF CURB
- TW TOP OF WALL
- FL FLOW LINE
- EG EXISTING GRADE
- EOG EDGE OF GUTTER
- NG NATURAL GROUND
- PP POWER POLE
- FF FINISH FLOOR
- SW SIDEWALK
- TG TOP OF GRATE
- INV INVERT
- WM WATER METER
- EXIST. BLOCK WALL
- SSMH SSMH
- POWER POLE
- PROPERTY LINE
- CENTERLINE
- CHAINLINK FENCE
- SUBAREA BOUNDARY
- FLOWLINE AND DIRECTION OF FLOW



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PRE-DEVELOPMENT
 HYDROLOGY MAP
 FOR
 A.P.N. 0586-081-13
 YUCCA VALLEY, CA 92284

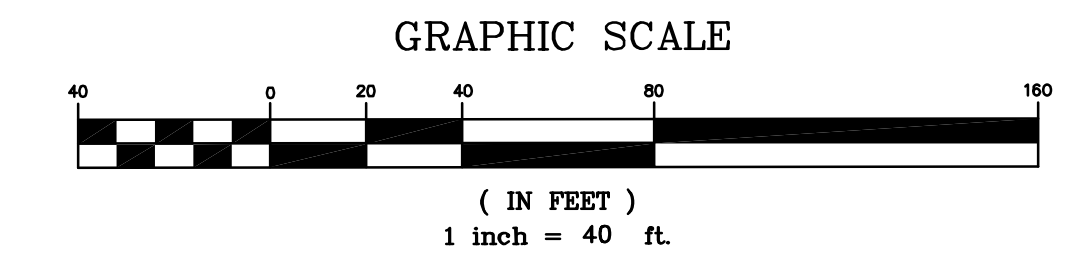
JOB No.
 SHEET
 1 OF 2



POST-DEVELOPMENT						
Drainage Area	A (acres)	Soils Group	Coefficient C	TC (min)	I _{rc-100yr} (In/hr)	Q (cfs)
1	0.52	B	0.847	7.30	6.00	2.64
2	0.48	B	0.846	7.50	5.94	2.41
3	0.40	B	0.855	6.40	6.60	2.26
4	0.27	B	0.870	5.90	6.95	1.63
5	0.20	B	0.863	6.00	6.80	1.17
6	0.37	B	0.853	6.55	6.45	2.04
7	0.24	B	0.865	5.25	7.50	1.56
8	0.10	B	0.882	4.75	7.80	0.69
9	0.32	B	0.868	6.00	6.80	1.89
10	0.29	B	0.850	7.20	6.00	1.48
11	0.22	B	0.863	6.50	6.50	1.23
12	0.03	B	0.796	7.30	6.00	0.14
13	0.28	B	0.736	13.20	3.90	0.80
14	2.02	B	0.751	13.10	3.90	5.92
15	0.46	B	0.847	7.15	6.00	2.34
16	0.29	B	0.859	6.00	6.80	1.69
17	0.32	B	0.868	5.90	6.95	1.93
18	0.13	B	0.852	5.70	7.10	0.79
19	0.37	B	0.852	7.00	6.10	1.92
20	0.37	B	0.849	6.60	6.40	2.01
21	0.24	B	0.866	6.40	6.60	1.37
22	0.35	B	0.858	6.70	6.30	1.89
23	0.24	B	0.863	6.10	6.70	1.39
24	0.18	B	0.895	6.00	6.80	1.10
25	0.38	B	0.851	7.00	6.10	1.97
26	0.10	B	0.882	5.10	7.70	0.68
27	0.20	B	0.735	13.40	3.85	0.57
28	0.14	B	0.889	5.75	7.20	0.90
29	0.14	B	0.893	4.25	7.80	0.98
TOTAL						47.38

Drainage Area	A (acres)	Soils Group	POST-DEVELOPMENT						
			CN AMC II	CN AMC III	S	I _c	P ₂₄	Y	V (Ac-ft)
1	0.52	B	56	75.8	3.19	0.64	5.34	0.52	0.121
2	0.48	B	56	75.8	3.19	0.64	5.34	0.52	0.112
3	0.40	B	56	75.8	3.19	0.64	5.34	0.52	0.093
4	0.27	B	56	75.8	3.19	0.64	5.34	0.52	0.063
5	0.20	B	56	75.8	3.19	0.64	5.34	0.52	0.047
6	0.37	B	56	75.8	3.19	0.64	5.34	0.52	0.086
7	0.24	B	56	75.8	3.19	0.64	5.34	0.52	0.056
8	0.10	B	56	75.8	3.19	0.64	5.34	0.52	0.023
9	0.32	B	56	75.8	3.19	0.64	5.34	0.52	0.075
10	0.29	B	56	75.8	3.19	0.64	5.34	0.52	0.068
11	0.22	B	56	75.8	3.19	0.64	5.34	0.52	0.051
12	0.03	B	56	75.8	3.19	0.64	5.34	0.52	0.007
13	0.28	B	56	75.8	3.19	0.64	5.34	0.52	0.065
14	2.02	B	56	75.8	3.19	0.64	5.34	0.52	0.471
15	0.46	B	56	75.8	3.19	0.64	5.34	0.52	0.107
16	0.29	B	56	75.8	3.19	0.64	5.34	0.52	0.068
17	0.32	B	56	75.8	3.19	0.64	5.34	0.52	0.075
18	0.13	B	56	75.8	3.19	0.64	5.34	0.52	0.030
19	0.37	B	56	75.8	3.19	0.64	5.34	0.52	0.086
20	0.37	B	56	75.8	3.19	0.64	5.34	0.52	0.086
21	0.24	B	56	75.8	3.19	0.64	5.34	0.52	0.056
22	0.35	B	56	75.8	3.19	0.64	5.34	0.52	0.082
23	0.24	B	56	75.8	3.19	0.64	5.34	0.52	0.056
24	0.18	B	56	75.8	3.19	0.64	5.34	0.52	0.042
25	0.38	B	56	75.8	3.19	0.64	5.34	0.52	0.089
26	0.10	B	56	75.8	3.19	0.64	5.34	0.52	0.023
27	0.20	B	56	75.8	3.19	0.64	5.34	0.52	0.047
28	0.14	B	56	75.8	3.19	0.64	5.34	0.52	0.033
29	0.14	B	56	75.8	3.19	0.64	5.34	0.52	0.033
TOTAL									2.252

- LEGEND**
- AC (205.16) ASPHALT CONCRETE
 - EXISTING ELEVATION
 - C CENTER LINE
 - PROPERTY LINE
 - WM WATER METER
 - FS FINISH SURFACE
 - TC TOP OF CURB
 - TW TOP OF WALL
 - FL FLOW LINE
 - EG EXISTING GRADE
 - EOG EDGE OF GUTTER
 - NG NATURAL GROUND
 - PP POWER POLE
 - FF FINISH FLOOR
 - SW SIDEWALK
 - TG TOP OF GRATE
 - INV INVERT
 - WM WATER METER
 - EXIST. BLOCK WALL
 - SSMH
 - POWER POLE
 - PROPERTY LINE
 - CENTERLINE
 - CHAINLINK FENCE
 - SUBAREA BOUNDARY
 - FLOWLINE AND DIRECTION OF FLOW



MAP PREPARED BY:
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 17612 MAPES AVENUE
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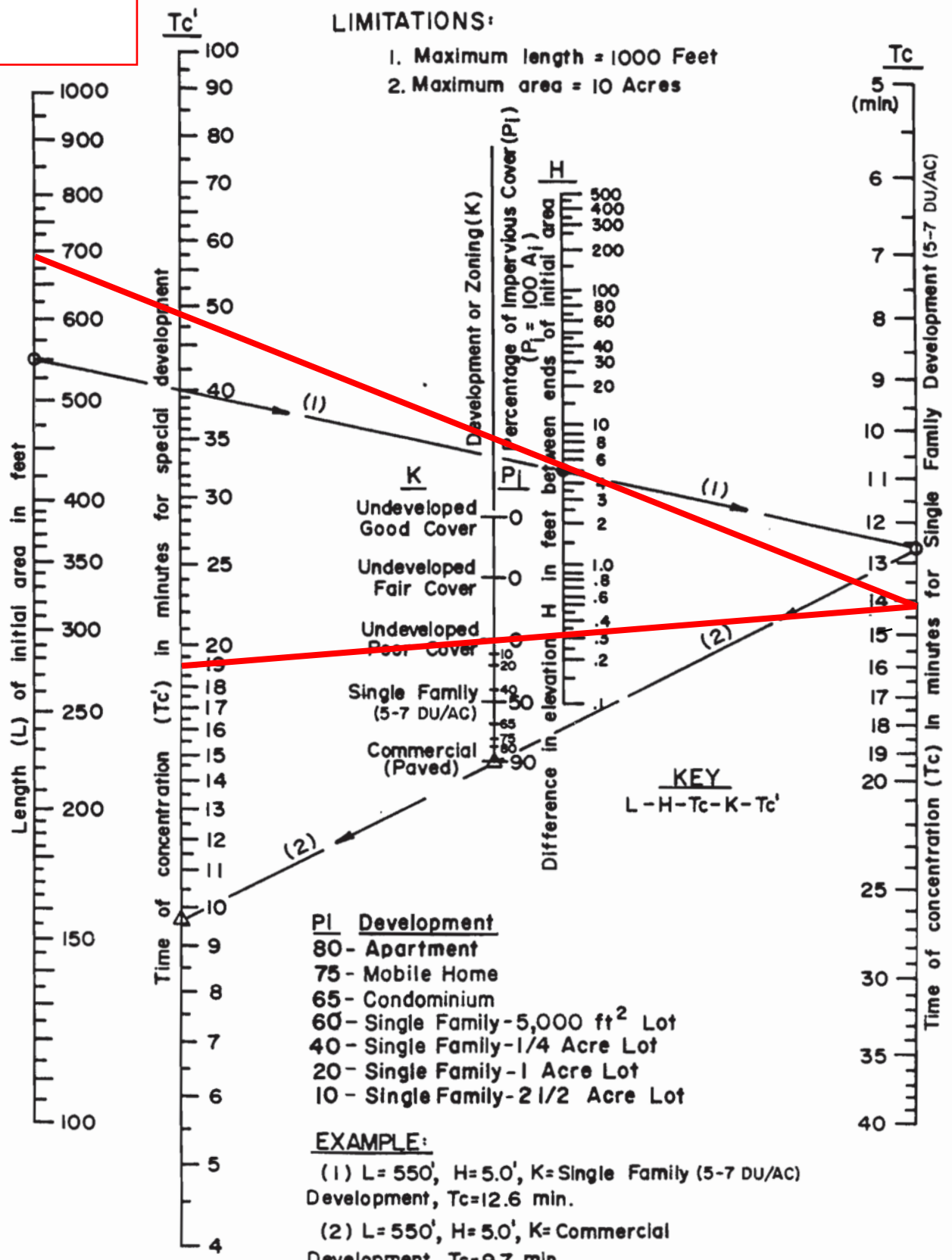
POST DEVELOPMENT
 HYDROLOGY MAP
 FOR
 A.P.N. 0586-081-13
 YUCCA VALLEY, CA 92284

JOB No.
 SHEET
 1 OF 2

Pre-development DA-A
 Flow length= \sim 693'
 H=5.42'
 %Imp=0.0
 Tc'=19 min

LIMITATIONS:

1. Maximum length = 1000 Feet
2. Maximum area = 10 Acres



SAN BERNARDINO COUNTY
 HYDROLOGY MANUAL

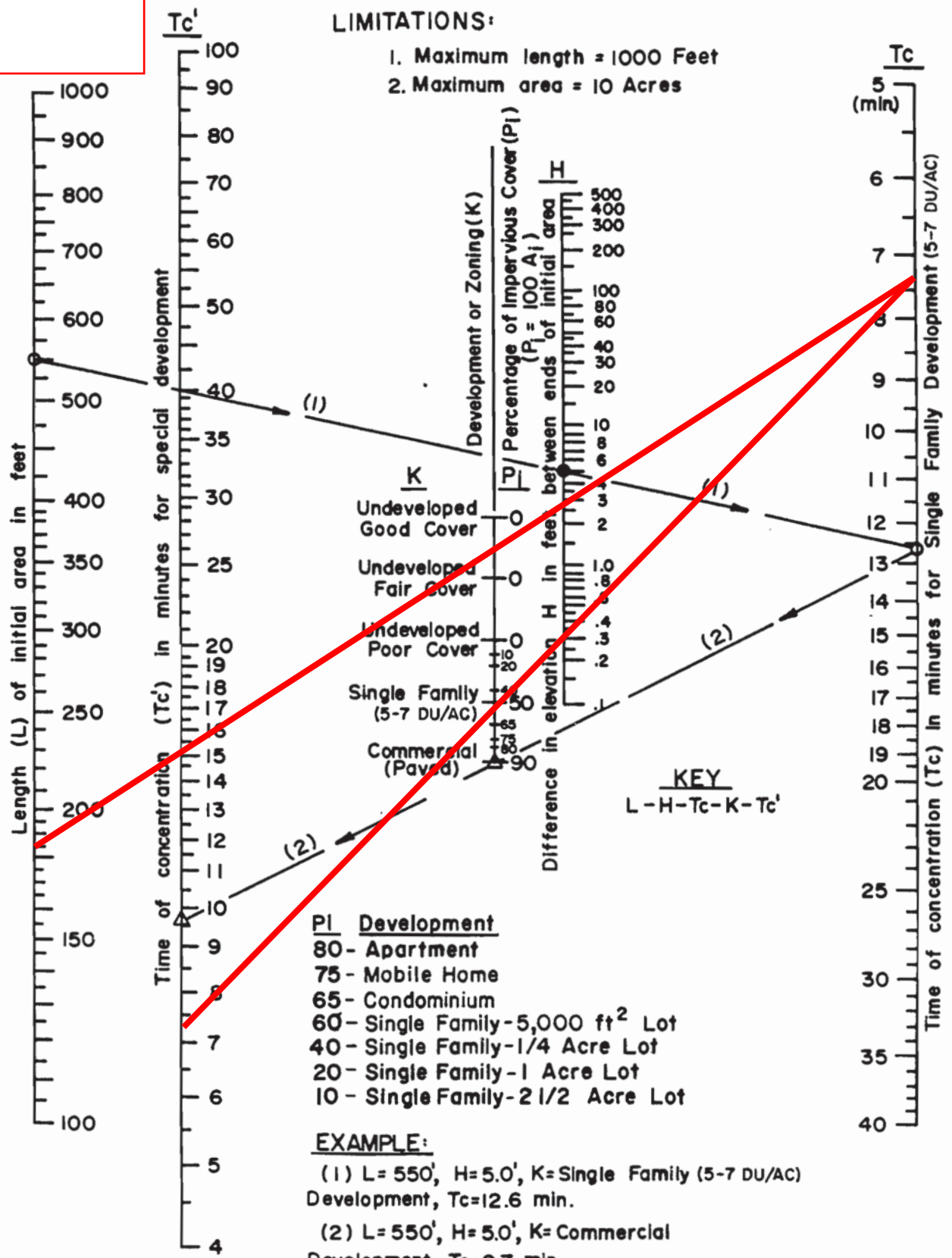
TIME OF CONCENTRATION
 NOMOGRAPH
 FOR INITIAL SUBAREA

Figure D-1

Post-development DA-1
 Flow length= $\sim 185'$
 $H=2.81'$
 $\%Imp=0.53$
 $Tc'=7.3$ min

LIMITATIONS:

1. Maximum length = 1000 Feet
2. Maximum area = 10 Acres



SAN BERNARDINO COUNTY
 HYDROLOGY MANUAL

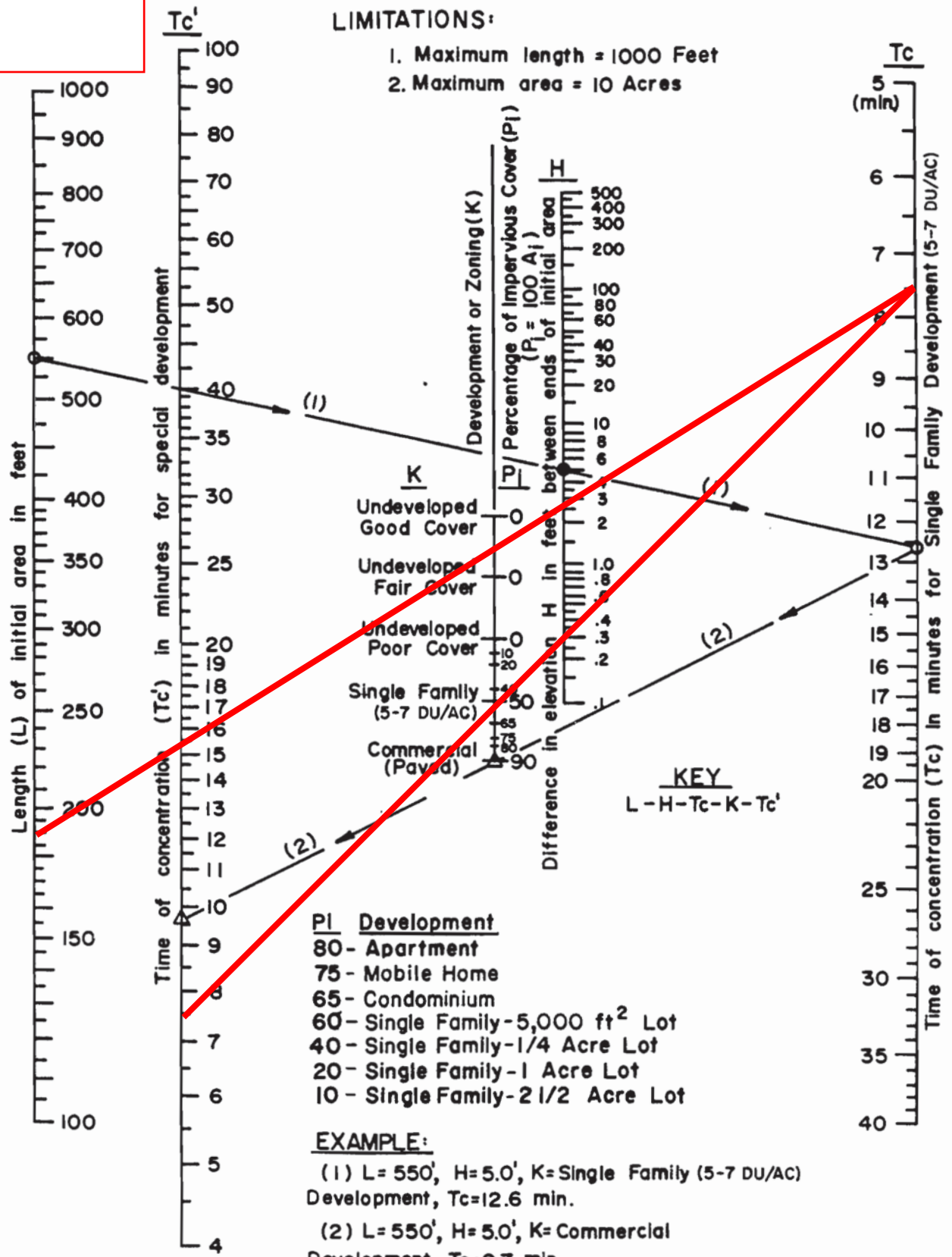
TIME OF CONCENTRATION
 NOMOGRAPH
 FOR INITIAL SUBAREA

Figure D-1

Post-development DA-2
 Flow length= \sim 190'
 $H=2.81'$
 $\%Imp=0.53$
 $Tc'=7.5$ min

LIMITATIONS:

