City of Fontana

Master Storm Drain Plan

January 2025

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CITY OF FONTANA MASTER STORM DRAIN PLAN

January 21, 2025

Prepared for:

FONTANA
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List of Abbreviations and Acronyms

1D	One-Dimensional
2D	Two-Dimensional
AES	Applied Engineering Solutions (Hydrology Software Program)
AMC	Antecedent Moisture Condition
AOS 1	Area of Study 1
AOS 2	Area of Study 2
AOS 3	Area of Study 3
As-builts	Construction Plans
ATSF	Atchison, Topeka and Santa Fe Railroad
BMP	Best Management Practice (Water Quality Treatment Facility)
CB	Catch Basin
cfs	Cubic Feet per Second
CIP	Capital Improvement Program
City	City of Fontana
County	San Bernadino County
CSDP	Comprehensive Storm Drain Plan
DBL	Double
DEA	David Evans and Associates, Inc.
DEM	Digital Elevation Model
EOC	Emergency operation center
EPA	Environmental Protection Agency
FEMA	Federal Management Agency
GIS	Geographic Information System
HGL	Hydraulic Grade Line
IB	Infiltration Basin
ID	Identification
LID	Low Impact Development
MH	Manhole
MSDP	Master Storm Drain Plan
N/A	Not Applicable
NC	Natural Channel
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
RCB	Reinforced Concrete Box
RCC	Rectangular Concrete Channel

RCP	Reinforced Concrete Pipe
RWQCB	Regional Water Quality Control Board
SBCFCD	San Bernardino County Flood Control District
TC	Time of Concentration
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USGS	United States Geological Survey
WSPGW	Water Surface Profile Gradient for Windows (Hydraulic Software)
WxH	"Width" by "Height"

EXECUTIVE SUMMARY

This Master Storm Drain Plan (MSDP) is an update to the City of Fontana (City) 1992 *City of Fontana and "Sphere of Influence" Master Storm Drain Plan Study* (MSDP) prepared by Hall and Foreman (now David Evans and Associates, Inc. (DEA)). This MSDP includes comprehensive analysis of the City's drainage systems to help identify critical short-term and long-term drainage issues and provides a corresponding list of prioritized capital projects intended to help alleviate them. Prioritized project descriptions, estimated costs, and supporting figures are provided. This report provides the basis for adopting fees to provide funding for design and construction of the capital projects.

Evaluation of the drainage patterns and storm drain recommendations were divided into three separate areas of study to provide a clear level of detail and for planning purposes, which are identified as Area of Study 1 (AOS 1), Area of Study 2 (AOS 2), and Area of Study 3 (AOS 3). Tasks included performing a hydrologic and hydraulic analysis of the City's storm drain infrastructure. Hydrologic analysis followed the San Bernardino County Hydrology Manual and evaluation of the drainage system hydraulics used the modeling software InfoWorks ICM. Where applicable, existing hydrology studies were used where current and relevant information was provided. An integrated 1- and 2-dimensional (1D/2D) model was developed to represent the storm drain systems in each of the three major study areas listed above. The 1D elements of the model are limited to the master plan of drainage facilities of 36-inch diameter and larger but does not include city or regional detention or recharge facilities. The 2D elements of the model include the surface mesh representing a Digital Elevation Model (DEM) derived ground surface to model overland flow and surface retention storage.

The storm drain system models were used to assess and identify areas of insufficient conveyance capacity and corresponding flooding. To alleviate areas of flooding and insufficient conveyance, proposed ultimate improvements were analyzed with the existing model. The model results with the proposed improvements were then used to determine the conveyance and storm drain capital projects. Development of the capital projects identified a total of 198 projects to address infrastructure needs. The average project cost was $5,925,000, with the minimum being $235,000 and maximum being $87,343,000. In total the cost of AOS 1 is $898,928,000, AOS 2 is $131,702,000, and AOS 3 is $137,433,000.

A set of evaluation criteria was developed to assist in selecting the most critical projects for the City to pursue. The importance of each project was considered using four evaluation criteria: 1. Downstream to Upstream Prioritization 2. Known Flooded Areas 3. Depth of Flooding and 4. Road Hierarchy Drainage. Capital projects received prioritization scores between 1.0 and 4.4, with 59 projects receiving a score of 2.6 or above, which corresponds to the 30th percentile score.

1 INTRODUCTION

1.1 PURPOSE OF THE MASTER PLAN

This Master Storm Drain Plan (MSDP) is an update to the City of Fontana (City) 1992 *City of Fontana and "Sphere of Influence" Master Storm Drain Plan Study* (MSDP) prepared by Hall and Foreman (now David Evans and Associates, Inc. (DEA)). It is intended to be a user-friendly guidance tool for assessing, planning, and achieving goals for future storm drain management system improvements within Fontana over a 30- to 50-year planning horizon. The target audience is City staff, elected officials, developers, and anyone interested in storm management improvements in Fontana. This MSDP includes comprehensive analysis of the City's existing and proposed drainage systems to help identify critical short-term and long-term drainage issues and provides a corresponding list of prioritized capital projects intended to help alleviate them. Prioritized project descriptions, estimated costs, and supporting figures are provided. This report provides the basis for adopting fees to provide funding for design and construction of the capital projects.

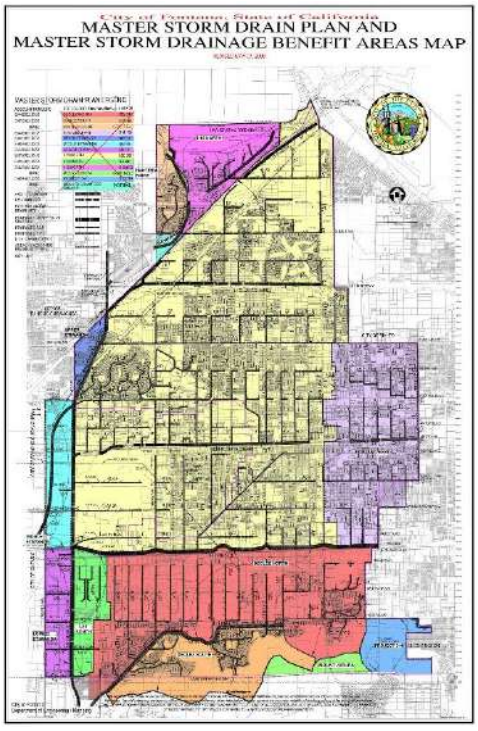

Figure 1-1. Current City of Fontana Master Plan, Developed in 1992, Revised in 2006

The City of Fontana and its sphere of influence encompasses approximately 52.4 square miles and is located adjacent to the cities of Rancho Cucamonga, Rialto, Bloomington, and Jurupa Valley in San Bernadino County, California. The Etiwanda and San Sevaine channels run through the westside of Fontana, carrying flows from the Los Angeles mountains to the north and to the Santa Ana River to the south.

Evaluation of the drainage patterns and storm drain recommendations are divided into three separate areas, which are identified as Area of Study 1 (AOS 1), Area of Study 2 (AOS 2), and Area of Study 3 (AOS 3). These areas are primarily tributary to the Etiwanda/San Sevaine Watershed and a small portion

of the City is tributary to the Rialto Storm Channel east of the City. Figure 1-2 is a project location map showing the general extents of the three regional areas of study.

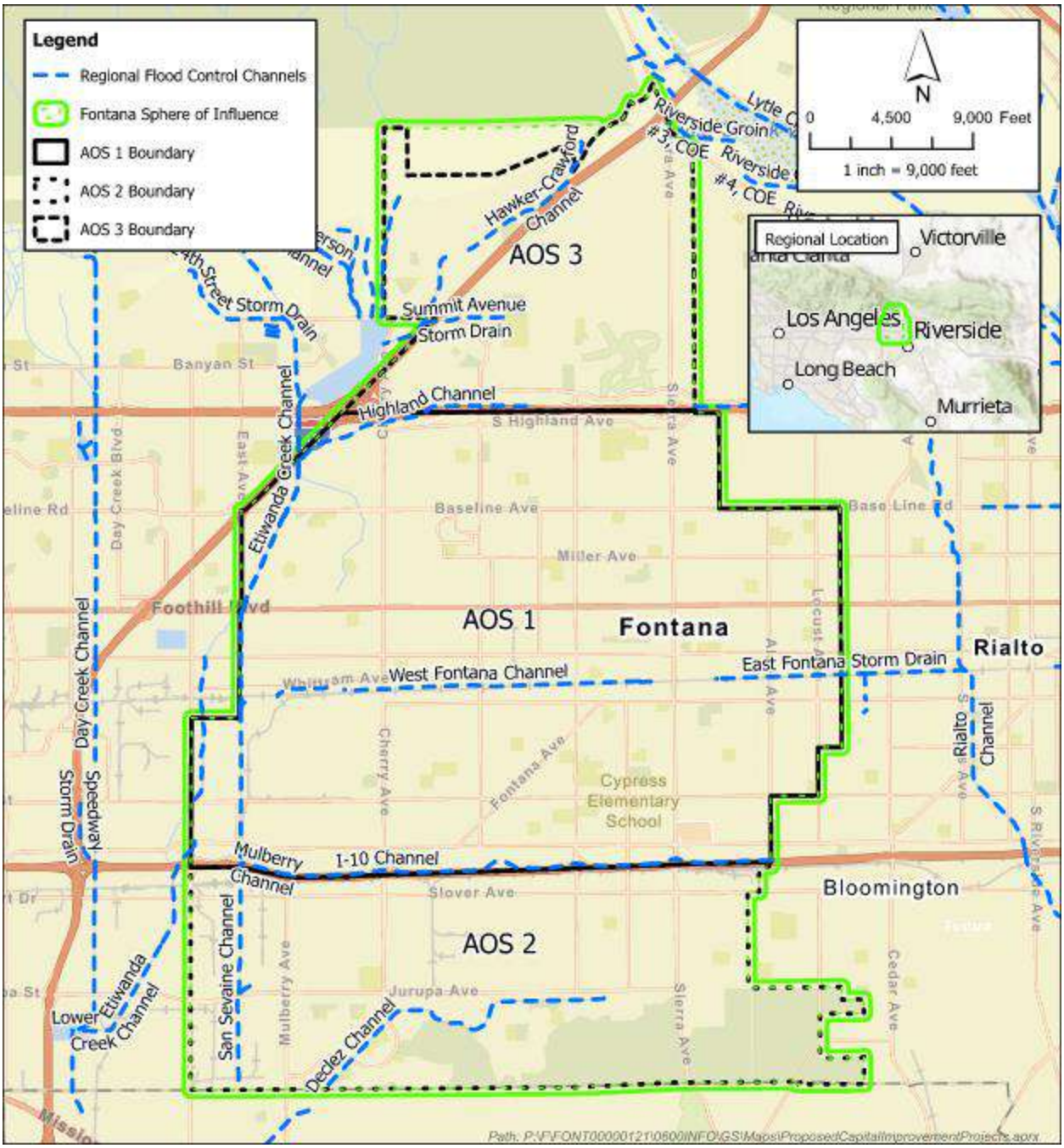

Figure 1-2. Project Location Overview

1.2 MASTER PLAN OBJECTIVES AND APPROACH

Development of this MSDP and the recommended capital projects started with City and DEA collaborating to determine key goals and objectives for the updated MSDP. This collaborative approach established that the primary focus of this MSDP should be to address storm drain conveyance limitations and localized flooding problems. This MSDP is intended to address and support the goals and objectives listed below, be easy to use, and be easy to update for future revisions.

This updated MSDP has the following objectives:

1. Analyze the City's existing and future storm drain system capacities to identify potential deficiencies and needed improvements. The improvements considered include:
    - Updating hydrology to current NOAA Atlas 14 rainfall data following the County of San Bernardino Hydrology Manual Addendum for Arid Regions dated April 2010
    - Incorporate development which has occurred since the 1992 MSDP
    - Incorporate proposed land use data from the City of Fontana General Plan Land Use Map dated February 2022
    - Assess conveyance capacity of primary storm drainage features throughout the City
2. Develop a prioritized list of capital projects that address storm drain system deficiencies (existing and future). The capital projects includes:
    - A description of the City's existing storm drain system
    - A project prioritization matrix based on key project benefits
    - A system overview of considered and recommended projects, a City-wide capital projects figure, and a planning-level cost estimate
    - A hydraulic model that can be used to assess system responses to improvements and basin changes/developments
    - Provide overall cost estimates to assist in creation of development impact fees for drainage infrastructure

Once the objectives were established, the project assessment and analysis began. This step included researching past studies and recommended projects, interviewing City staff about known problems, and performing a hydrologic and hydraulic analysis of the City's storm drain infrastructure. Evaluation of the drainage system used the modeling software InfoWorks ICM. An integrated 1- and 2-dimensional (1D/2D) model was developed to represent the storm drain systems in each of the three major areas listed above. The model was limited to drainage facilities of 36-inch diameter and larger. City and regional detention and recharge facilities were not analyzed for capacity as part of this analysis.

The storm drain system models were used to assess and identify areas of insufficient conveyance capacity and corresponding flooding. To alleviate areas of flooding and insufficient conveyance, proposed ultimate improvements were analyzed with the existing model. The model results with the proposed improvements were then used to inform the conveyance and storm drain capital projects. The next step was to prioritize the potential projects based on a matrix of selection criteria established in collaboration between DEA and the City. A total of 198 potential capital projects were identified to address existing capacity limitations and flooding.

1.3 DESIGN CRITERIA

The City's 1992 MSDP storm management design standards include public and private development requirements, which are intended to provide guidance to design professionals and ensure consistency in the safety and quality of infrastructure improvements that align with conveyance and flood alleviation goals. The original MSDP design standards will continue to be used with this update.

A summary of the 1992 design standards follows:

- The 100-year design recurrence interval storm was directed by the National Flood Insurance Act of 1968 and the necessity to protect new habitable structures from flooding during the 100-year storm. It was used to size all primary storm lines proposed for the capital projects.
- The hydrologic analysis was based on the *San Bernardino Hydrology Manual* dated January 1986. The rational method was used to develop unit hydrographs within the Advanced Engineering Software (AES) program. The 1992 MSDP used NOAA Atlas 2 rainfall data, but since that time the City and San Bernardino County have updated to NOAA Atlas 14 rainfall data, which represent an increase of approximately 25%. The updated MSDP uses flows generated from NOAA Atlas 14. See Section 3.1 for more information.
- For the sake of economy, some proposed pipes were limited to convey the 25-year event, where the streets hold the difference in runoff between the 25-year and the 100-year events. Figure 1-3 below shows the design criteria from the 1992 SMPD for these locations. These pipes are generally smaller than 54 inches and located at the upstream ends of proposed projects or along smaller collector lines; larger pipes (typically greater than 54 inches) were sized to convey the 100-year event. See Sections 3.1 and 3.2 for more information.

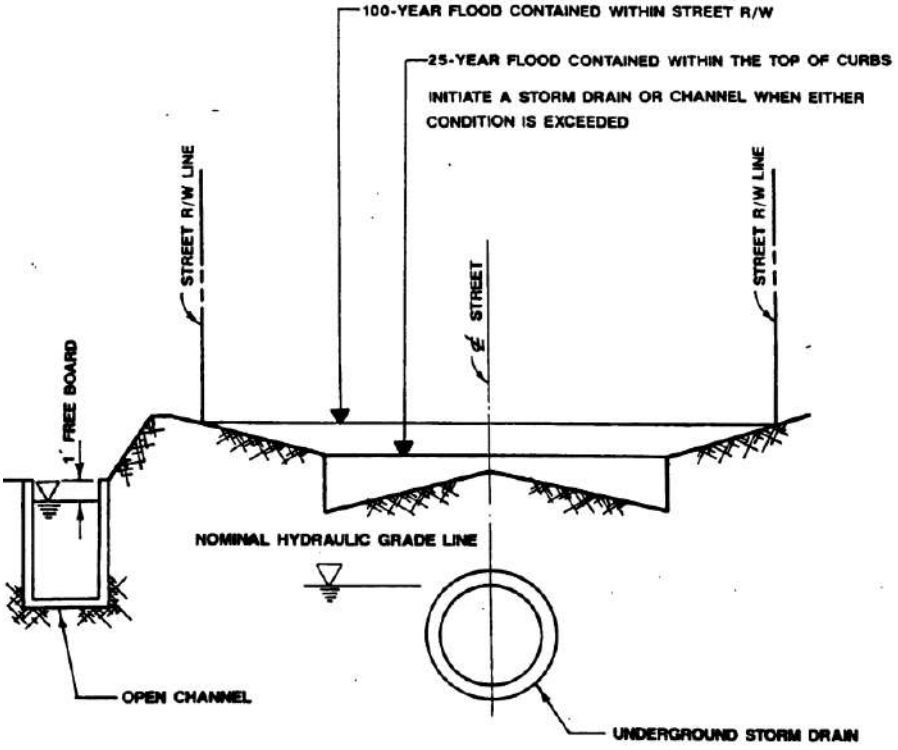

Figure 1-3. Design Criteria

1.4 PREVIOUS STUDIES AND AVAILABLE DATA

The 1992 MSDP was used as the basis of this study. However, additional studies, specific plans, and other data were also used to prepare this master plan. Table 1-1 lists reports used to provide data and supplementary information to complete this study.

In addition to the studies and reports listed below, as-built plans were used to accurately model existing storm drain infrastructure across the City. Geospatial information (shapefiles) containing existing storm drain pipes and manholes were also used to model existing infrastructure. Additional shapefiles were provided by the City containing information on City streets, pertinent utilities, known flooding locations, land use, and City boundaries.

Three-foot resolution LiDAR derived topography obtained from the City was used in the hydrologic and hydraulic analyses for runoff calculations and facility sizing. Additionally, high resolution aerial photos from 2016 were used to explore, assess, and confirm locations of pertinent drainage features and City infrastructure. All studies, reports, as-built plans, and geospatial information pertaining to City storm drain infrastructure were provided by the City of Fontana.

Table 1-1. Previous Studies, Specific Plans, and Reports

Previous Study/Report	Year	Author	Purpose
City of Fontana MSPD	1992	Hall & Foreman, Inc.	Basis of updated analysis herein
Downtown Core Project Environmental Impact Report	2023	De Novo Planning Group	AOS 1 proposed dev.
Speedway Commerce Center Specific Plan	2022	Kimley Horn	AOS 1 proposed dev.
Rialto Comprehensive Storm Drain Plan	1988	JMM Consulting, Inc.	AOS 1 proposed project
Village of Heritage Hydrology Report	1988	Hall & Foreman, Inc.	AOS 1 proposed project
Westgate Specific Plan	2017	JHA Consulting	AOS1/AOS 3 proposed dev.
Southridge Specific Plan	1981	PBR, Inc.	AOS 2 hydrology
West Valley Logistics Center Specific Plan	2018	Metis Environmental Group	AOS 2 proposed dev.
City of Fontana Infrastructure Drainage Report	2006	AEI CASC Engineering	AOS 3 hydrology
Summit Heights Drainage Report	2002	Hall & Foreman, Inc.	AOS 3 proposed dev.
Hunter's Ridge Specific Plan	1988	Crosby Mead Benton & Assoc.	AOS 3 proposed dev.
Coyote Canyon Specific Plan	1997	AEI CASC Engineering	AOS 3 proposed dev.
Ventana at Duncan Canyon Specific Plan	2022	Frontier Enterprises	AOS 3 proposed dev.
Final Drainage Study (Arboretum)	2020	Q3	AOS 3 hydrology
I-15 Logistics Center Hydrology Report	2021	David Evans and Assoc., Inc.	AOS 3 hydrology
Citrus Heights North Specific Plan	2004	T&B Planning Consultants, Inc.	AOS 3 proposed dev.
Citrus Heights South Specific Plan	2003	T&B Planning Consultants, Inc.	AOS 3 proposed dev.
The Arboretum Specific Plan	2009	Place Works	AOS 3 proposed dev.

2 AREA OF STUDY CHARACTERISTICS

This section provides details of the MSDP study area, describing the local climate, topography, soils, existing storm drain infrastructure, and land use conditions used to develop the hydrologic and hydraulic models.

2.1 AREA OF STUDY OVERVIEW

The entire City is located within the Santa Ana River Watershed and ultimately drains to the Santa Ana River. The Fontana watershed lies in the plain adjacent to the Santa Ana River. Generally, the topography of the area is relatively flat, sloping from north to southwest at approximately a 0.5 percent grade. Although, there are portions of the City which drain towards the southeast, located primarily east of Sierra Avenue. The watershed is predominately urbanized. Storm runoff is generally intercepted by local City facilities then conveyed to major San Bernadino County facilities to the Santa Ana River, then to the Pacific Ocean.

2.1.1 AOS 1

AOS 1 has a drainage area of approximately 20 square miles (sq. mi.; 12,914 ac). The area occupies the middle of the City and is entirely within the City of Fontana (Figure 2-1). AOS 1 is bounded by Interstate 210 (Foothill Freeway) to the north and Interstate 10 to the south. West of Sierra Avenue, AOS 1 drains towards the Etiwanda/San Sevaine Watershed while areas east of Sierra Avenue (between Baseline Road and I-10 Freeway) drain towards the East Fontana Channel following the north side of the Atchison, Topeka and Santa Fe Railroad (ATSF) from Palmetto Avenue to the Rialto Channel. Both areas ultimately drain to the Santa Ana River and into the Pacific Ocean. AOS 1 is fully developed with mixed land uses and contains some of the oldest developments in the City, including the entire Downtown Development area. It is the highest priority for improving storm drainage.

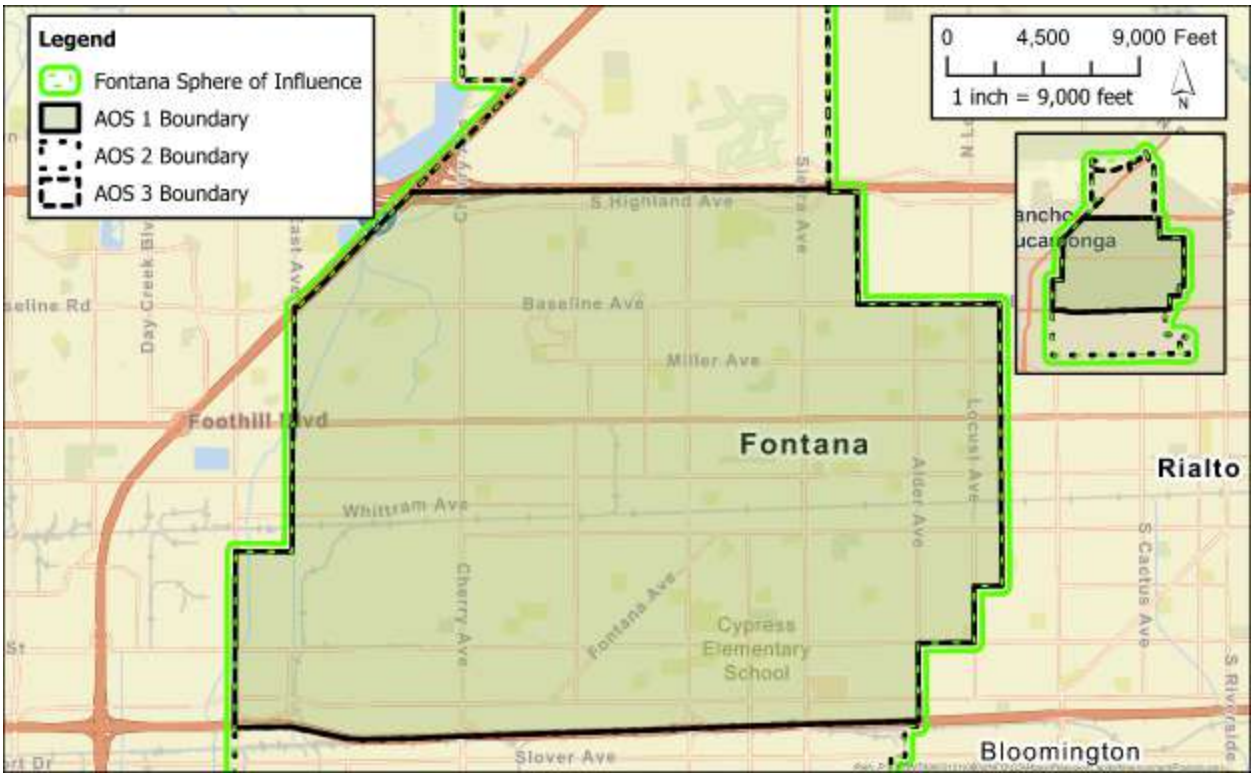

Figure 2-1. AOS 1 Overview

2.1.2 AOS 2

AOS 2 is directly south of AOS 1 and has a drainage area of approximately 14 square miles (9,120 acres). The area is entirely within the City of Fontana (Figure 2-2). AOS 2 is bounded by Interstate 10 to the north and Philadelphia Avenue, the Jurupa Hills, and the Fontana City Boundary to the south. AOS 2 drains primarily to the Declez Channel, which runs northeast to southwest through the study area. North of the Jurupa Hills, AOS 2 drains southwest, while the Jurupa Hills drain primarily north. The Western-most portions of AOS 2 (generally west of Calabash Avenue) drain towards the San Sevaine Channel. Both channels ultimately drain south to the Santa Ana River and into the Pacific Ocean. The southeast portion of AOS 2, adjacent to the Jurupa Hills drains to the east and into Rialto. The West Valley Logistics Center Specific Plan is proposed in this area but was not considered in this analysis as the specific hydrology and hydraulic analysis for this project is under City review and not finalized for inclusion. AOS 2 has been mostly developed since the 1992 Master Plan was completed and contains mixed land uses. The exception to this occurs near Jurupa Avenue, north of Jurupa Avenue there is significant industrial development and redevelopment opportunities and the area south of Jurupa Avenue and into the Jurupa Hills, remain undeveloped.

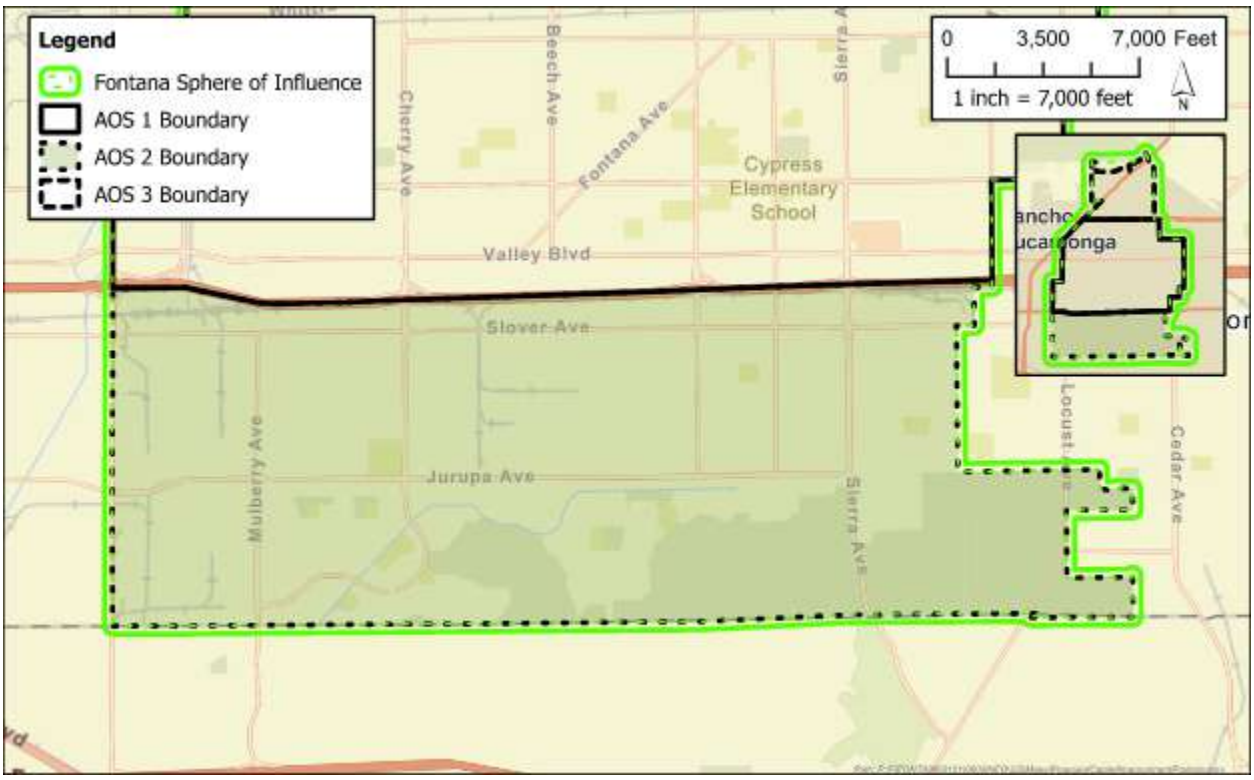

Figure 2-2. AOS 2 Overview

2.1.3 AOS 3

AOS 3 is located north of AOS 1 and has a drainage area of approximately 9 square miles (5,691 acres). The area is entirely within the City of Fontana and drains primarily southwest (Figure 2-3). AOS 3 is bounded by Interstate 210 (Foothill Freeway) to the south and the San Gabriel Mountains to the north. Interstate 15 runs southwest to northeast through AOS 3. Most of AOS 3 north of Interstate 15 drains to the Hawker-Crawford Channel. Areas south of Interstate 15 and north of Summit Avenue drain to the Summit Avenue Storm Drain. Areas between Summit Avenue and Interstate 210 drain to the Highland Channel. All areas East of Sierra Avenue drain towards the Cactus Channel, which heads east and south through Rialto. All of AOS 3 ultimately drains to the Santa Ana River and into the Pacific Ocean. AOS 3 is the most recently developed, primarily with residential land uses. Many portions of AOS 3 remain undeveloped, specifically in the northern portion of the study area.

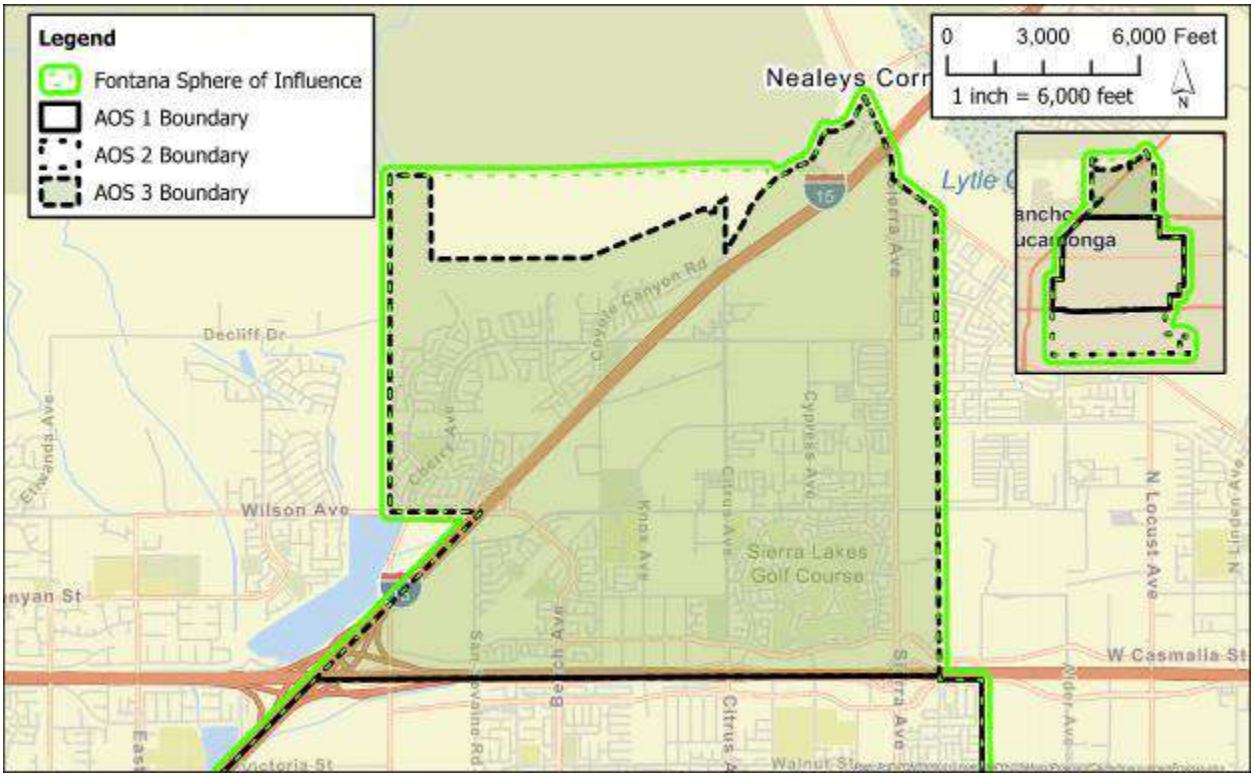

Figure 2-3. AOS 3 Overview

2.1.4 SPHERE OF influence

In addition to the City of Fontana boundary, the City also retains a 'sphere of influence' boundary, which is an expanded version of the City boundary that includes areas surrounding the City that may be annexed in the future. These areas were also included in the analysis and are shown in Figure 1-2. The majority of the additional area not included in AOS 1, 2, or 3 mentioned previously is located to the West of AOS 1 and includes Kaiser and the Auto Club Speedway (5,092 acres). This area is primarily composed of residential and industrial land use and drains to the San Sevaine Channel. Additional, smaller areas within the sphere of influence that were included in the analysis are located to the southeast of AOS 1 (158 acres), and to the North of AOS 3 in the San Gabriel Mountains (508 acres).

2.2 EXISTING STORM DRAIN INFRASTRUCTURE

The density and adequacy of existing City-owned storm drain infrastructure varies across the City. Since the 1992 MSDP, many developments have been constructed with corresponding storm drain infrastructure that meets capacity requirements. However, other areas are still primarily without subsurface storm drain drainage infrastructure to control local flooding. A summary of existing infrastructure by AOS is provided below. All existing storm drain drainage pipes are shown in Appendix 2.

2.2.1 AOS 1

AOS 1 is the oldest and most infrastructure-deficient area of the City. Most of the AOS lacks drainage infrastructure more than park drains and minor (< 36 inches in diameter) storm drainage lines to control localized flooding. The major storm drainage lines (≥ 36 inches in diameter) that do exist are infrequent and primarily centralized in newer parts of the AOS, such as the Village of Heritage and areas north of Baseline Avenue, where portions of the 1992 MSDP were implemented (Figure 2-4).

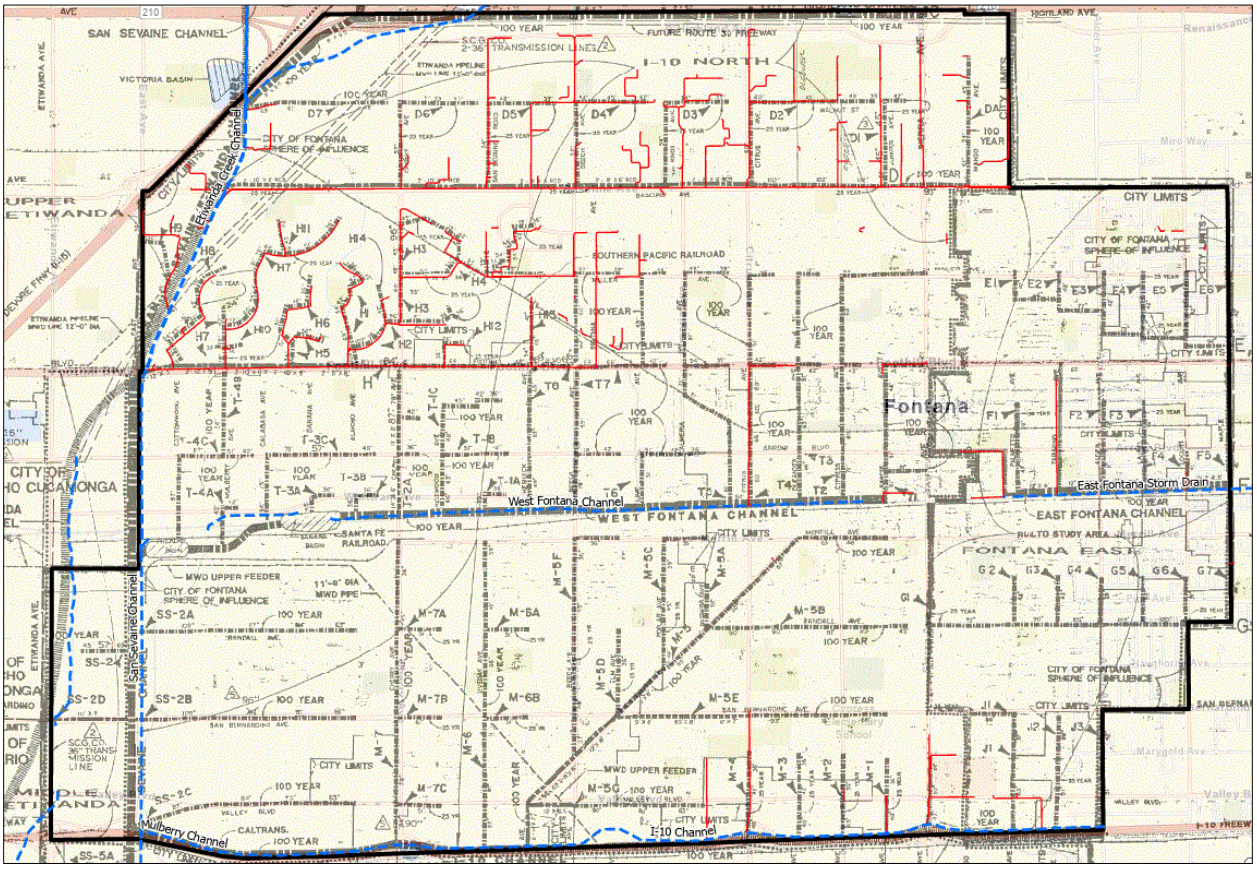

Figure 2-4. Comparison of Proposed Lines From the 1992 Master Plan to Existing Pipes in AOS 1 (red lines)

2.2.2 AOS 2

AOS 2 has been mostly developed since the 1992 MSDP, and newer residential and industrial developments have sufficient drainage infrastructure. Major storm drain lines, such as the DZ lines, from the 1992 MSDP are present running north to south along most streets between Mulberry Avenue and Sierra Avenue, draining to the Declez Channel (Figure 2-5). Residential developments, including Southridge and Sycamore Hills, also drain via major storm drainage lines to the Declez Channel. Other areas remain undeveloped.

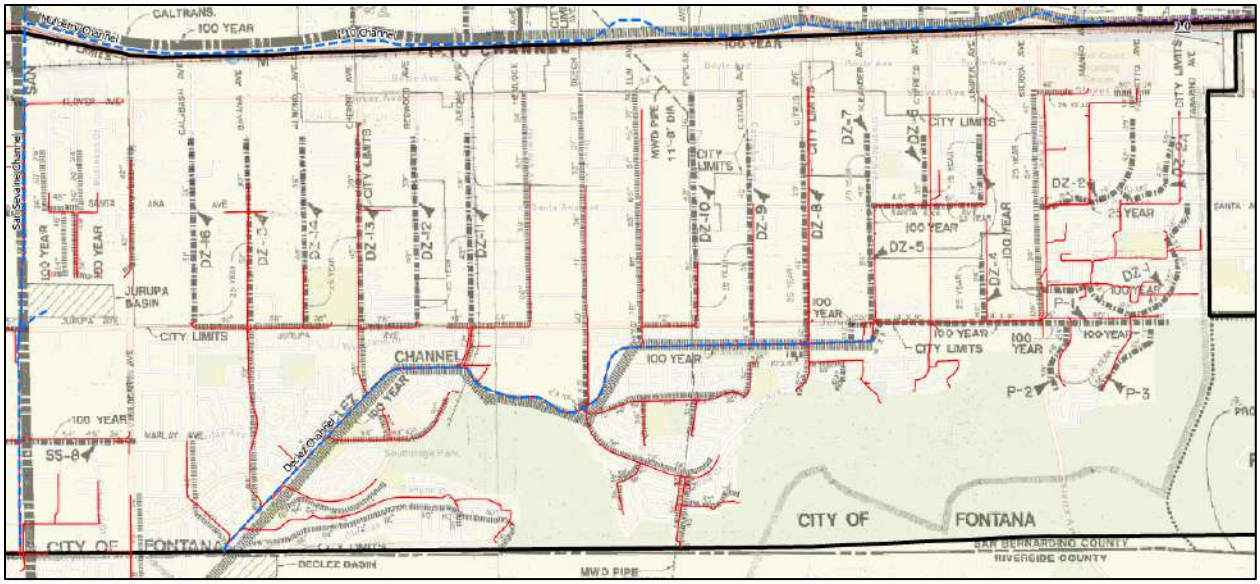

Figure 2-5. Comparison of DZ Lines from the 1992 Master Plan to Existing Pipes in AOS 2 (red lines)

2.2.3 AOS 3

AOS 3 is the most recently developed; new residential developments are planned or in construction in several areas. Most of the developed portions of the AOS have sufficient storm drain infrastructure, including the B- and C-lines from the 1992 MSDP (Figure 2-6). Similarly, the Hunter's Ridge and Coyote Canyon developments contain lines presented in the 1992 MSDP. Undeveloped areas in the northern portions of the AOS have specific plans in place, including the Arboretum development north of Duncan Canyon Road which has major storm lines proposed that are similar to those in the 1992 MSDP. Runoff from areas north of I-15 currently flow through a series of box culverts below I-15 and discharge into an undeveloped area to the south. Drainage patterns for these culverts will be altered based on planned development and are reflected in the present study.

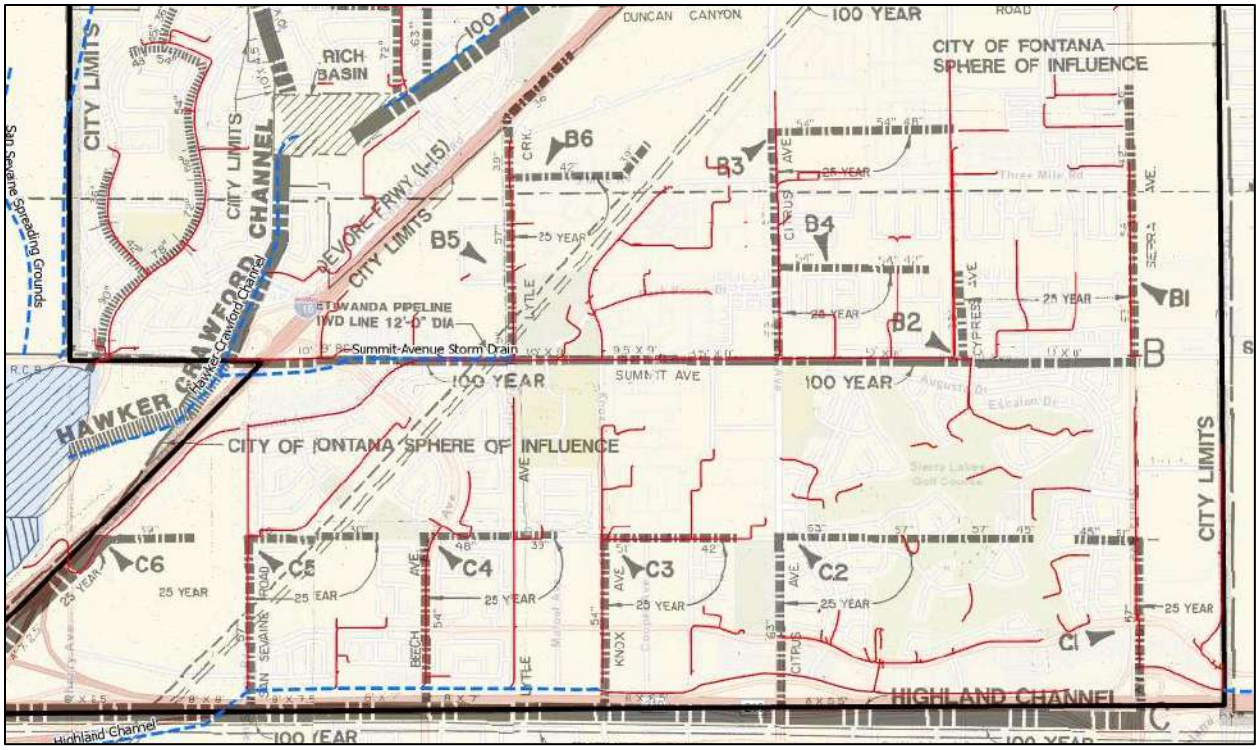

Figure 2-6. Comparison of B and C Lines from the 1992 Master Plan to Existing Pipes in AOS 3 (red lines)

2.3 REGIONAL FLOOD CONTROL CHANNELS

San Bernadino County (County) Department of Public Works operates and maintains several regional flood control channels throughout the City of Fontana. These channels act as the downstream discharge points for major City-owned and maintained storm drain infrastructure. The location and extent of the facilities is shown in Figure 1-2. These include:

Declez Channel – This major facility is a concrete trapezoidal channel that begins at Sierra Avenue, flows west, and drains the majority of AOS 2. It discharges to the Declez Detention Basin before continuing southwest to the San Sevaine Channel. The Chino Basin Groundwater Recharge basins are located along the Declez Channel, near the intersection of Jurupa Avenue and Beech Avenue; however, these basins were not included in the present analysis as they are County facilities and were outside the scope of this study. The Declez Channel was included in the capacity analysis for this study to determine if additional flow to the channel would require upsizing portions of the channel.

I-10 Channel – The I-10 Channel is owned and maintained by Caltrans and flows east to west along the northern side of I-10. It drains the southern portion of AOS 1 before discharging into the San Sevaine Channel. It was included in the capacity analysis to determine if additional flow to the channel would require upsizing portions of the channel.

West Fontana Channel – The West Fontana Channel is a rectangular channel that flows east-to-west along the Burlington Northern and Sante Fe Railroad and drains the middle and western portions of AOS 1. It discharges to the San Sevaine Channel after flowing through two regional detention facilities. The analysis calculated the channel capacity through the first detention basin (Banana Basin).

Highland Channel – The Highland Channel is a concrete trapezoidal channel that drains AOS 3 between Foothill Freeway and Summit Avenue from Citrus Avenue west. It flows under the Foothill Freeway and into the San Sevaine Channel. It was not included in this analysis because it was determined to be sufficiently sized to convey flows from the contributing watershed based on results of this analysis compared to the design discharge (Q100) for the channel.

East Fontana Channel – The East Fontana Channel is a trapezoidal channel that begins at Mango Avenue and drains east, collecting runoff from eastern AOS 1 between the Burlington Northern and Sante Fe Railroad and Foothills Boulevard. It eventually drains to the Rialto Channel to the east. It was included in the capacity analysis of the current study to determine if additional flow to the channel would require upsizing portions of the channel.

Hawker-Crawford Channel – This channel begins in the north-central portion of AOS 3, north of I-15, and flows southwest, collecting runoff from Hunter's Ridge and Coyote Canyon developments. A reroute of the channel is currently under construction due to the adjacent Nara Hills Development north of I-15. The channel flows into the Rich Detention Basin, then continues and discharges to the San Sevaine Basins. The channel was not included in the present analysis because it is in AOS 3, which is the most recently developed, it is County maintained, and because the area north of the channel that drains into the facility contains new development that was assumed to have sufficiently sized infrastructure.

San Sevaine Channel – The San Sevaine Channel originates in northern AOS 3 at the foot of the San Gabriel Mountains and flows south into the San Sevaine Detention Basins. It then continues south along the western edge of Fontana until it eventually discharges to the Santa Ana River. This channel collects runoff from the majority of the City as it acts as the final discharge point for the other regional channels mentioned above (except the East Fontana Channel). It was not included in the analysis, as it is a County-operated facility, was further downstream from many of the discharge points used in the capacity analysis, and was assumed to be sufficiently sized.

2.4 CLIMATE AND RAINFALL

The City of Fontana climate is characterized as Mediterranean, with hot, dry summers and cool, cloudy winters. Annual rainfall is 14 inches, on average, and rain typically occurs during winter storms between December and March. Snow accumulates in the San Gabriel Mountains to the north of the city that contributes to runoff during the spring freshet. Rainfall typically falls in intense, short duration events, except during more unique events, such as atmospheric rivers that can bring substantial rain over days.

The 1992 MSDP used rainfall data from NOAA Atlas 2 (NOAA, 1973), where rainfall depths and intensities are based on data from fewer rain gauges than updated NOAA Atlas 14 data. The NOAA Atlas 14 Publication (NOAA, 2014) includes data from additional rain gauges that were not available at the time of NOAA Atlas 2, as well as approximately 25 years of additional data from the gauges included in NOAA Atlas 2. The rainfall values from NOAA Atlas 14 were used in this analysis (see Section 3.1 for more information). In general, rainfall intensities based on data from Atlas 14 are 6-10% higher than those from Atlas 2, on average. This analysis used rainfall depths and intensities unique to each AOS, considering the spatial variation in rainfall from north to south Fontana, reflected in the NOAA Atlas 14 data below.

Table 2-1. 1-Hour Rainfall Intensity (in/hr) Comparison for NOAA Atlas 14 and Atlas 2

Source	Recurrence Interval	AOS 1	AOS 2	AOS 3	Average
Atlas 14	100-Year	1.58	1.33	1.80	1.57
	25-Year	1.20	1.02	1.42	1.21
Atlas 2	100-Year	1.40	1.35	1.52	1.42
	25-Year	1.11	1.06	1.22	1.13

2.5 EXISTING LAND USE

Existing land use was based on the 2022 General Plan Land Use Map provided by the City but revised to represent existing conditions. For example, areas that were not currently developed, but are reflected as such in the 2022 general plan, were assigned a land use of 'Open Space' for the hydrologic analysis. Areas outside of the general plan boundary, such as those in the San Gabriel Mountains to the north and Jurupa Hills to the south that contribute runoff were also characterized as 'Open Space'. Land use designations for existing conditions were confirmed via aerial imagery. An exhibit showing the existing land use applied to the hydrologic modeling is shown in Appendix 1.

2.6 PROPOSED LAND USE

Future land use designations were provided by the City as information from the General Plan adopted in 2022. An exhibit showing the future land use applied to the hydrologic modeling is shown in Appendix 1. A summary of land use for existing and proposed conditions is shown in Table 2-2. A comparison of between impervious percentage used in the 1992 MSDP and this study is provided in Appendix 1. This figure shows an increase in land-use density and corresponding impervious area compared to the 1992 MSDP.

Table 2-2. Existing and Proposed Land Use Summary Table

AOS	Total Acres[1]	Existing Land Use		Proposed Land Use	
		Impervious Acres	Impervious %	Impervious Acres	Impervious %
1	17,812	9,966	56	10,773	60
2	9,016	5,530	61	5,606	62
3	5,858	2,660	45	2,730	47

[1]Values discount area within right of way of I-15, I-10, and Foothill Freeway, and include area within the sphere of influence outside of AOS boundaries

2.7 SOILS

Soils across the City are primarily well-drained, hydrologic group A soils, such as loamy and gravelly sands. Some areas in mountainous areas to the north and south of the City are less well-drained, hydrologic soil group B, C, and D soils. Soil data was extracted from the USDA Web Soil Survey (USDA, 2023) for the entire sphere of influence. An exhibit showing the soils data applied to the hydrologic modeling is shown in

Figure 2-7. Table 2-3 below summarizes hydrologic soil types in each AOS. Generally, soils in the very northern portion of the City and within the very southern portions of the City are of a finer material and less permeable than the majority of the City which are course and well-draining.

Table 2-3. Hydrologic Soil Groups Summary Table

AOS	Hydrologic Soil Group								Total Acres[1]
	A		B		C		D		
	Acres	%	Acres	%	Acres	%	Acres	%	
1	18,163	100	-	-	-	-	-	-	18,163
2	7,501	82.3	-	-	65	0.7	1,554	17	9,120
3	5,349	86.3	88	1.4	104	1.7	657	10.6	6,198

[1]Values include area within the sphere of influence outside of AOS boundaries.

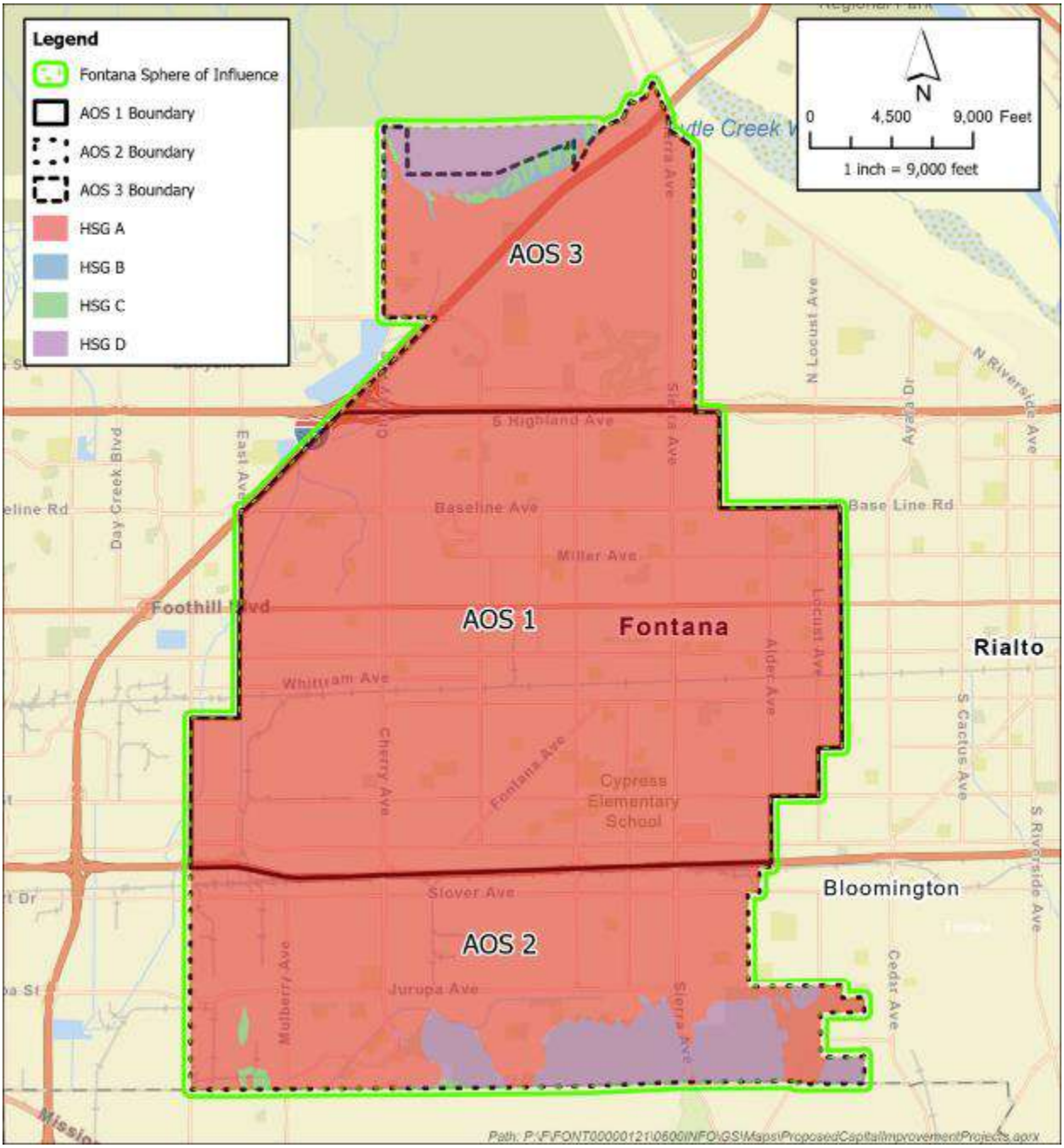

Figure 2-7. Hydrologic Soil Groups

2.8 KNOWN FLOODING

Areas of known flooding were provided by the City and based on locations where the Public Works Department routinely places Flooded Zone signs during periods of heavy rainfall. These areas are concentrated in AOS 1 near the Downtown Development Area and along Sierra Avenue to the south, and in AOS 2 along Jurupa Avenue. The City provides notices within City limits and does not provide signage for unincorporated areas. Figure 2-8 shows locations of known flooding provided by the City.

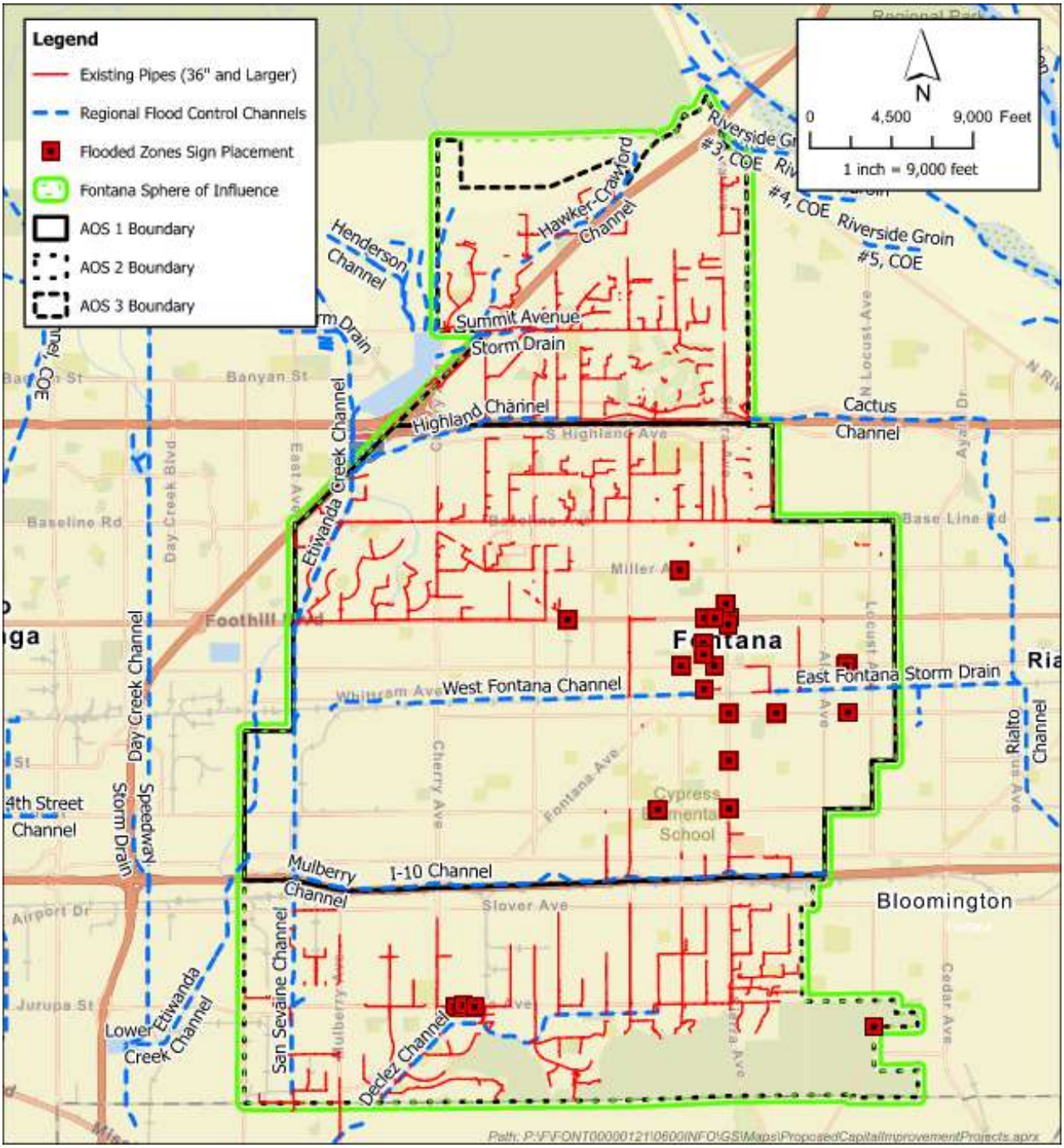

Figure 2-8. Known Flooding Locations

3 CAPACITY EVALUATION

3.1 HYDROLOGIC ANALYSIS

3.1.1 TECHNICAL APPROACH

The rational method was used to compute peak runoff rates and develop unit hydrographs to analyze the capacity of existing and proposed storm pipes. Rational method analyses and unit hydrographs were prepared in accordance with the San Bernardino County Flood Control Hydrology Manual. The hydrologic analysis was completed for existing and proposed conditions using updated NOAA 14 rainfall data. The proposed conditions hydrology used land use data from the 2022 General Plan Land Use Map provided by the City. The existing conditions hydrology used the same land use plan but considered areas that have not yet been developed as Open Space.

The hydrologic analysis was divided into two parts. First, hydrology for subbasins draining to existing and proposed storm drain mains/trunklines throughout the City were calculated using the Advanced Engineering Software (AES), Version 2013, for both the 25- and 100-year storms. The second part of the hydrologic analysis included the delineation of additional, smaller subbasins so the proposed storm drain system could be developed with the smallest collector line being at or near a 36-inch pipe diameter. The rational method was used to size the proposed collector lines primarily for the 25-year storm, but also included some collector lines designed for the 100-year storm.

3.1.2 DESIGN STORMS

NOAA Atlas 14 data was used in the analysis. Depths associated with the 5-minute through 24-hour duration were input into AES to produce runoff unit hydrographs. Rainfall data was extracted from the centroid of each area of study. Table 3-1 through Table 3-3 below show the rainfall values used in the analysis.

Table 3-1. AOS 1 NOAA 14 Rainfall Depth for Design Storm Events

Storm Event	Duration					
	5 min	30 min	1 hour	3 hours	6 hours	24 hours
	Depth (inches)					
25-Year	0.31	0.81	1.20	2.18	3.13	5.88
100-Year	0.41	1.06	1.58	2.78	3.94	7.32

Table 3-2. AOS 2 NOAA 14 Rainfall Depth for Design Storm Events

Storm Event	Duration					
	5 min	30 min	1 hour	3 hours	6 hours	24 hours
	Depth (inches)					
25-Year	0.27	0.69	1.02	1.78	2.49	4.57
100-Year	0.35	0.91	1.33	2.26	3.11	5.69

Table 3-3. AOS 3 NOAA 14 Rainfall Depth for Design Storm Events

Storm Event	Duration					
	5 min	30 min	1 hour	3 hours	6 hours	24 hours
	Depth (inches)					
25-Year	0.35	0.92	1.42	2.68	3.98	7.64
100-Year	0.44	1.17	1.80	3.37	4.97	9.53

3.1.3 SUBBASIN DELINEATION

Subbasin delineations for this study used delineations and parcel shapes from the 1992 MSPD study but were updated where necessary to represent current terrain and flow patterns based on updated topographic information. The 1992 MSPD did not include areas that drain towards the East Fontana Channel in Rialto (San Bernardino County Flood Control project area 3-3), so additional delineation was completed in this area based on the Rialto Channel Drainage Area Storm Drain Plan and general drainage patterns of the area. Figure 3-1 shows delineated subbasins for the trunkline hydrologic analysis. Figure 3-2 shows delineated subbasins for each basin used in the collector hydrologic analysis. Figure 3-4 and Figure 3-5 exhibits the M-line portion of AOS 1 used for the collector hydrologic analysis.

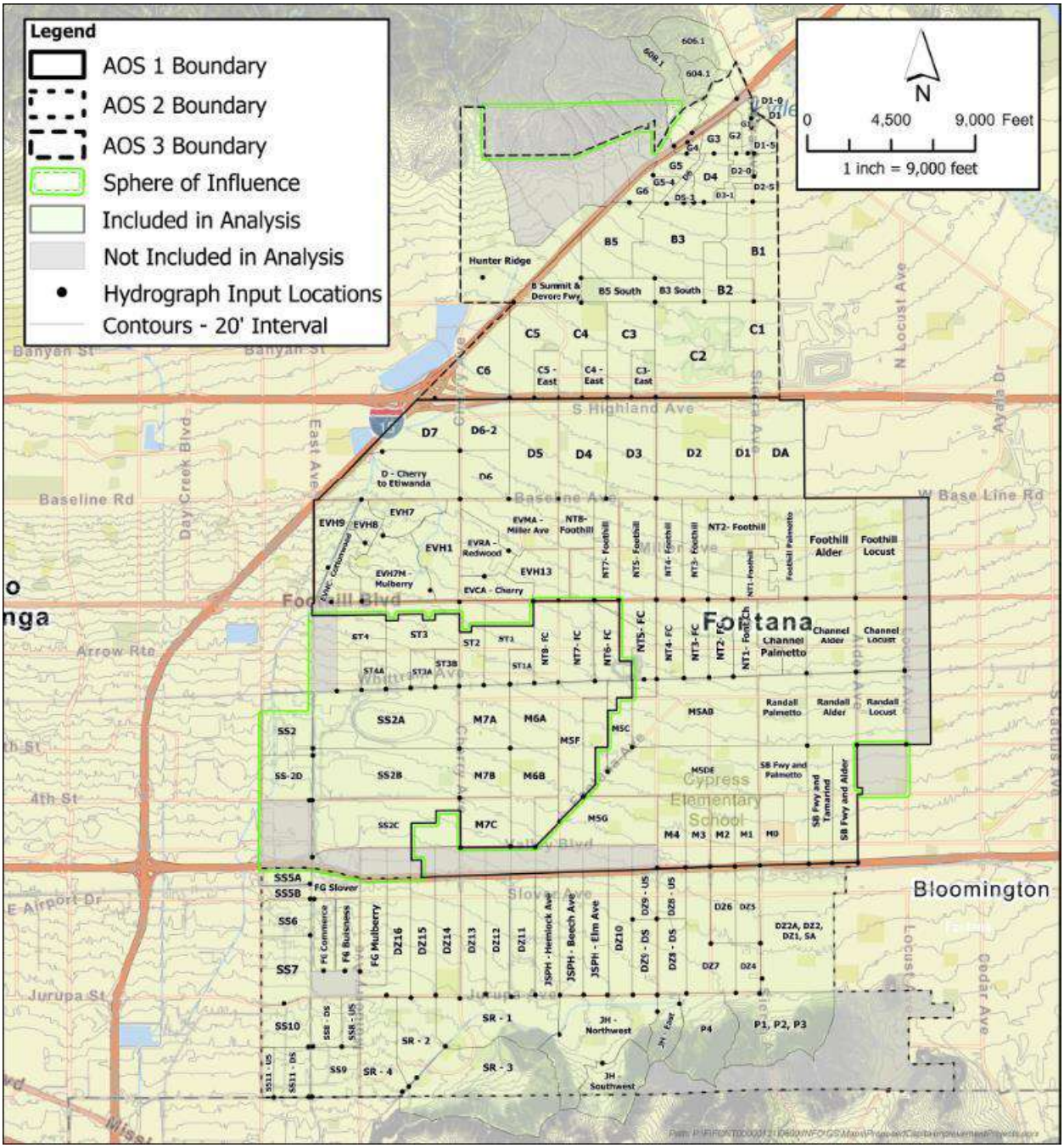

Figure 3-1. Subbasins Used in the Trunkline Hydrologic Analysis

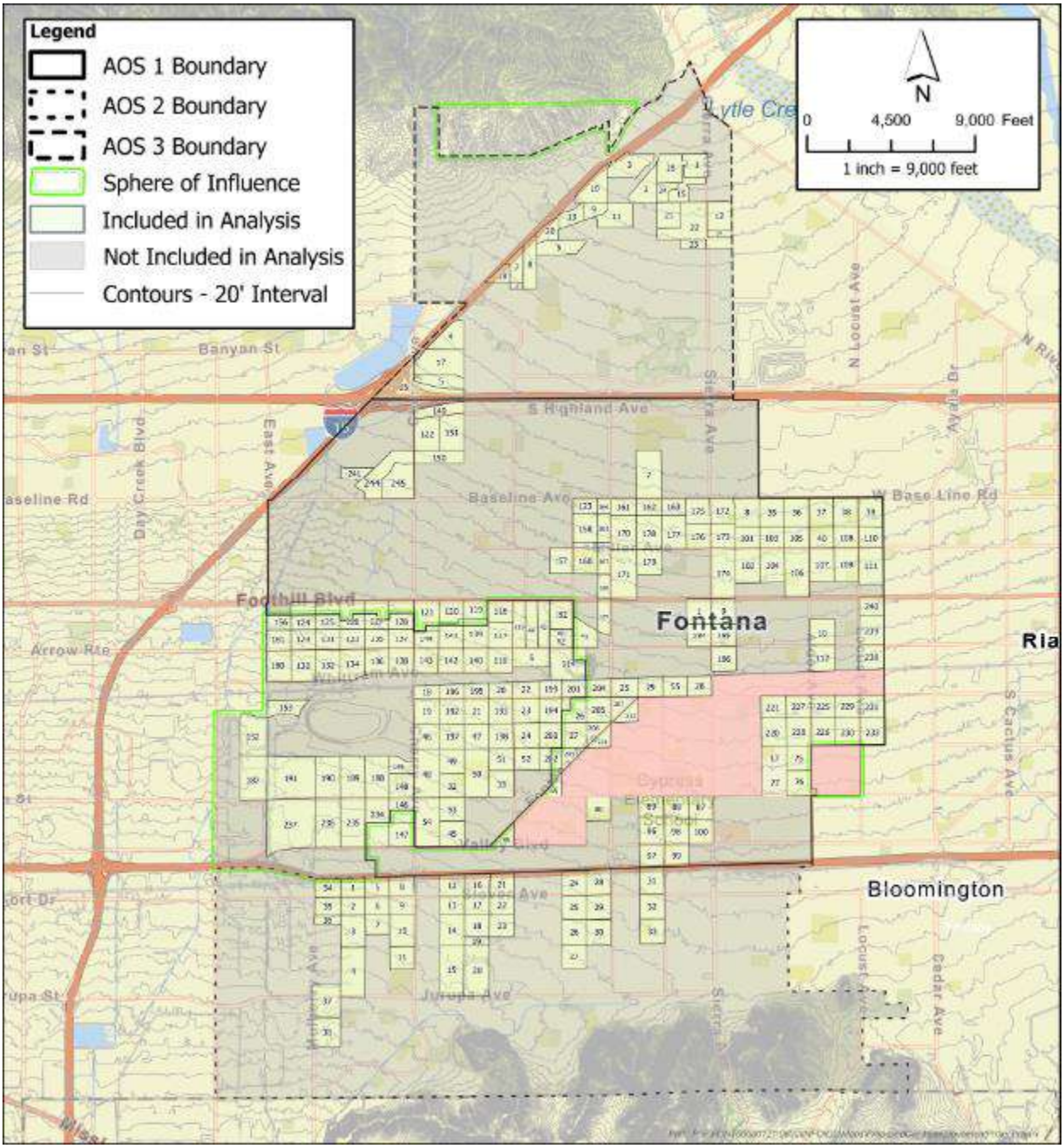

Figure 3-2. Subbasins Used in the Collector Hydrologic Analysis. Areas in Pink Shown in Detail in Figure 3-4.

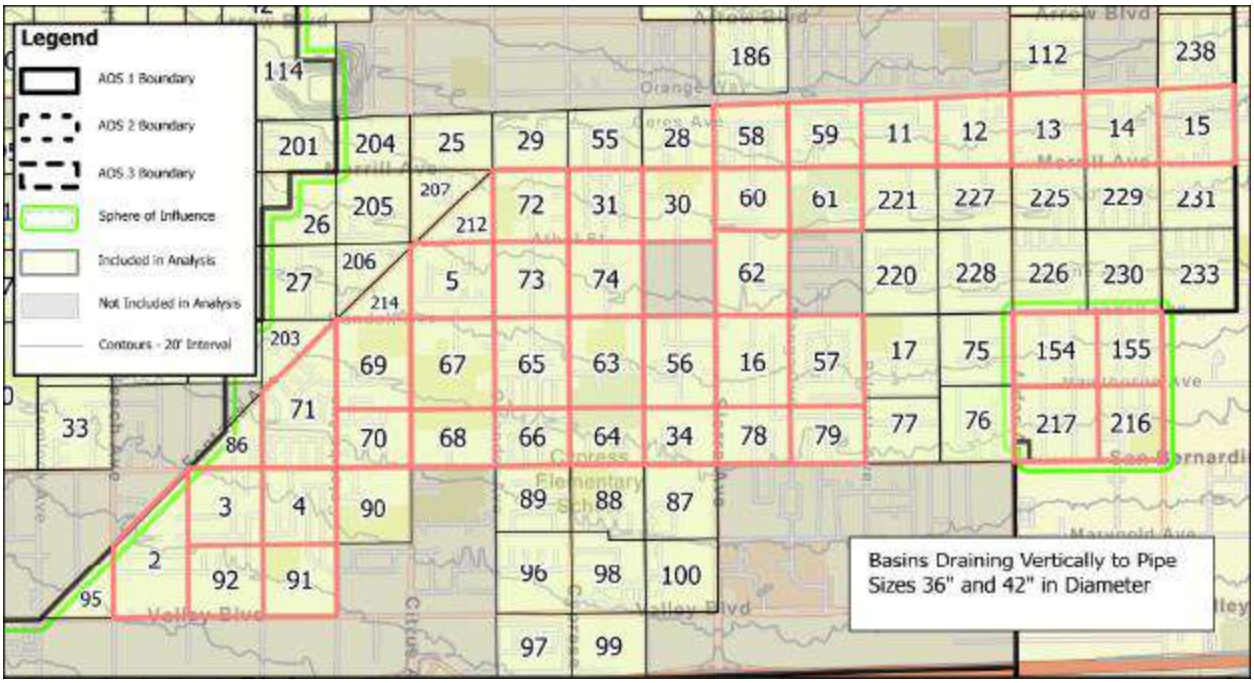

Figure 3-3. Detailed of Collector Basin Delineation for 'M' Line Portion of AOS 1 for Pipe Sizes 36" through 42".

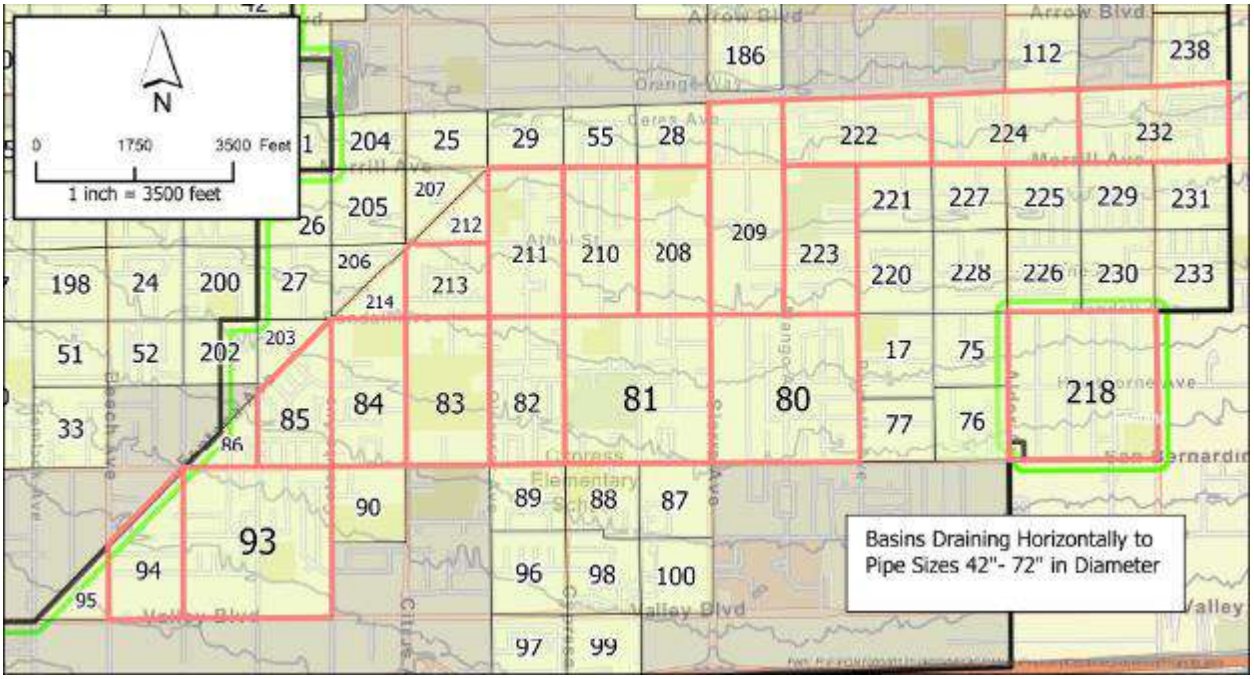

Figure 3-4. Detailed of Collector Basin Delineation for 'M' Line Portion of AOS 1 for Pipe Sizes 42" through 72"

3.1.4 RUNOFF COEFFICIENTS

Runoff coefficients for each subbasin were computed based on land use and underlying soil conditions, using procedures from sections C.6 and D.5 from the San Bernadino Hydrology Manual. The climate characteristics of the City of Fontana were classified as "valley".

First, the 24-hour storm runoff yield, Y, was computed for each land use and soil combination (subarea) within each subbasin, based on the curve number and 24-hour rainfall depth:

$$I_a = 0.2 * S$$

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

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

Where I_a is the initial rainfall abstraction (in.); S is the estimated total soil capacity (in.), CN is the subarea curve number listed in Table 3-4 based on land use and soil condition, Y_j is the 24-hour storm runoff yield fraction for subarea j, and P_{24} is the 24-hour storm rainfall (in.).

Then, the area-weighted 24-hour storm runoff yield, Y, was computed for each subbasin:

$$Y = \frac{Y_1 A_1 + \cdots + Y_m A_m}{A_1 + \cdots + A_m}$$

The low loss fraction (portion of runoff lost) was then calculated as:

$$\bar{Y} = 1 - Y$$

Where $\bar{Y}$ is the area weighted low loss fraction for each subbasin.

After, the maximum loss rate (in/hr) was computed for each land use and soil combination within each subbasin:

$$F_i = A_p F_p$$

Where $A_p$is the pervious area fraction of the subarea (unitless) based on land use (Table 3-4), and F_p is the infiltration rate (in/hr) based on soil type and antecedent moisture condition (AMC) (Table 3-5).

Then, the area-weighted maximum loss rate, F was computed for each subbasin:

$$F = \frac{F_1 A_1 + \cdots + F_m A_m}{A_1 + \cdots + A_m}$$

For the trunkline analysis, both the low loss fraction and maximum loss rate were then used as inputs to develop unit hydrographs in AES. AMC II was assumed for computations of F and $\bar{Y}$ during the 25-year event and AMC III was assumed for computation of F and $\bar{Y}$ during the 100-year event. Curve numbers were adjusted for AMC III conditions per Table C.1 within the San Bernardina Hydrology Manual. For the

trunkline analysis, time of concentrations (TC) were calculated in AES based on landuse, flowpath and/or pipe length, and assumed velocities.

Table 3-4. Land Use Types, Curve Numbers, and Associated A (San Bernardino Hydrology Manual)

Land Use Description	Hydrologic Soil Group				A_p
	A	B	C	D	
Apartments	32	56	69	75	0.20
Barren	78	86	91	93	1.00
Chaparral, Broadleaf, Fair	40	63	75	81	1.00
Chaparral, Narrowleaf, Fair	55	72	81	86	1.00
Commercial	32	56	69	75	0.10
Commercial, Industrial	32	56	69	75	0.10
Condominiums	32	56	69	75	0.35
Fallow	77	86	91	94	1.00
Grass, Annual or Perennial, Fair	50	69	79	84	1.00
Meadows or Cienegas, Fair	51	70	80	84	1.00
Open Brush, Fair	46	66	77	83	1.00
Open Brush, Good	41	63	75	81	1.00
Orchards, Evergreen, Fair	44	65	77	82	1.00
Public Park	32	56	69	75	0.85
Residential 1 acre lots	32	56	69	75	0.80
Residential 2 dwellings/acre	32	56	69	75	0.70
Residential 2.5 acre lots	32	56	69	75	0.90
Residential 3-4 dwellings/acre	32	56	69	75	0.60
Residential 5-7 dwellings/acre	32	56	69	75	0.50
Residential 8-10 dwellings/acre	32	56	69	75	0.40
Residential 10+ dwellings/acre	32	56	69	75	0.20
Row Crops, Good	67	78	85	89	1.00
Row Crops, Poor	72	81	88	91	1.00
School	32	56	69	75	0.60
Turf, Good	33	58	72	79	1.00
Water	98	98	98	98	0.00
Woodland, Fair	36	60	73	79	1.00
Woodland, Grass, Fair	44	65	77	82	1.00
Woodland, Poor	45	66	77	83	1.00

Table 3-5. Assumed Infiltration Rates (F_p) by Hydrologic Soil Group for the Rational Method Analysis

Hydrologic Soil Group	AMC II F_p Value (in/hr)	AMC III F_p Value (in/hr)
A	0.40	0.18
B	0.30	0.12
C	0.25	0.10
D	0.20	0.07

For the collector analysis, a weighted runoff coefficient, C, was calculated for each subbasin as:

$$C = 0.90 * \left((1 - A_p) + \frac{(I - F_p) * A_p}{I} \right)$$

Where A_p and F_p are as previously defined, and I is the rainfall intensity for a storm duration equal to the subbasin time of concentration. Time of concentration for each basin for the collector analysis was estimated by assuming a velocity along the diagonal flow path across each basin. Average velocities were 0.75, 1.0, and 2.0 ft/s for basins in AOS 1, 2, and 3, respectively, based on the average slope of each AOS. I was determined for each subbasin by fitting a power curve to the rainfall intensity-duration curve for events between 5 minutes and 6 hours; an example for AOS 1 is shown in Figure 3-5.

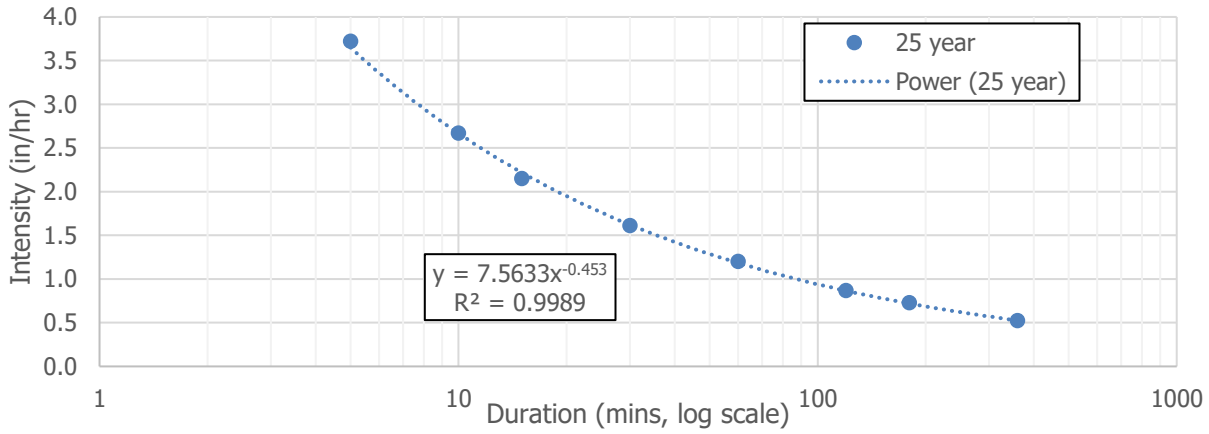

Figure 3-5. Intensity-Duration Curve for AOS 1 to Determine Runoff Coefficients for the Collector Hydrologic Analysis

Peak flow rates were then determined for the collector analysis by the rational method equation:

$$Q = C * I * A$$

3.1.5 UNIT HYDROGRAPH DEVELOPMENT

AES was used to develop runoff unit hydrographs for the trunkline analysis using the resulting times of concentration, loss rates, and low loss fractions described previously. An example of the unit hydrographs generated in AES are shown below in Figure 3-6. Tabular data for all subbasins used in the trunkline analysis are shown in Appendix 1.

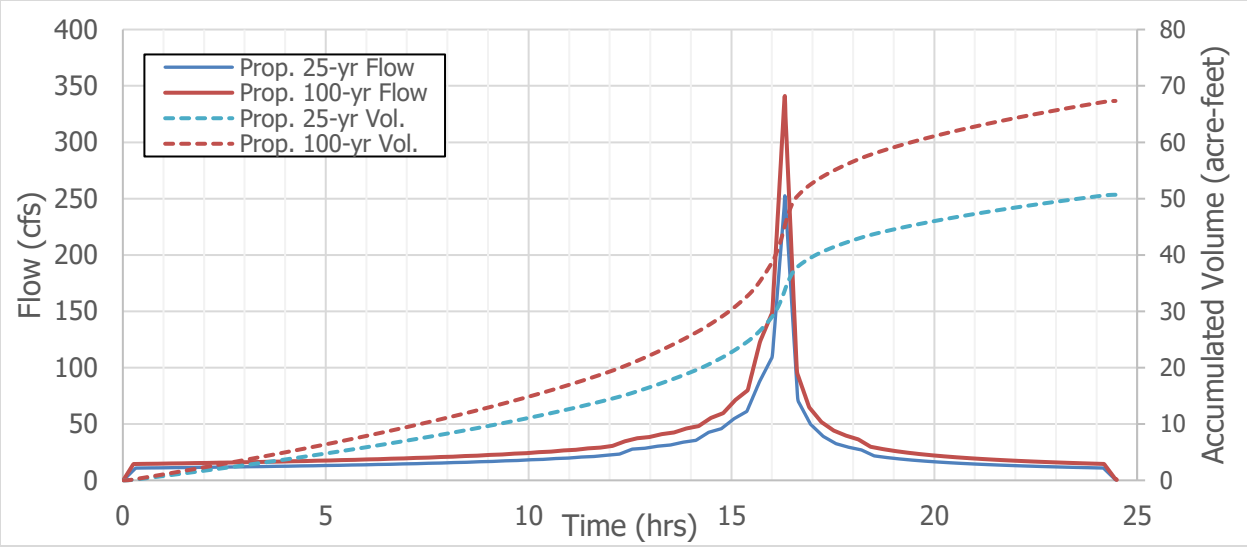

Figure 3-6. Flow and Accumulated Volume for Subbasin D7 in AOS 1 for the 25- and 100-year storms

3.2 HYDRAULIC ANALYSIS

3.2.1 TECHNICAL APPROACH

A coupled 1- and 2-dimensional (1D/2D) hydraulic model was used to evaluate flooding across the City. Autodesk InfoWorks ICM was used to perform this analysis. Dynamic modeling allows the effects of storage and backwater in conduits and floodplains and the timing of the hydrographs to yield a more realistic representation of hydraulic conditions. InfoWorks ICM can model the surface using 2D flow, while linking to the storm drain system with a 1D analysis. The result is a comprehensive model that can dynamically communicate between the surface and storm drain. Using these modeling techniques, hydraulic analyses were completed for both baseline (existing storm infrastructure network) and proposed conditions. Figure 3-7 provides a schematic of how a 1D/2D model is configured. The InfoWorks ICM input and results can be found in Appendix 2.

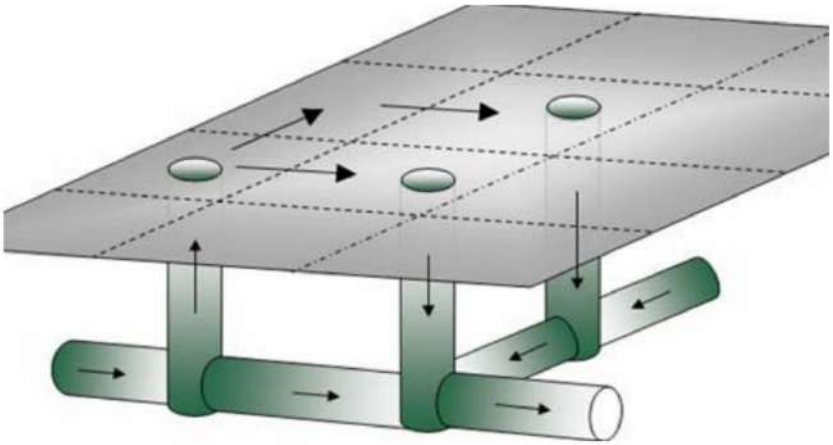

Figure 3-7. Graphic Representation of 1D/2D Surface/Subsurface Model (from Barnard et al., 2007)

3.2.2 1D MODEL FOR STORM PIPE NETWORK

As-built data and shapefiles showing existing storm drainage pipes and manholes were provided by the City. After a thorough review of the data quality, this information was imported into the InfoWorks ICM model to create 1D elements representing existing pipes and manholes. For AOS 1, existing pipes larger than 18-inches were included in this analysis. AOS 2 and 3 were more recently developed and have fewer capacity issues than older areas of the City, so only the existing pipes 36 inches and larger were included for AOS 2 and 3. All existing pipes incorporated into the ICM model are shown in a large-scale exhibit in Appendix 2.

3.2.3 2D MODEL FOR SURFACE FLOWS

The 2D model domain in InfoWorks ICM relies on topographic data, a computational mesh, and connections to the 1D storm drain model domain. Topography was represented in the model by a 3-foot resolution Digital Elevation Model (DEM) provided by the City. The DEM and associated 50-foot elevation contours are shown in Figure 3-8. All elevations reference the North American Vertical Datum of 1988 (NAVD88).

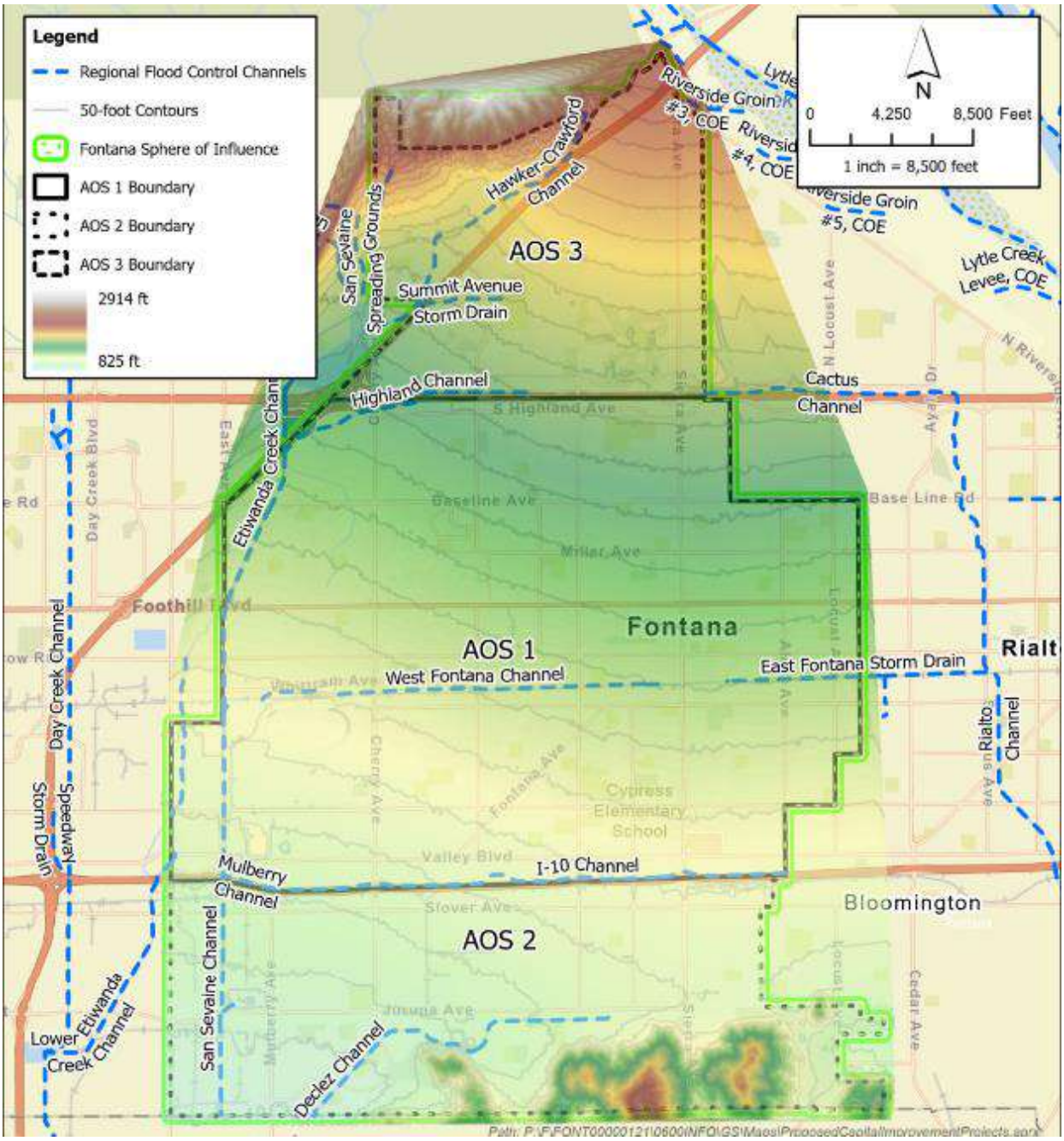

Figure 3-8. City of Fontana Topography

The computational mesh resolution is an important consideration in 2D modeling. Small mesh cell sizes increase accuracy but require additional computation time, while larger mesh sizes compromise accuracy but decrease computation time. Multiple cell sizes can be specified within one model, allowing a larger mesh size to be used in areas where a high level of detail is not required for an accurate model result, such as areas with flat topography. A smaller mesh size should be used in primary areas of interest or where topography changes rapidly. The mesh size specified in this study was intended to replicate the hydraulic behavior of the drainage watershed. It is recommended to have major 2D surface flow paths (such as streets, open channels) to be represented by at least three to four cells. This study used a dynamic 1000-

square foot maximum mesh element area size that decreased in size where topography rapidly changes, to a minimum element size of 100-square feet. This mesh size best reflected conveyance within the City and captured enough detail for accurate hydraulic routing to 1D elements. An example of the mesh size resolution is shown in Figure 3-9.

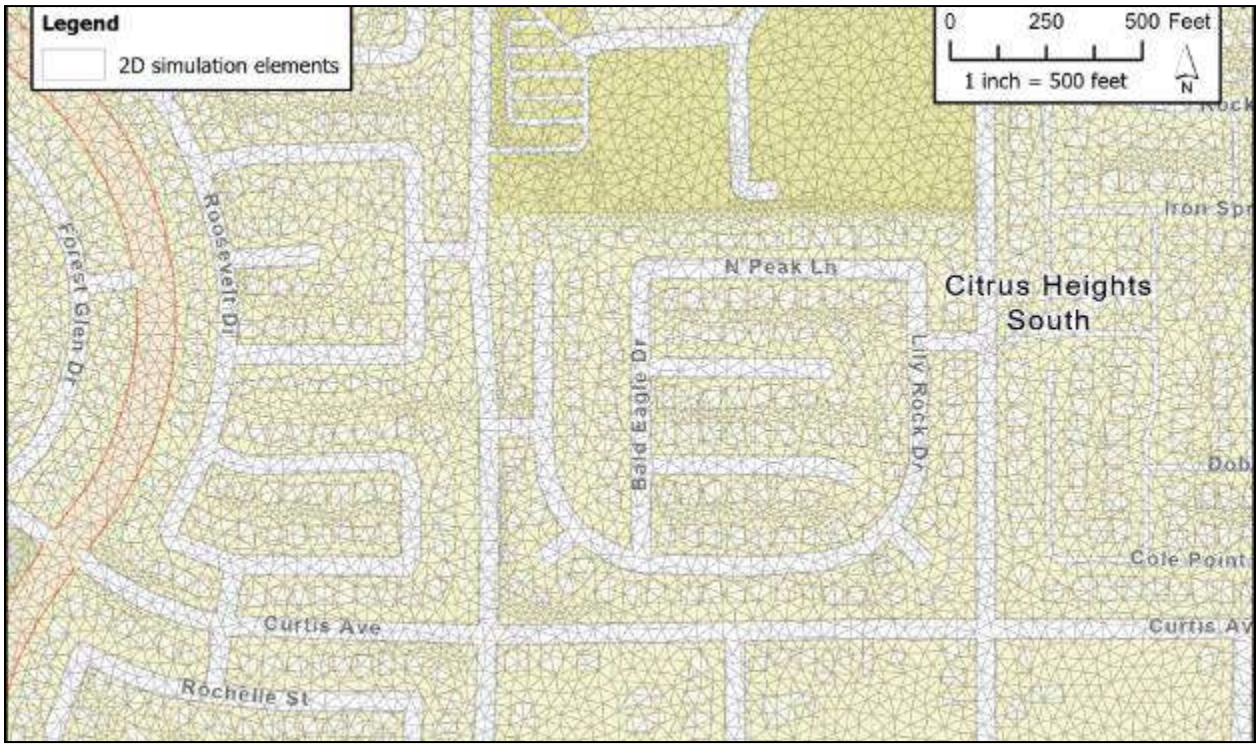

Figure 3-9. Example of 2D Mesh Element Resolution in AOS 3

3.2.4 BOUNDARY CONDITIONS

Hydrographs from the hydrologic analysis were input at discrete 2D points, node locations (manholes), or the upstream end of culverts to capture the accumulation of runoff and resulting flow throughout the City. Hydrographs were primarily input along trunklines (as shown on Figure 3-1) and as surface flow inputs under existing conditions; proposed condition analyses only included flow inputs along the trunklines.

Modeling ended at the downstream end of trunklines where they either flowed outside the City's sphere of influence or into County-maintained detention basins or channels. Downstream boundary conditions for these locations were set to outfall with or without considering flow onto the 2D mesh, depending on location. 2D outfall locations were modeled using normal depth as a downstream boundary condition.

3.2.5 MODEL VALIDATION

Model validation was completed by referencing the model results to known flooding locations (Figure 2-8), as this was the only evidence available from the City. Figure 3-10 shows the 100-year storm hydraulic modeling results for existing conditions overlaid with known flooding locations.

Flooding history provided in the City Local Hazard Mitigation Plan from 2017 was also used to anecdotally confirm model results. This process provided a level of confidence that the rainfall-runoff relationships in the model sufficiently reflect real world conditions.

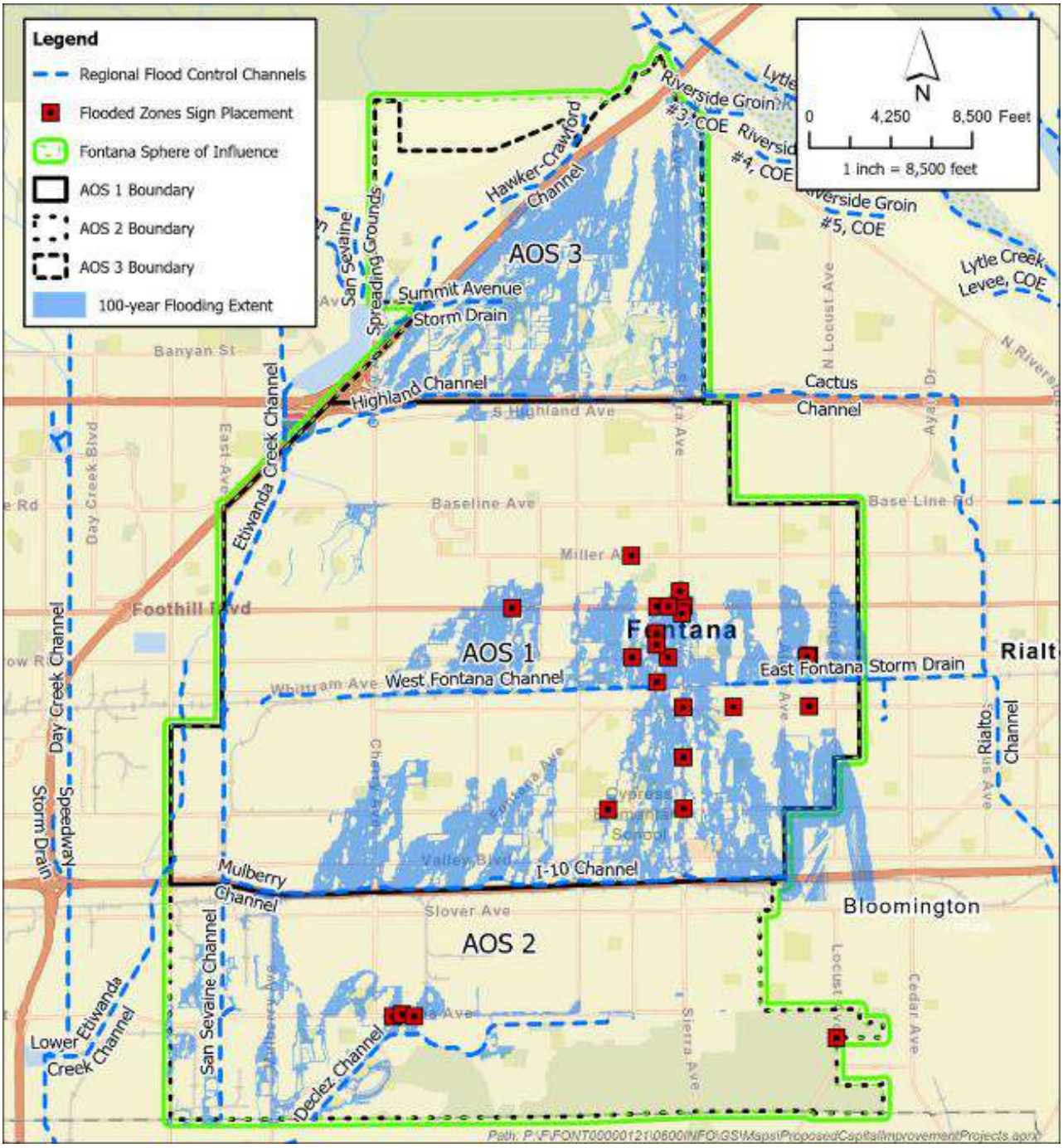

Figure 3-10. 100-year Storm Existing Conditions Hydraulic Modeling Results for Model Validation

Pertinent Information from City of Fontana Flooding History:

- October 19-20, 2004 – "The San Sevaine wash was completely overrun at the Railroad undercrossing just north of Slover Avenue. The resulting flooding waters washed out the train tracks." During this event, 3 inches fell in 24-hour in nearby San Bernardino (USGS Station 340436117173001); nearly 14 inches fell at the Lytle Creek gauge in the San Gabriel Mountains north of Fontana (USGS Station 341509117312601). These depths are associated with approximately the 25-year event. The San Sevaine channel was not explicitly modeled for this study as it is a County maintained facility, but the areas draining Solver Avenue were. This area experiences flooding greater than 1.25 feet during the 100-year event (Figure 3-11).

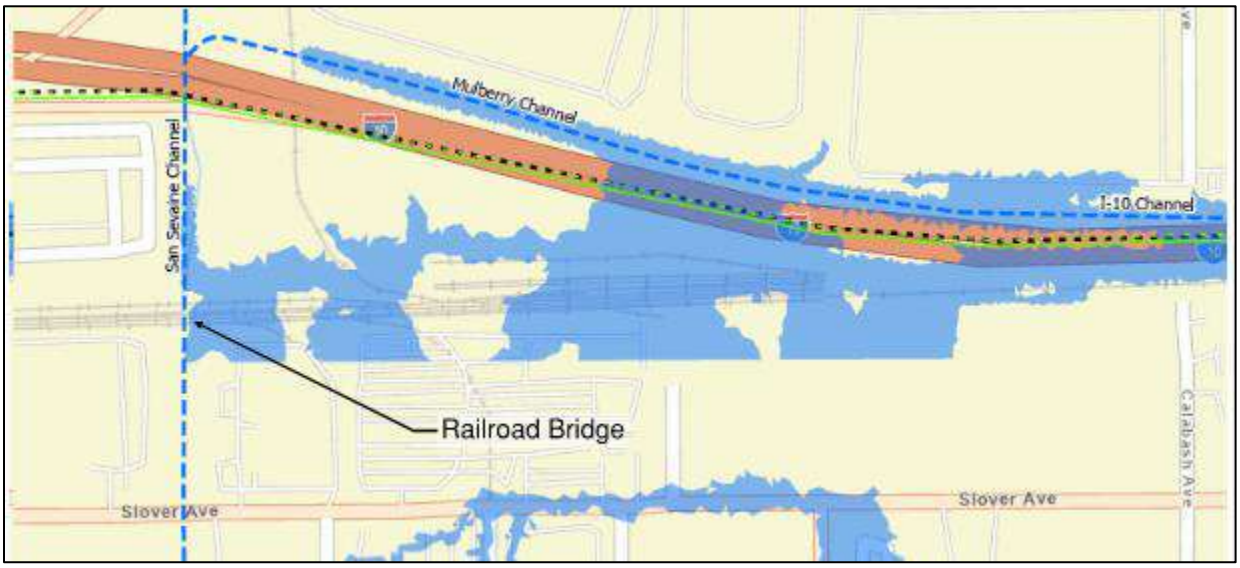

Figure 3-11. ICM Model Results Near Slover Avenue During the 100-year Event

- December 31, 2004 – "Etiwanda Avenue had to be closed due to flash flooding." Although the anecdote does not state the area along Etiwanda Avenue that closed, areas along Etiwanda Avenue do experience flooding based on the modeling results, specifically near Jurupa Avenue (Figure 3-12).

Figure 3-12. ICM Model Results Near Etiwanda and Jurupa Avenue During the 100-year Event

3.3 MODEL RESULTS

3.3.1 HYDRAULIC MODEL RESULTS

The existing condition hydraulic results provide a baseline to assess drainage infrastructure deficiency and comparison to proposed drainage improvements. Modeling results indicate that flooding under existing conditions for the 25- and 100-year events is widespread and overwhelms existing infrastructure and streets in many areas, with the worst flooding occurring in AOS 1 and 3. Large portions of both AOS are devoid of drainage infrastructure to handle major storm events. Figure 3-13 to Figure 3-15 show the extent and depth of flooding for the 25-year event under existing conditions for each AOS. The 100-year event is shown in Appendix 2.

General flooding behavior in AOS 1 during the 25-year event is from northeast to the southwest. Much of the flooding from the northern portion of AOS 1 is intercepted by the East and West Fontana Channels. However, runoff along Sierra Avenue and around the downtown development area continues south as it travels between the East and West Fontana Channels. Runoff in southern AOS 1 collects in the I-10 channel. The majority of the flooding is less than 0.1 feet; however, many areas experience flooding depths greater than 0.5 feet, such as along Beech Avenue, Valley Boulevard, Oleander Avenue, Catawba Avenue, and Alder Avenue.

In AOS 2, flooding is focused in the west portion of the AOS, where runoff travels primarily south to the Declez Channel. Flooding depths more than 0.5 feet occur along Jurupa Avenue, Cherry Avenue, and Calabash Avenue, as well as other discrete areas near the Declez Channel. Most of the flooding along Jurupa Avenue appears to be linked to flooding along Redwood Avenue and Live Oak Avenue, which are void of storm drain infrastructure.

Floods in AOS 3 are primarily conveyed under I-15 from the north through a series of box culverts. These culverts convey runoff from the San Gabriel Mountains. Runoff travels south and west through the AOS, with flooding depths primarily less than 0.1 feet. Few areas experience flooding deeper than 0.5 feet because the existing drainage infrastructure controls surface flooding in the lower portions of the AOS and because runoff from the north travels over undeveloped areas as unconcentrated flow. However, some areas have concentrated runoff reach depths greater than 0.5 feet, such as along Citrus Avenue and Sierra Avenue.

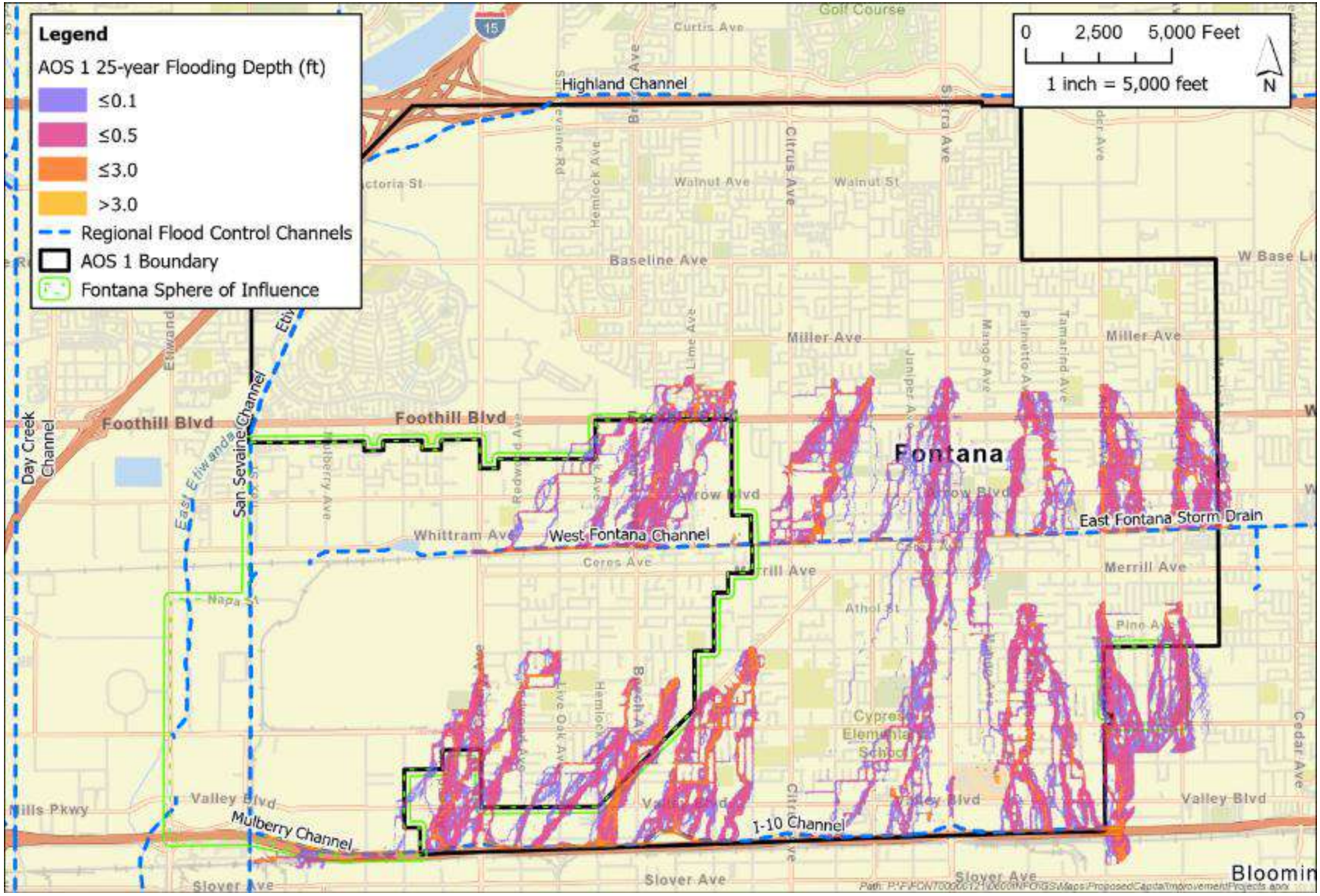

Figure 3-13. Existing Conditions 25-year Flooding in AOS 1

Figure 3-14. Existing Conditions 25-year Flooding in AOS 2

Figure 3-15. Existing Conditions 25-year Flooding in AOS 3

To evaluate flooding results within each AOS, the following indicators were considered to determine the significance of flooding within each area.

3.3.2 CRITICAL FACILITIES

According to the Federal Management Agency (FEMA), the term "critical facilities" is used to describe all manmade structures or other improvements that, because of their function, size, service area, or uniqueness, have the potential to cause serious bodily harm, extensive property damage, or disruption of vital socioeconomic activities if they are destroyed, damaged, or if their functionality is impaired. Critical facilities commonly include all public and private facilities that a community considers essential for the delivery of vital services and for the protection of the community. They usually include:

- emergency response facilities (fire stations, police stations, rescue squads, and emergency operation centers [EOCs])
- custodial facilities (jails and other detention centers, long-term care facilities, hospitals, and other health care facilities)
- schools
- emergency shelters
- utilities (water supply, wastewater treatment facilities, and power)
- communications and transportation facilities
- any other assets determined by the community to be of critical importance for the protection of the health and safety of the population

Critical facilities were included in the assessment and protection during a storm event and are shown in Figure 3-16. Table 3-6 and Table 3-7 provides lists of critical facilities that were flooded during the 25- and 100-year event based on the results of the capacity analysis. Data on critical facilities were provided by the San Bernardino County Plan in Geographic Information System (GIS) shapefile format. Tables displaying data for all impacted critical facilities is shown in Appendix 2.

Table 3-6. Critical Facilities Impacted by Flooding Greater than 0.5 Feet During the 25-year Event

AOS	Facility Name	Maximum Ponding Depth (feet)
1	ROBERTO M TRUCKING	1.2
2	FUSD/CANYON CREST ELEMENTARY	1.0
2	SIERRA ALUMINUM CO	0.9
2	SIERRA ALUMINUM FONTANA FINISHING OPERATION	0.9
2	CLIFFSTAR CORPORATION/FONTANA	0.9
1	ALAMEDA PAINTING CO., INC.	0.8
2	CANYON CREST ELEMENTARY SCHOOL	0.6
1	RUBEN BAROCIO	0.6
2	AMERICAN SECURITY PRODUCTS CO	0.6
1	HERNANDEZ BOARD AND CARE	0.6
2	CURTIS 1000	0.5
3	SOUTHERN CALIFORNIA EDISON	0.5

Table 3-7. Critical Facilities Impacted by Flooding Greater than 0.5 Feet During the 100-year Event

AOS	Facility Name	Maximum Ponding Depth (feet)
2	OAK PARK ELEMENTARY SCHOOL	1.6
2	FUSD/OAK PARK	1.2
2	FUSD/CANYON CREST ELEMENTARY	1.2
2	SIERRA ALUMINUM CO	1.2
2	SIERRA ALUMINUM FONTANA FINISHING OPERATION	1.2
2	CLIFFSTAR CORPORATION/FONTANA	1.1
1	ROBERTO M TRUCKING	0.8
2	CANYON CREST ELEMENTARY SCHOOL	0.8
1	RUBEN BAROCIO	0.8
2	CURTIS 1000	0.7
2	AMERICAN SECURITY PRODUCTS CO	0.7
1	HERNANDEZ BOARD AND CARE	0.6
3	SOUTHERN CALIFORNIA EDISON	0.6
1	BIRCH CONTINUATION HIGH SCHOOL	0.6
1	ALL START ACADEMY	0.6
1	C & M STEEL	0.6
1	ALAMEDA PAINTING CO., INC.	0.5
2	CHAPARRAL ELEMENTARY SCHOOL	0.5
1	CIRCLE K STORE #349	0.5
1	PALMETTO FAMILY HOME	0.5
1	MARYGOLD MWC	0.5

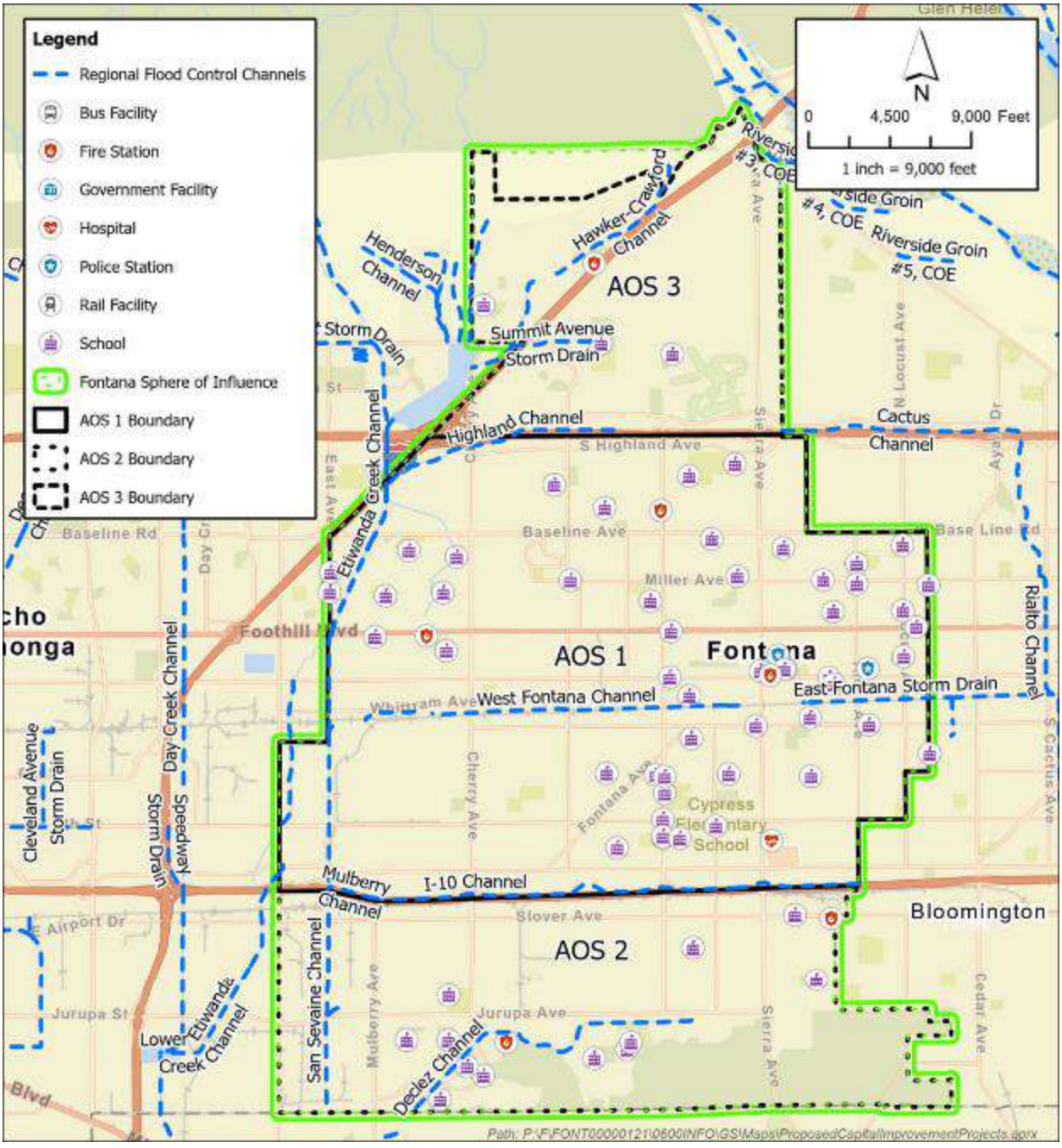

Figure 3-16. Select Critical Facilities within the Sphere of Influence

3.3.3 MAXIMUM DEPTH

The hydraulic modeling allows results to be displayed in terms of maximum ponding depth. This is the highest depth at each cell (location) that occurs during a particular storm event. This parameter helps to clearly identify ponded areas where flood depth exceeds existing street curbs or right-of-way. According to the various Emergency Management Handbooks "Deep floodwaters can be dangerous because they can

destabilize people and cars, and carry them away, resulting in injuries and fatalities. For instance, 3-feet deep water with no velocity is sufficient to prevent able-bodied adults from wading."

