Preliminary Drainage Study
for
Aspire
137 West Valley Parkway
Escondido, Ca 92025

Prepared For:
Touchstone MF Fund I, LLC
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San Diego, CA 92131
Mr. Addison Garza

Prepared By:

Touchstone Development, Inc.
9909 Mira Mesa Blvd, Suite 150
San Diego, CA 92131

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 standards.

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

8/20/2019

Alberto Sandoval RCE 89041 Date

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INTRODUCTION 1.0

This Drainage Report supports preliminary engineering design for Aspire Project, located at 137 West Valley Parkway in Escondido, Ca. The project site is bound by West Valley Parkway on the north, Maple Street to the west and an alley to the south. Refer to the Vicinity Map shown at the end of this section.

The project proposes to develop a parcel currently owned by the City of Escondido (APN 229-421-26). Project consists of the removal of an existing surface parking lot. A new podium style 6-story 131 unit residential structure with a parking on the first level and basement level. Offsite improvements include removal and replacement of existing sidewalk on West Valley Parkway and removal of portion of existing sidewalk and curb and gutter in the alley. Utility connections to existing storm drain, sewer and water are included. The overall project disturbance area is approximately 1.2 acres.

Aspire is located within the Escondido Hydrologic Sub-Area (HSA 904.62), which is part of the Escondido Creek Hydrologic Area (HA 904.60) and Carlsbad Hydrologic Unit (HU 904.00).

The existing site has a ridgeline that traverses the site in a northerly and southerly direction. Each half drain into a private catch basin adjacent to the Right of Way and piped into public curb inlets on West Valley Parkway. The largest curb inlet is located at the SE corner of intersection with West Valley Parkway and Maple Street. The curb inlet also captures a portion of the halfwidth improvements along the frontage. Runoff from the alley and south portion of the site is conveyed along a curb and gutter adjacent to the project's southerly property line. Flows are captured in a curb inlet at the intersection with Maple Street and alley. Runoff continues north along Maple Street in an 18" RCP SD and confluences with flows from curb inlet mentioned above. Runoff flows north in an 18" RCP SD before confluencing in a storm drain cleanout with runoff in a 36" SD (DWG. No. P1003). The 36" RCP SD conveys flows from the remainder of the site (east half) and flows from a portion of Broadway (west halfwidth) and West Valley Parkway (south halfwidth).

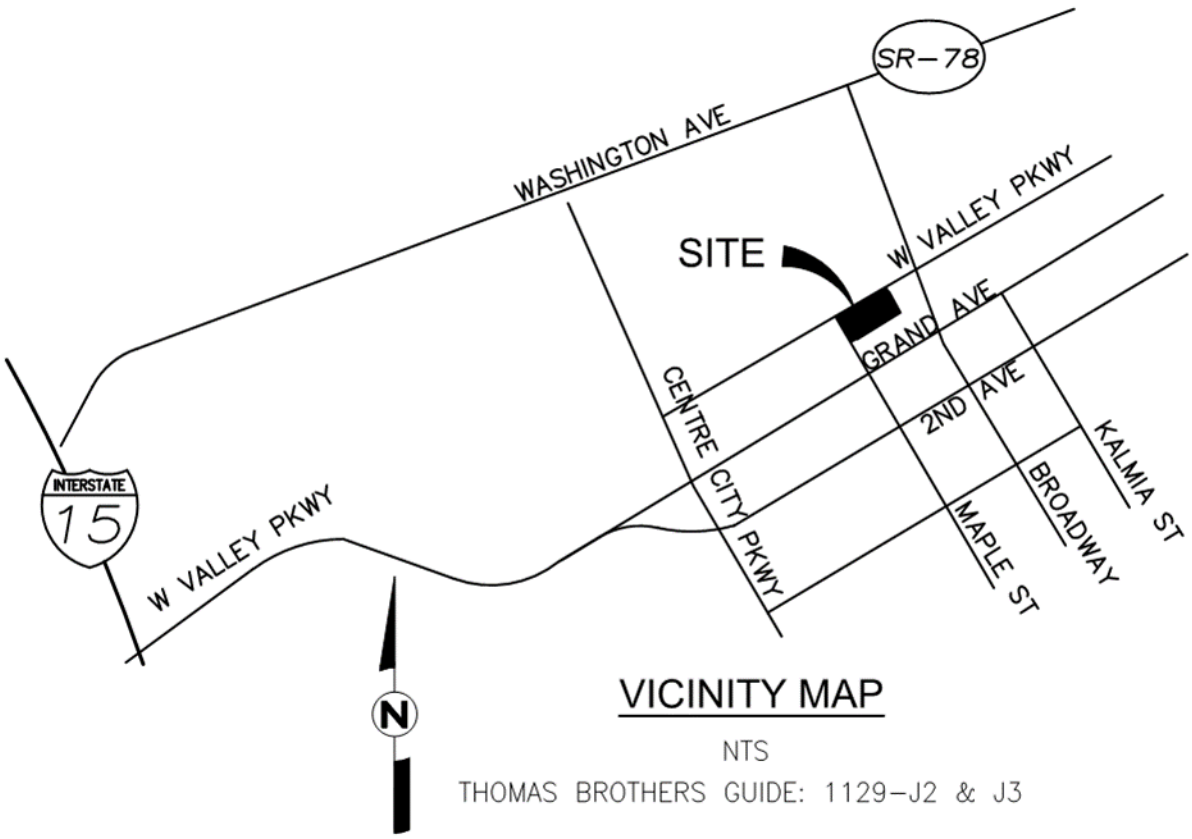
The Aspire project will mimic the existing drainage patterns, which flow in a northwesterly direction. Runoff from the west portion of building roof and outdoor deck will be directed to raised planters located in the outdoor deck and street level prior to discharging to an existing curb inlet at the SE intersection of West Valley Parkway and Maple Street. East portion of the roof and outdoor deck will discharge to a proposed curb inlet on West Valley Parkway which discharges

into an existing 36" RCP SD flowing west on West Valley Parkway. Runoff from the site and surrounding areas discharge into concrete lined Escondido Creek 0.2 miles north of the site. Escondido Creek eventually discharges into San Elijo Lagoon approximately 12 miles downstream and eventually connects to the Pacific Ocean.

STORM WATER PLAN REQUIREMENTS 1.1

The site design BMPs, source control and treatment control BMPs that will be utilized to address water quality for the project are described in the Storm Water Quality Management Plan (SWQMP) titled, "Priority Development Project Major Storm Water Quality Management Plan (PDP SWQMP) for Aspire 137 West Valley Parkway, Escondido, Ca 92025", prepared by Touchstone Development, Inc.

VICINITY MAP 1.2



HYDROLOGIC METHODOLOGY AND CRITERIA 2.0

This study has been prepared consistent with current City of Escondido's ordinances and procedures. All components of the study are designed to convey storm water based on a 50-year flood event. The anticipated storm runoff has been calculated using the Rational Method based on the 2003 County of San Diego Hydrology Manual.

The Rational Method (RM) is a mathematical formula used to determine the maximum runoff rate from a given rainfall. It has particular application in urban storm drainage, where it is used to estimate peak runoff rates from small urban and rural watersheds for the design of storm drains and small drainage structures.

The RM formula estimates the peak rate of runoff at any location in a watershed as a function of the drainage area (A), runoff coefficient (C), and rainfall intensity (I) for a duration equal to the time of concentration (Tc), which is the time required for water to flow from the most remote point of the basin to the location being analyzed. The RM formula is expressed as follows:

Q = C I A

Q = peak discharge, cubic feet per second (cfs)

C = runoff coefficient, based on San Diego County Hydrology Manual (Refer to Appendix A)

I = Rainfall intensity (in/hr) (Refer to Appendix A)

A = Drainage Area, (Acres)

The RM formula is based on the assumption that for constant rainfall intensity, the peak discharge rate at a point will occur when the raindrop that falls at the most upstream point in the tributary drainage basin arrives at the point of interest.

Runoff coefficients (C) based on land use and soil types were obtained from the City of Escondido Design Standards, figure1. Soil types were determined from the US Department of Agriculture (USDA) Soil Survey program. This runoff coefficient was then multiplied by the percentage of total area (A) included in that class.

The rainfall intensity (I) can be determined from the County of San Diego Intensity-Duration Design Chart. The 6-hour storm rainfall amount (P6) and 24-hour storm rainfall amount (P24), were determined from the isopluvial maps provided in Appendix A. Intensity can also be calculated using the following equation:

$I = 7.44 (P_6) (D^{-.645})$

I = Intensity (inches/hour)

P_6 = 6 Hour Precipitation (inches)

D = Duration in minutes (use Tc)

The Time of Concentration (Tc) is the time required for runoff to flow from the most remote part of the drainage area to the point of interest. The Tc is composed of two components: initial time of concentration (Ti) and travel time (Tt). The Ti is the time required for runoff to travel across the surface of the most remote subarea in the study, or "initial subarea." The Tt is the time required for the runoff to flow in a watercourse or series of watercourses from the initial subarea to the point of interest. For the RM, the Tc at any point within the drainage area is given by:

$Tc = Ti + Tt$

$Tt = (11.9*L^3 / \Delta E)^{0.385}$

L = Longest flow path distance (mi)

ΔE = Change in elevation along flowpath (ft)

The Advanced Engineering Software, based on the 2003 County of San Diego Hydrology Manual, was used to determine on-site 50-year, 6-hour peak flow rates.

The Advanced Engineering Software is a computer-aided design program in which the user develops a node-link model of the watershed. The hydrologic model is developed by creating independent node-link models of each interior drainage basin and linking these sub-models together at confluence points. The program has the capability to perform calculations for 11 hydrologic processes. These processes are assigned code numbers that appear in the results. The code numbers and their significance are as follows:

Subarea Hydrologic Processes (Codes)

Code 1: Confluence analysis at node

Code 2: Initial subarea analysis, top of stream

Code 3: Pipe/box/culvert travel time (program estimated pipe size)

Code 4: Pipe/box/culvert travel time (user specified pipe size)

Code 5: Open channel travel time

Code 6: Streetflow analysis thru subarea

Code 7: User specified hydrology data at a node

Code 8: Addition of subarea runoff to main stream

Code 9: V-gutter flow thru subarea

Code 10: Copy main stream data onto memory bank

Code 11: Confluence a memory bank with the main stream memory

Code 12: Clear a memory bank

Code 13: Clear the main stream

Code 14: Copy a memory bank onto the main stream memory

Code 15: Hydrologic data bank storage function

Code 16: User specified source flow at a node

HYDROLOGIC RESULTS 3.0

The 50-year 6-hour peak flow rates for the pre- and post-project conditions can be found in Table 3.1. Drainage Basin boundaries, and drainage areas can be found on the workmaps titled, "Pre-Project Hydrologic Workmap for Aspire" and "Post-Project Hydrologic Workmap for Aspire", located in Map Pocket 1 and 2.

Pre-project and post-project hydrologic analyses have been performed for the 50-year storm event. For the purpose of this drainage report one major drainage basin has been identified, herein referred to as Drainage Basin 100. Basin 100 comprised of approximately 3.6 acres which includes existing parking lot, landscaped slopes, roadways and commercial businesses adjacent to the site. Onsite runoff will be captured in private storm drain systems and discharged to existing storm drain infrastructure on West Valley Parkway.

Storm water runoff from Basin 100 in the pre- and post-project condition drain to the same point of interest. Table 3.1 summarizes the results of the 50-year pre-project and post-project hydrologic analyses for Aspire. The results show a decrease in flows which is a result of less area draining into West Valley Parkway via sheet flow. In the proposed condition, the area that previously discharged into West Valley Parkway via sheet flow will be captured in private storm drain and discharged into raised planters prior to discharging into the public storm drain on West Valley Parkway.

Table 3.1: Summary of Pre- and Post-Project 50-Year Peak Discharge Rates

	Node Number	Area (acres)	Q_{50} (cfs)	T_c (min)	I (in/hr)
Pre-Project/ Post-Project	104/104	3.6/3.6	11.7/11.3	14.6/13.7	3.7/3.9

CONCLUSION 4.0

This drainage report presents the 50-year, 6-hour post-project hydrologic analyses for the Aspire Project. The post-project condition peak discharge rates were determined using the Rational Method based on the hydrologic methodology and criteria described in the San Diego County Hydrology Manual, dated June 2003.

As designed, the development will not alter the natural drainage path or divert any water from the existing natural conditions or drainage boundaries. Runoff from the building roof and outdoor decks will be directed to raised planters located in the outdoor courtyard and street level prior to discharging to the public storm drain infrastructure on West Valley Parkway. Runoff from the site and surrounding areas discharge into concrete lined Escondido Creek 0.2 miles north of the site. Escondido Creek eventually discharges into San Elijo Lagoon approximately 12 miles downstream and eventually connects to the Pacific Ocean.

Appendix A: Hydrologic Reference Materials

Hydrologic Soil Group—San Diego County Area, California
(Aspire)

Map Scale: 1:921 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 10 20 40 60

Feet: 0 40 80 160 240

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
B/D
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:
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: San Diego County Area, California
Survey Area Data: Version 13, Sep 12, 2018

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

Date(s) aerial images were photographed: Nov 3, 2014—Nov 22, 2014

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

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
PeC	Placentia sandy loam, 2 to 9 percent slopes, warm MAAT, MLRA 19	C	1.6	100.0%
Totals for Area of Interest			**1.6**	**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.

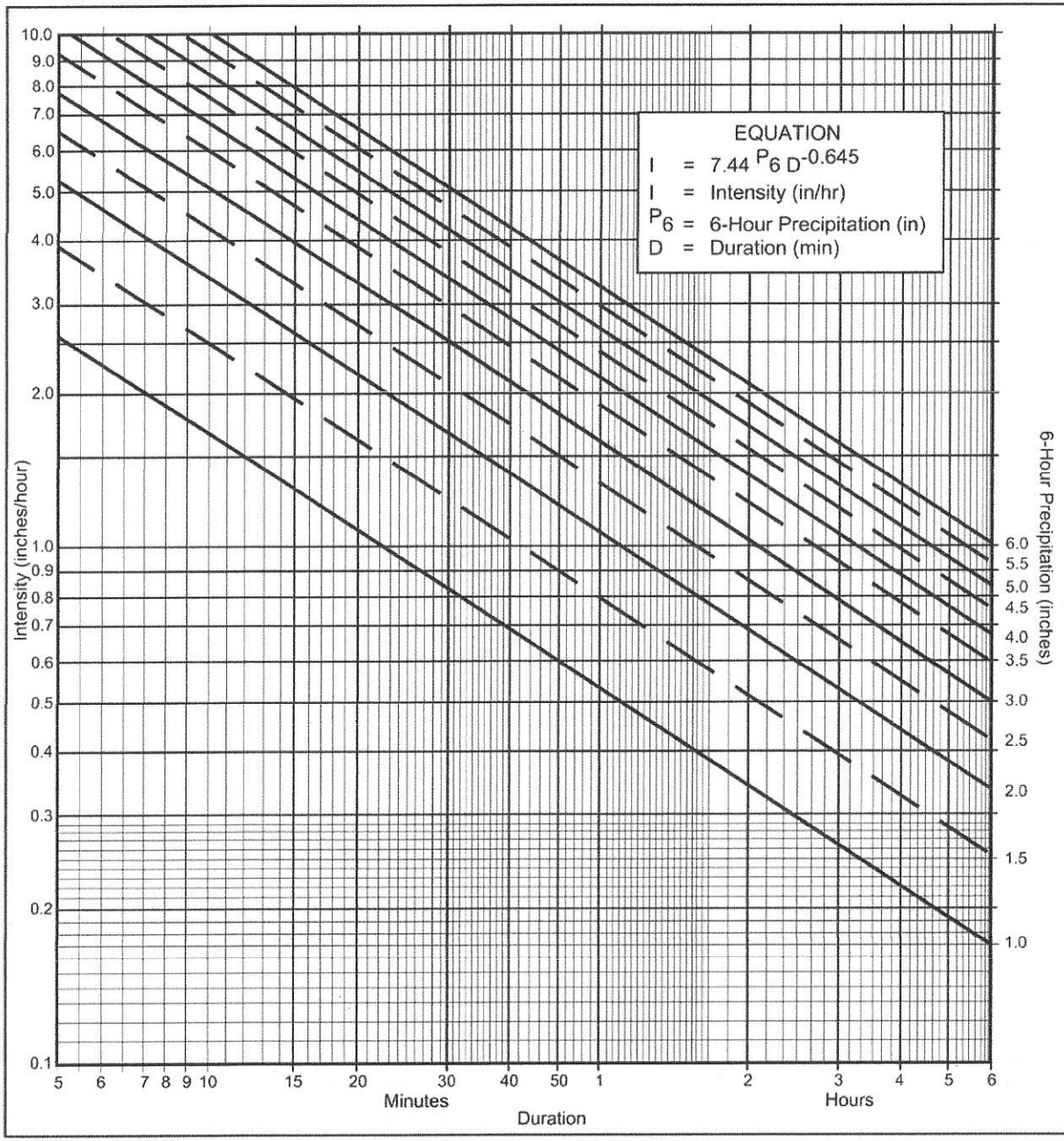
If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher



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 = 2.8 in., P_{24} = 5.9, $\frac{P_6}{P_{24}}$ = 47.5 %(2)

(c) Adjusted $P_6^{(2)}$ = 2.8 in.

(d) t_x = _____ min.

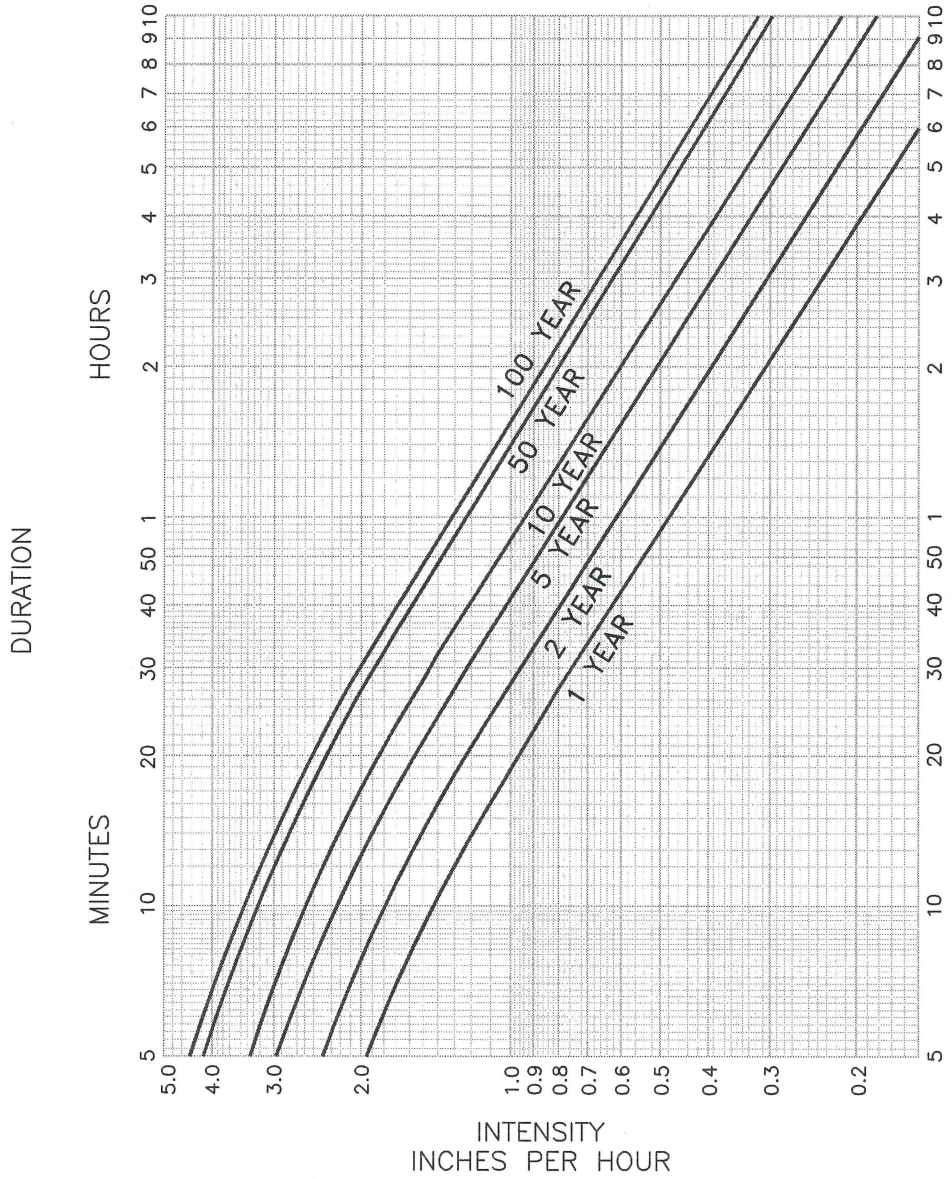
(e) I = _____ in./hr.

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

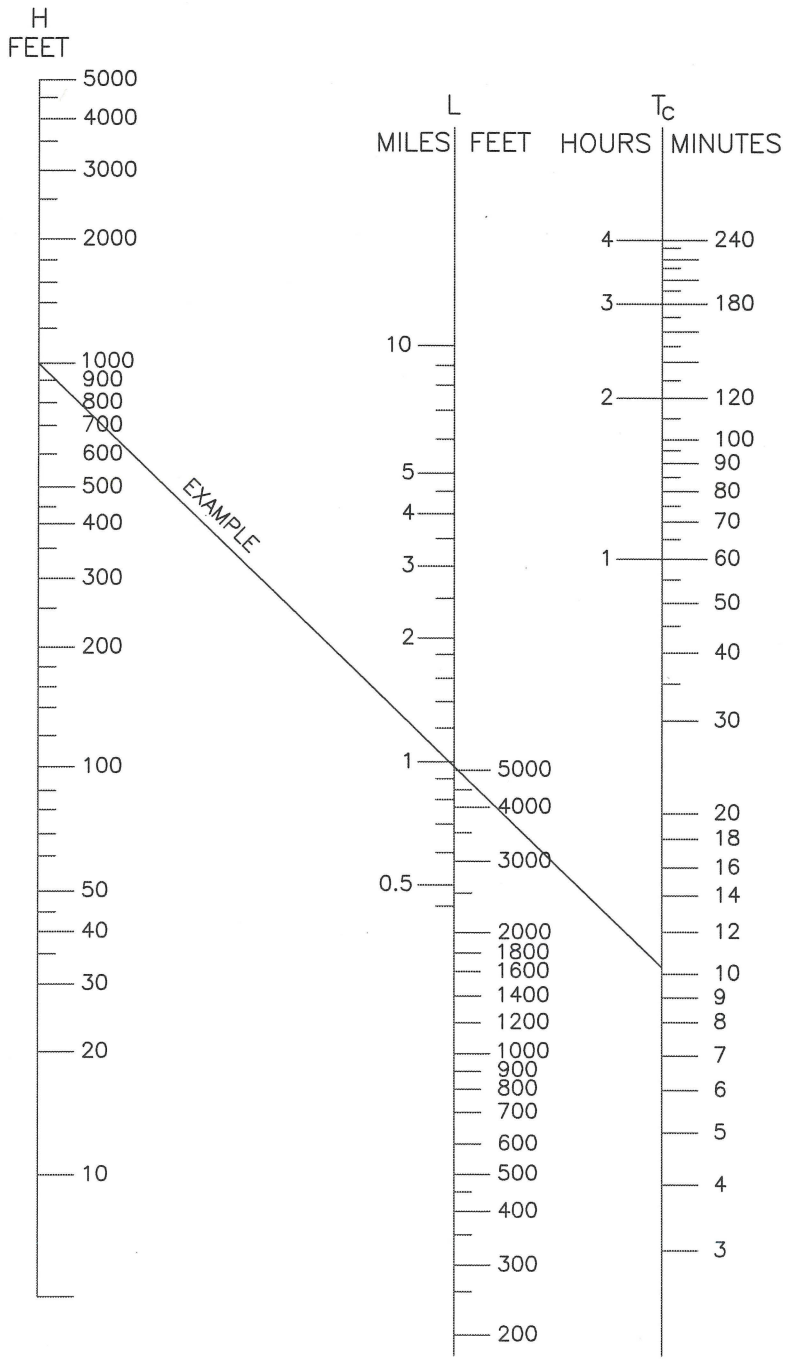
FIGURE 3-1



ESCONDIDO RUNOFF COEFFICIENTS

PARKS, GOLF COURSES, CEMETERIES	0.25
UNDEVELOPED LAND, OPEN SPACE	0.35
RURAL – OVER 1/2 ACRE LOTS	0.45
SINGLE FAMILY	0.55
MOBILE HOME	0.65
MULTIPLE UNITS	0.70
COMMERCIAL	0.85
INDUSTRIAL	0.95

APPROVED: DATE: 04-02-2014 P. W. DIRECTOR/CITY ENGINEER	CITY OF ESCONDIDO DEPARTMENT OF PUBLIC WORKS	SCALE: NOT TO SCALE
REVISED / APPROVED	RUN-OFF INTENSITY DURATION CURVE	FIGURE NO. 1



$$Tc = \left(\frac{11.9\ L^3}{H}\right)^{.385}$$

NOTE:

THIS CHART SHALL BE USED FOR ALL BASINS WITHIN THE CITY OF ESCONDIDO LESS 0.5 SQUARE MILE. THE MINIMUM Tc TO BE USED IS 10 MINUTES

Tc = TIME OF CONCENTRATION (HOURS)
L = LENGTH OF DRAINAGE COURSE (MILES)
H = DIFFERENCE IN ELEVATION FROM FURTHER MOST POINT OF DESIGN (FEET)

APPROVED: Edward N. Domingue DATE: 04-02-2014 P. W. DIRECTOR/CITY ENGINEER	CITY OF ESCONDIDO DEPARTMENT OF PUBLIC WORKS	SCALE: NOT TO SCALE
REVISED / APPROVED	RUNOFF TIME CHART	FIGURE NO. 2

County of San Diego Hydrology Manual

Rainfall Isopluvials

50 Year Rainfall Event - 6 Hours

Isopluvial (inches)

P6 = 2.8"

Orange County

Riverside County

Imperial County

Pacific Ocean

Mexico

OCEANSIDE
VISTA
CARLSBAD
ESCONDIDO
PROJECT SITE
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
We Have San Diego Covered!

N
W E
S

3 0 3 Miles

County of San Diego Hydrology Manual

Rainfall Isopluvials

50 Year Rainfall Event - 24 Hours

Isopluvial (inches)

P24 = 5.9"

Orange County

Riverside County

Imperial County

Mexico

Pacific Ocean

PROJECT 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
We Have San Diego Covered!

N W E S

3 0 3 Miles

Appendix B: 50-Year Pre-Project Condition Hydrologic Output

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          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                       2003,1985,1981 HYDROLOGY MANUAL
        (c) Copyright 1982-2016 Advanced Engineering Software (aes)
            Ver. 23.0 Release Date: 07/01/2016  License ID 1694

                          Analysis prepared by:
                     Touchstone Development, Inc.
                     9909 Mira Mesa Blvd, Suite 150
                     San Diego, Ca 92131
----------------------------------------------------------------------------
  FILE NAME: C:\AES2016\1054PRE.DAT
  TIME/DATE OF STUDY: 15:39 03/12/2019
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) =  50.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   2.800
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =  22
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =   0
  USER SPECIFIED Tc(MIN.) =   10.000
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.718
  SUBAREA RUNOFF(CFS) =      0.40
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.40

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    653.00  DOWNSTREAM(FEET) =    647.88
  CHANNEL LENGTH THRU SUBAREA(FEET) =   490.00   CHANNEL SLOPE =  0.0104
  CHANNEL BASE(FEET) =    1.50   "Z" FACTOR =  12.000
```

```
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.40
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.944
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.26
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.55
  AVERAGE FLOW DEPTH(FEET) =   0.22   TRAVEL TIME(MIN.) =   3.20
  Tc(MIN.) =   13.20
  SUBAREA AREA(ACRES) =     1.10       SUBAREA RUNOFF(CFS) =    3.69
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.850
  TOTAL AREA(ACRES) =        1.2         PEAK FLOW RATE(CFS) =       4.02

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.28   FLOW VELOCITY(FEET/SEC.) =   3.00
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    102.00 =     490.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    102.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.20
  RAINFALL INTENSITY(INCH/HR) =   3.94
  TOTAL STREAM AREA(ACRES) =     1.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.02

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    111.00 IS CODE =  22
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =   0
  USER SPECIFIED Tc(MIN.) =   10.000
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.718
  SUBAREA RUNOFF(CFS) =      0.40
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.40

****************************************************************************
  FLOW PROCESS FROM NODE    111.00 TO NODE    112.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    650.80  DOWNSTREAM(FEET) =    648.60
  CHANNEL LENGTH THRU SUBAREA(FEET) =   100.00   CHANNEL SLOPE =  0.0220
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  99.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.50
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.375
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.77
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.34
  AVERAGE FLOW DEPTH(FEET) =   0.04   TRAVEL TIME(MIN.) =   1.24
  Tc(MIN.) =   11.24
  SUBAREA AREA(ACRES) =     0.20       SUBAREA RUNOFF(CFS) =    0.74
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.850
  TOTAL AREA(ACRES) =        0.3         PEAK FLOW RATE(CFS) =       1.12
```

```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.05   FLOW VELOCITY(FEET/SEC.) =   1.55
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    112.00 =     590.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    112.00 TO NODE    102.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   647.60  DOWNSTREAM(FEET) =   647.00
  FLOW LENGTH(FEET) =    15.00   MANNING'S N =  0.013
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.68
  PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
  GIVEN PIPE DIAMETER(INCH) =   6.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.12
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =   11.29
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    102.00 =     605.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    102.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.29
  RAINFALL INTENSITY(INCH/HR) =   4.36
  TOTAL STREAM AREA(ACRES) =     0.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.12

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        4.02    13.20        3.944          1.20
      2        1.12    11.29        4.364          0.30

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        4.56    11.29       4.364
      2        5.03    13.20       3.944

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       5.03   Tc(MIN.) =   13.20
  TOTAL AREA(ACRES) =        1.5
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    102.00 =     605.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    103.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   646.00  DOWNSTREAM(FEET) =   645.77
  FLOW LENGTH(FEET) =    45.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.1 INCHES
```

```
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.38
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.03
  PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =   13.37
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    103.00 =     650.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    104.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   643.52  DOWNSTREAM(FEET) =   642.91
  FLOW LENGTH(FEET) =   244.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS   9.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.28
  GIVEN PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.03
  PIPE TRAVEL TIME(MIN.) =   1.24    Tc(MIN.) =   14.61
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    104.00 =     894.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    104.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    120.00 TO NODE    121.00 IS CODE =  22
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =   0
  USER SPECIFIED Tc(MIN.) =   10.000
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.718
  SUBAREA RUNOFF(CFS) =      0.40
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.40

****************************************************************************
  FLOW PROCESS FROM NODE    121.00 TO NODE    122.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    651.50  DOWNSTREAM(FEET) =    649.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =   375.00   CHANNEL SLOPE =  0.0059
  CHANNEL BASE(FEET) =    1.50   "Z" FACTOR =  12.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.40
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.013
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.80
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.19
  AVERAGE FLOW DEPTH(FEET) =   0.27   TRAVEL TIME(MIN.) =   2.85
  Tc(MIN.) =   12.85
  SUBAREA AREA(ACRES) =     1.40       SUBAREA RUNOFF(CFS) =    4.78
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.850
  TOTAL AREA(ACRES) =        1.5         PEAK FLOW RATE(CFS) =       5.12

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
```

```
  DEPTH(FEET) =  0.35   FLOW VELOCITY(FEET/SEC.) =   2.59
  LONGEST FLOWPATH FROM NODE    120.00 TO NODE    122.00 =     497.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    122.00 TO NODE    123.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   646.50  DOWNSTREAM(FEET) =   645.62
  FLOW LENGTH(FEET) =   192.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.21
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.12
  PIPE TRAVEL TIME(MIN.) =   0.76    Tc(MIN.) =   13.61
  LONGEST FLOWPATH FROM NODE    120.00 TO NODE    123.00 =     689.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    123.00 TO NODE    123.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.61
  RAINFALL INTENSITY(INCH/HR) =   3.87
  TOTAL STREAM AREA(ACRES) =     1.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.12

****************************************************************************
  FLOW PROCESS FROM NODE    130.00 TO NODE    131.00 IS CODE =  22
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =   0
  USER SPECIFIED Tc(MIN.) =   10.000
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.718
  SUBAREA RUNOFF(CFS) =      0.40
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.40

