Initial Study - Appendix F

WATER QUALITY ASSESSMENT REPORT

Water Quality Assessment Report

Bayshore Bikeway Segment 8B

Bayshore Bikeway Segment 8B – San Diego County
Cities of San Diego and Chula Vista
Federal Project No.: RPSTPLE – 6066 (102)

July 14, 2016

Caltrans

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STATE OF CALIFORNIA
Department of Transportation

Prepared By: _____ Date: 7/14/16

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The environmental review, consultation, and any other action required in accordance with applicable Federal laws for this project is being, or has been, carried-out by Caltrans under its assumption of responsibility pursuant to 23 USC 326.

Executive Summary

The primary purpose of the Water Quality Assessment Report (WQAR) is to fulfill requirements of the National Environmental Policy Act and the California Environmental Quality Act and to provide information for National Pollutant Discharge Elimination System (NPDES) permitting to the extent possible by analyzing potential impacts of the proposed project on water quality.

This WQAR discusses the Bayshore Bikeway Segment 8B project (project), the environmental setting of the project area, and the regulatory framework to which this project must adhere. Additional items discussed herein include surface water and groundwater resources and their water quality health within the project area, water quality impairments and beneficial uses, potential water quality impacts/benefits associated with the proposed project, and avoidance and/or minimization measures for potentially adverse impacts.

The San Diego Association of Governments (SANDAG) proposes to construct a Class I bike path facility in the south San Diego Bay area. The proposed Class I facility, which is a path that provides a separated right-of-way for the exclusive use of people walking and riding bikes, is a portion of Segment 8B of the Bayshore Bikeway as described in the *Bayshore Bikeway Plan* dated March 17, 2006. The bike path would extend a distance of approximately 0.25 mile adjacent to Bay Boulevard between Palomar Street in the City of Chula Vista and the main entrance to the South Bay Salt Works facility in the City of San Diego. The proposed project would help close the gap between two existing Class I facilities, Bayshore Bikeway Segment 8A and Bayshore Bikeway Segment 9, and would contribute to the vision of implementing the Bayshore Bikeway, which consists of a 24-mile regional bicycle facility around San Diego Bay to provide more transportation options and a scenic connection to employment centers, recreation facilities, and tourist destinations along the Bayfront.

The proposed project would extend southward along Bay Boulevard from Palomar Street adjacent to an existing drainage ditch and continue over an existing drainage ditch adjacent to Bay Boulevard and just east of inactive railroad tracks to the main driveway of the South Bay Salt Works facility. The proposed bike path would include an eight-foot-wide bike path with 2 to 3-foot-wide shoulders. The bike path would cross over the drainage ditch near Palomar Street on a bridge structure. From the proposed bridge to Ada Street, the bike path would be constructed as a cantilevered deck over the western side of the existing drainage ditch that runs adjacent to the west side of Bay Boulevard. South of Ada Street, the bike path would be constructed at grade on disturbed land. Additional improvements would include installation of chain link fencing along the west side of the bike path, railing along the east side of the deck, lighting, minor grading, utility relocations, bike lane striping, and other improvements as required by the cities of San Diego and Chula Vista and SANDAG. Two privately-owned parcels on the east side of Bay Boulevard between Stella Street and Ada Street are proposed to be utilized as a staging area for the contractor.

The project lies within the Otay Valley Hydrologic Area of the Otay Hydrologic Unit in the San Diego Region (Region 9) of the Regional Water Quality Control Board (RWQCB). This hydrologic unit covers approximately 160 square miles reaching inland approximately 24 miles. Inland surface waters within the Otay Valley Hydrologic Area have State of California Water

Quality Objectives (WQOs) for total dissolved solids (TDS), chlorides, sulfates, sodium, nutrients (nitrogen and phosphorus), iron, manganese, methylene blue active substance (MBAS), boron, odor, turbidity, color, and fluoride. Groundwater within the watershed has WQOs for TDS, chlorides, sulfates, sodium, nitrate, iron, manganese, MBAS, boron, odor, turbidity, color, and fluoride.

Construction of this project would result in short-term and temporary impacts from the generation of pollutants including sediment, soil stabilization residues, oil and grease, nutrients, organic compounds, and trash and debris. The RWCQB requires a Storm Water Pollution Prevention Plan (SWPPP) and compliance with the Construction General Permit (CGP) for projects disturbing more than one acre. Construction best management practices (BMPs) implemented during construction must be identified. The project has been designated as a Risk Level 1 per the RWQCB Construction General Permit requirements. The project-specific BMPs would meet the technology requirements stipulated in the National Pollutant Discharge Elimination System (NPDES) Construction General Permit.

The proposed project would add approximately 0.32 acre of impervious area. The project is required to implement BMPs approved by the City of San Diego to minimize impacts from potentially polluted runoff. A primary goal of the project design and implementation would be to meet the WQOs for inland surface waters and groundwater in the Otay River watershed.

The proposed project would comply with the following water quality measures, detailed in Section 5 herein.

- **WQ-1**: SWPPP
- **WQ-2**: Construction Site BMPs
- **WQ-3**: Design Pollution Prevention BMPs
- **WQ-4**: Storm Water Pollutant Control BMPs
- **WQ-5**: Maintenance

Through implementation of the above water quality measures, the project design, construction, and operation would comply with State storm water regulations, the requirements of the San Diego County Municipal Permit, and the City of San Diego Storm Water Standards.

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Acronyms and Abbreviations

BMP	Best Management Practice
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
cfs	cubic feet per second
CWA	Federal Clean Water Act
FEMA	Federal Emergency Management Agency
FIRM	Federal Insurance Rate Map
HMP	Hydromodification Management Plan
HU	Hydrologic Unit
LID	Low-Impact Development
mg/L	milligrams per liter
NPDES	National Pollutant Discharge Elimination System
PDP	Priority Development Project
Porter-Cologne	Porter-Cologne Water Quality Control Act
RWQCB	Regional Water Quality Control Board
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TDS	Total Dissolved Solids
TMDL	Total Maximum Daily Load
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
WDR	Waste Discharge Requirement
WQAR	Water Quality Assessment Report
WQO	Water Quality Objective

1. INTRODUCTION

1.1. Project Description

The San Diego Association of Governments (SANDAG) proposes the development of approximately 1,210 feet of new Class I bike path to help close the gap of existing portions of the Bayshore Bikeway. This segment of bike path, a portion of the segment labeled "Segment 8B" as described in the "Bayshore Bikeway Plan" dated March 17, 2006, is located in south San Diego County (Figure 1) between Palomar Street and the main entrance to the South Bay Salt Works facility. The northern portion, Segment 8A, has been designed and constructed.

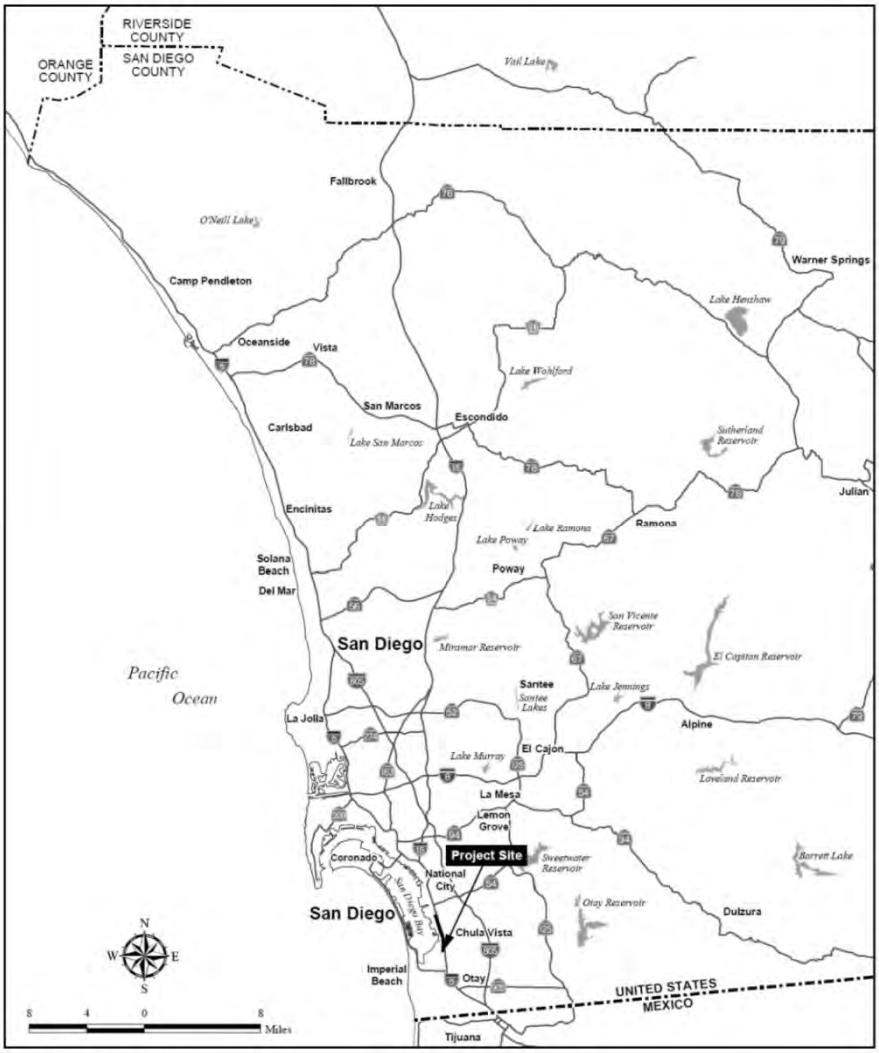


Figure 1: Project Vicinity

The primary purpose of the proposed improvements is to continue development of the Bayshore Bikeway. There are currently approximately 15 miles of the Bayshore Bikeway trail in use as a Class I bike path, with the proposed bike path extending 24 miles around San Diego Bay beginning at the Broadway Pier in San Diego and ending at the Coronado Ferry Terminal in Coronado. The route passes through the cities of San Diego, National City, Chula Vista, Imperial Beach and Coronado. There are currently several segments operating on Class II and III bike lanes and routes, many of which have been identified by SANDAG for improvements to Class I standards. Figure 2 below depicts the existing and future alignments of Bayshore Bikeway in its entirety. Segment 8B would help close the gap between two previously constructed segments of the bike path and advance the plan for a contiguous bicycle and pedestrian path connecting Chula Vista to National City and San Diego.

Figure 2: Bayshore Bikeway Route Map

The proposed segment of the bike path is currently being traversed by people walking and riding bicycles along surface streets. The development of a Class I bike path in this area will

encourage people walking and riding bicycles to avoid the surface streets which would provide a safer and more distinguished route as well as decrease congestion on the surface streets.

In 2010, T.Y. Lin International prepared a study entitled *Feasibility Study – Bayshore Bikeway Segment 8B* (August 2010) for the purpose of developing and analyzing several alternatives for Segment 8B. Five alternatives were developed in the Feasibility Study and analyzed according to the following key factors: safety, public access, connectivity with other segments, environmental impacts, constructability, construction cost, and maintenance. Alternative 3 was recommended for further study, which proposed an alignment along the west side of Bay Boulevard and along the existing South Bay Salt Works maintenance road. Revisions have been made to the recommended alternative as the project has progressed. The proposed improvements are discussed in the following section.

The project site is generally flat with elevations ranging from approximately +6 feet to +10 feet above mean sea level. Much of the land to the east of the proposed bike path slopes west toward the project area and is conveyed through storm drain channels and inlets that discharge to the Otay River and San Diego Bay. Storm water discharges from the site are considered direct discharges as defined by the State Water Board into San Diego Bay and Otay River. Existing site topography, drainage patterns, and storm water conveyance systems are shown in the Drainage Study located in Appendix 1.

The proposed project would not change the existing drainage patterns. The proposed on-site drainage areas would change due to the added pavement area and storm water facilities. Post construction surface drainage would be directed from designated segments of the bike path into either a pervious concrete shoulder or a vegetated swale on the low side of the superelevated path. Runoff will then be captured by a perforated pipe beneath the pervious concrete or vegetated swale where it would be conveyed into the existing drainage channels. Heavier flows would partially infiltrate and the remaining runoff would flow off-site toward existing drainage channels.

1.1.1. No Project Alternative

Under the No Build Alternative, none of the project components would be constructed or modified including the Class I bike path, retaining structures, drainage improvements, fencing, lighting, and utility relocations. All existing facilities would remain in their current configurations and locations within the project limits.

1.1.2. Build Alternative

The San Diego Association of Governments (SANDAG) proposes to construct a Class I bike path facility in the south San Diego Bay area. The proposed Class I facility, which is a path that provides a separated right-of-way for the exclusive use of people walking and riding bikes, is a portion of Segment 8B of the Bayshore Bikeway as described in the Bayshore Bikeway Plan dated March 17, 2006. The bike path would extend a distance of

approximately 0.23 mile adjacent to Bay Boulevard between Palomar Street in the City of Chula Vista and the main entrance to the South Bay Salt Works facility in the City of San Diego. The proposed project would help close the gap between two existing Class I facilities, Bayshore Bikeway Segment 8A and Bayshore Bikeway Segment 9, and would contribute to the vision of implementing the Bayshore Bikeway, which consists of a 24-mile regional bicycle facility around San Diego Bay to provide more transportation options and a scenic connection to employment centers, recreation facilities, and tourist destinations along the Bayfront.

The proposed project would extend southward along Bay Boulevard from Palomar Street over an existing drainage ditch near Palomar Street and continue over an existing drainage ditch adjacent to Bay Boulevard and just east of inactive railroad tracks previously part of the Coronado Belt Line to the main driveway of the South Bay Salt Works facility. The proposed facility would include an eight-foot-wide bike path with 2 to 3-foot-wide shoulders. The bike path would cross over the drainage ditch near Palomar Street on a bridge structure. From Palomar Street to Ada Street, the bike path would be constructed as a cantilevered deck over the western side of the existing drainage ditch that runs adjacent to the west side of Bay Boulevard. South of Ada Street, the bike path would be constructed at grade on disturbed land. Additional improvements would include installation of chain link fencing along the west side of the bike path, railing along the east side of the deck, lighting, minor grading, utility relocations, bike lane striping, and other improvements as required by the cities of San Diego and Chula Vista and SANDAG. Two privately-owned parcels on the east side of Bay Boulevard between Stella Street and Ada Street are proposed to be utilized as a staging area for the contractor.

The proposed preliminary improvement plans for the bike path can be found in Appendix 2.

1.2. Approach to Water Quality Assessment

The purpose of the WQAR is to fulfill the requirements of the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA), and to provide information, to the extent possible, for National Pollution Discharge Elimination System (NPDES) permitting. The document includes a discussion of the proposed project, the physical setting of the project area, and the regulatory framework with respect to water quality; it also provides data on surface water and groundwater resources within the project area and the water quality of these waters, describes water quality impairments and beneficial uses, identifies potential water quality impacts/benefits associated with the proposed project, and recommends avoidance and/or minimization measures for potentially adverse impacts.

2. REGULATORY SETTING

A Jurisdictional Delineation report was prepared by Helix Environmental Planning, Inc. in September 2014 to identify and map existing wetland and water resources potentially subject to the regulatory jurisdiction of the U.S. Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), California Department of Fish and Wildlife (CDFW), and California Coastal Commission (CCC). In addition to the State and Federal laws and requirements discussed in subsequent sections herein, the Bayshore Bikeway Segment 8B project would be subject to the following regulations.

The CDFW regulates temporary and permanent alterations or impacts to streambeds or lakes under California Fish and Game Code Section 1602. The CDFW requires a Streambed Alteration Agreement (SAA) for projects that will divert or obstruct the natural flow of water, change the bed, channel, or bank of any stream, or use any material from a streambed. The SAA is a contract between the applicant and CDFW stating which activities may occur in the riparian zone and stream course. It is expected that notification of Lake or Streambed Alteration would be required to the South Coast Region CDFW for the Segment 8B project.

Through provisions of the California Coastal Act, the CCC is authorized to issue a Coastal Development Permit (CDP) for projects within the Coastal Zone. In areas where a local entity has a certified Local Coastal Program (LCP), the local entity can issue a CDP if it is consistent with the LCP. However, the CCC has appeal authority for portions of the LCPs and retains jurisdiction over certain public trust lands and in areas without an LCP. The Bayshore Bikeway Segment 8B project is within the Coastal Zone and project approval would require issuance of a CDP.

2.1. Federal Laws and Requirements

2.1.1. Clean Water Act

In 1972 Congress amended the Federal Water Pollution Control Act, making the addition of pollutants to the waters of the United States (U.S.) from any point source unlawful unless the discharge is in compliance with a NPDES permit. Known today as the Clean Water Act (CWA), Congress has amended it several times. In the 1987 amendments, Congress directed dischargers of storm water from municipal and industrial/construction point sources to comply with the NPDES permit scheme. Important CWA sections are:

- Sections 303 and 304 require states to promulgate water quality standards, criteria, and guidelines.

- Section 401 requires an applicant for a federal license or permit to conduct any activity, which may result in a discharge to waters of the U.S., to obtain certification from the

State that the discharge will comply with other provisions of the act. (Most frequently required in tandem with a Section 404 permit request. See below).

- Section 402 establishes the NPDES, a permitting system for the discharges (except for dredge or fill material) of any pollutant into waters of the U.S. The RWQCBs administer this permitting program in California. Section 402(p) requires permits for discharges of storm water from industrial/construction and Municipal Separate Storm Sewer Systems (MS4s).

- Section 404 establishes a permit program for the discharge of dredge or fill material into waters of the U.S. This permit program is administered by the USACE.

The objective of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."

USACE issues two types of 404 permits: Standard and General permits. For General permits there are two types: Regional permits and Nationwide permits. Regional permits are issued for a general category of activities when they are similar in nature and cause minimal environmental effect. Nationwide permits are issued to authorize a variety of minor project activities with no more than minimal effects.

