# HYDROLOGY REPORT
FOR
**5228 CHELSEA STREET**
**APN: 415-062-10**
**DATE: OCTOBER 03, 2016**

PREPARED BY:
SAN DIEGO LAND SURVEYING AND ENGINEERING INC.
9665 CHESAPEAKE DRIVE, SUITE 445
SAN DIEGO, CA. 92123

**CITY OF SAN DIEGO**
**PTS 502954**

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## APPENDICES



## EXHIBITS

**PROJECT DESCRIPTION:**

EXISTING PROJECT SITE DESCRIPTION:

The site is 0.2040 acres in size and is occupied by single story single family home. The site splits the storm runoff in two directions. A portion of the site drains is to the south and to the Pacific Ocean. A portion of the site drains to Chelsea Street. This public road drains to the north. There are block retaining walls or screen walls on the north and south property lines. The east property line is Chelsea Street. Therefor none or minimal offsite water drains onto the site.

See the 20 scale drainage areas map in Exhibit A for more detail of the project.

The existing impervious area is 3,496 SF. or 0.0803 AC. **39.4%**

PROPOSED PROJECT DESCRIPTION:

The project will consist of remodel or removal of the existing home and the construction of a new single family home. The disturbed area is about 6000 square feet. The existing utilities will be reused, reducing the impact to the public right-of-way.

See the 20 scale drainage areas map in Exhibit B for more detail of the proposed project.

The proposed impervious area is 5,783 SF. or 0.1328 AC. **65.1%**

**STANDARDS AND METHODS:**

PURPOSE OF CALCULATIONGS:

Calculate the storm runoff generated by the residential site and the impact to the downstream lands.

HYDROLOGIC MODEL AND METHODS USED:

This report uses the "Rational Method" as demonstrated in the County of San Diego Storm Drain Manual.

**Q = CIA**

WATER QUALITY DESIGN STORM:

The design storm for this report shall be the 50 year storm for private drainage and the 100 year storm for public storm drain structures and flow paths. The 85% storm will be used for any storm water treatment structures that are required.

## ANALYSIS AND CONCLUSIONS

PRE-DEVELOPMENT RUNOFF VOLUMES AND PEAK FLOWS:

Runoff factor "C" for medium density residential (4.3 DU/A) with a soil type of "D" from table 3-1 "Runoff Coefficients for Urban Areas" from the above manual and attached in Appendix "B" is 0.52. See Exhibit "A" for plan view of the drainage area.

Modify C factor for actual impervious area.

Actual impervious area = $\frac{.394 + .52}{2}$ = **0.46**

Time of concentration is composed of "Maximum Overland Flow Length" plus "Travel Time" to point of discharge. The maximum overland flow length is taken form Table 3-2, included in Appendix C, for medium density residential (4.3 DU/A) with a grade of 2% is 8.1 mins. for the first 80 feet. There is no "Travel Time as the drainage area does not exceed 80 feet in length. 8.1 mins.

Using the 50 year storm and the rainfall intensity-duration-frequency curves from the chart in Appendix "D". Determine rainfall intensity "I". For 8.1 min., 50 year storm, the rainfall intensity = 3.54.

Using the 100 year storm and the rainfall intensity-duration-frequency curves from the chart in Appendix "D". Determine rainfall intensity "I". For 5 min., 100 year storm, the rainfall intensity = 3.92.

Zone Existing Area E1 = 0.1402 acres
This area consists of the portion of the site that drains to the Pacific Ocean.

Q50 = CIA = .46 x 3.54 x 0.1402 = 0.23 CFS
Q100 = CIA = .46 x 3.92 x 0.1402 = 0.25 CFS

Zone Existing Area E2 = 0.0638 acres
This area consists of the portion of the site that drains to Chelsea Road.

Q50 = CIA = .46 x 3.54 x 0.0638 = 0.10 CFS
Q100 = CIA = .46 x 3.92 x 0.0638 = 0.12 CFS

**Total project runoff:**
Q50 = 0.23 + 0.10 = 0.33 CFS
Q100 = 0.25 + 0.12 = 0.37 CFS

POST-PROJECT RUNOFF VOLUMES AND PEAK FLOWS:

Runoff factor "C" for medium density residential (4.3 DU/A) with a soil type of "D" from table 3-1 "Runoff Coefficients for Urban Areas" from the above manual and attached in Appendix "B" is 0.52. See Exhibit "A" for plan view of the drainage area.

Modify C factor for actual impervious area.

Actual impervious area = $\frac{.651 + .52}{2}$ = **0.59**

Time of concentration is composed of "Maximum Overland Flow Length" plus "Travel Time" to point of discharge. The maximum overland flow length is taken form Table 3-2, included in Appendix C, for medium density residential (4.3 DU/A) with a grade of 2% is 8.1 mins. for the first 80 feet. There is no "Travel Time as the drainage area does not exceed 80 feet in length. 8.1 mins.

Using the 50 year storm and the rainfall intensity-duration-frequency curves from the chart in Appendix "D". Determine rainfall intensity "I". For 8.1 min., 50 year storm, the rainfall intensity = 3.54.

Using the 100 year storm and the rainfall intensity-duration-frequency curves from the chart in Appendix "D". Determine rainfall intensity "I". For 5 min., 100 year storm, the rainfall intensity = 3.92.

Zone Proposed Area P1 = 0.1383 acres
This area consists of the portion of the site that drains to Chelsea Road.

Q50 = CIA = .59 x 3.54 x 0.1383 = 0.29 CFS
Q100 = CIA = .59 x 3.92 x 0.1383 = 0.32 CFS

Zone Proposed Area P2 = 0.0658 acres
This area consists of the portion of the site that drains to the Pacific Ocean.

Q50 = CIA = .59 x 3.54 x 0.0658 = 0.14 CFS
Q100 = CIA = .59 x 3.92 x 0.0658 = 0.15 CFS

**Total project runoff:**
Q50 = 0.29 + 0.14 = 0.43 CFS
Q100 = 0.32 + 0.15 = 0.47 CFS

CONCLUSION:

The most important design change from the existing condition is that the amount of area that drains to the Pacific Ocean has been greatly reduced. The existing runoff to the rear of the site of 0.25 CFS (100 year storm) is reduced to 0.15 CFS (100 year storm). This includes storm water that falls on a portion of the site that is the coastal bluffs.