Where maximum ponding depths exceeded 0.5 feet, flood waters travelled over curbs and onto adjacent properties. Figure 3-13, Figure 3-14, and Figure 3-15 show flooding depths for each AOS during the 25-year event. Figures for the 100-year event are in Appendix 2.

25-Year Event

Maximum ponding depths varied between 0 and 11 feet during the 25-year event in AOS 1, with the deepest flooding occurring along Foothills Boulevard where the road dips below the Empire Trail. Average ponding depth in AOS 1 is 0.27 feet; 84% of ponding depths by area are less than 0.5 feet.

In AOS 2, maximum ponding up to 7 feet occurs along the San Sevaine Channel and near Cherry Avenue along the Declez Channel. The average ponding depth in AOS 2 is 0.28 feet; 82% of ponding depths by area are less than 0.5 feet.

In AOS 3, maximum ponding of up to 12 feet occurs within the Sierra Lakes Golf Course. The average ponding depth in AOS 2 is 0.19 feet; 93% of ponding depths by area are less than 0.5 feet.

100-Year Event

The maximum ponding depth in AOS 1 varied between 0 and 13 feet during the 100-year event. Average ponding depth in AOS 1 is 0.29 feet; 84% of ponding depths by area are less than 0.5 feet.

In AOS 2, the maximum ponding depth varied between 0 and 8 feet. The average ponding depth in AOS 2 is 0.31 feet; 83% of ponding depths by area are less than 0.5 feet.

Maximum ponding depths varied between 0 and 15 feet in AOS 3. The average ponding depth in AOS 3 is 0.25 feet and 96% of ponding depths by area are less than 0.5 feet.

3.3.4 DURATION OF INUNDATION AND TIME TO INUNDATION

The time to inundation and duration of inundation are important parameters, especially for emergency planning purposes. The time to inundation represents the time it takes to achieve the flooded condition (i.e. depth threshold) at a particular location, while the duration of inundation is the time the flooding (ponding) remains at a particular location. These results allow users to visualize how long it takes to reach certain depths of flooding at critical locations within the City. Effective warning time is the time available for people to undertake appropriate actions, such as elevating or removing belongings and evacuating people and pets. Figure 3-17 to Figure 3-19 display the time to inundation across the City during the 25-year flood. Results for the 100-year event and additional figures showing the duration of inundation are shown in Appendix 2.

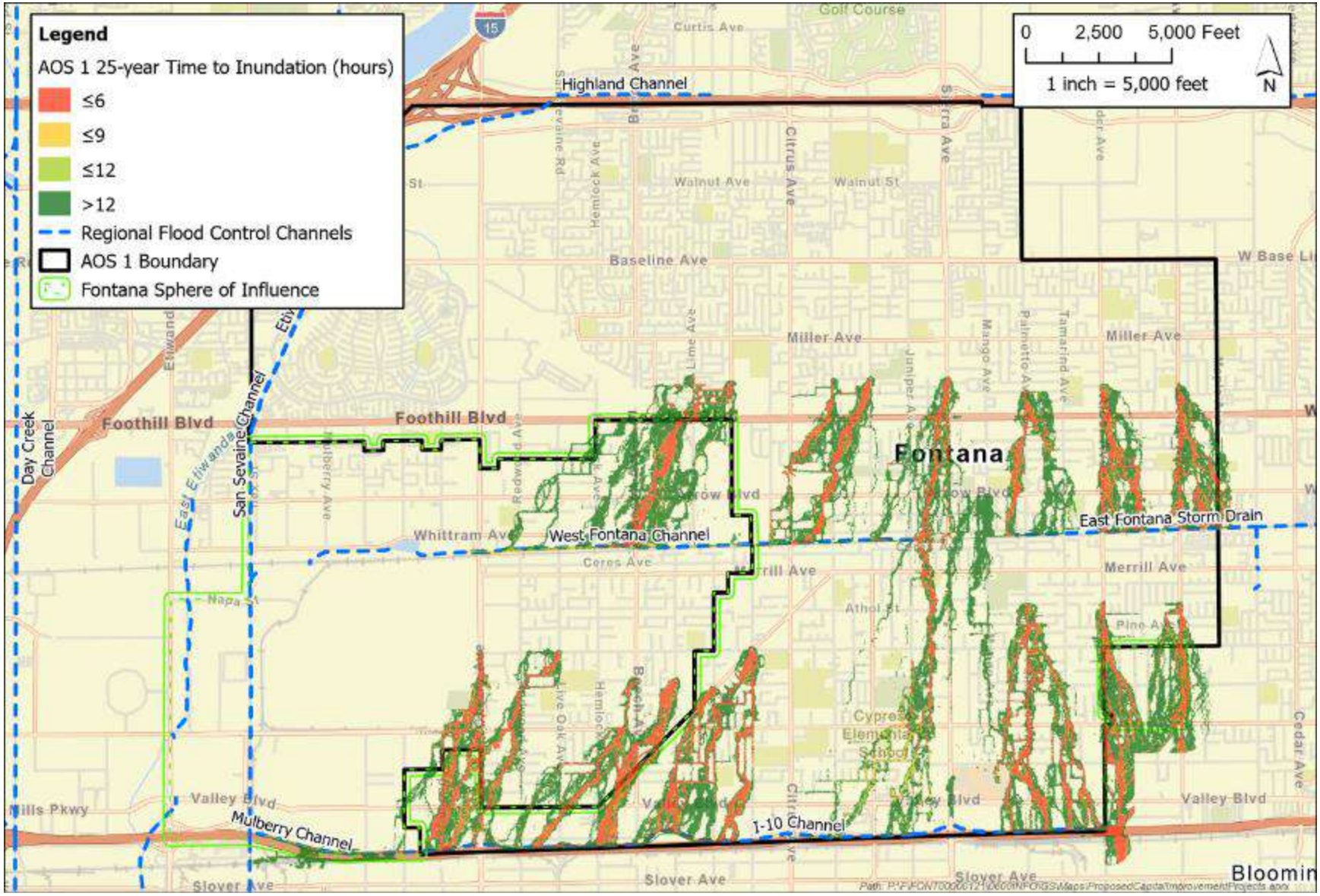

Figure 3-17. 25-year Time to Inundation for AOS 1

Figure 3-18. 25-year Time to Inundation for AOS 2

Figure 3-19. 25-year Time to Inundation for AOS 3

4 CAPITAL PROJECTS

4.1 MASTER STORM DRAIN CAPITAL PROJECTS

The development of the storm drain capital projects is intended to provide the City of Fontana with a comprehensive action plan to identify and address storm drain infrastructure issues and propose improvements to effectively manage storm runoff within City limits. Chapter 4 summarizes the process used to identify projects, prioritize these projects, and provide a corresponding cost summary.

The methodology used for identifying proposed projects included researching past studies, known maintenance issues, and performing a hydrologic and hydraulic model analysis of the City's infrastructure. The model results were reviewed for areas not meeting the design criteria discussed in section 1.3 and to alleviate flooding. Conveyance solutions were then developed into individual capital projects. Capital projects were spatially divided between major roadways to minimize project impacts during construction, see section 4.2 and 4.3 for additional details. Each project was given a unique indication name based on its location in relation to a prominent trunk line. Generally, this MSDP update attempted to follow the naming convention of the 1992 MSDP where feasible.

Development of the capital projects identified a total of 198 projects to address infrastructure needs. Each project was assessed using a set of weighted criteria to prioritize, with the top 30 percent of projects listed in Section 4.4. Project cost estimating is discussed in Section 4.3.

4.2 CAPITAL IMPROVEMENT PROJECTS

4.2.1 AOS 1

Capital Projects in AOS 1 primarily follow the line names and locations that were laid out in the 1992 MSDP but not yet built, with additional Capital Projects added to minimize flooding and adapt to changing road alignments and development since 1992. In total 135 Capital Projects are proposed in AOS 1. An overview of Capital Projects in AOS 1 is shown as Figure 4-1.

Additional 'SS' lines were added throughout the Auto Club Speedway following information from the Auto Club Specific Plan. Similarly, Capital Projects were added in the Westgate area in the northwest corner of AOS 1 following the latest plans available.

The proposed lines T-6 and T-6B along Lime Avenue and across Foothill Boulevard assumes the dip in Foothill Boulevard will be filled, and the Inland Empire Trail will be elevated above Foothill Boulevard. This is currently being addressed by the Margalo Bridge Project which, as of this moment, is a top priority project for the City.

4.2.2 AOS 2

Capital Projects in AOS 2 were also named following the line names and locations that were laid out in the 1992 MSDP. Compared to AOS 1, many of the lines proposed in the 1992 MSDP have already been built, but many smaller lines are still required to minimize flood risk. Lines DZ-4 through DZ-16 are proposed Capital Projects in AOS 2 between I-10 and Jurupa Avenue. An overview of Capital Projects in AOS 2 is shown as Figure 4-2.

Some lines required upsizing to convey the 100-year event, such as lines SR-3 and SR-1 in Southridge Village. Additional lines were also added in the southeast corner of AOS 2 to represent development associated with West Valley Logistics Center. In total 30 Capital Projects are proposed in AOS 2.

4.2.3 AOS 3

Capital Projects in AOS 3 were also named following the line names and locations that were laid out in the 1992 MP. Many proposed developments and specific plans provided additional Capital Projects that were incorporated into this master plan. These include lines associated with Ventana and the Arboretum at Fontana (A and B lines). In these cases, pipe sizes determined from other analyses were used to define the Capital Projects. In total 33 Capital Projects are proposed in AOS 3. An overview of Capital Projects in AOS 3 is shown as Figure 4-3.

4.2.4 PROPOSED PROJECTS ON REGIONAL FACILITIES

Hydraulic modeling revealed a need to upsize approximately 330 feet of the East Fontana Storm Drain between Kaiser Avenue and Palmetto Avenue, listed as Capital Project F-0. The existing channel is 5′ x 4′ and the proposed channel is 13′ x 4′ to match the pipe immediately upstream. This project was not estimated for cost or included in the project prioritization analysis but included in the Master Plan Exhibit in Appendix 3 for San Bernadino County consideration.

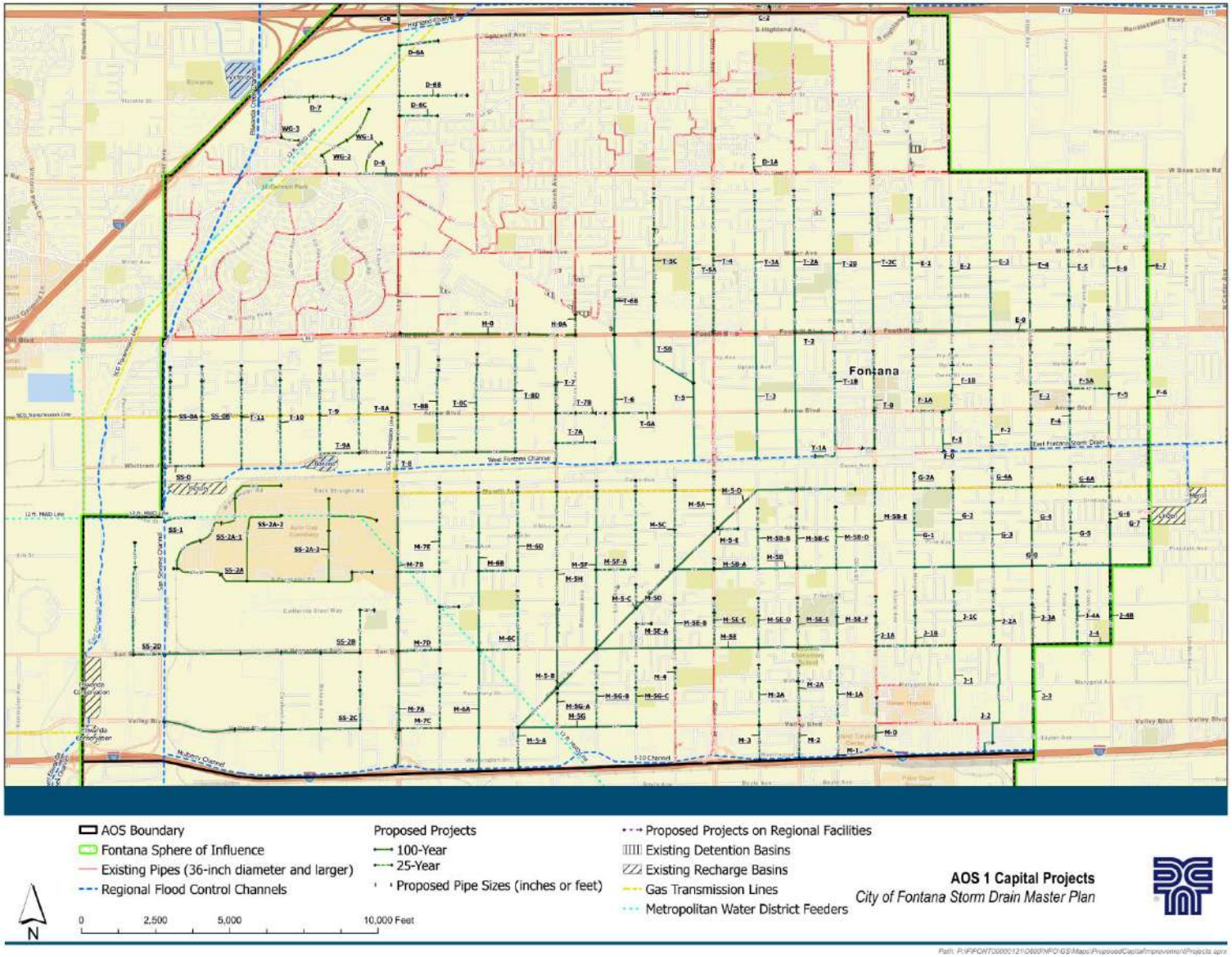

Figure 4-1. Capital Projects for AOS 1

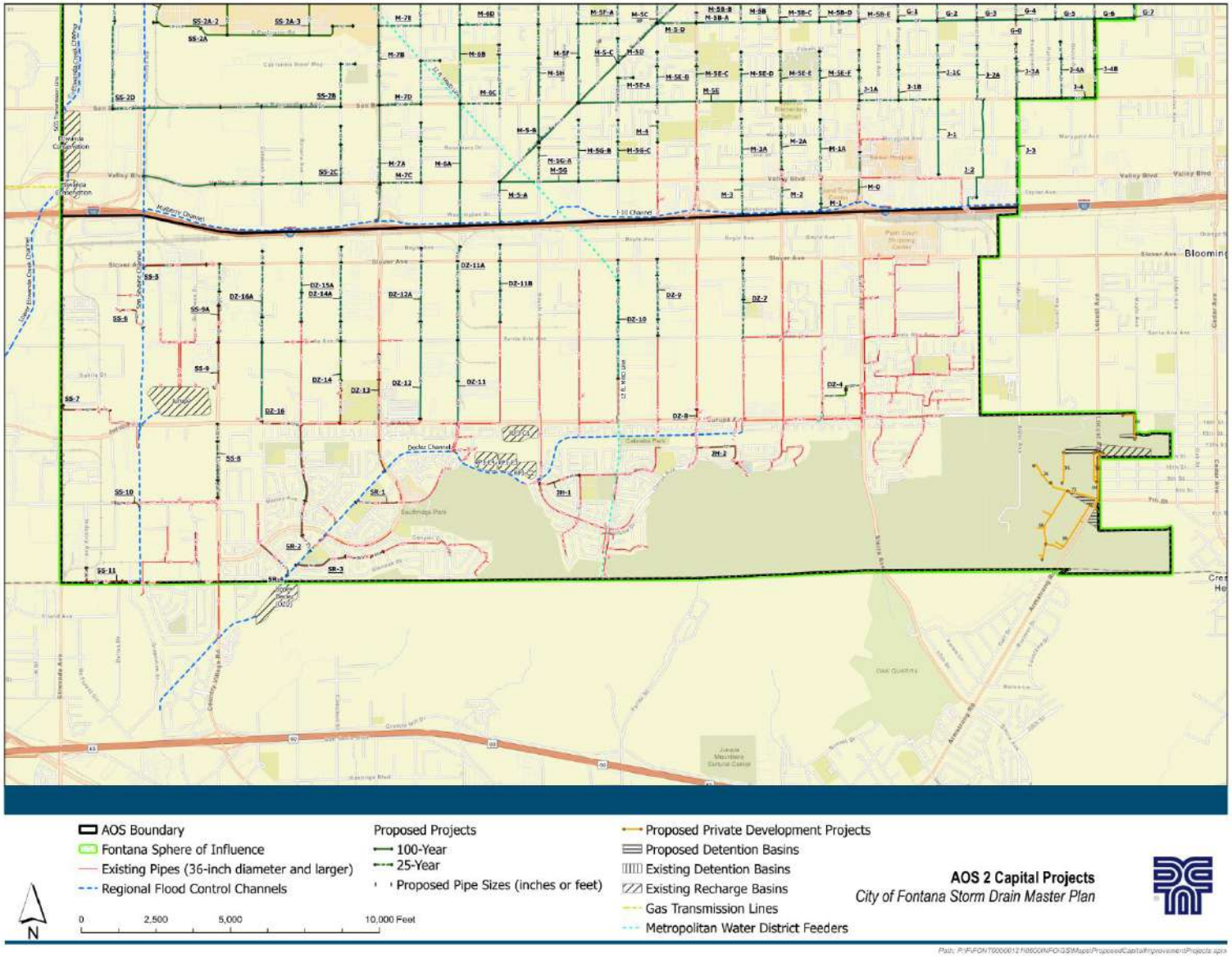

Figure 4-2. Capital Projects for AOS 2

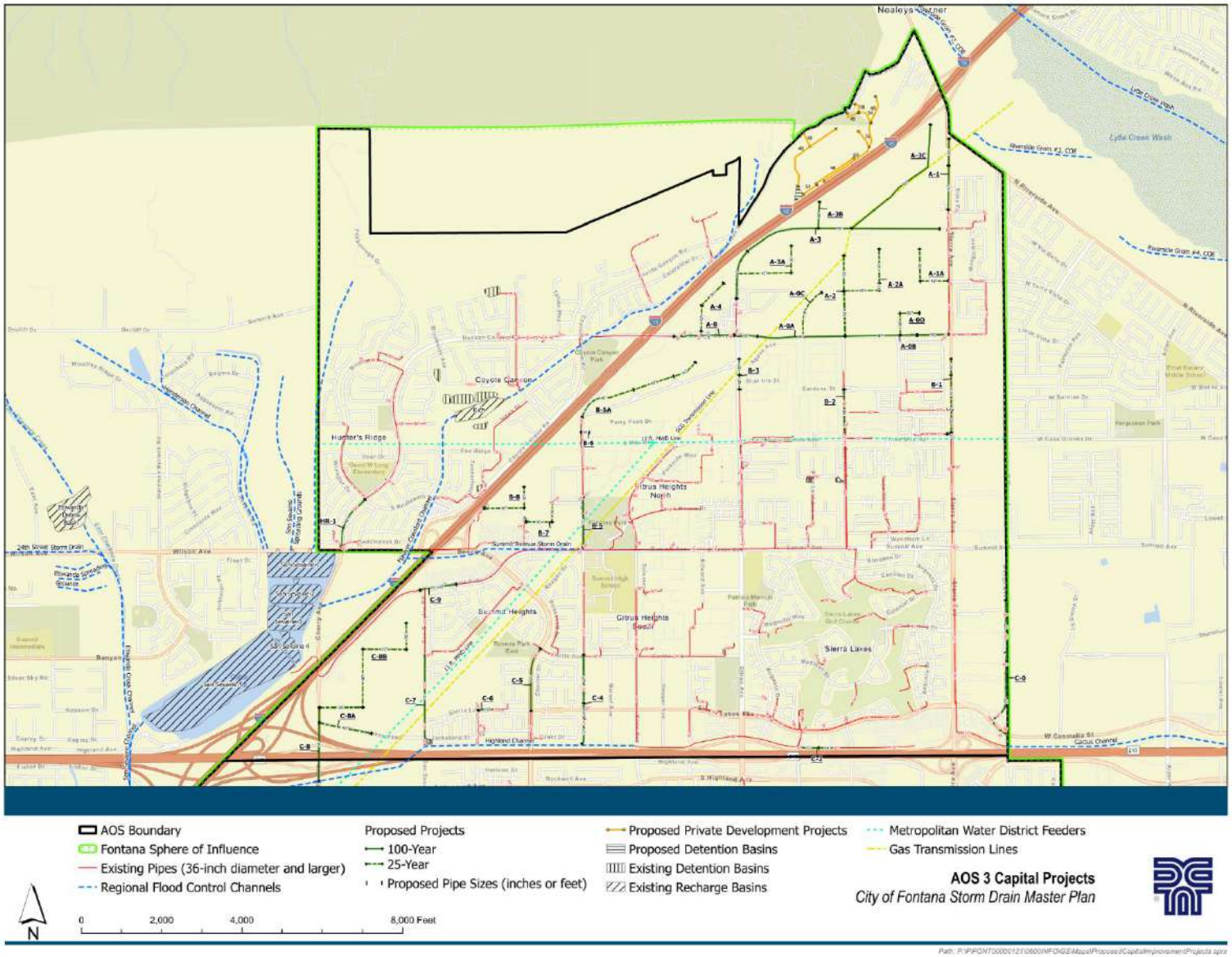

Figure 4-3. Capital Projects for AOS 3

4.3 CAPITAL PROJECT COST ESTIMATING

Cost estimates were prepared for each of the 198 proposed Capital Projects. The City of Fontana provided a current bid results list (project: DE-24-71-SB, 2024) that was used in conjunction with engineering judgement to determine unit prices for each line item included in the cost estimates. All unit prices are compiled in the Master List of Items (Table 4-2). The unit prices associated with the Master List of Items should only be recognized as average values without strict adherence to specifications and design standards required by the City of Fontana.

Reinforced concrete pipe (RCP) and reinforced concrete box (RCB) unit prices (feet) were determined by taking the average unit prices from the bid results list, excluding the minimum and maximum value, and interpolating for the pipe sizes not included in the provided bid results list using an exponential best fit line (R^2=0.99) relating pipe diameter to unit cost. No RCBs were included in the bid results list provided by the City, therefore, the diagonal cross-sectional length of each RCB size was used to determine unit costs, using the same exponential best fit line as for RCPs. Unit prices (feet) for RCP and RCB removal, where upsizing existing pipes was required, were estimated as 10% of the installation unit price of each corresponding pipe and interpolated for the pipe sizes not included in the provided bid results list.

Manhole unit prices were determined by taking the average unit price, excluding the minimum and maximum value. The manhole unit price includes the average bid price for two types of manholes (City of Fontana Standard Detail 3011 and 3012). The number of manholes for each Capital Project were calculated by taking the sum of pipe length (feet) in each project divided by an assumed maximum spacing of 400 feet (City of San Bernardino Storm Drain Design Policy Section 18.44).

Unit prices for saw cutting and removing existing asphalt pavement, replacing asphalt concrete pavement, and crushed miscellaneous base were listed in tons in the bid results list, which were converted to square feet by assuming an asphalt density of 0.0725 ton/$feet^3$ and a depth of 2 inches. The crushed miscellaneous base was assumed to be 12 inches, per City of Fontana Standard Detail 1008. The unit prices ($feet^2$) for these items were calculated by taking the average unit price, excluding the minimum and maximum value. Quantities were calculated assuming two feet of additional width was added to the outside diameter of each installed RCP and RCB per City of Fontana Standard Detail 1008.

Additional costs for each Capital Project were included for Traffic Control (5%), Erosion Control (1%), Mobilization and Demobilization (10%), Engineering and Design (10%), Surveying and Staking/Geotechnical (5%), and Construction Management/Staff (10%), based on engineering judgement.

A 20% contingency was assumed for each project for any unforeseen costs. This percentage was increased to 25% for projects that conflicted with major highways, the SCG transmission line, and the 12-foot diameter water main, this increase is noted as contingency + in cost estimates. The cost estimate analysis does not include costs for utility relocation and other miscellaneous items that would be required on a case-by-case basis.

Per the City of Fontana's direction, the extent of each project was partially dependent on the anticipated cost. A cost estimate for each Capital Project is provided in Appendix 4 and a summary is provided below in Table 4-1.

Table 4-1. Cost Summary

Study Area	Total Cost (2024 Dollars)	Average Cost (2024 Dollars)
AOS 1	$898,928,000	$4,439,000
AOS 2	$131,702,000	$3,477,000
AOS 3	$137,433,000	$2,671,000
Total	$1,168,063,000	NA

Table 4-2. Unit Costs Applied to the Capital Project Cost Estimates

Item	Unit of Measure	Unit Price
Install 36" RCP	FT	$527
Install 42" RCP	FT	$588
Install 48" RCP	FT	$656
Install 54" RCP	FT	$732
Install 60" RCP	FT	$816
Install 66" RCP	FT	$911
Install 72" RCP	FT	$1,016
Install 78" RCP	FT	$1,133
Install 84" RCP	FT	$1,264
Install 90" RCP	FT	$1,409
Install 96" RCP	FT	$1,572
Install 102" RCP	FT	$ 1,753
Install 120" RCP	FT	$2,433
Install Double 66" RCP	FT	$1,822
Install 6' x 4' RCB	FT	$1,323
Install 6' x 7' RCB	FT	$2,052
Install 8' x 5' RCB	FT	$2,150
Install 10' x 8' RCB	FT	$4,491
Install 10' x 10' RCB	FT	$6,012
Install 12' x 8' RCB	FT	$6,391
Install 12' x 9' RCB	FT	$7,251
Install 14' x 6' RCB	FT	$7,627
Install 14' x 7' RCB	FT	$8,361
Install Double 14' x 7' RCB	FT	$16,722
Remove 24" RCP	FT	$35
Remove 30" RCP	FT	$44
Remove 36" RCP	FT	$53
Remove 39" RCP	FT	$58
Remove 42" RCP	FT	$62
Remove 48" RCP	FT	$71

Item	Unit of Measure	Unit Price
Remove 54" RCP	FT	$80
Remove 60" RCP	FT	$89
Remove 64" RCP	FT	$96
Remove 66" RCP	FT	$99
Remove 69" RCP	FT	$103
Remove 72" RCP	FT	$108
Remove 78" RCP	FT	$117
Remove 84" RCP	FT	$126
Remove 12' x 8' RCB	FT	$639
Remove 12' x 9' RCB	FT	$725
Remove 12' x 10' RCB	FT	$811
Remove 14' x 8' RCB	FT	$910
Manhole	EA	$20,322
Catch Basin	EA	$21,003
Sawcut and Remove Existing AC Pavement	SF	$2.66
Replace Asphalt Concrete Pavement	SF	$2
Crushed Miscellaneous Base	SF	$4
Traffic Control	%	5%
Erosion Control	%	1%
Mobilization/Demobilization	%	10%
Engineering and Design	%	10%
Surveying & Staking/Geotechnical	%	5%
Construction Management/Staff	%	10%
Contingency	%	20%
Contingency +	%	25%

+ Notes projects that conflicted with major highways, the SCG transmission line, and the 12-foot diameter water main.

4.4 CAPITAL PROJECT PRIORITIZATION

A set of evaluation criteria was developed to assist in selecting the most critical projects for the City to pursue. The importance of each project was considered using four evaluation criteria: 1. Downstream to Upstream Prioritization 2. Known Flooded Areas 3. Depth of Flooding and 4. Road Hierarchy Drainage.

All criteria were determined for each project using output from the Infoworks ICM model and information on known flooding locations and road hierarchy provided by the City. Prioritization calculations were completed in ArcGIS Pro, Version 3.10. Each criterion is defined below.

4.4.1 PRIORITIZATION CRITERIA

Downstream to Upstream Prioritization

The downstream to upstream prioritization criterion provides a preference to projects that are located on the downstream end of a drainage system. Projects located downstream have the potential of benefiting a greater watershed area as these systems would possibly reduce the tailwater control in the tributary systems. To accurately score systems that act as tributaries to the main stem of a system, the assigned score of the most downstream section of the tributary will be compared to the assigned score of the main stem where the junction occurs. Independent storm drains not tied to a main stem (less than two laterals) will receive a score of no more than 3. Overall, the scores were assigned using engineering judgement. Table 4-3 shows the criterion scoring. A score of 5 indicates greater priority.

Table 4-3. Downstream to Upstream Prioritization Criteria

D/S to Upstream Percent	Score
Approximately 65 - 100%	1
Approximately 35 - 65%	3
Approximately < 35%	5

Known Flooded Areas

The known flooded areas criterion accounts for the projects potential to improve flooding in areas that have been documented by the city and residents. Projects adjacent to or that improve drainage in known flooded areas were ranked "5," and projects away from known flooded areas were ranked "1." Adjacency of a Capital Project to known flooded areas was limited to a radius of 1,000 feet.

Table 4-4. Known Flooded Areas Prioritization Criteria

Description	Score
Project does not contain known flooded areas	1
Project contains known flooded areas	5

Depth of Flooding

The depth of flooding criterion accounts for the projects with the most severe flooding depth based on the 100-year existing conditions model results. Projects with less than 0.5 feet of flooding were ranked "1," and projects with greater than 1.25 foot of flooding were ranked "5." For projects located on multiple streets, the most severe flooding depth was used for the ranking.

Table 4-5. Depth of Flooding Prioritization Scoring

Description	Score
Flooding Depths less than 0.5 feet	1
Flooding Depths between 0.5 and 0.75 feet	2
Flooding Depths between 0.75 and 1.0 feet	3
Flooding Depths between 1.0 and 1.25 feet	4
Flooding Depths more than 1.25 feet	5

Road Hierarchy Drainage Consideration

The road hierarchy drainage criterion accounts for the type of road that a project drains. Priority is given to projects that provide drainage to primary highways and major highways versus collector streets. If a project drains more than one type of road, it will be assigned the score associated with the highest scoring road type in the table below. Corridors within the downtown development area were classified as primary highways for this criterion to increase the rank of projects that drain the downtown development area. An exhibit showing the road hierarchy for the City is provided in Appendix 5.

Table 4-6. Road Hierarchy Drainage Consideration Scoring

Road Type	Score
Collector Street	1
Major Highway	3
Primary Highway	5

4.4.2 WEIGHTING FACTORS

The four prioritization criteria were given weights corresponding to the relative importance of each criterion and were developed in collaboration with the City. The weights for the four criteria, which add up to 100, are summarized in Table 4-7 below. The weighting system was developed to allow for specific criteria to hold more significance in the final project prioritization score. Once each project was scored on all four criteria, the final project ranking was determined by calculating a weighted score. The assigned weights were multiplied by the corresponding score and each criterion was added to achieve the final score, which ranged between 1 and 5. Projects with higher scores were given greater priority.

Table 4-7. Evaluation Criteria Weighting

Criteria	Weight
Downstream to Upstream Prioritization	30
Known Flooded Areas	30
Depth of Flooding	20
Road Hierarchy Drainage	20
Total	100

4.4.3 PRIORITIZATION RESULTS

Projects received prioritization scores between 1.0 and 4.4, with 59 projects receiving a score of 2.6 or above, which corresponds to the 30th percentile score. Table 4-8 and Figure 4-4 below show the results of the prioritization analysis and lists the top 30% highest scoring Capital Projects to improve drainage throughout the City. All prioritization data and results are shown in Appendix 5. Refer to the overall Master Plan exhibit in Appendix 3 for project locations.

Forty-three projects in AOS 1 received a score of 2.6 or greater. These projects are distributed throughout the AOS, but specifically in areas with a history of flooding and along major roadways, such as along Sierra, Fontana, and Beech Avenue. Eight projects in AOS 2 received a score of 2.6 or greater, with most of these projects near the intersection of Beech and Jurupa Avenue, where flooding is known to occur and due to the low position in the drainage network. AOS 3 had eight projects that received a score of 2.6, the maximum of any project in AOS 3. All of these projects are located adjacent to the Highland Channel.

Table 4-8. Prioritization Results for Projects in the Top 30%

Project Name	AOS #	DS/US Priority	Known Flooded Areas Priority	Depth of Flooding Priority	Road Hierarchy Priority	Weighted Score
F-4	1	3	5	5	5	4.4
M-5E	1	5	5	1	5	4.2
M-5B	1	3	5	2	5	3.8
DZ-11	2	3	5	1	5	3.6
G-2	1	3	5	1	5	3.6
G-2A	1	3	5	1	5	3.6
J-1A	1	3	5	1	5	3.6
M-5B-E	1	3	5	1	5	3.6
T-1A	1	3	5	1	5	3.6
M-3A	1	5	5	1	1	3.4
SS-10	2	5	1	3	5	3.4
T-6B	1	1	5	5	3	3.4
DZ-12	2	3	5	3	1	3.2
DZ-13	2	3	5	1	3	3.2
F-1	1	3	1	5	5	3.2
M-5H	1	5	1	2	5	3.2
T-2A	1	1	5	2	5	3.2
T-6	1	3	5	1	3	3.2
C-5	3	5	1	1	5	3
C-6	3	5	1	1	5	3
C-7	3	5	1	1	5	3
C-9	3	5	1	1	5	3
F-5A	1	1	5	1	5	3
G-4	1	3	1	4	5	3
HR-1	3	5	1	1	5	3
J-3	1	5	1	1	5	3
J-4B	1	3	1	4	5	3
M-2	1	5	1	1	5	3
M-5-A	1	5	1	5	1	3
M-5E-C	1	5	1	1	5	3
M-5F	1	5	1	1	5	3
M-6C	1	5	1	1	5	3
SR-2	2	5	1	1	5	3
SR-3	2	5	1	5	1	3
SR-4	2	5	1	1	5	3
SS-0	1	5	1	1	5	3
SS-11	2	5	1	1	5	3

Project Name	AOS #	DS/US Priority	Known Flooded Areas Priority	Depth of Flooding Priority	Road Hierarchy Priority	Weighted Score
T-0	1	1	5	1	5	3
T-11	1	5	1	1	5	3
T-1B	1	1	5	1	5	3
M-5-D	1	3	5	1	1	2.8
M-5E-D	1	3	5	1	1	2.8
M-7B	1	5	1	2	3	2.8
T-2	1	3	5	1	1	2.8
G-6	1	3	1	3	5	2.8
M-6D	1	5	1	3	1	2.6
M-7E	1	5	1	3	1	2.6
C-8	3	5	1	1	3	2.6
C-8A	3	5	1	1	3	2.6
C-8B	3	5	1	1	3	2.6
M-0	1	5	1	1	3	2.6
M-1	1	5	1	1	3	2.6
M-5G-A	1	5	1	1	3	2.6
M-5G-B	1	5	1	1	3	2.6
M-7A	1	5	1	1	3	2.6
M-7C	1	5	1	1	3	2.6
SS-2B	1	5	1	1	3	2.6
SS-2D	1	5	1	1	3	2.6
T-2C	1	1	5	1	3	2.6

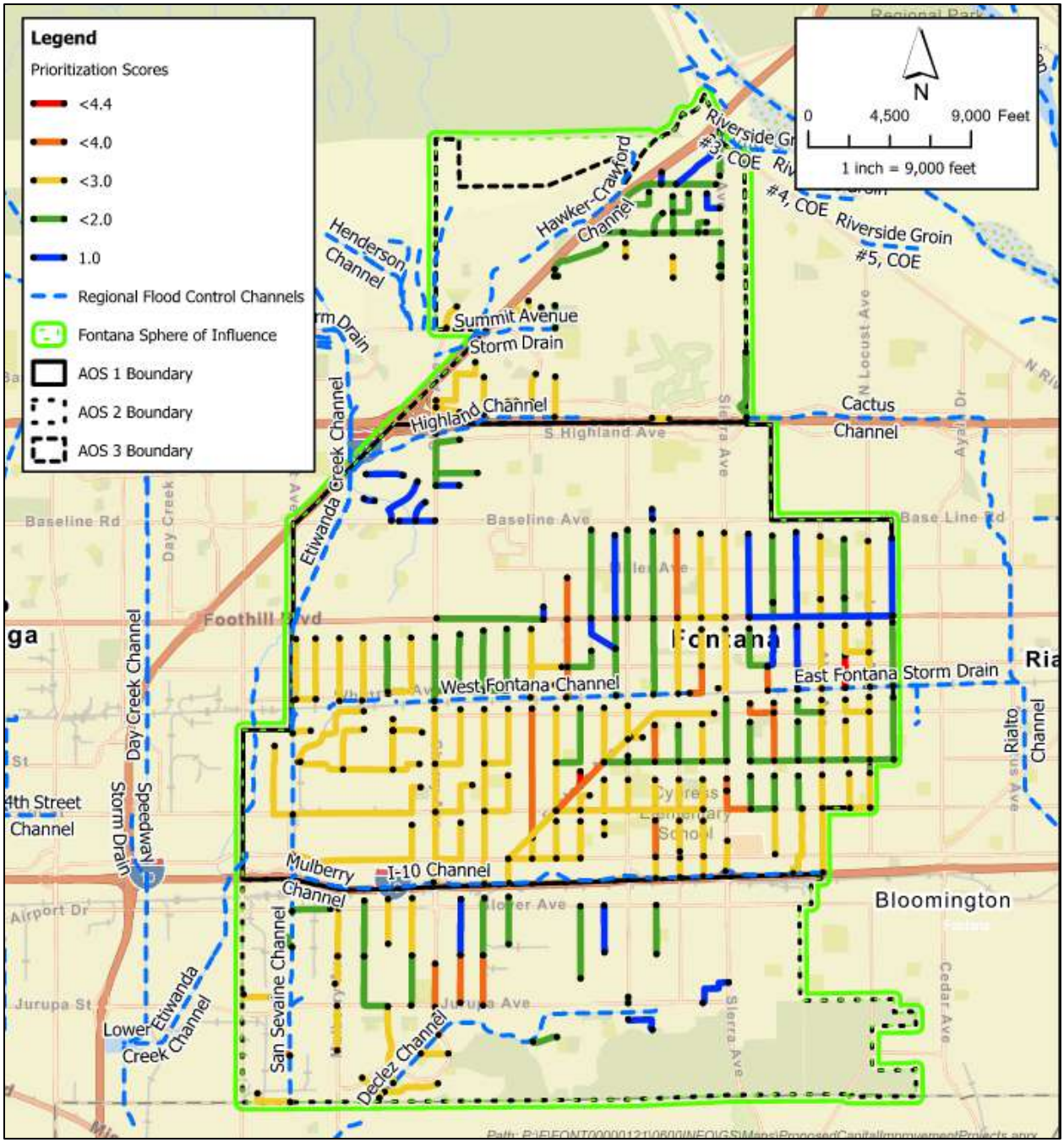

Figure 4-4. Prioritization Results

5 CONCLUSION AND RECOMMENDATIONS

A key outcome of this study is recommended stormwater infrastructure improvements as part of the 198 capital projects. These projects, once complete, will develop the backbone of the drainage system for the City and will address identified drainage issues. The capital projects should be done in conjunction with the San Bernardino County flood control facilities and other jurisdictional partners where improvements contribute to these systems. Additional improvement may be necessary for localized drainage issue beyond the scope of this study.

It is recommended the City of Fontana implement the following actions:

- Use this information to appropriately set drainage fees to finance the construction of the identified capital projects.
- Reserve and dedicate right-of-way where needed for future project construction.
- When development projects file tentative maps or preliminary plans, the City should require as much of the Master Plan facilities to be constructed as possible.

6 REFERENCES

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APPENDIX 1 HYDROLOGIC INPUTS AND RESULTS

Soils and Land Use Data

FONTANA
CALIFORNIA

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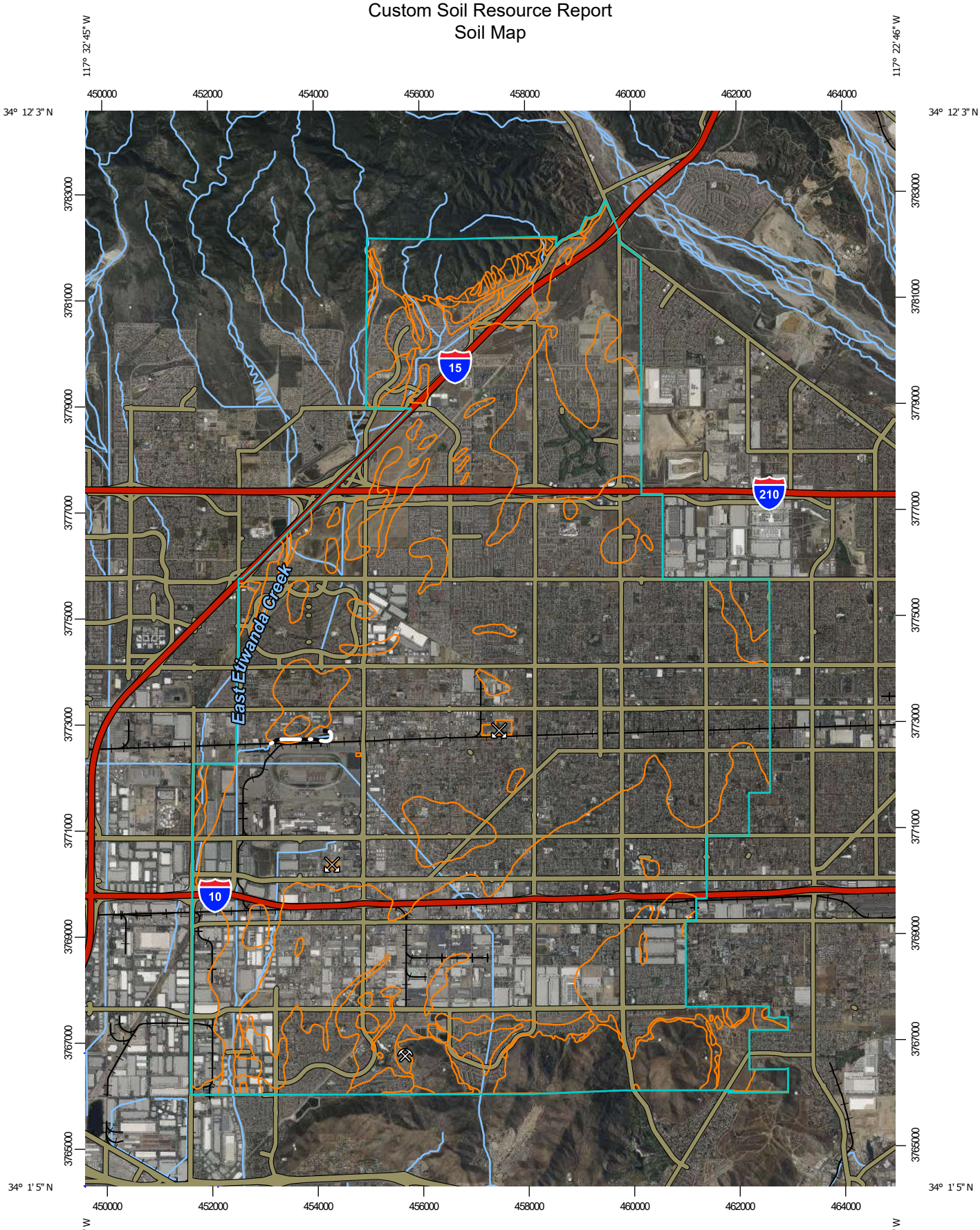
AND ASSOCIATES INC.

Custom Soil Resource Report
Soil Map



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

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 scales ranging from 1:15,800 to 1:24,000.

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 Bernardino County Southwestern Part, California
Survey Area Data: Version 15, Aug 30, 2023

Soil Survey Area: San Bernardino National Forest Area, California
Survey Area Data: Version 15, Aug 30, 2023

Soil Survey Area: Western Riverside Area, California
Survey Area Data: Version 16, Aug 30, 2023

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

MAP LEGEND

MAP INFORMATION

Date(s) aerial images were photographed: Mar 17, 2022—Jun 12, 2022

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.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Cb	Chino silt loam	18.7	0.1%
CnD	Cieneba sandy loam, 9 to 15 percent slopes	176.5	0.5%
Cr	Cieneba-Rock outcrop complex, 30 to 50 percent slopes, MLRA 20	2,022.4	6.0%
Db	Delhi fine sand	2,088.2	6.2%
GP	Quarries and Pits soils	44.8	0.1%
Gr	Grangeville fine sandy loam, warm MAAT, MLRA 19	71.0	0.2%
GtC	Greenfield sandy loam, 2 to 9 percent slopes	44.0	0.1%
GtD	Greenfield fine sandy loam, 9 to 15 percent slopes	2.5	0.0%
HaC	Hanford coarse sandy loam, 2 to 9 percent slopes	836.3	2.5%
HaD	Hanford coarse sandy loam, 9 to 15 percent slopes	111.6	0.3%
HbA	Hanford sandy loam, 0 to 2 percent slopes	26.8	0.1%
Hr	Hilmar loamy fine sand	34.1	0.1%
M-W	Miscellaneous water	20.2	0.1%
MoC	Monserate sandy loam, 2 to 9 percent slopes	11.0	0.0%
Ps	Psamments, Fluvents and Frequently flooded soils	71.5	0.2%
RmC	Ramona sandy loam, 2 to 9 percent slopes, MLRA 19	11.0	0.0%
RmD	Ramona sandy loam, 9 to 15 percent slopes	3.4	0.0%
RmE2	Ramona sandy loam, 15 to 30 percent slopes, eroded	92.0	0.3%
ShF	Saugus sandy loam, 30 to 50 percent slopes	87.0	0.3%
SoC	Soboba gravelly loamy sand, 0 to 9 percent slopes	1,661.4	5.0%
SpC	Soboba stony loamy sand, 2 to 9 percent slopes	1,372.2	4.1%
TuB	Tujunga loamy sand, 0 to 5 percent slopes	7,961.9	23.8%
TvC	Tujunga gravelly loamy sand, 0 to 9 percent slopes	16,690.5	49.8%
W	Water	1.4	0.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Subtotals for Soil Survey Area		**33,460.5**	**99.9%**
Totals for Area of Interest		**33,485.4**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AbD	Soboba-Hanford families association, 2 to 15 percent slopes	5.5	0.0%
DnG	Trigo family-Lithic Xerorthents, warm complex, 50 to 75 percent slopes	5.0	0.0%
Subtotals for Soil Survey Area		**10.5**	**0.0%**
Totals for Area of Interest		**33,485.4**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Cr	Cieneba-Rock outcrop complex, 30 to 50 percent slopes, MLRA 20	8.4	0.0%
Db	Delhi fine sand	4.2	0.0%
HcD2	Hanford coarse sandy loam, 8 to 15 percent slopes, eroded	0.5	0.0%
Hr	Hilmar loamy fine sand	0.4	0.0%
MmC2	Monserate sandy loam, 5 to 8 percent slopes, eroded	0.7	0.0%
TwC	Tujunga gravelly loamy sand, 0 to 8 percent slopes	0.3	0.0%
Subtotals for Soil Survey Area		**14.4**	**0.0%**
Totals for Area of Interest		**33,485.4**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion

of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group

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.

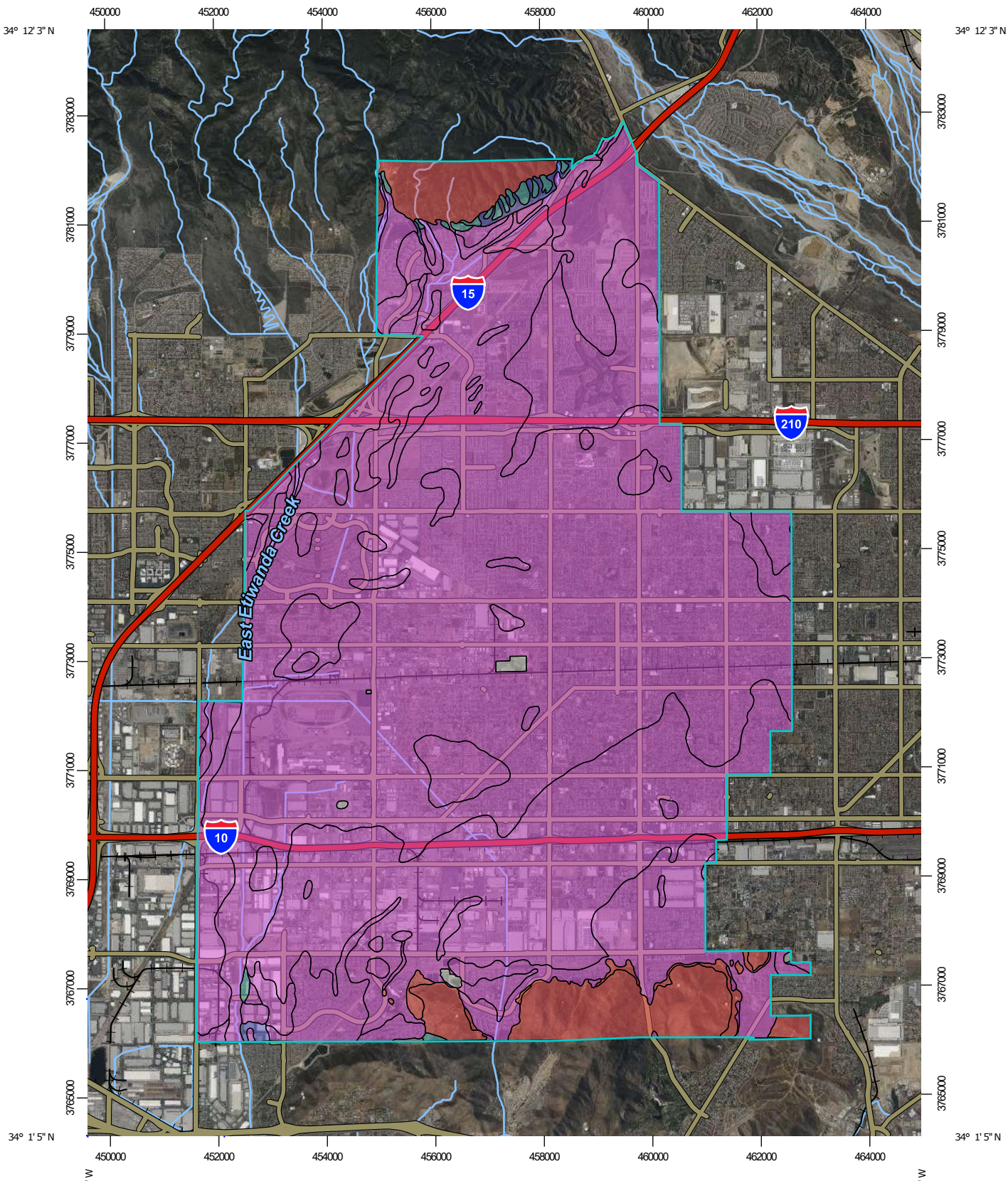
Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

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.

Custom Soil Resource Report
Map—Hydrologic Soil Group



Map Scale: 1:99,000 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 1000 2000 4000 6000

Feet
0 4500 9000 18000 27000

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 scales ranging from 1:15,800 to 1:24,000.

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 Bernardino County Southwestern Part, California
Survey Area Data: Version 15, Aug 30, 2023

Soil Survey Area: San Bernardino National Forest Area, California
Survey Area Data: Version 15, Aug 30, 2023

Soil Survey Area: Western Riverside Area, California
Survey Area Data: Version 16, Aug 30, 2023

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

MAP LEGEND

MAP INFORMATION

Date(s) aerial images were photographed: Mar 17, 2022—Jun 12, 2022

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.

Table—Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
Cb	Chino silt loam	C	18.7	0.1%
CnD	Cieneba sandy loam, 9 to 15 percent slopes	D	176.5	0.5%
Cr	Cieneba-Rock outcrop complex, 30 to 50 percent slopes, MLRA 20	D	2,022.4	6.0%
Db	Delhi fine sand	A	2,088.2	6.2%
GP	Quarries and Pits soils		44.8	0.1%
Gr	Grangeville fine sandy loam, warm MAAT, MLRA 19	A	71.0	0.2%
GtC	Greenfield sandy loam, 2 to 9 percent slopes	A	44.0	0.1%
GtD	Greenfield fine sandy loam, 9 to 15 percent slopes	A	2.5	0.0%
HaC	Hanford coarse sandy loam, 2 to 9 percent slopes	A	836.3	2.5%
HaD	Hanford coarse sandy loam, 9 to 15 percent slopes	A	111.6	0.3%
HbA	Hanford sandy loam, 0 to 2 percent slopes	A	26.8	0.1%
Hr	Hilmar loamy fine sand	B	34.1	0.1%
M-W	Miscellaneous water		20.2	0.1%
MoC	Monserate sandy loam, 2 to 9 percent slopes	C	11.0	0.0%
Ps	Psamments, Fluvents and Frequently flooded soils	A	71.5	0.2%
RmC	Ramona sandy loam, 2 to 9 percent slopes, MLRA 19	C	11.0	0.0%
RmD	Ramona sandy loam, 9 to 15 percent slopes	C	3.4	0.0%
RmE2	Ramona sandy loam, 15 to 30 percent slopes, eroded	C	92.0	0.3%
ShF	Saugus sandy loam, 30 to 50 percent slopes	B	87.0	0.3%
SoC	Soboba gravelly loamy sand, 0 to 9 percent slopes	A	1,661.4	5.0%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
SpC	Soboba stony loamy sand, 2 to 9 percent slopes	A	1,372.2	4.1%
TuB	Tujunga loamy sand, 0 to 5 percent slopes	A	7,961.9	23.8%
TvC	Tujunga gravelly loamy sand, 0 to 9 percent slopes	A	16,690.5	49.8%
W	Water		1.4	0.0%
Subtotals for Soil Survey Area			**33,460.5**	**99.9%**
Totals for Area of Interest			**33,485.4**	**100.0%**

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AbD	Soboba-Hanford families association, 2 to 15 percent slopes	A	5.5	0.0%
DnG	Trigo family-Lithic Xerorthents, warm complex, 50 to 75 percent slopes	D	5.0	0.0%
Subtotals for Soil Survey Area			**10.5**	**0.0%**
Totals for Area of Interest			**33,485.4**	**100.0%**

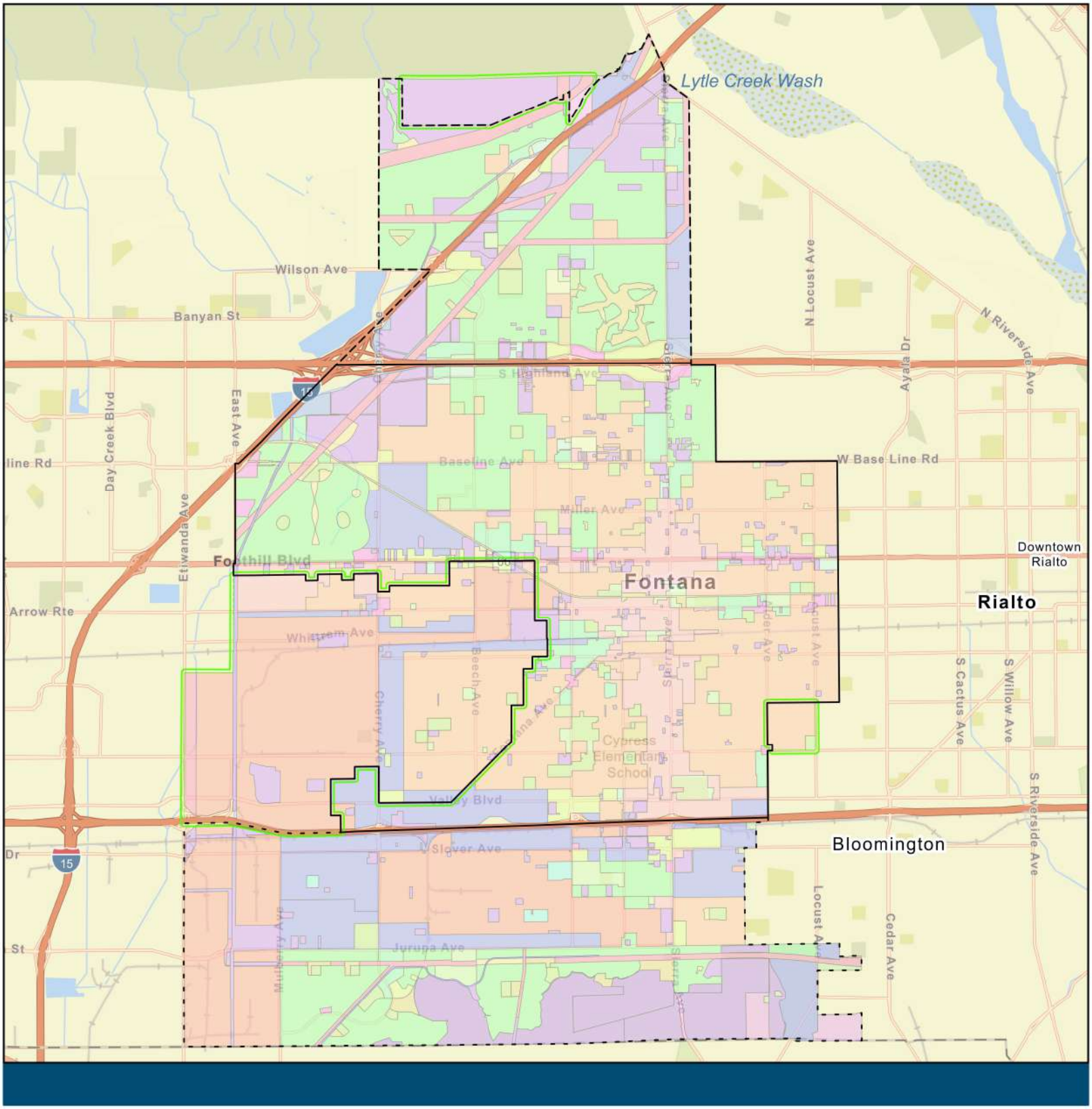
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
Cr	Cieneba-Rock outcrop complex, 30 to 50 percent slopes, MLRA 20	D	8.4	0.0%
Db	Delhi fine sand	A	4.2	0.0%
HcD2	Hanford coarse sandy loam, 8 to 15 percent slopes, eroded	A	0.5	0.0%
Hr	Hilmar loamy fine sand	C	0.4	0.0%
MmC2	Monserate sandy loam, 5 to 8 percent slopes, eroded	C	0.7	0.0%
TwC	Tujunga gravelly loamy sand, 0 to 8 percent slopes	A	0.3	0.0%
Subtotals for Soil Survey Area			**14.4**	**0.0%**
Totals for Area of Interest			**33,485.4**	**100.0%**

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher



- AOS 1 Boundary
- AOS 2 Boundary
- AOS 3 Boundary
- Sphere of Influence
- Community Commercial
- General Commercial
- General Industrial
- Light Industrial
- Medium Density Residential
- Multi Family High Residential
- Multi Family Med/High Residential
- Walkable Mixed Use Urban Village
- N/A
- Open Space
- Public Facilities
- Public Utility
- Recreational Facilities
- Walkable Mixed Use Corridor & Downtown
- Regional Mixed Use
- Residential Estates
- Residential Planned Community
- Residential Trucking
- Single Family Residential
- Multi Family Residential

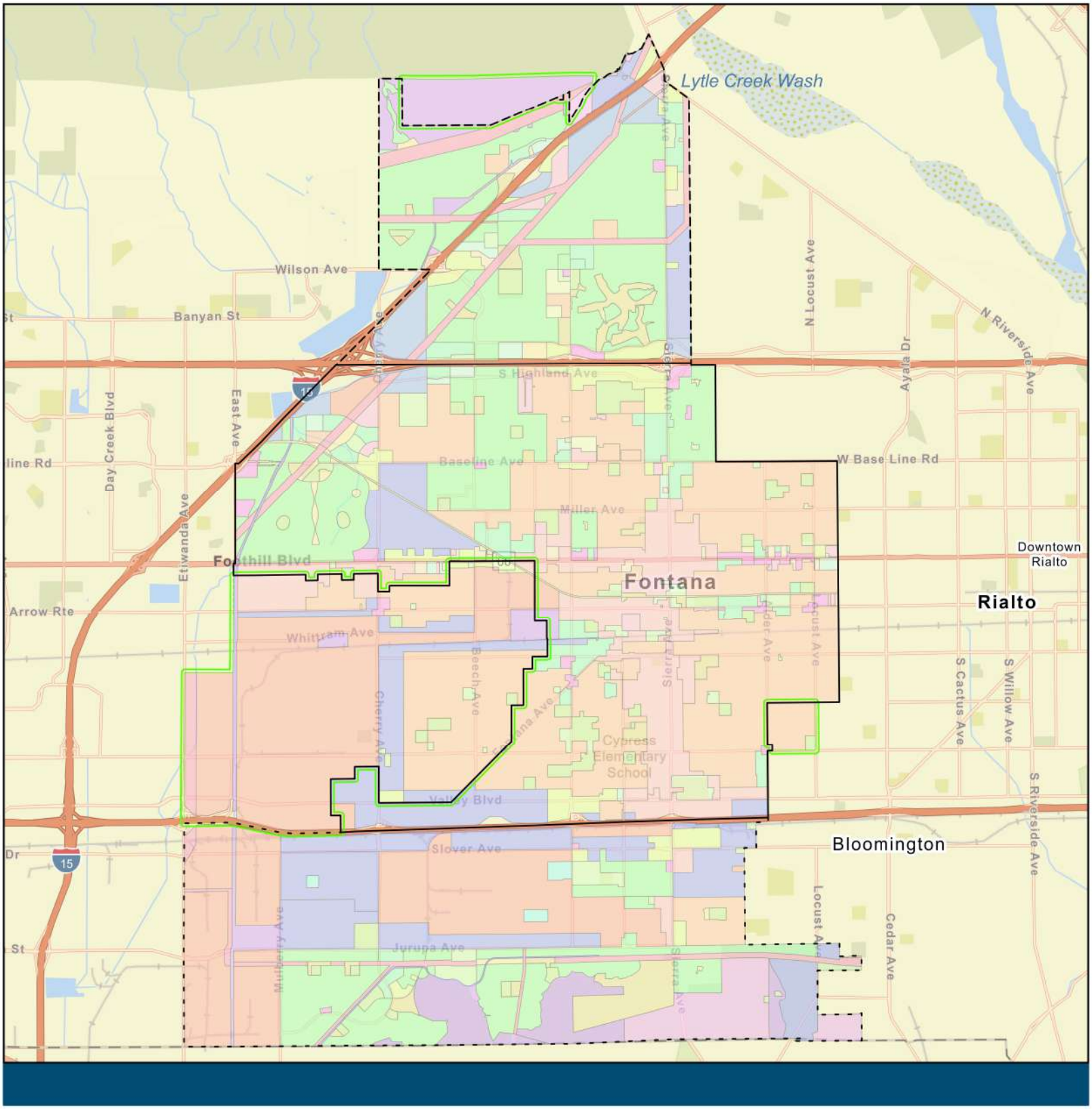
N

0 4,000 8,000 16,000 Feet

Existing Land Use

City of Fontana Storm Drain Master Plan

Path: \\deainc.com\files\PROJECT\F\FONT00000121\0600INFO\GS\Maps\ProposedCapitalImprovementProjects.aprx



- AOS 1 Boundary
- AOS 2 Boundary
- AOS 3 Boundary
- Sphere of Influence
- Community Commercial
- General Commercial
- General Industrial
- Light Industrial
- Medium Density Residential
- Multi Family High Residential
- Multi Family Med/High Residential
- Walkable Mixed Use Urban Village
- N/A
- Open Space
- Public Facilities
- Public Utility
- Recreational Facilities
- Walkable Mixed Use Corridor & Downtown
- Regional Mixed Use
- Residential Estates
- Residential Planned Community
- Residential Trucking
- Single Family Residential
- Multi Family Residential

N

0 4,000 8,000 16,000 Feet

Proposed Land Use

City of Fontana Storm Drain Master Plan

Path: \\deainc.com\files\PROJECT\F\FONT00000121\0600INFO\GS\Maps\ProposedCapitalImprovementProjects.aprx

Legend

City Boundary

Percent Impervious Increase/Decrease

90
80
70
60
50
40
30
25
20
15
10
0
-5
-10
-20
-25
-30
-35
-40
-45
-50
-55
-60
-65
-75
-80

DAVID EVANS AND ASSOCIATES INC.
17542 E. 17th Street, Suite 150
Tustin, CA 92780
(714) 665-4500

This product was made for informational and display purposes only and was created with the best available data at time of production. It does not represent any legal information or boundaries.

Land Use Comparison Map
City of Fontana
Storm Drain Master Plan Update

Trunkline Analysis, Loss Rates Tables

FONTANA
CALIFORNIA

DAVID EVANS
AND ASSOCIATES INC.

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line Cherry to Etiwanda

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
16	A	Residential 3-4 dwellings/acre	32	52	6.33	8.86	0.60	0.40	0.18	3.84
15	A	School	32	52	5.93	8.31	0.60	0.40	0.18	3.60
13	A	Commercial	32	52	11.25	11.68	0.10	0.40	0.18	0.52
30	A	Residential 10+ dwellings/acre	32	52	23.15	24.89	0.20	0.40	0.18	2.40
87	A	Public Park	32	52	13.98	33.21	0.85	0.40	0.18	29.58
38	A	Public Park	32	52	6.11	14.50	0.85	0.40	0.18	12.92
84	A	Residential 5-7 dwellings/acre	32	52	41.13	52.32	0.50	0.40	0.18	16.80
37	A	Commercial	32	52	32.03	33.24	0.10	0.40	0.18	1.48
19	A	Public Park	32	52	3.05	7.25	0.85	0.40	0.18	6.46
10	A	Residential 10+ dwellings/acre	32	52	7.72	8.30	0.20	0.40	0.18	0.80
9	A	Public Park	32	52	1.45	3.44	0.85	0.40	0.18	3.06
21	A	Commercial	32	52	18.18	18.87	0.10	0.40	0.18	0.84
379				Low Loss Fraction (1-Y) =	0.551	0.407			F_m =	0.217

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line D1

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
3	A	Commercial	32	52	2.72	2.82	0.10	0.40	0.18	0.13
3	A	Commercial	32	52	2.86	2.96	0.10	0.40	0.18	0.13
3	A	Commercial	32	52	2.60	2.70	0.10	0.40	0.18	0.12
11	A	Commercial	32	52	9.52	9.88	0.10	0.40	0.18	0.44
6	A	Commercial	32	52	4.98	5.17	0.10	0.40	0.18	0.23
12	A	Commercial	32	52	10.06	10.44	0.10	0.40	0.18	0.46
14	A	Commercial	32	52	12.46	12.94	0.10	0.40	0.18	0.58
6	A	Commercial	32	52	5.31	5.52	0.10	0.40	0.18	0.25
9	A	Commercial	32	52	7.55	7.83	0.10	0.40	0.18	0.35
22	A	Residential 8-10 dwellings/acre	32	52	12.86	15.25	0.40	0.40	0.18	3.53
25	A	Residential 8-10 dwellings/acre	32	52	14.86	17.62	0.40	0.40	0.18	4.08
3	A	Apartments	32	52	1.93	2.07	0.20	0.40	0.18	0.20
25	A	Residential 8-10 dwellings/acre	32	52	14.77	17.50	0.40	0.40	1.18	4.05
142	Low Loss Fraction (1-Y) =				0.280	0.208	F_m =			0.102

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line D2

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
10	A	Residential 8-10 dwellings/acre	32	52	5.84	6.92	0.40	0.40	0.18	1.60
69	A	Residential 3-4 dwellings/acre	32	52	27.26	38.17	0.60	0.40	0.18	16.54
3	A	Residential 10+ dwellings/acre	32	52	2.16	2.32	0.20	0.40	0.18	0.22
78	A	Residential 3-4 dwellings/acre	32	52	31.02	43.43	0.60	0.40	0.18	18.82
1	A	Residential 10+ dwellings/acre	32	52	0.39	0.41	0.20	0.40	0.18	0.04
24	A	Condominiums	32	52	15.13	17.43	0.35	0.40	0.18	3.36
20	A	Apartments	32	52	15.43	16.59	0.20	0.40	0.18	1.60
39	A	Residential 3-4 dwellings/acre	32	52	15.43	21.60	0.60	0.40	0.18	9.36
5	A	Commercial	32	52	4.33	4.49	0.10	0.40	0.18	0.20
3	A	Residential 3-4 dwellings/acre	32	52	0.99	1.38	0.60	0.40	0.18	0.60
3	A	School	32	52	0.99	1.38	0.60	0.40	0.18	0.60
3	A	Residential 3-4 dwellings/acre	32	52	1.11	1.55	0.60	0.40	0.18	0.67
3	A	School	32	52	1.11	1.55	0.60	0.40	1.18	0.67
6	A	Commercial	32	52	4.85	5.03	0.10	0.40	0.18	0.22
9	A	Commercial	32	52	7.79	8.09	0.10	0.40	0.18	0.36
5	A	School	32	52	1.98	2.77	0.60	0.40	0.18	1.20
5	A	Residential 3-4 dwellings/acre	32	52	1.82	2.55	0.60	0.40	0.18	1.10
13	A	Commercial	32	52	10.99	11.41	0.10	0.40	0.18	0.51
15	A	School	32	52	5.90	8.25	0.60	0.40	0.18	3.58
9	A	Residential 3-4 dwellings/acre	32	52	3.64	5.10	0.60	0.40	1.18	2.21
54	A	School	32	52	21.37	29.91	0.60	0.40	0.18	12.96
26	A	Commercial	32	52	22.50	23.36	0.10	0.40	0.18	1.04
45	A	Residential 3-4 dwellings/acre	32	52	17.80	24.93	0.60	0.40	0.18	10.80
38	A	Commercial	32	52	32.89	34.14	0.10	0.40	0.18	1.52
483	Low Loss Fraction (1-Y) =				0.477	0.353	F_m =			0.186

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line D3

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
11	A	Residential 10+ dwellings/acre	32	52	8.49	9.12	0.20	0.40	0.18	0.88
67	A	Residential 5-7 dwellings/acre	32	52	32.81	41.73	0.50	0.40	0.18	13.40
8	A	Public Park	32	52	1.29	3.05	0.85	0.40	0.18	2.72
13	A	Residential 8-10 dwellings/acre	32	52	7.30	8.65	0.40	0.40	0.18	2.00
2	A	Apartments	32	52	1.54	1.66	0.20	0.40	0.18	0.16
56	A	Residential 3-4 dwellings/acre	32	52	22.16	31.02	0.60	0.40	0.18	13.44
1	A	Commercial	32	52	1.21	1.26	0.10	0.40	0.18	0.06
3	A	Residential 3-4 dwellings/acre	32	52	1.19	1.66	0.60	0.40	0.18	0.72
5	A	Residential 3-4 dwellings/acre	32	52	1.98	2.77	0.60	0.40	0.18	1.20
2	A	Commercial	32	52	1.30	1.35	0.10	0.40	0.18	0.06
9	A	Residential 3-4 dwellings/acre	32	52	3.36	4.71	0.60	0.40	0.18	2.04
3	A	Commercial	32	52	2.60	2.70	0.10	0.40	0.18	0.12
17	A	Residential 3-4 dwellings/acre	32	52	6.73	9.42	0.60	0.40	1.18	4.08
5	A	Commercial	32	52	4.33	4.49	0.10	0.40	0.18	0.20
33	A	Residential 3-4 dwellings/acre	32	52	13.06	18.28	0.60	0.40	0.18	7.92
22	A	Residential 10+ dwellings/acre	32	52	16.97	18.25	0.20	0.40	0.18	1.76
52	A	Residential 3-4 dwellings/acre	32	52	20.57	28.81	0.60	0.40	0.18	12.48
308	Low Loss Fraction (1-Y) =				0.523	0.386	F_m =			0.205

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line D4

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
10	A	School	32	52	3.96	5.54	0.60	0.40	0.18	2.40
152	A	Residential 5-7 dwellings/acre	32	52	74.42	94.67	0.50	0.40	0.18	30.40
3	A	Residential 10+ dwellings/acre	32	52	2.31	2.49	0.20	0.40	0.18	0.24
2	A	Residential 3-4 dwellings/acre	32	52	0.79	1.11	0.60	0.40	0.18	0.48
5	A	Residential 10+ dwellings/acre	32	52	3.86	4.15	0.20	0.40	0.18	0.40
2	A	Residential 3-4 dwellings/acre	32	52	0.79	1.11	0.60	0.40	0.18	0.48
5	A	Residential 10+ dwellings/acre	32	52	3.86	4.15	0.20	0.40	0.18	0.40
4	A	Residential 5-7 dwellings/acre	32	52	1.96	2.49	0.50	0.40	0.18	0.80
20	A	Residential 5-7 dwellings/acre	32	52	9.79	12.46	0.50	0.40	0.18	4.00
38	A	Residential 5-7 dwellings/acre	32	52	18.61	23.67	0.50	0.40	0.18	7.60
38	A	Residential 5-7 dwellings/acre	32	52	18.61	23.67	0.50	0.40	0.18	7.60
11	A	Public Park	32	52	1.77	4.20	0.85	0.40	0.18	3.74
32	A	Residential 5-7 dwellings/acre	32	52	15.67	19.93	0.50	0.40	1.18	6.40
322	Low Loss Fraction (1-Y) =				0.514	0.380	F_m =			0.202

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line D5

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
160	A	Residential 3-4 dwellings/acre	32	52	63.38	88.74	0.60	0.40	0.18	38.45
2	A	Residential 10+ dwellings/acre	32	52	1.54	1.66	0.20	0.40	0.18	0.16
3	A	Residential 5-7 dwellings/acre	32	52	1.22	1.56	0.50	0.40	0.18	0.50
5	A	Residential 5-7 dwellings/acre	32	52	2.45	3.11	0.50	0.40	0.18	1.00
2	A	Residential 10+ dwellings/acre	32	52	1.70	1.82	0.20	0.40	0.18	0.18
8	A	Residential 5-7 dwellings/acre	32	52	3.77	4.80	0.50	0.40	0.18	1.54
5	A	Residential 10+ dwellings/acre	32	52	3.47	3.73	0.20	0.40	0.18	0.36
15	A	Residential 5-7 dwellings/acre	32	52	7.10	9.03	0.50	0.40	0.18	2.90
2	A	School	32	52	0.79	1.11	0.60	0.40	0.18	0.48
9	A	Residential 10+ dwellings/acre	32	52	6.94	7.47	0.20	0.40	0.18	0.72
10	A	School	32	52	3.96	5.54	0.60	0.40	0.18	2.40
20	A	Residential 5-7 dwellings/acre	32	52	9.79	12.46	0.50	0.40	0.18	4.00
20	A	Residential 8-10 dwellings/acre	32	52	11.67	13.83	0.40	0.40	1.18	3.20
10	A	Residential 10+ dwellings/acre	32	52	7.72	8.30	0.20	0.40	0.18	0.80
50	A	Residential 3-4 dwellings/acre	32	52	19.78	27.70	0.60	0.40	0.18	12.00
320				Low Loss Fraction (1-Y) =	0.545	0.403			F_m =	0.215

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line D6

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
23	A	School	32	52	9.10	12.74	0.60	0.40	0.18	5.52
12	A	Commercial	32	52	10.39	10.78	0.10	0.40	0.18	0.48
124	A	Residential 3-4 dwellings/acre	32	52	49.08	68.72	0.60	0.40	0.18	29.77
159	Low Loss Fraction (1-Y) =				0.569	0.420	F_m =			0.225

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line D6-2

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
5	A	Residential 10+ dwellings/acre	32	52	3.86	4.15	0.20	0.40	0.18	0.40
1	A	Residential 10+ dwellings/acre	32	52	0.39	0.41	0.20	0.40	0.18	0.04
5	A	School	32	52	1.78	2.49	0.60	0.40	0.18	1.08
5	A	School	32	52	1.98	2.77	0.60	0.40	0.18	1.20
5	A	Residential 10+ dwellings/acre	32	52	3.86	4.15	0.20	0.40	0.18	0.40
10	A	School	32	52	3.96	5.54	0.60	0.40	0.18	2.40
10	A	Residential 10+ dwellings/acre	32	52	7.72	8.30	0.20	0.40	0.18	0.80
16	A	School	32	52	6.33	8.86	0.60	0.40	0.18	3.84
18	A	Residential 10+ dwellings/acre	32	52	13.89	14.93	0.20	0.40	0.18	1.44
5	A	School	32	52	1.98	2.77	0.60	0.40	0.18	1.20
14	A	Residential 2.5 acre lots	32	52	1.59	4.86	0.90	0.40	0.18	5.04
30	A	Residential 3-4 dwellings/acre	32	52	11.87	16.62	0.60	0.40	0.18	7.20
20	A	Residential 10+ dwellings/acre	32	52	15.43	16.59	0.20	0.40	1.18	1.60
143	Low Loss Fraction (1-Y) =				0.478	0.354	F_m =			0.186

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line D7

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
2	A	Commercial	32	52	1.73	1.80	0.10	0.40	0.18	0.08
1	A	Residential 2.5 acre lots	32	52	0.07	0.21	0.90	0.40	0.18	0.22
2	A	Residential 2.5 acre lots	32	52	0.17	0.52	0.90	0.40	0.18	0.54
4	A	Residential 10+ dwellings/acre	32	52	2.70	2.90	0.20	0.40	0.18	0.28
3	A	Commercial	32	52	2.60	2.70	0.10	0.40	0.18	0.12
2	A	Residential 2.5 acre lots	32	52	0.23	0.69	0.90	0.40	0.18	0.72
3	A	Residential 10+ dwellings/acre	32	52	2.31	2.49	0.20	0.40	0.18	0.24
4	A	Residential 10+ dwellings/acre	32	52	3.09	3.32	0.20	0.40	0.18	0.32
5	A	Residential 2.5 acre lots	32	52	0.57	1.74	0.90	0.40	0.18	1.80
7	A	Commercial	32	52	6.06	6.29	0.10	0.40	0.18	0.28
20	A	Commercial	32	52	17.31	17.97	0.10	0.40	0.18	0.80
8	A	Residential 2.5 acre lots	32	52	0.91	2.78	0.90	0.40	0.18	2.88
1	A	Residential 10+ dwellings/acre	32	52	0.77	0.83	0.20	0.40	1.18	0.08
40	A	Commercial	32	52	34.62	35.94	0.10	0.40	0.18	1.60
36	A	Residential 10+ dwellings/acre	32	52	27.78	29.86	0.20	0.40	0.18	2.88
2	A	Commercial	32	52	1.73	1.80	0.10	0.40	0.18	0.08
139	Low Loss Fraction (1-Y) =				0.259	0.193	F_m =			0.093

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line DA

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25 5.88	Low Loss Fraction (1-Y) x Area 100 7.32	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
6	A	Residential 5-7 dwellings/acre	32	52	2.79	3.55	0.50	0.40	0.18	1.14
4	A	Commercial	32	52	3.12	3.23	0.10	0.40	0.18	0.14
9	A	Commercial	32	52	7.96	8.27	0.10	0.40	0.18	0.37
10	A	Residential 5-7 dwellings/acre	32	52	5.09	6.48	0.50	0.40	0.18	2.08
27	A	Residential 5-7 dwellings/acre	32	52	13.42	17.07	0.50	0.40	0.18	5.48
2	A	Public Park	32	52	0.37	0.88	0.85	0.40	0.18	0.78
12	A	Commercial	32	52	10.30	10.69	0.10	0.40	0.18	0.48
81	A	Residential 5-7 dwellings/acre	32	52	39.51	50.26	0.50	0.40	0.18	16.14
4	A	Commercial	32	52	3.32	3.45	0.10	0.40	0.18	0.15
72	A	Residential 5-7 dwellings/acre	32	52	35.20	44.78	0.50	0.40	0.18	14.38
5	A	Residential 8-10 dwellings/acre	32	52	2.92	3.46	0.40	0.40	0.18	0.80
3	A	Commercial	32	52	2.16	2.25	0.10	0.40	0.18	0.10
77	A	Residential 5-7 dwellings/acre	32	52	37.51	47.71	0.50	0.40	1.18	15.32
3	A	Residential 2.5 acre lots	32	52	0.31	0.94	0.90	0.40	0.18	0.97
314		Low Loss Fraction (1-Y) =			0.477	0.353		F_m =		0.186

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - East Village Cherry Ave

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
72	A	Commercial	32	52	62.32	64.69	0.10	0.40	0.18	2.88
37	A	Commercial	32	52	32.03	33.24	0.10	0.40	0.18	1.48
109	Low Loss Fraction (1-Y) =				0.134	0.102	F_m =			0.040

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - East Village H1

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
44	A	Commercial	32	52	38.08	39.53	0.10	0.40	0.18	1.76
12	A	School	32	52	4.75	6.65	0.60	0.40	0.18	2.88
6	A	Public Park	32	52	0.96	2.29	0.85	0.40	0.18	2.04
22	A	Commercial	32	52	19.04	19.77	0.10	0.40	0.18	0.88
19	A	Commercial	32	52	16.45	17.07	0.10	0.40	0.18	0.76
120	A	Residential 5-7 dwellings/acre	32	52	58.76	74.74	0.50	0.40	0.18	24.00
223	Low Loss Fraction (1-Y) =				0.381	0.282	F_m =			0.145

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - East Village H13

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25	Low Loss Fraction (1-Y) x Area 100	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
63	A	Commercial	32	52	54.53	56.60	0.10	0.40	0.18	2.52
2	A	Residential 10+ dwellings/acre	32	52	1.54	1.66	0.20	0.40	0.18	0.16
4	A	Residential 10+ dwellings/acre	32	52	3.09	3.32	0.20	0.40	0.18	0.32
12	A	Commercial	32	52	10.39	10.78	0.10	0.40	0.18	0.48
46	A	Residential 3-4 dwellings/acre	32	52	18.20	25.48	0.60	0.40	0.18	11.04
5	A	Public Park	32	52	0.80	1.91	0.85	0.40	0.18	1.70
132		Low Loss Fraction (1-Y) =			0.329	0.244		F_m =		0.123

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - East Village H7

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
29	A	Public Park	32	52	4.66	11.07	0.85	0.40	0.18	9.86
18	A	School	32	52	7.12	9.97	0.60	0.40	0.18	4.32
9	A	Commercial	32	52	7.79	8.09	0.10	0.40	0.18	0.36
9	A	Commercial	32	52	7.79	8.09	0.10	0.40	0.18	0.36
62	A	Residential 5-7 dwellings/acre	32	52	30.36	38.62	0.50	0.40	0.18	12.40
127		Low Loss Fraction (1-Y) =			0.546	0.403		F_m =		0.215

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - East Village Mulberry Ave

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
12	A	Public Park	32	52	1.93	4.58	0.85	0.40	0.18	4.08
10	A	School	32	52	3.96	5.54	0.60	0.40	0.18	2.40
252	A	Residential 5-7 dwellings/acre	32	52	123.39	156.95	0.50	0.40	0.18	50.40
274	Low Loss Fraction (1-Y) =				0.528	0.390	F_m =			0.208

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - East Village H8

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25	Low Loss Fraction (1-Y) x Area 100	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
45	A	Residential 5-7 dwellings/acre	32	52	22.03	28.03	0.50	0.40	0.18	9.00
12	A	Residential 2.5 acre lots	32	52	1.36	4.17	0.90	0.40	0.18	4.32
57				Low Loss Fraction (1-Y) =	0.590	0.435			F_m =	0.234

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - East Village H9

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
14	A	Commercial	32	52	12.12	12.58	0.10	0.40	0.18	0.56
13	A	Residential 10+ dwellings/acre	32	52	10.03	10.78	0.20	0.40	0.18	1.04
37	A	Commercial	32	52	32.03	33.24	0.10	0.40	0.18	1.48
86	A	Residential 5-7 dwellings/acre	32	52	42.11	53.56	0.50	0.40	0.18	17.20
150	Low Loss Fraction (1-Y) =				0.358	0.266	F_m =			0.135

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - East Village Cottonwood Ave

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25	Low Loss Fraction (1-Y) x Area 100	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
126	A	Residential 5-7 dwellings/acre	32	52	61.69	78.48	0.50	0.40	0.18	25.20
12	A	Residential 2.5 acre lots	32	52	1.36	4.17	0.90	0.40	0.18	4.32
138		Low Loss Fraction (1-Y) =			0.543	0.401	F_m =			0.214

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - East Village Miller Ave

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
151	A	Residential 5-7 dwellings/acre	32	52	73.94	94.05	0.50	0.40	0.18	30.20
10	A	School	32	52	3.96	5.54	0.60	0.40	0.18	2.40
3	A	Residential 3-4 dwellings/acre	32	52	1.19	1.66	0.60	0.40	0.18	0.72
86	A	Commercial	32	52	74.44	77.26	0.10	0.40	0.18	3.44
2	A	Public Park	32	52	0.32	0.76	0.85	0.40	0.18	0.68
252		Low Loss Fraction (1-Y) =			0.390	0.289		F_m =		0.149

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - East Village Redwood Ave

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
158	A	Commercial	32	52	136.76	141.95	0.10	0.40	0.18	6.32
4	A	Public Park	32	52	0.64	1.53	0.85	0.40	0.18	1.36
162	Low Loss Fraction (1-Y) =				0.152	0.114	F_m =			0.047

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line M0

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
10	A	Residential 3-4 dwellings/acre	32	52	3.96	5.54	0.60	0.40	0.18	2.40
2	A	Apartments	32	52	1.16	1.24	0.20	0.40	0.18	0.12
1	A	Residential 3-4 dwellings/acre	32	52	0.40	0.55	0.60	0.40	0.18	0.24
10	A	Apartments	32	52	7.72	8.30	0.20	0.40	0.18	0.80
20	A	Apartments	32	52	15.43	16.59	0.20	0.40	0.18	1.60
20	A	Commercial	32	52	17.31	17.97	0.10	0.40	0.18	0.80
6	A	Apartments	32	52	4.63	4.98	0.20	0.40	0.18	0.48
15	A	Commercial	32	52	12.98	13.48	0.10	0.40	0.18	0.60
6	A	Commercial	32	52	5.19	5.39	0.10	0.40	0.18	0.24
27	A	Apartments	32	52	20.83	22.40	0.20	0.40	0.18	2.16
117	Low Loss Fraction (1-Y) =				0.231	0.172	F_m =			0.081

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line M1

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25	Low Loss Fraction (1-Y) x Area 100	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
10	A	Apartments	32	52	7.72	8.30	0.20	0.40	0.18	0.80
10	A	Apartments	32	52	7.72	8.30	0.20	0.40	0.18	0.80
20	A	Apartments	32	52	15.43	16.59	0.20	0.40	0.18	1.60
40	A	Apartments	32	52	30.86	33.18	0.20	0.40	0.18	3.20
6	A	Commercial	32	52	5.19	5.39	0.10	0.40	0.18	0.24
28	A	Apartments	32	52	21.60	23.23	0.20	0.40	0.18	2.24
114			Low Loss Fraction (1-Y) =		0.223	0.167		F_m =		0.078

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line M2

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25	Low Loss Fraction (1-Y) x Area 100	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
			II	III	5.88	7.32		II	III	
5	A	Apartments	32	52	3.86	4.15	0.20	0.40	0.18	0.40
5	A	Residential 3-4 dwellings/acre	32	52	1.98	2.77	0.60	0.40	0.18	1.20
10	A	Residential 3-4 dwellings/acre	32	52	3.96	5.54	0.60	0.40	0.18	2.40
10	A	School	32	52	3.96	5.54	0.60	0.40	0.18	2.40
8	A	Residential 3-4 dwellings/acre	32	52	3.17	4.43	0.60	0.40	0.18	1.92
23	A	Residential 3-4 dwellings/acre	32	52	9.10	12.74	0.60	0.40	0.18	5.52
19	A	Apartments	32	52	14.66	15.76	0.20	0.40	0.18	1.52
8	A	Commercial	32	52	6.92	7.19	0.10	0.40	0.18	0.32
26	A	Apartments	32	52	20.06	21.57	0.20	0.40	0.18	2.08
114	Low Loss Fraction (1-Y) =				0.406	0.301	F_m =			0.156

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line M3

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25	Low Loss Fraction (1-Y) x Area 100	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
					5.88	7.32				
9	A	Residential 3-4 dwellings/acre	32	52	3.64	5.10	0.60	0.40	0.18	2.21
9	A	Residential 3-4 dwellings/acre	32	52	3.64	5.10	0.60	0.40	0.18	2.21
8	A	Residential 3-4 dwellings/acre	32	52	3.17	4.43	0.60	0.40	0.18	1.92
8	A	Residential 3-4 dwellings/acre	32	52	3.17	4.43	0.60	0.40	0.18	1.92
22	A	Residential 3-4 dwellings/acre	32	52	8.70	12.19	0.60	0.40	0.18	5.28
5	A	Residential 10+ dwellings/acre	32	52	3.86	4.15	0.20	0.40	0.18	0.40
13	A	Commercial	32	52	11.25	11.68	0.10	0.40	0.18	0.52
6	A	Residential 3-4 dwellings/acre	32	52	2.37	3.32	0.60	0.40	0.18	1.44
1	A	Residential 8-10 dwellings/acre	32	52	0.58	0.69	0.40	0.40	0.18	0.16
4	A	Commercial	32	52	3.03	3.14	0.10	0.40	0.18	0.14
30	A	Residential 3-4 dwellings/acre	32	52	11.87	16.62	0.60	0.40	0.18	7.20
115		Low Loss Fraction (1-Y) =			0.519	0.383		F_m =		0.204

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line M4

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
5	A	School	32	52	1.98	2.77	0.60	0.40	0.18	1.20
5	A	Residential 3-4 dwellings/acre	32	52	1.98	2.77	0.60	0.40	0.18	1.20
10	A	School	32	52	3.96	5.54	0.60	0.40	0.18	2.40
8	A	School	32	52	3.17	4.43	0.60	0.40	0.18	1.92
6	A	Residential 3-4 dwellings/acre	32	52	2.37	3.32	0.60	0.40	0.18	1.44
30	A	Residential 3-4 dwellings/acre	32	52	11.87	16.62	0.60	0.40	0.18	7.20
8	A	Commercial	32	52	6.92	7.19	0.10	0.40	0.18	0.32
20	A	Residential 3-4 dwellings/acre	32	52	7.91	11.08	0.60	0.40	0.18	4.80
42	A	Commercial	32	52	36.35	37.73	0.10	0.40	0.18	1.68
134		Low Loss Fraction (1-Y) =			0.429	0.318		F_m =		0.165

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line M5AB

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
7	A	Apartments	32	52	5.02	5.39	0.20	0.40	0.18	0.52
4	A	Apartments	32	52	2.70	2.90	0.20	0.40	0.18	0.28
2	A	Apartments	32	52	1.54	1.66	0.20	0.40	0.18	0.16
8	A	Residential 3-4 dwellings/acre	32	52	3.17	4.43	0.60	0.40	0.18	1.92
5	A	Apartments	32	52	3.86	4.15	0.20	0.40	0.18	0.40
8	A	Residential 3-4 dwellings/acre	32	52	3.17	4.43	0.60	0.40	0.18	1.92
13	A	Apartments	32	52	10.03	10.78	0.20	0.40	0.18	1.04
19	A	Residential 3-4 dwellings/acre	32	52	7.52	10.52	0.60	0.40	0.18	4.56
17	A	Apartments	32	52	13.12	14.10	0.20	0.40	0.18	1.36
14	A	Residential 8-10 dwellings/acre	32	52	8.17	9.68	0.40	0.40	0.18	2.24
4	A	Commercial	32	52	3.46	3.59	0.10	0.40	0.18	0.16
4	A	Residential 8-10 dwellings/acre	32	52	2.33	2.77	0.40	0.40	0.18	0.64
4	A	Commercial	32	52	3.46	3.59	0.10	0.40	1.18	0.16
11	A	Residential 8-10 dwellings/acre	32	52	6.42	7.61	0.40	0.40	0.18	1.76
11	A	Residential 8-10 dwellings/acre	32	52	6.42	7.61	0.40	0.40	0.18	1.76
2	A	Commercial	32	52	1.73	1.80	0.10	0.40	0.18	0.08
21	A	Residential 8-10 dwellings/acre	32	52	12.26	14.53	0.40	0.40	0.18	3.36
2	A	Residential 8-10 dwellings/acre	32	52	1.17	1.38	0.40	0.40	0.18	0.32
8	A	Commercial	32	52	6.92	7.19	0.10	0.40	0.18	0.32
2	A	Commercial	32	52	1.73	1.80	0.10	0.40	1.18	0.08
8	A	Residential 3-4 dwellings/acre	32	52	3.17	4.43	0.60	0.40	0.18	1.92
10	A	Residential 8-10 dwellings/acre	32	52	5.84	6.92	0.40	0.40	0.18	1.60
10	A	Residential 3-4 dwellings/acre	32	52	3.96	5.54	0.60	0.40	0.18	2.40
18	A	Residential 3-4 dwellings/acre	32	52	7.12	9.97	0.60	0.40	0.18	4.32
1	A	Commercial	32	52	0.43	0.45	0.10	0.40	0.18	0.02
3	A	Residential 8-10 dwellings/acre	32	52	1.75	2.08	0.40	0.40	0.18	0.48
10	A	Apartments	32	52	7.72	8.30	0.20	0.40	0.18	0.80
10	A	Apartments	32	52	7.72	8.30	0.20	0.40	0.18	0.80
20	A	Apartments	32	52	15.43	16.59	0.20	0.40	0.18	1.60
40	A	Apartments	32	52	30.86	33.18	0.20	0.40	0.18	3.20
24	A	Residential 3-4 dwellings/acre	32	52	9.50	13.29	0.60	0.40	0.18	5.76
56	A	Apartments	32	52	43.21	46.45	0.20	0.40	0.18	4.48
15	A	Residential 8-10 dwellings/acre	32	52	8.75	10.38	0.40	0.40	0.18	2.40
8	A	School	32	52	3.17	4.43	0.60	0.40	0.18	1.92
16	A	Apartments	32	52	12.35	13.27	0.20	0.40	0.18	1.28
41	A	Residential 3-4 dwellings/acre	32	52	16.22	22.71	0.60	0.40	0.18	9.84
3	A	Commercial	32	52	2.60	2.70	0.10	0.40	0.18	0.12
62	A	Residential 3-4 dwellings/acre	32	52	24.53	34.34	0.60	0.40	0.18	14.88
12	A	Residential 8-10 dwellings/acre	32	52	7.00	8.30	0.40	0.40	0.18	1.92
2	A	Commercial	32	52	1.73	1.80	0.10	0.40	0.18	0.08
5	A	Residential 3-4 dwellings/acre	32	52	1.98	2.77	0.60	0.40	0.18	1.20
539		Low Loss Fraction (1-Y) =			0.407	0.302		F_m =		0.156

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line M5C

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
7	A	Commercial	32	52	6.06	6.29	0.10	0.40	0.18	0.28
2	A	Commercial	32	52	1.73	1.80	0.10	0.40	0.18	0.08
9	A	Residential 8-10 dwellings/acre	32	52	5.25	6.23	0.40	0.40	0.18	1.44
9	A	Residential 8-10 dwellings/acre	32	52	5.25	6.23	0.40	0.40	0.18	1.44
17	A	Commercial	32	52	14.71	15.27	0.10	0.40	0.18	0.68
11	A	Residential 3-4 dwellings/acre	32	52	4.35	6.09	0.60	0.40	0.18	2.64
14	A	Residential 8-10 dwellings/acre	32	52	8.17	9.68	0.40	0.40	0.18	2.24
26	A	Residential 3-4 dwellings/acre	32	52	10.29	14.40	0.60	0.40	0.18	6.24
40	A	Residential 3-4 dwellings/acre	32	52	15.83	22.16	0.60	0.40	0.18	9.60
20	A	Residential 3-4 dwellings/acre	32	52	7.91	11.08	0.60	0.40	0.18	4.80
155	Low Loss Fraction (1-Y) =				0.487	0.360	F_m =			0.190

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line M5DE

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
10	A	Apartments	32	52	7.72	8.30	0.20	0.40	0.18	0.80
8	A	Apartments	32	52	5.79	6.22	0.20	0.40	0.18	0.60
7	A	Apartments	32	52	5.56	5.97	0.20	0.40	0.18	0.58
25	A	Apartments	32	52	19.29	20.74	0.20	0.40	0.18	2.00
30	A	Apartments	32	52	23.15	24.89	0.20	0.40	0.18	2.40
11	A	Apartments	32	52	8.49	9.12	0.20	0.40	0.18	0.88
8	A	School	32	52	3.17	4.43	0.60	0.40	0.18	1.92
36	A	Residential 3-4 dwellings/acre	32	52	14.24	19.94	0.60	0.40	0.18	8.64
25	A	Public Park	32	52	4.02	9.54	0.85	0.40	0.18	8.50
80	A	Residential 3-4 dwellings/acre	32	52	31.65	44.32	0.60	0.40	0.18	19.20
50	A	School	32	52	19.78	27.70	0.60	0.40	0.18	12.00
39	A	Residential 3-4 dwellings/acre	32	52	15.43	21.60	0.60	0.40	0.18	9.36
30	A	School	32	52	11.87	16.62	0.60	0.40	1.18	7.20
50	A	Residential 3-4 dwellings/acre	32	52	19.78	27.70	0.60	0.40	0.18	12.00
60	A	Residential 3-4 dwellings/acre	32	52	23.74	33.24	0.60	0.40	0.18	14.40
1	A	Commercial	32	52	0.87	0.90	0.10	0.40	0.18	0.04
19	A	Residential 3-4 dwellings/acre	32	52	7.52	10.52	0.60	0.40	0.18	4.56
10	A	Residential 3-4 dwellings/acre	32	52	3.96	5.54	0.60	0.40	0.18	2.40
10	A	Residential 3-4 dwellings/acre	32	52	3.96	5.54	0.60	0.40	0.18	2.40
20	A	Residential 3-4 dwellings/acre	32	52	7.91	11.08	0.60	0.40	1.18	4.80
9	A	School	32	52	3.56	4.99	0.60	0.40	0.18	2.16
33	A	Residential 3-4 dwellings/acre	32	52	13.06	18.28	0.60	0.40	0.18	7.92
60	A	Commercial	32	52	51.93	53.90	0.10	0.40	0.18	2.40
631		Low Loss Fraction (1-Y) =			0.514	0.380		F_m =		0.202

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line M5F

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
8	A	Residential 5-7 dwellings/acre	32	52	3.67	4.67	0.50	0.40	0.18	1.50
8	A	Commercial	32	52	6.49	6.74	0.10	0.40	0.18	0.30
11	A	Residential 3-4 dwellings/acre	32	52	4.35	6.09	0.60	0.40	0.18	2.64
17	A	Commercial	32	52	14.71	15.27	0.10	0.40	0.18	0.68
10	A	Residential 3-4 dwellings/acre	32	52	3.96	5.54	0.60	0.40	0.18	2.40
40	A	Residential 3-4 dwellings/acre	32	52	15.83	22.16	0.60	0.40	0.18	9.60
40	A	Residential 3-4 dwellings/acre	32	52	15.83	22.16	0.60	0.40	0.18	9.60
2	A	Commercial	32	52	1.30	1.35	0.10	0.40	0.18	0.06
79	A	Residential 3-4 dwellings/acre	32	52	31.26	43.76	0.60	0.40	0.18	18.96
20	A	Residential 3-4 dwellings/acre	32	52	7.91	11.08	0.60	0.40	0.18	4.80
234	Low Loss Fraction (1-Y) =				0.549	0.405	F_m =			0.216

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line M5G

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
7	A	Residential 3-4 dwellings/acre	32	52	2.77	3.88	0.60	0.40	0.18	1.68
7	A	School	32	52	2.77	3.88	0.60	0.40	0.18	1.68
7	A	Residential 3-4 dwellings/acre	32	52	2.77	3.88	0.60	0.40	0.18	1.68
7	A	School	32	52	2.77	3.88	0.60	0.40	0.18	1.68
6	A	School	32	52	2.37	3.32	0.60	0.40	0.18	1.44
6	A	Residential 3-4 dwellings/acre	32	52	2.37	3.32	0.60	0.40	0.18	1.44
20	A	Residential 3-4 dwellings/acre	32	52	7.91	11.08	0.60	0.40	0.18	4.80
20	A	Commercial	32	52	17.31	17.97	0.10	0.40	0.18	0.80
50	A	Residential 3-4 dwellings/acre	32	52	19.78	27.70	0.60	0.40	0.18	12.00
10	A	School	32	52	3.96	5.54	0.60	0.40	0.18	2.40
20	A	Commercial	32	52	17.31	17.97	0.10	0.40	0.18	0.80
20	A	Commercial	32	52	17.31	17.97	0.10	0.40	0.18	0.80
60	A	Residential 3-4 dwellings/acre	32	52	23.74	33.24	0.60	0.40	1.18	14.40
20	A	Commercial	32	52	17.31	17.97	0.10	0.40	0.18	0.80
41	A	Residential 3-4 dwellings/acre	32	52	16.22	22.71	0.60	0.40	0.18	9.84
20	A	Commercial	32	52	17.31	17.97	0.10	0.40	0.18	0.80
5	A	Commercial	32	52	4.33	4.49	0.10	0.40	0.18	0.20
55	A	Residential 3-4 dwellings/acre	32	52	21.76	30.47	0.60	0.40	0.18	13.20
381				Low Loss Fraction (1-Y) =	0.475	0.351			F_m =	0.185

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line M6A

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
6	A	Commercial	32	52	5.19	5.39	0.10	0.40	0.18	0.24
6	A	Commercial	32	52	5.19	5.39	0.10	0.40	0.18	0.24
11	A	Residential 3-4 dwellings/acre	32	52	4.35	6.09	0.60	0.40	0.18	2.64
14	A	Commercial	32	52	12.12	12.58	0.10	0.40	0.18	0.56
9	A	Residential 3-4 dwellings/acre	32	52	3.56	4.99	0.60	0.40	0.18	2.16
40	A	Residential 3-4 dwellings/acre	32	52	15.83	22.16	0.60	0.40	0.18	9.60
10	A	Residential 3-4 dwellings/acre	32	52	3.96	5.54	0.60	0.40	0.18	2.40
10	A	Residential 3-4 dwellings/acre	32	52	3.96	5.54	0.60	0.40	0.18	2.40
20	A	Residential 3-4 dwellings/acre	32	52	7.91	11.08	0.60	0.40	0.18	4.80
10	A	School	32	52	3.96	5.54	0.60	0.40	0.18	2.40
30	A	Residential 3-4 dwellings/acre	32	52	11.87	16.62	0.60	0.40	0.18	7.20
40	A	Residential 3-4 dwellings/acre	32	52	15.83	22.16	0.60	0.40	0.18	9.60
206		Low Loss Fraction (1-Y) =			0.545	0.403		F_m =		0.215

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line M6B

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
9	A	Residential 3-4 dwellings/acre	32	52	3.56	4.99	0.60	0.40	0.18	2.16
8	A	Residential 3-4 dwellings/acre	32	52	3.17	4.43	0.60	0.40	0.18	1.92
17	A	Residential 3-4 dwellings/acre	32	52	6.73	9.42	0.60	0.40	0.18	4.08
46	A	Residential 3-4 dwellings/acre	32	52	18.20	25.48	0.60	0.40	0.18	11.04
20	A	School	32	52	7.91	11.08	0.60	0.40	0.18	4.80
60	A	Residential 3-4 dwellings/acre	32	52	23.74	33.24	0.60	0.40	0.18	14.40
20	A	Commercial	32	52	17.31	17.97	0.10	0.40	0.18	0.80
60	A	Residential 3-4 dwellings/acre	32	52	23.74	33.24	0.60	0.40	0.18	14.40
240		Low Loss Fraction (1-Y) =			0.565	0.417		F_m =		0.223

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line M7A

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25	Low Loss Fraction (1-Y) x Area 100	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
					5.88	7.32				
6	A	Commercial	32	52	5.19	5.39	0.10	0.40	0.18	0.24
5	A	Commercial	32	52	4.33	4.49	0.10	0.40	0.18	0.20
10	A	Residential 3-4 dwellings/acre	32	52	3.96	5.54	0.60	0.40	0.18	2.40
20	A	Commercial	32	52	17.31	17.97	0.10	0.40	0.18	0.80
40	A	Commercial	32	52	34.62	35.94	0.10	0.40	0.18	1.60
10	A	Residential 3-4 dwellings/acre	32	52	3.96	5.54	0.60	0.40	0.18	2.40
10	A	Residential 3-4 dwellings/acre	32	52	3.96	5.54	0.60	0.40	0.18	2.40
20	A	Residential 3-4 dwellings/acre	32	52	7.91	11.08	0.60	0.40	0.18	4.80
40	A	Residential 3-4 dwellings/acre	32	52	15.83	22.16	0.60	0.40	0.18	9.60
40	A	Commercial	32	52	34.62	35.94	0.10	0.40	0.18	1.60
201	Low Loss Fraction (1-Y) =				0.345	0.256	F_m =			0.130

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line M7B

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25	Low Loss Fraction (1-Y) x Area 100	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
					5.88	7.32				
10	A	Residential 3-4 dwellings/acre	32	52	3.96	5.54	0.60	0.40	0.18	2.40
10	A	Residential 3-4 dwellings/acre	32	52	3.96	5.54	0.60	0.40	0.18	2.40
20	A	Residential 3-4 dwellings/acre	32	52	7.91	11.08	0.60	0.40	0.18	4.80
10	A	School	32	52	3.96	5.54	0.60	0.40	0.18	2.40
30	A	Residential 3-4 dwellings/acre	32	52	11.87	16.62	0.60	0.40	0.18	7.20
2	A	Residential 8-10 dwellings/acre	32	52	1.17	1.38	0.40	0.40	0.18	0.32
79	A	Commercial	32	52	68.38	70.97	0.10	0.40	0.18	3.16
161	Low Loss Fraction (1-Y) =				0.371	0.275	F_m =			0.141

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line M7C

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25	Low Loss Fraction (1-Y) x Area 100	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
					5.88	7.32				
10	A	Residential 3-4 dwellings/acre	32	52	3.96	5.54	0.60	0.40	0.18	2.40
10	A	Residential 3-4 dwellings/acre	32	52	3.96	5.54	0.60	0.40	0.18	2.40
20	A	Residential 3-4 dwellings/acre	32	52	7.91	11.08	0.60	0.40	0.18	4.80
20	A	Commercial	32	52	17.31	17.97	0.10	0.40	0.18	0.80
20	A	Residential 3-4 dwellings/acre	32	52	7.91	11.08	0.60	0.40	0.18	4.80
20	A	Commercial	32	52	17.31	17.97	0.10	0.40	0.18	0.80
5	A	Residential 3-4 dwellings/acre	32	52	1.98	2.77	0.60	0.40	0.18	1.20
56	A	Commercial	32	52	48.47	50.31	0.10	0.40	0.18	2.24
161		Low Loss Fraction (1-Y) =			0.324	0.241		F_m =		0.121

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line NT1 - Fontana Channel

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
2	A	Commercial	32	52	1.73	1.80	0.10	0.40	0.18	0.08
38	A	Apartments	32	52	29.32	31.52	0.20	0.40	0.18	3.04
33	A	Apartments	32	52	25.46	27.37	0.20	0.40	0.18	2.64
2	A	Public Park	32	52	0.32	0.76	0.85	0.40	0.18	0.68
4	A	Residential 8-10 dwellings/acre	32	52	2.04	2.42	0.40	0.40	0.18	0.56
1	A	Residential 10+ dwellings/acre	32	52	0.10	0.21	0.80	0.40	0.18	0.16
10	A	Residential 3-4 dwellings/acre	32	52	3.96	5.54	0.60	0.40	0.18	2.40
3	A	Residential 3-4 dwellings/acre	32	52	0.99	1.38	0.60	0.40	0.18	0.60
8	A	Apartments	32	52	5.79	6.22	0.20	0.40	0.18	0.60
7	A	Residential 3-4 dwellings/acre	32	52	2.77	3.88	0.60	0.40	0.18	1.68
8	A	Apartments	32	52	6.17	6.64	0.20	0.40	0.18	0.64
1	A	Commercial	32	52	0.43	0.45	0.10	0.40	0.18	0.02
20	A	Apartments	32	52	15.05	16.18	0.20	0.40	1.18	1.56
20	A	Apartments	32	52	15.43	16.59	0.20	0.40	0.18	1.60
154	Low Loss Fraction (1-Y) =				0.289	0.215	F_m =			0.106

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line NT1 - Foothill

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
4	A	Residential 3-4 dwellings/acre	32	52	1.58	2.22	0.60	0.40	0.18	0.96
4	A	Apartments	32	52	3.09	3.32	0.20	0.40	0.18	0.32
2	A	Residential 3-4 dwellings/acre	32	52	0.79	1.11	0.60	0.40	0.18	0.48
15	A	Apartments	32	52	11.57	12.44	0.20	0.40	0.18	1.20
26	A	Apartments	32	52	20.06	21.57	0.20	0.40	0.18	2.08
20	A	Apartments	32	52	15.43	16.59	0.20	0.40	0.18	1.60
20	A	Apartments	32	52	15.43	16.59	0.20	0.40	0.18	1.60
40	A	Apartments	32	52	30.86	33.18	0.20	0.40	0.18	3.20
131		Low Loss Fraction (1-Y) =			0.246	0.183		F_m =		0.087

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line NT2 - Fontana Channel

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25	Low Loss Fraction (1-Y) x Area 100	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
			II	III	5.88	7.32		II	III	
15	A	Apartments	32	52	11.57	12.44	0.20	0.40	0.18	1.20
8	A	Residential 3-4 dwellings/acre	32	52	3.17	4.43	0.60	0.40	0.18	1.92
17	A	Residential 3-4 dwellings/acre	32	52	6.73	9.42	0.60	0.40	0.18	4.08
31	A	Apartments	32	52	23.92	25.72	0.20	0.40	0.18	2.48
8	A	Public Park	32	52	1.29	3.05	0.85	0.40	0.18	2.72
1	A	Apartments	32	52	0.77	0.83	0.20	0.40	0.18	0.08
24	A	Apartments	32	52	18.52	19.91	0.20	0.40	0.18	1.92
21	A	Residential 10+ dwellings/acre	32	52	16.20	17.42	0.20	0.40	0.18	1.68
2	A	Commercial	32	52	1.73	1.80	0.10	0.40	0.18	0.08
127	Low Loss Fraction (1-Y) =				0.339	0.252	F_m =			0.127

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line NT2 - Foothill

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25	Low Loss Fraction (1-Y) x Area 100	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
8	A	Residential 5-7 dwellings/acre	32	52	3.92	4.98	0.50	0.40	0.18	1.60
2	A	Commercial	32	52	1.73	1.80	0.10	0.40	0.18	0.08
5	A	Commercial	32	52	4.33	4.49	0.10	0.40	0.18	0.20
10	A	Residential 10+ dwellings/acre	32	52	7.72	8.30	0.20	0.40	0.18	0.80
5	A	Apartments	32	52	3.86	4.15	0.20	0.40	0.18	0.40
20	A	Residential 8-10 dwellings/acre	32	52	11.67	13.83	0.40	0.40	0.18	3.20
11	A	Apartments	32	52	8.49	9.12	0.20	0.40	0.18	0.88
8	A	Residential 3-4 dwellings/acre	32	52	3.17	4.43	0.60	0.40	0.18	1.92
5	A	Apartments	32	52	3.86	4.15	0.20	0.40	0.18	0.40
5	A	Residential 3-4 dwellings/acre	32	52	1.98	2.77	0.60	0.40	0.18	1.20
1	A	Commercial	32	52	0.43	0.45	0.10	0.40	0.18	0.02
10	A	Residential 10+ dwellings/acre	32	52	7.72	8.30	0.20	0.40	0.18	0.80
10	A	School	32	52	3.96	5.54	0.60	0.40	1.18	2.40
20	A	Residential 3-4 dwellings/acre	32	52	7.91	11.08	0.60	0.40	0.18	4.80
8	A	Commercial	32	52	6.92	7.19	0.10	0.40	0.18	0.32
3	A	Residential 10+ dwellings/acre	32	52	1.93	2.07	0.20	0.40	0.18	0.20
40	A	Residential 3-4 dwellings/acre	32	52	15.83	22.16	0.60	0.40	0.18	9.60
40	A	Residential 3-4 dwellings/acre	32	52	15.83	22.16	0.60	0.40	0.18	9.60
3	A	Residential 3-4 dwellings/acre	32	52	1.35	1.88	0.60	0.40	0.18	0.82
2	A	Public Park	32	52	0.26	0.61	0.85	0.40	1.18	0.54
1	A	Public Park	32	52	0.16	0.38	0.85	0.40	0.18	0.34
4	A	Residential 3-4 dwellings/acre	32	52	1.50	2.10	0.60	0.40	0.18	0.91
1	A	Residential 3-4 dwellings/acre	32	52	0.20	0.28	0.60	0.40	0.18	0.12
3	A	Apartments	32	52	1.93	2.07	0.20	0.40	0.18	0.20
4	A	Apartments	32	52	3.09	3.32	0.20	0.40	0.18	0.32
8	A	Residential 3-4 dwellings/acre	32	52	3.17	4.43	0.60	0.40	0.18	1.92
4	A	Public Park	32	52	0.64	1.53	0.85	0.40	0.18	1.36
5	A	Apartments	32	52	3.86	4.15	0.20	0.40	0.18	0.40
10	A	Residential 3-4 dwellings/acre	32	52	3.96	5.54	0.60	0.40	0.18	2.40
4	A	Public Park	32	52	0.64	1.53	0.85	0.40	0.18	1.36
20	A	Residential 3-4 dwellings/acre	32	52	7.91	11.08	0.60	0.40	0.18	4.80
4	A	Public Park	32	52	0.64	1.53	0.85	0.40	0.18	1.36
8	A	Apartments	32	52	6.17	6.64	0.20	0.40	0.18	0.64
290		Low Loss Fraction (1-Y) =			0.494	0.365		F_m =		0.193

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line NT3 - Fontana Channel

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
23	A	Residential 3-4 dwellings/acre	32	52	9.10	12.74	0.60	0.40	0.18	5.52
16	A	Apartments	32	52	12.35	13.27	0.20	0.40	0.18	1.28
6	A	Residential 3-4 dwellings/acre	32	52	2.37	3.32	0.60	0.40	0.18	1.44
18	A	Public Park	32	52	2.81	6.68	0.85	0.40	0.18	5.95
18	A	Apartments	32	52	13.50	14.52	0.20	0.40	0.18	1.40
40	A	Apartments	32	52	30.48	32.77	0.20	0.40	0.18	3.16
10	A	Commercial	32	52	8.66	8.98	0.10	0.40	0.18	0.40
130	Low Loss Fraction (1-Y) =				0.388	0.287	F_m =			0.148

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line NT3 - Foothill

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
5	A	School	32	52	1.82	2.55	0.60	0.40	0.18	1.10
4	A	Residential 3-4 dwellings/acre	32	52	1.38	1.94	0.60	0.40	0.18	0.84
8	A	Residential 3-4 dwellings/acre	32	52	3.17	4.43	0.60	0.40	0.18	1.92
5	A	Residential 3-4 dwellings/acre	32	52	1.98	2.77	0.60	0.40	0.18	1.20
5	A	School	32	52	1.98	2.77	0.60	0.40	0.18	1.20
16	A	Residential 3-4 dwellings/acre	32	52	6.33	8.86	0.60	0.40	0.18	3.84
41	A	Residential 3-4 dwellings/acre	32	52	16.22	22.71	0.60	0.40	0.18	9.84
8	A	Residential 3-4 dwellings/acre	32	52	2.97	4.15	0.60	0.40	0.18	1.80
8	A	Residential 3-4 dwellings/acre	32	52	2.97	4.15	0.60	0.40	0.18	1.80
1	A	Residential 3-4 dwellings/acre	32	52	0.32	0.44	0.60	0.40	0.18	0.19
5	A	Apartments	32	52	3.86	4.15	0.20	0.40	0.18	0.40
16	A	Residential 3-4 dwellings/acre	32	52	6.33	8.86	0.60	0.40	0.18	3.84
5	A	Apartments	32	52	3.86	4.15	0.20	0.40	1.18	0.40
30	A	Residential 3-4 dwellings/acre	32	52	11.87	16.62	0.60	0.40	0.18	7.20
10	A	Apartments	32	52	7.72	8.30	0.20	0.40	0.18	0.80
165	Low Loss Fraction (1-Y) =				0.559	0.413	F_m =			0.221

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line NT4 - Fontana Channel

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
22	A	Apartments	32	52	16.59	17.83	0.20	0.40	0.18	1.72
5	A	Residential 3-4 dwellings/acre	32	52	1.98	2.77	0.60	0.40	0.18	1.20
37	A	Residential 3-4 dwellings/acre	32	52	14.64	20.50	0.60	0.40	0.18	8.88
17	A	Residential 3-4 dwellings/acre	32	52	6.65	9.31	0.60	0.40	0.18	4.03
11	A	Apartments	32	52	8.49	9.12	0.20	0.40	0.18	0.88
1	A	Public Park	32	52	0.16	0.38	0.85	0.40	0.18	0.34
20	A	Apartments	32	52	15.43	16.59	0.20	0.40	0.18	1.60
3	A	Public Park	32	52	0.42	0.99	0.85	0.40	0.18	0.88
1	A	Residential 3-4 dwellings/acre	32	52	0.51	0.72	0.60	0.40	0.18	0.31
23	A	Apartments	32	52	17.75	19.08	0.20	0.40	0.18	1.84
10	A	School	32	52	3.96	5.54	0.60	0.40	0.18	2.40
22	A	Residential 8-10 dwellings/acre	32	52	12.84	15.22	0.40	0.40	0.18	3.52
171	Low Loss Fraction (1-Y) =				0.419	0.310	F_m =			0.161