****************************************************************************
  FLOW PROCESS FROM NODE    131.00 TO NODE    132.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    650.80  DOWNSTREAM(FEET) =    648.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =   125.00   CHANNEL SLOPE =  0.0216
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  99.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.50
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.353
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.96
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.57
  AVERAGE FLOW DEPTH(FEET) =   0.04   TRAVEL TIME(MIN.) =   1.33
  Tc(MIN.) =   11.33
  SUBAREA AREA(ACRES) =     0.30       SUBAREA RUNOFF(CFS) =    1.11
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.850
```

```
  TOTAL AREA(ACRES) =        0.4         PEAK FLOW RATE(CFS) =       1.48

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.06   FLOW VELOCITY(FEET/SEC.) =   1.69
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    132.00 =     317.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    132.00 TO NODE    123.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   647.15  DOWNSTREAM(FEET) =   646.40
  FLOW LENGTH(FEET) =    24.00   MANNING'S N =  0.013
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.54
  PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
  GIVEN PIPE DIAMETER(INCH) =   6.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.48
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =   11.38
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    123.00 =     341.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    123.00 TO NODE    123.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.38
  RAINFALL INTENSITY(INCH/HR) =   4.34
  TOTAL STREAM AREA(ACRES) =     0.40
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.48

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        5.12    13.61        3.867          1.50
      2        1.48    11.38        4.340          0.40

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        5.76    11.38       4.340
      2        6.43    13.61       3.867

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       6.43   Tc(MIN.) =   13.61
  TOTAL AREA(ACRES) =        1.9
  LONGEST FLOWPATH FROM NODE    120.00 TO NODE    123.00 =     689.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    123.00 TO NODE    123.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.867
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8500
```

```
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8500
  SUBAREA AREA(ACRES) =    0.20   SUBAREA RUNOFF(CFS) =    0.66
  TOTAL AREA(ACRES) =        2.1   TOTAL RUNOFF(CFS) =       6.90
  TC(MIN.) =   13.61

****************************************************************************
  FLOW PROCESS FROM NODE    123.00 TO NODE    104.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   645.29  DOWNSTREAM(FEET) =   642.91
  FLOW LENGTH(FEET) =    45.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.37
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.90
  PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =   13.68
  LONGEST FLOWPATH FROM NODE    120.00 TO NODE    104.00 =     734.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    104.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER       (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1         6.90    13.68       3.855        2.10
  LONGEST FLOWPATH FROM NODE    120.00 TO NODE    104.00 =     734.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER       (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1         5.03    14.61       3.695        1.50
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    104.00 =     894.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      11.61      13.68        3.855
      2      11.65      14.61        3.695

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      11.65   Tc(MIN.) =   14.61
  TOTAL AREA(ACRES) =        3.6

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    104.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        3.6  TC(MIN.) =     14.61
  PEAK FLOW RATE(CFS)   =      11.65
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

Appendix C: 50-Year Post-Project Condition Hydrologic Output

```
****************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2016 Advanced Engineering Software (aes)
              Ver. 23.0 Release Date: 07/01/2016  License ID 1694

                              Analysis prepared by:
                                 Touchstone Development, Inc.
                                 9909 Mira Mesa Blvd, Suite 150
                                 San Diego, Ca 92131
----------------------------------------------------------------------------
  FILE NAME: C:\AES2016\1054POST.DAT
  TIME/DATE OF STUDY: 16:03 03/12/2019
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) =  50.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   2.800
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =  22
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =   0
  USER SPECIFIED Tc(MIN.) =   10.000
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.718
  SUBAREA RUNOFF(CFS) =      0.40
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.40

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    653.00  DOWNSTREAM(FEET) =    647.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =   550.00   CHANNEL SLOPE =  0.0096
  CHANNEL BASE(FEET) =    1.50   "Z" FACTOR =  12.000
```

```
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.40
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.804
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.71
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.31
  AVERAGE FLOW DEPTH(FEET) =   0.19   TRAVEL TIME(MIN.) =   3.96
  Tc(MIN.) =   13.96
  SUBAREA AREA(ACRES) =     0.80       SUBAREA RUNOFF(CFS) =    2.59
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.850
  TOTAL AREA(ACRES) =        0.9         PEAK FLOW RATE(CFS) =       2.91

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.24   FLOW VELOCITY(FEET/SEC.) =   2.74
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    102.00 =     550.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    102.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.96
  RAINFALL INTENSITY(INCH/HR) =   3.80
  TOTAL STREAM AREA(ACRES) =     0.90
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.91

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    111.00 IS CODE =  22
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  GENERAL COMMERCIAL RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =   0
  USER SPECIFIED Tc(MIN.) =   10.000
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.718
  SUBAREA RUNOFF(CFS) =      0.40
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.40

****************************************************************************
  FLOW PROCESS FROM NODE    111.00 TO NODE    111.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.718
  *USER SPECIFIED(SUBAREA):
  GENERAL COMMERCIAL RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8500
  SUBAREA AREA(ACRES) =    0.40   SUBAREA RUNOFF(CFS) =    1.60
  TOTAL AREA(ACRES) =        0.5   TOTAL RUNOFF(CFS) =       2.01
  TC(MIN.) =   10.00

****************************************************************************
  FLOW PROCESS FROM NODE    111.00 TO NODE    102.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   646.00  DOWNSTREAM(FEET) =   644.40
```

```
  FLOW LENGTH(FEET) =    10.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   3.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.39
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.01
  PIPE TRAVEL TIME(MIN.) =   0.01    Tc(MIN.) =   10.01
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    102.00 =      55.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    102.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.01
  RAINFALL INTENSITY(INCH/HR) =   4.71
  TOTAL STREAM AREA(ACRES) =     0.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.01

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        2.91    13.96        3.804          0.90
      2        2.01    10.01        4.714          0.50

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        4.09    10.01       4.714
      2        4.53    13.96       3.804

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       4.53   Tc(MIN.) =   13.96
  TOTAL AREA(ACRES) =        1.4
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    102.00 =     550.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    103.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   645.00  DOWNSTREAM(FEET) =   644.70
  FLOW LENGTH(FEET) =    45.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.74
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.53
  PIPE TRAVEL TIME(MIN.) =   0.16    Tc(MIN.) =   14.12
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    103.00 =     595.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    104.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   643.40  DOWNSTREAM(FEET) =   642.91
```

```
  FLOW LENGTH(FEET) =   204.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS   9.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.14
  GIVEN PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.53
  PIPE TRAVEL TIME(MIN.) =   1.08    Tc(MIN.) =   15.20
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    104.00 =     799.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    104.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    120.00 TO NODE    121.00 IS CODE =  22
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =   0
  USER SPECIFIED Tc(MIN.) =   10.000
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.718
  SUBAREA RUNOFF(CFS) =      0.40
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.40

****************************************************************************
  FLOW PROCESS FROM NODE    121.00 TO NODE    122.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    651.50  DOWNSTREAM(FEET) =    649.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =   375.00   CHANNEL SLOPE =  0.0059
  CHANNEL BASE(FEET) =    1.50   "Z" FACTOR =  12.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.40
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.013
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.80
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.19
  AVERAGE FLOW DEPTH(FEET) =   0.27   TRAVEL TIME(MIN.) =   2.85
  Tc(MIN.) =   12.85
  SUBAREA AREA(ACRES) =     1.40       SUBAREA RUNOFF(CFS) =    4.78
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.850
  TOTAL AREA(ACRES) =        1.5         PEAK FLOW RATE(CFS) =       5.12

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.35   FLOW VELOCITY(FEET/SEC.) =   2.59
  LONGEST FLOWPATH FROM NODE    120.00 TO NODE    122.00 =     497.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    122.00 TO NODE    123.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   646.50  DOWNSTREAM(FEET) =   645.62
  FLOW LENGTH(FEET) =   192.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.21
```

```
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.12
  PIPE TRAVEL TIME(MIN.) =   0.76    Tc(MIN.) =   13.61
  LONGEST FLOWPATH FROM NODE    120.00 TO NODE    123.00 =     689.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    123.00 TO NODE    123.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.61
  RAINFALL INTENSITY(INCH/HR) =   3.87
  TOTAL STREAM AREA(ACRES) =     1.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.12

****************************************************************************
  FLOW PROCESS FROM NODE    130.00 TO NODE    131.00 IS CODE =  22
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =   0
  USER SPECIFIED Tc(MIN.) =   10.000
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.718
  SUBAREA RUNOFF(CFS) =      0.40
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.40

****************************************************************************
  FLOW PROCESS FROM NODE    131.00 TO NODE    131.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.718
  *USER SPECIFIED(SUBAREA):
  GENERAL COMMERCIAL RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8500
  SUBAREA AREA(ACRES) =    0.40   SUBAREA RUNOFF(CFS) =    1.60
  TOTAL AREA(ACRES) =        0.5   TOTAL RUNOFF(CFS) =       2.01
  TC(MIN.) =   10.00

****************************************************************************
  FLOW PROCESS FROM NODE    131.00 TO NODE    123.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   646.20  DOWNSTREAM(FEET) =   645.60
  FLOW LENGTH(FEET) =   130.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   8.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.31
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.01
  PIPE TRAVEL TIME(MIN.) =   0.65    Tc(MIN.) =   10.65
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    123.00 =     140.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    123.00 TO NODE    123.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
```

```
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.65
  RAINFALL INTENSITY(INCH/HR) =   4.53
  TOTAL STREAM AREA(ACRES) =     0.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.01

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        5.12    13.61        3.867          1.50
      2        2.01    10.65        4.529          0.50

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        6.01    10.65       4.529
      2        6.83    13.61       3.867

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       6.83   Tc(MIN.) =   13.61
  TOTAL AREA(ACRES) =        2.0
  LONGEST FLOWPATH FROM NODE    120.00 TO NODE    123.00 =     689.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    123.00 TO NODE    123.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.867
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8500
  SUBAREA AREA(ACRES) =    0.20   SUBAREA RUNOFF(CFS) =    0.66
  TOTAL AREA(ACRES) =        2.2   TOTAL RUNOFF(CFS) =       7.23
  TC(MIN.) =   13.61

****************************************************************************
  FLOW PROCESS FROM NODE    123.00 TO NODE    104.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   645.29  DOWNSTREAM(FEET) =   642.91
  FLOW LENGTH(FEET) =    45.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.53
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.23
  PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =   13.68
  LONGEST FLOWPATH FROM NODE    120.00 TO NODE    104.00 =     734.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    104.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================
```