There are also two types of Standard permits: Individual permits and Letters of Permission. Ordinarily, projects that do not meet the criteria for a Nationwide Permit may be permitted under one of USACE's Standard permits. For Standard permits, the USACE decision to approve is based on compliance with U.S. Environmental Protection Agency's (EPA) Section 404(b)(1) Guidelines (U.S. EPA CFR 40 Part 230), and whether permit approval is in the public interest. The 404(b)(1) Guidelines were developed by the U.S. EPA in conjunction with USACE, and allow the discharge of dredged or fill material into the aquatic system (waters of the U.S.) only if there is no practicable alternative which would have less adverse effects. The Guidelines state that USACE may not issue a permit if there is a least environmentally damaging practicable alternative (LEDPA) to the proposed discharge that would have less effects on waters of the U.S., and not have any other significant adverse environmental consequences. Per Guidelines, documentation is needed that a sequence of avoidance, minimization, and compensation measures have been followed, in that order. The Guidelines also restrict permitting activities that violate water quality or toxic effluent standards, jeopardize the continued existence of listed species, violate marine sanctuary protections, or cause "significant degradation" to waters of the U.S. In addition, every permit from the USACE, even if not subject to the 404(b)(1) Guidelines, must meet general requirements. See 33 CFR 320.4.

2.2. State Laws and Requirements

2.2.1. Porter-Cologne Water Quality Control Act

California's Porter-Cologne Act, enacted in 1969, provides the legal basis for water quality regulation within California. This Act requires a "Report of Waste Discharge" for any

discharge of waste (liquid, solid, or gaseous) to land or surface waters that may impair beneficial uses for surface and/or groundwater of the State. It predates the CWA and regulates discharges to waters of the State. Waters of the State include more than just waters of the U.S., like groundwater and surface waters not considered waters of the U.S. Additionally, it prohibits discharges of "waste" as defined and this definition is broader than the CWA definition of "pollutant". Discharges under the Porter-Cologne Act are permitted by Waste Discharge Requirements (WDRs) and may be required even when the discharge is already permitted or exempt under the CWA.

The State Water Resources Control Board (SWRCB) and RWQCBs are responsible for establishing the water quality standards (objectives and beneficial uses) required by the CWA, and regulating discharges to ensure compliance with the water quality standards. Details regarding water quality standards in a project area are contained in the applicable RWQCB Basin Plan. In California, Regional Boards designate beneficial uses for all water body segments in their jurisdictions, and then set criteria necessary to protect these uses. Consequently, the water quality standards developed for particular water segments are based on the designated use and vary depending on such use. In addition, the SWRCB identifies waters failing to meet standards for specific pollutants, which are then state-listed in accordance with CWA Section 303(d). If a state determines that waters are impaired for one or more constituents and the standards cannot be met through point source or non-source point controls (NPDES permits or Waste Discharge Requirements), the CWA requires the establishment of Total Maximum Daily Loads (TMDLs). TMDLs specify allowable pollutant loads from all sources (point, non-point, and natural) for a given watershed.

2.2.2. State Water Resources Control Board and Regional Water Quality Control Boards

The SWRCB adjudicates water rights, sets water pollution control policy, and issues water board orders on matters of statewide application, and oversees water quality functions throughout the state by approving Basin Plans, TMDLs, and NPDES permits. RWCQBs are responsible for protecting beneficial uses of water resources within their regional jurisdiction using planning, permitting, and enforcement authorities to meet this responsibility.

2.2.2.1. National Pollution Discharge Elimination System (NPDES) Program

2.2.2.1.1. Construction General Permit

Construction General Permit (CGP) Order No. 2012-0006-DWQ became effective on July 17, 2012. The permit regulates storm water discharges from construction sites which result in a Disturbed Soil Area (DSA) of one acre or greater, and/or are smaller sites that are part of a larger common plan of development. For all projects subject to the CGP, applicants are required to develop and implement an effective Storm Water Pollution Prevention Plan (SWPPP). In accordance with the Department's Standard Specifications, a Water Pollution Control Plan (WPCP) is necessary for projects with a

DSA less than one acre. The proposed project will have a DSA of 1.3 acres, and therefore will require a SWPPP.

By law, all storm water discharges associated with construction activity where clearing, grading, and excavation result in soil disturbance of at least one acre must comply with the provisions of the CGP. Construction activity that results in soil disturbances of less than one acre is subject to this CGP if there is potential for significant water quality impairment resulting from the activity as determined by the RWQCB. Operators of regulated construction sites are required to develop storm water pollution prevention plans; to implement sediment, erosion, and pollution prevention control measures; and to obtain coverage under the CGP.

The CGP separates projects into Risk Levels 1, 2, or 3. Risk levels are determined during the planning and design phases, and are based on potential erosion and transport to receiving waters. Requirements apply according to the Risk Level determined. For example, a Risk Level 3 (highest risk) project would require compulsory storm water runoff pH and turbidity monitoring, and pre- and post-construction aquatic biological assessments during specified seasonal windows.

The project has been designated as a Risk Level 1 per the RWQCB Construction General Permit requirements. The Risk Level Assessment can be found in Appendix 3.

2.2.2.1.2. Section 401 Permitting

Under Section 401 of the CWA, any project requiring a federal license or permit that may result in a discharge to a water of the U.S. must obtain a 401 Certification, which certifies that the project will be in compliance with State water quality standards. The most common federal permit triggering 401 Certification is a CWA Section 404 permit, issued by USACE. The 401 permit certifications are obtained from the appropriate RWQCB, dependent on the project location, and are required before USACE issues a 404 permit.

In some cases the RWQCB may have specific concerns with discharges associated with a project. As a result, the RWQCB may issue a set of requirements known as Waste Discharge Requirements (WDRs) under the State Water Code (Porter-Cologne Act) that define activities, such as the inclusion of specific features, effluent limitations, monitoring, and plan submittals that are to be implemented for protecting or benefiting water quality. WDRs can be issued to address both permanent and temporary discharges of a project.

2.3. Regional and Local Requirements

The SWRCB carries out its water quality protection authority through basin plans, which establish water quality standards for particular bodies of water. Water quality standards in California are composed of three parts: the designation of beneficial water uses, water quality objectives to protect those uses, and implementation programs designed to achieve and maintain compliance with the water quality objectives.

The San Diego RWQCB is responsible for the basin plan in which the proposed project lies, the San Diego Basin. The RWQCB implements management plans to modify and adopt standards under provisions set forth in Section 303(c) of the CWA and California Water Code (Division 7, Section 13240).

The SWRCB Resolution 2005-0019 adopted amendments to the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California in 2005. This policy provides implementation measures for numerical criteria contained in the California Toxics Rule, promulgated in May 2000 by USEPA. When combined with the beneficial use designations in the basin plan, these documents establish statewide water quality standards for toxic constituents in surface waters.

2.3.1. Basin Plan

The Basin Plan for the San Diego Basin, RWQCB Region 9, establishes water quality objectives for constituents that could potentially cause an adverse effect or impact on the beneficial uses of water. Specifically, basin plans are designed to accomplish the following:

- Designate beneficial uses for surface water and groundwater.
- Set the narrative and numerical objectives that must be attained or maintained to protect the designated beneficial uses and conform to California's anti-degradation policy.
- Describe implementation programs to protect the beneficial uses of all water in the region.
- Describe surveillance and monitoring activities to evaluate the effectiveness of the basin plans.

The basin plans incorporate by reference all applicable SWRCB and RWQCB plans and policies. In addition to basin plan requirements, the RWQCB has water quality control authority under Section 401 of the CWA if the City were to apply for a Nationwide Permit under Section 404 of the CWA.

2.3.2. San Diego County Municipal Storm Water Permit

Under Phase I of its storm water program, the USEPA published NPDES permit application requirements for municipal storm water discharges for municipalities that own and operate separate storm drain systems serving populations of 100,000 or more, or that contribute significant pollutants to waters of the U.S. The proposed project is subject to the San Diego Municipal Storm Water NPDES Permit (Municipal Permit) under Order R9-2013-0001. The proposed project design would have to comply with requirements and measures outlined in this municipal permit to minimize impacts to water quality and runoff hydrology for the construction and operational phases of the proposed project.

2.3.3. City of San Diego Storm Water Standards

Under the Municipal Permit (Order R9-2013-0001), the City of San Diego is required to implement storm water pollution regulations for development projects, which include requirements for storm water BMPs during the construction and post-construction phases of the project.

The primary objectives of the storm water pollution regulations City of San Diego Storm Water Standards Manual (2012) are to:

- Prohibit non-storm water discharges;
- Reduce the discharge of pollutants to storm water conveyance systems to the maximum extent practicable by implementing BMPs during the project's construction and post-development phases;
- Provide consistency with the Model Standard Urban Storm Water Mitigation Plan approved on March 24, 2009;
- Provide guidance for proper implementation of low-impact development (LID) facilities and design approaches;
- Provide guidance for conformance with regional hydromodification management requirements; and,
- Provide consistency with the Model BMP Design Manual, San Diego Region.

2.3.4. City of San Diego Hydromodification Management Plan

According to Section D.1 of the Municipal Permit, a formal Hydromodification Management Plan (HMP) is required to control increases in runoff (rates and durations) for all Priority Development Projects (PDP). This project is not a PDP, and is a PDP Exempt Project as defined by the Storm Water Requirements Applicability Checklist in Form DS-560 (see Appendix 4), and therefore an HMP is not required.

3. AFFECTED ENVIRONMENT

3.1. Introduction

This section describes the existing environment in the project area that could potentially be affected by the proposed bike path.

3.2. General Setting

The project is located in the cities of San Diego and Chula Vista in the southwestern portion of San Diego County. The bike path would extend between Palomar Street and the main entrance to the South Bay Salt Works. The geography along the proposed bike path alignment consists of flat to gently sloping terrain with elevations ranging from approximately +6 feet to +10 feet above mean sea level. Salt evaporation ponds, present between the bike path and San Diego Bay, are located approximately 100 feet west of the proposed bike path. San Diego Bay is approximately 3500 feet west of the proposed bike path. According to the *Bayshore Bikeway Segment 8B Final Phase I Environmental Site Assessment* (Phase I ESA) prepared by Allied Geotechnical Engineers, Inc. (March 31, 2016), groundwater in this area has a potential beneficial use for agricultural, municipal, and industrial supply. Much of the proposed alignment is undeveloped and lacks vegetation; however, the surrounding environment is typically covered with short grasses.

3.2.1. Population and Land Use

The majority of the project footprint is proposed within undeveloped land. However, there are industrial and transportation facilities within the immediate vicinity of the project. Residential and commercial developments also exist within a few hundred feet of the proposed alignment.

A portion of the proposed bike path alignment borders the evaporation ponds of South Bay Salt Works. This operation has played a large role in the production of salt for California since the 1930s and continues to be a major component in the solar salt industry. Also notable is the plant's eligibility to the National Register of Historic Places due to its lasting importance in California. The site includes a full range of evaporation, condensation, and crystallization ponds (National Park Service). Portions of the land on which the South Bay Salt Works is located are part of the San Diego Bay National Wildlife Refuge.

The northern portion of the bike path alignment would be aligned parallel to the existing SD&AE railway. This segment of the railway is the Coronado Belt line, which has been abandoned. Other transportation facilities in the area include Bay Boulevard, parallel to the proposed bike path, and the South Bay Salt Works access road, a portion of which the bike path is proposed to traverse. The bike path would be separated from South Bay Salt Works operations by a physical barrier, such as a fence.

3.2.2. Topography

The topography of the project area is generally flat at very low elevation above sea level. Much of the land to the east of the proposed bike path slopes west toward the project area. Project site elevations range from approximately +6 feet to +10 feet above mean sea level. The main disturbances to the uniform flat grade is the existing open channel that flows south to north and outlets to an existing channel at Palomar Street which flows west to drain into San Diego Bay. At the northern end of the project, the bike path is proposed to be constructed above existing grade and partially within the channel using a retaining structure to support the bike path and maintain the channel's flow capacity.

3.2.3. Hydrology

3.2.3.1. Regional Hydrology

The project lies within the San Diego Region (Region 9) of the RWQCB. This region covers approximately 3,900 square miles containing most of San Diego County as well as the southwest portions of Riverside and Orange Counties. The region is bounded by the Pacific Ocean on the west and the Mexican border on the south. The northern boundary is located approximately 85 miles north of the Mexican border and the eastern border is formed by the Laguna Mountains and other mountains in the Cleveland National Forest.

3.2.3.2. Local Hydrology

The Bayshore Bikeway Segment 8B project is located within the Otay Valley Hydrologic Area of the Otay Hydrologic Unit (Figure 3) as designated by the California RWQCB. This hydrologic unit covers approximately 160 square miles reaching inland approximately 24 miles

The watershed consists primarily of unincorporated area, but also includes portions of the cities of Chula Vista, Imperial Beach, Coronado, National City, and San Diego. Predominant land uses are open space and urban/residential. Major water bodies in the Otay Hydrologic Unit are the Upper and Lower Otay Reservoirs, Otay River, and San Diego Bay.

The Otay River, the second largest river draining into the San Diego Bay, drains the north-facing slopes of the San Ysidro Mountains and the southerly slopes of the Jamul Mountains. The outlet of the Otay River is in the southernmost portion of the San Diego Bay, which eventually drains into the Pacific Ocean.

Drainage patterns within the project site are generally south to north. North of Ada Street, there is an existing open channel paralleling Bay Boulevard that flows south to north and outlets to an existing channel at Palomar Street that turns west and eventually flows into

San Diego Bay. The tributary watershed boundary to this open channel is an approximate 0.5 square mile area that crosses to the east of Interstate 5.

Figure 3: Otay Hydrologic Unit

3.2.3.2.1. Precipitation and Climate

Precipitation in San Diego County is derived from frontal low-pressure systems that originate over the Pacific Ocean and generally travel southeast into southern California. The majority of precipitation occurs during the cooler months of the year from November through March, and is infrequent during summer months. According to the San Diego

Regional Board's Basin Plan, the average annual precipitation in the project area is approximately 11 to 19 inches, where precipitation generally increases landward. The 50-year 24-hour average precipitation amount is 4 inches, and the 100-year 24-hour average precipitation amount is 4.5 inches for the project area (County of San Diego, 2003). The weather is characterized by mild, wet winters and dry, warm summers. According to U.S. Climate Data (2015), the mean temperature range for the months of November through April is between 48.5°F and 68.8°F. The mean temperature range for the months of May through October is 61.8°F to 75.0°F.

3.2.3.2.2. Flood Plains

The project alignment is located outside the 100-year flood zone. The 100-year flood zone, Zone A, is located immediately west and south of the bike path alignment, containing the evaporation ponds for South Bay Salt Works and Main Street west of Interstate 5. The 500-year flood zone, Zone X, is located south and east of the project area within the Otay River Valley.

3.2.3.2.3. Municipal Supply

The City of San Diego currently uses imported water, local surface water, recycled water, and a small amount of groundwater as its supply sources. Since 1947, most of its water is purchased from the San Diego County Water Authority (SDCWA), which imports water from the Metropolitan Water District of Southern California (MWD), comprised of 26 public water agencies. The MWD obtains its water from the Colorado River and northern California via the State Water Project. The City's surface water is collected as runoff from local watersheds in the City's nine reservoirs. Within the City's jurisdiction are several groundwater basins being studied to determine their potential as water storage or supply sources (City of San Diego, 2010).

3.2.3.3. Groundwater Hydrology

According to the Phase I ESA, depth to groundwater along the bike path alignment is anticipated to be at or slightly above the water level in the San Diego Bay, and is expected to change daily in response to tidal fluctuations. Shallow water conditions may occur, especially during the wet season, in certain areas along the proposed alignment. Groundwater elevations may vary from approximately +7.65 feet to +10.00 feet above mean sea level.

3.2.4. **Geology/Soils**

3.2.4.1. Soil Erosion Potential

Soils throughout the project area consist of fill, alluvium, and Bay Point Formation. The Phase I ESA states that the majority of the proposed alignment, which would traverse along the western edge of the Nestor Marine Terrace, is underlain by undivided Old Paralic Deposits of late to middle Pleistocene age, which are also referred to as undivided Bay Point Formation and an unnamed marine sandstone. The deposits are generally described as poorly sorted, moderately permeable, reddish-brown, interfingered strandline, beach, estuarine and colluvial deposits composed of siltstone, sandstone, and conglomerate that rests on the Nestor Terrace.

Young Alluvial Deposits of Holocene to late Pleistocene age are mapped at the southerly terminus of the proposed bike path. The alluvium is flood plain deposit associated with the Otay River south of Main Street. The deposits are described as poorly consolidated, poorly sorted, permeable flood plain deposits of sandy, silty, or clay bearing alluvium.

Artificial man-made fill is mapped west of the proposed bike path and is primarily associated with the salt evaporation ponds. There are no known faults or landslides along the proposed bike path alignment.

The project site is underlain by Class D (very slow infiltration) soils with 35% or less passing the U.S. Standard #200 sieve. Corrosion potential is considered high. These soils do not infiltrate precipitation well and have a high runoff potential when thoroughly wet.

According to NRCS, surface soils throughout the project site consist of the following:

- Huerhuero loam, 2 to 9 percent slopes
- Huerhuero loam, 5 to 9 percent slopes, eroded

The soil-erodibility K factor for the proposed project site is 0.43 per the Natural Resources Conservation Service Web Soil Survey (NRCS, 2014). Typical K values range from 0.02 to 0.69, with the higher values indicating an increased susceptibility of the soil to erosion.

3.2.5. Biological Communities

3.2.5.1. Aquatic Habitat

3.2.5.1.1. Special Status Species

According to the *Bayshore Bikeway Segment 8B Project Natural Environment Study* prepared by Helix Environmental Planning, Inc. (May 2016), no special status plant or animal species were documented in the biological study area.

3.2.5.1.2. Stream/Riparian Habitats

Waters of the U.S. and State, along with State and Federal wetlands, occur within the biological study area.