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line NT4 - Foothill

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
8	A	Residential 3-4 dwellings/acre	32	52	2.97	4.15	0.60	0.40	0.18	1.80
8	A	Residential 3-4 dwellings/acre	32	52	2.97	4.15	0.60	0.40	0.18	1.80
5	A	Residential 3-4 dwellings/acre	32	52	2.10	2.94	0.60	0.40	0.18	1.27
20	A	Residential 3-4 dwellings/acre	32	52	7.91	11.08	0.60	0.40	0.18	4.80
2	A	Commercial	32	52	1.73	1.80	0.10	0.40	0.18	0.08
6	A	Commercial	32	52	5.54	5.75	0.10	0.40	0.18	0.26
39	A	Residential 3-4 dwellings/acre	32	52	15.35	21.49	0.60	0.40	0.18	9.31
8	A	Residential 5-7 dwellings/acre	32	52	3.67	4.67	0.50	0.40	0.18	1.50
8	A	Residential 5-7 dwellings/acre	32	52	3.67	4.67	0.50	0.40	0.18	1.50
3	A	Commercial	32	52	2.16	2.25	0.10	0.40	0.18	0.10
3	A	Residential 8-10 dwellings/acre	32	52	1.63	1.94	0.40	0.40	0.18	0.45
2	A	Public Park	32	52	0.24	0.57	0.85	0.40	0.18	0.51
15	A	Residential 5-7 dwellings/acre	32	52	7.34	9.34	0.50	0.40	1.18	3.00
3	A	Commercial	32	52	2.60	2.70	0.10	0.40	0.18	0.12
2	A	Residential 8-10 dwellings/acre	32	52	1.17	1.38	0.40	0.40	0.18	0.32
32	A	Residential 5-7 dwellings/acre	32	52	15.67	19.93	0.50	0.40	0.18	6.40
2	A	Residential 8-10 dwellings/acre	32	52	1.40	1.66	0.40	0.40	0.18	0.38
8	A	Commercial	32	52	6.92	7.19	0.10	0.40	0.18	0.32
172			Low Loss Fraction (1-Y) =		0.505	0.373		F_m =		0.198

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line NT5 - Fontana Channel

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
14	A	Apartments	32	52	10.80	11.61	0.20	0.40	0.18	1.12
1	A	Public Park	32	52	0.16	0.38	0.85	0.40	0.18	0.34
14	A	Apartments	32	52	10.80	11.61	0.20	0.40	0.18	1.12
22	A	Residential 3-4 dwellings/acre	32	52	8.70	12.19	0.60	0.40	0.18	5.28
2	A	Public Park	32	52	0.32	0.76	0.85	0.40	0.18	0.68
10	A	Apartments	32	52	7.72	8.30	0.20	0.40	0.18	0.80
10	A	Apartments	32	52	7.72	8.30	0.20	0.40	0.18	0.80
15	A	Residential 8-10 dwellings/acre	32	52	8.75	10.38	0.40	0.40	0.18	2.40
26	A	Residential 2.5 acre lots	32	52	2.96	9.03	0.90	0.40	0.18	9.36
114	Low Loss Fraction (1-Y) =				0.492	0.364	F_m =			0.192

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line NT5 - Foothill

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25	Low Loss Fraction (1-Y) x Area 100	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
					5.88	7.32				
2	A	Commercial	32	52	1.99	2.07	0.10	0.40	0.18	0.09
5	A	Residential 3-4 dwellings/acre	32	52	1.98	2.77	0.60	0.40	0.18	1.20
8	A	Residential 3-4 dwellings/acre	32	52	2.97	4.15	0.60	0.40	0.18	1.80
5	A	Residential 3-4 dwellings/acre	32	52	1.98	2.77	0.60	0.40	0.18	1.20
3	A	Commercial	32	52	2.60	2.70	0.10	0.40	0.18	0.12
18	A	Residential 3-4 dwellings/acre	32	52	7.12	9.97	0.60	0.40	0.18	4.32
40	A	Residential 3-4 dwellings/acre	32	52	15.83	22.16	0.60	0.40	0.18	9.60
40	A	Residential 3-4 dwellings/acre	32	52	15.83	22.16	0.60	0.40	0.18	9.60
8	A	Apartments	32	52	5.79	6.22	0.20	0.40	0.18	0.60
8	A	Apartments	32	52	5.79	6.22	0.20	0.40	0.18	0.60
5	A	Apartments	32	52	3.86	4.15	0.20	0.40	0.18	0.40
20	A	Apartments	32	52	15.43	16.59	0.20	0.40	0.18	1.60
20	A	School	32	52	7.91	11.08	0.60	0.40	1.18	4.80
10	A	Apartments	32	52	7.72	8.30	0.20	0.40	0.18	0.80
10	A	Residential 10+ dwellings/acre	32	52	7.72	8.30	0.20	0.40	0.18	0.80
10	A	School	32	52	3.96	5.54	0.60	0.40	0.18	2.40
10	A	Residential 10+ dwellings/acre	32	52	7.72	8.30	0.20	0.40	0.18	0.80
20	A	Apartments	32	52	15.43	16.59	0.20	0.40	0.18	1.60
241			Low Loss Fraction (1-Y) =		0.454	0.335			F_m =	0.176

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line NT6

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
10	A	Commercial	32	52	8.66	8.98	0.10	0.40	0.18	0.40
10	A	Commercial	32	52	8.66	8.98	0.10	0.40	0.18	0.40
20	A	Commercial	32	52	17.31	17.97	0.10	0.40	0.18	0.80
28	A	Commercial	32	52	24.24	25.16	0.10	0.40	0.18	1.12
40	A	Commercial	32	52	34.62	35.94	0.10	0.40	0.18	1.60
78	A	Residential 2.5 acre lots	32	52	8.87	27.09	0.90	0.40	0.18	28.08
186	Low Loss Fraction (1-Y) =				0.450	0.333	F_m =			0.174

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line NT7 - Fontana Channel

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
35	A	Residential 3-4 dwellings/acre	32	52	13.85	19.39	0.60	0.40	0.18	8.40
64	A	Residential 8-10 dwellings/acre	32	52	37.35	44.27	0.40	0.40	0.18	10.24
4	A	Public Park	32	52	0.64	1.53	0.85	0.40	0.18	1.36
3	A	Commercial	32	52	2.60	2.70	0.10	0.40	0.18	0.12
2	A	Residential 3-4 dwellings/acre	32	52	0.79	1.11	0.60	0.40	0.18	0.48
15	A	Residential 10+ dwellings/acre	32	52	3.01	6.03	0.80	0.40	0.18	4.64
0	A	Public Park	32	52	0.06	0.15	0.85	0.40	0.18	0.14
5	A	Commercial	32	52	4.33	4.49	0.10	0.40	0.18	0.20
2	A	Commercial	32	52	1.73	1.80	0.10	0.40	0.18	0.08
8	A	Commercial	32	52	6.49	6.74	0.10	0.40	0.18	0.30
5	A	Commercial	32	52	4.33	4.49	0.10	0.40	0.18	0.20
20	A	Commercial	32	52	17.31	17.97	0.10	0.40	0.18	0.80
40	A	Commercial	32	52	34.62	35.94	0.10	0.40	1.18	1.60
40	A	Commercial	32	52	34.62	35.94	0.10	0.40	0.18	1.60
80	A	Commercial	32	52	69.24	71.87	0.10	0.40	0.18	3.20
322				Low Loss Fraction (1-Y) =	0.284	0.211			F_m =	0.103

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line NT7 - Foothill

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
8	A	Residential 3-4 dwellings/acre	32	52	2.97	4.15	0.60	0.40	0.18	1.80
8	A	Residential 3-4 dwellings/acre	32	52	2.97	4.15	0.60	0.40	0.18	1.80
5	A	Residential 3-4 dwellings/acre	32	52	1.98	2.77	0.60	0.40	0.18	1.20
20	A	Residential 3-4 dwellings/acre	32	52	7.91	11.08	0.60	0.40	0.18	4.80
40	A	Residential 3-4 dwellings/acre	32	52	15.83	22.16	0.60	0.40	0.18	9.60
8	A	Residential 3-4 dwellings/acre	32	52	2.97	4.15	0.60	0.40	0.18	1.80
2	A	Residential 3-4 dwellings/acre	32	52	0.79	1.11	0.60	0.40	0.18	0.48
6	A	Residential 8-10 dwellings/acre	32	52	3.21	3.80	0.40	0.40	0.18	0.88
2	A	Residential 8-10 dwellings/acre	32	52	1.17	1.38	0.40	0.40	0.18	0.32
3	A	Apartments	32	52	2.31	2.49	0.20	0.40	0.18	0.24
13	A	Residential 3-4 dwellings/acre	32	52	4.95	6.92	0.60	0.40	0.18	3.00
9	A	Residential 8-10 dwellings/acre	32	52	4.96	5.88	0.40	0.40	0.18	1.36
4	A	Apartments	32	52	3.09	3.32	0.20	0.40	1.18	0.32
23	A	Residential 3-4 dwellings/acre	32	52	9.10	12.74	0.60	0.40	0.18	5.52
9	A	Residential 8-10 dwellings/acre	32	52	5.25	6.23	0.40	0.40	0.18	1.44
6	A	Apartments	32	52	4.63	4.98	0.20	0.40	0.18	0.48
163	Low Loss Fraction (1-Y) =				0.546	0.403	F_m =			0.215

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line NT8 - Fontana Channel

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
10	A	Commercial	32	52	8.66	8.98	0.10	0.40	0.18	0.40
27	A	Residential 3-4 dwellings/acre	32	52	10.68	14.96	0.60	0.40	0.18	6.48
48	A	Residential 3-4 dwellings/acre	32	52	18.99	26.59	0.60	0.40	0.18	11.52
45	A	Commercial	32	52	38.95	40.43	0.10	0.40	0.18	1.80
11	A	Residential 3-4 dwellings/acre	32	52	4.35	6.09	0.60	0.40	0.18	2.64
141	Low Loss Fraction (1-Y) =				0.421	0.312	F_m =			0.162

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line NT8 - Foothill

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
8	A	Residential 5-7 dwellings/acre	32	52	3.67	4.67	0.50	0.40	0.18	1.50
8	A	Residential 5-7 dwellings/acre	32	52	3.67	4.67	0.50	0.40	0.18	1.50
5	A	Residential 5-7 dwellings/acre	32	52	2.45	3.11	0.50	0.40	0.18	1.00
20	A	Residential 5-7 dwellings/acre	32	52	9.79	12.46	0.50	0.40	0.18	4.00
40	A	Residential 5-7 dwellings/acre	32	52	19.59	24.91	0.50	0.40	0.18	8.00
5	A	Commercial	32	52	4.33	4.49	0.10	0.40	0.18	0.20
35	A	Residential 5-7 dwellings/acre	32	52	17.14	21.80	0.50	0.40	0.18	7.00
20	A	Residential 3-4 dwellings/acre	32	52	7.91	11.08	0.60	0.40	0.18	4.80
1	A	Public Park	32	52	0.16	0.38	0.85	0.40	0.18	0.34
21	A	Commercial	32	52	18.18	18.87	0.10	0.40	0.18	0.84
2	A	Residential 10+ dwellings/acre	32	52	0.42	0.83	0.80	0.40	0.18	0.64
164	Low Loss Fraction (1-Y) =				0.468	0.346	F_m =			0.182

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line Channel Alder

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25	Low Loss Fraction (1-Y) x Area 100	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
					5.88	7.32				
21	A	Residential 3-4 dwellings/acre	32	52	8.31	11.63	0.60	0.40	0.18	5.04
14	A	Residential 8-10 dwellings/acre	32	52	8.17	9.68	0.40	0.40	0.18	2.24
17	A	Residential 8-10 dwellings/acre	32	52	9.92	11.76	0.40	0.40	0.18	2.72
2	A	Public Park	32	52	0.32	0.76	0.85	0.40	0.18	0.68
25	A	Residential 3-4 dwellings/acre	32	52	9.89	13.85	0.60	0.40	0.18	6.00
23	A	Residential 3-4 dwellings/acre	32	52	9.10	12.74	0.60	0.40	0.18	5.52
19	A	Residential 8-10 dwellings/acre	32	52	11.09	13.14	0.40	0.40	0.18	3.04
1	A	Commercial	32	52	0.87	0.90	0.10	0.40	0.18	0.04
10	A	Commercial	32	52	8.66	8.98	0.10	0.40	0.18	0.40
25	A	Residential 3-4 dwellings/acre	32	52	9.89	13.85	0.60	0.40	0.18	6.00
2	A	Public Park	32	52	0.32	0.76	0.85	0.40	0.18	0.68
3	A	Residential 10+ dwellings/acre	32	52	2.31	2.49	0.20	0.40	0.18	0.24
15	A	Residential 8-10 dwellings/acre	32	52	8.75	10.38	0.40	0.40	1.18	2.40
1	A	Commercial	32	52	0.87	0.90	0.10	0.40	0.18	0.04
24	A	Residential 3-4 dwellings/acre	32	52	9.50	13.29	0.60	0.40	0.18	5.76
25	A	Residential 3-4 dwellings/acre	32	52	9.89	13.85	0.60	0.40	0.18	6.00
9	A	School	32	52	3.56	4.99	0.60	0.40	0.18	2.16
8	A	Commercial	32	52	6.92	7.19	0.10	0.40	0.18	0.32
244		Low Loss Fraction (1-Y) =			0.515	0.381		F_m =		0.202

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line Channel Locust

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
21	A	Residential 3-4 dwellings/acre	32	52	8.31	11.63	0.60	0.40	0.18	5.04
7	A	Residential 10+ dwellings/acre	32	52	5.40	5.81	0.20	0.40	0.18	0.56
7	A	Commercial	32	52	6.06	6.29	0.10	0.40	0.18	0.28
23	A	Residential 3-4 dwellings/acre	32	52	9.10	12.74	0.60	0.40	0.18	5.52
2	A	Public Park	32	52	0.32	0.76	0.85	0.40	0.18	0.68
20	A	Residential 8-10 dwellings/acre	32	52	11.67	13.83	0.40	0.40	0.18	3.20
10	A	Residential 8-10 dwellings/acre	32	52	5.84	6.92	0.40	0.40	0.18	1.60
31	A	Residential 3-4 dwellings/acre	32	52	12.27	17.17	0.60	0.40	0.18	7.44
8	A	Commercial	32	52	6.92	7.19	0.10	0.40	0.18	0.32
46	A	Residential 3-4 dwellings/acre	32	52	18.20	25.48	0.60	0.40	0.18	11.04
2	A	Public Park	32	52	0.32	0.76	0.85	0.40	0.18	0.68
8	A	Residential 8-10 dwellings/acre	32	52	4.67	5.53	0.40	0.40	0.18	1.28
10	A	School	32	52	3.96	5.54	0.60	0.40	1.18	2.40
5	A	Residential 10+ dwellings/acre	32	52	3.86	4.15	0.20	0.40	0.18	0.40
36	A	Residential 3-4 dwellings/acre	32	52	14.24	19.94	0.60	0.40	0.18	8.64
5	A	Commercial	32	52	4.33	4.49	0.10	0.40	0.18	0.20
241	Low Loss Fraction (1-Y) =				0.521	0.385	F_m =			0.204

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line Channel Palmetto

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
15	A	Residential 3-4 dwellings/acre	32	52	5.93	8.31	0.60	0.40	0.18	3.60
20	A	Apartments	32	52	15.43	16.59	0.20	0.40	0.18	1.60
18	A	School	32	52	7.12	9.97	0.60	0.40	0.18	4.32
2	A	Public Park	32	52	0.32	0.76	0.85	0.40	0.18	0.68
25	A	Residential 3-4 dwellings/acre	32	52	9.89	13.85	0.60	0.40	0.18	6.00
35	A	Apartments	32	52	27.00	29.03	0.20	0.40	0.18	2.80
12	A	Residential 3-4 dwellings/acre	32	52	4.75	6.65	0.60	0.40	0.18	2.88
13	A	Apartments	32	52	10.03	10.78	0.20	0.40	0.18	1.04
8	A	Public Park	32	52	1.29	3.05	0.85	0.40	0.18	2.72
6	A	Commercial	32	52	5.19	5.39	0.10	0.40	0.18	0.24
5	A	School	32	52	1.98	2.77	0.60	0.40	0.18	1.20
11	A	Public Park	32	52	1.77	4.20	0.85	0.40	0.18	3.74
33	A	Residential 3-4 dwellings/acre	32	52	13.06	18.28	0.60	0.40	1.18	7.92
203	Low Loss Fraction (1-Y) =				0.489	0.361	F_m =			0.191

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line Foothill Alder

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25 5.88	Low Loss Fraction (1-Y) x Area 100 7.32	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
82	A	Residential 3-4 dwellings/acre	32	52	32.44	45.42	0.60	0.40	0.18	19.68
69	A	Residential 3-4 dwellings/acre	32	52	27.30	38.22	0.60	0.40	0.18	16.56
11	A	Commercial	32	52	9.52	9.88	0.10	0.40	0.18	0.44
82	A	Residential 3-4 dwellings/acre	32	52	32.44	45.42	0.60	0.40	0.18	19.68
5	A	Commercial	32	52	4.33	4.49	0.10	0.40	0.18	0.20
13	A	Residential 8-10 dwellings/acre	32	52	7.59	8.99	0.40	0.40	0.18	2.08
5	A	Public Park	32	52	0.80	1.91	0.85	0.40	0.18	1.70
10	A	School	32	52	3.96	5.54	0.60	0.40	0.18	2.40
47	A	Residential 3-4 dwellings/acre	32	52	18.60	26.04	0.60	0.40	0.18	11.28
324	Low Loss Fraction (1-Y) =				0.577	0.426	F_m =			0.228

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line Foothill Locust

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
23	A	School	32	52	9.10	12.74	0.60	0.40	0.18	5.52
58	A	Residential 3-4 dwellings/acre	32	52	22.95	32.13	0.60	0.40	0.18	13.92
5	A	Residential 8-10 dwellings/acre	32	52	2.92	3.46	0.40	0.40	0.18	0.80
5	A	Commercial	32	52	4.33	4.49	0.10	0.40	0.18	0.20
11	A	Residential 10+ dwellings/acre	32	52	8.49	9.12	0.20	0.40	0.18	0.88
30	A	Residential 3-4 dwellings/acre	32	52	11.87	16.62	0.60	0.40	0.18	7.20
30	A	Residential 3-4 dwellings/acre	32	52	11.87	16.62	0.60	0.40	0.18	7.20
2	A	Public Park	32	52	0.32	0.76	0.85	0.40	0.18	0.68
68	A	Residential 3-4 dwellings/acre	32	52	26.90	37.67	0.60	0.40	0.18	16.32
10	A	School	32	52	3.96	5.54	0.60	0.40	0.18	2.40
7	A	Commercial	32	52	6.06	6.29	0.10	0.40	0.18	0.28
63	A	Residential 3-4 dwellings/acre	32	52	24.93	34.90	0.60	0.40	0.18	15.12
10	A	School	32	52	3.96	5.54	0.60	0.40	1.18	2.40
322	Low Loss Fraction (1-Y) =				0.573	0.423	F_m =			0.226

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line Foothill Palmetto

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25 5.88	Low Loss Fraction (1-Y) x Area 100 7.32	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
81	A	Residential 3-4 dwellings/acre	32	52	32.05	44.87	0.60	0.40	0.18	19.44
11	A	Residential 3-4 dwellings/acre	32	52	4.35	6.09	0.60	0.40	0.18	2.64
10	A	School	32	52	3.96	5.54	0.60	0.40	0.18	2.40
11	A	Residential 8-10 dwellings/acre	32	52	6.42	7.61	0.40	0.40	0.18	1.76
34	A	Apartments	32	52	26.23	28.20	0.20	0.40	0.18	2.72
3	A	Residential 10+ dwellings/acre	32	52	2.31	2.49	0.20	0.40	0.18	0.24
42	A	Residential 3-4 dwellings/acre	32	52	16.62	23.27	0.60	0.40	0.18	10.08
20	A	Apartments	32	52	15.43	16.59	0.20	0.40	0.18	1.60
11	A	Residential 3-4 dwellings/acre	32	52	4.35	6.09	0.60	0.40	0.18	2.64
223		Low Loss Fraction (1-Y) =			0.499	0.369		F_m =		0.195

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line Randall Alder

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25 5.88	Low Loss Fraction (1-Y) x Area 100 7.32	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
72	A	Residential 3-4 dwellings/acre	32	52	28.49	39.88	0.60	0.40	0.18	17.28
45	A	Residential 3-4 dwellings/acre	32	52	17.80	24.93	0.60	0.40	0.18	10.80
72	A	Residential 3-4 dwellings/acre	32	52	28.49	39.88	0.60	0.40	0.18	17.28
45	A	Residential 3-4 dwellings/acre	32	52	17.80	24.93	0.60	0.40	0.18	10.80
234	Low Loss Fraction (1-Y) =				0.604	0.446	F_m =			0.240

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line Randall Locust

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
1	A	School	32	52	0.40	0.55	0.60	0.40	0.18	0.24
72	A	Residential 3-4 dwellings/acre	32	52	28.49	39.88	0.60	0.40	0.18	17.28
45	A	Residential 3-4 dwellings/acre	32	52	17.80	24.93	0.60	0.40	0.18	10.80
75	A	Residential 3-4 dwellings/acre	32	52	29.67	41.55	0.60	0.40	0.18	18.00
44	A	Residential 3-4 dwellings/acre	32	52	17.41	24.37	0.60	0.40	0.18	10.56
237	Low Loss Fraction (1-Y) =				0.604	0.446	F_m =			0.240

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line Randall Palmetto

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25	Low Loss Fraction (1-Y) x Area 100	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
					5.88	7.32				
48	A	Apartments	32	52	37.04	39.82	0.20	0.40	0.18	3.84
20	A	Residential 3-4 dwellings/acre	32	52	7.91	11.08	0.60	0.40	0.18	4.80
46	A	Apartments	32	52	35.49	38.16	0.20	0.40	0.18	3.68
42	A	Residential 3-4 dwellings/acre	32	52	16.62	23.27	0.60	0.40	0.18	10.08
2	A	Public Park	32	52	0.32	0.76	0.85	0.40	0.18	0.68
2	A	Apartments	32	52	1.54	1.66	0.20	0.40	0.18	0.16
25	A	Public Park	32	52	4.02	9.54	0.85	0.40	0.18	8.50
42	A	Residential 3-4 dwellings/acre	32	52	16.62	23.27	0.60	0.40	0.18	10.08
227	Low Loss Fraction (1-Y) =				0.473	0.350	F_m =			0.184

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line SB Fwy and Alder

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25	Low Loss Fraction (1-Y) x Area 100	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
					5.88	7.32				
2	A	Commercial	32	52	1.73	1.80	0.10	0.40	0.18	0.08
78	A	Residential 3-4 dwellings/acre	32	52	30.86	43.21	0.60	0.40	0.18	18.72
2	A	Commercial	32	52	1.73	1.80	0.10	0.40	0.18	0.08
27	A	Residential 8-10 dwellings/acre	32	52	15.76	18.68	0.40	0.40	0.18	4.32
31	A	Residential 3-4 dwellings/acre	32	52	12.27	17.17	0.60	0.40	0.18	7.44
19	A	Apartments	32	52	14.66	15.76	0.20	0.40	0.18	1.52
29	A	Commercial	32	52	25.10	26.05	0.10	0.40	0.18	1.16
188	Low Loss Fraction (1-Y) =				0.457	0.338	F_m =			0.177

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line SB Fwy and Palmetto

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25	Low Loss Fraction (1-Y) x Area 100	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
					5.88	7.32				
80	A	Residential 3-4 dwellings/acre	32	52	31.65	44.32	0.60	0.40	0.18	19.20
40	A	Apartments	32	52	30.86	33.18	0.20	0.40	0.18	3.20
40	A	Residential 3-4 dwellings/acre	32	52	15.83	22.16	0.60	0.40	0.18	9.60
18	A	Apartments	32	52	13.50	14.52	0.20	0.40	0.18	1.40
38	A	Residential 3-4 dwellings/acre	32	52	15.04	21.05	0.60	0.40	0.18	9.12
25	A	Commercial	32	52	21.64	22.46	0.10	0.40	0.18	1.00
30	A	Apartments	32	52	23.15	24.89	0.20	0.40	0.18	2.40
271		Low Loss Fraction (1-Y) =			0.439	0.325		F_m =		0.170

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line SB Fwy and Tamarind

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25	Low Loss Fraction (1-Y) x Area 100	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
10	A	School	32	52	3.96	5.54	0.60	0.40	0.18	2.40
71	A	Residential 3-4 dwellings/acre	32	52	28.09	39.33	0.60	0.40	0.18	17.04
18	A	Apartments	32	52	13.89	14.93	0.20	0.40	0.18	1.44
59	A	Residential 3-4 dwellings/acre	32	52	23.34	32.68	0.60	0.40	0.18	14.16
16	A	Apartments	32	52	12.35	13.27	0.20	0.40	0.18	1.28
13	A	Commercial	32	52	11.25	11.68	0.10	0.40	0.18	0.52
187		Low Loss Fraction (1-Y) =			0.503	0.372		F_m =		0.197

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line SS2

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
10	A	Residential 2.5 acre lots	32	52	1.14	3.47	0.90	0.40	0.18	3.60
10	A	Residential 2.5 acre lots	32	52	1.14	3.47	0.90	0.40	0.18	3.60
17	A	Residential 2.5 acre lots	32	52	1.93	5.90	0.90	0.40	0.18	6.12
37	A	Commercial	32	52	32.03	33.24	0.10	0.40	0.18	1.48
45	A	Commercial	32	52	38.95	40.43	0.10	0.40	0.18	1.80
45	A	Commercial	32	52	38.95	40.43	0.10	0.40	0.18	1.80
164	Low Loss Fraction (1-Y) =				0.304	0.226	F_m =			0.112

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line SS2A

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
10	A	Commercial	32	52	8.66	8.98	0.10	0.40	0.18	0.40
10	A	Commercial	32	52	8.66	8.98	0.10	0.40	0.18	0.40
20	A	Commercial	32	52	17.31	17.97	0.10	0.40	0.18	0.80
20	A	Commercial	32	52	17.31	17.97	0.10	0.40	0.18	0.80
40	A	Commercial	32	52	34.62	35.94	0.10	0.40	0.18	1.60
96	A	Commercial	32	52	83.09	86.25	0.10	0.40	0.18	3.84
100	A	Commercial	32	52	86.55	89.84	0.10	0.40	0.18	4.00
96	A	Commercial	32	52	83.09	86.25	0.10	0.40	0.18	3.84
174	A	Commercial	32	52	150.60	156.32	0.10	0.40	0.18	6.96
566	Low Loss Fraction (1-Y) =				0.134	0.102	F_m =			0.040

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line SS2B

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
10	A	Commercial	32	52	8.66	8.98	0.10	0.40	0.18	0.40
10	A	Commercial	32	52	8.66	8.98	0.10	0.40	0.18	0.40
20	A	Commercial	32	52	17.31	17.97	0.10	0.40	0.18	0.80
40	A	Commercial	32	52	34.62	35.94	0.10	0.40	0.18	1.60
80	A	Commercial	32	52	69.24	71.87	0.10	0.40	0.18	3.20
80	A	Commercial	32	52	69.24	71.87	0.10	0.40	0.18	3.20
88	A	Commercial	32	52	76.17	79.06	0.10	0.40	0.18	3.52
154	A	Commercial	32	52	133.29	138.36	0.10	0.40	0.18	6.16
482	Low Loss Fraction (1-Y) =				0.134	0.102	F_m =			0.040

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line SS2C

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
10	A	Commercial	32	52	8.66	8.98	0.10	0.40	0.18	0.40
10	A	Commercial	32	52	8.66	8.98	0.10	0.40	0.18	0.40
20	A	Commercial	32	52	17.31	17.97	0.10	0.40	0.18	0.80
40	A	Commercial	32	52	34.62	35.94	0.10	0.40	0.18	1.60
80	A	Commercial	32	52	69.24	71.87	0.10	0.40	0.18	3.20
80	A	Commercial	32	52	69.24	71.87	0.10	0.40	0.18	3.20
83	A	Commercial	32	52	71.84	74.57	0.10	0.40	0.18	3.32
151	A	Commercial	32	52	130.70	135.66	0.10	0.40	0.18	6.04
474	Low Loss Fraction (1-Y) =				0.134	0.102	F_m =			0.040

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - Line SS2D

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
10	A	Residential 3-4 dwellings/acre	32	52	3.96	5.54	0.60	0.40	0.18	2.40
10	A	Residential 3-4 dwellings/acre	32	52	3.96	5.54	0.60	0.40	0.18	2.40
10	A	Residential 3-4 dwellings/acre	32	52	3.96	5.54	0.60	0.40	0.18	2.40
20	A	Commercial	32	52	17.31	17.97	0.10	0.40	0.18	0.80
20	A	Residential 3-4 dwellings/acre	32	52	7.91	11.08	0.60	0.40	0.18	4.80
20	A	Commercial	32	52	17.31	17.97	0.10	0.40	0.18	0.80
5	A	Residential 3-4 dwellings/acre	32	52	1.98	2.77	0.60	0.40	0.18	1.20
56	A	Commercial	32	52	48.47	50.31	0.10	0.40	0.18	2.24
151	Low Loss Fraction (1-Y) =				0.306	0.227	F_m =			0.113

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - West Fontana T1

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
7	A	Residential 10+ dwellings/acre	32	52	5.40	5.81	0.20	0.40	0.18	0.56
3	A	Residential 3-4 dwellings/acre	32	52	1.19	1.66	0.60	0.40	0.18	0.72
6	A	Residential 10+ dwellings/acre	32	52	4.63	4.98	0.20	0.40	0.18	0.48
3	A	Residential 3-4 dwellings/acre	32	52	1.27	1.77	0.60	0.40	0.18	0.77
6	A	Residential 10+ dwellings/acre	32	52	4.63	4.98	0.20	0.40	0.18	0.48
3	A	Residential 3-4 dwellings/acre	32	52	1.19	1.66	0.60	0.40	0.18	0.72
10	A	Residential 10+ dwellings/acre	32	52	7.72	8.30	0.20	0.40	0.18	0.80
10	A	Residential 3-4 dwellings/acre	32	52	3.96	5.54	0.60	0.40	0.18	2.40
10	A	Apartments	32	52	7.72	8.30	0.20	0.40	0.18	0.80
7	A	Residential 3-4 dwellings/acre	32	52	2.77	3.88	0.60	0.40	0.18	1.68
5	A	Residential 3-4 dwellings/acre	32	52	1.98	2.77	0.60	0.40	0.18	1.20
5	A	Residential 3-4 dwellings/acre	32	52	1.98	2.77	0.60	0.40	0.18	1.20
10	A	Residential 3-4 dwellings/acre	32	52	3.96	5.54	0.60	0.40	1.18	2.40
10	A	Residential 3-4 dwellings/acre	32	52	3.96	5.54	0.60	0.40	0.18	2.40
17	A	Residential 3-4 dwellings/acre	32	52	6.53	9.14	0.60	0.40	0.18	3.96
43	A	Residential 3-4 dwellings/acre	32	52	17.13	23.99	0.60	0.40	0.18	10.39
10	A	Commercial	32	52	8.66	8.98	0.10	0.40	0.18	0.40
30	A	Residential 3-4 dwellings/acre	32	52	11.87	16.62	0.60	0.40	0.18	7.20
20	A	Commercial	32	52	17.31	17.97	0.10	0.40	0.18	0.80
215	Low Loss Fraction (1-Y) =				0.471	0.348	F_m =			0.183

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - West Fontana T1A

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25 5.88	Low Loss Fraction (1-Y) x Area 100 7.32	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
5	A	Residential 3-4 dwellings/acre	32	52	1.98	2.77	0.60	0.40	0.18	1.20
5	A	Commercial	32	52	4.33	4.49	0.10	0.40	0.18	0.20
5	A	Residential 3-4 dwellings/acre	32	52	1.98	2.77	0.60	0.40	0.18	1.20
5	A	Commercial	32	52	4.33	4.49	0.10	0.40	0.18	0.20
9	A	Residential 3-4 dwellings/acre	32	52	3.56	4.99	0.60	0.40	0.18	2.16
9	A	Commercial	32	52	7.79	8.09	0.10	0.40	0.18	0.36
15	A	Commercial	32	52	12.98	13.48	0.10	0.40	0.18	0.60
53	Low Loss Fraction (1-Y) =				0.303	0.225	F_m =			0.112

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - West Fontana T2

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
1	A	Residential 3-4 dwellings/acre	32	52	0.40	0.55	0.60	0.40	0.18	0.24
9	A	Apartments	32	52	6.94	7.47	0.20	0.40	0.18	0.72
2	A	Apartments	32	52	1.54	1.66	0.20	0.40	0.18	0.16
4	A	Residential 3-4 dwellings/acre	32	52	1.58	2.22	0.60	0.40	0.18	0.96
1	A	Apartments	32	52	0.77	0.83	0.20	0.40	0.18	0.08
6	A	Residential 3-4 dwellings/acre	32	52	2.37	3.32	0.60	0.40	0.18	1.44
18	A	Residential 3-4 dwellings/acre	32	52	7.12	9.97	0.60	0.40	0.18	4.32
2	A	Residential 3-4 dwellings/acre	32	52	0.79	1.11	0.60	0.40	0.18	0.48
5	A	Apartments	32	52	3.47	3.73	0.20	0.40	0.18	0.36
10	A	Residential 3-4 dwellings/acre	32	52	3.96	5.54	0.60	0.40	0.18	2.40
7	A	Residential 3-4 dwellings/acre	32	52	2.85	3.99	0.60	0.40	0.18	1.73
10	A	Commercial	32	52	8.66	8.98	0.10	0.40	0.18	0.40
7	A	Residential 3-4 dwellings/acre	32	52	2.57	3.60	0.60	0.40	1.18	1.56
22	A	Commercial	32	52	19.04	19.77	0.10	0.40	0.18	0.88
10	A	School	32	52	3.96	5.54	0.60	0.40	0.18	2.40
8	A	Residential 3-4 dwellings/acre	32	52	3.17	4.43	0.60	0.40	0.18	1.92
19	A	Commercial	32	52	16.45	17.07	0.10	0.40	0.18	0.76
140			Low Loss Fraction (1-Y) =		0.389	0.288		F_m =		0.148

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - West Fontana T3

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
8	A	Apartments	32	52	5.79	6.22	0.20	0.40	0.18	0.60
8	A	Apartments	32	52	5.79	6.22	0.20	0.40	0.18	0.60
5	A	Commercial	32	52	4.33	4.49	0.10	0.40	0.18	0.20
15	A	Apartments	32	52	11.57	12.44	0.20	0.40	0.18	1.20
5	A	Commercial	32	52	4.33	4.49	0.10	0.40	0.18	0.20
29	A	Apartments	32	52	22.38	24.06	0.20	0.40	0.18	2.32
9	A	Residential 3-4 dwellings/acre	32	52	3.56	4.99	0.60	0.40	0.18	2.16
3	A	Residential 8-10 dwellings/acre	32	52	1.46	1.73	0.40	0.40	0.18	0.40
7	A	Apartments	32	52	5.40	5.81	0.20	0.40	0.18	0.56
10	A	School	32	52	3.76	5.26	0.60	0.40	0.18	2.28
59	A	Residential 3-4 dwellings/acre	32	52	23.34	32.68	0.60	0.40	0.18	14.16
32	A	Residential 3-4 dwellings/acre	32	52	12.66	17.73	0.60	0.40	0.18	7.68
47	A	Apartments	32	52	36.26	38.99	0.20	0.40	1.18	3.76
38	A	Commercial	32	52	32.89	34.14	0.10	0.40	0.18	1.52
8	A	Residential 2.5 acre lots	32	52	0.91	2.78	0.90	0.40	0.18	2.88
6	A	Commercial	32	52	5.19	5.39	0.10	0.40	0.18	0.24
287	Low Loss Fraction (1-Y) =				0.374	0.277	F_m =			0.142

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - West Fontana T3A

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25 5.88	Low Loss Fraction (1-Y) x Area 100 7.32	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
3	A	Commercial	32	52	2.60	2.70	0.10	0.40	0.18	0.12
2	A	Commercial	32	52	1.73	1.80	0.10	0.40	0.18	0.08
5	A	Commercial	32	52	4.33	4.49	0.10	0.40	0.18	0.20
10	A	Commercial	32	52	8.66	8.98	0.10	0.40	0.18	0.40
20	A	Commercial	32	52	17.31	17.97	0.10	0.40	0.18	0.80
5	A	Commercial	32	52	4.33	4.49	0.10	0.40	0.18	0.20
16	A	Commercial	32	52	13.85	14.37	0.10	0.40	0.18	0.64
61	Low Loss Fraction (1-Y) =				0.134	0.102	F_m =			0.040

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - West Fontana T3B

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
5	A	Commercial	32	52	4.33	4.49	0.10	0.40	0.18	0.20
5	A	Commercial	32	52	4.33	4.49	0.10	0.40	0.18	0.20
10	A	Commercial	32	52	8.66	8.98	0.10	0.40	0.18	0.40
20	A	Commercial	32	52	17.31	17.97	0.10	0.40	0.18	0.80
21	A	Commercial	32	52	18.18	18.87	0.10	0.40	0.18	0.84
61	Low Loss Fraction (1-Y) =				0.134	0.102	F_m =			0.040

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - West Fontana T4

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25	Low Loss Fraction (1-Y) x Area 100	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
					5.88	7.32				
8	A	Apartments	32	52	5.79	6.22	0.20	0.40	0.18	0.60
8	A	Apartments	32	52	5.79	6.22	0.20	0.40	0.18	0.60
5	A	Apartments	32	52	3.86	4.15	0.20	0.40	0.18	0.40
20	A	Apartments	32	52	15.43	16.59	0.20	0.40	0.18	1.60
40	A	Apartments	32	52	30.86	33.18	0.20	0.40	0.18	3.20
80	A	Apartments	32	52	61.73	66.36	0.20	0.40	0.18	6.40
51	A	Commercial	32	52	44.14	45.82	0.10	0.40	0.18	2.04
15	A	Commercial	32	52	12.98	13.48	0.10	0.40	0.18	0.60
226			Low Loss Fraction (1-Y) =		0.201	0.150			F_m =	0.068

FONTANA MASTER PLAN OF DRAINAGE

AOS 1

Unit Hydrograph Method Loss Rate Parameter Development - West Fontana T4A

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25	Low Loss Fraction (1-Y) x Area 100	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
5	A	Commercial	32	52	4.33	4.49	0.10	0.40	0.18	0.20
3	A	Commercial	32	52	2.16	2.25	0.10	0.40	0.18	0.10
8	A	Commercial	32	52	6.49	6.74	0.10	0.40	0.18	0.30
15	A	Commercial	32	52	12.98	13.48	0.10	0.40	0.18	0.60
21	A	Commercial	32	52	18.18	18.87	0.10	0.40	0.18	0.84
13	A	Commercial	32	52	11.25	11.68	0.10	0.40	0.18	0.52
64	Low Loss Fraction (1-Y) =				0.134	0.102	F_m =			0.040

FONTANA MASTER PLAN OF DRAINAGE

AOS 2

Unit Hydrograph Method Loss Rate Parameter Development - Line DZ10 - Poplar Ave

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
9	A	Commercial	32	52	7.36	7.64	0.10	0.40	0.18	0.34
9	A	Commercial	32	52	7.36	7.64	0.10	0.40	0.18	0.34
20	A	Commercial	32	52	17.31	17.97	0.10	0.40	0.18	0.80
33	A	Commercial	32	52	28.56	29.65	0.10	0.40	0.18	1.32
46	A	Commercial	32	52	39.82	41.33	0.10	0.40	0.18	1.84
63	A	Commercial	32	52	54.53	56.60	0.10	0.40	0.18	2.52
20	A	Residential 2 dwellings/acre	32	52	6.03	9.70	0.70	0.40	0.18	5.60
199	Low Loss Fraction (1-Y) =				0.191	0.143	F_m =			0.064

FONTANA MASTER PLAN OF DRAINAGE

AOS 2

Unit Hydrograph Method Loss Rate Parameter Development - Line DZ11 - Live Oak Ave

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
8	A	Commercial	32	52	6.49	6.74	0.10	0.40	0.18	0.30
8	A	Commercial	32	52	6.49	6.74	0.10	0.40	0.18	0.30
15	A	Commercial	32	52	12.98	13.48	0.10	0.40	0.18	0.60
30	A	Commercial	32	52	25.97	26.95	0.10	0.40	0.18	1.20
37	A	Commercial	32	52	32.03	33.24	0.10	0.40	0.18	1.48
16	A	Commercial	32	52	13.85	14.37	0.10	0.40	0.18	0.64
87	A	Commercial	32	52	75.30	78.16	0.10	0.40	0.18	3.48
200	Low Loss Fraction (1-Y) =				0.134	0.102	F_m =			0.040

FONTANA MASTER PLAN OF DRAINAGE

AOS 2

Unit Hydrograph Method Loss Rate Parameter Development - Line DZ12 - Redwood Ave

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25	Low Loss Fraction (1-Y) x Area 100	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
			II	III	5.88	7.32		II	III	
9	A	Commercial	32	52	7.79	8.09	0.10	0.40	0.18	0.36
6	A	Commercial	32	52	4.76	4.94	0.10	0.40	0.18	0.22
15	A	Commercial	32	52	12.55	13.03	0.10	0.40	0.18	0.58
29	A	Commercial	32	52	25.10	26.05	0.10	0.40	0.18	1.16
50	A	Commercial	32	52	43.28	44.92	0.10	0.40	0.18	2.00
80	A	Commercial	32	52	69.24	71.87	0.10	0.40	0.18	3.20
188	Low Loss Fraction (1-Y) =				0.134	0.102	F_m =			0.040

FONTANA MASTER PLAN OF DRAINAGE

AOS 2

Unit Hydrograph Method Loss Rate Parameter Development - Line DZ13 - Cherry Ave

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25	Low Loss Fraction (1-Y) x Area 100	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
					5.88	7.32				
7	A	Commercial	32	52	6.06	6.29	0.10	0.40	0.18	0.28
7	A	Commercial	32	52	6.06	6.29	0.10	0.40	0.18	0.28
14	A	Commercial	32	52	12.12	12.58	0.10	0.40	0.18	0.56
28	A	Commercial	32	52	24.24	25.16	0.10	0.40	0.18	1.12
52	A	Commercial	32	52	45.01	46.72	0.10	0.40	0.18	2.08
83	A	Commercial	32	52	71.84	74.57	0.10	0.40	0.18	3.32
191		Low Loss Fraction (1-Y) =			0.134	0.102		F_m =		0.040

FONTANA MASTER PLAN OF DRAINAGE

AOS 2

Unit Hydrograph Method Loss Rate Parameter Development - Line DZ14 - Almond Ave

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
10	A	Commercial	32	52	8.66	8.98	0.10	0.40	0.18	0.40
9	A	Commercial	32	52	7.79	8.09	0.10	0.40	0.18	0.36
9	A	Commercial	32	52	7.79	8.09	0.10	0.40	0.18	0.36
27	A	Commercial	32	52	23.37	24.26	0.10	0.40	0.18	1.08
53	A	Commercial	32	52	45.87	47.62	0.10	0.40	0.18	2.12
40	A	Commercial	32	52	34.62	35.94	0.10	0.40	0.18	1.60
43	A	School	32	52	17.01	23.82	0.60	0.40	0.18	10.32
191	Low Loss Fraction (1-Y) =				0.240	0.179	F_m =			0.085

FONTANA MASTER PLAN OF DRAINAGE

AOS 2

Unit Hydrograph Method Loss Rate Parameter Development - Line DZ15 - Banana Ave

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25	Low Loss Fraction (1-Y) x Area 100	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
					5.88	7.32				
10	A	Commercial	32	52	8.66	8.98	0.10	0.40	0.18	0.40
9	A	Commercial	32	52	7.79	8.09	0.10	0.40	0.18	0.36
9	A	Commercial	32	52	7.79	8.09	0.10	0.40	0.18	0.36
27	A	Commercial	32	52	23.37	24.26	0.10	0.40	0.18	1.08
51	A	Commercial	32	52	44.14	45.82	0.10	0.40	0.18	2.04
83	A	Commercial	32	52	71.84	74.57	0.10	0.40	0.18	3.32
189	Low Loss Fraction (1-Y) =				0.134	0.102	F_m =			0.040

FONTANA MASTER PLAN OF DRAINAGE

AOS 2

Unit Hydrograph Method Loss Rate Parameter Development - Line DZ16 - Calabash Ave

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
10	A	Commercial	32	52	8.66	8.98	0.10	0.40	0.18	0.40
9	A	Commercial	32	52	7.79	8.09	0.10	0.40	0.18	0.36
9	A	Commercial	32	52	7.79	8.09	0.10	0.40	0.18	0.36
27	A	Commercial	32	52	23.37	24.26	0.10	0.40	0.18	1.08
10	A	Residential 2 dwellings/acre	32	52	3.02	4.85	0.70	0.40	0.18	2.80
42	A	Commercial	32	52	36.35	37.73	0.10	0.40	0.18	1.68
83	A	Commercial	32	52	71.84	74.57	0.10	0.40	0.18	3.32
190	Low Loss Fraction (1-Y) =				0.164	0.123	F_m =			0.053

FONTANA MASTER PLAN OF DRAINAGE

AOS 2

Unit Hydrograph Method Loss Rate Parameter Development - Line DZ2A, DZ2, DZ1, SA - Sierra Ave

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
31	A	Public Park	32	52	4.98	11.83	0.85	0.40	0.18	10.54
21	A	School	32	52	8.31	11.63	0.60	0.40	0.18	5.04
5	A	Commercial	32	52	4.33	4.49	0.10	0.40	0.18	0.20
90	A	Commercial	32	52	77.90	80.86	0.10	0.40	0.18	3.60
35	A	Apartments	32	52	27.00	29.03	0.20	0.40	0.18	2.80
274	A	Commercial	32	52	237.16	246.16	0.10	0.40	0.18	10.96
196	A	Residential 3-4 dwellings/acre	32	52	77.55	108.57	0.60	0.40	0.18	47.04
652	Low Loss Fraction (1-Y) =				0.329	0.245	F_m =			0.123

FONTANA MASTER PLAN OF DRAINAGE

AOS 2

Unit Hydrograph Method Loss Rate Parameter Development - Line DZ4 - South Juniper Ave

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
10	A	Apartments	32	52	7.72	8.30	0.20	0.40	0.18	0.80
3	A	Commercial	32	52	2.60	2.70	0.10	0.40	0.18	0.12
2	A	Residential 5-7 dwellings/acre	32	52	0.98	1.25	0.50	0.40	0.18	0.40
5	A	Apartments	32	52	3.86	4.15	0.20	0.40	0.18	0.40
10	A	Apartments	32	52	7.72	8.30	0.20	0.40	0.18	0.80
10	A	Commercial	32	52	8.66	8.98	0.10	0.40	0.18	0.40
10	A	Apartments	32	52	7.72	8.30	0.20	0.40	0.18	0.80
10	A	Commercial	32	52	8.66	8.98	0.10	0.40	0.18	0.40
6	A	Apartments	32	52	4.63	4.98	0.20	0.40	0.18	0.48
10	A	Commercial	32	52	8.66	8.98	0.10	0.40	0.18	0.40
76			Low Loss Fraction (1-Y) =		0.195	0.146		F_m =		0.066

FONTANA MASTER PLAN OF DRAINAGE

AOS 2

Unit Hydrograph Method Loss Rate Parameter Development - Line SS5A - Pacific Railroad and San Sevaine Channel

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
5	A	Commercial	32	52	4.33	4.49	0.10	0.40	0.18	0.20
5	A	Commercial	32	52	4.33	4.49	0.10	0.40	0.18	0.20
11	A	Commercial	32	52	9.52	9.88	0.10	0.40	0.18	0.44
21	A	Commercial	32	52	18.18	18.87	0.10	0.40	0.18	0.84
10	A	Commercial	32	52	8.66	8.98	0.10	0.40	0.18	0.40
7	A	Residential 5-7 dwellings/acre	32	52	3.43	4.36	0.50	0.40	0.18	1.40
8	A	Residential 5-7 dwellings/acre	32	52	3.92	4.98	0.50	0.40	0.18	1.60
23	A	Residential 5-7 dwellings/acre	32	52	11.26	14.33	0.50	0.40	0.18	4.60
6	A	Residential 5-7 dwellings/acre	32	52	2.94	3.74	0.50	0.40	0.18	1.20
12	A	Residential 5-7 dwellings/acre	32	52	5.88	7.47	0.50	0.40	0.18	2.40
5	A	Commercial	32	52	4.33	4.49	0.10	0.40	0.18	0.20
5	A	Commercial	32	52	4.33	4.49	0.10	0.40	0.18	0.20
10	A	Commercial	32	52	8.66	8.98	0.10	0.40	0.18	0.40
10	A	Commercial	32	52	8.66	8.98	0.10	0.40	0.18	0.40
4	A	Commercial	32	52	3.46	3.59	0.10	0.40	0.18	0.16
5	A	Commercial	32	52	4.33	4.49	0.10	0.40	0.18	0.20
10	A	Commercial	32	52	8.66	8.98	0.10	0.40	0.18	0.40
5	A	Commercial	32	52	4.33	4.49	0.10	0.40	0.18	0.20
5	A	Commercial	32	52	4.33	4.49	0.10	0.40	0.18	0.20
167	Low Loss Fraction (1-Y) =				0.261	0.194	F_m =			0.094

FONTANA MASTER PLAN OF DRAINAGE

AOS 2

Unit Hydrograph Method Loss Rate Parameter Development - Line DZ6 - Cypress Ave

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25	Low Loss Fraction (1-Y) x Area 100	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
			II	**III**	**5.88**	**7.32**				
10	A	Commercial	32	52	8.66	8.98	0.10	0.40	0.18	0.40
10	A	Commercial	32	52	8.66	8.98	0.10	0.40	0.18	0.40
20	A	Commercial	32	52	17.31	17.97	0.10	0.40	0.18	0.80
14	A	Residential 5-7 dwellings/acre	32	52	6.85	8.72	0.50	0.40	0.18	2.80
20	A	Commercial	32	52	17.31	17.97	0.10	0.40	0.18	0.80
45	A	Residential 5-7 dwellings/acre	32	52	22.03	28.03	0.50	0.40	0.18	9.00
119	Low Loss Fraction (1-Y) =				0.321	0.238	F_m =			0.119

FONTANA MASTER PLAN OF DRAINAGE

AOS 2

Unit Hydrograph Method Loss Rate Parameter Development - Line DZ7 - Oleander

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
31	A	Residential 5-7 dwellings/acre	32	52	15.18	19.31	0.50	0.40	0.18	6.20
51	A	Commercial	32	52	44.14	45.82	0.10	0.40	0.18	2.04
25	A	Residential 5-7 dwellings/acre	32	52	12.24	15.57	0.50	0.40	0.18	5.00
21	A	School	32	52	8.31	11.63	0.60	0.40	0.18	5.04
10	A	Commercial	32	52	8.66	8.98	0.10	0.40	0.18	0.40
10	A	Commercial	32	52	8.66	8.98	0.10	0.40	0.18	0.40
20	A	Commercial	32	52	17.31	17.97	0.10	0.40	0.18	0.80
16	A	Commercial	32	52	13.85	14.37	0.10	0.40	0.18	0.64
19	A	Residential 5-7 dwellings/acre	32	52	9.30	11.83	0.50	0.40	0.18	3.80
2	A	Residential 5-7 dwellings/acre	32	52	0.98	1.25	0.50	0.40	0.18	0.40
81	A	Commercial	32	52	70.11	72.77	0.10	0.40	0.18	3.24
286		Low Loss Fraction (1-Y) =			0.270	0.201			F_m =	0.098

FONTANA MASTER PLAN OF DRAINAGE

AOS 2

Unit Hydrograph Method Loss Rate Parameter Development - Line DZ8 D/S - Citrus Ave

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
23	A	Residential 5-7 dwellings/acre	32	52	11.26	14.33	0.50	0.40	0.18	4.60
30	A	School	32	52	11.87	16.62	0.60	0.40	0.18	7.20
98	A	Commercial	32	52	84.82	88.04	0.10	0.40	0.18	3.92
151	Low Loss Fraction (1-Y) =				0.285	0.212	F_m =			0.104

FONTANA MASTER PLAN OF DRAINAGE

AOS 2

Unit Hydrograph Method Loss Rate Parameter Development - Line DZ8 U/S - Citrus Ave

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
10	A	Commercial	32	52	8.66	8.98	0.10	0.40	0.18	0.40
10	A	Commercial	32	52	8.66	8.98	0.10	0.40	0.18	0.40
20	A	Commercial	32	52	17.31	17.97	0.10	0.40	0.18	0.80
23	A	Commercial	32	52	19.91	20.66	0.10	0.40	0.18	0.92
16	A	School	32	52	6.33	8.86	0.60	0.40	0.18	3.84
79	Low Loss Fraction (1-Y) =				0.230	0.171	F_m =			0.081

FONTANA MASTER PLAN OF DRAINAGE

AOS 2

Unit Hydrograph Method Loss Rate Parameter Development - Line DZ9 D/S - Catawea Ave

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
18	A	Residential 2 dwellings/acre	32	52	5.43	8.73	0.70	0.40	0.18	5.04
29	A	Commercial	32	52	25.10	26.05	0.10	0.40	0.18	1.16
85	A	Commercial	32	52	73.57	76.36	0.10	0.40	0.18	3.40
132	Low Loss Fraction (1-Y) =				0.211	0.158	F_m =			0.073

FONTANA MASTER PLAN OF DRAINAGE

AOS 2

Unit Hydrograph Method Loss Rate Parameter Development - Line DZ9 U/S - Catawea Ave

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
9	A	Commercial	32	52	7.79	8.09	0.10	0.40	0.18	0.36
9	A	Commercial	32	52	7.79	8.09	0.10	0.40	0.18	0.36
20	A	Commercial	32	52	17.31	17.97	0.10	0.40	0.18	0.80
13	A	Residential 2 dwellings/acre	32	52	3.92	6.31	0.70	0.40	0.18	3.64
20	A	Commercial	32	52	17.31	17.97	0.10	0.40	0.18	0.80
71	Low Loss Fraction (1-Y) =				0.238	0.177	F_m =			0.084

FONTANA MASTER PLAN OF DRAINAGE

AOS 2

Unit Hydrograph Method Loss Rate Parameter Development - Line FGCS - Business Dr

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25	Low Loss Fraction (1-Y) x Area 100	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
			II	III	5.88	7.32		II	III	
117	A	Commercial	32	52	101.27	105.11	0.10	0.40	0.18	4.68
117				Low Loss Fraction (1-Y) =	0.134	0.102			F_m =	0.040

FONTANA MASTER PLAN OF DRAINAGE

AOS 2

Unit Hydrograph Method Loss Rate Parameter Development - Line FGCS - Commerce Way

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
102	A	Commercial	32	52	88.29	91.64	0.10	0.40	0.18	4.08
17	A	Open Brush, Fair	46	66	2.36	8.03	1.00	0.40	0.18	6.80
119				Low Loss Fraction (1-Y) =	0.238	0.162			F_m =	0.091

FONTANA MASTER PLAN OF DRAINAGE

AOS 2

Unit Hydrograph Method Loss Rate Parameter Development - Line FGCS - Mulberry Avenue

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25	Low Loss Fraction (1-Y) x Area 100	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
					5.88	7.32				
28.0	A	Commercial	32	52	24.24	25.16	0.10	0.40	0.18	1.12
28.0	A	Commercial	32	52	24.24	25.16	0.10	0.40	0.18	1.12
49.0	A	Commercial	32	52	42.41	44.02	0.10	0.40	0.18	1.96
105.0	Low Loss Fraction (1-Y) =				0.134	0.102	F_m =			0.040

FONTANA MASTER PLAN OF DRAINAGE

AOS 2

Unit Hydrograph Method Loss Rate Parameter Development - Line FGCS - Slover Ave

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
70	A	Commercial	32	52	60.59	62.89	0.10	0.40	0.18	2.80
13	A	Open Brush, Fair	46	66	1.81	6.14	1.00	0.40	0.18	5.20
83				Low Loss Fraction (1-Y) =	0.248	0.168			F_m =	0.096

FONTANA MASTER PLAN OF DRAINAGE

AOS 2

Unit Hydrograph Method Loss Rate Parameter Development - Line JH - Jurupa Hills East

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
13	A	Residential 5-7 dwellings/acre	32	52	6.37	8.10	0.50	0.40	0.18	2.60
2	A	Open Brush, Fair	46	66	0.28	0.94	1.00	0.40	0.18	0.80
9	A	Commercial	32	52	7.79	8.09	0.10	0.40	0.18	0.36
21	A	Residential 5-7 dwellings/acre	32	52	10.28	13.08	0.50	0.40	0.18	4.20
8	A	Open Brush, Fair	46	66	1.11	3.78	1.00	0.40	0.18	3.20
49	D	Open Brush, Fair	83	96	33.17	45.65	1.00	0.20	0.07	9.80
14	D	Public Park	75	91	8.45	12.20	0.85	0.20	0.07	2.38
116	Low Loss Fraction (1-Y) =				0.419	0.208	F_m =			0.201

FONTANA MASTER PLAN OF DRAINAGE

AOS 2

Unit Hydrograph Method Loss Rate Parameter Development - Line JH - Jurupa Hills Northwest

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
30	A	Residential 5-7 dwellings/acre	32	52	14.69	18.69	0.50	0.40	0.18	6.00
28	A	Residential 5-7 dwellings/acre	32	52	13.71	17.44	0.50	0.40	0.18	5.60
13	A	Commercial	32	52	11.25	11.68	0.10	0.40	0.18	0.52
9	A	Open Brush, Fair	46	66	1.25	4.25	1.00	0.40	0.18	3.60
13	A	Public Park	32	52	2.09	4.96	0.85	0.40	0.18	4.42
4	A	Public Park	32	52	0.64	1.53	0.85	0.40	0.18	1.36
12	A	Public Park	32	52	1.93	4.58	0.85	0.40	0.18	4.08
6	A	Commercial	32	52	5.19	5.39	0.10	0.40	0.18	0.24
142	A	Residential 5-7 dwellings/acre	32	52	69.53	88.44	0.50	0.40	0.18	28.40
10	A	School	32	52	3.96	5.54	0.60	0.40	0.18	2.40
10	A	Public Park	32	52	1.61	3.82	0.85	0.40	0.18	3.40
89	A	Residential 5-7 dwellings/acre	32	52	43.58	55.43	0.50	0.40	0.18	17.80
11	A	School	32	52	4.35	6.09	0.60	0.40	0.18	2.64
22	D	Open Brush, Fair	83	96	14.89	20.49	1.00	0.20	0.07	4.40
6	A	Open Brush, Fair	46	66	0.83	2.83	1.00	0.40	0.18	2.40
77	D	Open Brush, Fair	83	96	52.12	71.73	1.00	0.20	0.07	15.40
482	Low Loss Fraction (1-Y) =				0.499	0.330	F_m =			0.213

FONTANA MASTER PLAN OF DRAINAGE

AOS 2

Unit Hydrograph Method Loss Rate Parameter Development - Line JH - Jurupa Hills Southwest

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
14	A	Open Brush, Fair	46	66	1.95	6.61	1.00	0.40	0.18	5.60
77	D	Open Brush, Fair	83	96	52.12	71.73	1.00	0.20	0.07	15.40
21	A	Open Brush, Fair	46	66	2.92	9.92	1.00	0.40	0.18	8.40
9	B	Open Brush, Fair	66	84	3.60	6.67	1.00	0.30	0.12	2.70
49	D	Open Brush, Fair	83	96	33.17	45.65	1.00	0.20	0.07	9.80
9	A	Open Brush, Fair	46	66	1.25	4.25	1.00	0.40	0.18	3.60
4	D	Open Brush, Fair	83	96	2.71	3.73	1.00	0.20	0.07	0.80
15	A	Residential 5-7 dwellings/acre	32	52	7.34	9.34	0.50	0.40	0.18	3.00
6	A	Commercial	32	52	5.19	5.39	0.10	0.40	0.18	0.24
32	A	Residential 5-7 dwellings/acre	32	52	15.67	19.93	0.50	0.40	0.18	6.40
2	D	Residential 5-7 dwellings/acre	75	91	1.50	1.82	0.50	0.20	0.07	0.20
238		Low Loss Fraction (1-Y) =			0.465	0.223		F_m =		0.236

FONTANA MASTER PLAN OF DRAINAGE

AOS 2

Unit Hydrograph Method Loss Rate Parameter Development - Line JSPH - Beech Ave

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25	Low Loss Fraction (1-Y) x Area 100	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
					5.88	7.32				
8	A	Commercial	32	52	6.92	7.19	0.10	0.40	0.18	0.32
8	A	Commercial	32	52	6.92	7.19	0.10	0.40	0.18	0.32
17	A	Commercial	32	52	14.71	15.27	0.10	0.40	0.18	0.68
81	A	Commercial	32	52	70.11	72.77	0.10	0.40	0.18	3.24
85	A	Commercial	32	52	73.57	76.36	0.10	0.40	0.18	3.40
199	Low Loss Fraction (1-Y) =				0.134	0.102	F_m =			0.040

FONTANA MASTER PLAN OF DRAINAGE

AOS 2

Unit Hydrograph Method Loss Rate Parameter Development - Line JSPH - Elm Ave

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
7	A	Commercial	32	52	6.06	6.29	0.10	0.40	0.18	0.28
7	A	Commercial	32	52	6.06	6.29	0.10	0.40	0.18	0.28
20	A	Commercial	32	52	17.31	17.97	0.10	0.40	0.18	0.80
80	A	Commercial	32	52	69.24	71.87	0.10	0.40	0.18	3.20
84	A	Commercial	32	52	72.71	75.47	0.10	0.40	0.18	3.36
198	Low Loss Fraction (1-Y) =				0.134	0.102	F_m =			0.040

FONTANA MASTER PLAN OF DRAINAGE

AOS 2

Unit Hydrograph Method Loss Rate Parameter Development - Line JSPH - Hemlock Ave

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
7	A	Commercial	32	52	6.06	6.29	0.10	0.40	0.18	0.28
8	A	Commercial	32	52	6.92	7.19	0.10	0.40	0.18	0.32
17	A	Commercial	32	52	14.71	15.27	0.10	0.40	0.18	0.68
82	A	Commercial	32	52	70.97	73.67	0.10	0.40	0.18	3.28
85	A	Commercial	32	52	73.57	76.36	0.10	0.40	0.18	3.40
199	Low Loss Fraction (1-Y) =				0.134	0.102	F_m =			0.040

FONTANA MASTER PLAN OF DRAINAGE

AOS 2

Unit Hydrograph Method Loss Rate Parameter Development - Line P1, P2, & P3 - Sierra Ave

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25	Low Loss Fraction (1-Y) x Area 100	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
			II	III	5.88	7.32		II	III	
62	A	Residential 5-7 dwellings/acre	32	52	30.36	38.62	0.50	0.40	0.18	12.40
36	A	Commercial	32	52	31.16	32.34	0.10	0.40	0.18	1.44
2	D	Commercial	75	91	1.84	1.91	0.10	0.20	0.07	0.04
5	A	Residential 2 dwellings/acre	32	52	1.51	2.43	0.70	0.40	0.18	1.40
117	D	Residential 2 dwellings/acre	75	91	77.97	103.92	0.70	0.20	0.07	16.38
2	A	Public Park	32	52	0.32	0.76	0.85	0.40	0.18	0.68
53	A	Residential 5-7 dwellings/acre	32	52	25.95	33.01	0.50	0.40	0.18	10.60
56	D	Residential 5-7 dwellings/acre	75	91	42.01	51.01	0.50	0.20	0.07	5.60
10	A	Public Park	32	52	1.61	3.82	0.85	0.40	0.18	3.40
87	D	Public Park	75	91	52.52	75.80	0.85	0.20	0.07	14.79
430			Low Loss Fraction (1-Y) =		0.383	0.201		F_m =		0.155

FONTANA MASTER PLAN OF DRAINAGE

AOS 2

Unit Hydrograph Method Loss Rate Parameter Development - Line P4

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
28	A	Residential 5-7 dwellings/acre	32	52	13.71	17.44	0.50	0.40	0.18	5.60
17	A	Residential 2.5 acre lots	32	52	1.93	5.90	0.90	0.40	0.18	6.12
44	A	Residential 5-7 dwellings/acre	32	52	21.54	27.40	0.50	0.40	0.18	8.80
9	A	Public Park	32	52	1.45	3.44	0.85	0.40	0.18	3.06
153	D	Public Park	75	91	92.36	133.31	0.85	0.20	0.07	26.01
32	D	Open Brush, Fair	83	96	21.66	29.81	1.00	0.20	0.07	6.40
8	D	Residential 2 dwellings/acre	75	91	5.33	7.11	0.70	0.20	0.07	1.12
291	Low Loss Fraction (1-Y) =				0.457	0.229	F_m =			0.196

FONTANA MASTER PLAN OF DRAINAGE

AOS 2

Unit Hydrograph Method Loss Rate Parameter Development - Line SR - Southridge 1

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25 5.88	Low Loss Fraction (1-Y) x Area 100 7.32	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
59	A	Residential 5-7 dwellings/acre	32	52	28.89	36.75	0.50	0.40	0.18	11.80
21	A	Residential 2.5 acre lots	32	52	2.39	7.29	0.90	0.40	0.18	7.56
23	A	School	32	52	9.10	12.74	0.60	0.40	0.18	5.52
1	A	Public Park	32	52	0.16	0.38	0.85	0.40	0.18	0.34
50	A	Commercial	32	52	43.28	44.92	0.10	0.40	0.18	2.00
38	A	Residential 5-7 dwellings/acre	32	52	18.61	23.67	0.50	0.40	0.18	7.60
50	A	Open Brush, Fair	46	66	6.95	23.62	1.00	0.40	0.18	20.00
43	D	Open Brush, Fair	83	96	29.11	40.06	1.00	0.20	0.07	8.60
12	A	School	32	52	4.75	6.65	0.60	0.40	0.18	2.88
19	A	Commercial	32	52	16.45	17.07	0.10	0.40	0.18	0.76
1	D	Commercial	75	91	0.92	0.96	0.10	0.20	0.07	0.02
2	A	Residential 5-7 dwellings/acre	32	52	0.98	1.25	0.50	0.40	0.18	0.40
2	D	Residential 5-7 dwellings/acre	75	91	1.50	1.82	0.50	0.20	0.07	0.20
20	A	School	32	52	7.91	11.08	0.60	0.40	0.18	4.80
43	A	School	32	52	17.01	23.82	0.60	0.40	0.18	10.32
384			Low Loss Fraction (1-Y) =		0.510	0.344	F_m =			0.216

FONTANA MASTER PLAN OF DRAINAGE

AOS 2

Unit Hydrograph Method Loss Rate Parameter Development - Line SR - Southridge 2

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
132	A	Residential 5-7 dwellings/acre	32	52	64.63	82.21	0.50	0.40	0.18	26.40
4	A	Commercial	32	52	3.46	3.59	0.10	0.40	0.18	0.16
6	A	School	32	52	2.37	3.32	0.60	0.40	0.18	1.44
10	A	Public Park	32	52	1.61	3.82	0.85	0.40	0.18	3.40
14	A	Commercial	32	52	12.12	12.58	0.10	0.40	0.18	0.56
31	A	Residential 5-7 dwellings/acre	32	52	15.18	19.31	0.50	0.40	0.18	6.20
4	A	Open Brush, Fair	46	66	0.56	1.89	1.00	0.40	0.18	1.60
201	Low Loss Fraction (1-Y) =				0.503	0.370	F_m =			0.198

FONTANA MASTER PLAN OF DRAINAGE

AOS 2

Unit Hydrograph Method Loss Rate Parameter Development - Line SR - Southridge 3

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25 5.88	Low Loss Fraction (1-Y) x Area 100 7.32	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
40	A	Open Brush, Fair	46	66	5.56	18.89	1.00	0.40	0.18	16.00
208	D	Open Brush, Fair	83	96	140.79	193.76	1.00	0.20	0.07	41.60
38	C	Open Brush, Fair	77	92	21.81	33.19	1.00	0.25	0.10	9.50
3	A	Open Brush, Fair	46	66	0.42	1.42	1.00	0.40	0.18	1.20
119	D	Open Brush, Fair	83	96	80.55	110.85	1.00	0.20	0.07	23.80
8	C	Open Brush, Fair	77	92	4.59	6.99	1.00	0.25	0.10	2.00
10	A	Open Brush, Fair	46	66	1.39	4.72	1.00	0.40	0.18	4.00
216	A	Residential 5-7 dwellings/acre	32	52	105.76	134.53	0.50	0.40	0.18	43.20
19	D	Residential 5-7 dwellings/acre	75	91	14.25	17.31	0.50	0.20	0.07	1.90
3	C	Residential 5-7 dwellings/acre	69	86	2.11	2.62	0.50	0.25	0.10	0.38
4	A	Public Park	32	52	0.64	1.53	0.85	0.40	0.18	1.36
6	A	School	32	52	2.37	3.32	0.60	0.40	0.18	1.44
8	A	School	32	52	3.17	4.43	0.60	0.40	0.18	1.92
6	A	School	32	52	2.37	3.32	0.60	0.40	0.18	1.44
26	A	Public Park	32	52	4.18	9.92	0.85	0.40	0.18	8.84
2	D	Public Park	75	91	1.21	1.74	0.85	0.20	0.07	0.34
716			Low Loss Fraction (1-Y) =		0.454	0.234		F_m =		0.222

FONTANA MASTER PLAN OF DRAINAGE

AOS 2

Unit Hydrograph Method Loss Rate Parameter Development - Line SR - Southridge 4

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25 5.88	Low Loss Fraction (1-Y) x Area 100 7.32	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
237	A	Residential 5-7 dwellings/acre	32	52	116.04	147.61	0.50	0.40	0.18	47.40
11	A	Commercial	32	52	9.52	9.88	0.10	0.40	0.18	0.44
5	A	Public Park	32	52	0.80	1.91	0.85	0.40	0.18	1.70
3	A	School	32	52	1.19	1.66	0.60	0.40	0.18	0.72
1	A	Open Brush, Fair	46	66	0.14	0.47	1.00	0.40	0.18	0.40
257	Low Loss Fraction (1-Y) =				0.503	0.371	F_m =			0.197

FONTANA MASTER PLAN OF DRAINAGE

AOS 2

Unit Hydrograph Method Loss Rate Parameter Development - Line SS10 - West Marlay Ave to San Sevaine Channel

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
8	A	Commercial	32	52	6.49	6.74	0.10	0.40	0.18	0.30
7	A	Commercial	32	52	6.06	6.29	0.10	0.40	0.18	0.28
6	A	Commercial	32	52	5.19	5.39	0.10	0.40	0.18	0.24
20	A	Commercial	32	52	17.31	17.97	0.10	0.40	0.18	0.80
41	A	Commercial	32	52	35.49	36.83	0.10	0.40	0.18	1.64
12	A	Residential 2.5 acre lots	32	52	1.36	4.17	0.90	0.40	0.18	4.32
70	A	Commercial	32	52	60.59	62.89	0.10	0.40	0.18	2.80
164	Low Loss Fraction (1-Y) =				0.190	0.142	F_m =			0.063

FONTANA MASTER PLAN OF DRAINAGE

AOS 2

Unit Hydrograph Method Loss Rate Parameter Development - Line SS11 D/S - Riverside Road to San Sevaine Channel

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25	Low Loss Fraction (1-Y) x Area 100	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
					5.88	7.32				
41	A	Commercial	32	52	35.49	36.83	0.10	0.40	0.18	1.64
4	A	Residential 2.5 acre lots	32	52	0.45	1.39	0.90	0.40	0.18	1.44
78	A	Commercial	32	52	67.51	70.08	0.10	0.40	0.18	3.12
123	Low Loss Fraction (1-Y) =				0.159	0.120	F_m =			0.050

FONTANA MASTER PLAN OF DRAINAGE

AOS 2

Unit Hydrograph Method Loss Rate Parameter Development - Line SS11 U/S - Riverside Road to San Sevaine Channel

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
8	A	Commercial	32	52	6.49	6.74	0.10	0.40	0.18	0.30
7	A	Commercial	32	52	6.06	6.29	0.10	0.40	0.18	0.28
6	A	Commercial	32	52	5.19	5.39	0.10	0.40	0.18	0.24
20	A	Commercial	32	52	17.31	17.97	0.10	0.40	0.18	0.80
41	Low Loss Fraction (1-Y) =				0.134	0.102	F_m =			0.040

FONTANA MASTER PLAN OF DRAINAGE

AOS 2

Unit Hydrograph Method Loss Rate Parameter Development - Line SS5A - Pacific Railroad and San Sevaine Channel

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
6	A	Commercial	32	52	5.19	5.39	0.10	0.40	0.18	0.24
6	A	Residential 2.5 acre lots	32	52	0.68	2.08	0.90	0.40	0.18	2.16
12	A	Commercial	32	52	10.39	10.78	0.10	0.40	0.18	0.48
13	A	Commercial	32	52	11.25	11.68	0.10	0.40	0.18	0.52
13	A	Commercial	32	52	11.25	11.68	0.10	0.40	0.18	0.52
50	Low Loss Fraction (1-Y) =				0.225	0.168	F_m =			0.078

FONTANA MASTER PLAN OF DRAINAGE

AOS 2

Unit Hydrograph Method Loss Rate Parameter Development -Line SS5B - Slover Ave and San Sevaine Channel

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
10	A	Residential 2.5 acre lots	32	52	1.14	3.47	0.90	0.40	0.18	3.60
1	A	Commercial	32	52	0.87	0.90	0.10	0.40	0.18	0.04
11	A	Commercial	32	52	9.52	9.88	0.10	0.40	0.18	0.44
12	A	Commercial	32	52	10.39	10.78	0.10	0.40	0.18	0.48
13	A	Commercial	32	52	11.25	11.68	0.10	0.40	0.18	0.52
47	Low Loss Fraction (1-Y) =				0.294	0.219	F_m =			0.108

FONTANA MASTER PLAN OF DRAINAGE

AOS 2

Unit Hydrograph Method Loss Rate Parameter Development - Line SS6 - Santa Ana Ave and San Sevaine Channel

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
2	A	Residential 2.5 acre lots	32	52	0.23	0.69	0.90	0.40	0.18	0.72
5	A	Commercial	32	52	4.33	4.49	0.10	0.40	0.18	0.20
7	A	Commercial	32	52	6.06	6.29	0.10	0.40	0.18	0.28
1	A	Residential 2.5 acre lots	32	52	0.11	0.35	0.90	0.40	0.18	0.36
4	A	Commercial	32	52	3.46	3.59	0.10	0.40	0.18	0.16
18	A	Commercial	32	52	15.58	16.17	0.10	0.40	0.18	0.72
1	A	Residential 2.5 acre lots	32	52	0.11	0.35	0.90	0.40	0.18	0.36
37	A	Commercial	32	52	32.03	33.24	0.10	0.40	0.18	1.48
2	A	Residential 2.5 acre lots	32	52	0.23	0.69	0.90	0.40	0.18	0.72
2	A	Residential 2.5 acre lots	32	52	0.23	0.69	0.90	0.40	0.18	0.72
38	A	Commercial	32	52	32.89	34.14	0.10	0.40	0.18	1.52
38	A	Commercial	32	52	32.89	34.14	0.10	0.40	0.18	1.52
5	A	Residential 2.5 acre lots	32	52	0.57	1.74	0.90	0.40	0.18	1.80
160	Low Loss Fraction (1-Y) =				0.196	0.146	F_m =			0.066

FONTANA MASTER PLAN OF DRAINAGE

AOS 2

Unit Hydrograph Method Loss Rate Parameter Development - Line SS7 - Jurupa Ave and San Sevaine Channel

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
194	A	Commercial	32	52	167.92	174.29	0.10	0.40	0.18	7.76
26	A	Commercial	32	52	22.50	23.36	0.10	0.40	0.18	1.04
220	Low Loss Fraction (1-Y) =				0.134	0.102	F_m =			0.040

FONTANA MASTER PLAN OF DRAINAGE

AOS 2

Unit Hydrograph Method Loss Rate Parameter Development - Line SS8 D/S - East Marlay Ave to San Sevaine Channel

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
2	A	Residential 2.5 acre lots	32	52	0.23	0.69	0.90	0.40	0.18	0.72
20	A	Commercial	32	52	17.31	17.97	0.10	0.40	0.18	0.80
13	A	Residential 2.5 acre lots	32	52	1.48	4.51	0.90	0.40	0.18	4.68
62	A	Commercial	32	52	53.23	55.25	0.10	0.40	0.18	2.46
97			Low Loss Fraction (1-Y) =		0.251	0.187		F_m =		0.090

FONTANA MASTER PLAN OF DRAINAGE

AOS 2

Unit Hydrograph Method Loss Rate Parameter Development - Line SS8 U/S - East Marlay Ave to San Sevaine Channel

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
5	A	Commercial	32	52	4.33	4.49	0.10	0.40	0.18	0.20
5	A	Commercial	32	52	4.33	4.49	0.10	0.40	0.18	0.20
4	A	Commercial	32	52	3.03	3.14	0.10	0.40	0.18	0.14
1	A	Residential 2.5 acre lots	32	52	0.11	0.35	0.90	0.40	0.18	0.36
13	A	Commercial	32	52	10.82	11.23	0.10	0.40	0.18	0.50
2	A	Residential 2.5 acre lots	32	52	0.23	0.69	0.90	0.40	0.18	0.72
26	A	Commercial	32	52	22.50	23.36	0.10	0.40	0.18	1.04
55	Low Loss Fraction (1-Y) =				0.175	0.132	F_m =			0.057

FONTANA MASTER PLAN OF DRAINAGE

AOS 2

Unit Hydrograph Method Loss Rate Parameter Development - Line SS9 - West Marlay Ave to San Sevaine Channel

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25	Low Loss Fraction (1-Y) x Area 100	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
					5.88	7.32				
121	A	Commercial	32	52	104.73	108.71	0.10	0.40	0.18	4.84
34	C	Commercial	69	86	30.88	32.25	0.10	0.25	0.10	0.85
6	A	Open Brush, Fair	46	66	0.83	2.83	1.00	0.40	0.18	2.40
161	Low Loss Fraction (1-Y) =				0.153	0.107	F_m =			0.050

FONTANA MASTER PLAN OF DRAINAGE

AOS 3

Unit Hydrograph Method Loss Rate Parameter Development - Line 604.1

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
3	A	Residential 2 dwellings/acre	32	52	0.76	1.21	0.70	0.40	0.18	0.70
49	A	Commercial	32	52	42.60	44.22	0.10	0.40	0.18	1.97
47	A	Open Brush, Fair	46	66	6.58	22.38	1.00	0.40	0.18	18.95
11	A	Residential 2.5 acre lots	32	52	1.23	3.75	0.90	0.40	0.18	3.89
1	D	Residential 2 dwellings/acre	75	91	0.50	0.67	0.70	0.20	0.07	0.11
1	D	Commercial	75	91	1.14	1.19	0.10	0.20	0.07	0.02
39	D	Open Brush, Fair	83	96	26.64	36.66	1.00	0.20	0.07	7.87
151			Low Loss Fraction (1-Y) =		0.475	0.272		F_m =		0.222

FONTANA MASTER PLAN OF DRAINAGE

AOS 3

Unit Hydrograph Method Loss Rate Parameter Development - Line 606.1

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
14	A	Commercial	32	52	12.29	12.76	0.10	0.40	0.18	0.57
75	A	Open Brush, Fair	46	66	10.39	35.32	1.00	0.40	0.18	29.91
6	A	Residential 2.5 acre lots	32	52	0.73	2.23	0.90	0.40	0.18	2.31
109	D	Open Brush, Fair	83	96	74.08	101.95	1.00	0.20	0.07	21.89
205				Low Loss Fraction (1-Y) =	0.524	0.257			F_m =	0.267

FONTANA MASTER PLAN OF DRAINAGE

AOS 3

Unit Hydrograph Method Loss Rate Parameter Development - Line 608.1

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
18	A	Residential 2 dwellings/acre	32	52	5.49	8.82	0.70	0.40	0.18	5.09
41	A	Commercial	32	52	35.12	36.45	0.10	0.40	0.18	1.62
13	A	Open Brush, Fair	46	66	1.77	6.00	1.00	0.40	0.18	5.08
6	B	Residential 2 dwellings/acre	56	76	2.96	4.55	0.70	0.30	0.12	1.32
3	B	Residential 2.5 acre lots	56	76	0.95	1.88	0.90	0.30	0.12	0.78
0	C	Residential 2 dwellings/acre	69	86	0.09	0.12	0.70	0.25	0.10	0.03
0	C	Open Brush, Fair	77	92	0.01	0.02	1.00	0.25	0.10	0.00
5	C	Residential 2.5 acre lots	69	86	2.49	3.99	0.90	0.25	0.10	1.13
0	D	Residential 2 dwellings/acre	75	91	0.02	0.03	0.70	0.20	0.07	0.00
0	D	Open Brush, Fair	83	96	0.06	0.08	1.00	0.20	0.07	0.02
108	D	Open Brush, Fair	83	96	73.26	100.83	1.00	0.20	0.07	21.65
2	D	Residential 2.5 acre lots	75	91	1.05	1.56	0.90	0.20	0.07	0.32
196	Low Loss Fraction (1-Y) =				0.371	0.161	F_m =			0.189

FONTANA MASTER PLAN OF DRAINAGE

AOS 3

Unit Hydrograph Method Loss Rate Parameter Development - Line B Summit & Devore Fwy

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25 5.88	Low Loss Fraction (1-Y) x Area 100 7.32	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
40	A	Commercial	32	52	34.62	35.94	0.10	0.40	0.18	1.60
39	A	Residential 10+ dwellings/acre	32	52	30.09	32.35	0.20	0.40	0.18	3.12
10	A	Residential 2.5 acre lots	32	52	1.14	3.47	0.90	0.40	0.18	3.60
14	A	School	32	52	5.54	7.76	0.60	0.40	0.18	3.36
32	A	Residential 5-7 dwellings/acre	32	52	15.67	19.93	0.50	0.40	0.18	6.40
135		Low Loss Fraction (1-Y) =			0.355	0.263		F_m =		0.134

FONTANA MASTER PLAN OF DRAINAGE

AOS 3

Unit Hydrograph Method Loss Rate Parameter Development - Line B1

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
3	A	Residential 2.5 acre lots	32	52	0.34	1.04	0.90	0.40	0.18	1.08
3	A	Residential 10+ dwellings/acre	32	52	2.31	2.49	0.20	0.40	0.18	0.24
6	A	Commercial	32	52	5.19	5.39	0.10	0.40	0.18	0.24
3	A	Residential 2.5 acre lots	32	52	0.34	1.04	0.90	0.40	0.18	1.08
4	A	Residential 10+ dwellings/acre	32	52	3.09	3.32	0.20	0.40	0.18	0.32
7	A	Commercial	32	52	6.06	6.29	0.10	0.40	0.18	0.28
28	A	Residential 5-7 dwellings/acre	32	52	13.71	17.44	0.50	0.40	0.18	5.60
5	A	Residential 2.5 acre lots	32	52	0.57	1.74	0.90	0.40	0.18	1.80
13	A	Residential 10+ dwellings/acre	32	52	10.03	10.78	0.20	0.40	0.18	1.04
1	A	Commercial	32	52	0.87	0.90	0.10	0.40	0.18	0.04
30	A	Residential 5-7 dwellings/acre	32	52	14.69	18.69	0.50	0.40	0.18	6.00
24	A	Residential 5-7 dwellings/acre	32	52	11.75	14.95	0.50	0.40	0.18	4.80
9	A	Residential 2.5 acre lots	32	52	1.02	3.13	0.90	0.40	0.18	3.24
20	A	Commercial	32	52	17.31	17.97	0.10	0.40	0.18	0.80
7	A	Residential 10+ dwellings/acre	32	52	5.40	5.81	0.20	0.40	0.18	0.56
29	A	Commercial	32	52	25.10	26.05	0.10	0.40	0.18	1.16
13	A	Residential 2.5 acre lots	32	52	1.48	4.51	0.90	0.40	0.18	4.68
40	A	Residential 5-7 dwellings/acre	32	52	19.59	24.91	0.50	0.40	0.18	8.00
11	A	Residential 2.5 acre lots	32	52	1.25	3.82	0.90	0.40	0.18	3.96
37	A	Commercial	32	52	32.03	33.24	0.10	0.40	0.18	1.48
293		Low Loss Fraction (1-Y) =			0.413	0.305			F_m =	0.158

FONTANA MASTER PLAN OF DRAINAGE

AOS 3

Unit Hydrograph Method Loss Rate Parameter Development - Line B2

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
24	A	Residential 5-7 dwellings/acre	32	52	11.75	14.95	0.50	0.40	0.18	4.80
25	A	Residential 5-7 dwellings/acre	32	52	12.24	15.57	0.50	0.40	0.18	5.00
26	A	Residential 5-7 dwellings/acre	32	52	12.73	16.19	0.50	0.40	0.18	5.20
3	A	Residential 5-7 dwellings/acre	32	52	1.47	1.87	0.50	0.40	0.18	0.60
2	A	Residential 5-7 dwellings/acre	32	52	0.98	1.25	0.50	0.40	0.18	0.40
1	A	Residential 2.5 acre lots	32	52	0.11	0.35	0.90	0.40	0.18	0.36
1	A	Residential 2.5 acre lots	32	52	0.11	0.35	0.90	0.40	0.18	0.36
5	A	Residential 5-7 dwellings/acre	32	52	2.45	3.11	0.50	0.40	0.18	1.00
16	A	Residential 5-7 dwellings/acre	32	52	7.83	9.97	0.50	0.40	0.18	3.20
4	A	Residential 2.5 acre lots	32	52	0.45	1.39	0.90	0.40	0.18	1.44
15	A	Residential 5-7 dwellings/acre	32	52	7.34	9.34	0.50	0.40	0.18	3.00
3	A	Residential 2.5 acre lots	32	52	0.34	1.04	0.90	0.40	0.18	1.08
125		Low Loss Fraction (1-Y) =			0.537	0.397		F_m =		0.212

FONTANA MASTER PLAN OF DRAINAGE

AOS 3

Unit Hydrograph Method Loss Rate Parameter Development - Line B3

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
8	A	Residential 5-7 dwellings/acre	32	52	3.92	4.98	0.50	0.40	0.18	1.60
8	A	Residential 5-7 dwellings/acre	32	52	3.92	4.98	0.50	0.40	0.18	1.60
16	A	Residential 5-7 dwellings/acre	32	52	7.83	9.97	0.50	0.40	0.18	3.20
29	A	Residential 5-7 dwellings/acre	32	52	14.20	18.06	0.50	0.40	0.18	5.80
12	A	Residential 5-7 dwellings/acre	32	52	5.88	7.47	0.50	0.40	0.18	2.40
12	A	Residential 5-7 dwellings/acre	32	52	5.88	7.47	0.50	0.40	0.18	2.40
22	A	Residential 5-7 dwellings/acre	32	52	10.77	13.70	0.50	0.40	0.18	4.40
19	A	Residential 5-7 dwellings/acre	32	52	9.30	11.83	0.50	0.40	0.18	3.80
56	A	Residential 5-7 dwellings/acre	32	52	27.42	34.88	0.50	0.40	0.18	11.20
7	A	Residential 2.5 acre lots	32	52	0.80	2.43	0.90	0.40	0.18	2.52
2	A	Residential 10+ dwellings/acre	32	52	1.54	1.66	0.20	0.40	0.18	0.16
6	A	Residential 10+ dwellings/acre	32	52	4.63	4.98	0.20	0.40	0.18	0.48
9	A	Residential 2.5 acre lots	32	52	1.02	3.13	0.90	0.40	0.18	3.24
12	A	Residential 5-7 dwellings/acre	32	52	5.88	7.47	0.50	0.40	0.18	2.40
3	A	Residential 5-7 dwellings/acre	32	52	1.47	1.87	0.50	0.40	0.18	0.60
2	A	Residential 3-4 dwellings/acre	32	52	0.79	1.11	0.60	0.40	0.18	0.48
2	A	Residential 2.5 acre lots	32	52	0.23	0.69	0.90	0.40	0.18	0.72
4	A	Residential 3-4 dwellings/acre	32	52	1.58	2.22	0.60	0.40	0.18	0.96
2	A	Residential 2.5 acre lots	32	52	0.23	0.69	0.90	0.40	0.18	0.72
6	A	Residential 3-4 dwellings/acre	32	52	2.37	3.32	0.60	0.40	0.18	1.44
3	A	Residential 5-7 dwellings/acre	32	52	1.47	1.87	0.50	0.40	0.18	0.60
5	A	Residential 5-7 dwellings/acre	32	52	2.45	3.11	0.50	0.40	0.18	1.00
11	A	Residential 3-4 dwellings/acre	32	52	4.35	6.09	0.60	0.40	0.18	2.64
3	A	Residential 2.5 acre lots	32	52	0.34	1.04	0.90	0.40	0.18	1.08
5	A	Residential 5-7 dwellings/acre	32	52	2.45	3.11	0.50	0.40	0.18	1.00
8	A	Residential 3-4 dwellings/acre	32	52	3.17	4.43	0.60	0.40	0.18	1.92
3	A	Residential 2.5 acre lots	32	52	0.34	1.04	0.90	0.40	0.18	1.08
46	A	Residential 5-7 dwellings/acre	32	52	22.52	28.65	0.50	0.40	0.18	9.20
10	A	Residential 2.5 acre lots	32	52	1.14	3.47	0.90	0.40	0.18	3.60
42	A	Residential 5-7 dwellings/acre	32	52	20.56	26.16	0.50	0.40	0.18	8.40
9	A	Residential 2.5 acre lots	32	52	1.02	3.13	0.90	0.40	0.18	3.24
382		Low Loss Fraction (1-Y) =			0.556	0.411		F_m =		0.220

FONTANA MASTER PLAN OF DRAINAGE

AOS 3

Unit Hydrograph Method Loss Rate Parameter Development - Line B3 South

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25 5.88	Low Loss Fraction (1-Y) x Area 100 7.32	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
24	A	Residential 5-7 dwellings/acre	32	52	11.75	14.95	0.50	0.40	0.18	4.80
38	A	Residential 8-10 dwellings/acre	32	52	22.18	26.29	0.40	0.40	0.18	6.08
13	A	Residential 5-7 dwellings/acre	32	52	6.37	8.10	0.50	0.40	0.18	2.60
75	Low Loss Fraction (1-Y) =				0.463	0.342	F_m =			0.180

FONTANA MASTER PLAN OF DRAINAGE
AOS 3
Unit Hydrograph Method Loss Rate Parameter Development - Line B5

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
6	A	Residential 10+ dwellings/acre	32	52	4.63	4.98	0.20	0.40	0.18	0.48
20	A	Residential 10+ dwellings/acre	32	52	15.43	16.59	0.20	0.40	0.18	1.60
25	A	Residential 10+ dwellings/acre	32	52	19.29	20.74	0.20	0.40	0.18	2.00
1	A	Residential 2.5 acre lots	32	52	0.11	0.35	0.90	0.40	0.18	0.36
4	A	Commercial	32	52	3.46	3.59	0.10	0.40	0.18	0.16
4	A	Residential 10+ dwellings/acre	32	52	3.09	3.32	0.20	0.40	0.18	0.32
8	A	Residential 10+ dwellings/acre	32	52	6.17	6.64	0.20	0.40	0.18	0.64
3	A	Residential 5-7 dwellings/acre	32	52	1.47	1.87	0.50	0.40	0.18	0.60
5	A	Residential 2.5 acre lots	32	52	0.57	1.74	0.90	0.40	0.18	1.80
3	A	Residential 5-7 dwellings/acre	32	52	1.47	1.87	0.50	0.40	0.18	0.60
6	A	Residential 2.5 acre lots	32	52	0.68	2.08	0.90	0.40	0.18	2.16
8	A	Residential 2.5 acre lots	32	52	0.91	2.78	0.90	0.40	0.18	2.88
3	A	Residential 8-10 dwellings/acre	32	52	1.75	2.08	0.40	0.40	0.18	0.48
1	A	Residential 5-7 dwellings/acre	32	52	0.49	0.62	0.50	0.40	0.18	0.20
8	A	Residential 10+ dwellings/acre	32	52	6.17	6.64	0.20	0.40	0.18	0.64
6	A	Residential 2.5 acre lots	32	52	0.68	2.08	0.90	0.40	0.18	2.16
6	A	Residential 10+ dwellings/acre	32	52	4.63	4.98	0.20	0.40	0.18	0.48
11	A	Residential 8-10 dwellings/acre	32	52	6.42	7.61	0.40	0.40	0.18	1.76
2	A	Residential 5-7 dwellings/acre	32	52	0.98	1.25	0.50	0.40	0.18	0.40
9	A	Residential 2.5 acre lots	32	52	1.02	3.13	0.90	0.40	0.18	3.24
2	A	Residential 10+ dwellings/acre	32	52	1.54	1.66	0.20	0.40	0.18	0.16
16	A	Residential 8-10 dwellings/acre	32	52	9.34	11.07	0.40	0.40	0.18	2.56
5	A	Residential 5-7 dwellings/acre	32	52	2.45	3.11	0.50	0.40	0.18	1.00
3	A	Residential 5-7 dwellings/acre	32	52	1.47	1.87	0.50	0.40	0.18	0.60
3	A	Residential 5-7 dwellings/acre	32	52	1.47	1.87	0.50	0.40	0.18	0.60
1	A	Residential 2.5 acre lots	32	52	0.11	0.35	0.90	0.40	0.18	0.36
5	A	Residential 5-7 dwellings/acre	32	52	2.45	3.11	0.50	0.40	0.18	1.00
2	A	Residential 2.5 acre lots	32	52	0.23	0.69	0.90	0.40	0.18	0.72
12	A	Residential 5-7 dwellings/acre	32	52	5.88	7.47	0.50	0.40	0.18	2.40
10	A	Residential 2.5 acre lots	32	52	1.14	3.47	0.90	0.40	0.18	3.60
23	A	Residential 2.5 acre lots	32	52	2.62	7.99	0.90	0.40	0.18	8.28
29	A	Residential 5-7 dwellings/acre	32	52	14.20	18.06	0.50	0.40	0.18	5.80
250		Low Loss Fraction (1-Y) =			0.511	0.377		F_m =		0.200

FONTANA MASTER PLAN OF DRAINAGE

AOS 3

Unit Hydrograph Method Loss Rate Parameter Development - Line B5 South

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
38	A	Residential 5-7 dwellings/acre	32	52	18.61	23.67	0.50	0.40	0.18	7.60
37	A	Residential 5-7 dwellings/acre	32	52	18.12	23.04	0.50	0.40	0.18	7.40
4	A	Residential 5-7 dwellings/acre	32	52	1.96	2.49	0.50	0.40	0.18	0.80
24	A	Public Park	32	52	3.86	9.16	0.85	0.40	0.18	8.16
13	A	Residential 2.5 acre lots	32	52	1.48	4.51	0.90	0.40	0.18	4.68
116		Low Loss Fraction (1-Y) =			0.621	0.458		F_m =		0.247

FONTANA MASTER PLAN OF DRAINAGE

AOS 3

Unit Hydrograph Method Loss Rate Parameter Development - Line C1

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
1	A	Public Park	32	52	0.16	0.38	0.85	0.40	0.18	0.34
3	A	Residential 5-7 dwellings/acre	32	52	1.47	1.87	0.50	0.40	0.18	0.60
2	A	Public Park	32	52	0.32	0.76	0.85	0.40	0.18	0.68
3	A	Residential 5-7 dwellings/acre	32	52	1.47	1.87	0.50	0.40	0.18	0.60
3	A	Public Park	32	52	0.48	1.15	0.85	0.40	0.18	1.02
6	A	Residential 5-7 dwellings/acre	32	52	2.94	3.74	0.50	0.40	0.18	1.20
14	A	Residential 5-7 dwellings/acre	32	52	6.85	8.72	0.50	0.40	0.18	2.80
6	A	Public Park	32	52	0.96	2.29	0.85	0.40	0.18	2.04
2	A	Public Park	32	52	0.32	0.76	0.85	0.40	0.18	0.68
42	A	Residential 5-7 dwellings/acre	32	52	20.56	26.16	0.50	0.40	0.18	8.40
8	A	Commercial	32	52	6.92	7.19	0.10	0.40	0.18	0.32
10	A	Commercial	32	52	8.66	8.98	0.10	0.40	0.18	0.40
18	A	Commercial	32	52	15.58	16.17	0.10	0.40	0.18	0.72
44	A	Commercial	32	52	38.08	39.53	0.10	0.40	0.18	1.76
7	A	Commercial	32	52	6.06	6.29	0.10	0.40	0.18	0.28
7	A	Commercial	32	52	6.06	6.29	0.10	0.40	0.18	0.28
16	A	Commercial	32	52	13.85	14.37	0.10	0.40	0.18	0.64
27	A	Residential 10+ dwellings/acre	32	52	20.83	22.40	0.20	0.40	0.18	2.16
4	A	Commercial	32	52	3.46	3.59	0.10	0.40	0.18	0.16
223	Low Loss Fraction (1-Y) =				0.305	0.226	F_m =			0.112

FONTANA MASTER PLAN OF DRAINAGE

AOS 3

Unit Hydrograph Method Loss Rate Parameter Development - Line C2

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
8	A	Public Park	32	52	1.29	3.05	0.85	0.40	0.18	2.72
32	A	Residential 5-7 dwellings/acre	32	52	15.67	19.93	0.50	0.40	0.18	6.40
24	A	Commercial	32	52	20.77	21.56	0.10	0.40	0.18	0.96
22	A	Residential 5-7 dwellings/acre	32	52	10.77	13.70	0.50	0.40	0.18	4.40
22	A	Commercial	32	52	19.04	19.77	0.10	0.40	0.18	0.88
25	A	Public Park	32	52	4.02	9.54	0.85	0.40	0.18	8.50
27	A	Residential 5-7 dwellings/acre	32	52	13.22	16.82	0.50	0.40	0.18	5.40
28	A	Public Park	32	52	4.50	10.69	0.85	0.40	0.18	9.52
15	A	Commercial	32	52	12.98	13.48	0.10	0.40	0.18	0.60
53	A	Residential 5-7 dwellings/acre	32	52	25.95	33.01	0.50	0.40	0.18	10.60
17	A	Commercial	32	52	14.71	15.27	0.10	0.40	0.18	0.68
1	A	Public Park	32	52	0.16	0.38	0.85	0.40	0.18	0.34
3	A	Residential 5-7 dwellings/acre	32	52	1.47	1.87	0.50	0.40	0.18	0.60
4	A	Public Park	32	52	0.64	1.53	0.85	0.40	0.18	1.36
2	A	Residential 5-7 dwellings/acre	32	52	0.98	1.25	0.50	0.40	0.18	0.40
3	A	Public Park	32	52	0.48	1.15	0.85	0.40	0.18	1.02
8	A	Residential 5-7 dwellings/acre	32	52	3.92	4.98	0.50	0.40	0.18	1.60
6	A	Public Park	32	52	0.96	2.29	0.85	0.40	0.18	2.04
11	A	Residential 5-7 dwellings/acre	32	52	5.39	6.85	0.50	0.40	0.18	2.20
24	A	Public Park	32	52	3.86	9.16	0.85	0.40	0.18	8.16
17	A	Residential 5-7 dwellings/acre	32	52	8.32	10.59	0.50	0.40	0.18	3.40
45	A	Residential 5-7 dwellings/acre	32	52	22.03	28.03	0.50	0.40	0.18	9.00
28	A	Public Park	32	52	4.50	10.69	0.85	0.40	0.18	9.52
13	A	School	32	52	5.14	7.20	0.60	0.40	0.18	3.12
17	A	Public Park	32	52	2.73	6.49	0.85	0.40	0.18	5.78
56	A	Residential 5-7 dwellings/acre	32	52	27.42	34.88	0.50	0.40	0.18	11.20
511		Low Loss Fraction (1-Y) =			0.548	0.405		F_m =		0.216

FONTANA MASTER PLAN OF DRAINAGE

AOS 3

Unit Hydrograph Method Loss Rate Parameter Development - Line C3

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
41	A	Residential 5-7 dwellings/acre	32	52	20.08	25.54	0.50	0.40	0.18	8.20
27	A	Public Park	32	52	4.34	10.31	0.85	0.40	0.18	9.18
2	A	Condominiums	32	52	1.26	1.45	0.35	0.40	0.18	0.28
1	A	Residential 1 acre lots	32	52	0.21	0.42	0.80	0.40	0.18	0.32
1	A	Commercial	32	52	0.87	0.90	0.10	0.40	0.18	0.04
5	A	Residential 3-4 dwellings/acre	32	52	1.98	2.77	0.60	0.40	0.18	1.20
1	A	Commercial	32	52	0.87	0.90	0.10	0.40	0.18	0.04
1	A	Residential 1 acre lots	32	52	0.21	0.42	0.80	0.40	0.18	0.32
2	A	Condominiums	32	52	1.26	1.45	0.35	0.40	0.18	0.28
4	A	Residential 3-4 dwellings/acre	32	52	1.58	2.22	0.60	0.40	0.18	0.96
4	A	Residential 1 acre lots	32	52	0.83	1.66	0.80	0.40	0.18	1.28
6	A	Condominiums	32	52	3.78	4.36	0.35	0.40	0.18	0.84
7	A	Residential 3-4 dwellings/acre	32	52	2.77	3.88	0.60	0.40	0.18	1.68
30	A	Condominiums	32	52	18.92	21.79	0.35	0.40	0.18	4.20
10	A	Residential 3-4 dwellings/acre	32	52	3.96	5.54	0.60	0.40	0.18	2.40
78	A	Residential 5-7 dwellings/acre	32	52	38.19	48.58	0.50	0.40	0.18	15.60
220	Low Loss Fraction (1-Y) =				0.540	0.399	F_m =			0.213

FONTANA MASTER PLAN OF DRAINAGE

AOS 3

Unit Hydrograph Method Loss Rate Parameter Development - Line C3 East

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25 5.88	Low Loss Fraction (1-Y) x Area 100 7.32	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
20	A	Commercial	32	52	17.31	17.97	0.10	0.40	0.18	0.80
22	A	Public Park	32	52	3.54	8.40	0.85	0.40	0.18	7.48
21	A	Residential 5-7 dwellings/acre	32	52	10.28	13.08	0.50	0.40	0.18	4.20
63	Low Loss Fraction (1-Y) =				0.506	0.374	F_m =			0.198

FONTANA MASTER PLAN OF DRAINAGE

AOS 3

Unit Hydrograph Method Loss Rate Parameter Development - Line C4

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25 5.88	Low Loss Fraction (1-Y) x Area 100 7.32	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
71	A	Residential 5-7 dwellings/acre	32	52	34.76	44.22	0.50	0.40	0.18	14.20
63	D	Residential 5-7 dwellings/acre	75	91	47.26	57.38	0.50	0.20	0.07	6.30
15	D	Residential 2.5 acre lots	75	91	8.74	12.98	0.90	0.20	0.07	2.70
149		Low Loss Fraction (1-Y) =			0.391	0.231	F_m =			0.156

FONTANA MASTER PLAN OF DRAINAGE

AOS 3

Unit Hydrograph Method Loss Rate Parameter Development - Line C4 East

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
28	A	Residential 10+ dwellings/acre	32	52	21.60	23.23	0.20	0.40	0.18	2.24
43	A	Residential 5-7 dwellings/acre	32	52	21.05	26.78	0.50	0.40	0.18	8.60
5	A	School	32	52	1.98	2.77	0.60	0.40	0.18	1.20
5	A	Residential 5-7 dwellings/acre	32	52	2.45	3.11	0.50	0.40	0.18	1.00
5	A	Residential 5-7 dwellings/acre	32	52	2.45	3.11	0.50	0.40	0.18	1.00
6	A	School	32	52	2.37	3.32	0.60	0.40	0.18	1.44
9	A	Residential 5-7 dwellings/acre	32	52	4.41	5.61	0.50	0.40	0.18	1.80
9	A	School	32	52	3.56	4.99	0.60	0.40	0.18	2.16
22	A	Residential 5-7 dwellings/acre	32	52	10.77	13.70	0.50	0.40	0.18	4.40
20	A	School	32	52	7.91	11.08	0.60	0.40	0.18	4.80
152		Low Loss Fraction (1-Y) =			0.483	0.357		F_m =		0.188

FONTANA MASTER PLAN OF DRAINAGE

AOS 3

Unit Hydrograph Method Loss Rate Parameter Development - Line C5

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
27	A	Residential 5-7 dwellings/acre	32	52	13.22	16.82	0.50	0.40	0.18	5.40
16	A	Residential 2.5 acre lots	32	52	1.82	5.56	0.90	0.40	0.18	5.76
24	A	Residential 8-10 dwellings/acre	32	52	14.01	16.60	0.40	0.40	0.18	3.84
5	A	Residential 8-10 dwellings/acre	32	52	2.92	3.46	0.40	0.40	0.18	0.80
1	A	Residential 2.5 acre lots	32	52	0.11	0.35	0.90	0.40	0.18	0.36
3	A	Residential 5-7 dwellings/acre	32	52	1.47	1.87	0.50	0.40	0.18	0.60
3	A	Residential 5-7 dwellings/acre	32	52	1.47	1.87	0.50	0.40	0.18	0.60
1	A	Public Park	32	52	0.16	0.38	0.85	0.40	0.18	0.34
1	A	Residential 2.5 acre lots	32	52	0.11	0.35	0.90	0.40	0.18	0.36
1	A	Public Park	32	52	0.16	0.38	0.85	0.40	0.18	0.34
6	A	Residential 5-7 dwellings/acre	32	52	2.94	3.74	0.50	0.40	0.18	1.20
2	A	Residential 2.5 acre lots	32	52	0.23	0.69	0.90	0.40	0.18	0.72
1	A	Commercial	32	52	0.87	0.90	0.10	0.40	0.18	0.04
10	A	Residential 5-7 dwellings/acre	32	52	4.90	6.23	0.50	0.40	0.18	2.00
4	A	Residential 2.5 acre lots	32	52	0.45	1.39	0.90	0.40	0.18	1.44
5	A	Public Park	32	52	0.80	1.91	0.85	0.40	0.18	1.70
8	A	Commercial	32	52	6.92	7.19	0.10	0.40	0.18	0.32
17	A	Residential 5-7 dwellings/acre	32	52	8.32	10.59	0.50	0.40	0.18	3.40
4	A	Public Park	32	52	0.64	1.53	0.85	0.40	0.18	1.36
7	A	Residential 2.5 acre lots	32	52	0.80	2.43	0.90	0.40	0.18	2.52
20	A	Commercial	32	52	17.31	17.97	0.10	0.40	0.18	0.80
50	A	Residential 5-7 dwellings/acre	32	52	24.48	31.14	0.50	0.40	0.18	10.00
2	A	Public Park	32	52	0.32	0.76	0.85	0.40	0.18	0.68
218				Low Loss Fraction (1-Y) =	0.521	0.385			F_m =	0.204

FONTANA MASTER PLAN OF DRAINAGE

AOS 3

Unit Hydrograph Method Loss Rate Parameter Development - Line C5 East

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25 5.88	Low Loss Fraction (1-Y) x Area 100 7.32	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
40	A	Residential 5-7 dwellings/acre	32	52	19.59	24.91	0.50	0.40	0.18	8.00
20	A	Residential 8-10 dwellings/acre	32	52	11.67	13.83	0.40	0.40	0.18	3.20
10	A	Residential 8-10 dwellings/acre	32	52	5.84	6.92	0.40	0.40	0.18	1.60
70		Low Loss Fraction (1-Y) =			0.470	0.348	F_m =			0.183

FONTANA MASTER PLAN OF DRAINAGE

AOS 3

Unit Hydrograph Method Loss Rate Parameter Development - Line C6

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
58	A	Residential 10+ dwellings/acre	32	52	44.75	48.11	0.20	0.40	0.18	4.64
13	A	Residential 2.5 acre lots	32	52	1.48	4.51	0.90	0.40	0.18	4.68
64	A	Residential 10+ dwellings/acre	32	52	49.38	53.09	0.20	0.40	0.18	5.12
60	A	Commercial	32	52	51.93	53.90	0.10	0.40	0.18	2.40
4	A	Residential 10+ dwellings/acre	32	52	3.09	3.32	0.20	0.40	0.18	0.32
5	A	Residential 10+ dwellings/acre	32	52	3.86	4.15	0.20	0.40	0.18	0.40
12	A	Residential 10+ dwellings/acre	32	52	9.26	9.95	0.20	0.40	0.18	0.96
16	A	Residential 10+ dwellings/acre	32	52	12.35	13.27	0.20	0.40	0.18	1.28
13	A	Residential 10+ dwellings/acre	32	52	10.03	10.78	0.20	0.40	0.18	1.04
245	Low Loss Fraction (1-Y) =				0.240	0.179	F_m =			0.085

FONTANA MASTER PLAN OF DRAINAGE

AOS 3

Unit Hydrograph Method Loss Rate Parameter Development - Line D1

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25 5.88	Low Loss Fraction (1-Y) x Area 100 7.32	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
3	A	Commercial	32	52	2.24	2.33	0.10	0.40	0.18	0.10
2	A	Commercial	32	52	1.64	1.70	0.10	0.40	0.18	0.08
3	A	Residential 5-7 dwellings/acre	32	52	1.63	2.07	0.50	0.40	0.18	0.67
8	Low Loss Fraction (1-Y) =				0.295	0.219	F_m =			0.108

FONTANA MASTER PLAN OF DRAINAGE

AOS 3

Unit Hydrograph Method Loss Rate Parameter Development - Line D1-0

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
5	A	Commercial	32	52	4.24	4.40	0.10	0.40	0.18	0.20
5	Low Loss Fraction (1-Y) =				0.134	0.102	F_m =			0.040

FONTANA MASTER PLAN OF DRAINAGE

AOS 3

Unit Hydrograph Method Loss Rate Parameter Development - Line D1-5

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
3	A	Commercial	32	52	2.67	2.78	0.10	0.40	0.18	0.12
3	A	Residential 5-7 dwellings/acre	32	52	1.63	2.07	0.50	0.40	0.18	0.66
1	A	Commercial	32	52	1.23	1.28	0.10	0.40	0.18	0.06
6	A	Residential 5-7 dwellings/acre	32	52	3.08	3.92	0.50	0.40	0.18	1.26
27	A	Residential 5-7 dwellings/acre	32	52	12.98	16.51	0.50	0.40	0.18	5.30
41				Low Loss Fraction (1-Y) =	0.469	0.347			F_m =	0.182

FONTANA MASTER PLAN OF DRAINAGE

AOS 3

Unit Hydrograph Method Loss Rate Parameter Development - Line D2-0

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
11	A	Residential 8-10 dwellings/acre	32	52	6.36	7.54	0.40	0.40	0.18	1.74
1	A	Public Park	32	52	0.14	0.34	0.85	0.40	0.18	0.30
9	A	Condominiums	32	52	5.36	6.17	0.35	0.40	0.18	1.19
13	A	Residential 10+ dwellings/acre	32	52	9.88	10.62	0.20	0.40	0.18	1.02
5	A	Commercial	32	52	4.25	4.41	0.10	0.40	0.18	0.20
38				Low Loss Fraction (1-Y) =	0.316	0.235			F_m =	0.117

FONTANA MASTER PLAN OF DRAINAGE

AOS 3

Unit Hydrograph Method Loss Rate Parameter Development - Line D2-5

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
15	A	School	32	52	5.74	8.03	0.60	0.40	0.18	3.48
13	A	Residential 5-7 dwellings/acre	32	52	6.56	8.35	0.50	0.40	0.18	2.68
24	A	Residential 5-7 dwellings/acre	32	52	11.70	14.89	0.50	0.40	0.18	4.78
5	A	Commercial	32	52	4.48	4.65	0.10	0.40	0.18	0.21
5	A	Commercial	32	52	4.31	4.47	0.10	0.40	0.18	0.20
10	A	Commercial	32	52	8.92	9.25	0.10	0.40	0.18	0.41
72	Low Loss Fraction (1-Y) =				0.423	0.313	F_m =			0.163

FONTANA MASTER PLAN OF DRAINAGE

AOS 3

Unit Hydrograph Method Loss Rate Parameter Development - Line D3-1

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
6	A	Commercial	32	52	5.19	5.39	0.10	0.40	0.18	0.24
6	A	Condominiums	32	52	3.78	4.36	0.35	0.40	0.18	0.84
1	A	Public Park	32	52	0.14	0.32	0.85	0.40	0.18	0.29
2	A	Public Park	32	52	0.32	0.76	0.85	0.40	0.18	0.68
4	A	Condominiums	32	52	2.52	2.90	0.35	0.40	0.18	0.56
2	A	Residential 5-7 dwellings/acre	32	52	0.98	1.25	0.50	0.40	0.18	0.40
21	Low Loss Fraction (1-Y) =				0.380	0.281	F_m =			0.144

FONTANA MASTER PLAN OF DRAINAGE

AOS 3

Unit Hydrograph Method Loss Rate Parameter Development - Line D3-1

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25	Low Loss Fraction (1-Y) x Area 100	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
					5.88	7.32				
10	A	Commercial	32	52	8.22	8.53	0.10	0.40	0.18	0.38
7	A	Condominiums	32	52	4.35	5.01	0.35	0.40	0.18	0.97
1	A	Public Park	32	52	0.14	0.32	0.85	0.40	0.18	0.29
4	A	Public Park	32	52	0.66	1.58	0.85	0.40	0.18	1.40
8	A	Condominiums	32	52	5.17	5.95	0.35	0.40	0.18	1.15
8	A	Residential 5-7 dwellings/acre	32	52	4.11	5.23	0.50	0.40	0.18	1.68
38	Low Loss Fraction (1-Y) =				0.403	0.299	F_m =			0.154

FONTANA MASTER PLAN OF DRAINAGE

AOS 3

Unit Hydrograph Method Loss Rate Parameter Development - Line D4

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25 5.88	Low Loss Fraction (1-Y) x Area 100 7.32	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
5	A	Residential 8-10 dwellings/acre	32	52	3.09	3.67	0.40	0.40	0.18	0.85
7	A	Residential 8-10 dwellings/acre	32	52	4.03	4.77	0.40	0.40	0.18	1.10
2	A	Public Park	32	52	0.37	0.88	0.85	0.40	0.18	0.78
20	A	Condominiums	32	52	12.86	14.81	0.35	0.40	0.18	2.86
9	A	Condominiums	32	52	5.49	6.32	0.35	0.40	0.18	1.22
8	A	Condominiums	32	52	5.17	5.95	0.35	0.40	0.18	1.15
1	A	Public Park	32	52	0.18	0.42	0.85	0.40	0.18	0.37
10	A	Condominiums	32	52	6.37	7.33	0.35	0.40	0.18	1.41
6	A	Condominiums	32	52	3.91	4.50	0.35	0.40	0.18	0.87
9	A	Residential 5-7 dwellings/acre	32	52	4.16	5.29	0.50	0.40	0.18	1.70
7	A	Public Park	32	52	1.17	2.79	0.85	0.40	0.18	2.48
8	A	Residential 5-7 dwellings/acre	32	52	4.11	5.23	0.50	0.40	0.18	1.68
93	Low Loss Fraction (1-Y) =				0.455	0.336	F_m =			0.176

FONTANA MASTER PLAN OF DRAINAGE

AOS 3

Unit Hydrograph Method Loss Rate Parameter Development - Line D5-3

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25	Low Loss Fraction (1-Y) x Area 100	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
7	A	Public Park	32	52	1.13	2.67	0.85	0.40	0.18	2.38
10	A	Condominiums	32	52	6.05	6.97	0.35	0.40	0.18	1.34
8	A	Commercial	32	52	6.84	7.10	0.10	0.40	0.18	0.32
25	Low Loss Fraction (1-Y) =				0.428	0.317	F_m =			0.165

FONTANA MASTER PLAN OF DRAINAGE

AOS 3

Unit Hydrograph Method Loss Rate Parameter Development - Line D6

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
6	A	Open Brush, Fair	46	66	0.83	2.83	1.00	0.40	0.18	2.40
7	A	Open Brush, Fair	46	66	0.93	3.16	1.00	0.40	0.18	2.68
14	A	Open Brush, Fair	46	66	1.89	6.42	1.00	0.40	0.18	5.44
26	Low Loss Fraction (1-Y) =				0.861	0.528	F_m =			0.400

FONTANA MASTER PLAN OF DRAINAGE

AOS 3

Unit Hydrograph Method Loss Rate Parameter Development - Line G1

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25 5.88	Low Loss Fraction (1-Y) x Area 100 7.32	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
14	A	Commercial	32	52	12.38	12.85	0.10	0.40	0.18	0.57
12	A	Commercial	32	52	10.30	10.69	0.10	0.40	0.18	0.48
16	A	Commercial	32	52	14.19	14.73	0.10	0.40	0.18	0.66
43	Low Loss Fraction (1-Y) =				0.134	0.102	F_m =			0.040

FONTANA MASTER PLAN OF DRAINAGE

AOS 3

Unit Hydrograph Method Loss Rate Parameter Development - Line G2

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25	Low Loss Fraction (1-Y) x Area 100	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
12	A	Commercial	32	52	10.13	10.51	0.10	0.40	0.18	0.47
16	a	Commercial	32	52	14.02	14.55	0.10	0.40	0.18	0.65
28			Low Loss Fraction (1-Y) =		0.134	0.102		F_m =		0.040

FONTANA MASTER PLAN OF DRAINAGE

AOS 3

Unit Hydrograph Method Loss Rate Parameter Development - Line G3

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
8	A	Commercial	32	52	6.66	6.92	0.10	0.40	0.18	0.31
15	A	Commercial	32	52	12.90	13.39	0.10	0.40	0.18	0.60
6	A	Open Brush, Fair	46	66	0.81	2.74	1.00	0.40	0.18	2.32
18	A	Commercial	32	52	15.84	16.44	0.10	0.40	0.18	0.73
7	A	Open Brush, Fair	46	66	0.99	3.35	1.00	0.40	0.18	2.84
54	Low Loss Fraction (1-Y) =				0.309	0.204	F_m =			0.126

FONTANA MASTER PLAN OF DRAINAGE

AOS 3

Unit Hydrograph Method Loss Rate Parameter Development - Line G4

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
22	A	Commercial	32	52	18.96	19.68	0.10	0.40	0.18	0.88
22	Low Loss Fraction (1-Y) =				0.134	0.102	F_m =			0.040

FONTANA MASTER PLAN OF DRAINAGE

AOS 3

Unit Hydrograph Method Loss Rate Parameter Development - Line G5

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
6	A	Commercial	32	52	5.11	5.30	0.10	0.40	0.18	0.24
10	A	Commercial	32	52	8.92	9.25	0.10	0.40	0.18	0.41
26	A	Commercial	32	52	22.85	23.72	0.10	0.40	0.18	1.06
16	A	Commercial	32	52	13.42	13.93	0.10	0.40	0.18	0.62
58	Low Loss Fraction (1-Y) =				0.134	0.102	F_m =			0.040

FONTANA MASTER PLAN OF DRAINAGE

AOS 3

Unit Hydrograph Method Loss Rate Parameter Development - Line G5-4

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
1	A	Commercial	32	52	0.87	0.90	0.10	0.40	0.18	0.04
3	A	Commercial	32	52	2.60	2.70	0.10	0.40	0.18	0.12
12	A	Commercial	32	52	10.39	10.78	0.10	0.40	0.18	0.48
14	A	Commercial	32	52	12.12	12.58	0.10	0.40	0.18	0.56
30				Low Loss Fraction (1-Y) =	0.134	0.102			F_m =	0.040

FONTANA MASTER PLAN OF DRAINAGE

AOS 3

Unit Hydrograph Method Loss Rate Parameter Development - Line G6

Area (ac)	Soil Type	Land Use	Curve Number (CN)		Low Loss Fraction (1-Y) x Area		Ap	Fp		Maximum Loss Rate (Fm) x Area
			AMC		25	100		AMC		
			II	III	5.88	7.32		II	III	
26	A	Commercial	32	52	22.59	23.45	0.10	0.40	0.18	1.04
48	A	Commercial	32	52	41.89	43.48	0.10	0.40	0.18	1.94
75	Low Loss Fraction (1-Y) =				0.134	0.102	F_m =			0.040

FONTANA MASTER PLAN OF DRAINAGE

AOS 3

Unit Hydrograph Method Loss Rate Parameter Development - Hunter Ridge

Area (ac)	Soil Type	Land Use	Curve Number (CN) AMC II	Curve Number (CN) AMC III	Low Loss Fraction (1-Y) x Area 25	Low Loss Fraction (1-Y) x Area 100	Ap	Fp AMC II	Fp AMC III	Maximum Loss Rate (Fm) x Area
					5.88	7.32				
458	A	Residential 5-7 dwellings/acre	32	52	224.25	285.26	0.50	0.40	0.18	91.60
7	D	Residential 5-7 dwellings/acre	75	91	5.25	6.38	0.50	0.20	0.07	0.70
8	C	Residential 5-7 dwellings/acre	69	86	5.62	6.98	0.50	0.25	0.10	1.00
92	A	Residential 2.5 acre lots	32	52	10.46	31.95	0.90	0.40	0.18	33.12
40	A	Public Park	32	52	6.43	15.27	0.85	0.40	0.18	13.60
11	A	School	32	52	4.35	6.09	0.60	0.40	0.18	2.64
45	D	Open Brush, Fair	83	96	30.46	41.92	1.00	0.20	0.07	9.00
45	A	Open Brush, Fair	46	66	6.25	21.26	1.00	0.40	0.18	18.00
706			Low Loss Fraction (1-Y) =		0.585	0.412		F_m =		0.240

Rational Method Calculations, Collector Analysis

FONTANA
CALIFORNIA

DAVID EVANS
AND ASSOCIATES INC.