1. Maximum length = 1000 Feet
2. Maximum area = 10 Acres



SAN BERNARDINO COUNTY
 HYDROLOGY MANUAL

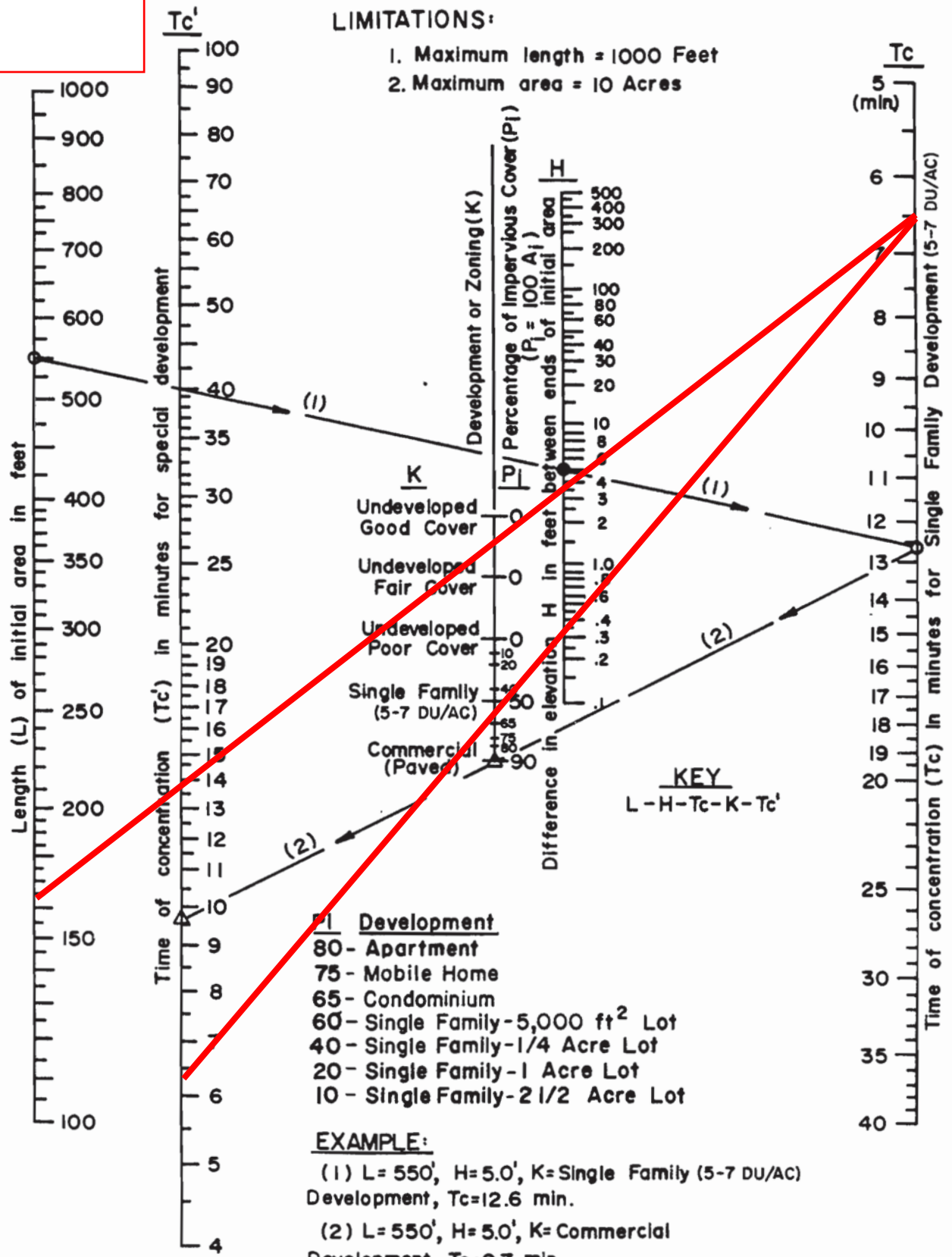
TIME OF CONCENTRATION
NOMOGRAPH
FOR INITIAL SUBAREA

Figure D-1

Post-development DA-3
 Flow length= \sim 164'
 H=3.8'
 %Imp=0.56
 Tc'=6.4 min

LIMITATIONS:

1. Maximum length = 1000 Feet
2. Maximum area = 10 Acres



SAN BERNARDINO COUNTY
 HYDROLOGY MANUAL

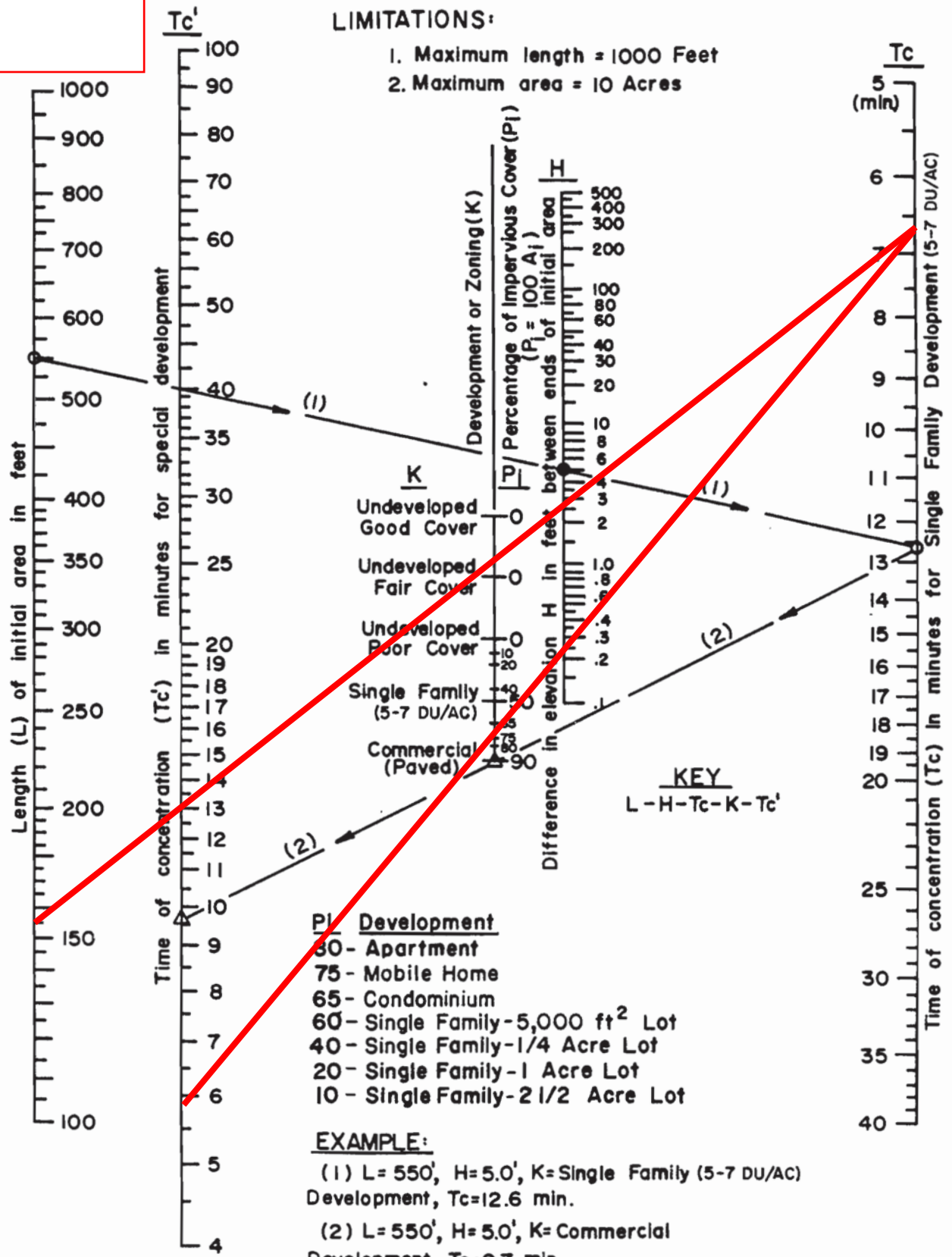
TIME OF CONCENTRATION
NOMOGRAPH
FOR INITIAL SUBAREA

Figure D-1

Post-development DA-4
 Flow length= $\sim 155'$
 $H=2.7'$
 $\%Imp=0.69$
 $Tc'=5.9$ min

LIMITATIONS:

1. Maximum length = 1000 Feet
2. Maximum area = 10 Acres



SAN BERNARDINO COUNTY
 HYDROLOGY MANUAL

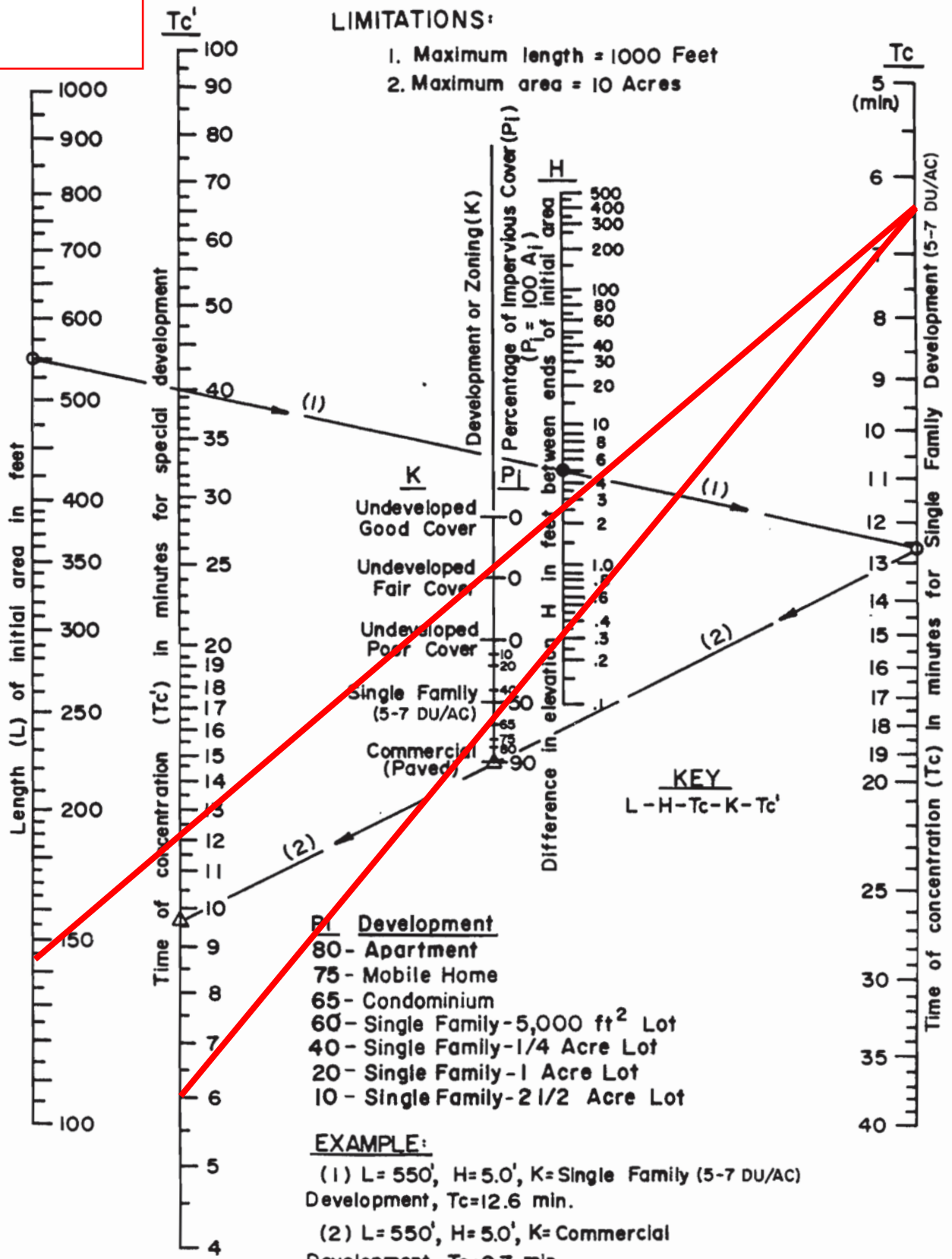
TIME OF CONCENTRATION
 NOMOGRAPH
 FOR INITIAL SUBAREA

Figure D-1

Post-development DA-5
 Flow length= \sim 144'
 $H=2.66'$
 $\%Imp=0.63$
 $Tc'=6$ min

LIMITATIONS:

1. Maximum length = 1000 Feet
2. Maximum area = 10 Acres



SAN BERNARDINO COUNTY
 HYDROLOGY MANUAL

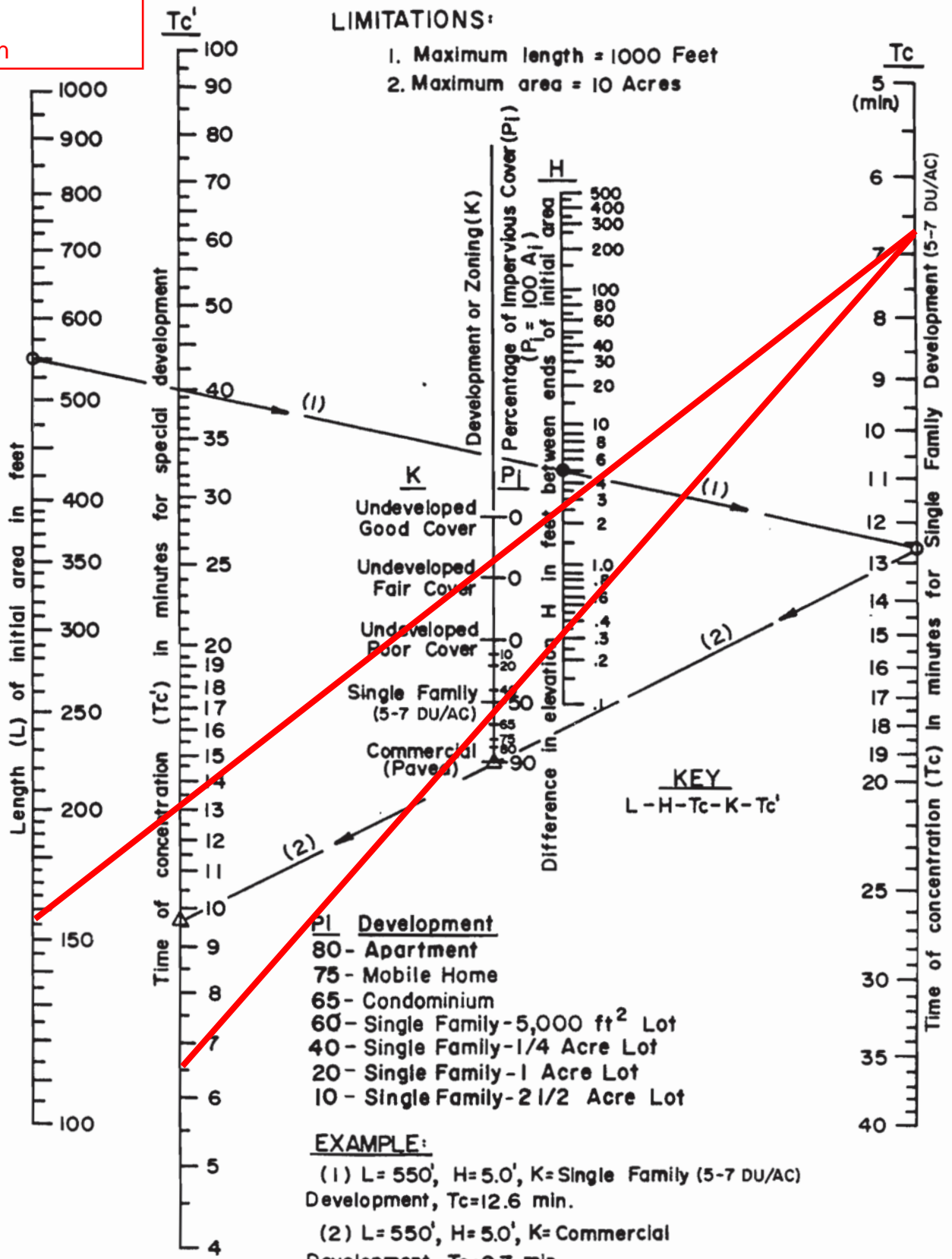
TIME OF CONCENTRATION
NOMOGRAPH
FOR INITIAL SUBAREA

Figure D-1

Post-development DA-6
 Flow length= \sim 157'
 $H=2.68'$
 $\%Imp=0.55$
 $Tc'=6.55$ min

LIMITATIONS:

1. Maximum length = 1000 Feet
2. Maximum area = 10 Acres



SAN BERNARDINO COUNTY
 HYDROLOGY MANUAL

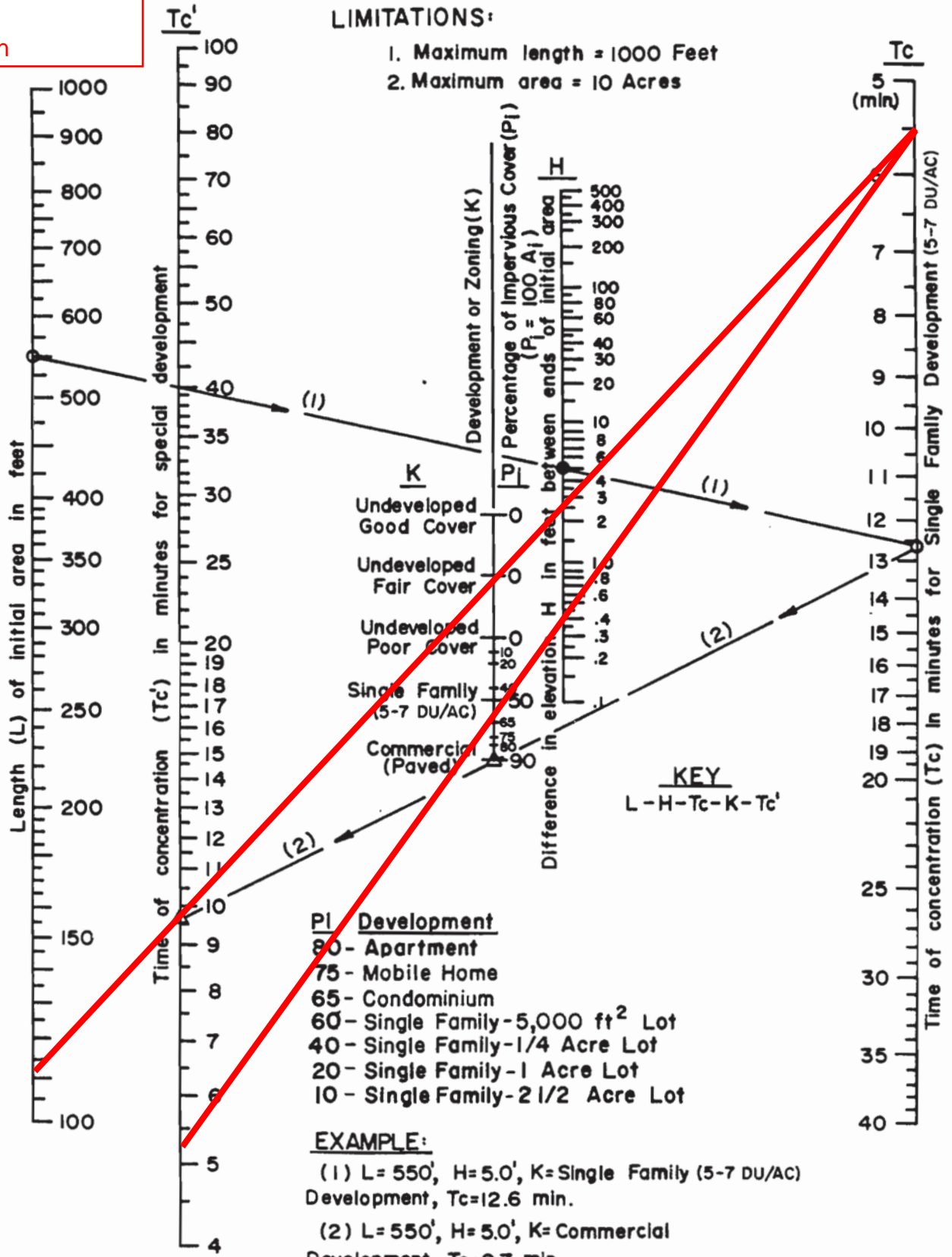
TIME OF CONCENTRATION
NOMOGRAPH
FOR INITIAL SUBAREA