Arundo-dominated Riparian, and non-native grassland habitats are located in the northern portion of the project area primarily to the east of the proposed bike path. Ornamental vegetation is found in the northern and southern portions of the project area.

3.2.5.1.3. Wetlands

Wetland habitats consisting of coastal brackish marsh, freshwater marsh, herbaceous wetland, and open water are found within the project footprint. Potential impacts to coastal brackish marsh and freshwater marsh could occur with implementation of the project.

3.3. Water Quality Objectives/Standards and Beneficial Uses

The San Diego Basin Plan defines beneficial uses as the uses of water necessary for the survival or well-being of man, plants, and wildlife. Twenty-three beneficial uses are defined by the SWRCB and designated with the San Diego region. These uses of water serve to promote the tangible and intangible economic, social, and environmental goals of mankind. Examples include drinking, swimming, industrial and agricultural water supply, and other support for fresh and saline aquatic habitats. Beneficial uses of the inland surface waters and the groundwater basins must not be threatened by the proposed project.

3.3.1. Surface Water Quality Objectives/Standards and Beneficial Uses

The San Diego Basin Plan lists water quality objectives for inland surface waters according to hydrologic unit. The water quality objectives for inland surface waters within the Otay Valley Hydrologic Area are listed below. Inland surface waters shall not contain concentrations of the following constituents in excess of the corresponding numerical value.

- Total Dissolved Solids: 1,000 milligrams per liter (mg/L)
- Chlorides: 400 mg/L
- Sulfates: 500 mg/L
- Percent Sodium: 60 mg/L
- Nitrogen and Phosphorus: 0.1 mg/L
- Iron: 0.3 mg/L
- Manganese: 0.05 mg/L
- Methylene Blue Active Substance: 0.5 mg/L
- Boron: 0.75 mg/L
- Odor: none
- Turbidity: 20 nephelometric turbidity units
- Color Units: 20

- Fluoride: 1.0 mg/L

The existing and potential beneficial uses of surface waters in the Otay River watershed, listed below, include agricultural supply, contact water recreation and freshwater and wildlife habitat and are summarized below in Table 1.

Table 1: Surface Water Beneficial Uses in the Otay River Watershed

Beneficial Uses	Inland Surface Water
Municipal and Domestic Supply	Exempt*
Agricultural Supply	Existing
Industrial Service Supply	Potential
Contact Water Recreation	Potential
Non-Contact Water Recreation	Existing
Warm Freshwater Habitat	Existing
Wildlife Habitat	Existing
Rare, Threatened, or Endangered	Existing

**Exempted by San Diego RWQCB from municipal use.*

Definitions of beneficial uses are shown below.

Municipal and Domestic Supply: waters used for community, military, municipal, or individual water supply systems including drinking water supply.

Agricultural Supply: waters used for farming, horticulture, or ranching including irrigation, stock watering, and support of vegetation for range grazing.

Industrial Service Supply: waters used for industrial activities that do not depend primarily on water quality including mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, and oil well re-pressurization.

Contact Water Recreation: waters used for recreational activities involving body contact with water where ingestion is reasonably possible including swimming, wading, water-skiing, diving, surfing, and fishing.

Non-Contact Water Recreation: waters used for recreational activities involving proximity to water, but not normally involving body contact with water where ingestion is reasonably possible including picnicking, sunbathing, hiking, camping, boating, hunting, sightseeing, and aesthetic enjoyment in conjunction with the above activities.

Warm Freshwater Habitat: waters used for supporting warm water ecosystems including preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife.

Wildlife Habitat: waters used for supporting terrestrial ecosystems including preservation and enhancement of terrestrial habitats, vegetation, wildlife, or wildlife food and water sources.

Rare, Threatened, or Endangered: waters used for supporting habitats necessary for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened, or endangered.

3.3.2 Groundwater Quality Objectives/Standards and Beneficial Uses

The San Diego Basin Plan lists water quality objectives for groundwater according to hydrologic unit. The water quality objectives for groundwater within the Otay Valley Hydrologic Area are listed below. Groundwater shall not contain concentrations of the following constituents in excess of the corresponding numerical value.

- Total Dissolved Solids: 1,500 milligrams per liter (mg/L)
- Chlorides: 500 mg/L
- Sulfates: 500 mg/L
- Percent Sodium: 60 mg/L
- Nitrate: 10 mg/L
- Iron: 0.3 mg/L
- Manganese: 0.05 mg/L
- Methylene Blue Active Substance: 0.5 mg/L
- Boron: 0.75 mg/L
- Odor: none
- Turbidity: 5 nephelometric turbidity units
- Color Units: 15
- Fluoride: 1.0 mg/L

The existing beneficial uses of groundwater in the Otay River watershed are listed in the table below.

Table 2: Groundwater Beneficial Uses in the Otay River Watershed

Beneficial Uses	Groundwater
Municipal and Domestic Supply	Existing
Agricultural Supply	Existing
Industrial Service Supply	Existing

3.4. Existing Water Quality

The proposed bike path is located in the Otay River watershed. Water quality problems are limited to the presence of elevated coliform bacteria in the Pacific Ocean receiving waters near

Coronado. However, expected population increases could increase the volume of urban runoff in the watershed, which could alter the existing water quality and result in the natural resources becoming degraded.

3.4.1. List of Impaired Waters

San Diego Bay, into which the Otay River outlets, is listed as impaired for PCBs (polychlorinated biphenyls). The Total Maximum Daily Loads (TMDLs) are not available, the expected completion date is listed as 2019 per the SWRCB data for Impaired Water Bodies and Pollutant Assessments.

4. ENVIRONMENTAL CONSEQUENCES

4.1. Introduction

The proposed bike path would result in the addition of 0.32 acre of impervious surface, which along with the negligible increase in runoff flow, would need to conform to BMP requirements approved the Cities of San Diego and Chula Vista in order to meet inland surface water and groundwater water quality objectives in the Otay River watershed. To meet the requirements, the proposed improvements would include new pervious paving with a sub-drain system, underground drainage systems, and a vegetated swale. Project runoff would be conveyed directly to storm water treatment BMPs and the existing drainage system. The potential environmental consequences associated with project implementation are detailed in subsequent sections.

4.2. Potential Impacts to Water Quality

The potential impacts of the proposed project on water quality and storm water runoff were evaluated to determine if they would 1) substantially reduce the ability to achieve water quality objectives, or 2) result in water quality degradation due to on-site storm water discharges during construction and operation.

The City of San Diego Storm Water Standards identifies anticipated and potential project pollutants by various land use categories. Segment 8B of the Bayshore Bikeway is categorized as Streets, Highways, and Freeways land use. Anticipated pollutants for this type of land use include sediments, heavy metals, organic compounds (including petroleum hydrocarbons), trash and debris, oil and grease, bacteria and viruses. The primary pollutants that would be expected from the proposed bike path include minimal amounts of trash and debris. Because the bike path would prohibit vehicle use, except for maintenance vehicles, heavy metals, organic compounds, and oil and grease would rarely be anticipated with the proposed improvements. Sediments, heavy metals, organic compounds, and oil and grease may be short-term anticipated pollutants during the construction phase.

Potential pollutants for the Streets, Highways, and Freeways land use category include nutrients and pesticides (if landscaping exists on-site), and oxygen demanding substances (including solvents). The potential pollutants for this area would not be altered by the proposed project, and the project improvements do not include landscaping.

4.2.1. Anticipated Changes to the Physical/Chemical Characteristics of the Aquatic Environment

4.2.1.1. Substrate

There are no anticipated changes to the substrate due to the proposed project.

4.2.1.2. Currents, Circulation or Drainage Patterns

The project proposes to maintain existing drainage patterns. The project would increase impervious surface area, which could result in higher runoff volumes. However, because the volume is small, the proposed discharge would have minimal impacts to current patterns and water circulation.

4.2.1.3. Suspended Particulates (Turbidity)

The potential for increased turbidity would be related to temporary impacts during construction before soil stability and swale vegetation have reached optimum levels. This could result in short-term increases in the level of suspended particles in the water, which could, if the levels are elevated for extended amounts of time, reduce light penetration and decrease the rate of photosynthesis and primary productivity of an aquatic area. The suspended material could react with dissolved oxygen in the water, resulting in oxygen depletion. Significant increase in suspended particles are visible and aesthetically displeasing. Short-term impacts from turbidity would be mitigated through implementation of a SWPPP and the use of BMPs.

4.2.1.4. Oil, Grease and Chemical Pollutants

Increases to constituent concentrations of oil, grease, and chemical pollutants would primarily occur as a result of increased impervious area. However, because vehicles would be prohibited from using the bike path, potential pollutants associated with vehicles (i.e. oil, grease, chemical pollutants, and metals) would not be anticipated with the proposed improvements. Short-term impacts from these pollutants would be mitigated through implementation of a SWPPP and the use of BMPs.

4.2.1.5. Temperature, Oxygen, Depletion and Other Parameters

A possible pollutant from the proposed project would be minimal amounts of trash and debris. The project may include trash receptacles at various locations along the length of the bike path to enable users to properly dispose of trash and prevent it from entering the surrounding aquatic environment. The receptacles would adhere to applicable City of San Diego standards by including attached lids to prevent rainfall intrusion. High trash usage areas would not be anticipated with the proposed project.

Pollutants including bacteria and potential viruses from pet waste is not anticipated with the proposed project.

4.2.1.6. Flood Control Functions

The increase in impervious area from the proposed project would be relatively small when compared to the existing impervious area within the Otay River watershed. This slight increase in runoff volume would have negligible effects on the flood control functions in the project area.

4.2.1.7. Storm, Wave and Erosion Buffers

The slight increase in runoff volume would have negligible effects on storm, wave, and erosion buffers.

4.2.1.8. Erosion and Accretion Patterns

The slight increase in runoff volume would have negligible effects on erosion and accretion patterns.

4.2.1.9. Aquifer Recharge/Groundwater

The existing beneficial uses of groundwater in the Otay River watershed are Municipal and Domestic Supply, Agricultural Supply, and Industrial Service Supply. All storm water runoff from the proposed project would be directed into a vegetated swales or perforated pipe below pervious concrete, where it would be conveyed to the existing drainage system. The project site is underlain by Class D (very slow infiltration) soils with 35% or less passing the U.S. Standard #200 sieve. These soils do not infiltrate precipitation well and have a high runoff potential when thoroughly wet. Therefore, the potential for the proposed project to impact groundwater is very low.

4.2.1.10. Baseflow

The Otay River is ephemeral in nature, flowing primarily during the wet season and typically only during storm events. The river has no perennial baseflow.

4.2.2. Anticipated Changes to the Biological Characteristics of the Aquatic Environment

4.2.2.1. Special Aquatic Sites

In the northern portion of the project area, the existing ditch west of Bay Boulevard between Palomar Street and Ada Street supports wetland habitats consisting of coastal brackish marsh, streambed, and open water. Discharge of fill material in wetlands could damage habitat and adversely affect the biological productivity of wetland ecosystems by

dewatering, permanently flooding, or altering substrate elevation of periodicity of water movement. Disruption or elimination of the wetland system could degrade water quality by interfering with the filtration function of wetlands and discharging fill material in wetlands may modify their capacity to retain and store floodwaters.

The project area is located near the San Diego Bay National Wildlife Refuge (Figure 4), which includes the evaporation ponds at the southern end of the San Diego Bay, portions of the south bay's open water areas, and the portion of the Otay River and associated floodplain west of Interstate 5 (Otay River Watershed Management Plan, May 2006).

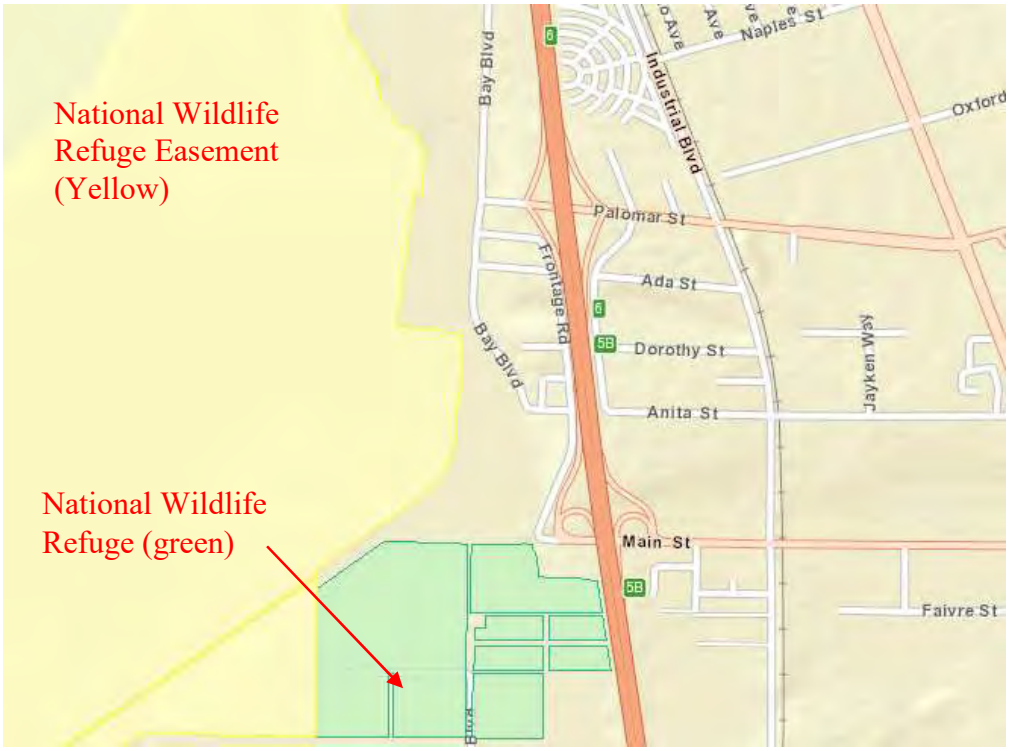


Figure 4: San Diego Bay National Wildlife Refuge

Construction activities could cause impacts to the Refuge due to the discharge of fill material disrupting the breeding, spawning, migratory movements or other critical life requirements of fish and wildlife and changing the balance of water and land areas which could modify refuge management practices. The project and all construction activities will be located approximately 2,300 feet north of the Nation Wildlife Refuge. Storm water within the project site flow north and west. Therefore impacts to the Refuge are not anticipated as a result of this project.

4.2.2.2. Invasive Species

Invasive species within the project footprint would be removed by project construction. A qualified biologist will review the project revegetation/erosion control plans to ensure no invasive species are included. Upon completion of grading, all areas of temporary

disturbance (except for the proposed contractor staging area) shall be revegetated with native species.

4.2.3. Anticipated Changes to the Human Use Characteristics of the Aquatic Environment

4.2.3.1. Existing and Potential Water Supplies; Water Conservation

Temporary pollutants including sediments, heavy metals, organic compounds, and oil and grease could have the potential to seep into the ground during construction, possibly affecting groundwater. However, the project site is underlain with soils which do not infiltrate well and have a high runoff potential when thoroughly wet. Therefore, the potential for the proposed project to impact groundwater is very low

4.2.3.2. Recreational or Commercial Fisheries

An increase in pollutants could lead to water quality degradation and affect the suitability of recreational and commercial fishing areas as habitat for populations of consumable aquatic organisms. Pollutant discharges could result in the chemical contamination of recreational and commercial fisheries, and could interfere with the reproductive success of recreational and commercially important aquatic species through disruption of migration and spawning areas. The introduction of pollutants at critical times in their life cycle may directly reduce populations of commercially important aquatic organisms or indirectly reduce them by reducing organisms upon which they depend for food. The proposed project will provide for storm water filtration by the use of pervious concrete and a vegetated swale, and is restricted to motor vehicles, and therefore will not increase pollutants that degrade the water quality.

4.2.3.3. Other Water Related Recreation

Increases in turbidity and other pollutants could impact water-related recreational activities undertaken for amusement and relaxation including swimming, fishing, sightseeing, and hiking. Changing turbidity, suspended particulates, temperature, dissolved oxygen or materials, sight, taste, and odor could impact the recreational use of the water. The proposed project will provide for storm water detention by the use of pervious concrete and a vegetated swale, and is restricted to motor vehicles, and therefore will not increase turbidity or other pollutants.

4.2.3.4. Aesthetics of the Aquatic Ecosystem

Increases in pollutants could impact the aesthetics of the natural aquatic ecosystem by degrading water quality, inducing inappropriate development, encouraging unplanned or

incompatible human access, or affecting the features and characteristics of the aquatic area which make it valuable to surrounding property owners. Activities that degrade water quality, disrupt natural substrate and vegetational characteristics, deny access to or visibility of the resource, or result in odor, air quality, or noise level changes could reduce the value of an aquatic area to the local property owners. The project will not encourage unplanned or incompatible human access to the aquatic area. Motor vehicles are restricted from the bike path, therefore odor, air quality, and noise levels will not be affected.

4.2.3.5. Parks, National and Historic Monuments, National Seashores, Wild and Scenic Rivers, Wilderness Areas, etc.

Increases in pollutants could modify the aesthetic, educational, historical, recreational, and/or scientific qualities of parks, national and historic monuments, national seashores, or wild and scenic rivers. The proposed project is not located near areas designated as parks, national and historic monuments, national seashores, or wild and scenic rivers. However, the project area is located near the San Diego Bay National Wildlife Refuge. The proposed project is for people walking and riding bicycles and is restricted to motor vehicles, and therefore will not increase pollutants that degrade the water quality.

4.2.3.6. Traffic/Transportation Patterns

The project would not alter existing traffic/transportation patterns. The proposed bike path would be aligned adjacent the roadway with the majority of the construction outside the traveled way of Bay Boulevard Short-term traffic control due to closure of the south bound lane of Bay Boulevard would be anticipated on a temporary basis during the construction phase.