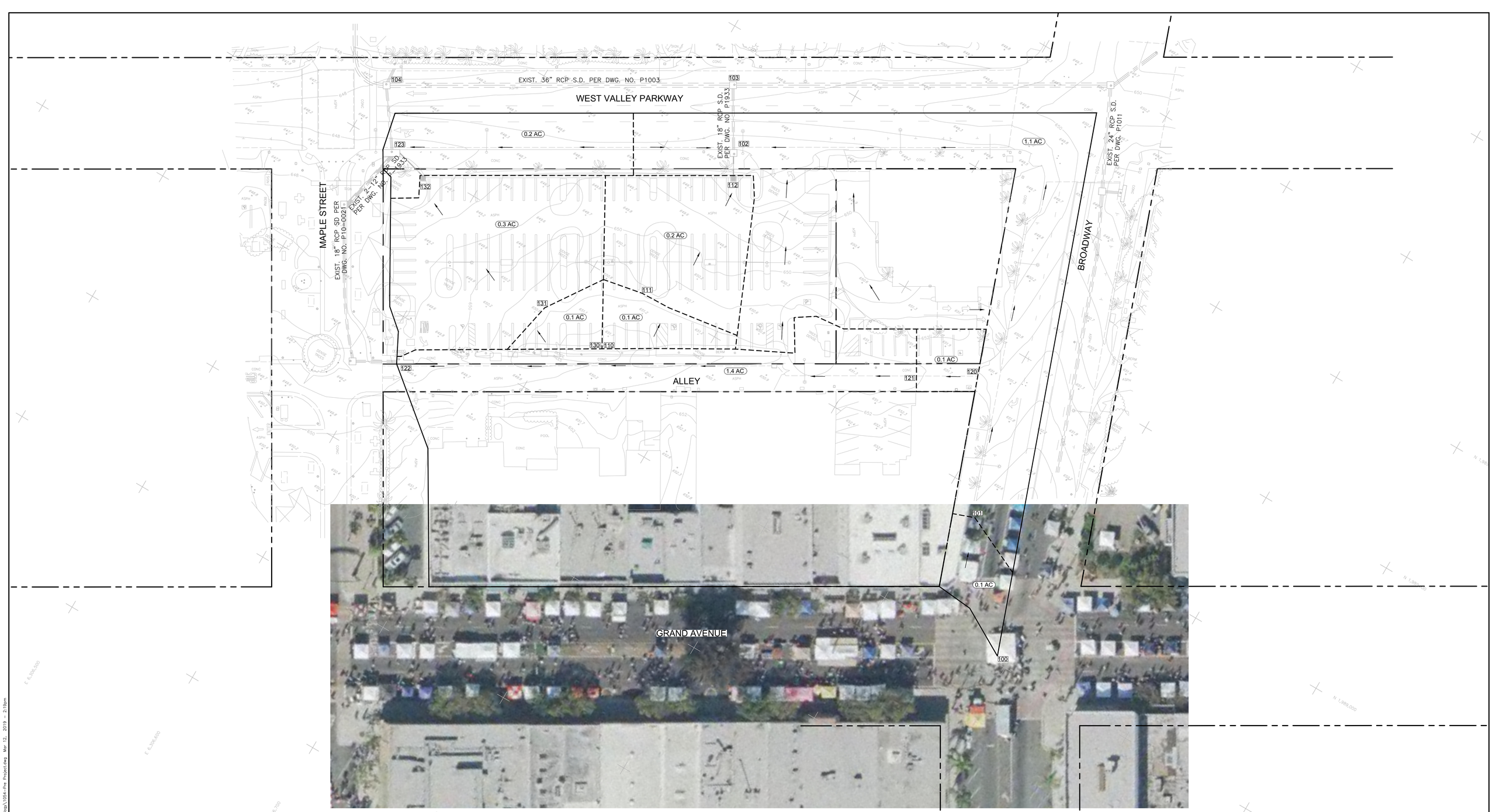
```
  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
      1        7.23    13.68       3.855        2.20
  LONGEST FLOWPATH FROM NODE    120.00 TO NODE    104.00 =     734.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
      1        4.53    15.20       3.601        1.40
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    104.00 =     799.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)      (MIN.)   (INCH/HOUR)
      1      11.31       13.68        3.855
      2      11.28       15.20        3.601

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      11.31   Tc(MIN.) =   13.68
  TOTAL AREA(ACRES) =        3.6

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    104.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        3.6  TC(MIN.) =     13.68
  PEAK FLOW RATE(CFS)   =      11.31
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```



LEGEND

PROPERTY BOUNDARY	
MAJOR DRAINAGE BOUNDARY	
MINOR DRAINAGE BOUNDARY	
FLOW DIRECTION	
NODE NUMBER	100
BASIN AREA	0.1 AC

N

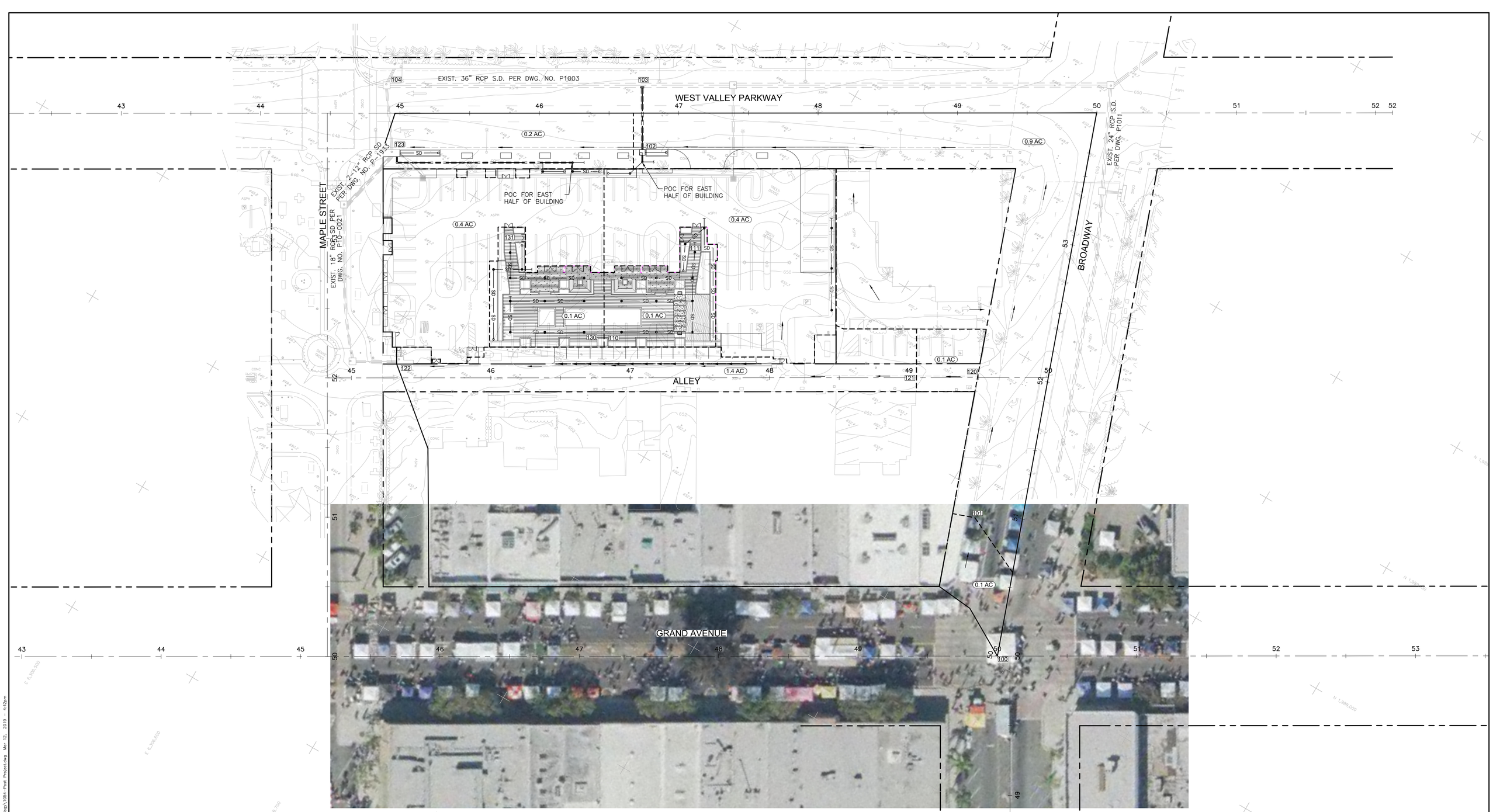
0 30 60 90

SCALE: 1" =30'

TOUCHSTONE DEVELOPMENT

PRE-PROJECT DRAINAGE MAP FOR ASPIRE

Z:\Common Share_Civil\Projects\1054 Aspire\Documents\Reports\Hydrology\1054-Pre Project.dwg Mar 12, 2019 - 2:19pm



LEGEND

PROPERTY BOUNDARY	
MAJOR DRAINAGE BOUNDARY	
MINOR DRAINAGE BOUNDARY	
FLOW DIRECTION	
NODE NUMBER	100
BASIN AREA	0.1 AC

0 30 60 90

SCALE: 1" =30'

TOUCHSTONE DEVELOPMENT

POST-PROJECT DRAINAGE MAP FOR ASPIRE

Z:\Common Share_Civil\Projects\1054 Aspire\Documents\Reports\Hydrology\1054-Post Project.dwg Mar 12, 2019 - 4:43pm

City of Escondido
PRIORITY DEVELOPMENT PROJECT (PDP) SWQMP

Aspire
137 W. Valley Parkway
Escondido, CA 92025

ASSESSOR'S PARCEL NUMBER(S):
229-421-26

ENGINEER OF WORK:

REGISTERED PROFESSIONAL ENGINEER
ALBERTO SANDOVAL
No. 89041
CIVIL
STATE OF CALIFORNIA

Alberto Sandoval RCE 89041 — **Date** 8/20/2019

PREPARED FOR:
Touchstone MF FUND I, LLC
9909 Mira Mesa Boulevard,Suite 150
San Diego, Ca 92131
(858) 586-0414

PDP SWQMP PREPARED BY:
Touchstone Development, Inc.
9909 Mira Mesa Boulevard,Suite 150
San Diego, Ca 92131
(858) 586-0414
DATE OF SWQMP:
March 11, 2019

PLANS PREPARED BY:

TOUCHSTONE
DEVELOPMENT
Touchstone Development,Inc.
9909 Mira Mesa Boulevard,Suite 150
San Diego, Ca 92131
(858) 586-0414

SWQMP APPROVED BY:

APPROVAL DATE:

ESCONDIDO
City of Choice

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TABLE OF CONTENTS

ATTACHMENTS

Attachment 1: Backup for PDP Pollutant Control BMPs
- Attachment 1a: Storm Water Pollutant Control Worksheet Calculations (Worksheets B.3-1,B.1-1,B.5-1)
- Attachment 1b: Form I-5, Categorization of Infiltration Feasibility Condition
- Attachment 1c: Form I-6, Factor of Safety and Design Infiltration Rate Worksheet
- Attachment 1d: Drainage Management Area (DMA) Exhibit
- Attachment 1e: Individual Structural BMP DMA Mapbook

Attachment 2: Backup for PDP Hydromodification Control Measures
- Attachment 2a: Flow Control Facility Design
- Attachment 2b: Hydromodification Management Exhibit
- Attachment 2c: Management of Critical Coarse Sediment Yield Areas
- Attachment 2d: Geomorphic Assessment of Receiving Channels (optional)
- Attachment 2e: Vector Control Plan (if applicable)

Attachment 3: Structural BMP Maintenance Plan
- Attachment 3a: Structural BMP Maintenance Thresholds and Actions
- Attachment 3b: Draft Maintenance Agreements / Notifications (when applicable)

Attachment 4: City of Escondido PDP Structural BMP Verification

Attachment 5: Copy of Plan Sheets Showing Permanent Storm Water BMPs

ACRONYMS

ACP	Alternative Compliance Project
APN	Assessor's Parcel Number
BMP	Best Management Practice
DMA	Drainage Management Area
EOW	Engineer of Work
HMP	Hydromodification Management Plan
HSG	Hydrologic Soil Group
MS4	Municipal Separate Storm Sewer System
N/A	Not Applicable
PDP	Priority Development Project
PE	Professional Engineer
SC	Source Control
SD	Site Design
SDRWQCB	San Diego Regional Water Quality Control Board
SIC	Standard Industrial Classification
SWDM	Storm Water Design Manual
SWQMP	Storm Water Quality Management Plan
WMAA	Watershed Management Area Analysis
WQIP	Water Quality Improvement Plan

PDP SWQMP PREPARER'S CERTIFICATION PAGE

Project Name: Aspire
Permit Application Number:

PREPARER'S CERTIFICATION

I hereby declare that I am the Engineer in Responsible Charge of design of storm water best management practices (BMPs) for this project, and that I have exercised responsible charge over the design of the BMPs as defined in Section 6703 of the Business and Professions Code, and that the design is consistent with the PDP requirements of the City of Escondido Storm Water Design Manual, which is a design manual for compliance with the City of Escondido Municipal Code (Chapter 22, Article 2) and regional MS4 Permit (California Regional Water Quality Control Board San Diego Region Order No. R9-2013-0001 as amended by R9-2015-0001 and R9-2015-0100) requirements for storm water management.

I have read and understand that the City of Escondido has adopted minimum requirements for managing urban runoff, including storm water, from land development activities, as described in the Storm Water Design Manual. I certify that this PDP SWQMP has been completed to the best of my ability and accurately reflects the project being proposed and the applicable BMPs proposed to minimize the potentially negative impacts of this project's land development activities on water quality. I understand and acknowledge that the plan check review of this PDP SWQMP by City staff is confined to a review and does not relieve me, as the Engineer in Responsible Charge of design of storm water BMPs for this project, of my responsibilities for project design.

Alberto Sandoval, PE 89041 EXP. 9/30/2020
Engineer of Work's Signature, PE Number & Expiration Date

Alberto Sandoval
Print Name

Touchstone Development, Inc.
Company

8/20/2019
Date

Engineer's Seal:

SUBMITTAL RECORD

Use this Table to keep a record of submittals of this PDP SWQMP. Each time the PDP SWQMP is re-submitted, provide the date and status of the project. In column 4 summarize the changes that have been made or indicate if response to plancheck comments is included. When applicable, insert response to plancheck comments behind this page.

Preliminary Design / Planning / CEQA

Submittal Number	Date	Summary of Changes
1	March 11,2018	Initial Submittal
2		
3		
4		

Final Design

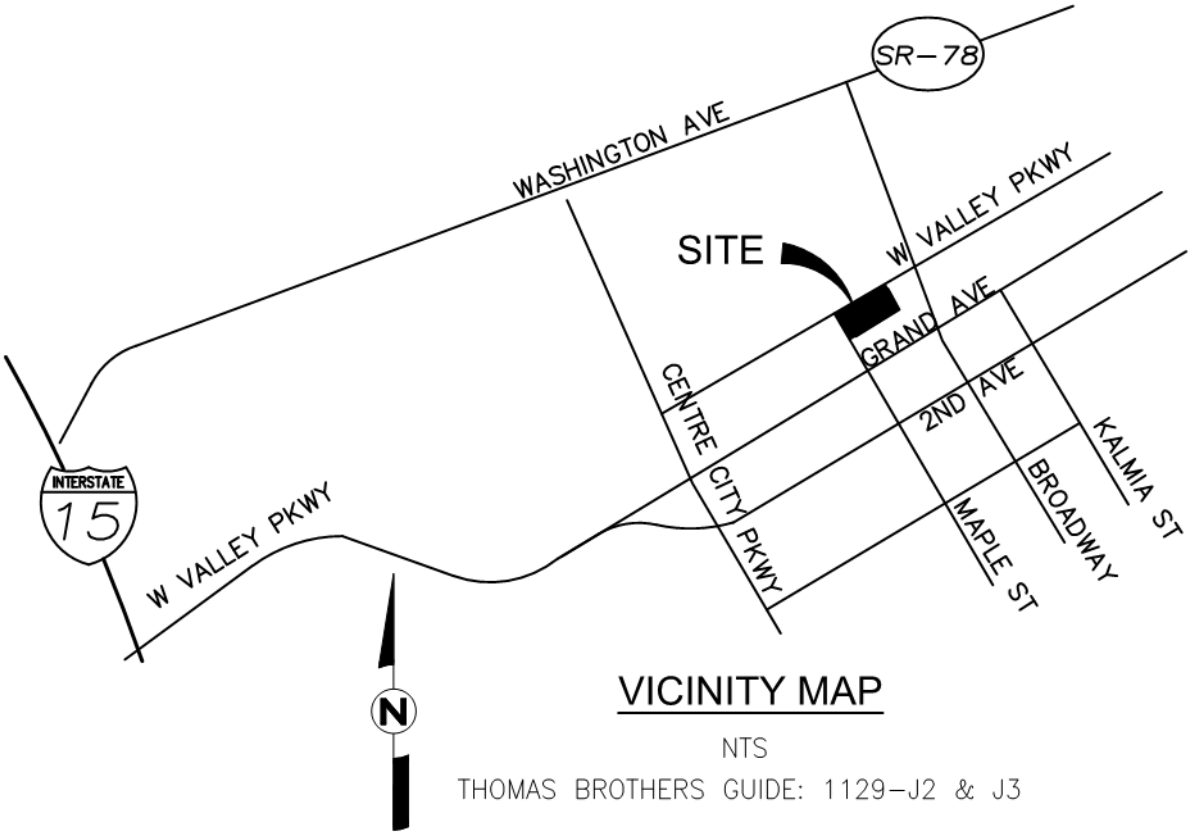
Submittal Number	Date	Summary of Changes
1		
2		
3		
4		

Plan Changes

Submittal Number	Date	Summary of Changes
1		
2		
3		
4		

PROJECT VICINITY **MAP**

Project Name: Aspire
Record ID:



Step 1: Project type determination (Standard or Priority Development Project) (Form I-2a)

Project Summary Information	
Project Name	Aspire
Project Address	137 West Valley Parkway Escondido, Ca 92025
Assessor's Parcel Number(s)	229-421-26
Permit Application Number	
Project Watershed (Hydrologic Unit)	Select One: Carlsbad 904 San Dieguito 905
Parcel Area (total area of Assessor's Parcel(s) associated with the project)	1.04 Acres (45,489 Square Feet)
Area to be disturbed by the project (Project Area)	1.15 Acres (50,157 Square Feet)
Project Proposed Impervious Area (subset of Project Area)	1.05 Acres (45,797 Square Feet)
Project Proposed Pervious Area (subset of Project Area)	0.10 Acres (4,360 Square Feet)
Note: Proposed Impervious Area + Proposed Pervious Area = Area to be Disturbed by the Project. This may be less than the Parcel Area.	

Confirmation of Priority Development Project Determination
The project is (select one): ☐ New Development ☒ Redevelopment[1]
The total proposed newly created or replaced impervious area is: 45,797 ft^2

[1] Redevelopment is defined as: The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include routine maintenance activities, such as trenching and resurfacing associated with utility work; pavement grinding; resurfacing existing roadways; new sidewalks construction; pedestrian ramps; or bike lanes on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Solar energy farms that are not also one of the categories listed in Step 2b of Table 1-1. City staff must also determine that appropriate BMPs are provided to mitigate for downstream impacts due to significant changes to the existing hydrology

Is the project in any of the following categories, (a) through (f)?			
Yes ☐	No ☒	(a)	New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.
Yes ☒	No ☐	(b)	Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.
Yes ☒	No ☐	(c)	New and redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses: (i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (Standard Industrial Classification (SIC) code 5812). (ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater. (iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce. (iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.
Yes ☐	No ☒	(d)	New or redevelopment projects that create and/or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands). *Note: ESAs are areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.*
Yes ☐	No ☒	(e)	New development projects, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface, that support one or more of the following uses: (i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following SIC codes: 5013, 5014, 5541, 7532-7534, or 7536-7539. (ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

Yes ☐	No ☒	(e)	New development projects, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface, that support one or more of the following uses: (iii) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following SIC codes: 5013, 5014, 5541, 7532-7534, or 7536-7539. (iv) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.
Yes ☒	No ☐	(f)	New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction. *Note: See Storm Water Design Manual Section 1.4.2 for additional guidance.*

Does the project meet the definition of one or more of the Priority Development Project categories (a) through (f) listed above?

☐ No – the project is not a Priority Development Project (Standard Project).

☒ Yes – the project is a Priority Development Project (PDP).

Further guidance may be found in Chapter 1 and Table 1-2 of the Storm Water Design Manual.

The following is for **redevelopment PDPs only**:

The area of existing (pre-project) impervious area at the project site is:	44,182 ft^2 (A)
The total proposed newly created or replaced impervious area is	45,797 ft^2 (B)
Percent impervious surface created or replaced (B/A)*100:	104%

The percent impervious surface created or replaced is (select one based on the above calculation):

☐ less than or equal to fifty percent (50%) – **only newly created or replaced impervious areas are considered a PDP and subject to stormwater requirements**

OR

☒ greater than fifty percent (50%) – **the entire project site is considered a PDP and subject to stormwater requirements**

Step 1.1: Storm Water Quality Management Plan requirements

Step	Answer	Progression
Is the project a Standard Project, Priority Development Project (PDP), or exception to PDP definitions? To answer this item, complete Step 1 Project Type Determination Checklist on Pages 1 and 2, and see PDP exemption information below. For further guidance, see Section 1.4 of the Storm Water Design Manual *in its entirety*.	☐ Standard Project	Standard Project requirements apply, including Standard Project SWQMP. **Complete Form I-1.**
	☒ PDP	Standard and PDP requirements apply, including PDP SWQMP. **SWQMP Required.**
	☐ PDP with ACP	If participating in offsite alternative compliance, **complete Step 6.3 and an ACP SWQMP.**
	☐ PDP Exemption	**Go to Step 1.2 below.**

Step 1.2: Exemption to PDP definitions

Is the project exempt from PDP definitions based on either of the following:	If so:
☐ Projects that are only new or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria: (i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR (ii) Designed and constructed to be hydraulically disconnected from paved streets or roads [i.e., runoff from the new improvement does not drain directly onto paved streets or roads]; OR (iii) Designed and constructed with permeable pavements or surfaces in accordance with County of San Diego Green Streets Infrastructure;	Standard Project requirements apply, AND any additional requirements specific to the type of project. City concurrence with the exemption is required. *Provide discussion and list any additional requirements below in this form.*
☐ Projects that are only retrofitting or redeveloping existing paved alleys, streets or roads that are designed and constructed in accordance with the City of Escondido Guidance on Green Infrastructure.	**PDP Exempt.**
Discussion / justification, and additional requirements for exceptions to PDP definitions, if applicable:	

Step 2: Construction Storm Water BMPs

Construction storm water BMPs shall be shown on the Grading Plan and (if applicable) included in the Storm Water Pollution Prevention Plan (SWPPP).

Step 3: City of Escondido PDP SWQMP Site Information Checklist (Form I-2a)

Step 3.1: Description of Existing Site Condition

Current Status of the Site (select all that apply):
☒Existing development
☐Previously graded but not built out
☐Demolition completed without new construction
☐Agricultural or other non-impervious use
☐Vacant, undeveloped/natural

Description / Additional Information:
The site is currently a vacant medical building that encompasses 2/3 of the property. A demolition permit is in process to demolish the existing building and parking structure.

Existing Land Cover Includes (select all that apply and provide each area on site):
☒ Vegetative Cover 0.14 Acres (5,975 Square Feet)
☐ Non-Vegetated Pervious Areas _____Acres (_____Square Feet)
☒ Impervious Areas 1.01 Acres (44,182 Square Feet)
Description / Additional Information:
Areas are comprised of areas inside and outside the property boundary which amount to disturbed area for the project.

Underlying Soil belongs to Hydrologic Soil Group (select all that apply):
☐NRCS Type A
☐NRCS Type B
☒NRCS Type C
☐NRCS Type D

Approximate Depth to Groundwater (GW) (or N/A for no infiltration BMPs):N/A
☐GW Depth < 5 feet
☐5 feet < GW Depth < 10 feet
☐10 feet < GW Depth < 20 feet
☐ GW Depth > 20 feet
Groundwater was not encountered as stated in the Geotechnical Study.

Existing Natural Hydrologic Features (select all that apply):
☐Watercourses
☐Seeps
☐Springs
☐Wetlands
☒None
☐Other

Description / Additional Information:
There are not natural hydrologic features as the site is comprised of a surface parking lot.

Step 3.2: Description of Existing Site Drainage Patterns

How is storm water runoff conveyed from the site? At a minimum, this description should answer:

(1) Whether existing drainage conveyance is natural or urban;
(2) Is runoff from offsite conveyed through the site? if yes, quantify all offsite drainage areas, design flows, and locations where offsite flows enter the project site, and summarize how such flows are conveyed through the site;
(3) Provide details regarding existing project site drainage conveyance network, including any existing storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, natural or constructed channels; and
(4) Identify all discharge locations from the existing project site along with a summary of conveyance system size and capacity for each of the discharge locations. Provide summary of the pre-project drainage areas and design flows to each of the existing runoff discharge locations.

Describe existing site drainage patterns:

The existing site has a ridgeline that traverses the site in a northerly and southerly direction. Each half drain into a private catch basin adjacent to the Right of Way and piped into public curb inlets on West Valley Parkway. The largest curb inlet is located at the SE corner of intersection with West Valley Parkway and Maple Street. The curb inlet also captures a portion of the halfwidth improvements along the frontage. Runoff from the alley and south portion of the site is conveyed along a curb and gutter adjacent to the project's southerly property line. Flows are captured in a curb inlet at the intersection with Maple Street and alley. Runoff continues north along Maple Street in an 18" RCP SD and confluences with flows from curb inlet mentioned above. Runoff flows north in an 18" RCP SD before confluencing with runoff in a 36" SD (DWG. No. P1003). The 36" RCP SD conveys flows from the remainder of the site (east half) and flows from a portion of Broadway (west halfwidth) and West Valley Parkway (south halfwidth). Runoff discharges into concrete lined Escondido Creek 0.2 miles north of the site. Escondido Creek eventually discharges into San Elijo Lagoon approximately 12 miles downstream and eventually connects to the Pacific Ocean.

Step 3.3: Description of Proposed Site Development

Project Description / Proposed Land Use and/or Activities:
The project consists of the removal of an existing surface parking lot and existing sidewalk along West Valley Parkway. A new podium style 6-story 131 unit residential structure with a parking on the first level and basement level. Offsite improvements include removal and replacement of existing sidewalk on West Valley Parkway and removal of portion of existing sidewalk and curb and gutter in the alley.

List/describe proposed impervious features of the project (e.g., buildings, roadways, parking lots, courtyards, athletic courts, other impervious features):
The proposed impervious features include building rooftop, podium decks, asphalt pavement and sidewalk on West Valley Parkway. Runoff from the rooftops and podium deck will be directed to the raised planter boxes in the outdoor courtyard and street level for treatment. The AC pavement associated with the parking stalls in the alley and newly constructed sidewalk will be treated in a Roadside Swales on West Valley Parkway. The pollutant control standards for the exposed AC Pavement and concrete ribbon gutter in the alley will be provided in the Roadside Swale on West Valley Parkway through the use of "Onsite Alternative Compliance".
The overall project footprint shows an increase of 3% in impervious surfaces. See tabulated numbers in Attachment 1.

List/describe proposed pervious features of the project (e.g., landscape areas):
The proposed pervious features for the project include landscaping, raised planters on the outdoor podium deck and street level and roadside swale. The raised planters located in the outdoor courtyard, street level and roadside swales will serve to meet pollutant control requirements for the subject project. The landscaping outside the building footprint will be considered "self-mitigating" as surrounding flows will not comingle with the landscaped area.

Does the project include grading and changes to site topography?

☒Yes
☐No

Description / Additional Information:
The grading for the project will consist of exporting soil due to excavation for the basement parking. The building footprint encompasses the majority of the property. The walls surrounding the basement parking will be retaining existing improvements adjacent to the site.

Insert acreage or square feet for the different land cover types in the table below:

Change in Land Cover Type Summary			
Land Cover Type	Existing (acres or ft^2)	Proposed (acres or ft^2)	Percent Change
Vegetation	5,975	4,360	-37%
Pervious (non-vegetated)			
Impervious	44,182	45,797	+3.7%

Step 3.4: Description of Proposed Site Drainage Patterns

Does the project include changes to site drainage (e.g., installation of new storm water conveyance systems)?

☒Yes
☐No

If yes, provide details regarding the proposed project site drainage conveyance network, including storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, natural or constructed channels, and the method for conveying offsite flows through or around the proposed project site. Identify all discharge locations from the proposed project site along with a summary of the conveyance system size and capacity for each of the discharge locations. Provide a summary of pre- and post-project drainage areas and design flows to each of the runoff discharge locations. Reference the drainage study for detailed calculations.

Describe proposed site drainage patterns:

The Aspire project will mimic the existing drainage patterns, which flow in a northwesterly direction. Runoff from the west portion of building roof and outdoor deck will be directed to raised planters located in the outdoor deck and street level prior to discharging to an existing curb inlet at the SE intersection of West Valley Parkway and Maple Street. East portion of the roof and outdoor deck will discharge to a proposed curb inlet on West Valley Parkway which discharges into an existing 36" RCP SD flowing west on West Valley Parkway.
Undisturbed areas adjacent to the alley will consists of crushed rock and are considered "self-mitigating" as they do not comingle with hardscape from the project. Landscaped area on the 2nd level, east of the site is self-mitigating. Flows will confluence with treated runoff from the raised planters in the outdoor deck prior to discharging to the proposed curb inlet on West Valley Parkway.
The portion of uncovered parking stalls in the alley will discharge to the existing curb inlet at the intersection with Maple Street.
Runoff from the rooftops and podium deck will be directed to the raised planter boxes in the outdoor courtyard and street level for treatment. The AC pavement associated with the parking stalls in the alley and newly constructed sidewalk will be treated in a Roadside Swales on West Valley Parkway.
The pre and post project drainage area going into the existing Storm Drain Cleanout on the West Valley Parkway intersection with Maple Street is 3.6 Acres. The 50 year Peak Pre and Post Project flows are tabulated below:

	Node Number	Area (acres)	Q_{50} (cfs)	T_c (min)	I (in/hr)
Pre-Project/ Post-Project	104/104	3.6/3.6	11.7/11.3	14.6/13.7	3.7/3.9

Refer to Drainage Study titled "Preliminary Drainage Study for Aspire", prepared by Touchstone Development, Inc.

Step 3.5: Potential Pollutant Source Areas

Identify whether any of the following features, activities, and/or pollutant source areas will be present (select all that apply).

- ☒ On-site storm drain inlets
- ☒ Interior floor drains and elevator shaft sump pumps
- ☒ Interior parking garages
- ☒ Need for future indoor & structural pest control
- ☒ Landscape/Outdoor Pesticide Use
- ☒ Pools, spas, ponds, decorative fountains, and other water features
- ☐ Food service
- ☐ Refuse areas
- ☐ Industrial processes
- ☐ Outdoor storage of equipment or materials
- ☐ Vehicle and Equipment Cleaning
- ☐ Vehicle/Equipment Repair and Maintenance
- ☐ Fuel Dispensing Areas
- ☐ Loading Docks
- ☐ Fire Sprinkler Test Water
- ☐ Miscellaneous Drain or Wash Water
- ☒ Plazas, sidewalks, and parking lots
- ☐ Other (provide description)

Description / Additional Information:

Step 3.6: Identification and Narrative of Receiving Water and Pollutants of Concern

Describe flow path of storm water from the project site discharge location(s), through urban storm conveyance systems as applicable, to receiving creeks, rivers, and lagoons as applicable, and ultimate discharge to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable):
Runoff from the rooftops and podium deck will be directed to the raised planter boxes in the outdoor courtyard and street level for treatment. The AC pavement associated with the parking stalls in the alley and newly constructed sidewalk will be treated in a Roadside Swales on West Valley Parkway. Private storm drain lines will convey the flows in the planters toward the north and into an existing and proposed curb inlet on West Valley Parkway. Flows eventually discharge into concrete lined Escondido Creek 0.2 miles north of the site. Escondido Creek eventually discharges into San Elijo Lagoon approximately 12 miles downstream and eventually connects to the Pacific Ocean. Escondido Creek and San Elijo Lagoon are impaired for Phosphate and Eutrophic which fall under the Nutrient Pollutant Category. Per BMP factsheet BF-1 sheet E-69, where receiving waters are impaired or have TMDL for nutrients, the system shall be designed with nutrient sensitive media design following the guidance of BMP fact sheet BF-2. The Biosoil Media mix will be modified by the Landscape Architect at Final Engineering to minimize nutrient export from the Media mix and the plants.

List any 303(d) impaired water bodies[2] within the path of storm water from the project site to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable), identify the pollutant(s)/stressor(s) causing impairment, and identify any TMDLs and/or Highest Priority Pollutants from the WQIP for the impaired water bodies:

303(d) Impaired Water Body	Pollutant(s)/Stressor(s)	TMDLs / WQIP Highest
Escondido Creek	DDT (Dichlorodiphenyltrichloroethane), Enterococcus, Fecal Coliform, Manganese,Phosphate,Selenium,Sulfates, Total Dissolved Solids, Total Nitrogen as N, Toxicity	Pesticides, Fecal indicator bacteria, metals/metalloids, nutrients,other inorganics,salinity,toxicity
Pacific Ocean Shoreline	Total Coliform	Indicator Bacteria
San Elijo Lagoon	Eutrophic,Indicator Bacteria, Sedimentation/Siltation	Nutrients, Fecal Indicator Bacteria,Sediment

Identification of Project Site Pollutants*

*Identification of project site pollutants below is only required if flow-thru treatment BMPs are implemented onsite in lieu of retention or biofiltration BMPs. Note the project must also participate in an alternative compliance program (unless prior lawful approval to meet earlier PDP requirements is demonstrated).

Identify pollutants expected from the project site based on all proposed use(s) of the site (see Storm Water Design Manual Appendix B.6):

Pollutant	Not Applicable to the Project Site	Anticipated from the Project Site	Also a Receiving Water Pollutant of Concern
Sediment			
Nutrients			
Heavy Metals			
Organic Compounds			
Trash & Debris			

Oxygen Demanding Substances			
Oil & Grease			
Bacteria & Viruses			
Pesticides			

[2] The current list of Section 303(d) impaired water bodies can be found at http://www.waterboards.ca.gov/water_issues/programs/water_quality_assessment/#impaired

Step 3.7: Hydromodification Management Requirements

Do hydromodification management requirements apply (see Section 1.6 of the Storm Water Design Manual)?

☐Yes, hydromodification management requirements for flow control and preservation of critical coarse sediment yield areas are applicable.

☐No, the project will discharge runoff directly to existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.

☐No, the project will discharge runoff directly to conveyance channels whose bed and bank are concrete-lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.

☒No, the project will discharge runoff directly to an area identified as appropriate for an exemption by the WMAA[3] for the watershed in which the project resides.

Description / Additional Information (to be provided if a 'No' answer has been selected above): Hydromodification Management Requirements are not required as the project discharges to Escondido Creek which is exempt from Hydromodification Requirements, see fact sheet included In Attachment 2.

[3]The Watershed Management Area Analysis (WMAA) is an optional element for inclusion in the Water Quality Improvement Plans (WQIPs) described in the 2013 MS4 Permit [Provision B.3.b.(4)]. It is

available online at the Project Clean Water website:
http://www.projectcleanwater.org/index.php?option=com_content&view=article&id=248

Step 3.7.1: Critical Coarse Sediment Yield Areas*

***This Section only required if hydromodification management requirements apply**

Based on the maps provided within the WMAA, do potential critical coarse sediment yield areas exist within the project drainage boundaries?

Yes

☒ No, no critical coarse sediment yield areas to be protected based on WMAA maps

If yes, have any of the optional analyses presented in Section 6.2 of the manual been performed?

6.2.1 Verification of GLUs (classification that provides an estimate of sediment yield based on geology, hillslope, and land cover) Onsite

6.2.2 Downstream Systems Sensitivity to Coarse Sediment

6.2.3 Optional Additional Analysis of Potential Critical Coarse Sediment Yield Areas Onsite

No optional analyses performed, the project will avoid critical coarse sediment yield areas identified based on WMAA maps

If optional analyses were performed, what is the final result?

No critical coarse sediment yield areas to be protected based on verification of GLUs onsite.