The majority of the site and its storm runoff will be directed to the front yard landscaping and the public street (Chelsea Street).

Total street side runoff is less than .5 CFS and can sheet flow over the curb.

**CERTIFICATION STATEMENT:**

This Hydrology Report has been prepared under the direction of the following registered civil engineer. The registered civil engineer (Engineer) attests to the technical information contained herein and the engineering data upon which the following design, recommendations, conclusions and decisions are based. The selection, sizing, and design of storm water treatment and other control measures in this report meet the requirements of the Regional Water Quality Control Board Order R9-2013-0001 and subsequent amendments.

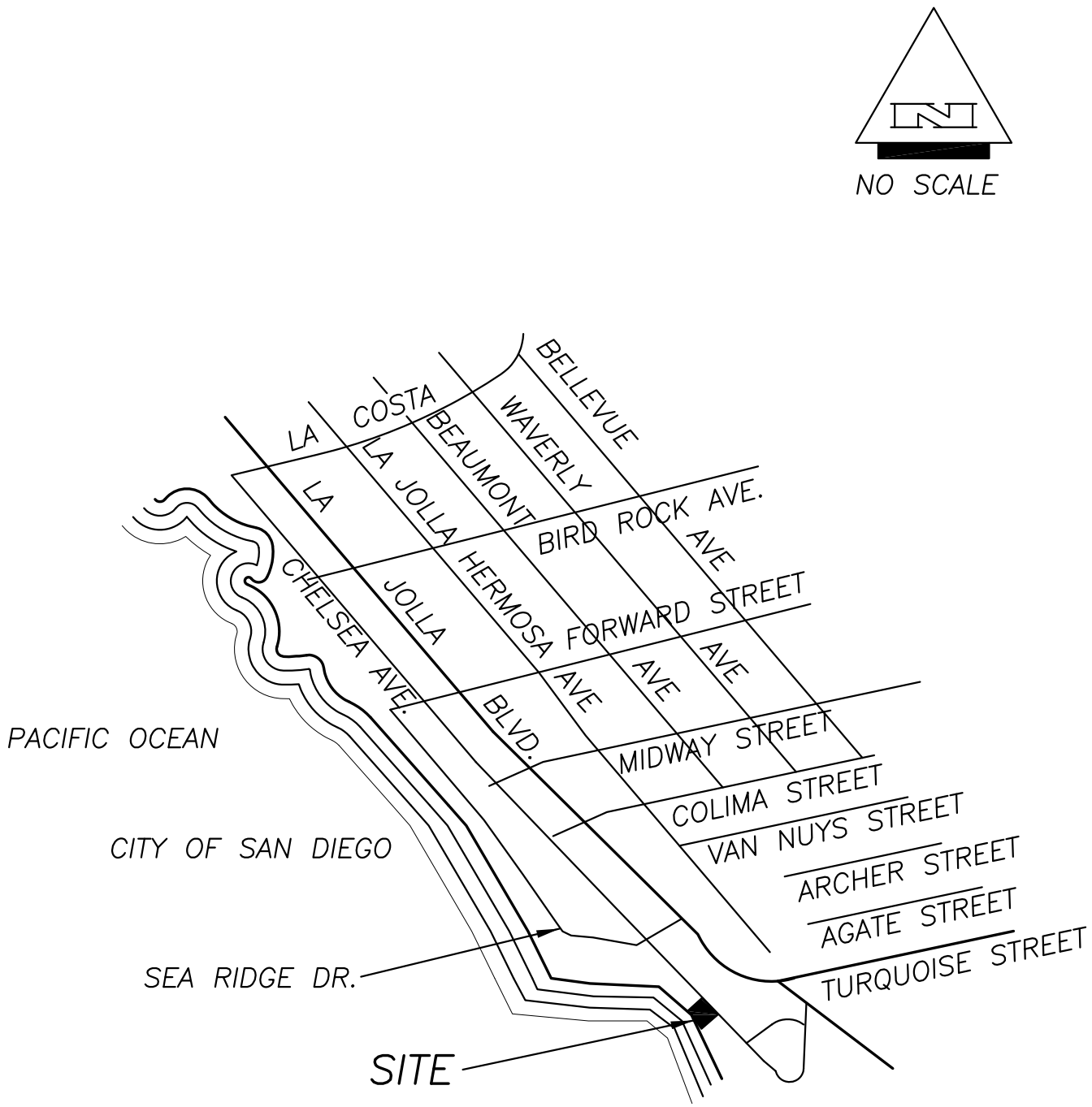
ENGINEER OF WORK:

_____ DATE: 10-03-2016

MICHAEL LEE SMITH, RCE 35471
MY REGISTRATION EXPIRES ON
9/30/2017

# APPENDIX A

## VICINITY MAP




# VICINITY MAP

NOT TO SCALE

# APPENDIX B

## COUNTY OF SAN DIEGO STORM DRAIN MANUAL
## TABLE 3-1, RUNOFF COEFFICIENTS FOR URBAN AREA

## Table 3-1
## RUNOFF COEFFICIENTS FOR URBAN AREAS

| Land Use | | Runoff Coefficient "C" | | | | |
|---|---|---|---|---|---|---|
| | | | Soil Type | | | |
| NRCS Elements | County Elements | % IMPER. | A | B | C | D |
| Undisturbed Natural Terrain (Natural) | Permanent Open Space | 0* | 0.20 | 0.25 | 0.30 | 0.35 |
| Low Density Residential (LDR) | Residential, 1.0 DU/A or less | 10 | 0.27 | 0.32 | 0.36 | 0.41 |
| Low Density Residential (LDR) | Residential, 2.0 DU/A or less | 20 | 0.34 | 0.38 | 0.42 | 0.46 |
| Low Density Residential (LDR) | Residential, 2.9 DU/A or less | 25 | 0.38 | 0.41 | 0.45 | 0.49 |
| Medium Density Residential (MDR) | Residential, 4.3 DU/A or less | 30 | 0.41 | 0.45 | 0.48 | 0.52 |
| Medium Density Residential (MDR) | Residential, 7.3 DU/A or less | 40 | 0.48 | 0.51 | 0.54 | 0.57 |
| Medium Density Residential (MDR) | Residential, 10.9 DU/A or less | 45 | 0.52 | 0.54 | 0.57 | 0.60 |
| Medium Density Residential (MDR) | Residential, 14.5 DU/A or less | 50 | 0.55 | 0.58 | 0.60 | 0.63 |
| High Density Residential (HDR) | Residential, 24.0 DU/A or less | 65 | 0.66 | 0.67 | 0.69 | 0.71 |
| High Density Residential (HDR) | Residential, 43.0 DU/A or less | 80 | 0.76 | 0.77 | 0.78 | 0.79 |
| Commercial/Industrial (N. Com) | Neighborhood Commercial | 80 | 0.76 | 0.77 | 0.78 | 0.79 |
| Commercial/Industrial (G. Com) | General Commercial | 85 | 0.80 | 0.80 | 0.81 | 0.82 |
| Commercial/Industrial (O.P. Com) | Office Professional/Commercial | 90 | 0.83 | 0.84 | 0.84 | 0.85 |
| Commercial/Industrial (Limited I.) | Limited Industrial | 90 | 0.83 | 0.84 | 0.84 | 0.85 |
| Commercial/Industrial (General I.) | General Industrial | 95 | 0.87 | 0.87 | 0.87 | 0.87 |

*The values associated with 0% impervious may be used for direct calculation of the runoff coefficient as described in Section 3.1.2 (representing the pervious runoff coefficient, Cp, for the soil type), or for areas that will remain undisturbed in perpetuity. Justification must be given that the area will remain natural forever (e.g., the area is located in Cleveland National Forest).
DU/A = dwelling units per acre
NRCS = National Resources Conservation Service

# APPENDIX C

## COUNTY OF SAN DIEGO STORM DRAIN MANUAL
## FIGURE 3-1, TIME OF CONCENTRATION CHARTS

Note that the Initial Time of Concentration should be reflective of the general land-use at the upstream end of a drainage basin. A single lot with an area of two or less acres does not have a significant effect where the drainage basin area is 20 to 600 acres.

Table 3-2 provides limits of the length (Maximum Length ($L_M$)) of sheet flow to be used in hydrology studies. Initial $T_i$ values based on average C values for the Land Use Element are also included. These values can be used in planning and design applications as described below. Exceptions may be approved by the "Regulating Agency" when submitted with a detailed study.

**Table 3-2**

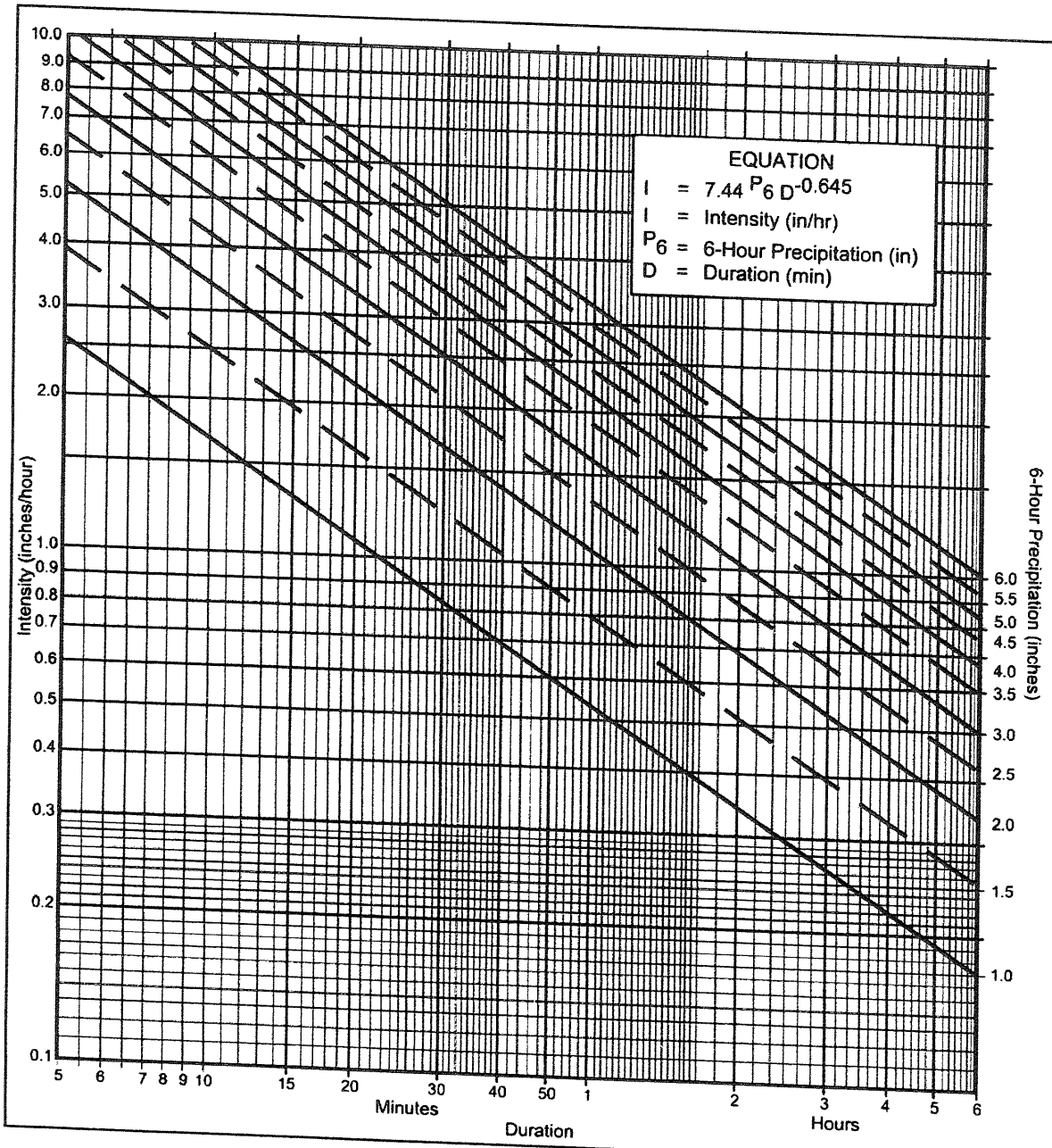
**MAXIMUM OVERLAND FLOW LENGTH ($L_M$) & INITIAL TIME OF CONCENTRATION ($T_i$)**