4.2.3.7. Energy Consumption or Generation

The proposed project may include lighting which would consume negligible amounts of energy during nighttime hours when the lighting is on to provide better visibility for path users. The project would not generate any energy.

4.2.3.8. Navigation

The proposed project would not alter navigable waterways. There are no navigable waterways within the project area.

4.2.3.9. Safety

Currently, people walking and riding bicycles must traverse the project area on surface streets to make the connection between the two existing segments of the Bayshore Bikeway. The proposed project would increase safety by encouraging people walking and

riding bicycles to avoid the roadways and instead travel on the designated bike path. People walking and riding bicycles would continue on surface streets for the remaining undeveloped sections of the Bayshore Bikeway.

4.2.3.10. Industry

The proposed project would be constructed along the eastern edge of South Bay Salt Works. Temporary impacts could result in operational effects to South Bay Salt Works during construction. However, the proposed project would not result in permanent impacts to industry in the project area.

4.2.4. Short-Term Impacts During Construction

Short-term impacts from sediments, heavy metals, organic compounds, oil and grease from construction tasks, vehicles, and equipment, and dewatering activities may be anticipated during the construction phase.

4.2.4.1. Physical/Chemical Characteristics of the Aquatic Environment

The short-term impacts would occur before the soil stability and swale vegetation reaches optimum levels. Construction of the proposed bike path would include grading, excavation, and modification to the landscape in the project area, which would expose unprotected soil to erosion by wind, rain, and runoff. Sheet and/or concentrated flows could erode the soil, creating suspended soil particles, which could settle and cause siltation downstream. This could result in potential impacts to the physical/chemical characteristics of the aquatic environment. The construction activities listed below could contribute increased sediment and materials to receiving waters.

- **Daily Contractor Activities**: Routine activities such as material delivery, storage, waste management, equipment usage, and use of a staging area could generate dust, sediments, and debris. Fuel, oil and other spills from construction equipment could potentially impact the physical and chemical characteristics of the aquatic environment.
- **Vegetation Removal/Trimming**: Vegetation clearing and trimming would be conducted for construction and access to the project site. This would result in exposed topsoil which tends to be more susceptible to erosion.
- **Grading**: Grading would include removal of the natural topsoil and creation of engineered slopes using fill material. Graded material could be susceptible to erosion without temporary and/or permanent erosion control measures.

A SWPPP would be prepared to identify the pollution prevention measures that will be taken. The SWPPP would be implemented to reduce or eliminate the discharge of pollutants to storm water conveyance systems.

4.2.4.2. Biological Characteristics of the Aquatic Environment

Pollutants resulting from construction activities, discussed in Section 4.2.4.1, that could have potential impacts on the biological characteristics of the aquatic environment include sediment, trash, concrete waste, sanitary waste, and chemicals. A SWPPP would be prepared and implemented and therefore the potential for pollutants from construction activities impacting the aquatic environment is low.

4.2.4.3. Human Use Characteristics of the Aquatic Environment

Short term pollutants resulting from the construction activities described in Section 4.2.4.1 that could have potential impacts to the human use characteristics of the aquatic environment include sediment, trash, concrete waste, sanitary waste, and chemicals. A SWPPP would be prepared and implemented and therefore the potential for pollutants from construction activities impacting the aquatic environment is low.

4.2.5. Long-Term Impacts During Operation and Maintenance

The project will include BMPs to provide post-construction water quality benefits to the project area. The proposed improvements would include new pervious paving with a sub-drain system, and a vegetated swale. BMPs are shown in the preliminary improvement plans in Appendix 2.

4.2.5.1. Physical/Chemical Characteristics of the Aquatic Environment

The proposed project would slightly increase the impervious surface area, which could contribute to pollution of water resources through the collection and runoff of potential minimal amounts of trash and debris. However, the increase in impervious area relative to the total impervious area in the watershed is negligible and is not expected to result in excessive trash and debris. Trash receptacles may be available along the length of the bike path to mitigate long-term impacts during bike path operation and maintenance.

4.2.5.2. Biological Characteristics of the Aquatic Environment

Pollutants that could have potential impacts on the biological characteristics of the aquatic environment include sediment, trash, sanitary waste, chemicals, oil, and grease. Post construction erosion control measures would protect from sediment entering the aquatic environment. Trash receptacles may be available along the bike path to mitigate the impact of trash. The bike path would be restricted to motor vehicles, except for infrequent maintenance vehicles. Therefore the accumulation of motor vehicle-related chemicals, oil, and grease is not anticipated and would not enter the aquatic environment.

4.2.5.3. Human Use Characteristics of the Aquatic Environment

Pollutants that could have potential impacts on the human use characteristics of the aquatic environment include sediment, trash, sanitary waste, chemicals, oil, and grease. Post construction erosion control measures would protect from sediment entering the aquatic environment. Trash receptacles may be available along the bike path to mitigate the impact of trash. The bike path would be restricted to motor vehicles, except for infrequent maintenance vehicles. Therefore the accumulation of motor vehicle-related chemicals, oil, and grease is not anticipated and would not enter the aquatic environment.

4.3. Impact Assessment Methodology

Because the No Project Alternative does not propose any improvements or modifications to the existing conditions, it will not be evaluated. The Build Alternative would include both short-term, during construction, and long-term, during operation and maintenance, impacts as discussed in Sections 4.2.4 and 4.2.5, respectively. All potential impacts would be addressed by implementation of Construction Site BMPs, and Source Control and Site Design BMPs, and Storm Water Pollutant Control BMPs.

Construction Site BMPs would be implemented to reduce or eliminate pollutants in storm water discharges and authorized non-storm water discharges from the project site during the construction phase and would be identified in the SWPPP.

Source Control and Site Design BMPs would be incorporated into the design of the project to address potential pollutants during bike path operations and maintenance. Source control BMPs generally refer to methods intended to minimize pollution generation at the project. They are designed to reduce the potential for contamination by controlling it at the source. Site Design BMPs generally refer to design techniques to maintain natural drainage pathways, minimize impervious area, and conserve natural areas.

The City of San Diego Storm Water Standards Manual provides guidance to determine which Storm Water Pollutant Control BMPs are applicable to the project. Per *Section 5.5 BMP Selection and Design*, Flow-thru Treatment Control Category is applicable to the project. Storm Water Pollution Control BMPs would be implemented through the use of pervious concrete pavement and a vegetated swale.

4.4. Alternative-Specific Impact Analysis

The No Project alternative would not increase the impervious area in the project vicinity or alter existing conditions. This alternative would not result in impacts to receiving waters or increase the anticipated pollutants, including trash and debris or bacteria and viruses due to pet waste.

The Build Alternative would result in 1.3 acres of total disturbed soil and a net impervious area of 0.32 acre. The cost of avoidance and minimization measures is the sum of the Water Quality

Measures identified in Section 5. The preliminary estimated cost for these measures for the Build alternative is $160,000. The treatment areas and cost for mitigation measures are preliminary and subject to change during the final design phase.

4.5. Cumulative Impacts

The cumulative study area for water quality and storm water runoff is the Otay Valley Hydrologic Area within the Otay Hydrologic Unit. Drainage from the project site would eventually drain into the San Diego Bay. Existing surrounding land uses include undeveloped land, commercial, industrial, and residential.

According to the Otay River Watershed Management Plan developed by San Diego County (2006), the Otay River watershed is a rapidly urbanizing coastal watershed with development concentrated along the flat coastal plain. Population and housing are expected to nearly double in the next 25 years, contributing to the loss of undeveloped and agricultural land. Conversion of undeveloped land to other uses could result in hydromodification and increased pollutant loading into surface waters and the potential for reaching groundwater. Urbanization could introduce new pollutant sources associated with new land uses.

To counteract the impacts associated with increased development, all projects in the watershed must undergo review by the applicable lead agency for compliance with NPDES permits for construction activities and project operations, as well as compliance with local urban runoff ordinances. BMPs must be implemented in site designs to reduce sources of pollutants and treat storm water runoff. This includes compliance with all federal, state, and local requirements discussed in Section 2, including those mandated by the San Diego RWQCB.

The purpose of the NPDES permit program is to restore beneficial uses of receiving waters. Compliance with NPDES regulations is considered sufficient for mitigating water quality impacts. The Build alternative would improve runoff water quality in the project area because it would implement BMPs to treat and convey storm water, and would therefore not contribute to cumulative water quality impacts. The proposed project would implement design pollution prevention BMPs and may include trash receptacles at various locations along the length of the bike path. The receptacles would adhere to City of San Diego standards and would include attached lids to prevent rainfall intrusion.

5. AVOIDANCE AND MINIMIZATION MEASURES

Construction site, design pollution prevention, and treatment control BMPs would be incorporated into the final design of the project. Compliance with the Construction General Permit Caltrans Statewide NPDES permit, County Municipal Permit, and the City of San Diego Storm Water Standards would be required for potential construction and post-construction

impacts. The Water Quality Measures described below can be applied to address potential water quality impacts.

WQ-1: SWPPP – In accordance with the Construction General Permit, a SWPPP would be prepared to address all construction-related activities, equipment, and materials with the potential to impact water quality. The SWPPP would identify the sources of pollutants that may affect storm water quality, include construction site BMPs to control pollutants and sediment, and provide for catch basin/inlet protection, construction materials management, and non-storm water BMPs.

WQ-2: Construction Site BMPs – The contractor would use construction site BMPs in accordance with all applicable state and local agency standards. The purpose of the BMPs would be to stabilize disturbed soil and minimize erosion, and to capture and remove sediment from runoff before it leaves the project site both during and after the construction phase. All construction site BMPs would adhere to the latest edition of the Storm Water Quality Handbook: Construction Site Best Management Practices Manual (Caltrans). The contractor would implement, at minimum, the following BMPs to reduce impacts to receiving waters due to potential pollutants generated during construction.

- Scheduling (SS-1)
- Preservation of Existing Vegetation (SS-2)
- Geotextiles, Mats, Plastic Covers, and Erosion Control Blankets (SS-7)
- Silt Fence (SC-1)
- Fiber Rolls (SC-5)
- Gravel Bag Berm (SC-6)
- Street Sweeping and Vacuuming (SC-7)
- Sand Bag Barrier (SC-8)
- Storm Drain Inlet Protection (SC-10)
- Stabilized Construction Entrance (TC-1)
- Dewatering Operations (NS-2)
- Vehicle and Equipment Cleaning (NS-8)
- Vehicle and Equipment Fueling (NS-9)
- Vehicle and Equipment Maintenance (NS-10)
- Concrete Curing (NS-12)
- Concrete Finishing (NS-14)
- Material Delivery and Storage (WM-1)
- Material Use (WM-2)
- Stockpile Management (WM-3)
- Spill Prevention and Control (WM-4)
- Solid Waste Management (WM-5)
- Hazardous Waste Management (WM-6)
- Concrete Waste Management (WM-8)

WQ-3: Design Pollution Prevention BMPs – Design Pollution Prevention BMPs would be implemented as permanent measures to minimize water quality impacts pollution in storm water runoff. The following BMPs would be implemented for the project:

- Preservation of Existing Vegetation
- Concentrated Flow Conveyance Systems
    - Ditches, Berms, Dikes, and Swales
- Slope/Surface Protection Systems
- Storm Water Conveyance System Stamping and Signage
- Pervious Concrete

WQ-4: Storm Water Pollutant Control BMPs – City-approved treatment control BMPs would be incorporated into the project design to minimize impacts from potential pollutants in storm water runoff. The primary anticipated pollutants for the proposed bike path are minimal amounts of trash. Storm Water Pollutant Control BMPs for this project would include a vegetated swale adjacent to a segment of the bike path, and pervious concrete. The swale and pervious concrete would treat low flows of storm water using filtration and convey storm water during high flows.

WQ-5: Maintenance – Maintenance for all permanent BMPs would be required to verify proper performance and ensure ongoing maintenance of the BMP facilities. Operation and maintenance of BMP facilities would be the responsibility of the City of San Diego.

6. REFERENCES

Caltrans Division of Design Stormwater homepage for guidance and tools (Project Risk Level, Estimating for CGP, Erosion Prediction software, etc.):
http://www.dot.ca.gov/hq/oppd/stormwtr/index.htm

Caltrans Division of Environmental Analysis Storm Water Homepage:
http://www.dot.ca.gov/hq/env/stormwater/

Caltrans Standard Environmental Reference (SER) Volume I

- For wetlands, hydromorphic method and water assessment information, see Chapter 15 - Waters of the U.S. and the State:
  http://www.dot.ca.gov/ser/vol1/sec3/natural/ch15wetland/ch15wetland.htm

- For hydraulic studies and floodplain encroachment information, see Chapter 17 - Floodplains: http://www.dot.ca.gov/ser/vol1/sec3/special/ch17flood/chap17.htm

- For Coastal Zone permits information, see Chapter 18 - Coastal Zone:
  http://www.dot.ca.gov/ser/vol1/sec3/special/ch18coastal/chap18.htm

- For Wild and Scenic Rivers information, see Chapter 19 - Wild and Scenic Rivers:
  http://www.dot.ca.gov/ser/vol1/sec3/special/ch19wsrivers/chap19.htm

Caltrans Storm Water Quality Handbook Project Planning and Design Guide (PPDG):
http://www.dot.ca.gov/hq/oppd/stormwtr/swdr2010/PPDG%20July%202010%20r2.pdf

Caltrans Stormwater Quality Practice Guidelines:
http://pd.dot.ca.gov/env/stormwater/html/practice_guidelines.htm

City of San Diego Storm Water Standards Manual:
http://www.sandiego.gov/stormwater/regulations

Regional Water Quality Control Board website and Basin Plans:
http://www.swrcb.ca.gov/plans_policies/

State Water Resources Control Board Storm Water Program, 2012-0006-DWQ Construction General Permit:
http://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.shtml

United States (U.S.) Environmental Protection Agency Section 404(b)(1) guidelines:
http://www.epa.gov/owow/wetlands/pdf/40cfrPart230.pdf

6.1. Preparer(s) Qualifications

Andrea Dodge, P.E., Project Engineer. B.S., Civil Engineering, San Diego State University; 9 years of civil engineering consultant experience.

7. APPENDICES

Appendix 1

Drainage Study

Drainage Study

Bayshore Bikeway Segment 8B

June 2016

Table of Contents

List of Figures

List of Appendices

1. 1. INTRODUCTION

The purpose of this Drainage Study is to analyze existing and proposed on-site and off-site hydrology, and to design the proposed storm drain system and storm water treatment concept for the proposed Segment 8B of the Bayshore Bikeway.

This study is based on the City of San Diego Drainage Design Manual (1984) for the existing and proposed project site hydrology and existing watershed hydrology. The San Diego County Drainage Design Manual (March 2005) and the City of San Diego Storm Water Standards (January 2012) were used for the design of the storm drain and storm water systems.

This Drainage Study is subject to revisions as needed to accommodate changes to project design, or as required by the City and/or project Registered Civil Engineer.

1.1. Project Description

This Drainage Study was prepared to evaluate the proposed Bayshore Bikeway Segment 8B project (herein referred to as proposed project) located in the cities of San Diego and Chula Vista, San Diego County. The project would partially fill a gap in the regional bicycle network and contribute to the vision of implementing the Bayshore Bikeway, which consists of a 24-mile regional bicycle facility around San Diego Bay to provide more transportation options and a scenic connection to employment centers, recreation facilities, and tourist destinations along the Bayfront.

The San Diego Association of Governments (SANDAG) proposes to construct a portion of the planned Bayshore Bikeway along the eastern San Diego Bayfront in the cities of San Diego and Chula Vista. The proposed project includes a portion of the Bayshore Bikeway identified within Segment 8B of the Bayshore Bikeway Plan (dated March 17, 2006). The proposed project would consist of a Class I bikeway, which is a path that provides a separated right-of-way for the exclusive use of people walking and riding bikes, extending southward approximately 0.25 mile along the west side of Bay Boulevard from the terminus of Segment 8A at Palomar Street in the City of Chula Vista to the main driveway of the South Bay Salt Works facility in the City of San Diego. The proposed bikeway would include an eight-foot-wide bike path with two to three-foot-wide shoulders. The bike path would cross over a drainage ditch near Palomar Street on a bridge structure, and from Palomar Street to Ada Street, it would be constructed as a cantilevered deck over the western side of an existing drainage ditch that runs adjacent to the west side of Bay Boulevard. South of Ada Street, the bike path would be constructed at grade. Additional improvements would include installation of a new storm drain inlet and culvert just north of Palomar Street, curb and gutter, chain link fencing along the west side of the bike path, railing along the east side of the deck, lighting, minor grading, bike lane striping, utilities improvements and relocations, and other improvements as required by the cities of San Diego and Chula Vista and SANDAG.

The primary purpose of these improvements is to continue to develop the Bayshore Bikeway. There are currently approximately 15 miles of the trail in use as a Class I bike path, with the proposed bikeway extending 24 miles around San Diego Bay beginning at the Broadway Pier in San Diego and ending at the Coronado Ferry Terminal in Coronado. The route passes through the cities of San Diego, National City, Chula Vista, Imperial Beach and Coronado. There are currently several segments that operate on Class II and III bike lanes and route, many of which have been identified by SANDAG for development.

The proposed Segment 8B of the bikeway is currently being traversed by people riding bicycles along surface streets. The development of a Class I bike path in this area will provide mobility choices for people riding bicycles, providing a safer and more distinguished bike route, and decrease congestion on the surface streets. The proposed improvements include surface improvements, drainage structures, retaining walls, bridge, striping, minor grading, fencing, relocation of existing utilities, lighting, and other improvements as required by the cities and SANDAG.

In 2010, TY Lin International prepared a study entitled *Feasibility Study – Bayshore Bikeway Segment 8B* (August 2010) for the purpose of developing and analyzing several alternatives for Segment 8B of the Bayshore Bikeway. Five alternatives were developed in the Feasibility Study and analyzed according to the following key factors: safety, public access, connectivity with other segments, environmental impacts, constructability, construction cost, and maintenance. Alternative 3 was recommended for further study, which proposed an alignment along the west side of Bay Boulevard. Revisions have been made to the recommended alternative as the project has progressed. The proposed improvements are discussed in the following section.