Figure D-1

Post-development DA-7
 Flow length= $\sim 112'$
 $H=2.68'$
 $\%Imp=0.61$
 $Tc'=5.25$ min

LIMITATIONS:

1. Maximum length = 1000 Feet
2. Maximum area = 10 Acres



SAN BERNARDINO COUNTY
 HYDROLOGY MANUAL

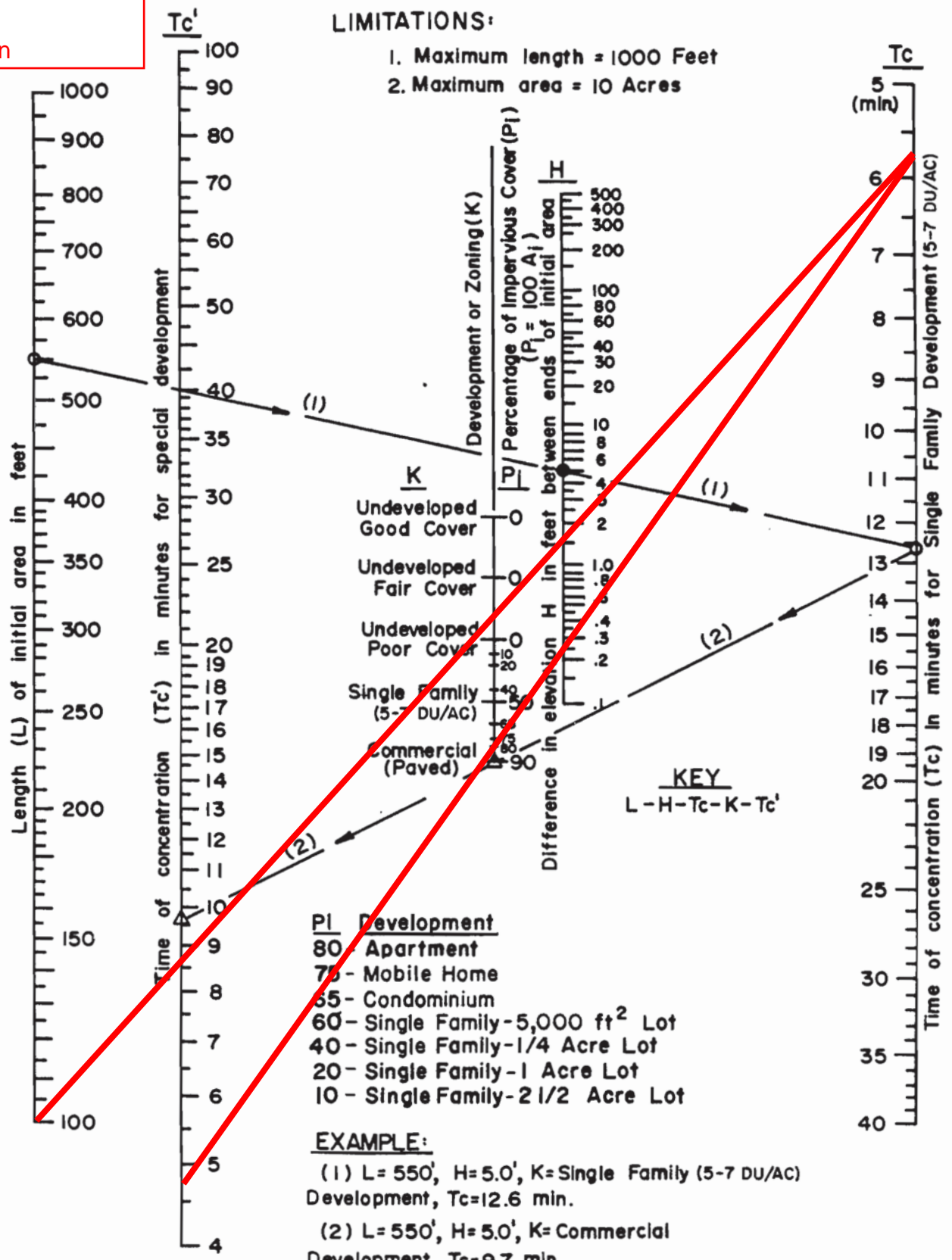
TIME OF CONCENTRATION
NOMOGRAPH
FOR INITIAL SUBAREA

Figure D-1

Post-development DA-8
 Flow length= \sim 99'
 $H=1.52'$
 $\%Imp=0.80$
 $Tc'=4.75$ min

LIMITATIONS:

1. Maximum length = 1000 Feet
2. Maximum area = 10 Acres



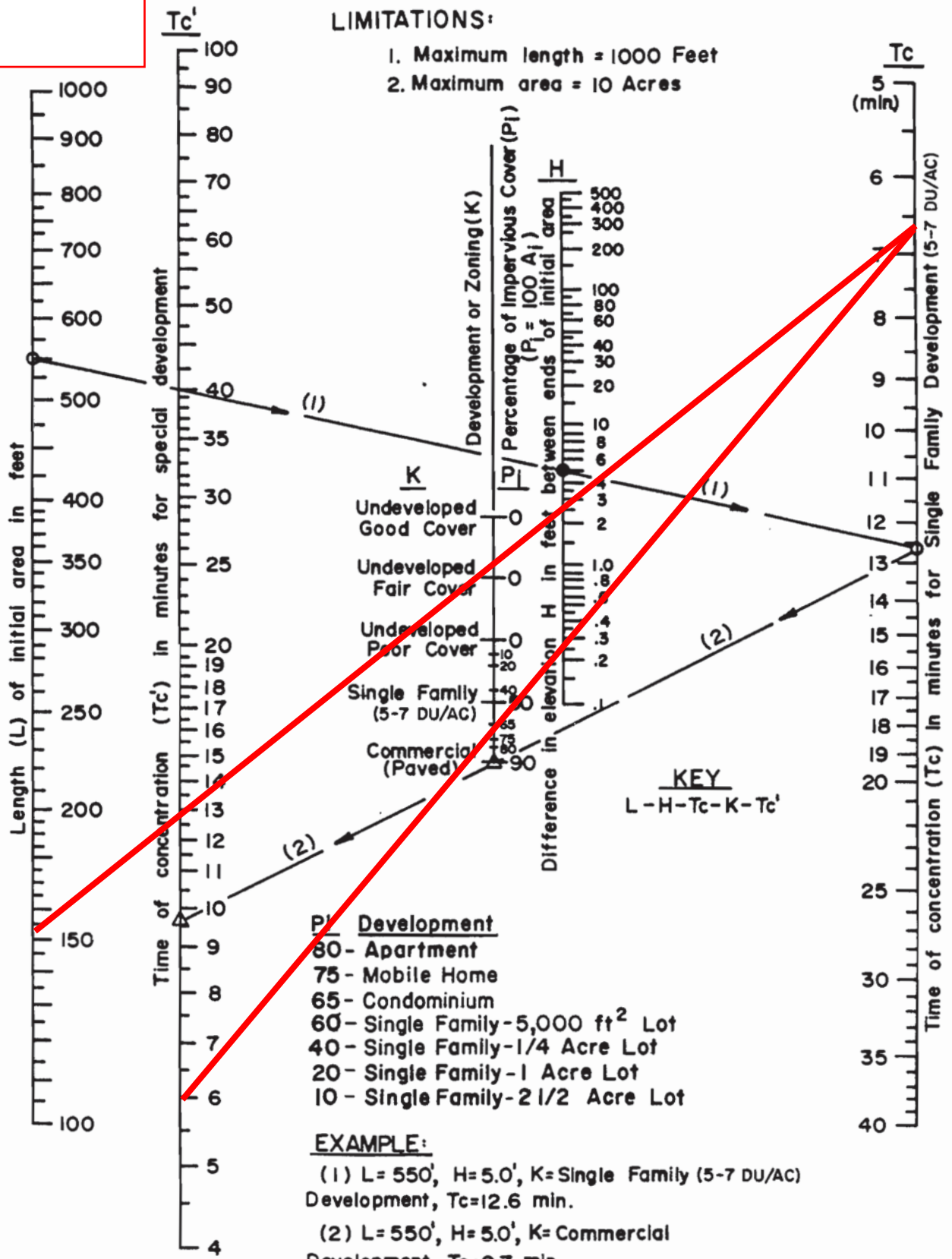
SAN BERNARDINO COUNTY
 HYDROLOGY MANUAL

TIME OF CONCENTRATION
NOMOGRAPH
FOR INITIAL SUBAREA

Post-development DA-9
 Flow length= \sim 153'
 $H=2.66'$
 $\%Imp=0.67$
 $Tc'=6$ min

LIMITATIONS:

1. Maximum length = 1000 Feet
2. Maximum area = 10 Acres



SAN BERNARDINO COUNTY
 HYDROLOGY MANUAL

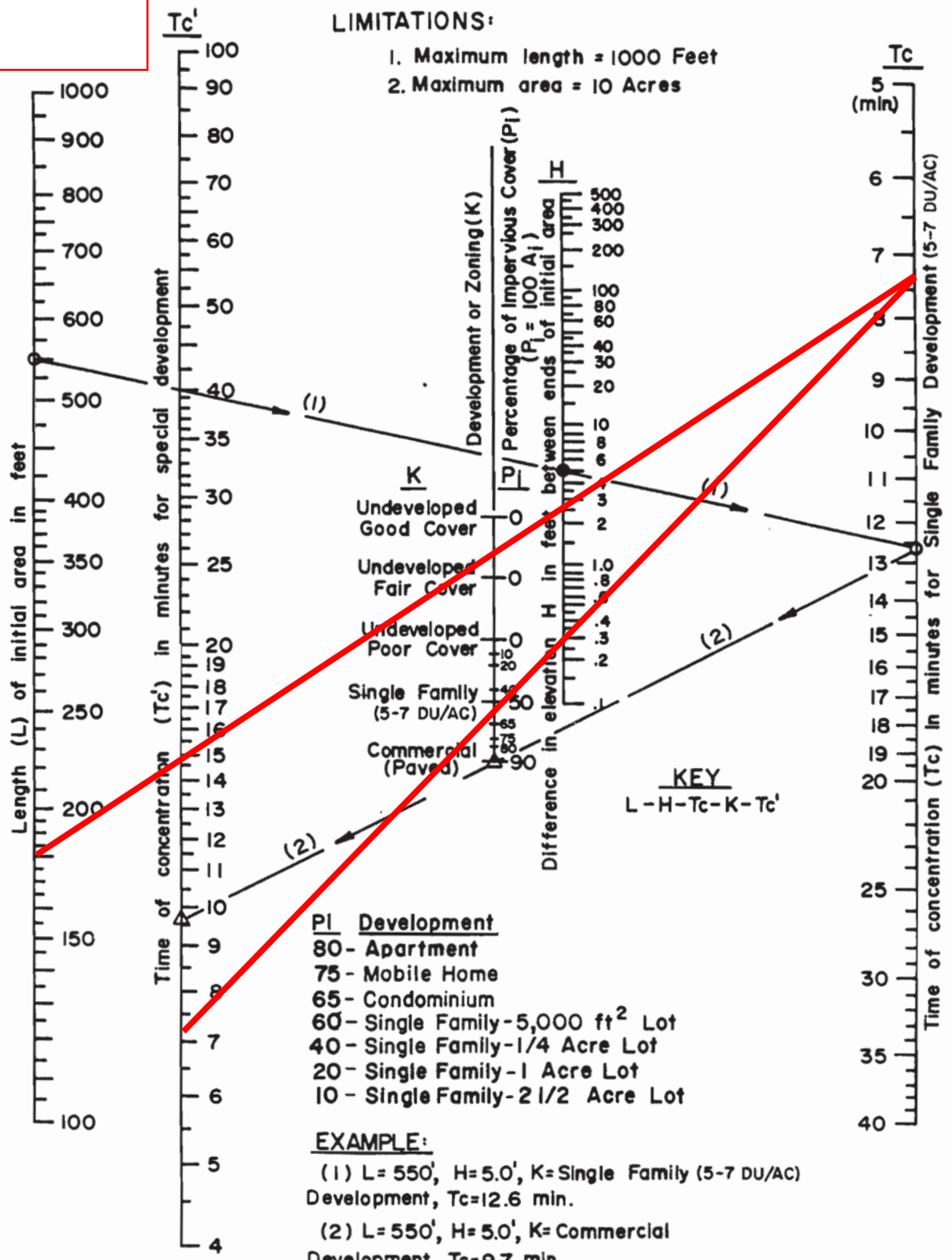
TIME OF CONCENTRATION
NOMOGRAPH
FOR INITIAL SUBAREA

Figure D-1

Post-development DA-10
 Flow length= \sim 181'
 $H=2.72'$
 $\%Imp=0.55$
 $Tc'=7.2$ min

LIMITATIONS:

1. Maximum length = 1000 Feet
2. Maximum area = 10 Acres



SAN BERNARDINO COUNTY
 HYDROLOGY MANUAL

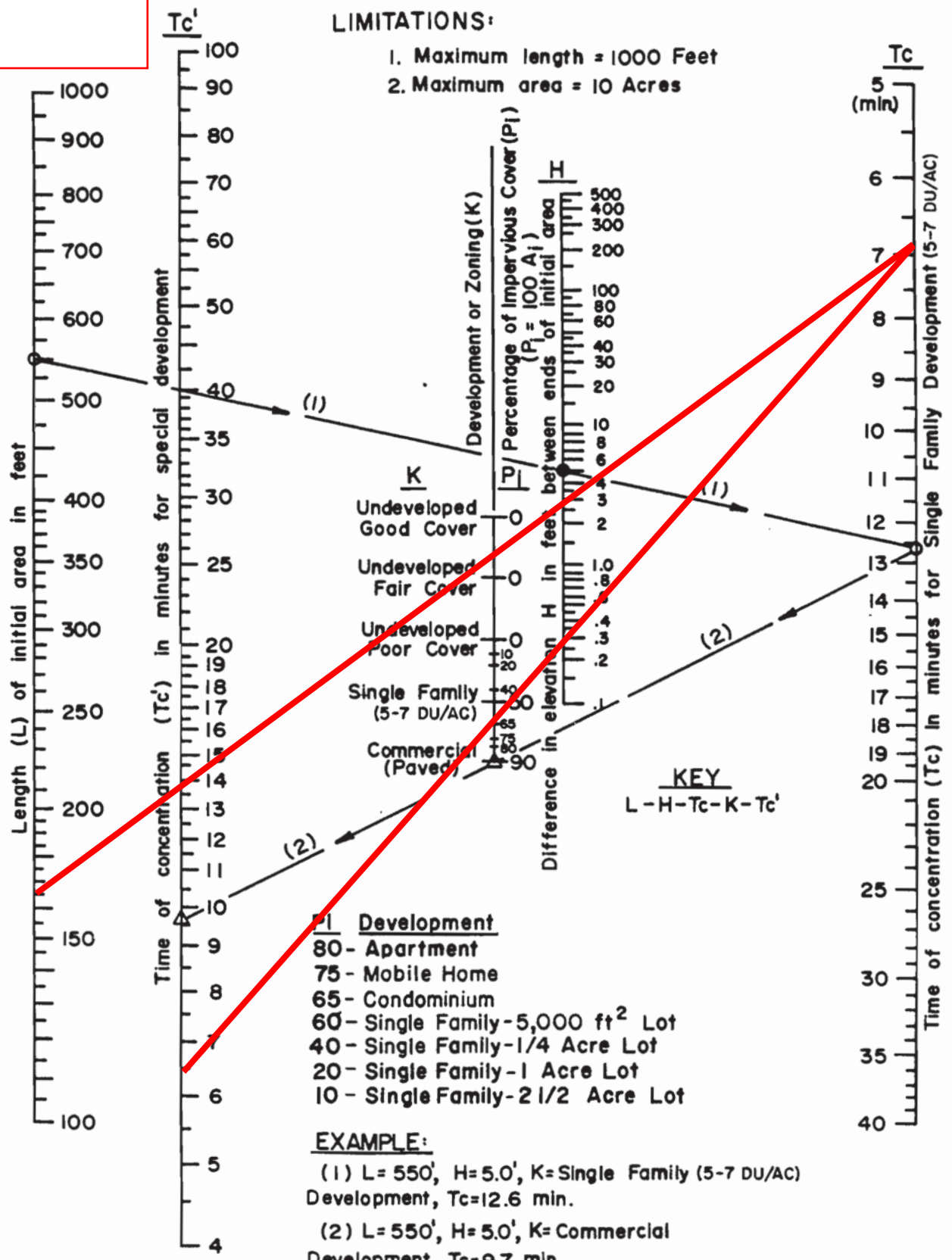
TIME OF CONCENTRATION
NOMOGRAPH
FOR INITIAL SUBAREA

Figure D-1

Post-development DA-11
 Flow length= \sim 165'
 $H=2.72'$
 $\%Imp=0.64$
 $Tc'=6.5$ min

LIMITATIONS:

1. Maximum length = 1000 Feet
2. Maximum area = 10 Acres



SAN BERNARDINO COUNTY
 HYDROLOGY MANUAL

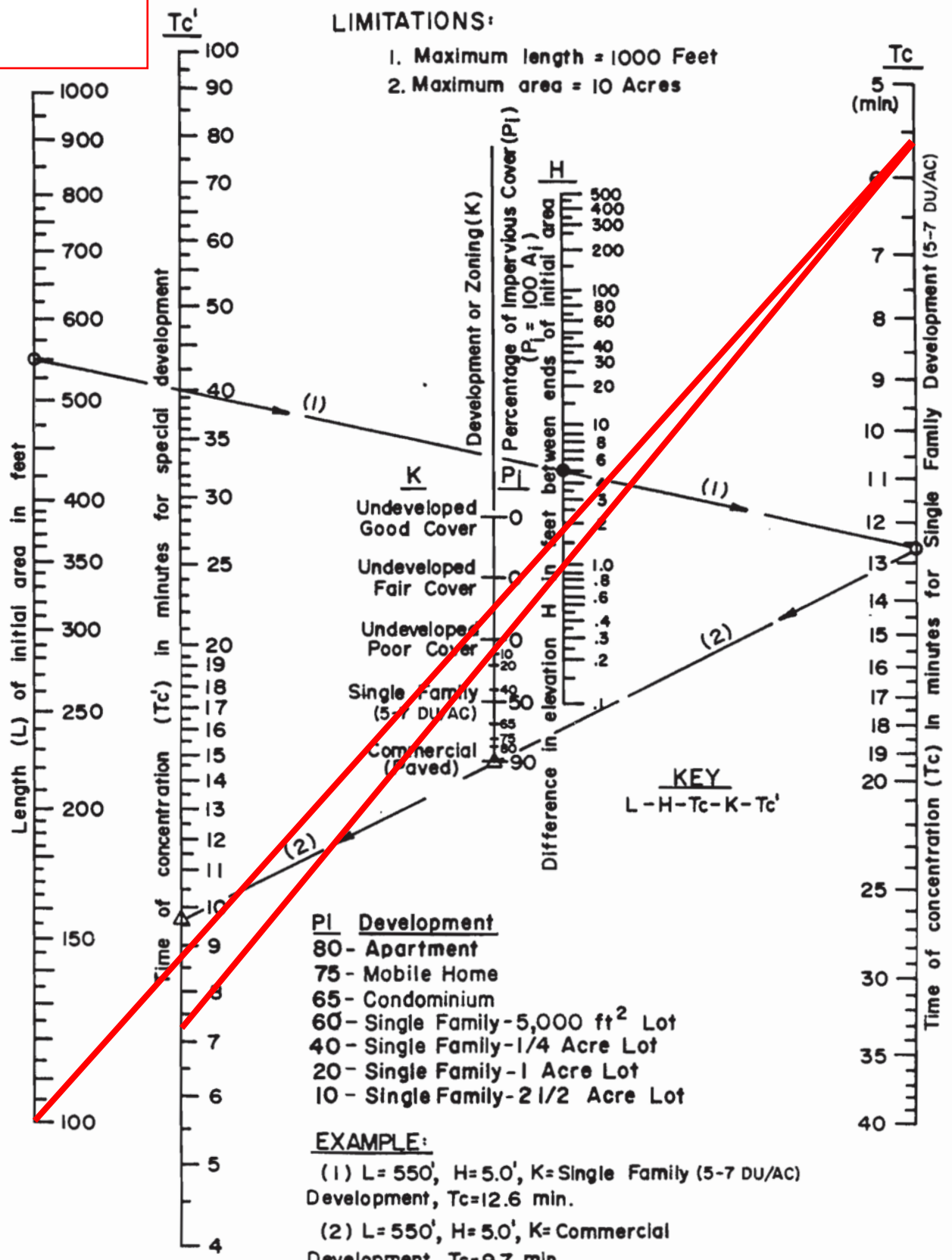
TIME OF CONCENTRATION
NOMOGRAPH
FOR INITIAL SUBAREA