| Element* | DU/ Acre | .5% | | 1% | | 2% | | 3% | | 5% | | 10% | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $L_M$ | $T_i$ | $L_M$ | $T_i$ | $L_M$ | $T_i$ | $L_M$ | $T_i$ | $L_M$ | $T_i$ | $L_M$ | $T_i$ |
| Natural | | 50 | 13.2 | 70 | 12.5 | 85 | 10.9 | 100 | 10.3 | 100 | 8.7 | 100 | 6.9 |
| LDR | 1 | 50 | 12.2 | 70 | 11.5 | 85 | 10.0 | 100 | 9.5 | 100 | 8.0 | 100 | 6.4 |
| LDR | 2 | 50 | 11.3 | 70 | 10.5 | 85 | 9.2 | 100 | 8.8 | 100 | 7.4 | 100 | 5.8 |
| LDR | 2.9 | 50 | 10.7 | 70 | 10.0 | 85 | 8.8 | 95 | 8.1 | 100 | 7.0 | 100 | 5.6 |
| MDR | 4.3 | 50 | 10.2 | 70 | 9.6 | 80 | 8.1 | 95 | 7.8 | 100 | 6.7 | 100 | 5.3 |
| MDR | 7.3 | 50 | 9.2 | 65 | 8.4 | 80 | 7.4 | 95 | 7.0 | 100 | 6.0 | 100 | 4.8 |
| MDR | 10.9 | 50 | 8.7 | 65 | 7.9 | 80 | 6.9 | 90 | 6.4 | 100 | 5.7 | 100 | 4.5 |
| MDR | 14.5 | 50 | 8.2 | 65 | 7.4 | 80 | 6.5 | 90 | 6.0 | 100 | 5.4 | 100 | 4.3 |
| HDR | 24 | 50 | 6.7 | 65 | 6.1 | 75 | 5.1 | 90 | 4.9 | 95 | 4.3 | 100 | 3.5 |
| HDR | 43 | 50 | 5.3 | 65 | 4.7 | 75 | 4.0 | 85 | 3.8 | 95 | 3.4 | 100 | 2.7 |
| N. Com | | 50 | 5.3 | 60 | 4.5 | 75 | 4.0 | 85 | 3.8 | 95 | 3.4 | 100 | 2.7 |
| G. Com | | 50 | 4.7 | 60 | 4.1 | 75 | 3.6 | 85 | 3.4 | 90 | 2.9 | 100 | 2.4 |
| O.P./Com | | 50 | 4.2 | 60 | 3.7 | 70 | 3.1 | 80 | 2.9 | 90 | 2.6 | 100 | 2.2 |
| Limited I. | | 50 | 4.2 | 60 | 3.7 | 70 | 3.1 | 80 | 2.9 | 90 | 2.6 | 100 | 2.2 |
| General I. | | 50 | 3.7 | 60 | 3.2 | 70 | 2.7 | 80 | 2.6 | 90 | 2.3 | 100 | 1.9 |

*See Table 3-1 for more detailed description

# APPENDIX D

## COUNTY OF SAN DIEGO STORM DRAIN MANUAL
## FIGURE 3-1, INTENSITY DURATION DESIGN CHART




**Directions for Application:**

(1) From precipitation maps determine 6 hr and 24 hr amounts for the selected frequency. These maps are included in the County Hydrology Manual (10, 50, and 100 yr maps included in the Design and Procedure Manual).

(2) Adjust 6 hr precipitation (if necessary) so that it is within the range of 45% to 65% of the 24 hr precipitation (not applicaple to Desert).

(3) Plot 6 hr precipitation on the right side of the chart.

(4) Draw a line through the point parallel to the plotted lines.

(5) This line is the intensity-duration curve for the location being analyzed.

**Application Form:**

(a) Selected frequency 50 year

(b) $P_6$ = 1.8 in., $P_{24}$ = 3.4, $\frac{P_6}{P_{24}}$ = 53 %(2)

(c) Adjusted $P_6$(2) = 1.8 in.

(d) $t_x$ = 8.1 min.

(e) I = 3.54 in./hr.

Note: This chart replaces the Intensity-Duration-Frequency curves used since 1965.

| P6 / Duration | 1 | 1.5 | 2 | 2.5 | 3 | 3.5 | 4 | 4.5 | 5 | 5.5 | 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 2.63 | 3.95 | 5.27 | 6.59 | 7.90 | 9.22 | 10.54 | 11.86 | 13.17 | 14.49 | 15.81 |
| 7 | 2.12 | 3.18 | 4.24 | 5.30 | 6.36 | 7.42 | 8.48 | 9.54 | 10.60 | 11.66 | 12.72 |
| 10 | 1.68 | 2.53 | 3.37 | 4.21 | 5.05 | 5.90 | 6.74 | 7.58 | 8.42 | 9.27 | 10.11 |
| 15 | 1.30 | 1.95 | 2.59 | 3.24 | 3.89 | 4.54 | 5.19 | 5.84 | 6.49 | 7.13 | 7.78 |
| 20 | 1.08 | 1.62 | 2.15 | 2.69 | 3.23 | 3.77 | 4.31 | 4.85 | 5.39 | 5.93 | 6.46 |
| 25 | 0.93 | 1.40 | 1.87 | 2.33 | 2.80 | 3.27 | 3.73 | 4.20 | 4.67 | 5.13 | 5.60 |
| 30 | 0.83 | 1.24 | 1.66 | 2.07 | 2.49 | 2.90 | 3.32 | 3.73 | 4.15 | 4.56 | 4.98 |
| 40 | 0.69 | 1.03 | 1.38 | 1.72 | 2.07 | 2.41 | 2.76 | 3.10 | 3.45 | 3.79 | 4.13 |
| 50 | 0.60 | 0.90 | 1.19 | 1.49 | 1.79 | 2.09 | 2.39 | 2.69 | 2.98 | 3.28 | 3.58 |
| 60 | 0.53 | 0.80 | 1.06 | 1.33 | 1.59 | 1.86 | 2.12 | 2.39 | 2.65 | 2.92 | 3.18 |
| 90 | 0.41 | 0.61 | 0.82 | 1.02 | 1.23 | 1.43 | 1.63 | 1.84 | 2.04 | 2.25 | 2.45 |
| 120 | 0.34 | 0.51 | 0.68 | 0.85 | 1.02 | 1.19 | 1.36 | 1.53 | 1.70 | 1.87 | 2.04 |
| 150 | 0.29 | 0.44 | 0.59 | 0.73 | 0.88 | 1.03 | 1.18 | 1.32 | 1.47 | 1.62 | 1.76 |
| 180 | 0.26 | 0.39 | 0.52 | 0.65 | 0.78 | 0.91 | 1.04 | 1.18 | 1.31 | 1.44 | 1.57 |
| 240 | 0.22 | 0.33 | 0.43 | 0.54 | 0.65 | 0.76 | 0.87 | 0.98 | 1.08 | 1.19 | 1.30 |
| 300 | 0.19 | 0.28 | 0.38 | 0.47 | 0.56 | 0.66 | 0.75 | 0.85 | 0.94 | 1.03 | 1.13 |
| 360 | 0.17 | 0.25 | 0.33 | 0.42 | 0.50 | 0.58 | 0.67 | 0.75 | 0.84 | 0.92 | 1.00 |