AOS 1 Rational Method Calculations

	RATIONAL METHOD													MANNING'S EQUATION						25-Year			100-Year		
		AMC II			AMC III																				
Basin ID	Ap	Fp	Fm	C_{25yr}	Fp	Fm	C_{100yr}	Tc (min)	i_{25yr} (in/hr)	i_{100yr} (in/hr)	A (ac)	Q_{runoff_25yr} (cfs)	Q_{runoff_100yr} (cfs)	Diameter (ft)	Diameter (in.)	n	Slope (ft/ft)	A Pipe (ft^2)	R Pipe (ft)	Q-capacity (cfs)	Q-calculated (cfs)	Q-difference (cfs)	Q-capacity (cfs)	Q-calculated (cfs)	Q-difference (cfs)
1	0.20	0.40	0.08	0.85	0.18	0.04	0.88	42	1.39	1.81	41	48	65	3.0	36	0.013	0.016	7.07	0.83	85	48	37	85	65	20
2	0.44	0.40	0.18	0.78	0.18	0.08	0.86	51	1.27	1.66	61	60	86	3.5	42	0.013	0.011	9.62	0.91	104	60	44	104	86	18
3	0.60	0.40	0.24	0.74	0.18	0.11	0.85	42	1.39	1.81	41	43	63	3.0	36	0.013	0.014	7.07	0.83	79	43	37	79	63	16
4	0.60	0.40	0.24	0.75	0.18	0.11	0.85	42	1.40	1.82	40	42	62	3.0	36	0.013	0.012	7.07	0.83	74	42	32	74	62	12
5	0.57	0.40	0.23	0.75	0.18	0.10	0.85	44	1.36	1.77	45	46	68	3.0	36	0.013	0.015	7.07	0.83	83	46	37	83	68	15
6	0.10	0.40	0.04	0.87	0.18	0.02	0.89	44	1.36	1.77	45	54	71	3.0	36	0.013	0.007	7.07	0.83	54	54	0	54	71	-18
7	0.59	0.40	0.23	0.72	0.18	0.11	0.84	59	1.19	1.55	82	70	106	3.5	42	0.013	0.02	9.62	0.91	144	70	74	144	106	38
8	0.60	0.40	0.24	0.74	0.18	0.11	0.84	45	1.35	1.75	47	47	70	3.0	36	0.013	0.017	7.07	0.83	86	47	39	86	70	16
9	0.25	0.40	0.10	0.83	0.18	0.05	0.88	42	1.39	1.81	41	47	65	3.0	36	0.013	0.017	7.07	0.83	87	47	40	87	65	22
10	0.41	0.40	0.16	0.81	0.18	0.07	0.87	30	1.63	2.13	20	27	38	3.0	36	0.013	0.015	7.07	0.83	81	27	54	81	38	43
11	0.60	0.40	0.24	0.75	0.18	0.11	0.85	40	1.43	1.86	36	39	57	3.0	36	0.013	0.013	7.07	0.83	75	39	36	75	57	18
12	0.60	0.40	0.24	0.75	0.18	0.11	0.85	40	1.42	1.85	37	40	58	3.0	36	0.013	0.016	7.07	0.83	84	40	44	84	58	25
13	0.60	0.40	0.24	0.75	0.18	0.11	0.85	40	1.42	1.85	38	40	59	3.0	36	0.013	0.014	7.07	0.83	80	40	40	80	59	21
14	0.60	0.40	0.24	0.75	0.18	0.11	0.85	41	1.41	1.83	39	41	61	3.0	36	0.013	0.015	7.07	0.83	82	41	41	82	61	22
15	0.60	0.40	0.24	0.74	0.18	0.11	0.85	42	1.39	1.81	42	43	64	3.0	36	0.013	0.013	7.07	0.83	77	43	34	77	64	14
16	0.40	0.40	0.16	0.79	0.18	0.07	0.86	46	1.33	1.74	49	52	74	3.0	36	0.013	0.014	7.07	0.83	78	52	25	78	74	4
17	0.60	0.40	0.24	0.74	0.18	0.11	0.84	44	1.36	1.77	46	46	69	3.0	36	0.013	0.015	7.07	0.83	81	46	35	81	69	12
18	0.10	0.40	0.04	0.88	0.18	0.02	0.89	32	1.58	2.06	23	32	43	3.0	36	0.013	0.058	7.07	0.83	160	32	128	160	43	117
19	0.10	0.40	0.04	0.87	0.18	0.02	0.89	53	1.25	1.62	66	72	95	3.5	42	0.013	0.023	9.62	0.91	152	72	80	152	95	56
20	0.30	0.40	0.12	0.83	0.18	0.05	0.88	33	1.55	2.03	25	32	45	3.0	36	0.013	0.014	7.07	0.83	78	32	46	78	45	34
21	0.49	0.40	0.20	0.76	0.18	0.09	0.85	53	1.25	1.62	66	63	91	3.5	42	0.013	0.014	9.62	0.91	121	63	58	121	91	29
22	0.29	0.40	0.12	0.83	0.18	0.05	0.88	35	1.52	1.98	28	35	48	3.0	36	0.013	0.015	7.07	0.83	81	35	46	81	48	33
23	0.48	0.40	0.19	0.76	0.18	0.09	0.85	54	1.24	1.61	69	65	94	3.5	42	0.013	0.017	9.62	0.91	130	65	65	130	94	36
24	0.52	0.40	0.21	0.73	0.18	0.09	0.84	69	1.11	1.44	111	90	134	4.0	48	0.013	0.015	12.57	1.00	175	90	85	175	134	41
25	0.33	0.40	0.13	0.82	0.18	0.06	0.87	38	1.46	1.90	34	40	56	3.0	36	0.013	0.017	7.07	0.83	86	40	46	86	56	30
26	0.44	0.40	0.18	0.77	0.18	0.08	0.86	54	1.24	1.61	68	65	94	3.5	42	0.013	0.011	9.62	0.91	106	65	41	106	94	13
27	0.50	0.40	0.20	0.74	0.18	0.09	0.84	68	1.12	1.45	108	89	132	4.0	48	0.013	0.014	12.57	1.00	170	89	81	170	132	38
28	0.39	0.40	0.16	0.80	0.18	0.07	0.87	38	1.46	1.91	33	39	54	3.0	36	0.013	0.005	7.07	0.83	47	39	9	47	54	-7
29	0.38	0.40	0.15	0.78	0.18	0.07	0.86	64	1.15	1.49	96	86	123	4.0	48	0.013	0.01	12.57	1.00	146	86	60	146	123	23
30	0.20	0.40	0.08	0.85	0.18	0.04	0.88	42	1.40	1.82	40	48	64	3.0	36	0.013	0.014	7.07	0.83	80	48	32	80	64	15
31	0.44	0.40	0.18	0.79	0.18	0.08	0.86	42	1.40	1.82	40	44	63	3.0	36	0.013	0.017	7.07	0.83	86	44	42	86	63	23
32	0.60	0.40	0.24	0.72	0.18	0.11	0.84	59	1.19	1.55	80	69	105	3.5	42	0.013	0.014	9.62	0.91	121	69	52	121	105	16
33	0.60	0.40	0.24	0.72	0.18	0.11	0.84	59	1.20	1.55	80	69	104	3.5	42	0.013	0.015	9.62	0.91	121	69	52	121	104	17
34	0.20	0.40	0.08	0.84	0.18	0.04	0.88	59	1.20	1.55	80	80	109	3.5	42	0.013	0.014	9.62	0.91	118	80	37	118	109	9
35	0.60	0.40	0.24	0.74	0.18	0.11	0.84	45	1.35	1.76	47	47	69	3.0	36	0.013	0.02	7.07	0.83	94	47	48	94	69	25
36	0.60	0.40	0.24	0.74	0.18	0.11	0.84	45	1.35	1.75	47	47	70	3.0	36	0.013	0.017	7.07	0.83	86	47	39	86	70	16
37	0.60	0.40	0.24	0.74	0.18	0.11	0.84	45	1.35	1.76	47	47	69	3.0	36	0.013	0.018	7.07	0.83	91	47	44	91	69	21
38	0.60	0.40	0.24	0.74	0.18	0.11	0.84	45	1.35	1.76	46	46	69	3.0	36	0.013	0.019	7.07	0.83	91	46	44	91	69	22
39	0.60	0.40	0.24	0.74	0.18	0.11	0.84	45	1.34	1.75	48	48	71	3.0	36	0.013	0.016	7.07	0.83	85	48	37	85	71	14
40	0.60	0.40	0.24	0.72	0.18	0.11	0.84	59	1.19	1.55	81	70	105	3.5	42	0.013	0.017	9.62	0.91	132	70	62	132	105	26
41	0.11	0.40	0.04	0.87	0.18	0.02	0.89	42	1.39	1.80	42	50	67	3.0	36	0.013	0.016	7.07	0.83	85	50	34	85	67	18
42	0.11	0.40	0.04	0.87	0.18	0.02	0.89	56	1.22	1.58	74	78	104	3.5	42	0.013	0.006	9.62	0.91	78	78	0	78	104	-26
43	0.11	0.40	0.04	0.87	0.18	0.02	0.89	41	1.40	1.82	40	49	65	3.0	36	0.013	0.015	7.07	0.83	81	49	32	81	65	16
44	0.10	0.40	0.04	0.87	0.18	0.02	0.89	59	1.20	1.55	80	83	110	3.5	42	0.013	0.016	9.62	0.91	126	83	43	126	110	15
45	0.47	0.40	0.19	0.76	0.18	0.09	0.85	59	1.19	1.55	80	73	106	3.5	42	0.013	0.013	9.62	0.91	117	73	44	117	106	11
46	0.10	0.40	0.04	0.87	0.18	0.02	0.89	68	1.12	1.45	108	105	139	4.0	48	0.013	0.017	12.57	1.00	187	105	82	187	139	47
47	0.53	0.40	0.21	0.73	0.18	0.10	0.84	67	1.13	1.46	105	86	129	4.0	48	0.013	0.012	12.57	1.00	155	86	69	155	129	27
48	0.35	0.40	0.14	0.78	0.18	0.06	0.86	84	1.02	1.31	165	130	185	4.5	54	0.013	0.005	15.90	1.08	138	130	8	138	185	-47
49	0.60	0.40	0.24	0.75	0.18	0.11	0.85	41	1.40	1.83	40	42	61	3.0	36	0.013	0.006	7.07	0.83	53	42	11	53	61	-8
50	0.60	0.40	0.24	0.69	0.18	0.11	0.83	83	1.02	1.32	160	112	175	4.0	48	0.013	0.007	12.57	1.00	120	112	8	120	175	-54
51	0.60	0.40	0.24	0.75	0.18	0.11	0.85	39	1.44	1.88	35	38	56	3.0	36	0.013	0.016	7.07	0.83	85	38	47	85	56	29
52	0.54	0.40	0.22	0.71	0.18	0.10	0.84	79	1.04	1.35	146	109	165	4.5	54	0.013	0.012	15.90	1.08	211	109	103	211	165	47
53	0.59	0.40	0.24	0.75	0.18	0.11	0.85	41	1.41	1.84	39	41	60	3.0	36	0.013	0.014	7.07	0.83	79	41	38	79	60	18
54	0.29	0.40	0.12	0.80	0.18	0.05	0.86	84	1.02	1.32	163	132	186	4.5	54	0.013	0.005	15.90	1.08	139	132	7	139	186	-47
55	0.42	0.40	0.17	0.78	0.18	0.07	0.86	53	1.26	1.63	65	63	90	3.5	42	0.013	0.008	9.62	0.91	89	63	26	89	90	-1
56	0.20	0.40	0.08	0.85	0.18	0.04	0.88	46	1.33	1.73	50	56	76	3.0	36	0.013	0.014	7.07	0.83	79	56	23	79	76	3
57	0.60	0.40	0.24	0.74	0.18	0.11	0.84	46	1.33	1.73	50	49	73	3.0	36	0.013	0.014	7.07	0.83	78	49	29	78	73	5
58	0.44	0.40	0.18	0.79	0.18	0.08	0.86	38	1.45	1.89	34	39	55	3.0	36	0.013	0.014	7.07	0.83	79	39	40	79	55	23
59	0.60	0.40	0.24	0.75	0.18	0.11	0.85	39	1.45	1.89	34	37	55	3.0	36	0.013	0.016	7.07	0.83	84	37	46	84	55	29
60	0.32	0.40	0.13	0.81	0.18	0.06	0.87	54	1.24	1.61	69	69	96	3.5	42	0.013	0.014	9.62	0.91	117	69	49	117	96	21
61	0.75	0.40	0.30	0.71	0.18	0.13	0.84	39	1.45	1.89	34	36	54	3.0	36	0.013	0.018	7.07	0.83	90	36	54	90	54	35
62	0.27	0.40	0.11	0.81	0.18	0.05	0.87	70	1.10	1.43	114	102	142	4.0	48	0.013	0.015	12.57	1.00	174	102	71	174	142	32
63	0.59	0.40	0.23	0.74	0.18	0.11	0.85	46	1.33	1.73	50	49	73	3.0	36	0.013	0.014	7.07	0.83	78	49	29	78	73	5
64	0.62	0.40	0.25	0.71	0.18	0.11	0.83	58	1.20	1.55	80	68	103	3.5	42	0.013	0.015	9.62	0.91	124	68	56	124	103	20
65	0.60	0.40	0.24	0.74	0.18	0.11	0.84	46	1.33	1.73	50	49	73	3.0	36	0.013	0.015	7.07	0.83	82	49	32	82	73	8
66	0.60	0.40	0.24	0.72	0.18	0.11	0.84	59	1.19	1.55	81	69	105	3.5	42	0.013	0.014	9.62	0.91	120	69	51	120	105	15
67	0.60	0.40	0.24	0.73	0.18	0.11	0.84	49	1.30	1.69	56	53	79	3.0	36	0.013	0.014	7.07	0.83	80	53	27	80	79	1
68	0.60	0.40	0.24	0.71	0.18	0.11	0.84	62	1.16	1.51	90	75	114	3.5	42	0.013	0.016	9.62	0.91	128	75	53	128	114	14
69	0.60	0.40	0.24	0.74	0.18	0.11	0.84	46	1.33	1.74	49	49	72	3.0	36	0.013	0.01	7.07	0.83	67	49	19	67	72	-5
70	0.60	0.40	0.24	0.72	0.18	0.11	0.84	59	1.20	1.55	80	69	104	3.5	42	0.013	0.015	9.62	0.91	124	69	55	124	104	20

AOS 1 Rational Method Calculations

	RATIONAL METHOD													MANNING'S EQUATION						25-Year			100-Year		
		AMC II			AMC III																				
Basin ID	Ap	Fp	Fm	C_{25yr}	Fp	Fm	C_{100yr}	Tc (min)	i_{25yr} (in/hr)	i_{100yr} (in/hr)	A (ac)	Q_{runoff_25yr} (cfs)	Q_{runoff_100yr} (cfs)	Diameter (ft)	Diameter (in.)	n	Slope (ft/ft)	A Pipe (ft^2)	R Pipe (ft)	Q-capacity (cfs)	Q-calculated (cfs)	Q-difference (cfs)	Q-capacity (cfs)	Q-calculated (cfs)	Q-difference (cfs)
71	0.60	0.40	0.24	0.75	0.18	0.11	0.85	39	1.43	1.87	36	38	57	3.0	36	0.013	0.005	7.07	0.83	49	38	10	49	57	-8
72	0.42	0.40	0.17	0.79	0.18	0.08	0.86	42	1.40	1.82	40	44	63	3.0	36	0.013	0.018	7.07	0.83	90	44	46	90	63	27
73	0.48	0.40	0.19	0.75	0.18	0.09	0.85	59	1.19	1.55	81	73	107	3.5	42	0.013	0.016	9.62	0.91	128	73	55	128	107	21
74	0.32	0.40	0.13	0.80	0.18	0.06	0.87	59	1.20	1.55	80	77	108	3.5	42	0.013	0.012	9.62	0.91	109	77	32	109	108	1
75	0.60	0.40	0.24	0.75	0.18	0.11	0.85	41	1.40	1.83	39	41	61	3.0	36	0.013	0.016	7.07	0.83	86	41	44	86	61	25
76	0.59	0.40	0.23	0.72	0.18	0.11	0.84	59	1.20	1.55	80	69	104	3.5	42	0.013	0.014	9.62	0.91	118	69	49	118	104	14
77	0.60	0.40	0.24	0.72	0.18	0.11	0.84	59	1.19	1.55	81	69	105	3.5	42	0.013	0.015	9.62	0.91	124	69	55	124	105	19
78	0.40	0.40	0.16	0.78	0.18	0.07	0.86	58	1.20	1.56	79	74	106	3.5	42	0.013	0.013	9.62	0.91	113	74	39	113	106	7
79	0.60	0.40	0.24	0.72	0.18	0.11	0.84	59	1.19	1.55	80	69	104	3.5	42	0.013	0.012	9.62	0.91	109	69	40	109	104	5
80	0.50	0.40	0.20	0.72	0.18	0.09	0.84	83	1.02	1.32	160	118	177	5.0	60	0.013	0.005	19.63	1.16	184	118	66	184	177	7
81	0.41	0.40	0.16	0.76	0.18	0.07	0.85	83	1.02	1.32	159	123	179	5.0	60	0.013	0.005	19.63	1.16	184	123	61	184	179	5
82	0.48	0.40	0.19	0.72	0.18	0.09	0.84	102	0.93	1.20	240	160	242	5.5	66	0.013	0.006	23.76	1.24	249	160	89	249	242	7
83	0.51	0.40	0.20	0.69	0.18	0.09	0.83	119	0.87	1.12	330	197	305	6.0	72	0.013	0.006	28.27	1.31	328	197	131	328	305	23
84	0.53	0.40	0.21	0.67	0.18	0.09	0.82	133	0.83	1.06	410	227	358	6.0	72	0.013	0.007	28.27	1.31	362	227	135	362	358	4
85	0.54	0.40	0.21	0.66	0.18	0.10	0.82	142	0.80	1.03	470	248	395	6.5	78	0.013	0.006	33.18	1.38	406	248	158	406	395	11
86	0.54	0.40	0.22	0.66	0.18	0.10	0.81	145	0.79	1.02	490	255	408	6.5	78	0.013	0.006	33.18	1.38	419	255	164	419	408	12
87	0.20	0.40	0.08	0.85	0.18	0.04	0.88	42	1.40	1.82	40	48	65	3.0	36	0.013	0.014	7.07	0.83	79	48	32	79	65	15
88	0.55	0.40	0.22	0.76	0.18	0.10	0.85	40	1.42	1.85	38	41	59	3.0	36	0.013	0.012	7.07	0.83	73	41	33	73	59	14
89	0.60	0.40	0.24	0.75	0.18	0.11	0.85	39	1.43	1.87	36	39	57	3.0	36	0.013	0.013	7.07	0.83	76	39	38	76	57	20
90	0.60	0.40	0.24	0.75	0.18	0.11	0.85	42	1.39	1.82	41	42	62	3.0	36	0.013	0.016	7.07	0.83	84	42	42	84	62	22
91	0.48	0.40	0.19	0.76	0.18	0.09	0.85	58	1.20	1.56	79	72	105	3.5	42	0.013	0.012	9.62	0.91	111	72	39	111	105	6
92	0.48	0.40	0.19	0.76	0.18	0.09	0.85	59	1.19	1.55	80	73	106	3.5	42	0.013	0.014	9.62	0.91	119	73	46	119	106	13
93	0.48	0.40	0.19	0.73	0.18	0.09	0.84	83	1.02	1.32	160	120	178	4.5	54	0.013	0.008	15.90	1.08	176	120	56	176	178	-2
94	0.47	0.40	0.19	0.72	0.18	0.08	0.84	97	0.95	1.23	220	151	227	5.5	66	0.013	0.005	23.76	1.24	228	151	77	228	227	1
95	0.44	0.40	0.18	0.73	0.18	0.08	0.84	102	0.93	1.20	240	164	243	5.5	66	0.013	0.006	23.76	1.24	260	164	96	260	243	17
96	0.49	0.40	0.20	0.75	0.18	0.09	0.85	59	1.19	1.55	81	72	106	3.5	42	0.013	0.012	9.62	0.91	110	72	38	110	106	4
97	0.50	0.40	0.20	0.73	0.18	0.09	0.84	71	1.10	1.42	117	95	141	4.0	48	0.013	0.014	12.57	1.00	171	95	76	171	141	30
98	0.48	0.40	0.19	0.76	0.18	0.09	0.85	59	1.20	1.55	80	72	105	4.0	48	0.013	0.012	12.57	1.00	156	72	84	156	105	51
99	0.39	0.40	0.15	0.77	0.18	0.07	0.86	70	1.10	1.43	115	98	141	4.0	48	0.013	0.026	12.57	1.00	233	98	135	233	141	92
100	0.20	0.40	0.08	0.84	0.18	0.04	0.88	59	1.20	1.55	80	80	109	3.5	42	0.013	0.014	9.62	0.91	117	80	37	117	109	8
101	0.60	0.40	0.24	0.72	0.18	0.11	0.84	60	1.19	1.54	83	70	107	3.5	42	0.013	0.02	9.62	0.91	142	70	72	142	107	36
102	0.56	0.40	0.22	0.71	0.18	0.10	0.83	77	1.06	1.37	138	104	158	4.0	48	0.013	0.016	12.57	1.00	184	104	81	184	158	27
103	0.60	0.40	0.24	0.72	0.18	0.11	0.84	59	1.19	1.55	81	69	105	3.5	42	0.013	0.017	9.62	0.91	133	69	64	133	105	28
104	0.60	0.40	0.24	0.70	0.18	0.11	0.83	77	1.06	1.37	136	101	155	4.5	54	0.013	0.016	15.90	1.08	248	101	148	248	155	93
105	0.60	0.40	0.24	0.72	0.18	0.11	0.84	59	1.19	1.54	82	70	106	3.5	42	0.013	0.018	9.62	0.91	134	70	64	134	106	28
106	0.58	0.40	0.23	0.70	0.18	0.10	0.83	83	1.02	1.32	162	115	177	4.5	54	0.013	0.017	15.90	1.08	256	115	142	256	177	80
107	0.60	0.40	0.24	0.70	0.18	0.11	0.83	76	1.06	1.37	136	100	155	4.5	54	0.013	0.018	15.90	1.08	260	100	160	260	155	106
108	0.61	0.40	0.24	0.72	0.18	0.11	0.84	59	1.19	1.55	80	69	104	3.5	42	0.013	0.018	9.62	0.91	136	69	68	136	104	32
109	0.60	0.40	0.24	0.70	0.18	0.11	0.83	76	1.06	1.38	135	100	154	4.5	54	0.013	0.017	15.90	1.08	255	100	155	255	154	100
110	0.60	0.40	0.24	0.72	0.18	0.11	0.84	59	1.19	1.55	81	70	105	3.5	42	0.013	0.017	9.62	0.91	132	70	62	132	105	27
111	0.60	0.40	0.24	0.70	0.18	0.11	0.83	78	1.05	1.36	141	103	159	4.5	54	0.013	0.016	15.90	1.08	252	103	149	252	159	93
112	0.50	0.40	0.20	0.76	0.18	0.09	0.85	51	1.27	1.65	62	59	86	3.5	42	0.013	0.018	9.62	0.91	134	59	74	134	86	47
115	0.10	0.40	0.04	0.87	0.18	0.02	0.89	72	1.09	1.41	120	113	151	4.0	48	0.013	0.016	12.57	1.00	179	113	66	179	151	29
116	0.46	0.40	0.19	0.78	0.18	0.08	0.86	40	1.42	1.85	38	42	60	3.0	36	0.013	0.015	7.07	0.83	80	42	38	80	60	20
117	0.54	0.40	0.22	0.74	0.18	0.10	0.84	60	1.18	1.54	84	73	109	3.5	42	0.013	0.015	9.62	0.91	125	73	52	125	109	16
118	0.44	0.40	0.17	0.75	0.18	0.08	0.85	73	1.08	1.40	125	102	149	4.0	48	0.013	0.016	12.57	1.00	183	102	81	183	149	34
119	0.31	0.40	0.13	0.82	0.18	0.06	0.87	36	1.49	1.94	30	37	52	3.0	36	0.013	0.016	7.07	0.83	83	37	46	83	52	32
120	0.36	0.40	0.14	0.81	0.18	0.06	0.87	39	1.43	1.87	36	42	59	3.0	36	0.013	0.014	7.07	0.83	79	42	37	79	59	21
121	0.46	0.40	0.18	0.78	0.18	0.08	0.86	46	1.34	1.74	49	51	73	3.0	36	0.013	0.014	7.07	0.83	79	51	29	79	73	6
122	0.44	0.40	0.18	0.78	0.18	0.08	0.86	50	1.29	1.67	58	58	83	3.5	42	0.013	0.014	9.62	0.91	120	58	62	120	83	37
123	0.60	0.40	0.24	0.76	0.18	0.11	0.85	32	1.56	2.04	25	29	43	3.0	36	0.013	0.021	7.07	0.83	98	29	68	98	43	55
124	0.21	0.40	0.08	0.85	0.18	0.04	0.88	44	1.36	1.77	45	52	71	3.0	36	0.013	0.013	7.07	0.83	77	52	25	77	71	7
125	0.21	0.40	0.08	0.85	0.18	0.04	0.88	44	1.36	1.77	46	53	71	3.0	36	0.013	0.015	7.07	0.83	81	53	29	81	71	10
126	0.24	0.40	0.10	0.84	0.18	0.04	0.88	44	1.36	1.77	46	52	71	3.0	36	0.013	0.016	7.07	0.83	84	52	32	84	71	13
127	0.52	0.40	0.21	0.76	0.18	0.09	0.85	44	1.36	1.77	46	47	69	3.0	36	0.013	0.015	7.07	0.83	82	47	34	82	69	13
128	0.20	0.40	0.08	0.85	0.18	0.04	0.88	45	1.35	1.76	47	53	72	3.0	36	0.013	0.012	7.07	0.83	73	53	20	73	72	1
129	0.20	0.40	0.08	0.84	0.18	0.04	0.88	59	1.19	1.55	81	81	110	3.5	42	0.013	0.015	9.62	0.91	123	81	42	123	110	13
130	0.16	0.40	0.07	0.84	0.18	0.03	0.88	75	1.07	1.39	131	118	160	4.0	48	0.013	0.013	12.57	1.00	162	118	44	162	160	2
131	0.20	0.40	0.08	0.84	0.18	0.04	0.88	59	1.19	1.55	81	81	110	3.5	42	0.013	0.013	9.62	0.91	114	81	33	114	110	3
132	0.16	0.40	0.07	0.84	0.18	0.03	0.88	75	1.07	1.38	131	119	160	4.0	48	0.013	0.02	12.57	1.00	201	119	83	201	160	41
133	0.36	0.40	0.15	0.79	0.18	0.07	0.86	59	1.19	1.55	81	76	108	3.5	42	0.013	0.013	9.62	0.91	117	76	41	117	108	9
134	0.27	0.40	0.11	0.81	0.18	0.05	0.87	74	1.07	1.39	129	112	156	4.0	48	0.013	0.019	12.57	1.00	200	112	88	200	156	44
135	0.56	0.40	0.22	0.73	0.18	0.10	0.84	59	1.20	1.55	80	70	104	3.5	42	0.013	0.012	9.62	0.91	112	70	42	112	104	8
136	0.41	0.40	0.16	0.77	0.18	0.07	0.85	72	1.09	1.42	119	100	144	4.0	48	0.013	0.013	12.57	1.00	165	100	65	165	144	21
137	0.24	0.40	0.10	0.83	0.18	0.04	0.88	59	1.19	1.55	80	80	109	3.5	42	0.013	0.016	9.62	0.91	126	80	47	126	109	17
138	0.19	0.40	0.08	0.84	0.18	0.03	0.88	72	1.09	1.42	119	109	148	4.0	48	0.013	0.013	12.57	1.00	165	109	56	165	148	17
139	0.49	0.40	0.20	0.75	0.18	0.09	0.85	59	1.20	1.55	80	72	105	3.5	42	0.013	0.014	9.62	0.91	121	72	49	121	105	16
140	0.45	0.40	0.18	0.75	0.18	0.08	0.85	71	1.10	1.42	118	97	142	4.0	48	0.013	0.017	12.57	1.00	187	97	90	187	142	45
141	0.49	0.40	0.20	0.75	0.18	0.09	0.85	59	1.19	1.55	81	72	106	3.5	42	0.013	0.014	9.62	0.91	118	72	45	118	106	12
142	0.49	0.40	0.20	0.74	0.18	0.09	0.84	72	1.09	1.41	121	98	144	4.0	48	0.013	0.018	12.57	1.00	191	98	93	191	144	46

AOS 1 Rational Method Calculations

	RATIONAL METHOD													MANNING'S EQUATION						25-Year			100-Year		
		AMC II			AMC III																				
Basin ID	Ap	Fp	Fm	C_{25yr}	Fp	Fm	C_{100yr}	Tc (min)	i_{25yr} (in/hr)	i_{100yr} (in/hr)	A (ac)	Q_{runoff_25yr} (cfs)	Q_{runoff_100yr} (cfs)	Diameter (ft)	Diameter (in.)	n	Slope (ft/ft)	A Pipe (ft^2)	R Pipe (ft)	Q-capacity (cfs)	Q-calculated (cfs)	Q-difference (cfs)	Q-capacity (cfs)	Q-calculated (cfs)	Q-difference (cfs)
143	0.41	0.40	0.16	0.76	0.18	0.07	0.85	72	1.09	1.41	121	101	145	4.0	48	0.013	0.014	12.57	1.00	169	101	69	169	145	24
144	0.45	0.40	0.18	0.76	0.18	0.08	0.85	59	1.19	1.55	81	74	107	3.5	42	0.013	0.014	9.62	0.91	120	74	46	120	107	13
145	0.10	0.40	0.04	0.88	0.18	0.02	0.89	31	1.59	2.07	23	32	43	3.0	36	0.013	0.005	7.07	0.83	47	32	15	47	43	5
146	0.10	0.40	0.04	0.87	0.18	0.02	0.89	42	1.39	1.82	41	50	66	3.0	36	0.013	0.015	7.07	0.83	80	50	31	80	66	15
147	0.10	0.40	0.04	0.87	0.18	0.02	0.89	58	1.20	1.56	79	83	110	3.5	42	0.013	0.013	9.62	0.91	116	83	33	116	110	6
148	0.10	0.40	0.04	0.87	0.18	0.02	0.89	53	1.25	1.63	65	71	95	3.5	42	0.013	0.014	9.62	0.91	121	71	49	121	95	26
149	0.34	0.37	0.14	0.82	0.17	0.06	0.87	39	1.44	1.88	35	41	57	3.0	36	0.013	0.018	7.07	0.83	89	41	47	89	57	31
150	0.60	0.40	0.24	0.75	0.18	0.11	0.85	42	1.38	1.80	42	43	64	3.0	36	0.013	0.008	7.07	0.83	59	43	16	59	64	-5
151	0.48	0.40	0.19	0.74	0.18	0.09	0.85	70	1.11	1.43	113	93	137	4.0	48	0.013	0.01	12.57	1.00	145	93	52	145	137	8
152	0.11	0.40	0.04	0.87	0.18	0.02	0.89	55	1.23	1.60	70	75	99	3.5	42	0.013	0.016	9.62	0.91	125	75	51	125	99	26
153	0.11	0.40	0.04	0.87	0.18	0.02	0.89	39	1.44	1.88	35	44	59	3.0	36	0.013	0.005	7.07	0.83	47	44	3	47	59	-11
154	0.60	0.40	0.24	0.74	0.18	0.11	0.85	44	1.36	1.77	46	46	68	3.0	36	0.013	0.016	7.07	0.83	83	46	38	83	68	15
155	0.60	0.40	0.24	0.75	0.18	0.11	0.85	39	1.44	1.88	35	38	56	3.0	36	0.013	0.015	7.07	0.83	83	38	45	83	56	27
156	0.20	0.39	0.08	0.86	0.18	0.04	0.88	32	1.57	2.05	24	32	44	3.0	36	0.013	0.016	7.07	0.83	84	32	51	84	44	40
157	0.60	0.40	0.24	0.75	0.18	0.11	0.85	42	1.39	1.81	41	43	63	3.5	42	0.013	0.013	9.62	0.91	116	43	73	116	63	53
158	0.60	0.40	0.24	0.72	0.18	0.11	0.84	56	1.22	1.59	72	64	96	4.0	48	0.013	0.02	12.57	1.00	203	64	139	203	96	107
159	0.60	0.40	0.24	0.72	0.18	0.11	0.84	59	1.19	1.55	81	69	105	4.0	48	0.013	0.016	12.57	1.00	179	69	110	179	105	74
160	0.56	0.40	0.23	0.71	0.18	0.10	0.84	73	1.09	1.41	123	95	144	4.5	54	0.013	0.018	15.90	1.08	265	95	170	265	144	120
161	0.46	0.40	0.18	0.79	0.18	0.08	0.86	36	1.49	1.95	30	35	50	3.0	36	0.013	0.021	7.07	0.83	96	35	61	96	50	46
162	0.60	0.40	0.24	0.76	0.18	0.11	0.85	35	1.51	1.97	29	33	48	3.0	36	0.013	0.019	7.07	0.83	93	33	60	93	48	45
163	0.60	0.40	0.24	0.76	0.18	0.11	0.85	34	1.52	1.99	28	32	47	3.0	36	0.013	0.019	7.07	0.83	91	32	60	91	47	45
164	0.39	0.40	0.16	0.82	0.18	0.07	0.87	23	1.82	2.38	13	19	26	3.0	36	0.013	0.019	7.07	0.83	91	19	73	91	26	65
165	0.53	0.40	0.21	0.77	0.18	0.10	0.85	40	1.42	1.86	37	40	59	3.0	36	0.013	0.019	7.07	0.83	91	40	51	91	59	33
166	0.54	0.40	0.21	0.76	0.18	0.10	0.85	42	1.39	1.81	42	44	64	3.0	36	0.013	0.019	7.07	0.83	92	44	48	92	64	28
167	0.42	0.40	0.17	0.78	0.18	0.08	0.86	52	1.26	1.64	63	62	89	3.5	42	0.013	0.017	9.62	0.91	133	62	71	133	89	44
168	0.37	0.40	0.15	0.79	0.18	0.07	0.86	60	1.18	1.54	84	78	111	4.0	48	0.013	0.017	12.57	1.00	188	78	110	188	111	77
169	0.39	0.40	0.16	0.77	0.18	0.07	0.86	70	1.11	1.44	112	96	138	4.5	54	0.013	0.015	15.90	1.08	240	96	144	240	138	102
170	0.55	0.40	0.22	0.73	0.18	0.10	0.84	62	1.17	1.52	88	76	113	3.5	42	0.013	0.018	9.62	0.91	136	76	61	136	113	24
171	0.49	0.40	0.20	0.72	0.18	0.09	0.84	87	1.00	1.29	175	127	190	4.0	48	0.013	0.018	12.57	1.00	194	127	67	194	190	4
172	0.43	0.40	0.17	0.79	0.18	0.08	0.86	42	1.39	1.81	42	46	65	3.0	36	0.013	0.016	7.07	0.83	85	46	39	85	65	20
173	0.44	0.40	0.17	0.77	0.18	0.08	0.85	59	1.19	1.54	82	75	108	3.5	42	0.013	0.018	9.62	0.91	136	75	61	136	108	28
174	0.36	0.40	0.14	0.77	0.18	0.06	0.86	84	1.02	1.32	162	128	183	4.5	54	0.013	0.016	15.90	1.08	250	128	122	250	183	67
175	0.29	0.40	0.12	0.83	0.18	0.05	0.87	42	1.39	1.81	41	47	65	3.0	36	0.013	0.017	7.07	0.83	87	47	40	87	65	22
176	0.36	0.40	0.14	0.79	0.18	0.06	0.86	59	1.19	1.55	81	77	108	3.5	42	0.013	0.019	9.62	0.91	138	77	62	138	108	30
177	0.60	0.40	0.24	0.72	0.18	0.11	0.84	59	1.19	1.55	81	69	105	3.5	42	0.013	0.019	9.62	0.91	137	69	68	137	105	32
178	0.60	0.40	0.24	0.72	0.18	0.11	0.84	60	1.18	1.53	84	72	108	3.5	42	0.013	0.019	9.62	0.91	138	72	66	138	108	30
179	0.60	0.40	0.24	0.70	0.18	0.11	0.83	74	1.08	1.40	126	95	146	4.0	48	0.013	0.017	12.57	1.00	190	95	95	190	146	44
180	0.16	0.40	0.06	0.85	0.18	0.03	0.88	69	1.11	1.44	111	104	140	4.0	48	0.013	0.013	12.57	1.00	164	104	60	164	140	24
181	0.20	0.39	0.08	0.85	0.18	0.04	0.88	51	1.28	1.66	60	65	87	3.5	42	0.013	0.014	9.62	0.91	118	65	53	118	87	30
184	0.23	0.40	0.09	0.83	0.18	0.04	0.88	59	1.20	1.55	80	80	109	3.5	42	0.013	0.015	9.62	0.91	123	80	43	123	109	14
185	0.35	0.40	0.14	0.79	0.18	0.06	0.86	59	1.19	1.55	80	76	108	3.5	42	0.013	0.016	9.62	0.91	126	76	50	126	108	18
186	0.38	0.40	0.15	0.77	0.18	0.07	0.86	72	1.09	1.41	120	101	145	4.5	54	0.013	0.017	15.90	1.08	260	101	159	260	145	115
187	0.10	0.40	0.04	0.86	0.18	0.02	0.89	80	1.04	1.34	150	134	179	4.5	54	0.013	0.011	15.90	1.08	210	134	75	210	179	31
188	0.10	0.40	0.04	0.87	0.18	0.02	0.89	76	1.06	1.38	134	123	164	4.5	54	0.013	0.007	15.90	1.08	165	123	41	165	164	1
189	0.10	0.40	0.04	0.86	0.18	0.02	0.89	94	0.97	1.25	205	171	227	5.0	60	0.013	0.008	19.63	1.16	233	171	62	233	227	6
190	0.10	0.40	0.04	0.86	0.18	0.02	0.89	109	0.90	1.16	277	215	286	5.5	66	0.013	0.008	23.76	1.24	291	215	76	291	286	5
191	0.10	0.40	0.04	0.86	0.18	0.02	0.88	134	0.82	1.06	417	293	391	6.5	78	0.013	0.008	33.18	1.38	465	293	172	465	391	75
192	0.49	0.40	0.20	0.76	0.18	0.09	0.85	52	1.26	1.64	64	61	89	3.5	42	0.013	0.015	9.62	0.91	122	61	61	122	89	33
193	0.48	0.40	0.19	0.76	0.18	0.09	0.85	53	1.25	1.63	65	62	90	3.5	42	0.013	0.014	9.62	0.91	121	62	59	121	90	31
194	0.48	0.40	0.19	0.76	0.18	0.09	0.85	54	1.24	1.62	67	64	92	3.5	42	0.013	0.017	9.62	0.91	130	64	67	130	92	38
195	0.30	0.40	0.12	0.83	0.18	0.05	0.88	32	1.57	2.05	24	32	44	3.0	36	0.013	0.015	7.07	0.83	80	32	49	80	44	37
196	0.31	0.40	0.12	0.83	0.18	0.06	0.88	31	1.59	2.07	23	30	42	3.0	36	0.013	0.017	7.07	0.83	88	30	58	88	42	46
197	0.53	0.40	0.21	0.73	0.18	0.10	0.84	67	1.13	1.46	103	85	127	4.0	48	0.013	0.015	12.57	1.00	174	85	89	174	127	47
198	0.53	0.40	0.21	0.73	0.18	0.09	0.84	67	1.12	1.46	105	86	129	4.0	48	0.013	0.015	12.57	1.00	176	86	90	176	129	48
199	0.31	0.40	0.12	0.83	0.18	0.06	0.87	34	1.53	1.99	27	34	47	3.0	36	0.013	0.018	7.07	0.83	89	34	54	89	47	41
200	0.53	0.40	0.21	0.73	0.18	0.09	0.84	68	1.12	1.45	107	88	131	4.0	48	0.013	0.016	12.57	1.00	181	88	93	181	131	50
201	0.31	0.40	0.12	0.83	0.18	0.05	0.88	35	1.52	1.98	28	35	48	3.0	36	0.013	0.025	7.07	0.83	105	35	71	105	48	57
202	0.52	0.40	0.21	0.70	0.18	0.09	0.83	104	0.92	1.19	249	160	246	5.0	60	0.013	0.014	19.63	1.16	304	160	143	304	246	57
203	0.60	0.40	0.24	0.77	0.18	0.11	0.85	29	1.64	2.15	20	25	36	3.0	36	0.013	0.014	7.07	0.83	79	25	54	79	36	43
204	0.31	0.40	0.12	0.83	0.18	0.06	0.87	35	1.50	1.96	29	36	50	3.0	36	0.013	0.015	7.07	0.83	81	36	45	81	50	31
205	0.36	0.40	0.15	0.79	0.18	0.07	0.86	54	1.24	1.61	69	68	96	3.5	42	0.013	0.016	9.62	0.91	128	68	60	128	96	32
206	0.41	0.40	0.16	0.77	0.18	0.07	0.86	62	1.16	1.51	91	81	117	4.0	48	0.013	0.014	12.57	1.00	168	81	87	168	117	51
207	0.35	0.40	0.14	0.80	0.18	0.06	0.87	49	1.29	1.68	57	59	83	3.5	42	0.013	0.013	9.62	0.91	113	59	54	113	83	30
208	0.20	0.40	0.08	0.84	0.18	0.04	0.88	58	1.20	1.56	79	80	109	3.5	42	0.013	0.016	9.62	0.91	126	80	46	126	109	17
209	0.24	0.40	0.10	0.81	0.18	0.04	0.87	91	0.98	1.27	194	154	213	5.5	66	0.013	0.005	23.76	1.24	237	154	84	237	213	24
210	0.27	0.40	0.11	0.79	0.18	0.05	0.86	109	0.90	1.17	274	197	276	6.0	72	0.013	0.005	28.27	1.31	299	197	103	299	276	23
211	0.32	0.40	0.13	0.77	0.18	0.06	0.85	124	0.85	1.10	355	232	333	6.0	72	0.013	0.006	28.27	1.31	333	232	101	333	333	0
212	0.58	0.40	0.23	0.77	0.18	0.10	0.86	30	1.62	2.12	21	26	38	3.0	36	0.013	0.006	7.07	0.83	52	26	25	52	38	14
213	0.34	0.40	0.14	0.75	0.18	0.06	0.85	131	0.83	1.07	400	249	363	6.0	72	0.013	0.007	28.27	1.31	364	249	115	364	363	2
214	0.35	0.40	0.14	0.75	0.18	0.06	0.85	134	0.82	1.06	419	258	376	6.5	78	0.013	0.006	33.18	1.38	403	258	145	403	376	27

AOS 1 Rational Method Calculations

	RATIONAL METHOD													MANNING'S EQUATION						25-Year			100-Year		
		AMC II			AMC III																				
Basin ID	Ap	Fp	Fm	C_{25yr}	Fp	Fm	C_{100yr}	Tc (min)	i_{25yr} (in/hr)	i_{100yr} (in/hr)	A (ac)	Q_{runoff_25yr} (cfs)	Q_{runoff_100yr} (cfs)	Diameter (ft)	Diameter (in.)	n	Slope (ft/ft)	A Pipe (ft^2)	R Pipe (ft)	Q-capacity (cfs)	Q-calculated (cfs)	Q-difference (cfs)	Q-capacity (cfs)	Q-calculated (cfs)	Q-difference (cfs)
215	0.60	0.40	0.24	0.73	0.18	0.11	0.84	51	1.28	1.66	60	56	84	3.5	42	0.013	0.016	9.62	0.91	129	56	73	129	84	45
216	0.60	0.40	0.24	0.72	0.18	0.11	0.84	55	1.23	1.60	70	62	94	3.5	42	0.013	0.016	9.62	0.91	126	62	64	126	94	32
217	0.61	0.41	0.24	0.71	0.18	0.11	0.83	62	1.17	1.52	88	73	112	3.5	42	0.013	0.013	9.62	0.91	113	73	40	113	112	1
218	0.60	0.41	0.24	0.69	0.18	0.11	0.83	82	1.02	1.33	158	111	173	4.0	48	0.013	0.007	12.57	1.00	120	111	9	120	173	-53
221	0.60	0.40	0.24	0.71	0.18	0.11	0.83	68	1.12	1.45	107	85	129	4.5	54	0.013	0.015	15.90	1.08	243	85	158	243	129	113
222	0.60	0.40	0.24	0.72	0.18	0.11	0.84	55	1.23	1.60	71	63	95	3.5	42	0.013	0.005	9.62	0.91	71	63	8	71	95	-24
223	0.67	0.40	0.27	0.70	0.18	0.12	0.83	58	1.20	1.56	79	66	102	3.5	42	0.013	0.017	9.62	0.91	129	66	63	129	102	27
224	0.60	0.40	0.24	0.72	0.18	0.11	0.84	57	1.21	1.58	75	66	99	3.5	42	0.013	0.005	9.62	0.91	71	66	5	71	99	-28
225	0.60	0.40	0.24	0.71	0.18	0.11	0.83	69	1.11	1.44	110	86	132	4.5	54	0.013	0.015	15.90	1.08	245	86	158	245	132	112
227	0.60	0.40	0.24	0.75	0.18	0.11	0.85	39	1.44	1.88	35	38	56	3.0	36	0.013	0.015	7.07	0.83	81	38	43	81	56	25
228	0.60	0.40	0.24	0.72	0.18	0.11	0.84	59	1.20	1.55	80	69	104	3.5	42	0.013	0.017	9.62	0.91	130	69	61	130	104	26
229	0.60	0.40	0.24	0.75	0.18	0.11	0.85	39	1.43	1.87	36	39	57	3.0	36	0.013	0.015	7.07	0.83	81	39	43	81	57	24
230	0.60	0.40	0.24	0.72	0.18	0.11	0.84	59	1.20	1.55	80	69	104	3.5	42	0.013	0.015	9.62	0.91	123	69	55	123	104	20
231	0.60	0.40	0.24	0.70	0.18	0.11	0.83	71	1.10	1.42	117	90	139	4.5	54	0.013	0.015	15.90	1.08	241	90	151	241	139	103
232	0.60	0.40	0.24	0.72	0.18	0.11	0.84	59	1.19	1.55	81	69	105	3.5	42	0.013	0.005	9.62	0.91	71	69	2	71	105	-34
233	0.60	0.40	0.24	0.69	0.18	0.11	0.83	83	1.02	1.32	161	113	176	4.5	54	0.013	0.015	15.90	1.08	243	113	130	243	176	67
234	0.10	0.40	0.04	0.87	0.18	0.02	0.89	82	1.03	1.33	155	138	184	5.0	60	0.013	0.005	19.63	1.16	189	138	51	189	184	6
235	0.10	0.40	0.04	0.86	0.18	0.02	0.89	101	0.94	1.21	235	190	252	5.5	66	0.013	0.006	23.76	1.24	260	190	70	260	252	8
236	0.10	0.40	0.04	0.86	0.18	0.02	0.89	117	0.87	1.13	318	239	318	6.0	72	0.013	0.006	28.27	1.31	328	239	89	328	318	10
237	0.10	0.40	0.04	0.85	0.18	0.02	0.88	144	0.80	1.03	479	326	435	6.5	78	0.013	0.026	33.18	1.38	851	326	525	851	435	416
238	0.48	0.40	0.19	0.74	0.18	0.09	0.85	72	1.09	1.41	120	97	144	4.5	54	0.013	0.019	15.90	1.08	269	97	172	269	144	126
239	0.42	0.40	0.17	0.77	0.18	0.08	0.86	59	1.20	1.55	80	74	106	3.5	42	0.013	0.015	9.62	0.91	124	74	50	124	106	18
240	0.33	0.40	0.13	0.82	0.18	0.06	0.87	36	1.49	1.95	30	37	51	3.0	36	0.013	0.016	7.07	0.83	83	37	47	83	51	32
241	0.67	0.40	0.27	0.75	0.18	0.12	0.85	30	1.62	2.12	21	26	38	4.0	48	0.013	0.008	12.57	1.00	128	26	102	128	38	90
242	0.53	0.40	0.21	0.76	0.18	0.10	0.85	41	1.41	1.84	39	42	61	3.0	36	0.013	0.02	7.07	0.83	95	42	54	95	61	35
243	0.62	0.40	0.25	0.73	0.18	0.11	0.84	47	1.32	1.72	52	50	75	3.5	42	0.013	0.038	9.62	0.91	196	50	146	196	75	121
244	0.60	0.40	0.24	0.72	0.18	0.11	0.84	56	1.22	1.58	73	65	98	4.0	48	0.013	0.019	12.57	1.00	196	65	131	196	98	98
245	0.35	0.40	0.14	0.80	0.18	0.06	0.86	55	1.23	1.60	70	69	97	4.0	48	0.013	0.016	12.57	1.00	184	69	116	184	97	87
246	0.50	0.40	0.20	0.70	0.18	0.09	0.83	114	0.88	1.14	303	186	286	5.5	66	0.013	0.019	23.76	1.24	459	186	273	459	286	173
247	0.37	0.40	0.15	0.81	0.18	0.07	0.87	39	1.44	1.88	35	41	58	3.0	36	0.013	0.015	7.07	0.83	81	41	39	81	58	23
248	0.47	0.40	0.19	0.77	0.18	0.09	0.85	52	1.27	1.65	62	60	87	3.5	42	0.013	0.02	9.62	0.91	141	60	81	141	87	54
249	0.50	0.40	0.20	0.75	0.18	0.09	0.85	59	1.19	1.55	81	72	106	4.0	48	0.013	0.019	12.57	1.00	199	72	126	199	106	92
250	0.52	0.40	0.21	0.77	0.18	0.09	0.86	39	1.44	1.88	35	39	56	3.0	36	0.013	0.017	7.07	0.83	87	39	48	87	56	31
251	0.56	0.40	0.22	0.74	0.18	0.10	0.85	51	1.27	1.65	62	58	86	3.5	42	0.013	0.014	9.62	0.91	121	58	63	121	86	35
252	0.53	0.40	0.21	0.74	0.18	0.09	0.84	59	1.20	1.55	80	71	105	4.0	48	0.013	0.018	12.57	1.00	194	71	123	194	105	89
253	0.51	0.40	0.20	0.73	0.18	0.09	0.84	70	1.10	1.43	114	92	137	4.5	54	0.013	0.017	15.90	1.08	260	92	167	260	137	122
254	0.52	0.40	0.21	0.73	0.18	0.09	0.84	73	1.08	1.40	124	98	146	5.0	60	0.013	0.024	19.63	1.16	401	98	303	401	146	255
255	0.45	0.40	0.18	0.79	0.18	0.08	0.86	39	1.44	1.88	35	40	57	3.0	36	0.013	0.016	7.07	0.83	84	40	45	84	57	28
256	0.52	0.40	0.21	0.75	0.18	0.09	0.85	51	1.27	1.66	61	58	85	3.5	42	0.013	0.014	9.62	0.91	118	58	60	118	85	33
257	0.49	0.40	0.19	0.75	0.18	0.09	0.85	59	1.20	1.55	80	72	105	4.0	48	0.013	0.022	12.57	1.00	212	72	140	212	105	107
258	0.42	0.40	0.17	0.80	0.18	0.07	0.86	39	1.44	1.88	35	40	57	3.0	36	0.013	0.015	7.07	0.83	81	40	41	81	57	24
259	0.50	0.40	0.20	0.76	0.18	0.09	0.85	51	1.28	1.66	60	58	85	3.5	42	0.013	0.012	9.62	0.91	112	58	54	112	85	27
260	0.45	0.40	0.18	0.79	0.18	0.08	0.86	39	1.44	1.88	35	40	57	3.0	36	0.013	0.016	7.07	0.83	84	40	43	84	57	26
261	0.49	0.40	0.20	0.76	0.18	0.09	0.85	50	1.28	1.67	59	58	84	3.5	42	0.013	0.013	9.62	0.91	116	58	59	116	84	33

AOS 2 Rational Method Calculations

	RATIONAL METHOD													MANNING'S EQUATION						25-Year			100-Year		
		AMC II			AMC III																				
Basin ID	Ap	Fp	Fm	C_{25yr}	Fp	Fm	C_{100yr}	Tc (min)	i_{25yr} (in/hr)	i_{100yr} (in/hr)	A (ac)	Q_{runoff_25yr} (cfs)	Q_{runoff_100yr} (cfs)	Diameter (ft)	Diameter (in.)	n	Slope (ft/ft)	A Pipe (ft^2)	R Pipe (ft)	Q-capacity (cfs)	Q-calculated (cfs)	Q-difference (cfs)	Q-capacity (cfs)	Q-calculated (cfs)	Q-difference (cfs)
1	0.10	0.40	0.04	0.88	0.18	0.02	0.89	27	1.44	1.87	30	38	50	3	36	0.013	0.012	7.07	0.83	72	38	34	72	50	22
2	0.10	0.40	0.04	0.87	0.18	0.02	0.89	38	1.23	1.59	59	64	84	3.5	42	0.013	0.015	9.62	0.91	123	64	60	123	84	39
3	0.15	0.40	0.06	0.85	0.18	0.03	0.88	52	1.06	1.36	111	100	134	4	48	0.013	0.009	12.57	1.00	139	100	39	139	134	5
4	0.13	0.40	0.05	0.85	0.18	0.02	0.88	68	0.93	1.19	193	153	203	4.5	54	0.013	0.014	15.90	1.08	237	153	84	237	203	33
5	0.10	0.40	0.04	0.87	0.18	0.02	0.89	27	1.43	1.86	31	38	51	3	36	0.013	0.012	7.07	0.83	72	38	33	72	51	21
6	0.10	0.40	0.04	0.87	0.18	0.02	0.89	38	1.23	1.58	60	64	84	3.5	42	0.013	0.013	9.62	0.91	117	64	53	117	84	32
7	0.10	0.40	0.04	0.87	0.18	0.02	0.89	47	1.11	1.44	90	87	114	4	48	0.013	0.013	12.57	1.00	162	87	76	162	114	48
8	0.10	0.40	0.04	0.87	0.18	0.02	0.89	29	1.40	1.82	34	41	55	3	36	0.013	0.014	7.07	0.83	78	41	36	78	55	23
9	0.10	0.40	0.04	0.87	0.18	0.02	0.89	40	1.20	1.55	65	68	89	3.5	42	0.013	0.013	9.62	0.91	115	68	47	115	89	26
10	0.10	0.40	0.04	0.87	0.18	0.02	0.89	53	1.05	1.35	116	105	139	4	48	0.013	0.013	12.57	1.00	167	105	61	167	139	27
11	0.10	0.40	0.04	0.86	0.18	0.02	0.89	62	0.98	1.26	156	132	174	4.5	54	0.013	0.014	15.90	1.08	231	132	99	231	174	56
12	0.10	0.40	0.04	0.87	0.18	0.02	0.89	29	1.39	1.80	35	43	56	3	36	0.013	0.015	7.07	0.83	82	43	39	82	56	25
13	0.10	0.40	0.04	0.87	0.18	0.02	0.89	40	1.20	1.55	65	68	90	3.5	42	0.013	0.012	9.62	0.91	110	68	42	110	90	20
14	0.10	0.40	0.04	0.87	0.18	0.02	0.89	53	1.05	1.35	115	104	138	4	48	0.013	0.013	12.57	1.00	166	104	61	166	138	28
15	0.10	0.40	0.04	0.86	0.18	0.02	0.89	69	0.93	1.19	195	156	206	5	60	0.013	0.013	19.63	1.16	296	156	140	296	206	90
16	0.10	0.40	0.04	0.87	0.18	0.02	0.89	30	1.38	1.78	36	44	58	3	36	0.013	0.014	7.07	0.83	78	44	35	78	58	21
17	0.10	0.40	0.04	0.87	0.18	0.02	0.89	40	1.19	1.54	68	70	92	3.5	42	0.013	0.013	9.62	0.91	113	70	43	113	92	21
18	0.10	0.40	0.04	0.87	0.18	0.02	0.89	50	1.08	1.39	104	97	128	4	48	0.013	0.013	12.57	1.00	165	97	68	165	128	37
19	0.10	0.40	0.04	0.87	0.18	0.02	0.89	54	1.04	1.34	118	107	141	4.5	54	0.013	0.014	15.90	1.08	235	107	128	235	141	94
20	0.10	0.40	0.04	0.86	0.18	0.02	0.89	71	0.92	1.18	206	163	215	5	60	0.013	0.016	19.63	1.16	327	163	164	327	215	112
21	0.10	0.40	0.04	0.87	0.18	0.02	0.89	30	1.38	1.78	36	44	58	3	36	0.013	0.015	7.07	0.83	82	44	38	82	58	24
22	0.10	0.40	0.04	0.87	0.18	0.02	0.89	40	1.19	1.54	67	70	92	3.5	42	0.013	0.016	9.62	0.91	126	70	56	126	92	34
23	0.10	0.40	0.04	0.87	0.18	0.02	0.89	50	1.08	1.39	103	96	127	4	48	0.013	0.014	12.57	1.00	168	96	72	168	127	41
24	0.10	0.40	0.04	0.87	0.18	0.02	0.89	31	1.36	1.76	39	46	60	3	36	0.013	0.009	7.07	0.83	65	46	19	65	60	4
25	0.10	0.40	0.04	0.87	0.18	0.02	0.89	43	1.15	1.49	77	78	102	3.5	42	0.013	0.013	9.62	0.91	116	78	39	116	102	14
26	0.10	0.40	0.04	0.87	0.18	0.02	0.89	53	1.05	1.35	118	107	141	4	48	0.013	0.012	12.57	1.00	154	107	48	154	141	13
27	0.17	0.40	0.07	0.84	0.18	0.03	0.88	62	0.97	1.25	159	129	174	4.5	54	0.013	0.01	15.90	1.08	197	129	68	197	174	23
28	0.10	0.40	0.04	0.87	0.18	0.02	0.89	32	1.34	1.73	42	48	64	3	36	0.013	0.013	7.07	0.83	76	48	28	76	64	12
29	0.24	0.40	0.10	0.82	0.18	0.04	0.87	45	1.14	1.47	82	77	105	3.5	42	0.013	0.011	9.62	0.91	104	77	27	104	105	-1
30	0.25	0.40	0.10	0.81	0.18	0.05	0.87	54	1.04	1.33	123	103	142	4	48	0.013	0.01	12.57	1.00	146	103	43	146	142	4
31	0.10	0.40	0.04	0.87	0.18	0.02	0.89	33	1.31	1.70	44	51	67	3	36	0.013	0.013	7.07	0.83	76	51	25	76	67	8
32	0.22	0.40	0.09	0.83	0.18	0.04	0.88	45	1.13	1.46	84	79	108	3.5	42	0.013	0.011	9.62	0.91	105	79	26	105	108	-3
33	0.33	0.40	0.13	0.79	0.18	0.06	0.86	55	1.03	1.33	125	101	143	4	48	0.013	0.011	12.57	1.00	148	101	47	148	143	6
34	0.10	0.40	0.04	0.87	0.18	0.02	0.89	28	1.42	1.84	32	40	53	3	36	0.013	0.012	7.07	0.83	73	40	34	73	53	21
35	0.10	0.40	0.04	0.87	0.18	0.02	0.89	39	1.21	1.56	63	67	88	3.5	42	0.013	0.012	9.62	0.91	111	67	44	111	88	23
36	0.10	0.40	0.04	0.87	0.18	0.02	0.89	44	1.15	1.48	79	79	104	3.5	42	0.013	0.012	9.62	0.91	110	79	31	110	104	6
37	0.41	0.40	0.16	0.78	0.18	0.07	0.86	37	1.23	1.60	58	56	79	3.5	42	0.013	0.009	9.62	0.91	94	56	38	94	79	14
38	0.45	0.40	0.18	0.75	0.18	0.08	0.85	52	1.06	1.36	111	88	128	4	48	0.013	0.019	12.57	1.00	197	88	109	197	128	69

AOS 3 Rational Method Calculations

	RATIONAL METHOD													MANNING'S EQUATION						25-Year			100-Year		
		AMC II			AMC III																				
Basin ID	Ap	Fp	Fm	C	Fp	Fm	C	Tc (min)	i_{25yr} (in/hr)	i_{100yr} (in/hr)	A (ac)	Q_{runoff_25yr} (cfs)	Q_{runoff_100yr} (cfs)	Diameter (ft)	Diameter (in.)	n	Slope (ft/ft)	A Pipe (ft^2)	R Pipe (ft)	Q-capacity (cfs)	Q-calculated (cfs)	Q-difference (cfs)	Q-capacity (cfs)	Q-calculated (cfs)	Q-difference (cfs)
1	0.50	0.40	0.20	0.83	0.18	0.09	0.89	15	2.50	3.18	39	81	110	3	36	0.013	0.023	7.07	0.83	102	81	21	102	110	-8
2	0.53	0.40	0.21	0.82	0.18	0.10	0.89	16	2.44	3.10	44	88	121	3	36	0.013	0.033	7.07	0.83	121	88	33	121	121	0
3	0.20	0.40	0.08	0.87	0.18	0.04	0.90	19	2.29	2.92	59	117	153	3.5	42	0.013	0.02	9.62	0.91	141	117	24	141	153	-13
4	0.23	0.40	0.09	0.87	0.18	0.04	0.90	17	2.41	3.07	46	97	127	3.5	42	0.013	0.013	9.62	0.91	116	97	19	116	127	-12
5	0.34	0.40	0.14	0.85	0.18	0.06	0.89	15	2.53	3.22	37	80	106	3.5	42	0.013	0.012	9.62	0.91	111	80	31	111	106	5
6	0.50	0.40	0.20	0.83	0.18	0.09	0.89	16	2.44	3.11	44	88	120	3	36	0.013	0.019	7.07	0.83	91	88	3	91	120	-29
7	0.37	0.40	0.15	0.85	0.18	0.07	0.89	13	2.69	3.43	28	63	84	3	36	0.013	0.019	7.07	0.83	91	63	28	91	84	7
8	0.49	0.40	0.19	0.83	0.18	0.09	0.89	16	2.44	3.11	44	88	120	3	36	0.013	0.021	7.07	0.83	96	88	8	96	120	-24
9	0.20	0.40	0.08	0.87	0.18	0.04	0.90	11	2.84	3.62	21	53	69	3	36	0.013	0.028	7.07	0.83	113	53	60	113	69	43
10	0.16	0.40	0.07	0.87	0.18	0.03	0.90	18	2.35	2.99	52	107	140	3.5	42	0.013	0.025	9.62	0.91	159	107	52	159	140	19
11	0.61	0.40	0.24	0.81	0.18	0.11	0.88	17	2.38	3.02	50	95	132	3.5	42	0.013	0.027	9.62	0.91	166	95	71	166	132	34
12	0.34	0.40	0.13	0.85	0.18	0.06	0.89	17	2.40	3.06	47	96	128	3.5	42	0.013	0.031	9.62	0.91	177	96	81	177	128	48
13	0.20	0.40	0.08	0.87	0.18	0.04	0.90	17	2.41	3.07	46	97	128	3.5	42	0.013	0.026	9.62	0.91	163	97	66	163	128	35
14	0.34	0.40	0.14	0.85	0.18	0.06	0.89	19	2.30	2.93	57	112	150	3.5	42	0.013	0.015	9.62	0.91	124	112	12	124	150	-26
15	0.50	0.40	0.20	0.83	0.18	0.09	0.89	14	2.61	3.32	32	69	94	4	48	0.013	0.031	12.57	1.00	254	69	185	254	94	160
16	0.51	0.40	0.20	0.82	0.18	0.09	0.89	18	2.36	3.00	52	100	137	4	48	0.013	0.019	12.57	1.00	198	100	97	198	137	60
17	0.22	0.40	0.09	0.86	0.18	0.04	0.90	27	1.95	2.48	125	210	278	4.5	54	0.013	0.018	15.90	1.08	265	210	56	265	278	-13
18	0.32	0.40	0.13	0.85	0.18	0.06	0.89	17	2.40	3.05	47	97	129	4	48	0.013	0.032	12.57	1.00	257	97	160	257	129	128
19	0.45	0.40	0.18	0.83	0.18	0.08	0.89	17	2.38	3.03	49	97	132	4	48	0.013	0.029	12.57	1.00	245	97	148	245	132	113
20	0.29	0.40	0.12	0.85	0.18	0.05	0.89	21	2.18	2.77	74	138	185	4	48	0.013	0.025	12.57	1.00	228	138	90	228	185	43
21	0.50	0.40	0.20	0.83	0.18	0.09	0.89	16	2.47	3.14	41	84	115	4	48	0.013	0.027	12.57	1.00	236	84	152	236	115	121
22	0.42	0.40	0.17	0.82	0.18	0.08	0.89	31	1.86	2.36	159	242	333	4.5	54	0.013	0.029	15.90	1.08	335	242	93	335	333	2
23	0.50	0.40	0.20	0.84	0.18	0.09	0.89	10	3.03	3.86	16	40	54	4.5	54	0.013	0.021	15.90	1.08	287	40	247	287	54	233
24	0.51	0.40	0.20	0.82	0.18	0.09	0.89	21	2.21	2.81	70	126	174	4.5	54	0.013	0.03	15.90	1.08	341	126	215	341	174	168
25	0.24	0.40	0.10	0.85	0.18	0.04	0.90	39	1.68	2.13	254	362	485	6.5	78	0.013	0.016	33.18	1.38	654	362	293	654	485	170

Intensity-Duration Curves for Each Basin based on NOAA Atlas 14 Precipitation Intensity Data

AOS 1

Duration	Duration (mins)	25 year (in/hr)	100 year (in/hr)
5-min:	5	3.72	4.9
10-min:	10	2.67	3.51
15-min:	15	2.15	2.83
30-min:	30	1.61	2.12
60-min:	60	1.2	1.58
2-hr:	120	0.869	1.12
3-hr:	180	0.727	0.926
6-hr:	360	0.523	0.658
12-hr:	720	0.35	0.436
24-hr:	1440	0.245	0.305
2-day:	2880	0.16	0.202
3-day:	4320	0.121	0.156
4-day:	5760	0.101	0.131
7-day:	10080	0.069	0.09
10-day:	14400	0.053	0.071
20-day:	28800	0.033	0.045
30-day:	43200	0.026	0.036
45-day:	64800	0.021	0.028
60-day:	86400	0.018	0.024

Equations: $y = 7.5633x^{-0.453}$ $y = 10.229x^{-0.463}$

AOS 2

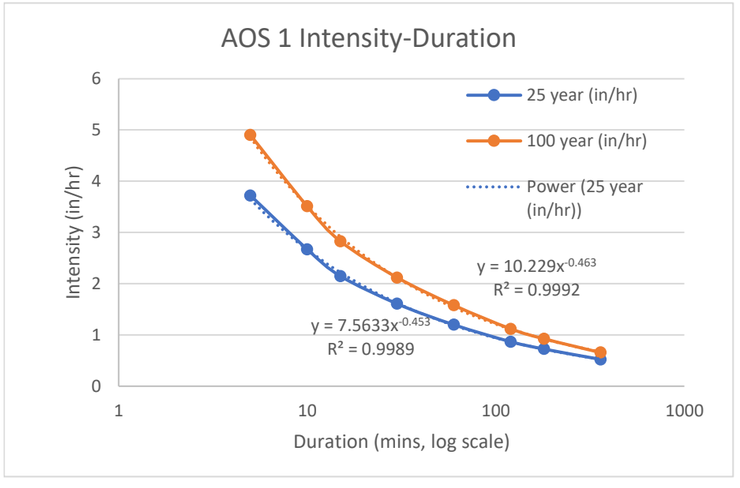
Duration (mins)	25 year (in/hr)	100 year (in/hr)
5	3.19	4.18
10	2.29	2.99
15	1.84	2.41
30	1.38	1.81
60	1.02	1.33
120	0.718	0.918
180	0.593	0.752
360	0.415	0.52
720	0.274	0.341
1440	0.191	0.237
2880	0.122	0.155
4320	0.093	0.119
5760	0.078	0.1
10080	0.053	0.07
14400	0.042	0.055
28800	0.026	0.035
43200	0.021	0.028
64800	0.016	0.022
5	0.014	0.019

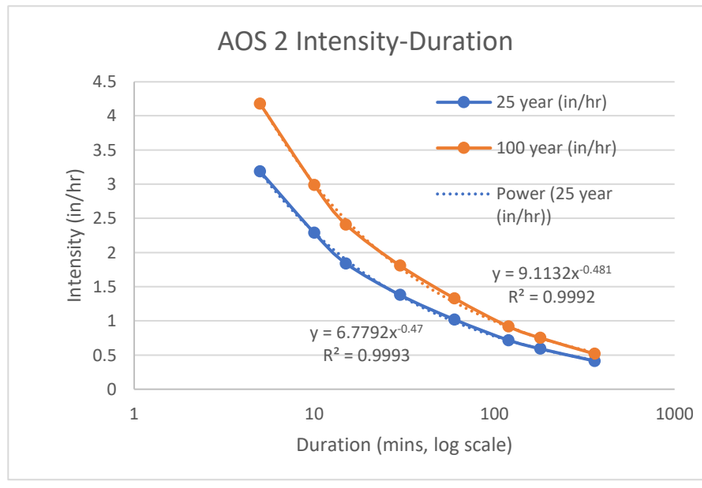
Equations: $y = 6.7792x^{-0.47}$ $y = 9.1132x^{-0.481}$

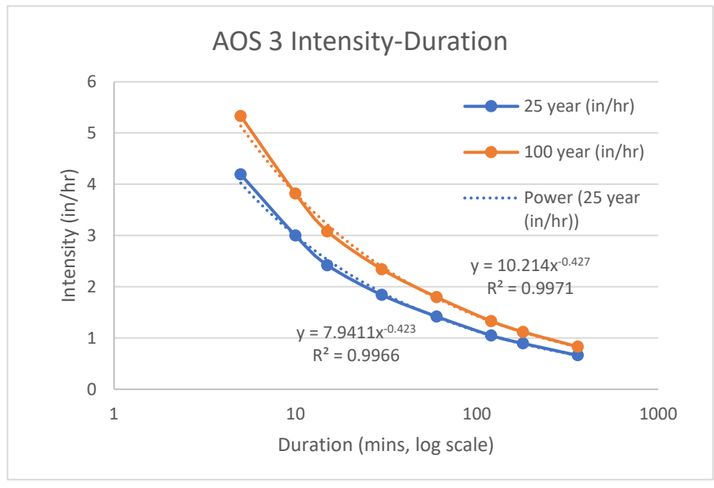
AOS 3

Duration (mins)	25 year (in/hr)	100 year (in/hr)
5	4.19	5.33
10	3	3.82
15	2.42	3.08
30	1.84	2.34
60	1.42	1.8
120	1.05	1.33
180	0.894	1.12
360	0.664	0.83
720	0.456	0.568
1440	0.318	0.397
2880	0.209	0.267
4320	0.16	0.21
5760	0.133	0.177
10080	0.09	0.12
14400	0.069	0.093
28800	0.043	0.058
43200	0.033	0.046
64800	0.027	0.037
86400	0.023	0.032

Equations: $y = 7.9411x^{-0.423}$ $y = 10.214x^{-0.427}$







Trunkline Analysis Subbasin Peak Flows

FONTANA
CALIFORNIA

DAVID EVANS
AND ASSOCIATES INC.

AOS	Project Name	Pipe Size (in. or ft)	Design Flow (cfs)	Design Event (years)	Design Flow Method	Length (ft)	Project Prioritization Score	Drainage Area (ac)
1	D-1A	42"	70	25	Rational	538	1	82
1	D-6	10' x 8'	1270	100	ICM	1986	1	2322
1	D-6A	36"	41	25	Rational	1314	1.4	35
1	D-6A	42"	41	25	Rational	1691	1.4	35
1	D-6A	54"	151	25	Rational	678	1.4	177
1	D-6B	36"	58	25	Rational	372	1.4	58
1	D-6B	42"	58	25	Rational	613	1.4	58
1	D-6B	48"	93	25	Rational	1296	1.4	113
1	D-6C	36"	43	25	Rational	1284	1	42
1	D-7	48"	127	100	Pro Development	444	1	92
1	D-7	54"	127	100	Pro Development	668	1	110
1	D-7	60"	211	100	Pro Development	947	1	136
1	E-0	102"	1408	100	ICM	7913	1	875
1	E-1	36"	59	25	Rational	783	1	42
1	E-1	42"	97	25	Rational	1169	1	82
1	E-1	48"	97	25	Rational	2643	1	82
1	E-1	54"	165	25	Rational	2643	1	162
1	E-2	66"	434	100	ICM	795	1.4	229
1	E-2	36"	62	25	Rational	687	1.4	47
1	E-2	42"	91	25	Rational	1149	1.4	83
1	E-2	48"	91	25	Rational	511	1.4	83
1	E-2	54"	134	25	Rational	1339	1.4	138
1	E-3	36"	61	25	Rational	881	1	47
1	E-3	42"	90	25	Rational	1141	1	81
1	E-3	48"	90	25	Rational	999	1	81
1	E-3	54"	130	25	Rational	1644	1	136
1	E-4	72"	602	100	ICM	952	2.2	324
1	E-4	36"	61	25	Rational	648	2.2	47
1	E-4	42"	91	25	Rational	1133	2.2	82
1	E-4	54"	149	25	Rational	1689	2.2	162
1	E-5	66"	185	100	Rational	1000	1.8	162
1	E-5	36"	61	25	Rational	471	1.8	47
1	E-5	42"	90	25	Rational	1137	1.8	81
1	E-5	54"	130	25	Rational	1647	1.8	136
1	E-6	72"	570	100	ICM	675	2.2	322
1	E-6	36"	61	25	Rational	320	2.2	46
1	E-6	42"	89	25	Rational	1179	2.2	80
1	E-6	54"	129	25	Rational	1969	2.2	135
1	E-7	36"	62	25	Rational	554	1	48
1	E-7	42"	90	25	Rational	1070	1	81
1	E-7	54"	134	25	Rational	1987	1	141
1	E-7	66"	134	25	Rational	668	1	141
1	F-1	72"	402	100	ICM	1333	3.2	205
1	F-1A	36"	47	25	Rational	721	2	41
1	F-1A	42"	76	25	Rational	681	2	60
1	F-1A	48"	101	25	Rational	650	2	80
1	F-1A	54"	125	25	Rational	996	2	99
1	F-1B	36"	41	25	Rational	709	1	35
1	F-1B	42"	60	25	Rational	686	1	62
1	F-1B	48"	72	25	Rational	963	1	81
1	F-2	36"	39	25	Rational	812	1	35
1	F-2	42"	58	25	Rational	641	1	62
1	F-2	48"	71	25	Rational	661	1	80
1	F-2	54"	137	100	Rational	1107	1	114
1	F-2	60"	146	100	Rational	274	1	124
1	F-3	36"	40	25	Rational	845	2.4	35
1	F-3	42"	58	25	Rational	631	2.4	61
1	F-3	48"	72	25	Rational	663	2.4	80
1	F-3	54"	348	100	ICM	528	2.4	193
1	F-3	66"	446	100	ICM	833	2.4	247
1	F-4	36"	27	25	Rational	477	4.4	45
1	F-4	42"	59	25	Rational	1311	4.4	87
1	F-5	36"	40	25	Rational	884	2.4	35
1	F-5	42"	58	25	Rational	703	2.4	59
1	F-5	72"	497	100	ICM	1969	2.4	242
1	F-5A	36"	40	25	Rational	830	3	35
1	F-5A	42"	58	25	Rational	602	3	58
1	F-6	36"	48	25	Rational	628	2	30
1	F-6	42"	96	25	Rational	1644	2	80
1	F-6	54"	126	25	Rational	1244	2	120
1	G-0	120"	1269	100	ICM	6602	1.6	700

AOS	Project Name	Pipe Size (in. or ft)	Design Flow (cfs)	Design Event (years)	Design Flow Method	Length (ft)	Project Prioritization Score	Drainage Area (ac)
1	G-0	54"	199	100	Rational	1319	1.6	153
1	G-1	36"	36	25	Rational	642	1.6	34
1	G-1	42"	66	25	Rational	1495	1.6	79
1	G-2	66"	420	100	ICM	1491	3.6	228
1	G-2	36"	51	25	Rational	541	3.6	36
1	G-2	54"	110	25	Rational	1162	3.6	107
1	G-2A	36"	37	25	Rational	521	3.6	34
1	G-2A	42"	63	25	Rational	1317	3.6	71
1	G-3	36"	38	25	Rational	665	1.6	35
1	G-3	42"	69	25	Rational	1481	1.6	80
1	G-4	66"	412	100	ICM	1441	3	235
1	G-4	36"	52	25	Rational	682	3	38
1	G-4	54"	112	25	Rational	1208	3	110
1	G-4A	36"	40	25	Rational	658	1.6	37
1	G-4A	42"	66	25	Rational	1320	1.6	75
1	G-5	36"	39	25	Rational	704	2.4	36
1	G-5	42"	69	25	Rational	1448	2.4	80
1	G-6	66"	446	100	ICM	1436	2.8	237
1	G-6	36"	56	25	Rational	808	2.8	42
1	G-6	54"	117	25	Rational	1218	2.8	117
1	G-6A	36"	41	25	Rational	674	2.4	39
1	G-6A	42"	69	25	Rational	1317	2.4	81
1	G-7	36"	43	25	Rational	775	1.6	42
1	G-7	54"	90	25	Rational	1194	1.6	117
1	G-7	60"	113	25	Rational	1458	1.6	161
1	H-0	72"	322	100	ICM	1325	1.6	240
1	H-0	78"	331	100	ICM	1325	1.6	372
1	H-0	84"	426	100	ICM	3894	1.6	481
1	H-0A	66"	286	100	Rational	681	1	303
1	J-1	78"	478	100	ICM	2512	2.2	274
1	J-1A	36"	52	25	Rational	661	3.6	49
1	J-1A	42"	74	25	Rational	1317	3.6	79
1	J-1A	42"	74	25	Rational	1013	3.6	79
1	J-1B	36"	49	25	Rational	796	1.6	50
1	J-1B	42"	69	25	Rational	1018	1.6	80
1	J-1B	54"	118	25	Rational	1323	1.6	160
1	J-1C	36"	46	25	Rational	658	2	46
1	J-1C	42"	69	25	Rational	1156	2	81
1	J-2	66"	328	100	ICM	3565	2.2	158
1	J-2	72"	319	100	ICM	556	2.2	191
1	J-2A	36"	46	25	Rational	649	1.8	46
1	J-2A	42"	69	25	Rational	1146	1.8	81
1	J-2A	60"	69	25	Rational	197	1.8	81
1	J-3	54"	382	100	ICM	1311	3	122
1	J-3	66"	380	100	ICM	1303	3	162
1	J-3	72"	379	100	ICM	926	3	195
1	J-3A	36"	41	25	Rational	485	2.4	39
1	J-3A	42"	69	25	Rational	1350	2.4	80
1	J-4	48"	112	25	Rational	1133	2.4	158
1	J-4A	36"	46	25	Rational	578	2.4	46
1	J-4A	42"	74	25	Rational	1326	2.4	88
1	J-4B	36"	38	25	Rational	592	3	35
1	J-4B	42"	62	25	Rational	1317	3	70
1	M-0	60"	232	100	ICM	1699	2.6	112
1	M-1	6' x 4'	271	100	ICM	250	2.6	115
1	M-1	60"	271	100	ICM	869	2.6	110
1	M-1A	36"	48	25	Rational	660	2.2	40
1	M-1A	42"	80	25	Rational	1231	2.2	80
1	M-2	48"	98	25	Rational	1083	3	115
1	M-2A	36"	41	25	Rational	544	2.2	38
1	M-2A	42"	72	25	Rational	1150	2.2	80
1	M-3	48"	95	25	Rational	1145	2.2	117
1	M-3A	36"	39	25	Rational	572	3.4	36
1	M-3A	42"	72	25	Rational	1459	3.4	81
1	M-4	36"	42	25	Rational	698	2.2	41
1	M-5A	36"	40	25	Rational	458	2.4	34
1	M-5A	42"	59	25	Rational	1393	2.4	57
1	M-5-A	2, 14' x 6'	3135	100	ICM	1281	3	1986
1	M-5B	66"	213	100	Rational	1329	3.8	194
1	M-5B	72"	276	100	Rational	1322	3.8	274
1	M-5B	78"	376	100	Rational	1322	3.8	419

AOS	Project Name	Pipe Size (in. or ft)	Design Flow (cfs)	Design Event (years)	Design Flow Method	Length (ft)	Project Prioritization Score	Drainage Area (ac)
1	M-5B	72"	363	100	Rational	2801	3.8	400
1	M-5-B	14' x 8'	2136	100	ICM	1877	2.4	1565
1	M-5-B	2, 14' x 6'	2501	100	ICM	1865	2.4	1946
1	M-5B-A	36"	46	25	Rational	335	2.4	45
1	M-5B-B	36"	44	25	Rational	690	2.4	40
1	M-5B-B	42"	73	25	Rational	1342	2.4	81
1	M-5B-C	36"	44	25	Rational	662	1.6	40
1	M-5B-C	42"	77	25	Rational	1348	1.6	80
1	M-5B-D	36"	48	25	Rational	728	1.6	40
1	M-5B-D	42"	80	25	Rational	1323	1.6	79
1	M-5B-E	36"	39	25	Rational	784	3.6	34
1	M-5B-E	42"	69	25	Rational	1313	3.6	69
1	M-5B-E	48"	102	25	Rational	1329	3.6	114
1	M-5C	36"	36	25	Rational	350	1.6	29
1	M-5C	42"	68	25	Rational	1319	1.6	69
1	M-5C	48"	81	25	Rational	1332	1.6	91
1	M-5-C	96"	1060	100	ICM	1869	2.4	697
1	M-5-C	96"	1366	100	ICM	1891	2.4	1326
1	M-5D	36"	25	25	Rational	801	1.8	20
1	M-5-D	36"	54	100	Rational	667	2.8	33
1	M-5-D	42"	90	100	Rational	1308	2.8	65
1	M-5-D	54"	123	100	Rational	3179	2.8	96
1	M-5-D	60"	244	100	Rational	2004	2.8	174
1	M-5E	60"	179	100	Rational	1312	4.2	159
1	M-5E	66"	242	100	Rational	1326	4.2	240
1	M-5E	72"	358	100	Rational	5471	4.2	410
1	M-5E	78"	408	100	Rational	5471	4.2	490
1	M-5-E	36"	34	25	Rational	692	2.4	21
1	M-5E-A	36"	38	25	Rational	511	2.2	36
1	M-5E-A	42"	56	25	Rational	812	2.2	60
1	M-5E-B	36"	49	25	Rational	493	2.2	49
1	M-5E-B	42"	69	25	Rational	1191	2.2	80
1	M-5E-C	36"	53	25	Rational	488	3	56
1	M-5E-C	42"	75	25	Rational	1175	3	90
1	M-5E-D	36"	49	25	Rational	589	2.8	50
1	M-5E-D	42"	69	25	Rational	1065	2.8	81
1	M-5E-E	36"	49	25	Rational	631	2.4	50
1	M-5E-E	42"	68	25	Rational	1030	2.4	80
1	M-5E-F	36"	56	25	Rational	650	2.4	50
1	M-5E-F	42"	80	25	Rational	1000	2.4	80
1	M-5F	36"	47	100	Rational	342	3	27
1	M-5F	42"	92	100	Rational	1312	3	67
1	M-5F	48"	131	100	Rational	1345	3	107
1	M-5F	60"	246	100	Rational	1135	3	249
1	M-5F	66"	264	100	Rational	1517	3	267
1	M-5F-A	36"	35	25	Rational	354	1.6	28
1	M-5F-A	42"	65	25	Rational	1328	1.6	68
1	M-5F-A	48"	89	25	Rational	1316	1.6	108
1	M-5F-A	54"	177	25	Rational	1328	1.6	143
1	M-5G	54"	178	100	Rational	1335	2.2	160
1	M-5G	66"	243	100	Rational	2646	2.2	240
1	M-5G-A	42"	60	25	Rational	1145	2.6	61
1	M-5G-B	36"	43	25	Rational	748	2.6	41
1	M-5G-B	42"	73	25	Rational	1309	2.6	80
1	M-5G-C	36"	42	25	Rational	727	2.2	40
1	M-5G-C	42"	72	25	Rational	1307	2.2	79
1	M-5H	72"	439	100	ICM	2829	3.2	239
1	M-5H	36"	46	25	Rational	347	3.2	28
1	M-5H	42"	84	25	Rational	1314	3.2	69
1	M-5H	48"	116	25	Rational	1335	3.2	111
1	M-5H	54"	141	25	Rational	1141	3.2	146
1	M-6A	72"	413	100	ICM	2630	2.2	450
1	M-6A	78"	408	100	ICM	1378	2.2	490
1	M-6B	66"	420	100	ICM	2646	2.2	210
1	M-6B	36"	44	100	Rational	334	2.2	24
1	M-6B	42"	91	100	Rational	1361	2.2	66
1	M-6B	48"	129	100	Rational	1289	2.2	105
1	M-6C	36"	38	25	Rational	320	3	35
1	M-6C	42"	69	25	Rational	1646	3	80
1	M-6C	48"	112	25	Rational	1309	3	160
1	M-6D	36"	32	25	Rational	340	2.6	25

AOS	Project Name	Pipe Size (in. or ft)	Design Flow (cfs)	Design Event (years)	Design Flow Method	Length (ft)	Project Prioritization Score	Drainage Area (ac)
1	M-6D	42"	62	25	Rational	1381	2.6	65
1	M-6D	48"	86	25	Rational	1273	2.6	105
1	M-6D	54"	86	25	Rational	1315	2.6	105
1	M-7A	84"	699	100	ICM	2678	2.6	540
1	M-7A	96"	698	100	ICM	1245	2.6	580
1	M-7B	72"	425	100	ICM	2661	2.8	377
1	M-7B	36"	43	100	Rational	396	2.8	23
1	M-7B	42"	95	100	Rational	1319	2.8	66
1	M-7B	48"	139	100	Rational	1338	2.8	108
1	M-7C	36"	41	25	Rational	632	2.6	39
1	M-7C	42"	73	25	Rational	1379	2.6	80
1	M-7C	54"	132	25	Rational	1370	2.6	163
1	M-7D	36"	42	25	Rational	652	2.2	40
1	M-7D	42"	69	25	Rational	1447	2.2	80
1	M-7D	54"	130	25	Rational	1393	2.2	165
1	M-7E	36"	30	25	Rational	335	2.6	23
1	M-7E	42"	61	25	Rational	1321	2.6	64
1	M-7E	48"	85	25	Rational	1350	2.6	103
1	M-7E	54"	85	25	Rational	1393	2.6	103
1	SS-0	54"	118	25	Rational	1087	3	131
1	SS-0	60"	222	25	Rational	197	3	208
1	SS-0A	36"	32	25	Rational	481	2.2	24
1	SS-0A	42"	65	25	Rational	1179	2.2	60
1	SS-0A	48"	104	25	Rational	1665	2.2	111
1	SS-0B	36"	52	25	Rational	500	2.4	45
1	SS-0B	42"	81	25	Rational	1191	2.4	81
1	SS-0B	48"	118	25	Rational	1651	2.4	131
1	SS-1	36"	44	25	Rational	1016	2.2	35
1	SS-2A	10' x 10'	886	100	Pro Development	1665	2.2	408
1	SS-2A	42"	65	100	Pro Development	683	2.2	13
1	SS-2A	72"	717	100	Pro Development	4809	2.2	274
1	SS-2A-1	36"	62	100	Pro Development	1815	2.2	39
1	SS-2A-1	42"	110	100	Pro Development	1218	2.2	69
1	SS-2A-1	48"	113	100	Pro Development	1037	2.2	73
1	SS-2A-1	54"	127	100	Pro Development	1377	2.2	108
1	SS-2A-2	48"	138	100	Pro Development	3246	2.2	77
1	SS-2A-3	36"	78	100	Pro Development	1643	2.2	19
1	SS-2A-3	36"	125	100	Pro Development	1081	2.2	42
1	SS-2A-3	72"	281	100	Pro Development	1702	2.2	144
1	SS-2B	36"	32	25	Rational	481	2.6	23
1	SS-2B	42"	71	25	Rational	1426	2.6	65
1	SS-2B	54"	164	100	Rational	1321	2.6	134
1	SS-2B	60"	227	100	Rational	1339	2.6	205
1	SS-2B	66"	286	100	Rational	1368	2.6	277
1	SS-2B	78"	391	100	Rational	2549	2.6	417
1	SS-2C	36"	50	25	Rational	619	2.2	41
1	SS-2C	42"	83	25	Rational	1286	2.2	79
1	SS-2C	60"	184	100	Rational	1318	2.2	155
1	SS-2C	66"	252	100	Rational	1338	2.2	235
1	SS-2C	72"	318	100	Rational	1569	2.2	318
1	SS-2C	78"	435	100	Rational	2518	2.2	479
1	SS-2D	36"	64	25	Rational	827	2.6	76
1	SS-2D	42"	75	25	Rational	2935	2.6	70
1	SS-2D	54"	134	25	Rational	1152	2.6	150
1	T-0	36"	62	25	Rational	725	3	41
1	T-0	42"	99	25	Rational	1278	3	80
1	T-0	54"	131	25	Rational	1272	3	120
1	T-0	54"	131	25	Rational	438	3	120
1	T-10	36"	52	25	Rational	496	2.2	46
1	T-10	42"	76	25	Rational	1186	2.2	81
1	T-10	48"	112	25	Rational	1745	2.2	129
1	T-11	36"	53	25	Rational	471	3	46
1	T-11	42"	81	25	Rational	1214	3	81
1	T-11	48"	119	25	Rational	1773	3	131
1	T-1A	60"	317	100	ICM	1215	3.6	171
1	T-1A	72"	318	100	ICM	952	3.6	171
1	T-1B	36"	48	25	Rational	719	3	41
1	T-1B	42"	80	25	Rational	1285	3	80
1	T-2	60"	244	100	Pro Development	285	2.8	177
1	T-2	66"	244	100	Pro Development	593	2.8	210
1	T-2	78"	292	100	Pro Development	457	2.8	243

AOS	Project Name	Pipe Size (in. or ft)	Design Flow (cfs)	Design Event (years)	Design Flow Method	Length (ft)	Project Prioritization Score	Drainage Area (ac)
1	T-2	96"	1151	100	Pro Development	5482	2.8	610
1	T-2A	48"	184	100	Pro Development	1860	3.2	136
1	T-2A	60"	236	100	Pro Development	787	3.2	162
1	T-2A	36"	47	100	Rational	317	3.2	28
1	T-2A	42"	105	100	Rational	1824	3.2	81
1	T-2B	54"	249	100	Pro Development	2579	2.2	160
1	T-2B	60"	256	100	Pro Development	68	2.2	162
1	T-2B	36"	65	100	Rational	638	2.2	41
1	T-2B	42"	108	100	Rational	1353	2.2	81
1	T-2C	54"	104	100	Pro Development	2560	2.6	162
1	T-2C	36"	65	100	Rational	683	2.6	42
1	T-2C	42"	108	100	Rational	1339	2.6	82
1	T-3	60"	322	100	ICM	3985	1.6	297
1	T-3	66"	322	100	ICM	1519	1.6	297
1	T-3A	60"	344	100	ICM	3985	1.4	166
1	T-3A	36"	43	25	Rational	323	1.4	29
1	T-3A	42"	93	25	Rational	1822	1.4	84
1	T-3A	48"	123	25	Rational	1371	1.4	126
1	T-4	36"	35	25	Rational	415	1.8	30
1	T-4	42"	76	25	Rational	1800	1.8	88
1	T-4	48"	127	25	Rational	2575	1.8	175
1	T-5	84"	734	100	ICM	2532	1.6	393
1	T-5	54"	138	100	Rational	1646	1.6	112
1	T-5A	36"	44	25	Rational	1848	1	42
1	T-5A	42"	62	25	Rational	1380	1	63
1	T-5A	48"	78	25	Rational	1387	1	84
1	T-5B	78"	512	100	ICM	2417	1	19
1	T-5C	72"	539	100	ICM	1231	1.6	145
1	T-5C	36"	38	25	Rational	294	1.6	25
1	T-5C	42"	83	25	Rational	1064	1.6	72
1	T-5C	48"	90	25	Rational	798	1.6	81
1	T-5C	54"	123	25	Rational	1499	1.6	123
1	T-6	66"	319	100	ICM	1988	3.2	273
1	T-6	72"	684	100	ICM	1688	3.2	351
1	T-6A	36"	50	25	Rational	873	1.6	42
1	T-6A	42"	78	25	Rational	1325	1.6	74
1	T-6B	60"	321	100	ICM	1441	3.4	164
1	T-6B	36"	44	100	Rational	423	3.4	24
1	T-6B	42"	63	100	Rational	415	3.4	41
1	T-7	36"	64	25	Rational	2616	2.4	40
1	T-7	42"	108	25	Rational	2616	2.4	80
1	T-7	60"	147	25	Rational	1714	2.4	120
1	T-7	60"	217	25	Rational	1714	2.4	165
1	T-7A	36"	54	25	Rational	1312	2.4	45
1	T-7B	36"	49	25	Rational	316	2.4	40
1	T-7B	42"	83	25	Rational	688	2.4	80
1	T-7B	48"	113	25	Rational	670	2.4	120
1	T-8	54"	149	100	Rational	2627	2	125
1	T-8	66"	291	100	Rational	1309	2	243
1	T-8	72"	435	100	Rational	1334	2	364
1	T-8	78"	581	100	Rational	564	2	485
1	T-8A	36"	51	25	Rational	538	2	49
1	T-8A	42"	74	25	Rational	1132	2	81
1	T-8A	48"	101	25	Rational	1299	2	121
1	T-8B	36"	42	25	Rational	353	1.6	36
1	T-8B	42"	72	25	Rational	1466	1.6	81
1	T-8B	48"	98	25	Rational	1310	1.6	121
1	T-8C	36"	37	25	Rational	382	1.6	30
1	T-8C	42"	72	25	Rational	1637	1.6	80
1	T-8C	48"	97	25	Rational	1300	1.6	118
1	T-8D	36"	42	25	Rational	1324	1.6	38
1	T-8D	42"	73	25	Rational	784	1.6	84
1	T-8D	48"	102	25	Rational	2627	1.6	125
1	T-9	36"	47	25	Rational	513	1.6	46
1	T-9	42"	70	25	Rational	1153	1.6	80
1	T-9	48"	100	25	Rational	1324	1.6	119
1	T-9	66"	209	25	Rational	371	1.6	177
1	T-9A	36"	53	25	Rational	515	2.4	47
1	T-9A	42"	80	25	Rational	1135	2.4	80
1	T-9A	48"	109	25	Rational	1308	2.4	119
1	T-9A	54"	109	25	Rational	1308	2.4	119

AOS	Project Name	Pipe Size (in. or ft)	Design Flow (cfs)	Design Event (years)	Design Flow Method	Length (ft)	Project Prioritization Score	Drainage Area (ac)
1	WG-1	48"	89	100	Pro Development	1218	1	70
1	WG-2	36"	54	100	Pro Development	1322	1	39
1	WG-2	42"	65	100	Pro Development	986	1	52
1	WG-2	48"	84	100	Pro Development	648	1	73
1	WG-3	48"	33	100	Pro Development	606	1	21

AOS	Project Name	Pipe Size (in. or ft)	Design Flow (cfs)	Design Event (years)	Design Flow Method	Length (ft)	Project Prioritization Score	Drainage Area (ac)
2	DZ-10	36"	46	25	Rational	685	1.8	39
2	DZ-10	42"	78	25	Rational	1414	1.8	77
2	DZ-10	48"	107	25	Rational	558	1.8	118
2	DZ-10	54"	129	25	Rational	1321	1.8	159
2	DZ-11	54"	141	100	Rational	1374	3.6	118
2	DZ-11	60"	369	100	ICM	1408	3.6	207
2	DZ-11A	36"	44	25	Rational	516	1.8	36
2	DZ-11A	42"	70	25	Rational	1000	1.8	68
2	DZ-11A	48"	97	25	Rational	1654	1.8	104
2	DZ-11B	36"	44	25	Rational	557	1.8	36
2	DZ-11B	42"	70	25	Rational	990	1.8	67
2	DZ-11B	48"	96	25	Rational	1056	1.8	103
2	DZ-12	60"	306	100	ICM	2612	3.2	196
2	DZ-12A	36"	43	25	Rational	448	1	35
2	DZ-12A	42"	68	25	Rational	2015	1	65
2	DZ-12A	48"	104	25	Rational	647	1	115
2	DZ-13	60"	290	100	ICM	849	3.2	157
2	DZ-13	66"	336	100	ICM	1548	3.2	202
2	DZ-13	84"	616	100	ICM	1081	3.2	398
2	DZ-14	54"	174	100	Rational	1307	2	156
2	DZ-14	66"	349	100	ICM	346	2	167
2	DZ-14	72"	357	100	ICM	1095	2	200
2	DZ-14A	36"	41	25	Rational	529	2.4	34
2	DZ-14A	42"	68	25	Rational	1983	2.4	65
2	DZ-14A	48"	105	25	Rational	661	2.4	116
2	DZ-15A	36"	38	25	Rational	489	2.4	31
2	DZ-15A	42"	64	25	Rational	996	2.4	60
2	DZ-15A	48"	87	25	Rational	975	2.4	90
2	DZ-16	2, 66"	347	100	ICM	1375	1.6	214
2	DZ-16	66"	341	100	ICM	2635	1.6	214
2	DZ-16A	36"	38	25	Rational	419	1.6	30
2	DZ-16A	42"	64	25	Rational	1799	1.6	59
2	DZ-16A	48"	100	25	Rational	850	1.6	111
2	DZ-4	108"	646	100	Pro Development	636	1	651
2	DZ-4	6' x 7'	405	100	Pro Development	110	1	83
2	DZ-4	84"	405	100	Pro Development	1649	1	83
2	DZ-7	36"	51	25	Rational	417	1.8	44
2	DZ-7	42"	79	25	Rational	970	1.8	84
2	DZ-7	48"	101	25	Rational	1317	1.8	125
2	DZ-8	72"	364	100	ICM	335	1.8	241
2	DZ-9	36"	48	25	Rational	549	1	42
2	DZ-9	42"	77	25	Rational	1472	1	82
2	DZ-9	48"	103	25	Rational	552	1	123
2	JH-1	84"	766	100	ICM	1382	1.6	466
2	JH-2	72"	236	100	ICM	1925	1	115
2	SR-1	2, 66"	664	100	ICM	1555	2.4	389
2	SR-2	14' x 6'	1092	100	ICM	617	3	807
2	SR-2	78"	943	100	ICM	2579	3	729
2	SR-2	84"	1092	100	ICM	1180	3	763
2	SR-3	84"	836	100	ICM	460	3	267
2	SR-3	96"	1100	100	ICM	852	3	321
2	SR-3	96"	1073	100	ICM	1769	3	427
2	SR-4	8' x 5'	356	100	ICM	1543	3	257
2	SS-10	66"	270	100	ICM	824	3.4	143
2	SS-11	48"	72	100	ICM	457	3	42
2	SS-11	60"	67	100	ICM	1200	3	124
2	SS-11	66"	265	100	ICM	618	3	161
2	SS-5	60"	123	100	ICM	2146	1.6	83
2	SS-6	60"	234	100	ICM	1236	1.8	121
2	SS-7	66"	251	100	ICM	1716	2.2	221
2	SS-8	36"	43	25	Rational	594	2.2	58
2	SS-8	42"	56	25	Rational	1296	2.2	111
2	SS-8	48"	88	25	Rational	576	2.2	32
2	SS-9	60"	238	100	ICM	1579	2.4	190
2	SS-9A	36"	40	25	Rational	925	2.4	63
2	SS-9A	42"	67	25	Rational	478	2.4	79
2	SS-9A	60"	240	25	ICM	1223	2.4	190

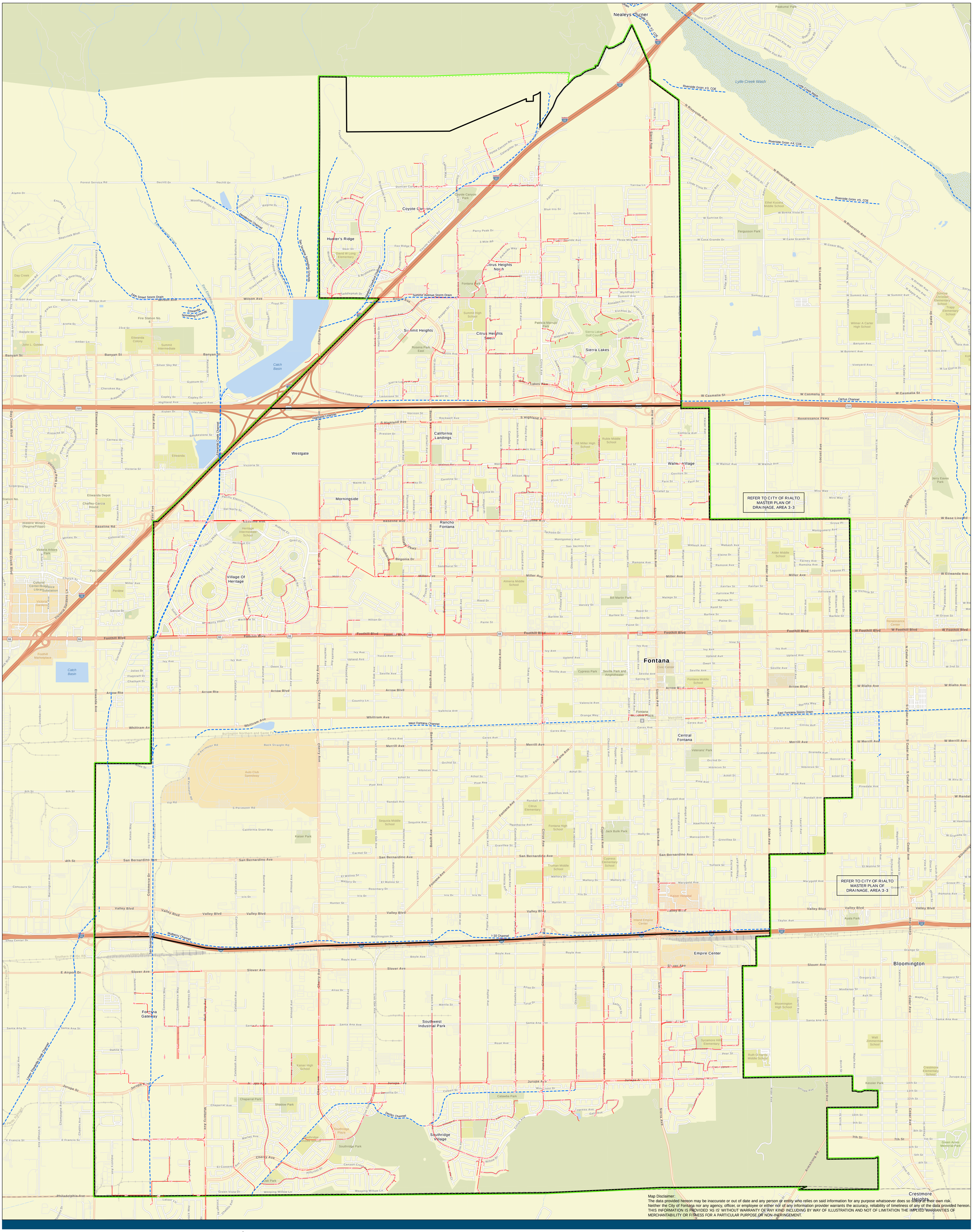
AOS	Project Name	Pipe Size (in. or ft)	Design Flow (cfs)	Design Event (years)	Design Flow Method	Length (ft)	Project Prioritization Score	Drainage Area (ac)
3	A-0	10' x 9'	2324	100	ICM	1505	1.4	1191
3	A-0A	84"	754	100	ICM	2192	1.8	367
3	A-0A	90"	858	100	ICM	584	1.8	397
3	A-0B	78"	438	100	ICM	782	1.8	203
3	A-0B	84"	488	100	ICM	1794	1.8	278
3	A-0C	36"	88	25	Rational	1280	1.8	44
3	A-0D	36"	41	25	Rational	476	1.8	19
3	A-0D	48"	69	25	Rational	548	1.8	32
3	A-1	36"	18	100	ICM	669	1.4	2
3	A-1	42"	46	100	ICM	1101	1.4	54
3	A-1A	36"	66	25	Rational	797	1	32
3	A-1A	48"	81	25	Rational	687	1	39
3	A-2	36"	55	25	Rational	886	1.8	31
3	A-2	54"	126	25	Rational	1125	1.8	70
3	A-2A	36"	69	25	Rational	851	1.8	36
3	A-2A	42"	85	25	Rational	177	1.8	44
3	A-2A	48"	100	25	Rational	874	1.8	52
3	A-3	90"	1396	100	ICM	4946	1.8	699
3	A-3	96"	1494	100	ICM	1242	1.8	757
3	A-3A	36"	71	25	Rational	674	1.8	36
3	A-3A	42"	117	25	Rational	1346	1.8	59
3	A-3B	96"	287	100	ICM	656	1	173
3	A-3C	66"	422	100	ICM	3507	1	330
3	A-4	36"	55	25	Rational	783	1	27
3	A-4	42"	107	25	Rational	637	1	52
3	B-1	36"	40	25	Rational	407	2	30
3	B-1	42"	112	25	Rational	868	2	57
3	B-1	42"	96	25	Rational	111	2	47
3	B-1	54"	242	25	Rational	562	2	159
3	B-1	54"	49	25	Rational	104	2	16
3	B-2	48"	84	25	Rational	1147	2.4	41
3	B-3	36"	65	25	Rational	398	2.4	32
3	B-3	42"	95	25	Rational	363	2.4	50
3	B-5	72"	653	100	ICM	1240	1.6	366
3	B-5A	36"	53	25	Rational	657	1.6	21
3	B-5A	42"	97	25	Rational	1053	1.6	46
3	B-5A	48"	138	25	Rational	1553	1.6	74
3	B-6	36"	88	25	Rational	201	1.6	44
3	B-7	36"	88	25	Rational	502	1.6	44
3	B-7	42"	97	25	Rational	641	1.6	49
3	B-8	36"	63	25	Rational	519	2.4	28
3	B-8	48"	97	25	Rational	994	2.4	47
3	C-0	60"	409	100	ICM	1297	1.6	153
3	C-0	72"	595	100	ICM	2586	1.6	223
3	C-2	66"	212	100	ICM	427	2.4	68
3	C-2	72"	265	100	ICM	521	2.4	79
3	C-4	60"	320	100	ICM	1209	2.2	149
3	C-4	66"	319	100	ICM	400	2.2	149
3	C-4	72"	319	100	ICM	628	2.2	149
3	C-5	60"	332	100	ICM	1600	3	152
3	C-6	42"	156	100	ICM	488	3	70
3	C-7	72"	631	100	ICM	2059	3	218
3	C-8	78"	485	100	Rational	1828	2.6	254
3	C-8A	42"	80	25	Rational	1331	2.6	37
3	C-8B	36"	72	25	Rational	660	2.6	32
3	C-8B	42"	97	25	Rational	1080	2.6	46
3	C-8B	48"	164	25	Rational	1450	2.6	98
3	C-8B	54"	210	25	Rational	1081	2.6	125
3	C-9	9' x 12'	2860	100	ICM	917	3	1241
3	HR-1	96"	1282	100	ICM	1378	3	706

APPENDIX 2 HYDRAULIC RESULTS SUMMARY

Existing Storm Drain Pipes Used For Capacity Analysis

FONTANA
CALIFORNIA

DAVID EVANS
AND ASSOCIATES INC.



Map Disclaimer:
The data provided hereon may be inaccurate or out of date and any person or entity who relies on said information for any purpose whatsoever does so solely at their own risk. Neither the City of Fontana nor any agency, officer, or employee or either nor of any information provider warrants the accuracy, reliability of timeliness of any of the data provided hereon. THIS INFORMATION IS PROVIDED 'AS IS' WITHOUT WARRANTY OF ANY KIND INCLUDING BY WAY OF ILLUSTRATION AND NOT OF LIMITATION THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT.

Legend

- AOS Boundary
- Fontana Sphere of Influence
- Existing Pipes (36-inch diameter and larger)
- Regional Flood Control Channels

N

0 1,500 3,000 6,000 Feet

Existing Storm Drain Pipes For Capacity Analysis

All Areas of Study

FONTANA CALIFORNIA

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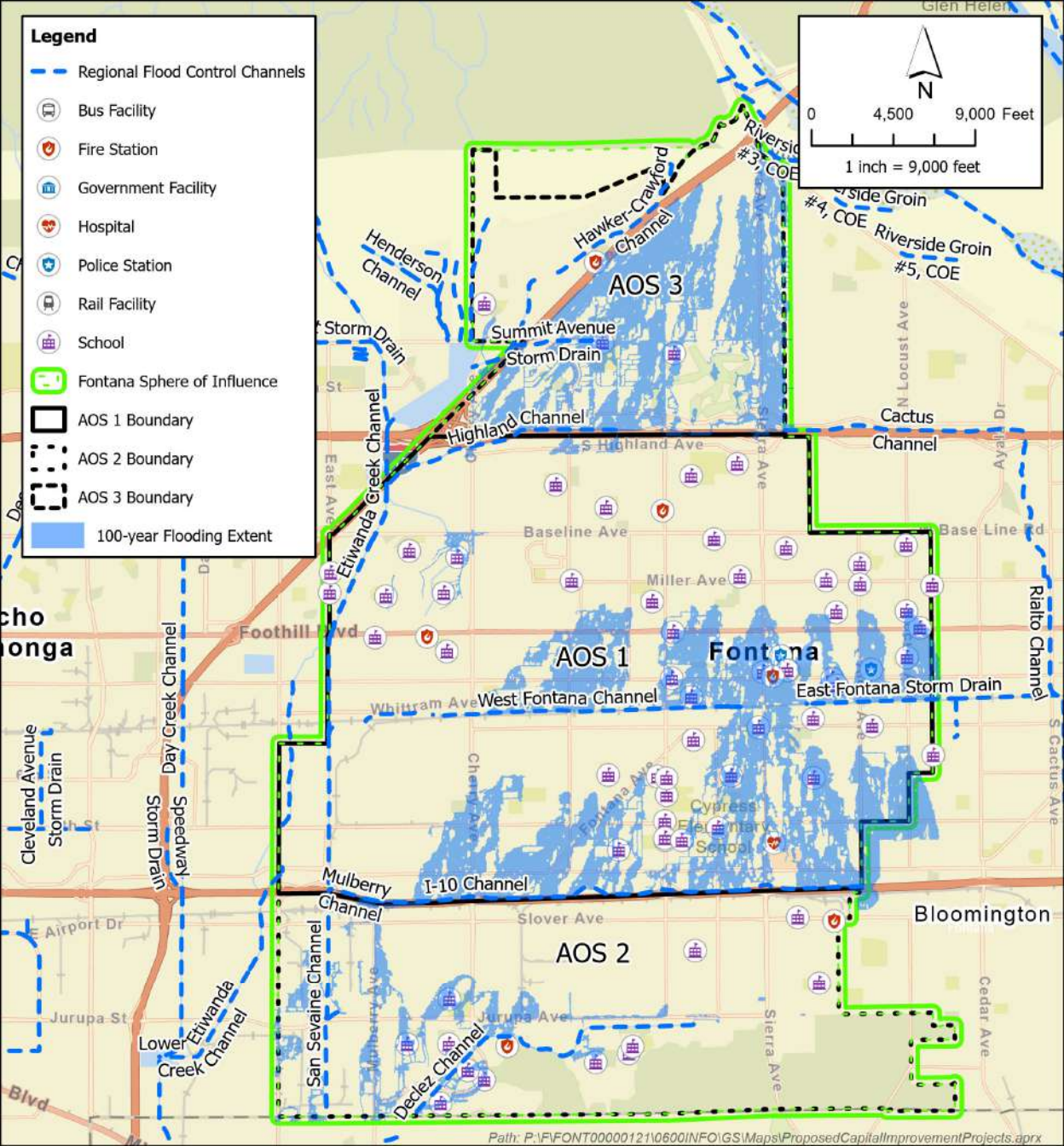
Critical Facility Flooding Data

FONTANA
CALIFORNIA

DAVID EVANS
AND ASSOCIATES INC.


