COFFEY ENGINEERING, INC.

Preliminary Drainage Study
Erb-Creamer

4285 1/3 Goldfinch Street
San Diego, CA 92103

APN 444-272-09-00
PTS 595127

Prepared for:

Ty Creamer

June 14, 2019

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1. **Existing Conditions**

In existing conditions, this site is a 5748 SF vacant lot located in a hillside area and is composed of various shrub, dirt, and other vegetation. In pre-construction conditions, the site contains one drainage basin (Basin 'B'). Basin 'B' generates approximately $Q_{(100)}$=0.30 cfs that sheet flows downhill in the Southeasterly direction towards an existing vegetated hill open space. Street preconstruction condition are in Drainage Map 'A'.

See Drainage Map 'A' and 'B'.

2. **Proposed Project**

In proposed conditions, this site will contain a single-family residence with new landscape and hardscape features. This project proposes 4,258 SF of impervious area, which includes the roof, driveway, stairs and other proposed on-site hardscape areas. The site is composed one drainage basin (Basins 'C').

This basin is expected to generate $Q_{(100)}$= 0.48 cfs of runoff .We are going to collect in a sump-pump the water generated from Basin 'C' and send it to the street.

See Drainage Map 'C'.

3. **Purpose and Scope of Report**

This report will evaluate the existing street runoff and the proposed site runoff that we are sending to the street and we will verify that no adverse impacts will occur to the street existing storm drain system.

4. **Method of Calculations**

The Rational Method, as defined by *City of San Diego Drainage Design Manual 2017*, will be used to calculate storm water flow rates. Where noted, the following calculations were used to determine flow properties:

Rainfall Characteristics

$Q = C * I * A$, where

Q = Flow rate (ft^3/sec)
C = Runoff coefficient
(Runoff coefficient per *City of San Diego Drainage Design Manual 2017* reproduced in Appendix C. Soil type D determined from the *Soil Hydrologic Groups* map from the County of San Diego Hydrology Manual reproduced in Appendix C also.)
I = Rainfall intensity (in/hr.)
A = Area (acres)

5. **Results and Conclusions:**

In existing conditions the street generates Q (100) = 2.29 cfs. The street runoff is collected on grated 3'X5' inlet located at Barr Ave low point and discharge to the creek with a 15" CMP drain (See Drainage Map 'A'). Based on the calculated post- construction drainage conditions, we are expecting to add (pump) to the street Q (100) = 0.367 cfs generated runoff from the site due to proposed new development.
The capacity of existing 15"CMP @ 32% 19.79 cfs. Therefore no adverse impacts will occur to the street existing storm drain system in post construction conditions.

6. **Clean Water Act (CWA) Compliance**

The proposed project is exempt from permitting under Federal Clean Water Act section 401 or 404 because it does not directly discharge into navigable waters of the United States.

7. **Declaration of Responsible Charge**

I hereby declare that I am the Civil Engineer of work for this project, that I have exercised responsible charge over the design of the project as defined in section 6703 of the business and professions code, and that the design is consistent with current design.

I understand that the check of project drawings and specifications by the City of San Diego is confined to a review only and does not relieve me, as Engineer of Work, of my responsibilities for project design.

PRELIMINARY

Michael C. Kinnear
RCE 76785
Exp. 12-30-18

Date

Appendix A –Reference Plans Drainage Maps

LEGEND

DESCRIPTION	SYMBOL
PROPERTY LINE	
EXISTING CONTOUR	
DIRECTION OF FLOW	→ →
SITE BASIN	
WATER COURSE DISTANCE	L=699'

BASIN A.1 AREA= 41,607 SF
STREETS AREA =13,740 SF
SINGLE FAMILY RESIDENCE =27,867 SF

C=(0.90x13,740+0.55x27,867)/41,607=0.666

BASIN 'A.1' –
BASIN AREA(A): 0.96 AC.
RUNOFF COEFFICIENT(C) (WEIGHTED): 0.666
INTENSITY(I)(FIGURE A–1): 3.6
100–YR. STORM FLOW: CIA=2.29 CFS.