Critical coarse sediment yield areas exist but additional analysis has determined that protection is not required. Documentation attached in Attachment 8 of the SWQMP.

Critical coarse sediment yield areas exist and require protection. The project will implement management measures described in Sections 6.2.4 and 6.2.5 as applicable, and the areas are identified on the SWQMP Exhibit.

Discussion / Additional Information:

Flow Control for Post-Project Runoff*

***This Section only required if hydromodification management requirements apply**
List and describe point(s) of compliance (POCs) for flow control for hydromodification management (see Section 6.3.1). For each POC, provide a POC identification name or number correlating to the project's HMP Exhibit and a receiving channel identification name or number correlating to the project's HMP Exhibit.
Has a geomorphic assessment been performed for the receiving channel(s)? ☐No, the low flow threshold is 0.1Q2 (default low flow threshold) ☐Yes, the result is the low flow threshold is 0.1Q2 ☐Yes, the result is the low flow threshold is 0.3Q2 ☐Yes, the result is the low flow threshold is 0.5Q2 *If a geomorphic assessment has been performed, provide title, date, and preparer:.* *Discussion / Additional Information: (optional)*

Step 3.8: Other Site Requirements and Constraints

When applicable, list other site requirements or constraints that will influence storm water management design, such as zoning requirements including setbacks and open space, or local codes governing minimum street width, sidewalk construction, allowable pavement types, and drainage requirements.

Optional Additional Information or Continuation of Previous Sections As Needed

This space provided for additional information or continuation of information from previous sections as needed.

Step 4: Source Control BMP Checklist (Form I-2b)

Source Control BMPs

All development projects must implement source control BMPs 4.2.1 through 4.2.6 where applicable and feasible. See Chapter 4.2 and Appendix E of the City Storm Water Design Manual for information to implement source control BMPs shown in this checklist. The following checklists serve as guides only. Mark what elements are included in your project. See Storm Water Design Manual Chapter 4 and Appendix E for more information on determining appropriate BMPs for your project.

Answer each category below pursuant to the following:

- "Yes" means the project will implement the source control BMP as described in Chapter 4.2 and/or Appendix E of the City Storm Water Design Manual. Discussion / justification is not required.
- "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.
- "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project has no outdoor materials storage areas). Discussion / justification must be provided.

Source Control Requirement	Applied?		
SC-1 Prevention of Illicit Discharges into the MS4	☒Yes	☐No	☐N/A
☒ Direct irrigation water away from impervious surfaces □ Direct vehicle wash water away from impervious surfaces □ Other: _____ *Discussion / justification if SC-1 not implemented:*			
SC-2 Storm Drain Stenciling or Signage	☒Yes	☐No	☐N/A
☒ Stencil or stamp storm drains with anti-dumping message ☒ Post signs prohibiting illegal dumping □ Other *Discussion / justification if SC-2 not implemented:*			
SC-3 Protect Outdoor Materials Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐Yes	☐No	☒N/A
□ Store materials inside a covered enclosure □ Direct runoff from downspouts and roofs away from storage areas □ Other *Discussion / justification if SC-3 not implemented:* Outdoor material storage is not anticipated for the project.			

SC-4 Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐Yes	☐No	☒N/A
□ Locate work area away from storm drains or catch basins □ Work over impermeable surfaces where spills and pollutants can be captured and removed *Discussion / justification if SC-4 not implemented:* Outdoor Material storage is not anticipated for the project.			
SC-5 Protect Trash Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☒Yes	☐No	☐N/A
☒ Locate trash containers in a roofed, walled enclosure ☒ Locate trash containers away from storm drains *Discussion / justification if SC-5 not implemented:*			
SC-6 Additional BMPs Based on Potential Sources of Runoff Pollutants (must answer for each source listed below):			
☐ A. On-site storm drain inlets	☒Yes	☐No	☐N/A
☐ B. Interior floor drains and elevator shaft sump pumps	☒Yes	☐No	☐N/A
☐ C. Interior parking garages	☒Yes	☐No	☐N/A
☐ D. Need for future indoor & structural pest control	☒Yes	☐No	☐N/A
☐ E. Landscape/outdoor pesticide use	☒Yes	☐No	☐N/A
☐ F. Pools, spas, ponds, fountains, and other water features	☒Yes	☐No	☐N/A
☐ G. Food service	☐Yes	☒No	☐N/A
☐ H. Refuse areas	☐Yes	☒No	☐N/A
☐ I. Industrial processes	☐Yes	☒No	☐N/A
☐ J. Outdoor storage of equipment or materials	☐Yes	☒No	☐N/A
☐ K. Vehicle and equipment cleaning	☐Yes	☒No	☐N/A
☐ L. Vehicle/equipment repair and maintenance	☐Yes	☒No	☐N/A
☐ M. Fuel dispensing areas	☐Yes	☒No	☐N/A
☐ N. Loading docks	☐Yes	☒No	☐N/A
☐ O. Fire sprinkler test water	☐Yes	☒No	☐N/A
☐ P. Miscellaneous drain or wash water	☐Yes	☒No	☐N/A
☐ Q. Plazas, sidewalks, and parking lots	☒Yes	☐No	☐N/A
Discussion / justification if SC-6 not implemented. Clearly identify which sources of runoff pollutants are discussed. Justification must be provided for <u>all</u> "No" answers shown above. The project proposes the construction of a multi-family structure with underground parking. Items G-P are not anticipated.			

Note: Show all source control measures described above that are included in design capture volume calculations in the plan sheets of Attachment 5.

Step 5: Site Design BMP Checklist (Form I-2c)

Site Design BMPs

All development projects must implement site design BMPs SD-A through SD-H where applicable and feasible. See Chapter 4.3 and Appendix E of the City Storm Water Design Manual for information to implement site design BMPs shown in this checklist. The following checklists serve as guides only. Mark what elements are included in your project. See Storm Water Design Manual Chapter 4 and Appendix E for more information on determining appropriate BMPs for your project.

Answer each category below pursuant to the following:

- "Yes" means the project will implement the site design BMP as described in Chapter 4.3 and/or Appendix E of the City Storm Water Design Manual. Discussion / justification is not required.
- "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.
- "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project site has no existing natural areas to conserve). Discussion / justification must be provided.

Site Design Requirement	Applied?		
SD-1 Maintain Natural Drainage Pathways and Hydrologic Features	☒Yes	☐No	☐N/A
□ Maintain existing drainage patterns *Discussion / justification if SD-1 not implemented:*			
SD-2 Conserve Natural Areas, Soils, and Vegetation	☐Yes	☒No	☐N/A
□ Preserve trees (see Zoning Code Art. 55 Grading & Erosion Control; Art. 62 Landscape Regulations) □ Avoid sensitive areas such as wetlands and waterways *Discussion / justification if SD-2 not implemented:* *The existing trees that lie within the proposed building limits. Conserving them is not feasible.*			
SD-3 Minimize Impervious Area	☐Yes	☒No	☐N/A
□ Install parking and driving aisles to minimum width required to meet standards *Discussion / justification if SD-3 not implemented:* *The building footprint encompasses the majority of the property, therefore minimizing impervious areas onsite is not feasible. The outdoor courtyards will implement landscaped/pervious surfaces. The offsite improvements will remove existing pavement and replace it with landscaped areas.*			

SD-4 Minimize Soil Compaction	☒Yes	☐No	☐N/A
☒ Avoid compaction in planned landscaped spaces □ Till and amend soil for improved infiltration capacity *Discussion / justification if SD-4 not implemented:*			
SD-5 Impervious Area Dispersion	☒Yes	☐No	☐N/A
☒ Drain rooftops, roads or sidewalks into adjacent landscape areas ☒ Drain impervious surfaces through pervious areas *Discussion / justification if SD-5 not implemented:*			
SD-6 Runoff Collection			
Discussion / justification if SD-6 not implemented:	☒Yes	☐No	☐N/A
SD-7 Landscaping with Native or Drought Tolerant Species			
Discussion / justification if SD-7 not implemented:	☒Yes	☐No	☐N/A
SD-8 Harvesting and Using Precipitation			
Discussion / justification if SD-8 not implemented: *Rain Barrels and/or Cisterns are feasible only in the outdoor deck as runoff needs to be directed to biofiltration basins for treatment after retention. Placement will be of a challenge for aesthetics as there is not much room in the outdoor decks where it won't be an eyesore to tenants that use the outdoor decks. Infiltration is not feasible as the existing soil is comprised of Type C hydrologic soil which has low infiltration rates. The building encompasses the majority of the property, use of infiltration may undermine the structural integrity of the the building.*	☐Yes	☒No	☐N/A

Note: Show all site design measures described above that are included in design capture volume calculations in the plan sheets of Attachment 5.

Step 6: PDP Structural BMPs (Form I-3)

All PDPs must implement structural BMPs for storm water pollutant control (see Chapter 5 of the Storm Water Design Manual). Selection of PDP structural BMPs for storm water pollutant control must be based on the selection process described in Chapter 5. PDPs subject to hydromodification management requirements must also implement structural BMPs for flow control for hydromodification management (see Chapter 6 of the Storm Water Design Manual). Both storm water pollutant control and flow control for hydromodification management can be achieved within the same structural BMP(s).

PDP structural BMPs must be verified by the City at the completion of construction. This may include requiring the project owner or project owner's representative and engineer of record to certify construction of the structural BMPs (see Section 8.2.3.2 of the Storm Water Design Manual). PDP structural BMPs must be maintained into perpetuity, and the City must confirm the maintenance (see Section 7 of the Storm Water Design Manual).

Use this section to provide narrative description of the general strategy for structural BMP implementation at the project site in the box below. Then complete the PDP structural BMP summary information sheet (Step 6.2) for each structural BMP within the project (copy the BMP summary information sheet [Step 6.2] as many times as needed to provide summary information for each individual structural BMP).

Step 6.1: Description of structural BMP strategy

Describe the general strategy for structural BMP implementation at the site. This information must describe how the steps for selecting and designing storm water pollutant control BMPs presented in Section 5.1 of the Storm Water D*esign Manual were followed, and the results (type of BMPs selected). For projects requiring hydromodification flow control BMPs, indicate whether pollutant control and flow control BMPs are integrated or separate. At the end of this discussion provide a summary of all the structural BMPs within the project including the type and number.*

The BMP feasibility analysis (Worksheet B.3-1) was performed and results were that Biofiltration BMPs be implemented. The anticipated demand for the project to implement capture & reuse was less than what was available. Furthermore, the site consists of hydrologic soil C, which provides low infiltration rates, therefore infiltration was deemed infeasible. The raised planters are on the outdoor deck or on the street level adjacent to the underground parking. Partial retention of water in type C soil has the potential to undermine the structural stability of the building walls. Harvest and reuse was considered but determined to be impractical due to the space constraints and aesthetics as the outdoor decks would be the location that would be most practical.
Runoff from the rooftops and podium deck will be directed to the raised planter boxes in the outdoor courtyard and street level for treatment. The AC pavement associated with the parking stalls in the alley and newly constructed sidewalk will be treated in a Roadside Swales on West Valley Parkway. Hardscape improvements that discharge into the Public Right of Way which exceed the De-minimus threshold have been accounted for in the calculations for Sidewalk West through "Onsite Alternative Compliance, therefore all impervious surfaces are accounted for in the pollutant control calculations.

Flows from the site discharge into concrete lined Escondido Creek 0.2 miles north of the site. Escondido Creek eventually discharges into San Elijo Lagoon approximately 12 miles downstream and eventually connects to the Pacific Ocean. Escondido Creek and San Elijo Lagoon are impaired for Phosphate and Eutrophic which fall under the Nutrient Pollutant Category. Per BMP factsheet BF-1 sheet E-69, where receiving waters are impaired or have TMDL for nutrients, the system shall be designed with nutrient sensitive media design following the guidance of BMP fact sheet BF-2 (Provided in Attachment 3). The Biosoil Media mix will be modified by the Landscape Architect at Final Engineering to minimize nutrient export from the Media mix and the plants.

Description of structural **BMP** strategy continued
(Page reserved for continuation of description of general strategy for structural **BMP** implementation at the site)

(Continued from previous page)

Step 6.2: Structural BMP Checklist

(Copy this page as needed to provide information for each individual proposed structural BMP)	
Structural BMP ID No.	
Construction Plan Sheet No.	
Type of structural BMP: ☐Retention by harvest and use (HU-1) ☐Retention by infiltration basin (INF-1) ☐Retention by bioretention (INF-2) ☐Retention by permeable pavement (INF-3) ☐Partial retention by biofiltration with partial retention (PR-1) ☒Biofiltration (BF-1) ☒Biofiltration with Nutrient Sensitive Media Design (BF-2) ☐Proprietary Biofiltration (BF-3) meeting all requirements of Appendix F ☐Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) ☐Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) ☐Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) ☐Detention pond or vault for hydromodification management ☐Other (describe in discussion section below)	
Purpose: ☒Pollutant control only ☐Hydromodification control only ☐Combined pollutant control and hydromodification control ☐Pre-treatment/forebay for another structural BMP ☐Other (describe in discussion section below)	
Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification forms (See Section 8.2.3.2 of the Storm Water Design Manual)	Property owner to identify/contract third party during final engineering.
Who will be the final owner of this BMP?	☐HOA ☒Property Owner ☐City ☐Other (describe)
Who will maintain this BMP into perpetuity?	☐HOA ☒Property Owner ☐City ☐Other (describe)
Discussion (as needed): *(Continue on subsequent pages as necessary)*	

Step 6.3: Offsite Alternative Compliance Participation Form

THIS FORM IS NOT APPLICABLE AT THIS TIME: An Alternative Compliance Program is under consideration by the City of Escondido.	
PDP INFORMATION	
Record ID:	
Assessor's Parcel Number(s) [APN(s)]	
What are your PDP Pollutant Control Debits? *See Attachment 1 of the PDP SWQMP	
What are your PDP HMP Debits? (if applicable) *See Attachment 2 of the PDP SWQMP	
ACP Information	
Record ID:	
Assessor's Parcel Number(s) [APN(s)]	
Project Owner/Address	
What are your ACP Pollutant Control Credits? *See Attachment 1 of the ACP SWQMP	
What are your ACP HMP Debits? (if applicable) *See Attachment 2 of the ACP SWQMP	
Is your ACP in the same watershed as your PDP? ☐Yes ☐No	Will your ACP project be completed prior to the completion of the PDP? ☐Yes ☐No
Does your ACP account for all Deficits generated by the PDP? ☐Yes ☐No (PDP and/or ACP must be redesigned to account for all deficits generated by the PDP.)	What is the difference between your PDP debits and ACP Credits? *(ACP Credits -Total PDP Debits = Total Earned Credits) _____

ATTACHMENT 1

BACKUP FOR PDP POLLUTANT CONTROL BMPS

This is the cover sheet for Attachment 1.

Indicate which Items are Included behind this cover sheet:

Attachment Sequence	Contents	Checklist
Attachment 1a	Storm Water Pollutant Control Worksheet Calculations -Worksheet B.2-1 (Required) -Worksheet B.3-1 (Form I-4; Required) -Worksheet B.4-1 (if applicable) -Worksheet B.5-1 (if applicable) -Worksheet B.5-2 (if applicable) -Worksheet B.5-3 (if applicable) -Worksheet B.6-1 (if applicable) -Summary Worksheet (optional)	☐Included
Attachment 1b	Form I-5, Categorization of Infiltration Feasibility Condition (Required unless the project will use harvest and use BMPs) Refer to Appendices C and D of the Storm Water Design Manual to complete Form I-5.	☒Included ☐Not included because the entire project will use harvest and use BMPs
Attachment 1c	Form I-6, Factor of Safety and Design Infiltration Rate Worksheet (Required unless the project will use harvest and use BMPs) Refer to Appendices C and D of the Storm Water Design Manual to complete Form I-6.	☒Included ☐Not included because the entire project will use harvest and use BMPs
Attachment 1d	DMA Exhibit (Required) See DMA Exhibit Checklist on the back of this Attachment cover sheet.	☒Included
Attachment 1e	Individual Structural BMP DMA Mapbook (Required) -Place each map on 8.5”x11” paper. -Show at a minimum the DMA, Structural BMP, and any existing hydrologic features within the DMA.	☒Included

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Use this checklist to ensure the required information has been included on the DMA Exhibit:

The DMA Exhibit must identify:

☐Underlying hydrologic soil group
☐Approximate depth to groundwater
☐Existing natural hydrologic features (watercourses, seeps, springs, wetlands)
☐Critical coarse sediment yield areas to be protected
☐Existing topography and impervious areas
☐Existing and proposed site drainage network and connections to drainage offsite
☐Proposed demolition
☐Proposed grading
☐Proposed impervious features
☐Proposed design features and surface treatments used to minimize imperviousness
☐Drainage management area (DMA) boundaries, DMA ID numbers, and DMA areas (square footage or acreage), and DMA type (i.e., drains to BMP, self-retaining, or self-mitigating)
☐Potential pollutant source areas and corresponding required source controls (see Chapter 4, Appendix E.1, and Step 3.5)
☐Structural BMPs (identify location, structural BMP ID#, type of BMP, and size/detail)

DMA Name	POC	BMP TYPE	Soil Type	DMA Pervious Area	DMA Impervious Area	DMA Area	% Impervious	Runoff Factor (TABLE G.2-1)	DMA Area x Runoff Factor	C (runoff factor)	d [1]	Roof	Hardscape	Pervious/Landscaping
DMA-1	POC-1	BIOFILTRATION BASIN	C	325	11,031	11,356	97%	1.00	11,031	0.97	0.55	11,031	0	325
								0.10	33					
DMA-2	POC-1	BIOFILTRATION BASIN	C	110	4,019	4,129	97%	1.00	4,019	0.98	0.55	4,019	0	110
								0.10	11					
DMA-3	POC-1	BIOFILTRATION BASIN	C	105	3,744	3,849	97%	1.00	3,744	0.98	0.55	3,744	0	105
								0.10	11					
DMA-4	POC-1	BIOFILTRATION BASIN	C	385	11,930	12,315	97%	1.00	11,930	0.97	0.55	11,930	0	385
								0.10	39					
DMA-5	POC-1	BIOFILTRATION BASIN	C	517	1,428	1,945	73%	1.00	1,428	0.76	0.55	0	1,428	517
								0.10	52					
DMA-6	POC-1	BIOFILTRATION BASIN	C	460	1,924	2,384	81%	1.00	1,924	0.83	0.55	0	1,924	460
								0.10	46					
DMA-7	POC-1	BIOFILTRATION BASIN	C	1,405	3,042	4,447	68%	1.00	3,042	0.72	0.55	0	3,042	1,405
								0.10	141					
Sidewalk-West [3]	POC-1	BIOFILTRATION BASIN	C	420	3,954	4,374	90%	1.00	3,954	0.91	0.55	0	3,954	420
								0.10	42					
Sidewalk-East [3]	POC-1	BIOFILTRATION BASIN	C	98	2,157	2,255	96%	1.00	2,157	0.96	0.55	0	2,157	98
								0.10	10					

[1] 85th percentile, 24- hr storm event rainfall depth (inches), refer to section B.1.3 of San Diego Model BMP Design Manual

[2] Landscape Area outside of Building, within the Property Boundary is not calculated as part of DMA's as it is considered "Self-Mitigating". Pool and Spa areas on the outdoor deck are excluded from calculations.

[3] Only impervious surfaces such as sidewalk and AC pavement that were removed and replaced are accounted for in the calculations. Existing AC pavement and sidewalk are not included in the calculations.

Overall Project Pervious/Impervious Areas

Overall Disturbed Area		Impervious Area (ft^2)	Pervious Area (ft^2)	% Impervious
Pre-Project	50,157	44,182	5,975	88%
Post-Project	50,157	45,797	4,360	91%
			Increase	**3%**

Worksheet B.2-1. DCV
See County of San Diego Worksheet B.1-1

	Design Capture Volume	Worksheet B-2.1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=		inches
2	Area tributary to BMP (s)	A=		acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=		unitless
4	Street trees volume reduction	TCV=		cubic-feet
5	Rain barrels volume reduction	RCV=		cubic-feet
6	Calculate DCV = (3630 x C x d x A) – TCV - RCV	DCV=		cubic-feet

Automated Worksheet B.3-1: Project-Scale BMP Feasibility Analysis (V1.3)

Category	#	Description	Value	Units
Capture & Use Inputs	0	Design Capture Volume for Entire Project Site	1,824	cubic-feet
	1	Proposed Development Type	Residential	unitless
	2	Number of Residents or Employees at Proposed Development	400	#
	3	Total Planted Area within Development	4,360	sq-ft
	4	Water Use Category for Proposed Planted Areas	Low	unitless
Infiltration Inputs	5	Is Average Site Design Infiltration Rate ≤0.500 Inches per Hour?	Yes	yes/no
	6	Is Average Site Design Infiltration Rate ≤0.010 Inches per Hour?	No	yes/no
	7	Is Infiltration of the Full DCV Anticipated to Produce Negative Impacts?	Yes	yes/no
	8	Is Infiltration of Any Volume Anticipated to Produce Negative Impacts?	Yes	yes/no
Calculations	9	36-Hour Toilet Use Per Resident or Employee	1.86	cubic-feet
	10	Subtotal: Anticipated 36 Hour Toilet Use	746	cubic-feet
	11	Anticipated 1 Acre Landscape Use Over 36 Hours	52.14	cubic-feet
	12	Subtotal: Anticipated Landscape Use Over 36 Hours	5	cubic-feet
	13	Total Anticipated Use Over 36 Hours	751	cubic-feet
	14	Total Anticipated Use / Design Capture Volume	0.41	cubic-feet
	15	Are Full Capture and Use Techniques Feasible for this Project?	No	unitless
	16	Is Full Retention Feasible for this Project?	No	yes/no
	17	Is Partial Retention Feasible for this Project?	No	yes/no
Result	18	Feasibility Category	5	1, 2, 3, 4, 5

Worksheet B.3-1 General Notes:

A. Applicants may use this worksheet to determine the types of structural BMPs that are acceptable for implementation at their project site (as required in Section 5 of the BMPDM). User input should be provided for yellow shaded cells, values for all other cells will be automatically generated. Projects demonstrating feasibility or potential feasibility via this worksheet are encouraged to incorporate capture and use features in their project.

B. Negative impacts associated with retention may include geotechnical, groundwater, water balance, or other issues identified by a geotechnical engineer and substantiated through completion of Form I-8.

C. Feasibility Category 1: Applicant must implement capture & use, retention, and/or infiltration elements for the entire DCV.

D. Feasibility Category 2: Applicant must implement capture & use elements for the entire DCV.

E. Feasibility Category 3: Applicant must implement retention and/or infiltration elements for all DMAs with Design Infiltration Rates greater than 0.50 in/hr.

F. Feasibility Category 4: Applicant must implement standard unlined biofiltration BMPs sized at ≥3% of the effective impervious tributary area for all DMAs with Design Infiltration Rates of 0.011 to 0.50 in/hr. Applicants may be permitted to implement lined BMPs, reduced size BMPs, and/or specialized biofiltration BMPs provided additional criteria identified in "Supplemental Retention Criteria for Non-Standard Biofiltration BMPs" are satisfied.

G. Feasibility Category 5: Applicant must implement standard lined biofiltration BMPs sized at ≥3% of the effective impervious tributary area for all DMAs with Design Infiltration Rates of 0.010 in/hr or less. Applicants may also be permitted to implement reduced size and/or specialized biofiltration BMPs provided additional criteria identified in "Supplemental Retention Criteria for Non-Standard Biofiltration BMPs" are satisfied.

H. PDPs participating in an offsite alternative compliance program are not held to the feasibility categories presented herein.

Automated Worksheet B.1-1: Calculation of Design Capture Volume (V1.3)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Standard Drainage Basin Inputs	0	Drainage Basin ID or Name	DMA-1	DMA-2	DMA-3	DMA-4	DMA-5	DMA-6	DMA-7	Sidewalk west	Sidewalk east		unitless
	1	Basin Drains to the Following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration		unitless
	2	85th Percentile 24-hr Storm Depth	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55		inches
	3	Design Infiltration Rate Recommended by Geotechnical Engineer											in/hr
	4	Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	11,031	4,019	3,744	11,930	1,428	1,924	3,042	3,954	2,157		sq-ft
	5	Semi-Pervious Surfaces Not Serving as Dispersion Area (C=0.30)											sq-ft
	6	Engineered Pervious Surfaces Not Serving as Dispersion Area (C=0.10)											sq-ft
	7	Natural Type A Soil Not Serving as Dispersion Area (C=0.10)											sq-ft
	8	Natural Type B Soil Not Serving as Dispersion Area (C=0.14)											sq-ft
	9	Natural Type C Soil Not Serving as Dispersion Area (C=0.23)	325	110	105	385	517	460	1,405	420	98		sq-ft
	10	Natural Type D Soil Not Serving as Dispersion Area (C=0.30)											sq-ft
Dispersion Area, Tree Well & Rain Barrel Inputs (Optional)	11	Does Tributary Incorporate Dispersion, Tree Wells, and/or Rain Barrels?	No	No	No	No	No	No	No	No	No	No	yes/no
	12	Impervious Surfaces **Directed to Dispersion Area** per SD-B (Ci=0.90)											sq-ft
	13	Semi-Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	14	Engineered Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	15	Natural Type A Soil **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	16	Natural Type B Soil **Serving as Dispersion Area** per SD-B (Ci=0.14)											sq-ft
	17	Natural Type C Soil **Serving as Dispersion Area** per SD-B (Ci=0.23)											sq-ft
	18	Natural Type D Soil **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	19	Number of Tree Wells Proposed per SD-A											#
	20	Average Mature Tree Canopy Diameter											ft
	21	Number of Rain Barrels Proposed per SD-E											#
	22	Average Rain Barrel Size											gal
Treatment Train Inputs & Calculations	23	Does BMP Overflow to Stormwater Features in Downstream Drainage?	No	No	No	No	No	No	No	No	No	No	unitless
	24	Identify Downstream Drainage Basin Providing Treatment in Series											unitless
	25	Percent of Upstream Flows Directed to Downstream Dispersion Areas											percent
	26	Upstream Impervious Surfaces Directed to Dispersion Area (Ci=0.90)	0	0	0	0	0	0	0	0	0	0	cubic-feet
	27	Upstream Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	0	0	0	0	0	0	0	0	0	0	cubic-feet
Initial Runoff Factor Calculation	28	Total Tributary Area	11,356	4,129	3,849	12,315	1,945	2,384	4,447	4,374	2,255	0	sq-ft
	29	Initial Runoff Factor for Standard Drainage Areas	0.88	0.88	0.88	0.88	0.72	0.77	0.69	0.84	0.87	0.00	unitless
	30	Initial Runoff Factor for Dispersed & Dispersion Areas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	31	Initial Weighted Runoff Factor	0.88	0.88	0.88	0.88	0.72	0.77	0.69	0.84	0.87	0.00	unitless
	32	Initial Design Capture Volume	458	167	155	497	64	84	141	168	90	0	cubic-feet
Dispersion Area Adjustments	33	Total Impervious Area Dispersed to Pervious Surface	0	0	0	0	0	0	0	0	0	0	sq-ft
	34	Total Pervious Dispersion Area	0	0	0	0	0	0	0	0	0	0	sq-ft
	35	Ratio of Dispersed Impervious Area to Pervious Dispersion Area	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ratio
	36	Adjustment Factor for Dispersed & Dispersion Areas	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	ratio
	37	Runoff Factor After Dispersion Techniques	0.88	0.88	0.88	0.88	0.72	0.77	0.69	0.84	0.87	n/a	unitless
	38	Design Capture Volume After Dispersion Techniques	458	167	155	497	64	84	141	168	90	0	cubic-feet
Tree & Barrel Adjustments	39	Total Tree Well Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
	40	Total Rain Barrel Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
Results	41	Final Adjusted Runoff Factor	0.88	0.88	0.88	0.88	0.72	0.77	0.69	0.84	0.87	0.00	unitless
	42	Final Effective Tributary Area	9,993	3,634	3,387	10,837	1,400	1,836	3,068	3,674	1,962	0	sq-ft