Figure D-1

Post-development DA-12
 Flow length= $\sim 87'$
 $H=1.95'$
 $\%Imp=0.07$
 $Tc'=7.3$ min

LIMITATIONS:

1. Maximum length = 1000 Feet
2. Maximum area = 10 Acres



SAN BERNARDINO COUNTY
 HYDROLOGY MANUAL

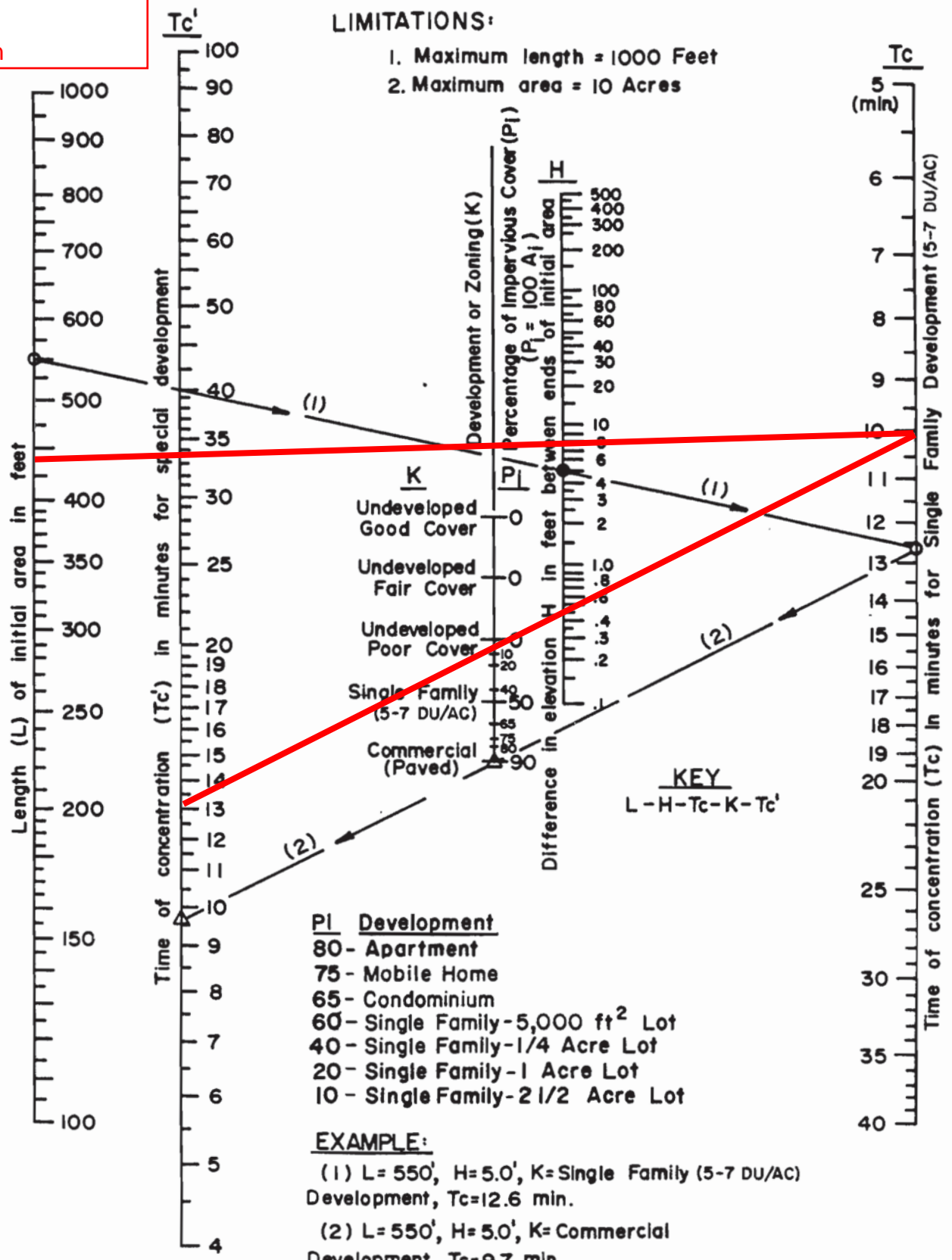
TIME OF CONCENTRATION
NOMOGRAPH
FOR INITIAL SUBAREA

Figure D-1

Post-development DA-13
 Flow length= \sim 444'
 H=8'
 %Imp=0.05
 Tc'=13.2 min

LIMITATIONS:

1. Maximum length = 1000 Feet
2. Maximum area = 10 Acres



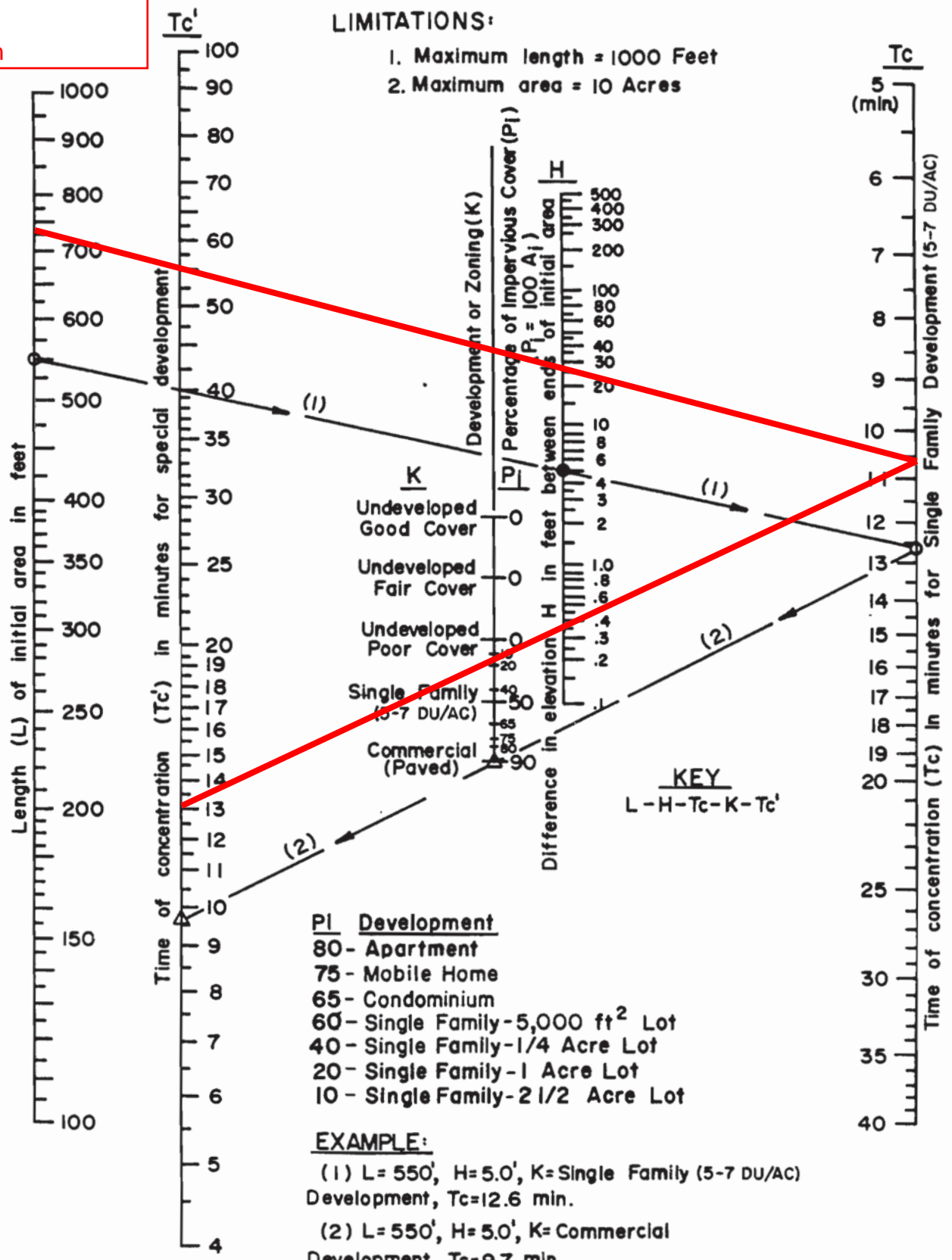
SAN BERNARDINO COUNTY
 HYDROLOGY MANUAL

TIME OF CONCENTRATION
 NOMOGRAPH
 FOR INITIAL SUBAREA

Post-development DA-14
 Flow length= $\sim 736'$
 $H=26.65'$
 $\%Imp=0.14$
 $Tc'=13.1$ min

LIMITATIONS:

1. Maximum length = 1000 Feet
2. Maximum area = 10 Acres



SAN BERNARDINO COUNTY
 HYDROLOGY MANUAL

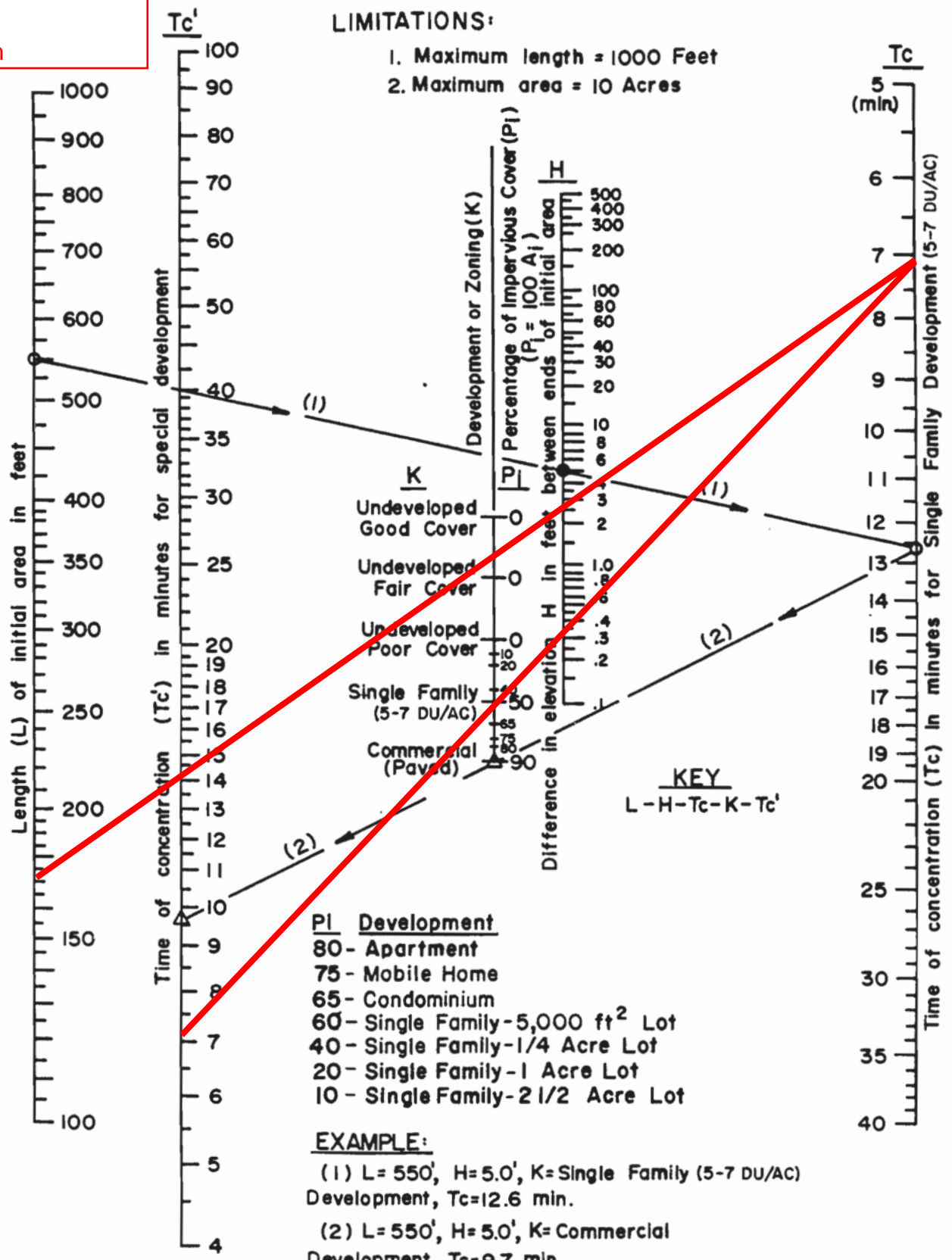
TIME OF CONCENTRATION
NOMOGRAPH
FOR INITIAL SUBAREA

Figure D-1

Post-development DA-15
 Flow length= \sim 172'
 $H=2.74'$
 $\%Imp=0.53$
 $Tc'=7.15$ min

LIMITATIONS:

1. Maximum length = 1000 Feet
2. Maximum area = 10 Acres



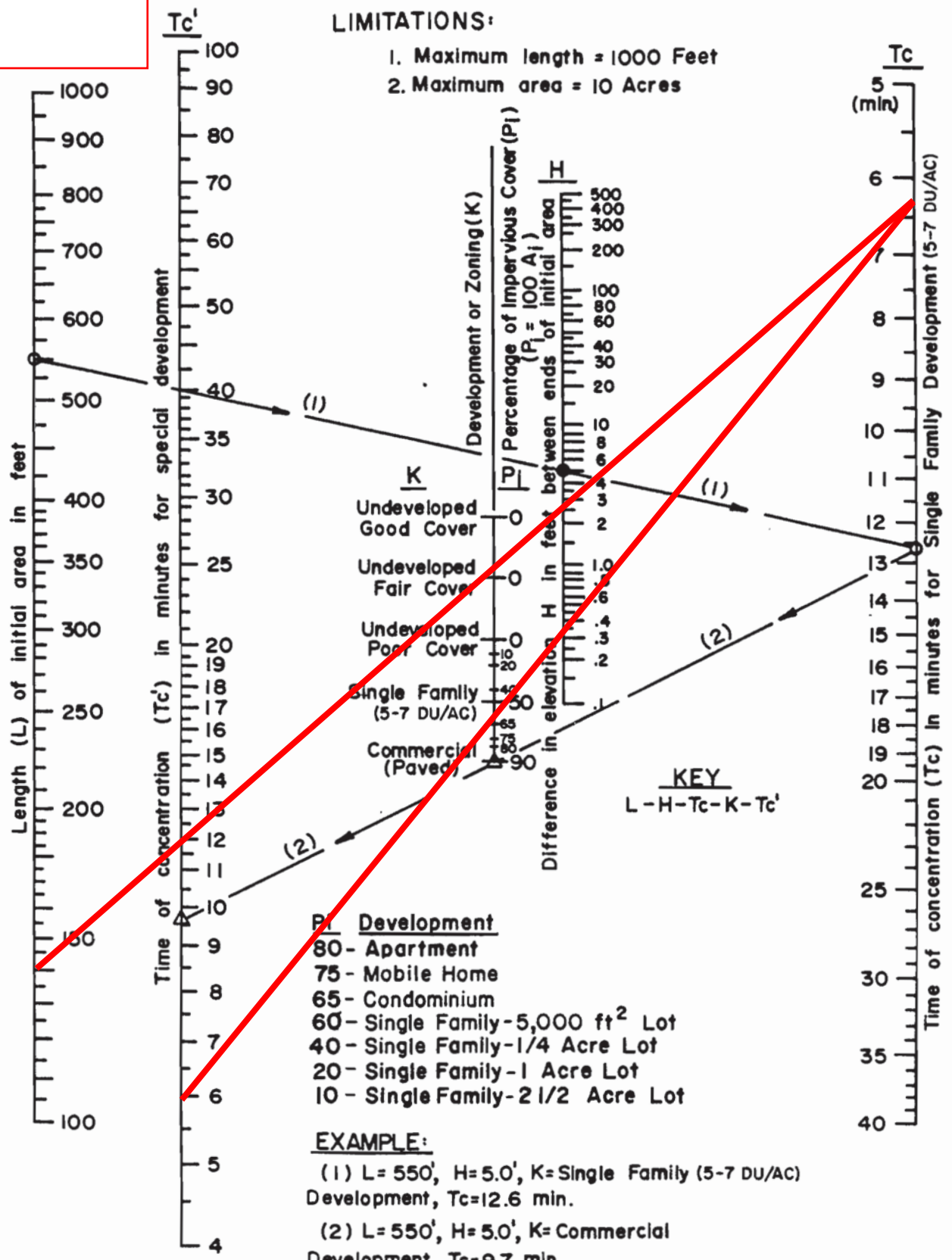
SAN BERNARDINO COUNTY
 HYDROLOGY MANUAL

TIME OF CONCENTRATION
NOMOGRAPH
FOR INITIAL SUBAREA

Post-development DA-16
 Flow length= \sim 141'
 $H=2.74'$
 $\%Imp=0.59$
 $Tc'=6$ min

LIMITATIONS:

1. Maximum length = 1000 Feet
2. Maximum area = 10 Acres



SAN BERNARDINO COUNTY
 HYDROLOGY MANUAL

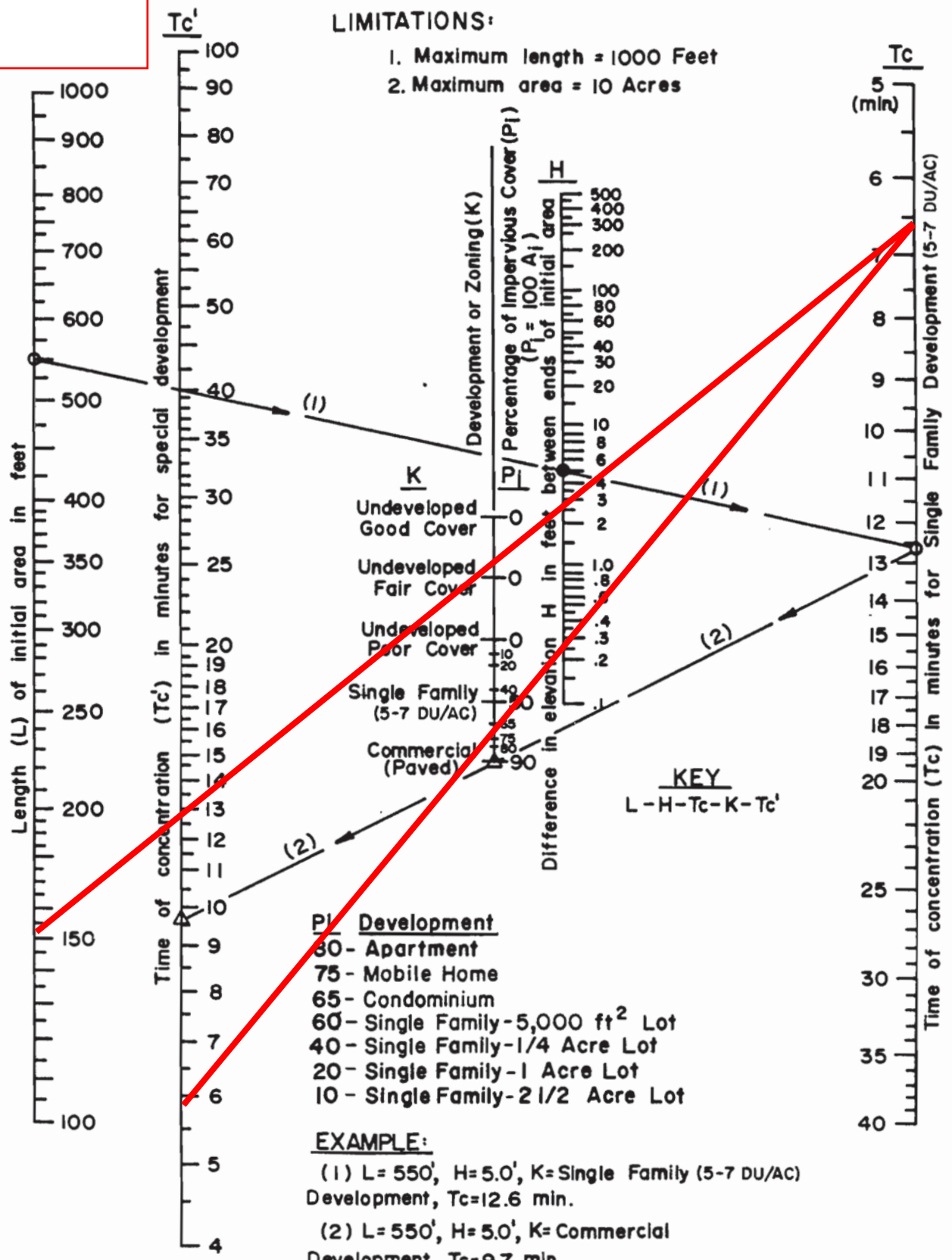
TIME OF CONCENTRATION
 NOMOGRAPH
 FOR INITIAL SUBAREA