N

SCALE: 1"=50'

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DRAINAGE MAP 'A'
BARR ST EXISTING CONDITIONS
SCALE: 1"=50'

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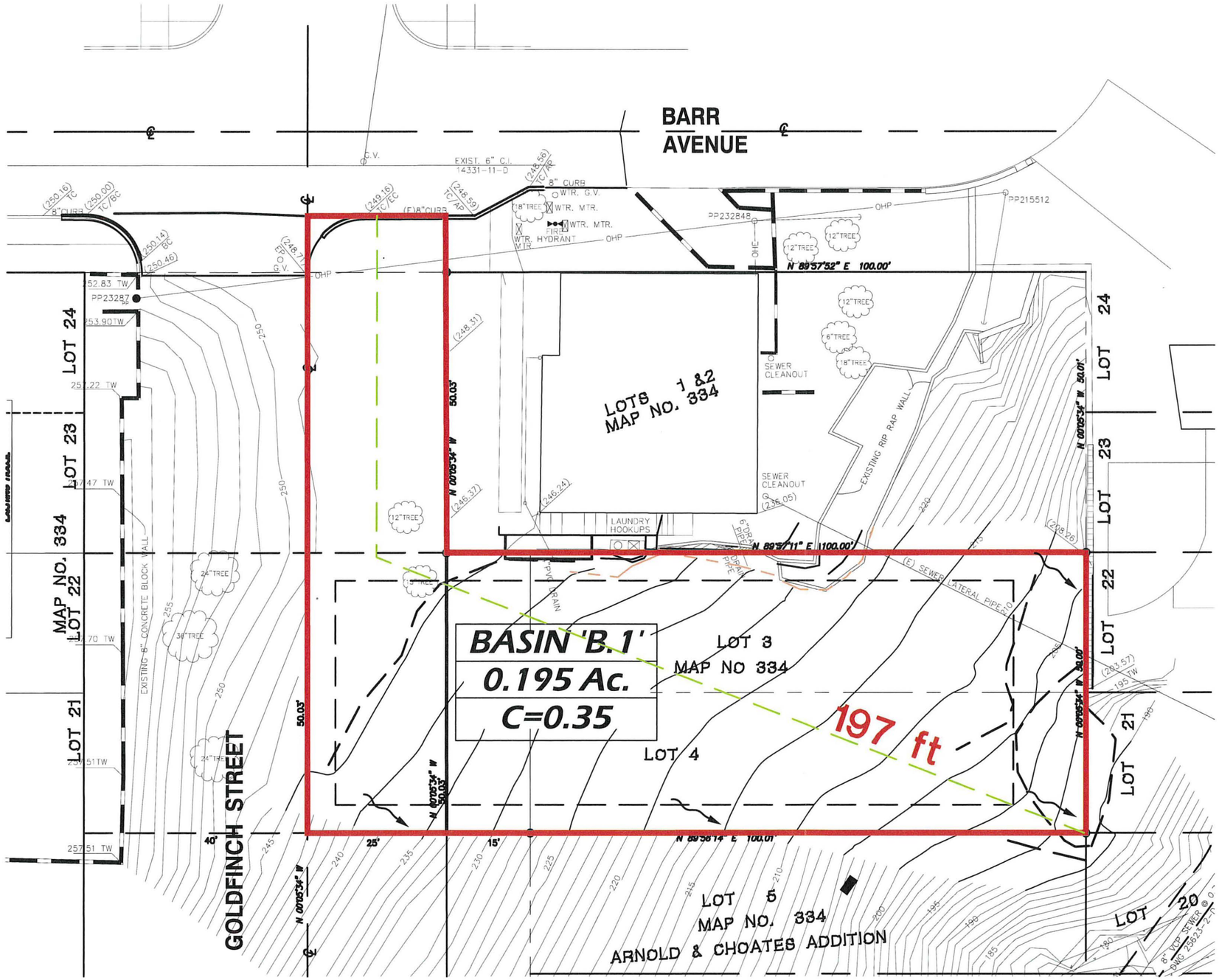

LEGEND

DESCRIPTION	SYMBOL
PROPERTY LINE	
EXISTING CONTOUR	
DIRECTION OF FLOW	
SITE BASIN	
WATER COURSE DISTANCE	L-699'

BASIN 'B.1' –
BASIN AREA(A): 8493 AC.=0.195 Ac
RUNOFF COEFFICIENT (C): 0.35
INTENSITY(I)(FIGURE A-1): 4.4
100-YR. STORM FLOW: CIA=0.30 CFS.