	43	Initial Design Capture Volume Retained by Site Design Elements	0	0	0	0	0	0	0	0	0	0	cubic-feet
	44	Final Design Capture Volume Tributary to BMP	458	167	155	497	64	84	141	168	90	0	cubic-feet

Worksheet B.1-1 General Notes:

A. Applicants may use this worksheet to calculate design capture volumes for up to 10 drainage areas User input must be provided for yellow shaded cells, values for all other cells will be automatically generated, errors/notifications will be highlighted in red and summarized below. Upon completion of this worksheet, proceed to the appropriate BMP Sizing worksheet(s).

Automated Worksheet B.5-1: Sizing Lined or Unlined Biofiltration BMPs (V1.3)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
BMP Inputs	0	Drainage Basin ID or Name	DMA-1	DMA-2	DMA-3	DMA-4	DMA-5	DMA-6	DMA-7	Sidewalk west	Sidewalk east	-	sq-ft
	1	Design Infiltration Rate Recommended by Geotechnical Engineer	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-	in/hr
	2	Effective Tributary Area	9,993	3,634	3,387	10,837	1,400	1,836	3,068	3,674	1,962	-	sq-ft
	3	Minimum Biofiltration Footprint Sizing Factor	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	-	ratio
	4	Design Capture Volume Tributary to BMP	458	167	155	497	64	84	141	168	90	-	cubic-feet
	5	Is Biofiltration Basin Impermeably Lined or Unlined?	Lined	Lined	Lined	Lined	Lined	Lined	Lined	Lined	Lined		unitless
	6	Provided Biofiltration BMP Surface Area	325	110	105	385	50	56	128	112	66		sq-ft
	7	Provided Surface Ponding Depth	6	6	6	6	6	6	6	6	6		inches
	8	Provided Soil Media Thickness	18	18	18	18	18	18	18	18	18		inches
	9	Provided Depth of Gravel Above Underdrain Invert	12	12	12	12	12	12	12	12	12		inches
	10	Diameter of Underdrain or Hydromod Orifice (Select Smallest)	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50		inches
	11	Provided Depth of Gravel Below the Underdrain	3	3	3	3	3	3	3	3	3		inches
Retention Calculations	12	Volume Infiltrated Over 6 Hour Storm	0	0	0	0	0	0	0	0	0	0	cubic-feet
	13	Soil Media Pore Space Available for Retention	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	unitless
	14	Gravel Pore Space Available for Retention	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	15	Effective Retention Depth	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.00	inches
	16	Calculated Retention Storage Drawdown (Including 6 Hr Storm)	120	120	120	120	120	120	120	120	120	0	hours
	17	Volume Retained by BMP	24	8	8	29	4	4	10	8	5	0	cubic-feet
	18	Fraction of DCV Retained	0.05	0.05	0.05	0.06	0.06	0.05	0.07	0.05	0.06	0.00	ratio
	19	Portion of Retention Performance Standard Satisfied	0.06	0.06	0.06	0.07	0.07	0.06	0.08	0.06	0.07	0.00	ratio
	20	Fraction of DCV Retained (normalized to 36-hr drawdown)	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.03	0.03	0.00	ratio
	21	Design Capture Volume Remaining for Biofiltration	444	162	150	482	62	81	135	163	87	0	cubic-feet
Biofiltration Calculations	22	Max Hydromod Flow Rate through Underdrain	0.0113	0.0113	0.0113	0.0113	0.0113	0.0113	0.0113	0.0113	0.0113	n/a	CFS
	23	Max Soil Filtration Rate Allowed by Underdrain Orifice	1.51	4.45	4.66	1.27	9.79	8.74	3.82	4.37	7.42	n/a	in/hr
	24	Soil Media Filtration Rate per Specifications	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	in/hr
	25	Soil Media Filtration Rate to be used for Sizing	1.51	4.45	4.66	1.27	5.00	5.00	3.82	4.37	5.00	5.00	in/hr
	26	Depth Biofiltered Over 6 Hour Storm	9.04	26.70	27.97	7.63	30.00	30.00	22.95	26.23	30.00	30.00	inches
	27	Soil Media Pore Space Available for Biofiltration	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	unitless
	28	Effective Depth of Biofiltration Storage	14.40	14.40	14.40	14.40	14.40	14.40	14.40	14.40	14.40	0.00	inches
	29	Drawdown Time for Surface Ponding	4	1	1	5	1	1	2	1	1	0	hours
	30	Drawdown Time for Effective Biofiltration Depth	10	3	3	11	3	3	4	3	3	0	hours
	31	Total Depth Biofiltered	23.44	41.10	42.37	22.03	44.40	44.40	37.35	40.63	44.40	30.00	inches
	32	Option 1 - Biofilter 1.50 DCV: Target Volume	666	243	225	723	93	122	203	245	131	0	cubic-feet
	33	Option 1 - Provided Biofiltration Volume	635	243	225	707	93	122	203	245	131	0	cubic-feet
	34	Option 2 - Store 0.75 DCV: Target Volume	333	122	113	362	47	61	101	122	65	0	cubic-feet
	35	Option 2 - Provided Storage Volume	333	122	113	362	47	61	101	122	65	0	cubic-feet
	36	Portion of Biofiltration Performance Standard Satisfied	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	ratio
Result	37	Do Site Design Elements and BMPs Satisfy Annual Retention Requirements?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-	yes/no
	38	Overall Portion of Performance Standard Satisfied	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	ratio
	39	This BMP Overflows to the Following Drainage Basin	-	-	-	-	-	-	-	-	-	-	unitless
	40	**Deficit of Effectively Treated Stormwater**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**n/a**	cubic-feet

Worksheet B.5-1 General Notes:

A. Applicants may use this worksheet to size Lined or Unlined Biofiltration BMPs (BF-1, PR-1) for up to 10 basins. User input must be provided for yellow shaded cells, values for blue cells are automatically populated based on user inputs from previous worksheets, values for all other cells will be automatically generated, errors/notifications will be highlighted in red/orange and summarized below. BMPs fully satisfying the pollutant control performance standards will have a deficit treated volume of zero and be highlighted in green.

Summary of Stormwater Pollutant Control Calculations (V1.3)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
General Info	0	Drainage Basin ID or Name	DMA-1	DMA-2	DMA-3	DMA-4	DMA-5	DMA-6	DMA-7	Sidewalk west	Sidewalk east	-	unitless
	1	85th Percentile Storm Depth	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	-	inches
	2	Design Infiltration Rate Recommended by Geotechnical Engineer	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-	in/hr
	3	Total Tributary Area	11,356	4,129	3,849	12,315	1,945	2,384	4,447	4,374	2,255	-	sq-ft
	4	85th Percentile Storm Volume (Rainfall Volume)	520	189	176	564	89	109	204	200	103	-	cubic-feet
Initial DCV	5	Initial Weighted Runoff Factor	0.88	0.88	0.88	0.88	0.72	0.77	0.69	0.84	0.87	-	unitless
	6	Initial Design Capture Volume	458	167	155	497	64	84	141	168	90	-	cubic-feet
Site Design Volume Reductions	7	Dispersion Area Reductions	0	0	0	0	0	0	0	0	0	-	cubic-feet
	8	Tree Well and Rain Barrel Reductions	0	0	0	0	0	0	0	0	0	-	cubic-feet
BMP Volume Reductions	9	Effective Area Tributary to BMP	9,993	3,634	3,387	10,837	1,400	1,836	3,068	3,674	1,962	-	square feet
	10	Final Design Capture Volume Tributary to BMP	458	167	155	497	64	84	141	168	90	-	cubic-feet
	11	Basin Drains to the Following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	-	unitless
	12	Volume Retained by BMP (normalized to 36 hour drawdown)	14	5	5	15	2	3	6	5	3	-	cubic-feet
Total Volume Reductions	13	Total Fraction of Initial DCV Retained within DMA	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.03	0.03	-	fraction
	14	Percent of Average Annual Runoff Retention Provided	4.6%	4.6%	4.6%	4.6%	4.6%	6.1%	6.1%	4.6%	4.6%	-	%
	15	Percent of Average Annual Runoff Retention Required	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	-	%
Performance Standard	16	Percent of Pollution Control Standard Satisfied	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	-	%
Treatment Train	17	Discharges to Secondary Treatment in Drainage Basin	-	-	-	-	-	-	-	-	-	-	unitless
	18	Impervious Surface Area Still Requiring Treatment	0	0	0	0	0	0	0	0	0	-	square feet
	19	Impervious Surfaces Directed to Downstream Dispersion Area	-	-	-	-	-	-	-	-	-	-	square feet
	20	Impervious Surfaces Not Directed to Downstream Dispersion Area	-	-	-	-	-	-	-	-	-	-	square feet
Result	21	Deficit of Effectively Treated Stormwater	0	0	0	0	0	0	0	0	0	-	cubic-feet

Summary Notes:

All fields in this summary worksheet are populated based on previous user inputs. If applicable, drainage basin elements that require revisions and/or supplemental information outside the scope of these worksheets are highlighted in orange and summairzed in the red text below. If all drainage basins achieve full compliance without a need for supplemental information, a green message will appear below.

-Congratulations, all specified drainage basins and BMPs are in compliance with stormwater pollutant control requirements. Include 11x17 color prints of this summary sheet and supporting worksheet calculations as part of the SWQMP submittal package.

False

Categorization of Infiltration Feasibility Condition	Form I-5

Part 1 - Full Infiltration Feasibility Screening Criteria

Would infiltration of the full design volume be feasible from a physical perspective without any undesirable consequences that cannot be reasonably mitigated?

Criteria	Screening Question	Yes	No
1	**Is the estimated reliable infiltration rate below proposed facility locations greater than 0.5 inches per hour?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		X

Provide basis: Per the NCRS Web Soil Survey, the Hydrologic Soil Groups at the subject site are labeled as map unit names Fallbrook Sandy Loam (FaD2) and Placencia Sandy Loam (PeC). Both units have a hydrologic soil rating of C. Group C soils are expected to have a slow infiltration rate when thoroughly wet and a slow rate of water transmission. For preliminary design purposes the potential infiltration rate for the site can be estimated to range from 0 inches/hour to 0.08 inches/hour in accordance with Table G.1-5 of the BMP Manual. Additionally, relatively impermeable granitic soils were found at or just below the planned site elevations.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

2	**Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.		X

Provide basis:

Both units have a hydrologic soil rating of C. Group C soils are expected to have a slow infiltration rate when thoroughly wet and a slow rate of water transmission. For preliminary design purposes the potential infiltration rate for the site can be estimated to range from 0 inches/hour to 0.08 inches/hour in accordance with Table G.1-5 of the BMP Manual. Additionally, relatively impermeable granitic soils were found at or just below the planned site elevations

Form I-5			
Criteria	Screening Question	**Yes**	**No**
3	**Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination (shallow water table, storm water pollutants or other factors) that cannot be mitigated to an acceptable level?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	X	
Provide basis: Borings obtained by Christian Wheeler Engineering on April 2017 to a max depth of 15.5 feet with no ground water encountered. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
4	**Can infiltration greater than 0.5 inches per hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams or increased discharge of contaminated groundwater to surface waters?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	X	
Provide basis: We do not expect infiltration will cause water balance issues such as seasonality of ephemeral streams or increased discharge of contaminated groundwater to surface waters. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
Part 1 Result*	If all answers to rows 1 - 4 are "**Yes**" a full infiltration design is potentially feasible. The feasibility screening category is **Full Infiltration** If any answer from row 1-4 is "**No**", infiltration may be possible to some extent but would not generally be feasible or desirable to achieve a "full infiltration" design. Proceed to Part 2		NO

Form I-5

Part 2 – Partial Infiltration vs. No Infiltration Feasibility Screening Criteria

Would infiltration of water in any appreciable amount be physically feasible without any negative consequences that cannot be reasonably mitigated?

Criteria	Screening Question	Yes	No
5	**Do soil and geologic conditions allow for infiltration in any appreciable rate or volume?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		X

Provide basis: Per the NCRS Web Soil Survey, the Hydrologic Soil Groups at the subject site are labeled as map unit names Fallbrook Sandy Loam (FaD2) and Placencia Sandy Loam (PeC). Both units have a hydrologic soil rating of C. Group C soils are expected to have a slow infiltration rate when thoroughly wet and a slow rate of water transmission. For preliminary design purposes the potential infiltration rate for the site can be estimated to range from 0 inches/hour to 0.08 inches/hour in accordance with Table G.1-5 of the BMP Manual. Additionally, relatively impermeable granitic soils were found at or just below the planned site elevations.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.

6	**Can Infiltration in any appreciable quantity be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level**? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.		X

Provide basis:

Both units have a hydrologic soil rating of C. Group C soils are expected to have a slow infiltration rate when thoroughly wet and a slow rate of water transmission. For preliminary design purposes the potential infiltration rate for the site can be estimated to range from 0 inches/hour to 0.08 inches/hour in accordance with Table G.1-5 of the BMP Manual. Additionally, relatively impermeable granitic soils were found at or just below the planned site elevations.

Form I-5			
Criteria	Screening Question	**Yes**	**No**
7	**Can Infiltration in any appreciable quantity be allowed without posing significant risk for groundwater related concerns (shallow water table, storm water pollutants or other factors)?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	X	
Provide basis: Borings obtained by Christian Wheeler Engineering on April 2017 to a max depth of 15.5 feet with no ground water encountered. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
8	**Can infiltration be allowed without violating downstream water rights**? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		X
Provide basis: There are no downstream water rights for the subject property. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
Part 2 Result*	If all answers from row 5-8 are yes then partial infiltration design is potentially feasible. The feasibility screening category is **Partial Infiltration.** If any answer from row 5-8 is no, then infiltration of any volume is considered to be **infeasible** within the drainage area. The feasibility screening category is **No Infiltration.**		NO

Form I-5 Certification

The Geotechnical Engineer certifies they completed Form I-5 except Criteria 4 & 8 (see Appendix C.4.3).

Professional Geotechnical Engineer's Printed Name:

Shawn Caya

Professional Geotechnical Engineer's Signed Name:

Date:

[SEAL]

The Project Design Engineer certifies they completed Criteria 4 & 8 (see Appendix C.4.4).

Professional Project Design Engineer's Printed Name:

Alberto Sandoval

Professional Project Design Engineer's Signed Name:

Date:

[SEAL]

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Factor of Safety and Design Infiltration Rate Worksheet				Form I-6	
Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25	2	0.50
		Predominant soil texture	0.25	3	0.75
		Site soil variability	0.25	1	0.25
		Depth to groundwater / impervious layer	0.25	2	0.50
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			2.0
B	Design	Level of pretreatment/ expected sediment loads	0.5		
		Redundancy/resiliency	0.25		
		Compaction during construction	0.25		
		Design Safety Factor, $S_B = \Sigma p$			
Combined Safety Factor, $S_{total} = S_A \times S_B$					
Observed Infiltration Rate, inch/hr, $K_{observed}$ (corrected for test-specific bias)					
Design Infiltration Rate, in/hr, $K_{design} = K_{observed} / S_{total}$					
Supporting Data					
Briefly describe infiltration test and provide reference to test forms: Per the NCRS Web Soil Survey, the Hydrologic Soil Groups at the subject site are labeled as map unit names Fallbrook Sandy Loam (FaD2) and Placencia Sandy Loam (PeC). Both units have a hydrologic soil rating of C. Group C soils are expected to have a slow infiltration rate when thoroughly wet and a slow rate of water transmission. For preliminary design purposes the potential infiltration rate for the site can be estimated to range from 0 inches/hour to 0.08 inches/hour in accordance with Table G.1-5 of the BMP Manual. Additionally, relatively impermeable granitic soils were found at or just below the planned site elevations.					

Factor of Safety and Design Infiltration Rate Worksheet	Form I-6 Certification

The Geotechnical Engineer certifies they completed Form I-6 (see Appendix C.4.3).

Professional Geotechnical Engineer's Printed Name:

Shawn Caya

Professional Geotechnical Engineer's Signed Name:

Date:

[SEAL]

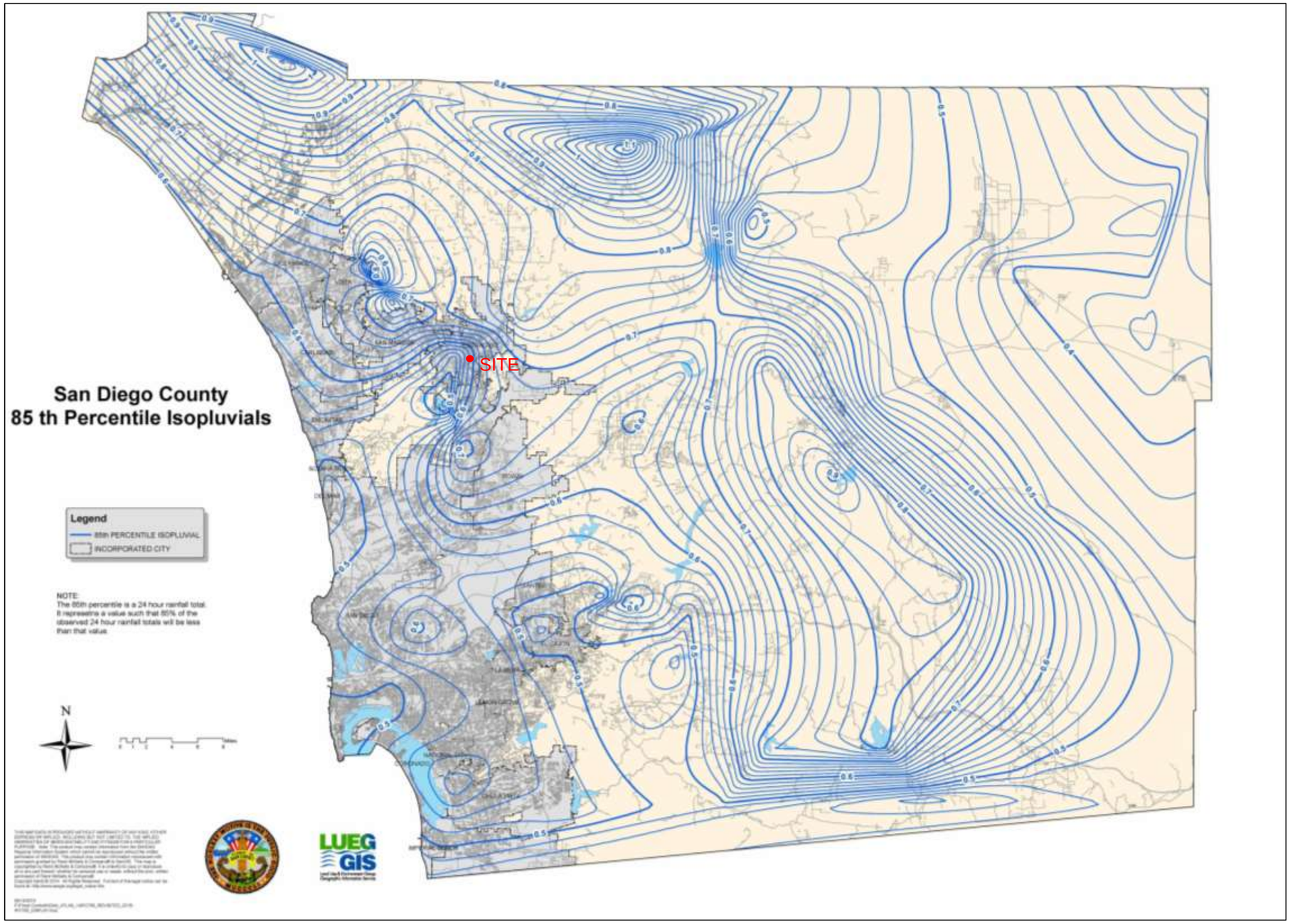
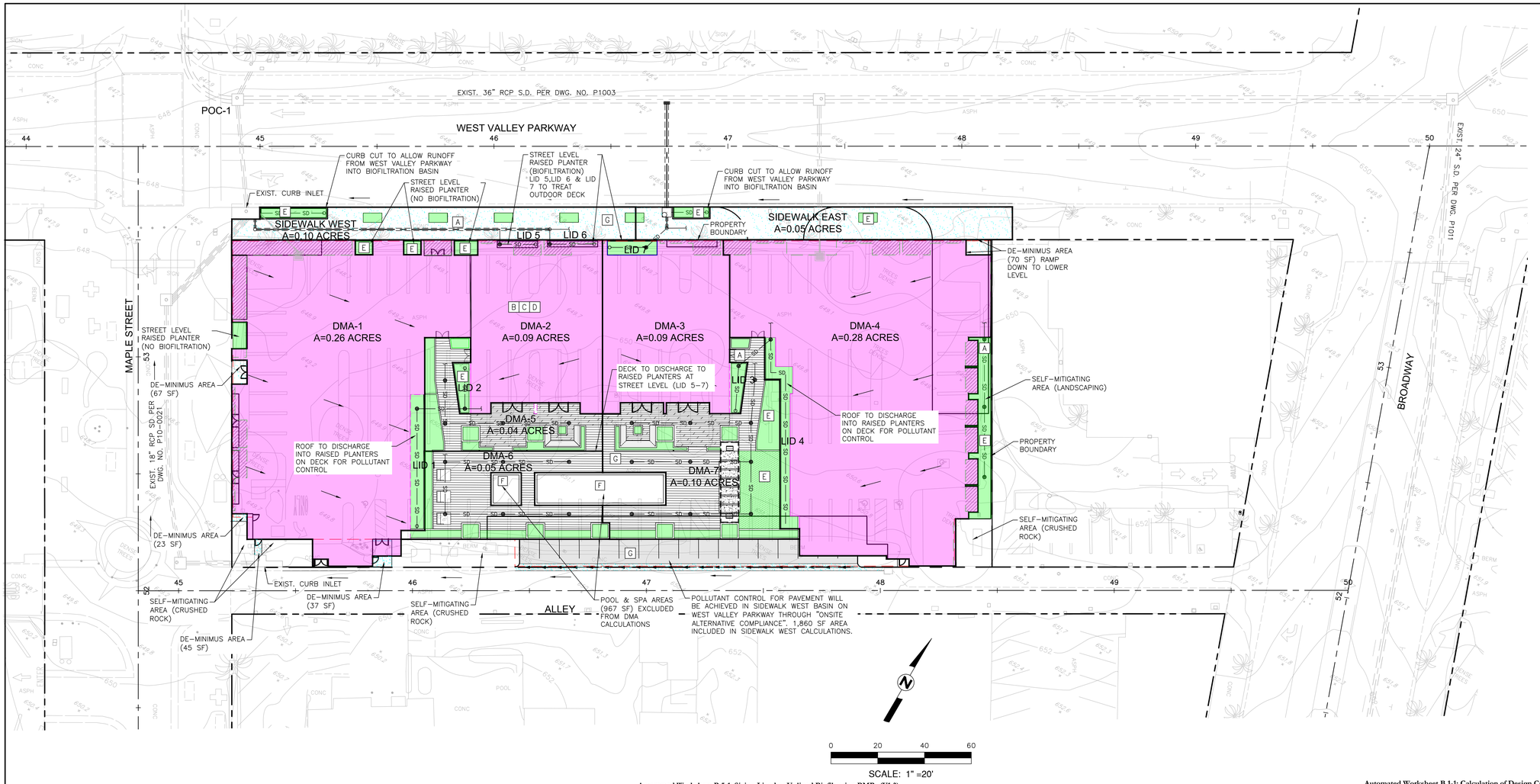
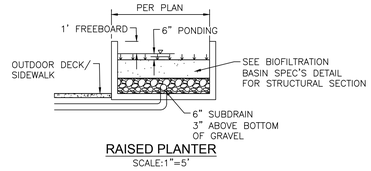
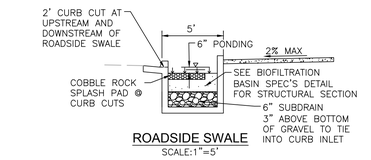


Figure B.1-1: 85th Percentile 24-hour Isopluvial Map

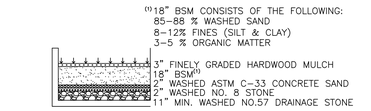




RAISED PLANTER
SCALE:1"=5'



ROADSIDE SWALE
SCALE:1"=5'



(1) 18" BSM CONSISTS OF THE FOLLOWING:
85-88 % WASHED SAND
8-12% FINES (SILT & CLAY)
3-5 % ORGANIC MATTER

BIOFILTRATION BASIN SPEC'S
SCALE:1"=5'

NOTES

1) UNDERLYING HYDROLOGIC SOIL TYPE 'C'
2) NO GROUNDWATER DEPTH PER GEOTECHNICAL ENGINEER'S REPORT
3) NO ONSITE POTENTIAL CRITICAL COARSE SEDIMENT
4) ALL DMA'S DRAIN TO LINEAR BIOFILTRATION BASINS, BF-1 AND BF-2
5) LANDSCAPING SHALL BE PERFORMED WITH NATIVE OR DROUGHT TOLERANT SPECIES
6) LANDSCAPING IN THE EXTERIOR OF THE BUILDING IS CONSIDERED "SELF-MITIGATING" AS IMPERVIOUS SURFACES DO NOT COMINGLE.
6) THE IMPROVEMENTS WITHIN THE PUBLIC RIGHT OF WAY CONSISTS OF REMOVAL AND REPLACEMENT OF EXISTING SIDEWALK AND PAVEMENT. THE IMPROVEMENTS WILL REDUCE THE AMOUNT OF PAVEMENT AND HARDSCAPE BY ADDING ADDITIONAL LANDSCAPE AREAS, A DECREASE OF 16% IMPERVIOUS SURFACES IS ANTICIPATED, SEE SWQMP REPORT FOR TABULATED AREAS.
7) IMPERVIOUS AREAS WITHIN THE PROPERTY BOUNDARY THAT DISCHARGE INTO THE R/W ALONG WITH REMOVED AND REPLACED IMPERVIOUS SURFACES IN THE R/W AND WITHIN THE PUBLIC RIGHT OF WAY WERE ACCOUNTED FOR IN SIZING SIDEWALK EAST AND WEST BASINS. ALTHOUGH THE AREA IN THE ALLEY DON'T DRAIN INTO SIDEWALK WEST BASIN, MITIGATION WAS PROVIDED WHICH IS KNOWN AS "ONSITE ALTERNATIVE COMPLIANCE" AS THERE IS EXISTING NON DISTURBED PAVEMENT THAT DISCHARGES INTO THE BASIN.

LEGEND

- DRAINAGE BASIN BOUNDARY
- BIOFILTRATION BASIN
- PROPOSED ROOF
- PROPOSED PAVEMENT
- PROPOSED HARDSCAPE
- PROPOSED LANDSCAPE
- PROPOSED STORM DRAIN
- PROPOSED SUBDRAIN OR SD FROM OUTDOOR DECK
- DIRECTION OF FLOW
- ONSITE STORM DRAIN INLET [A]
- INTERIOR FLOOR DRAINS & ELEVATOR SHAFT SUMP PUMPS [B]
- INTERIOR PARKING GARAGES [C]
- INDOOR & STRUCTURAL PEST CONTROL [D]
- LANDSCAPE/OUTDOOR PESTICIDE USE [E]
- POOL, SPAS, PONDS & DECORATIVE FOUNTAINS [F]
- PLAZAS, SIDEWALKS, AND PARKING LOTS [G]

Automated Worksheet B.5-1: Sizing Lined or Unlined Biofiltration BMPs (V1.3)

Category	#	Description	i	ii	iii	iv	v	vi	vii	viii	ix	x	Units
BMP Inputs	0	Drainage Basin ID or Name	DMA-1	DMA-2	DMA-3	DMA-4	DMA-5	DMA-6	DMA-7	Sidewalk west	Sidewalk east	-	sq-ft
	1	Design Infiltration Rate Recommended by Geotechnical Engineer	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-	in/hr
	2	Effective Tributary Area	9,993	3,634	3,387	10,837	1,400	1,836	3,068	3,674	1,962	-	sq-ft
	3	Minimum Biofiltration Footprint Sizing Factor	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	-	ratio
	4	Design Capture Volume Tributary to BMP	458	167	155	497	64	84	141	168	90	-	cubic-feet
	5	Is Biofiltration Basin Impermeably Lined or Unlined?	Lined	Lined	Lined	Lined	Lined	Lined	Lined	Lined	Lined		unitless
	6	Provided Biofiltration BMP Surface Area	325	110	105	385	50	56	128	112	66		sq-ft
	7	Provided Surface Ponding Depth	6	6	6	6	6	6	6	6	6		inches
	8	Provided Soil Media Thickness	18	18	18	18	18	18	18	18	18		inches
	9	Provided Depth of Gravel Above Underdrain Invert	12	12	12	12	12	12	12	12	12		inches
	10	Diameter of Underdrain or Hydromod Orifice (Select Smallest)	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50		inches
	11	Provided Depth of Gravel Below the Underdrain	3	3	3	3	3	3	3	3	3		inches
Retention Calculations	12	Volume Infiltrated Over 6 Hour Storm	0	0	0	0	0	0	0	0	0	0	cubic-feet
	13	Soil Media Pore Space Available for Retention	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	unitless
	14	Gravel Pore Space Available for Retention	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	15	Effective Retention Depth	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.00	inches
	16	Calculated Retention Storage Drawdown (Including 6 Hr Storm)	120	120	120	120	120	120	120	120	120	0	hours
	17	Volume Retained by BMP	24	8	8	29	4	4	10	8	5	0	cubic-feet
	18	Fraction of DCV Retained	0.05	0.05	0.05	0.06	0.06	0.05	0.07	0.05	0.06	0.00	ratio
	19	Portion of Retention Performance Standard Satisfied	0.06	0.06	0.06	0.07	0.07	0.06	0.08	0.06	0.07	0.00	ratio
	20	Fraction of DCV Retained (normalized to 36-hr drawdown)	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.03	0.03	0.00	ratio
	21	Design Capture Volume Remaining for Biofiltration	444	162	150	482	62	81	135	163	87	0	cubic-feet
Biofiltration Calculations	22	Max Hydromod Flow Rate through Underdrain	0.0113	0.0113	0.0113	0.0113	0.0113	0.0113	0.0113	0.0113	0.0113	n/a	CFS
	23	Max Soil Filtration Rate Allowed by Underdrain Orifice	1.51	4.45	4.66	1.27	9.79	8.74	3.82	4.37	7.42	n/a	in/hr
	24	Soil Media Filtration Rate per Specifications	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	in/hr
	25	Soil Media Filtration Rate to be used for Sizing	1.51	4.45	4.66	1.27	5.00	5.00	3.82	4.37	5.00	5.00	in/hr
	26	Depth Biofiltered Over 6 Hour Storm	9.04	26.70	27.97	7.63	30.00	30.00	22.95	26.23	30.00	30.00	inches
	27	Soil Media Pore Space Available for Biofiltration	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	unitless
	28	Effective Depth of Biofiltration Storage	14.40	14.40	14.40	14.40	14.40	14.40	14.40	14.40	14.40	0.00	inches
	29	Drawdown Time for Surface Ponding	4	1	1	5	1	1	2	1	1	0	hours
	30	Drawdown Time for Effective Biofiltration Depth	10	3	3	11	3	3	4	3	3	0	hours
	31	Total Depth Biofiltered	23.44	41.10	42.37	22.03	44.40	44.40	37.35	40.63	44.40	30.00	inches
	32	Option 1 - Biofilter 1.50 DCV: Target Volume	666	243	225	723	93	122	203	245	131	0	cubic-feet
	33	Option 1 - Provided Biofiltration Volume	635	243	225	707	93	122	203	245	131	0	cubic-feet
	34	Option 2 - Store 0.75 DCV: Target Volume	333	122	113	362	47	61	101	122	65	0	cubic-feet
	35	Option 2 - Provided Storage Volume	333	122	113	362	47	61	101	122	65	0	cubic-feet
	36	Portion of Biofiltration Performance Standard Satisfied	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	ratio
Result	37	Do Site Design Elements and BMPs Satisfy Annual Retention Requirements?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-	yes/no
	38	Overall Portion of Performance Standard Satisfied	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	ratio
	39	This BMP Overflows to the Following Drainage Basin	-	-	-	-	-	-	-	-	-	-	unitless
	40	**Deficit of Effectively Treated Stormwater**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**n/a**	cubic-feet

Worksheet B.5-1 General Notes:

A. Applicants may use this worksheet to size Lined or Unlined Biofiltration BMPs (BF-1, PR-1) for up to 10 basins. User input must be provided for yellow shaded cells, values for blue cells are automatically populated based on user inputs from previous worksheets, values for all other cells will be automatically generated, errors/notifications will be highlighted in red/orange and summarized below. BMPs fully satisfying the pollutant control performance standards will have a deficit treated volume of zero and be highlighted in green.

Automated Worksheet B.1-1: Calculation of Design Capture Volume (V1.3)

Category	#	Description	i	ii	iii	iv	v	vi	vii	viii	ix	x	Units
Standard Drainage Basin Inputs	0	Drainage Basin ID or Name	DMA-1	DMA-2	DMA-3	DMA-4	DMA-5	DMA-6	DMA-7	Sidewalk west	Sidewalk east		unitless
	1	Basin Drains to the Following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration		unitless
	2	85th Percentile 24-hr Storm Depth	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55		inches
	3	Design Infiltration Rate Recommended by Geotechnical Engineer											in/hr
	4	Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	11,031	4,019	3,744	11,930	1,428	1,924	3,042	3,954	2,157		sq-ft
	5	Semi-Pervious Surfaces Not Serving as Dispersion Area (C=0.30)											sq-ft
	6	Engineered Pervious Surfaces Not Serving as Dispersion Area (C=0.10)											sq-ft
	7	Natural Type A Soil Not Serving as Dispersion Area (C=0.10)											sq-ft
	8	Natural Type B Soil Not Serving as Dispersion Area (C=0.14)											sq-ft
	9	Natural Type C Soil Not Serving as Dispersion Area (C=0.23)	325	110	105	385	517	460	1,405	420	98		sq-ft
	10	Natural Type D Soil Not Serving as Dispersion Area (C=0.30)											sq-ft
Dispersion Area, Tree Well & Rain Barrel Inputs (Optional)	11	Does Tributary Incorporate Dispersion, Tree Wells, and/or Rain Barrels?	No	No	No	No	No	No	No	No	No	No	yes/no
	12	Impervious Surfaces **Directed to Dispersion Area** per SD-B (Ci=0.90)											sq-ft
	13	Semi-Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	14	Engineered Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	15	Natural Type A Soil **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	16	Natural Type B Soil **Serving as Dispersion Area** per SD-B (Ci=0.14)											sq-ft
	17	Natural Type C Soil **Serving as Dispersion Area** per SD-B (Ci=0.23)											sq-ft
	18	Natural Type D Soil **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	19	Number of Tree Wells Proposed per SD-A											#
	20	Average Mature Tree Canopy Diameter											ft
	21	Number of Rain Barrels Proposed per SD-E											#
	22	Average Rain Barrel Size											gal
Treatment Train Inputs & Calculations	23	Does BMP Overflow to Stormwater Features in Downstream Drainage?	No	No	No	No	No	No	No	No	No	No	unitless
	24	Identify Downstream Drainage Basin Providing Treatment in Series											unitless
	25	Percent of Upstream Flows Directed to Downstream Dispersion Area											percent
	26	Upstream Impervious Surfaces Directed to Dispersion Area (Ci=0.90)	0	0	0	0	0	0	0	0	0	0	cubic-feet
	27	Upstream Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	0	0	0	0	0	0	0	0	0	0	cubic-feet
Initial Runoff Factor Calculation	28	Total Tributary Area	11,356	4,129	3,849	12,315	1,945	2,384	4,447	4,374	2,255	0	sq-ft
	29	Initial Runoff Factor for Standard Drainage Areas	0.88	0.88	0.88	0.88	0.72	0.77	0.69	0.84	0.87	0.00	unitless
	30	Initial Runoff Factor for Dispersed & Dispersion Areas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	31	Initial Weighted Runoff Factor	0.88	0.88	0.88	0.88	0.72	0.77	0.69	0.84	0.87	0.00	unitless
	32	Initial Design Capture Volume	458	167	155	497	64	84	141	168	90	0	cubic-feet
Dispersion Area Adjustments	33	Total Impervious Area Dispersed to Pervious Surface	0	0	0	0	0	0	0	0	0	0	sq-ft
	34	Total Pervious Dispersion Area	0	0	0	0	0	0	0	0	0	0	sq-ft
	35	Ratio of Dispersed Impervious Area to Pervious Dispersion Area	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ratio
	36	Adjustment Factor for Dispersed & Dispersion Areas	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	ratio
	37	Runoff Factor After Dispersion Techniques	0.88	0.88	0.88	0.88	0.72	0.77	0.69	0.84	0.87	n/a	unitless
	38	Design Capture Volume After Dispersion Techniques	458	167	155	497	64	84	141	168	90	0	cubic-feet
Tree & Barrel Adjustments	39	Total Tree Well Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
	40	Total Rain Barrel Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
Results	41	Final Adjusted Runoff Factor	0.88	0.88	0.88	0.88	0.72	0.77	0.69	0.84	0.87	0.00	unitless
	42	Final Effective Tributary Area	9,993	3,634	3,387	10,837	1,400	1,836	3,068	3,674	1,962	0	sq-ft
	43	Initial Design Capture Volume Retained by Site Design Elements	0	0	0	0	0	0	0	0	0	0	cubic-feet
	44	Final Design Capture Volume Tributary to BMP	458	167	155	497	64	84	141	168	90	0	cubic-feet

Worksheet B.1-1 General Notes:

A. Applicants may use this worksheet to calculate design capture volumes for up to 10 drainage areas User input must be provided for yellow shaded cells, values for all other cells will be automatically generated, errors/notifications will be highlighted in red and summarized below. Upon completion of this worksheet, proceed to the appropriate BMP Sizing worksheet(s).

TOUCHSTONE DEVELOPMENT

ASPIRE DMA EXHIBIT

Hydrologic Soil Group—San Diego County Area, California
(Aspire)

Map Scale: 1:921 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 10 20 40 60

Feet: 0 40 80 160 240

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
B/D
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:
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: San Diego County Area, California
Survey Area Data: Version 13, Sep 12, 2018

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

Date(s) aerial images were photographed: Nov 3, 2014—Nov 22, 2014

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

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
PeC	Placentia sandy loam, 2 to 9 percent slopes, warm MAAT, MLRA 19	C	1.6	100.0%
Totals for Area of Interest			**1.6**	**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

E.12 BF-1 Biofiltration

Location: 43rd Street and Logan Avenue, San Diego, California

MS4 Permit Category
Biofiltration

Manual Category
Biofiltration

Applicable Performance Standard
Pollutant Control
Flow Control

Primary Benefits
Treatment
Volume Reduction (Incidental)
Peak Flow Attenuation (Optional)

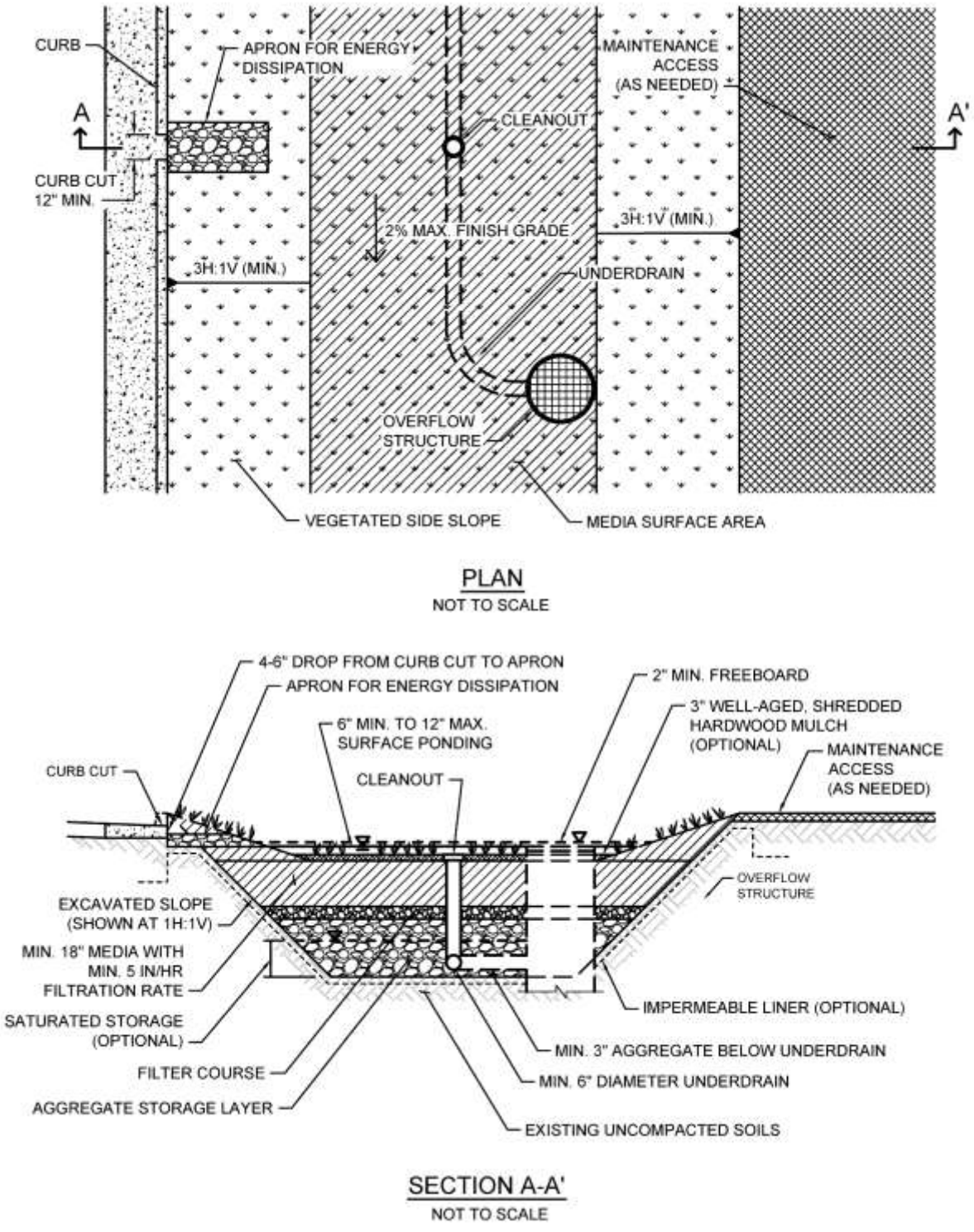
Description

Biofiltration (Bioretention with underdrain) facilities are vegetated surface water systems that filter water through vegetation, and soil or engineered media prior to discharge via underdrain or overflow to the downstream conveyance system. Bioretention with underdrain facilities are commonly incorporated into the site within parking lot landscaping, along roadsides, and in open spaces. Because these types of facilities have limited or no infiltration, they are typically designed to provide enough hydraulic head to move flows through the underdrain connection to the storm drain system. Treatment is achieved through filtration, sedimentation, sorption, biochemical processes and plant uptake.

Typical bioretention with underdrain components include:

- Inflow distribution mechanisms (e.g, perimeter flow spreader or filter strips)
- Energy dissipation mechanism for concentrated inflows (e.g., splash blocks or riprap)
- Shallow surface ponding for captured flows
- Side slope and basin bottom vegetation selected based on expected climate and ponding depth
- Non-floating mulch layer (Optional)
- Media layer (planting mix or engineered media) capable of supporting vegetation growth
- Filter course layer consisting of aggregate to prevent the migration of fines into uncompacted native soils or the aggregate storage layer
- Aggregate storage layer with underdrain(s)
- Impermeable liner or uncompacted native soils at the bottom of the facility

- Overflow structure



Typical plan and Section view of a Biofiltration BMP

Design Adaptations for Project Goals

Biofiltration Treatment BMP for storm water pollutant control. The system is lined or un-lined to provide incidental infiltration, and an underdrain is provided at the bottom to carry away filtered runoff. This configuration is considered to provide biofiltration treatment via flow through the media layer. Storage provided above the underdrain within surface ponding, media, and aggregate storage is considered included in the biofiltration treatment volume. Saturated storage within the aggregate storage layer can be added to this design by raising the underdrain above the bottom of the aggregate storage layer or via an internal weir structure designed to maintain a specific water level elevation.

Integrated storm water flow control and pollutant control configuration. The system can be designed to provide flow rate and duration control by primarily providing increased surface ponding and/or having a deeper aggregate storage layer above the underdrain. This will allow for significant detention storage, which can be controlled via inclusion of an outlet structure at the downstream end of the underdrain.

Design Criteria and Considerations

Bioretention with underdrain must meet the following design criteria. Deviations from the below criteria may be approved at the discretion of the [City Engineer] if it is determined to be appropriate:

	Siting and Design	*Intent/Rationale*
☐	Placement observes geotechnical recommendations regarding potential hazards (e.g., slope stability, landslides, liquefaction zones) and setbacks (e.g., slopes, foundations, utilities).	Must not negatively impact existing site geotechnical concerns.
☐	An impermeable liner or other hydraulic restriction layer is included if site constraints indicate that infiltration or lateral flows should not be allowed.	Lining prevents storm water from impacting groundwater and/or sensitive environmental or geotechnical features. Incidental infiltration, when allowable, can aid in pollutant removal and groundwater recharge.
☐	Contributing tributary area shall be ≤ 5 acres (≤ 1 acre preferred).	Bigger BMPs require additional design features for proper performance. Contributing tributary area greater than 5 acres may be allowed at the discretion of the [City Engineer} if the following conditions are met: 1) incorporate design features (e.g. flow spreaders) to

Siting and Design		*Intent/Rationale*
		minimizing short circuiting of flows in the BMP and 2) incorporate additional design features requested by the [City Engineer] for proper performance of the regional BMP.
☐	Finish grade of the facility is ≤ 2%.	Flatter surfaces reduce erosion and channelization within the facility.
Surface Ponding		
☐	Surface ponding is limited to a 24-hour drawdown time.	Surface ponding limited to 24 hours for plant health. Surface ponding drawdown time greater than 24-hours but less than 96 hours may be allowed at the discretion of the [City Engineer] if certified by a landscape architect or agronomist.
☐	Surface ponding depth is ≥ 6 and ≤ 12 inches.	Surface ponding capacity lowers subsurface storage requirements. Deep surface ponding raises safety concerns. Surface ponding depth greater than 12 inches (for additional pollutant control or surface outlet structures or flow-control orifices) may be allowed at the discretion of the [City Engineer] if the following conditions are met: 1) surface ponding depth drawdown time is less than 24 hours; and 2) safety issues and fencing requirements are considered (typically ponding greater than 18" will require a fence and/or flatter side slopes) and 3) potential for elevated clogging risk is considered.
☐	A minimum of 12 inches of freeboard is provided.	Freeboard provides room for head over overflow structures and minimizes risk of uncontrolled surface discharge.
☐	Side slopes are stabilized with vegetation and are = 3H:1V or shallower.	Gentler side slopes are safer, less prone to erosion, able to establish vegetation more quickly and easier to maintain.
Vegetation		

	Siting and Design	***Intent/Rationale***
☐	Plantings are suitable for the climate and expected ponding depth. A plant list to aid in selection can be found in Appendix E.20.	Plants suited to the climate and ponding depth are more likely to survive.
☐	An irrigation system with a connection to water supply should be provided as needed.	Seasonal irrigation might be needed to keep plants healthy.
	Mulch (Optional or Mandatory – Dependent on jurisdiction)	
☐	A minimum of 3 inches of well-aged, shredded hardwood mulch that has been stockpiled or stored for at least 12 months is provided.	Mulch will suppress weeds and maintain moisture for plant growth. Aging mulch kills pathogens and weed seeds and allows the beneficial microbes to multiply.
	Media Layer	
☐	Media maintains a minimum filtration rate of 5 in/hr over lifetime of facility. An initial filtration rate of 8 to 12 in/hr is recommended to allow for clogging over time; the initial filtration rate should not exceed 12 inches per hour.	A filtration rate of at least 5 inches per hour allows soil to drain between events. The initial rate should be higher than long term target rate to account for clogging over time. However an excessively high initial rate can have a negative impact on treatment performance, therefore an upper limit is needed.
☐	Media is a minimum 18 inches deep, meeting either of these two media specifications: City of San Diego Storm Water Standards Appendix F (February 2016, unless superseded by more recent edition) **or** County of San Diego Low Impact Development Handbook: Appendix G -Bioretention Soil Specification (June 2014, unless superseded by more recent edition). Alternatively, for proprietary designs and custom media mixes not meeting the media specifications contained in the 2016 City Storm Water Standards or County LID Manual, the media meets the pollutant treatment performance criteria in Section F.1.	A deep media layer provides additional filtration and supports plants with deeper roots. Standard specifications shall be followed. For non-standard or proprietary designs, compliance with F.1 ensures that adequate treatment performance will be provided.
☐	Media surface area is 3% of contributing area times adjusted runoff factor or greater. Unless	Greater surface area to tributary area ratios: a) maximizes volume retention as

Siting and Design		*Intent/Rationale*
	demonstrated that the BMP surface area can be smaller than 3%.	required by the MS4 Permit and b) decrease loading rates per square foot and therefore increase longevity. Adjusted runoff factor is to account for site design BMPs implemented upstream of the BMP (such as rain barrels, impervious area dispersion, etc.). Refer to Appendix B.2 guidance. Use Worksheet B.5-1 Line 26 to estimate the minimum surface area required per this criteria.
☐	Where receiving waters are impaired or have a TMDL for nutrients, the system is designed with nutrient sensitive media design (see fact sheet BF-2).	Potential for pollutant export is partly a function of media composition; media design must minimize potential for export of nutrients, particularly where receiving waters are impaired for nutrients.
Filter Course Layer		
☐	A filter course is used to prevent migration of fines through layers of the facility. Filter fabric is not used.	Migration of media can cause clogging of the aggregate storage layer void spaces or subgrade. Filter fabric is more likely to clog.
☐	Filter course is washed and free of fines.	Washing aggregate will help eliminate fines that could clog the facility and impede infiltration.
☐	Filter course calculations assessing suitability for particle migration prevention have been completed.	Gradation relationship between layers can evaluate factors (e.g., bridging, permeability, and uniformity) to determine if particle sizing is appropriate or if an intermediate layer is needed.
Aggregate Storage Layer		
☐	Class 2 Permeable per Caltrans specification 68-1.025 is recommended for the storage layer. Washed, open-graded crushed rock may be used, however a 4-6 inch washed pea gravel filter course layer at the top of the crushed rock is required.	Washing aggregate will help eliminate fines that could clog the aggregate storage layer void spaces or subgrade.

Siting and Design		*Intent/Rationale*
☐	The depth of aggregate provided (12-inch typical) and storage layer configuration is adequate for providing conveyance for underdrain flows to the outlet structure.	Proper storage layer configuration and underdrain placement will minimize facility drawdown time.
Inflow, Underdrain, and Outflow Structures		
☐	Inflow, underdrains and outflow structures are accessible for inspection and maintenance.	Maintenance will prevent clogging and ensure proper operation of the flow control structures.
☐	Inflow velocities are limited to 3 ft/s or less or use energy dissipation methods. (e.g., riprap, level spreader) for concentrated inflows.	High inflow velocities can cause erosion, scour and/or channeling.
☐	Curb cut inlets are at least 12 inches wide, have a 4-6 inch reveal (drop) and an apron and energy dissipation as needed.	Inlets must not restrict flow and apron prevents blockage from vegetation as it grows in. Energy dissipation prevents erosion.
☐	Underdrain outlet elevation should be a minimum of 3 inches above the bottom elevation of the aggregate storage layer.	A minimal separation from subgrade or the liner lessens the risk of fines entering the underdrain and can improve hydraulic performance by allowing perforations to remain unblocked.
☐	Minimum underdrain diameter is 6 inches.	Smaller diameter underdrains are prone to clogging.
☐	Underdrains are made of slotted, PVC pipe conforming to ASTM D 3034 or equivalent or corrugated, HDPE pipe conforming to AASHTO 252M or equivalent.	Slotted underdrains provide greater intake capacity, clog resistant drainage, and reduced entrance velocity into the pipe, thereby reducing the chances of solids migration.
☐	An underdrain cleanout with a minimum 6-inch diameter and lockable cap is placed every 250 to 300 feet as required based on underdrain length.	Properly spaced cleanouts will facilitate underdrain maintenance.
☐	Overflow is safely conveyed to a downstream storm drain system or discharge point Size overflow structure to pass 100-year peak flow for on-line infiltration basins and water quality peak flow for off-line basins.	Planning for overflow lessens the risk of property damage due to flooding.

Conceptual Design and Sizing Approach for Storm Water Pollutant Control Only

To design bioretention with underdrain for storm water pollutant control only (no flow control required), the following steps should be taken:

1. Verify that siting and design criteria have been met, including placement requirements, contributing tributary area, maximum side and finish grade slopes, and the recommended media surface area tributary ratio.
2. Calculate the DCV per Appendix B based on expected site design runoff for tributary areas.
3. Use the sizing worksheet presented in Appendix B.5 to size biofiltration BMPs.

Conceptual Design and Sizing Approach when Storm Water Flow Control is Applicable

Control of flow rates and/or durations will typically require significant surface ponding and/or aggregate storage volumes, and therefore the following steps should be taken prior to determination of storm water pollutant control design. Pre-development and allowable post-project flow rates and durations should be determined as discussed in Chapter 6 of the manual.

1. Verify that siting and design criteria have been met, including placement requirements, contributing tributary area, maximum side and finish grade slopes, and the recommended media surface area tributary ratio.
2. Iteratively determine the facility footprint area, surface ponding and/or aggregate storage layer depth required to provide detention storage to reduce flow rates and durations to allowable limits. Flow rates and durations can be controlled from detention storage by altering outlet structure orifice size(s) and/or water control levels. Multi-level orifices can be used within an outlet structure to control the full range of flows.
3. If bioretention with underdrain cannot fully provide the flow rate and duration control required by this manual, an upstream or downstream structure with significant storage volume such as an underground vault can be used to provide remaining controls.
4. After bioretention with underdrain has been designed to meet flow control requirements, calculations must be completed to verify if storm water pollutant control requirements to treat the DCV have been met.

E.13 BF-2 Nutrient Sensitive Media Design

Some studies of bioretention with underdrains have observed export of nutrients, particularly inorganic nitrogen (nitrate and nitrite) and dissolved phosphorus. This has been observed to be a short-lived phenomenon in some studies or a long term issue in some studies. The composition of the soil media, including the chemistry of individual elements is believed to be an important factor in the potential for nutrient export. Organic amendments, often compost, have been identified as the most likely source of nutrient export. The quality and stability of organic amendments can vary widely.

The biofiltration media specifications contained in the County of San Diego Low Impact Development Handbook: Appendix G -Bioretention Soil Specification (June 2014, unless superseded by more recent edition) and the City of San Diego Low Impact Development Design Manual (page B-18) (July 2011, unless superseded by more recent edition) were developed with consideration of the potential for nutrient export. These specifications include criteria for individual component characteristics and quality in order to control the overall quality of the blended mixes. As of the publication of this manual, the June 2014 County of San Diego specifications provide more detail regarding mix design and quality control.

The City and County specifications noted above were developed for general purposes to meet permeability and treatment goals. In cases where the BMP discharges to receiving waters with nutrient impairments or nutrient TMDLs, the biofiltration media should be designed with the specific goal of minimizing the potential for export of nutrients from the media. Therefore, in addition to adhering to the City or County media specifications, the following guidelines should be followed:

1. Select plant palette to minimize plant nutrient needs

A landscape architect or agronomist should be consulted to select a plant palette that minimizes nutrient needs. Utilizing plants with low nutrient needs results in less need to enrich the biofiltration soil mix. If nutrient quantity is then tailored to plants with lower nutrient needs, these plants will generally have less competition from weeds, which typically need higher nutrient content. The following practices are recommended to minimize nutrient needs of the plant palette:

- **Utilize native, drought-tolerant plants and grasses where possible.** Native plants generally have a broader tolerance for nutrient content, and can be longer lived in leaner/lower nutrient soils.

- **Start plants from smaller starts or seed.** Younger plants are generally more tolerant of lower nutrient levels and tend to help develop soil structure as they grow. Given the lower cost of smaller plants, the project should be able to accept a plant mortality rate that is somewhat higher than starting from larger plants and providing high organic content.

2. Minimize excess nutrients in media mix

Once the low-nutrient plant palette is established (item 1), the landscape architect and/or agronomist should be consulted to assist in the design of a biofiltration media to balance the interests of plant establishment, water retention capacity (irrigation demand), and the potential for nutrient export. The following guidelines should be followed:

- **The mix should not exceed the nutrient needs of plants.** In conventional landscape design, the nutrient needs of plants are often exceeded intentionally in order to provide a factor of safety for plant survival. This practice must be avoided in biofiltration media as excess nutrients will increase the chance of export. The mix designer should keep in mind that nutrients can be added later (through mulching, tilling of amendments into the surface), but it is not possible to remove nutrients, once added.

- **The actual nutrient content and organic content of the selected organic amendment source should be determined when specifying mix proportions.** Nutrient content (i.e., C:N ratio; plant extractable nutrients) and organic content (i.e, % organic material) are relatively inexpensive to measure via standard agronomic methods and can provide important information about mix design. If mix design relies on approximate assumption about nutrient/organic content and this is not confirmed with testing (or the results of prior representative testing), it is possible that the mix could contain much more nutrient than intended.

- **Nutrients are better retained in soils with higher cation exchange capacity.** Cation exchange capacity can be increased through selection of organic material with naturally high cation exchange capacity, such as peat or coconut coir pith, and/or selection of inorganic material with high cation exchange capacity such as some sands or engineered minerals (e.g., low P-index sands, zeolites, rhyolites, etc). Including higher cation exchange capacity materials would tend to reduce the net export of nutrients. Natural silty materials also provide cation exchange capacity; however potential impacts to permeability need to be considered.

- **Focus on soil structure as well as nutrient content.** Soil structure is loosely defined as the ability of the soil to conduct and store water and nutrients as well as the degree of aeration of the soil. Soil structure can be more important than nutrient content in plant survival and biologic health of the system. If a good soil structure can be created with very low amounts of organic amendment, plants survivability should still be provided. While soil structure generally develops with time, biofiltration media can be designed to promote earlier development of soil structure. Soil structure is enhanced by the use of amendments with high humus content (as found in well-aged organic material). In addition, soil structure can be enhanced through the use of organic material with a distribution of particle sizes (i.e., a more heterogeneous mix).

- **Consider alternatives to compost.** Compost, by nature, is a material that is continually evolving and decaying. It can be challenging to determine whether tests previously done on a given compost stock are still representative. It can also be challenging to determine how the

properties of the compost will change once placed in the media bed. More stable materials such as aged coco coir pith, peat, biochar, shredded bark, and/or other amendments should be considered.

With these considerations, it is anticipated that less than 10 percent organic amendment by volume could be used, while still balancing plant survivability and water retention. If compost is used, designers should strongly consider utilizing less than 10 percent by volume.

3. Design with partial retention and/or internal water storage

An internal water storage zone, as described in Fact Sheet PR-1 is believed to improve retention of nutrients. For lined systems, an internal water storage zone worked by providing a zone that fluctuates between aerobic and anaerobic conditions, resulting in nitrification/denitrification. In soils that will allow infiltration, a partial retention design (PR-1) allows significant volume reduction and can also promote nitrification/denitrification.

Acknowledgment: This fact sheet has been adapted from the Orange County Technical Guidance Document (May 2011). It was originally developed based on input from: Deborah Deets, City of Los Angeles Bureau of Sanitation, Drew Ready, Center for Watershed Health, Rick Fisher, ASLA, City of Los Angeles Bureau of Engineering, Dr. Garn Wallace, Wallace Laboratories, Glen Dake, GDML, and Jason Schmidt, Tree People. The guidance provided herein does not reflect the individual opinions of any individual listed above and should not be cited or otherwise attributed to those listed.

ATTACHMENT 2

BACKUP FOR PDP HYDROMODIFICATION CONTROL MEASURES

This is the cover sheet for Attachment 2.

☒Mark this box if this attachment is empty because the project is exempt from PDP hydromodification management requirements.

Indicate which Items are Included behind this cover sheet:

Attachment Sequence	**Contents**	**Checklist**
Attachment 2a	Flow Control Facility Design, including Structural BMP Drawdown Calculations and Overflow Design Summary (Required) See Chapter 6 and Appendix G of the Storm Water Design Manual	☐Included ☐Submitted as separate stand-alone document
Attachment 2b	Hydromodification Management Exhibit (Required)	☐Included See Hydromodification Management Exhibit Checklist on the back of this Attachment cover sheet.
Attachment 2c	Management of Critical Coarse Sediment Yield Areas See Section 6.2 and Appendix H of the Storm Water Design Manual.	☐Exhibit depicting onsite and/or upstream sources of critical coarse sediment as mapped in the WMAA AND, ☐Demonstration that the project effectively avoids and bypasses sources of mapped critical coarse sediment OR, ☐Demonstration that project does not generate a net impact on the receiving water.
Attachment 2d	Geomorphic Assessment of Receiving Channels (Optional) See Section 6.3.4 of the Storm Water Design Manual.	☐Not performed ☐Included ☐Submitted as separate stand-alone document
Attachment 2e	Vector Control Plan (Required when structural BMPs will not drain in 96 hours)	☐Included ☐Not required because BMPs will drain in less than 96 hours

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Use this checklist to ensure the required information has been included on the Hydromodification Management Exhibit:

The Hydromodification Management Exhibit must identify:

- ☐Underlying hydrologic soil group
- ☐Approximate depth to groundwater
- ☐Existing natural hydrologic features (watercourses, seeps, springs, wetlands)
- ☐Critical coarse sediment yield areas to be protected
- ☐Existing topography
- ☐Existing and proposed site drainage network and connections to drainage offsite
- ☐Proposed grading
- ☐Proposed impervious features
- ☐Proposed design features and surface treatments used to minimize imperviousness
- ☐Point(s) of Compliance (POC) for Hydromodification Management
- ☐Existing and proposed drainage boundary and drainage area to each POC (when necessary, create separate exhibits for pre-development and post-project conditions)
- ☐Structural BMPs for hydromodification management (identify location, type of BMP, and size/detail)

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Factsheet for the proposed Hydromodification Exemption for Escondido Creek

What is hydromodification?

It is the process by which water modifies the land, specifically in creeks, rivers and other drainages.

What causes hydromodification?

Development can change the storm water runoff characteristics of the land. Adding hardscape (concrete, asphalt) can increase the volume and rate of runoff from the land. This can result in greater erosive forces in the drainages downstream. This can result in changes in the shape and size (depth, width, gradient) of the channel downstream.

Why is hydromodification a problem?

Erosive conditions in the channel are disruptive to the health of the river habitat. Suspended sediment disturbed by erosion causes cloudy water and can impact aquatic bugs and fish. Plants up to and including trees can be washed away or buried. The amount and diversity of living things in the channel is reduced.

What is being done about this?

To prevent this from occurring most development and redevelopment project designs need to include measures to hold water onsite and release it at a rate as if there was no development at the site. This typically requires the use of large basins or underground tanks on the development. Areas where hydromodification has been shown to be unlikely to occur have been exempted from these requirements, including Otay River, San Luis Rey River, Forester Creek, San Diego River; and Buena Vista, Agua Hedionda and Batiquitos Lagoons.

What is Escondido Creek?

Escondido Creek is a subwatershed within the Carlsbad Watershed Management Area. Escondido Creek runs from north-east San Diego County westward discharging into San Elijo Lagoon and eventually the Pacific Ocean. The study applied to the Escondido Creek downstream of the concrete channel in Escondido to its discharge point into the lagoon.

Why was an exemption not already made for Escondido Creek?

The studies, modeling and analysis required to obtain an exemption is rigorous and expensive. The justification for some exemptions (concrete-lined creek going all the way to the ocean) is more obvious than others. Due to the unique conditions of Escondido Creek it was decided that further study would be beneficial to assess whether there is a potential for impacts from hydromodification. Only when the required studies were completed, could an exemption even be considered.

Will removing hydromodification requirements for direct discharges to Escondido Creek negatively impact downstream water bodies?

No, the sediment transport model developed for Escondido Creek shows the downstream segment to be depositional (accumulating sediment which is the opposite of eroding). The modelling results are consistent with the current problematic condition of sediment deposition and long-term siltation in San Elijo Lagoon. Since continued deposition is predicted, hydromodification impacts are not anticipated in the downstream receiving bodies. In addition, artificially lowering flowrates to downstream receiving water bodies (by implementing hydromodification controls where they are not needed) may increase siltation in the lagoon.

In fact, artificially lowering flowrates to downstream receiving water bodies (by implementing hydromodification controls where they are not needed) is likely to increase siltation in the lagoon.