**Intensity-Duration Design Chart - Template**

1.5 1.8 2
7 3.18 3.82 4.24
8.1 3.54
10 2.53 3.05 3.37

FIGURE
3-1

# County of San Diego Hydrology Manual

*Rainfall Isopluvials*

**50 Year Rainfall Event - 6 Hours**

Isopluvial (inches)

1.8

Orange County

Riverside County

Imperial County

Pacific Ocean

Mexico

SITE

OCEANSIDE
VISTA
CARLSBAD
ESCONDIDO
ENCINITAS
SOLANA BEACH
DEL MAR
POWAY
S.D. COUNTY
SANTEE
SAN DIEGO
EL CAJON
LA MESA
LEMON GROVE
CORONADO
SD
CHULA VISTA
IMPERIAL BEACH

117°30' 117°15' 117°00' 116°45' 116°30' 116°15'

33°30' 33°15' 33°00' 32°45' 32°30'

DPW GIS
Department of Public Works Geographic Information Services

SanGIS
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N W E S

3 0 3 Miles

# County of San Diego Hydrology Manual

*Rainfall Isopluvials*

**50 Year Rainfall Event - 24 Hours**

Isopluvial (inches)

3.4

Orange County

Riverside County

Imperial County

Pacific Ocean

Mexico

OCEANSIDE
VISTA
CARLSBAD
ESCONDIDO
ENCINITAS
SOLANA BEACH
DEL MAR
POWAY
S.D. COUNTY
SANTEE
SAN DIEGO
SITE
EL CAJON
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CORONADO
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IMPERIAL BEACH

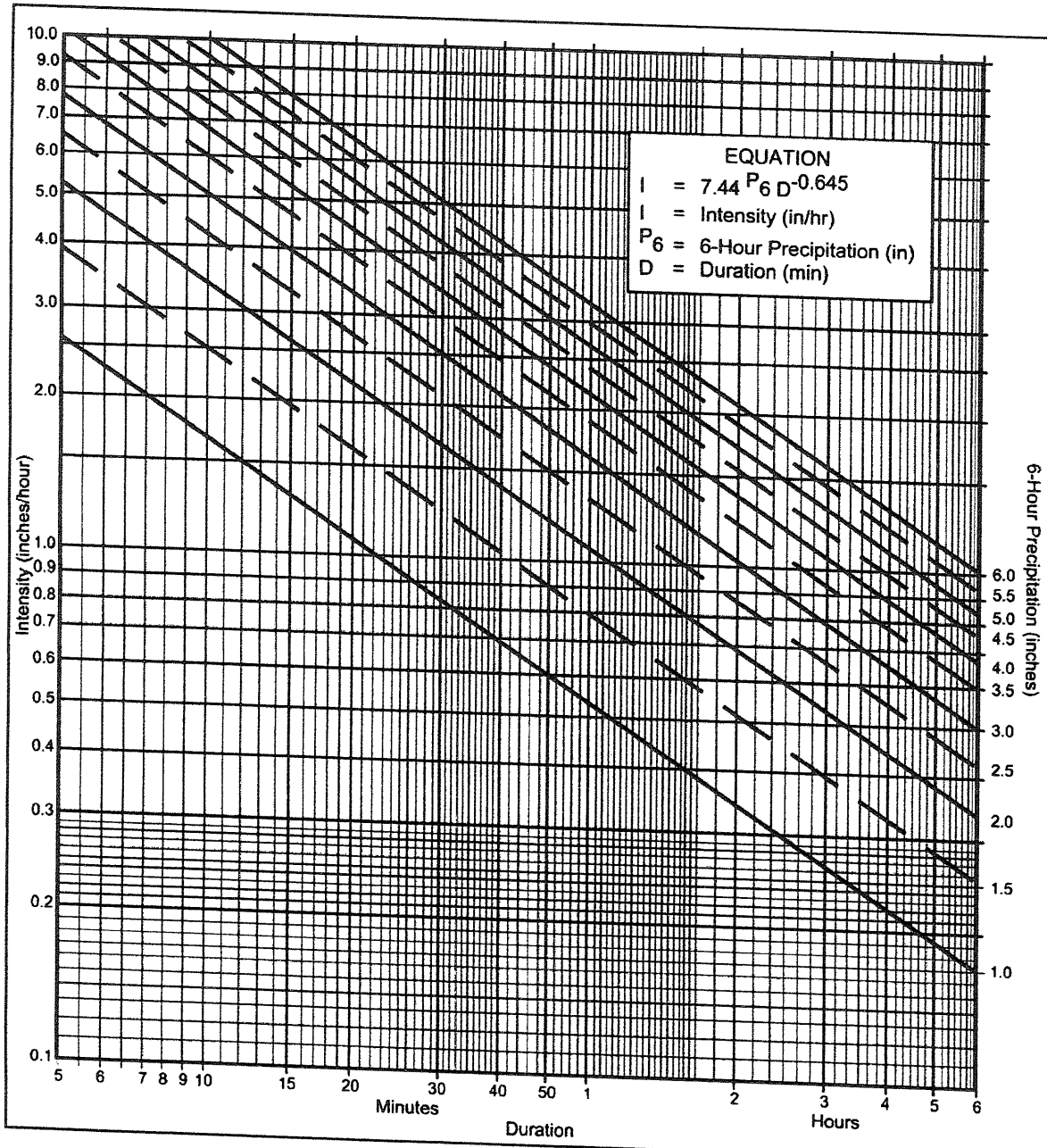
117°30' 117°15' 117°00' 116°45' 116°30' 116°15'

33°30' 33°15' 33°00' 32°45' 32°30'



N W E S

3 0 3 Miles




**Directions for Application:**

(1) From precipitation maps determine 6 hr and 24 hr amounts for the selected frequency. These maps are included in the County Hydrology Manual (10, 50, and 100 yr maps included in the Design and Procedure Manual).