N

SCALE: 1"=20'

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DRAINAGE MAP 'B'
SITE-EXISTING CONDITIONS
SCALE: 1"=20'

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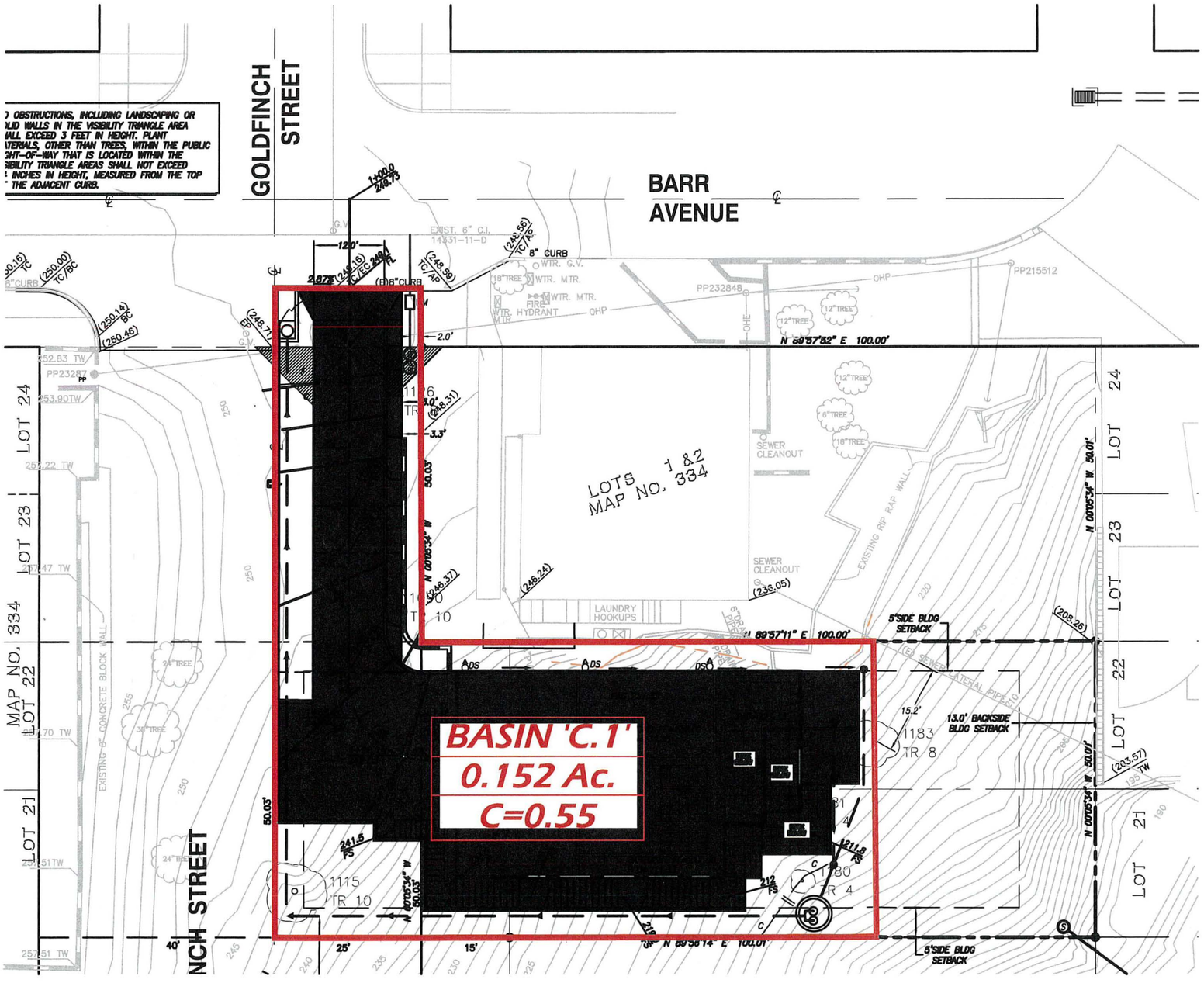

LEGEND

DESCRIPTION	SYMBOL
PROPERTY LINE	
EXISTING CONTOUR	
DIRECTION OF FLOW	
SITE BASIN	
WATER COURSE DISTANCE	L=699'

BASIN 'C.1' –
BASIN AREA(A): 6603 AC.–0.152 Ac
RUNOFF COEFFICIENT (C): 0.55
INTENSITY(I)(FIGURE A–1): 4.4
100–YR. STORM FLOW: CIA=0.367 CFS.