Legend
Regional Flood Control Channels
Bus Facility
Fire Station
Government Facility
Hospital
Police Station
Rail Facility
School
Fontana Sphere of Influence
AOS 1 Boundary
AOS 2 Boundary
AOS 3 Boundary
100-year Flooding Extent
N
0
4,500
9,000 Feet
1 inch = 9,000 feet
AOS 3
AOS 1
AOS 2
Fontana
Bloomington
Hawker-Crawford Channel
Henderson Channel
Summit Avenue Storm Drain
Highland Channel
Cactus Channel
Etiwanda Creek Channel
Day Creek Channel
West Fontana Channel
East Fontana Storm Drain
Rialto Channel
Cleveland Avenue Storm Drain
Speedway Storm Drain
Mulberry Channel
I-10 Channel
San Sevaine Channel
Declez Channel
Lower Etiwanda Creek Channel
Cypress Elementary School
Foothill Blvd
Baseline Ave
Miller Ave
Whittram Ave
Slover Ave
Jurupa Ave
Jurupa St
Airport Dr
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AOS 1 25-year			
Facility Type	**Facility Name**	**Address**	**Maximum Ponding Depth (ft)**
Hazmat	ROBERTO M TRUCKING	15701 MANZANITA DRIVE, FONTANA, CA 92335	1.214
Hazmat	ALAMEDA PAINTING CO., INC.	10207 ELM AVENUE, FONTANA, CA 92335-6322	0.822
Hazmat	RUBEN BAROCIO	9982 CAROB AVE, FONTANA, CA 92335	0.611
Vulnerable Population-Adult Residential Care	HERNANDEZ BOARD AND CARE	17754 E. UPLAND AVENUE, FONTANA, CA	0.55
Hazmat	C & M STEEL	10312 ALMOND AVE, FONTANA, CA 92335	0.49
Vulnerable Population-Adult Residential Care	PALMETTO FAMILY HOME	9169 PALMETTO AVENUE, FONTANA, CA	0.47
Vulnerable Population-Child Care	FUSD/POPLAR ELEMENTARY	9937 POPLAR AVENUE, FONTANA, CA	0.465
Vulnerable Population-Child Care	ALL START ACADEMY	10022 PALMETTO AVENUE, FONTANA, CA	0.463
Hazmat	CIRCLE K STORE #349	7980 SIERRA ST, FONTANA, CA 92335	0.457
Hazmat	MARYGOLD MWC	9725 ALDER AVE, BLOOMINGTON, CA 92316	0.441
Hazmat	TRANS-WEST FORD TRUCK SALES INC	10150 CHERRY AVENUE, FONTANA, CA 92335	0.41
Hazmat	ALAMEDA PAINTING CO INC	15567 VALLEY BL, FONTANA, CA 92335-6351	0.367
Hazmat	JDC INDUSTRIES	15567 VALLEY BL, FONTANA, CA 92335-6351	0.367
Hazmat	UTILITY TRAILER SALES CO	15567 VALLEY BLVD, FONTANA, CA 92335	0.367
Hazmat	17861 RB8	10238 CHERRY AVE, FONTANA, CA 92335	0.335
Hazmat	ZIPPY LUBE-A-TRUCK #2	10238 CHERRY AVE., FONTANA, CA 92335-	0.335
Hazmat	PIRATE TRUCKING RAFAEL PEREZ	17552 IRIS DR, BLOOMINGTON, CA 92316	0.333
School	BIRCH CONTINUATION HIGH SCHOOL	7930 LOCUST AVENUE, FONTANA, CA	0.33
Vulnerable Population-Foster/Home Care	MIA'S HOMES FOSTER FAMILY AGENCY	8285 SIERRA AVE, FONTANA, CA, 92335	0.318
Hazmat	RUSH TRUCK CENTER FONTANA BODY SHOP	10122 ELM AVE, FONTANA, CA 92335	0.316
Vulnerable Population-Child Care	FUSD-PORTER ELEMENTARY	8330 LOCUST AVENUE, FONTANA, CA	0.313
Hazmat	UHAUL CENTER OF FONTANA	16823 FOTHILL BLVD, FONTANA, CA 92335-8400	0.31
Hazmat	PACIFIC BELL	16816 ARROW BLVD, FONTANA, CA 92335	0.25
Hazmat	JIFFY LUBE #12	8893 SIERRA AVE, FONTANA, CA 92335	0.245
Hazmat	JIFFY LUBE #539	8893 SIERRA AVE, FONTANA, CA 92335-	0.245
Hazmat	MACIAS TRUCK REPAIR	14959 VALLEY BLVD, FONTANA, CA 92335	0.239
Hazmat	STEELCO INC.	17507 VALLEY BLVD., BLOOMINGTON, CA 92316	0.239
Hazmat	THREE BROTHERS AUTO AND TRUCK RECYCLE	17565 VALLEY BLVD, BLOOMINGTON, CA 923161964	0.239
Railway Bridge	STATE ROUTE 66	34.1067, -117.4633, FONTANA, CA	0.235
Vulnerable Population-Adult Residential Care	ALEXANDER ILAGAN	9063 OLIVE ST., FONTANA, CA	0.233
Vulnerable Population-Adult Residential Care	UNLICENSED	9063 OLIVE ST., FONTANA, CA	0.233
Vulnerable Population-Senior Care	UNLICENSED	9063 OLIVE ST, FONTANA, CA, 92335	0.233
Hazmat	EXPRESS AUTO REPAIR	8185 SIERRA AVE, FONTANA, CA 92335	0.223
Vulnerable Population-Child Care	WEEKDAY NURSERY SCHOOL OF COMMUNITY CHURCH	8316 SIERRA AVENUE, FONTANA, CA	0.217
Hazmat	GENERAL ENVIRONMENTAL MANAGEMENT INC	9980 CHERRY AVE, FONTANA, CA 923355219	0.217
Hazmat	PRESTIGE STATIONS INC NO 0770	8898 SIERRA AVE, FONTANA, CA 92335	0.217
Hazmat	FONTANA CITY YARD	17780 ARROW BLVD., FONTANA, CA 92335	0.209
Hazmat	FONTANA SHERIFF SUBSTAION	17780 ARROW BLVD., FONTANA, CA 92335	0.209
Hazmat	FOLLETTS CLEANERS	8676 WHEELER, FONTANA, CA 92335	0.207
Hazmat	ARCO FACILITY NO 01815	10087 SIERRA AVE, FONTANA, CA 92335	0.202
Hazmat	RIALTO USD AUTOSHOP	18150 FOOTHILL BLVD, FONTANA, CA 92335	0.199
Hazmat	SUNRISE FORD D B A SUNRISE HYUNDAI	18150 FOOTHILL BLVD, FONTANA, CA 92335	0.199
Hazmat	SIERRA ONE HOUR CLEANERS	8260 SIERRA AVE, FONTANA, CA 92335	0.197
Vulnerable Population-Senior Care	MOUNTAIN VIEW RESIDENTIAL CARE	9073 OLIVE ST, FONTANA, CA, 92335	0.178
Vulnerable Population-Senior Care	LA FUENTE LAVENDER	9545 TAMARIND AVE, FONTANA, CA, 92335	0.171

AOS 1 25-year			
Facility Type	**Facility Name**	**Address**	**Maximum Ponding Depth (ft)**
Hazmat	BIG RIG TRUCK REPAIR	14578 VALLEY BLVD, FONTANA, CA 92335	0.162
Hazmat	PIPELINE TRUCKING CO	9875 ALMOND ST, FONTANA, CA 92335	0.159
Hazmat	BOSCH KIA	10025 SIERRA AVE, FONTANA, CA 92335	0.146
Hazmat	HARBOR FREIGHT TOOLS USA INC	8933 SIERRA AVE, FONTANA, CA 92335	0.144
Hazmat	FONTANA MASONRY SUPPLY INC	17795 FOOTHILL BLVD, FONTANA, CA 92335	0.143
School	Agape Christian, The	18202 FOOTHILL BLVD, FONTANA, CA	0.142
Hazmat	ARTUROS TAILOR SHOP	8990 SIERRA AVE UNIT G, FONTANA, CA 92335-4769	0.139
Hazmat	STEVES AUTO SALES	16874 FOOTHILL BLVD, FONTANA, CA 92335	0.132
Vulnerable Population-Child Care	FUSD/PALMETTO ELEMENTARY SCHOOL	9325 PALMETTO AVENUE, FONTANA, CA	0.128
Hazmat	SCHNEIDER NATIONAL	14392 VALLEY BLVD, FONTANA, CA 92335	0.121
Hazmat	TIME OUT L L C D B A AM PM 11	10062 CHERRY AVE, FONTANA, CA 92335	0.116
Hazmat	CIRCLE K STORE #489	14906VALLEY BLVD, FONTANA, CA 92335	0.102
Hazmat	ADAMS CLEANERS & DRAPERIES	8827 SIERRA AVE, FONTANA, CA 92335	0.1
Hazmat	VALLEY AUTO CENTER	15689 VALLEY BLVD, FONTANA, CA 92335	0.095
Hazmat	EXECUTIVE CLEANERS	8923 SIERRA, FONTANA, CA 92335	0.093
School	PALMETTO ELEMENTARY SCHOOL	9325 PALMETTO AVENUE, FONTANA, CA	0.086
Vulnerable Population-Foster/Home Care	MASADA HOMES FFA	8485 TAMARIND AVE, FONTANA, CA, 92335	0.084
Vulnerable Population-Child Care	ALTUS ACADEMY	205 N. MAPLE AVE., RIALTO, CA	0.079
Hazmat	REPO RANCH	15836 VALLEY BLVD, FONTANA, CA 92335	0.076
Hazmat	BUDGET TIRE AND AUTO REPAIR	8595 SIERRA, FONTANA, CA 92335-3839	0.073
School	WORKFORCE PREP. CENTER	8442 SIERRA AVENUE, FONTANA, CA	0.069
Hazmat	LUCKY GAS & FOOD	17312 FOOTHILL VLVD, FONTANA, CA 92335	0.067
Hazmat	SOUTHWEST TRUCK REPAIR	14887 E VALLEY, FONTANA, CA 92335	0.065
Hazmat	PEP BOYS #680	16711 VALLEY BLVD, FONTANA, CA 92335-6692	0.063
Vulnerable Population-Adult Residential Care	KHEESA'S FAMILY HOME	17269 SAN BERNARDINO AVE., FONTANA, CA	0.054
Hazmat	SIERRA VALERO, INC	10115 SIERRA AVE, FONTANA, CA 923356724	0.049
Hazmat	TEXACO SERVICE STATION	10115 SIERRA AVE, FONTANA, CA 923356724	0.049
School	Peace in the Valley Christian Academy	17487 ARROW BLVD, FONTANA, CA	0.048
School	TED PORTER ELEMENTARY SCHOOL	8330 LOCUST AVENUE, FONTANA, CA	0.047
School	POPLAR ELEMENTARY SCHOOL	9937 POPLAR AVENUE, FONTANA, CA	0.045
Hazmat	JSS MARKET	14518 VALLEY BLVD, FONTANA, CA 92335	0.045
Hazmat	ECONO LUBE N TUNE NO 79	9433 SIERRA AVE, FONTANA, CA 92335	0.043
Hazmat	FONTANA CLEANERS	16960 FOOTHILL BLVD, FONTANA, CA 92335	0.043
Hazmat	NICE RIVERSIDE INC	16960-C FOOTHILL BLVD, FONTANA, CA 92335	0.043
Hazmat	GIBRALTAR TRANSMISSIONS	9429 SIERRA AVE, FONTANA, CA 92335	0.042
Hazmat	PACIFIC BELL	17070 CERES ST, FONTANA, CA 92335-8611	0.042
School	SOUTH TAMARIND ELEMENTARY SCHOOL	8561 TAMARIND AVENUE, FONTANA, CA	0.041
Hazmat	RITE AID NO 5695	16910 FOOTHILL BLVD, FONTANA, CA 92335 3502	0.041
Vulnerable Population-Child Care	FUSD/SOUTH TAMARIND ELEMENTARY	8561 TAMARIND AVE., FONTANA, CA	0.04
Hazmat	AVILA AUTO BODY INC	UNKNOWN, FONTANA, CA 92335	0.039
Hazmat	WILLS TIRE AUTO CENTER	9439 SIERRA AVE, FONTANA, CA 92335	0.039
Hazmat	FONTANA TRANSMISSION REPAIR	8445 JUNIPER AVE, FONTANA, CA 92335	0.036
Hazmat	MAINE ENTERPRISES	14887 VALLEY BLVD, FONTANA, CA 92335	0.036
Hazmat	MIDAS FONTANA	9413 SIERRA AVE, FONTANA, CA 92335	0.036
Hazmat	BUTLER FLEET SERVICE	14714 VALLEY BLVD, FONTANA, CA 92335	0.034

AOS 1 25-year			
Facility Type	**Facility Name**	**Address**	**Maximum Ponding Depth (ft)**
Hazmat	CIRCLE K STORE #316	16617 MERRILL ST, FONTANA, CA 92335	0.033
Hazmat	VIRGIL MOBILE REPAIR	10044 FONTANA AVENUE, FONTANA, CA 92335-	0.033
Hazmat	AUTOZONE #5613	9535 SIERRA AVE, FONTANA, CA 92335-2414	0.032
Hazmat	CALIFORNIA AUTOMOTIVE IND	16726 SPRING ST, FONTANA, CA 92335	0.032
Hazmat	EXXON MOBIL OIL CORP	16925 FOOTHILL BLVD, FONTANA, CA 92335	0.031
Police Station	SB Co. Sheriff - Fontana Station	17780 ARROW BLVD, FONTANA, CA	0.028
Hazmat	CIRCLE K STORE #5802	16900 FOOTHILL BLVD, FONTANA, CA 92335	0.028
Hazmat	TOSCO 30567	16900 FOOTHILL BLVD, FONTANA, CA 92335	0.028
Utility-Communication Facility	TowerCo Assets LLC	9683 ALDER AVENUE, FONTANA, CA	0.027
Hazmat	EXPO NUMBER 600	16721 VALLEY BLVD, FONTANA, CA 92335	0.026
Hazmat	HA LO AUTOMOTIVE	9417 SIERRA AVE, FONTANA, CA 92335	0.026
Hazmat	KRAGEN AUTO PARTS #1749	9800 SIERRA AVE, FONTANA, CA 92335-6719	0.02
Vulnerable Population-Adult Residential Care	FIRST STEP FONTANA	8621 JUNIPER AVE. #101, FONTANA, CA	0.019
Vulnerable Population-Child Care	FUSD/CYPRESS ELEMENTARY SCHOOL	9751 CYPRESS, FONTANA, CA	0.019
Hazmat	DONS AUTO CENTER	16282 VALLY BLVD, FONTANA, CA 92335	0.019
Hazmat	WINSTON TIRE FONTANA	9550 SIERRA AVE, FONTANA, CA 92335	0.019
School	OLEANDER ELEMENTARY SCHOOL	8650 OLEANDER AVENUE, FONTANA, CA	0.018
Hazmat	HOUSE OF HONDA	9530 SIERRA, FONTANA, CA 92335-2423	0.018
Hazmat	KRAGEN AUTO PARTS #0341	16990 FOOTHILL BLVD, FONTANA, CA 92335-	0.018
Hazmat	GEORGE'S SIERRA SHELL	9684 SIERRA AVE, FONTANA, CA 92335	0.015
Vulnerable Population-Child Care	FUSD/OLEANDER ELEMENTARY	8650 OLEANDER AVENUE, FONTANA, CA	0.012

AOS 2 25-year			
Facility Type	**Facility Name**	**Address**	**Maximum Ponding Depth (ft)**
Vulnerable Population-Child Care	FUSD/CANYON CREST ELEMENTARY	11851 CHERRY AVENUE, FONTANA, CA	1.016
Hazmat	SIERRA ALUMINUM CO	11711 PACIFIC AVENUE, FONTANA, CA 92337-6961	0.938
Hazmat	SIERRA ALUMINUM FONTANA FINISHING OPERATION	11806 PACIFIC AVENUE, FONTANA, CA 92337-6962	0.938
Hazmat	CLIFFSTAR CORPORATION/FONTANA	11751 PACIFIC AVE, FONTANA, CA 92337	0.93
School	CANYON CREST ELEMENTARY SCHOOL	11851 CHERRY AVENUE, FONTANA, CA	0.642
Hazmat	AMERICAN SECURITY PRODUCTS CO	11925 PACIFIC AVE, FONTANA, CA 92337-8205	0.574
Hazmat	CURTIS 1000	10887 COMMERCE WAY STE A, FONTANA, CA 92337	0.506
School	OAK PARK ELEMENTARY SCHOOL	14200 LIVE OAK AVENUE, FONTANA, CA	0.405
School	CHAPARRAL ELEMENTARY SCHOOL	14000 SHADOW HILLS DRIVE, FONTANA, CA	0.391
Hazmat	SOUTHERN CALIFORNIA SCREEN PRI	10680 MULBERRY AVE, FONTANA, CA 92337	0.335
Vulnerable Population-Child Care	FUSD/OAK PARK	14200 LIVE OAK AVENUE, FONTANA, CA	0.292
School	SOUTHRIDGE MIDDLE SCHOOL	14500 LIVE OAK AVENUE, FONTANA, CA	0.186
Vulnerable Population-Child Care	FUSD-KAISER H.S.	11155 ALMOND AVENUE, FONTANA, CA	0.176
Hazmat	AZTEC CONCRETE ACCESSORIES INC	10780 MULBERRY AVE, FONTANA, CA 92337	0.12
Hazmat	GOLDEN W OIL CO INC	11040 CHERRY AVE, FONTANA, CA 92337-7119	0.109
Hazmat	GENUINE PARTS COMPANY	11710 PACIFIC AVE, FONTANA, CA 92335	0.079
Hazmat	METALCRAFT FONTANA FACILITY	10840 MULBERRY AVE, FONTANA, CA 92337	0.07
Hazmat	R K M EQUIPMENT AND TRUCKING	10787 MULBERRY B, FONTANA, CA 92335	0.066
School	KAISER HIGH SCHOOL	11155 ALMOND AVENUE	0.047
Hazmat	SCRIPTO TOKAI CORPORATION	11591 ETIWANDA AVENUE, FONTANA, CA 92337-6927	0.046
Hazmat	U S REDUCTION CO	11600 ETIWANDA AVE, FONTANA, CA 92337-6929	0.032
Hazmat	RECTICEL FOAM CORP.	13215 MARLAY AVE., FONTANA, CA 92335	0.027
Hazmat	THOMPSON BLDG MATERIALS	11027 CHERRY AVE, FONTANA, CA 92335	0.026
Hazmat	WESTERN MANUFACTURING	11027 CHERRY AVE S E LOT, FONTANA, CA 923370917	0.026
Hazmat	S & H CABINETS & MFG INC	10860 MULBERRY AVENUE, FONTANA, CA 92337-7027	0.025
Hazmat	STARLITE RECLAMATION ENVIRONMENTAL SVCS	11225 MULBERRY AVE, FONTANA, CA 923370000	0.023
Hazmat	TUTOR SALIBA CORP	11171 CHERRY AVE, FONTANA, CA 92337-7195	0.016

AOS 3 25-year			
Facility Type	**Facility Name**	**Address**	**Maximum Ponding Depth (ft)**
Utility-Communication Facility	SOUTHERN CALIFORNIA EDISON	4949 CITRUS AVENUE, FONTANA, CA	0.506
Vulnerable Population-Adult Residential Care	UPCHURCH ARF-PINE VALLEY	5855 PINE VALLEY DR., FONTANA, CA	0.337
Vulnerable Population-Senior Care	UPCHURCH ARF-PINE VALLEY	5855 PINE VALLEY DR, FONTANA, CA, 92336	0.337
Hazmat	SOUTHERN CALIFORNIA GAS CO	DUNCAN CANYON RD AND CITRIS AV, FONTANA, CA 92335	0.214
Vulnerable Population-Senior Care	ABBY'S HOME	15554 ROCKWELL AVE, FONTANA, CA, 92336	0.208
Hazmat	TARGET DISTRIBUTION CENTER T3806	3105 NORTH MANGO AVENUE, RIALTO, CA 92660	0.138
Hazmat	JDK HOLDINGS INC	15218 SUMMIT AVE, FONTANA, CA 92336	0.106
Hazmat	STATER BROS MARKETS #175 FALCON RIDGE	15222 SUMMIT AVE, FONTANA, CA 92336	0.046
Vulnerable Population-Senior Care	BRENTWOOD ELDER CARE II	15986 Baltray Way, Fontana, CA, 92336	0.045
Hazmat	CU PLUS PRODUCTS, LLC	15028 COYOTE CT, FONTANA, CA 92336	0.031
Hazmat	KNOX STREET MERCURY	6133 KNOX STREET, FONTANA, CA 92336-4519	0.026
Hazmat	CVS PHARMACY #8589	15286 SUMMIT AVE, FONTANA, CA 92336	0.021
Hazmat	CHEVRON #211869	15160 SUMMIT AVE., FONTANA, CA 92336	0.019
Hazmat	PACIFIC DIAZO PRODUCTS INC	6183 SIERRA AVENUE, UNITS 7 & 8, FONTANA, CA 92336-1201	0.017
Hazmat	TARGET STORE T1958	15272 SUMMIT AVE, FONTANA, CA 92336	0.011

AOS 1 100-year			
Facility Type	**Facility Name**	**Address**	**Maximum Ponding Depth (ft)**
Hazmat	ROBERTO M TRUCKING	15701 MANZANITA DRIVE, FONTANA, CA 92335	0.788
Hazmat	RUBEN BAROCIO	9982 CAROB AVE, FONTANA, CA 92335	0.759
Vulnerable Population-Adult Residential Care	HERNANDEZ BOARD AND CARE	17754 E. UPLAND AVENUE, FONTANA, CA	0.629
School	BIRCH CONTINUATION HIGH SCHOOL	7930 LOCUST AVENUE	0.592
Vulnerable Population-Child Care	ALL START ACADEMY	10022 PALMETTO AVENUE, FONTANA, CA	0.559
Hazmat	C & M STEEL	10312 ALMOND AVE, FONTANA, CA 92335	0.559
Hazmat	ALAMEDA PAINTING CO., INC.	10207 ELM AVENUE, FONTANA, CA 92335-6322	0.546
Hazmat	CIRCLE K STORE #349	7980 SIERRA ST, FONTANA, CA 92335	0.537
Vulnerable Population-Adult Residential Care	PALMETTO FAMILY HOME	9169 PALMETTO AVENUE, FONTANA, CA	0.521
Hazmat	MARYGOLD MWC	9725 ALDER AVE, BLOOMINGTON, CA 92316	0.516
Hazmat	TRANS-WEST FORD TRUCK SALES INC	10150 CHERRY AVENUE, FONTANA, CA 92335	0.468
Hazmat	PIRATE TRUCKING RAFAEL PEREZ	17552 IRIS DR, BLOOMINGTON, CA 92316	0.413
Hazmat	ARCO FACILITY NO 01815	10087 SIERRA AVE, FONTANA, CA 92335	0.412
Hazmat	17861 RB8	10238 CHERRY AVE, FONTANA, CA 92335	0.392
Hazmat	ZIPPY LUBE-A-TRUCK #2	10238 CHERRY AVE., FONTANA, CA 92335-	0.392
Vulnerable Population-Foster/Home Care	MIA'S HOMES FOSTER FAMILY AGENCY	8285 SIERRA AVE, FONTANA, CA, 92335	0.37
Hazmat	UHAUL CENTER OF FONTANA	16823 FOTHILL BLVD, FONTANA, CA 92335-8400	0.368
Vulnerable Population-Child Care	FUSD-PORTER ELEMENTARY	8330 LOCUST AVENUE, FONTANA, CA	0.36
Railway Bridge	STATE ROUTE 66	34.1067, -117.4633, FONTANA, CA	0.293
Hazmat	PACIFIC BELL	16816 ARROW BLVD, FONTANA, CA 92335	0.292
Hazmat	STEELCO INC.	17507 VALLEY BLVD., BLOOMINGTON, CA 92316	0.291
Hazmat	THREE BROTHERS AUTO AND TRUCK RECYCLE	17565 VALLEY BLVD, BLOOMINGTON, CA 923161964	0.291
Hazmat	MACIAS TRUCK REPAIR	14959 VALLEY BLVD, FONTANA, CA 92335	0.277
Vulnerable Population-Adult Residential Care	ALEXANDER ILAGAN	9063 OLIVE ST., FONTANA, CA	0.276
Vulnerable Population-Adult Residential Care	UNLICENSED	9063 OLIVE ST., FONTANA, CA	0.276
Vulnerable Population-Senior Care	UNLICENSED	9063 OLIVE ST, FONTANA, CA, 92335	0.276
Hazmat	BOSCH KIA	10025 SIERRA AVE, FONTANA, CA 92335	0.276
Hazmat	RIALTO USD AUTOSHOP	18150 FOOTHILL BLVD, FONTANA, CA 92335	0.272
Hazmat	SUNRISE FORD D B A SUNRISE HYUNDAI	18150 FOOTHILL BLVD, FONTANA, CA 92335	0.272
Vulnerable Population-Child Care	WEEKDAY NURSERY SCHOOL OF COMMUNITY CHURCH	8316 SIERRA AVENUE, FONTANA, CA	0.262
Hazmat	FONTANA CITY YARD	17780 ARROW BLVD., FONTANA, CA 92335	0.261
Hazmat	FONTANA SHERIFF SUBSTAION	17780 ARROW BLVD., FONTANA, CA 92335	0.261
Hazmat	JIFFY LUBE #12	8893 SIERRA AVE, FONTANA, CA 92335	0.26
Hazmat	JIFFY LUBE #539	8893 SIERRA AVE, FONTANA, CA 92335-	0.26
Hazmat	GENERAL ENVIRONMENTAL MANAGEMENT INC	9980 CHERRY AVE, FONTANA, CA 923355219	0.254
Hazmat	EXPRESS AUTO REPAIR	8185 SIERRA AVE, FONTANA, CA 92335	0.253
Hazmat	RUSH TRUCK CENTER FONTANA BODY SHOP	10122 ELM AVE, FONTANA, CA 923350000	0.241
Hazmat	PRESTIGE STATIONS INC NO 0770	8898 SIERRA AVE, FONTANA, CA 92335	0.235
Hazmat	BIG RIG TRUCK REPAIR	14578 VALLEY BLVD, FONTANA, CA 92335	0.231
Hazmat	SIERRA ONE HOUR CLEANERS	8260 SIERRA AVE, FONTANA, CA 92335	0.231
Vulnerable Population-Senior Care	MOUNTAIN VIEW RESIDENTIAL CARE	9073 OLIVE ST, FONTANA, CA, 92335	0.221
Hazmat	FOLLETTS CLEANERS	8676 WHEELER, FONTANA, CA 92335	0.217
School	Agape Christian, The	18202 FOOTHILL BLVD, FONTANA, CA	0.199
Vulnerable Population-Senior Care	LA FUENTE LAVENDER	9545 TAMARIND AVE, FONTANA, CA, 92335	0.195
Hazmat	FONTANA MASONRY SUPPLY INC	17795 FOOTHILL BLVD, FONTANA, CA 92335	0.191

AOS 1 100-year			
Facility Type	**Facility Name**	**Address**	**Maximum Ponding Depth (ft)**
Hazmat	PIPELINE TRUCKING CO	9875 ALMOND ST, FONTANA, CA 92335	0.179
Hazmat	ARTUROS TAILOR SHOP	8990 SIERRA AVE UNIT G, FONTANA, CA 92335-4769	0.165
Hazmat	STEVES AUTO SALES	16874 FOOTHILL BLVD, FONTANA, CA 92335	0.165
Hazmat	HARBOR FREIGHT TOOLS USA INC	8933 SIERRA AVE, FONTANA, CA 92335	0.161
Vulnerable Population-Child Care	FUSD/POPLAR ELEMENTARY	9937 POPLAR AVENUE, FONTANA, CA	0.16
Hazmat	SCHNEIDER NATIONAL	14392 VALLEY BLVD, FONTANA, CA 92335	0.153
Hazmat	TIME OUT L L C D B A AM PM 11	10062 CHERRY AVE, FONTANA, CA 92335	0.142
Vulnerable Population-Child Care	FUSD/PALMETTO ELEMENTARY SCHOOL	9325 PALMETTO AVENUE, FONTANA, CA	0.139
Hazmat	CIRCLE K STORE #489	14906VALLEY BLVD, FONTANA, CA 92335	0.13
Hazmat	SIERRA VALERO, INC	10115 SIERRA AVE, FONTANA, CA 923356724	0.128
Hazmat	TEXACO SERVICE STATION	10115 SIERRA AVE, FONTANA, CA 923356724	0.128
Hazmat	MOUNTAIN VIEW TIRE/GOODYEAR	14373 BASELINE ROAD, FONTANA, CA 92336-	0.116
Hazmat	ADAMS CLEANERS & DRAPERIES	8827 SIERRA AVE, FONTANA, CA 92335	0.111
Hazmat	LUCKY GAS & FOOD	17312 FOOTHILL VLVD, FONTANA, CA 92335	0.11
Hazmat	KAISER FOUNDATION HOSPITALS/	9961 SIERRA AVENUE, FONTANA, CA 92335-6720	0.108
Hazmat	KAISER PERMANENTE	9961 SIERRA AVE, FONTANA, CA 92335	0.108
Hazmat	ALAMEDA PAINTING CO INC	15567 VALLEY BL, FONTANA, CA 92335-6351	0.107
Hazmat	EXECUTIVE CLEANERS	8923 SIERRA, FONTANA, CA 92335	0.107
Hazmat	JDC INDUSTRIES	15567 VALLEY BL, FONTANA, CA 92335-6351	0.107
Hazmat	UTILITY TRAILER SALES CO	15567 VALLEY BLVD, FONTANA, CA 92335	0.107
Vulnerable Population-Child Care	ALTUS ACADEMY	205 N. MAPLE AVE., RIALTO, CA	0.099
Hazmat	AUTOZONE #2891	14343 BASELINE AVE, FONTANA, CA 92336-	0.099
Vulnerable Population-Foster/Home Care	MASADA HOMES FFA	8485 TAMARIND AVE, FONTANA, CA, 92335	0.098
School	PALMETTO ELEMENTARY SCHOOL	9325 PALMETTO AVENUE, FONTANA, CA	0.096
Hazmat	BUDGET TIRE AND AUTO REPAIR	8595 SIERRA, FONTANA, CA 92335-3839	0.09
Hazmat	PACIFIC BELL	17070 CERES ST, FONTANA, CA 92335-8611	0.087
School	WORKFORCE PREP. CENTER	8442 SIERRA AVENUE, FONTANA, CA	0.083
Hazmat	SOUTHWEST TRUCK REPAIR	14887 E VALLEY, FONTANA, CA 92335	0.077
Hazmat	PEP BOYS #680	16711 VALLEY BLVD, FONTANA, CA 92335-6692	0.076
School	Peace in the Valley Christian Academy	17487 ARROW BLVD, FONTANA, CA	0.066
Hazmat	VIRGIL MOBILE REPAIR	10044 FONTANA AVENUE, FONTANA, CA 92335-	0.064
School	TED PORTER ELEMENTARY SCHOOL	8330 LOCUST AVENUE, FONTANA, CA	0.061
School	SOUTH TAMARIND ELEMENTARY SCHOOL	8561 TAMARIND AVENUE, FONTANA, CA	0.059
Hazmat	CHEVRON STATION NO 209515	14526 BASELINE RD, FONTANA, CA 92336-1645	0.058
Hazmat	FONTANA CLEANERS	16960 FOOTHILL BLVD, FONTANA, CA 92335	0.057
Hazmat	NICE RIVERSIDE INC	16960-C FOOTHILL BLVD, FONTANA, CA 92335	0.057
Hazmat	RITE AID NO 5695	16910 FOOTHILL BLVD, FONTANA, CA 92335 3502	0.056
Hazmat	CIRCLE K STORE #316	16617 MERRILL ST, FONTANA, CA 92335	0.054
Hazmat	ECONO LUBE N TUNE NO 79	9433 SIERRA AVE, FONTANA, CA 92335	0.054
Hazmat	JSS MARKET	14518 VALLEY BLVD, FONTANA, CA 92335	0.054
Hazmat	BUTLER FLEET SERVICE	14714 VALLEY BLVD, FONTANA, CA 92335	0.053
Hazmat	AVILA AUTO BODY INC	UNKNOWN, FONTANA, CA 92335	0.052
Hazmat	GIBRALTAR TRANSMISSIONS	9429 SIERRA AVE, FONTANA, CA 92335	0.052
Vulnerable Population-Child Care	FUSD/SOUTH TAMARIND ELEMENTARY	8561 TAMARIND AVE., FONTANA, CA	0.051
Hazmat	MORGAN CORP	9993 ALMOND AVE, FONTANA, CA 92335	0.051

AOS 1 100-year			
Facility Type	**Facility Name**	**Address**	**Maximum Ponding Depth (ft)**
Hazmat	WILLS TIRE AUTO CENTER	9439 SIERRA AVE, FONTANA, CA 92335	0.048
Hazmat	MAINE ENTERPRISES	14887 VALLEY BLVD, FONTANA, CA 92335	0.047
Hazmat	EXXON MOBIL OIL CORP	16925 FOOTHILL BLVD, FONTANA, CA 92335	0.045
Hazmat	FONTANA TRANSMISSION REPAIR	8445 JUNIPER AVE, FONTANA, CA 92335	0.045
Hazmat	MIDAS FONTANA	9413 SIERRA AVE, FONTANA, CA 92335	0.045
Hazmat	AUTOZONE #5613	9535 SIERRA AVE, FONTANA, CA 92335-2414	0.044
Police Station	SB Co. Sheriff - Fontana Station	17780 ARROW BLVD, FONTANA, CA	0.043
Vulnerable Population-Adult Residential Care	SEVILLE CARE CENTER	16186 SEVILLE AVE, FONTANA, CA	0.043
Hazmat	CALIFORNIA AUTOMOTIVE IND	16726 SPRING ST, FONTANA, CA 92335	0.042
Hazmat	CIRCLE K STORE #5802	16900 FOOTHILL BLVD, FONTANA, CA 92335	0.042
Hazmat	TOSCO 30567	16900 FOOTHILL BLVD, FONTANA, CA 92335	0.042
Utility-Communication Facility	TowerCo Assets LLC	9683 ALDER AVENUE, FONTANA, CA	0.042
Hazmat	KRAGEN AUTO PARTS #1749	9800 SIERRA AVE, FONTANA, CA 92335-6719	0.038
Hazmat	EXPO NUMBER 600	16721 VALLEY BLVD, FONTANA, CA 92335	0.035
Hazmat	HA LO AUTOMOTIVE	9417 SIERRA AVE, FONTANA, CA 92335	0.033
Hazmat	WINSTON TIRE FONTANA	9550 SIERRA AVE, FONTANA, CA 92335	0.031
School	OLEANDER ELEMENTARY SCHOOL	8650 OLEANDER AVENUE, FONTANA, CA	0.026
Hazmat	KRAGEN AUTO PARTS #0341	16990 FOOTHILL BLVD, FONTANA, CA 92335	0.026
Vulnerable Population-Child Care	FUSD/CYPRESS ELEMENTARY SCHOOL	9751 CYPRESS, FONTANA, CA	0.025
Vulnerable Population-Adult Residential Care	FIRST STEP FONTANA	8621 JUNIPER AVE. #101, FONTANA, CA	0.024
Hazmat	HOUSE OF HONDA	9530 SIERRA, FONTANA, CA 92335-2423	0.024
Hazmat	ARCO FACILITY NO 09693	16090 FOOTHILL BLVD, FONTANA, CA 92335	0.023
Hazmat	DONS AUTO CENTER	16282 VALLY BLVD, FONTANA, CA 92335	0.023
Hazmat	GEORGE'S SIERRA SHELL	9684 SIERRA AVE, FONTANA, CA 92335	0.022
Vulnerable Population-Adult Residential Care	KHEESA'S FAMILY HOME	17269 SAN BERNARDINO AVE., FONTANA, CA	0.021
Vulnerable Population-Child Care	FUSD/OLEANDER ELEMENTARY	8650 OLEANDER AVENUE, FONTANA, CA	0.017
Hazmat	FONTANA CITY OF	16489 ORANGE WAY, FONTANA, CA 92335	0.017
Hazmat	MOUNTAINEER CD - CITY OF FONTANA	16489 ORANGE WAY, FONTANA - CA 92335	0.017
Hazmat	ROCK HONDA	9612 SIERRA AVE, FONTANA, CA 92335	0.016
EOC	City of FONTANA EOC (in PD)	17005 UPLAND AVE, FONTANA, CA	0.015
Police Station	Fontana Police Department (& EOC)	17005 UPLAND AVE, FONTANA, CA	0.015
Hazmat	REPO RANCH	15836 VALLEY BLVD, FONTANA, CA 92335	0.013
Hazmat	CVS PHARMACY NO 9619	9840 SIERRA AVE, FONTANA, CA 92335	0.012
Hazmat	INTERSTATE EXPRESS INC	10010 BEECH AVENUE, FONTANA, CA 92335	0.012
Hazmat	J AND F TRUCKING	15055 VALLEY BLVD, FONTANA, CA 923355000	0.012
Hazmat	GASCO SERVICE STATION #595	16081 VALLEY BLVD, FONTANA, CA 92335	0.011

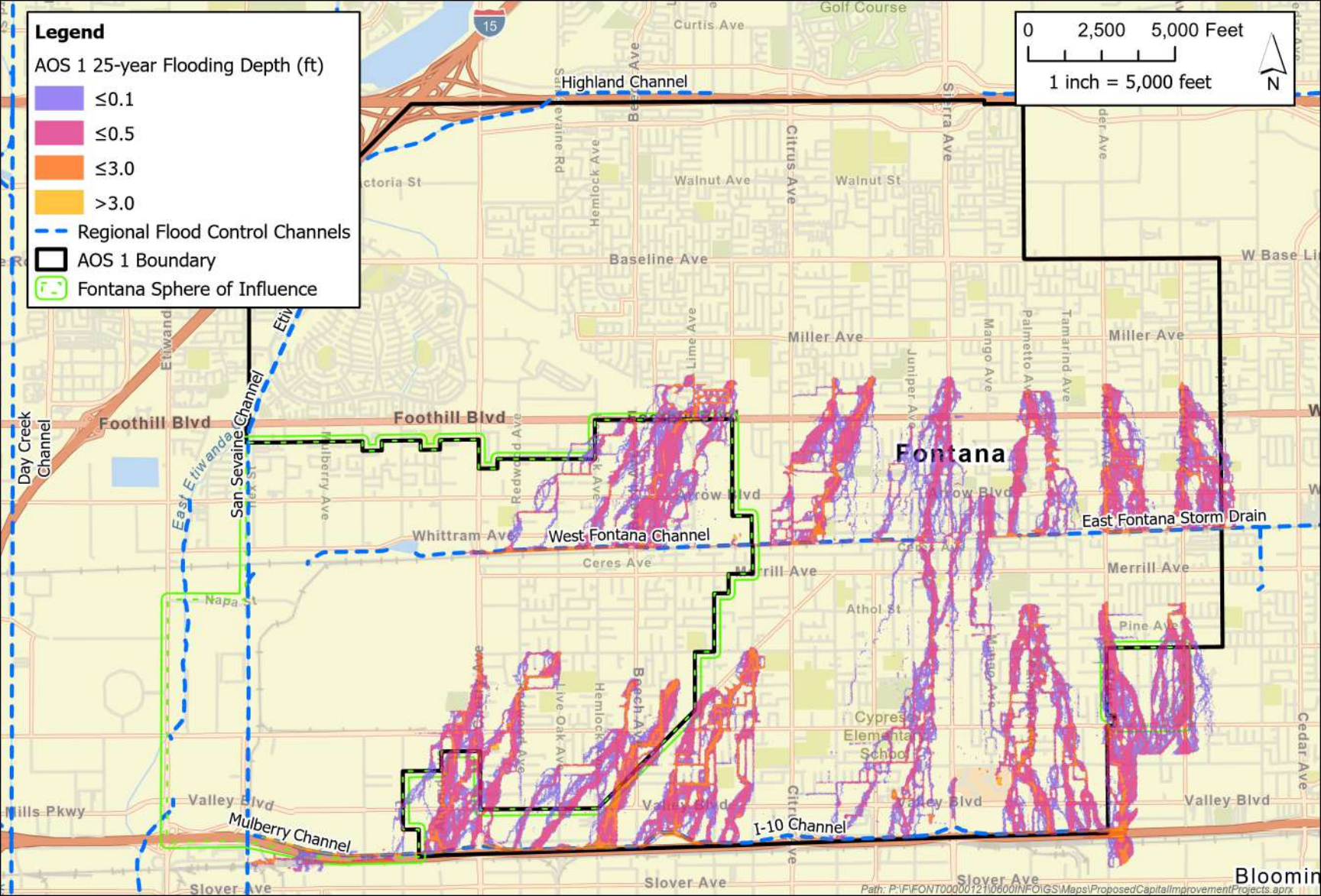
AOS 2 100-year			
Facility Type	**Facility Name**	**Address**	**Maximum Ponding Depth (ft)**
School	OAK PARK ELEMENTARY SCHOOL	14200 LIVE OAK AVENUE	1.606
Vulnerable Population-Child Care	FUSD/OAK PARK	14200 LIVE OAK AVENUE, FONTANA, CA	1.234
Vulnerable Population-Child Care	FUSD/CANYON CREST ELEMENTARY	11851 CHERRY AVENUE, FONTANA, CA	1.22
Hazmat	SIERRA ALUMINUM CO	11711 PACIFIC AVENUE, FONTANA, CA 92337-6961	1.172
Hazmat	SIERRA ALUMINUM FONTANA FINISHING OPERATION	11806 PACIFIC AVENUE, FONTANA, CA 92337-6962	1.172
Hazmat	CLIFFSTAR CORPORATION/FONTANA	11751 PACIFIC AVE, FONTANA, CA 92337	1.14
School	CANYON CREST ELEMENTARY SCHOOL	11851 CHERRY AVENUE	0.771
Hazmat	CURTIS 1000	10887 COMMERCE WAY STE A, FONTANA, CA 92337	0.728
Hazmat	AMERICAN SECURITY PRODUCTS CO	11925 PACIFIC AVE, FONTANA, CA 92337-8205	0.72
School	CHAPARRAL ELEMENTARY SCHOOL	14000 SHADOW HILLS DRIVE	0.545
School	SOUTHRIDGE MIDDLE SCHOOL	14500 LIVE OAK AVENUE	0.472
Vulnerable Population-Child Care	FUSD-KAISER H.S.	11155 ALMOND AVENUE, FONTANA, CA	0.338
Hazmat	CEMEX FONTANA PLANT	13220 SANTA ANA AVE, FONTANA, CA 92337	0.337
Hazmat	SUPERIOR TRAILER WORK	13700 SLOVER AVE, FONTANA, CA 92335	0.245
Hazmat	STARLITE RECLAMATION ENVIRONMENTAL SVCS	11225 MULBERRY AVE, FONTANA, CA 923370000	0.2
Hazmat	GOLDEN W OIL CO INC	11040 CHERRY AVE, FONTANA, CA 92337-7119	0.182
Hazmat	DURAN TRUCKING	11236 CITRUS AVE, FONTANA, CA 92337	0.179
Hazmat	ZEPEDA BROTHERS	11236 CITRUS AVE, FONTANA, CA 92337	0.179
Hazmat	AZTEC CONCRETE ACCESSORIES INC	10780 MULBERRY AVE, FONTANA, CA 92337	0.17
Hazmat	PACIFIC CORRUGATED PIPE CO	13680 SLOVER AVENUE, FONTANA, CA 92335	0.168
Hazmat	CLARK PACIFIC	13592 SLOVER AV, FONTANA, CA 92337-6978	0.165
Hazmat	SCRIPTO TOKAI CORPORATION	11591 ETIWANDA AVENUE, FONTANA, CA 92337-6927	0.155
Hazmat	METALCRAFT FONTANA FACILITY	10840 MULBERRY AVE, FONTANA, CA 92337	0.143
Hazmat	U S REDUCTION CO	11600 ETIWANDA AVE, FONTANA, CA 92337-6929	0.126
Hazmat	R K M EQUIPMENT AND TRUCKING	10787 MULBERRY B, FONTANA, CA 92335	0.122
Hazmat	CAT CONTRACTING INC	10911 JASMINE ST, FONTANA, CA 92337	0.114
Hazmat	RECTICEL FOAM CORP.	13215 MARLAY AVE., FONTANA, CA 92335	0.108
Hazmat	GENUINE PARTS COMPANY	11710 PACIFIC AVE, FONTANA, CA 92335	0.105
School	KAISER HIGH SCHOOL	11155 ALMOND AVENUE	0.104
Hazmat	SOUTHERN CALIFORNIA SCREEN PRI	10680 MULBERRY AVE, FONTANA, CA 92337	0.097
Hazmat	S & H CABINETS & MFG INC	10860 MULBERRY AVENUE, FONTANA, CA 92337-7027	0.078
Hazmat	THOMPSON BLDG MATERIALS	11027 CHERRY AVE, FONTANA, CA 92335	0.075
Hazmat	WESTERN MANUFACTURING	11027 CHERRY AVE S E LOT, FONTANA, CA 923370917	0.075
Hazmat	FORCE OFFSHORE LLC	13052 DAHLIA ST, FONTANA, CA 92337	0.072
Hazmat	BRAGG CRANE SVC	13188 DAHLIA ST, FONTANA, CA 92335	0.069
Hazmat	FEDEX FREIGHT WEST INC	11153 MULBERRY, FONTANA, CA 92337-7030	0.04
Hazmat	TUTOR SALIBA CORP	11171 CHERRY AVE, FONTANA, CA 92337-7195	0.035
Hazmat	30 MINUTE PHOTO SOUTHRIDGE PLAZA	11623 CHERRY AVE, FONTANA, CA 92337	0.028
Hazmat	C L PHARRIS SAND & GRAVEL INC	SUNWEST MATERIALS, FONTANA, CA 92337	0.023
Hazmat	MCBEE FLEET SERVICE	11081 REDWOOD AVE, FONTANA, CA 92335	0.023
Hazmat	RUAN LEASING COMPANY	13803 SANTA ANA AVENUE, FONTANA, CA 92337-7033	0.019
Hazmat	NORCO RANCH INC	15750 JURUPA AVE, FONTANA, CA 92337	0.015
Hazmat	DELTAMERCANTILE GROUP INC	10580 MULBERRY AVE, FONTANA, CA 92337	0.013

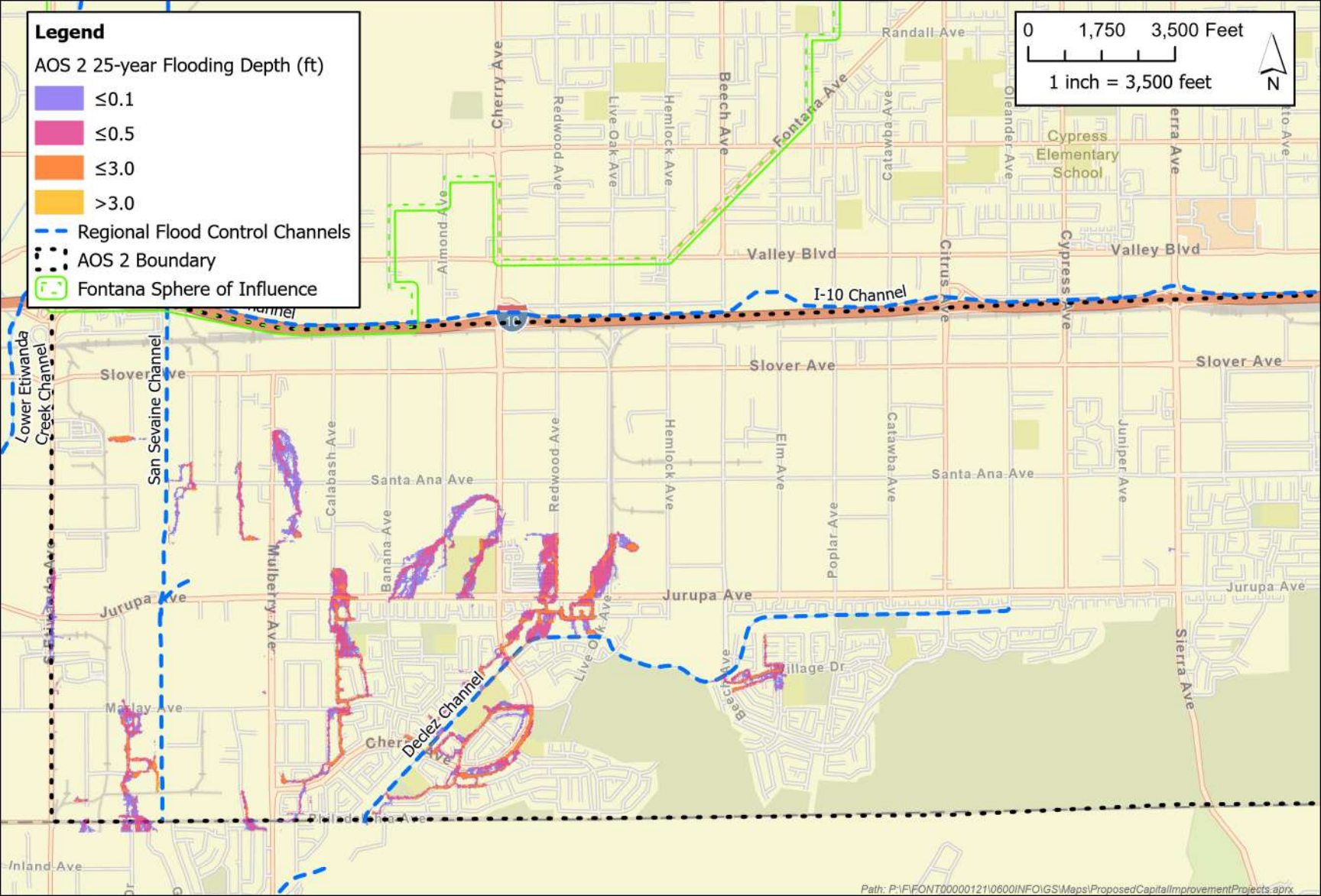
AOS 3 100-year			
Facility Type	**Facility Name**	**Address**	**Maximum Ponding Depth (ft)**
Utility-Communication Facility	SOUTHERN CALIFORNIA EDISON	4949 Citrus Avenue, FONTANA, CA	0.593
Vulnerable Population-Adult Residential Care	UPCHURCH ARF-PINE VALLEY	5855 PINE VALLEY DR., FONTANA, CA	0.454
Vulnerable Population-Senior Care	UPCHURCH ARF-PINE VALLEY	5855 Pine Valley Dr, Fontana, CA, 92336	0.454
Vulnerable Population-Senior Care	ABBY'S HOME	15554 Rockwell Ave, Fontana, CA, 92336	0.342
Hazmat	SOUTHERN CALIFORNIA GAS CO	DUNCAN CANYON RD AND CITRIS AV, FONTANA, CA 92335	0.244
Hazmat	JDK HOLDINGS INC	15218 SUMMIT AVE, FONTANA, CA 92336	0.22
Hazmat	TARGET DISTRIBUTION CENTER T3806	3105 NORTH MANGO AVENUE, RIALTO, CA 92660	0.18
Hazmat	STATER BROS MARKETS #175 FALCON RIDGE	15222 SUMMIT AVE, FONTANA, CA 92336	0.142
Hazmat	PACIFIC DIAZO PRODUCTS INC	6183 SIERRA AVENUE, UNITS 7 & 8, FONTANA, CA 92336-1201	0.113
Hazmat	CVS PHARMACY #8589	15286 SUMMIT AVE, FONTANA, CA 92336	0.082
Hazmat	CU PLUS PRODUCTS, LLC	15028 COYOTE CT, FONTANA, CA 92336	0.08
Vulnerable Population-Senior Care	BRENTWOOD ELDER CARE II	15986 Baltray Way, Fontana, CA, 92336	0.06
Hazmat	CHEVRON #211869	15160 SUMMIT AVE., FONTANA, CA 92336	0.054
Hazmat	KNOX STREET MERCURY	6133 KNOX STREET, FONTANA, CA 92336-4519	0.05
Hazmat	TARGET STORE T1958	15272 SUMMIT AVE, FONTANA, CA 92336	0.046
Hazmat	HOME DEPOT NO HD 6960	16005 SIERRA LAKES PKWY, FONTANA, CA 92336	0.039
Utility-Communication Facility	Horizon Tower, LLC	6428 Catawba Avenue, Fontana, CA	0.016

Existing Conditions Flooding Depths, 25-Year Event

FONTANA
CALIFORNIA

DAVID EVANS
AND ASSOCIATES INC.


Legend
AOS 1 25-year Flooding Depth (ft)
≤0.1
≤0.5
≤3.0
>3.0
Regional Flood Control Channels
AOS 1 Boundary
Fontana Sphere of Influence
0 2,500 5,000 Feet
1 inch = 5,000 feet
N
Highland Channel
West Fontana Channel
East Fontana Storm Drain
Mulberry Channel
I-10 Channel
Day Creek Channel
San Sevaine Channel
East Etiwanda
Foothill Blvd
Whittram Ave
Ceres Ave
Merrill Ave
Valley Blvd
Slover Ave
Miller Ave
Baseline Ave
Walnut Ave
Walnut St
Athol St
Napa St
Fontana
Golf Course
Curtis Ave
Citrus Ave
Sierra Ave
Lime Ave
Juniper Ave
Mango Ave
Palmetto Ave
Tamarind Ave
Pine Ave
Cedar Ave
Mulberry Ave
Redwood Ave
Live Oak Ave
Hemlock Ave
Beech Ave
Cypress Elementary School
Bloomin


Legend
AOS 2 25-year Flooding Depth (ft)
≤0.1
≤0.5
≤3.0
>3.0
Regional Flood Control Channels
AOS 2 Boundary
Fontana Sphere of influence
0 1,750 3,500 Feet
1 inch = 3,500 feet
N
Randall Ave
Cherry Ave
Redwood Ave
Live Oak Ave
Hemlock Ave
Beech Ave
Fontana Ave
Catawba Ave
Oleander Ave
Cypress Elementary School
Almond Ave
Valley Blvd
Citrus Ave
Cypress Ave
I-10 Channel
Slover Ave
Lower Etiwanda Creek Channel
San Sevaine Channel
Calabash Ave
Santa Ana Ave
Banana Ave
Elm Ave
Poplar Ave
Juniper Ave
Mulberry Ave
Jurupa Ave
Declez Channel
Village Dr
Sierra Ave
Marlay Ave
Inland Ave
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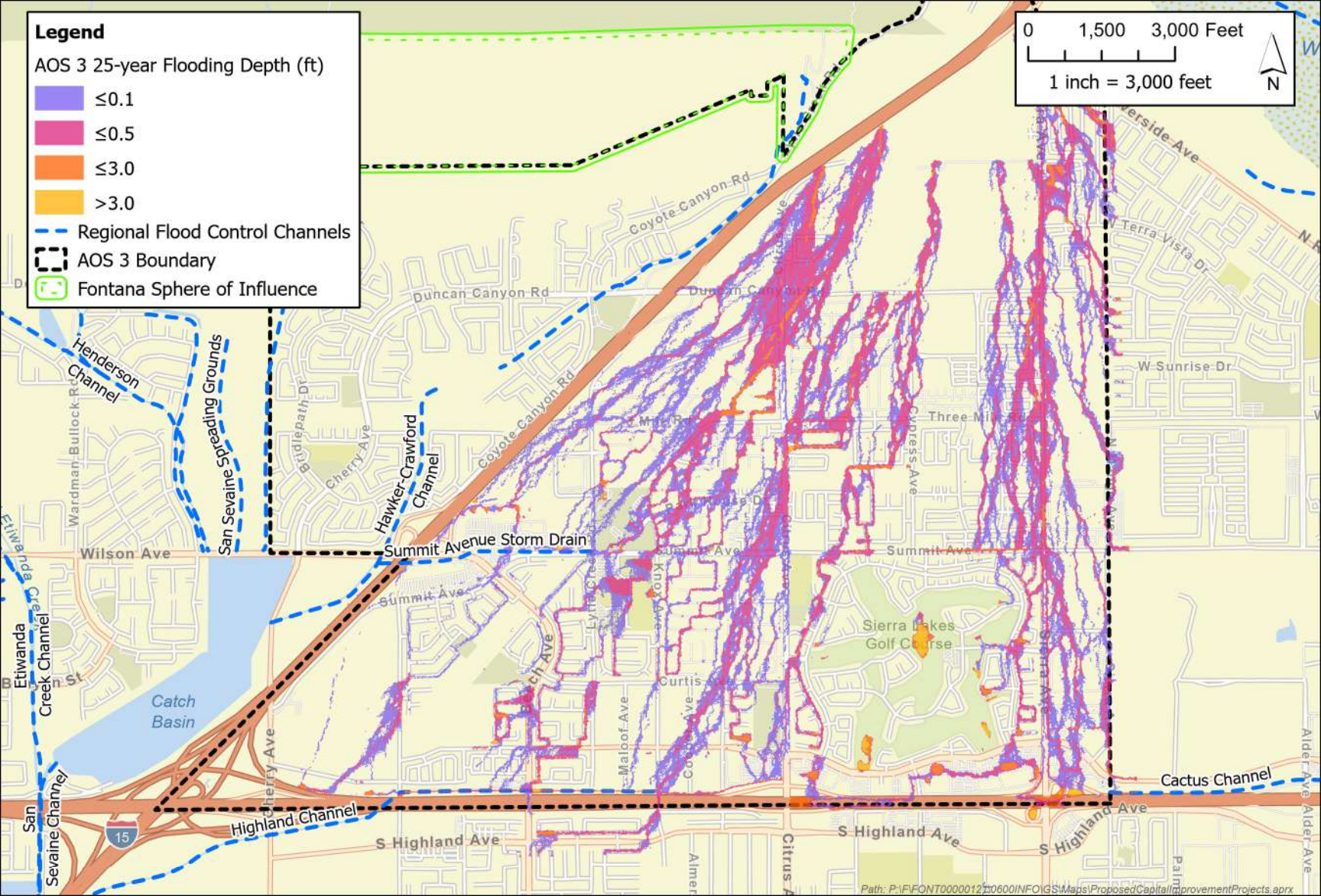
Legend
AOS 3 25-year Flooding Depth (ft)
≤0.1
≤0.5
≤3.0
>3.0
Regional Flood Control Channels
AOS 3 Boundary
Fontana Sphere of Influence
0
1,500
3,000 Feet
1 inch = 3,000 feet
N
Henderson Channel
San Sevaine Spreading Grounds
Hawker-Crawford Channel
Summit Avenue Storm Drain
Etiwanda Creek Channel
Catch Basin
San Sevaine Channel
Highland Channel
Cactus Channel
Coyote Canyon Rd
Duncan Canyon Rd
Wilson Ave
Summit Ave
S Highland Ave
W Sunrise Dr
Three Mile Rd
Sierra Lakes Golf Course
Cherry Ave
Maloof Ave
Cypress Ave
Citrus Ave
Alder Ave
Terra Vista Dr
Curtis
Wardman
Bullock Rd
Bridle Path Dr
Knox Ave
Lytle Creek
Palm
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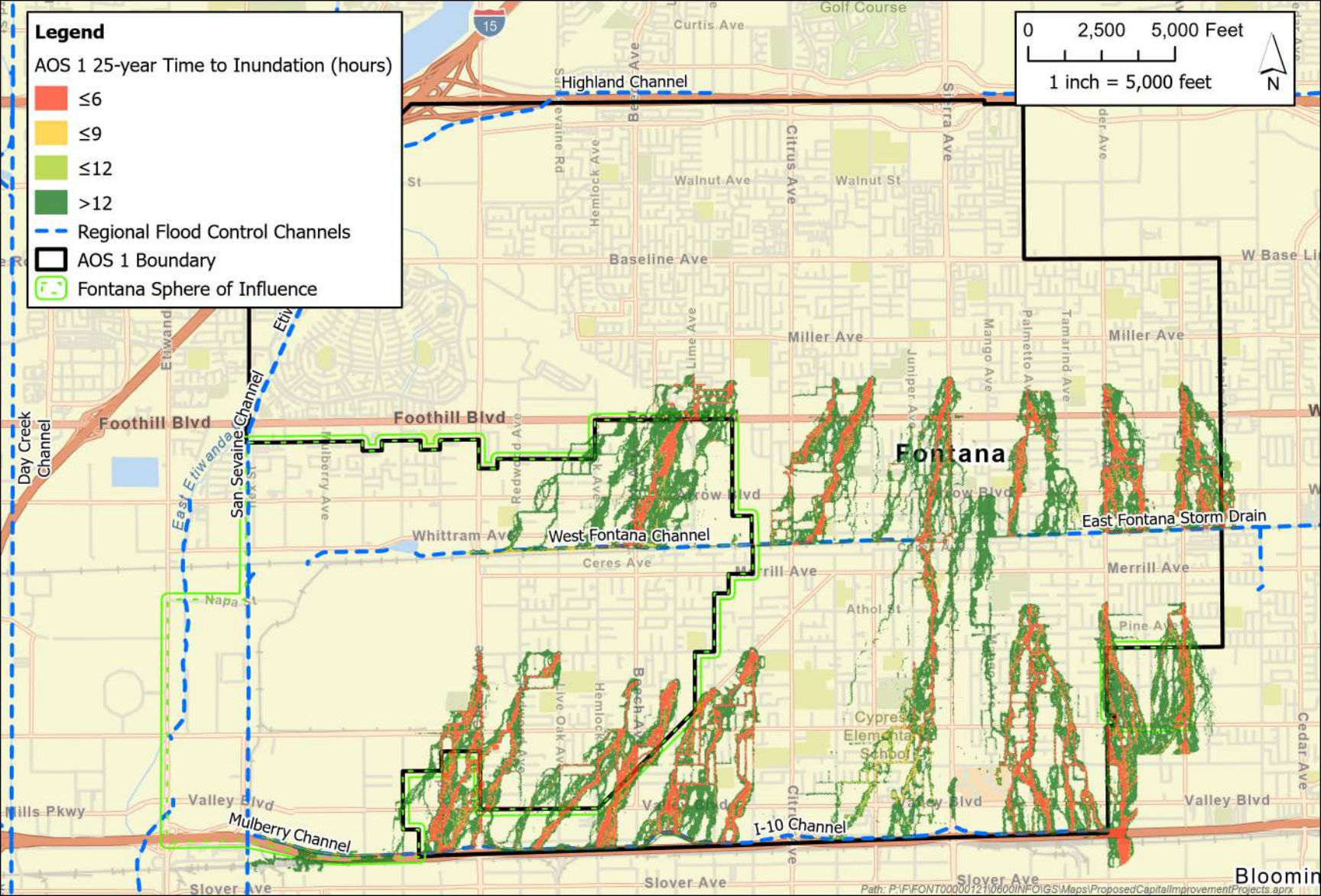
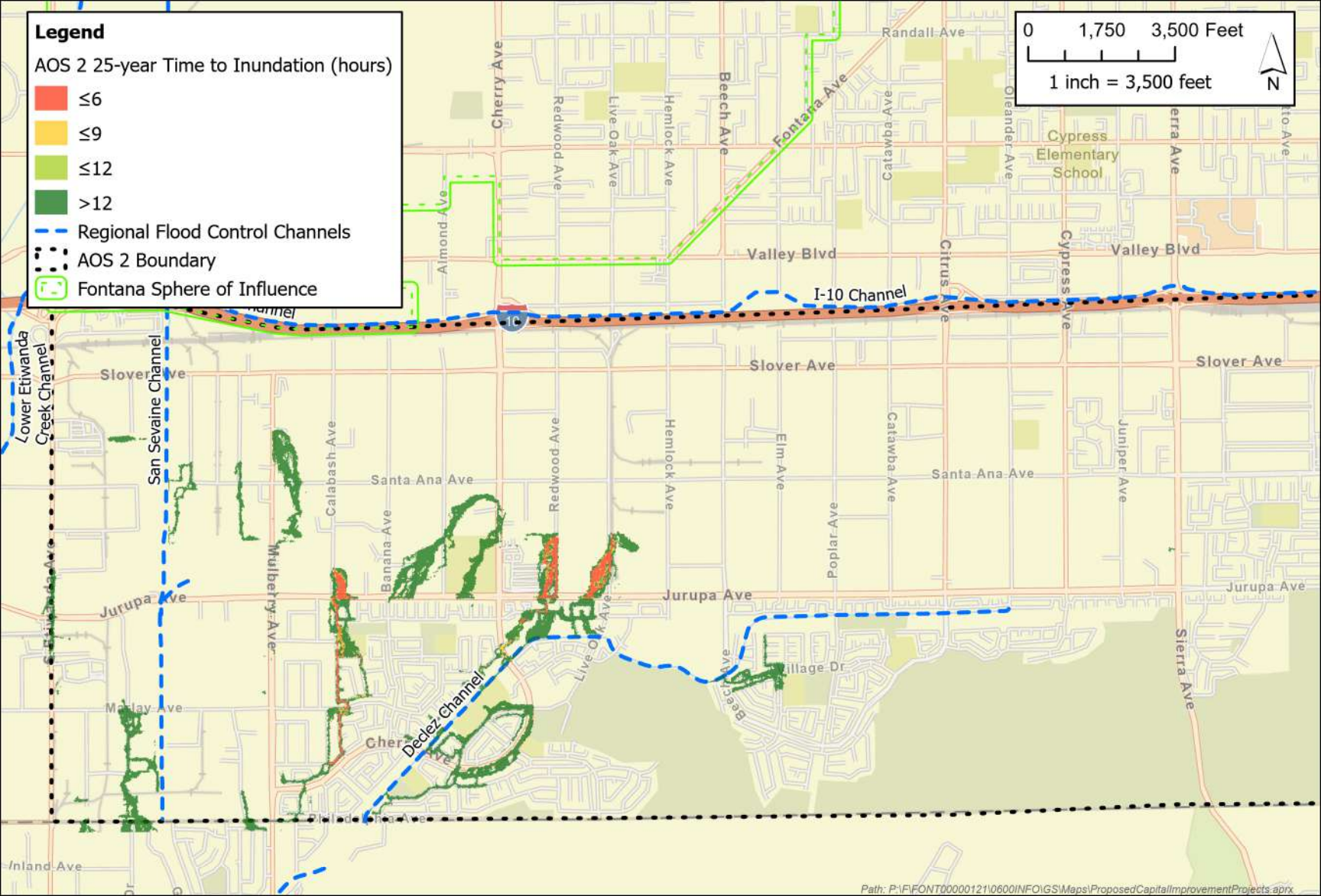
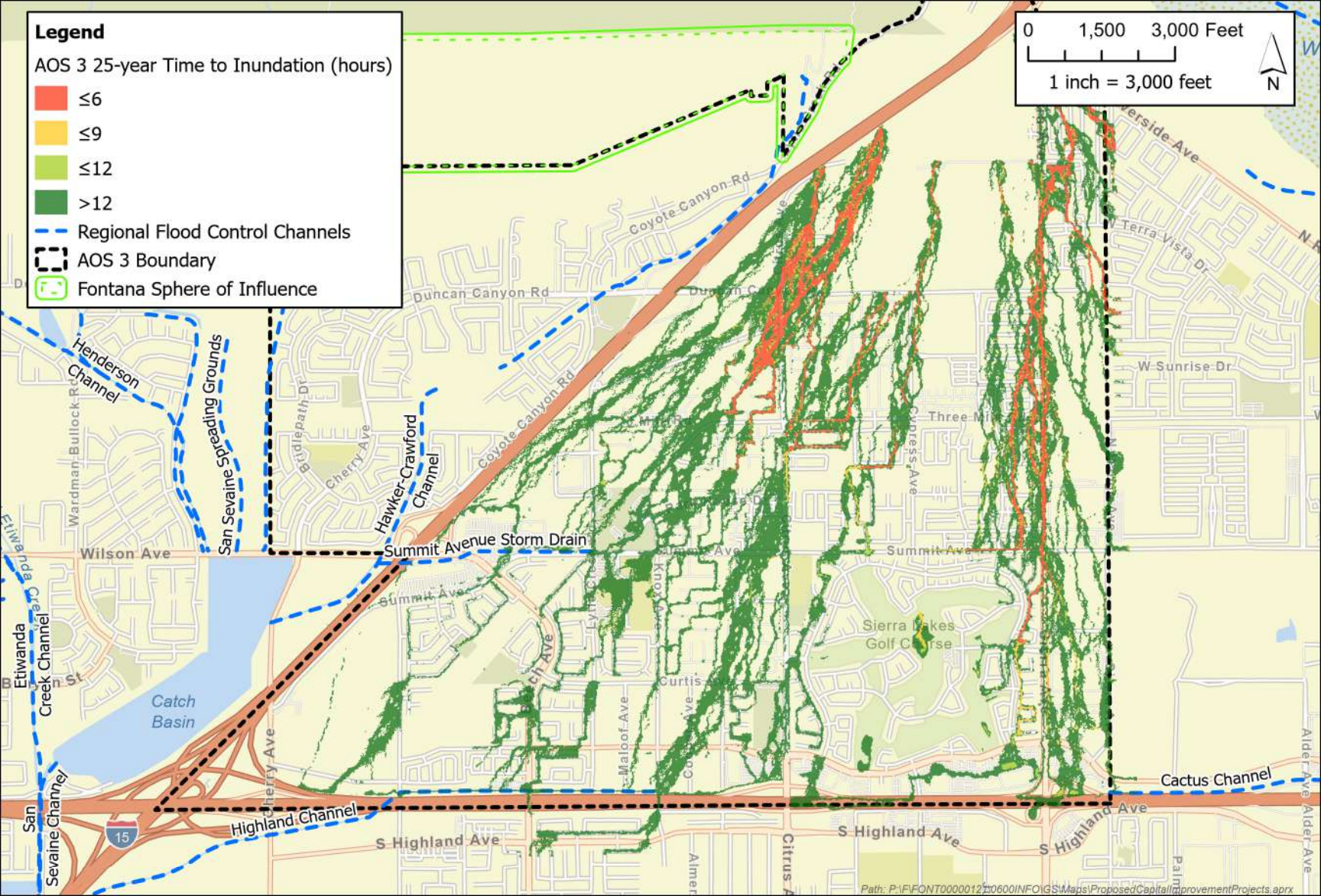
Existing Conditions Time to Inundation, 25-Year Event

FONTANA
CALIFORNIA

DAVID EVANS
AND ASSOCIATES INC.


Legend
AOS 1 25-year Time to Inundation (hours)
≤6
≤9
≤12
>12
Regional Flood Control Channels
AOS 1 Boundary
Fontana Sphere of Influence
0 2,500 5,000 Feet
1 inch = 5,000 feet
N
Highland Channel
Foothill Blvd
Foothill Blvd
Fontana
East Fontana Storm Drain
West Fontana Channel
San Sevaine Channel
Day Creek Channel
East Etiwanda Creek
Mulberry Channel
I-10 Channel
Baseline Ave
Miller Ave
Miller Ave
Merrill Ave
Merrill Ave
Whittram Ave
Ceres Ave
Valley Blvd
Valley Blvd
Valley Blvd
Slover Ave
Slover Ave
Walnut Ave
Walnut St
Curtis Ave
Golf Course
Citrus Ave
Sierra Ave
Lime Ave
Juniper Ave
Mango Ave
Palmetto Ave
Tamarind Ave
Redwood Ave
Mulberry Ave
Live Oak Ave
Hemlock Ave
Beech Ave
Athol St
Pine Ave
Napa St
Cedar Ave
Mills Pkwy
Bloomin


Legend
AOS 2 25-year Time to Inundation (hours)
≤6
≤9
≤12
>12
Regional Flood Control Channels
AOS 2 Boundary
Fontana Sphere of Influence
0 1,750 3,500 Feet
1 inch = 3,500 feet
N
Randall Ave
Cherry Ave
Redwood Ave
Live Oak Ave
Hemlock Ave
Beech Ave
Fontana Ave
Catawba Ave
Oleander Ave
Cypress Elementary School
Sierra Ave
Almond Ave
Valley Blvd
Citrus Ave
Cypress Ave
I-10 Channel
Slover Ave
Lower Etiwanda Creek Channel
San Sevaine Channel
Calabash Ave
Santa Ana Ave
Banana Ave
Mulberry Ave
Elm Ave
Poplar Ave
Juniper Ave
Jurupa Ave
Declez Channel
Village Dr
Merlay Ave
Inland Ave


Legend
AOS 3 25-year Time to Inundation (hours)
≤6
≤9
≤12
>12
Regional Flood Control Channels
AOS 3 Boundary
Fontana Sphere of Influence
0 1,500 3,000 Feet
1 inch = 3,000 feet
N
Henderson Channel
San Sevaine Spreading Grounds
Hawker-Crawford Channel
Summit Avenue Storm Drain
Cactus Channel
Highland Channel
San Sevaine Channel
Etiwanda Creek Channel
Catch Basin
Sierra Lakes Golf Course
Coyote Canyon Rd
Duncan Canyon Rd
Wilson Ave
Summit Ave
S Highland Ave
W Sunrise Dr
Terra Vista Dr
Cherry Ave
Maloof Ave
Citrus Ave
Alder Ave
Bridle Path Dr
Wardman Bullock Rd
Three Mi
Curtis
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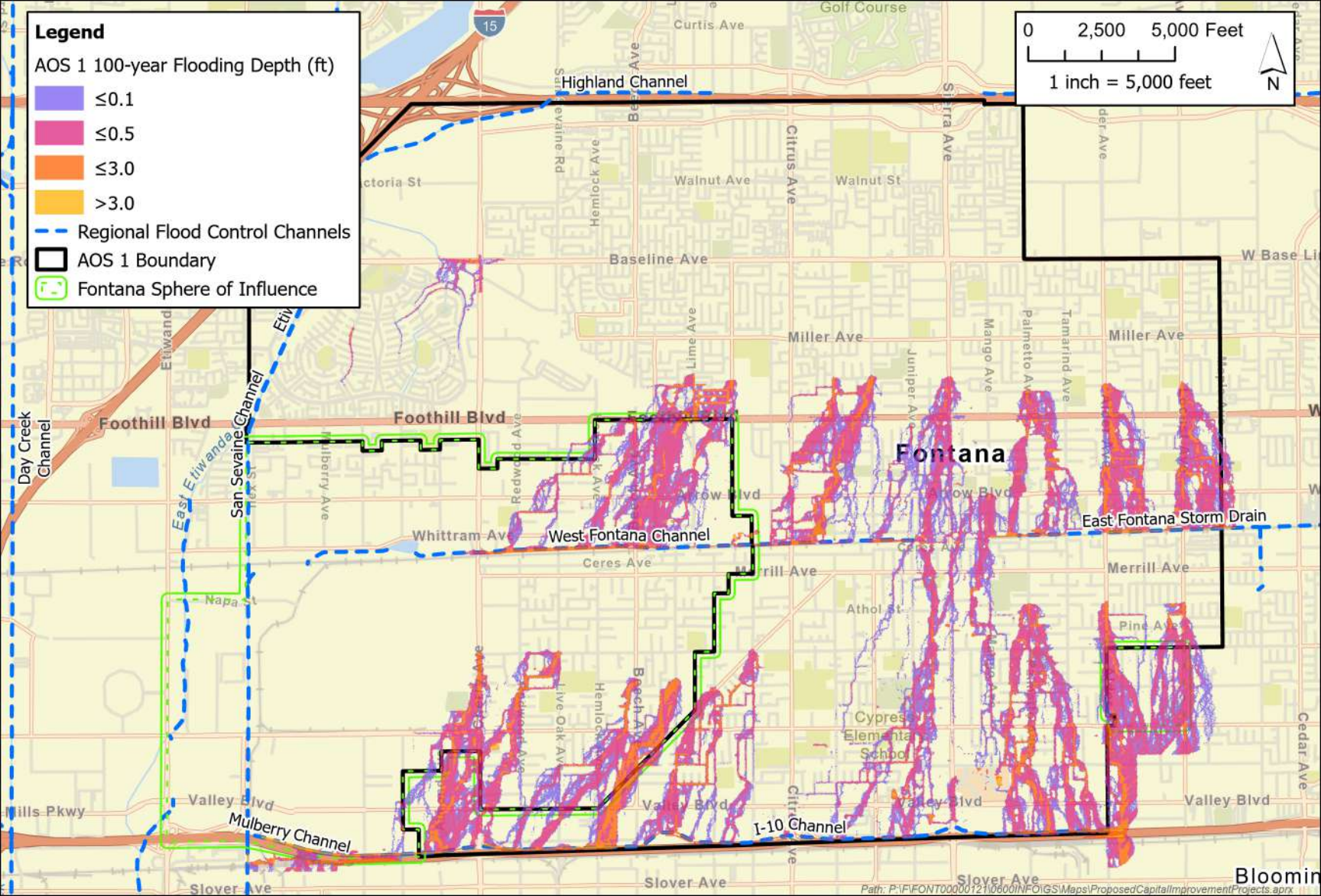
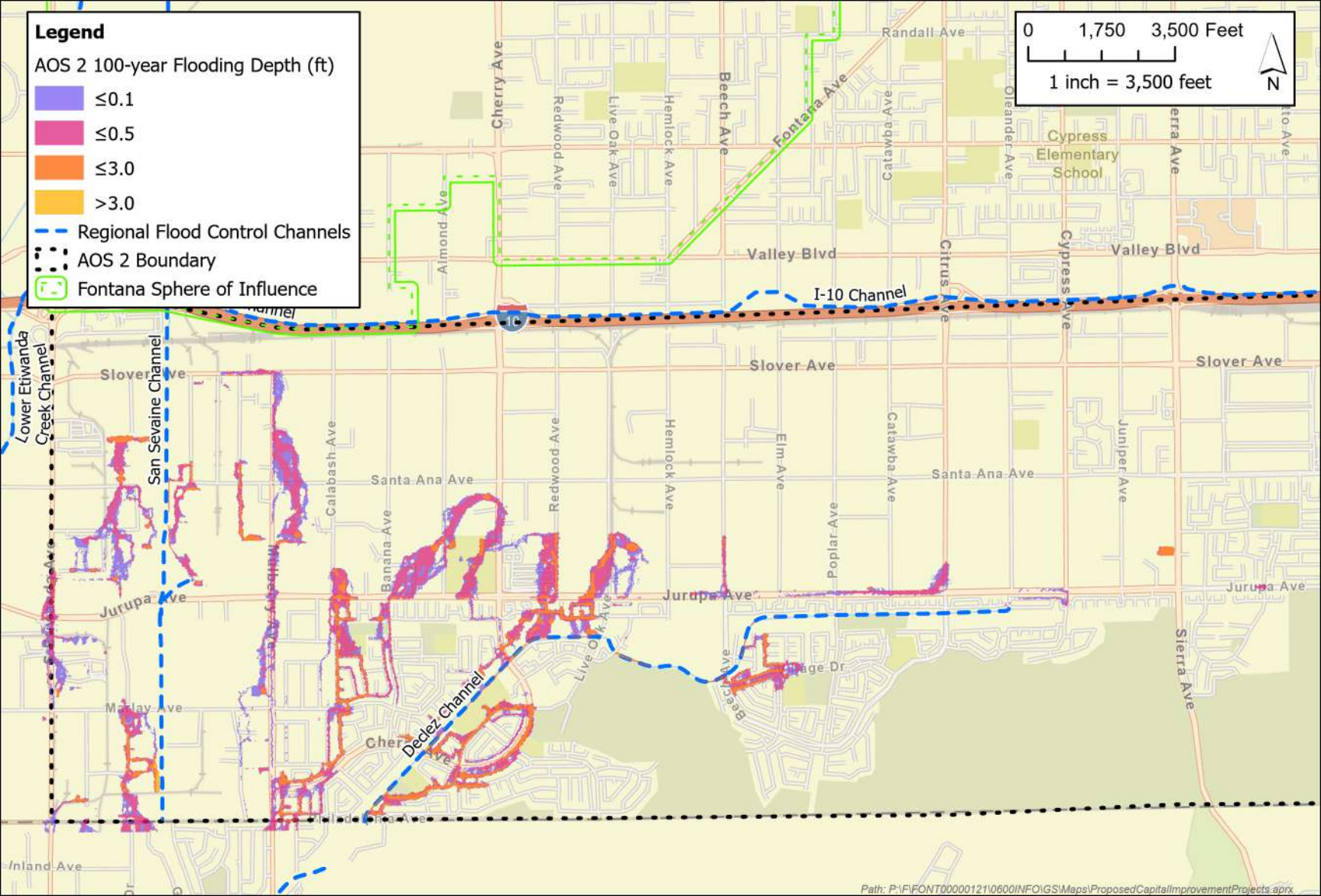
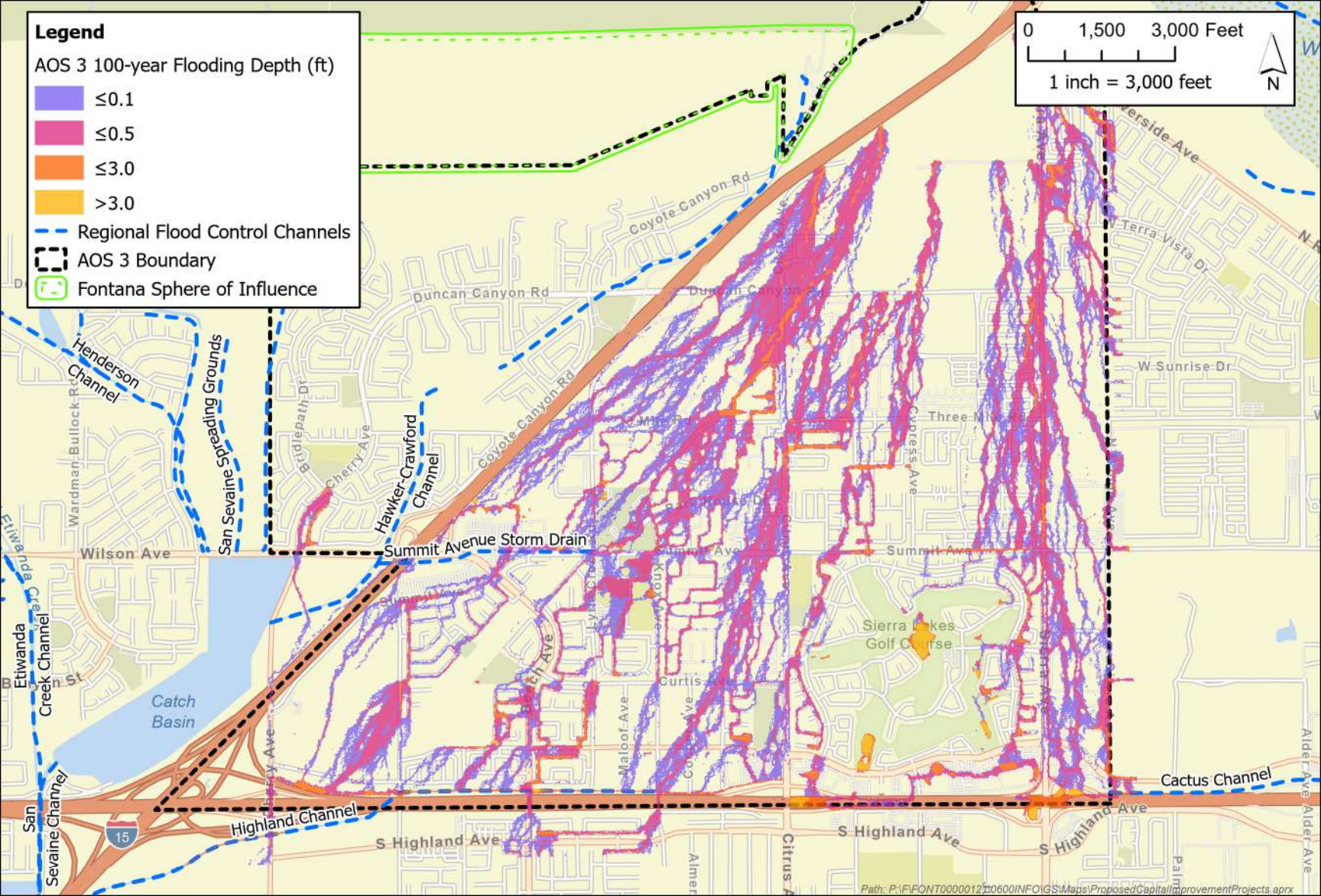
Existing Conditions Flooding Depths, 100-Year Event

FONTANA
CALIFORNIA

DAVID EVANS
AND ASSOCIATES INC.


Legend
AOS 1 100-year Flooding Depth (ft)
≤0.1
≤0.5
≤3.0
>3.0
Regional Flood Control Channels
AOS 1 Boundary
Fontana Sphere of Influence
0 2,500 5,000 Feet
1 inch = 5,000 feet
N
Highland Channel
Foothill Blvd
Foothill Blvd
Fontana
Baseline Ave
Miller Ave
Miller Ave
Whittram Ave
West Fontana Channel
East Fontana Storm Drain
Ceres Ave
Merrill Ave
Valley Blvd
Valley Blvd
Valley Blvd
Mulberry Channel
I-10 Channel
Slover Ave
Slover Ave
Day Creek Channel
San Sevaine Channel
East Etiwanda
Citrus Ave
Sierra Ave
Walnut Ave
Walnut St
Lime Ave
Juniper Ave
Mango Ave
Palmetto Ave
Tamarind Ave
Redwood Ave
Mulberry Ave
Live Oak Ave
Cypress Elementary School
Athol St
Pine Ave
Cedar Ave
Napa St
Golf Course
Curtis Ave
Bloomin

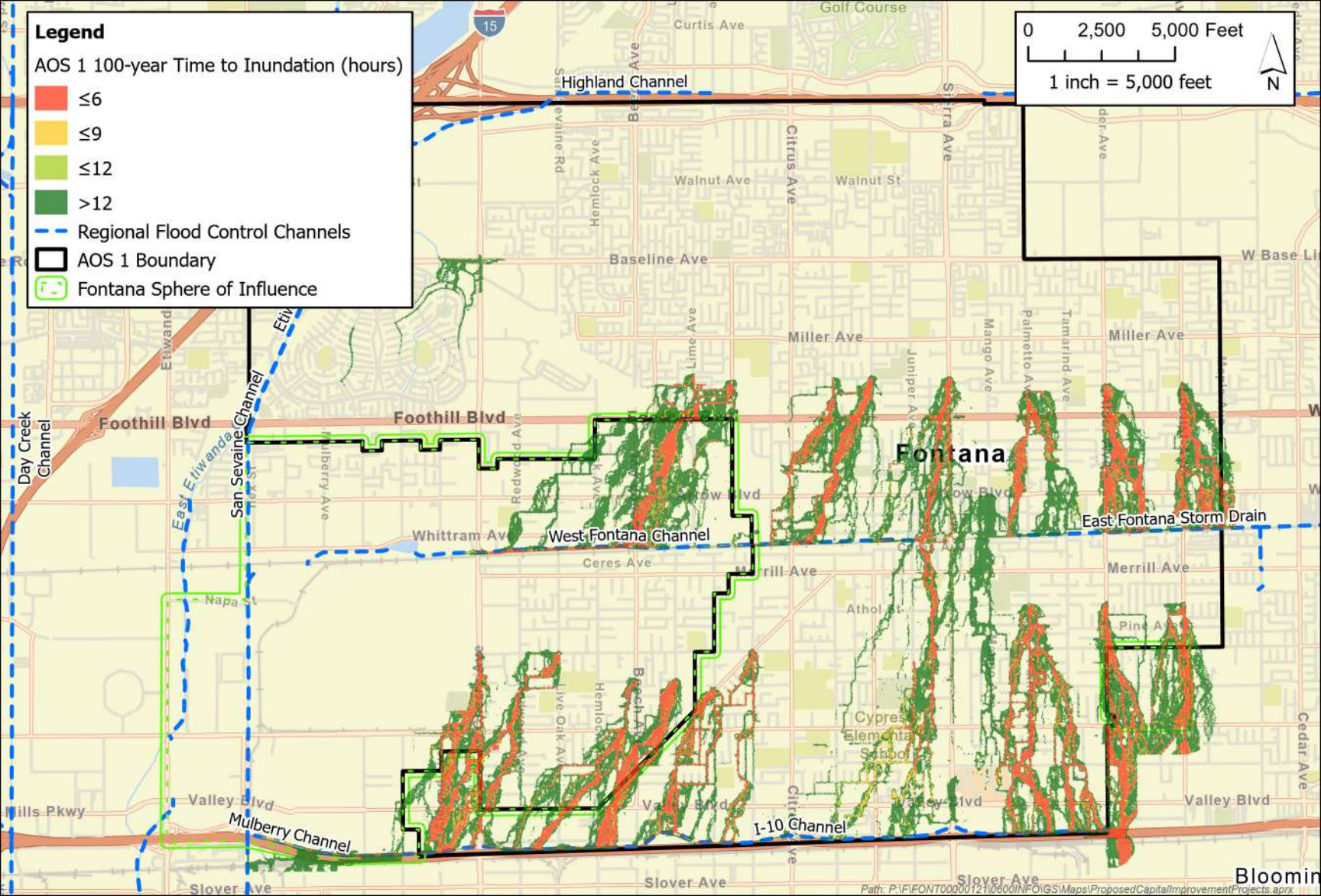

Legend
AOS 2 100-year Flooding Depth (ft)
≤0.1
≤0.5
≤3.0
>3.0
Regional Flood Control Channels
AOS 2 Boundary
Fontana Sphere of Influence
0 1,750 3,500 Feet
1 inch = 3,500 feet
N
Randall Ave
Cherry Ave
Redwood Ave
Live Oak Ave
Hemlock Ave
Beech Ave
Fontana Ave
Catawba Ave
Oleander Ave
Cypress Elementary School
Almond Ave
Valley Blvd
Citrus Ave
Cypress Ave
I-10 Channel
Slover Ave
Lower Etiwanda Creek Channel
San Sevaine Channel
Calabash Ave
Santa Ana Ave
Banana Ave
Elm Ave
Poplar Ave
Juniper Ave
Jurupa Ave
Declez Channel
Beech Ave
Sierra Ave
Merlay Ave
Inland Ave
Path: P:\F\FONT00000121\0600\INFO\GS\Maps\ProposedCapitalImprovementProjects.aprx

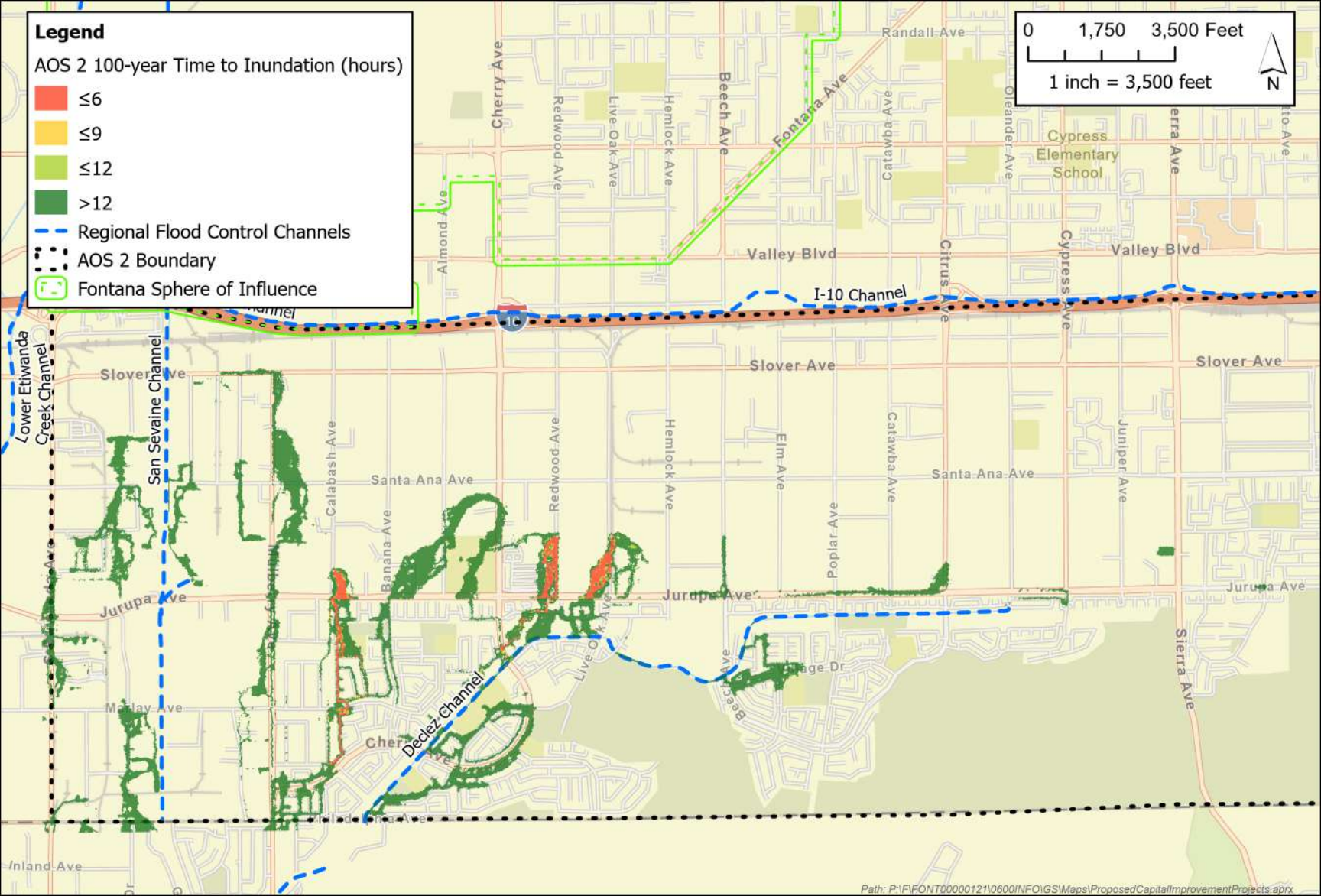

Legend
AOS 3 100-year Flooding Depth (ft)
≤0.1
≤0.5
≤3.0
>3.0
Regional Flood Control Channels
AOS 3 Boundary
Fontana Sphere of Influence
0
1,500
3,000 Feet
1 inch = 3,000 feet
N
Henderson Channel
San Sevaine Spreading Grounds
Hawker-Crawford Channel
Summit Avenue Storm Drain
Highland Channel
Cactus Channel
Etiwanda Creek Channel
San Sevaine Channel
Catch Basin
Sierra Lakes Golf Course
Coyote Canyon Rd
Duncan Canyon Rd
Wilson Ave
Summit Ave
S Highland Ave
W Sunrise Dr
Terra Vista Dr
Cherry Ave
Cypress Ave
Maloof Ave
Citrus Ave
Alder Ave
Wardman Bullock Rd
Bridle Path Dr
Three Mile Rd
Curtis
Knox Ave
Beech Ave
Palm Ave
Path: P:\FONT00000125\0600\INFO\GIS\Maps\ProposedCapitalImprovementProjects.aprx

Existing Conditions Time to Inundation, 100-Year Event

FONTANA
CALIFORNIA

DAVID EVANS
AND ASSOCIATES INC.


Legend
AOS 1 100-year Time to Inundation (hours)
≤6
≤9
≤12
>12
Regional Flood Control Channels
AOS 1 Boundary
Fontana Sphere of Influence
0 2,500 5,000 Feet
1 inch = 5,000 feet
N
Highland Channel
Curtis Ave
Golf Course
Walnut Ave
Walnut St
Baseline Ave
Miller Ave
Foothill Blvd
Fontana
Whittram Ave
West Fontana Channel
East Fontana Storm Drain
Ceres Ave
Merrill Ave
Athol St
Valley Blvd
Mulberry Channel
I-10 Channel
Slover Ave
Day Creek Channel
San Sevaine Channel
East Etiwanda
Etiwanda
Mulberry Ave
Redwood Ave
Lime Ave
Citrus Ave
Sierra Ave
Juniper Ave
Mango Ave
Palmetto Ave
Tamarind Ave
Beech Ave
Hemlock Ave
Live Oak Ave
Cedar Ave
Napa St
Pine Ave
Cypress Elementary School
Mills Pkwy
Bloomin
Path: P:\F\FONT00000121\0600\INFO\GIS\Maps\ProposedCapitalImprovementProjects.aprx


Legend
AOS 2 100-year Time to Inundation (hours)
≤6
≤9
≤12
>12
Regional Flood Control Channels
AOS 2 Boundary
Fontana Sphere of Influence
0 1,750 3,500 Feet
1 inch = 3,500 feet
N
Randall Ave
Cherry Ave
Redwood Ave
Live Oak Ave
Hemlock Ave
Beech Ave
Fontana Ave
Catawba Ave
Oleander Ave
Cypress Elementary School
Almond Ave
Valley Blvd
Citrus Ave
Cypress Ave
I-10 Channel
Slover Ave
Lower Etiwanda Creek Channel
San Sevaine Channel
Calabash Ave
Santa Ana Ave
Banana Ave
Elm Ave
Poplar Ave
Juniper Ave
Jurupa Ave
Declez Channel
Sierra Ave
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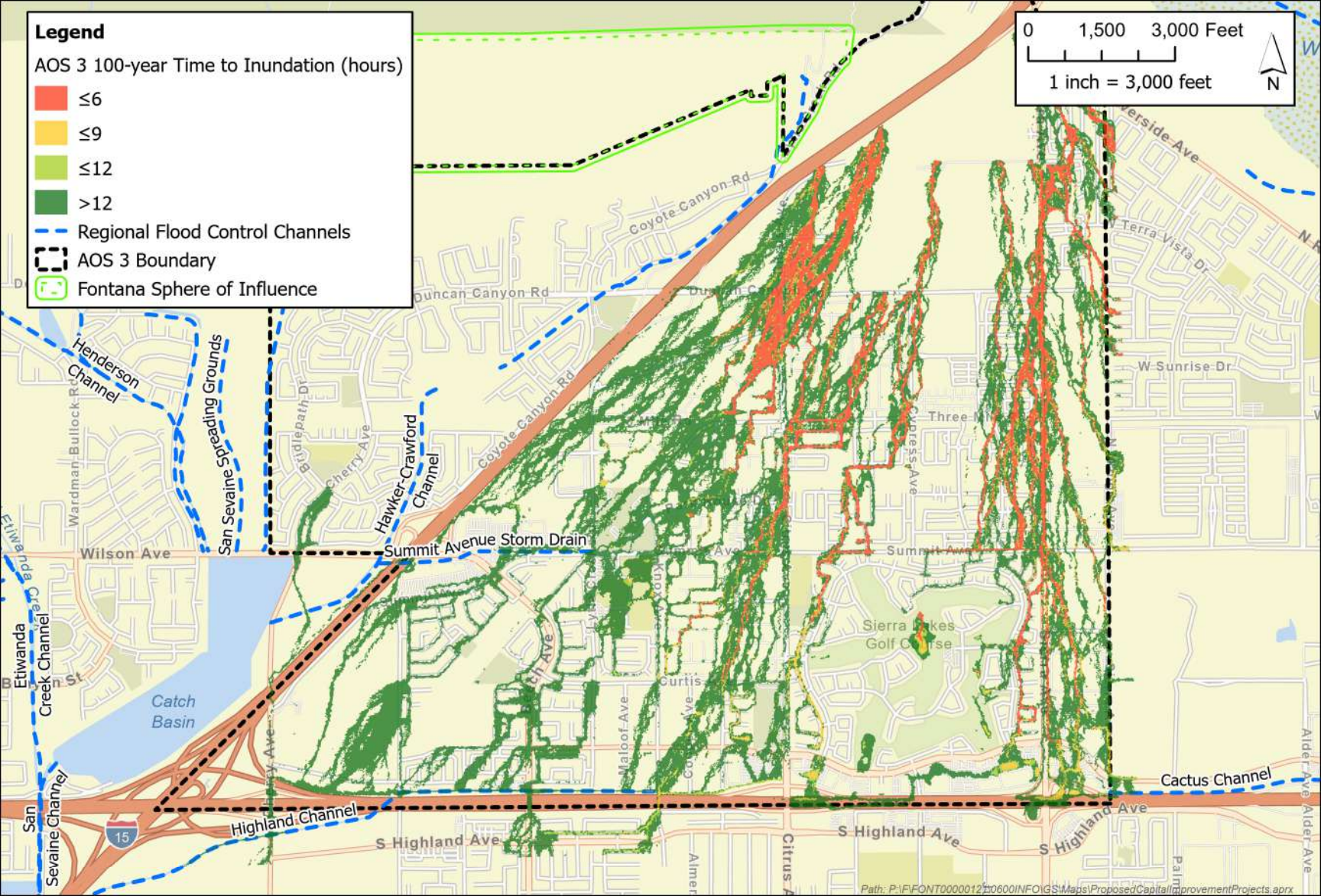
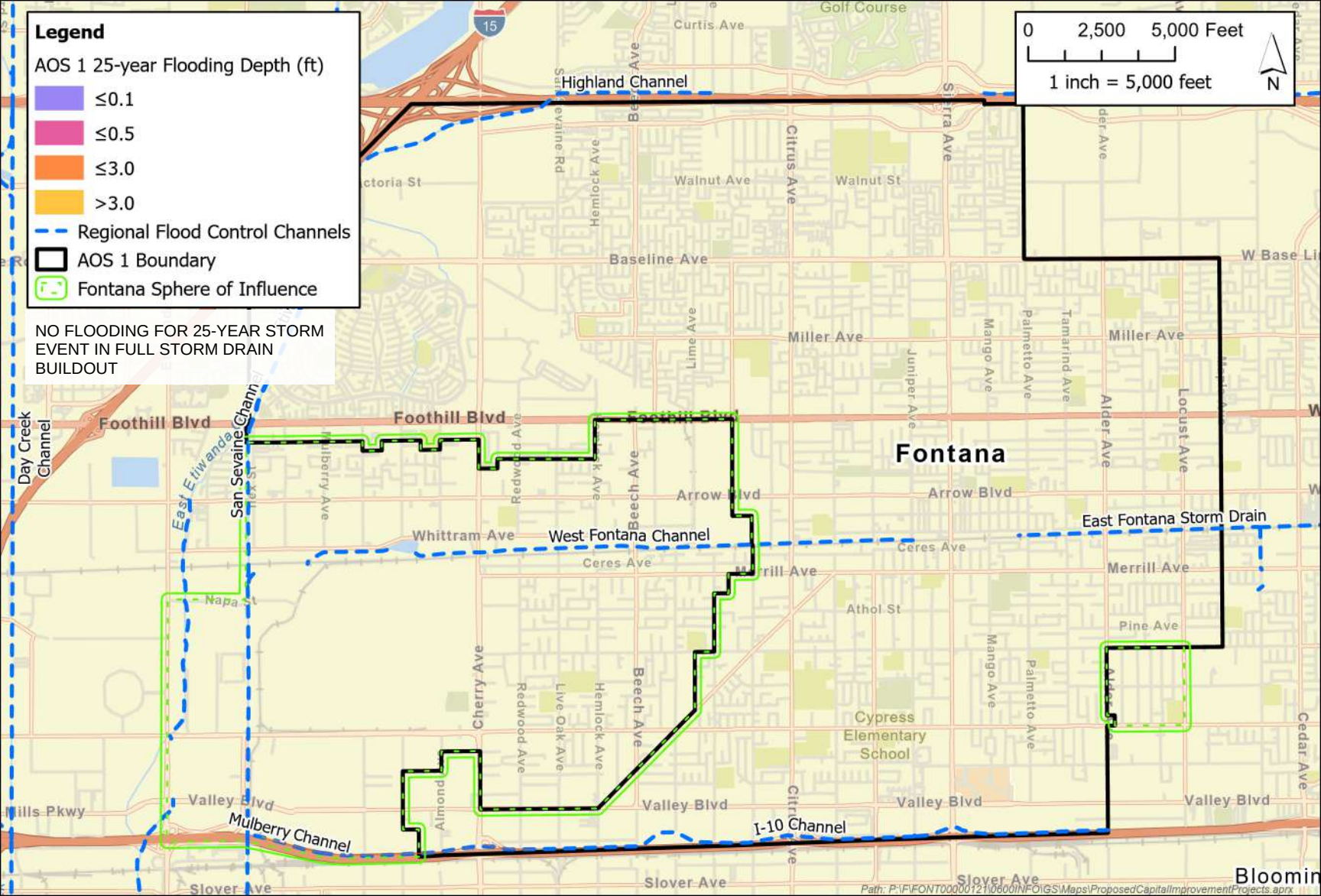

Legend
AOS 3 100-year Time to Inundation (hours)
≤6
≤9
≤12
>12
Regional Flood Control Channels
AOS 3 Boundary
Fontana Sphere of Influence
0
1,500
3,000 Feet
1 inch = 3,000 feet
N
Coyote Canyon Rd
Duncan Canyon Rd
Henderson Channel
San Sevaine Spreading Grounds
Hawker-Crawford Channel
Summit Avenue Storm Drain
Wilson Ave
Etiwanda Creek Channel
Catch Basin
Highland Channel
San Sevaine Channel
Cactus Channel
S Highland Ave
W Sunrise Dr
Terra Vista Dr
Cypress Ave
Maloof Ave
Curtis
Sierra Lakes Golf Course
Bridle Path Dr
Cherry Ave
Wardman Bullock Rd
15

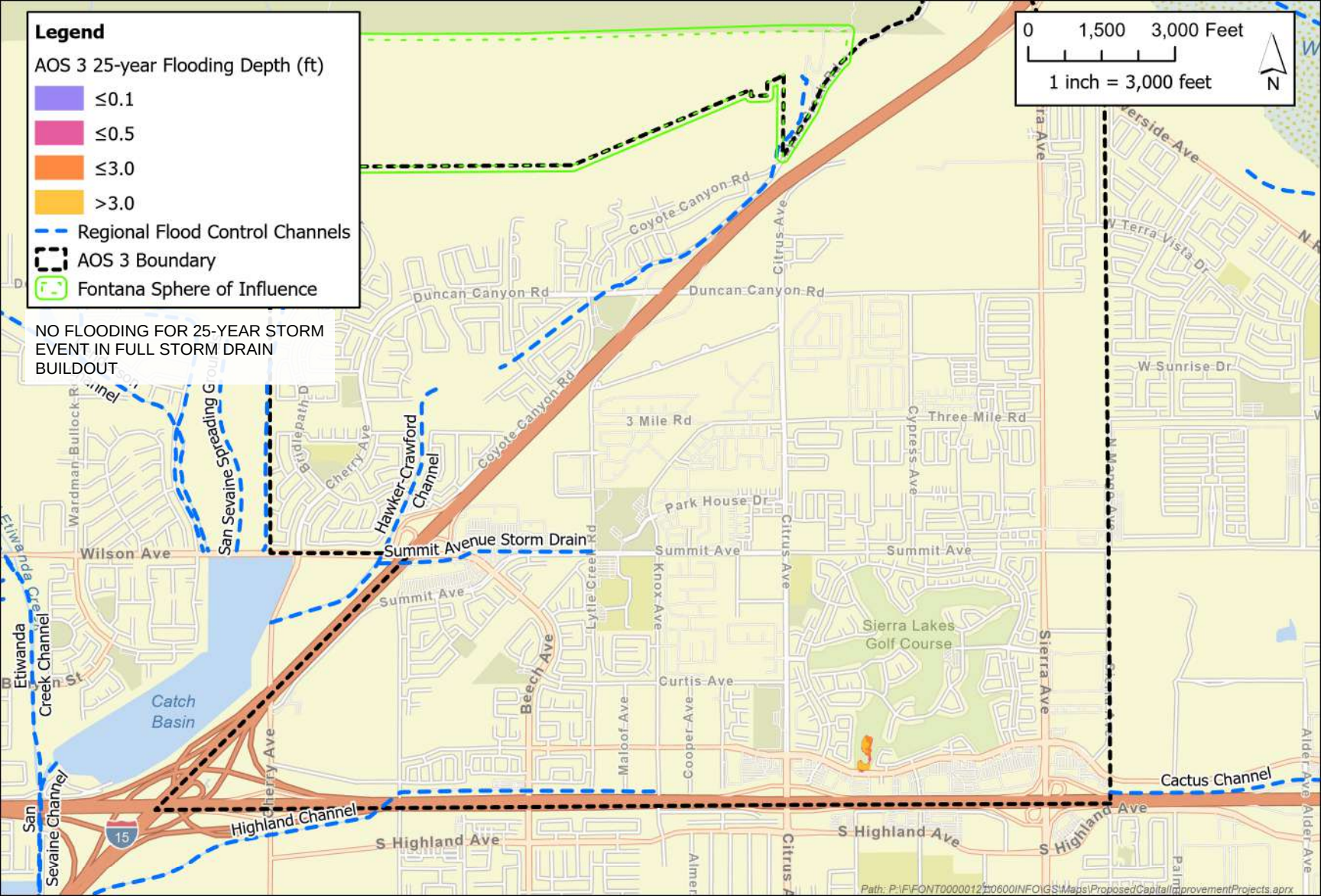
Proposed Conditions Flooding Depths, 25-Year Event

FONTANA
CALIFORNIA

DAVID EVANS
AND ASSOCIATES INC.


Legend
AOS 1 25-year Flooding Depth (ft)
≤0.1
≤0.5
≤3.0
>3.0
Regional Flood Control Channels
AOS 1 Boundary
Fontana Sphere of Influence
NO FLOODING FOR 25-YEAR STORM EVENT IN FULL STORM DRAIN BUILDOUT
0 2,500 5,000 Feet
1 inch = 5,000 feet
N
Highland Channel
Foothill Blvd
Day Creek Channel
San Sevaine Channel
East Etiwanda Creek
West Fontana Channel
East Fontana Storm Drain
Mulberry Channel
I-10 Channel
Fontana
Arrow Blvd
Whittram Ave
Ceres Ave
Merrill Ave
Valley Blvd
Slover Ave
Miller Ave
Baseline Ave
Walnut Ave
Walnut St
Curtis Ave
Golf Course
Citrus Ave
Sierra Ave
Beech Ave
Cherry Ave
Redwood Ave
Live Oak Ave
Hemlock Ave
Almond Ave
Lime Ave
Juniper Ave
Mango Ave
Palmetto Ave
Tamarind Ave
Alder Ave
Locust Ave
Cedar Ave
Pine Ave
Athol St
Napa St
Mulberry Ave
Cypress Elementary School
Bloomin
Path: P:\F\FONT00000121\0600\INFO\GS\Maps\ProposedCapitalImprovementProjects.aprx

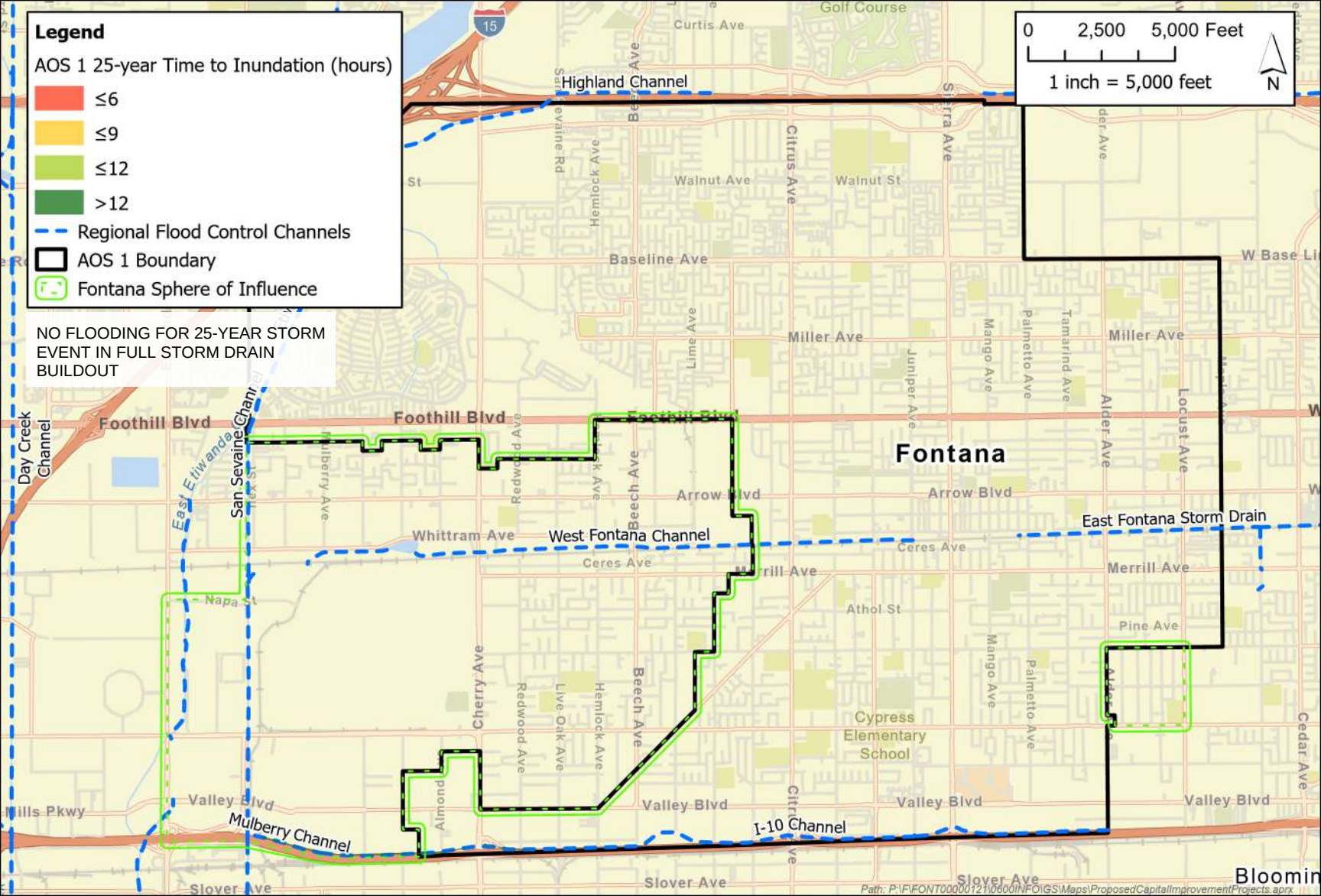
Legend AOS 2 25-year Flooding Depth (ft)
≤0.1
≤0.5
≤3.0
>3.0
Regional Flood Control Channels
AOS 2 Boundary
Fontana Sphere of Influence
NO FLOODING FOR 25-YEAR STORM EVENT IN FULL STORM DRAIN BUILDOUT
0 1,750 3,500 Feet
1 inch = 3,500 feet
N
Randall Ave
Cherry Ave
Redwood Ave
Live Oak Ave
Hemlock Ave
Beech Ave
Fontana Ave
Catawba Ave
Oleander Ave
Cypress Elementary School
Sierra Ave
Almond Ave
Valley Blvd
Citrus Ave
Cypress Ave
I-10 Channel
Slover Ave
Lower Etiwanda Creek Channel
San Sevaine Channel
Calabash Ave
Banana Ave
Santa Ana Ave
Elm Ave
Poplar Ave
Juniper Ave
Jurupa Ave
Mulberry Ave
Village Dr
Declez Channel
Marlay Ave
Inland Ave


Legend
AOS 3 25-year Flooding Depth (ft)
≤0.1
≤0.5
≤3.0
>3.0
Regional Flood Control Channels
AOS 3 Boundary
Fontana Sphere of Influence
NO FLOODING FOR 25-YEAR STORM EVENT IN FULL STORM DRAIN BUILDOUT
0 1,500 3,000 Feet
1 inch = 3,000 feet
N
Coyote Canyon Rd
Duncan Canyon Rd
Citrus Ave
Verside Ave
Terra Vista Dr
W Sunrise Dr
3 Mile Rd
Three Mile Rd
Cypress Ave
Park House Dr
Summit Avenue Storm Drain
Summit Ave
Wilson Ave
Hawker-Crawford Channel
San Sevaine Spreading G
Wardman Bullock R
Bridle Path D
Cherry Ave
Etiwanda Creek Channel
Lytle Creek Rd
Knox Ave
Beech Ave
Curtis Ave
Maloof Ave
Cooper Ave
Sierra Lakes Golf Course
Sierra Ave
Catch Basin
Cactus Channel
Highland Channel
S Highland Ave
San Sevaine Channel
15
Path: P:\FONT00000125\0600\INFO\GS\Maps\ProposedCapitalImprovementProjects.aprx

Proposed Conditions Time to Inundation, 25-Year Event

FONTANA
CALIFORNIA

DAVID EVANS
AND ASSOCIATES INC.