1.1.1. Proposed Alignment

The proposed alignment consists of approximately 1,210 linear feet of Class I bike path between Palomar Street and the main entrance to the South Bay Salt Works facility. The project alignment would extend along the western side of Bay Boulevard within an existing privately-owned parcel. This portion of the bike path would be designed partially cantilevered over an existing drainage ditch.

The proposed alignment for the bike path can be found in appendix A.

2. PROJECT SITE ASSESSMENT

2.1. Existing Conditions

The project is located in the cities of San Diego and Chula Vista in the southwestern portion of San Diego County as shown in Figure 1 below.

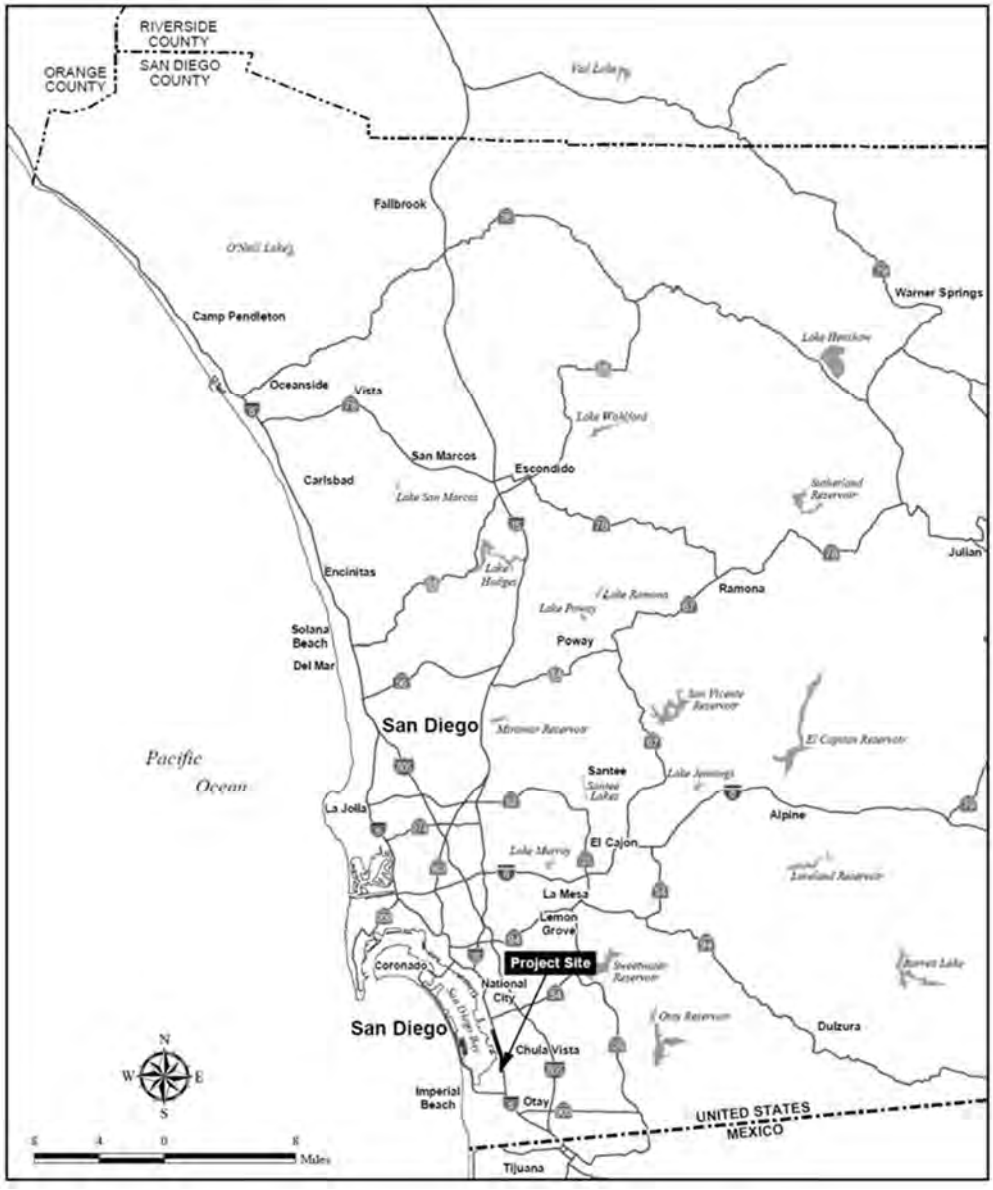


Figure 1: Project Vicinity

The bike path would extend between Palomar Street and the main entrance to the South Bay Salt Works facility along Bay Boulevard.

Drainage of the existing project site consists of overland flow, channel flow, and several drainage culverts west of Bay Boulevard.

2.2. Existing Drainage Patterns

The Bayshore Bikeway Segment 8B project is located in the Otay Hydrologic Unit within the Otay River watershed which drains approximately 160 square miles and reaches inland approximately 24 miles. The watershed, shown in Figure 2 below, consists primarily of unincorporated area, but also includes portions of the cities of Chula Vista, Imperial Beach, Coronado, National City, and San Diego. Major water bodies in the Otay Hydrologic Unit are the Upper and Lower Otay Reservoirs, Otay River, and San Diego Bay.

The Otay River, the second largest river draining into the San Diego Bay, drains the north-facing slopes of the San Ysidro Mountains and the southerly slopes of the Jamul Mountains. The outlet of the Otay River is in the southernmost portion of the San Diego Bay, which eventually drains into the Pacific Ocean.

Drainage patterns within the project site are generally south to north. North of Ada Street, there is an existing open channel paralleling Bay Boulevard that flows south to north and outlets to an existing channel at Palomar Street that turns west and eventually flows into San Diego Bay at Telegraph Canyon in the City of San Diego.

Figure 2: Otay Hydrologic Unit

2.3. Proposed Project

The proposed project would construct approximately 1,210 feet of paved Class I bike path west of Bay Boulevard between Palomar Street and the main entrance to the South Bay Salt Works facility. Construction of the project would include new impervious and pervious paving with a sub-drain system, a vegetated swale and two curb inlets.

3. EXISTING CONDITIONS

3.1. Existing Watershed Hydrology

3.1.1. Hydrology Design Criteria

Hydrology design for the Bayshore Bikeway Segment 8B project adheres to the design criteria outlined in the City of San Diego Drainage Design Manual (DDM), 1984. The watershed tributary to the proposed project area is 0.005 square miles, or 2.9 acres. Therefore, according to Section 1-102 of the DDM, the rational method will be used to determine the watershed peak runoff for the 100-year storm.

The rational method uses the following equation to calculate the flow rate, Q (in cubic feet per second).

$$Q = CIA$$

Where: C = runoff coefficient
I = rainfall intensity (inches per hour)
A = drainage basin area (acres)

The runoff criteria for the underground storm drain system shall be based upon a 50-year frequency storm per Section 1-102 of the DDM.

3.1.2. Design Parameters

The rainfall intensity was obtained from the Rainfall Intensity-Duration-Frequency Curves for San Diego County located in Appendix I of the DDM. The flow rate was obtained using the Rational Method Q=CIA. Time of Concentration was calculated from the sum of the Overland Flow Time and the Street Gutter/Concentrated Flow Time.

3.1.3. Existing On-Site Characteristics

The geography along the proposed bikeway alignment consists of flat to gently sloping terrain with elevations ranging from approximately +6 feet to +10 feet above mean sea level. The majority of the project footprint is proposed within undeveloped land and is typically bare or includes short grasses. The drainage ditch contains dense vegetation. There are industrial and transportation facilities within the immediate vicinity of the project. Residential and commercial developments also exist within a few hundred feet of the proposed alignment.

The main disturbance to the uniform flat grade is the existing open channel parallel to the proposed bike path and west of Bay Boulevard. The tributary area to this open channel is 0.5 square miles and crosses to the east of Interstate 5. The elevations of this watercourse range from 51 feet to 0 feet. Analysis of the basin was conducted and the results show that during the 100-year flood, the ditch and adjacent Bay Boulevard would be flooded and behave in subcritical flow. The proposed project has been designed to not impact the channel hydraulics by constructing a concrete cantilevered deck for the trail above the channel and installing a bridge for the crossing that is located south of Palomar Street, thereby not substantially decreasing the conveyance area of the channel.

According to the flow patterns and existing conditions, the proposed on-site project area can be divided into two drainage areas, represented in the figure below.

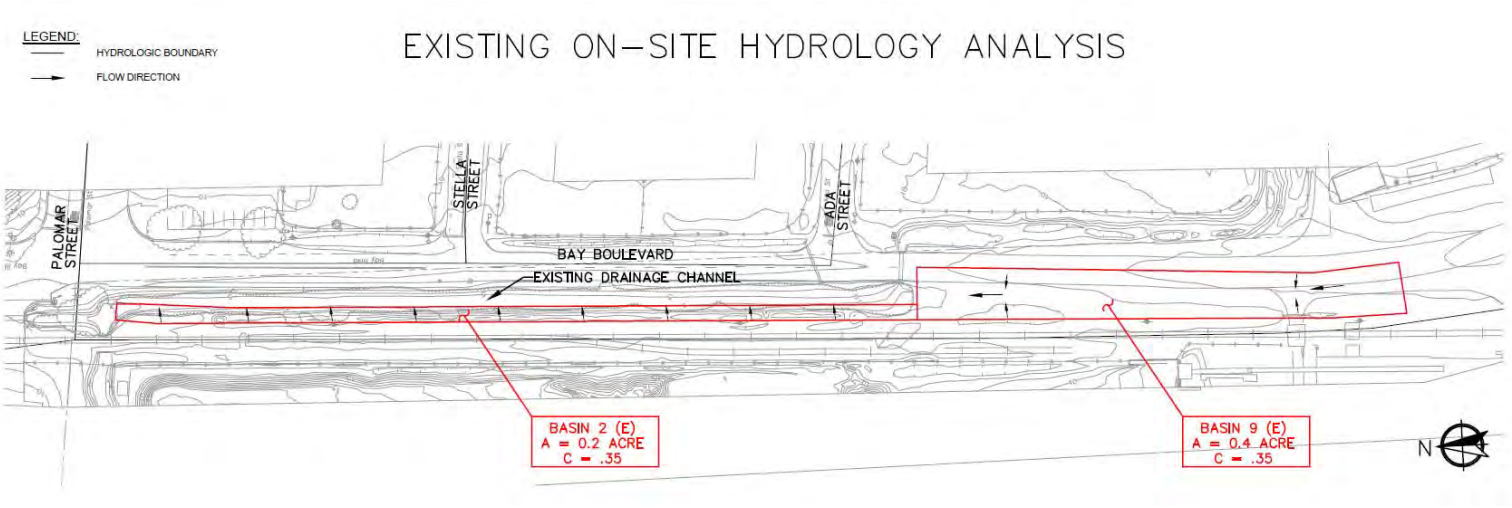


Figure 3: Existing On-Site Hydrology Area

3.1.4. Existing On-Site Results

The table below shows the areas and flow rates for the drainage areas. The drainage calculations can be found in Appendix C.

Existing On-Site Areas

Area	A (ac)	I (in/hr)	C	Q (cfs)
2E	0.20	4.4	0.35	0.3
9E	0.40	3.1	0.35	0.4

3.1.5. Existing Off-Site Characteristics

According to the flow patterns and existing conditions, there is one off-site drainage area that will be impacted by the proposed project. This drainage area is the western side of Bay Boulevard from the high point at the I-5 L Street exit, located 0.6 miles north of Palomar Street, to Palomar Street. Bay Boulevard is a paved 2 lane road with curb and gutter. The drainage area is represented in the figure below.

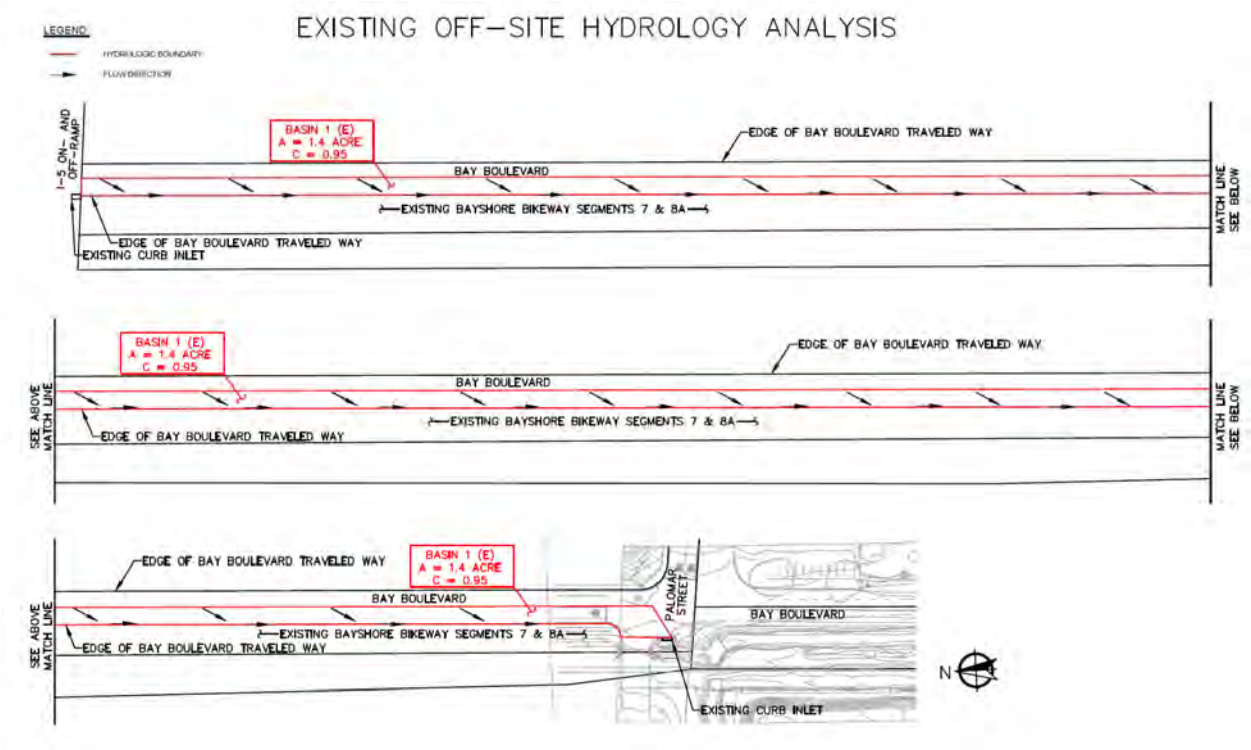


Figure 4: Existing Off-Site Hydrology Area

3.1.6. Existing Off-Site Results

The table below shows the area and flow rate for the drainage area. The drainage calculations can be found in Appendix B.

Area 1E

A	1.4	ac
I	2.2	in/hr
C	0.95	
Q	2.9	cfs

4. PROPOSED CONDITIONS

The proposed project would change the drainage patterns within the watershed and on-site areas. The on-site conditions would be modified in the proposed project because of the additional pavement comprising the bike path as well as the proposed drainage and storm water facilities.

4.1. Proposed Watershed Hydrology

The project site covers an area of approximately 1.5 acres, which is 0.09% percent of the total watershed area. Therefore, it is unlikely that the proposed project would result in a significant change to the total storm water runoff within the watershed.

4.1.1. Hydrology Design Criteria

The design criteria for the proposed on-site hydrology is the same as the existing on-site hydrology as discussed previously in Section 3.1.1.

4.1.2. Design Parameters

The design parameters for the proposed on-site hydrology are the same as the existing on-site hydrology as discussed previously in Section 3.1.2.

4.1.3. Proposed On-Site Characteristics

The project site is divided into six drainage areas according to flow patterns and proposed conditions. These areas differ from the existing drainage areas discuss in Section 3.1.3. The proposed bike path increases the impervious area and is super elevated which modifies the existing flow patterns. The figure below shows the proposed drainage areas in the project site.

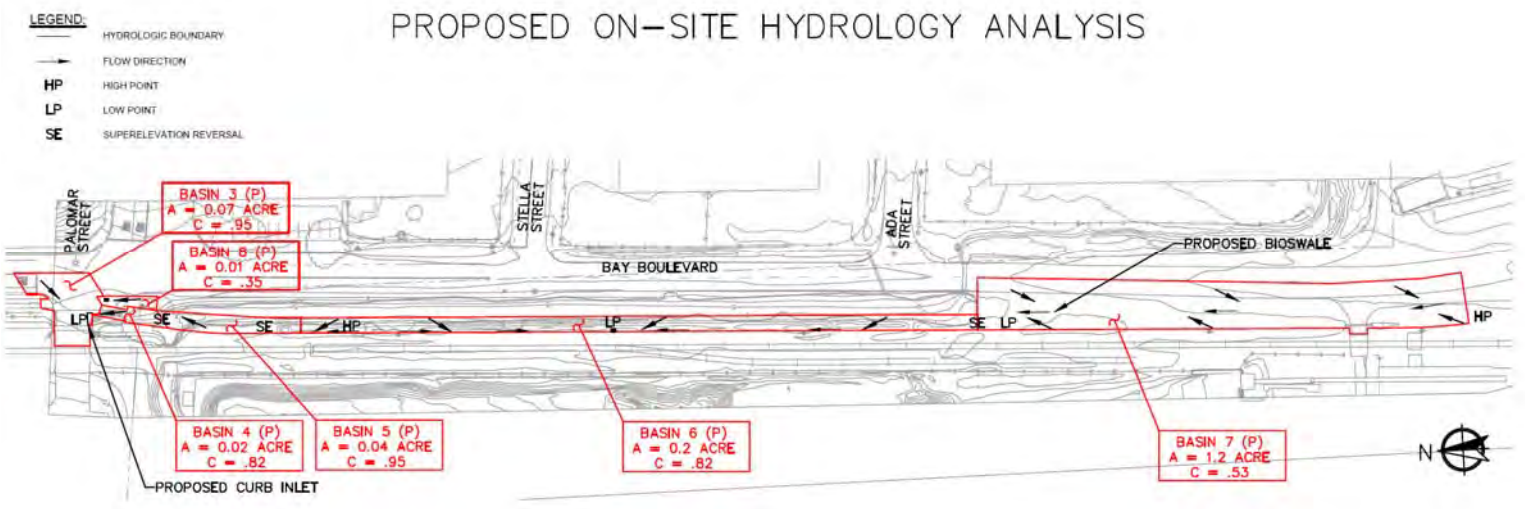


Figure 5: Proposed On-Site Hydrology Area

4.1.4. Proposed On-Site Results

The table below shows the areas and flow rates for each of the six proposed drainage areas. The drainage calculations can be found in Appendix D.