ESCONDIDO
City of Choice

Factsheet for the proposed Hydromodification Exemption for Escondido Creek

Who benefits from this?

The whole community benefits. If we want to see redevelopment within Escondido, and promote projects to counteract urban sprawl, then removing this exemption eliminates a barrier to regeneration within the area. Regeneration allows new housing, businesses and facilities to develop here, improving everyone's quality of life. Redevelopment can also improve water quality, supportive of our watershed goal to improve riparian habitat, as it implements pollution treatment measures (retention and bioretention) that do not exist on older developed properties. The creek additionally benefits by not creating imbalance downstream by artificially reducing flow rates, as that could potentially be harmful.

Where does this exemption apply?

This exemption only applies to developments that directly discharge to Escondido Creek within and downstream of the concrete-lined channel. That means it discharges through a pipe or concrete-lined channel. For example, this would apply to land already developed within Escondido, close to the creek.

Development that connects to an earthen channel, however short, will not benefit. Typically resource agencies (Army Corps, etc) discourage concrete-lined channels to be installed in natural drainages, so this will not encourage the construction of more concrete-lined channels. If approved, the Watershed Management Area Analysis of the Water Quality Improvement Plan (http://www.projectcleanwater.org/carlsbad-water-quality-improvement-plan/) would be updated to include the exemption analysis.

Will this Allow Pollution from New Development and Redevelopment?

No, the exemption only applies to hydromodification controls. Applicable requirements for site design low impact development features, source control and pollutant control (retention or bioretention) will still be required. These will treat pollution.

Will this stop future changes to the concrete channel in Escondido?

No, any changes to the channel (such as the removal of areas of concrete and other projects) would need to design for the volume and flowrate of the creek in the flood condition. Therefore whether it is concrete or earthen, the channel would still function in the same way in terms of flood control. Eliminating the hydromodification component would simplify the evaluation of Alternative Compliance projects, such as creek restoration projects, thereby removing a barrier to their implementation.

To Comment on this Proposed Hydromodification Exemption:

Go to **http://www.projectcleanwater.org/event/carlsbad-wma-consultation-panel-escondido-creek-hydromodification-exemption/** to download a copy of the exemption applicability study.

After your review of the study, please submit comments in writing to water@escondido.org by **August 25th at 5pm** (please note that our system can accept emails of less than 5 MB only).

Thank you for your interest!

ESCONDIDO
City of Choice

ATTACHMENT 3

Structural BMP Maintenance Information

This is the cover sheet for Attachment 3.

Indicate which Items are Included behind this cover sheet:

Attachment Sequence	Contents	Checklist
Attachment 3a	Structural BMP Maintenance Plan (Required)	☒Included See Structural BMP Maintenance Information Checklist on the back of this Attachment cover sheet.
Attachment 3b	Draft Storm Water Control Facilities Maintenance Agreement (SWCFMA) (when applicable)	☒Included ☐Not Applicable

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Use this checklist to ensure the required information has been included in the Structural BMP Maintenance Information Attachment:

Attachment 3a must identify:

- ☐Specific maintenance indicators and actions for proposed structural BMP(s). This must be based on Section 7.7 of the Storm Water Design Manual and enhanced to reflect actual proposed components of the structural BMP(s)
- ☐How to access the structural BMP(s) to inspect and perform maintenance
- ☐Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
- ☐Manufacturer and part number for proprietary parts of structural BMP(s) when applicable
- ☐Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)
- ☐Recommended equipment to perform maintenance
- ☐When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management

Attachment 3b: For all Structural BMPs, Attachment 3b must include a draft maintenance agreement in the City's standard format (PDP applicant to contact City staff to obtain the current maintenance agreement forms or download from City's website).

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Attachment 3a

Maintenance Indicators and Actions

Maintenance shall be per “Summary of Standard Inspection and Maintenance for BF-1 Biofiltration” provided in the following sheet.

Accessibility to Structural BMPs

Maintenance crews to access the biolfiltration basins in outdoor courtyard and street level.

Inspection Facilitation Features

Cleanouts at the upstream end of the biofiltration basins and Area Drains at the downstream end are provided for each biofiltration basin.

Responsible Party for Maintenance and Funding Mechanism

Structural BMPs will be the responsibility of the developer up until a Homeowner Association is established. The Homeowner Association will charge homeowners a monthly fee for the upkeep of the project which includes maintenance of the Structural BMPs.

FREE RECORDING REQUESTED
PURSUANT TO GOVERNMENT
CODE SECTION 27383
RECORDING REQUESTED BY:

CITY OF ESCONDIDO

WHEN RECORDED MAIL TO:

CITY ENGINEER
CITY OF ESCONDIDO
201 N. BROADWAY
ESCONDIDO, CA 92025

(SPACE ABOVE FOR RECORDER'S USE ONLY)

Documentary Transfer Tax $_____
Signature _____

STORM WATER CONTROL FACILITY MAINTENANCE AGREEMENT
APN NO. 229-421-26

THIS AGREEMENT for the design, construction, maintenance and repair of the Storm Water Control Facilities (SWCF(s)), installed on the property as identified in the San Diego County Assessor Tax Roll for 20__, as APN No. 229-421-26, and commonly known as _____, Escondido, California, ("Property") is entered into between the **CITY OF ESCONDIDO**, a municipal corporation ("CITY") and _____**,** Developer and/or Property Owner ("LOT OWNER(s)"), and in accordance with the CITY of Escondido Grading Plan No. GP__-_____ ("Grading Plan"). ("Agreement")

WHEREAS, installation and maintenance of Storm Water Control Facilities is required pursuant to the Escondido Municipal Code, the California Regional Water Quality Control Board ("RWQCB") and by the CITY as a condition of approval of property development; and

WHEREAS, LOT OWNER(s) is the owner of certain real property being developed that provides benefit to the general public and the CITY and meets the requirements of the California RWQCB Order R9-2013-0001 and National Pollution Discharge Elimination System No. CAS0109266; and

WHEREAS, the current and future subdivision LOT OWNER(s) will use the SWCF(s) as installed per the Grading Plan and the provisions of the Storm Water Quality Management Plan ("Storm Water Plan") prepared by the LOT OWNER(s) and approved by the CITY on _____, 201_; and

WHEREAS, it is the mutual desire of the parties to this Agreement that the SWCF(s) be maintained in a safe and usable condition by the LOT OWNER(s); and

WHEREAS, it is the mutual desire of the parties to this Agreement to establish a method for the maintenance and repair of the SWCF(s); and

WHEREAS, the CITY shall have the right but not the obligation to enforce full compliance with the terms and conditions of this Agreement; and

WHEREAS, it is the mutual intention of the parties that this Agreement constitute a covenant running with the land, binding upon each successive LOT OWNER of all or any portion of the property.

NOW, THEREFORE, IT IS HEREBY AGREED AS FOLLOWS:

1. The Property is benefited by this Agreement, and present and successive LOT OWNER(s) of all or any portion of the property are expressly bound hereby for the benefit of the land. In the event any of the herein described parcels of land are subdivided further, the LOT OWNER(s), heirs, assigns and successors in interest of each such newly created parcel shall be liable under this Agreement for their then pro rata share of expenses and such pro rata shares of expenses shall be computed to reflect such newly created parcels.

2. The cost and expense of maintaining the SWCF(s) shall be the responsibility of and paid by the LOT OWNER(s) or their heirs, assigns and successors in interest. The SWCF(s) shall be constructed and maintained by the LOT OWNER(s) in accordance with the CITY- approved Grading Plan and Storm Water Plan, on file with the CITY.

3. Repair and maintenance responsibilities for all structural SWCF(s) and required Best Management Practices associated with the project are set forth in the Storm Water Plan. LOT OWNER(s) shall, as changes occur, provide the CITY with the name, title, and phone number the persons or entities responsible for maintenance and reporting activity, the persons or entities responsible for funding, schedules and procedures for inspection and maintenance of the SWCF(s) and implementation of worker training requirements, and any other activities necessary to ensure BMP maintenance. The Storm Water Plan shall provide for the servicing of all SWCF(s) as needed and at least once during August or September of each year, and for the retention of inspection and maintenance records for at least three (3) years. LOT OWNER(s) shall submit annual certification to the CITY's Department of Engineering Services between September 1 and October 1 of each year until the property is redeveloped. The certification shall document all maintenance performed and compliance with applicable permits.

4. CITY shall have the right to inspect the SWCF(s) and records as needed to ensure the SWCF(s) are being properly maintained.

5. Should any LOT OWNER(s) fail to pay their share of costs and expenses as required to use, maintain or repair the SWCF(s) in this Agreement, then the CITY or any other LOT OWNER shall be entitled without further notice to institute legal action for the collection of funds advanced on behalf of the LOT OWNER who did not pay their share of costs and expenses and shall be entitled to recover in such action in addition to the funds advanced, interest thereon at the current prime rate of interest, until paid, all costs and disbursements of such action, including such sum or sums as the court may fix as and for a reasonable attorney's fees.

6. Any liability of the LOT OWNER(s) to any worker employed to make repairs or provide maintenance under this Agreement, or to third persons, as well as any liability of the LOT OWNER(s) for damage to the property of agent, or any such worker, or any third persons, as a result of or arising out of repairs and maintenance under this Agreement, shall be borne, as between the LOT OWNER(s) in the same percentages as they bear the costs and expenses of such repairs and maintenance. Each LOT OWNER shall be responsible for and maintain his own insurance, if any. By this Agreement, the parties do not intend to provide for the sharing of liability with respect to

personal injury or property damage other than that attributable to the repairs and maintenance undertaken under this Agreement. Each of the LOT OWNER(s) agrees to indemnify the others from any and all liability for injury to him or damage to their property when such injury or damage results from, arises out of, or is attributable to any maintenance or repairs undertaken pursuant to this Agreement.

7. CITY Indemnification.

a) To the fullest extent permitted by law, LOT OWNER(s) shall jointly and severally indemnify, defend with legal counsel reasonably satisfactory to the CITY, and hold harmless the CITY and the CITY's officers, directors, employees, and council members (hereinafter referred to as "Indemnitees") from all actions, fines, sanctions, levies, penalties, orders and assessments of any kind harmless against any and all liability, loss, damage, fine, penalty, expense, claim, or cost (including without limitation costs and fees of litigation) of every nature (collectively referred to as "RWQCB Orders") that may arise out of or relate to LOT OWNER(s)'s obligations for implementation of storm water management in accordance with the RWQCB Order R9-2013-0001 and subsequent amendments, including any reasonable attorney's fees, costs and expenses incurred by the Indemnitees in responding to any RWQCB Orders arising out of or relating to implementation of storm water management. LOT OWNER(s) obligations shall include but not be limited to design, construction, maintenance and required documentation of the maintenance activities related to all storm water treatment measures proposed for the project and included in the STORM WATER PLAN, approved _____, arising out of or in connection with this Agreement or its performance (including acts of omission) except for liability caused by the Indemnitiees' willful misconduct.

b) LOT OWNER(s) obligation to defend shall apply whether or not Indemnitees were negligent or otherwise at fault and whether or not the RWQCB's Orders have any merit. LOT OWNER(s) obligation to defend shall apply with full force and effect regardless of any concurrent negligence or fault by the Indemnitees, or any of them. However LOT OWNER(s) shall not be obligated under this Agreement to indemnify any Indemnitee after entry of a non-appealable final judgment after trial or award in a judicial proceeding for that portion of the final judgment that arises from the willful misconduct of that Indemnitee.

c) LOT OWNER(s) duty to defend the Indemnitees is separate, independent and free standing from LOT OWNER(s) duty to indemnify and hold harmless the Indemnitees. LOT OWNER(s) defense obligation shall arise immediately upon receipt by CITY or LOT OWNER(s) of any written Notice of Violation or equivalent notice of intent to levy any fines, penalties or sanctions against Indemnitees by the RWQCB or other enforcement agency, and shall continue until the entry of any final and non-appealable RWQCB or other enforcement orders.

d) LOT OWNER(s) obligation to indemnify, defend and hold harmless shall be carried on to future property OWNERS and shall continue until the time that the site is redeveloped.

e) It is expressly understood and agreed that the foregoing provisions will survive termination of this Agreement, unless the property is properly redeveloped.

(f) The indemnity protections provided by this Agreement are not intended to exceed the indemnity available under applicable law. If the indemnity protections are found by a court to be unlawful in any way, the protection shall be curtailed or adjusted, but only to the minimum extent

required to conform to applicable law.

(g) Nothing in the Agreement, the specifications or other contract documents or CITY approval of the plans and specifications or inspection of the work is intended to include a review, inspection, acknowledgment of any responsibility for any such matter, and CITY, CITY's engineer, and their consultants, and each of their officials, directors, officers, employees and agents, shall have absolutely no responsibility or liability thereof.

8. If, in the CITY's sole judgment said SWCF(s) are not being maintained to standards set forth in paragraph 3 of this Agreement, the CITY may thereupon provide written notice to all LOT OWNER(s) to initiate repairs or construction within ninety (90) days. Upon failure to demonstrate good faith to make repairs or construction within ninety (90), the LOT OWNER(s) agree that the CITY may make all needed repairs to said SWCF(s) and/or construct SWCF(s) to meet the standards set forth in paragraph 3 and to then assess costs to all LOT OWNER(s) equally.

9. If the CITY elects to make necessary maintenance or repairs in accordance with this Agreement, said work shall be without warranty. Said repairs shall be accepted "as is" by the LOT OWNER(s) without any warranty of workmanship and be guaranteed and indemnified by them in accordance this Agreement.

10. The foregoing covenants shall run with the land and shall be deemed to be for the benefit of the land of each of the LOT OWNER(s) and each and every person who shall at any time own all or any portion of the property referred to herein.

11. It is understood and agreed that the covenants herein contained shall be binding on the heirs, executors, administrators, successors, and assigns of each of the LOT OWNER(s).

12. This Agreement shall be recorded and that all obligations created shall constitute a covenant running with the land and any subsequent purchaser of all or any portion thereof, by acceptance of delivery of a deed and/or conveyance regardless of form shall be deemed to have consented to and become bound by this Agreement.

13. The terms of this Agreement may be amended in writing upon majority approval of the LOT OWNER(s) and consent of the CITY.

14. This Agreement shall be governed by the laws of the State of California. In the event that any of the provisions of this Agreement are held to be unenforceable or invalid by any court of competent jurisdiction, the validity, and enforceability of the remaining provisions shall not be affected thereby.

SIGNATURE PAGE FOLLOWS ON PAGE 5:

SIGNATURE PAGE

LOT OWNER(s): XXXXXXX

_____
PRINT NAME AND TITLE

_____ _____
SIGNATURE DATE SIGNED

_____
PRINT NAME AND TITLE

_____ _____
SIGNATURE DATE SIGNED

_____
PRINT NAME AND TITLE

_____ _____
SIGNATURE DATE SIGNED

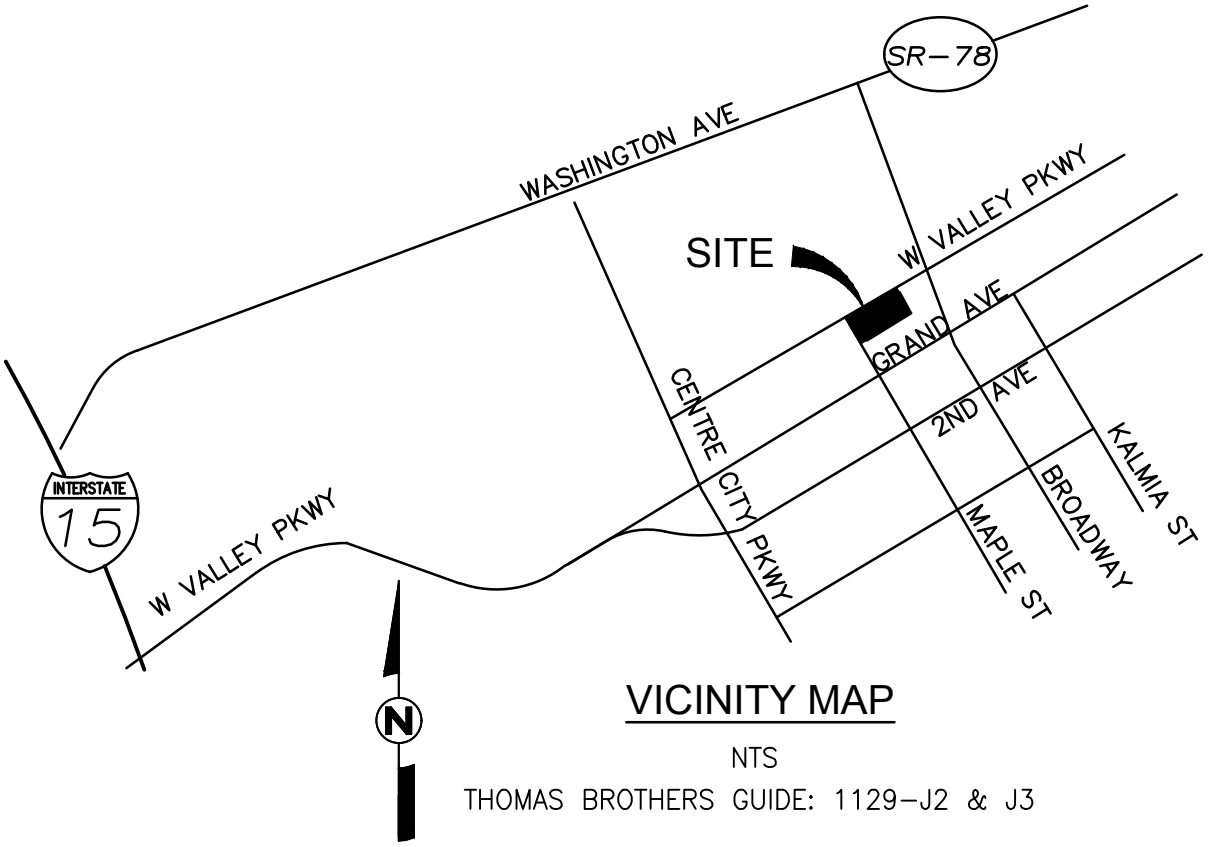
ATTACH CALIFORNIA ALL PURPOSE NOTARY ACKNOWLEDGMENT FOR ABOVE SIGNATURES

CITY OF ESCONDIDO,
a municipal Corporation

Date Signed: _____ By: _____
Director of Public Works / City Engineer

APPROVED AS TO FORM:
Michael McGuinness, City Attorney

By: _____



VICINITY MAP

NTS

THOMAS BROTHERS GUIDE: 1129-J2 & J3

EXHIBIT "A"
137 WEST VALLEY PARKWAY
STORM WATER CONTROL
FACILITY MAINTENANCE AGREEMENT

TOUCHSTONE DEVELOPMENT

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BMP DESCRIPTION		POST-CONSTRUCTION PERMANENT BMP OPERATION & MAINTENANCE PROCEDURE DETAILS[1]		
		O&M RESPONSIBLE PARTY DESIGNEE: PROPERTY OWNER		
		INSPECTION FREQUENCY	**MAINTENANCE FREQUENCY**	**MAINTENANCE METHOD**
SITE DESIGN	LANDSCAPED AREAS	MONTHLY (NOTE: INSPECTOR SHALL CHECK FOR THE FOLLOWING MAINTENANCE INDICATORS: EROSION IN THE FORM OF RILLS OR GULLIES, DEAD VEGETATION, BARE AREAS OR LESS THAN 70% VEGETATION, ANIMAL BURROWS, HOLES OR MOUNDS, AND TRASH.)	1. ROUTINE MOWING AND TRIMMING AND TRASH REMOVAL; MONTHLY. 2. NON-ROUTINE MAINTENANCE AS-NEEDED BASED ON MAINTENANCE INDICATORS.	1. FILL AND COMPACT AREAS OF RUTS, RILLS, OR GULLIES; 2. RE-SEED AND/OR PLANT SLOPES AND AREAS OF EXPOSED SOILS; AND 3. ROUTINE MOWING AND TRIMMING AND TRASH REMOVAL.
	OUTLET PROTECTION	1. MONTHLY; 2. WITHIN 24 HOURS AFTER EACH "SIGNIFICANT RAIN EVENT" [2] AND 3. WITHIN 24 HOURS FOLLOWING CONSTRUCTION IN IMMEDIATE AREA OF OUTLET PROTECTION	1. AS DETERMINED BY INSPECTION; 2. WHEN DISTURBED OR MISSING ROCKS (RIP RAP), OR SOIL EROSION BELOW AND/OR ADJACENT TO OUTLET PROTECTION ARE OBSERVED.	1. REMOVE TRASH, DEBRIS AND LEAVES. REPAIR ANY DAMAGE TO ROOF DRAINS; 2. IMMEDIATELY REPOSITION ALL DISPLACED ENERGY DISSIPATER; AND 3. IF SOIL EROSION IS FOUND, EXTEND ENERGY DISSIPATER (I.E. LANDSCAPE ROCKS AND/OR SPLASH PADS); REPOSITION OR INCREASE LIMITS OF ENERGY DISSIPATER TO FULLY COVER ERODED AREA.

EXHIBIT "B"
O.M.P. (TABLE FORMAT)
Aspire

BMP DESCRIPTION		POST-CONSTRUCTION PERMANENT BMP OPERATION & MAINTENANCE PROCEDURE DETAILS[1] O&M RESPONSIBLE PARTY DESIGNEE: PROPERTY OWNER		
		INSPECTION FREQUENCY	**MAINTENANCE FREQUENCY**	**MAINTENANCE METHOD**
SOURCE CONTROL	INTEGRATED PEST MANAGEMENT	TWICE A YEAR (ON OR BEFORE SEPTEMBER 30TH AND FOLLOWING THE RAINING SEASON AFTER MAY 1ST.)	WHEN THE PEST OR PESTS, OBSERVED IN GREATEST ABUNDANCE OR CAUSE THE MOST OBSERVED SYMPTOMS, ARE IDENTIFIED.	CHECK FREQUENTLY FOR PESTS, AND TREAT WITH A PESTICIDE ONLY WHEN A PEST IS PRESENT, ETC.
	EFFECTIVE IRRIGATION SYSTEM	MONTHLY	WHEN BROKEN SPRINKLER HEADS, RAIN SHUTOFF DEVICES, AND FLOW REDUCERS ARE OBSERVED; OR RUNNING SPRINKLERS IN RAIN ARE OBSERVED.	REPAIR OR REPLACE THE BROKEN AND/OR MALFUNCTIONING PARTS OF IRRIGATION SYSTEM.

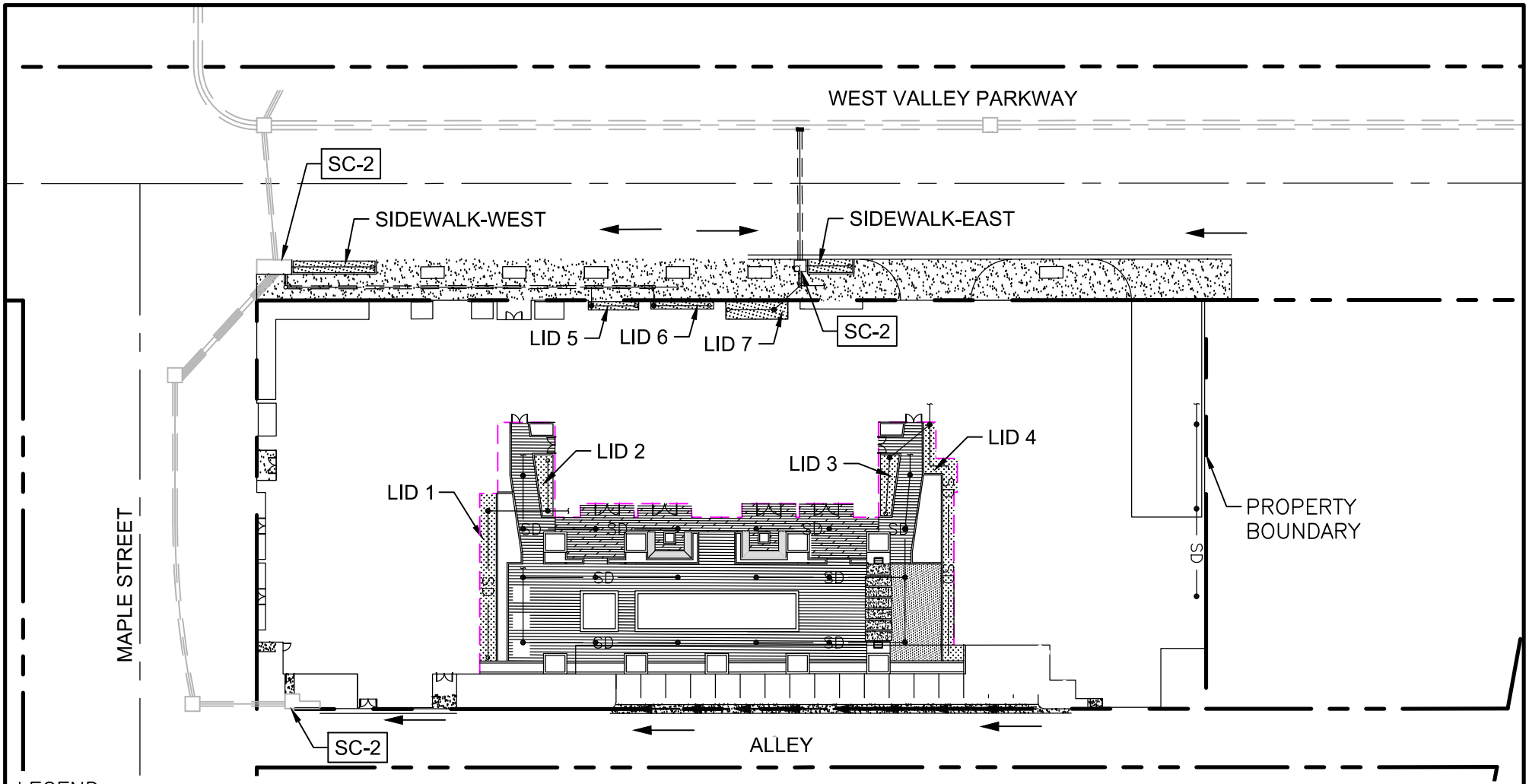
EXHIBIT "B"
O.M.P. (TABLE FORMAT)
Aspire
2 OF 4

BMP DESCRIPTION		POST-CONSTRUCTION PERMANENT BMP OPERATION & MAINTENANCE PROCEDURE DETAILS[1]		
		O&M RESPONSIBLE PARTY DESIGNEE: PROPERTY OWNER		
		INSPECTION FREQUENCY	MAINTENANCE FREQUENCY	MAINTENANCE METHOD
SOURCE CONTROL	TRASH STORAGE AREAS	WEEKLY	AS DETERMINED BY INSPECTION.	1. IF STANDING WATER IS OBSERVED IN THE AREA, DETERMINE THE WATER SOURCE AND REMOVE THE SOURCE. ALLOW STANDING WATER TO EVAPORATE. IF WATER DOES NOT EVAPORATE IN 48 HOURS, REDISTRIBUTE THE WATER TO LANDSCAPED AREA(S). DO NOT DRAIN WATER TO STORM DRAIN SYSTEM. 2. REMOVE AND PROPERLY DISPOSE LOOSE TRASH, DEBRIS, AND LEAKED OR SPILLED MATERIALS. USE APPROPRIATE SPILL CLEANUP MATERIAL AS NECESSARY TO REMOVE ALL LEAKED AND SPILLED MATERIALS INCLUDING MATERIALS ADHERED TO PAVEMENT. IDENTIFY AND REMOVE OR REPAIR THE SOURCE OF ANY LEAKED OR SPILLED MATERIALS. 3. REPAIR THE FOLLOWING AS APPLICABLE: GATE, WALL, BIN, LID OR ROOF AWNING (WHERE APPLICABLE), CRACKED OR COMPROMISED PAVING OR OTHER FLOOR SURFACE (AS APPLICABLE).

BMP DESCRIPTION		POST-CONSTRUCTION PERMANENT BMP OPERATION & MAINTENANCE PROCEDURE DETAILS[1]		
		O&M RESPONSIBLE PARTY DESIGNEE: PROPERTY OWNER		
		INSPECTION FREQUENCY	**MAINTENANCE FREQUENCY**	**MAINTENANCE METHOD**
SOURCE CONTROL	PREVENTIVE STENCILING AND SIGNAGE	ANNUALLY	WHEN FULLY OR PARTIALLY ERASED SIGNS ARE OBSERVED; WHEN DUMPING OF TRASH ARE OBSERVED AT PUBLIC ACCESS POINTS, BUILDING ENTRANCES, PUBLIC PARKS, ETC.	1. REPLACE OR REPAINT THE STENCILS AND SIGNAGE SO THAT THEY ARE LEGIBLE; AND 2. MAKE SURE THAT THEY ARE PLACED AT ALL REQUIRED LOCATIONS (I.E.- ALL INLETS).
TREATMENT CONTROL	BIOFILTRATION FACILITIES	TWICE A YEAR (ON OR BEFORE SEPTEMBER 30TH AND FOLLOWING THE RAINING SEASON AFTER MAY 1ST.) AND AFTER MAJOR STORM EVENTS	1. AS DETERMINED BY INSPECTION; AND 2. ON OR BEFORE SEPTEMBER 30TH AND FOLLOWING THE RAINY SEASON AFTER MAY 1ST.	1. REPLACE MULCH IN AREAS OF RUTS, RILLS, OR GULLIES; 2. RE-SEED AND/OR PLANT SLOPES AND AREAS OF EXPOSED SOILS; AND 3. ROUTINE MAINTENANCE TO REMOVE ACCUMULATED MATERIALS SUCH AS TRASH AND DEBRIS. 4. NON-ROUTINE MAINTENANCE WILL BE REQUIRED TO BACKWASH AND CLEAR UNDERDRAINS IF INSPECTION INDICATES UNDERDRAINS ARE CLOGGED. 5. DEPENDING ON POLLUTANT LOADS, SOILS MAY NEED TO BE REPLACED EVERY 5 TO 10 YEARS.

1. REFER TO THE STORM WATER QUALITY MANAGEMENT PLAN (SWQMP) FOR MORE SPECIFIC INFORMATION.
2. A SIGNIFICANT RAIN EVENT IS CONSIDERED WHENEVER THE NATIONAL WEATHER SERVICE REPORTS 0.50" OF RAIN IN 48 HOURS FOR THE LOCAL COMMUNITY.

EXHIBIT "B"
O.M.P. (TABLE FORMAT)
Aspire



LEGEND

PROPERTY BOUNDARY

PROPOSED BUILDING FOOTPRINT

STORM DRAIN

PROPOSED SUBDRAIN OR OUTDOOR DECK SD — SD — SD —

PROPOSED RAISED PLANTER OR ROADSIDE SWALE

SCALE: 1"=50'

SHOWN SOURCE CONTROL BMPs:

SC-2: PREVENTATIVE STENCILING OR SIGNAGE

EXHIBIT "C"
137 WEST VALLEY PARKWAY
STORM WATER CONTROL
FACILITY MAINTENANCE AGREEMENT

TOUCHSTONE DEVELOPMENT

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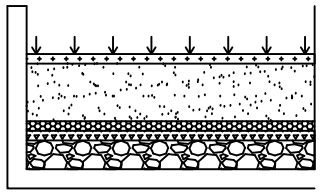
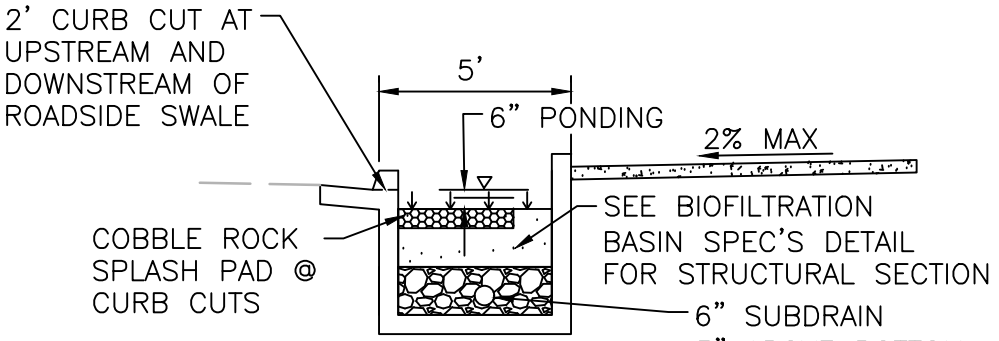


(1) 18" BSM CONSISTS OF THE FOLLOWING:
85–88 % WASHED SAND
8–12% FINES (SILT & CLAY)
3–5 % ORGANIC MATTER

3" FINELY GRADED HARDWOOD MULCH
18" BSM(1)
2" WASHED ASTM C–33 CONCRETE SAND
2" WASHED NO. 8 STONE
11" MIN. WASHED NO.57 DRAINAGE STONE

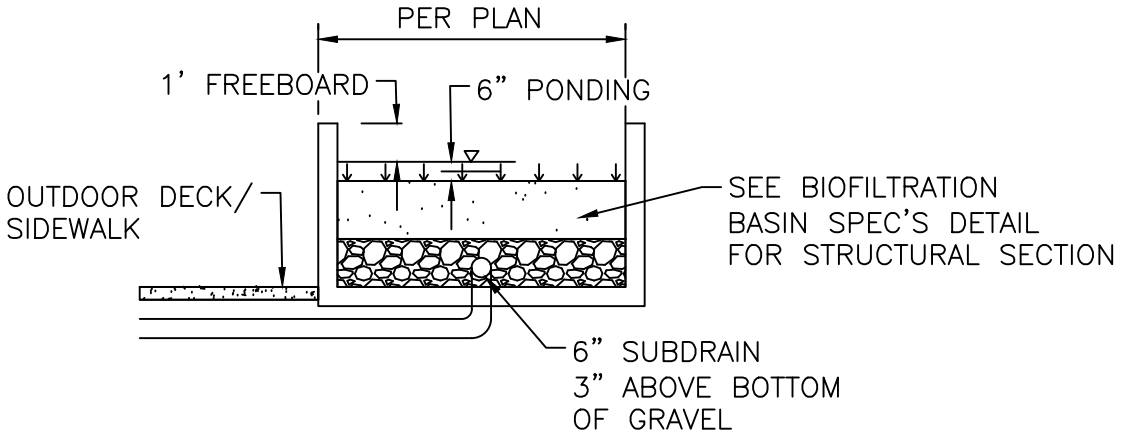
BIOFILTRATION BASIN SPEC'S

SCALE:1"=5'



ROADSIDE SWALE

SCALE:1"=5'



RAISED PLANTER

SCALE:1"=5'

EXHIBIT "D"
137 WEST VALLEY PARKWAY
STORM WATER CONTROL
FACILITY MAINTENANCE AGREEMENT

TOUCHSTONE DEVELOPMENT

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RAISED PLANTER/ROADSIDE SWALE DATA							
BIOFILTRATION BASIN DESIGNATION	BASIN ELEVATION	TOP OF GRATE	PONDING DEPTH SURFACE AREA (FT^2)	PONDING DEPTH (IN)	SOIL MEDIA DEPTH (IN)	GRAVEL DEPTH ABOVE SUBDRAIN INVERT (IN)	LOW FLOW ORIFICE (IN)
LID 1	667.2	667.7	325	6"	18"	12"	0.5"
LID 2	667.2	667.7	110	6"	18"	12"	0.5"
LID 3	667.2	667.7	105	6"	18"	12"	0.5"
LID 4	667.2	667.7	385	6"	18"	12"	0.5"
LID 5	651.8	652.3	50	6"	18"	12"	0.5"
LID 6	651.8	652.3	56	6"	18"	12"	0.5"
LID 7	651.8	652.3	128	6"	18"	12"	0.5"
SIDEWALK WEST	647.5	–	112	6"	18"	12"	0.5"
SIDEWALK EAST	648.0	–	66	6"	18"	12"	0.5"

EXHIBIT "D"
137 WEST VALLEY PARKWAY
STORM WATER CONTROL
FACILITY MAINTENANCE AGREEMENT

TOUCHSTONE DEVELOPMENT

BF-1
Biofiltration

BMP MAINTENANCE FACT SHEET
FOR
STRUCTURAL BMP BF-1 BIOFILTRATION

Biofiltration facilities are vegetated surface water systems that filter water through vegetation, and soil or engineered media prior to discharge via underdrain or overflow to the downstream conveyance system. Biofiltration facilities have limited or no infiltration. They are typically designed to provide enough hydraulic head to move flows through the underdrain connection to the storm drain system. Typical biofiltration components include:

- Inflow distribution mechanisms (e.g., perimeter flow spreader or filter strips)
- Energy dissipation mechanism for concentrated inflows (e.g., splash blocks or riprap)
- Shallow surface ponding for captured flows
- Side slope and basin bottom vegetation selected based on climate and ponding depth
- Non-floating mulch layer
- Media layer (planting mix or engineered media) capable of supporting vegetation growth
- Filter course layer consisting of aggregate to prevent the migration of fines into uncompacted native soils or the aggregate storage layer
- Aggregate storage layer with underdrain(s)
- Impermeable liner or uncompacted native soils at the bottom of the facility
- Overflow structure

Normal Expected Maintenance

Biofiltration requires routine maintenance to: remove accumulated materials such as sediment, trash or debris; maintain vegetation health; maintain infiltration capacity of the media layer; replenish mulch; and maintain integrity of side slopes, inlets, energy dissipators, and outlets. A summary table of standard inspection and maintenance indicators is provided within this Fact Sheet.

Non-Standard Maintenance or BMP Failure

If any of the following scenarios are observed, the BMP is not performing as intended to protect downstream waterways from pollution and/or erosion. Corrective maintenance, increased inspection and maintenance, BMP replacement, or a different BMP type will be required.

- The BMP is not drained between storm events. Surface ponding longer than approximately 24 hours following a storm event may be detrimental to vegetation health, and surface ponding longer than approximately 96 hours following a storm event poses a risk of vector (mosquito) breeding. Poor drainage can result from clogging of the media layer, filter course, aggregate storage layer, underdrain, or outlet structure. The specific cause of the drainage issue must be determined and corrected.
- Sediment, trash, or debris accumulation greater than 25% of the surface ponding volume within one month. This means the load from the tributary drainage area is too high, reducing BMP function or clogging the BMP. This would require pretreatment measures within the tributary area draining to the BMP to intercept the materials. Pretreatment components, especially for sediment, will extend the life of components that are more expensive to replace such as media, filter course, and aggregate layers.
- Erosion due to concentrated storm water runoff flow that is not readily corrected by adding erosion control blankets, adding stone at flow entry points, or minor re-grading to restore proper drainage according to the original plan. If the issue is not corrected by restoring the BMP to the original plan and grade, the [City Engineer] shall be contacted prior to any additional repairs or reconstruction.

Other Special Considerations

Biofiltration is a vegetated structural BMP. Vegetated structural BMPs that are constructed in the vicinity of, or connected to, an existing jurisdictional water or wetland could inadvertently result in creation of expanded waters or wetlands. As such, vegetated structural BMPs have the potential to come under the jurisdiction of the United States Army Corps of Engineers, SDRWQCB, California Department of Fish and Wildlife, or the United States Fish and Wildlife Service. This could result in the need for specific resource agency permits and costly mitigation to perform maintenance of the structural BMP. Along with proper placement of a structural BMP, **routine maintenance is key to preventing this scenario**.