(2) Adjust 6 hr precipitation (if necessary) so that it is within the range of 45% to 65% of the 24 hr precipitation (not applicaple to Desert).

(3) Plot 6 hr precipitation on the right side of the chart.

(4) Draw a line through the point parallel to the plotted lines.

(5) This line is the intensity-duration curve for the location being analyzed.

**Application Form:**

(a) Selected frequency 100 year

(b) $P_6$ = 2.0 in., $P_{24}$ = 3.9, $\frac{P_6}{P_{24}}$ = 51 %(2)

(c) Adjusted $P_6$(2) = 2.0 in.

(d) $t_x$ = 8.1 min.

(e) I = 3.92 in./hr.

Note: This chart replaces the Intensity-Duration-Frequency curves used since 1965.

| P6 / Duration | 1 | 1.5 | 2 | 2.5 | 3 | 3.5 | 4 | 4.5 | 5 | 5.5 | 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | I | I | I | I | I | I | I | I | I | I | I |
| 5 | 2.63 | 3.95 | 5.27 | 6.59 | 7.90 | 9.22 | 10.54 | 11.86 | 13.17 | 14.49 | 15.81 |
| 7 | 2.12 | 3.18 | 4.24 | 5.30 | 6.36 | 7.42 | 8.48 | 9.54 | 10.60 | 11.66 | 12.72 |
| 10 | 1.68 | 2.53 | 3.37 | 4.21 | 5.05 | 5.90 | 6.74 | 7.58 | 8.42 | 9.27 | 10.11 |
| 15 | 1.30 | 1.95 | 2.59 | 3.24 | 3.89 | 4.54 | 5.19 | 5.84 | 6.49 | 7.13 | 7.78 |
| 20 | 1.08 | 1.62 | 2.15 | 2.69 | 3.23 | 3.77 | 4.31 | 4.85 | 5.39 | 5.93 | 6.46 |
| 25 | 0.93 | 1.40 | 1.87 | 2.33 | 2.80 | 3.27 | 3.73 | 4.20 | 4.67 | 5.13 | 5.60 |
| 30 | 0.83 | 1.24 | 1.66 | 2.07 | 2.49 | 2.90 | 3.32 | 3.73 | 4.15 | 4.56 | 4.98 |
| 40 | 0.69 | 1.03 | 1.38 | 1.72 | 2.07 | 2.41 | 2.76 | 3.10 | 3.45 | 3.79 | 4.13 |
| 50 | 0.60 | 0.90 | 1.19 | 1.49 | 1.79 | 2.09 | 2.39 | 2.69 | 2.98 | 3.28 | 3.58 |
| 60 | 0.53 | 0.80 | 1.06 | 1.33 | 1.59 | 1.86 | 2.12 | 2.39 | 2.65 | 2.92 | 3.18 |
| 90 | 0.41 | 0.61 | 0.82 | 1.02 | 1.23 | 1.43 | 1.63 | 1.84 | 2.04 | 2.25 | 2.45 |
| 120 | 0.34 | 0.51 | 0.68 | 0.85 | 1.02 | 1.19 | 1.36 | 1.53 | 1.70 | 1.87 | 2.04 |
| 150 | 0.29 | 0.44 | 0.59 | 0.73 | 0.88 | 1.03 | 1.18 | 1.32 | 1.47 | 1.62 | 1.76 |
| 180 | 0.26 | 0.39 | 0.52 | 0.65 | 0.78 | 0.91 | 1.04 | 1.18 | 1.31 | 1.44 | 1.57 |
| 240 | 0.22 | 0.33 | 0.43 | 0.54 | 0.65 | 0.76 | 0.87 | 0.98 | 1.08 | 1.19 | 1.30 |
| 300 | 0.19 | 0.28 | 0.38 | 0.47 | 0.56 | 0.66 | 0.75 | 0.85 | 0.94 | 1.03 | 1.13 |
| 360 | 0.17 | 0.25 | 0.33 | 0.42 | 0.50 | 0.58 | 0.67 | 0.75 | 0.84 | 0.92 | 1.00 |

**Intensity-Duration Design Chart - Template**

7 4.24
8.1 3.92
10 3.37

FIGURE
3-1

# County of San Diego Hydrology Manual

*Rainfall Isopluvials*

**100 Year Rainfall Event - 6 Hours**

Isopluvial (inches)

2.0

SITE

Orange County

Riverside County

Imperial County

Mexico

Pacific Ocean

OCEANSIDE
VISTA
CARLSBAD
ESCONDIDO
ENCINITAS
SOLANA BEACH
DEL MAR
POWAY
S.D. COUNTY
SANTEE
SAN DIEGO
EL CAJON
LA MESA
LEMON GROVE
CORONADO
SD
CHULA VISTA
IMPERIAL BEACH

117°30' 117°15' 117°00' 116°45' 116°30' 116°15'
33°30' 33°15' 33°00' 32°45' 32°30'