Legend
AOS 1 25-year Time to Inundation (hours)
≤6
≤9
≤12
>12
Regional Flood Control Channels
AOS 1 Boundary
Fontana Sphere of Influence
NO FLOODING FOR 25-YEAR STORM EVENT IN FULL STORM DRAIN BUILDOUT
0 2,500 5,000 Feet
1 inch = 5,000 feet
N
Highland Channel
Foothill Blvd
Day Creek Channel
East Etiwanda Creek
San Sevaine Channel
Fontana
Arrow Blvd
Whittram Ave
West Fontana Channel
East Fontana Storm Drain
Ceres Ave
Merrill Ave
Athol St
Pine Ave
Cypress Elementary School
Valley Blvd
Mulberry Channel
I-10 Channel
Slover Ave
Baseline Ave
Miller Ave
Walnut Ave
Walnut St
Curtis Ave
Golf Course
Citrus Ave
Sierra Ave
Beech Ave
Cherry Ave
Redwood Ave
Live Oak Ave
Hemlock Ave
Almond
Lime Ave
Juniper Ave
Mango Ave
Palmetto Ave
Tamarind Ave
Alder Ave
Locust Ave
Cedar Ave
Napa St
Mulberry Ave
Hamlock Ave
Mills Pkwy
Bloomin
Path: P:\F\FONT00000121\0600INFO\GIS\Maps\ProposedCapitalImprovementProjects.aprx

Legend
AOS 2 25-year Time to Inundation (hours)
≤6
≤9
≤12
>12
Regional Flood Control Channels
AOS 2 Boundary
Fontana Sphere of Influence
NO FLOODING FOR 25-YEAR STORM EVENT IN FULL STORM DRAIN BUILDOUT
0 1,750 3,500 Feet
1 inch = 3,500 feet
N
Randall Ave
Cherry Ave
Redwood Ave
Live Oak Ave
Hemlock Ave
Beech Ave
Fontana Ave
Catawba Ave
Oleander Ave
Cypress Elementary School
Sierra Ave
Almond Ave
Valley Blvd
Citrus Ave
Cypress Ave
I-10 Channel
Slover Ave
Lower Etiwanda Creek Channel
San Sevaine Channel
Calabash Ave
Banana Ave
Elm Ave
Poplar Ave
Juniper Ave
Santa Ana Ave
Mulberry Ave
Jurupa Ave
Village Dr
Declez Channel
Marlay Ave
Inland Ave
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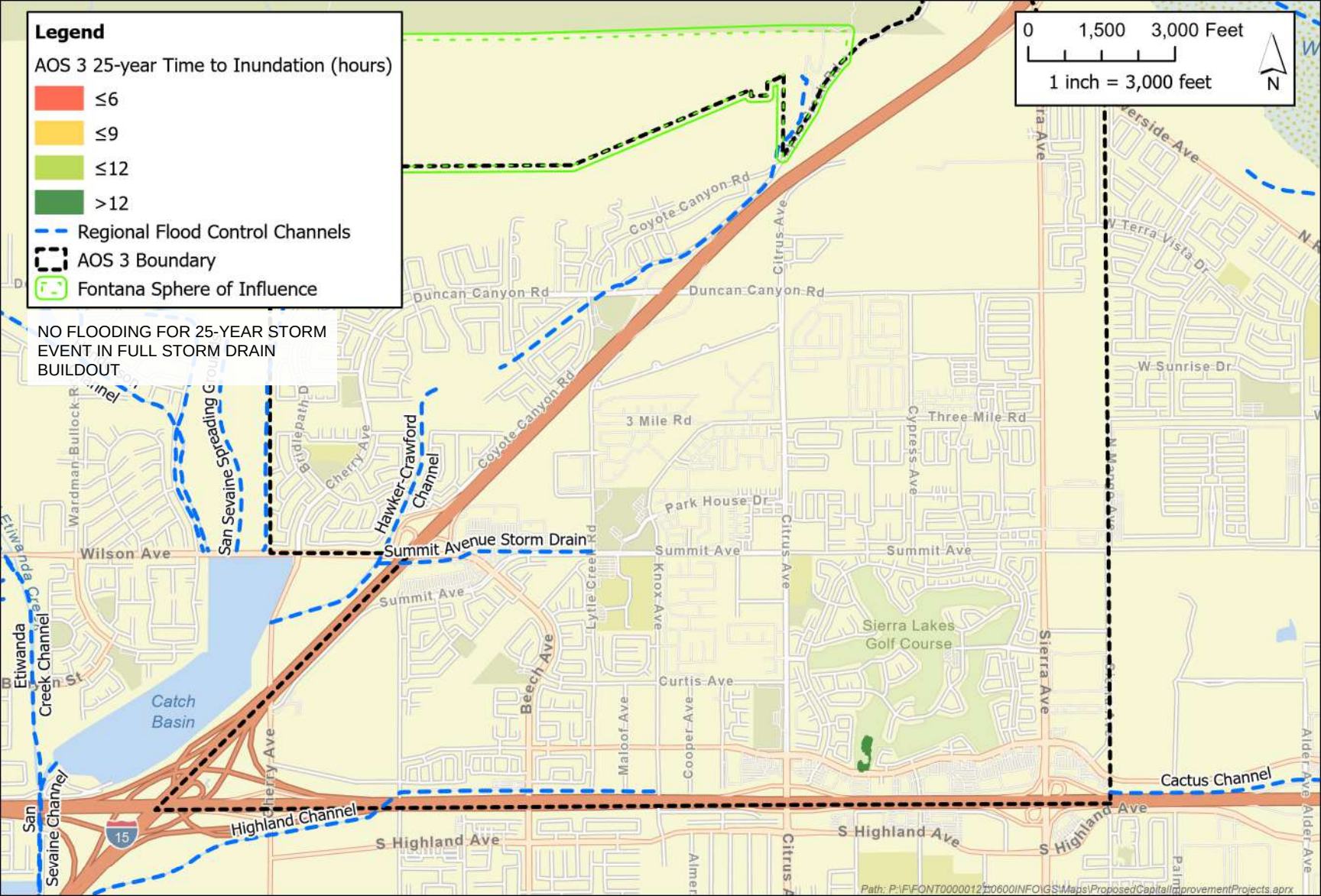
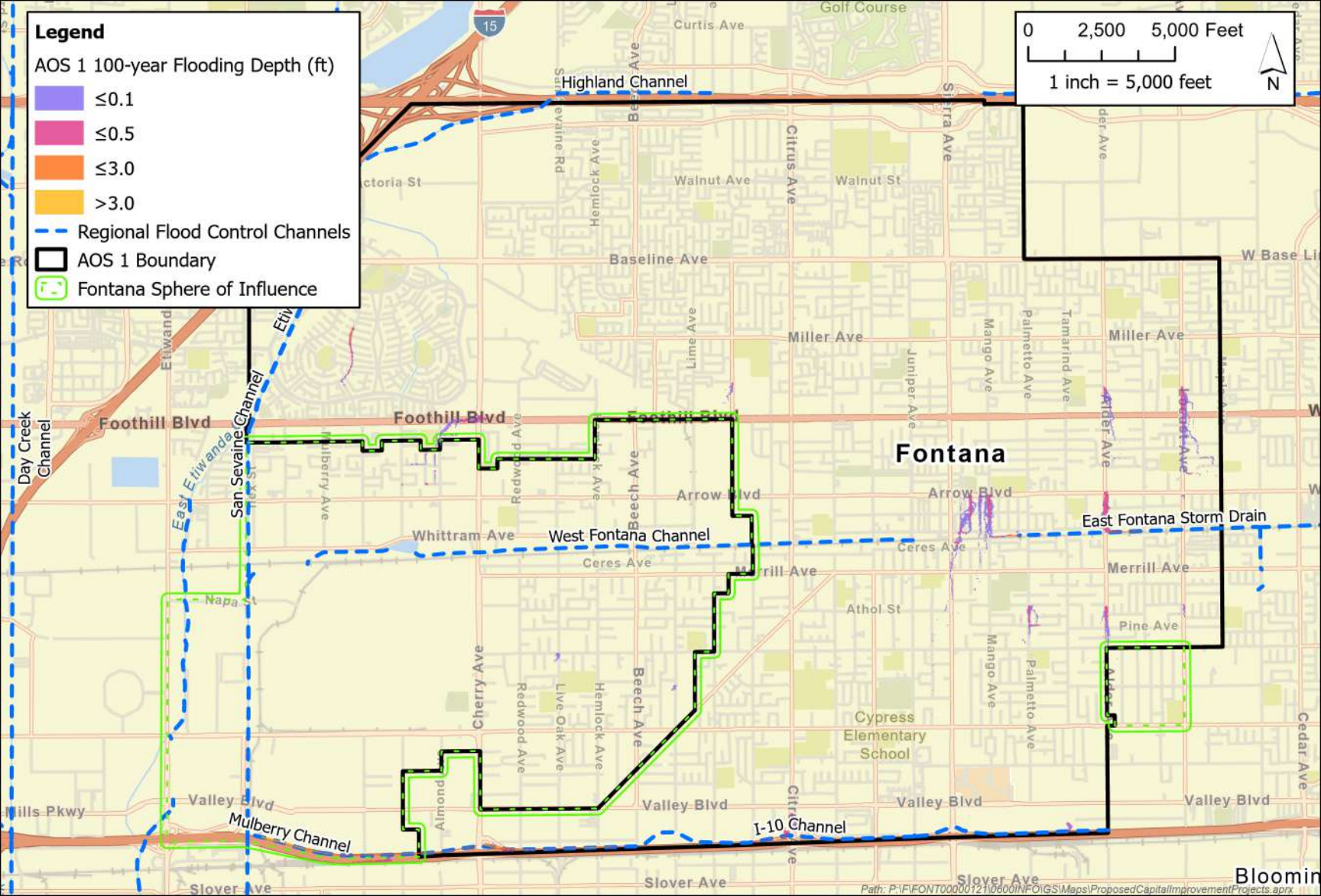

Legend
AOS 3 25-year Time to Inundation (hours)
≤6
≤9
≤12
>12
Regional Flood Control Channels
AOS 3 Boundary
Fontana Sphere of Influence
NO FLOODING FOR 25-YEAR STORM EVENT IN FULL STORM DRAIN BUILDOUT
0 1,500 3,000 Feet
1 inch = 3,000 feet
N
Coyote Canyon Rd
Duncan Canyon Rd
Citrus Ave
3 Mile Rd
Three Mile Rd
Park House Dr
Summit Ave
Wilson Ave
Summit Avenue Storm Drain
Hawker-Crawford Channel
San Sevaine Spreading G
Wardman Bullock R
Cherry Ave
Etiwanda Creek Channel
Etiwanda Creek Channel
Catch Basin
Lytle Creek Rd
Knox Ave
Beech Ave
Maloof Ave
Cooper Ave
Curtis Ave
Sierra Lakes Golf Course
Sierra Ave
Cypress Ave
W Sunrise Dr
Terra Vista Dr
Verside Ave
Cactus Channel
Highland Channel
S Highland Ave
San Sevaine Channel
15
Alder Ave
Path: P:\FONT00000125\0600\INFO\GIS\Maps\ProposedCapitalImprovementProjects.aprx

Proposed Conditions Flooding Depths, 100-Year Event

FONTANA
CALIFORNIA

DAVID EVANS
AND ASSOCIATES INC.


Legend
AOS 1 100-year Flooding Depth (ft)
≤0.1
≤0.5
≤3.0
>3.0
Regional Flood Control Channels
AOS 1 Boundary
Fontana Sphere of Influence
0 2,500 5,000 Feet
1 inch = 5,000 feet
N
Highland Channel
Day Creek Channel
San Sevaine Channel
East Etiwanda
West Fontana Channel
East Fontana Storm Drain
Mulberry Channel
I-10 Channel
Fontana
Foothill Blvd
Baseline Ave
Miller Ave
Arrow Blvd
Whittram Ave
Ceres Ave
Merrill Ave
Athol St
Pine Ave
Valley Blvd
Slover Ave
Walnut Ave
Walnut St
Curtis Ave
Golf Course
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Juniper Ave
Mango Ave
Palmetto Ave
Tamarind Ave
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Live Oak Ave
Hemlock Ave
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Cypress Elementary School
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Mulberry Ave
Hamlock Ave
Cedar Ave
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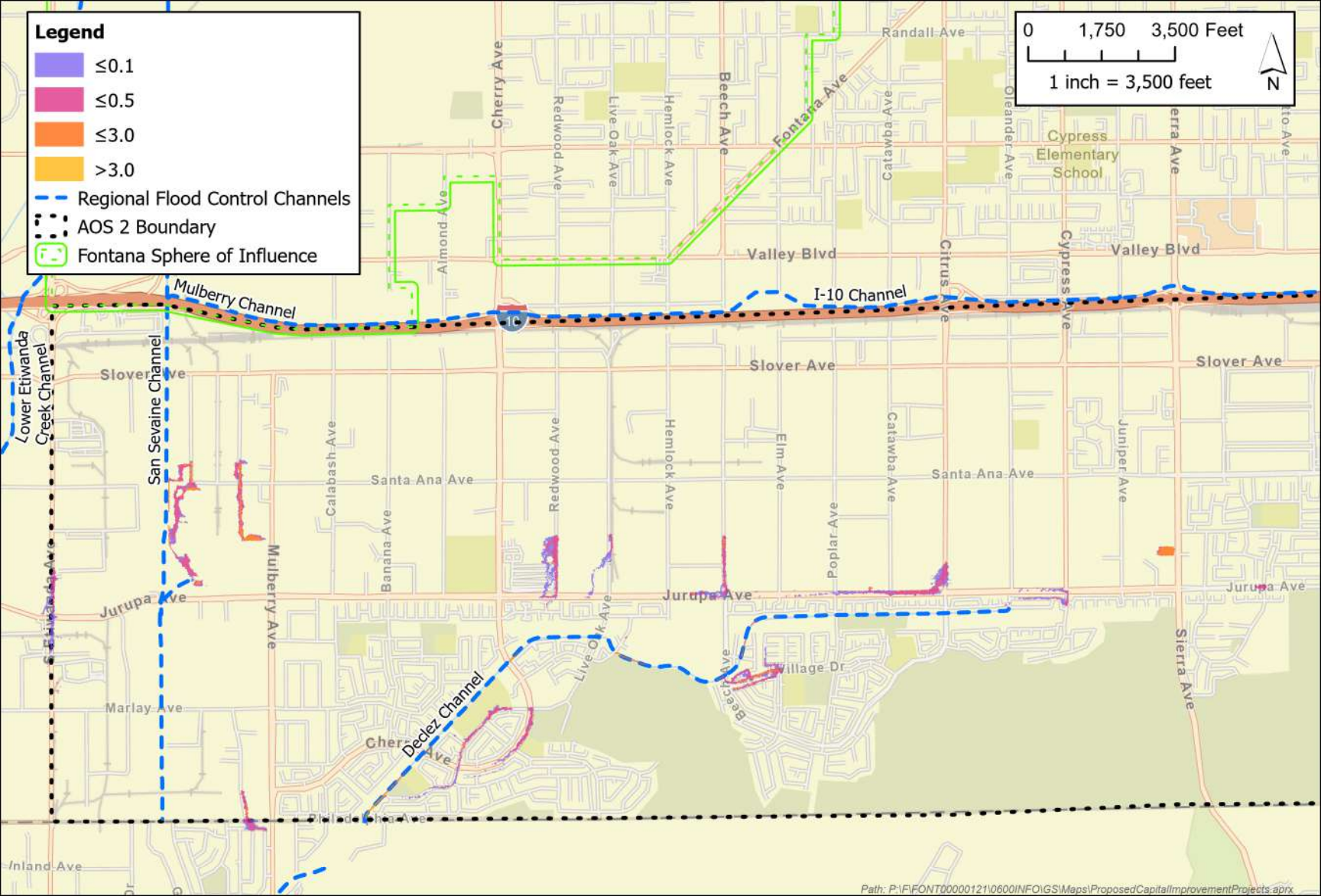

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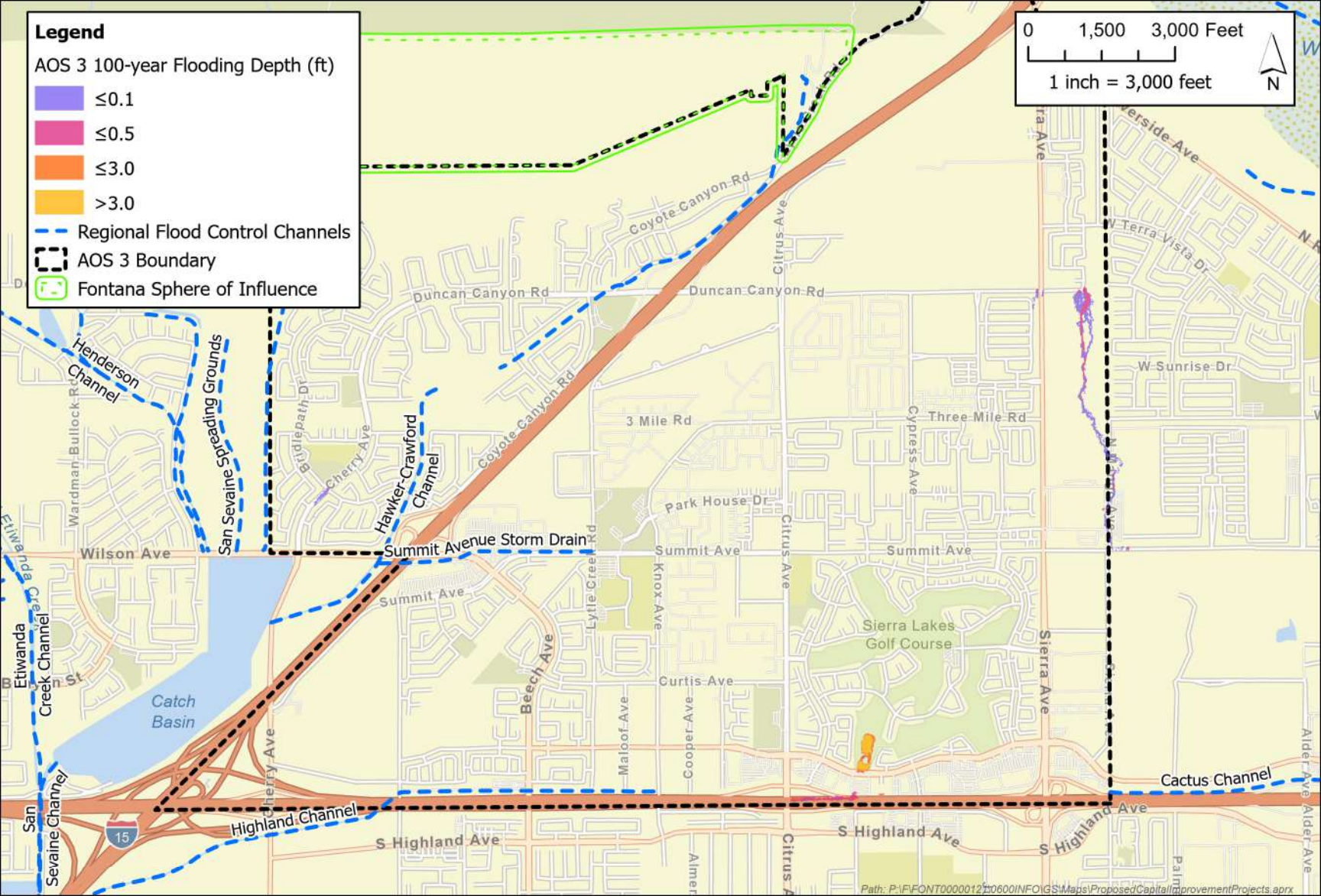
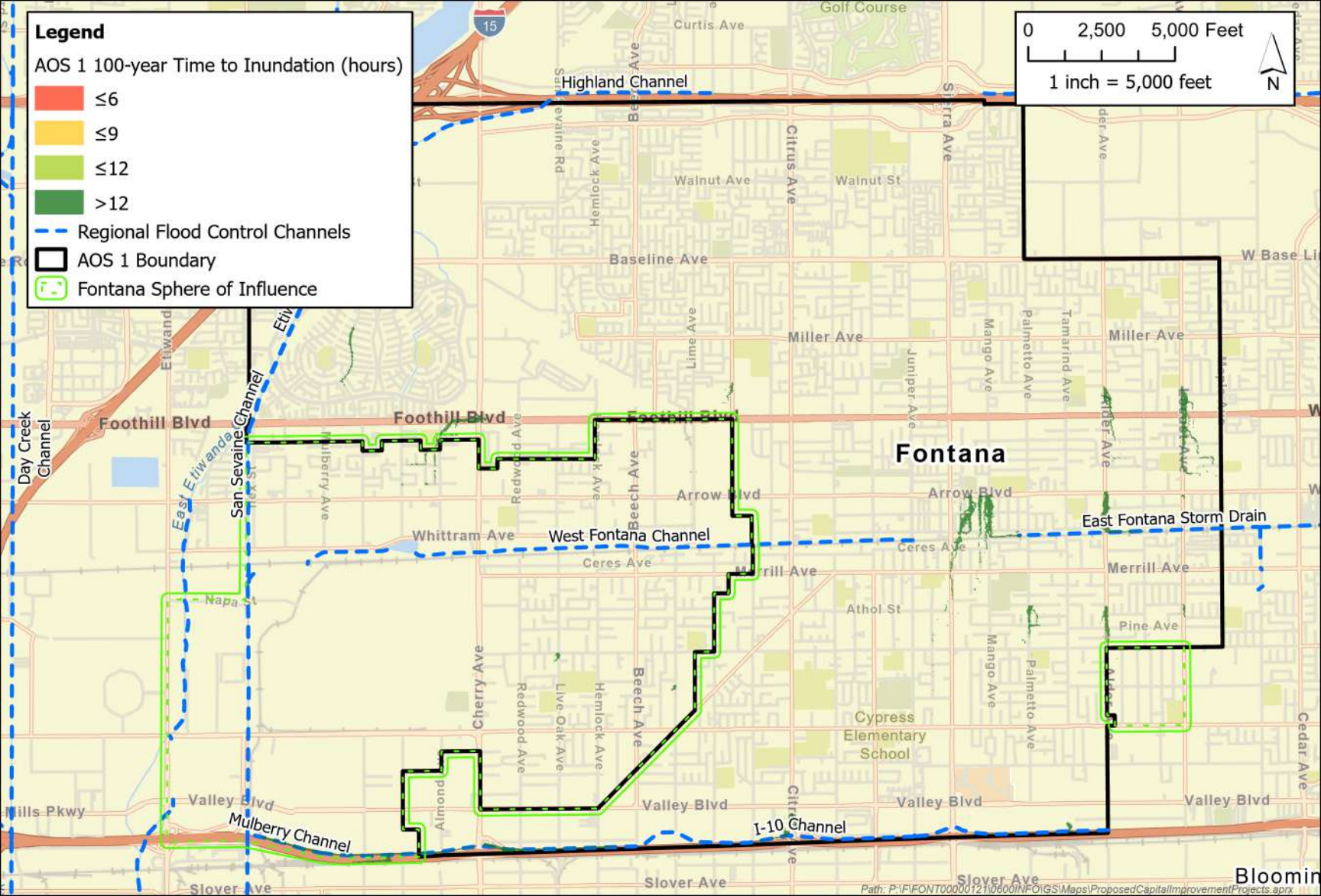

Legend
AOS 3 100-year Flooding Depth (ft)
≤0.1
≤0.5
≤3.0
>3.0
Regional Flood Control Channels
AOS 3 Boundary
Fontana Sphere of Influence
0
1,500
3,000 Feet
1 inch = 3,000 feet
N
Coyote Canyon Rd
Duncan Canyon Rd
Citrus Ave
Terra Vista Dr
Verside Ave
W Sunrise Dr
Three Mile Rd
3 Mile Rd
Cypress Ave
Park House Dr
Summit Ave
Wilson Ave
Summit Avenue Storm Drain
Henderson Channel
San Sevaine Spreading Grounds
Hawker-Crawford Channel
Bridle Path Dr
Cherry Ave
Wardman Bullock Rd
Etiwanda Creek Channel
Catch Basin
Lytle Creek Rd
Knox Ave
Beech Ave
Maloof Ave
Cooper Ave
Curtis Ave
Sierra Lakes Golf Course
Sierra Ave
Cactus Channel
Highland Channel
S Highland Ave
San Sevaine Channel
15
Alder Ave
Path: P:\FONT00000125\0600\INFO\GS\Maps\ProposedCapitalImprovementProjects.aprx

Proposed Conditions Time to Inundation, 100-Year Event

FONTANA
CALIFORNIA

DAVID EVANS
AND ASSOCIATES INC.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≤12
>12
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AOS 1 Boundary
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Highland Channel
Curtis Ave
Golf Course
Sierra Ave
Citrus Ave
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Walnut St
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Miller Ave
Lime Ave
Juniper Ave
Mango Ave
Palmetto Ave
Tamarind Ave
Foothill Blvd
Day Creek Channel
San Sevaine Channel
East Etiwanda
Etiwanda
Fontana
Arrow Blvd
Whittram Ave
West Fontana Channel
East Fontana Storm Drain
Ceres Ave
Merrill Ave
Athol St
Pine Ave
Napa St
Cherry Ave
Redwood Ave
Live Oak Ave
Hemlock Ave
Beech Ave
Cypress Elementary School
Valley Blvd
Mulberry Channel
I-10 Channel
Slover Ave
Cedar Ave
Mills Pkwy
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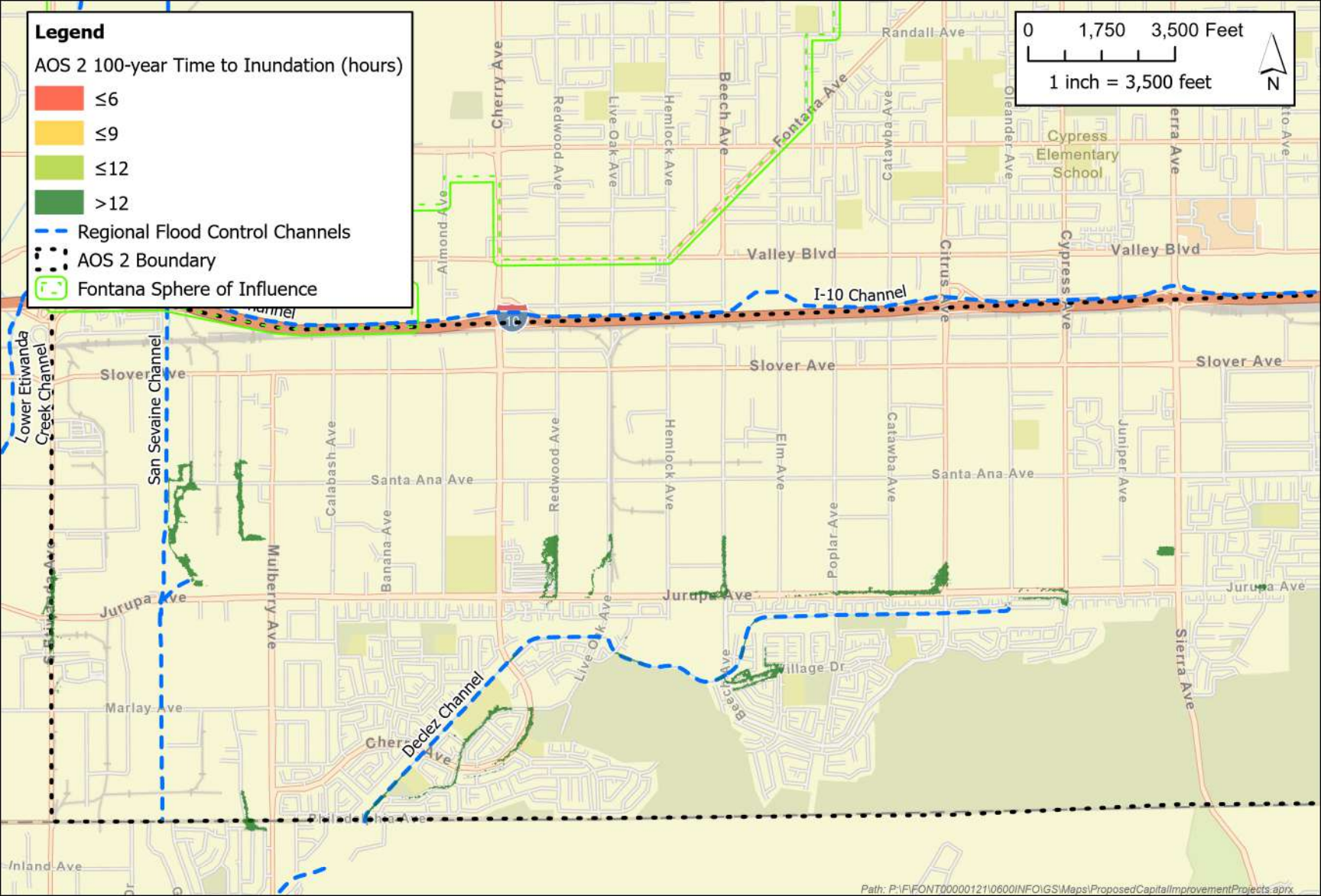
Path: P:\F\FONT00000121\0600\INFO\GIS\Maps\ProposedCapitalImprovementProjects.aprx


Legend
AOS 2 100-year Time to Inundation (hours)
≤6
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≤12
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Regional Flood Control Channels
AOS 2 Boundary
Fontana Sphere of Influence
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1 inch = 3,500 feet
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Randall Ave
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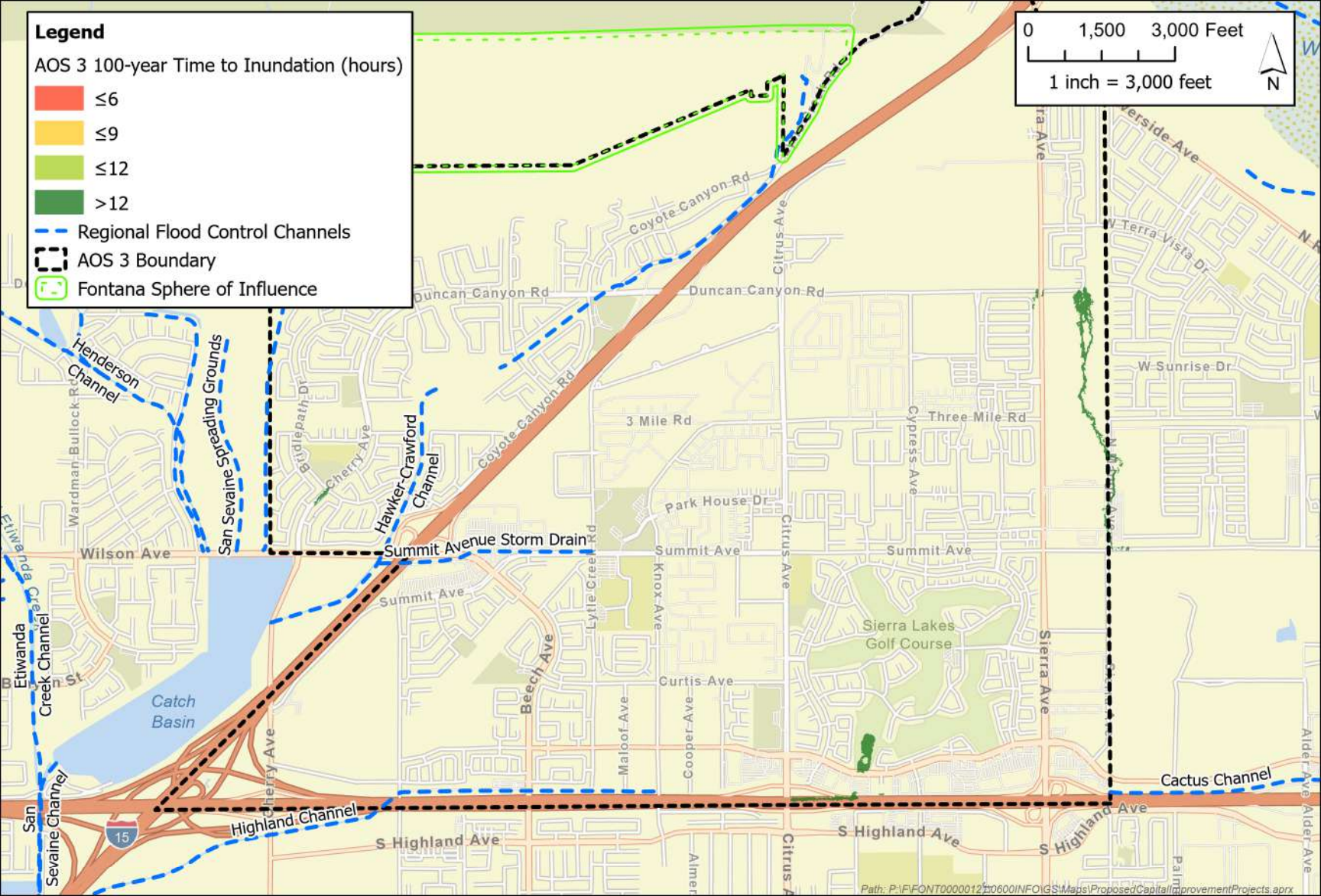
Live Oak Ave
Hemlock Ave
Beech Ave
Fontana Ave
Catawba Ave
Oleander Ave
Cypress Elementary School
Almond Ave
Valley Blvd
Citrus Ave
Cypress Ave
I-10 Channel
Slover Ave
Lower Etiwanda Creek Channel
San Sevaine Channel
Calabash Ave
Banana Ave
Mulberry Ave
Elm Ave
Poplar Ave
Juniper Ave
Santa Ana Ave
Jurupa Ave
Declez Channel
Village Dr
Marlay Ave
Sierra Ave
Inland Ave
Path: P:\F\FONT00000121\0600INFO\GS\Maps\ProposedCapitalImprovementProjects.aprx


Legend
AOS 3 100-year Time to Inundation (hours)
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≤12
>12
Regional Flood Control Channels
AOS 3 Boundary
Fontana Sphere of influence
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1,500
3,000 Feet
1 inch = 3,000 feet
N
Henderson Channel
San Sevaine Spreading Grounds
Hawker-Crawford Channel
Summit Avenue Storm Drain
Cactus Channel
Highland Channel
San Sevaine Channel
Etiwanda Creek Channel
Catch Basin
Sierra Lakes Golf Course
Coyote Canyon Rd
Duncan Canyon Rd
3 Mile Rd
Three Mile Rd
Park House Dr
Summit Ave
Wilson Ave
Curtis Ave
S Highland Ave
W Sunrise Dr
Citrus Ave
Cherry Ave
Beech Ave
Maloof Ave
Cooper Ave
Knox Ave
Lytle Creek Rd
Cypress Ave
Sierra Ave
Alder Ave
Bridle Path Dr
Wardman Bullock Rd
Etiwanda Ave
Terra Vista Dr
Verside Ave
15
Path: P:\FONT00000125\0600\INFO\GIS\Maps\ProposedCapitalImprovementProjects.aprx

Proposed Pipe Design Flows

FONTANA
CALIFORNIA

DAVID EVANS
AND ASSOCIATES INC.

AOS	Project Name	Pipe Size (in. or ft)	Design Flow (cfs)	Design Event (years)	Design Flow Method	Length (ft)	Project Prioritization Score	Drainage Area (ac)
1	D-1A	42"	70	25	Rational	538	1	82
1	D-6	10' x 8'	1270	100	ICM	1986	1	2322
1	D-6A	36"	41	25	Rational	1314	1.4	35
1	D-6A	42"	41	25	Rational	1691	1.4	35
1	D-6A	54"	151	25	Rational	678	1.4	177
1	D-6B	36"	58	25	Rational	372	1.4	58
1	D-6B	42"	58	25	Rational	613	1.4	58
1	D-6B	48"	93	25	Rational	1296	1.4	113
1	D-6C	36"	43	25	Rational	1284	1	42
1	D-7	48"	127	100	Pro Development	444	1	92
1	D-7	54"	127	100	Pro Development	668	1	110
1	D-7	60"	211	100	Pro Development	947	1	136
1	E-0	102"	1408	100	ICM	7913	1	875
1	E-1	36"	59	25	Rational	783	1	42
1	E-1	42"	97	25	Rational	1169	1	82
1	E-1	48"	97	25	Rational	2643	1	82
1	E-1	54"	165	25	Rational	2643	1	162
1	E-2	66"	434	100	ICM	795	1.4	229
1	E-2	36"	62	25	Rational	687	1.4	47
1	E-2	42"	91	25	Rational	1149	1.4	83
1	E-2	48"	91	25	Rational	511	1.4	83
1	E-2	54"	134	25	Rational	1339	1.4	138
1	E-3	36"	61	25	Rational	881	1	47
1	E-3	42"	90	25	Rational	1141	1	81
1	E-3	48"	90	25	Rational	999	1	81
1	E-3	54"	130	25	Rational	1644	1	136
1	E-4	72"	602	100	ICM	952	2.2	324
1	E-4	36"	61	25	Rational	648	2.2	47
1	E-4	42"	91	25	Rational	1133	2.2	82
1	E-4	54"	149	25	Rational	1689	2.2	162
1	E-5	66"	147	100	Rational	1000	1.8	162
1	E-5	36"	61	25	Rational	471	1.8	47
1	E-5	42"	90	25	Rational	1137	1.8	81
1	E-5	54"	130	25	Rational	1647	1.8	136
1	E-6	72"	570	100	ICM	675	2.2	322
1	E-6	36"	61	25	Rational	320	2.2	46
1	E-6	42"	89	25	Rational	1179	2.2	80
1	E-6	54"	129	25	Rational	1969	2.2	135
1	E-7	36"	62	25	Rational	554	1	48
1	E-7	42"	90	25	Rational	1070	1	81
1	E-7	54"	134	25	Rational	1987	1	141
1	E-7	66"	134	25	Rational	668	1	141
1	F-1	72"	402	100	ICM	1333	3.2	205
1	F-1A	36"	47	25	Rational	721	2	41
1	F-1A	42"	76	25	Rational	681	2	60
1	F-1A	48"	101	25	Rational	650	2	80
1	F-1A	54"	125	25	Rational	996	2	99
1	F-1B	36"	41	25	Rational	709	1	35
1	F-1B	42"	60	25	Rational	686	1	62
1	F-1B	48"	72	25	Rational	963	1	81
1	F-2	36"	39	25	Rational	812	1	35
1	F-2	42"	58	25	Rational	641	1	62
1	F-2	48"	71	25	Rational	661	1	80
1	F-2	54"	120	100	Rational	1107	1	114
1	F-2	60"	127	100	Rational	274	1	124
1	F-3	36"	40	25	Rational	845	2.4	35
1	F-3	42"	58	25	Rational	631	2.4	61
1	F-3	48"	72	25	Rational	663	2.4	80
1	F-3	54"	348	100	ICM	528	2.4	193
1	F-3	66"	446	100	ICM	833	2.4	247
1	F-4	36"	27	25	Rational	477	4.4	45
1	F-4	42"	59	25	Rational	1311	4.4	87
1	F-5	36"	40	25	Rational	884	2.4	35
1	F-5	42"	58	25	Rational	703	2.4	59
1	F-5	72"	497	100	ICM	1969	2.4	242
1	F-5A	36"	40	25	Rational	830	3	35
1	F-5A	42"	58	25	Rational	602	3	58
1	F-6	36"	48	25	Rational	628	2	30
1	F-6	42"	96	25	Rational	1644	2	80
1	F-6	54"	126	25	Rational	1244	2	120
1	G-0	120"	1269	100	ICM	6602	1.6	700

AOS	Project Name	Pipe Size (in. or ft)	Design Flow (cfs)	Design Event (years)	Design Flow Method	Length (ft)	Project Prioritization Score	Drainage Area (ac)
1	G-0	54"	110	100	Rational	1319	1.6	153
1	G-1	36"	36	25	Rational	642	1.6	34
1	G-1	42"	66	25	Rational	1495	1.6	79
1	G-2	66"	420	100	ICM	1491	3.6	228
1	G-2	36"	51	25	Rational	541	3.6	36
1	G-2	54"	110	25	Rational	1162	3.6	107
1	G-2A	36"	37	25	Rational	521	3.6	34
1	G-2A	42"	63	25	Rational	1317	3.6	71
1	G-3	36"	38	25	Rational	665	1.6	35
1	G-3	42"	69	25	Rational	1481	1.6	80
1	G-4	66"	412	100	ICM	1441	3	235
1	G-4	36"	52	25	Rational	682	3	38
1	G-4	54"	112	25	Rational	1208	3	110
1	G-4A	36"	40	25	Rational	658	1.6	37
1	G-4A	42"	66	25	Rational	1320	1.6	75
1	G-5	36"	39	25	Rational	704	2.4	36
1	G-5	42"	69	25	Rational	1448	2.4	80
1	G-6	66"	446	100	ICM	1436	2.8	237
1	G-6	36"	56	25	Rational	808	2.8	42
1	G-6	54"	117	25	Rational	1218	2.8	117
1	G-6A	36"	41	25	Rational	674	2.4	39
1	G-6A	42"	69	25	Rational	1317	2.4	81
1	G-7	36"	43	25	Rational	775	1.6	42
1	G-7	54"	90	25	Rational	1194	1.6	117
1	G-7	60"	113	25	Rational	1458	1.6	161
1	H-0	72"	322	100	ICM	1325	1.6	240
1	H-0	78"	331	100	ICM	1325	1.6	372
1	H-0	84"	426	100	ICM	3894	1.6	481
1	H-0A	66"	240	100	Rational	681	1	303
1	J-1	78"	478	100	ICM	2512	2.2	274
1	J-1A	36"	52	25	Rational	661	3.6	49
1	J-1A	42"	74	25	Rational	1317	3.6	79
1	J-1A	42"	74	25	Rational	1013	3.6	79
1	J-1B	36"	49	25	Rational	796	1.6	50
1	J-1B	42"	69	25	Rational	1018	1.6	80
1	J-1B	54"	118	25	Rational	1323	1.6	160
1	J-1C	36"	46	25	Rational	658	2	46
1	J-1C	42"	69	25	Rational	1156	2	81
1	J-2	66"	328	100	ICM	3565	2.2	158
1	J-2	72"	319	100	ICM	556	2.2	191
1	J-2A	36"	46	25	Rational	649	1.8	46
1	J-2A	42"	69	25	Rational	1146	1.8	81
1	J-2A	60"	69	25	Rational	197	1.8	81
1	J-3	54"	382	100	ICM	1311	3	122
1	J-3	66"	380	100	ICM	1303	3	162
1	J-3	72"	379	100	ICM	926	3	195
1	J-3A	36"	41	25	Rational	485	2.4	39
1	J-3A	42"	69	25	Rational	1350	2.4	80
1	J-4	48"	112	25	Rational	1133	2.4	158
1	J-4A	36"	46	25	Rational	578	2.4	46
1	J-4A	42"	74	25	Rational	1326	2.4	88
1	J-4B	36"	38	25	Rational	592	3	35
1	J-4B	42"	62	25	Rational	1317	3	70
1	M-0	60"	232	100	ICM	1699	2.6	112
1	M-1	6' x 4'	271	100	ICM	250	2.6	115
1	M-1	60"	271	100	ICM	869	2.6	110
1	M-1A	36"	48	25	Rational	660	2.2	40
1	M-1A	42"	80	25	Rational	1231	2.2	80
1	M-2	48"	98	25	Rational	1083	3	115
1	M-2A	36"	41	25	Rational	544	2.2	38
1	M-2A	42"	72	25	Rational	1150	2.2	80
1	M-3	48"	95	25	Rational	1145	2.2	117
1	M-3A	36"	39	25	Rational	572	3.4	36
1	M-3A	42"	72	25	Rational	1459	3.4	81
1	M-4	36"	42	25	Rational	698	2.2	41
1	M-5A	36"	40	25	Rational	458	2.4	34
1	M-5A	42"	59	25	Rational	1393	2.4	57
1	M-5-A	2, 14' x 6'	3135	100	ICM	1281	3	1986
1	M-5B	60"	199	100	Rational	1329	3.8	194
1	M-5B	66"	254	100	Rational	1322	3.8	274
1	M-5B	72"	321	100	Rational	1322	3.8	400

AOS	Project Name	Pipe Size (in. or ft)	Design Flow (cfs)	Design Event (years)	Design Flow Method	Length (ft)	Project Prioritization Score	Drainage Area (ac)
1	M-5B	72"	332	100	Rational	2801	3.8	419
1	M-5-B	14' x 8'	2136	100	ICM	1877	2.4	1565
1	M-5-B	2, 14' x 6'	2501	100	ICM	1865	2.4	1946
1	M-5B-A	36"	46	25	Rational	335	2.4	45
1	M-5B-B	36"	44	25	Rational	690	2.4	40
1	M-5B-B	42"	73	25	Rational	1342	2.4	81
1	M-5B-C	36"	44	25	Rational	662	1.6	40
1	M-5B-C	42"	77	25	Rational	1348	1.6	80
1	M-5B-D	36"	48	25	Rational	728	1.6	40
1	M-5B-D	42"	80	25	Rational	1323	1.6	79
1	M-5B-E	36"	39	25	Rational	784	3.6	34
1	M-5B-E	42"	69	25	Rational	1313	3.6	69
1	M-5B-E	48"	102	25	Rational	1329	3.6	114
1	M-5C	36"	36	25	Rational	350	1.6	29
1	M-5C	42"	68	25	Rational	1319	1.6	69
1	M-5C	48"	81	25	Rational	1332	1.6	91
1	M-5-C	96"	1060	100	ICM	1869	2.4	697
1	M-5-C	96"	1366	100	ICM	1891	2.4	1326
1	M-5D	36"	25	25	Rational	801	1.8	20
1	M-5-D	36"	39	100	Rational	667	2.8	33
1	M-5-D	42"	63	100	Rational	1308	2.8	65
1	M-5-D	54"	86	100	Rational	3179	2.8	96
1	M-5-D	60"	145	100	Rational	2004	2.8	143
1	M-5E	60"	159	100	Rational	1312	4.2	159
1	M-5E	66"	207	100	Rational	1326	4.2	240
1	M-5E	72"	293	100	Rational	5471	4.2	410
1	M-5E	78"	328	100	Rational	5471	4.2	490
1	M-5-E	36"	34	25	Rational	692	2.4	21
1	M-5E-A	36"	38	25	Rational	511	2.2	36
1	M-5E-A	42"	56	25	Rational	812	2.2	60
1	M-5E-B	36"	49	25	Rational	493	2.2	49
1	M-5E-B	42"	69	25	Rational	1191	2.2	80
1	M-5E-C	36"	53	25	Rational	488	3	56
1	M-5E-C	42"	75	25	Rational	1175	3	90
1	M-5E-D	36"	49	25	Rational	589	2.8	50
1	M-5E-D	42"	69	25	Rational	1065	2.8	81
1	M-5E-E	36"	49	25	Rational	631	2.4	50
1	M-5E-E	42"	68	25	Rational	1030	2.4	80
1	M-5E-F	36"	56	25	Rational	650	2.4	50
1	M-5E-F	42"	80	25	Rational	1000	2.4	80
1	M-5F	36"	45	100	Rational	342	3	27
1	M-5F	42"	83	100	Rational	1312	3	67
1	M-5F	48"	114	100	Rational	1345	3	107
1	M-5F	60"	207	100	Rational	1135	3	249
1	M-5F	66"	222	100	Rational	1517	3	267
1	M-5F-A	36"	35	25	Rational	354	1.6	28
1	M-5F-A	42"	65	25	Rational	1328	1.6	68
1	M-5F-A	48"	89	25	Rational	1316	1.6	108
1	M-5F-A	54"	177	25	Rational	1328	1.6	143
1	M-5G	54"	155	100	Rational	1335	2.2	160
1	M-5G	66"	211	100	Rational	2646	2.2	240
1	M-5G-A	42"	60	25	Rational	1145	2.6	61
1	M-5G-B	36"	43	25	Rational	748	2.6	41
1	M-5G-B	42"	73	25	Rational	1309	2.6	80
1	M-5G-C	36"	42	25	Rational	727	2.2	40
1	M-5G-C	42"	72	25	Rational	1307	2.2	79
1	M-5H	72"	439	100	ICM	2829	3.2	239
1	M-5H	36"	46	25	Rational	347	3.2	28
1	M-5H	42"	84	25	Rational	1314	3.2	69
1	M-5H	48"	116	25	Rational	1335	3.2	111
1	M-5H	54"	141	25	Rational	1141	3.2	146
1	M-6A	72"	413	100	ICM	2630	2.2	450
1	M-6A	78"	408	100	ICM	1378	2.2	490
1	M-6B	66"	420	100	ICM	2646	2.2	210
1	M-6B	36"	41	100	Rational	334	2.2	24
1	M-6B	42"	81	100	Rational	1361	2.2	66
1	M-6B	48"	112	100	Rational	1289	2.2	105
1	M-6C	36"	38	25	Rational	320	3	35
1	M-6C	42"	69	25	Rational	1646	3	80
1	M-6C	48"	112	25	Rational	1309	3	160
1	M-6D	36"	32	25	Rational	340	2.6	25

AOS	Project Name	Pipe Size (in. or ft)	Design Flow (cfs)	Design Event (years)	Design Flow Method	Length (ft)	Project Prioritization Score	Drainage Area (ac)
1	M-6D	42"	62	25	Rational	1381	2.6	65
1	M-6D	48"	86	25	Rational	1273	2.6	105
1	M-6D	54"	86	25	Rational	1315	2.6	105
1	M-7A	84"	699	100	ICM	2678	2.6	540
1	M-7A	96"	698	100	ICM	1245	2.6	580
1	M-7B	72"	425	100	ICM	2661	2.8	377
1	M-7B	36"	42	100	Rational	396	2.8	23
1	M-7B	42"	93	100	Rational	1319	2.8	66
1	M-7B	48"	136	100	Rational	1338	2.8	108
1	M-7C	36"	41	25	Rational	632	2.6	39
1	M-7C	42"	73	25	Rational	1379	2.6	80
1	M-7C	54"	132	25	Rational	1370	2.6	163
1	M-7D	36"	42	25	Rational	652	2.2	40
1	M-7D	42"	69	25	Rational	1447	2.2	80
1	M-7D	54"	130	25	Rational	1393	2.2	165
1	M-7E	36"	30	25	Rational	335	2.6	23
1	M-7E	42"	61	25	Rational	1321	2.6	64
1	M-7E	48"	85	25	Rational	1350	2.6	103
1	M-7E	54"	85	25	Rational	1393	2.6	103
1	SS-0	54"	118	25	Rational	1087	3	131
1	SS-0	60"	222	25	Rational	197	3	208
1	SS-0A	36"	32	25	Rational	481	2.2	24
1	SS-0A	42"	65	25	Rational	1179	2.2	60
1	SS-0A	48"	104	25	Rational	1665	2.2	111
1	SS-0B	36"	52	25	Rational	500	2.4	45
1	SS-0B	42"	81	25	Rational	1191	2.4	81
1	SS-0B	48"	118	25	Rational	1651	2.4	131
1	SS-1	36"	44	25	Rational	1016	2.2	35
1	SS-2A	10' x 10'	886	100	Pro Development	1665	2.2	408
1	SS-2A	42"	65	100	Pro Development	683	2.2	13
1	SS-2A	72"	717	100	Pro Development	4809	2.2	274
1	SS-2A-1	36"	62	100	Pro Development	1815	2.2	39
1	SS-2A-1	42"	110	100	Pro Development	1218	2.2	69
1	SS-2A-1	48"	113	100	Pro Development	1037	2.2	73
1	SS-2A-1	54"	127	100	Pro Development	1377	2.2	108
1	SS-2A-2	48"	138	100	Pro Development	3246	2.2	77
1	SS-2A-3	36"	78	100	Pro Development	1643	2.2	19
1	SS-2A-3	36"	125	100	Pro Development	1081	2.2	42
1	SS-2A-3	72"	281	100	Pro Development	1702	2.2	144
1	SS-2B	36"	32	100	Rational	481	2.6	23
1	SS-2B	42"	71	100	Rational	1426	2.6	65
1	SS-2B	54"	160	100	Rational	1321	2.6	134
1	SS-2B	60"	221	100	Rational	1339	2.6	205
1	SS-2B	66"	278	100	Rational	1368	2.6	277
1	SS-2B	78"	378	100	Rational	2549	2.6	417
1	SS-2C	36"	50	100	Rational	619	2.2	41
1	SS-2C	42"	83	100	Rational	1286	2.2	79
1	SS-2C	60"	179	100	Rational	1318	2.2	155
1	SS-2C	66"	245	100	Rational	1338	2.2	235
1	SS-2C	72"	308	100	Rational	1569	2.2	318
1	SS-2C	78"	420	100	Rational	2518	2.2	479
1	SS-2D	36"	64	25	Rational	827	2.6	76
1	SS-2D	42"	75	25	Rational	2935	2.6	70
1	SS-2D	54"	134	25	Rational	1152	2.6	150
1	T-0	36"	62	25	Rational	725	3	41
1	T-0	42"	99	25	Rational	1278	3	80
1	T-0	54"	131	25	Rational	1272	3	120
1	T-0	54"	131	25	Rational	438	3	120
1	T-10	36"	52	25	Rational	496	2.2	46
1	T-10	42"	76	25	Rational	1186	2.2	81
1	T-10	48"	112	25	Rational	1745	2.2	129
1	T-11	36"	53	25	Rational	471	3	46
1	T-11	42"	81	25	Rational	1214	3	81
1	T-11	48"	119	25	Rational	1773	3	131
1	T-1A	60"	317	100	ICM	1215	3.6	171
1	T-1A	72"	318	100	ICM	952	3.6	171
1	T-1B	36"	48	25	Rational	719	3	41
1	T-1B	42"	80	25	Rational	1285	3	80
1	T-2	60"	244	100	Pro Development	285	2.8	177
1	T-2	66"	244	100	Pro Development	593	2.8	210
1	T-2	78"	292	100	Pro Development	457	2.8	243

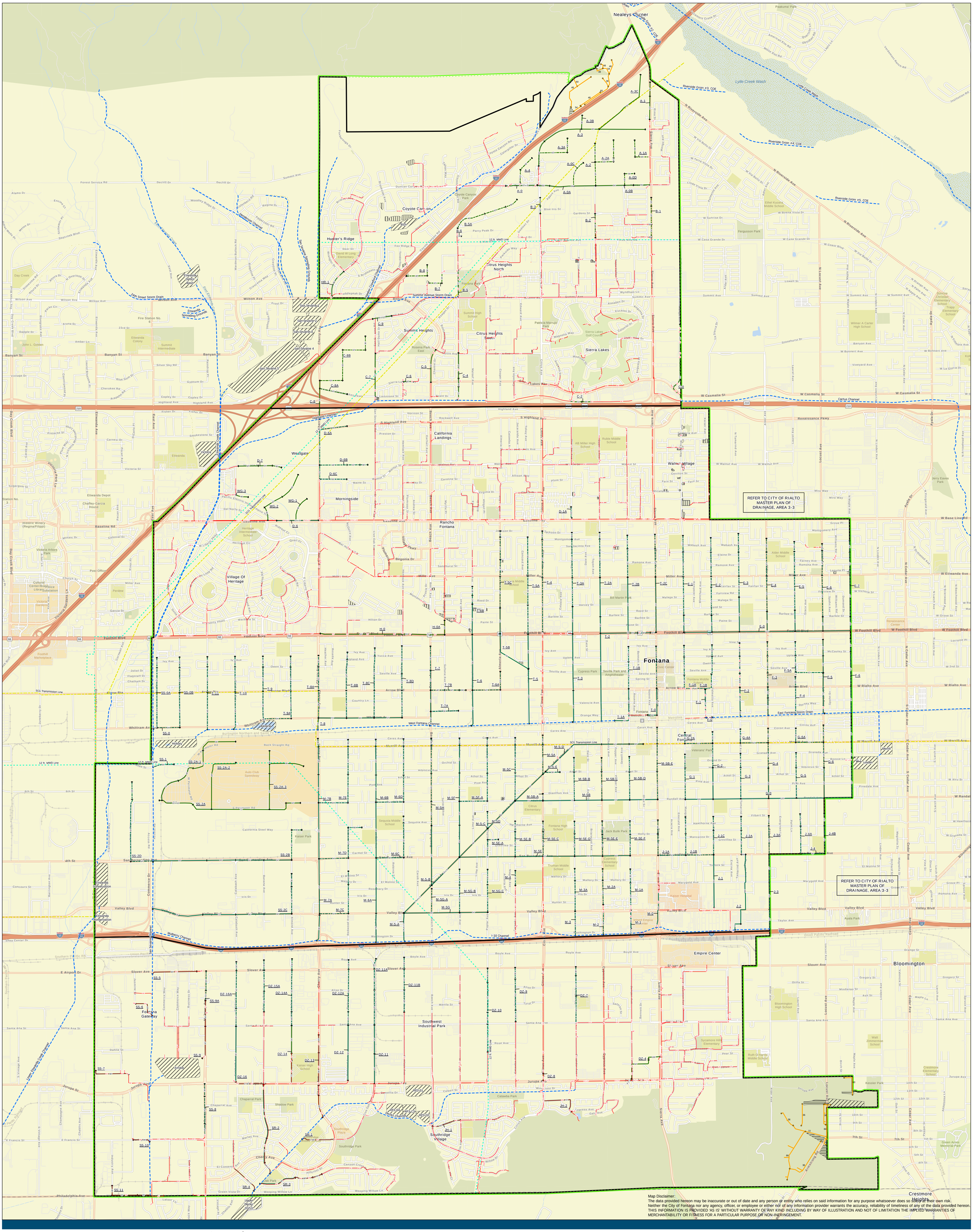
AOS	Project Name	Pipe Size (in. or ft)	Design Flow (cfs)	Design Event (years)	Design Flow Method	Length (ft)	Project Prioritization Score	Drainage Area (ac)
1	T-2	96"	1151	100	Pro Development	5482	2.8	610
1	T-2A	48"	184	100	Pro Development	1860	3.2	136
1	T-2A	60"	236	100	Pro Development	787	3.2	162
1	T-2A	36"	32	100	Rational	317	3.2	28
1	T-2A	42"	69	100	Rational	1824	3.2	81
1	T-2B	54"	249	100	Pro Development	2579	2.2	160
1	T-2B	60"	256	100	Pro Development	68	2.2	162
1	T-2B	36"	47	100	Rational	638	2.2	41
1	T-2B	42"	77	100	Rational	1353	2.2	81
1	T-2C	54"	104	100	Pro Development	2560	2.6	162
1	T-2C	36"	46	100	Rational	683	2.6	42
1	T-2C	42"	75	100	Rational	1339	2.6	82
1	T-3	60"	322	100	ICM	3985	1.6	297
1	T-3	66"	322	100	ICM	1519	1.6	297
1	T-3A	60"	344	100	ICM	3985	1.4	166
1	T-3A	36"	43	25	Rational	323	1.4	29
1	T-3A	42"	93	25	Rational	1822	1.4	84
1	T-3A	48"	123	25	Rational	1371	1.4	126
1	T-4	36"	35	25	Rational	415	1.8	30
1	T-4	42"	76	25	Rational	1800	1.8	88
1	T-4	48"	127	25	Rational	2575	1.8	175
1	T-5	84"	734	100	ICM	2532	1.6	393
1	T-5	54"	125	100	Rational	1646	1.6	112
1	T-5A	36"	44	25	Rational	1848	1	42
1	T-5A	42"	62	25	Rational	1380	1	63
1	T-5A	48"	78	25	Rational	1387	1	84
1	T-5B	78"	512	100	ICM	2417	1	19
1	T-5C	72"	539	100	ICM	1231	1.6	145
1	T-5C	36"	38	25	Rational	294	1.6	25
1	T-5C	42"	83	25	Rational	1064	1.6	72
1	T-5C	48"	90	25	Rational	798	1.6	81
1	T-5C	54"	123	25	Rational	1499	1.6	123
1	T-6	66"	319	100	ICM	1988	3.2	273
1	T-6	72"	684	100	ICM	1688	3.2	351
1	T-6A	36"	50	25	Rational	873	1.6	42
1	T-6A	42"	78	25	Rational	1325	1.6	74
1	T-6B	60"	321	100	ICM	1441	3.4	164
1	T-6B	36"	37	100	Rational	423	3.4	24
1	T-6B	42"	43	100	Rational	415	3.4	24
1	T-7	36"	64	25	Rational	2616	2.4	40
1	T-7	42"	108	25	Rational	2616	2.4	80
1	T-7	60"	147	25	Rational	1714	2.4	120
1	T-7	60"	217	25	Rational	1714	2.4	165
1	T-7A	36"	54	25	Rational	1312	2.4	45
1	T-7B	36"	49	25	Rational	316	2.4	40
1	T-7B	42"	83	25	Rational	688	2.4	80
1	T-7B	48"	113	25	Rational	670	2.4	120
1	T-8	54"	132	100	Rational	2627	2	125
1	T-8	66"	258	100	Rational	1309	2	177
1	T-8	72"	384	100	Rational	1334	2	298
1	T-8	78"	515	100	Rational	564	2	419
1	T-8A	36"	51	25	Rational	538	2	49
1	T-8A	42"	74	25	Rational	1132	2	81
1	T-8A	48"	101	25	Rational	1299	2	121
1	T-8B	36"	42	25	Rational	353	1.6	36
1	T-8B	42"	72	25	Rational	1466	1.6	81
1	T-8B	48"	98	25	Rational	1310	1.6	121
1	T-8C	36"	37	25	Rational	382	1.6	30
1	T-8C	42"	72	25	Rational	1637	1.6	80
1	T-8C	48"	97	25	Rational	1300	1.6	118
1	T-8D	36"	42	25	Rational	1324	1.6	38
1	T-8D	42"	73	25	Rational	784	1.6	84
1	T-8D	48"	102	25	Rational	2627	1.6	125
1	T-9	36"	47	25	Rational	513	1.6	46
1	T-9	42"	70	25	Rational	1153	1.6	80
1	T-9	48"	100	25	Rational	1324	1.6	119
1	T-9	66"	209	25	Rational	371	1.6	177
1	T-9A	36"	53	25	Rational	515	2.4	47
1	T-9A	42"	80	25	Rational	1135	2.4	80
1	T-9A	48"	109	25	Rational	1308	2.4	119
1	T-9A	54"	109	25	Rational	1308	2.4	119

AOS	Project Name	Pipe Size (in. or ft)	Design Flow (cfs)	Design Event (years)	Design Flow Method	Length (ft)	Project Prioritization Score	Drainage Area (ac)
1	WG-1	48"	89	100	Pro Development	1218	1	70
1	WG-2	36"	54	100	Pro Development	1322	1	39
1	WG-2	42"	65	100	Pro Development	986	1	52
1	WG-2	48"	84	100	Pro Development	648	1	73
1	WG-3	48"	33	100	Pro Development	606	1	21

AOS	Project Name	Pipe Size (in. or ft)	Design Flow (cfs)	Design Event (years)	Design Flow Method	Length (ft)	Project Prioritization Score	Drainage Area (ac)
2	DZ-10	36"	46	25	Rational	685	1.8	39
2	DZ-10	42"	78	25	Rational	1414	1.8	77
2	DZ-10	48"	107	25	Rational	558	1.8	118
2	DZ-10	54"	129	25	Rational	1321	1.8	159
2	DZ-11	54"	209	100	Rational	1374	3.6	118
2	DZ-11	60"	369	100	ICM	1408	3.6	207
2	DZ-11A	36"	44	25	Rational	516	1.8	36
2	DZ-11A	42"	70	25	Rational	1000	1.8	68
2	DZ-11A	48"	97	25	Rational	1654	1.8	104
2	DZ-11B	36"	44	25	Rational	557	1.8	36
2	DZ-11B	42"	70	25	Rational	990	1.8	67
2	DZ-11B	48"	96	25	Rational	1056	1.8	103
2	DZ-12	60"	306	100	ICM	2612	3.2	196
2	DZ-12A	36"	43	25	Rational	448	1	35
2	DZ-12A	42"	68	25	Rational	2015	1	65
2	DZ-12A	48"	104	25	Rational	647	1	115
2	DZ-13	60"	290	100	ICM	849	3.2	157
2	DZ-13	66"	336	100	ICM	1548	3.2	202
2	DZ-13	84"	616	100	ICM	1081	3.2	398
2	DZ-14	54"	170	100	Rational	1307	2	156
2	DZ-14	66"	349	100	ICM	346	2	167
2	DZ-14	72"	357	100	ICM	1095	2	200
2	DZ-14A	36"	41	25	Rational	529	2.4	34
2	DZ-14A	42"	68	25	Rational	1983	2.4	65
2	DZ-14A	48"	105	25	Rational	661	2.4	116
2	DZ-15A	36"	38	25	Rational	489	2.4	31
2	DZ-15A	42"	64	25	Rational	996	2.4	60
2	DZ-15A	48"	87	25	Rational	975	2.4	90
2	DZ-16	2, 66"	347	100	ICM	1375	1.6	214
2	DZ-16	66"	341	100	ICM	2635	1.6	214
2	DZ-16A	36"	38	25	Rational	419	1.6	30
2	DZ-16A	42"	64	25	Rational	1799	1.6	59
2	DZ-16A	48"	100	25	Rational	850	1.6	111
2	DZ-4	108"	646	100	Pro Development	636	1	651
2	DZ-4	6' x 7'	405	100	Pro Development	110	1	83
2	DZ-4	84"	405	100	Pro Development	1649	1	83
2	DZ-7	36"	51	25	Rational	417	1.8	44
2	DZ-7	42"	79	25	Rational	970	1.8	84
2	DZ-7	48"	101	25	Rational	1317	1.8	125
2	DZ-8	72"	364	100	ICM	335	1.8	241
2	DZ-9	36"	48	25	Rational	549	1	42
2	DZ-9	42"	77	25	Rational	1472	1	82
2	DZ-9	48"	103	25	Rational	552	1	123
2	JH-1	84"	766	100	ICM	1382	1.6	466
2	JH-2	72"	236	100	ICM	1925	1	115
2	SR-1	2, 66"	664	100	ICM	1555	2.4	389
2	SR-2	14' x 6'	1092	100	ICM	617	3	807
2	SR-2	78"	943	100	ICM	2579	3	729
2	SR-2	84"	1092	100	ICM	1180	3	763
2	SR-3	84"	836	100	ICM	460	3	267
2	SR-3	96"	1100	100	ICM	852	3	321
2	SR-3	96"	1073	100	ICM	1769	3	427
2	SR-4	8' x 5'	356	100	ICM	1543	3	257
2	SS-10	66"	270	100	ICM	824	3.4	143
2	SS-11	48"	72	100	ICM	457	3	42
2	SS-11	60"	67	100	ICM	1200	3	124
2	SS-11	66"	265	100	ICM	618	3	161
2	SS-5	60"	123	100	ICM	2146	1.6	83
2	SS-6	60"	234	100	ICM	1236	1.8	121
2	SS-7	66"	251	100	ICM	1716	2.2	221
2	SS-8	36"	43	25	Rational	594	2.2	58
2	SS-8	42"	56	25	Rational	1296	2.2	111
2	SS-8	48"	88	25	Rational	576	2.2	32
2	SS-9	60"	238	100	ICM	1579	2.4	190
2	SS-9A	36"	40	25	Rational	925	2.4	63
2	SS-9A	42"	67	25	Rational	478	2.4	79
2	SS-9A	60"	240	25	ICM	1223	2.4	190

AOS	Project Name	Pipe Size (in. or ft)	Design Flow (cfs)	Design Event (years)	Design Flow Method	Length (ft)	Project Prioritization Score	Drainage Area (ac)
3	A-0	10' x 9'	2324	100	ICM	1505	1.4	1191
3	A-0A	84"	754	100	ICM	2192	1.8	367
3	A-0A	90"	858	100	ICM	584	1.8	397
3	A-0B	78"	438	100	ICM	782	1.8	203
3	A-0B	84"	488	100	ICM	1794	1.8	278
3	A-0C	36"	88	25	Rational	1280	1.8	44
3	A-0D	36"	41	25	Rational	476	1.8	19
3	A-0D	48"	69	25	Rational	548	1.8	32
3	A-1	36"	18	100	ICM	669	1.4	2
3	A-1	42"	46	100	ICM	1101	1.4	54
3	A-1A	36"	66	25	Rational	797	1	32
3	A-1A	48"	81	25	Rational	687	1	39
3	A-2	36"	55	25	Rational	886	1.8	31
3	A-2	54"	126	25	Rational	1125	1.8	70
3	A-2A	36"	69	25	Rational	851	1.8	36
3	A-2A	42"	85	25	Rational	177	1.8	44
3	A-2A	48"	100	25	Rational	874	1.8	52
3	A-3	90"	1396	100	ICM	4946	1.8	699
3	A-3	96"	1494	100	ICM	1242	1.8	757
3	A-3A	36"	71	25	Rational	674	1.8	36
3	A-3A	42"	117	25	Rational	1346	1.8	59
3	A-3B	96"	287	100	ICM	656	1	173
3	A-3C	66"	422	100	ICM	3507	1	330
3	A-4	36"	55	25	Rational	783	1	27
3	A-4	42"	107	25	Rational	637	1	52
3	B-1	36"	40	25	Rational	407	2	30
3	B-1	42"	112	25	Rational	868	2	57
3	B-1	42"	96	25	Rational	111	2	47
3	B-1	54"	242	25	Rational	562	2	159
3	B-1	54"	49	25	Rational	104	2	16
3	B-2	48"	84	25	Rational	1147	2.4	41
3	B-3	36"	65	25	Rational	398	2.4	32
3	B-3	42"	95	25	Rational	363	2.4	50
3	B-5	72"	653	100	ICM	1240	1.6	366
3	B-5A	36"	53	25	Rational	657	1.6	21
3	B-5A	42"	97	25	Rational	1053	1.6	46
3	B-5A	48"	138	25	Rational	1553	1.6	74
3	B-6	36"	88	25	Rational	201	1.6	44
3	B-7	36"	88	25	Rational	502	1.6	44
3	B-7	42"	97	25	Rational	641	1.6	49
3	B-8	36"	63	25	Rational	519	2.4	28
3	B-8	48"	97	25	Rational	994	2.4	47
3	C-0	60"	409	100	ICM	1297	1.6	153
3	C-0	72"	595	100	ICM	2586	1.6	223
3	C-2	66"	212	100	ICM	427	2.4	68
3	C-2	72"	265	100	ICM	521	2.4	79
3	C-4	60"	320	100	ICM	1209	2.2	149
3	C-4	66"	319	100	ICM	400	2.2	149
3	C-4	72"	319	100	ICM	628	2.2	149
3	C-5	60"	332	100	ICM	1600	3	152
3	C-6	42"	156	100	ICM	488	3	70
3	C-7	72"	631	100	ICM	2059	3	218
3	C-8	78"	459	100	Rational	1828	2.6	254
3	C-8A	42"	80	25	Rational	1331	2.6	37
3	C-8B	36"	72	25	Rational	660	2.6	32
3	C-8B	42"	97	25	Rational	1080	2.6	46
3	C-8B	48"	164	25	Rational	1450	2.6	98
3	C-8B	54"	210	25	Rational	1081	2.6	125
3	C-9	9' x 12'	2860	100	ICM	917	3	1241
3	HR-1	96"	1282	100	ICM	1378	3	706

APPENDIX 3 CAPITAL PROJECT EXHIBITS



Map Disclaimer:
The data provided hereon may be inaccurate or out of date and any person or entity who relies on said information for any purpose whatsoever does so solely at their own risk. Neither the City of Fontana nor any agency, officer, or employee or either nor of any information provider warrants the accuracy, reliability of timeliness of any of the data provided hereon. THIS INFORMATION IS PROVIDED 'AS IS' WITHOUT WARRANTY OF ANY KIND INCLUDING BY WAY OF ILLUSTRATION AND NOT OF LIMITATION THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT.

N

0 1,500 3,000 6,000 Feet

Legend

- AOS Boundary
- Fontana Sphere of Influence
- Existing Pipes (36-inch diameter and larger)
- Regional Flood Control Channels
- Metropolitan Water District Feeders
- Gas Transmission Lines

Proposed Projects

- 100-Year
- 25-Year
- Proposed Pipe Sizes (inches or feet)
- Proposed Projects on Regional Facilities
- Proposed Private Development Projects

- Proposed Detention Basins
- Existing Detention Basins
- Existing Recharge Basins

Capital Improvement Project Prioritization Scores

All Areas of Study

FONTANA CALIFORNIA

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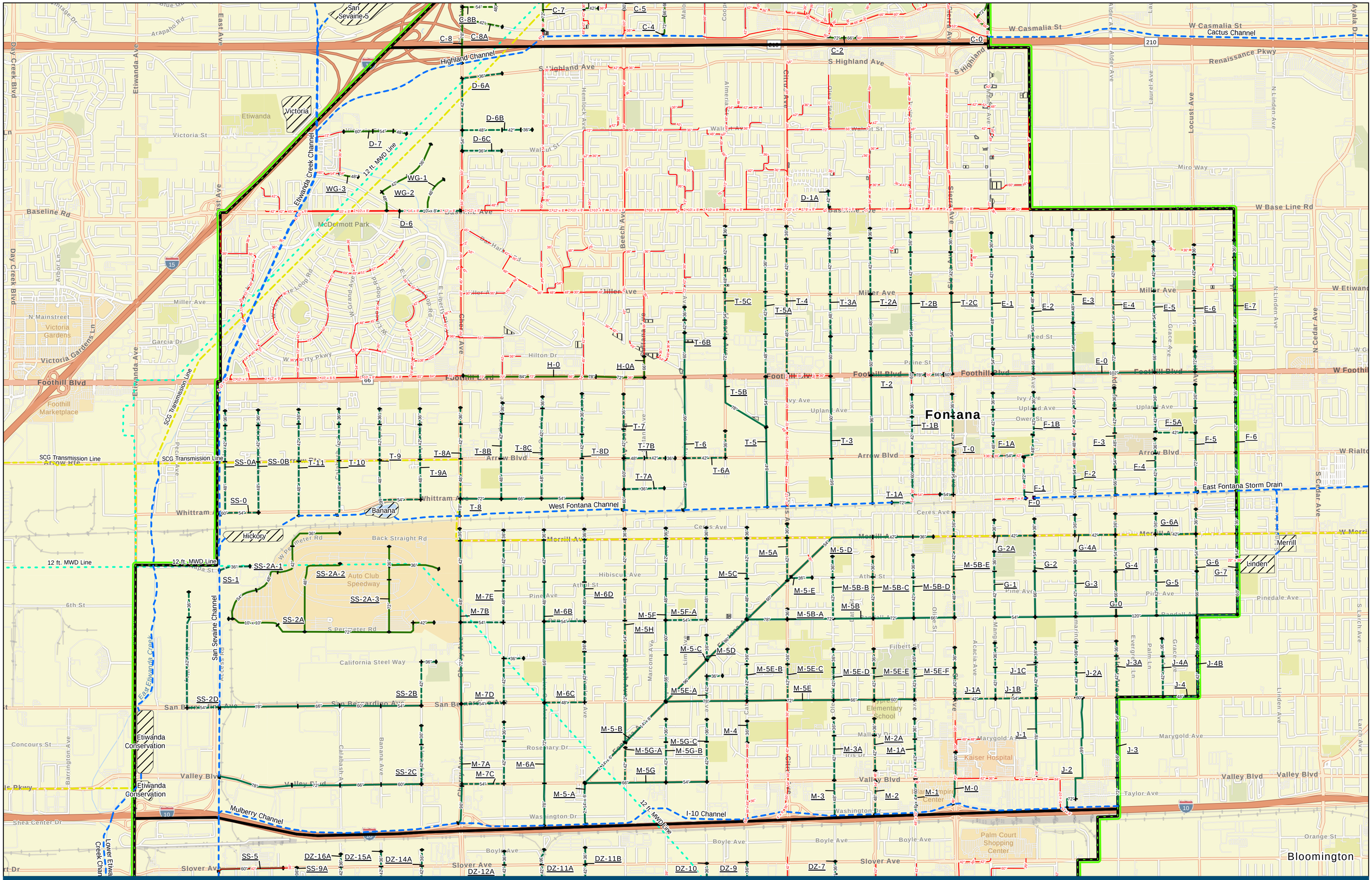
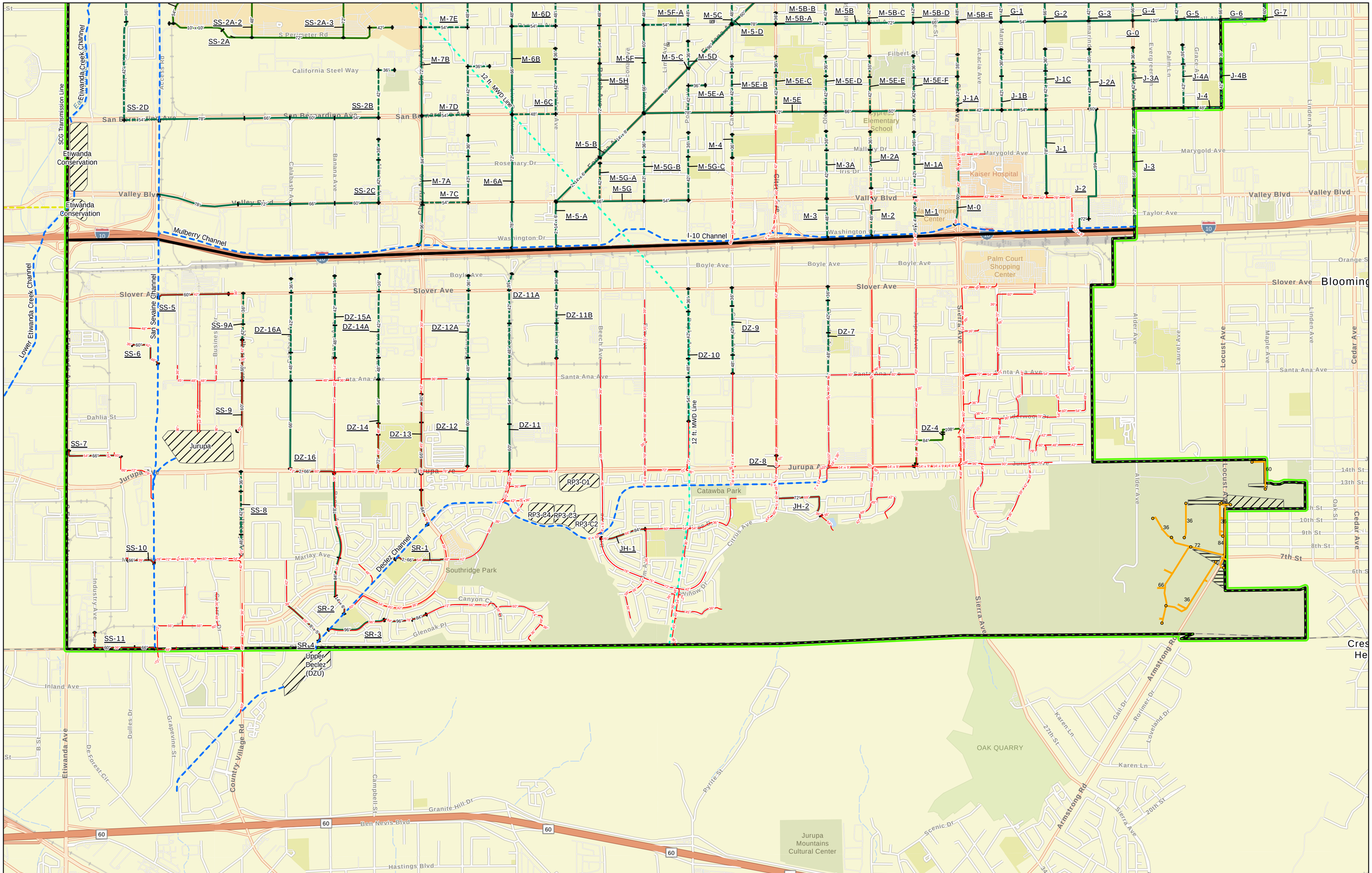


AOS 1 Capital Projects

City of Fontana Storm Drain Master Plan



AOS Boundary
Fontana Sphere of Influence
Existing Pipes (36-inch diameter and larger)
Regional Flood Control Channels

Proposed Projects
100-Year
25-Year
Proposed Pipe Sizes (inches or feet)

Proposed Private Development Projects
Proposed Detention Basins
Existing Detention Basins
Existing Recharge Basins

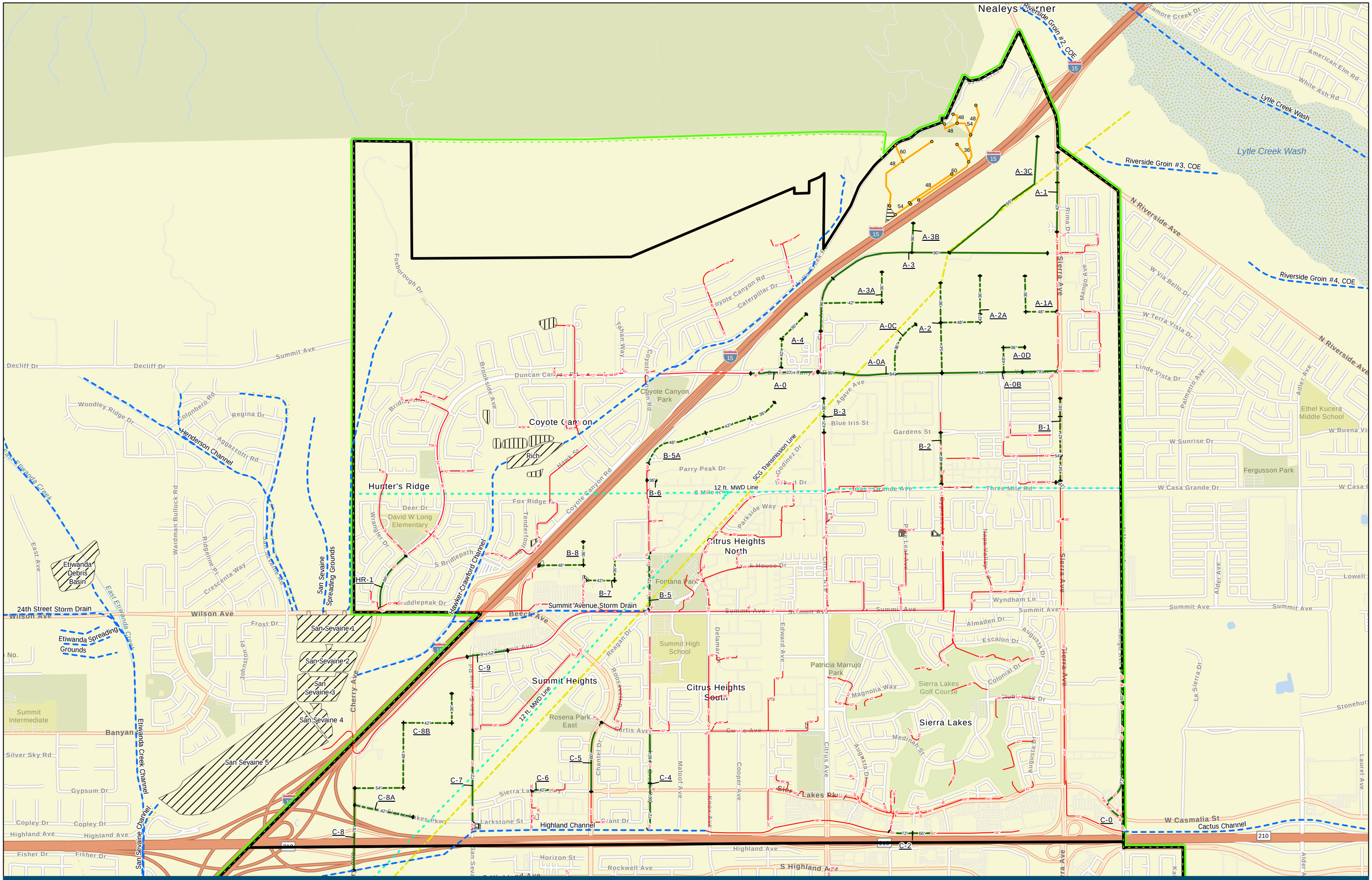
Metropolitan Water District Feeders
Gas Transmission Lines

N

0 2,500 5,000 10,000 Feet

AOS 2 Capital Projects

City of Fontana Storm Drain Master Plan



AOS 3 Capital Projects

City of Fontana Storm Drain Master Plan

AOS 1 Capital Project Cost Estimates

FONTANA
CALIFORNIA

DAVID EVANS
AND ASSOCIATES INC.

Project	Cost
D-1A	$638,000.00
D-6	$20,519,000.00
D-6A	$4,675,000.00
D-6B	$3,028,000.00
D-6C	$1,459,000.00
D-7	$3,131,000.00
E-0	$27,459,000.00
E-1	$10,120,000.00
E-2	$6,511,000.00
E-3	$6,394,000.00
E-4	$6,764,000.00
E-5	$6,409,000.00
E-6	$6,249,000.00
E-7	$6,321,000.00
F-1	$2,821,000.00
F-1A	$4,093,000.00
F-1B	$2,986,000.00
F-2	$4,982,000.00
F-3	$4,898,000.00
F-4	$2,134,000.00
F-5	$5,824,000.00
F-5A	$3,272,000.00
F-6	$4,530,000.00
G-0	$31,966,000.00
G-1	$2,509,000.00
G-2	$5,221,000.00
G-2A	$2,275,000.00
G-3	$2,518,000.00
G-4	$5,360,000.00
G-4A	$2,411,000.00
G-5	$2,514,000.00
G-6	$5,496,000.00
G-6A	$2,435,000.00
G-7	$5,223,000.00

Project	Cost
H-0	$16,558,000.00
H-0A	$1,376,000.00
J-1	$5,558,000.00
J-1A	$3,660,000.00
J-1B	$4,074,000.00
J-1C	$2,140,000.00
J-2	$7,918,000.00
J-2A	$2,425,000.00
J-3	$6,428,000.00
J-3A	$2,178,000.00
J-4	$1,528,000.00
J-4A	$2,248,000.00
J-4B	$2,255,000.00
M-0	$3,064,000.00
M-1	$2,254,000.00
M-1A	$2,228,000.00
M-2	$1,528,000.00
M-2A	$1,980,000.00
M-3	$1,604,000.00
M-3A	$2,490,000.00
M-4	$775,000.00
M-5-A	$42,209,000.00
M-5-B	$87,343,000.00
M-5-C	$11,275,000.00
M-5-D	$10,714,000.00
M-5-E	$807,000.00
M-5A	$2,295,000.00
M-5B	$13,584,000.00
M-5B-A	$377,000.00
M-5B-B	$2,380,000.00
M-5B-C	$2,359,000.00
M-5B-D	$2,398,000.00
M-5B-E	$4,419,000.00
M-5C	$3,936,000.00

Project	Cost
M-5D	$883,000.00
M-5E	$27,493,000.00
M-5E-A	$1,543,000.00
M-5E-B	$1,985,000.00
M-5E-C	$1,960,000.00
M-5E-D	$1,931,000.00
M-5E-E	$1,936,000.00
M-5E-F	$1,914,000.00
M-5F	$8,724,000.00
M-5F-A	$5,968,000.00
M-5G	$7,041,000.00
M-5G-A	$1,450,000.00
M-5G-B	$2,428,000.00
M-5G-C	$2,473,000.00
M-5H	$11,553,000.00
M-6A	$8,300,000.00
M-6B	$8,904,000.00
M-6C	$4,254,000.00
M-6D	$6,021,000.00
M-7A	$10,749,000.00
M-7B	$9,501,000.00
M-7C	$4,550,000.00
M-7D	$4,736,000.00
M-7E	$6,074,000.00
SS-0	$3,850,000.00
SS-0A	$3,800,000.00
SS-0B	$4,371,000.00
SS-1	$1,130,000.00
SS-2A-1	$7,183,000.00
SS-2A	$28,483,000.00
SS-2A-2	$4,513,000.00
SS-2A-3	$6,658,000.00
SS-2B	$15,071,000.00
SS-2C	$16,093,000.00

Project	Cost
SS-2D	$4,625,000.00
T-0	$6,570,000.00
T-10	$4,439,000.00
T-11	$4,489,000.00
T-1A	$3,929,000.00
T-1B	$2,342,000.00
T-2	$20,035,000.00
T-2A	$7,649,000.00
T-2B	$6,375,000.00
T-2C	$6,388,000.00
T-3	$9,259,000.00
T-3A	$11,376,000.00
T-4	$5,880,000.00
T-5	$8,995,000.00
T-5A	$5,790,000.00
T-5B	$5,614,000.00
T-5C	$7,346,000.00
T-6	$7,250,000.00
T-6A	$2,584,000.00
T-6B	$3,350,000.00
T-7	$12,064,000.00
T-7A	$1,434,000.00
T-7B	$2,069,000.00
T-8	$10,190,000.00
T-8A	$3,685,000.00
T-8B	$3,920,000.00
T-8C	$3,768,000.00
T-8D	$5,920,000.00
T-9	$4,593,000.00
T-9A	$5,871,000.00
WG-1	$1,625,000.00
WG-2	$3,643,000.00
WG-3	$828,000.00

Name	D-1A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 42" RCP	FT	540	$588	$ 318,000
2	Manhole	EA	1	$20,322	$ 20,000
3	Sawcut and Remove Existing AC Pavement	SF	3,180	$2.66	$ 8,000
4	Crushed Miscellaneous Base	SF	3,180	$4	$ 13,000
5	Replace Asphalt Concrete Pavement	SF	3,180	$2	$ 6,000
6	Traffic Control	%	5%		$ 18,000
7	Erosion Control	%	1%		$ 4,000
8	Moblilization/Demobilization	%	10%		$ 39,000
			SUBTOTAL (CONSTRUCTION)		$ 426,000
	Engineering and Design	%	10%		$ 42,600
	Surveying & Staking & Geotechnical	%	5%		$ 21,000
	Construction Management/Staff	%	10%		$ 42,600
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 106,000
			SUBTOTAL COST		$ 532,000
			CONTINGENCY	20%	$ 106,000
			TOTAL PROJECT		$ 638,000

* All unit prices reflect 2024 costs.

Name	D-6				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 10' x 8' RCB	FT	1,990	$4,491	$ 8,937,000
2	Manhole	EA	5	$20,322	$ 102,000
3	Remove 14' x 8' RCB	FT	850	$910	$ 773,000
4	Remove 12' x 8' RCB	FT	1,990	$639	$ 1,272,000
5	Sawcut and Remove Existing AC Pavement	SF	19,900	$2.66	$ 53,000
6	Crushed Miscellaneous Base	SF	19,900	$4	$ 80,000
7	Replace Asphalt Concrete Pavement	SF	19,900	$2	$ 40,000
8	Traffic Control	%	5%		$ 563,000
9	Erosion Control	%	1%		$ 118,000
10	Moblilization/Demobilization	%	10%		$ 1,194,000
			SUBTOTAL (CONSTRUCTION)		$ 13,132,000
	Engineering and Design	%	10%		$ 1,313,000
	Surveying & Staking & Geotechnical	%	5%		$ 657,000
	Construction Management/Staff	%	10%		$ 1,313,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 3,283,000
			SUBTOTAL COST		$ 16,415,000
			CONTINGENCY +	25%	$ 4,104,000
			TOTAL PROJECT		$ 20,519,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	D-6A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	1,320	$527	$ 696,000
2	Install 42" RCP	FT	1,700	$588	$ 1,000,000
3	Install 54" RCP	FT	680	$732	$ 498,000
4	Manhole	EA	9	$20,322	$ 183,000
5	Sawcut and Remove Existing AC Pavement	SF	21,740	$2.66	$ 58,000
6	Crushed Miscellaneous Base	SF	21,740	$4	$ 87,000
7	Replace Asphalt Concrete Pavement	SF	21,740	$2	$ 43,000
8	Traffic Control	%	5%		$ 128,000
9	Erosion Control	%	1%		$ 27,000
10	Moblilization/Demobilization	%	10%		$ 272,000
			SUBTOTAL (CONSTRUCTION)		$ 2,992,000
	Engineering and Design	%	10%		$ 299,000
	Surveying & Staking & Geotechnical	%	5%		$ 150,000
	Construction Management/Staff	%	10%		$ 299,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 748,000
			SUBTOTAL COST		$ 3,740,000
			CONTINGENCY +	25%	$ 935,000
			TOTAL PROJECT		$ 4,675,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway, 12' water main, and SCG transmisson line conflict

Name	D-6B				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	380	$527	$ 200,000
2	Install 42" RCP	FT	620	$588	$ 365,000
3	Install 48" RCP	FT	1,300	$656	$ 853,000
4	Manhole	EA	6	$20,322	$ 122,000
5	Sawcut and Remove Existing AC Pavement	SF	14,020	$2.66	$ 37,000
6	Crushed Miscellaneous Base	SF	14,020	$4	$ 56,000
7	Replace Asphalt Concrete Pavement	SF	14,020	$2	$ 28,000
8	Traffic Control	%	5%		$ 83,000
9	Erosion Control	%	1%		$ 17,000
10	Moblilization/Demobilization	%	10%		$ 176,000
			SUBTOTAL (CONSTRUCTION)		$ 1,937,000
	Engineering and Design	%	10%		$ 194,000
	Surveying & Staking & Geotechnical	%	5%		$ 97,000
	Construction Management/Staff	%	10%		$ 194,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 485,000
			SUBTOTAL COST		$ 2,422,000
			CONTINGENCY +	25%	$ 606,000
			TOTAL PROJECT		$ 3,028,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	D-6C				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	1,290	$527	$ 680,000
2	Manhole	EA	3	$20,322	$ 61,000
3	Sawcut and Remove Existing AC Pavement	SF	6,880	$2.66	$ 18,000
4	Crushed Miscellaneous Base	SF	6,880	$4	$ 28,000
5	Replace Asphalt Concrete Pavement	SF	6,880	$2	$ 14,000
6	Traffic Control	%	5%		$ 40,000
7	Erosion Control	%	1%		$ 8,000
8	Moblilization/Demobilization	%	10%		$ 85,000
			SUBTOTAL (CONSTRUCTION)		$ 934,000
	Engineering and Design	%	10%		$ 93,000
	Surveying & Staking & Geotechnical	%	5%		$ 47,000
	Construction Management/Staff	%	10%		$ 93,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 233,000
			SUBTOTAL COST		$ 1,167,000
			CONTINGENCY +	25%	$ 292,000
			TOTAL PROJECT		$ 1,459,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	D-7				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 48" RCP	FT	450	$656	$ 295,000
2	Install 54" RCP	FT	670	$732	$ 490,000
3	Install 60" RCP	FT	950	$816	$ 775,000
4	Manhole	EA	5	$20,322	$ 102,000
5	Sawcut and Remove Existing AC Pavement	SF	14,680	$2.66	$ 39,000
6	Crushed Miscellaneous Base	SF	14,680	$4	$ 59,000
7	Replace Asphalt Concrete Pavement	SF	14,680	$2	$ 29,000
8	Traffic Control	%	5%		$ 89,000
9	Erosion Control	%	1%		$ 19,000
10	Moblilization/Demobilization	%	10%		$ 190,000
			SUBTOTAL (CONSTRUCTION)		$ 2,087,000
	Engineering and Design	%	10%		$ 209,000
	Surveying & Staking & Geotechnical	%	5%		$ 104,000
	Construction Management/Staff	%	10%		$ 209,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 522,000
			SUBTOTAL COST		$ 2,609,000
			CONTINGENCY	20%	$ 522,000
			TOTAL PROJECT		$ 3,131,000

* All unit prices reflect 2024 costs.

Name	E-0				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 102" RCP	FT	7,920	$1,753	$ 13,884,000
2	Manhole	EA	20	$20,322	$ 406,000
3	Sawcut and Remove Existing AC Pavement	SF	89,430	$2.66	$ 238,000
4	Crushed Miscellaneous Base	SF	89,430	$4	$ 358,000
5	Replace Asphalt Concrete Pavement	SF	89,430	$2	$ 179,000
6	Traffic Control	%	5%		$ 753,000
7	Erosion Control	%	1%		$ 158,000
8	Moblilization/Demobilization	%	10%		$ 1,598,000
			SUBTOTAL (CONSTRUCTION)		$ 17,574,000
	Engineering and Design	%	10%		$ 1,757,000
	Surveying & Staking & Geotechnical	%	5%		$ 879,000
	Construction Management/Staff	%	10%		$ 1,757,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 4,393,000
			SUBTOTAL COST		$ 21,967,000
			CONTINGENCY +	25%	$ 5,492,000
			TOTAL PROJECT		$ 27,459,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	E-1				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	790	$527	$ 416,000
2	Install 42" RCP	FT	1,170	$588	$ 688,000
3	Install 48" RCP	FT	2,650	$656	$ 1,738,000
4	Install 54" RCP	FT	2,650	$732	$ 1,940,000
5	Manhole	EA	18	$20,322	$ 366,000
6	Sawcut and Remove Existing AC Pavement	SF	46,540	$2.66	$ 124,000
7	Crushed Miscellaneous Base	SF	46,540	$4	$ 186,000
8	Replace Asphalt Concrete Pavement	SF	46,540	$2	$ 93,000
9	Traffic Control	%	5%		$ 278,000
10	Erosion Control	%	1%		$ 58,000
11	Moblilization/Demobilization	%	10%		$ 589,000
			SUBTOTAL (CONSTRUCTION)		$ 6,476,000
	Engineering and Design	%	10%		$ 648,000
	Surveying & Staking & Geotechnical	%	5%		$ 324,000
	Construction Management/Staff	%	10%		$ 648,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 1,620,000
			SUBTOTAL COST		$ 8,096,000
			CONTINGENCY +	25%	$ 2,024,000
			TOTAL PROJECT		$ 10,120,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	E-2				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	690	$527	$ 364,000
2	Install 42" RCP	FT	1,150	$588	$ 676,000
3	Install 48" RCP	FT	520	$656	$ 341,000
4	Install 54" RCP	FT	1,340	$732	$ 981,000
5	Install 66" RCP	FT	800	$911	$ 729,000
6	Manhole	EA	11	$20,322	$ 224,000
7	Sawcut and Remove Existing AC Pavement	SF	29,540	$2.66	$ 79,000
8	Crushed Miscellaneous Base	SF	29,540	$4	$ 118,000
9	Replace Asphalt Concrete Pavement	SF	29,540	$2	$ 59,000
10	Traffic Control	%	5%		$ 179,000
11	Erosion Control	%	1%		$ 38,000
12	Moblilization/Demobilization	%	10%		$ 379,000
			SUBTOTAL (CONSTRUCTION)		$ 4,167,000
	Engineering and Design	%	10%		$ 417,000
	Surveying & Staking & Geotechnical	%	5%		$ 208,000
	Construction Management/Staff	%	10%		$ 417,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 1,042,000
			SUBTOTAL COST		$ 5,209,000
			CONTINGENCY +	25%	$ 1,302,000
			TOTAL PROJECT		$ 6,511,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	E-3				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	890	$527	$ 469,000
2	Install 42" RCP	FT	1,150	$588	$ 676,000
3	Install 48" RCP	FT	1,000	$656	$ 656,000
4	Install 54" RCP	FT	1,650	$732	$ 1,208,000
5	Manhole	EA	12	$20,322	$ 244,000
6	Sawcut and Remove Existing AC Pavement	SF	29,410	$2.66	$ 78,000
7	Crushed Miscellaneous Base	SF	29,410	$4	$ 118,000
8	Replace Asphalt Concrete Pavement	SF	29,410	$2	$ 59,000
9	Traffic Control	%	5%		$ 175,000
10	Erosion Control	%	1%		$ 37,000
11	Moblilization/Demobilization	%	10%		$ 372,000
			SUBTOTAL (CONSTRUCTION)		$ 4,092,000
	Engineering and Design	%	10%		$ 409,000
	Surveying & Staking & Geotechnical	%	5%		$ 205,000
	Construction Management/Staff	%	10%		$ 409,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 1,023,000
			SUBTOTAL COST		$ 5,115,000
			CONTINGENCY +	25%	$ 1,279,000
			TOTAL PROJECT		$ 6,394,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	E-4				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	650	$527	$ 343,000
2	Install 42" RCP	FT	1,140	$588	$ 670,000
3	Install 54" RCP	FT	1,690	$732	$ 1,237,000
4	Install 72" RCP	FT	960	$1,016	$ 975,000
5	Manhole	EA	11	$20,322	$ 224,000
6	Sawcut and Remove Existing AC Pavement	SF	30,170	$2.66	$ 80,000
7	Crushed Miscellaneous Base	SF	30,170	$4	$ 121,000
8	Replace Asphalt Concrete Pavement	SF	30,170	$2	$ 60,000
9	Traffic Control	%	5%		$ 186,000
10	Erosion Control	%	1%		$ 39,000
11	Moblilization/Demobilization	%	10%		$ 394,000
			SUBTOTAL (CONSTRUCTION)		$ 4,329,000
	Engineering and Design	%	10%		$ 433,000
	Surveying & Staking & Geotechnical	%	5%		$ 216,000
	Construction Management/Staff	%	10%		$ 433,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 1,082,000
			SUBTOTAL COST		$ 5,411,000
			CONTINGENCY +	25%	$ 1,353,000
			TOTAL PROJECT		$ 6,764,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	E-5				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	480	$527	$ 253,000
2	Install 42" RCP	FT	1,140	$588	$ 670,000
3	Install 54" RCP	FT	1,650	$732	$ 1,208,000
4	Install 66" RCP	FT	1,000	$911	$ 911,000
5	Manhole	EA	11	$20,322	$ 224,000
6	Sawcut and Remove Existing AC Pavement	SF	28,790	$2.66	$ 77,000
7	Crushed Miscellaneous Base	SF	28,790	$4	$ 115,000
8	Replace Asphalt Concrete Pavement	SF	28,790	$2	$ 58,000
9	Traffic Control	%	5%		$ 176,000
10	Erosion Control	%	1%		$ 37,000
11	Moblilization/Demobilization	%	10%		$ 373,000
			SUBTOTAL (CONSTRUCTION)		$ 4,102,000
	Engineering and Design	%	10%		$ 410,000
	Surveying & Staking & Geotechnical	%	5%		$ 205,000
	Construction Management/Staff	%	10%		$ 410,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 1,025,000
			SUBTOTAL COST		$ 5,127,000
			CONTINGENCY +	25%	$ 1,282,000
			TOTAL PROJECT		$ 6,409,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	E-6				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	320	$527	$ 169,000
2	Install 42" RCP	FT	1,180	$588	$ 694,000
3	Install 54" RCP	FT	1,970	$732	$ 1,442,000
4	Install 72" RCP	FT	680	$1,016	$ 691,000
5	Manhole	EA	10	$20,322	$ 203,000
6	Sawcut and Remove Existing AC Pavement	SF	26,450	$2.66	$ 70,000
7	Crushed Miscellaneous Base	SF	26,450	$4	$ 106,000
8	Replace Asphalt Concrete Pavement	SF	26,450	$2	$ 53,000
9	Traffic Control	%	5%		$ 171,000
10	Erosion Control	%	1%		$ 36,000
11	Moblilization/Demobilization	%	10%		$ 364,000
			SUBTOTAL (CONSTRUCTION)		$ 3,999,000
	Engineering and Design	%	10%		$ 400,000
	Surveying & Staking & Geotechnical	%	5%		$ 200,000
	Construction Management/Staff	%	10%		$ 400,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 1,000,000
			SUBTOTAL COST		$ 4,999,000
			CONTINGENCY +	25%	$ 1,250,000
			TOTAL PROJECT		$ 6,249,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	E-7				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	560	$527	$ 295,000
2	Install 42" RCP	FT	1,070	$588	$ 629,000
3	Install 54" RCP	FT	1,990	$732	$ 1,457,000
4	Install 66" RCP	FT	670	$911	$ 610,000
5	Manhole	EA	11	$20,322	$ 224,000
6	Sawcut and Remove Existing AC Pavement	SF	29,240	$2.66	$ 78,000
7	Crushed Miscellaneous Base	SF	29,240	$4	$ 117,000
8	Replace Asphalt Concrete Pavement	SF	29,240	$2	$ 58,000
9	Traffic Control	%	5%		$ 173,000
10	Erosion Control	%	1%		$ 36,000
11	Moblilization/Demobilization	%	10%		$ 368,000
			SUBTOTAL (CONSTRUCTION)		$ 4,045,000
	Engineering and Design	%	10%		$ 405,000
	Surveying & Staking & Geotechnical	%	5%		$ 202,000
	Construction Management/Staff	%	10%		$ 405,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 1,012,000
			SUBTOTAL COST		$ 5,057,000
			CONTINGENCY +	25%	$ 1,264,000
			TOTAL PROJECT		$ 6,321,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	F-1				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 72" RCP	FT	1,340	$1,016	$ 1,361,000
2	Manhole	EA	3	$20,322	$ 61,000
3	Remove 48" RCP	FT	530	$71	$ 38,000
4	Remove 54" RCP	FT	650	$80	$ 52,000
5	Sawcut and Remove Existing AC Pavement	SF	11,510	$2.66	$ 31,000
6	Crushed Miscellaneous Base	SF	11,510	$4	$ 46,000
7	Replace Asphalt Concrete Pavement	SF	11,510	$2	$ 23,000
8	Traffic Control	%	5%		$ 81,000
9	Erosion Control	%	1%		$ 17,000
10	Moblilization/Demobilization	%	10%		$ 171,000
			SUBTOTAL (CONSTRUCTION)		$ 1,881,000
	Engineering and Design	%	10%		$ 188,000
	Surveying & Staking & Geotechnical	%	5%		$ 94,000
	Construction Management/Staff	%	10%		$ 188,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 470,000
			SUBTOTAL COST		$ 2,351,000
			CONTINGENCY	20%	$ 470,000
			TOTAL PROJECT		$ 2,821,000

* All unit prices reflect 2024 costs.

Name	F-1A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	730	$527	$ 385,000
2	Install 42" RCP	FT	690	$588	$ 406,000
3	Install 48" RCP	FT	650	$656	$ 426,000
4	Install 54" RCP	FT	1,000	$732	$ 732,000
5	Manhole	EA	8	$20,322	$ 163,000
6	Remove 42" RCP	FT	980	$62	$ 61,000
7	Sawcut and Remove Existing AC Pavement	SF	19,210	$2.66	$ 51,000
8	Crushed Miscellaneous Base	SF	19,210	$4	$ 77,000
9	Replace Asphalt Concrete Pavement	SF	19,210	$2	$ 38,000
10	Traffic Control	%	5%		$ 117,000
11	Erosion Control	%	1%		$ 25,000
12	Moblilization/Demobilization	%	10%		$ 248,000
			SUBTOTAL (CONSTRUCTION)		$ 2,729,000
	Engineering and Design	%	10%		$ 273,000
	Surveying & Staking & Geotechnical	%	5%		$ 136,000
	Construction Management/Staff	%	10%		$ 273,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 682,000
			SUBTOTAL COST		$ 3,411,000
			CONTINGENCY	20%	$ 682,000
			TOTAL PROJECT		$ 4,093,000

* All unit prices reflect 2024 costs.

Name	F-1B				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	710	$527	$ 374,000
2	Install 42" RCP	FT	690	$588	$ 406,000
3	Install 48" RCP	FT	970	$656	$ 636,000
4	Manhole	EA	6	$20,322	$ 122,000
5	Remove 24" RCP	FT	200	$35	$ 7,000
6	Remove 30" RCP	FT	920	$44	$ 40,000
7	Sawcut and Remove Existing AC Pavement	SF	14,070	$2.66	$ 37,000
8	Crushed Miscellaneous Base	SF	14,070	$4	$ 56,000
9	Replace Asphalt Concrete Pavement	SF	14,070	$2	$ 28,000
10	Traffic Control	%	5%		$ 85,000
11	Erosion Control	%	1%		$ 18,000
12	Moblilization/Demobilization	%	10%		$ 181,000
			SUBTOTAL (CONSTRUCTION)		$ 1,990,000
	Engineering and Design	%	10%		$ 199,000
	Surveying & Staking & Geotechnical	%	5%		$ 100,000
	Construction Management/Staff	%	10%		$ 199,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 498,000
			SUBTOTAL COST		$ 2,488,000
			CONTINGENCY	20%	$ 498,000
			TOTAL PROJECT		$ 2,986,000

* All unit prices reflect 2024 costs.

Name	F-2				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	820	$527	$ 432,000
2	Install 42" RCP	FT	650	$588	$ 382,000
3	Install 48" RCP	FT	660	$656	$ 433,000
4	Install 54" RCP	FT	1,110	$732	$ 813,000
5	Install 60" RCP	FT	280	$816	$ 228,000
6	Manhole	EA	9	$20,322	$ 183,000
7	Remove 36" RCP	FT	720	$53	$ 38,000
8	Remove 39" RCP	FT	850	$58	$ 49,000
9	Remove 42" RCP	FT	320	$62	$ 20,000
10	Remove 48" RCP	FT	1,080	$71	$ 77,000
11	Sawcut and Remove Existing AC Pavement	SF	22,260	$2.66	$ 59,000
12	Crushed Miscellaneous Base	SF	22,260	$4	$ 89,000
13	Replace Asphalt Concrete Pavement	SF	22,260	$2	$ 45,000
14	Traffic Control	%	5%		$ 142,000
15	Erosion Control	%	1%		$ 30,000
16	Moblilization/Demobilization	%	10%		$ 302,000
	SUBTOTAL (CONSTRUCTION)				$ 3,322,000
	Engineering and Design	%	10%		$ 332,000
	Surveying & Staking & Geotechnical	%	5%		$ 166,000
	Construction Management/Staff	%	10%		$ 332,000
	SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)				$ 830,000
	SUBTOTAL COST				$ 4,152,000
	CONTINGENCY			20%	$ 830,000
	TOTAL PROJECT				$ 4,982,000

* All unit prices reflect 2024 costs.

Name	F-3				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	850	$527	$ 448,000
2	Install 42" RCP	FT	640	$588	$ 376,000
3	Install 48" RCP	FT	670	$656	$ 440,000
4	Install 54" RCP	FT	530	$732	$ 388,000
5	Install 66" RCP	FT	840	$911	$ 765,000
6	Manhole	EA	9	$20,322	$ 183,000
7	Sawcut and Remove Existing AC Pavement	SF	23,040	$2.66	$ 61,000
8	Crushed Miscellaneous Base	SF	23,040	$4	$ 92,000
9	Replace Asphalt Concrete Pavement	SF	23,040	$2	$ 46,000
10	Traffic Control	%	5%		$ 140,000
11	Erosion Control	%	1%		$ 29,000
12	Moblilization/Demobilization	%	10%		$ 297,000
			SUBTOTAL (CONSTRUCTION)		$ 3,265,000
	Engineering and Design	%	10%		$ 327,000
	Surveying & Staking & Geotechnical	%	5%		$ 163,000
	Construction Management/Staff	%	10%		$ 327,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 817,000
			SUBTOTAL COST		$ 4,082,000
			CONTINGENCY	20%	$ 816,000
			TOTAL PROJECT		$ 4,898,000

* All unit prices reflect 2024 costs.

Name	F-4				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	480	$527	$ 253,000
2	Install 42" RCP	FT	1,320	$588	$ 776,000
3	Manhole	EA	5	$20,322	$ 102,000
4	Sawcut and Remove Existing AC Pavement	SF	10,320	$2.66	$ 27,000
5	Crushed Miscellaneous Base	SF	10,320	$4	$ 41,000
6	Replace Asphalt Concrete Pavement	SF	10,320	$2	$ 21,000
7	Traffic Control	%	5%		$ 61,000
8	Erosion Control	%	1%		$ 13,000
9	Moblilization/Demobilization	%	10%		$ 129,000
			SUBTOTAL (CONSTRUCTION)		$ 1,423,000
	Engineering and Design	%	10%		$ 142,000
	Surveying & Staking & Geotechnical	%	5%		$ 71,000
	Construction Management/Staff	%	10%		$ 142,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 355,000
			SUBTOTAL COST		$ 1,778,000
			CONTINGENCY	20%	$ 356,000
			TOTAL PROJECT		$ 2,134,000

* All unit prices reflect 2024 costs.

Name	F-5				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	890	$527	$ 469,000
2	Install 42" RCP	FT	710	$588	$ 417,000
3	Install 72" RCP	FT	1,970	$1,016	$ 2,002,000
4	Manhole	EA	9	$20,322	$ 183,000
5	Remove 39" RCP	FT	590	$58	$ 34,000
6	Sawcut and Remove Existing AC Pavement	SF	25,830	$2.66	$ 69,000
7	Crushed Miscellaneous Base	SF	25,830	$4	$ 103,000
8	Replace Asphalt Concrete Pavement	SF	25,830	$2	$ 52,000
9	Traffic Control	%	5%		$ 166,000
10	Erosion Control	%	1%		$ 35,000
11	Moblilization/Demobilization	%	10%		$ 353,000
			SUBTOTAL (CONSTRUCTION)		$ 3,883,000
	Engineering and Design	%	10%		$ 388,000
	Surveying & Staking & Geotechnical	%	5%		$ 194,000
	Construction Management/Staff	%	10%		$ 388,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 970,000
			SUBTOTAL COST		$ 4,853,000
			CONTINGENCY	20%	$ 971,000
			TOTAL PROJECT		$ 5,824,000

* All unit prices reflect 2024 costs.

Name	F-5A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	830	$527	$ 437,000
2	Install 42" RCP	FT	610	$588	$ 359,000
3	Install 42" RCP	FT	1,330	$588	$ 782,000
4	Manhole	EA	7	$20,322	$ 142,000
5	Sawcut and Remove Existing AC Pavement	SF	17,270	$2.66	$ 46,000
6	Crushed Miscellaneous Base	SF	17,270	$4	$ 69,000
7	Replace Asphalt Concrete Pavement	SF	17,270	$2	$ 35,000
8	Traffic Control	%	5%		$ 94,000
9	Erosion Control	%	1%		$ 20,000
10	Moblilization/Demobilization	%	10%		$ 198,000
			SUBTOTAL (CONSTRUCTION)		$ 2,182,000
	Engineering and Design	%	10%		$ 218,000
	Surveying & Staking & Geotechnical	%	5%		$ 109,000
	Construction Management/Staff	%	10%		$ 218,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 545,000
			SUBTOTAL COST		$ 2,727,000
			CONTINGENCY	20%	$ 545,000
			TOTAL PROJECT		$ 3,272,000

* All unit prices reflect 2024 costs.

Name	F-6				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	630	$527	$ 332,000
2	Install 42" RCP	FT	1,650	$588	$ 970,000
3	Install 54" RCP	FT	1,250	$732	$ 915,000
4	Manhole	EA	9	$20,322	$ 183,000
5	Sawcut and Remove Existing AC Pavement	SF	21,760	$2.66	$ 58,000
6	Crushed Miscellaneous Base	SF	21,760	$4	$ 87,000
7	Replace Asphalt Concrete Pavement	SF	21,760	$2	$ 44,000
8	Traffic Control	%	5%		$ 129,000
9	Erosion Control	%	1%		$ 27,000
10	Moblilization/Demobilization	%	10%		$ 275,000
			SUBTOTAL (CONSTRUCTION)		$ 3,020,000
	Engineering and Design	%	10%		$ 302,000
	Surveying & Staking & Geotechnical	%	5%		$ 151,000
	Construction Management/Staff	%	10%		$ 302,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 755,000
			SUBTOTAL COST		$ 3,775,000
			CONTINGENCY	20%	$ 755,000
			TOTAL PROJECT		$ 4,530,000

* All unit prices reflect 2024 costs.

Name	G-0				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 54" RCP	FT	1,320	$732	$ 966,000
2	Install 120" RCP	FT	6,610	$2,433	$ 16,082,000
3	Manhole	EA	20	$20,322	$ 406,000
4	Sawcut and Remove Existing AC Pavement	SF	94,020	$2.66	$ 250,000
5	Crushed Miscellaneous Base	SF	94,020	$4	$ 376,000
6	Replace Asphalt Concrete Pavement	SF	94,020	$2	$ 188,000
7	Traffic Control	%	5%		$ 913,000
8	Erosion Control	%	1%		$ 192,000
9	Moblilization/Demobilization	%	10%		$ 1,937,000
			SUBTOTAL (CONSTRUCTION)		$ 21,310,000
	Engineering and Design	%	10%		$ 2,131,000
	Surveying & Staking & Geotechnical	%	5%		$ 1,066,000
	Construction Management/Staff	%	10%		$ 2,131,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 5,328,000
			SUBTOTAL COST		$ 26,638,000
			CONTINGENCY	20%	$ 5,328,000
			TOTAL PROJECT		$ 31,966,000

* All unit prices reflect 2024 costs.

Name	G-1				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	650	$527	$ 343,000
2	Install 42" RCP	FT	1,500	$588	$ 882,000
3	Manhole	EA	5	$20,322	$ 102,000
4	Sawcut and Remove Existing AC Pavement	SF	12,280	$2.66	$ 33,000
5	Crushed Miscellaneous Base	SF	12,280	$4	$ 49,000
6	Replace Asphalt Concrete Pavement	SF	12,280	$2	$ 25,000
7	Traffic Control	%	5%		$ 72,000
8	Erosion Control	%	1%		$ 15,000
9	Moblilization/Demobilization	%	10%		$ 152,000
			SUBTOTAL (CONSTRUCTION)		$ 1,673,000
	Engineering and Design	%	10%		$ 167,000
	Surveying & Staking & Geotechnical	%	5%		$ 84,000
	Construction Management/Staff	%	10%		$ 167,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 418,000
			SUBTOTAL COST		$ 2,091,000
			CONTINGENCY	20%	$ 418,000
			TOTAL PROJECT		$ 2,509,000

* All unit prices reflect 2024 costs.

Name	G-2				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	550	$527	$ 290,000
2	Install 54" RCP	FT	1,170	$732	$ 856,000
3	Install 66" RCP	FT	1,490	$911	$ 1,357,000
4	Manhole	EA	8	$20,322	$ 163,000
5	Sawcut and Remove Existing AC Pavement	SF	23,060	$2.66	$ 61,000
6	Crushed Miscellaneous Base	SF	23,060	$4	$ 92,000
7	Replace Asphalt Concrete Pavement	SF	23,060	$2	$ 46,000
8	Traffic Control	%	5%		$ 143,000
9	Erosion Control	%	1%		$ 30,000
10	Moblilization/Demobilization	%	10%		$ 304,000
			SUBTOTAL (CONSTRUCTION)		$ 3,342,000
	Engineering and Design	%	10%		$ 334,000
	Surveying & Staking & Geotechnical	%	5%		$ 167,000
	Construction Management/Staff	%	10%		$ 334,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 835,000
			SUBTOTAL COST		$ 4,177,000
			CONTINGENCY +	25%	$ 1,044,000
			TOTAL PROJECT		$ 5,221,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to SCG transmisson line conflict

Name	G-2A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	530	$527	$ 279,000
2	Install 42" RCP	FT	1,320	$588	$ 776,000
3	Manhole	EA	5	$20,322	$ 102,000
4	Sawcut and Remove Existing AC Pavement	SF	10,590	$2.66	$ 28,000
5	Crushed Miscellaneous Base	SF	10,590	$4	$ 42,000
6	Replace Asphalt Concrete Pavement	SF	10,590	$2	$ 21,000
7	Traffic Control	%	5%		$ 62,000
8	Erosion Control	%	1%		$ 13,000
9	Moblilization/Demobilization	%	10%		$ 132,000
			SUBTOTAL (CONSTRUCTION)		$ 1,455,000
	Engineering and Design	%	10%		$ 146,000
	Surveying & Staking & Geotechnical	%	5%		$ 73,000
	Construction Management/Staff	%	10%		$ 146,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 365,000
			SUBTOTAL COST		$ 1,820,000
			CONTINGENCY +	25%	$ 455,000
			TOTAL PROJECT		$ 2,275,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to SCG transmisson line conflict

Name	G-3				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	670	$527	$ 353,000
2	Install 42" RCP	FT	1,490	$588	$ 876,000
3	Manhole	EA	5	$20,322	$ 102,000
4	Sawcut and Remove Existing AC Pavement	SF	12,330	$2.66	$ 33,000
5	Crushed Miscellaneous Base	SF	12,330	$4	$ 49,000
6	Replace Asphalt Concrete Pavement	SF	12,330	$2	$ 25,000
7	Traffic Control	%	5%		$ 72,000
8	Erosion Control	%	1%		$ 15,000
9	Moblilization/Demobilization	%	10%		$ 153,000
			SUBTOTAL (CONSTRUCTION)		$ 1,678,000
	Engineering and Design	%	10%		$ 168,000
	Surveying & Staking & Geotechnical	%	5%		$ 84,000
	Construction Management/Staff	%	10%		$ 168,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 420,000
			SUBTOTAL COST		$ 2,098,000
			CONTINGENCY	20%	$ 420,000
			TOTAL PROJECT		$ 2,518,000

* All unit prices reflect 2024 costs.