The results of the proposed hydrology calculations, when compared to the existing hydrology calculations shown in Section 3.2.3, reflect an increase of 3.2 cubic feet per second in the flow of the 100-year storm.

Proposed On-Site Areas

Area	A (ac)	I (in/hr)	C	Q (cfs)
3P	0.07	4.4	0.95	0.3
4P	0.02	4.4	0.82	0.1
5P	0.04	4.4	0.95	0.2
6P	0.20	4.0	0.82	0.7
7P	1.20	4.1	0.53	2.6
8P	0.01	3.9	0.35	.001

4.1.5. Proposed Off-Site Characteristics

The proposed off-site drainage area is the same as the existing off-site drainage area except for a change in inlet location. The proposed inlet is 56' north of the existing inlet in order to collect the runoff before the trail head. This results in a 0.1 acre decrease in the drainage area.

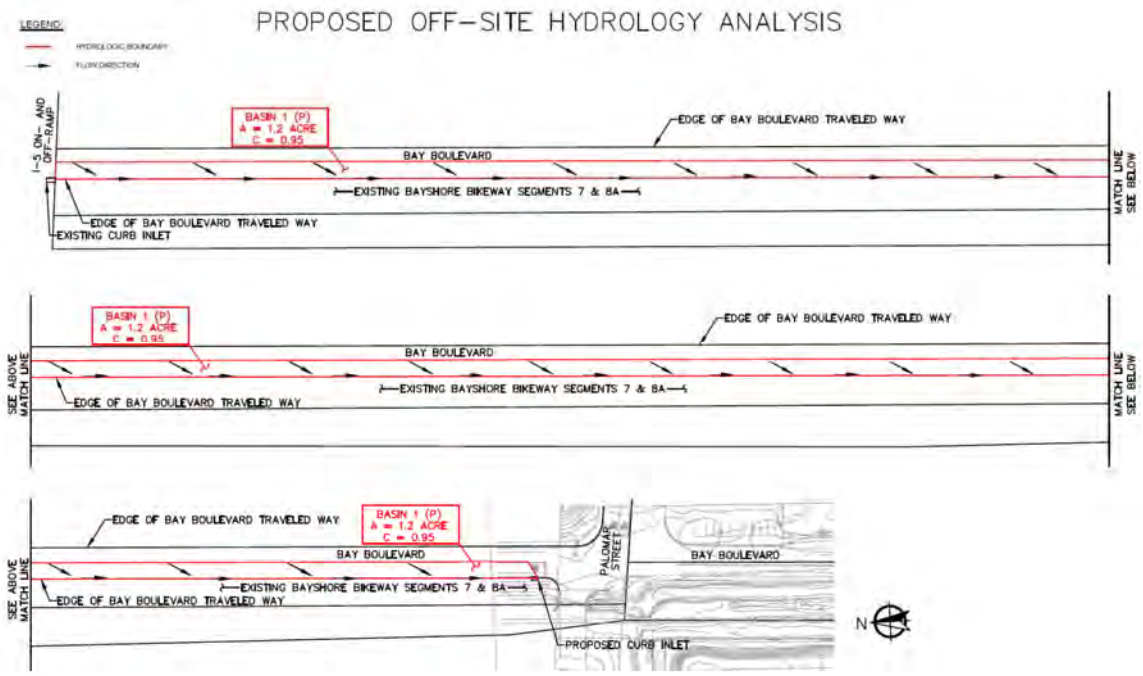


Figure 6: Proposed Off-Site Hydrology Area

4.1.6. Proposed Off-Site Results

The table below shows the area and flow rate for the proposed drainage area. The drainage calculations can be found in Appendix E.

Area 1P

A	1.3	ac
I	2.2	in/hr
C	0.95	
Q	2.7	cfs

5. DRAINAGE AND STORM WATER DESIGN

5.1. Proposed Project Impacts

The off-site storm flow does not increase due to the project. The proposed project would increase the 100-year on-site storm flow by 3.2 cubic feet per second. This increase in flow would be mitigated by drainage and storm water design practices.

5.2. Proposed Project Requirements

The drainage system for the proposed project would be designed to meet the following requirements:

1. Protect the proposed project from flooding during a 100-year storm event.
2. Treat project runoff for pollutants in conformance with the City of San Diego Storm Water Standards.
3. Mitigate the increase in storm flow due to the proposed project.

5.3. Proposed Drainage System

The drainage design provides for the capture of all flow of a 100-year storm event.

- The flow from drainage area 1P is captured at the proposed 8’ type A curb inlet at 289+84.
- Drainage area 3P is captured in the proposed 5’ type C curb inlet at 290+41.
- Drainage area 4P is a short section of trail (23’) in which the water will run from the bike path to a 2’ wide pervious concrete shoulder section to allow for infiltration and treatment.
- Drainage area 5P is a 75’ bridge over the existing creek. The runoff from this area will enter the creek.
- The project runoff from drainage area 6P is directed to the pervious concrete shoulder to allow for infiltration and treatment. Small rain events will be collected in the pervious concrete and reservoir underneath. Larger storm events will be collected by the 6” curb and directed to the 2’ X 2’ Type G modified catch basin located at the low point (294+98.50). From the catch basin, it will travel to the creek in an 18” diameter RCP pipe.
- Drainage area 7P is directed to an 8’ vegetated swale designed to allow for infiltration.
- Drainage area 8P is directed to a 2’ X 2’ Type G modified catch basin, which will connect to the proposed Type F modified catch basin with an 18” diameter RCP pipe.

Directing project runoff to pervious surfaces and the detention facility (vegetated swale), will mitigate the small increase in storm flow.

6. REFERENCES

City of San Diego Drainage Design Manal:
http://www.sandiego.gov/sites/default/files/legacy/publicworks/pdf/edocref/drainagedesignmanual.pdf

County of San Diego Drainage Design Manual
http://www.sandiegocounty.gov/dpw/floodcontrol/floodcontrolpdf/drainage-designmanual05.pdf

City of San Diego Storm Water Standards Manual
https://www.sandiego.gov/sites/default/files/legacy/thinkblue/pdf/stormwatermanual.pdf

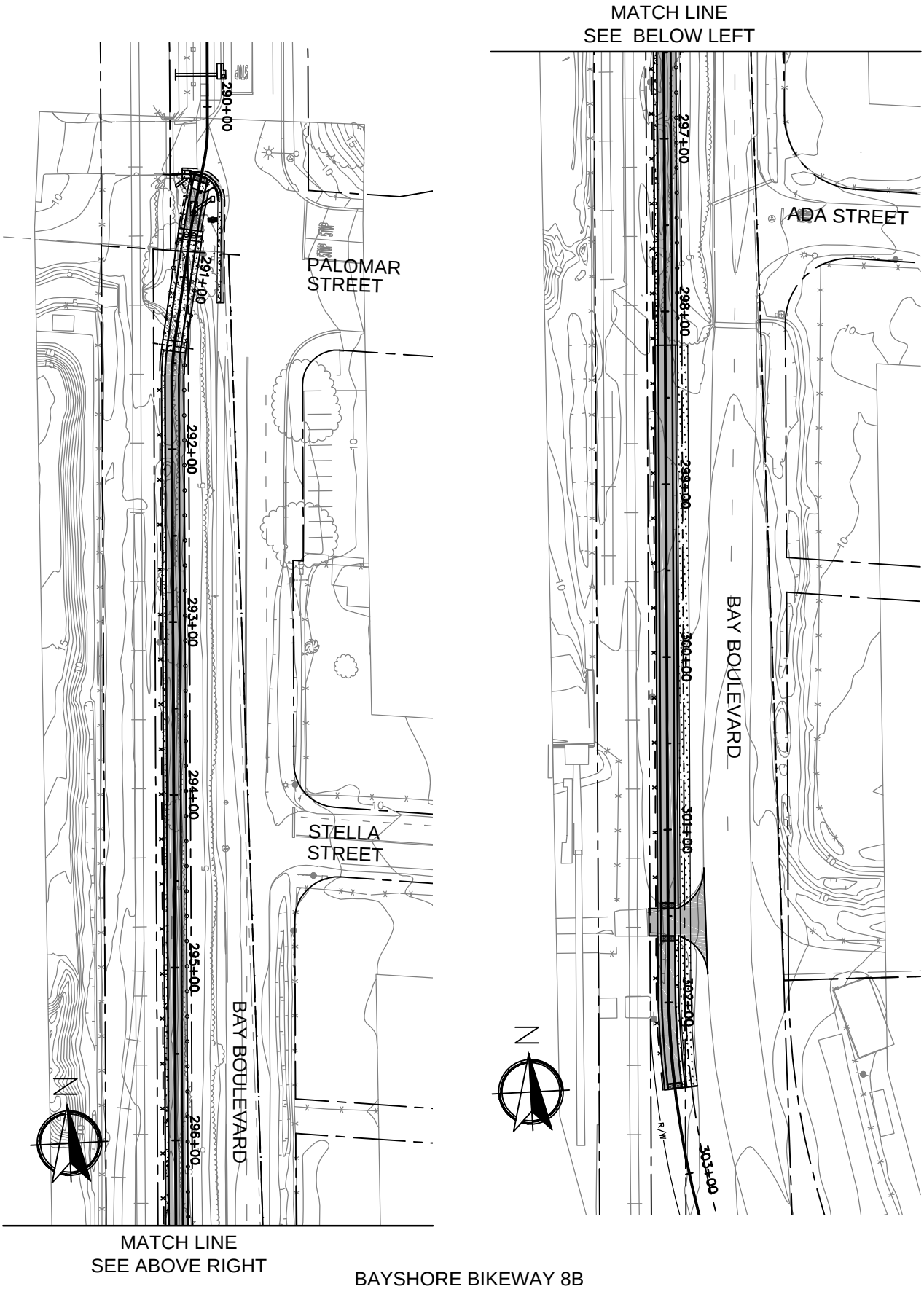
Caltrans Storm Water Quality Handbook
Pervious Pavement Design Guidance
http://www.dot.ca.gov/hq/oppd/stormwtr/bmp/DG-Pervious-Pvm_082114.pdf

Caltrans Storm Water Quality Handbook
Biofiltration Swale Design Guidance
http://www.dot.ca.gov/hq/LandArch/ec/stormwater/guidance/DG-Biofiltration%20Swale-060111.pdf

County of San Diego Low Impact Development Handbook
http://www.sandiegocounty.gov/content/dam/sdc/dplu/docs/LID_Handbook_2014.pdf

APPENDICES

APPENDIX A



BAYSHORE BIKEWAY 8B
PROPOSED ALIGNMENT

APPENDIX B

Basin 1E

Land Use	Runoff Coefficient C	Area (AC)
AC	0.95	1.4

$T_c = T_i + T_f$ Time of concentraion = overland flow time + street gutter flow time

Overland Flow Time:

Overland distance	25	Ft	
Slope	2	%	
Runoff Coefficient	0.95		
Overland Flow Time	2	min	City Manual APP I-E (see attached)

Street Gutter Flow Time:

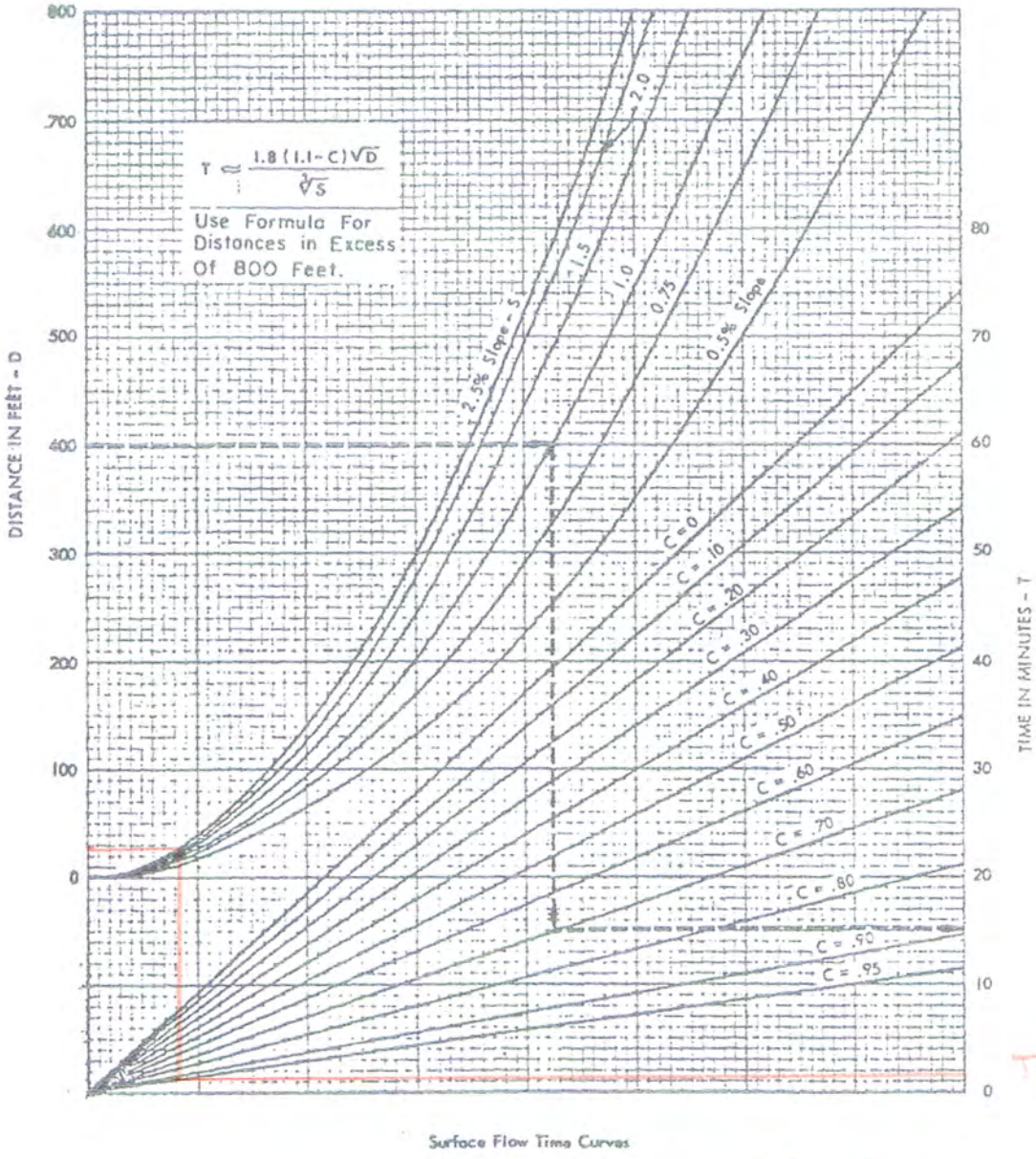
Assume T_c = 26 Min

I_{100} =	2.2	in/hr	City Manual APP I (see attached)
$Q_{100} = CI_{100}A$	2.9	CFS	
S_{ave} (gutter slope)	0.67	%	7A Asbuilts (261+79 28.22' to 291+04 8.49')
V=	2	FPS	City Manual Chart 1-104.12 (see attached)
Gutter Flow Length	2925	Ft	
Gutter Flow Time	24	Min	
Check Assumption:			
$T_c = T_i + T_f$	26	Min	
Does it match assumption?	yes		

Flow Rate:

Q=CIA	**2.9**	**CFS**

URBAN AREAS OVERLAND TIME OF FLOW CURVES



Surface Flow Time Curves

$T_L = 2$ min

L = 25 FT
S = 2%
C = .95

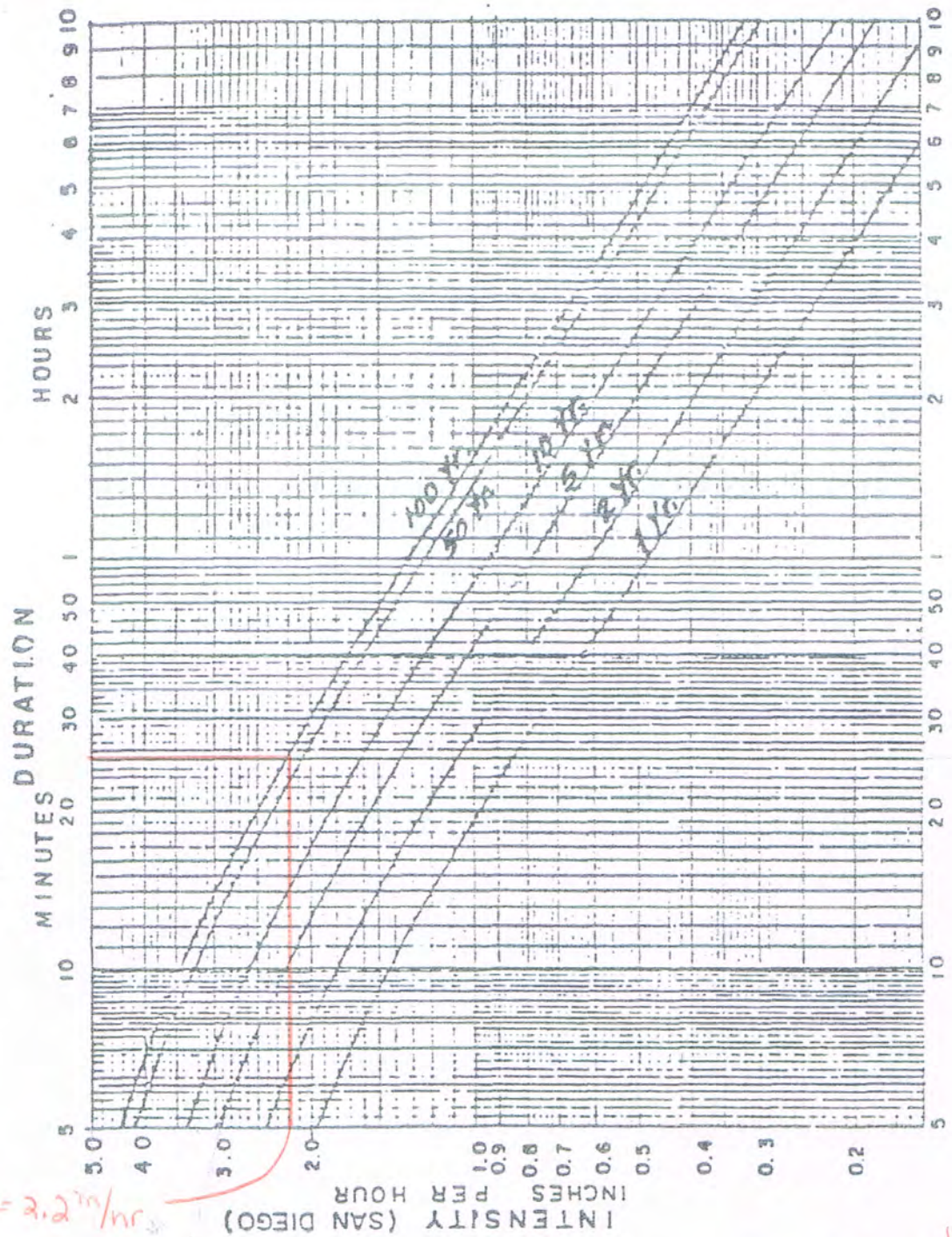
EXAMPLE:

GIVEN: LENGTH OF FLOW = 400 FT.
SLOPE = 1.0 %
COEFFICIENT OF RUNOFF C = .70

READ: OVERLAND FLOWTIME = 15 MINUTES

I-E

Basin 1E



RAINFALL

INTENSITY - DURATION - FREQUENCY

CURVES

for

COUNTY OF SAN DIEGO

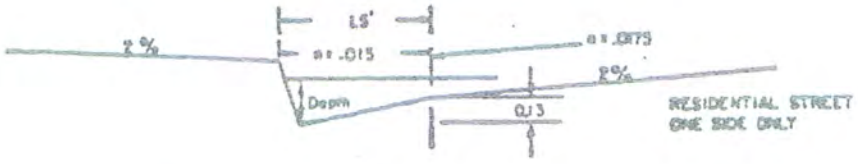
ELEV.	FACTOR
0–1500	1.00
1500–3000	1.25
3000–4000	1.42
4000–5000	1.60
5000–6000	1.70
DESERT	1.25

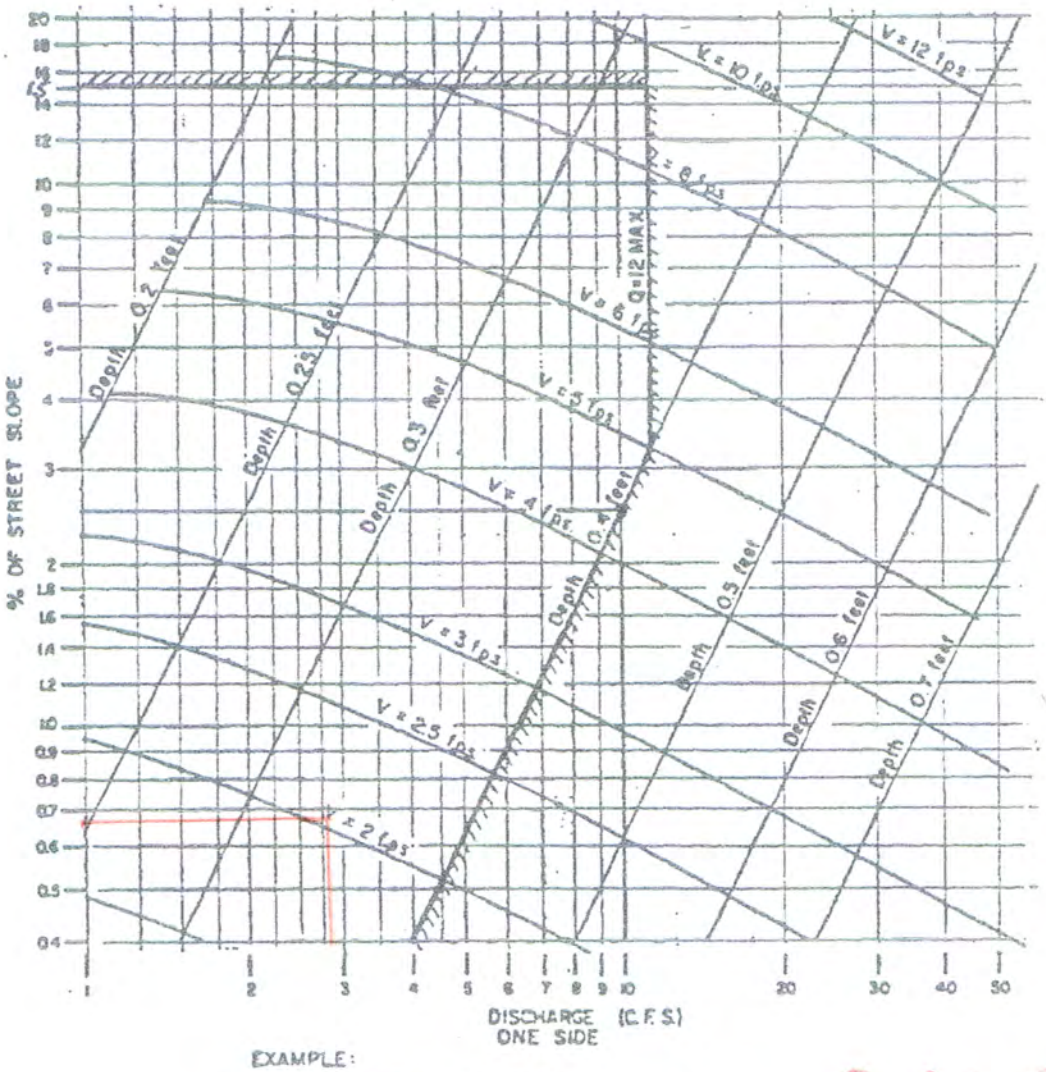
To obtain correct intensity, multiply intensity on chart by factor for design elevation.

APPENDIX I

Basin 1E

CHART I-104.12





EXAMPLE:

Given: Q = 10 S = 2.5%
Chart gives: Depth = 0.4, Velocity = 4.4 fps

Q = 2.9 cfs
Save = 0.6 T/.
use V = 2.0 fps

REV.		CITY OF SAN DIEGO - DESIGN GUIDE	SHT. NO.
		GUTTER AND ROADWAY DISCHARGE - VELOCITY CHART	

Basin 1E

APPENDIX C

Basin 2E

Land Use	Runoff Coefficient C	Area (AC)	
Natural	0.35	0.2	SD County Hydrology Manual - Table 3-1

$T_c = T_i + T_f$ Time of concentraion = overland flow time + concentrated flow time

* no concentrated flow (street gutter flow)

Overland Flow Time:

Overland distance	13	Ft	
Slope	43	%	
Runoff Coefficient	0.35		
Overland Flow Time	1	min	equation from City Manual APP I-E (see attached)

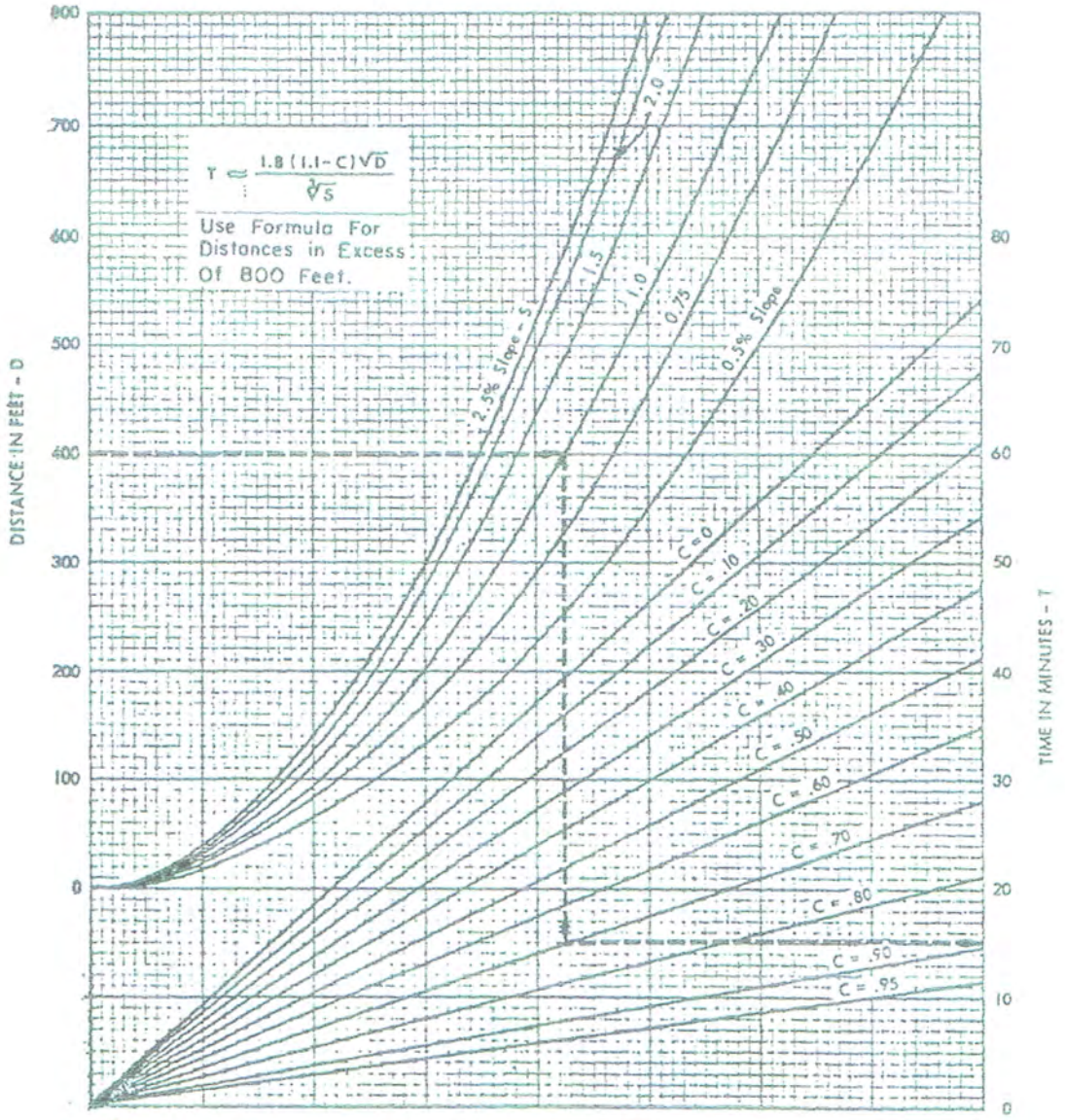
Concentrated Flow Time:

Assume T_c = 5 Min			
I_{100} =	4.4	in/hr	City Manual APP I (see attached)
$Q_{100} = CI_{100}A$	0.3	CFS	
S_{ave} (concentrated slope)		%	
V		FPS	City Manual Chart 1-104.12 (see attached)
Concentrated Flow Length		Ft	
Concentrated Flow Time	-	Min	
Check Assumption:			
$T_c = T_i + T_f$	5	Min	
Does it match assumption?	yes		use T_C=5min mimimum

Flow Rate:

Q=CIA **0.3** **CFS**

URBAN AREAS OVERLAND TIME OF FLOW CURVES



Surface Flow Time Curves

$T_c = \frac{1.8(1.1-.35)\sqrt{13}}{\sqrt[3]{43}} = 1 \text{ min}$

L = 13 ft
S = 43%
C = 0.35

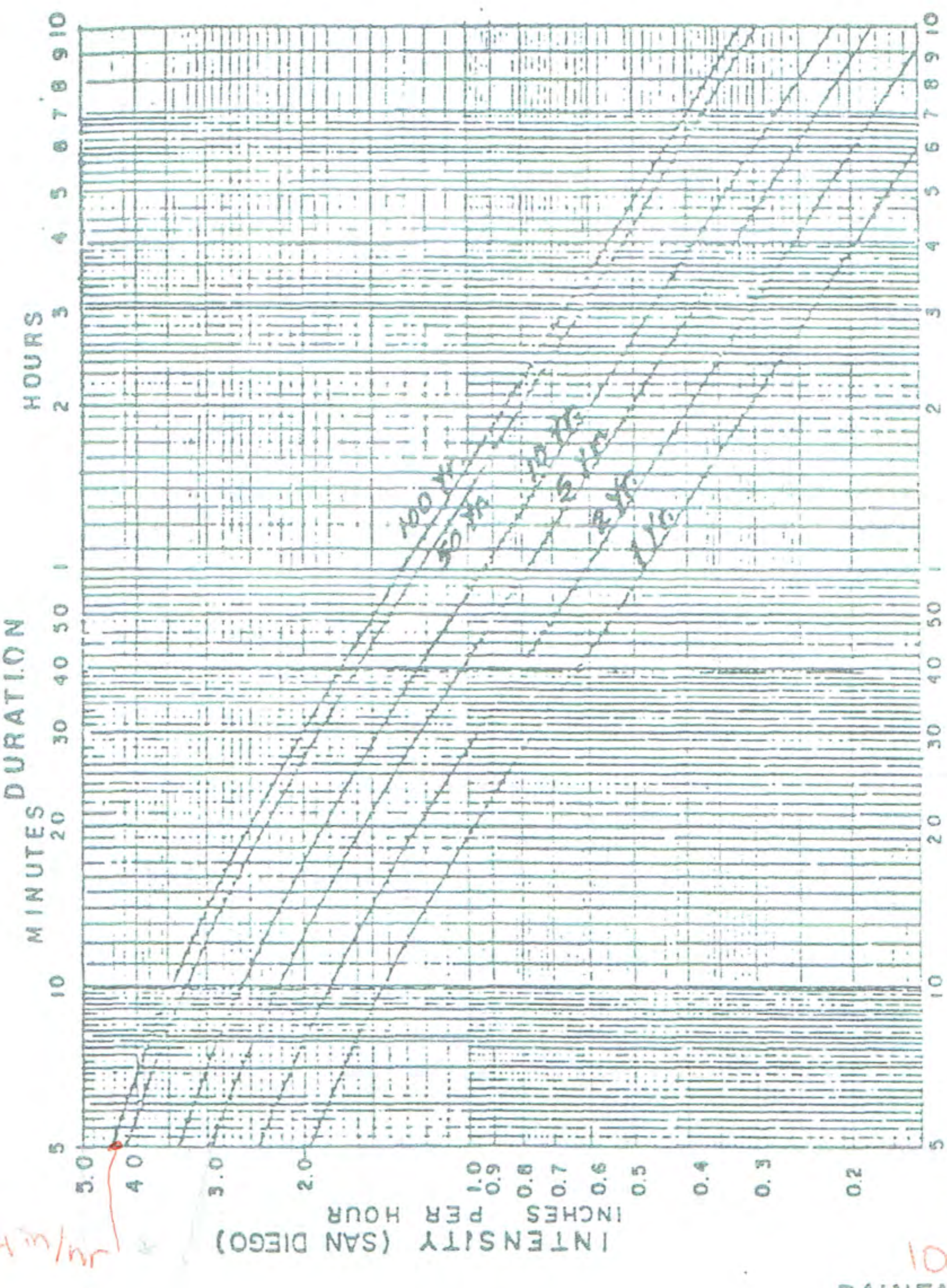
EXAMPLE:

GIVEN: LENGTH OF FLOW = 400 FT.
SLOPE = 1.0 %
COEFFICIENT OF RUNOFF C = .70

READ: OVERLAND FLOWTIME = 15 MINUTES

I - E

Basin 3E



Tc=5min
100 yr Storm

RAINFALL

INTENSITY - DURATION - FREQUENC

CURVES

for

COUNTY OF SAN DIEGO

APPENDIX I

ELEV.	FACTOR
0–1500	1.00
1500–3000	1.25
3000–4000	1.42
4000–5000	1.60
5000–6000	1.70
DESERT	1.25

To obtain correct intensity, multiply intensity on chart by factor for design elevation.