N

SCALE: 1"=20'

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4285 1/3 Goldfinch Street, CA 92103

DRAINAGE MAP 'C'
SITE-PROPOSED CONDITIONS
SCALE: 1"=20'

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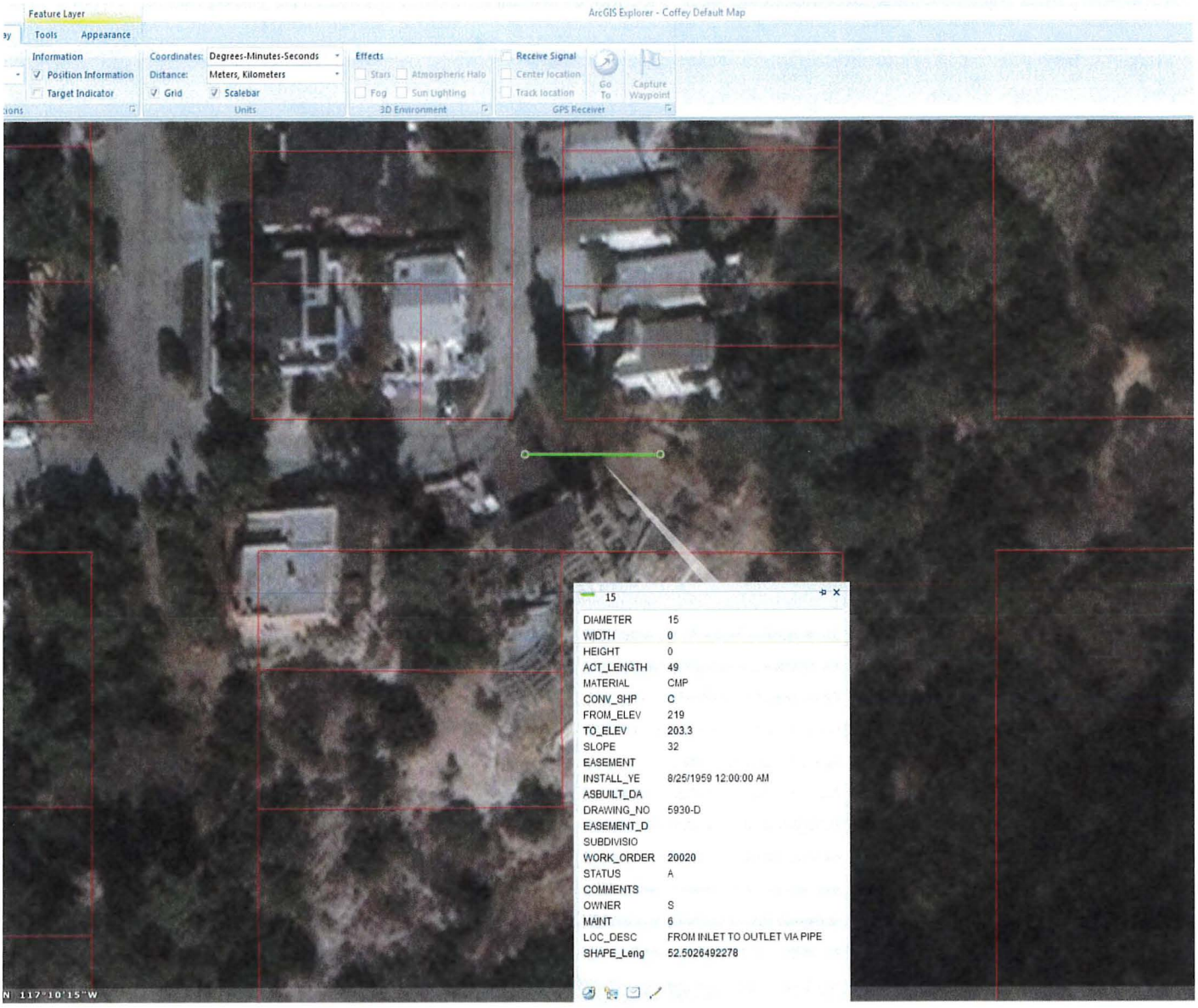
Appendix B –Calculation/Evaluations