Name	G-4				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	690	$527	$ 364,000
2	Install 54" RCP	FT	1,210	$732	$ 886,000
3	Install 66" RCP	FT	1,450	$911	$ 1,321,000
4	Manhole	EA	8	$20,322	$ 163,000
5	Sawcut and Remove Existing AC Pavement	SF	23,760	$2.66	$ 63,000
6	Crushed Miscellaneous Base	SF	23,760	$4	$ 95,000
7	Replace Asphalt Concrete Pavement	SF	23,760	$2	$ 48,000
8	Traffic Control	%	5%		$ 147,000
9	Erosion Control	%	1%		$ 31,000
10	Moblilization/Demobilization	%	10%		$ 312,000
			SUBTOTAL (CONSTRUCTION)		$ 3,430,000
	Engineering and Design	%	10%		$ 343,000
	Surveying & Staking & Geotechnical	%	5%		$ 172,000
	Construction Management/Staff	%	10%		$ 343,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 858,000
			SUBTOTAL COST		$ 4,288,000
			CONTINGENCY +	25%	$ 1,072,000
			TOTAL PROJECT		$ 5,360,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to SCG transmisson line conflict

Name	G-4A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	660	$527	$ 348,000
2	Install 42" RCP	FT	1,320	$588	$ 776,000
3	Manhole	EA	5	$20,322	$ 102,000
4	Sawcut and Remove Existing AC Pavement	SF	11,280	$2.66	$ 30,000
5	Crushed Miscellaneous Base	SF	11,280	$4	$ 45,000
6	Replace Asphalt Concrete Pavement	SF	11,280	$2	$ 23,000
7	Traffic Control	%	5%		$ 66,000
8	Erosion Control	%	1%		$ 14,000
9	Moblilization/Demobilization	%	10%		$ 140,000
			SUBTOTAL (CONSTRUCTION)		$ 1,544,000
	Engineering and Design	%	10%		$ 154,000
	Surveying & Staking & Geotechnical	%	5%		$ 77,000
	Construction Management/Staff	%	10%		$ 154,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 385,000
			SUBTOTAL COST		$ 1,929,000
			CONTINGENCY +	25%	$ 482,000
			TOTAL PROJECT		$ 2,411,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to SCG transmisson line conflict

Name	G-5				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	710	$527	$ 374,000
2	Install 42" RCP	FT	1,450	$588	$ 853,000
3	Manhole	EA	5	$20,322	$ 102,000
4	Sawcut and Remove Existing AC Pavement	SF	12,310	$2.66	$ 33,000
5	Crushed Miscellaneous Base	SF	12,310	$4	$ 49,000
6	Replace Asphalt Concrete Pavement	SF	12,310	$2	$ 25,000
7	Traffic Control	%	5%		$ 72,000
8	Erosion Control	%	1%		$ 15,000
9	Moblilization/Demobilization	%	10%		$ 152,000
			SUBTOTAL (CONSTRUCTION)		$ 1,675,000
	Engineering and Design	%	10%		$ 168,000
	Surveying & Staking & Geotechnical	%	5%		$ 84,000
	Construction Management/Staff	%	10%		$ 168,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 420,000
			SUBTOTAL COST		$ 2,095,000
			CONTINGENCY	20%	$ 419,000
			TOTAL PROJECT		$ 2,514,000

* All unit prices reflect 2024 costs.

Name	G-6				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	810	$527	$ 427,000
2	Install 54" RCP	FT	1,220	$732	$ 893,000
3	Install 66" RCP	FT	1,440	$911	$ 1,312,000
4	Manhole	EA	9	$20,322	$ 183,000
5	Sawcut and Remove Existing AC Pavement	SF	23,050	$2.66	$ 61,000
6	Crushed Miscellaneous Base	SF	23,050	$4	$ 92,000
7	Replace Asphalt Concrete Pavement	SF	23,050	$2	$ 46,000
8	Traffic Control	%	5%		$ 151,000
9	Erosion Control	%	1%		$ 32,000
10	Moblilization/Demobilization	%	10%		$ 320,000
			SUBTOTAL (CONSTRUCTION)		$ 3,517,000
	Engineering and Design	%	10%		$ 352,000
	Surveying & Staking & Geotechnical	%	5%		$ 176,000
	Construction Management/Staff	%	10%		$ 352,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 880,000
			SUBTOTAL COST		$ 4,397,000
			CONTINGENCY +	25%	$ 1,099,000
			TOTAL PROJECT		$ 5,496,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to SCG transmisson line conflict

Name	G-6A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	680	$527	$ 358,000
2	Install 42" RCP	FT	1,320	$588	$ 776,000
3	Manhole	EA	5	$20,322	$ 102,000
4	Sawcut and Remove Existing AC Pavement	SF	11,390	$2.66	$ 30,000
5	Crushed Miscellaneous Base	SF	11,390	$4	$ 46,000
6	Replace Asphalt Concrete Pavement	SF	11,390	$2	$ 23,000
7	Traffic Control	%	5%		$ 67,000
8	Erosion Control	%	1%		$ 14,000
9	Moblilization/Demobilization	%	10%		$ 142,000
			SUBTOTAL (CONSTRUCTION)		$ 1,558,000
	Engineering and Design	%	10%		$ 156,000
	Surveying & Staking & Geotechnical	%	5%		$ 78,000
	Construction Management/Staff	%	10%		$ 156,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 390,000
			SUBTOTAL COST		$ 1,948,000
			CONTINGENCY +	25%	$ 487,000
			TOTAL PROJECT		$ 2,435,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to SCG transmisson line conflict

Name	G-7				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	780	$527	$ 411,000
2	Install 54" RCP	FT	1,200	$732	$ 878,000
3	Install 60" RCP	FT	1,460	$816	$ 1,191,000
4	Manhole	EA	9	$20,322	$ 183,000
5	Sawcut and Remove Existing AC Pavement	SF	23,460	$2.66	$ 62,000
6	Crushed Miscellaneous Base	SF	23,460	$4	$ 94,000
7	Replace Asphalt Concrete Pavement	SF	23,460	$2	$ 47,000
8	Traffic Control	%	5%		$ 143,000
9	Erosion Control	%	1%		$ 30,000
10	Moblilization/Demobilization	%	10%		$ 304,000
			SUBTOTAL (CONSTRUCTION)		$ 3,343,000
	Engineering and Design	%	10%		$ 334,000
	Surveying & Staking & Geotechnical	%	5%		$ 167,000
	Construction Management/Staff	%	10%		$ 334,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 835,000
			SUBTOTAL COST		$ 4,178,000
			CONTINGENCY +	25%	$ 1,045,000
			TOTAL PROJECT		$ 5,223,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to SCG transmisson line conflict

Name	H-0				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 72" RCP	FT	1,330	$1,016	$ 1,351,000
2	Install 78" RCP	FT	1,330	$1,133	$ 1,507,000
3	Install 84" RCP	FT	3,900	$1,264	$ 4,930,000
4	Manhole	EA	16	$20,322	$ 325,000
5	Remove 42" RCP	FT	420	$62	$ 26,000
6	Remove 66" RCP	FT	730	$99	$ 72,000
7	Remove 72" RCP	FT	3,170	$108	$ 342,000
8	Sawcut and Remove Existing AC Pavement	SF	61,260	$2.66	$ 163,000
9	Crushed Miscellaneous Base	SF	61,260	$4	$ 245,000
10	Replace Asphalt Concrete Pavement	SF	61,260	$2	$ 123,000
11	Traffic Control	%	5%		$ 454,000
12	Erosion Control	%	1%		$ 95,000
13	Moblilization/Demobilization	%	10%		$ 963,000
			SUBTOTAL (CONSTRUCTION)		$ 10,596,000
	Engineering and Design	%	10%		$ 1,060,000
	Surveying & Staking & Geotechnical	%	5%		$ 530,000
	Construction Management/Staff	%	10%		$ 1,060,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 2,650,000
			SUBTOTAL COST		$ 13,246,000
			CONTINGENCY +	25%	$ 3,312,000
			TOTAL PROJECT		$ 16,558,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	H-0A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 66" RCP	FT	690	$911	$ 629,000
2	Manhole	EA	2	$20,322	$ 41,000
3	Remove 36" RCP	FT	690	$53	$ 37,000
4	Sawcut and Remove Existing AC Pavement	SF	5,550	$2.66	$ 15,000
5	Crushed Miscellaneous Base	SF	5,550	$4	$ 22,000
6	Replace Asphalt Concrete Pavement	SF	5,550	$2	$ 11,000
7	Traffic Control	%	5%		$ 38,000
8	Erosion Control	%	1%		$ 8,000
9	Moblilization/Demobilization	%	10%		$ 80,000
			SUBTOTAL (CONSTRUCTION)		$ 881,000
	Engineering and Design	%	10%		$ 88,000
	Surveying & Staking & Geotechnical	%	5%		$ 44,000
	Construction Management/Staff	%	10%		$ 88,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 220,000
			SUBTOTAL COST		$ 1,101,000
			CONTINGENCY +	25%	$ 275,000
			TOTAL PROJECT		$ 1,376,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	J-1				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 78" RCP	FT	2,520	$1,133	$ 2,855,000
2	Manhole	EA	6	$20,322	$ 122,000
3	Sawcut and Remove Existing AC Pavement	SF	23,000	$2.66	$ 61,000
4	Crushed Miscellaneous Base	SF	23,000	$4	$ 92,000
5	Replace Asphalt Concrete Pavement	SF	23,000	$2	$ 46,000
6	Traffic Control	%	5%		$ 159,000
7	Erosion Control	%	1%		$ 33,000
8	Moblilization/Demobilization	%	10%		$ 337,000
			SUBTOTAL (CONSTRUCTION)		$ 3,705,000
	Engineering and Design	%	10%		$ 371,000
	Surveying & Staking & Geotechnical	%	5%		$ 185,000
	Construction Management/Staff	%	10%		$ 371,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 927,000
			SUBTOTAL COST		$ 4,632,000
			CONTINGENCY	20%	$ 926,000
			TOTAL PROJECT		$ 5,558,000

* All unit prices reflect 2024 costs.

Name	J-1A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	660	$527	$ 348,000
2	Install 42" RCP	FT	2,330	$588	$ 1,370,000
3	Manhole	EA	7	$20,322	$ 142,000
4	Sawcut and Remove Existing AC Pavement	SF	17,210	$2.66	$ 46,000
5	Crushed Miscellaneous Base	SF	17,210	$4	$ 69,000
6	Replace Asphalt Concrete Pavement	SF	17,210	$2	$ 34,000
7	Traffic Control	%	5%		$ 100,000
8	Erosion Control	%	1%		$ 21,000
9	Moblilization/Demobilization	%	10%		$ 213,000
			SUBTOTAL (CONSTRUCTION)		$ 2,343,000
	Engineering and Design	%	10%		$ 234,000
	Surveying & Staking & Geotechnical	%	5%		$ 117,000
	Construction Management/Staff	%	10%		$ 234,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 585,000
			SUBTOTAL COST		$ 2,928,000
			CONTINGENCY +	25%	$ 732,000
			TOTAL PROJECT		$ 3,660,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	J-1B				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	800	$527	$ 422,000
2	Install 42" RCP	FT	1,020	$588	$ 600,000
3	Install 54" RCP	FT	1,330	$732	$ 974,000
4	Manhole	EA	8	$20,322	$ 163,000
5	Sawcut and Remove Existing AC Pavement	SF	19,520	$2.66	$ 52,000
6	Crushed Miscellaneous Base	SF	19,520	$4	$ 78,000
7	Replace Asphalt Concrete Pavement	SF	19,520	$2	$ 39,000
8	Traffic Control	%	5%		$ 116,000
9	Erosion Control	%	1%		$ 24,000
10	Moblilization/Demobilization	%	10%		$ 247,000
			SUBTOTAL (CONSTRUCTION)		$ 2,715,000
	Engineering and Design	%	10%		$ 272,000
	Surveying & Staking & Geotechnical	%	5%		$ 136,000
	Construction Management/Staff	%	10%		$ 272,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 680,000
			SUBTOTAL COST		$ 3,395,000
			CONTINGENCY	20%	$ 679,000
			TOTAL PROJECT		$ 4,074,000

* All unit prices reflect 2024 costs.

Name	J-1C				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	660	$527	$ 348,000
2	Install 42" RCP	FT	1,160	$588	$ 682,000
3	Manhole	EA	5	$20,322	$ 102,000
4	Sawcut and Remove Existing AC Pavement	SF	10,340	$2.66	$ 28,000
5	Crushed Miscellaneous Base	SF	10,340	$4	$ 41,000
6	Replace Asphalt Concrete Pavement	SF	10,340	$2	$ 21,000
7	Traffic Control	%	5%		$ 61,000
8	Erosion Control	%	1%		$ 13,000
9	Moblilization/Demobilization	%	10%		$ 130,000
			SUBTOTAL (CONSTRUCTION)		$ 1,426,000
	Engineering and Design	%	10%		$ 143,000
	Surveying & Staking & Geotechnical	%	5%		$ 71,000
	Construction Management/Staff	%	10%		$ 143,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 357,000
			SUBTOTAL COST		$ 1,783,000
			CONTINGENCY	20%	$ 357,000
			TOTAL PROJECT		$ 2,140,000

* All unit prices reflect 2024 costs.

Name	J-2				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 66" RCP	FT	3,570	$911	$ 3,252,000
2	Install 72" RCP	FT	560	$1,016	$ 569,000
3	Manhole	EA	10	$20,322	$ 203,000
4	Remove 24" RCP	FT	400	$35	$ 14,000
5	Remove 30" RCP	FT	340	$44	$ 15,000
6	Sawcut and Remove Existing AC Pavement	SF	33,520	$2.66	$ 89,000
7	Crushed Miscellaneous Base	SF	33,520	$4	$ 134,000
8	Replace Asphalt Concrete Pavement	SF	33,520	$2	$ 67,000
9	Traffic Control	%	5%		$ 217,000
10	Erosion Control	%	1%		$ 46,000
11	Moblilization/Demobilization	%	10%		$ 461,000
			SUBTOTAL (CONSTRUCTION)		$ 5,067,000
	Engineering and Design	%	10%		$ 507,000
	Surveying & Staking & Geotechnical	%	5%		$ 253,000
	Construction Management/Staff	%	10%		$ 507,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 1,267,000
			SUBTOTAL COST		$ 6,334,000
			CONTINGENCY +	25%	$ 1,584,000
			TOTAL PROJECT		$ 7,918,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	J-2A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	650	$527	$ 343,000
2	Install 42" RCP	FT	1,150	$588	$ 676,000
3	Install 60" RCP	FT	200	$816	$ 163,000
4	Manhole	EA	5	$20,322	$ 102,000
5	Sawcut and Remove Existing AC Pavement	SF	11,730	$2.66	$ 31,000
6	Crushed Miscellaneous Base	SF	11,730	$4	$ 47,000
7	Replace Asphalt Concrete Pavement	SF	11,730	$2	$ 23,000
8	Traffic Control	%	5%		$ 69,000
9	Erosion Control	%	1%		$ 15,000
10	Moblilization/Demobilization	%	10%		$ 147,000
			SUBTOTAL (CONSTRUCTION)		$ 1,616,000
	Engineering and Design	%	10%		$ 162,000
	Surveying & Staking & Geotechnical	%	5%		$ 81,000
	Construction Management/Staff	%	10%		$ 162,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 405,000
			SUBTOTAL COST		$ 2,021,000
			CONTINGENCY	20%	$ 404,000
			TOTAL PROJECT		$ 2,425,000

* All unit prices reflect 2024 costs.

Name	J-3				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 54" RCP	FT	1,320	$732	$ 966,000
2	Install 66" RCP	FT	1,310	$911	$ 1,193,000
3	Install 72" RCP	FT	930	$1,016	$ 945,000
4	Manhole	EA	9	$20,322	$ 183,000
5	Sawcut and Remove Existing AC Pavement	SF	27,670	$2.66	$ 74,000
6	Crushed Miscellaneous Base	SF	27,670	$4	$ 111,000
7	Replace Asphalt Concrete Pavement	SF	27,670	$2	$ 55,000
8	Traffic Control	%	5%		$ 176,000
9	Erosion Control	%	1%		$ 37,000
10	Moblilization/Demobilization	%	10%		$ 374,000
			SUBTOTAL (CONSTRUCTION)		$ 4,114,000
	Engineering and Design	%	10%		$ 411,000
	Surveying & Staking & Geotechnical	%	5%		$ 206,000
	Construction Management/Staff	%	10%		$ 411,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 1,028,000
			SUBTOTAL COST		$ 5,142,000
			CONTINGENCY +	25%	$ 1,286,000
			TOTAL PROJECT		$ 6,428,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	J-3A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	490	$527	$ 258,000
2	Install 42" RCP	FT	1,350	$588	$ 794,000
3	Manhole	EA	5	$20,322	$ 102,000
4	Sawcut and Remove Existing AC Pavement	SF	10,550	$2.66	$ 28,000
5	Crushed Miscellaneous Base	SF	10,550	$4	$ 42,000
6	Replace Asphalt Concrete Pavement	SF	10,550	$2	$ 21,000
7	Traffic Control	%	5%		$ 62,000
8	Erosion Control	%	1%		$ 13,000
9	Moblilization/Demobilization	%	10%		$ 132,000
			SUBTOTAL (CONSTRUCTION)		$ 1,452,000
	Engineering and Design	%	10%		$ 145,000
	Surveying & Staking & Geotechnical	%	5%		$ 73,000
	Construction Management/Staff	%	10%		$ 145,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 363,000
			SUBTOTAL COST		$ 1,815,000
			CONTINGENCY	20%	$ 363,000
			TOTAL PROJECT		$ 2,178,000

* All unit prices reflect 2024 costs.

Name	J-4				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 48" RCP	FT	1,140	$656	$ 748,000
2	Manhole	EA	3	$20,322	$ 61,000
3	Sawcut and Remove Existing AC Pavement	SF	7,320	$2.66	$ 19,000
4	Crushed Miscellaneous Base	SF	7,320	$4	$ 29,000
5	Replace Asphalt Concrete Pavement	SF	7,320	$2	$ 15,000
6	Traffic Control	%	5%		$ 44,000
7	Erosion Control	%	1%		$ 9,000
8	Moblilization/Demobilization	%	10%		$ 93,000
			SUBTOTAL (CONSTRUCTION)		$ 1,018,000
	Engineering and Design	%	10%		$ 102,000
	Surveying & Staking & Geotechnical	%	5%		$ 51,000
	Construction Management/Staff	%	10%		$ 102,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 255,000
			SUBTOTAL COST		$ 1,273,000
			CONTINGENCY	20%	$ 255,000
			TOTAL PROJECT		$ 1,528,000

* All unit prices reflect 2024 costs.

Name	J-4A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	580	$527	$ 306,000
2	Install 42" RCP	FT	1,330	$588	$ 782,000
3	Manhole	EA	5	$20,322	$ 102,000
4	Sawcut and Remove Existing AC Pavement	SF	10,910	$2.66	$ 29,000
5	Crushed Miscellaneous Base	SF	10,910	$4	$ 44,000
6	Replace Asphalt Concrete Pavement	SF	10,910	$2	$ 22,000
7	Traffic Control	%	5%		$ 64,000
8	Erosion Control	%	1%		$ 13,000
9	Moblilization/Demobilization	%	10%		$ 136,000
			SUBTOTAL (CONSTRUCTION)		$ 1,498,000
	Engineering and Design	%	10%		$ 150,000
	Surveying & Staking & Geotechnical	%	5%		$ 75,000
	Construction Management/Staff	%	10%		$ 150,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 375,000
			SUBTOTAL COST		$ 1,873,000
			CONTINGENCY	20%	$ 375,000
			TOTAL PROJECT		$ 2,248,000

* All unit prices reflect 2024 costs.

Name	J-4B				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	600	$527	$ 316,000
2	Install 42" RCP	FT	1,320	$588	$ 776,000
3	Manhole	EA	5	$20,322	$ 102,000
4	Sawcut and Remove Existing AC Pavement	SF	10,960	$2.66	$ 29,000
5	Crushed Miscellaneous Base	SF	10,960	$4	$ 44,000
6	Replace Asphalt Concrete Pavement	SF	10,960	$2	$ 22,000
7	Traffic Control	%	5%		$ 64,000
8	Erosion Control	%	1%		$ 14,000
9	Moblilization/Demobilization	%	10%		$ 137,000
			SUBTOTAL (CONSTRUCTION)		$ 1,504,000
	Engineering and Design	%	10%		$ 150,000
	Surveying & Staking & Geotechnical	%	5%		$ 75,000
	Construction Management/Staff	%	10%		$ 150,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 375,000
			SUBTOTAL COST		$ 1,879,000
			CONTINGENCY	20%	$ 376,000
			TOTAL PROJECT		$ 2,255,000

* All unit prices reflect 2024 costs.

Name	M-0				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 60" RCP	FT	1,700	$816	$ 1,387,000
2	Manhole	EA	4	$20,322	$ 81,000
3	Remove 42" RCP	FT	910	$62	$ 56,000
4	Remove 48" RCP	FT	650	$71	$ 46,000
5	Sawcut and Remove Existing AC Pavement	SF	12,750	$2.66	$ 34,000
6	Crushed Miscellaneous Base	SF	12,750	$4	$ 51,000
7	Replace Asphalt Concrete Pavement	SF	12,750	$2	$ 26,000
8	Traffic Control	%	5%		$ 84,000
9	Erosion Control	%	1%		$ 18,000
10	Moblilization/Demobilization	%	10%		$ 178,000
			SUBTOTAL (CONSTRUCTION)		$ 1,961,000
	Engineering and Design	%	10%		$ 196,000
	Surveying & Staking & Geotechnical	%	5%		$ 98,000
	Construction Management/Staff	%	10%		$ 196,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 490,000
			SUBTOTAL COST		$ 2,451,000
			CONTINGENCY +	25%	$ 613,000
			TOTAL PROJECT		$ 3,064,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	M-1				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 60" RCP	FT	870	$816	$ 710,000
2	Install 6' x 4' RCB	FT	250	$1,323	$ 331,000
3	Manhole	EA	3	$20,322	$ 61,000
4	Remove 48" RCP	FT	840	$71	$ 60,000
5	Sawcut and Remove Existing AC Pavement	SF	8,680	$2.66	$ 23,000
6	Crushed Miscellaneous Base	SF	8,680	$4	$ 35,000
7	Replace Asphalt Concrete Pavement	SF	8,680	$2	$ 17,000
8	Traffic Control	%	5%		$ 62,000
9	Erosion Control	%	1%		$ 13,000
10	Moblilization/Demobilization	%	10%		$ 131,000
			SUBTOTAL (CONSTRUCTION)		$ 1,443,000
	Engineering and Design	%	10%		$ 144,000
	Surveying & Staking & Geotechnical	%	5%		$ 72,000
	Construction Management/Staff	%	10%		$ 144,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 360,000
			SUBTOTAL COST		$ 1,803,000
			CONTINGENCY +	25%	$ 451,000
			TOTAL PROJECT		$ 2,254,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	M-1A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	660	$527	$ 348,000
2	Install 42" RCP	FT	1,240	$588	$ 729,000
3	Manhole	EA	5	$20,322	$ 102,000
4	Sawcut and Remove Existing AC Pavement	SF	10,810	$2.66	$ 29,000
5	Crushed Miscellaneous Base	SF	10,810	$4	$ 43,000
6	Replace Asphalt Concrete Pavement	SF	10,810	$2	$ 22,000
7	Traffic Control	%	5%		$ 64,000
8	Erosion Control	%	1%		$ 13,000
9	Moblilization/Demobilization	%	10%		$ 135,000
			SUBTOTAL (CONSTRUCTION)		$ 1,485,000
	Engineering and Design	%	10%		$ 149,000
	Surveying & Staking & Geotechnical	%	5%		$ 74,000
	Construction Management/Staff	%	10%		$ 149,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 372,000
			SUBTOTAL COST		$ 1,857,000
			CONTINGENCY	20%	$ 371,000
			TOTAL PROJECT		$ 2,228,000

* All unit prices reflect 2024 costs.

Name	M-2				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 48" RCP	FT	1,090	$656	$ 715,000
2	Manhole	EA	3	$20,322	$ 61,000
3	Sawcut and Remove Existing AC Pavement	SF	7,000	$2.66	$ 19,000
4	Crushed Miscellaneous Base	SF	7,000	$4	$ 28,000
5	Replace Asphalt Concrete Pavement	SF	7,000	$2	$ 14,000
6	Traffic Control	%	5%		$ 42,000
7	Erosion Control	%	1%		$ 9,000
8	Moblilization/Demobilization	%	10%		$ 89,000
			SUBTOTAL (CONSTRUCTION)		$ 977,000
	Engineering and Design	%	10%		$ 98,000
	Surveying & Staking & Geotechnical	%	5%		$ 49,000
	Construction Management/Staff	%	10%		$ 98,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 245,000
			SUBTOTAL COST		$ 1,222,000
			CONTINGENCY +	25%	$ 306,000
			TOTAL PROJECT		$ 1,528,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	M-2A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	550	$527	$ 290,000
2	Install 42" RCP	FT	1,150	$588	$ 676,000
3	Manhole	EA	4	$20,322	$ 81,000
4	Sawcut and Remove Existing AC Pavement	SF	9,690	$2.66	$ 26,000
5	Crushed Miscellaneous Base	SF	9,690	$4	$ 39,000
6	Replace Asphalt Concrete Pavement	SF	9,690	$2	$ 19,000
7	Traffic Control	%	5%		$ 57,000
8	Erosion Control	%	1%		$ 12,000
9	Moblilization/Demobilization	%	10%		$ 120,000
			SUBTOTAL (CONSTRUCTION)		$ 1,320,000
	Engineering and Design	%	10%		$ 132,000
	Surveying & Staking & Geotechnical	%	5%		$ 66,000
	Construction Management/Staff	%	10%		$ 132,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 330,000
			SUBTOTAL COST		$ 1,650,000
			CONTINGENCY	20%	$ 330,000
			TOTAL PROJECT		$ 1,980,000

* All unit prices reflect 2024 costs.

Name	M-3				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 48" RCP	FT	1,150	$656	$ 754,000
2	Manhole	EA	3	$20,322	$ 61,000
3	Sawcut and Remove Existing AC Pavement	SF	7,380	$2.66	$ 20,000
4	Crushed Miscellaneous Base	SF	7,380	$4	$ 30,000
5	Replace Asphalt Concrete Pavement	SF	7,380	$2	$ 15,000
6	Traffic Control	%	5%		$ 44,000
7	Erosion Control	%	1%		$ 9,000
8	Moblilization/Demobilization	%	10%		$ 93,000
			SUBTOTAL (CONSTRUCTION)		$ 1,026,000
	Engineering and Design	%	10%		$ 103,000
	Surveying & Staking & Geotechnical	%	5%		$ 51,000
	Construction Management/Staff	%	10%		$ 103,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 257,000
			SUBTOTAL COST		$ 1,283,000
			CONTINGENCY +	25%	$ 321,000
			TOTAL PROJECT		$ 1,604,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	M-3A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	580	$527	$ 306,000
2	Install 42" RCP	FT	1,460	$588	$ 858,000
3	Manhole	EA	5	$20,322	$ 102,000
4	Sawcut and Remove Existing AC Pavement	SF	11,680	$2.66	$ 31,000
5	Crushed Miscellaneous Base	SF	11,680	$4	$ 47,000
6	Replace Asphalt Concrete Pavement	SF	11,680	$2	$ 23,000
7	Traffic Control	%	5%		$ 68,000
8	Erosion Control	%	1%		$ 14,000
9	Moblilization/Demobilization	%	10%		$ 145,000
			SUBTOTAL (CONSTRUCTION)		$ 1,594,000
	Engineering and Design	%	10%		$ 159,000
	Surveying & Staking & Geotechnical	%	5%		$ 80,000
	Construction Management/Staff	%	10%		$ 159,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 398,000
			SUBTOTAL COST		$ 1,992,000
			CONTINGENCY +	25%	$ 498,000
			TOTAL PROJECT		$ 2,490,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	M-4				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	700	$527	$ 369,000
2	Manhole	EA	2	$20,322	$ 41,000
3	Sawcut and Remove Existing AC Pavement	SF	3,740	$2.66	$ 10,000
4	Crushed Miscellaneous Base	SF	3,740	$4	$ 15,000
5	Replace Asphalt Concrete Pavement	SF	3,740	$2	$ 7,000
6	Traffic Control	%	5%		$ 22,000
7	Erosion Control	%	1%		$ 5,000
8	Moblilization/Demobilization	%	10%		$ 47,000
			SUBTOTAL (CONSTRUCTION)		$ 516,000
	Engineering and Design	%	10%		$ 51,600
	Surveying & Staking & Geotechnical	%	5%		$ 26,000
	Construction Management/Staff	%	10%		$ 52,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 129,600
			SUBTOTAL COST		$ 645,600
			CONTINGENCY	20%	$ 129,000
			TOTAL PROJECT		$ 774,600

* All unit prices reflect 2024 costs.

Name	M-5-A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install Double 14' x 6' RCB	FT	1,360	$16,722	$ 22,742,000
2	Manhole	EA	3	$20,322	$ 61,000
3	Sawcut and Remove Existing AC Pavement	SF	40,800	$2.66	$ 109,000
4	Crushed Miscellaneous Base	SF	40,800	$4	$ 163,000
5	Replace Asphalt Concrete Pavement	SF	40,800	$2	$ 82,000
6	Traffic Control	%	5%		$ 1,158,000
7	Erosion Control	%	1%		$ 243,000
8	Moblilization/Demobilization	%	10%		$ 2,456,000
			SUBTOTAL (CONSTRUCTION)		$ 27,014,000
	Engineering and Design	%	10%		$ 2,701,000
	Surveying & Staking & Geotechnical	%	5%		$ 1,351,000
	Construction Management/Staff	%	10%		$ 2,701,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 6,753,000
			SUBTOTAL COST		$ 33,767,000
			CONTINGENCY +	25%	$ 8,442,000
			TOTAL PROJECT		$ 42,209,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	M-5-B				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 14' x 8' RCB	FT	1,880	$8,361	$ 15,719,000
2	Install Double 14' x 6' RCB	FT	1,870	$16,722	$ 31,270,000
3	Manhole	EA	9	$20,322	$ 183,000
4	Sawcut and Remove Existing AC Pavement	SF	86,180	$2.66	$ 229,000
5	Crushed Miscellaneous Base	SF	86,180	$4	$ 345,000
6	Replace Asphalt Concrete Pavement	SF	86,180	$2	$ 172,000
7	Traffic Control	%	5%		$ 2,396,000
8	Erosion Control	%	1%		$ 503,000
9	Moblilization/Demobilization	%	10%		$ 5,082,000
			SUBTOTAL (CONSTRUCTION)		$ 55,899,000
	Engineering and Design	%	10%		$ 5,590,000
	Surveying & Staking & Geotechnical	%	5%		$ 2,795,000
	Construction Management/Staff	%	10%		$ 5,590,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 13,975,000
			SUBTOTAL COST		$ 69,874,000
			CONTINGENCY +	25%	$ 17,469,000
			TOTAL PROJECT		$ 87,343,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to 12' water main conflict

Name	M-5-C				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 96" RCP	FT	3,760	$1,572	$ 5,911,000
2	Manhole	EA	9	$20,322	$ 183,000
3	Sawcut and Remove Existing AC Pavement	SF	40,270	$2.66	$ 107,000
4	Crushed Miscellaneous Base	SF	40,270	$4	$ 161,000
5	Replace Asphalt Concrete Pavement	SF	40,270	$2	$ 81,000
6	Traffic Control	%	5%		$ 322,000
7	Erosion Control	%	1%		$ 68,000
8	Moblilization/Demobilization	%	10%		$ 683,000
			SUBTOTAL (CONSTRUCTION)		$ 7,516,000
	Engineering and Design	%	10%		$ 752,000
	Surveying & Staking & Geotechnical	%	5%		$ 376,000
	Construction Management/Staff	%	10%		$ 752,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 1,880,000
			SUBTOTAL COST		$ 9,396,000
			CONTINGENCY	20%	$ 1,879,000
			TOTAL PROJECT		$ 11,275,000

* All unit prices reflect 2024 costs.

Name	M-5-D				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	670	$527	$ 353,000
2	Install 42" RCP	FT	1,310	$588	$ 770,000
3	Install 54" RCP	FT	3,180	$732	$ 2,328,000
4	Install 60" RCP	FT	2,010	$816	$ 1,640,000
5	Manhole	EA	18	$20,322	$ 366,000
6	Sawcut and Remove Existing AC Pavement	SF	48,560	$2.66	$ 129,000
7	Crushed Miscellaneous Base	SF	48,560	$4	$ 194,000
8	Replace Asphalt Concrete Pavement	SF	48,560	$2	$ 97,000
9	Traffic Control	%	5%		$ 294,000
10	Erosion Control	%	1%		$ 62,000
11	Moblilization/Demobilization	%	10%		$ 623,000
			SUBTOTAL (CONSTRUCTION)		$ 6,856,000
	Engineering and Design	%	10%		$ 686,000
	Surveying & Staking & Geotechnical	%	5%		$ 343,000
	Construction Management/Staff	%	10%		$ 686,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 1,715,000
			SUBTOTAL COST		$ 8,571,000
			CONTINGENCY +	25%	$ 2,143,000
			TOTAL PROJECT		$ 10,714,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to SCG transmisson line conflict

Name	M-5-E				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	700	$527	$ 369,000
2	Manhole	EA	2	$20,322	$ 41,000
3	Sawcut and Remove Existing AC Pavement	SF	3,740	$2.66	$ 10,000
4	Crushed Miscellaneous Base	SF	3,740	$4	$ 15,000
5	Replace Asphalt Concrete Pavement	SF	3,740	$2	$ 7,000
6	Traffic Control	%	5%		$ 22,000
7	Erosion Control	%	1%		$ 5,000
8	Moblilization/Demobilization	%	10%		$ 47,000
			SUBTOTAL (CONSTRUCTION)		$ 516,000
	Engineering and Design	%	10%		$ 51,600
	Surveying & Staking & Geotechnical	%	5%		$ 26,000
	Construction Management/Staff	%	10%		$ 52,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 129,600
			SUBTOTAL COST		$ 645,600
			CONTINGENCY +	25%	$ 161,000
			TOTAL PROJECT		$ 806,600

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to SCG transmisson line conflict

Name	M-5A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	460	$527	$ 242,000
2	Install 42" RCP	FT	1,400	$588	$ 823,000
3	Manhole	EA	5	$20,322	$ 102,000
4	Sawcut and Remove Existing AC Pavement	SF	10,680	$2.66	$ 28,000
5	Crushed Miscellaneous Base	SF	10,680	$4	$ 43,000
6	Replace Asphalt Concrete Pavement	SF	10,680	$2	$ 21,000
7	Traffic Control	%	5%		$ 63,000
8	Erosion Control	%	1%		$ 13,000
9	Moblilization/Demobilization	%	10%		$ 134,000
			SUBTOTAL (CONSTRUCTION)		$ 1,469,000
	Engineering and Design	%	10%		$ 147,000
	Surveying & Staking & Geotechnical	%	5%		$ 73,000
	Construction Management/Staff	%	10%		$ 147,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 367,000
			SUBTOTAL COST		$ 1,836,000
			CONTINGENCY +	25%	$ 459,000
			TOTAL PROJECT		$ 2,295,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to SCG transmisson line conflict

Name	M-5B				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 66" RCP	FT	1,330	$911	$ 1,212,000
2	Install 72" RCP	FT	4,130	$1,016	$ 4,196,000
3	Install 78" RCP	FT	1,330	$1,133	$ 1,507,000
4	Manhole	EA	17	$20,322	$ 345,000
5	Sawcut and Remove Existing AC Pavement	SF	58,000	$2.66	$ 154,000
6	Crushed Miscellaneous Base	SF	58,000	$4	$ 232,000
7	Replace Asphalt Concrete Pavement	SF	58,000	$2	$ 116,000
8	Traffic Control	%	5%		$ 388,000
9	Erosion Control	%	1%		$ 82,000
10	Moblilization/Demobilization	%	10%		$ 823,000
			SUBTOTAL (CONSTRUCTION)		$ 9,055,000
	Engineering and Design	%	10%		$ 906,000
	Surveying & Staking & Geotechnical	%	5%		$ 453,000
	Construction Management/Staff	%	10%		$ 906,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 2,265,000
			SUBTOTAL COST		$ 11,320,000
			CONTINGENCY	20%	$ 2,264,000
			TOTAL PROJECT		$ 13,584,000

* All unit prices reflect 2024 costs.

Name	M-5B-A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	340	$527	$ 179,000
2	Manhole	EA	1	$20,322	$ 20,000
3	Sawcut and Remove Existing AC Pavement	SF	1,820	$2.66	$ 5,000
4	Crushed Miscellaneous Base	SF	1,820	$4	$ 7,000
5	Replace Asphalt Concrete Pavement	SF	1,820	$2	$ 4,000
6	Traffic Control	%	5%		$ 11,000
7	Erosion Control	%	1%		$ 2,000
8	Moblilization/Demobilization	%	10%		$ 23,000
			SUBTOTAL (CONSTRUCTION)		$ 251,000
	Engineering and Design	%	10%		$ 25,100
	Surveying & Staking & Geotechnical	%	5%		$ 13,000
	Construction Management/Staff	%	10%		$ 25,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 63,100
			SUBTOTAL COST		$ 314,100
			CONTINGENCY	20%	$ 63,000
			TOTAL PROJECT		$ 377,100

* All unit prices reflect 2024 costs.

Name	M-5B-B				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	690	$527	$ 364,000
2	Install 42" RCP	FT	1,350	$588	$ 794,000
3	Manhole	EA	5	$20,322	$ 102,000
4	Sawcut and Remove Existing AC Pavement	SF	11,620	$2.66	$ 31,000
5	Crushed Miscellaneous Base	SF	11,620	$4	$ 46,000
6	Replace Asphalt Concrete Pavement	SF	11,620	$2	$ 23,000
7	Traffic Control	%	5%		$ 68,000
8	Erosion Control	%	1%		$ 14,000
9	Moblilization/Demobilization	%	10%		$ 144,000
			SUBTOTAL (CONSTRUCTION)		$ 1,586,000
	Engineering and Design	%	10%		$ 159,000
	Surveying & Staking & Geotechnical	%	5%		$ 79,000
	Construction Management/Staff	%	10%		$ 159,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 397,000
			SUBTOTAL COST		$ 1,983,000
			CONTINGENCY	20%	$ 397,000
			TOTAL PROJECT		$ 2,380,000

* All unit prices reflect 2024 costs.

Name	M-5B-C				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	670	$527	$ 353,000
2	Install 42" RCP	FT	1,350	$588	$ 794,000
3	Manhole	EA	5	$20,322	$ 102,000
4	Sawcut and Remove Existing AC Pavement	SF	11,510	$2.66	$ 31,000
5	Crushed Miscellaneous Base	SF	11,510	$4	$ 46,000
6	Replace Asphalt Concrete Pavement	SF	11,510	$2	$ 23,000
7	Traffic Control	%	5%		$ 67,000
8	Erosion Control	%	1%		$ 14,000
9	Moblilization/Demobilization	%	10%		$ 143,000
			SUBTOTAL (CONSTRUCTION)		$ 1,573,000
	Engineering and Design	%	10%		$ 157,000
	Surveying & Staking & Geotechnical	%	5%		$ 79,000
	Construction Management/Staff	%	10%		$ 157,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 393,000
			SUBTOTAL COST		$ 1,966,000
			CONTINGENCY	20%	$ 393,000
			TOTAL PROJECT		$ 2,359,000

* All unit prices reflect 2024 costs.

Name	M-5B-D	100			
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	730	$527	$ 385,000
2	Install 42" RCP	FT	1,330	$588	$ 782,000
3	Manhole	EA	5	$20,322	$ 102,000
4	Sawcut and Remove Existing AC Pavement	SF	11,710	$2.66	$ 31,000
5	Crushed Miscellaneous Base	SF	11,710	$4	$ 47,000
6	Replace Asphalt Concrete Pavement	SF	11,710	$2	$ 23,000
7	Traffic Control	%	5%		$ 69,000
8	Erosion Control	%	1%		$ 14,000
9	Moblilization/Demobilization	%	10%		$ 145,000
			SUBTOTAL (CONSTRUCTION)		$ 1,598,000
	Engineering and Design	%	10%		$ 160,000
	Surveying & Staking & Geotechnical	%	5%		$ 80,000
	Construction Management/Staff	%	10%		$ 160,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 400,000
			SUBTOTAL COST		$ 1,998,000
			CONTINGENCY	20%	$ 400,000
			TOTAL PROJECT		$ 2,398,000

* All unit prices reflect 2024 costs.

Name	M-5B-E				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	790	$527	$ 416,000
2	Install 42" RCP	FT	1,320	$588	$ 776,000
3	Install 48" RCP	FT	1,330	$656	$ 872,000
4	Manhole	EA	9	$20,322	$ 183,000
5	Sawcut and Remove Existing AC Pavement	SF	20,510	$2.66	$ 55,000
6	Crushed Miscellaneous Base	SF	20,510	$4	$ 82,000
7	Replace Asphalt Concrete Pavement	SF	20,510	$2	$ 41,000
8	Traffic Control	%	5%		$ 121,000
9	Erosion Control	%	1%		$ 25,000
10	Moblilization/Demobilization	%	10%		$ 257,000
			SUBTOTAL (CONSTRUCTION)		$ 2,828,000
	Engineering and Design	%	10%		$ 283,000
	Surveying & Staking & Geotechnical	%	5%		$ 141,000
	Construction Management/Staff	%	10%		$ 283,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 707,000
			SUBTOTAL COST		$ 3,535,000
			CONTINGENCY +	25%	$ 884,000
			TOTAL PROJECT		$ 4,419,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway and SCG transmisson line conflict

Name	M-5C				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	350	$527	$ 184,000
2	Install 42" RCP	FT	1,320	$588	$ 776,000
3	Install 48" RCP	FT	1,340	$656	$ 879,000
4	Manhole	EA	8	$20,322	$ 163,000
5	Sawcut and Remove Existing AC Pavement	SF	18,220	$2.66	$ 48,000
6	Crushed Miscellaneous Base	SF	18,220	$4	$ 73,000
7	Replace Asphalt Concrete Pavement	SF	18,220	$2	$ 36,000
8	Traffic Control	%	5%		$ 108,000
9	Erosion Control	%	1%		$ 23,000
10	Moblilization/Demobilization	%	10%		$ 229,000
			SUBTOTAL (CONSTRUCTION)		$ 2,519,000
	Engineering and Design	%	10%		$ 252,000
	Surveying & Staking & Geotechnical	%	5%		$ 126,000
	Construction Management/Staff	%	10%		$ 252,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 630,000
			SUBTOTAL COST		$ 3,149,000
			CONTINGENCY +	25%	$ 787,000
			TOTAL PROJECT		$ 3,936,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to SCG transmisson line conflict

Name	M-5D				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	810	$527	$ 427,000
2	Manhole	EA	2	$20,322	$ 41,000
3	Sawcut and Remove Existing AC Pavement	SF	4,320	$2.66	$ 11,000
4	Crushed Miscellaneous Base	SF	4,320	$4	$ 17,000
5	Replace Asphalt Concrete Pavement	SF	4,320	$2	$ 9,000
6	Traffic Control	%	5%		$ 25,000
7	Erosion Control	%	1%		$ 5,000
8	Moblilization/Demobilization	%	10%		$ 54,000
			SUBTOTAL (CONSTRUCTION)		$ 589,000
	Engineering and Design	%	10%		$ 58,900
	Surveying & Staking & Geotechnical	%	5%		$ 29,000
	Construction Management/Staff	%	10%		$ 59,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 146,900
			SUBTOTAL COST		$ 735,900
			CONTINGENCY	20%	$ 147,000
			TOTAL PROJECT		$ 882,900

* All unit prices reflect 2024 costs.

Name	M-5E				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 60" RCP	FT	1,320	$816	$ 1,077,000
2	Install 66" RCP	FT	1,330	$911	$ 1,212,000
3	Install 72" RCP	FT	5,480	$1,016	$ 5,568,000
4	Install 78" RCP	FT	5,480	$1,133	$ 6,209,000
5	Manhole	EA	34	$20,322	$ 691,000
6	Sawcut and Remove Existing AC Pavement	SF	110,270	$2.66	$ 293,000
7	Crushed Miscellaneous Base	SF	110,270	$4	$ 441,000
8	Replace Asphalt Concrete Pavement	SF	110,270	$2	$ 221,000
9	Traffic Control	%	5%		$ 786,000
10	Erosion Control	%	1%		$ 165,000
11	Moblilization/Demobilization	%	10%		$ 1,666,000
			SUBTOTAL (CONSTRUCTION)		$ 18,329,000
	Engineering and Design	%	10%		$ 1,833,000
	Surveying & Staking & Geotechnical	%	5%		$ 916,000
	Construction Management/Staff	%	10%		$ 1,833,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 4,582,000
			SUBTOTAL COST		$ 22,911,000
			CONTINGENCY	20%	$ 4,582,000
			TOTAL PROJECT		$ 27,493,000

* All unit prices reflect 2024 costs.

Name	M-5E-A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	520	$527	$ 274,000
2	Install 42" RCP	FT	820	$588	$ 482,000
3	Manhole	EA	3	$20,322	$ 61,000
4	Sawcut and Remove Existing AC Pavement	SF	7,600	$2.66	$ 20,000
5	Crushed Miscellaneous Base	SF	7,600	$4	$ 30,000
6	Replace Asphalt Concrete Pavement	SF	7,600	$2	$ 15,000
7	Traffic Control	%	5%		$ 44,000
8	Erosion Control	%	1%		$ 9,000
9	Moblilization/Demobilization	%	10%		$ 94,000
			SUBTOTAL (CONSTRUCTION)		$ 1,029,000
	Engineering and Design	%	10%		$ 103,000
	Surveying & Staking & Geotechnical	%	5%		$ 51,000
	Construction Management/Staff	%	10%		$ 103,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 257,000
			SUBTOTAL COST		$ 1,286,000
			CONTINGENCY	20%	$ 257,000
			TOTAL PROJECT		$ 1,543,000

* All unit prices reflect 2024 costs.

Name	M-5E-B				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	500	$527	$ 264,000
2	Install 42" RCP	FT	1,200	$588	$ 706,000
3	Manhole	EA	4	$20,322	$ 81,000
4	Sawcut and Remove Existing AC Pavement	SF	9,720	$2.66	$ 26,000
5	Crushed Miscellaneous Base	SF	9,720	$4	$ 39,000
6	Replace Asphalt Concrete Pavement	SF	9,720	$2	$ 19,000
7	Traffic Control	%	5%		$ 57,000
8	Erosion Control	%	1%		$ 12,000
9	Moblilization/Demobilization	%	10%		$ 120,000
			SUBTOTAL (CONSTRUCTION)		$ 1,324,000
	Engineering and Design	%	10%		$ 132,000
	Surveying & Staking & Geotechnical	%	5%		$ 66,000
	Construction Management/Staff	%	10%		$ 132,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 330,000
			SUBTOTAL COST		$ 1,654,000
			CONTINGENCY	20%	$ 331,000
			TOTAL PROJECT		$ 1,985,000

* All unit prices reflect 2024 costs.

Name	M-5E-C				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	490	$527	$ 258,000
2	Install 42" RCP	FT	1,180	$588	$ 694,000
3	Manhole	EA	4	$20,322	$ 81,000
4	Remove 36" RCP	FT	70	$53	$ 4,000
5	Sawcut and Remove Existing AC Pavement	SF	9,550	$2.66	$ 25,000
6	Crushed Miscellaneous Base	SF	9,550	$4	$ 38,000
7	Replace Asphalt Concrete Pavement	SF	9,550	$2	$ 19,000
8	Traffic Control	%	5%		$ 56,000
9	Erosion Control	%	1%		$ 12,000
10	Moblilization/Demobilization	%	10%		$ 119,000
			SUBTOTAL (CONSTRUCTION)		$ 1,306,000
	Engineering and Design	%	10%		$ 131,000
	Surveying & Staking & Geotechnical	%	5%		$ 65,000
	Construction Management/Staff	%	10%		$ 131,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 327,000
			SUBTOTAL COST		$ 1,633,000
			CONTINGENCY	20%	$ 327,000
			TOTAL PROJECT		$ 1,960,000

* All unit prices reflect 2024 costs.

Name	M-5E-D				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	590	$527	$ 311,000
2	Install 42" RCP	FT	1,070	$588	$ 629,000
3	Manhole	EA	4	$20,322	$ 81,000
4	Sawcut and Remove Existing AC Pavement	SF	9,440	$2.66	$ 25,000
5	Crushed Miscellaneous Base	SF	9,440	$4	$ 38,000
6	Replace Asphalt Concrete Pavement	SF	9,440	$2	$ 19,000
7	Traffic Control	%	5%		$ 55,000
8	Erosion Control	%	1%		$ 12,000
9	Moblilization/Demobilization	%	10%		$ 117,000
			SUBTOTAL (CONSTRUCTION)		$ 1,287,000
	Engineering and Design	%	10%		$ 129,000
	Surveying & Staking & Geotechnical	%	5%		$ 64,000
	Construction Management/Staff	%	10%		$ 129,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 322,000
			SUBTOTAL COST		$ 1,609,000
			CONTINGENCY	20%	$ 322,000
			TOTAL PROJECT		$ 1,931,000

* All unit prices reflect 2024 costs.

Name	M-5E-E				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	640	$527	$ 337,000
2	Install 42" RCP	FT	1,030	$588	$ 606,000
3	Manhole	EA	4	$20,322	$ 81,000
4	Sawcut and Remove Existing AC Pavement	SF	9,470	$2.66	$ 25,000
5	Crushed Miscellaneous Base	SF	9,470	$4	$ 38,000
6	Replace Asphalt Concrete Pavement	SF	9,470	$2	$ 19,000
7	Traffic Control	%	5%		$ 55,000
8	Erosion Control	%	1%		$ 12,000
9	Moblilization/Demobilization	%	10%		$ 117,000
			SUBTOTAL (CONSTRUCTION)		$ 1,290,000
	Engineering and Design	%	10%		$ 129,000
	Surveying & Staking & Geotechnical	%	5%		$ 65,000
	Construction Management/Staff	%	10%		$ 129,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 323,000
			SUBTOTAL COST		$ 1,613,000
			CONTINGENCY	20%	$ 323,000
			TOTAL PROJECT		$ 1,936,000

* All unit prices reflect 2024 costs.

Name	M-5E-F				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	650	$527	$ 343,000
2	Install 42" RCP	FT	1,000	$588	$ 588,000
3	Manhole	EA	4	$20,322	$ 81,000
4	Sawcut and Remove Existing AC Pavement	SF	9,350	$2.66	$ 25,000
5	Crushed Miscellaneous Base	SF	9,350	$4	$ 37,000
6	Replace Asphalt Concrete Pavement	SF	9,350	$2	$ 19,000
7	Traffic Control	%	5%		$ 55,000
8	Erosion Control	%	1%		$ 11,000
9	Moblilization/Demobilization	%	10%		$ 116,000
			SUBTOTAL (CONSTRUCTION)		$ 1,275,000
	Engineering and Design	%	10%		$ 128,000
	Surveying & Staking & Geotechnical	%	5%		$ 64,000
	Construction Management/Staff	%	10%		$ 128,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 320,000
			SUBTOTAL COST		$ 1,595,000
			CONTINGENCY	20%	$ 319,000
			TOTAL PROJECT		$ 1,914,000

* All unit prices reflect 2024 costs.

Name	M-5F				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	350	$527	$ 184,000
2	Install 42" RCP	FT	1,320	$588	$ 776,000
3	Install 48" RCP	FT	1,350	$656	$ 886,000
4	Install 60" RCP	FT	1,140	$816	$ 930,000
5	Install 66" RCP	FT	1,520	$911	$ 1,385,000
6	Manhole	EA	14	$20,322	$ 285,000
7	Sawcut and Remove Existing AC Pavement	SF	39,320	$2.66	$ 105,000
8	Crushed Miscellaneous Base	SF	39,320	$4	$ 157,000
9	Replace Asphalt Concrete Pavement	SF	39,320	$2	$ 79,000
10	Traffic Control	%	5%		$ 239,000
11	Erosion Control	%	1%		$ 50,000
12	Moblilization/Demobilization	%	10%		$ 508,000
			SUBTOTAL (CONSTRUCTION)		$ 5,584,000
	Engineering and Design	%	10%		$ 558,000
	Surveying & Staking & Geotechnical	%	5%		$ 279,000
	Construction Management/Staff	%	10%		$ 558,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 1,395,000
			SUBTOTAL COST		$ 6,979,000
			CONTINGENCY +	25%	$ 1,745,000
			TOTAL PROJECT		$ 8,724,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to SCG transmisson line conflict

Name	M-5F-A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	360	$527	$ 190,000
2	Install 42" RCP	FT	1,330	$588	$ 782,000
3	Install 48" RCP	FT	1,320	$656	$ 866,000
4	Install 54" RCP	FT	1,330	$732	$ 974,000
5	Manhole	EA	11	$20,322	$ 224,000
6	Sawcut and Remove Existing AC Pavement	SF	27,460	$2.66	$ 73,000
7	Crushed Miscellaneous Base	SF	27,460	$4	$ 110,000
8	Replace Asphalt Concrete Pavement	SF	27,460	$2	$ 55,000
9	Traffic Control	%	5%		$ 164,000
10	Erosion Control	%	1%		$ 34,000
11	Moblilization/Demobilization	%	10%		$ 347,000
			SUBTOTAL (CONSTRUCTION)		$ 3,819,000
	Engineering and Design	%	10%		$ 382,000
	Surveying & Staking & Geotechnical	%	5%		$ 191,000
	Construction Management/Staff	%	10%		$ 382,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 955,000
			SUBTOTAL COST		$ 4,774,000
			CONTINGENCY +	25%	$ 1,194,000
			TOTAL PROJECT		$ 5,968,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to SCG transmisson line conflict

Name	M-5G				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 54" RCP	FT	1,340	$732	$ 981,000
2	Install 66" RCP	FT	2,650	$911	$ 2,414,000
3	Manhole	EA	10	$20,322	$ 203,000
4	Sawcut and Remove Existing AC Pavement	SF	30,530	$2.66	$ 81,000
5	Crushed Miscellaneous Base	SF	30,530	$4	$ 122,000
6	Replace Asphalt Concrete Pavement	SF	30,530	$2	$ 61,000
7	Traffic Control	%	5%		$ 193,000
8	Erosion Control	%	1%		$ 41,000
9	Moblilization/Demobilization	%	10%		$ 410,000
	SUBTOTAL (CONSTRUCTION)				$ 4,506,000
	Engineering and Design	%	10%		$ 451,000
	Surveying & Staking & Geotechnical	%	5%		$ 225,000
	Construction Management/Staff	%	10%		$ 451,000
	SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)				$ 1,127,000
	SUBTOTAL COST				$ 5,633,000
	CONTINGENCY +			25%	$ 1,408,000
	TOTAL PROJECT				$ 7,041,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway and 12' water main conflict

Name	M-5G-A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 42" RCP	FT	1,150	$588	$ 676,000
2	Manhole	EA	3	$20,322	$ 61,000
3	Sawcut and Remove Existing AC Pavement	SF	6,760	$2.66	$ 18,000
4	Crushed Miscellaneous Base	SF	6,760	$4	$ 27,000
5	Replace Asphalt Concrete Pavement	SF	6,760	$2	$ 14,000
6	Traffic Control	%	5%		$ 40,000
7	Erosion Control	%	1%		$ 8,000
8	Moblilization/Demobilization	%	10%		$ 84,000
			SUBTOTAL (CONSTRUCTION)		$ 928,000
	Engineering and Design	%	10%		$ 93,000
	Surveying & Staking & Geotechnical	%	5%		$ 46,000
	Construction Management/Staff	%	10%		$ 93,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 232,000
			SUBTOTAL COST		$ 1,160,000
			CONTINGENCY +	25%	$ 290,000
			TOTAL PROJECT		$ 1,450,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	M-5G-B				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	1,310	$527	$ 690,000
2	Install 42" RCP	FT	750	$588	$ 441,000
3	Manhole	EA	5	$20,322	$ 102,000
4	Sawcut and Remove Existing AC Pavement	SF	11,400	$2.66	$ 30,000
5	Crushed Miscellaneous Base	SF	11,400	$4	$ 46,000
6	Replace Asphalt Concrete Pavement	SF	11,400	$2	$ 23,000
7	Traffic Control	%	5%		$ 67,000
8	Erosion Control	%	1%		$ 14,000
9	Moblilization/Demobilization	%	10%		$ 141,000
			SUBTOTAL (CONSTRUCTION)		$ 1,554,000
	Engineering and Design	%	10%		$ 155,000
	Surveying & Staking & Geotechnical	%	5%		$ 78,000
	Construction Management/Staff	%	10%		$ 155,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 388,000
			SUBTOTAL COST		$ 1,942,000
			CONTINGENCY +	25%	$ 486,000
			TOTAL PROJECT		$ 2,428,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	M-5G-C				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	730	$527	$ 385,000
2	Install 42" RCP	FT	1,310	$588	$ 770,000
3	Manhole	EA	5	$20,322	$ 102,000
4	Sawcut and Remove Existing AC Pavement	SF	11,590	$2.66	$ 31,000
5	Crushed Miscellaneous Base	SF	11,590	$4	$ 46,000
6	Replace Asphalt Concrete Pavement	SF	11,590	$2	$ 23,000
7	Traffic Control	%	5%		$ 68,000
8	Erosion Control	%	1%		$ 14,000
9	Moblilization/Demobilization	%	10%		$ 144,000
			SUBTOTAL (CONSTRUCTION)		$ 1,583,000
	Engineering and Design	%	10%		$ 158,000
	Surveying & Staking & Geotechnical	%	5%		$ 79,000
	Construction Management/Staff	%	10%		$ 158,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 395,000
			SUBTOTAL COST		$ 1,978,000
			CONTINGENCY +	25%	$ 495,000
			TOTAL PROJECT		$ 2,473,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	M-5H				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	350	$527	$ 184,000
2	Install 42" RCP	FT	1,320	$588	$ 776,000
3	Install 48" RCP	FT	1,340	$656	$ 879,000
4	Install 54" RCP	FT	1,150	$732	$ 842,000
5	Install 72" RCP	FT	2,830	$1,016	$ 2,875,000
6	Manhole	EA	17	$20,322	$ 345,000
7	Sawcut and Remove Existing AC Pavement	SF	50,520	$2.66	$ 134,000
8	Crushed Miscellaneous Base	SF	50,520	$4	$ 202,000
9	Replace Asphalt Concrete Pavement	SF	50,520	$2	$ 101,000
10	Traffic Control	%	5%		$ 317,000
11	Erosion Control	%	1%		$ 67,000
12	Moblilization/Demobilization	%	10%		$ 672,000
			SUBTOTAL (CONSTRUCTION)		$ 7,394,000
	Engineering and Design	%	10%		$ 739,000
	Surveying & Staking & Geotechnical	%	5%		$ 370,000
	Construction Management/Staff	%	10%		$ 739,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 1,848,000
			SUBTOTAL COST		$ 9,242,000
			CONTINGENCY +	25%	$ 2,311,000
			TOTAL PROJECT		$ 11,553,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to SCG transmisson line conflict

Name	M-6A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 72" RCP	FT	2,630	$1,016	$ 2,672,000
2	Install 78" RCP	FT	1,380	$1,133	$ 1,564,000
3	Manhole	EA	10	$20,322	$ 203,000
4	Sawcut and Remove Existing AC Pavement	SF	35,170	$2.66	$ 94,000
5	Crushed Miscellaneous Base	SF	35,170	$4	$ 141,000
6	Replace Asphalt Concrete Pavement	SF	35,170	$2	$ 70,000
7	Traffic Control	%	5%		$ 237,000
8	Erosion Control	%	1%		$ 50,000
9	Moblilization/Demobilization	%	10%		$ 503,000
			SUBTOTAL (CONSTRUCTION)		$ 5,534,000
	Engineering and Design	%	10%		$ 553,000
	Surveying & Staking & Geotechnical	%	5%		$ 277,000
	Construction Management/Staff	%	10%		$ 553,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 1,383,000
			SUBTOTAL COST		$ 6,917,000
			CONTINGENCY	20%	$ 1,383,000
			TOTAL PROJECT		$ 8,300,000

* All unit prices reflect 2024 costs.

Name	M-6B				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	340	$527	$ 179,000
2	Install 42" RCP	FT	1,370	$588	$ 806,000
3	Install 48" RCP	FT	1,290	$656	$ 846,000
4	Install 66" RCP	FT	2,650	$911	$ 2,414,000
5	Manhole	EA	14	$20,322	$ 285,000
6	Sawcut and Remove Existing AC Pavement	SF	40,890	$2.66	$ 109,000
7	Crushed Miscellaneous Base	SF	40,890	$4	$ 164,000
8	Replace Asphalt Concrete Pavement	SF	40,890	$2	$ 82,000
9	Traffic Control	%	5%		$ 244,000
10	Erosion Control	%	1%		$ 51,000
11	Moblilization/Demobilization	%	10%		$ 518,000
			SUBTOTAL (CONSTRUCTION)		$ 5,698,000
	Engineering and Design	%	10%		$ 570,000
	Surveying & Staking & Geotechnical	%	5%		$ 285,000
	Construction Management/Staff	%	10%		$ 570,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 1,425,000
			SUBTOTAL COST		$ 7,123,000
			CONTINGENCY +	25%	$ 1,781,000
			TOTAL PROJECT		$ 8,904,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to 12' water main and SCG transmisson line conflict

Name	M-6C				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	320	$527	$ 169,000
2	Install 42" RCP	FT	1,650	$588	$ 970,000
3	Install 48" RCP	FT	1,310	$656	$ 859,000
4	Manhole	EA	8	$20,322	$ 163,000
5	Sawcut and Remove Existing AC Pavement	SF	19,810	$2.66	$ 53,000
6	Crushed Miscellaneous Base	SF	19,810	$4	$ 79,000
7	Replace Asphalt Concrete Pavement	SF	19,810	$2	$ 40,000
8	Traffic Control	%	5%		$ 117,000
9	Erosion Control	%	1%		$ 25,000
10	Moblilization/Demobilization	%	10%		$ 248,000
			SUBTOTAL (CONSTRUCTION)		$ 2,723,000
	Engineering and Design	%	10%		$ 272,000
	Surveying & Staking & Geotechnical	%	5%		$ 136,000
	Construction Management/Staff	%	10%		$ 272,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 680,000
			SUBTOTAL COST		$ 3,403,000
			CONTINGENCY +	25%	$ 851,000
			TOTAL PROJECT		$ 4,254,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to 12' water main conflict

Name	M-6D				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	340	$527	$ 179,000
2	Install 42" RCP	FT	1,380	$588	$ 811,000
3	Install 48" RCP	FT	1,280	$656	$ 840,000
4	Install 54" RCP	FT	1,380	$732	$ 1,010,000
5	Manhole	EA	11	$20,322	$ 224,000
6	Sawcut and Remove Existing AC Pavement	SF	27,740	$2.66	$ 74,000
7	Crushed Miscellaneous Base	SF	27,740	$4	$ 111,000
8	Replace Asphalt Concrete Pavement	SF	27,740	$2	$ 55,000
9	Traffic Control	%	5%		$ 165,000
10	Erosion Control	%	1%		$ 35,000
11	Moblilization/Demobilization	%	10%		$ 350,000
			SUBTOTAL (CONSTRUCTION)		$ 3,854,000
	Engineering and Design	%	10%		$ 385,000
	Surveying & Staking & Geotechnical	%	5%		$ 193,000
	Construction Management/Staff	%	10%		$ 385,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 963,000
			SUBTOTAL COST		$ 4,817,000
			CONTINGENCY +	25%	$ 1,204,000
			TOTAL PROJECT		$ 6,021,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to SCG transmisson line conflict

Name	M-7A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 84" RCP	FT	2,680	$1,264	$ 3,388,000
2	Install 96" RCP	FT	1,250	$1,572	$ 1,965,000
3	Manhole	EA	10	$20,322	$ 203,000
4	Sawcut and Remove Existing AC Pavement	SF	39,350	$2.66	$ 105,000
5	Crushed Miscellaneous Base	SF	39,350	$4	$ 157,000
6	Replace Asphalt Concrete Pavement	SF	39,350	$2	$ 79,000
7	Traffic Control	%	5%		$ 295,000
8	Erosion Control	%	1%		$ 62,000
9	Moblilization/Demobilization	%	10%		$ 625,000
			SUBTOTAL (CONSTRUCTION)		$ 6,879,000
	Engineering and Design	%	10%		$ 688,000
	Surveying & Staking & Geotechnical	%	5%		$ 344,000
	Construction Management/Staff	%	10%		$ 688,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 1,720,000
			SUBTOTAL COST		$ 8,599,000
			CONTINGENCY +	25%	$ 2,150,000
			TOTAL PROJECT		$ 10,749,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	M-7B				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	400	$527	$ 211,000
2	Install 42" RCP	FT	1,320	$588	$ 776,000
3	Install 48" RCP	FT	1,340	$656	$ 879,000
4	Install 72" RCP	FT	2,660	$1,016	$ 2,703,000
5	Manhole	EA	14	$20,322	$ 285,000
6	Sawcut and Remove Existing AC Pavement	SF	41,320	$2.66	$ 110,000
7	Crushed Miscellaneous Base	SF	41,320	$4	$ 165,000
8	Replace Asphalt Concrete Pavement	SF	41,320	$2	$ 83,000
9	Traffic Control	%	5%		$ 261,000
10	Erosion Control	%	1%		$ 55,000
11	Moblilization/Demobilization	%	10%		$ 553,000
			SUBTOTAL (CONSTRUCTION)		$ 6,081,000
	Engineering and Design	%	10%		$ 608,000
	Surveying & Staking & Geotechnical	%	5%		$ 304,000
	Construction Management/Staff	%	10%		$ 608,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 1,520,000
			SUBTOTAL COST		$ 7,601,000
			CONTINGENCY +	25%	$ 1,900,000
			TOTAL PROJECT		$ 9,501,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway, 12' water main conflict, and SCG transmisson line conflict

Name	M-7C				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	640	$527	$ 337,000
2	Install 42" RCP	FT	1,380	$588	$ 811,000
3	Install 54" RCP	FT	1,370	$732	$ 1,003,000
4	Manhole	EA	8	$20,322	$ 163,000
5	Sawcut and Remove Existing AC Pavement	SF	21,060	$2.66	$ 56,000
6	Crushed Miscellaneous Base	SF	21,060	$4	$ 84,000
7	Replace Asphalt Concrete Pavement	SF	21,060	$2	$ 42,000
8	Traffic Control	%	5%		$ 125,000
9	Erosion Control	%	1%		$ 26,000
10	Moblilization/Demobilization	%	10%		$ 265,000
			SUBTOTAL (CONSTRUCTION)		$ 2,912,000
	Engineering and Design	%	10%		$ 291,000
	Surveying & Staking & Geotechnical	%	5%		$ 146,000
	Construction Management/Staff	%	10%		$ 291,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 728,000
			SUBTOTAL COST		$ 3,640,000
			CONTINGENCY +	25%	$ 910,000
			TOTAL PROJECT		$ 4,550,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	M-7D				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	660	$527	$ 348,000
2	Install 42" RCP	FT	1,450	$588	$ 853,000
3	Install 54" RCP	FT	1,400	$732	$ 1,025,000
4	Manhole	EA	9	$20,322	$ 183,000
5	Sawcut and Remove Existing AC Pavement	SF	21,790	$2.66	$ 58,000
6	Crushed Miscellaneous Base	SF	21,790	$4	$ 87,000
7	Replace Asphalt Concrete Pavement	SF	21,790	$2	$ 44,000
8	Traffic Control	%	5%		$ 130,000
9	Erosion Control	%	1%		$ 27,000
10	Moblilization/Demobilization	%	10%		$ 276,000
			SUBTOTAL (CONSTRUCTION)		$ 3,031,000
	Engineering and Design	%	10%		$ 303,000
	Surveying & Staking & Geotechnical	%	5%		$ 152,000
	Construction Management/Staff	%	10%		$ 303,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 758,000
			SUBTOTAL COST		$ 3,789,000
			CONTINGENCY +	25%	$ 947,000
			TOTAL PROJECT		$ 4,736,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to 12' water main conflict

Name	M-7E				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	340	$527	$ 179,000
2	Install 42" RCP	FT	1,320	$588	$ 776,000
3	Install 48" RCP	FT	1,350	$656	$ 886,000
4	Install 54" RCP	FT	1,400	$732	$ 1,025,000
5	Manhole	EA	11	$20,322	$ 224,000
6	Sawcut and Remove Existing AC Pavement	SF	27,980	$2.66	$ 74,000
7	Crushed Miscellaneous Base	SF	27,980	$4	$ 112,000
8	Replace Asphalt Concrete Pavement	SF	27,980	$2	$ 56,000
9	Traffic Control	%	5%		$ 167,000
10	Erosion Control	%	1%		$ 35,000
11	Moblilization/Demobilization	%	10%		$ 353,000
			SUBTOTAL (CONSTRUCTION)		$ 3,887,000
	Engineering and Design	%	10%		$ 389,000
	Surveying & Staking & Geotechnical	%	5%		$ 194,000
	Construction Management/Staff	%	10%		$ 389,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 972,000
			SUBTOTAL COST		$ 4,859,000
			CONTINGENCY +	25%	$ 1,215,000
			TOTAL PROJECT		$ 6,074,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to 12' water main conflict and SCG transmisson line conflict

Name	SS-0				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 54" RCP	FT	1,090	$732	$ 798,000
2	Install 60" RCP	FT	200	$816	$ 163,000
3	Manhole	EA	3	$20,322	$ 61,000
4	Sawcut and Remove Existing AC Pavement	SF	9,090	$2.66	$ 24,000
5	Crushed Miscellaneous Base	SF	9,090	$4	$ 36,000
6	Replace Asphalt Concrete Pavement	SF	9,090	$2	$ 18,000
7	Traffic Control	%	5%		$ 55,000
8	Erosion Control	%	1%		$ 12,000
9	Moblilization/Demobilization	%	10%		$ 117,000
			SUBTOTAL (CONSTRUCTION)		$ 1,284,000
	Engineering and Design	%	10%		$ 128,000
	Surveying & Staking & Geotechnical	%	5%		$ 64,000
	Construction Management/Staff	%	10%		$ 128,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 320,000
			SUBTOTAL COST		$ 3,208,000
			CONTINGENCY	20%	$ 642,000
			TOTAL PROJECT		$ 3,850,000

* All unit prices reflect 2024 costs.

Name	SS-0A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 42" RCP	FT	1,180	$588	$ 694,000
2	Install 48" RCP	FT	1,670	$656	$ 1,096,000
3	Manhole	EA	7	$20,322	$ 142,000
4	Sawcut and Remove Existing AC Pavement	SF	17,650	$2.66	$ 47,000
5	Crushed Miscellaneous Base	SF	17,650	$4	$ 71,000
6	Replace Asphalt Concrete Pavement	SF	17,650	$2	$ 35,000
7	Traffic Control	%	5%		$ 104,000
8	Erosion Control	%	1%		$ 22,000
9	Moblilization/Demobilization	%	10%		$ 221,000
			SUBTOTAL (CONSTRUCTION)		$ 2,432,000
	Engineering and Design	%	10%		$ 243,000
	Surveying & Staking & Geotechnical	%	5%		$ 122,000
	Construction Management/Staff	%	10%		$ 243,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 608,000
			SUBTOTAL COST		$ 3,040,000
			CONTINGENCY +	25%	$ 760,000
			TOTAL PROJECT		$ 3,800,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to SCG transmisson line conflict

Name	SS-0B				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	500	$527	$ 264,000
2	Install 42" RCP	FT	1,200	$588	$ 706,000
3	Install 48" RCP	FT	1,660	$656	$ 1,089,000
4	Manhole	EA	8	$20,322	$ 163,000
5	Sawcut and Remove Existing AC Pavement	SF	20,370	$2.66	$ 54,000
6	Crushed Miscellaneous Base	SF	20,370	$4	$ 81,000
7	Replace Asphalt Concrete Pavement	SF	20,370	$2	$ 41,000
8	Traffic Control	%	5%		$ 120,000
9	Erosion Control	%	1%		$ 25,000
10	Moblilization/Demobilization	%	10%		$ 254,000
			SUBTOTAL (CONSTRUCTION)		$ 2,797,000
	Engineering and Design	%	10%		$ 280,000
	Surveying & Staking & Geotechnical	%	5%		$ 140,000
	Construction Management/Staff	%	10%		$ 280,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 700,000
			SUBTOTAL COST		$ 3,497,000
			CONTINGENCY +	25%	$ 874,000
			TOTAL PROJECT		$ 4,371,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to SCG transmisson line conflict

Name	SS-1				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	1,020	$527	$ 538,000
2	Manhole	EA	3	$20,322	$ 61,000
3	Sawcut and Remove Existing AC Pavement	SF	5,440	$2.66	$ 14,000
4	Crushed Miscellaneous Base	SF	5,440	$4	$ 22,000
5	Replace Asphalt Concrete Pavement	SF	5,440	$2	$ 11,000
6	Traffic Control	%	5%		$ 32,000
7	Erosion Control	%	1%		$ 7,000
8	Moblilization/Demobilization	%	10%		$ 69,000
			SUBTOTAL (CONSTRUCTION)		$ 754,000
	Engineering and Design	%	10%		$ 75,000
	Surveying & Staking & Geotechnical	%	5%		$ 38,000
	Construction Management/Staff	%	10%		$ 75,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 188,000
			SUBTOTAL COST		$ 942,000
			CONTINGENCY	20%	$ 188,000
			TOTAL PROJECT		$ 1,130,000

* All unit prices reflect 2024 costs.

Name	SS-2A-1				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	1,820	$527	$ 959,000
2	Install 42" RCP	FT	1,220	$588	$ 717,000
3	Install 48" RCP	FT	1,040	$656	$ 682,000
4	Install 54" RCP	FT	1,380	$732	$ 1,010,000
5	Manhole	EA	14	$20,322	$ 285,000
6	Sawcut and Remove Existing AC Pavement	SF	33,150	$2.66	$ 88,000
7	Crushed Miscellaneous Base	SF	33,150	$4	$ 133,000
8	Replace Asphalt Concrete Pavement	SF	33,150	$2	$ 66,000
9	Traffic Control	%	5%		$ 197,000
10	Erosion Control	%	1%		$ 41,000
11	Moblilization/Demobilization	%	10%		$ 418,000
			SUBTOTAL (CONSTRUCTION)		$ 4,596,000
	Engineering and Design	%	10%		$ 460,000
	Surveying & Staking & Geotechnical	%	5%		$ 230,000
	Construction Management/Staff	%	10%		$ 460,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 1,150,000
			SUBTOTAL COST		$ 5,746,000
			CONTINGENCY +	25%	$ 1,437,000
			TOTAL PROJECT		$ 7,183,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to 12' water main conflict

Name	SS-2A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 42" RCP	FT	690	$588	$ 406,000
2	Install 72" RCP	FT	4,810	$1,016	$ 4,887,000
3	Install 10' x 10' RCB	FT	1,670	$6,012	$ 10,040,000
4	Manhole	EA	18	$20,322	$ 366,000
5	Sawcut and Remove Existing AC Pavement	SF	66,780	$2.66	$ 178,000
6	Crushed Miscellaneous Base	SF	66,780	$4	$ 267,000
7	Replace Asphalt Concrete Pavement	SF	66,780	$2	$ 134,000
8	Traffic Control	%	5%		$ 814,000
9	Erosion Control	%	1%		$ 171,000
10	Moblilization/Demobilization	%	10%		$ 1,726,000
			SUBTOTAL (CONSTRUCTION)		$ 18,989,000
	Engineering and Design	%	10%		$ 1,899,000
	Surveying & Staking & Geotechnical	%	5%		$ 949,000
	Construction Management/Staff	%	10%		$ 1,899,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 4,747,000
			SUBTOTAL COST		$ 23,736,000
			CONTINGENCY	20%	$ 4,747,000
			TOTAL PROJECT		$ 28,483,000

* All unit prices reflect 2024 costs.

Name	SS-2A-2				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 48" RCP	FT	3,250	$656	$ 2,132,000
2	Manhole	EA	8	$20,322	$ 163,000
3	Sawcut and Remove Existing AC Pavement	SF	20,860	$2.66	$ 55,000
4	Crushed Miscellaneous Base	SF	20,860	$4	$ 83,000
5	Replace Asphalt Concrete Pavement	SF	20,860	$2	$ 42,000
6	Traffic Control	%	5%		$ 124,000
7	Erosion Control	%	1%		$ 26,000
8	Moblilization/Demobilization	%	10%		$ 263,000
			SUBTOTAL (CONSTRUCTION)		$ 2,888,000
	Engineering and Design	%	10%		$ 289,000
	Surveying & Staking & Geotechnical	%	5%		$ 144,000
	Construction Management/Staff	%	10%		$ 289,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 722,000
			SUBTOTAL COST		$ 3,610,000
			CONTINGENCY +	25%	$ 903,000
			TOTAL PROJECT		$ 4,513,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to 12' water main conflict

Name	SS-2A-3				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	2,730	$527	$ 1,439,000
2	Install 72" RCP	FT	1,710	$1,016	$ 1,737,000
3	Manhole	EA	11	$20,322	$ 224,000
4	Sawcut and Remove Existing AC Pavement	SF	29,240	$2.66	$ 78,000
5	Crushed Miscellaneous Base	SF	29,240	$4	$ 117,000
6	Replace Asphalt Concrete Pavement	SF	29,240	$2	$ 58,000
7	Traffic Control	%	5%		$ 183,000
8	Erosion Control	%	1%		$ 38,000
9	Moblilization/Demobilization	%	10%		$ 387,000
			SUBTOTAL (CONSTRUCTION)		$ 4,261,000
	Engineering and Design	%	10%		$ 426,000
	Surveying & Staking & Geotechnical	%	5%		$ 213,000
	Construction Management/Staff	%	10%		$ 426,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 1,065,000
			SUBTOTAL COST		$ 5,326,000
			CONTINGENCY +	25%	$ 1,332,000
			TOTAL PROJECT		$ 6,658,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to 12' water main conflict

Name	SS-2B				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	490	$527	$ 258,000
2	Install 42" RCP	FT	1,430	$588	$ 841,000
3	Install 54" RCP	FT	1,330	$732	$ 974,000
4	Install 60" RCP	FT	1,340	$816	$ 1,093,000
5	Install 66" RCP	FT	1,370	$911	$ 1,248,000
6	Install 78" RCP	FT	2,550	$1,133	$ 2,889,000
7	Manhole	EA	20	$20,322	$ 406,000
8	Sawcut and Remove Existing AC Pavement	SF	64,610	$2.66	$ 172,000
9	Crushed Miscellaneous Base	SF	64,610	$4	$ 258,000
10	Replace Asphalt Concrete Pavement	SF	64,610	$2	$ 129,000
11	Traffic Control	%	5%		$ 413,000
12	Erosion Control	%	1%		$ 87,000
13	Moblilization/Demobilization	%	10%		$ 877,000
	SUBTOTAL (CONSTRUCTION)				$ 9,645,000
	Engineering and Design	%	10%		$ 965,000
	Surveying & Staking & Geotechnical	%	5%		$ 482,000
	Construction Management/Staff	%	10%		$ 965,000
	SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)				$ 2,412,000
	SUBTOTAL COST				$ 12,057,000
	CONTINGENCY +			25%	$ 3,014,000
	TOTAL PROJECT				$ 15,071,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	SS-2C				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	620	$527	$ 327,000
2	Install 42" RCP	FT	1,290	$588	$ 759,000
3	Install 60" RCP	FT	1,320	$816	$ 1,077,000
4	Install 66" RCP	FT	1,340	$911	$ 1,221,000
5	Install 72" RCP	FT	1,570	$1,016	$ 1,595,000
6	Install 78" RCP	FT	2,520	$1,133	$ 2,855,000
7	Manhole	EA	20	$20,322	$ 406,000
8	Sawcut and Remove Existing AC Pavement	SF	68,040	$2.66	$ 181,000
9	Crushed Miscellaneous Base	SF	68,040	$4	$ 272,000
10	Replace Asphalt Concrete Pavement	SF	68,040	$2	$ 136,000
11	Traffic Control	%	5%		$ 441,000
12	Erosion Control	%	1%		$ 93,000
13	Moblilization/Demobilization	%	10%		$ 936,000
			SUBTOTAL (CONSTRUCTION)		$ 10,299,000
	Engineering and Design	%	10%		$ 1,030,000
	Surveying & Staking & Geotechnical	%	5%		$ 515,000
	Construction Management/Staff	%	10%		$ 1,030,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 2,575,000
			SUBTOTAL COST		$ 12,874,000
			CONTINGENCY +	25%	$ 3,219,000
			TOTAL PROJECT		$ 16,093,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	SS-2D				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	830	$527	$ 437,000
2	Install 42" RCP	FT	2,940	$588	$ 1,729,000
3	Manhole	EA	9	$20,322	$ 183,000
4	Sawcut and Remove Existing AC Pavement	SF	21,700	$2.66	$ 58,000
5	Crushed Miscellaneous Base	SF	21,700	$4	$ 87,000
6	Replace Asphalt Concrete Pavement	SF	21,700	$2	$ 43,000
7	Traffic Control	%	5%		$ 127,000
8	Erosion Control	%	1%		$ 27,000
9	Moblilization/Demobilization	%	10%		$ 269,000
			SUBTOTAL (CONSTRUCTION)		$ 2,960,000
	Engineering and Design	%	10%		$ 296,000
	Surveying & Staking & Geotechnical	%	5%		$ 148,000
	Construction Management/Staff	%	10%		$ 296,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 740,000
			SUBTOTAL COST		$ 3,700,000
			CONTINGENCY +	25%	$ 925,000
			TOTAL PROJECT		$ 4,625,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	T-0				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	730	$527	$ 385,000
2	Install 42" RCP	FT	1,280	$588	$ 753,000
3	Install 54" RCP	FT	2,870	$732	$ 2,101,000
4	Manhole	EA	12	$20,322	$ 244,000
5	Sawcut and Remove Existing AC Pavement	SF	31,390	$2.66	$ 83,000
6	Crushed Miscellaneous Base	SF	31,390	$4	$ 126,000
7	Replace Asphalt Concrete Pavement	SF	31,390	$2	$ 63,000
8	Traffic Control	%	5%		$ 188,000
9	Erosion Control	%	1%		$ 39,000
10	Moblilization/Demobilization	%	10%		$ 398,000
			SUBTOTAL (CONSTRUCTION)		$ 4,380,000
	Engineering and Design	%	10%		$ 438,000
	Surveying & Staking & Geotechnical	%	5%		$ 219,000
	Construction Management/Staff	%	10%		$ 438,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 1,095,000
			SUBTOTAL COST		$ 5,475,000
			CONTINGENCY	20%	$ 1,095,000
			TOTAL PROJECT		$ 6,570,000

* All unit prices reflect 2024 costs.

Name	T-10				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	500	$527	$ 264,000
2	Install 42" RCP	FT	1,750	$588	$ 1,029,000
3	Install 48" RCP	FT	1,190	$656	$ 781,000
4	Manhole	EA	9	$20,322	$ 183,000
5	Sawcut and Remove Existing AC Pavement	SF	20,590	$2.66	$ 55,000
6	Crushed Miscellaneous Base	SF	20,590	$4	$ 82,000
7	Replace Asphalt Concrete Pavement	SF	20,590	$2	$ 41,000
8	Traffic Control	%	5%		$ 122,000
9	Erosion Control	%	1%		$ 26,000
10	Moblilization/Demobilization	%	10%		$ 258,000
			SUBTOTAL (CONSTRUCTION)		$ 2,841,000
	Engineering and Design	%	10%		$ 284,000
	Surveying & Staking & Geotechnical	%	5%		$ 142,000
	Construction Management/Staff	%	10%		$ 284,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 710,000
			SUBTOTAL COST		$ 3,551,000
			CONTINGENCY +	25%	$ 888,000
			TOTAL PROJECT		$ 4,439,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to SCG transmisson line conflict

Name	T-11				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	480	$527	$ 253,000
2	Install 42" RCP	FT	1,780	$588	$ 1,047,000
3	Install 48" RCP	FT	1,220	$656	$ 800,000
4	Manhole	EA	9	$20,322	$ 183,000
5	Sawcut and Remove Existing AC Pavement	SF	20,850	$2.66	$ 55,000
6	Crushed Miscellaneous Base	SF	20,850	$4	$ 83,000
7	Replace Asphalt Concrete Pavement	SF	20,850	$2	$ 42,000
8	Traffic Control	%	5%		$ 123,000
9	Erosion Control	%	1%		$ 26,000
10	Moblilization/Demobilization	%	10%		$ 261,000
			SUBTOTAL (CONSTRUCTION)		$ 2,873,000
	Engineering and Design	%	10%		$ 287,000
	Surveying & Staking & Geotechnical	%	5%		$ 144,000
	Construction Management/Staff	%	10%		$ 287,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 718,000
			SUBTOTAL COST		$ 3,591,000
			CONTINGENCY +	25%	$ 898,000
			TOTAL PROJECT		$ 4,489,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to SCG transmisson line conflict

Name	T-1A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 60" RCP	FT	1,220	$816	$ 996,000
2	Install 72" RCP	FT	960	$1,016	$ 975,000
3	Manhole	EA	5	$20,322	$ 102,000
4	Remove 54" RCP	FT	250	$80	$ 20,000
5	Sawcut and Remove Existing AC Pavement	SF	17,530	$2.66	$ 47,000
6	Crushed Miscellaneous Base	SF	17,530	$4	$ 70,000
7	Replace Asphalt Concrete Pavement	SF	17,530	$2	$ 35,000
8	Traffic Control	%	5%		$ 112,000
9	Erosion Control	%	1%		$ 24,000
10	Moblilization/Demobilization	%	10%		$ 238,000
			SUBTOTAL (CONSTRUCTION)		$ 2,619,000
	Engineering and Design	%	10%		$ 262,000
	Surveying & Staking & Geotechnical	%	5%		$ 131,000
	Construction Management/Staff	%	10%		$ 262,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 655,000
			SUBTOTAL COST		$ 3,274,000
			CONTINGENCY	20%	$ 655,000
			TOTAL PROJECT		$ 3,929,000

* All unit prices reflect 2024 costs.

Name	T-1B				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	720	$527	$ 379,000
2	Install 42" RCP	FT	1,290	$588	$ 759,000
3	Manhole	EA	5	$20,322	$ 102,000
4	Sawcut and Remove Existing AC Pavement	SF	11,420	$2.66	$ 30,000
5	Crushed Miscellaneous Base	SF	11,420	$4	$ 46,000
6	Replace Asphalt Concrete Pavement	SF	11,420	$2	$ 23,000
7	Traffic Control	%	5%		$ 67,000
8	Erosion Control	%	1%		$ 14,000
9	Moblilization/Demobilization	%	10%		$ 142,000
			SUBTOTAL (CONSTRUCTION)		$ 1,562,000
	Engineering and Design	%	10%		$ 156,000
	Surveying & Staking & Geotechnical	%	5%		$ 78,000
	Construction Management/Staff	%	10%		$ 156,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 390,000
			SUBTOTAL COST		$ 1,952,000
			CONTINGENCY	20%	$ 390,000
			TOTAL PROJECT		$ 2,342,000

* All unit prices reflect 2024 costs.

Name	T-2				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 60" RCP	FT	290	$816	$ 237,000
2	Install 66" RCP	FT	600	$911	$ 547,000
3	Install 78" RCP	FT	460	$1,133	$ 521,000
4	Install 96" RCP	FT	5,490	$1,572	$ 8,630,000
5	Manhole	EA	17	$20,322	$ 345,000
6	Remove 54" RCP	FT	1,300	$80	$ 104,000
7	Sawcut and Remove Existing AC Pavement	SF	70,220	$2.66	$ 187,000
8	Crushed Miscellaneous Base	SF	70,220	$4	$ 281,000
9	Replace Asphalt Concrete Pavement	SF	70,220	$2	$ 140,000
10	Traffic Control	%	5%		$ 550,000
11	Erosion Control	%	1%		$ 115,000
12	Moblilization/Demobilization	%	10%		$ 1,166,000
			SUBTOTAL (CONSTRUCTION)		$ 12,823,000
	Engineering and Design	%	10%		$ 1,282,000
	Surveying & Staking & Geotechnical	%	5%		$ 641,000
	Construction Management/Staff	%	10%		$ 1,282,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 3,205,000
			SUBTOTAL COST		$ 16,028,000
			CONTINGENCY +	25%	$ 4,007,000
			TOTAL PROJECT		$ 20,035,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	T-2A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	320	$527	$ 169,000
2	Install 42" RCP	FT	1,830	$588	$ 1,076,000
3	Install 48" RCP	FT	1,860	$656	$ 1,220,000
4	Install 60" RCP	FT	790	$816	$ 645,000
5	Manhole	EA	12	$20,322	$ 244,000
6	Sawcut and Remove Existing AC Pavement	SF	30,320	$2.66	$ 81,000
7	Crushed Miscellaneous Base	SF	30,320	$4	$ 121,000
8	Replace Asphalt Concrete Pavement	SF	30,320	$2	$ 61,000
9	Traffic Control	%	5%		$ 181,000
10	Erosion Control	%	1%		$ 38,000
11	Moblilization/Demobilization	%	10%		$ 384,000
			SUBTOTAL (CONSTRUCTION)		$ 4,220,000
	Engineering and Design	%	10%		$ 422,000
	Surveying & Staking & Geotechnical	%	5%		$ 211,000
	Construction Management/Staff	%	10%		$ 422,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 1,055,000
			SUBTOTAL COST		$ 5,275,000
			CONTINGENCY +	25%	$ 1,319,000
			TOTAL PROJECT		$ 7,649,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	T-2B				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	640	$527	$ 337,000
2	Install 42" RCP	FT	1,360	$588	$ 800,000
3	Install 54" RCP	FT	2,580	$732	$ 1,889,000
4	Manhole	EA	11	$20,322	$ 224,000
5	Remove 36" RCP	FT	90	$53	$ 5,000
6	Sawcut and Remove Existing AC Pavement	SF	27,960	$2.66	$ 74,000
7	Crushed Miscellaneous Base	SF	27,960	$4	$ 112,000
8	Replace Asphalt Concrete Pavement	SF	27,960	$2	$ 56,000
9	Traffic Control	%	5%		$ 175,000
10	Erosion Control	%	1%		$ 37,000
11	Moblilization/Demobilization	%	10%		$ 371,000
			SUBTOTAL (CONSTRUCTION)		$ 4,080,000
	Engineering and Design	%	10%		$ 408,000
	Surveying & Staking & Geotechnical	%	5%		$ 204,000
	Construction Management/Staff	%	10%		$ 408,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 1,020,000
			SUBTOTAL COST		$ 5,100,000
			CONTINGENCY +	25%	$ 1,275,000
			TOTAL PROJECT		$ 6,375,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	T-2C				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	690	$527	$ 364,000
2	Install 42" RCP	FT	1,340	$588	$ 788,000
3	Install 54" RCP	FT	2,560	$732	$ 1,874,000
4	Manhole	EA	11	$20,322	$ 224,000
5	Sawcut and Remove Existing AC Pavement	SF	29,370	$2.66	$ 78,000
6	Crushed Miscellaneous Base	SF	29,370	$4	$ 117,000
7	Replace Asphalt Concrete Pavement	SF	29,370	$2	$ 59,000
8	Traffic Control	%	5%		$ 175,000
9	Erosion Control	%	1%		$ 37,000
10	Moblilization/Demobilization	%	10%		$ 372,000
			SUBTOTAL (CONSTRUCTION)		$ 4,088,000
	Engineering and Design	%	10%		$ 409,000
	Surveying & Staking & Geotechnical	%	5%		$ 204,000
	Construction Management/Staff	%	10%		$ 409,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 1,022,000
			SUBTOTAL COST		$ 5,110,000
			CONTINGENCY +	25%	$ 1,278,000
			TOTAL PROJECT		$ 6,388,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	T-3				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 60" RCP	FT	3,990	$816	$ 3,256,000
2	Install 66" RCP	FT	1,520	$911	$ 1,385,000
3	Manhole	EA	14	$20,322	$ 285,000
4	Sawcut and Remove Existing AC Pavement	SF	42,150	$2.66	$ 112,000
5	Crushed Miscellaneous Base	SF	42,150	$4	$ 169,000
6	Replace Asphalt Concrete Pavement	SF	42,150	$2	$ 84,000
7	Traffic Control	%	5%		$ 265,000
8	Erosion Control	%	1%		$ 56,000
9	Moblilization/Demobilization	%	10%		$ 561,000
			SUBTOTAL (CONSTRUCTION)		$ 6,173,000
	Engineering and Design	%	10%		$ 617,000
	Surveying & Staking & Geotechnical	%	5%		$ 309,000
	Construction Management/Staff	%	10%		$ 617,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 1,543,000
			SUBTOTAL COST		$ 7,716,000
			CONTINGENCY	20%	$ 1,543,000
			TOTAL PROJECT		$ 9,259,000

* All unit prices reflect 2024 costs.

Name	T-3A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	330	$527	$ 174,000
2	Install 42" RCP	FT	1,830	$588	$ 1,076,000
3	Install 48" RCP	FT	1,380	$656	$ 905,000
4	Install 60" RCP	FT	3,990	$816	$ 3,256,000
5	Manhole	EA	19	$20,322	$ 386,000
6	Sawcut and Remove Existing AC Pavement	SF	51,300	$2.66	$ 136,000
7	Crushed Miscellaneous Base	SF	51,300	$4	$ 205,000
8	Replace Asphalt Concrete Pavement	SF	51,300	$2	$ 103,000
9	Traffic Control	%	5%		$ 312,000
10	Erosion Control	%	1%		$ 66,000
11	Moblilization/Demobilization	%	10%		$ 662,000
			SUBTOTAL (CONSTRUCTION)		$ 7,281,000
	Engineering and Design	%	10%		$ 728,000
	Surveying & Staking & Geotechnical	%	5%		$ 364,000
	Construction Management/Staff	%	10%		$ 728,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 1,820,000
			SUBTOTAL COST		$ 9,101,000
			CONTINGENCY +	25%	$ 2,275,000
			TOTAL PROJECT		$ 11,376,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	T-4				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	520	$527	$ 274,000
2	Install 42" RCP	FT	1,140	$588	$ 670,000
3	Install 48" RCP	FT	1,310	$656	$ 859,000
4	Install 54" RCP	FT	1,310	$732	$ 959,000
5	Manhole	EA	11	$20,322	$ 224,000
6	Remove 54" RCP	FT	60	$80	$ 5,000
7	Remove 60" RCP	FT	20	$89	$ 2,000
8	Sawcut and Remove Existing AC Pavement	SF	27,000	$2.66	$ 72,000
9	Crushed Miscellaneous Base	SF	27,000	$4	$ 108,000
10	Replace Asphalt Concrete Pavement	SF	27,000	$2	$ 54,000
11	Traffic Control	%	5%		$ 161,000
12	Erosion Control	%	1%		$ 34,000
13	Moblilization/Demobilization	%	10%		$ 342,000
			SUBTOTAL (CONSTRUCTION)		$ 3,764,000
	Engineering and Design	%	10%		$ 376,000
	Surveying & Staking & Geotechnical	%	5%		$ 188,000
	Construction Management/Staff	%	10%		$ 376,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 940,000
			SUBTOTAL COST		$ 4,704,000
			CONTINGENCY +	25%	$ 1,176,000
			TOTAL PROJECT		$ 5,880,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	T-5				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 54" RCP	FT	1,650	$732	$ 1,208,000
2	Install 84" RCP	FT	2,540	$1,264	$ 3,211,000
3	Manhole	EA	10	$20,322	$ 203,000
4	Sawcut and Remove Existing AC Pavement	SF	36,040	$2.66	$ 96,000
5	Crushed Miscellaneous Base	SF	36,040	$4	$ 144,000
6	Replace Asphalt Concrete Pavement	SF	36,040	$2	$ 72,000
7	Traffic Control	%	5%		$ 247,000
8	Erosion Control	%	1%		$ 52,000
9	Moblilization/Demobilization	%	10%		$ 523,000
			SUBTOTAL (CONSTRUCTION)		$ 5,756,000
	Engineering and Design	%	10%		$ 576,000
	Surveying & Staking & Geotechnical	%	5%		$ 288,000
	Construction Management/Staff	%	10%		$ 576,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 1,440,000
			SUBTOTAL COST		$ 7,196,000
			CONTINGENCY +	25%	$ 1,799,000
			TOTAL PROJECT		$ 8,995,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	T-5A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	1,850	$527	$ 975,000
2	Install 42" RCP	FT	1,380	$588	$ 811,000
3	Install 48" RCP	FT	1,390	$656	$ 912,000
4	Manhole	EA	12	$20,322	$ 244,000
5	Sawcut and Remove Existing AC Pavement	SF	26,900	$2.66	$ 72,000
6	Crushed Miscellaneous Base	SF	26,900	$4	$ 108,000
7	Replace Asphalt Concrete Pavement	SF	26,900	$2	$ 54,000
8	Traffic Control	%	5%		$ 159,000
9	Erosion Control	%	1%		$ 33,000
10	Moblilization/Demobilization	%	10%		$ 337,000
			SUBTOTAL (CONSTRUCTION)		$ 3,705,000
	Engineering and Design	%	10%		$ 371,000
	Surveying & Staking & Geotechnical	%	5%		$ 185,000
	Construction Management/Staff	%	10%		$ 371,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 927,000
			SUBTOTAL COST		$ 4,632,000
			CONTINGENCY +	25%	$ 1,158,000
			TOTAL PROJECT		$ 5,790,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	T-5B				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 78" RCP	FT	2,420	$1,133	$ 2,742,000
2	Manhole	EA	6	$20,322	$ 122,000
3	Remove 24" RCP	FT	720	$35	$ 25,000
4	Sawcut and Remove Existing AC Pavement	SF	22,090	$2.66	$ 59,000
5	Crushed Miscellaneous Base	SF	22,090	$4	$ 88,000
6	Replace Asphalt Concrete Pavement	SF	22,090	$2	$ 44,000
7	Traffic Control	%	5%		$ 154,000
8	Erosion Control	%	1%		$ 32,000
9	Moblilization/Demobilization	%	10%		$ 327,000
			SUBTOTAL (CONSTRUCTION)		$ 3,593,000
	Engineering and Design	%	10%		$ 359,000
	Surveying & Staking & Geotechnical	%	5%		$ 180,000
	Construction Management/Staff	%	10%		$ 359,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 898,000
			SUBTOTAL COST		$ 4,491,000
			CONTINGENCY +	25%	$ 1,123,000
			TOTAL PROJECT		$ 5,614,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	T-5C				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	300	$527	$ 158,000
2	Install 42" RCP	FT	1,070	$588	$ 629,000
3	Install 48" RCP	FT	800	$656	$ 525,000
4	Install 54" RCP	FT	1,500	$732	$ 1,098,000
5	Install 72" RCP	FT	1,230	$1,016	$ 1,250,000
6	Manhole	EA	12	$20,322	$ 244,000
7	Sawcut and Remove Existing AC Pavement	SF	34,020	$2.66	$ 90,000
8	Crushed Miscellaneous Base	SF	34,020	$4	$ 136,000
9	Replace Asphalt Concrete Pavement	SF	34,020	$2	$ 68,000
10	Traffic Control	%	5%		$ 210,000
11	Erosion Control	%	1%		$ 44,000
12	Moblilization/Demobilization	%	10%		$ 445,000
			SUBTOTAL (CONSTRUCTION)		$ 4,897,000
	Engineering and Design	%	10%		$ 490,000
	Surveying & Staking & Geotechnical	%	5%		$ 245,000
	Construction Management/Staff	%	10%		$ 490,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 1,225,000
			SUBTOTAL COST		$ 6,122,000
			CONTINGENCY	20%	$ 1,224,000
			TOTAL PROJECT		$ 7,346,000

* All unit prices reflect 2024 costs.

Name	T-6				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 66" RCP	FT	1,990	$911	$ 1,813,000
2	Install 72" RCP	FT	1,690	$1,016	$ 1,717,000
3	Manhole	EA	9	$20,322	$ 183,000
4	Sawcut and Remove Existing AC Pavement	SF	30,510	$2.66	$ 81,000
5	Crushed Miscellaneous Base	SF	30,510	$4	$ 122,000
6	Replace Asphalt Concrete Pavement	SF	30,510	$2	$ 61,000
7	Traffic Control	%	5%		$ 199,000
8	Erosion Control	%	1%		$ 42,000
9	Moblilization/Demobilization	%	10%		$ 422,000
			SUBTOTAL (CONSTRUCTION)		$ 4,640,000
	Engineering and Design	%	10%		$ 464,000
	Surveying & Staking & Geotechnical	%	5%		$ 232,000
	Construction Management/Staff	%	10%		$ 464,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 1,160,000
			SUBTOTAL COST		$ 5,800,000
			CONTINGENCY +	25%	$ 1,450,000
			TOTAL PROJECT		$ 7,250,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	T-6A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	880	$527	$ 464,000
2	Install 42" RCP	FT	1,330	$588	$ 782,000
3	Manhole	EA	6	$20,322	$ 122,000
4	Sawcut and Remove Existing AC Pavement	SF	12,510	$2.66	$ 33,000
5	Crushed Miscellaneous Base	SF	12,510	$4	$ 50,000
6	Replace Asphalt Concrete Pavement	SF	12,510	$2	$ 25,000
7	Traffic Control	%	5%		$ 74,000
8	Erosion Control	%	1%		$ 16,000
9	Moblilization/Demobilization	%	10%		$ 157,000
			SUBTOTAL (CONSTRUCTION)		$ 1,723,000
	Engineering and Design	%	10%		$ 172,000
	Surveying & Staking & Geotechnical	%	5%		$ 86,000
	Construction Management/Staff	%	10%		$ 172,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 430,000
			SUBTOTAL COST		$ 2,153,000
			CONTINGENCY	20%	$ 431,000
			TOTAL PROJECT		$ 2,584,000

* All unit prices reflect 2024 costs.

Name	T-6B				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	430	$527	$ 227,000
2	Install 42" RCP	FT	420	$588	$ 247,000
3	Install 60" RCP	FT	1,450	$816	$ 1,183,000
4	Manhole	EA	6	$20,322	$ 122,000
5	Sawcut and Remove Existing AC Pavement	SF	15,640	$2.66	$ 42,000
6	Crushed Miscellaneous Base	SF	15,640	$4	$ 63,000
7	Replace Asphalt Concrete Pavement	SF	15,640	$2	$ 31,000
8	Traffic Control	%	5%		$ 96,000
9	Erosion Control	%	1%		$ 20,000
10	Moblilization/Demobilization	%	10%		$ 203,000
			SUBTOTAL (CONSTRUCTION)		$ 2,234,000
	Engineering and Design	%	10%		$ 223,000
	Surveying & Staking & Geotechnical	%	5%		$ 112,000
	Construction Management/Staff	%	10%		$ 223,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 558,000
			SUBTOTAL COST		$ 2,792,000
			CONTINGENCY	20%	$ 558,000
			TOTAL PROJECT		$ 3,350,000

* All unit prices reflect 2024 costs.

Name	T-7				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	2,620	$527	$ 1,381,000
2	Install 42" RCP	FT	2,620	$588	$ 1,541,000
3	Install Double 66" RCP	FT	1,720	$1,822	$ 3,134,000
4	Manhole	EA	17	$20,322	$ 345,000
5	Sawcut and Remove Existing AC Pavement	SF	57,030	$2.66	$ 152,000
6	Crushed Miscellaneous Base	SF	57,030	$4	$ 228,000
7	Replace Asphalt Concrete Pavement	SF	57,030	$2	$ 114,000
8	Traffic Control	%	5%		$ 345,000
9	Erosion Control	%	1%		$ 72,000
10	Moblilization/Demobilization	%	10%		$ 731,000
			SUBTOTAL (CONSTRUCTION)		$ 8,043,000
	Engineering and Design	%	10%		$ 804,000
	Surveying & Staking & Geotechnical	%	5%		$ 402,000
	Construction Management/Staff	%	10%		$ 804,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 2,010,000
			SUBTOTAL COST		$ 10,053,000
			CONTINGENCY	20%	$ 2,011,000
			TOTAL PROJECT		$ 12,064,000

* All unit prices reflect 2024 costs.

Name	T-7A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	1,320	$527	$ 696,000
2	Manhole	EA	3	$20,322	$ 61,000
3	Sawcut and Remove Existing AC Pavement	SF	7,040	$2.66	$ 19,000
4	Crushed Miscellaneous Base	SF	7,040	$4	$ 28,000
5	Replace Asphalt Concrete Pavement	SF	7,040	$2	$ 14,000
6	Traffic Control	%	5%		$ 41,000
7	Erosion Control	%	1%		$ 9,000
8	Moblilization/Demobilization	%	10%		$ 87,000
			SUBTOTAL (CONSTRUCTION)		$ 955,000
	Engineering and Design	%	10%		$ 96,000
	Surveying & Staking & Geotechnical	%	5%		$ 48,000
	Construction Management/Staff	%	10%		$ 96,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 240,000
			SUBTOTAL COST		$ 1,195,000
			CONTINGENCY	20%	$ 239,000
			TOTAL PROJECT		$ 1,434,000

* All unit prices reflect 2024 costs.

Name	T-7B				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	320	$527	$ 169,000
2	Install 42" RCP	FT	690	$588	$ 406,000
3	Install 48" RCP	FT	670	$656	$ 440,000
4	Manhole	EA	4	$20,322	$ 81,000
5	Sawcut and Remove Existing AC Pavement	SF	10,060	$2.66	$ 27,000
6	Crushed Miscellaneous Base	SF	10,060	$4	$ 40,000
7	Replace Asphalt Concrete Pavement	SF	10,060	$2	$ 20,000
8	Traffic Control	%	5%		$ 59,000
9	Erosion Control	%	1%		$ 12,000
10	Moblilization/Demobilization	%	10%		$ 125,000
			SUBTOTAL (CONSTRUCTION)		$ 1,379,000
	Engineering and Design	%	10%		$ 138,000
	Surveying & Staking & Geotechnical	%	5%		$ 69,000
	Construction Management/Staff	%	10%		$ 138,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 345,000
			SUBTOTAL COST		$ 1,724,000
			CONTINGENCY	20%	$ 345,000
			TOTAL PROJECT		$ 2,069,000

* All unit prices reflect 2024 costs.

Name	T-8				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 54" RCP	FT	2,630	$732	$ 1,925,000
2	Install 66" RCP	FT	1,310	$911	$ 1,193,000
3	Install 72" RCP	FT	1,340	$1,016	$ 1,361,000
4	Install 78" RCP	FT	570	$1,133	$ 646,000
5	Manhole	EA	15	$20,322	$ 305,000
6	Sawcut and Remove Existing AC Pavement	SF	45,540	$2.66	$ 121,000
7	Crushed Miscellaneous Base	SF	45,540	$4	$ 182,000
8	Replace Asphalt Concrete Pavement	SF	45,540	$2	$ 91,000
9	Traffic Control	%	5%		$ 291,000
10	Erosion Control	%	1%		$ 61,000
11	Moblilization/Demobilization	%	10%		$ 618,000
			SUBTOTAL (CONSTRUCTION)		$ 6,794,000
	Engineering and Design	%	10%		$ 679,000
	Surveying & Staking & Geotechnical	%	5%		$ 340,000
	Construction Management/Staff	%	10%		$ 679,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 1,698,000
			SUBTOTAL COST		$ 8,492,000
			CONTINGENCY	20%	$ 1,698,000
			TOTAL PROJECT		$ 10,190,000

* All unit prices reflect 2024 costs.

Name	T-8A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	540	$527	$ 285,000
2	Install 42" RCP	FT	1,140	$588	$ 670,000
3	Install 48" RCP	FT	1,300	$656	$ 853,000
4	Manhole	EA	7	$20,322	$ 142,000
5	Sawcut and Remove Existing AC Pavement	SF	17,920	$2.66	$ 48,000
6	Crushed Miscellaneous Base	SF	17,920	$4	$ 72,000
7	Replace Asphalt Concrete Pavement	SF	17,920	$2	$ 36,000
8	Traffic Control	%	5%		$ 105,000
9	Erosion Control	%	1%		$ 22,000
10	Moblilization/Demobilization	%	10%		$ 223,000
			SUBTOTAL (CONSTRUCTION)		$ 2,456,000
	Engineering and Design	%	10%		$ 246,000
	Surveying & Staking & Geotechnical	%	5%		$ 123,000
	Construction Management/Staff	%	10%		$ 246,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 615,000
			SUBTOTAL COST		$ 3,071,000
			CONTINGENCY	20%	$ 614,000
			TOTAL PROJECT		$ 3,685,000

* All unit prices reflect 2024 costs.

Name	T-8B				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	360	$527	$ 190,000
2	Install 42" RCP	FT	1,470	$588	$ 864,000
3	Install 48" RCP	FT	1,310	$656	$ 859,000
4	Manhole	EA	8	$20,322	$ 163,000
5	Sawcut and Remove Existing AC Pavement	SF	18,970	$2.66	$ 50,000
6	Crushed Miscellaneous Base	SF	18,970	$4	$ 76,000
7	Replace Asphalt Concrete Pavement	SF	18,970	$2	$ 38,000
8	Traffic Control	%	5%		$ 112,000
9	Erosion Control	%	1%		$ 24,000
10	Moblilization/Demobilization	%	10%		$ 238,000
			SUBTOTAL (CONSTRUCTION)		$ 2,614,000
	Engineering and Design	%	10%		$ 261,000
	Surveying & Staking & Geotechnical	%	5%		$ 131,000
	Construction Management/Staff	%	10%		$ 261,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 653,000
			SUBTOTAL COST		$ 3,267,000
			CONTINGENCY	20%	$ 653,000
			TOTAL PROJECT		$ 3,920,000

* All unit prices reflect 2024 costs.

Name	T-8C				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	390	$527	$ 206,000
2	Install 42" RCP	FT	1,640	$588	$ 964,000
3	Install 48" RCP	FT	1,300	$656	$ 853,000
4	Manhole	EA	8	$20,322	$ 163,000
4	Sawcut and Remove Existing AC Pavement	SF	20,060	$2.66	$ 53,000
5	Crushed Miscellaneous Base	SF	20,060	$4	$ 80,000
6	Replace Asphalt Concrete Pavement	SF	20,060	$2	$ 40,000
7	Traffic Control	%	5%		$ 108,000
8	Erosion Control	%	1%		$ 23,000
9	Moblilization/Demobilization	%	10%		$ 228,000
			SUBTOTAL (CONSTRUCTION)		$ 2,512,000
	Engineering and Design	%	10%		$ 251,000
	Surveying & Staking & Geotechnical	%	5%		$ 126,000
	Construction Management/Staff	%	10%		$ 251,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 628,000
			SUBTOTAL COST		$ 3,140,000
			CONTINGENCY	20%	$ 628,000
			TOTAL PROJECT		$ 3,768,000

* All unit prices reflect 2024 costs.

Name	T-8D				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	1,330	$527	$ 701,000
2	Install 42" RCP	FT	790	$588	$ 465,000
3	Install 48" RCP	FT	2,630	$656	$ 1,725,000
4	Manhole	EA	12	$20,322	$ 244,000
5	Sawcut and Remove Existing AC Pavement	SF	28,620	$2.66	$ 76,000
6	Crushed Miscellaneous Base	SF	28,620	$4	$ 114,000
7	Replace Asphalt Concrete Pavement	SF	28,620	$2	$ 57,000
8	Traffic Control	%	5%		$ 169,000
9	Erosion Control	%	1%		$ 36,000
10	Moblilization/Demobilization	%	10%		$ 359,000
			SUBTOTAL (CONSTRUCTION)		$ 3,946,000
	Engineering and Design	%	10%		$ 395,000
	Surveying & Staking & Geotechnical	%	5%		$ 197,000
	Construction Management/Staff	%	10%		$ 395,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 987,000
			SUBTOTAL COST		$ 4,933,000
			CONTINGENCY	20%	$ 987,000
			TOTAL PROJECT		$ 5,920,000

* All unit prices reflect 2024 costs.

Name	T-9				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	520	$527	$ 274,000
2	Install 42" RCP	FT	1,160	$588	$ 682,000
3	Install 48" RCP	FT	1,330	$656	$ 872,000
4	Install 66" RCP	FT	380	$911	$ 346,000
5	Manhole	EA	8	$20,322	$ 163,000
6	Sawcut and Remove Existing AC Pavement	SF	21,180	$2.66	$ 56,000
7	Crushed Miscellaneous Base	SF	21,180	$4	$ 85,000
8	Replace Asphalt Concrete Pavement	SF	21,180	$2	$ 42,000
9	Traffic Control	%	5%		$ 126,000
10	Erosion Control	%	1%		$ 26,000
11	Moblilization/Demobilization	%	10%		$ 267,000
			SUBTOTAL (CONSTRUCTION)		$ 2,939,000
	Engineering and Design	%	10%		$ 294,000
	Surveying & Staking & Geotechnical	%	5%		$ 147,000
	Construction Management/Staff	%	10%		$ 294,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 735,000
			SUBTOTAL COST		$ 3,674,000
			CONTINGENCY +	25%	$ 919,000
			TOTAL PROJECT		$ 4,593,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to SCG transmisson line conflict

Name	T-9A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	520	$527	$ 274,000
2	Install 42" RCP	FT	1,140	$588	$ 670,000
3	Install 48" RCP	FT	1,310	$656	$ 859,000
4	Install 54" RCP	FT	1,310	$732	$ 959,000
5	Manhole	EA	11	$20,322	$ 224,000
6	Sawcut and Remove Existing AC Pavement	SF	27,000	$2.66	$ 72,000
7	Crushed Miscellaneous Base	SF	27,000	$4	$ 108,000
8	Replace Asphalt Concrete Pavement	SF	27,000	$2	$ 54,000
9	Traffic Control	%	5%		$ 161,000
10	Erosion Control	%	1%		$ 34,000
11	Moblilization/Demobilization	%	10%		$ 342,000
			SUBTOTAL (CONSTRUCTION)		$ 3,757,000
	Engineering and Design	%	10%		$ 376,000
	Surveying & Staking & Geotechnical	%	5%		$ 188,000
	Construction Management/Staff	%	10%		$ 376,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 940,000
			SUBTOTAL COST		$ 4,697,000
			CONTINGENCY +	25%	$ 1,174,000
			TOTAL PROJECT		$ 5,871,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to SCG transmisson line conflict

Name	WG-1				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 48" RCP	FT	1,220	$656	$ 800,000
2	Manhole	EA	3	$20,322	$ 61,000
3	Sawcut and Remove Existing AC Pavement	SF	7,830	$2.66	$ 21,000
4	Crushed Miscellaneous Base	SF	7,830	$4	$ 31,000
5	Replace Asphalt Concrete Pavement	SF	7,830	$2	$ 16,000
6	Traffic Control	%	5%		$ 46,000
7	Erosion Control	%	1%		$ 10,000
8	Moblilization/Demobilization	%	10%		$ 99,000
			SUBTOTAL (CONSTRUCTION)		$ 1,084,000
	Engineering and Design	%	10%		$ 108,000
	Surveying & Staking & Geotechnical	%	5%		$ 54,000
	Construction Management/Staff	%	10%		$ 108,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 270,000
			SUBTOTAL COST		$ 1,354,000
			CONTINGENCY	20%	$ 271,000
			TOTAL PROJECT		$ 1,625,000

* All unit prices reflect 2024 costs.

Name	WG-2				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	1,330	$527	$ 701,000
2	Install 42" RCP	FT	990	$588	$ 582,000
3	Install 48" RCP	FT	650	$656	$ 426,000
4	Manhole	EA	7	$20,322	$ 142,000
5	Sawcut and Remove Existing AC Pavement	SF	17,090	$2.66	$ 45,000
6	Crushed Miscellaneous Base	SF	17,090	$4	$ 68,000
7	Replace Asphalt Concrete Pavement	SF	17,090	$2	$ 34,000
8	Traffic Control	%	5%		$ 100,000
9	Erosion Control	%	1%		$ 21,000
10	Moblilization/Demobilization	%	10%		$ 212,000
			SUBTOTAL (CONSTRUCTION)		$ 2,331,000
	Engineering and Design	%	10%		$ 233,000
	Surveying & Staking & Geotechnical	%	5%		$ 117,000
	Construction Management/Staff	%	10%		$ 233,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 583,000
			SUBTOTAL COST		$ 2,914,000
			CONTINGENCY +	25%	$ 729,000
			TOTAL PROJECT		$ 3,643,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	WG-3				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 48" RCP	FT	610	$656	$ 400,000
2	Manhole	EA	2	$20,322	$ 41,000
3	Sawcut and Remove Existing AC Pavement	SF	3,660	$2.66	$ 10,000
4	Crushed Miscellaneous Base	SF	3,660	$4	$ 15,000
5	Replace Asphalt Concrete Pavement	SF	3,660	$2	$ 7,000
6	Traffic Control	%	5%		$ 24,000
7	Erosion Control	%	1%		$ 5,000
8	Moblilization/Demobilization	%	10%		$ 50,000
			SUBTOTAL (CONSTRUCTION)		$ 552,000
	Engineering and Design	%	10%		$ 55,200
	Surveying & Staking & Geotechnical	%	5%		$ 28,000
	Construction Management/Staff	%	10%		$ 55,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 138,200
			SUBTOTAL COST		$ 690,200
			CONTINGENCY	20%	$ 138,000
			TOTAL PROJECT		$ 828,200

* All unit prices reflect 2024 costs.

AOS 2 Capital Project Cost Estimates

FONTANA
CALIFORNIA

DAVID EVANS
AND ASSOCIATES INC.