BF-1
Biofiltration

SUMMARY OF STANDARD INSPECTION AND MAINTENANCE FOR BF-1 BIOFILTRATION		
The property owner is responsible to ensure inspection, operation and maintenance of permanent BMPs on their property unless responsibility has been formally transferred to an agency, community facilities district, homeowners association, property owners association, or other special district. Maintenance frequencies listed in this table are average/typical frequencies. Actual maintenance needs are site-specific, and maintenance may be required more frequently. Maintenance must be performed whenever needed, based on maintenance indicators presented in this table. The BMP owner is responsible for conducting regular inspections to see when maintenance is needed based on the maintenance indicators. During the first year of operation of a structural BMP, inspection is recommended at least once prior to August 31 and then monthly from September through May. Inspection during a storm event is also recommended. After the initial period of frequent inspections, the minimum inspection and maintenance frequency can be determined based on the results of the first year inspections.		
Threshold/Indicator	**Maintenance Action**	**Typical Maintenance Frequency**
Accumulation of sediment, litter, or debris	Remove and properly dispose of accumulated materials, without damage to the vegetation or compaction of the media layer.	• Inspect monthly. If the BMP is 25% full* or more in one month, increase inspection frequency to monthly plus after every 0.1-inch or larger storm event. • Remove any accumulated materials found at each inspection.
Obstructed inlet or outlet structure	Clear blockage.	• Inspect monthly and after every 0.5-inch or larger storm event. • Remove any accumulated materials found at each inspection.
Damage to structural components such as weirs, inlet or outlet structures	Repair or replace as applicable	• Inspect annually. • Maintenance when needed.
Poor vegetation establishment	Re-seed, re-plant, or re-establish vegetation per original plans.	• Inspect monthly. • Maintenance when needed.
Dead or diseased vegetation	Remove dead or diseased vegetation, re-seed, re-plant, or re-establish vegetation per original plans.	• Inspect monthly. • Maintenance when needed.
Overgrown vegetation	Mow or trim as appropriate.	• Inspect monthly. • Maintenance when needed.
2/3 of mulch has decomposed, or mulch has been removed	Remove decomposed fraction and top off with fresh mulch to a total depth of 3 inches.	• Inspect monthly. • Replenish mulch annually, or more frequently when needed based on inspection.

*"25% full" is defined as ¼ of the depth from the design bottom elevation to the crest of the outflow structure (e.g., if the height to the outflow opening is 12 inches from the bottom elevation, then the materials must be removed when there is 3 inches of accumulation – this should be marked on the outflow structure).

SUMMARY OF STANDARD INSPECTION AND MAINTENANCE FOR BF-1 BIOFILTRATION (Continued from previous page)		
Threshold/Indicator	**Maintenance Action**	**Typical Maintenance Frequency**
Erosion due to concentrated irrigation flow	Repair/re-seed/re-plant eroded areas and adjust the irrigation system.	• Inspect monthly. • Maintenance when needed.
Erosion due to concentrated storm water runoff flow	Repair/re-seed/re-plant eroded areas, and make appropriate corrective measures such as adding erosion control blankets, adding stone at flow entry points, or minor re-grading to restore proper drainage according to the original plan. If the issue is not corrected by restoring the BMP to the original plan and grade, the [City Engineer] shall be contacted prior to any additional repairs or reconstruction.	• Inspect after every 0.5-inch or larger storm event. If erosion due to storm water flow has been observed, increase inspection frequency to after every 0.1-inch or larger storm event. • Maintenance when needed. If the issue is not corrected by restoring the BMP to the original plan and grade, the [City Engineer] shall be contacted prior to any additional repairs or reconstruction.
Standing water in BMP for longer than 24 hours following a storm event Surface ponding longer than approximately 24 hours following a storm event may be detrimental to vegetation health	Make appropriate corrective measures such as adjusting irrigation system, removing obstructions of debris or invasive vegetation, clearing underdrains, or repairing/replacing clogged or compacted soils.	• Inspect monthly and after every 0.5-inch or larger storm event. If standing water is observed, increase inspection frequency to after every 0.1-inch or larger storm event. • Maintenance when needed.
Presence of mosquitos/larvae For images of egg rafts, larva, pupa, and adult mosquitos, see http://www.mosquito.org/biology	If mosquitos/larvae are observed: first, immediately remove any standing water by dispersing to nearby landscaping; second, make corrective measures as applicable to restore BMP drainage to prevent standing water. If mosquitos persist following corrective measures to remove standing water, or if the BMP design does not meet the 96-hour drawdown criteria due to release rates controlled by an orifice installed on the underdrain, the [City Engineer] shall be contacted to determine a solution. A different BMP type, or a Vector Management Plan prepared with concurrence from the County of San Diego Department of Environmental Health, may be required.	• Inspect monthly and after every 0.5-inch or larger storm event. If mosquitos are observed, increase inspection frequency to after every 0.1-inch or larger storm event. • Maintenance when needed.
Underdrain clogged	Clear blockage.	• Inspect if standing water is observed for longer than 24-96 hours following a storm event. • Maintenance when needed.

References

American Mosquito Control Association.
http://www.mosquito.org/
California Storm Water Quality Association (CASQA). 2003. Municipal BMP Handbook.
https://www.casqa.org/resources/bmp-handbooks/municipal-bmp-handbook
County of San Diego. 2014. Low Impact Development Handbook.
http://www.sandiegocounty.gov/content/sdc/dpw/watersheds/susmp/lid.html
San Diego County Copermittees. 2016. Model BMP Design Manual, Appendix E, Fact Sheet BF-1.
http://www.projectcleanwater.org/index.php?option=com_content&view=article&id=250&Itemid=220

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BF-1
Biofiltration

Date:	Inspector:	BMP ID No.:
Permit No.:	APN(s):	
Property / Development Name:	Responsible Party Name and Phone Number:	
Property Address of BMP:	Responsible Party Address:	

INSPECTION AND MAINTENANCE CHECKLIST FOR BF-1 BIOFILTRATION PAGE 1 of 5			
Threshold/Indicator	**Maintenance Recommendation**	**Date**	**Description of Maintenance Conducted**
Accumulation of sediment, litter, or debris Maintenance Needed? ☐ YES ☐ NO ☐ N/A	☐ Remove and properly dispose of accumulated materials, without damage to the vegetation ☐ If sediment, litter, or debris accumulation exceeds 25% of the surface ponding volume within one month (25% full*), add a forebay or other pre-treatment measures within the tributary area draining to the BMP to intercept the materials. ☐ Other / Comments:		
Poor vegetation establishment Maintenance Needed? ☐ YES ☐ NO ☐ N/A	☐ Re-seed, re-plant, or re-establish vegetation per original plans ☐ Other / Comments:		

*"25% full" is defined as ¼ of the depth from the design bottom elevation to the crest of the outflow structure (e.g., if the height to the outflow opening is 12 inches from the bottom elevation, then the materials must be removed when there is 3 inches of accumulation – this should be marked on the outflow structure).

Date:	Inspector:	BMP ID No.:
Permit No.:	APN(s):	

INSPECTION AND MAINTENANCE CHECKLIST FOR BF-1 BIOFILTRATION PAGE 2 of 5			
Threshold/Indicator	**Maintenance Recommendation**	**Date**	**Description of Maintenance Conducted**
Dead or diseased vegetation Maintenance Needed? ☐ YES ☐ NO ☐ N/A	☐ Remove dead or diseased vegetation, re-seed, re-plant, or re-establish vegetation per original plans ☐ Other / Comments:		
Overgrown vegetation Maintenance Needed? ☐ YES ☐ NO ☐ N/A	☐ Mow or trim as appropriate ☐ Other / Comments:		
2/3 of mulch has decomposed, or mulch has been removed Maintenance Needed? ☐ YES ☐ NO ☐ N/A	☐ Remove decomposed fraction and top off with fresh mulch to a total depth of 3 inches ☐ Other / Comments:		

Date:	Inspector:	BMP ID No.:
Permit No.:	APN(s):	

INSPECTION AND MAINTENANCE CHECKLIST FOR BF-1 BIOFILTRATION PAGE 3 of 5			
Threshold/Indicator	**Maintenance Recommendation**	**Date**	**Description of Maintenance Conducted**
Erosion due to concentrated irrigation flow Maintenance Needed? ☐ YES ☐ NO ☐ N/A	☐ Repair/re-seed/re-plant eroded areas and adjust the irrigation system ☐ Other / Comments:		
Erosion due to concentrated storm water runoff flow Maintenance Needed? ☐ YES ☐ NO ☐ N/A	☐ Repair/re-seed/re-plant eroded areas, and make appropriate corrective measures such as adding erosion control blankets, adding stone at flow entry points, or minor re-grading to restore proper drainage according to the original plan ☐ If the issue is not corrected by restoring the BMP to the original plan and grade, the [City Engineer] shall be contacted prior to any additional repairs or reconstruction ☐ Other / Comments:		

BF-1
Biofiltration

Date:	Inspector:	BMP ID No.:
Permit No.:	APN(s):	

INSPECTION AND MAINTENANCE CHECKLIST FOR BF-1 BIOFILTRATION PAGE 4 of 5			
Threshold/Indicator	**Maintenance Recommendation**	**Date**	**Description of Maintenance Conducted**
Obstructed inlet or outlet structure Maintenance Needed? ☐ YES ☐ NO ☐ N/A	☐ Clear blockage ☐ Other / Comments:		
Underdrain clogged (inspect underdrain if standing water is observed for longer than 24-96 hours following a storm event) Maintenance Needed? ☐ YES ☐ NO ☐ N/A	☐ Clear blockage ☐ Other / Comments:		
Damage to structural components such as weirs, inlet or outlet structures Maintenance Needed? ☐ YES ☐ NO ☐ N/A	☐ Repair or replace as applicable ☐ Other / Comments:		

BF-1
Biofiltration

Date:	Inspector:	BMP ID No.:
Permit No.:	APN(s):	

INSPECTION AND MAINTENANCE CHECKLIST FOR BF-1 BIOFILTRATION PAGE 5 of 5			
Threshold/Indicator	**Maintenance Recommendation**	**Date**	**Description of Maintenance Conducted**
Standing water in BMP for longer than 24-96 hours following a storm event* Surface ponding longer than approximately 24 hours following a storm event may be detrimental to vegetation health Maintenance Needed? ☐ YES ☐ NO ☐ N/A	☐ Make appropriate corrective measures such as adjusting irrigation system, removing obstructions of debris or invasive vegetation, clearing underdrains, or repairing/replacing clogged or compacted soils ☐ Other / Comments:		
Presence of mosquitos/larvae For images of egg rafts, larva, pupa, and adult mosquitos, see http://www.mosquito.org/biology Maintenance Needed? ☐ YES ☐ NO ☐ N/A	☐ Apply corrective measures to remove standing water in BMP when standing water occurs for longer than 24-96 hours following a storm event.** ☐ Other / Comments:		

*Surface ponding longer than approximately 24 hours following a storm event may be detrimental to vegetation health, and surface ponding longer than approximately 96 hours following a storm event poses a risk of vector (mosquito) breeding. Poor drainage can result from clogging of the media layer, filter course, aggregate storage layer, underdrain, or outlet structure. The specific cause of the drainage issue must be determined and corrected.

**If mosquitos persist following corrective measures to remove standing water, or if the BMP design does not meet the 96-hour drawdown criteria due to release rates controlled by an orifice installed on the underdrain, the [City Engineer] shall be contacted to determine a solution. A different BMP type, or a Vector Management Plan prepared with concurrence from the County of San Diego Department of Environmental Health, may be required.

ATTACHMENT 4

City of Escondido PDP Structural BMP Verification for Permitted Land Development Projects

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City of Escondido Storm Water Structural BMP Verification Form Page 1 of 4	
Project Summary Information	
Project Name	Aspire
Record ID (e.g., grading/improvement plan number)	
Project Address	137 West Valley Parkway, Escondido, Ca 92025
Assessor's Parcel Number(s) (APN(s))	
Project Watershed (Complete Hydrologic Unit, Area, and Subarea Name with Numeric Identifier)	Carlsbad Hydrologic Unit, Escondido Creek Hydrologic Area, Escondido Hydrologic Subarea (904.62)
Maintenance Notification / Agreement No.	
Responsible Party for Construction Phase	
Developer's Name	Touchstone Communities, LLC
Address	9909 Mira Mesa Boulevard, Suite 150 San Diego, Ca 92131
Email Address	kerry@touchstonecommunities.com
Phone Number	(858) 586-0414
Engineer of Work	Alberto Sandoval
Engineer's Phone Number	(858) 746-7419
Responsible Party for Ongoing Maintenance	
Owner's Name(s)*	Touchstone MF Fund I, LLC
Address	9909 Mira Mesa Boulevard, Suite 150 San Diego, Ca 92131
Email Address	kerry@touchstonecommunities.com
Phone Number	(858) 586-0414
*Note: If a corporation or LLC, provide information for principal partner or Agent for Service of Process. If an HOA, provide information for the Board or property manager at time of project closeout.	

City of Escondido Storm Water Structural BMP Verification Form Page 2 of 4				
Stormwater Structural Pollutant Control & Hydromodification Control BMPs* (List all from SWQMP)				
Description/Type of Structural BMP	**Plan Sheet #**	**Structural BMP ID#**	**Maintenance Agreement Recorded Doc #**	**Revisions**
Biofiltration Basin, BF-1, BF-2	Sht.1-2	LID 1		
Biofiltration Basin, BF-1, BF-2	Sht.1-2	LID 2		
Biofiltration Basin, BF-1, BF-2	Sht.1-2	LID 3		
Biofiltration Basin, BF-1, BF-2	Sht.1-2	LID 4		
Biofiltration Basin, BF-1, BF-2	Sht.1-2	LID 5		
Biofiltration Basin, BF-1, BF-2	Sht.1-2	LID 6		
Biofiltration Basin, BF-1, BF-2	Sht.1-2	LID 7		
Biofiltration Basin, BF-1, BF-2	Sht.1-2	Sidewalk-West		
Biofiltration Basin, BF-1, BF-2	Sht.1-2	Sidewalk-East		
*All Priority Development Projects (PDPs) require a Structural BMP				

Note: If this is a partial verification of Structural BMPs, provide a list and map denoting Structural BMPs that have already been submitted, those for this submission, and those anticipated in future submissions.

City of Escondido Storm Structural BMP Verification Form Page 3 of 4

Checklist for Engineer of Work (EOW) to submit to Field Engineering:

- ☐ Copy of the final accepted SWQMP and any accepted addendum.
- ☐ Copy of the most current plan showing the Storm Water Structural BMP Table, plans/cross-section sheets of the Structural BMPs and the location of each verified as-built Structural BMP.
- ☐ Photograph of each Structural BMP.
- ☐ Photograph(s) of each Structural BMP during the construction process to illustrate proper construction.
- ☐ Copy of the approved Structural BMP maintenance agreement and associated security

By signing below, I certify that the Structural BMP(s) for this project have been constructed and all BMPs are in substantial conformance with the approved plans and applicable regulations. I understand the City reserves the right to inspect the above BMPs to verify compliance with the approved plans and Storm Water Ordinance. Should it be determined that the BMPs were not constructed to plan or code, corrective actions may be necessary before permits can be closed.

Please sign your name and seal.

Professional Engineer's Printed Name:

_____

Professional Engineer's Signed Name:

_____

[SEAL]

Date: _____

City of Escondido Storm Water Structural BMP Verification Form Page 4 of 4

CITY - OFFICIAL USE ONLY:

Permit #:_____

City Inspector: _____

Date Project has/expects to close: _____

Date verification received from Engineer of Work (EOW): _____

By signing below, City Inspector concurs that every noted Structural BMP has been installed per plan.

City Inspector's Signature: _____Date: _____

FOR Environmental Programs:

Date Received from Field Engineering:_____

Environmental Programs Submittal Reviewer:_____

Environmental Programs Reviewer concurs that the information provided for the following Structural BMPs is acceptable to enter into the Structural BMP Maintenance verification inventory:

List **acceptable** Structural BMPs:

Environmental Programs Reviewer's Signature: _____

Date: _____

ATTACHMENT 5

Copy of Plan Sheets Showing Permanent Storm Water BMPs, Source Control, and Site Design

This is the cover sheet for Attachment 5.

Use this checklist to ensure the required information has been included on the plans:

The plans must identify:

☐Structural BMP(s) with ID numbers matching Step 6 Summary of PDP Structural BMPs
☐The grading and drainage design shown on the plans must be consistent with the delineation of DMAs shown on the DMA exhibit
☐Details and specifications for construction of structural BMP(s)
☐Signage indicating the location and boundary of structural BMP(s) as required by City staff
☐How to access the structural BMP(s) to inspect and perform maintenance
☐Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
☐Manufacturer and part number for proprietary parts of structural BMP(s) when applicable
☐Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)
☐Recommended equipment to perform maintenance
☐When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management
☐Include landscaping plan sheets showing vegetation requirements for vegetated structural BMP(s)
☐All BMPs must be fully dimensioned on the plans
☐When proprietary BMPs are used, site-specific cross section with outflow, inflow, and model number must be provided. Photocopies of general brochures are not acceptable.
☐Include all source control and site design measures described in Steps 4 and 5 of the SWQMP. Can be included as a separate exhibit as necessary.

***Note: Plan sheets included in this attachment can be full size or half size.**

MASTER & PRECISE DEVELOPMENT PLAN

ASPIRE

137 WEST VALLEY PARKWAY
CITY OF ESCONDIDO , CALIFORNIA

LEGEND

GRADING ITEMS	STD. DWGS.	SYMBOL
PROPERTY BOUNDARY		
EXISTING LOT LINE		
EXISTING EASEMENT		
EXISTING STREET CENTERLINE		
EASEMENT CALL OUT		1
EXISTING CONTOUR		650
EXISTING STORM DRAIN		
EXISTING WATER MAIN		W
EXISTING WATER SERVICE & BFP		W
EXISTING SEWER MAIN		S
EXISTING ELECTRICAL		E
EXISTING GAS MAIN		G
EXISTING CABLE TV		C
EXISTING TELEPHONE		T
CUT SLOPE		2:1
DAYLIGHT LINE		
PROPOSED CONTOUR		650
FLOW DIRECTION		
BASEMENT LEVEL LIMITS		
LEVEL 1 LIMITS		
LEVEL 2 OUTDOOR COURTYARD LIMITS		
LEVEL 3–6 LIMITS		
BALCONY LIMITS		
PROPOSED CURB & GUTTER		
PROPOSED RIBBON GUTTER		
PROPOSED SIDEWALK		
PROPOSED AC PAVEMENT		
STORM DRAIN	G–1–E	
CONCRETE LUG	SDRSD D–63	
STORM DRAIN CLEANOUT TYPE "B"	SDRSD D–9	
PROPOSED CURB INLET TYPE "B"	SDRSD D–2	
AREA DRAIN		
PROPOSED SUBDRAIN		SD SD
PROPOSED 8" WATER MAIN		W
PROPOSED WATER SERVICE	W–2–E	W
PROPOSED DCA	W–7–W	DCA
PROPOSED FIRE HYDRANT	W–3–E	
PROPOSED FDC & PIV		
PROPOSED 6" PVC SEWER LATERAL	S–2–E	S
PROPOSED ROADSIDE SWALE OR RAISED PLANTER W/ BIOSOIL MEDIA SEE DETAILS THIS SHEET		
LANDSCAPED AREA		

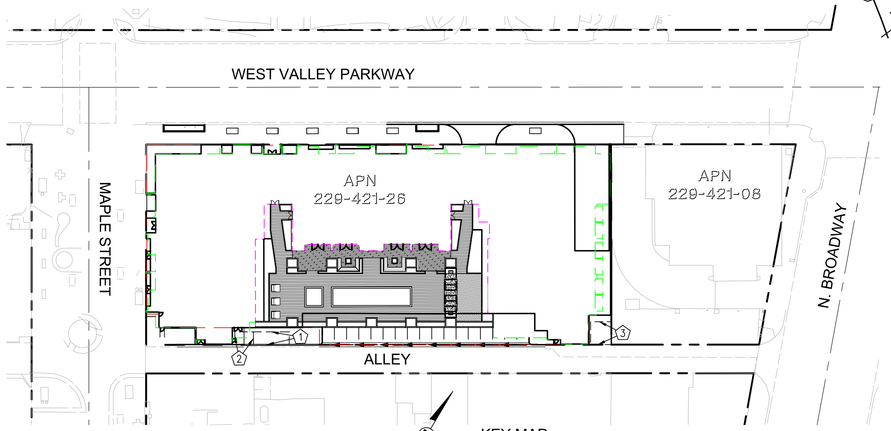
ABBREVIATIONS

AC	ASPHALTIC CONCRETE
BSM	BIORETENTION SOIL MEDIA
CB	CATCH BASIN
CO	CLEANOUT
CONC	CONCRETE
DWG	DRAWING
EC	END CURVE
ELEC	ELECTRIC
EV	ELECTRIC VALVE
EX	EXISTING
FDC	FIRE DEPARTMENT CONNECTION
FF	FINISH FLOOR
FG	FINISHED GRADE
FGBW	FINISH GRADE BACK OF WALL
FGFW	FINISH GRADE FACE OF WALL
FH	FIRE HYDRANT
FL	FLOW LINE
FS	FINISH SURFACE
GB	GRADE BREAK
GF	GARAGE FLOOR
HP	HIGH POINT
IE	INVERT ELEVATION
LP	LOW POINT
PA	PLANTING AREA
PCC	PORTLAND CEMENT CONCRETE
PIP	PROTECTED IN PACE
PIV	POST INDICATOR VALVE
PP	POWER POLE
PVC	POLYVINYL CHLORIDE
PVT	PRIVATE
RCP	REINFORCED CONCRETE PIPE
S	SEWER
SD	STORM DRAIN
SHT	SHEET
TC	TOP OF CURB
TCO	TOP OF CLEANOUT
TEL	TELEPHONE
TG	TOP OF GRATE
TW	TOP OF WALL
W	WATER

EXISTING EASEMENT NOTES

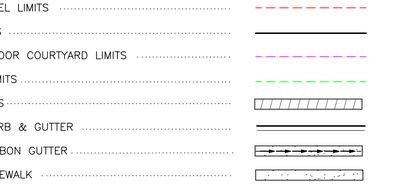
THE FOLLOWING IS A LIST OF EXCEPTIONS PER A PRELIMINARY REPORT PREPARED BY FIRST CHICAGO TITLE INSURANCE COMPANY AS ORDER NO. 12207411–993–SD2–CFU DATED DECEMBER 11, 2018. THE FOLLOWING ITEMS AFFECT PARCELS A,B AND C

(1)(2)(3) AN EASEMENT FOR PUBLIC UTILITIES, INGRESS, EGRESS AND INCIDENTAL PURPOSES, RECORDED DECEMBER 27, 1987 AS DOCUMENT NO. 1987–0702296 OF OFFICIAL RECORDS.
IN FAVOR OF: SAN DIEGO GAS AND ELECTRIC COMPANY
AFFECTS: AS DESCRIBED THEREIN

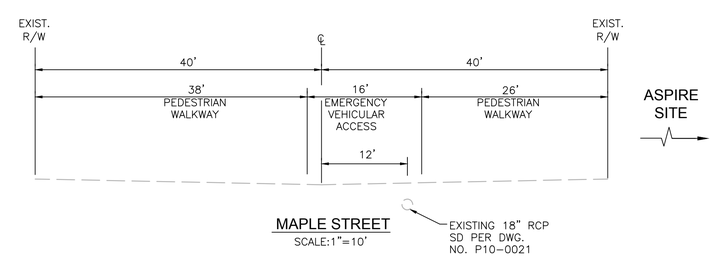


KEY MAP
SCALE: 1"=50'

SHEET INDEX

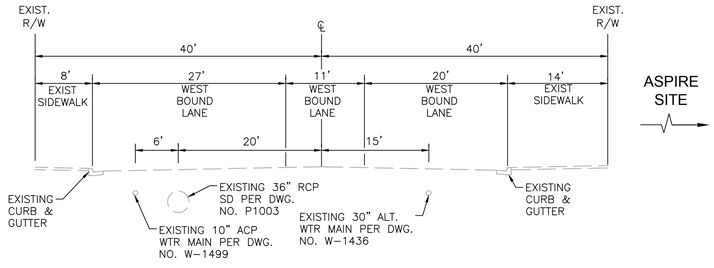


EXISTING ALLEY
SCALE:1"=10'



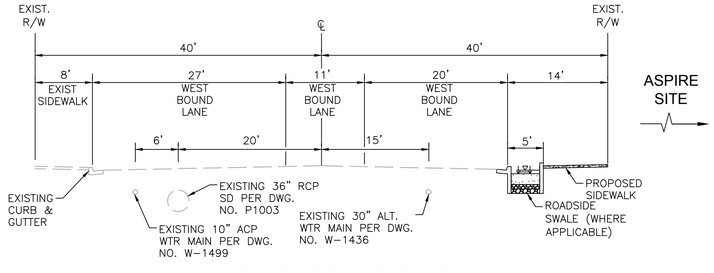
ASPIRE SITE

MAPLE STREET
SCALE:1"=10'



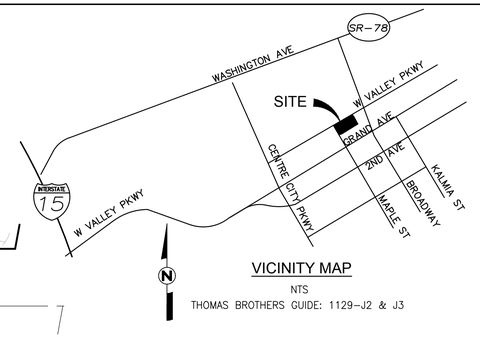
ASPIRE SITE

EXISTING WEST VALLEY PARKWAY
SCALE:1"=10'



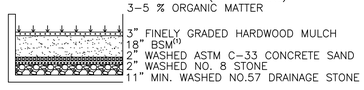
ASPIRE SITE

PROPOSED WEST VALLEY PARKWAY
SCALE:1"=10'

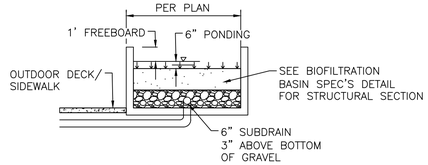


VICINITY MAP
NTS
THOMAS BROTHERS GUIDE: 1129–J2 & J3

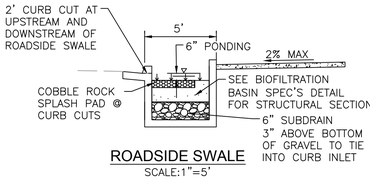
(1)18" BSM CONSISTS OF THE FOLLOWING:
85–88 % WASHED SAND
8–12% FINES (SILT & CLAY)
3–5 % ORGANIC MATTER



BIOFILTRATION BASIN SPEC'S
SCALE:1"=5'



RAISED PLANTER
SCALE:1"=5'



ROADSIDE SWALE
SCALE:1"=5'

GENERAL NOTES

1. PROPERTY BOUNDARY AREA =45,489 SF/1.04 ACRES
2. EXISTING/PROPOSED GENERAL PLAN:S–P–9
3. EXISTING/PROPOSED ZONING:S–P–9
4. EXISTING DENSITY: 75 DU/AC
5. PROPOSED DENSITY:131 DU/AC
6. ALL SITE IMPROVEMENTS SHALL CONFORM TO CITY OF ESCONDIDO DESIGN STANDARDS.
7. ALL EXIST./PROPOSED UTILITIES TO BE UNDERGROUND.
8. CUT SLOPES 1.5:1 MAX, FILL SLOPES 2:1 MAX.
9. PROPOSED ONSITE STORM DRAIN SHALL BE PRIVATE. PROPOSED STORM DRAIN ON WEST VALLEY PARKWAY SHALL BE PUBLIC.
10. PROJECTS SEWER AND WATER LATERALS TO CONNECT TO THE CITY'S PUBLIC MAIN LINES.
11. SOILS REPORT TITLED "REPORT OF PRELIMINARY GEOTECHNICAL INVESTIGATION PROPOSED MIXED USE DEVELOPMENT 137 WEST VALLEY PARKWAY ESCONDIDO, CA" PREPARED BY CHRISTIAN WHEELER ENGINEERING

PUBLIC UTILITIES/DISTRICTS

GAS AND ELECTRIC.....SAN DIEGO GAS AND ELECTRIC 1(800)411–7343
TELEPHONE.....AT&T (760)432–4200
WATER.....CITY OF ESCONDIDO (760)839–4657
SEWER.....CITY OF ESCONDIDO (760)839–4657
STORM WATER.....CITY OF ESCONDIDO (760)839–4657
FIRE.....CITY OF ESCONDIDO (760)839–5400
SCHOOLS.....ESCONDIDO UNION HS DIST. (760)291–3200

EARTHWORK

UNDERGROUND PARKING STRUCTURE QUANTITIES:
CUT: 19,000 CY FILL: 0 CY

TOPOGRAPHICAL SOURCE

TOPOGRAPHY SHOWN WAS PROVIDED BY PHOTOGRAMMETRIC METHODS BY GEODETIC CORPORATION ON 03–30–2017. SUPPLEMENTAL FIELD SURVEY PERFORMED BY MASSON AND ASSOCIATES, INC. ON 05/09/2017.

LEGAL DESCRIPTION

PARCEL 1:
LOTS 21 THROUGH 24 INCLUSIVE IN BLOCK 68 OF ESCONDIDO, IN THE CITY OF ESCONDIDO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO MAP THEREOF NO. 336, FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, JULY 10, 1886.

PARCEL 2:
LOTS 25 AND 26 IN BLOCK 68 OF ESCONDIDO, IN THE CITY OF ESCONDIDO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO MAP THEREOF NO. 336 FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO, JULY 10, 1886.

PARCEL 3:
LOTS 27 AND 28 IN BLOCK 68 OF ESCONDIDO, IN THE CITY OF ESCONDIDO, IN THE CITY OF ESCONDIDO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO MAP THEREOF NO. 336, FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, JULY 10, 1886.

PARCEL 4:
LOTS 29 THROUGH 33, INCLUSIVE, BLOCK 68 OF ESCONDIDO IN THE CITY OF ESCONDIDO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO MAP THEREOF NO. 336, FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, JULY 10, 1886.

BENCHMARK

CHISELED ON TOP OF CURB INLET, ON THE S.E. CORNER OF GRAND AVENUE AND BROADWAY STREET, AT THE EASTERLY BEGINNING OF CURB RETURN. ELEV.653.87

ASSESSOR'S PARCEL

APN: 229–421–26

ADDRESS

137 WEST VALLEY PARKWAY. ESCONDIDO, CA 92025

OWNER

CITY OF ESCONDIDO
201 NORTH BROADWAY
ESCONDIDO, CA 92025

APPLICANT

TOUCHSTONE MF FUND I, LLC
9909 MIRA MESA BLVD, SUITE #150
SAN DIEGO, CA 92131
(858) 586–0414

I HEREBY CERTIFY THAT TOUCHSTONE MF FUND I, LLC IS THE RECORD OWNER OF THE PROPERTY SHOWN ON THIS TENTATIVE MAP, AND THAT SAID MAP SHOWS ALL OF THE CONTIGUOUS OWNERSHIP IN WHICH IT HAS ANY DEED OR TRUST INTEREST. I UNDERSTAND THAT THE TOUCHSTONE MF FUND I, LLC
PROPERTY IS CONSIDERED CONTIGUOUS EVEN IF IT IS SEPARATED BY ROADS, STREETS,UTILITY EASEMENTS OR RAILROAD RIGHTS–OF–WAY.

BY:_____
ADDISON GARZA DATE

ENGINEER OF WORK

TOUCHSTONE DEVELOPMENT, INC.
9909 MIRA MESA BLVD. SUITE 150
SAN DIEGO, CA 92131
(858) 586–0414

REGISTERED PROFESSIONAL ENGINEER — ALBERTO SANDOVAL — No. 89041 — CIVIL — STATE OF CALIFORNIA

ALBERTO SANDOVAL DATE

PREPARED BY:
TOUCHSTONE DEVELOPMENT

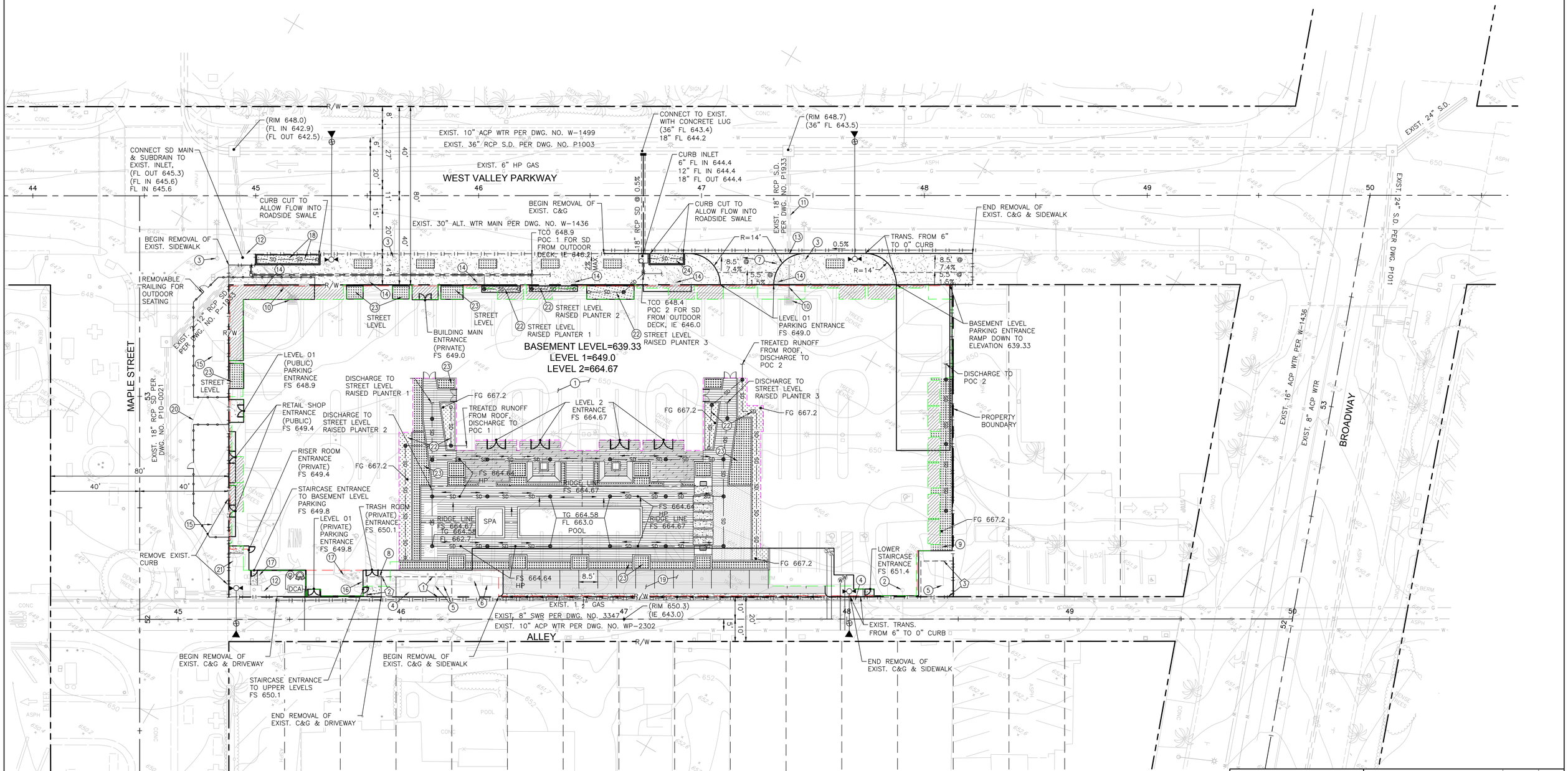
REVISION	DATE	BY

MASTER & PRECISE DEVELOPMENT PLAN FOR:

ASPIRE

137 WEST VALLEY PARKWAY
CITY OF ESCONDIDO, CALIFORNIA
TOUCHSTONE DEVELOPMENT, INC.

SHEET 1 OF 4



NOTES

1. EXISTING PARKING LOT TREES, CURB, ASPHALT, LIGHTS TO BE REMOVED
2. EXISTING STREET LIGHT TO BE RELOCATED
3. EXISTING STREET LIGHT TO REMAIN, PROTECT IN PLACE
4. EXISTING HANDHOLE TO REMAIN, PROTECT IN PLACE
5. EXISTING ELECTRONIC TRANSFORMER TO REMAIN, PROTECT IN PLACE
6. EXISTING DRY UTILITY CABINET TO REMAIN
7. EXISTING PULLBOX TO BE ADJUSTED TO GRADE
8. EXISTING TELEPHONE RISER TO BE RELOCATED
9. EXISTING ELECTRICAL PULLBOX TO BE RELOCATED
10. EXISTING CATCH BASIN AND SD TO BE REMOVED
11. EXISTING 18" SD TO BE ABANDONED AND PLUGGED
12. EXISTING CURB INLET TO REMAIN, PROTECT IN PLACE
13. EXISTING CURB INLET TO BE REMOVED
14. EXISTING PALM TREE TO BE REMOVED
15. EXISTING TREE/PLANTER BOX TO BE REMOVED
16. EXISTING WATER METER AND BACKFLOW PREVENTER TO BE REMOVED, SERVICE CAPPED AT MAIN
17. EXISTING IRRIGATION APPURTENANCED TO BE REMOVED
18. EXISTING TRAFFIC SIGNS TO BE RELOCATED
19. 17 SURFACE PARKING SPACES PARTIALLY COVERED BY BUILDING OVERHANG
20. EXISTING CANOPY WITH SEATING TO BE REMOVED
21. EXISTING FOUNTAIN/PUMP EQUIPMENT TO REMAIN, PROTECT IN PLACE
22. RAISED PLANTER WITH BIOSOIL MEDIA, SEE DETAIL SHEET 1
23. RAISED PLANTER
24. ROADSIDE SWALE SEE DETAIL SHEET 1

EASEMENT

(1)(2)(3) AN EASEMENT FOR PUBLIC UTILITIES, INGRESS, EGRESS AND INCIDENTAL PUPOSES, RECORDED DECEMBER 27, 1987 AS DOCUMENT NO. 1987-0702296 OF OFFICIAL RECORDS. IN FAVOR OF: SAN DIEGO GAS AND ELECTRIC COMPANY
AFFECTS: AS DESCRIBED THEREIN

0 20 40 60
SCALE: 1" =20'

PREPARED BY:
TOUCHSTONE DEVELOPMENT

REVISION	DATE	BY

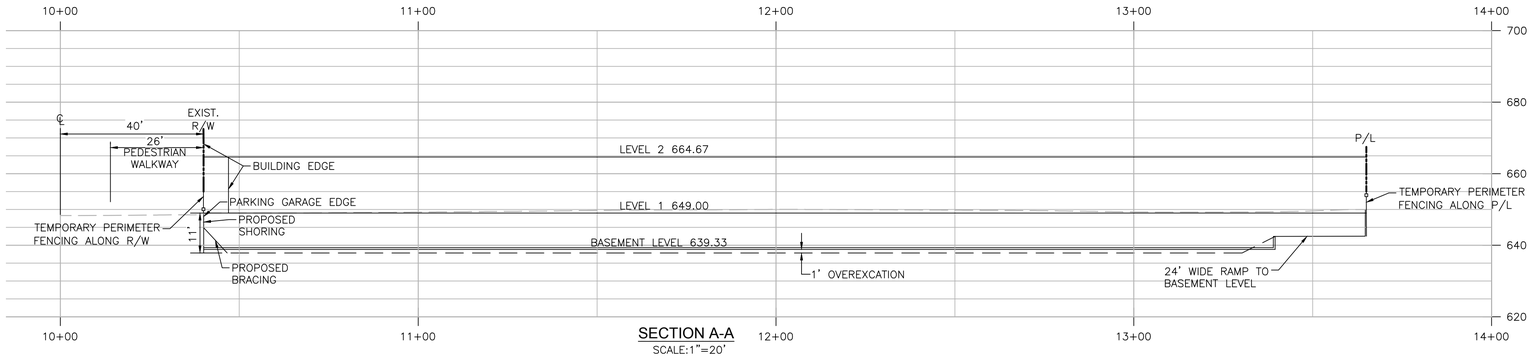
MASTER & PRECISE DEVELOPMENT PLAN FOR:

ASPIRE

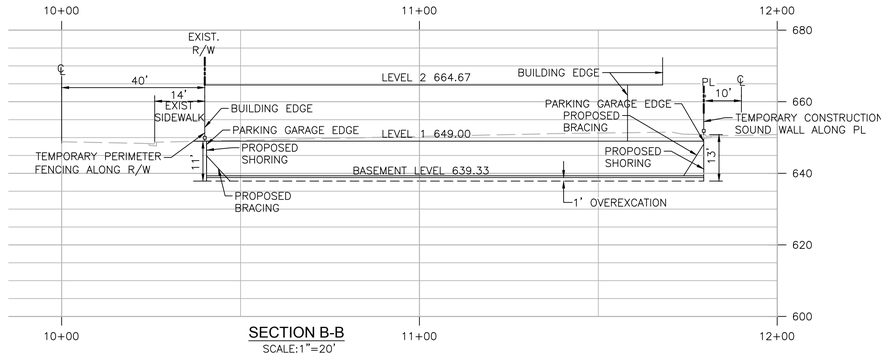
137 WEST VALLEY PARKWAY
CITY OF ESCONDIDO, CALIFORNIA
TOUCHSTONE DEVELOPMENT, INC.

SHEET 2 OF 4

Z:\Common Share_Civil\Projects\1054 Aspire\DWGs\Sheet_Dwgs\1054-GR0 02.dwg Mar 12, 2019 - 6:57pm



SECTION A-A
SCALE:1"=20'



SECTION B-B
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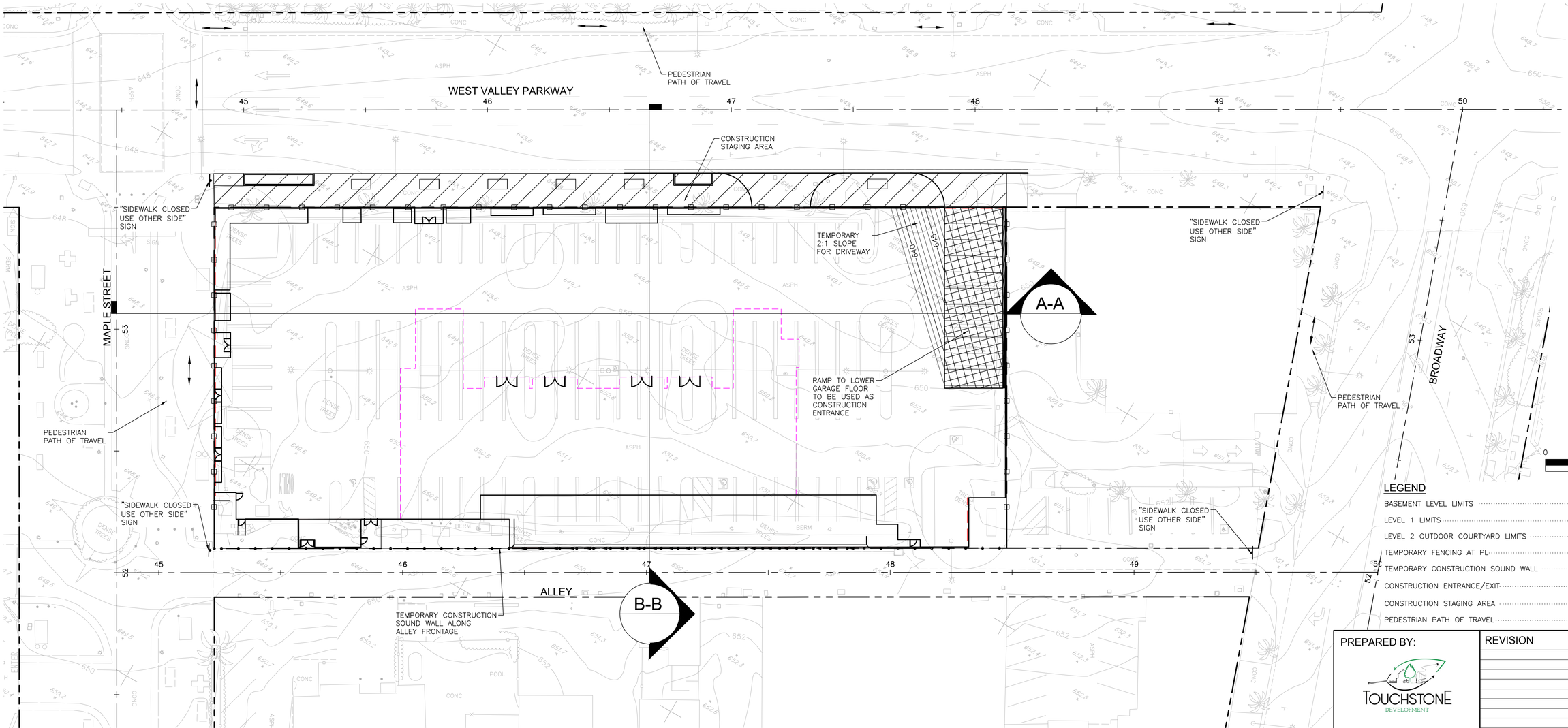

0 20 40 60
SCALE: 1" =20'

LEGEND

- BASEMENT LEVEL LIMITS
- LEVEL 1 LIMITS
- LEVEL 2 OUTDOOR COURTYARD LIMITS
- TEMPORARY FENCING AT PL
- TEMPORARY CONSTRUCTION SOUND WALL
- CONSTRUCTION ENTRANCE/EXIT
- CONSTRUCTION STAGING AREA
- PEDESTRIAN PATH OF TRAVEL

PREPARED BY:

TOUCHSTONE DEVELOPMENT

REVISION	DATE	BY

MASTER & PRECISE DEVELOPMENT PLAN FOR:

ASPIRE

137 WEST VALLEY PARKWAY
CITY OF ESCONDIDO, CALIFORNIA
TOUCHSTONE DEVELOPMENT, INC.

SHEET 3 OF 4

R/W

WEST VALLEY PARKWAY

MAPLE STREET

BROADWAY

N59°41'03"E 325.00' R/W

25.00' 25.00' 25.00' 25.00' 25.00' 25.00' 25.00' 25.00' 25.00' 25.00' 25.00' 25.00' 25.00' 25.00'

R/W

24'± TO EX. BLDG.

EXISTING BANK BUILDING TO REMAIN NOT A PART APN 228-421-08

LOT 33	LOT 32	LOT 31	LOT 30	LOT 29	LOT 28	LOT 27	LOT 26	LOT 25	LOT 24	LOT 23	LOT 22	LOT 21	LOT 20	LOT 19	LOT 18	LOT 17
S30°18'57"E	S30°18'57"E	S30°18'57"E	S30°18'57"E	S30°18'57"E	S30°18'57"E	S30°18'57"E	S30°18'57"E	S30°18'57"E	S30°18'57"E	S30°18'57"E	S30°18'57"E	S30°18'57"E	N30°18'57"W			
139.97'	139.96'	139.96'	139.94'	139.94'	139.93'	139.92'	139.91'	139.91'	139.90'	139.89'	139.88'	139.88'	139.97'			

MAP 336
BLK 68
APN
228-421-26

EXIST. BLDG.

80' TO EXIST. BLDG.

N59°40'01"E 325.00' R/W

20' TO EX. BLDG.

ALLEY

EXIST. BLDG.

EXIST. BLDG.

EASEMENT

① ② ③ AN EASEMENT FOR PUBLIC UTILITIES, INGRESS, EGRESS AND INCIDENTAL PUPOSES, RECORDED DECEMBER 27, 1987 AS DOCUMENT NO. 1987-0702296 OF OFFICIAL RECORDS. IN FAVOR OF: SAN DIEGO GAS AND ELECTRIC COMPANY AFFECTS: AS DESCRIBED THEREIN

0 20 40 60

SCALE: 1" =20'

PREPARED BY:

TOUCHSTONE DEVELOPMENT

REVISION	DATE	BY

MASTER & PRECISE DEVELOPMENT PLAN FOR:

ASPIRE

137 WEST VALLEY PARKWAY
CITY OF ESCONDIDO, CALIFORNIA
TOUCHSTONE DEVELOPMENT, INC.

SHEET 4 OF 4