Table A - Time of Concentration Flow Characteristics

	Urban Overland Flow				Pipe Flow			Summary			
Flow ID	Urban watercourse distance, D_u (ft)	Watercourse slope, s (%)	Runoff Coefficient, C	Overland Flow Time, T (min)	Pipe Length, L_p (ft)	Average velocity, V (fps)	Pipe travel time, D_p (min)	(5 min minimum) Total time-of-concentration, T_c (min)	Rainfall Intensity, I (in/hr)	Basin Area, A (acres)	Q (cfs)
								PRE-CONSTRUCTION- STREET			
A.1	163	3.00	0.67	*6.92*	0	6.0	*1.50*	8.42	3.60	0.955	**2.290**
								PRE CONSTRUCTION-SITE			
B.1	197	30.00	0.35	*0.73*	0	0.0	*0.00*	**5.00**	4.40	0.195	**0.300**
								POST-CONSTRUCTION- ON-SITE			
C.1	197	30.00	0.55	*4.47*	0	0.0	*0.00*	5.00	4.40	0.152	**0.367**


Feature Layer
ArcGIS Explorer - Coffey Default Map
Tools
Appearance
Information
Position Information
Target Indicator
Coordinates: Degrees-Minutes-Seconds
Distance: Meters, Kilometers
Grid
Scalebar
Units
Effects
Stars
Atmospheric Halo
Fog
Sun Lighting
3D Environment
Receive Signal
Center location
Track location
Go To
Capture Waypoint
GPS Receiver
15
DIAMETER 15
WIDTH 0
HEIGHT 0
ACT_LENGTH 49
MATERIAL CMP
CONV_SHP C
FROM_ELEV 219
TO_ELEV 203.3
SLOPE 32
EASEMENT
INSTALL_YE 8/25/1959 12:00:00 AM
ASBUILT_DA
DRAWING_NO 5930-D
EASEMENT_D
SUBDIVISIO
WORK_ORDER 20020
STATUS A
COMMENTS
OWNER S
MAINT 6
LOC_DESC FROM INLET TO OUTLET VIA PIPE
SHAPE_Leng 52.5026492278
N 117°10'15"W

EXISTING 15" CMP SD CAPACITY

DATE: 12-04-2018

TIME: 08:27:36

(1) Diameter (inches) ... 15. (2) Mannings n ..... .024

(3) slope (ft/ft) ..... .3200 (4) Q (cfs) 19.79

(5) depth (ft) ..... 1.25 (6) depth/Diameter ... 1.00

Velocity (fps) ..... 16.12 Velocity Head 4.04

Area (Sq. Ft.) 1.23

Critical Depth ..... 1.25 Critical Slope ... 0.3038

Critical Velocity ... 16.13 Froude Number .... N/A

Appendix C –Reference Tables & Figures (City of San Diego Drainage Manual 2017)