Figure D-1

Post-development DA-17
 Flow length= \sim 153'
 $H=2.66'$
 $\%Imp=0.68$
 $Tc'=5.9$ min

LIMITATIONS:

1. Maximum length = 1000 Feet
2. Maximum area = 10 Acres



SAN BERNARDINO COUNTY
 HYDROLOGY MANUAL

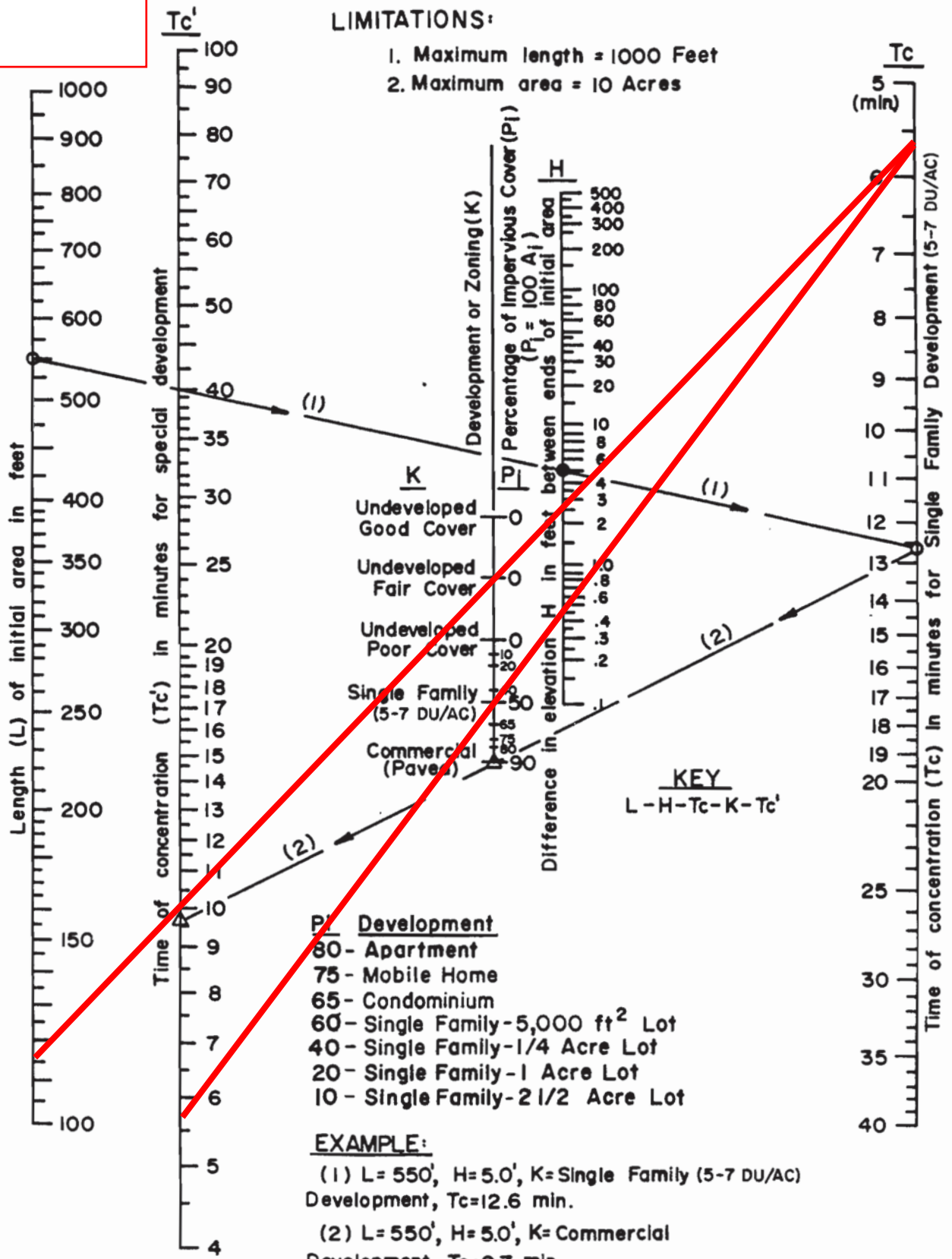
TIME OF CONCENTRATION
NOMOGRAPH
FOR INITIAL SUBAREA

Figure D-1

Post-development DA-18
 Flow length= \sim 116'
 $H=2.66'$
 $\%Imp=0.49$
 $Tc'=5.7$ min

LIMITATIONS:

1. Maximum length = 1000 Feet
2. Maximum area = 10 Acres



SAN BERNARDINO COUNTY
 HYDROLOGY MANUAL

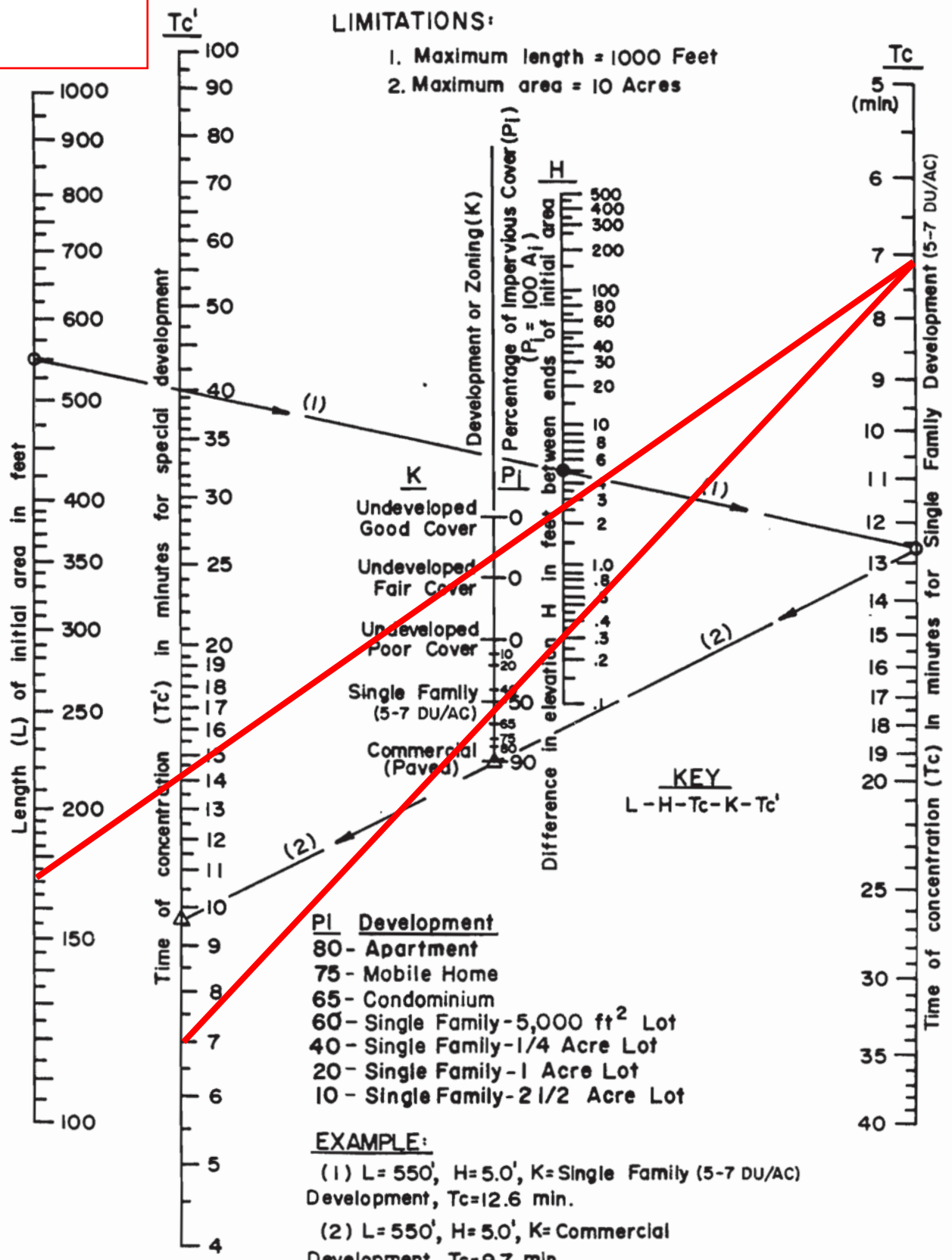
TIME OF CONCENTRATION
NOMOGRAPH
FOR INITIAL SUBAREA

Figure D-1

Post-development DA-19
 Flow length= $\sim 171'$
 $H=2.66'$
 $\%Imp=0.57$
 $Tc'=7$ min

LIMITATIONS:

1. Maximum length = 1000 Feet
2. Maximum area = 10 Acres



SAN BERNARDINO COUNTY
 HYDROLOGY MANUAL

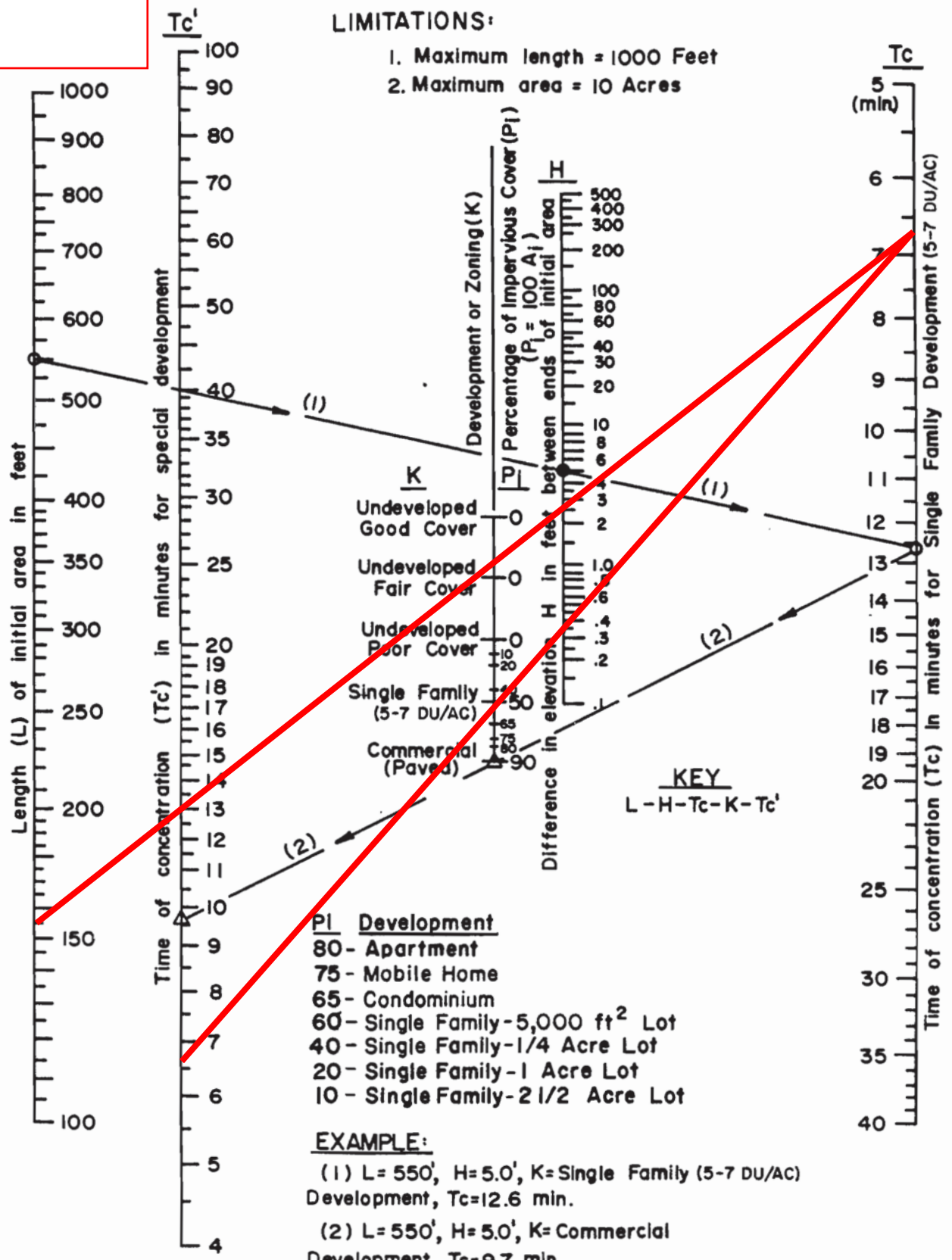
TIME OF CONCENTRATION
 NOMOGRAPH
 FOR INITIAL SUBAREA

Figure D-1

Post-development DA-20
 Flow length= \sim 155'
 $H=2.66'$
 $\%Imp=0.52$
 $Tc'=6.6$ min

LIMITATIONS:

1. Maximum length = 1000 Feet
2. Maximum area = 10 Acres



SAN BERNARDINO COUNTY
 HYDROLOGY MANUAL

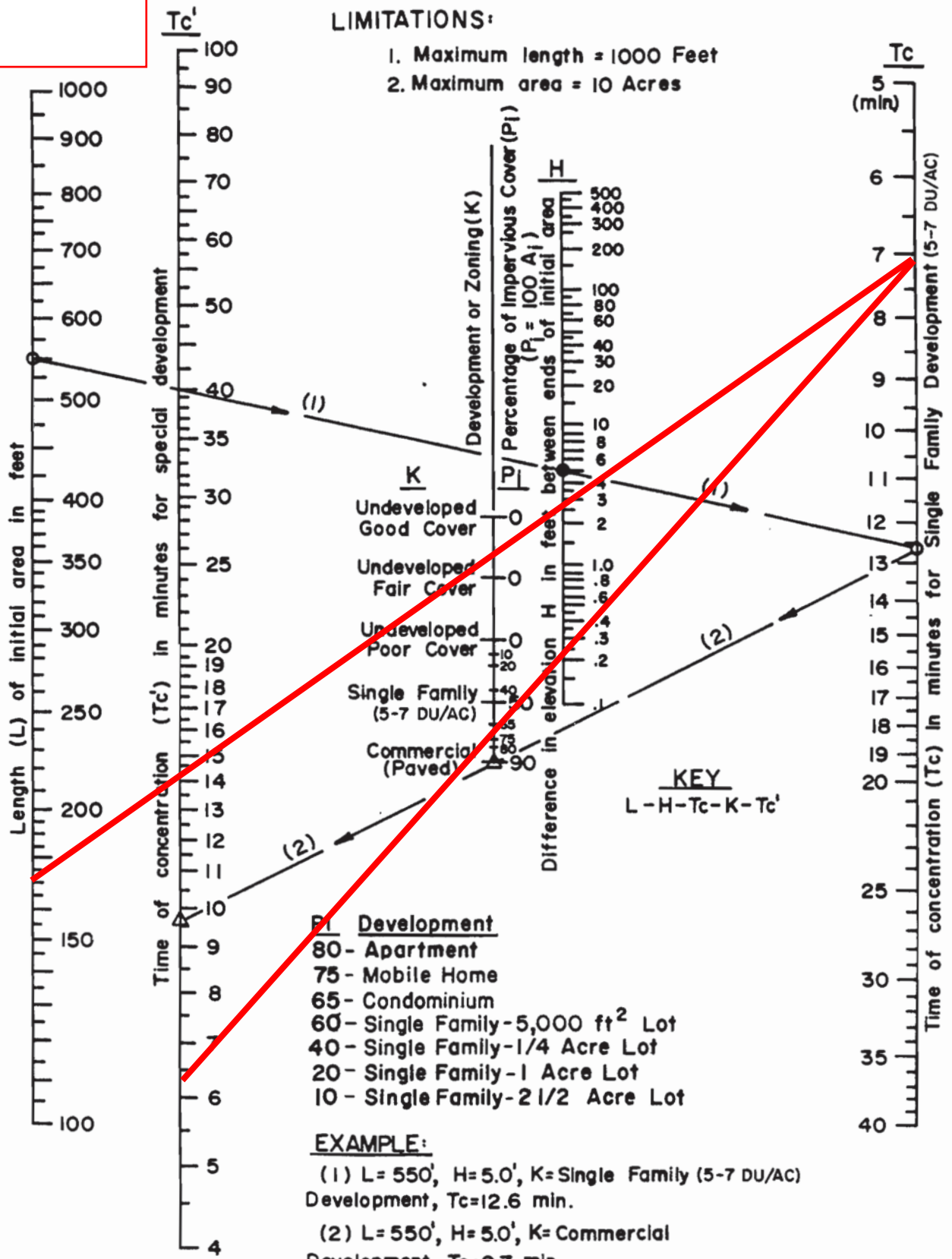
TIME OF CONCENTRATION
NOMOGRAPH
FOR INITIAL SUBAREA

Figure D-1

Post-development DA-21
 Flow length= \sim 173'
 $H=2.66'$
 $\%Imp=0.67$
 $Tc'=6.4$ min

LIMITATIONS:

1. Maximum length = 1000 Feet
2. Maximum area = 10 Acres



SAN BERNARDINO COUNTY
 HYDROLOGY MANUAL

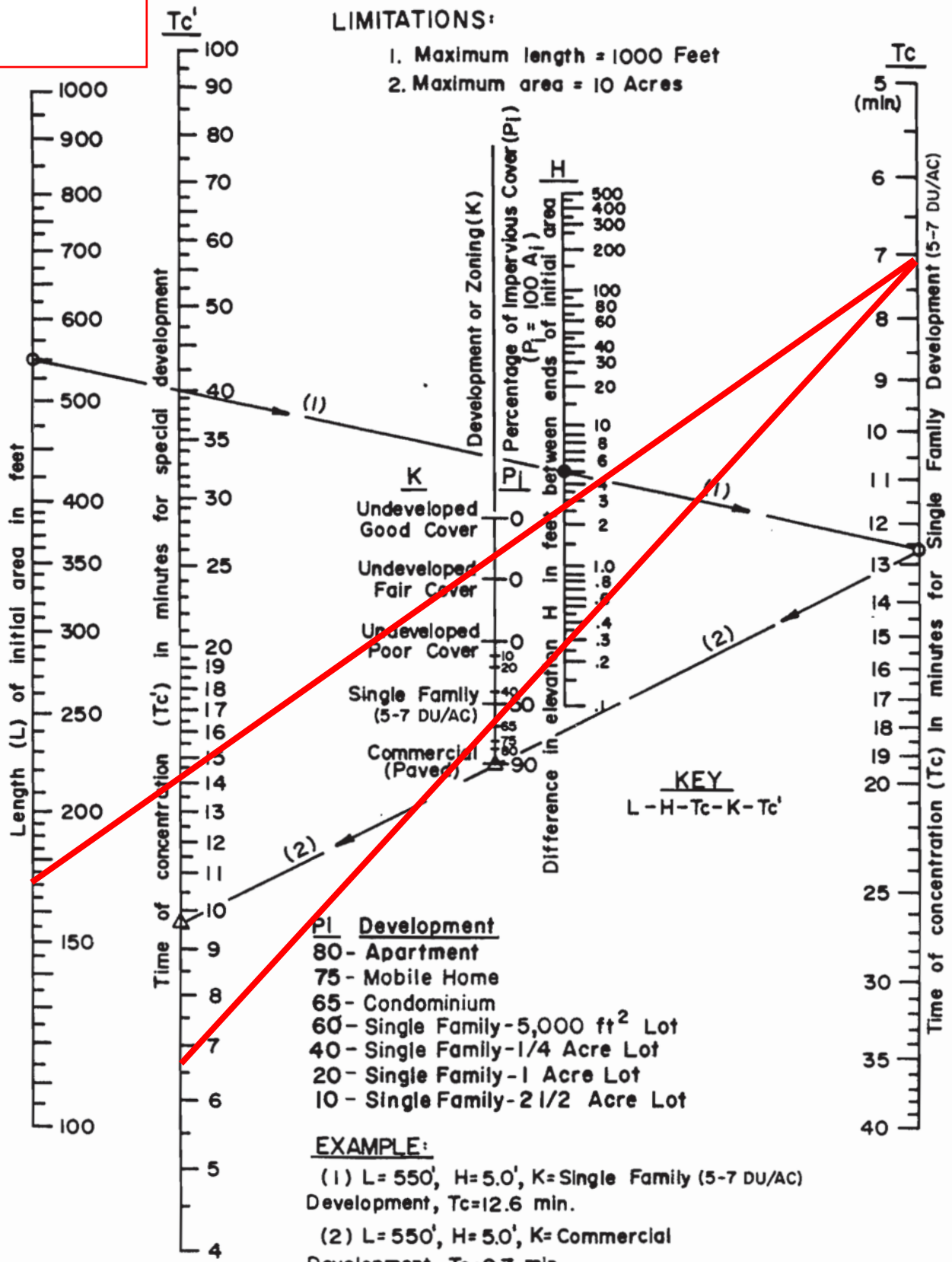
TIME OF CONCENTRATION
 NOMOGRAPH
 FOR INITIAL SUBAREA

Figure D-1

Post-development DA-22
 Flow length= \sim 172'
 $H=2.66'$
 $\%Imp=0.61$
 $Tc'=6.7$ min

LIMITATIONS:

1. Maximum length = 1000 Feet
2. Maximum area = 10 Acres



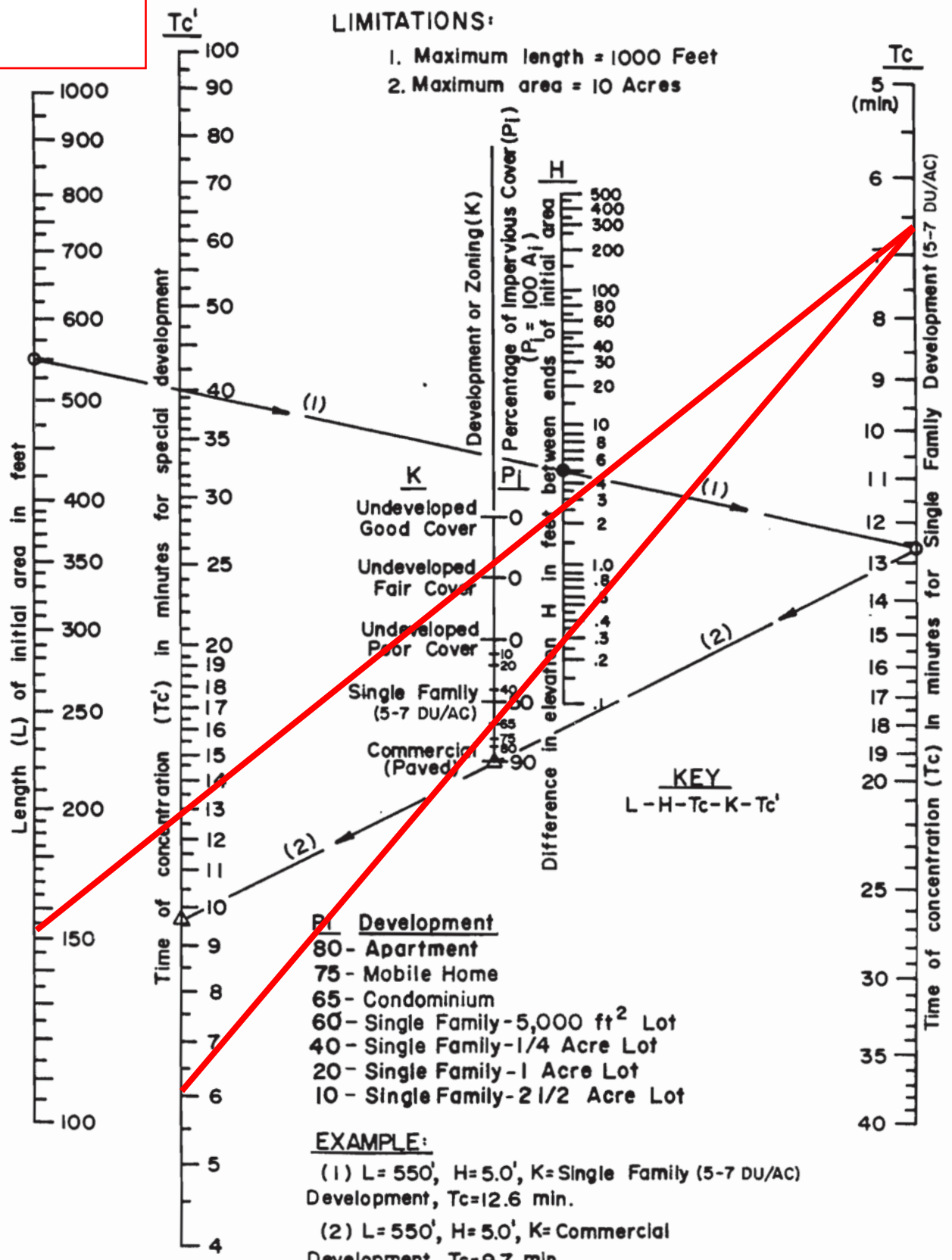
SAN BERNARDINO COUNTY
 HYDROLOGY MANUAL

TIME OF CONCENTRATION
 NOMOGRAPH
 FOR INITIAL SUBAREA

Post-development DA-23
 Flow length= \sim 154'
 $H=2.57'$
 $\%Imp=0.64$
 $Tc'=6.1$ min

LIMITATIONS:

1. Maximum length = 1000 Feet
2. Maximum area = 10 Acres



SAN BERNARDINO COUNTY
 HYDROLOGY MANUAL

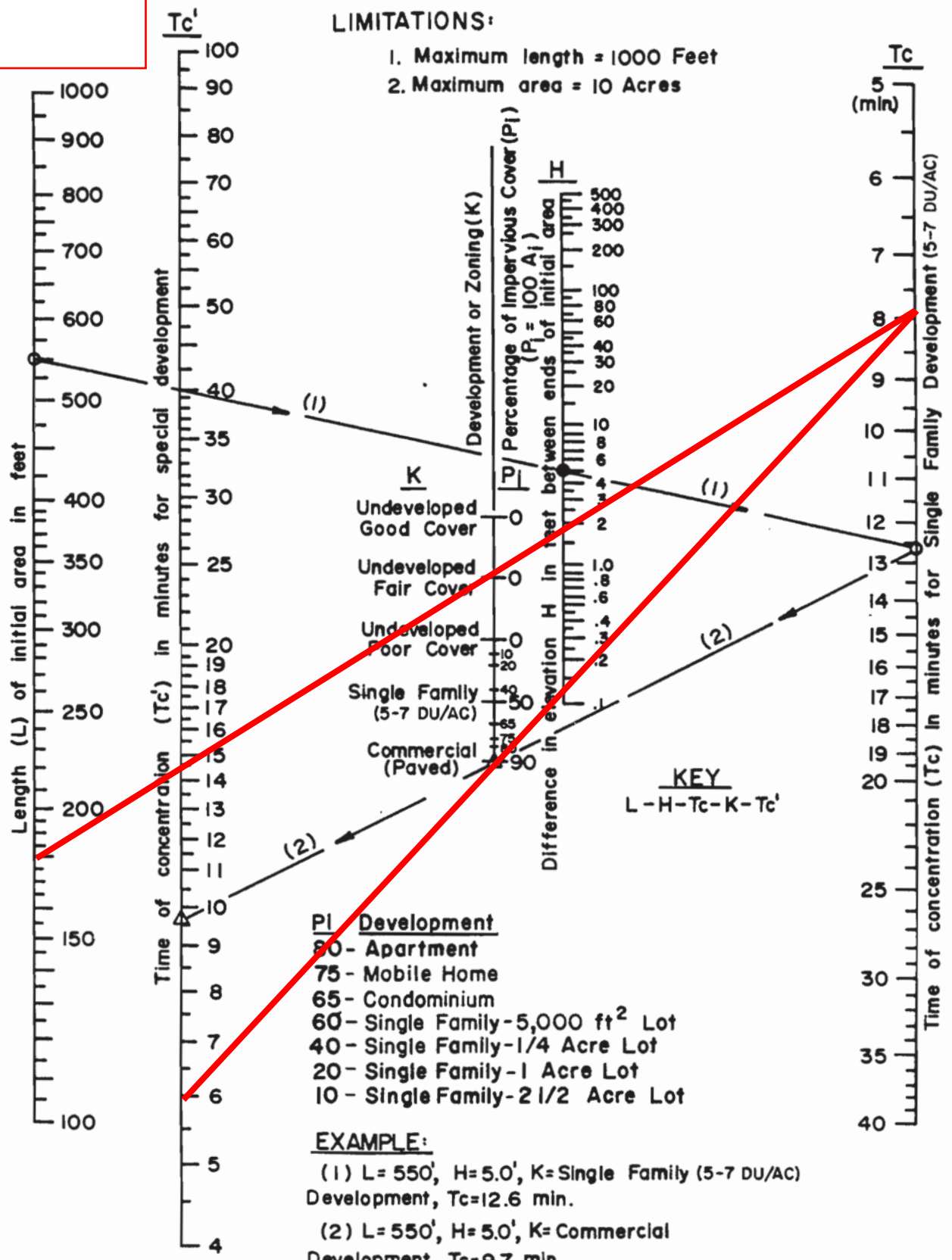
TIME OF CONCENTRATION
NOMOGRAPH
FOR INITIAL SUBAREA

Figure D-1

Post-development DA-24
 Flow length= \sim 180'
 $H=1.88'$
 $\%Imp=0.95$
 $Tc'=6$ min

LIMITATIONS:

1. Maximum length = 1000 Feet
2. Maximum area = 10 Acres



SAN BERNARDINO COUNTY
 HYDROLOGY MANUAL

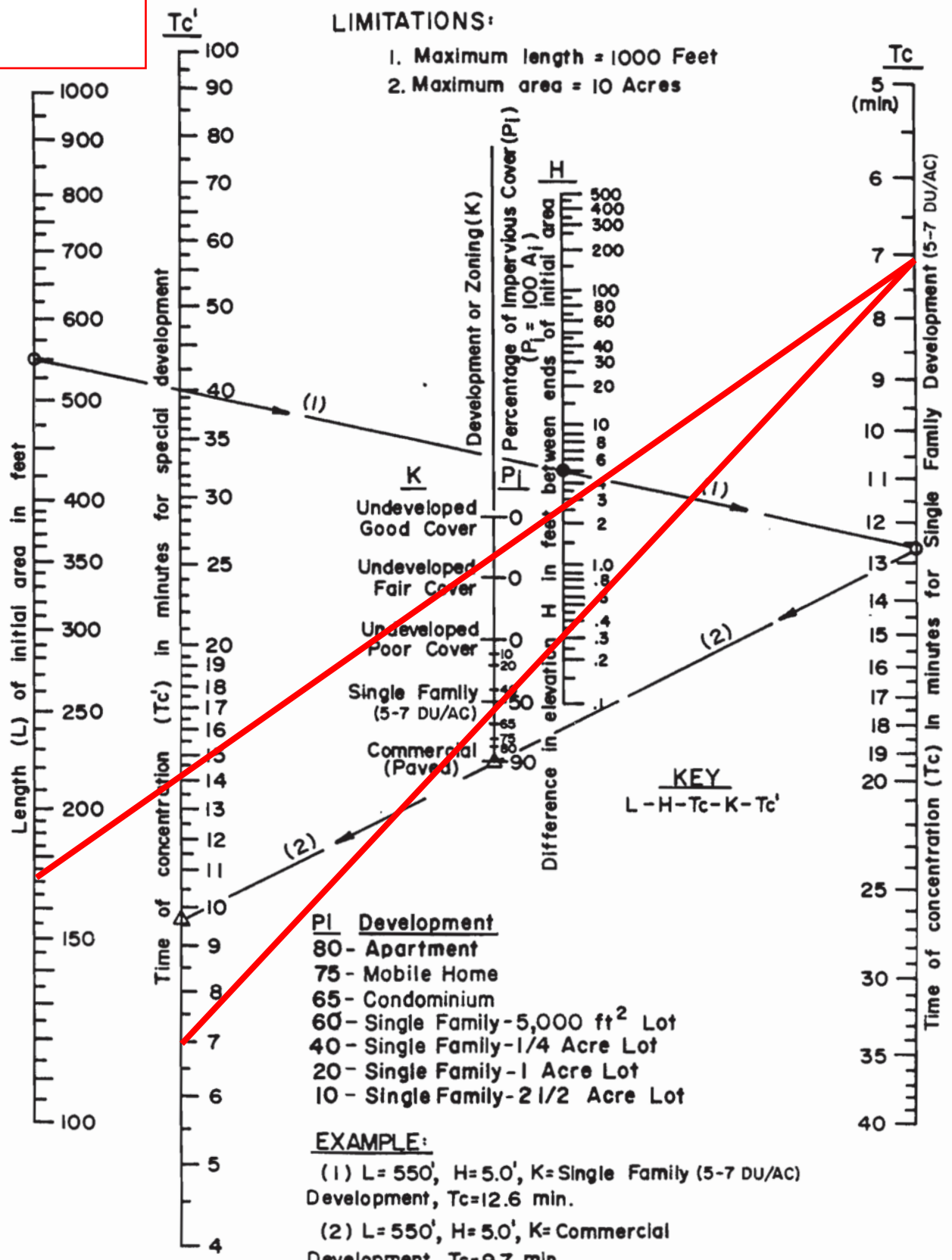
TIME OF CONCENTRATION
NOMOGRAPH
FOR INITIAL SUBAREA

Figure D-1

Post-development DA-25
 Flow length= $\sim 172'$
 $H=2.74'$
 $\%Imp=0.56$
 $Tc'=7$ min

LIMITATIONS:

1. Maximum length = 1000 Feet
2. Maximum area = 10 Acres



SAN BERNARDINO COUNTY
 HYDROLOGY MANUAL

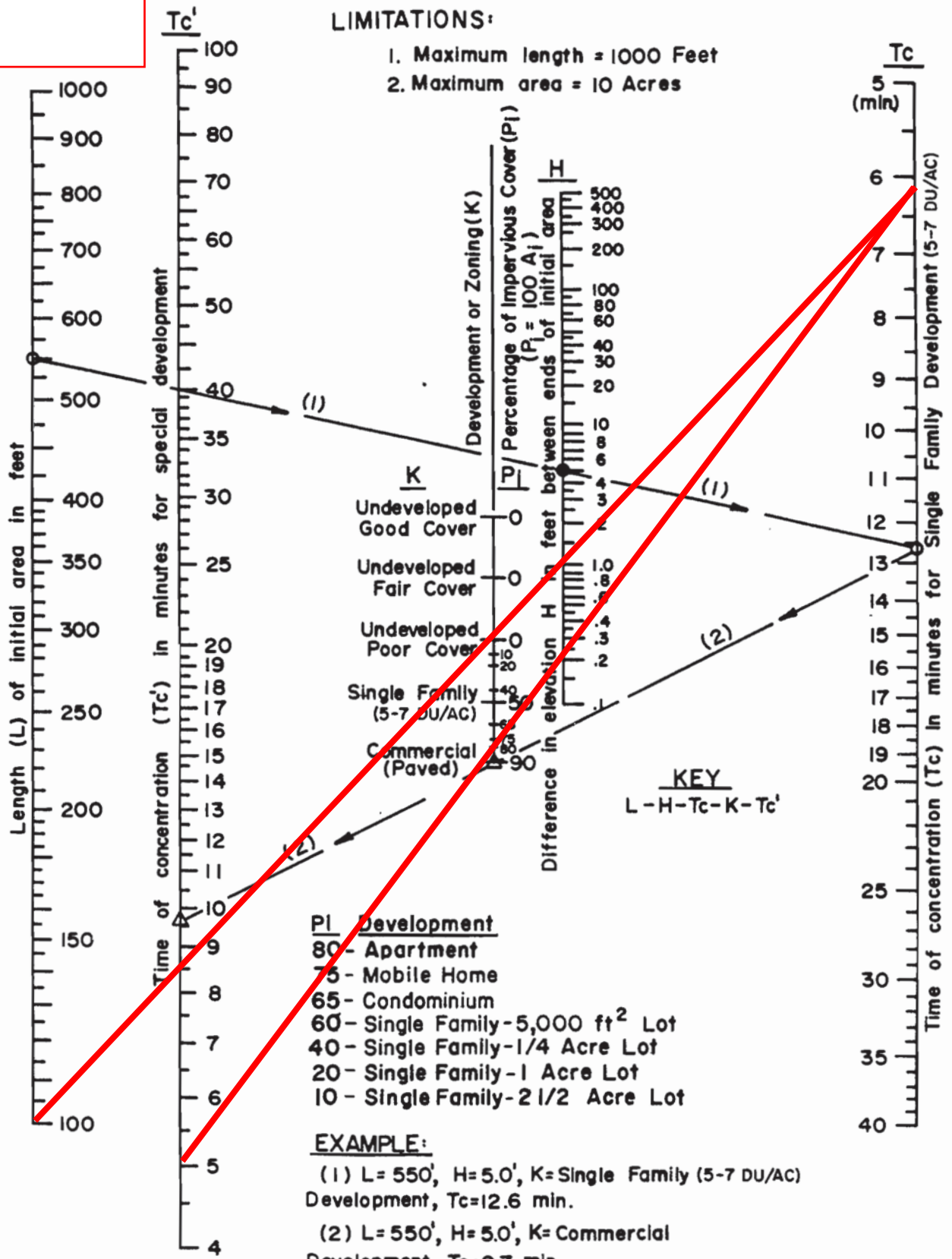
TIME OF CONCENTRATION
NOMOGRAPH
FOR INITIAL SUBAREA

Figure D-1

Post-development DA-26
 Flow length= $\sim 95'$
 $H=1.12'$
 $\%Imp=0.79$
 $Tc'=5.1$ min

LIMITATIONS:

1. Maximum length = 1000 Feet
2. Maximum area = 10 Acres



SAN BERNARDINO COUNTY
 HYDROLOGY MANUAL

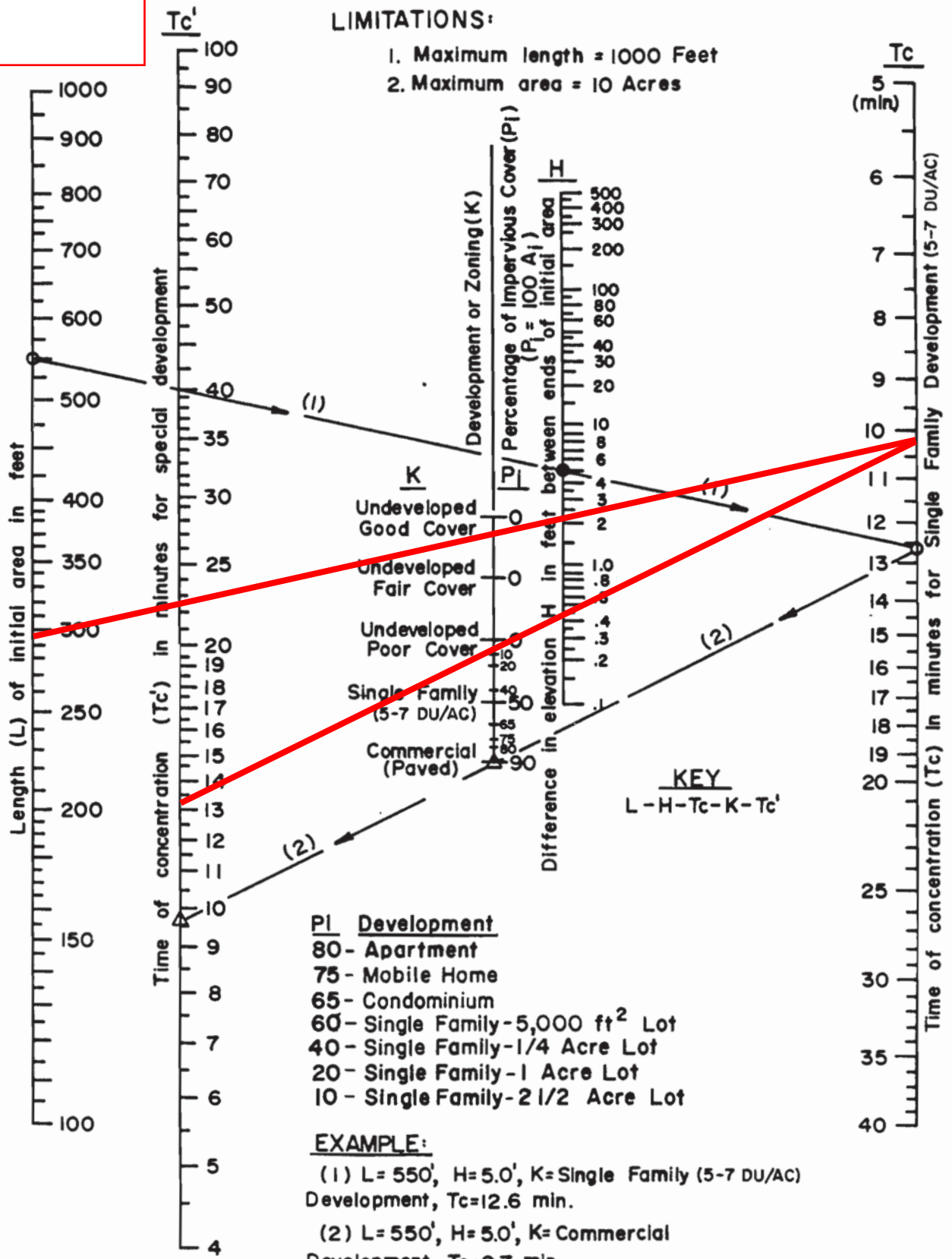
TIME OF CONCENTRATION
NOMOGRAPH
FOR INITIAL SUBAREA

Figure D-1

Post-development DA-27
 Flow length= \sim 296'
 $H=2.27'$
 $\%Imp=0.06$
 $Tc'=13.4$ min

LIMITATIONS:

1. Maximum length = 1000 Feet
2. Maximum area = 10 Acres



SAN BERNARDINO COUNTY
 HYDROLOGY MANUAL

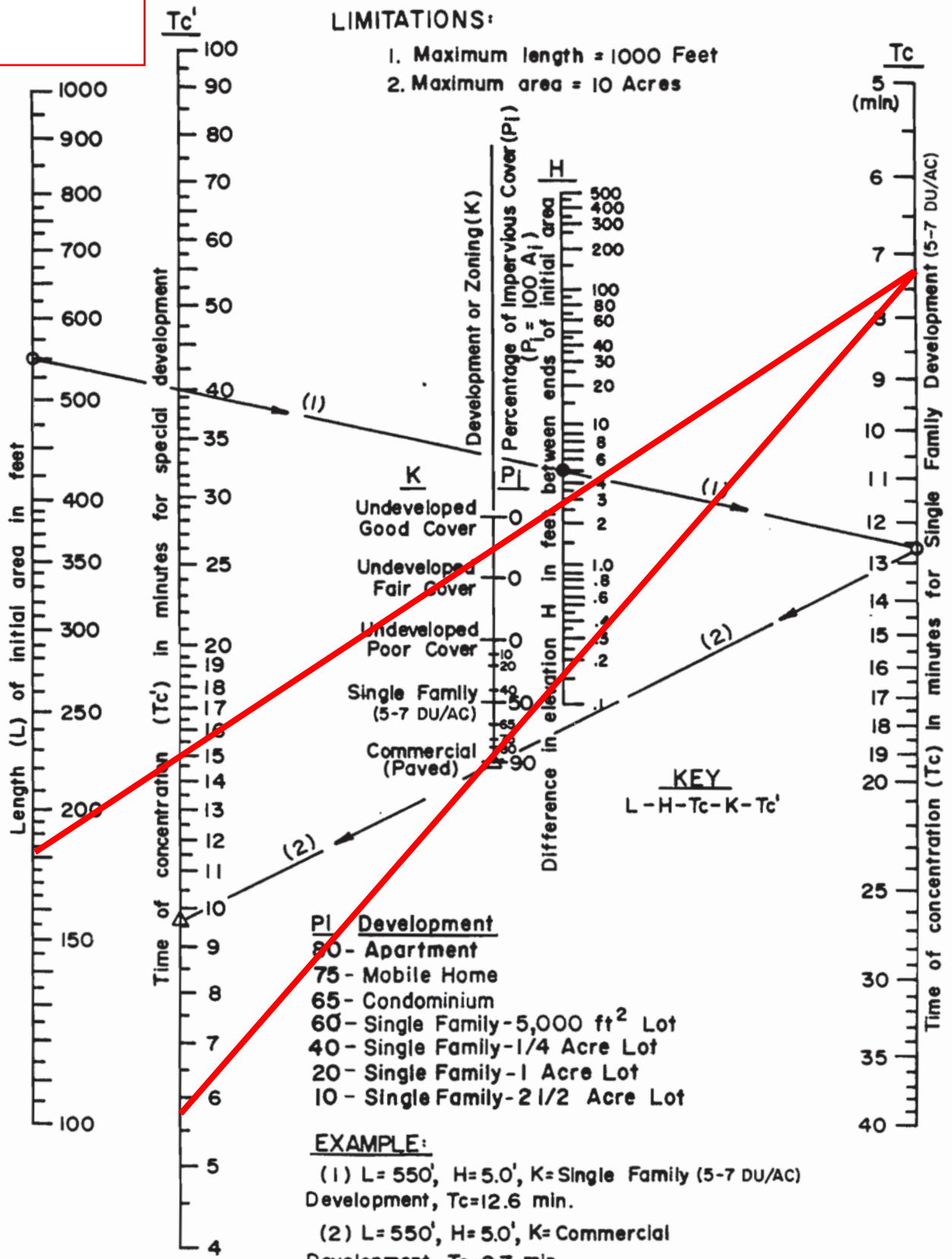
TIME OF CONCENTRATION
 NOMOGRAPH
 FOR INITIAL SUBAREA

Figure D-1

Post-development DA-28
 Flow length= \sim 183'
 $H=2.86'$
 $\%Imp=0.88$
 $Tc'=5.75$ min

LIMITATIONS:

1. Maximum length = 1000 Feet
2. Maximum area = 10 Acres

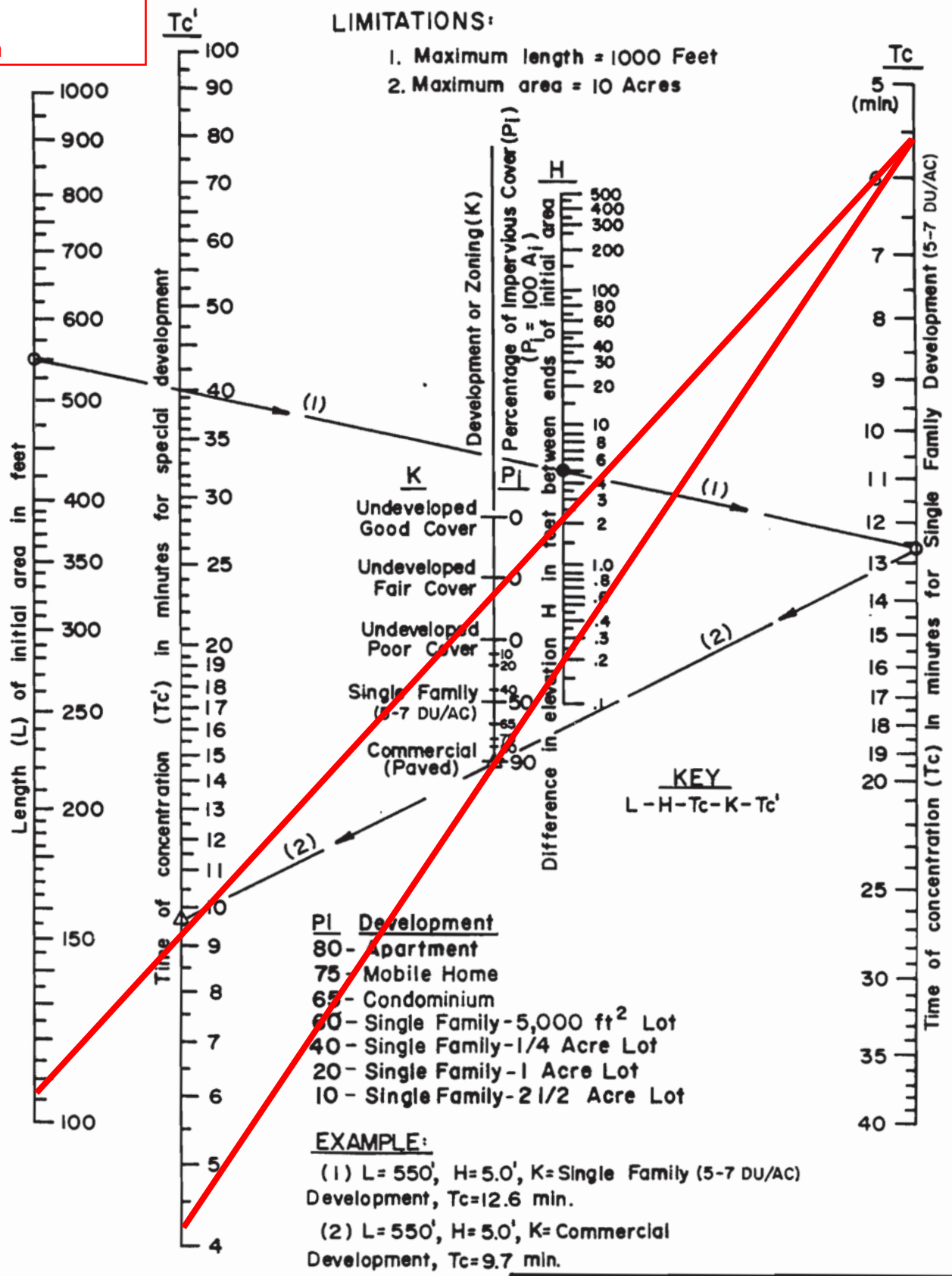


SAN BERNARDINO COUNTY
 HYDROLOGY MANUAL

TIME OF CONCENTRATION
 NOMOGRAPH
 FOR INITIAL SUBAREA

Figure D-1

Post-development DA-29
 Flow length= $\sim 106'$
 $H=2.24'$
 $\%Imp=0.91$
 $Tc'=4.25$ min



SAN BERNARDINO COUNTY
 HYDROLOGY MANUAL

TIME OF CONCENTRATION
NOMOGRAPH
FOR INITIAL SUBAREA

Figure D-1



NOAA Atlas 14, Volume 6, Version 2
Location name: Yucca Valley, California, USA*
Latitude: 34.1197°, Longitude: -116.4566°
Elevation: 3312 ft**
 * source: ESRI Maps
 ** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Tryppaluk, 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

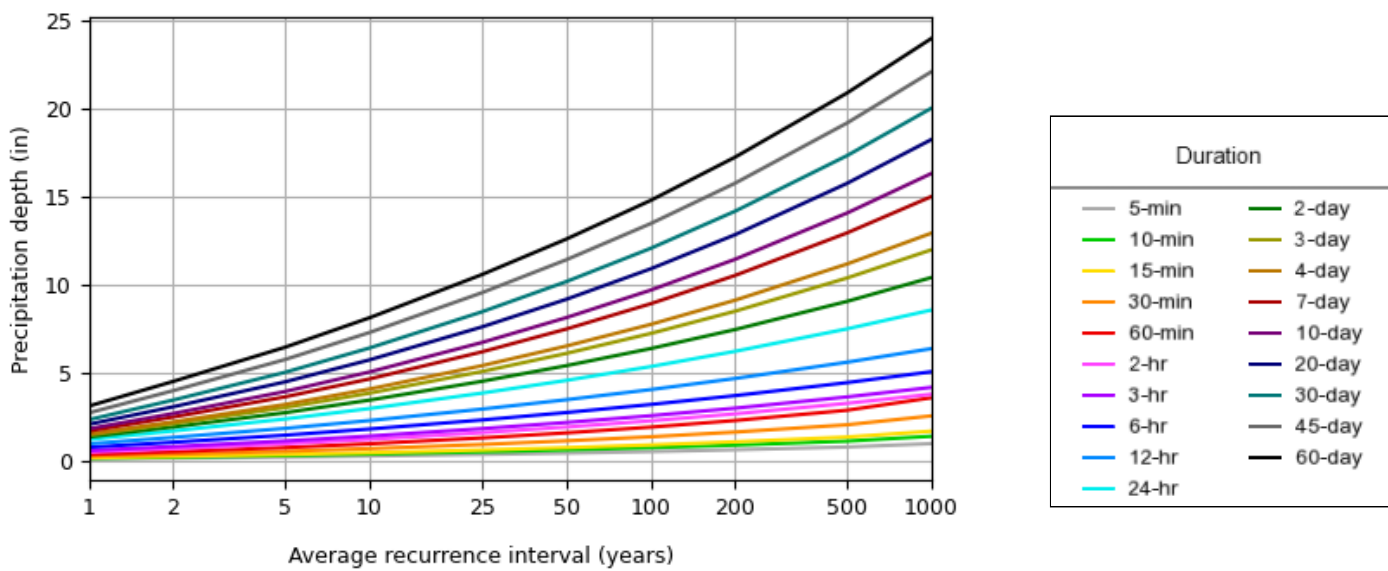
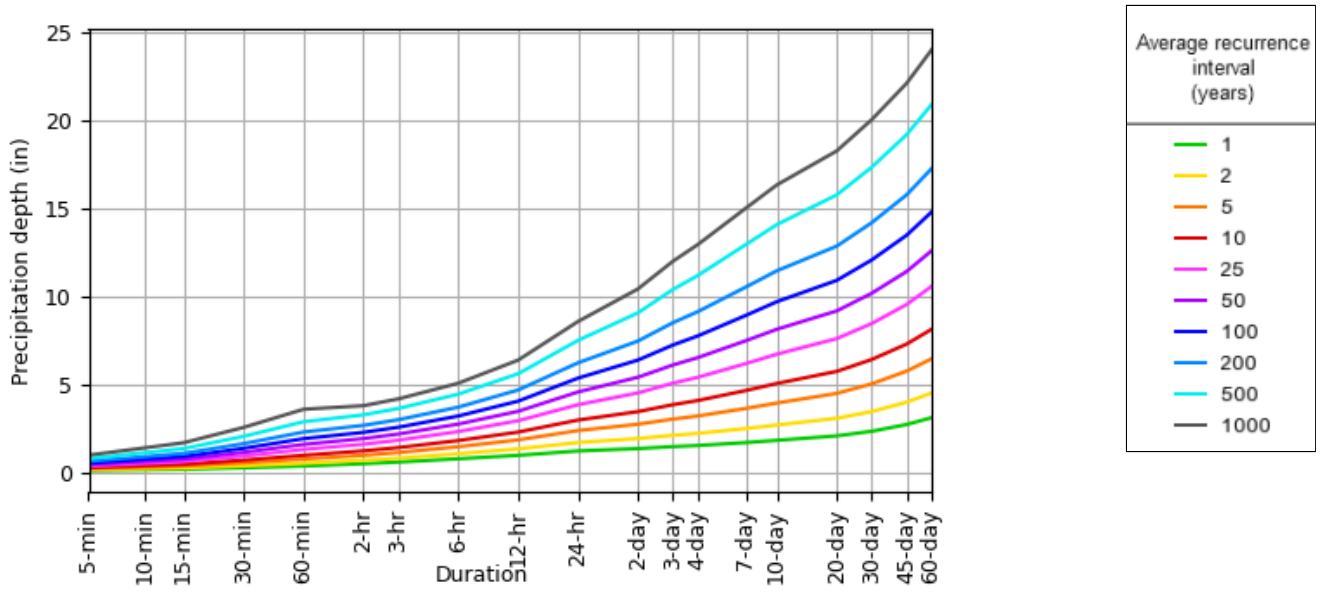
PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.093 (0.077-0.113)	0.136 (0.113-0.166)	0.200 (0.165-0.245)	0.258 (0.211-0.318)	0.347 (0.275-0.443)	0.425 (0.329-0.553)	0.513 (0.388-0.685)	0.615 (0.452-0.844)	0.772 (0.545-1.10)	0.964 (0.658-1.43)
10-min	0.133 (0.110-0.162)	0.195 (0.161-0.238)	0.286 (0.236-0.351)	0.369 (0.302-0.456)	0.497 (0.394-0.635)	0.609 (0.472-0.793)	0.735 (0.557-0.982)	0.881 (0.648-1.21)	1.11 (0.781-1.58)	1.38 (0.943-2.05)
15-min	0.161 (0.134-0.196)	0.236 (0.195-0.288)	0.346 (0.286-0.424)	0.447 (0.366-0.552)	0.602 (0.476-0.767)	0.736 (0.571-0.959)	0.889 (0.673-1.19)	1.07 (0.784-1.46)	1.34 (0.945-1.91)	1.67 (1.14-2.47)
30-min	0.245 (0.203-0.299)	0.359 (0.297-0.438)	0.527 (0.434-0.645)	0.679 (0.556-0.839)	0.915 (0.724-1.17)	1.12 (0.868-1.46)	1.35 (1.02-1.80)	1.62 (1.19-2.22)	2.03 (1.44-2.91)	2.54 (1.73-3.76)
60-min	0.344 (0.285-0.420)	0.504 (0.417-0.615)	0.740 (0.611-0.906)	0.955 (0.782-1.18)	1.29 (1.02-1.64)	1.57 (1.22-2.05)	1.90 (1.44-2.54)	2.28 (1.68-3.13)	2.86 (2.02-4.09)	3.57 (2.44-5.29)
2-hr	0.478 (0.396-0.583)	0.674 (0.557-0.822)	0.956 (0.788-1.17)	1.21 (0.988-1.49)	1.58 (1.25-2.02)	1.90 (1.48-2.48)	2.26 (1.71-3.01)	2.66 (1.96-3.64)	3.25 (2.30-4.65)	3.77 (2.57-5.59)
3-hr	0.571 (0.473-0.697)	0.794 (0.657-0.970)	1.11 (0.918-1.36)	1.39 (1.14-1.72)	1.81 (1.44-2.31)	2.16 (1.68-2.82)	2.55 (1.93-3.40)	2.98 (2.19-4.09)	3.62 (2.55-5.17)	4.16 (2.84-6.16)
6-hr	0.757 (0.627-0.923)	1.04 (0.862-1.27)	1.44 (1.19-1.77)	1.79 (1.47-2.21)	2.30 (1.82-2.94)	2.73 (2.12-3.55)	3.19 (2.41-4.25)	3.69 (2.72-5.07)	4.43 (3.13-6.34)	5.05 (3.44-7.48)
12-hr	0.953 (0.790-1.16)	1.32 (1.09-1.61)	1.83 (1.51-2.24)	2.28 (1.86-2.81)	2.92 (2.31-3.73)	3.46 (2.68-4.50)	4.03 (3.05-5.38)	4.67 (3.43-6.40)	5.59 (3.95-8.00)	6.36 (4.34-9.42)
24-hr	1.20 (1.06-1.38)	1.68 (1.49-1.94)	2.36 (2.09-2.73)	2.96 (2.59-3.45)	3.83 (3.25-4.61)	4.55 (3.78-5.60)	5.34 (4.33-6.72)	6.21 (4.90-8.03)	7.48 (5.67-10.1)	8.56 (6.27-11.9)
2-day	1.34 (1.18-1.54)	1.91 (1.69-2.20)	2.72 (2.40-3.14)	3.44 (3.01-4.01)	4.50 (3.81-5.42)	5.39 (4.48-6.62)	6.36 (5.16-8.01)	7.45 (5.87-9.63)	9.05 (6.85-12.2)	10.4 (7.62-14.5)
3-day	1.45 (1.28-1.67)	2.09 (1.85-2.41)	3.01 (2.66-3.48)	3.83 (3.35-4.46)	5.05 (4.28-6.08)	6.09 (5.05-7.48)	7.22 (5.86-9.09)	8.49 (6.70-11.0)	10.4 (7.86-14.0)	12.0 (8.78-16.7)
4-day	1.51 (1.34-1.74)	2.20 (1.95-2.54)	3.19 (2.81-3.69)	4.07 (3.56-4.74)	5.39 (4.57-6.49)	6.50 (5.40-7.99)	7.74 (6.27-9.74)	9.12 (7.19-11.8)	11.2 (8.46-15.0)	12.9 (9.47-18.0)
7-day	1.68 (1.49-1.93)	2.48 (2.19-2.86)	3.62 (3.20-4.18)	4.64 (4.06-5.41)	6.17 (5.23-7.43)	7.47 (6.20-9.18)	8.91 (7.22-11.2)	10.5 (8.30-13.6)	12.9 (9.80-17.4)	15.0 (11.0-20.9)
10-day	1.80 (1.60-2.08)	2.68 (2.37-3.09)	3.92 (3.46-4.54)	5.04 (4.41-5.87)	6.70 (5.68-8.07)	8.12 (6.74-9.98)	9.68 (7.85-12.2)	11.4 (9.03-14.8)	14.1 (10.7-18.9)	16.3 (12.0-22.7)
20-day	2.06 (1.82-2.37)	3.06 (2.70-3.52)	4.47 (3.95-5.17)	5.72 (5.01-6.67)	7.59 (6.43-9.13)	9.16 (7.61-11.3)	10.9 (8.83-13.7)	12.8 (10.1-16.6)	15.8 (11.9-21.2)	18.2 (13.4-25.4)
30-day	2.32 (2.06-2.67)	3.44 (3.04-3.97)	5.02 (4.43-5.80)	6.40 (5.60-7.46)	8.44 (7.16-10.2)	10.2 (8.44-12.5)	12.1 (9.78-15.2)	14.2 (11.2-18.3)	17.3 (13.1-23.3)	20.0 (14.7-27.9)
45-day	2.71 (2.40-3.12)	3.97 (3.52-4.58)	5.74 (5.07-6.64)	7.28 (6.37-8.49)	9.53 (8.08-11.5)	11.4 (9.47-14.0)	13.5 (10.9-16.9)	15.8 (12.4-20.4)	19.2 (14.5-25.8)	22.1 (16.2-30.8)
60-day	3.09 (2.74-3.56)	4.50 (3.98-5.19)	6.44 (5.68-7.44)	8.12 (7.11-9.46)	10.6 (8.95-12.7)	12.6 (10.4-15.5)	14.8 (12.0-18.6)	17.2 (13.6-22.3)	20.9 (15.8-28.1)	24.0 (17.6-33.4)