N W E S

3 0 3 Miles

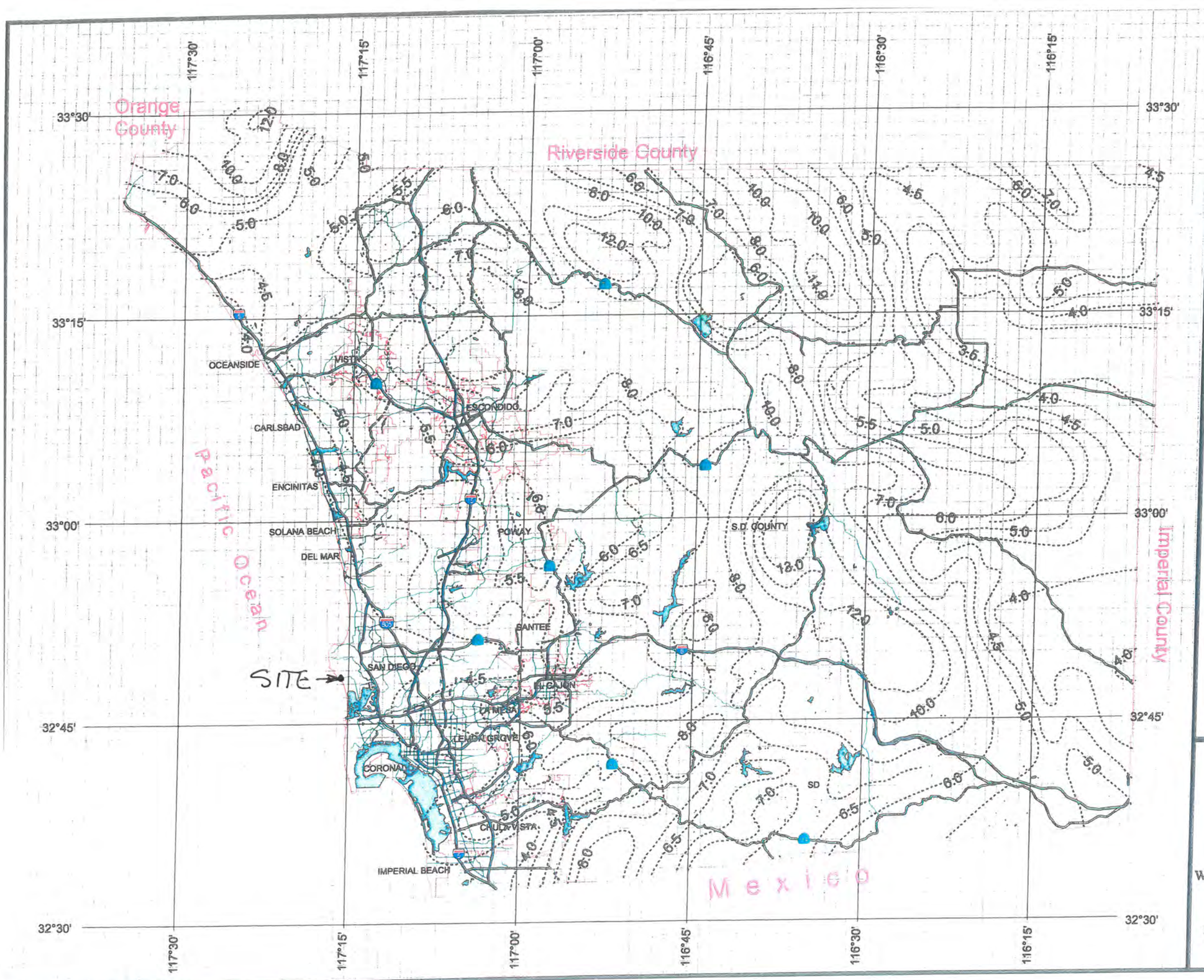
# County of San Diego Hydrology Manual

*Rainfall Isopluvials*

**100 Year Rainfall Event - 24 Hours**

Isopluvial (inches)

3.9

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Department of Public Works Geographic Information Services

SanGIS
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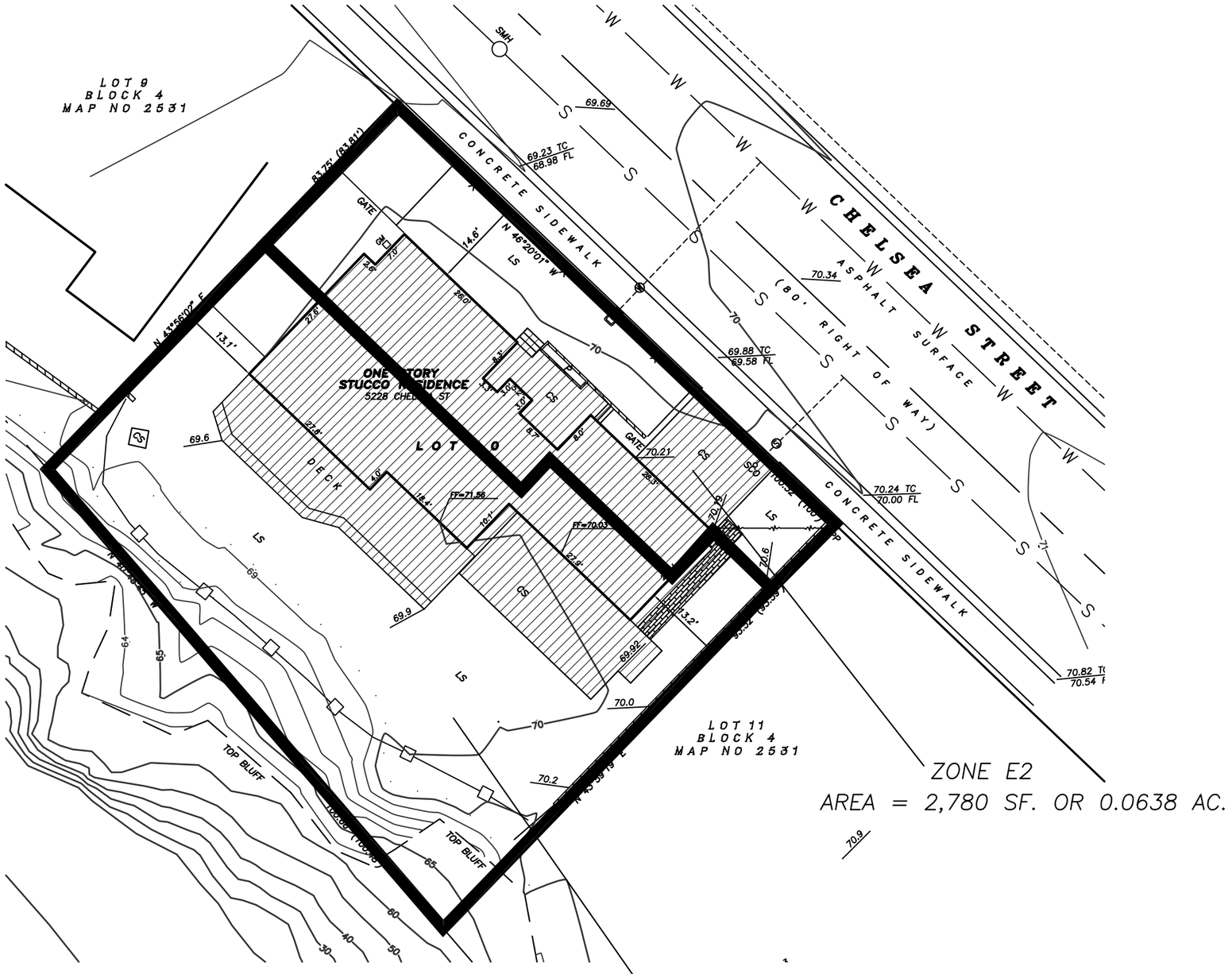
N W E S