Project	Cost
DZ-10	$6,060,000.00
DZ-11	$4,500,000.00
DZ-11A	$3,978,000.00
DZ-11B	$3,065,000.00
DZ-12	$4,272,000.00
DZ-12A	$3,806,000.00
DZ-13	$6,870,000.00
DZ-14	$4,683,000.00
DZ-14A	$2,651,000.00
DZ-15A	$3,030,000.00
DZ-16	$9,314,000.00
DZ-16A	$2,599,000.00
DZ-4	$7,155,000.00
DZ-7	$3,398,000.00
DZ-8	$745,000.00
DZ-9	$2,810,000.00
JH-1	$3,281,000.00
JH-2	$3,823,000.00
SR-1	$5,008,000.00
SR-2	$15,527,000.00
SR-3	$7,451,000.00
SR-4	$5,772,000.00
SS-10	$1,415,000.00
SS-11	$3,556,000.00
SS-5	$3,380,000.00
SS-6	$1,950,000.00
SS-7	$3,065,000.00
SS-8	$3,105,000.00
SS-9	$2,447,000.00
SS-9A	$2,986,000.00

Name	DZ-4				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 84" RCP	FT	1,650	$1,264	$ 2,086,000
2	Install 108" RCP	FT	640	$2,000	$ 1,280,000
3	Install 6' x 7' RCB	FT	110	$2,052	$ 226,000
4	Manhole	EA	6	$20,322	$ 122,000
5	Sawcut and Remove Existing AC Pavement	SF	24,490	$2.66	$ 65,000
6	Crushed Miscellaneous Base	SF	24,490	$4	$ 98,000
7	Replace Asphalt Concrete Pavement	SF	24,490	$2	$ 49,000
8	Traffic Control	%	5%		$ 196,000
9	Erosion Control	%	1%		$ 41,000
10	Mobilization/Demobilization	%	10%		$ 416,000
			SUBTOTAL (CONSTRUCTION)		$ 4,579,000
	Engineering and Design	%	10%		$ 458,000
	Surveying & Staking & Geotechnical	%	5%		$ 229,000
	Construction Management/Staff	%	10%		$ 458,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 1,145,000
			SUBTOTAL COST		$ 5,724,000
			CONTINGENCY +	25%	$ 1,431,000
			TOTAL PROJECT		$ 7,155,000

* All unit prices reflect 2024 cost.

+ Contingency increased to 25% due to major highway conflict

Name	DZ-7				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	420	$527	$ 221,000
2	Install 42" RCP	FT	970	$588	$ 570,000
3	Install 48" RCP	FT	1,320	$656	$ 866,000
4	Manhole	EA	7	$20,322	$ 142,000
5	Sawcut and Remove Existing AC Pavement	SF	16,410	$2.66	$ 44,000
6	Crushed Miscellaneous Base	SF	16,410	$4	$ 66,000
7	Replace Asphalt Concrete Pavement	SF	16,410	$2	$ 33,000
8	Traffic Control	%	5%		$ 97,000
9	Erosion Control	%	1%		$ 20,000
10	Mobilization/Demobilization	%	10%		$ 206,000
			SUBTOTAL (CONSTRUCTION)		$ 2,265,000
	Engineering and Design	%	10%		$ 227,000
	Surveying & Staking & Geotechnical	%	5%		$ 113,000
	Construction Management/Staff	%	10%		$ 227,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 567,000
			SUBTOTAL COST		$ 2,832,000
			CONTINGENCY	20%	$ 566,000
			TOTAL PROJECT		$ 3,398,000

* All unit prices reflect 2024 cost.

Name	DZ-8				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 72" RCP	FT	340	$1,016	$ 345,000
2	Manhole	EA	1	$20,322	$ 20,000
3	Remove 66" RCP	FT	590	$99	$ 58,000
4	Sawcut and Remove Existing AC Pavement	SF	2,920	$2.66	$ 8,000
5	Crushed Miscellaneous Base	SF	2,920	$4	$ 12,000
6	Replace Asphalt Concrete Pavement	SF	2,920	$2	$ 6,000
7	Traffic Control	%	5%		$ 22,000
8	Erosion Control	%	1%		$ 5,000
9	Mobilization/Demobilization	%	10%		$ 48,000
			SUBTOTAL (CONSTRUCTION)		$ 476,000
	Engineering and Design	%	10%		$ 47,600
	Surveying & Staking & Geotechnical	%	5%		$ 24,000
	Construction Management/Staff	%	10%		$ 48,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 119,600
			SUBTOTAL COST		$ 595,600
			CONTINGENCY +	25%	$ 149,000
			TOTAL PROJECT		$ 744,600

* All unit prices reflect 2024 cost.

+ Contingency increased to 25% due to major highway conflict

Name	DZ-9				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	550	$527	$ 290,000
2	Install 42" RCP	FT	1,470	$588	$ 864,000
3	Install 48" RCP	FT	550	$656	$ 361,000
4	Manhole	EA	6	$20,322	$ 122,000
6	Sawcut and Remove Existing AC Pavement	SF	15,100	$2.66	$ 40,000
7	Crushed Miscellaneous Base	SF	15,100	$4	$ 60,000
8	Replace Asphalt Concrete Pavement	SF	15,100	$2	$ 30,000
9	Traffic Control	%	5%		$ 88,000
10	Erosion Control	%	1%		$ 19,000
11	Mobilization/Demobilization	%	10%		$ 187,000
			SUBTOTAL (CONSTRUCTION)		$ 1,874,000
	Engineering and Design	%	10%		$ 187,000
	Surveying & Staking & Geotechnical	%	5%		$ 94,000
	Construction Management/Staff	%	10%		$ 187,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 468,000
			SUBTOTAL COST		$ 2,342,000
			CONTINGENCY	20%	$ 468,000
			TOTAL PROJECT		$ 2,810,000

* All unit prices reflect 2024 cost.

Name	DZ-10				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	340	$527	$ 179,000
2	Install 42" RCP	FT	1,320	$588	$ 776,000
3	Install 48" RCP	FT	1,350	$656	$ 886,000
4	Install 54" RCP	FT	1,390	$732	$ 1,017,000
5	Manhole	EA	11	$20,322	$ 224,000
6	Sawcut and Remove Existing AC Pavement	SF	27,900	$2.66	$ 74,000
7	Crushed Miscellaneous Base	SF	27,900	$4	$ 112,000
8	Replace Asphalt Concrete Pavement	SF	27,900	$2	$ 56,000
9	Traffic Control	%	5%		$ 166,000
10	Erosion Control	%	1%		$ 35,000
11	Mobilization/Demobilization	%	10%		$ 353,000
			SUBTOTAL (CONSTRUCTION)		$ 3,878,000
	Engineering and Design	%	10%		$ 388,000
	Surveying & Staking & Geotechnical	%	5%		$ 194,000
	Construction Management/Staff	%	10%		$ 388,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 970,000
			SUBTOTAL COST		$ 4,848,000
			CONTINGENCY +	25%	$ 1,212,000
			TOTAL PROJECT		$ 6,060,000

* All unit prices reflect 2024 cost.

+ Contingency increased to 25% due to 12' water main conflict

Name	DZ-11				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 54" RCP	FT	1,370	$732	$ 1,003,000
2	Install 60" RCP	FT	1,410	$816	$ 1,151,000
3	Manhole	EA	7	$20,322	$ 142,000
4	Sawcut and Remove Existing AC Pavement	SF	20,110	$2.66	$ 53,000
5	Crushed Miscellaneous Base	SF	20,110	$4	$ 80,000
6	Replace Asphalt Concrete Pavement	SF	20,110	$2	$ 40,000
7	Traffic Control	%	5%		$ 123,000
8	Erosion Control	%	1%		$ 26,000
9	Mobilization/Demobilization	%	10%		$ 262,000
	SUBTOTAL (CONSTRUCTION)				$ 2,880,000
	Engineering and Design	%	10%		$ 288,000
	Surveying & Staking & Geotechnical	%	5%		$ 144,000
	Construction Management/Staff	%	10%		$ 288,000
	SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)				$ 720,000
	SUBTOTAL COST				$ 3,600,000
	CONTINGENCY +			25%	$ 900,000
	TOTAL PROJECT				$ 4,500,000

* All unit prices reflect 2024 cost.

+ Contingency increased to 25% due to major highway conflict

Name	DZ-11A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	520	$527	$ 274,000
2	Install 42" RCP	FT	1,000	$588	$ 588,000
3	Install 48" RCP	FT	1,650	$656	$ 1,082,000
4	Manhole	EA	8	$20,322	$ 163,000
5	Sawcut and Remove Existing AC Pavement	SF	19,240	$2.66	$ 51,000
6	Crushed Miscellaneous Base	SF	19,240	$4	$ 77,000
7	Replace Asphalt Concrete Pavement	SF	19,240	$2	$ 38,000
8	Traffic Control	%	5%		$ 114,000
9	Erosion Control	%	1%		$ 24,000
10	Mobilization/Demobilization	%	10%		$ 241,000
			SUBTOTAL (CONSTRUCTION)		$ 2,652,000
	Engineering and Design	%	10%		$ 265,000
	Surveying & Staking & Geotechnical	%	5%		$ 133,000
	Construction Management/Staff	%	10%		$ 265,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 663,000
			SUBTOTAL COST		$ 3,315,000
			CONTINGENCY	20%	$ 663,000
			TOTAL PROJECT		$ 3,978,000

* All unit prices reflect 2024 cost.

Name	DZ-11B				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	560	$527	$ 295,000
2	Install 42" RCP	FT	990	$588	$ 582,000
3	Install 48" RCP	FT	1,060	$656	$ 695,000
4	Manhole	EA	7	$20,322	$ 142,000
5	Remove 24" RCP	FT	1,340	$35	$ 47,000
6	Remove 30" RCP	FT	750	$44	$ 33,000
7	Sawcut and Remove Existing AC Pavement	SF	15,600	$2.66	$ 41,000
8	Crushed Miscellaneous Base	SF	15,600	$4	$ 62,000
9	Replace Asphalt Concrete Pavement	SF	15,600	$2	$ 31,000
10	Traffic Control	%	5%		$ 96,000
11	Erosion Control	%	1%		$ 20,000
12	Mobilization/Demobilization	%	10%		$ 204,000
			SUBTOTAL (CONSTRUCTION)		$ 2,044,000
	Engineering and Design	%	10%		$ 204,000
	Surveying & Staking & Geotechnical	%	5%		$ 102,000
	Construction Management/Staff	%	10%		$ 204,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 510,000
			SUBTOTAL COST		$ 2,554,000
			CONTINGENCY	20%	$ 511,000
			TOTAL PROJECT		$ 3,065,000

* All unit prices reflect 2024 cost.

Name	DZ-12				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 60" RCP	FT	2,610	$816	$ 2,130,000
2	Manhole	EA	7	$20,322	$ 142,000
3	Sawcut and Remove Existing AC Pavement	SF	19,580	$2.66	$ 52,000
4	Crushed Miscellaneous Base	SF	19,580	$4	$ 78,000
5	Replace Asphalt Concrete Pavement	SF	19,580	$2	$ 39,000
6	Traffic Control	%	5%		$ 122,000
7	Erosion Control	%	1%		$ 26,000
8	Mobilization/Demobilization	%	10%		$ 259,000
	SUBTOTAL (CONSTRUCTION)				$ 2,848,000
	Engineering and Design	%	10%		$ 285,000
	Surveying & Staking & Geotechnical	%	5%		$ 142,000
	Construction Management/Staff	%	10%		$ 285,000
	SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)				$ 712,000
	SUBTOTAL COST				$ 3,560,000
	CONTINGENCY			20%	$ 712,000
	TOTAL PROJECT				$ 4,272,000

* All unit prices reflect 2024 cost.

Name	DZ-12A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	450	$527	$ 237,000
2	Install 42" RCP	FT	2,020	$588	$ 1,188,000
3	Install 48" RCP	FT	650	$656	$ 426,000
4	Manhole	EA	8	$20,322	$ 163,000
5	Sawcut and Remove Existing AC Pavement	SF	18,440	$2.66	$ 49,000
6	Crushed Miscellaneous Base	SF	18,440	$4	$ 74,000
7	Replace Asphalt Concrete Pavement	SF	18,440	$2	$ 37,000
8	Traffic Control	%	5%		$ 109,000
9	Erosion Control	%	1%		$ 23,000
10	Mobilization/Demobilization	%	10%		$ 231,000
			SUBTOTAL (CONSTRUCTION)		$ 2,537,000
	Engineering and Design	%	10%		$ 254,000
	Surveying & Staking & Geotechnical	%	5%		$ 127,000
	Construction Management/Staff	%	10%		$ 254,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 635,000
			SUBTOTAL COST		$ 3,172,000
			CONTINGENCY	20%	$ 634,000
			TOTAL PROJECT		$ 3,806,000

* All unit prices reflect 2024 cost.

Name	DZ-13				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 60" RCP	FT	850	$816	$ 694,000
2	Install 66" RCP	FT	1,550	$911	$ 1,412,000
3	Install 84" RCP	FT	1,080	$1,264	$ 1,365,000
4	Manhole	EA	9	$20,322	$ 183,000
5	Remove 48" RCP	FT	1,600	$71	$ 114,000
6	Remove 78" RCP	FT	1,050	$117	$ 123,000
7	Sawcut and Remove Existing AC Pavement	SF	29,280	$2.66	$ 78,000
8	Crushed Miscellaneous Base	SF	29,280	$4	$ 117,000
9	Replace Asphalt Concrete Pavement	SF	29,280	$2	$ 59,000
10	Traffic Control	%	5%		$ 207,000
11	Erosion Control	%	1%		$ 44,000
12	Mobilization/Demobilization	%	10%		$ 440,000
			SUBTOTAL (CONSTRUCTION)		$ 4,396,000
	Engineering and Design	%	10%		$ 440,000
	Surveying & Staking & Geotechnical	%	5%		$ 220,000
	Construction Management/Staff	%	10%		$ 440,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 1,100,000
			SUBTOTAL COST		$ 5,496,000
			CONTINGENCY +	25%	$ 1,374,000
			TOTAL PROJECT		$ 6,870,000

* All unit prices reflect 2024 cost.

+ Contingency increased to 25% due to major highway conflict

Name	DZ-14				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 54" RCP	FT	1,310	$732	$ 959,000
2	Install 66" RCP	FT	350	$911	$ 319,000
3	Install 72" RCP	FT	1,100	$1,016	$ 1,118,000
4	Manhole	EA	7	$20,322	$ 142,000
5	Remove 48" RCP	FT	1,320	$71	$ 94,000
6	Remove 64" RCP	FT	80	$96	$ 8,000
7	Sawcut and Remove Existing AC Pavement	SF	21,370	$2.66	$ 57,000
8	Crushed Miscellaneous Base	SF	21,370	$4	$ 85,000
9	Replace Asphalt Concrete Pavement	SF	21,370	$2	$ 43,000
10	Traffic Control	%	5%		$ 141,000
11	Erosion Control	%	1%		$ 30,000
12	Mobilization/Demobilization	%	10%		$ 300,000
			SUBTOTAL (CONSTRUCTION)		$ 2,996,000
	Engineering and Design	%	10%		$ 300,000
	Surveying & Staking & Geotechnical	%	5%		$ 150,000
	Construction Management/Staff	%	10%		$ 300,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 750,000
			SUBTOTAL COST		$ 3,746,000
			CONTINGENCY +	25%	$ 937,000
			TOTAL PROJECT		$ 4,683,000

* All unit prices reflect 2024 cost.

+ Contingency increased to 25% due to major highway conflict

Name	DZ-14A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	530	$527	$ 279,000
2	Install 42" RCP	FT	1,000	$588	$ 588,000
3	Install 48" RCP	FT	660	$656	$ 433,000
4	Manhole	EA	5	$20,322	$ 102,000
5	Sawcut and Remove Existing AC Pavement	SF	12,940	$2.66	$ 34,000
6	Crushed Miscellaneous Base	SF	12,940	$4	$ 52,000
7	Replace Asphalt Concrete Pavement	SF	12,940	$2	$ 26,000
8	Traffic Control	%	5%		$ 76,000
9	Erosion Control	%	1%		$ 16,000
10	Mobilization/Demobilization	%	10%		$ 161,000
			SUBTOTAL (CONSTRUCTION)		$ 1,767,000
	Engineering and Design	%	10%		$ 177,000
	Surveying & Staking & Geotechnical	%	5%		$ 88,000
	Construction Management/Staff	%	10%		$ 177,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 442,000
			SUBTOTAL COST		$ 2,209,000
			CONTINGENCY	20%	$ 442,000
			TOTAL PROJECT		$ 2,651,000

* All unit prices reflect 2024 cost.

Name	DZ-15A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	490	$527	$ 258,000
2	Install 42" RCP	FT	1,000	$588	$ 588,000
3	Install 48" RCP	FT	970	$656	$ 636,000
4	Manhole	EA	6	$20,322	$ 122,000
5	Sawcut and Remove Existing AC Pavement	SF	14,710	$2.66	$ 39,000
6	Crushed Miscellaneous Base	SF	14,710	$4	$ 59,000
7	Replace Asphalt Concrete Pavement	SF	14,710	$2	$ 29,000
8	Traffic Control	%	5%		$ 87,000
9	Erosion Control	%	1%		$ 18,000
10	Mobilization/Demobilization	%	10%		$ 184,000
			SUBTOTAL (CONSTRUCTION)		$ 2,020,000
	Engineering and Design	%	10%		$ 202,000
	Surveying & Staking & Geotechnical	%	5%		$ 101,000
	Construction Management/Staff	%	10%		$ 202,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 505,000
			SUBTOTAL COST		$ 2,525,000
			CONTINGENCY	20%	$ 505,000
			TOTAL PROJECT		$ 3,030,000

* All unit prices reflect 2024 cost.

Name	DZ-16				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 66" RCP	FT	2,640	$911	$ 2,405,000
2	Install Double 66" RCP	FT	1,380	$1,822	$ 2,514,000
3	Manhole	EA	10	$20,322	$ 203,000
4	Remove 42" RCP	FT	180	$62	$ 11,000
5	Remove 60" RCP	FT	1,250	$89	$ 111,000
6	Sawcut and Remove Existing AC Pavement	SF	43,430	$2.66	$ 116,000
7	Crushed Miscellaneous Base	SF	43,430	$4	$ 174,000
8	Replace Asphalt Concrete Pavement	SF	43,430	$2	$ 87,000
9	Traffic Control	%	5%		$ 281,000
10	Erosion Control	%	1%		$ 59,000
11	Mobilization/Demobilization	%	10%		$ 596,000
			SUBTOTAL (CONSTRUCTION)		$ 5,961,000
	Engineering and Design	%	10%		$ 596,000
	Surveying & Staking & Geotechnical	%	5%		$ 298,000
	Construction Management/Staff	%	10%		$ 596,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 1,490,000
			SUBTOTAL COST		$ 7,451,000
			CONTINGENCY +	25%	$ 1,863,000
			TOTAL PROJECT		$ 9,314,000

* All unit prices reflect 2024 cost.

+ Contingency increased to 25% due to major highway conflict

Name	DZ-16A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	420	$527	$ 221,000
2	Install 42" RCP	FT	840	$588	$ 494,000
3	Install 48" RCP	FT	850	$656	$ 558,000
4	Manhole	EA	5	$20,322	$ 102,000
5	Sawcut and Remove Existing AC Pavement	SF	12,630	$2.66	$ 34,000
6	Crushed Miscellaneous Base	SF	12,630	$4	$ 51,000
7	Replace Asphalt Concrete Pavement	SF	12,630	$2	$ 25,000
8	Traffic Control	%	5%		$ 74,000
9	Erosion Control	%	1%		$ 16,000
10	Mobilization/Demobilization	%	10%		$ 158,000
			SUBTOTAL (CONSTRUCTION)		$ 1,733,000
	Engineering and Design	%	10%		$ 173,000
	Surveying & Staking & Geotechnical	%	5%		$ 87,000
	Construction Management/Staff	%	10%		$ 173,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 433,000
			SUBTOTAL COST		$ 2,166,000
			CONTINGENCY	20%	$ 433,000
			TOTAL PROJECT		$ 2,599,000

* All unit prices reflect 2024 cost.

Name	JH-1				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 84" RCP	FT	1,380	$1,264	$ 1,744,000
2	Manhole	EA	3	$20,322	$ 61,000
3	Remove 66" RCP	FT	1,090	$99	$ 108,000
4	Remove 78" RCP	FT	290	$117	$ 34,000
5	Sawcut and Remove Existing AC Pavement	SF	13,340	$2.66	$ 35,000
6	Crushed Miscellaneous Base	SF	13,340	$4	$ 53,000
7	Replace Asphalt Concrete Pavement	SF	13,340	$2	$ 27,000
8	Traffic Control	%	5%		$ 103,000
9	Erosion Control	%	1%		$ 22,000
10	Mobilization/Demobilization	%	10%		$ 219,000
	SUBTOTAL (CONSTRUCTION)				$ 2,187,000
	Engineering and Design	%	10%		$ 219,000
	Surveying & Staking & Geotechnical	%	5%		$ 109,000
	Construction Management/Staff	%	10%		$ 219,000
	SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)				$ 547,000
	SUBTOTAL COST				$ 2,734,000
	CONTINGENCY			20%	$ 547,000
	TOTAL PROJECT				$ 3,281,000

* All unit prices reflect 2024 cost.

Name	JH-2				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 72" RCP	FT	1,930	$1,016	$ 1,961,000
2	Manhole	EA	5	$20,322	$ 102,000
3	Remove 69" RCP	FT	1,920	$103	$ 198,000
4	Sawcut and Remove Existing AC Pavement	SF	16,570	$2.66	$ 44,000
5	Crushed Miscellaneous Base	SF	16,570	$4	$ 66,000
6	Replace Asphalt Concrete Pavement	SF	16,570	$2	$ 33,000
7	Traffic Control	%	5%		$ 120,000
8	Erosion Control	%	1%		$ 25,000
9	Mobilization/Demobilization	%	10%		$ 255,000
			SUBTOTAL (CONSTRUCTION)		$ 2,549,000
	Engineering and Design	%	10%		$ 255,000
	Surveying & Staking & Geotechnical	%	5%		$ 127,000
	Construction Management/Staff	%	10%		$ 255,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 637,000
			SUBTOTAL COST		$ 3,186,000
			CONTINGENCY	20%	$ 637,000
			TOTAL PROJECT		$ 3,823,000

* All unit prices reflect 2024 cost.

Name	SR-1				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install Double 66" RCP	FT	1,560	$1,822	$ 2,842,000
2	Manhole	EA	4	$20,322	$ 81,000
3	Remove 54" RCP	FT	1,460	$80	$ 117,000
4	Sawcut and Remove Existing AC Pavement	SF	12,550	$2.66	$ 33,000
5	Crushed Miscellaneous Base	SF	12,550	$4	$ 50,000
6	Replace Asphalt Concrete Pavement	SF	12,550	$2	$ 25,000
7	Traffic Control	%	5%		$ 157,000
8	Erosion Control	%	1%		$ 33,000
9	Mobilization/Demobilization	%	10%		$ 334,000
			SUBTOTAL (CONSTRUCTION)		$ 3,338,000
	Engineering and Design	%	10%		$ 334,000
	Surveying & Staking & Geotechnical	%	5%		$ 167,000
	Construction Management/Staff	%	10%		$ 334,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 835,000
			SUBTOTAL COST		$ 4,173,000
			CONTINGENCY	20%	$ 835,000
			TOTAL PROJECT		$ 5,008,000

* All unit prices reflect 2024 cost.

Name	SR-2				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 78" RCP	FT	2,570	$1,133	$ 2,912,000
2	Install 84" RCP	FT	1,170	$1,264	$ 1,479,000
3	Install 14' x 6' RCB	FT	620	$7,627	$ 4,729,000
4	Manhole	EA	11	$20,322	$ 224,000
5	Remove 84" RCP	FT	580	$126	$ 73,000
6	Sawcut and Remove Existing AC Pavement	SF	39,720	$2.66	$ 106,000
7	Crushed Miscellaneous Base	SF	39,720	$4	$ 159,000
8	Replace Asphalt Concrete Pavement	SF	39,720	$2	$ 79,000
9	Traffic Control	%	5%		$ 488,000
10	Erosion Control	%	1%		$ 102,000
11	Mobilization/Demobilization	%	10%		$ 1,035,000
			SUBTOTAL (CONSTRUCTION)		$ 10,351,000
	Engineering and Design	%	10%		$ 1,035,000
	Surveying & Staking & Geotechnical	%	5%		$ 518,000
	Construction Management/Staff	%	10%		$ 1,035,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 2,588,000
			SUBTOTAL COST		$ 12,939,000
			CONTINGENCY	20%	$ 2,588,000
			TOTAL PROJECT		$ 15,527,000

* All unit prices reflect 2024 cost.

Name	SR-3				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 84" RCP	FT	460	$1,264	$ 581,000
2	Install 96" RCP	FT	2,260	$1,572	$ 3,553,000
3	Manhole	EA	7	$20,322	$ 142,000
4	Remove 72" RCP	FT	510	$108	$ 55,000
5	Remove 78" RCP	FT	290	$117	$ 34,000
6	Remove 84" RCP	FT	560	$126	$ 71,000
7	Sawcut and Remove Existing AC Pavement	SF	28,740	$2.66	$ 76,000
8	Crushed Miscellaneous Base	SF	28,740	$4	$ 115,000
9	Replace Asphalt Concrete Pavement	SF	28,740	$2	$ 57,000
10	Traffic Control	%	5%		$ 234,000
11	Erosion Control	%	1%		$ 49,000
12	Mobilization/Demobilization	%	10%		$ 497,000
			SUBTOTAL (CONSTRUCTION)		$ 4,967,000
	Engineering and Design	%	10%		$ 497,000
	Surveying & Staking & Geotechnical	%	5%		$ 248,000
	Construction Management/Staff	%	10%		$ 497,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 1,242,000
			SUBTOTAL COST		$ 6,209,000
			CONTINGENCY	20%	$ 1,242,000
			TOTAL PROJECT		$ 7,451,000

* All unit prices reflect 2024 cost.

Name	SR-4				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 8' x 5' RCB	FT	1,540	$2,150	$ 3,311,000
2	Manhole	EA	4	$20,322	$ 81,000
3	Remove 66" RCP	FT	1,440	$99	$ 143,000
4	Sawcut and Remove Existing AC Pavement	SF	10,780	$2.66	$ 29,000
5	Crushed Miscellaneous Base	SF	10,780	$4	$ 43,000
6	Replace Asphalt Concrete Pavement	SF	10,780	$2	$ 22,000
7	Traffic Control	%	5%		$ 181,000
8	Erosion Control	%	1%		$ 38,000
9	Mobilization/Demobilization	%	10%		$ 385,000
			SUBTOTAL (CONSTRUCTION)		$ 3,848,000
	Engineering and Design	%	10%		$ 385,000
	Surveying & Staking & Geotechnical	%	5%		$ 192,000
	Construction Management/Staff	%	10%		$ 385,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 962,000
			SUBTOTAL COST		$ 4,810,000
			CONTINGENCY	20%	$ 962,000
			TOTAL PROJECT		$ 5,772,000

* All unit prices reflect 2024 cost.

Name	SS-5				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 60" RCP	FT	2,150	$816	$ 1,754,000
2	Manhole	EA	5	$20,322	$ 102,000
3	Remove 42" RCP	FT	2,090	$62	$ 130,000
4	Sawcut and Remove Existing AC Pavement	SF	16,130	$2.66	$ 43,000
5	Crushed Miscellaneous Base	SF	16,130	$4	$ 65,000
6	Replace Asphalt Concrete Pavement	SF	16,130	$2	$ 32,000
7	Traffic Control	%	5%		$ 106,000
8	Erosion Control	%	1%		$ 22,000
9	Mobilization/Demobilization	%	10%		$ 225,000
			SUBTOTAL (CONSTRUCTION)		$ 2,254,000
	Engineering and Design	%	10%		$ 225,000
	Surveying & Staking & Geotechnical	%	5%		$ 113,000
	Construction Management/Staff	%	10%		$ 225,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 563,000
			SUBTOTAL COST		$ 2,817,000
			CONTINGENCY	20%	$ 563,000
			TOTAL PROJECT		$ 3,380,000

* All unit prices reflect 2024 cost.

Name	SS-6				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 60" RCP	FT	1,240	$816	$ 1,012,000
2	Manhole	EA	3	$20,322	$ 61,000
3	Remove 42" RCP	FT	920	$62	$ 57,000
4	Remove 48" RCP	FT	210	$71	$ 15,000
5	Sawcut and Remove Existing AC Pavement	SF	9,300	$2.66	$ 25,000
6	Crushed Miscellaneous Base	SF	9,300	$4	$ 37,000
7	Replace Asphalt Concrete Pavement	SF	9,300	$2	$ 19,000
8	Traffic Control	%	5%		$ 61,000
9	Erosion Control	%	1%		$ 13,000
10	Mobilization/Demobilization	%	10%		$ 130,000
			SUBTOTAL (CONSTRUCTION)		$ 1,300,000
	Engineering and Design	%	10%		$ 130,000
	Surveying & Staking & Geotechnical	%	5%		$ 65,000
	Construction Management/Staff	%	10%		$ 130,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 325,000
			SUBTOTAL COST		$ 1,625,000
			CONTINGENCY	20%	$ 325,000
			TOTAL PROJECT		$ 1,950,000

* All unit prices reflect 2024 cost.

Name	SS-7				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 66" RCP	FT	1,720	$911	$ 1,567,000
2	Manhole	EA	4	$20,322	$ 81,000
3	Remove 54" RCP	FT	1,210	$80	$ 97,000
4	Remove 60" RCP	FT	710	$89	$ 63,000
5	Sawcut and Remove Existing AC Pavement	SF	13,830	$2.66	$ 37,000
6	Crushed Miscellaneous Base	SF	13,830	$4	$ 55,000
7	Replace Asphalt Concrete Pavement	SF	13,830	$2	$ 28,000
8	Traffic Control	%	5%		$ 96,000
9	Erosion Control	%	1%		$ 20,000
10	Mobilization/Demobilization	%	10%		$ 204,000
			SUBTOTAL (CONSTRUCTION)		$ 2,044,000
	Engineering and Design	%	10%		$ 204,000
	Surveying & Staking & Geotechnical	%	5%		$ 102,000
	Construction Management/Staff	%	10%		$ 204,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 510,000
			SUBTOTAL COST		$ 2,554,000
			CONTINGENCY	20%	$ 511,000
			TOTAL PROJECT		$ 3,065,000

* All unit prices reflect 2024 cost.

Name	SS-8				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	590	$527	$ 311,000
2	Install 42" RCP	FT	1,300	$588	$ 764,000
3	Install 48" RCP	FT	580	$656	$ 380,000
4	Manhole	EA	6	$20,322	$ 122,000
5	Sawcut and Remove Existing AC Pavement	SF	14,510	$2.66	$ 39,000
6	Crushed Miscellaneous Base	SF	14,510	$4	$ 58,000
7	Replace Asphalt Concrete Pavement	SF	14,510	$2	$ 29,000
8	Traffic Control	%	5%		$ 85,000
9	Erosion Control	%	1%		$ 18,000
10	Mobilization/Demobilization	%	10%		$ 181,000
			SUBTOTAL (CONSTRUCTION)		$ 1,987,000
	Engineering and Design	%	10%		$ 199,000
	Surveying & Staking & Geotechnical	%	5%		$ 99,000
	Construction Management/Staff	%	10%		$ 199,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 497,000
			SUBTOTAL COST		$ 2,484,000
			CONTINGENCY +	25%	$ 621,000
			TOTAL PROJECT		$ 3,105,000

* All unit prices reflect 2024 cost.

+ Contingency increased to 25% due to major highway conflict

Name	SS-9				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 60" RCP	FT	1,550	$816	$ 1,265,000
2	Manhole	EA	4	$20,322	$ 81,000
3	Remove 42" RCP	FT	1,470	$62	$ 91,000
4	Sawcut and Remove Existing AC Pavement	SF	11,630	$2.66	$ 31,000
5	Crushed Miscellaneous Base	SF	11,630	$4	$ 47,000
6	Replace Asphalt Concrete Pavement	SF	11,630	$2	$ 23,000
7	Traffic Control	%	5%		$ 77,000
8	Erosion Control	%	1%		$ 16,000
9	Mobilization/Demobilization	%	10%		$ 163,000
			SUBTOTAL (CONSTRUCTION)		$ 1,631,000
	Engineering and Design	%	10%		$ 163,000
	Surveying & Staking & Geotechnical	%	5%		$ 82,000
	Construction Management/Staff	%	10%		$ 163,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 408,000
			SUBTOTAL COST		$ 2,039,000
			CONTINGENCY	20%	$ 408,000
			TOTAL PROJECT		$ 2,447,000

* All unit prices reflect 2024 cost.

Name	SS-9A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	930	$527	$ 490,000
2	Install 42" RCP	FT	480	$588	$ 282,000
3	Install 60" RCP	FT	1,220	$816	$ 996,000
4	Manhole	EA	7	$20,322	$ 142,000
5	Remove 42" RCP	FT	1,290	$62	$ 80,000
6	Sawcut and Remove Existing AC Pavement	SF	16,930	$2.66	$ 45,000
7	Crushed Miscellaneous Base	SF	16,930	$4	$ 68,000
8	Replace Asphalt Concrete Pavement	SF	16,930	$2	$ 34,000
9	Traffic Control	%	5%		$ 107,000
10	Erosion Control	%	1%		$ 22,000
11	Mobilization/Demobilization	%	10%		$ 227,000
			SUBTOTAL (CONSTRUCTION)		$ 1,990,000
	Engineering and Design	%	10%		$ 199,000
	Surveying & Staking & Geotechnical	%	5%		$ 100,000
	Construction Management/Staff	%	10%		$ 199,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 498,000
			SUBTOTAL COST		$ 2,488,000
			CONTINGENCY	20%	$ 498,000
			TOTAL PROJECT		$ 2,986,000

* All unit prices reflect 2024 cost.

Name	SS-10				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 66" RCP	FT	820	$911	$ 747,000
2	Manhole	EA	2	$20,322	$ 41,000
3	Remove 39" RCP	FT	770	$58	$ 45,000
4	Sawcut and Remove Existing AC Pavement	SF	6,590	$2.66	$ 18,000
5	Crushed Miscellaneous Base	SF	6,590	$4	$ 26,000
6	Replace Asphalt Concrete Pavement	SF	6,590	$2	$ 13,000
7	Traffic Control	%	5%		$ 45,000
8	Erosion Control	%	1%		$ 9,000
9	Mobilization/Demobilization	%	10%		$ 94,000
			SUBTOTAL (CONSTRUCTION)		$ 944,000
	Engineering and Design	%	10%		$ 94,000
	Surveying & Staking & Geotechnical	%	5%		$ 47,000
	Construction Management/Staff	%	10%		$ 94,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 235,000
			SUBTOTAL COST		$ 1,179,000
			CONTINGENCY	20%	$ 236,000
			TOTAL PROJECT		$ 1,415,000

* All unit prices reflect 2024 cost.

Name	SS-11				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 48" RCP	FT	460	$656	$ 302,000
2	Install 60" RCP	FT	1,200	$816	$ 979,000
3	Install 66" RCP	FT	620	$911	$ 565,000
4	Manhole	EA	6	$20,322	$ 122,000
5	Remove 36" RCP	FT	2,270	$53	$ 120,000
8	Sawcut and Remove Existing AC Pavement	SF	16,940	$2.66	$ 45,000
9	Crushed Miscellaneous Base	SF	16,940	$4	$ 68,000
10	Replace Asphalt Concrete Pavement	SF	16,940	$2	$ 34,000
11	Traffic Control	%	5%		$ 112,000
12	Erosion Control	%	1%		$ 23,000
13	Mobilization/Demobilization	%	10%		$ 237,000
			SUBTOTAL (CONSTRUCTION)		$ 2,370,000
	Engineering and Design	%	10%		$ 237,000
	Surveying & Staking & Geotechnical	%	5%		$ 119,000
	Construction Management/Staff	%	10%		$ 237,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 593,000
			SUBTOTAL COST		$ 2,963,000
			CONTINGENCY	20%	$ 593,000
			TOTAL PROJECT		$ 3,556,000

* All unit prices reflect 2024 cost.

AOS 3 Capital Project Cost Estimates

FONTANA
CALIFORNIA

DAVID EVANS
AND ASSOCIATES INC.

Project	Cost
A-0	$16,438,000.00
A-0A	$7,220,000.00
A-0B	$6,091,000.00
A-0C	$1,391,000.00
A-0D	$1,259,000.00
A-1	$2,042,000.00
A-1A	$1,799,000.00
A-2	$2,621,000.00
A-2A	$2,250,000.00
A-3	$16,535,000.00
A-3A	$2,359,000.00
A-3B	$1,996,000.00
A-3C	$6,606,000.00
A-4	$1,495,000.00
B-1	$2,709,000.00
B-2	$1,648,000.00
B-3	$911,000.00
B-5	$2,800,000.00
B-5A	$4,051,000.00
B-6	$235,000.00
B-7	$1,324,000.00
B-8	$1,886,000.00
C-0	$7,920,000.00
C-2	$1,951,000.00
C-4	$4,225,000.00
C-5	$2,776,000.00
C-6	$589,000.00
C-7	$4,623,000.00
C-8	$4,228,000.00
C-8A	$2,633,000.00
C-8B	$5,795,000.00
C-9	$12,900,000.00
HR-1	$4,127,000.00

Name	A-0				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 10' x9' RCB	FT	1,510	$5,252	$ 7,931,000
2	Manhole	EA	4	$20,322	$ 81,000
3	Remove 12' x 10' RCB	FT	1,510	$811	$ 1,225,000
4	Sawcut and Remove Existing AC Pavement	SF	18,120	$2.66	$ 48,000
5	Crushed Miscellaneous Base	SF	18,120	$4	$ 72,000
6	Replace Asphalt Concrete Pavement	SF	18,120	$2	$ 36,000
7	Traffic Control	%	5%		$ 470,000
8	Erosion Control	%	1%		$ 99,000
9	Mobilization/Demobilization	%	10%		$ 996,000
	SUBTOTAL (CONSTRUCTION)				$ 10,958,000
	Engineering and Design	%	10%		$ 1,096,000
	Surveying & Staking & Geotechnical	%	5%		$ 548,000
	Construction Management/Staff	%	10%		$ 1,096,000
	SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)				$ 2,740,000
	SUBTOTAL COST				$ 13,698,000
	CONTINGENCY			20%	$ 2,740,000
	TOTAL PROJECT				$ 16,438,000

* All unit prices reflect 2024 costs.

Name	A-0A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 84" RCP	FT	2,190	$1,264	$ 2,768,000
2	Install 90" RCP	FT	580	$1,409	$ 817,000
3	Manhole	EA	7	$20,322	$ 142,000
4	Sawcut and Remove Existing AC Pavement	SF	27,090	$2.66	$ 72,000
5	Crushed Miscellaneous Base	SF	27,090	$4	$ 108,000
6	Replace Asphalt Concrete Pavement	SF	27,090	$2	$ 54,000
7	Traffic Control	%	5%		$ 198,000
8	Erosion Control	%	1%		$ 42,000
9	Mobilization/Demobilization	%	10%		$ 420,000
	SUBTOTAL (CONSTRUCTION)				$ 4,621,000
	Engineering and Design	%	10%		$ 462,000
	Surveying & Staking & Geotechnical	%	5%		$ 231,000
	Construction Management/Staff	%	10%		$ 462,000
	SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)				$ 1,155,000
	SUBTOTAL COST				$ 5,776,000
	CONTINGENCY +			25%	$ 1,444,000
	TOTAL PROJECT				$ 7,220,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to SCG transmisson line conflict

Name	**A-0B**	100			
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 78" RCP	FT	780	$1,133	$ 884,000
2	Install 84" RCP	FT	1,790	$1,264	$ 2,263,000
3	Manhole	EA	6	$20,322	$ 122,000
4	Sawcut and Remove Existing AC Pavement	SF	24,420	$2.66	$ 65,000
5	Crushed Miscellaneous Base	SF	24,420	$4	$ 98,000
6	Replace Asphalt Concrete Pavement	SF	24,420	$2	$ 49,000
7	Traffic Control	%	5%		$ 174,000
8	Erosion Control	%	1%		$ 37,000
9	Mobilization/Demobilization	%	10%		$ 369,000
			SUBTOTAL (CONSTRUCTION)		$ 4,061,000
	Engineering and Design	%	10%		$ 406,000
	Surveying & Staking & Geotechnical	%	5%		$ 203,000
	Construction Management/Staff	%	10%		$ 406,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 1,015,000
			SUBTOTAL COST		$ 5,076,000
			CONTINGENCY	20%	$ 1,015,000
			TOTAL PROJECT		$ 6,091,000

* All unit prices reflect 2024 costs.

Name	A-0C				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	1,280	$527	$ 675,000
2	Manhole	EA	3	$20,322	$ 61,000
3	Sawcut and Remove Existing AC Pavement	SF	6,830	$2.66	$ 18,000
4	Crushed Miscellaneous Base	SF	6,830	$4	$ 27,000
5	Replace Asphalt Concrete Pavement	SF	6,830	$2	$ 14,000
6	Traffic Control	%	5%		$ 40,000
7	Erosion Control	%	1%		$ 8,000
8	Mobilization/Demobilization	%	10%		$ 84,000
	SUBTOTAL (CONSTRUCTION)				$ 927,000
	Engineering and Design	%	10%		$ 93,000
	Surveying & Staking & Geotechnical	%	5%		$ 46,000
	Construction Management/Staff	%	10%		$ 93,000
	SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)				$ 232,000
	SUBTOTAL COST				$ 1,159,000
	CONTINGENCY			20%	$ 232,000
	TOTAL PROJECT				$ 1,391,000

* All unit prices reflect 2024 costs.

Name	A-0D				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	480	$527	$ 253,000
2	Install 48" RCP	FT	550	$656	$ 361,000
3	Manhole	EA	3	$20,322	$ 61,000
4	Sawcut and Remove Existing AC Pavement	SF	5,790	$2.66	$ 15,000
5	Crushed Miscellaneous Base	SF	5,790	$4	$ 23,000
6	Replace Asphalt Concrete Pavement	SF	5,790	$2	$ 12,000
7	Traffic Control	%	5%		$ 36,000
8	Erosion Control	%	1%		$ 38,000
9	Mobilization/Demobilization	%	10%		$ 40,000
			SUBTOTAL (CONSTRUCTION)		$ 839,000
	Engineering and Design	%	10%		$ 84,000
	Surveying & Staking & Geotechnical	%	5%		$ 42,000
	Construction Management/Staff	%	10%		$ 84,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 210,000
			SUBTOTAL COST		$ 1,049,000
			CONTINGENCY	20%	$ 210,000
			TOTAL PROJECT		$ 1,259,000

* All unit prices reflect 2024 costs.

Name	A-1				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	670	$527	$ 353,000
2	Install 42" RCP	FT	1,100	$588	$ 647,000
3	Manhole	EA	4	$20,322	$ 81,000
4	Sawcut and Remove Existing AC Pavement	SF	10,040	$2.66	$ 27,000
5	Crushed Miscellaneous Base	SF	10,040	$4	$ 40,000
6	Replace Asphalt Concrete Pavement	SF	10,040	$2	$ 20,000
7	Traffic Control	%	5%		$ 58,000
8	Erosion Control	%	1%		$ 12,000
9	Mobilization/Demobilization	%	10%		$ 124,000
			SUBTOTAL (CONSTRUCTION)		$ 1,362,000
	Engineering and Design	%	10%		$ 136,000
	Surveying & Staking & Geotechnical	%	5%		$ 68,000
	Construction Management/Staff	%	10%		$ 136,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 340,000
			SUBTOTAL COST		$ 1,702,000
			CONTINGENCY	20%	$ 340,000
			TOTAL PROJECT		$ 2,042,000

* All unit prices reflect 2024 costs.

Name	A-1A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	800	$527	$ 422,000
2	Install 48" RCP	FT	690	$656	$ 453,000
3	Manhole	EA	4	$20,322	$ 81,000
4	Sawcut and Remove Existing AC Pavement	SF	8,320	$2.66	$ 22,000
5	Crushed Miscellaneous Base	SF	8,320	$4	$ 33,000
6	Replace Asphalt Concrete Pavement	SF	8,320	$2	$ 17,000
7	Traffic Control	%	5%		$ 51,000
8	Erosion Control	%	1%		$ 11,000
9	Mobilization/Demobilization	%	10%		$ 109,000
			SUBTOTAL (CONSTRUCTION)		$ 1,199,000
	Engineering and Design	%	10%		$ 120,000
	Surveying & Staking & Geotechnical	%	5%		$ 60,000
	Construction Management/Staff	%	10%		$ 120,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 300,000
			SUBTOTAL COST		$ 1,499,000
			CONTINGENCY	20%	$ 300,000
			TOTAL PROJECT		$ 1,799,000

* All unit prices reflect 2024 costs.

Name	A-2				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	890	$527	$ 469,000
2	Install 54" RCP	FT	1,130	$732	$ 827,000
3	Manhole	EA	5	$20,322	$ 102,000
4	Sawcut and Remove Existing AC Pavement	SF	11,390	$2.66	$ 30,000
5	Crushed Miscellaneous Base	SF	11,390	$4	$ 46,000
6	Replace Asphalt Concrete Pavement	SF	11,390	$2	$ 23,000
7	Traffic Control	%	5%		$ 75,000
8	Erosion Control	%	1%		$ 16,000
9	Mobilization/Demobilization	%	10%		$ 159,000
			SUBTOTAL (CONSTRUCTION)		$ 1,747,000
	Engineering and Design	%	10%		$ 175,000
	Surveying & Staking & Geotechnical	%	5%		$ 87,000
	Construction Management/Staff	%	10%		$ 175,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 437,000
			SUBTOTAL COST		$ 2,184,000
			CONTINGENCY	20%	$ 437,000
			TOTAL PROJECT		$ 2,621,000

* All unit prices reflect 2024 costs.

Name	A-2A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	850	$527	$ 448,000
2	Install 42" RCP	FT	120	$588	$ 71,000
3	Install 48" RCP	FT	870	$656	$ 571,000
4	Manhole	EA	5	$20,322	$ 102,000
5	Sawcut and Remove Existing AC Pavement	SF	10,820	$2.66	$ 29,000
6	Crushed Miscellaneous Base	SF	10,820	$4	$ 43,000
7	Replace Asphalt Concrete Pavement	SF	10,820	$2	$ 22,000
8	Traffic Control	%	5%		$ 64,000
9	Erosion Control	%	1%		$ 14,000
10	Mobilization/Demobilization	%	10%		$ 136,000
			SUBTOTAL (CONSTRUCTION)		$ 1,500,000
	Engineering and Design	%	10%		$ 150,000
	Surveying & Staking & Geotechnical	%	5%		$ 75,000
	Construction Management/Staff	%	10%		$ 150,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 375,000
			SUBTOTAL COST		$ 1,875,000
			CONTINGENCY	20%	$ 375,000
			TOTAL PROJECT		$ 2,250,000

* All unit prices reflect 2024 costs.

Name	A-3				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 90" RCP	FT	4,950	$1,409	$ 6,975,000
2	Install 96" RCP	FT	1,240	$1,572	$ 1,949,000
3	Manhole	EA	15	$20,322	$ 305,000
4	Sawcut and Remove Existing AC Pavement	SF	25,380	$2.66	$ 68,000
5	Crushed Miscellaneous Base	SF	25,380	$4	$ 102,000
6	Replace Asphalt Concrete Pavement	SF	25,380	$2	$ 51,000
7	Traffic Control	%	5%		$ 473,000
8	Erosion Control	%	1%		$ 99,000
9	Mobilization/Demobilization	%	10%		$ 1,002,000
			SUBTOTAL (CONSTRUCTION)		$ 11,024,000
	Engineering and Design	%	10%		$ 1,102,000
	Surveying & Staking & Geotechnical	%	5%		$ 551,000
	Construction Management/Staff	%	10%		$ 1,102,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 2,755,000
			SUBTOTAL COST		$ 13,779,000
			CONTINGENCY	20%	$ 2,756,000
			TOTAL PROJECT		$ 16,535,000

* All unit prices reflect 2024 costs.

Name	A-3A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	670	$527	$ 353,000
2	Install 42" RCP	FT	1,350	$588	$ 794,000
3	Manhole	EA	5	$20,322	$ 102,000
4	Sawcut and Remove Existing AC Pavement	SF	11,500	$2.66	$ 31,000
5	Crushed Miscellaneous Base	SF	11,500	$4	$ 46,000
6	Replace Asphalt Concrete Pavement	SF	11,500	$2	$ 23,000
7	Traffic Control	%	5%		$ 67,000
8	Erosion Control	%	1%		$ 14,000
9	Mobilization/Demobilization	%	10%		$ 143,000
			SUBTOTAL (CONSTRUCTION)		$ 1,573,000
	Engineering and Design	%	10%		$ 157,000
	Surveying & Staking & Geotechnical	%	5%		$ 79,000
	Construction Management/Staff	%	10%		$ 157,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 393,000
			SUBTOTAL COST		$ 1,966,000
			CONTINGENCY	20%	$ 393,000
			TOTAL PROJECT		$ 2,359,000

* All unit prices reflect 2024 costs.

Name	A-3B				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 96" RCP	FT	660	$1,572	$ 1,038,000
2	Manhole	EA	2	$20,322	$ 41,000
3	Sawcut and Remove Existing AC Pavement	SF	7,100	$2.66	$ 19,000
4	Crushed Miscellaneous Base	SF	7,100	$4	$ 28,000
5	Replace Asphalt Concrete Pavement	SF	7,100	$2	$ 14,000
6	Traffic Control	%	5%		$ 57,000
7	Erosion Control	%	1%		$ 12,000
8	Mobilization/Demobilization	%	10%		$ 121,000
			SUBTOTAL (CONSTRUCTION)		$ 1,330,000
	Engineering and Design	%	10%		$ 133,000
	Surveying & Staking & Geotechnical	%	5%		$ 67,000
	Construction Management/Staff	%	10%		$ 133,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 333,000
			SUBTOTAL COST		$ 1,663,000
			CONTINGENCY	20%	$ 333,000
			TOTAL PROJECT		$ 1,996,000

* All unit prices reflect 2024 costs.

Name	A-3C				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 66" RCP	FT	3,510	$911	$ 3,198,000
2	Manhole	EA	9	$20,322	$ 183,000
3	Sawcut and Remove Existing AC Pavement	SF	28,230	$2.66	$ 75,000
4	Crushed Miscellaneous Base	SF	28,230	$4	$ 113,000
5	Replace Asphalt Concrete Pavement	SF	28,230	$2	$ 56,000
6	Traffic Control	%	5%		$ 181,000
7	Erosion Control	%	1%		$ 38,000
8	Mobilization/Demobilization	%	10%		$ 384,000
			SUBTOTAL (CONSTRUCTION)		$ 4,228,000
	Engineering and Design	%	10%		$ 423,000
	Surveying & Staking & Geotechnical	%	5%		$ 211,000
	Construction Management/Staff	%	10%		$ 423,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 1,057,000
			SUBTOTAL COST		$ 5,285,000
			CONTINGENCY +	25%	$ 1,321,000
			TOTAL PROJECT		$ 6,606,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to SCG transmisson line conflict

Name	A-4				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	670	$527	$ 353,000
2	Install 42" RCP	FT	640	$588	$ 376,000
3	Manhole	EA	3	$20,322	$ 61,000
4	Sawcut and Remove Existing AC Pavement	SF	7,330	$2.66	$ 19,000
5	Crushed Miscellaneous Base	SF	7,330	$4	$ 29,000
6	Replace Asphalt Concrete Pavement	SF	7,330	$2	$ 15,000
7	Traffic Control	%	5%		$ 43,000
8	Erosion Control	%	1%		$ 9,000
9	Mobilization/Demobilization	%	10%		$ 91,000
	SUBTOTAL (CONSTRUCTION)				$ 996,000
	Engineering and Design	%	10%		$ 100,000
	Surveying & Staking & Geotechnical	%	5%		$ 50,000
	Construction Management/Staff	%	10%		$ 100,000
	SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)				$ 250,000
	SUBTOTAL COST				$ 1,246,000
	CONTINGENCY			20%	$ 249,000
	TOTAL PROJECT				$ 1,495,000

* All unit prices reflect 2024 costs.

Name	B-1				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	410	$527	$ 216,000
2	Install 42" RCP	FT	870	$588	$ 512,000
3	Install 42" RCP	FT	110	$588	$ 65,000
4	Install 54" RCP	FT	560	$732	$ 410,000
5	Install 54" RCP	FT	100	$732	$ 73,000
6	Manhole	EA	5	$20,322	$ 102,000
7	Sawcut and Remove Existing AC Pavement	SF	12,540	$2.66	$ 33,000
8	Crushed Miscellaneous Base	SF	12,540	$4	$ 50,000
9	Replace Asphalt Concrete Pavement	SF	12,540	$2	$ 25,000
10	Traffic Control	%	5%		$ 74,000
11	Erosion Control	%	1%		$ 16,000
12	Mobilization/Demobilization	%	10%		$ 158,000
			SUBTOTAL (CONSTRUCTION)		$ 1,734,000
	Engineering and Design	%	10%		$ 173,000
	Surveying & Staking & Geotechnical	%	5%		$ 87,000
	Construction Management/Staff	%	10%		$ 173,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 433,000
			SUBTOTAL COST		$ 2,167,000
			CONTINGENCY +	25%	$ 542,000
			TOTAL PROJECT		$ 2,709,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	B-2				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 48" RCP	FT	1,150	$656	$ 754,000
2	Manhole	EA	3	$20,322	$ 61,000
3	Remove 36" RCP	FT	1,150	$53	$ 61,000
4	Sawcut and Remove Existing AC Pavement	SF	7,380	$2.66	$ 20,000
5	Crushed Miscellaneous Base	SF	7,380	$4	$ 30,000
6	Replace Asphalt Concrete Pavement	SF	7,380	$2	$ 15,000
7	Traffic Control	%	5%		$ 47,000
8	Erosion Control	%	1%		$ 10,000
9	Mobilization/Demobilization	%	10%		$ 100,000
			SUBTOTAL (CONSTRUCTION)		$ 1,098,000
	Engineering and Design	%	10%		$ 110,000
	Surveying & Staking & Geotechnical	%	5%		$ 55,000
	Construction Management/Staff	%	10%		$ 110,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 275,000
			SUBTOTAL COST		$ 1,373,000
			CONTINGENCY	20%	$ 275,000
			TOTAL PROJECT		$ 1,648,000

* All unit prices reflect 2024 costs.

Name	B-3				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	400	$527	$ 211,000
2	Install 42" RCP	FT	360	$588	$ 212,000
3	Manhole	EA	2	$20,322	$ 41,000
4	Sawcut and Remove Existing AC Pavement	SF	4,250	$2.66	$ 11,000
5	Crushed Miscellaneous Base	SF	4,250	$4	$ 17,000
6	Replace Asphalt Concrete Pavement	SF	4,250	$2	$ 9,000
7	Traffic Control	%	5%		$ 25,000
8	Erosion Control	%	1%		$ 5,000
9	Mobilization/Demobilization	%	10%		$ 53,000
			SUBTOTAL (CONSTRUCTION)		$ 584,000
	Engineering and Design	%	10%		$ 58,400
	Surveying & Staking & Geotechnical	%	5%		$ 29,000
	Construction Management/Staff	%	10%		$ 58,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 145,000
			SUBTOTAL COST		$ 729,000
			CONTINGENCY +	25%	$ 182,000
			TOTAL PROJECT		$ 911,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to SCG transmisson line conflict

Name	B-5				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 72" RCP	FT	1,240	$1,016	$ 1,260,000
2	Manhole	EA	3	$20,322	$ 61,000
3	Remove 66" RCP	FT	1,240	$99	$ 123,000
4	Sawcut and Remove Existing AC Pavement	SF	10,640	$2.66	$ 28,000
5	Crushed Miscellaneous Base	SF	10,640	$4	$ 43,000
6	Replace Asphalt Concrete Pavement	SF	10,640	$2	$ 21,000
7	Traffic Control	%	5%		$ 77,000
8	Erosion Control	%	1%		$ 16,000
9	Mobilization/Demobilization	%	10%		$ 163,000
			SUBTOTAL (CONSTRUCTION)		$ 1,792,000
	Engineering and Design	%	10%		$ 179,000
	Surveying & Staking & Geotechnical	%	5%		$ 90,000
	Construction Management/Staff	%	10%		$ 179,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 448,000
			SUBTOTAL COST		$ 2,240,000
			CONTINGENCY +	25%	$ 560,000
			TOTAL PROJECT		$ 2,800,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to 12' water main and SCG transmisson line conflict

Name	B-5A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	660	$527	$ 348,000
2	Install 42" RCP	FT	1,050	$588	$ 617,000
3	Install 48" RCP	FT	1,550	$656	$ 1,017,000
4	Manhole	EA	8	$20,322	$ 163,000
5	Sawcut and Remove Existing AC Pavement	SF	19,630	$2.66	$ 52,000
6	Crushed Miscellaneous Base	SF	19,630	$4	$ 79,000
7	Replace Asphalt Concrete Pavement	SF	19,630	$2	$ 39,000
8	Traffic Control	%	5%		$ 116,000
9	Erosion Control	%	1%		$ 24,000
10	Mobilization/Demobilization	%	10%		$ 246,000
			SUBTOTAL (CONSTRUCTION)		$ 2,701,000
	Engineering and Design	%	10%		$ 270,000
	Surveying & Staking & Geotechnical	%	5%		$ 135,000
	Construction Management/Staff	%	10%		$ 270,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 675,000
			SUBTOTAL COST		$ 3,376,000
			CONTINGENCY	20%	$ 675,000
			TOTAL PROJECT		$ 4,051,000

* All unit prices reflect 2024 costs.

Name	B-6				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	200	$527	$ 105,000
2	Manhole	EA	1	$20,322	$ 20,000
3	Sawcut and Remove Existing AC Pavement	SF	1,070	$2.66	$ 3,000
4	Crushed Miscellaneous Base	SF	1,070	$4	$ 4,000
5	Replace Asphalt Concrete Pavement	SF	1,070	$2	$ 2,000
6	Traffic Control	%	5%		$ 7,000
7	Erosion Control	%	1%		$ 1,000
8	Mobilization/Demobilization	%	10%		$ 14,000
			SUBTOTAL (CONSTRUCTION)		$ 156,000
	Engineering and Design	%	10%		$ 15,600
	Surveying & Staking & Geotechnical	%	5%		$ 8,000
	Construction Management/Staff	%	10%		$ 16,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 40,000
			SUBTOTAL COST		$ 196,000
			CONTINGENCY	20%	$ 39,000
			TOTAL PROJECT		$ 235,000

* All unit prices reflect 2024 costs.

Name	B-7				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	500	$527	$ 264,000
2	Install 42" RCP	FT	640	$588	$ 376,000
3	Manhole	EA	3	$20,322	$ 61,000
4	Sawcut and Remove Existing AC Pavement	SF	6,430	$2.66	$ 17,000
5	Crushed Miscellaneous Base	SF	6,430	$4	$ 26,000
6	Replace Asphalt Concrete Pavement	SF	6,430	$2	$ 13,000
7	Traffic Control	%	5%		$ 38,000
8	Erosion Control	%	1%		$ 8,000
9	Mobilization/Demobilization	%	10%		$ 80,000
			SUBTOTAL (CONSTRUCTION)		$ 883,000
	Engineering and Design	%	10%		$ 88,000
	Surveying & Staking & Geotechnical	%	5%		$ 44,000
	Construction Management/Staff	%	10%		$ 88,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 220,000
			SUBTOTAL COST		$ 1,103,000
			CONTINGENCY	20%	$ 221,000
			TOTAL PROJECT		$ 1,324,000

* All unit prices reflect 2024 costs.

Name	B-8				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	520	$527	$ 274,000
2	Install 48" RCP	FT	990	$656	$ 649,000
3	Manhole	EA	4	$20,322	$ 81,000
4	Sawcut and Remove Existing AC Pavement	SF	8,590	$2.66	$ 23,000
5	Crushed Miscellaneous Base	SF	8,590	$4	$ 34,000
6	Replace Asphalt Concrete Pavement	SF	8,590	$2	$ 17,000
7	Traffic Control	%	5%		$ 54,000
8	Erosion Control	%	1%		$ 11,000
9	Mobilization/Demobilization	%	10%		$ 114,000
			SUBTOTAL (CONSTRUCTION)		$ 1,257,000
	Engineering and Design	%	10%		$ 126,000
	Surveying & Staking & Geotechnical	%	5%		$ 63,000
	Construction Management/Staff	%	10%		$ 126,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 315,000
			SUBTOTAL COST		$ 1,572,000
			CONTINGENCY	20%	$ 314,000
			TOTAL PROJECT		$ 1,886,000

* All unit prices reflect 2024 costs.

Name	C-0				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 60" RCP	FT	1,300	$816	$ 1,061,000
2	Install 72" RCP	FT	2,590	$1,016	$ 2,631,000
3	Manhole	EA	10	$20,322	$ 203,000
4	Remove 60" RCP	FT	3,030	$89	$ 270,000
5	Remove 66" RCP	FT	850	$99	$ 84,000
6	Sawcut and Remove Existing AC Pavement	SF	31,980	$2.66	$ 85,000
7	Crushed Miscellaneous Base	SF	31,980	$4	$ 128,000
8	Replace Asphalt Concrete Pavement	SF	31,980	$2	$ 64,000
9	Traffic Control	%	5%		$ 226,000
10	Erosion Control	%	1%		$ 48,000
11	Mobilization/Demobilization	%	10%		$ 480,000
			SUBTOTAL (CONSTRUCTION)		$ 5,280,000
	Engineering and Design	%	10%		$ 528,000
	Surveying & Staking & Geotechnical	%	5%		$ 264,000
	Construction Management/Staff	%	10%		$ 528,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 1,320,000
			SUBTOTAL COST		$ 6,600,000
			CONTINGENCY	20%	$ 1,320,000
			TOTAL PROJECT		$ 7,920,000

* All unit prices reflect 2024 costs.

Name	C-2				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 66" RCP	FT	430	$911	$ 392,000
2	Install 72" RCP	FT	520	$1,016	$ 528,000
3	Manhole	EA	2	$20,322	$ 41,000
4	Remove 60" RCP	FT	950	$89	$ 85,000
5	Sawcut and Remove Existing AC Pavement	SF	7,920	$2.66	$ 21,000
6	Crushed Miscellaneous Base	SF	7,920	$4	$ 32,000
7	Replace Asphalt Concrete Pavement	SF	7,920	$2	$ 16,000
8	Traffic Control	%	5%		$ 56,000
9	Erosion Control	%	1%		$ 12,000
10	Mobilization/Demobilization	%	10%		$ 118,000
			SUBTOTAL (CONSTRUCTION)		$ 1,301,000
	Engineering and Design	%	10%		$ 130,000
	Surveying & Staking & Geotechnical	%	5%		$ 65,000
	Construction Management/Staff	%	10%		$ 130,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 325,000
			SUBTOTAL COST		$ 1,626,000
			CONTINGENCY	20%	$ 325,000
			TOTAL PROJECT		$ 1,951,000

* All unit prices reflect 2024 costs.

Name	C-4				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 60" RCP	FT	1,210	$816	$ 987,000
2	Install 66" RCP	FT	400	$911	$ 364,000
3	Install 72" RCP	FT	630	$1,016	$ 640,000
4	Manhole	EA	6	$20,322	$ 122,000
5	Remove 42" RCP	FT	1,240	$62	$ 77,000
6	Remove 54" RCP	FT	890	$80	$ 71,000
7	Sawcut and Remove Existing AC Pavement	SF	17,700	$2.66	$ 47,000
8	Crushed Miscellaneous Base	SF	17,700	$4	$ 71,000
9	Replace Asphalt Concrete Pavement	SF	17,700	$2	$ 35,000
10	Traffic Control	%	5%		$ 121,000
11	Erosion Control	%	1%		$ 25,000
12	Mobilization/Demobilization	%	10%		$ 256,000
			SUBTOTAL (CONSTRUCTION)		$ 2,816,000
	Engineering and Design	%	10%		$ 282,000
	Surveying & Staking & Geotechnical	%	5%		$ 141,000
	Construction Management/Staff	%	10%		$ 282,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 705,000
			SUBTOTAL COST		$ 3,521,000
			CONTINGENCY	20%	$ 704,000
			TOTAL PROJECT		$ 4,225,000

* All unit prices reflect 2024 costs.

Name	C-5				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 60" RCP	FT	1,600	$816	$ 1,306,000
2	Manhole	EA	4	$20,322	$ 81,000
3	Remove 42" RCP	FT	1,540	$62	$ 95,000
4	Sawcut and Remove Existing AC Pavement	SF	12,000	$2.66	$ 32,000
5	Crushed Miscellaneous Base	SF	12,000	$4	$ 48,000
6	Replace Asphalt Concrete Pavement	SF	12,000	$2	$ 24,000
7	Traffic Control	%	5%		$ 79,000
8	Erosion Control	%	1%		$ 17,000
9	Mobilization/Demobilization	%	10%		$ 168,000
			SUBTOTAL (CONSTRUCTION)		$ 1,850,000
	Engineering and Design	%	10%		$ 185,000
	Surveying & Staking & Geotechnical	%	5%		$ 93,000
	Construction Management/Staff	%	10%		$ 185,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 463,000
			SUBTOTAL COST		$ 2,313,000
			CONTINGENCY	20%	$ 463,000
			TOTAL PROJECT		$ 2,776,000

* All unit prices reflect 2024 costs.

Name	C-6				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 42" RCP	FT	450	$588	$ 265,000
2	Manhole	EA	1	$20,322	$ 20,000
3	Remove 36" RCP	FT	520	$53	$ 28,000
4	Sawcut and Remove Existing AC Pavement	SF	2,640	$2.66	$ 7,000
5	Crushed Miscellaneous Base	SF	2,640	$4	$ 11,000
6	Replace Asphalt Concrete Pavement	SF	2,640	$2	$ 5,000
7	Traffic Control	%	5%		$ 17,000
8	Erosion Control	%	1%		$ 4,000
9	Mobilization/Demobilization	%	10%		$ 36,000
	SUBTOTAL (CONSTRUCTION)				$ 393,000
	Engineering and Design	%	10%		$ 39,300
	Surveying & Staking & Geotechnical	%	5%		$ 20,000
	Construction Management/Staff	%	10%		$ 39,000
	SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)				$ 98,000
	SUBTOTAL COST				$ 491,000
	CONTINGENCY			20%	$ 98,000
	TOTAL PROJECT				$ 589,000

* All unit prices reflect 2024 costs.

Name	C-7				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 72" RCP	FT	2,060	$1,016	$ 2,093,000
2	Manhole	EA	5	$20,322	$ 102,000
3	Remove 60" RCP	FT	1,470	$89	$ 131,000
4	Remove 66" RCP	FT	570	$99	$ 56,000
5	Sawcut and Remove Existing AC Pavement	SF	17,680	$2.66	$ 47,000
6	Crushed Miscellaneous Base	SF	17,680	$4	$ 71,000
7	Replace Asphalt Concrete Pavement	SF	17,680	$2	$ 35,000
8	Traffic Control	%	5%		$ 127,000
9	Erosion Control	%	1%		$ 27,000
10	Mobilization/Demobilization	%	10%		$ 269,000
			SUBTOTAL (CONSTRUCTION)		$ 2,958,000
	Engineering and Design	%	10%		$ 296,000
	Surveying & Staking & Geotechnical	%	5%		$ 148,000
	Construction Management/Staff	%	10%		$ 296,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 740,000
			SUBTOTAL COST		$ 3,698,000
			CONTINGENCY +	25%	$ 925,000
			TOTAL PROJECT		$ 4,623,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to 12' water main and SCG transmisson line conflict

Name	C-8				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 78" RCP	FT	1,830	$1,133	$ 2,073,000
2	Manhole	EA	5	$20,322	$ 102,000
3	Sawcut and Remove Existing AC Pavement	SF	16,700	$2.66	$ 44,000
4	Crushed Miscellaneous Base	SF	16,700	$4	$ 67,000
5	Replace Asphalt Concrete Pavement	SF	16,700	$2	$ 33,000
6	Traffic Control	%	5%		$ 116,000
7	Erosion Control	%	1%		$ 24,000
8	Mobilization/Demobilization	%	10%		$ 246,000
			SUBTOTAL (CONSTRUCTION)		$ 2,705,000
	Engineering and Design	%	10%		$ 271,000
	Surveying & Staking & Geotechnical	%	5%		$ 135,000
	Construction Management/Staff	%	10%		$ 271,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 677,000
			SUBTOTAL COST		$ 3,382,000
			CONTINGENCY +	25%	$ 846,000
			TOTAL PROJECT		$ 4,228,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	C-8A				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	1,330	$527	$ 701,000
2	Manhole	EA	3	$20,322	$ 61,000
3	Sawcut and Remove Existing AC Pavement	SF	7,090	$2.66	$ 19,000
4	Crushed Miscellaneous Base	SF	7,090	$4	$ 28,000
5	Replace Asphalt Concrete Pavement	SF	7,090	$2	$ 14,000
6	Traffic Control	%	5%		$ 41,000
7	Erosion Control	%	1%		$ 9,000
8	Mobilization/Demobilization	%	10%		$ 87,000
			SUBTOTAL (CONSTRUCTION)		$ 960,000
	Engineering and Design	%	10%		$ 1,002,000
	Surveying & Staking & Geotechnical	%	5%		$ 48,000
	Construction Management/Staff	%	10%		$ 96,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 1,146,000
			SUBTOTAL COST		$ 2,106,000
			CONTINGENCY +	25%	$ 527,000
			TOTAL PROJECT		$ 2,633,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	C-8B				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 36" RCP	FT	660	$527	$ 348,000
2	Install 42" RCP	FT	1,080	$588	$ 635,000
3	Install 48" RCP	FT	1,450	$656	$ 951,000
4	Install 54" RCP	FT	1,080	$732	$ 791,000
5	Manhole	EA	11	$20,322	$ 224,000
6	Sawcut and Remove Existing AC Pavement	SF	26,680	$2.66	$ 71,000
7	Crushed Miscellaneous Base	SF	26,680	$4	$ 107,000
8	Replace Asphalt Concrete Pavement	SF	26,680	$2	$ 53,000
9	Traffic Control	%	5%		$ 159,000
10	Erosion Control	%	1%		$ 33,000
11	Mobilization/Demobilization	%	10%		$ 337,000
			SUBTOTAL (CONSTRUCTION)		$ 3,709,000
	Engineering and Design	%	10%		$ 371,000
	Surveying & Staking & Geotechnical	%	5%		$ 185,000
	Construction Management/Staff	%	10%		$ 371,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 927,000
			SUBTOTAL COST		$ 4,636,000
			CONTINGENCY +	25%	$ 1,159,000
			TOTAL PROJECT		$ 5,795,000

* All unit prices reflect 2024 costs.

+ Contingency increased to 25% due to major highway conflict

Name	C-9				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 12' x 9' RCB	FT	920	$7,251	$ 6,671,000
2	Manhole	EA	2	$20,322	$ 41,000
3	Remove 12' x 9' RCB	FT	790	$725	$ 573,000
4	Sawcut and Remove Existing AC Pavement	SF	10,120	$2.66	$ 27,000
5	Crushed Miscellaneous Base	SF	10,120	$4	$ 40,000
6	Replace Asphalt Concrete Pavement	SF	10,120	$2	$ 20,000
7	Traffic Control	%	5%		$ 369,000
8	Erosion Control	%	1%		$ 77,000
9	Mobilization/Demobilization	%	10%		$ 782,000
			SUBTOTAL (CONSTRUCTION)		$ 8,600,000
	Engineering and Design	%	10%		$ 860,000
	Surveying & Staking & Geotechnical	%	5%		$ 430,000
	Construction Management/Staff	%	10%		$ 860,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 2,150,000
			SUBTOTAL COST		$ 10,750,000
			CONTINGENCY	20%	$ 2,150,000
			TOTAL PROJECT		$ 12,900,000

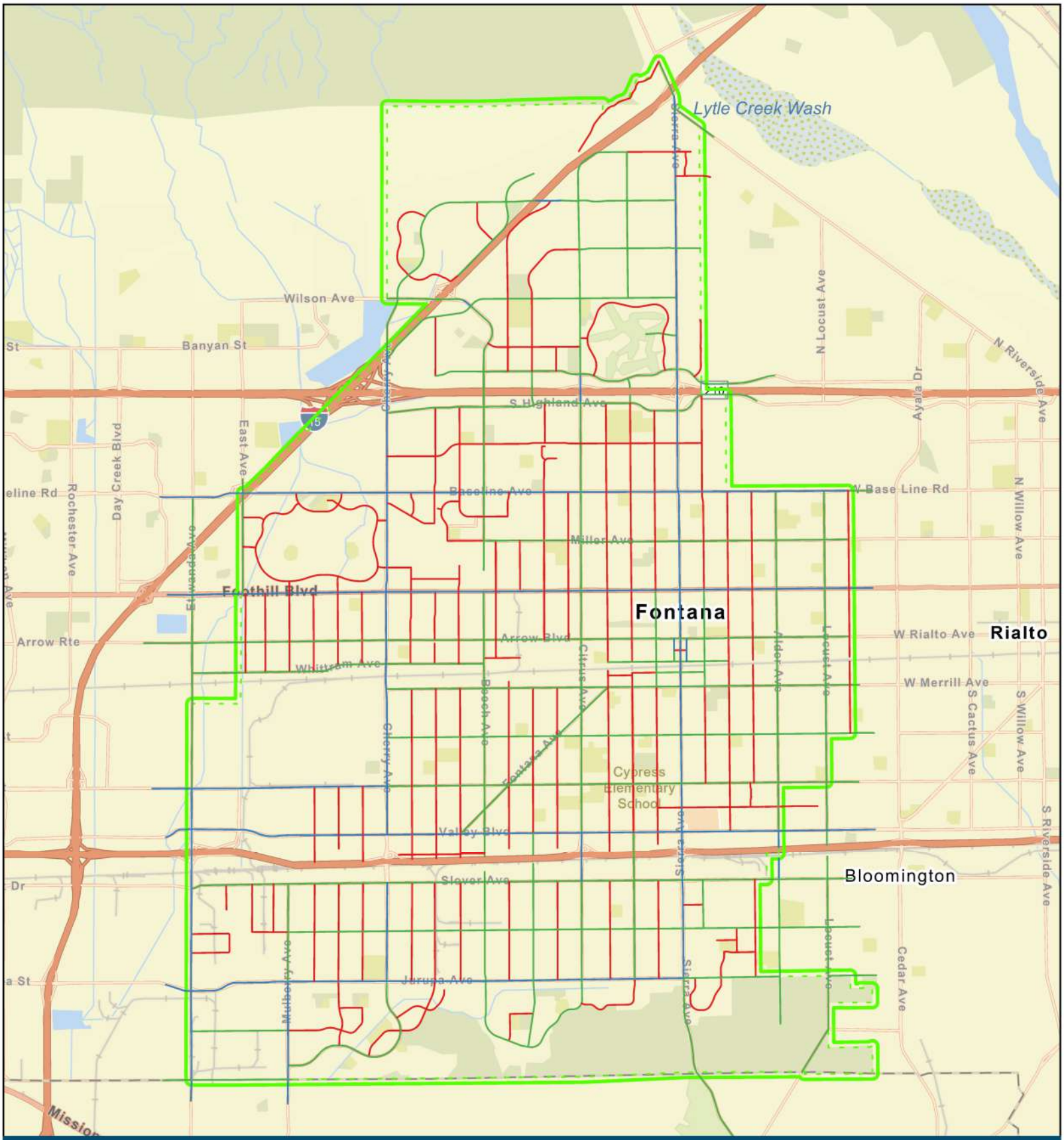
* All unit prices reflect 2024 costs.

Name	HR-1				
Item No.	Item Description	Project Total			
		Units	Quantities	Unit Price *	Item Total
1	Install 96" RCP	FT	1,380	$1,572	$ 2,169,000
2	Manhole	EA	3	$20,322	$ 61,000
3	Sawcut and Remove Existing AC Pavement	SF	14,840	$2.66	$ 39,000
4	Crushed Miscellaneous Base	SF	14,840	$4	$ 59,000
5	Replace Asphalt Concrete Pavement	SF	14,840	$2	$ 30,000
6	Traffic Control	%	5%		$ 118,000
7	Erosion Control	%	1%		$ 25,000
8	Mobilization/Demobilization	%	10%		$ 250,000
			SUBTOTAL (CONSTRUCTION)		$ 2,751,000
	Engineering and Design	%	10%		$ 275,000
	Surveying & Staking & Geotechnical	%	5%		$ 138,000
	Construction Management/Staff	%	10%		$ 275,000
			SUBTOTAL (ENGINEERING AND CONSTRUCTION ADMINISTRATION)		$ 688,000
			SUBTOTAL COST		$ 3,439,000
			CONTINGENCY	20%	$ 688,000
			TOTAL PROJECT		$ 4,127,000

* All unit prices reflect 2024 costs.

APPENDIX 4 CAPITAL PROJECT COST ESTIMATES

APPENDIX 5 CAPITAL PROJECT PRIORITIZATION TABLE



Legend

- Collector Street
- Primary Highway
- Major Highway
- Fontana Sphere of Influence

N

0 3,750 7,500 15,000 Feet

Road Hierarchy
City of Fontana Master Plan

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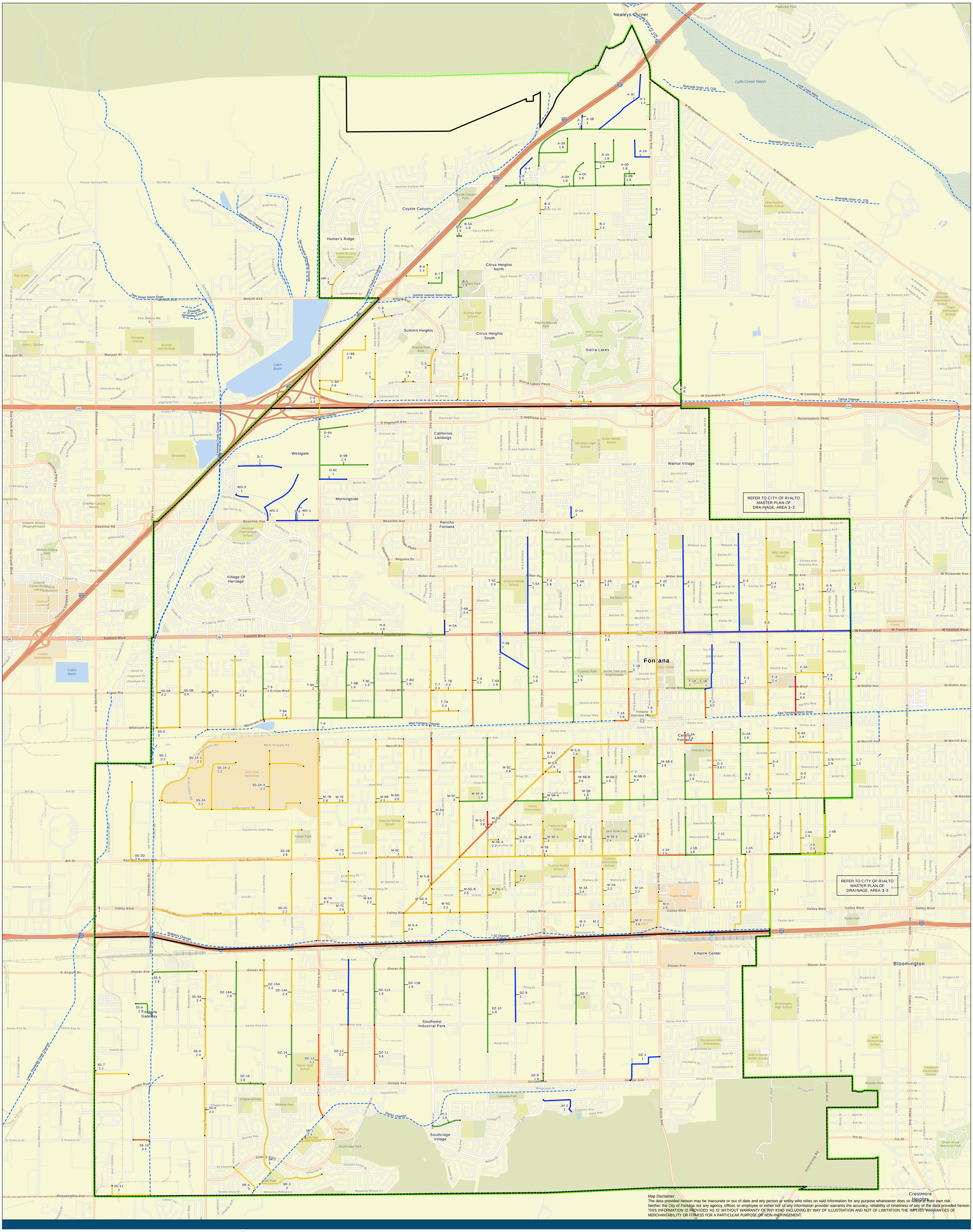
CIP Prioritization

FONTANA
CALIFORNIA

DAVID EVANS
AND ASSOCIATES INC.



Capital Improvement Project Prioritization Scores

All Areas of Study

FONTANA CALIFORNIA

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CIP Prioritization Calculations

FONTANA
CALIFORNIA

DAVID EVANS
AND ASSOCIATES INC.

AOS 1 Project Prioritization						
Project Name	AOS #	DS/US Priority	Known Flooded Areas Priority	Depth of Flooding Priority	Road Hierarchy Priority	Weighted Score
D-1A	1	1	1	1	1	1.0
D-6	1	1	1	1	1	1.0
D-6A	1	1	1	1	3	1.4
D-6B	1	1	1	1	3	1.4
D-6C	1	1	1	1	1	1.0
D-7	1	1	1	1	1	1.0
E-0	1	1	1	1	1	1.0
E-1	1	1	1	1	1	1.0
E-2	1	1	1	1	3	1.4
E-3	1	1	1	1	1	1.0
E-4	1	1	1	3	5	2.2
E-5	1	1	1	1	5	1.8
E-6	1	1	1	3	5	2.2
E-7	1	1	1	1	1	1.0
F-1	1	3	1	5	5	3.2
F-1A	1	1	1	2	5	2.0
F-1B	1	1	1	1	1	1.0
F-2	1	1	1	1	1	1.0
F-3	1	3	1	1	5	2.4
F-4	1	3	5	5	5	4.4
F-5	1	3	1	1	5	2.4
F-5A	1	1	5	1	5	3.0
F-6	1	3	1	3	1	2.0
G-0	1	3	1	1	1	1.6
G-1	1	3	1	1	1	1.6
G-2	1	3	5	1	5	3.6
G-2A	1	3	5	1	5	3.6
G-3	1	3	1	1	1	1.6
G-4	1	3	1	4	5	3.0
G-4A	1	3	1	1	1	1.6
G-5	1	3	1	1	5	2.4
G-6	1	3	1	3	5	2.8
G-6A	1	3	1	1	5	2.4
G-7	1	3	1	1	1	1.6
H-0	1	3	1	1	1	1.6
H-0A	1	1	1	1	1	1.0
J-1	1	5	1	1	1	2.2
J-1A	1	3	5	1	5	3.6
J-1B	1	3	1	1	1	1.6
J-1C	1	3	1	3	1	2.0
J-2	1	5	1	1	1	2.2
J-2A	1	3	1	2	1	1.8
J-3	1	5	1	1	5	3.0
J-3A	1	3	1	1	5	2.4
J-4	1	3	1	1	5	2.4
J-4A	1	3	1	1	5	2.4
J-4B	1	3	1	4	5	3.0
M-0	1	5	1	1	3	2.6
M-1	1	5	1	1	3	2.6
M-1A	1	5	1	1	1	2.2
M-2	1	5	1	1	5	3.0
M-2A	1	5	1	1	1	2.2
M-3	1	5	1	1	1	2.2
M-3A	1	5	5	1	1	3.4
M-4	1	5	1	1	1	2.2
M-5A	1	3	1	1	5	2.4
M-5-A	1	5	1	5	1	3.0
M-5B	1	3	5	2	5	3.8
M-5-B	1	5	1	2	1	2.4
M-5B-A	1	3	1	1	5	2.4
M-5B-B	1	3	1	1	5	2.4
M-5B-C	1	3	1	1	1	1.6
M-5B-D	1	3	1	1	1	1.6
M-5B-E	1	3	5	1	5	3.6
M-5C	1	3	1	1	1	1.6
M-5-C	1	5	1	2	1	2.4
M-5D	1	3	1	2	1	1.8
M-5-D	1	3	5	1	1	2.8
M-5E	1	5	5	1	5	4.2
M-5-E	1	3	1	1	5	2.4
M-5E-A	1	5	1	1	1	2.2
M-5E-B	1	5	1	1	1	2.2
M-5E-C	1	5	1	1	5	3.0

M-5E-D	1	3	5	1	1	2.8
M-5E-E	1	3	1	1	5	2.4
M-5E-F	1	3	1	1	5	2.4
M-5F	1	5	1	1	5	3.0
M-5F-A	1	3	1	1	1	1.6
M-5G	1	5	1	1	1	2.2
M-5G-A	1	5	1	1	3	2.6
M-5G-B	1	5	1	1	3	2.6
M-5G-C	1	5	1	1	1	2.2
M-5H	1	5	1	2	5	3.2
M-6A	1	5	1	1	1	2.2
M-6B	1	5	1	1	1	2.2
M-6C	1	5	1	1	5	3.0
M-6D	1	5	1	3	1	2.6
M-7A	1	5	1	1	3	2.6
M-7B	1	5	1	2	3	2.8
M-7C	1	5	1	1	3	2.6
M-7D	1	5	1	1	1	2.2
M-7E	1	5	1	3	1	2.6
SS-0	1	5	1	1	5	3.0
SS-0A	1	5	1	1	1	2.2
SS-0B	1	3	1	1	5	2.4
SS-1	1	5	1	1	1	2.2
SS-2A	1	5	1	1	1	2.2
SS-2A-1	1	5	1	1	1	2.2
SS-2A-2	1	5	1	1	1	2.2
SS-2A-3	1	5	1	1	1	2.2
SS-2B	1	5	1	1	3	2.6
SS-2C	1	5	1	1	1	2.2
SS-2D	1	5	1	1	3	2.6
T-0	1	1	5	1	5	3.0
T-10	1	5	1	1	1	2.2
T-11	1	5	1	1	5	3.0
T-1A	1	3	5	1	5	3.6
T-1B	1	1	5	1	5	3.0
T-2	1	3	5	1	1	2.8
T-2A	1	1	5	2	5	3.2
T-2B	1	1	5	1	1	2.2
T-2C	1	1	5	1	3	2.6
T-3	1	3	1	1	1	1.6
T-3A	1	1	1	1	3	1.4
T-4	1	1	1	1	5	1.8
T-5	1	3	1	1	1	1.6
T-5A	1	1	1	1	1	1.0
T-5B	1	1	1	1	1	1.0
T-5C	1	1	1	4	1	1.6
T-6	1	3	5	1	3	3.2
T-6A	1	3	1	1	1	1.6
T-6B	1	1	5	5	3	3.4
T-7	1	3	1	1	5	2.4
T-7A	1	3	1	1	5	2.4
T-7B	1	3	1	1	5	2.4
T-8	1	3	1	1	3	2.0
T-8A	1	3	1	1	3	2.0
T-8B	1	3	1	1	1	1.6
T-8C	1	3	1	1	1	1.6
T-8D	1	3	1	1	1	1.6
T-9	1	3	1	1	1	1.6
T-9A	1	3	1	1	5	2.4
WG-1	1	1	1	1	1	1.0
WG-2	1	1	1	1	1	1.0
WG-3	1	1	1	1	1	1.0

AOS 2 Project Prioritization						
Project Name	AOS #	DS/US Priority	Known Flooded Areas Priority	Depth of Flooding Priority	Road Hierarchy Priority	Weighted Score
DZ-10	2	1	1	1	5	1.8
DZ-11	2	3	5	1	5	3.6
DZ-11A	2	1	1	1	5	1.8
DZ-11B	2	1	1	1	5	1.8
DZ-12	2	3	5	3	1	3.2
DZ-12A	2	1	1	1	1	1.0
DZ-13	2	3	5	1	3	3.2
DZ-14	2	3	1	1	3	2.0
DZ-14A	2	3	1	1	5	2.4
DZ-15A	2	3	1	1	5	2.4
DZ-16	2	3	1	1	1	1.6
DZ-16A	2	3	1	1	1	1.6
DZ-4	2	1	1	1	1	1.0
DZ-7	2	1	1	1	5	1.8
DZ-8	2	1	1	1	5	1.8
DZ-9	2	1	1	1	1	1.0
JH-1	2	3	1	1	1	1.6
JH-2	2	1	1	1	1	1.0
SR-1	2	5	1	2	1	2.4
SR-2	2	5	1	1	5	3.0
SR-3	2	5	1	5	1	3.0
SR-4	2	5	1	1	5	3.0
SS-10	2	5	1	3	5	3.4
SS-11	2	5	1	1	5	3.0
SS-5	2	3	1	1	1	1.6
SS-6	2	3	1	2	1	1.8
SS-7	2	5	1	1	1	2.2
SS-8	2	5	1	1	1	2.2
SS-9	2	3	1	1	5	2.4
SS-9A	2	3	1	1	5	2.4

AOS 3 Project Prioritization						
Project Name	AOS #	DS/US Priority	Known Flooded Areas Priority	Depth of Flooding Priority	Road Hierarchy Priority	Weighted Score
A-0	3	1	1	1	3	1.4
A-0A	3	1	1	1	5	1.8
A-0B	3	1	1	1	5	1.8
A-0C	3	1	1	1	5	1.8
A-0D	3	1	1	1	5	1.8
A-1	3	1	1	1	3	1.4
A-1A	3	1	1	1	1	1.0
A-2	3	1	1	1	5	1.8
A-2A	3	1	1	1	5	1.8
A-3	3	1	1	1	5	1.8
A-3A	3	1	1	1	5	1.8
A-3B	3	1	1	1	1	1.0
A-3C	3	1	1	1	1	1.0
A-4	3	1	1	1	1	1.0
B-1	3	3	1	1	3	2.0
B-2	3	3	1	1	5	2.4
B-3	3	3	1	1	5	2.4
B-5	3	3	1	1	1	1.6
B-5A	3	3	1	1	1	1.6
B-6	3	3	1	1	1	1.6
B-7	3	3	1	1	1	1.6
B-8	3	3	1	5	1	2.4
C-0	3	3	1	1	1	1.6
C-2	3	5	1	2	1	2.4
C-4	3	5	1	1	1	2.2
C-5	3	5	1	1	5	3.0
C-6	3	5	1	1	5	3.0
C-7	3	5	1	1	5	3.0
C-8	3	5	1	1	3	2.6
C-8A	3	5	1	1	3	2.6
C-8B	3	5	1	1	3	2.6
C-9	3	5	1	1	5	3.0
HR-1	3	5	1	1	5	3.0

APPENDIX 6 DETENTION BASIN POLICY AND DESIGN CRITERIA

Detention Basin Policy and Design Criteria

FONTANA
CALIFORNIA

DAVID EVANS
AND ASSOCIATES INC.

DETENTION BASIN POLICY AND DESIGN CRITERIA

A. DETENTION BASIN POLICY

1. GENERAL

New development may increase flood hazards to downstream properties unless adequate drainage facilities are provided to mitigate potential drainage problems. The most desirable mitigation of potential drainage problems is the construction of street improvements and/or permanent drainage facilities to convey the increased drainage flows generated by the development.

The drainage facilities and/or street system should be connected to an ultimate drainage system and, if possible, the drainage system should be designed and constructed as part of the City's comprehensive storm drain plan.

Detention basins are often used as a part of the regional flood control system or as a temporary part of the local, ultimate drainage system. A regional detention facility is normally used to decrease and/or regulate downstream drainage flows, decrease the size of downstream drainage systems, or to provide for water conservation. Regional detention basin are normally constructed as a part of the City of Fontana system or are basins that can be incorporated into the Flood Control's District's existing or proposed drainage system.

Except for regional detention basins and water conservation basins, detention basins will not normally be permitted as a permanent part of the ultimate drainage system. This is due to the relatively high maintenance factors, nuisance factors, potential safety hazards, and the general lack of equipment and expertise of the City in maintaining such basins.

Except for joint use basins, at locations where such joint use is practical and desirable, and regional basins are described above, the use of permanent detention basins will not normally be permitted. The use of interim, local detention basins is discussed below and conditions for the use of the basins are provided.

Definitions of regional, local, interim and joint use basins are provided in Section B.1, "Detention Basin Design Criteria."

2. USE OF INTERIM LOCAL DETENTION BASINS

In the event it is shown to be uneconomical or otherwise impractical to connect to an existing portion of the ultimate drainage or flood control system, the use of interim, local detention basins will be permitted. Local detention basins are difficult to monitor, expensive to maintain, any may become a public nuisance. Therefore, interim detention basins shall only be used when the following conditions are met:

a. In the opinion of the City Engineer, the construction of an ultimate drainage system to serve the development is not economically feasible or practical.

b. The interim basins can be demonstrated to adequately mitigate downstream drainage flows.

c. Sufficient detailed data to ensure their feasibility shall be provided prior to Planning Commission approval.

d. A maintenance and inspection program for the detention basins shall be established for each development Funding shall be assured until such time as the ultimate drainage system can be constructed.

e. Sufficient design information and details shall be provided to show that the interim basins can be removed in the future and the development drainage system can be integrated into the ultimate drainage system unless this condition is waived by the City Engineer.

3. USE OF JOINT USE DETENTION BASINS

Joint use basins shall be utilized only in those conditions where it is shown to be uneconomical or otherwise impractical to construct or connect to an existing portion of the ultimate drainage system, and a beneficial joint use for the facility can be demonstrated.

The same general conditions listed in Section A,2 above shall be met. If the joint use basin is to be considered a permanent facility, Section A,2,e, will not be necessary.

The basin shall be site specific and shall be approved by all agencies involved.

B. DETENTION BASIN DESIGN CRITERIA

The following design parameters and criteria are provided as guidelines to ensure proper detention basin design, construction and operation. When absolutely necessary and dependent upon site conditions, these guidelines may be modified if approved in writing by the City Engineer. An engineering report will be necessary to justify and support any modifications.

1. DEFINITIONS

a. Regional Detention Basin

1) A basin which can be incorporated into the City of Fontana's existing or proposed drainage system,

2) Basin owned and operated by the City of Fontana, although it may be joint use, and

3) A basin which will reduce the downstream peak flow rate and the necessary downstream storm drain size.

b. Local Detention Basin

1) A basin which will not be incorporated into the City of Fontana's existing or proposed drainage system,

2) A basin owned by an individual or organization other than the City of Fontana, and

3) A basin which will reduce the downstream peak flow rate, but will not be considered in downsizing future downstream storm drains.

c. Joint Use Detention Basin

A regional or local detention basin which has an additional use such as football field, parking lot, golf course, lake, etc.

d. Temporary Detention Basin

1) A local detention basin used to reduce downstream peak flow rates until ultimate storm drain facilities can be constructed as part of a phased development, and

2) Generally, the life of the basin shall not exceed 10 years.

e. **Design Criteria**

Regional detention basins are assumed to be a part of the regional drainage system and, therefore, will be incorporated into the District drainage system.

All regional detention basins will be designed in accordance with the City of Fontana's "Detention Basin Design Criteria."

Local temporary and joint use basins shall be designed in accordance with these standards.

2. BASIN CAPACITY AND OUTLET DRAIN

a. When a basin is to be used to mitigate downstream impacts due to increased flows generated by a development, the basin capacity and outlet size shall be such that the post-development peak flow rate generated by the development shall be less than or equal to 90% of the pre-development peak flow rate from the site for all frequency storms up to and including 100-year.

1) Only 2, 10, 25 and 100-year storms need to be analyzed.

2) Additional studies shall be submitted where there exists more than one basin in the drainage area under review. The studies shall address the timing of the peak flow rates from the basins to ensure downstream flow rates are not increased.

b. When a basin (generally regional or regional joint use) is to be used to reduce the size of a master planned downstream drainage facility, the basin capacity and outlet size shall be such that the 100-year basin peak overflow rate is not greater than the downstream facility's design capacity.

1) If the basin outlets channel, open channel design capacities shall be per the City of Fontana criteria and policy. A permit from the City of Fontana will be required.

2) Pressure flow closed conduits shall be designed such that the hydraulic grade line is below the ground or street surface. In those reaches where no surface flow will be intercepted (now or in the future), a hydraulic grade line which encroaches on

or is slightly higher than the ground or street surface will be acceptable.

3) Non-pressure flow closed conduit capacities shall be based on a flow depth no greater than 0.8 times the conduit diameter or height.

c. Where downstream erosion is a major concern, the duration of erosive flow velocities for all frequency storms shall not be substantially increased unless other forms of mitigation are provided. This can be accomplished by reducing the peak flow rate further than that required above. Refer to "Handbook of Hydraulics" by Horace Williams King and Earnest F. Brater; and "Open Channel Hydraulics" by Ven Te Chow, Ph.d., for erosive flow velocities. In cases such as this, special studies and design may be required.

d. When there exists a potential for debris entering the basin, the basin capacity shall be increased or a desilting basin provided to accommodate the debris production generated from a 100-year storm four years after a burn (over the entire watershed), plus 20% due to maintenance uncertainties.

1) For all basins where a significant amount of debris accumulation is anticipated, a debris disposal area or areas may be required.

2) "A New Method of Estimating Debris-Storage Requirements for Debris Basin" by Fred E. Tatum of the U.S. Army Corps of Engineers shall be used for determining the 100-year debris volume.

3) The basin capacity for local detention basins fed by natural drainage courses or earth channels with undeveloped watershed less than 0.5 square mile shall be enlarged to handle an additional five years of accumulated annual debris based on the attached Figure 1. For basins fed by natural drainage courses with watersheds larger than 0.5 square mile, a special debris study may be necessary, or a regional detention basin shall be utilized.

4) The basin capacity for detention basins located in watersheds known to have a high risk of burning shall be increased as determined by the City Engineer.

e. **Outlet Drain**

1) The outlet pipe for all basins except temporary basins shall be a minimum 24-inch RCP (1,350 D minimum) for local basins. The outlet pipe or conduit shall be encased with cutoff collars per the "Los Angeles County Flood Control Design Manual - Debris Dams and Basins," or designed per "Section 242, Cut-and-Cover Conduit Detail" of the Bureau of Reclamation's publication "Design of Small Dams."

2) Reinforced concrete collars generally from 2 to 3 feet high, 12 to 18 inches wide, and spaced from 7 to 10 times their height shall be provided.

3) All joints for pipes not encased shall be rubber gasketed.

4) The pipe shall be capable of withstanding H_2O live loads plus the applicable dead loads.

5) Erosion control measures shall be provided at the outlet of the basin outlet pipe.

6) Temporary basin outlet pipes may be a minimum 24-inch CMP, 12-gauge with seep rings. Design considerations shall be as stated above.

7) A metered outlet structure may be necessary to provide the necessary flow attenuation for all frequency storms. 'V' shaped weirs and notched weirs are preferred over other alternates because they do not plug with debris and trash as easily as other designs. This condition may be waived on a case-by-case basis by the City Engineer, depending upon severity of drainage problems.

8) All detention basin outlets should be sized so the basin will drain within 24 hours after the basin reaches its 100-year peak depth/volume. If the basin does not drain in 24 hours, further studies using longer duration storms will be necessary. The basin storage volume (capacity) may need to be increased to accommodate subsequent storms.

9) Trash racks shall be provided at the inlet to the basin outlet structure(s).

10) Where warranted, and at the discretion of the City Engineer, a depth gauge shall be provided on the basin outlet structure in order to monitor debris deposition and basin operation.

11) Anti-vortex devices shall be provided where warranted.

f. **Analysis Methodology**

1) Pre-development and post-development peak flow rates shall be developed during the procedures outlined in the San Bernardino County Hydrology Manual, except as modified below. The input parameters (procedures) described in the manual shall be modified as follows when calculating the pre-development peak flow rates:

a) 10-year peak flow rates shall be calculated using 5-year rainfall,

b) 25-year peak flow rates shall be calculated using 10-year rainfall, and

c) 100-year peak flow rates shall be calculated using 25-year rainfall, and AMCll.

The basin outflow shall be metered to 90% of the calculated pre-development peak flow rates. The post-development peak flow rates to the basin shall be calculated in accordance with the County Hydrology Manual.

2) Basin inflow hydrographs shall be developed using the procedures outlined in the San Bernardino County Hydrology Manual, as modified.

3) Basin outflow hydrograph routing shall be developed by the Modified Puls Method.

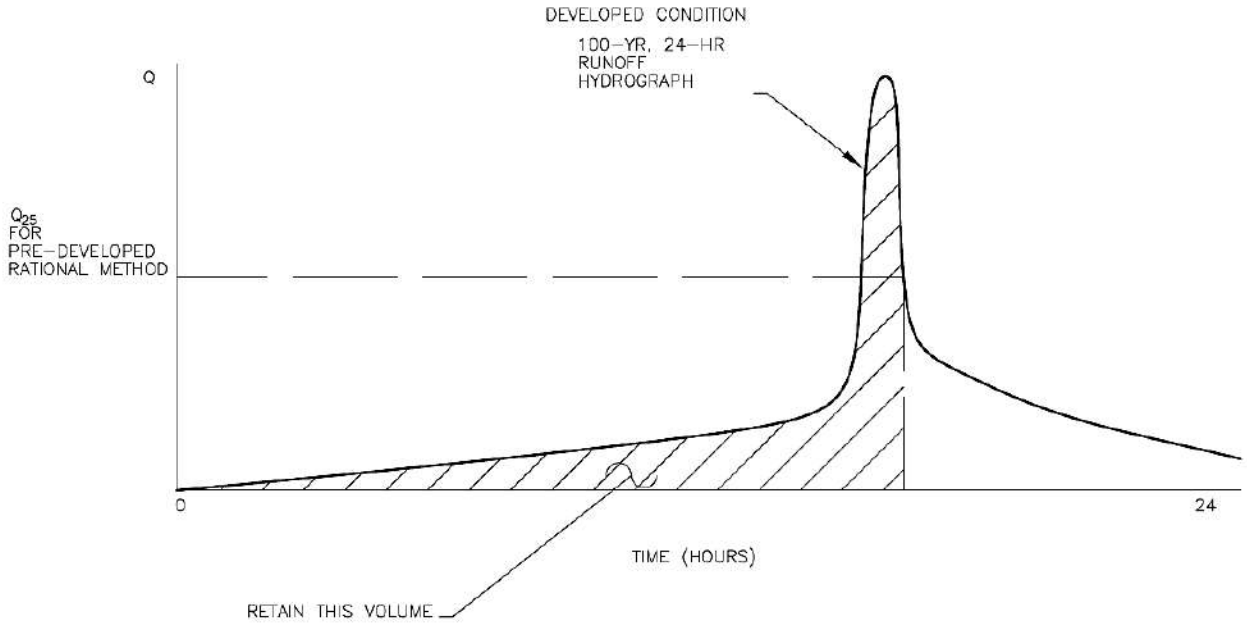
4) Channel hydrograph routing shall be calculated by the convex channel routing methods or by moving the hydrograph utilizing travel time.

g. **Small Watersheds Detention Basin Policy**

1) For detention basins intended to serve developments of 2 acres or less that have native soils with Hydrologic Soils Group A, basin size and outlet pipe requirements above may be modified as follows:

a) An outlet pipe as required in Basin Policy 2.e is not required.

b) The basin shall capture 100% of runoff from the beginning of a storm to the time the runoff is less than allowable maximum runoff in a 100-year event 24-your duration storm. See the illustration below. When the detention basin is combined with a water quality basin (BMP) obtain the extra volume for detention by increasing the square footage for infiltration such that the ponded depth limit as determined in the WQMP is not exceeded. For these smaller projects, the basin (or chamber) only needs to contain the higher of the DCV as determined in the WQMP or the volume determined in the method for described herein.



3. WATER SURFACE ELEVATION AND DEPTH

a. Local and Temporary Basins

1) Generally, no more than 50% of the basin's 100-year storage depth should be above existing ground, i.e., 50% or more of the 100-year minimum storage depth must be below the lowest ground outside basin. When feasible, the 100-year design water surface elevation should be at or below existing natural ground.

2) The basin's maximum water depth for 100-year design should be 8 feet or less. Reference is made to 3,a(3) and 3,b(2) below.

3) When site conditions warrant and safety can be assured, the above depth requirements may be modified if the following conditions are met:

   a) The detention basin is designed in accordance with the Los Angeles County Flood Control District's "Design Manual - Debris Dams and Basins."

   b) The basin embankment is designed and constructed of material or has a solid core which does not allow seepage or piping to occur due to rodent holes.

b. Regional Basins

1) Depths shall be as approved by the City of Fontana and the basin shall be designed in accordance with District Detention Basin Design Criteria.

2) Basins with embankment heights greater than or equal to 25 feet and capacity greater than or equal to 15 acre-feet, or a capacity greater than or equal to 50 acre-feet and a height greater than or equal to 6 feet, shall be reviewed and approved by the State Division of Safety of Dams.
(See Figure 2)

c. Joint Use Basins

1) Depths should be shallow and compatible with the secondary use.

2) The allowable depth in most cases will be site specific and shall be approved by all agencies involved.

4. EMERGENCY SPILLWAY

a. All detention basin spillways shall be designed to pass the fully developed 1,000-year peak flow rate ($Q = 1.35\ Q_{100} = 2.11\ Q_{10}$).

b. Spillway outflows shall be adequately conveyed to a storm drain, drainage channel, street or an established watercourse.

c. Generally, all spillway structures shall be constructed of reinforced concrete. For temporary detention basins. the spillway may be constructed with grouted rock or other forms of approved protection designed to resist maximum design velocities. The spillway may be waived tor small temporary basins at the discretion of the City Engineer.

d. When the spillway crest is more than 3 feet above the flowline of the facility the spillway outlets into, the spillway shall be constructed of reinforced concrete.

e. Generally, the spillway crest shall be at or above the basin's design 100-year high water line (HWL).

5. FREEBOARD TO THE TOP OF EMBANKMENT

a. Local and temporary basins shall have a minimum 1-foot of freeboard above the 1,000-year HWL on the emergency spillway of 2 feet of freeboard above the 100-year HWL in the basin, whichever is more stringent.

b. Joint use basins shall conform to the applicable local or regional freeboard requirements.

6. BASIN EMBANKMENT

a. Basin side slopes should be 3:1 or flatter on the wet side and 2:1 or flatter on the dry side. Steeper slopes may be acceptable on a case-by-case basis if rock lined and recommended in the soils and geotechnical report.

b. Top Width of Levee

1) Regional and local basins - 15 feet minimum*

2) Joint Use - site specific

3) Refer to Section 9,c

*It may be possible to deviate from minimum for Temporary Detention Basins.

c. For design of the embankment abutments and adjacent slopes, a soils and geotechnical report shall be prepared by a soils and geotechnical engineer with a demonstrated expertise in earth fill dam design. The report shall include:

1) Site geology, including bedding, foliation. fracture, joint, fault, and landslide plan attitudes.

2) Seismic conditions, including fault locations and potential seismic surface movements respective loadings and parameters of seismic shaking.

3) Potential impact of reservoir loading on geologic structure should be evaluated.

4) Detailed descriptions, locations and logs of all field explorations.

5) Field and laboratory tests and analysis descriptions and results.

6) Groundwater table elevation and analysis of near surface groundwater movement.

7) Recommended design parameters including, but not limited to, the following for the dam and its natural abutments and slopes adjacent to reservoir areas:

a) Lateral earth loadings

b) Shear strengths

c) Bearing capacities

d) Permeability

e) Slope stability analysis when saturated and during rapid drawdown conditions

f) Sieve analysis

g) Sand equivalents

h) Liquefaction analysis and, if appropriate, mitigation

i) Seismic Seiche analysis

j) UBC Chapter 70

8) Special design and construction recommendations including, but not limited to, the following:

a) Foundation preparation requirements

b) Suitability of materials for embankments (gradation, sand equivalent, etc.) and abutments

c) Compaction methods and minimum requirements
d) Seepage and piping control provisions

e) Potential for settlement

f) Seismic considerations

g) Minimum design factors of safety are:

	Without Seismic	With Seismic
Embankment, Abutment & Adjacent Slope Stability	1.5	1.1
Seepage – Piping	1.5	--

h) Necessity of impervious core or shear key

i) Erosion control of abutments

d. Basins not meeting the depth and side slope requirements set forth previously shall be designed in accordance with the Los Angeles County Flood Control District's "Design Manual – Debris Dams and Basins."

7. BASIN FLOOR

a. A low flow channel shall be provided from the basin inlet(s) to the basin outlet.

1) Where basin slopes exceed 2% or produce erosive flow velocities, the low flow channel should be protected from erosion with reinforced concrete, rock lining, or other form of approved erosion protection.

2) **Joint Use Basins**

a) A low flow channel or conduit should be provided to conduct minor flows around the dual use facilities wherever possible. Low flow channels may not be necessary for parking lot basins or other similar joint uses.

b) Low flow channel may be grass lined if there exists a maintenance program which included mowing and maintenance of turf in good condition, and velocities of flow through the various stages of discharge are low enough to be nonerosive.

b. Earth basin floors shall slope at a minimum 0.5% grade to the low flow channel.

c. Earth basin floors shall have a minimum grade of 0.5% from the inlet to the outlet unless waived by the City Engineer.

8. INLET STRUCTURE

a. Where storm drains enter the basin, energy dissipaters and/or erosion protection shall be provided.

b. Where natural drainage courses or channels enter the basin, some form of invert stabilization, such as reinforced concrete or grouted stone spillway, shall be provided.

c. Energy dissipaters may be required when the inletting flow velocities exceed 5 fps.

d. Inletting storm drains shall be a minimum 24-inch RCP (1,350 D).

9. **ACCESS**

a. Access to the detention basin area shall be provided by a roadway from a public street or public access to the parcel upon which the basin is constructed. The roadway shall have a minimum width of 15 feet.

b. Access shall be maintained under all weather conditions.

c. If the basin is isolated or not located adjacent to roadways, a 15-foot wide roadway shall be provided along the top of embankment. The intent of this criteria is to have continuous access around and to the basin for maintenance purposes. Under certain circumstances where it can be shown the recommended top width is not necessary for structural safety and maintenance, the criteria may be modified.

1) If access across the spillway is not provided, turnarounds or other adequate access as necessary for maintenance shall be provided on both sides of the spillway.

2) If there exists adequate access for maintenance, this requirement may be amended.

d. A 15-foot wide access ramp shall be provided to the basin floor. The width may be reduced to 10 feet for temporary detention basins.

e. The maximum roadway or access ramp slope shall be 10% unless the roadway is paved. If the roadway or access ramp is paved, the maximum slope shall be 12%. The ramp slope may be between 10% and 15% for temporary detention basins.

10. **FENCING**

a. All basins shall be fenced with 6-foot chain link fencing per Caltrans standards or other approved barrier unless otherwise approved by the Engineering Department. Joint use basin fencing will be site specific and must meet the needs of all agencies utilizing the basin.

b. Access to the basins shall be gated and locked.

11. RIGHTS-OF-WAY

a. Sufficient rights-of-way shall be provided for the construction and economical maintenance of the basin(s), including all fill and cut slopes, and shall include sufficient area to provide for an access road from a dedicated public street to the basin.

b. Regional basins shall be dedicated to the District or other appropriate agency in fee title.

c. Local, temporary, and joint use basins shall be covered by an adequate drainage easement.

12. REFERENCES TO BE USED IN DESIGN

"A New Method of Estimating Debris - Storage Requirements for Debris Basins": Tatum, U.S. Army Engineer District, Los Angeles, CA, 1963

"Design of Small Dams," U.S. Bureau of Reclamation, 1977

"Handbook of Hydraulics," King and Brater, McGraw Hill Book Company, Latest Edition

"Los Angeles County Flood Control Manual - Debris Dams and Basins," Los Angeles County Flood Control District

"Open-Channel Hydraulics," Ven Te Chow, Ph.d., 1959

"San Bernardino County Hydrology Manual," San Bernardino County, 1986

"San Bernardino County Hydrology Manual, Addendum" San Bernardino County, 2010

"San Bernardino County Standards and Specifications," San Bernardino County Department of Transportation/Flood Control/ Airports

C. DETENTION BASIN MAINTENANCE FINANCING MECHANISM AND POLICY

1. GENERAL

Maintenance responsibilities and related financing mechanism for detention basins, including joint use facilities, must be contained in the conditions of approval of each development. Detailed requirements must be included which would indicate the procedure to be followed, identification of responsible entity, and funding requirements for facilities construction, operation and maintenance. The joint use of detention basins is recommended where compatible uses and adequate maintenance can be assured. However, the approval of any joint use activity within detention basins must be contingent upon obtaining funding for ongoing operation and maintenance.

The lack of adequate maintenance is considered the most significant problem in the use of detention basins. Detention basins characteristically require more maintenance than do other storm drainage or flood control facilities. The proper functioning of the facility is also much more sensitive to proper maintenance. Adequate maintenance, including periodic inspection, debris removal, weed control, rodent and vector control and repairs, is essential to the successful use of the basins.

Maintenance costs for basins are variable and can be relatively high. Therefore, adequate funding dedicated solely for basin maintenance is important.

There are a number of methods available for generating funds necessary to pay for operation and maintenance of detention basins. Projects can be financed by some combination of resources and funding techniques. Following is a list of general funding mechanisms and techniques that can be used for the operation and maintenance of detention basins.

It is assumed all regional detention basins that area part of the City of Fontana's channel system will be maintained by the
City. Therefore, the basin maintenance mechanism discussed herein is for
local detention basins.

2. MAINTENANCE AND OPERATION FUNDING MECHANISMS

a. Developer Cash Deposit

The developer would establish a maintenance fund with a lump sum cash deposit. The maintenance fund to be established should be based on the rate of return on investment and the rate of inflation

as established annually. The fund would be equal to the present worth of the annual maintenance cost for economic life of the facilities. The present worth of the inflated cost of each annual maintenance cost will be treated as a single payment in determining the amount of the fund. The following presents the procedure for establishing the detention basins maintenance fund:

1) Estimate average annual maintenance costs at current year value.

2) Determine maintenance cost for each year in the future for the 50-year economic lite of the project. Maintenance cost will be increased each year by the adopted rate of inflation.

3) Determine the present worth of each year's maintenance cost at the established rate for return on investment.

4) The value of the maintenance fund will equal the sum of the present worth of each of the maintenance costs. The maintenance fund to be established for drainage should be based on the rate of return on investment and the rate of inflation as established annually by the State of California, Department of Water Resources, in the preparation of their annual project update bulletin titled "Management of the California State Water Project."

b. **Mello-Roos (Community Facilities Act of 1982)**

A Mello-Roos Special Tax District can be established by two-thirds vote of the landowners (when there are 12 or fewer registered voters) to construct and maintain detention basins. The annual tax rate is established for a given period of time necessary to pay off bonded indebtedness for the cost of constructing the detention basin and maintaining it for the life of the tax/bonds. The life of the tax is usually no more than 20-25 years. The tax rate can be reduced, but not increased.

Mello-Roos provides for establishment of a special tax which may be levied on the area within the district for the purpose of supporting the issuance of bonds or to otherwise pay the project costs as they are increased. If there are more than 12 registered voters, the election will be by voters.

c. **Homeowners Association**

Homeowners Association and other private ownerships are methods often used to maintain facilities after initial construction. This technique is used often for large, open space areas or recreational facilities for residential development where the common areas of the facilities are owned and maintained by the Association. Local governments, however, often express dissatisfaction with the level of expenditures and effort set forth by Homeowners Associations. The concern over the performance of a Homeowners Association to adequately provide required maintenance is especially true in the maintenance of detention basins. The basins are generally not a prominent feature of the common areas and the maintenance is capital intensive and technically complicated.

d. **Assessment District**

Assessment district financing utilizing a combination of 1911/1913/1915 processes can be used to construct the detention basin and also to operate and maintain the basin through the life of the bond payoff which is normally limited to 20 years. Maintenance can only be paid for by this method if an assessment district is formed to fund the cost of construction. The formation of t1e district is approved by the City. The district will be denied if there is a majority protest of the property owners to be assessed at a public hearing. The cost of constructing and maintaining the basin is added as an annual charge to the owner's property tax bill. This method will not increase the initial price of the single family home, commercial building, etc. An alternative method would have to be established to take effect alter pay off of the bonds. There is no administrative agency (such as with a service area of improvement zone) to deal with the operation and maintenance of facilities constructed by the assessment district process. The maintenance process would have to be established at the time of selling the bonds by a contractual agreement to ensure maintenance of the facilities for the bonding period. There would be limited flexibility to accommodate changes in conditions over the length of the bond payoff. An assessment district cannot be used to finance the maintenance and operation of parks and recreation facilities.

3. DETENTION BASIN MAINTENANCE POLICY

a. Local Basins - Private Ownership

The design of the private basin shall be done such that it will not be subject to failure and the design shall be reviewed and approved by the City in accordance with its standards and policy.

Those basins which are an integral part of a private development, such as a parking lot, athletic field or a park, shall be owned and maintenance by the private property owners.

It will be necessary for the City to inspect the construction, annually inspect the facility, and inspect the facility after storm events to ensure it is being properly maintained.
The private property owner shall be responsible for constructing the basin(s) and operating and maintaining the basin(s) thereafter. Funding for the facility maintenance shall be insured through a case trust fund in the name of the City with yearly interest less inspection fee provided to the Homeowners Association or the property owner, either of which will be responsible for the maintenance.

A drainage maintenance district or other acceptable public financing shall be established to operate and maintain the joint use facility. Public financing shall be implemented only in the event the cash trust is exhausted due to unforeseen costs.

b. Local Basins - Public Ownership

Any local basin that is not an integral part of a private development will be owned and operated by the City. A cash trust to create a sinking fund shall be provided by the development and held by the City for the maintenance and inspection of the basin.

A drainage maintenance district or other acceptable public financing to the City shall be established to operate and maintain the facility. Public financing shall be implemented only in the event the cash trust is exhausted due to unforeseen costs.

c. Regional Basins

Regional flood control detention basins will be owned and operated by the City of Fontana.

It may be necessary to fund the operation, maintenance and inspection of new regional basins by either method listed above under public ownership of local basins.

The operation, maintenance and inspection of new regional basins shall be accomplished by coordination and negotiation with the City of Fontana.