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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PF graphical

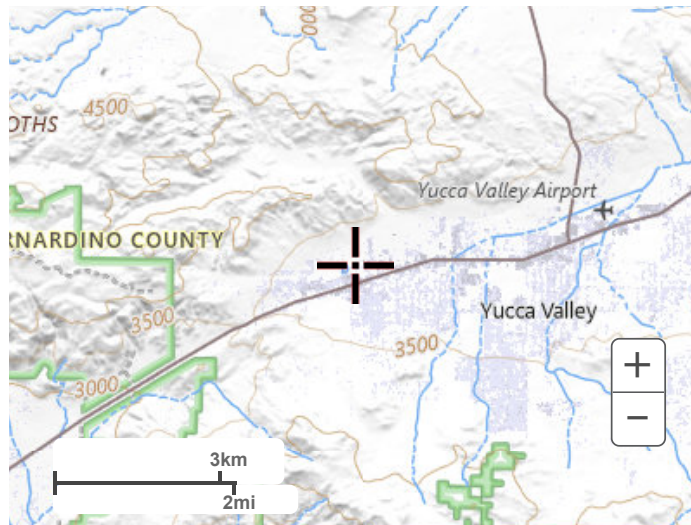
PDS-based depth-duration-frequency (DDF) curves
Latitude: 34.1197°, Longitude: -116.4566°



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Maps & aerials

Small scale terrain



Large scale terrain



Large scale map



Large scale aerial

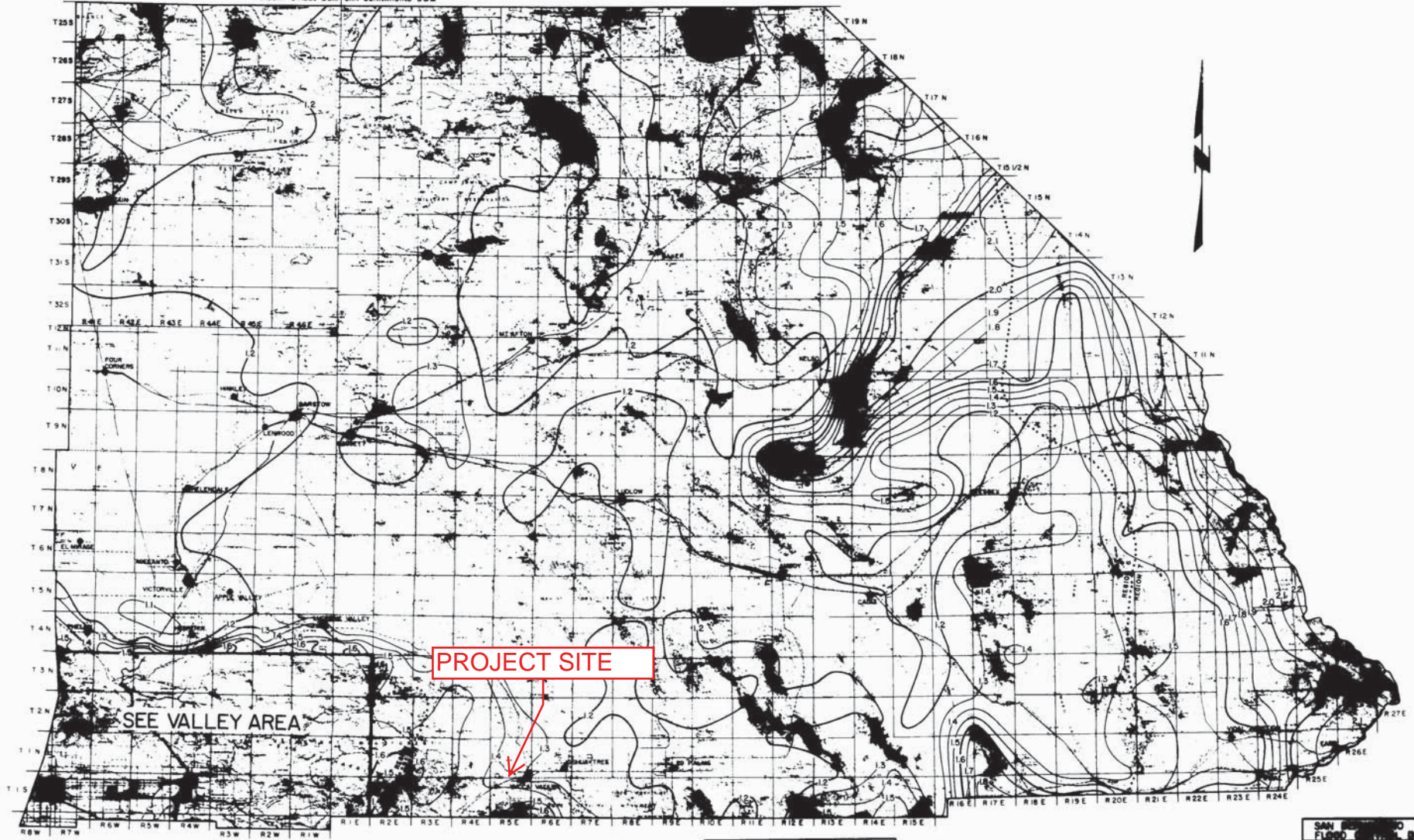


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1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

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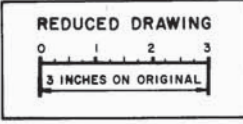
MOUNT DIABLO B&M SAN BERNARDINO B&M



PROJECT SITE

SEE VALLEY AREA

SAN BERNARDINO COUNTY
HYDROLOGY MANUAL



LEGEND:
 2 ISOLINES PRECIPITATION (INCHES)

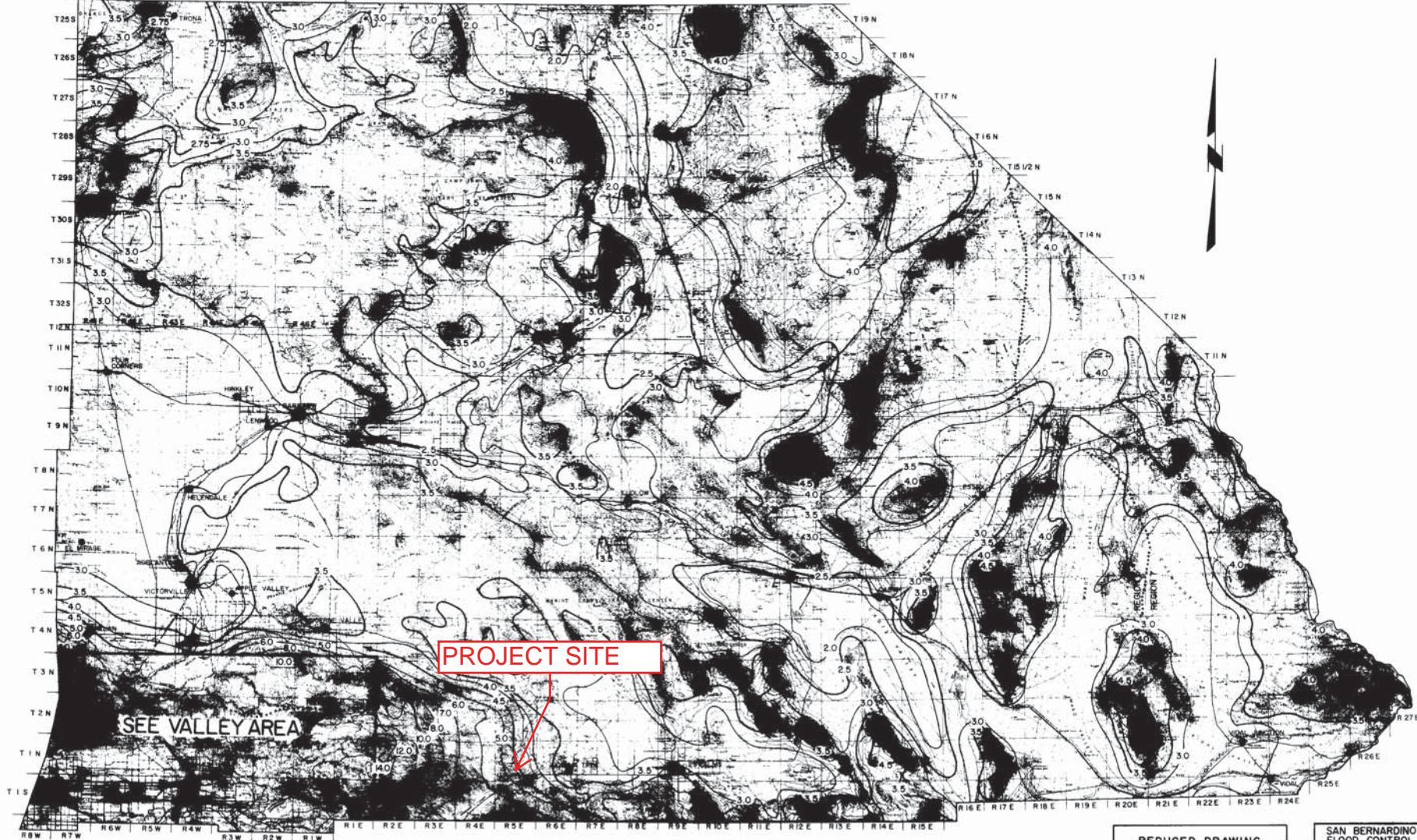
SAN BERNARDINO COUNTY
 FLOOD CONTROL DISTRICT

DESERT AREA
 ISHNETALS
 Y₁₀₀-100 YEAR 1 HOUR
 BASED ON USAC, NOAA ATLAS 2, 875

APPROVED BY:

DATE:

MOUNT DIABLO B&M | SAN BERNARDINO B&M

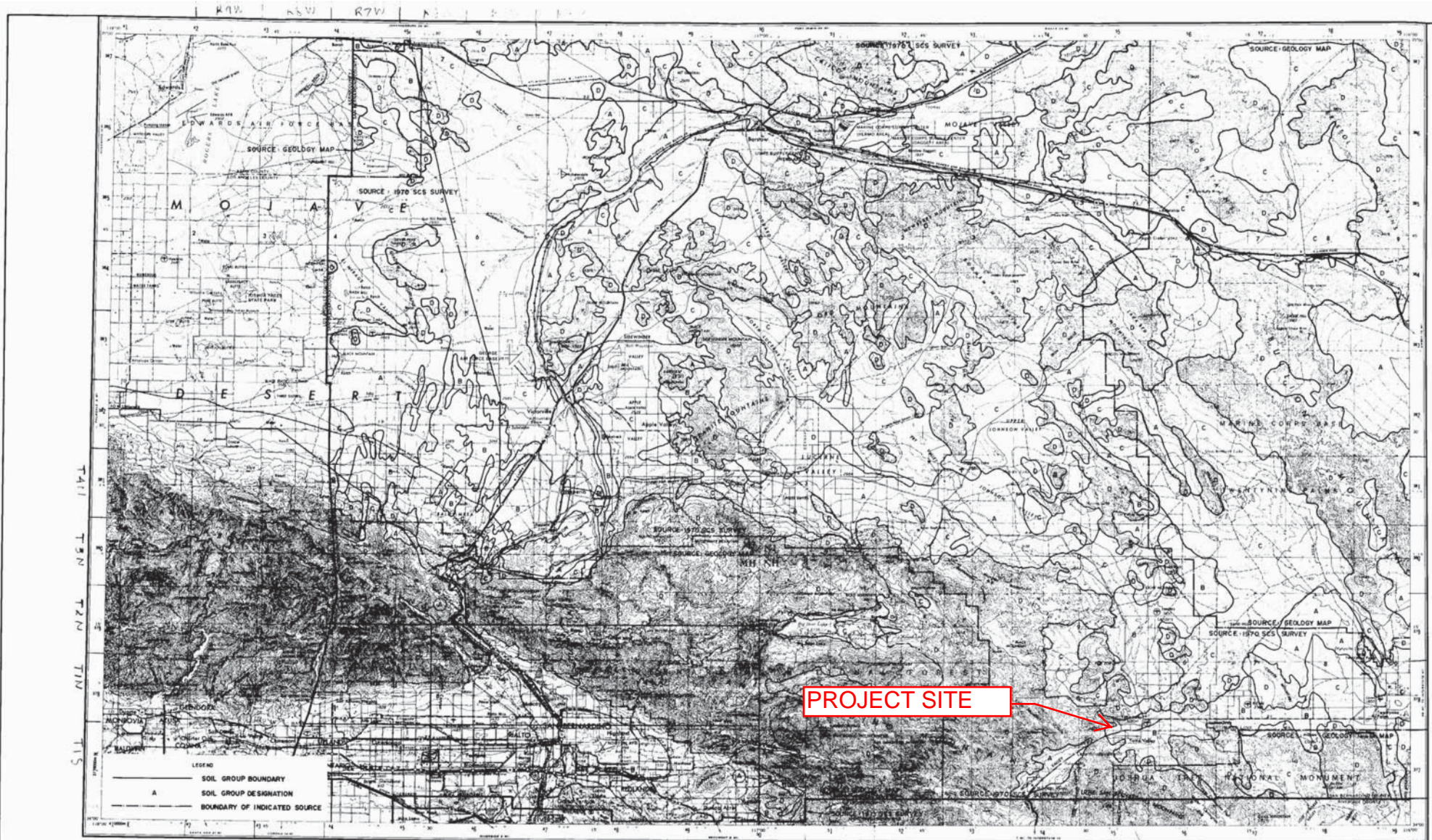


SAN BERNARDINO COUNTY
HYDROLOGY MANUAL

REDUCED DRAWING
 0 1 2 3
 3 INCHES ON ORIGINAL

LEGEND:
 3.5 ISOLINES PRECIPITATION (INCHES)

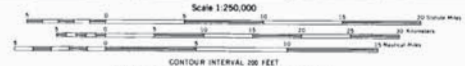
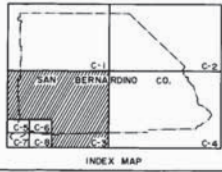
SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT			
DESERT AREA			
ISOHYETALS X ₁ - 100 YEAR 24 HOUR BASED ON USDC, NOAA ATLAS 2, 1973			
APPROVED BY			
DATE	SCALE	FILE NO	DWG NO
1982	7" x 6.4"	WRD-1	12 of 12



LEGEND
 — SOIL GROUP BOUNDARY
 A SOIL GROUP DESIGNATION
 - - - BOUNDARY OF INDICATED SOURCE

PROJECT SITE

SAN BERNARDINO COUNTY
HYDROLOGY MANUAL



CONTOUR INTERVAL 100 FEET
 WITH SUPPLEMENTARY CONTOURS AT 100 FOOT INTERVALS
 TRANSVERSE MERCATOR PROJECTION
 BLACK BOUNDARY LINES INDICATE THE BLACK MOUNTAIN UNIVERSAL TRANSVERSE MERCATOR GRID, ZONE 11
 THIS BOUNDARY IS DERIVED FROM THE UNITED STATES GEOLOGICAL SURVEY, 1983, AND IS LOCATED WITH
 THE CENTER OF THE EAST EDGE TO THE WEST EDGE OF THE GRID, 1000 FEET FROM THE CENTER OF THE EAST EDGE
 BASE MAP REPRODUCED FROM U.S.G.S. "SAN BERNARDINO" TOPOGRAPHIC MAP
SCALE REDUCED BY 1/2



HYDROLOGIC SOILS GROUP MAP
FOR
SOUTHCENTRAL AREA