3 0 3 Miles

# EXHIBIT A

## EXISTING CONDITIONS DRAINAGE AREAS MAP




# EXHIBIT A

## HYDROLOGY MAP
## EXISTING CONDITIONS

SCALE 1" = 20'

PROJECT AREA
AREA = 8,888 SF. OR 0.2040 AC.

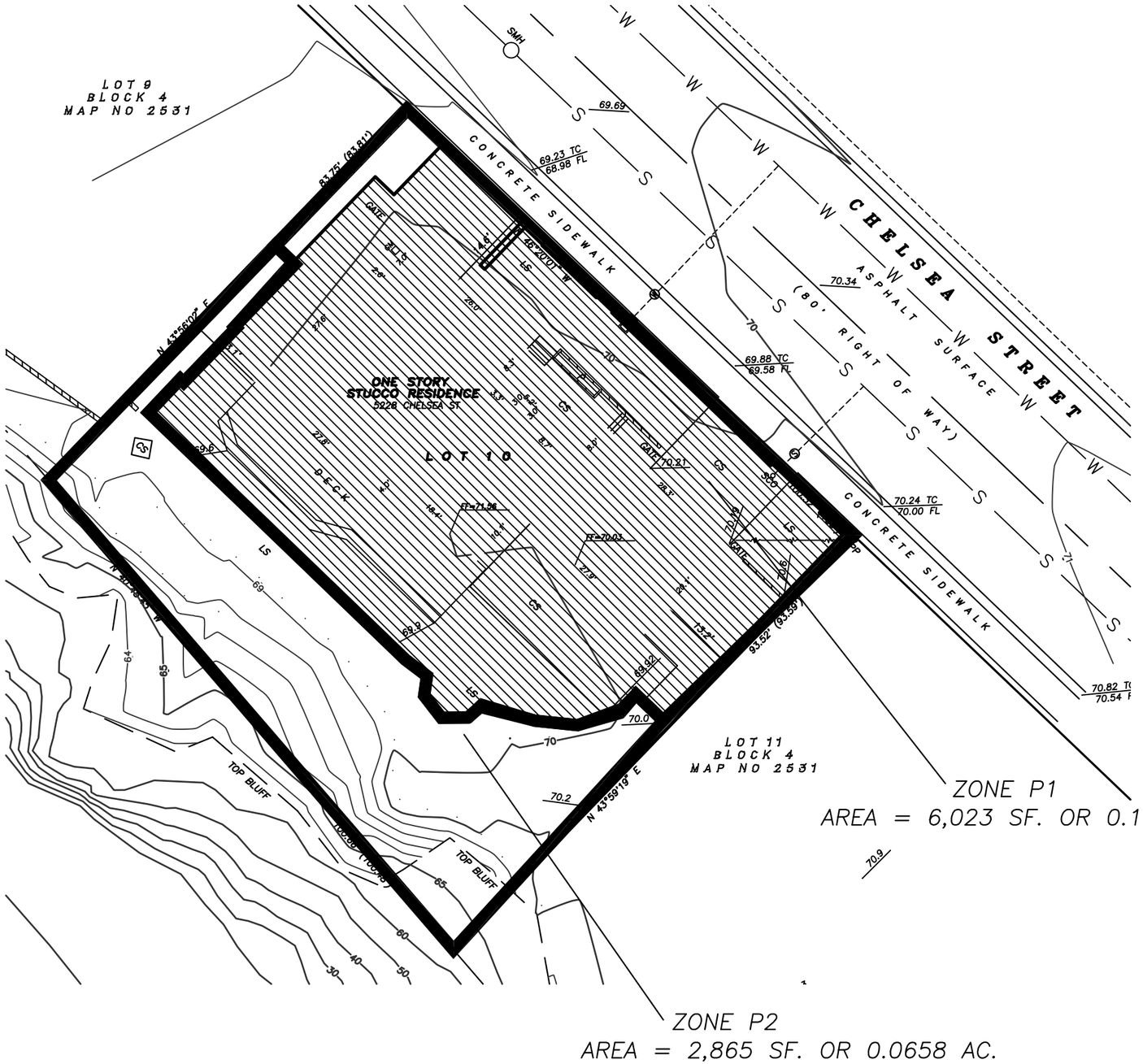
ZONE E1
AREA = 6,108 SF. OR 0.1402 AC.

ZONE E2
AREA = 2,780 SF. OR 0.0638 AC.

IMPERVIOUS AREA
AREA = 3,496 SF. OR 0.0803 AC.
60.7% OF SITE

# EXHIBIT B

## PROPOSED CONDITIONS DRAINAGE AREAS MAP




# EXHIBIT B

## HYDROLOGY MAP
## PROPOSED CONDITIONS

SCALE 1" = 20'

PROJECT AREA
AREA = 8,888 SF. OR 0.2040 AC.

ZONE P1
AREA = 6,023 SF. OR 0.1383 AC.

ZONE P2
AREA = 2,865 SF. OR 0.0658 AC.

IMPERVIOUS AREA
AREA = 5,783 SF. OR 0.1328 AC.
65.1% OF SITE