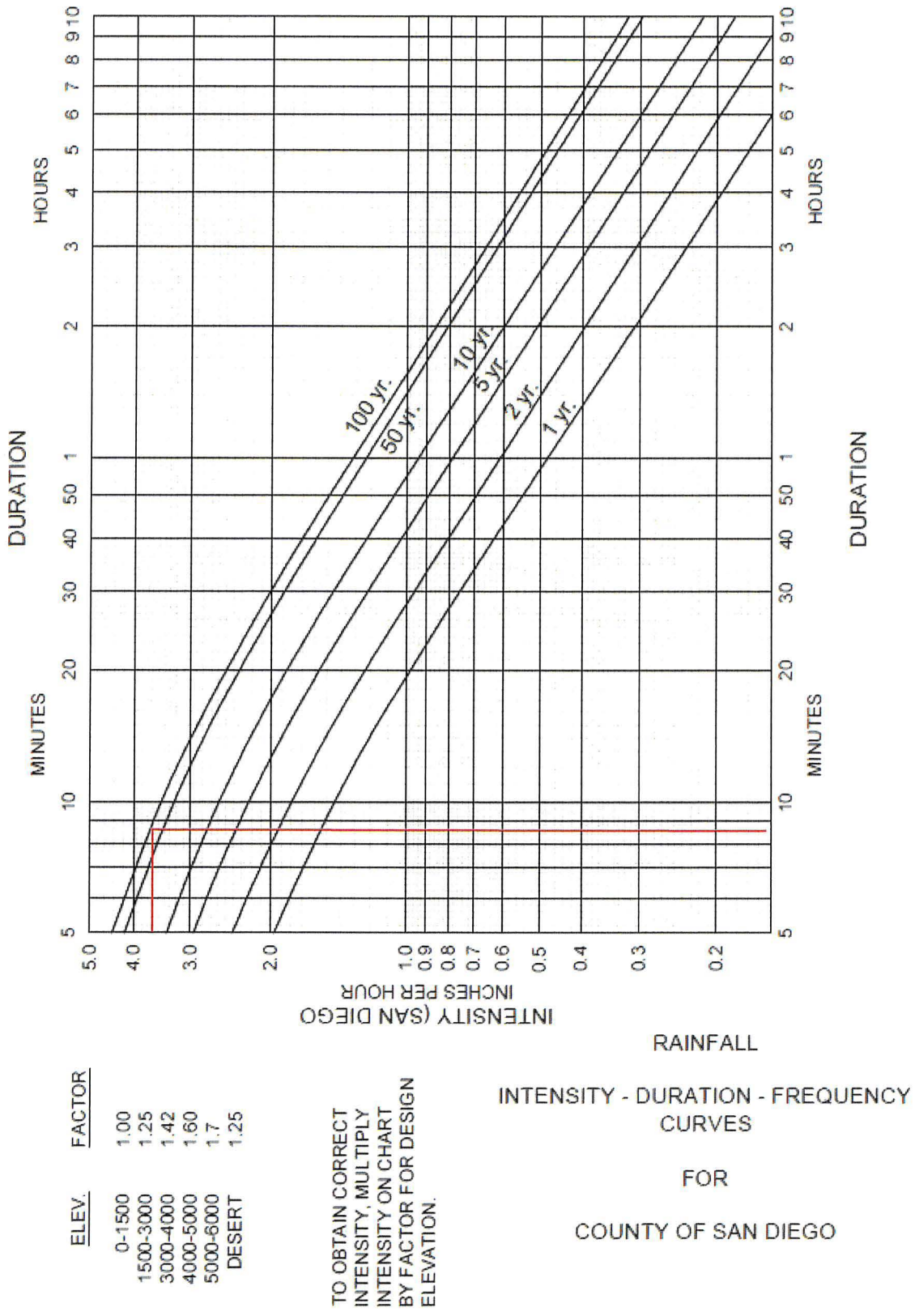


Figure A-1. Intensity-Duration-Frequency Design Chart

Table A-1. Runoff Coefficients for Rational Method

Land Use	Runoff Coefficient (C)
	Soil Type [1]
Residential:	
Single Family	0.55
Multi-Units	0.70
Mobile Homes	0.65
Rural (lots greater than ½ acre)	0.45
Commercial [2]	
80% Impervious	0.85
Industrial [2]	
90% Impervious	0.95

Note:
[1] Type D soil to be used for all areas.
[2] Where actual conditions deviate significantly from the tabulated imperviousness values of 80% or 90%, the values given for coefficient C, may be revised by multiplying 80% or 90% by the ratio of actual imperviousness to the tabulated imperviousness. However, in case shall the final coefficient be less than 0.50. For example: Consider commercial property on D soil.

Actual imperviousness = 50%
Tabulated imperviousness = 80%
Revised C = (50/80) x 0.85 = 0.53

The values in Table A–1 are typical for urban areas. However, if the basin contains rural or agricultural land use, parks, golf courses, or other types of nonurban land use that are expected to be permanent, the appropriate value should be selected based upon the soil and cover and approved by the City.

A.1.3. Rainfall Intensity

The rainfall intensity (I) is the rainfall in inches per hour (in/hr.) for a duration equal to the T_c for a selected storm frequency. Once a particular storm frequency has been selected for design and a T_c calculated for the drainage area, the rainfall intensity can be determined from the Intensity-Duration-Frequency Design Chart (Figure A-1).