Basin 2E

Basin 9E

Land Use	Runoff Coefficient C	Area (AC)	
Natural	0.35	0.4	SD County Hydrology Manual - Table 3-1

$T_c = T_i + T_f$ Time of concentraion = overland flow time + street gutter flow time

Overland Flow Time:

Overland distance	20	Ft	
Slope	0.2	%	
Runoff Coefficient	0.35		
Overland Flow Time	8	min	City Manual APP I-E (see attached)

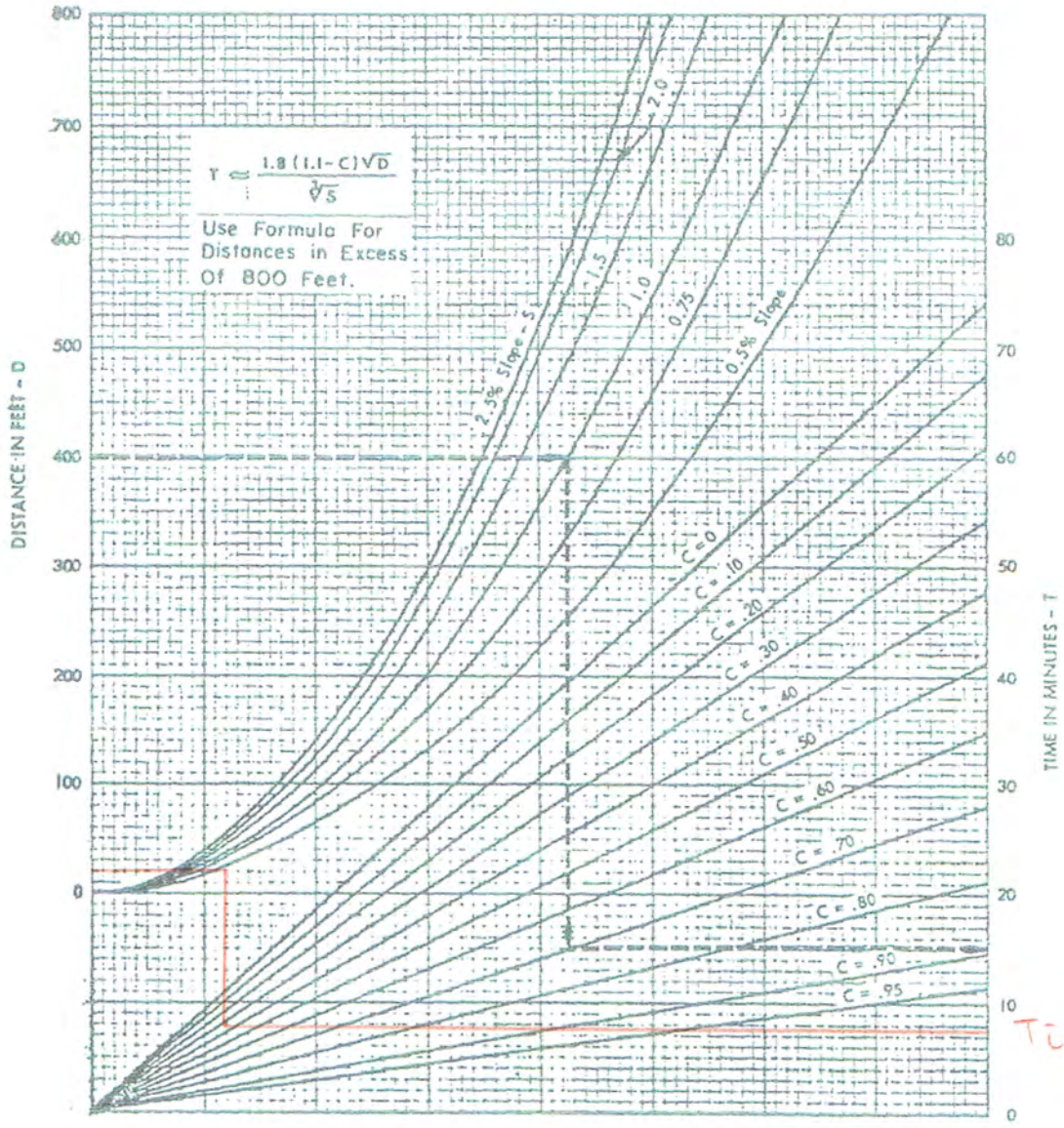
Street Gutter Flow Time:

Assume T_c = 13 Min			
I_{100} =	3.1	in/hr	City Manual APP I (see attached)
$Q_{100} = CI_{100}A$	0.4	CFS	
S_{ave} (gutter slope)	0.50	%	
V	1.4	FPS	City Manual Chart 1-104.12 (see attached)
Gutter Flow Length	430	Ft	
Gutter Flow Time	5	Min	
Check Assumption:			
$T_c = T_i + T_f$	13	Min	
Does it match assumption?	yes		

Flow Rate:

Q=CIA	**0.4**	**CFS**

URBAN AREAS OVERLAND TIME OF FLOW CURVES



Surface Flow Time Curves

Ti = 8 min

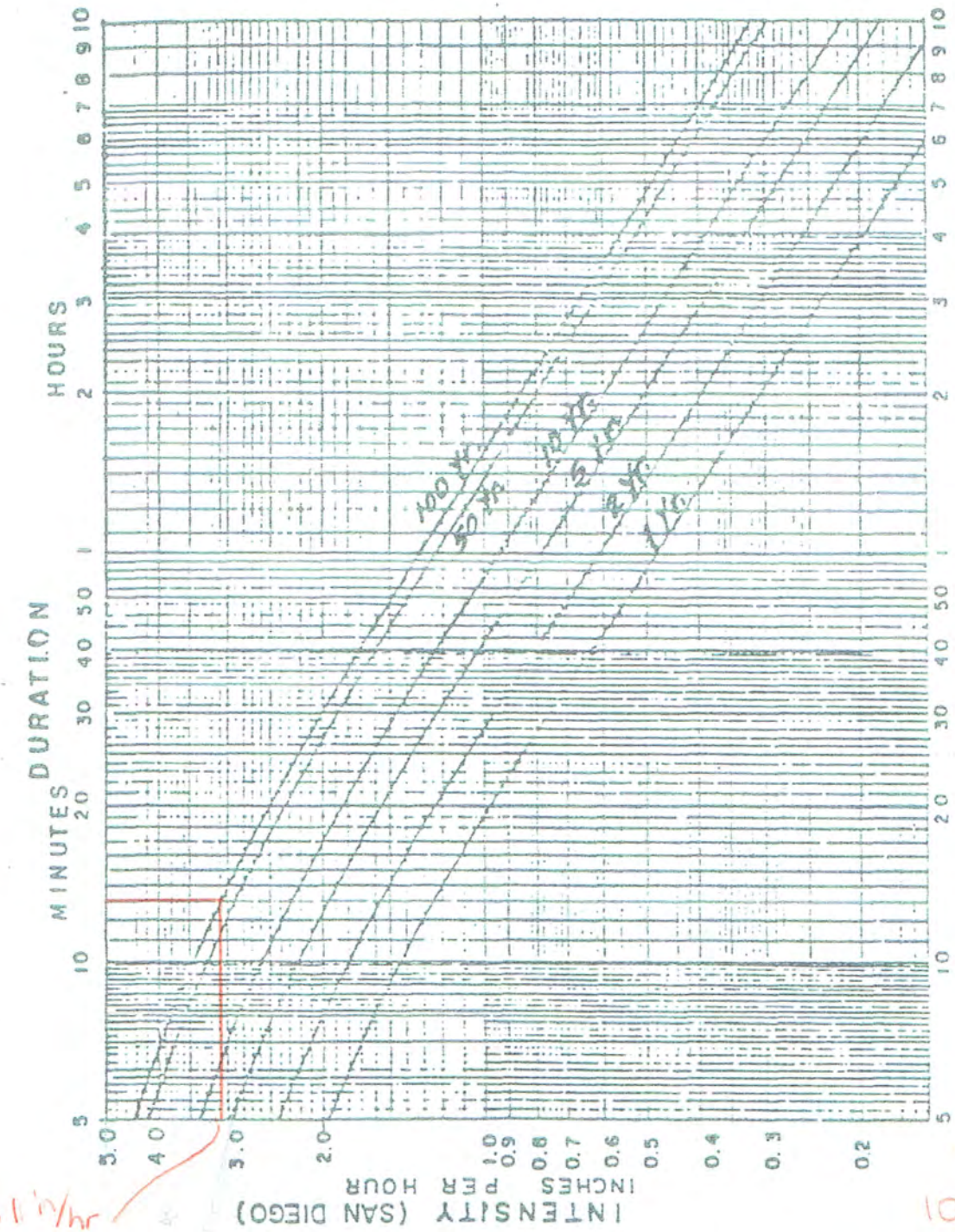
L = 20 ft
S = .2%
C = .35 I - E

EXAMPLE:

GIVEN: LENGTH OF FLOW = 400 FT.
SLOPE = 1.0 %
COEFFICIENT OF RUNOFF C = .70

READ: OVERLAND FLOWTIME = 15 MINUTES

Basin 9E



ELEV.	FACTOR
0–1500	1.00
1500–3000	1.25
3000–4000	1.42
4000–5000	1.60
5000–6000	1.70
DESERT	1.25

To obtain correct intensity, multiply intensity on chart by factor for design elevation.

RAINFALL

INTENSITY - DURATION - FREQUENCY

CURVES

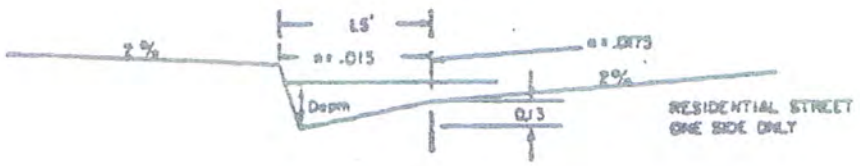
for

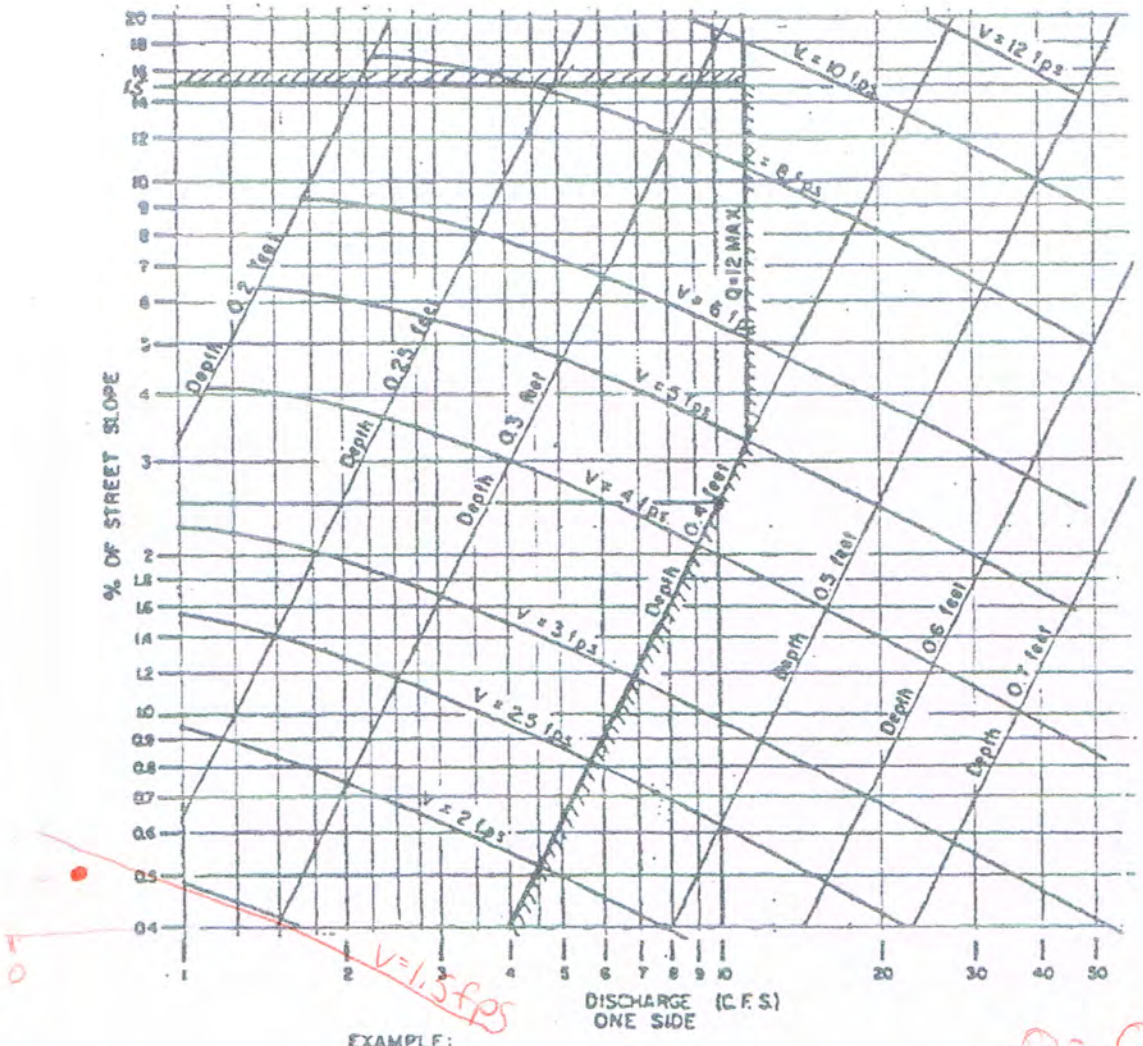
COUNTY OF SAN DIEGO

APPENDIX I

Basin 9E

CHART I-104.12





EXAMPLE:

Given: Q = 10 S = 2.5%
Chart gives: Depth = 0.4, Velocity = 4.4 f.p.s.

Q = 0.4
Save = 0.5'
use V = 1.4 fps

REV.		CITY OF SAN DIEGO - DESIGN GUIDE	SHT. NO.
		GUTTER AND ROADWAY DISCHARGE - VELOCITY CHART	

Basin 9E

APPENDIX D

Basin 3P

Land Use	Runoff Coefficient C	Area (AC)
PAVEMENT	0.95	0.07

$T_c = T_i + T_f$ Time of concentraion = overland flow time + street gutter flow time

Overland Flow Time:

Overland distance	25	Ft	
Slope	2	%	
Runoff Coefficient	0.95		
Overland Flow Time	1	min	City Manual APP I-E (see attached)

Street Gutter Flow Time:

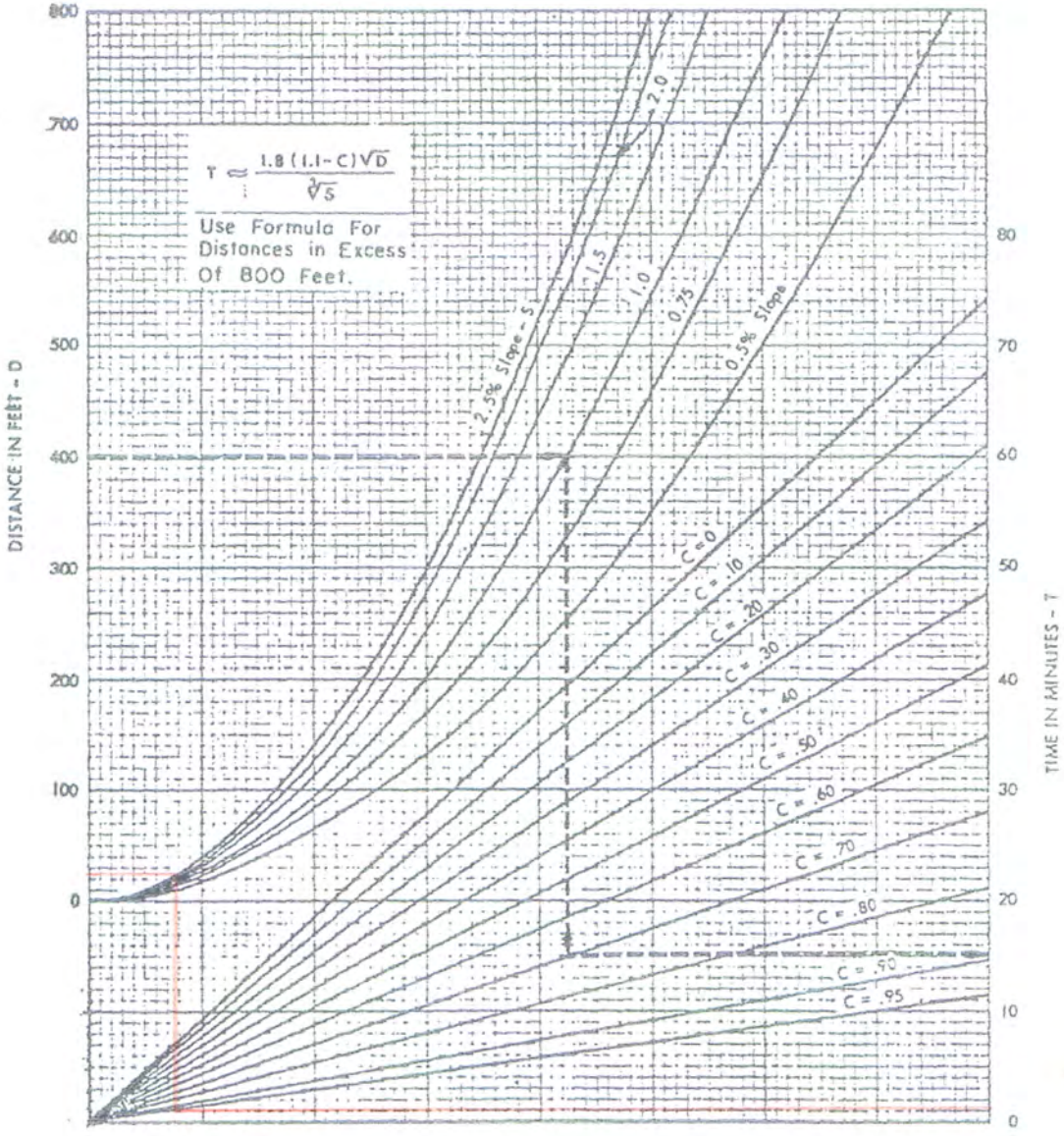
Assume T_c = 5 Min

I_{100} =	4.4	in/hr	City Manual APP I (see attached)
$Q_{100} = CI_{100}A$	0.3	CFS	
S_{ave} (gutter slope)	1.5	%	FROM SURFACE IN C3D
V	2.3	FPS	City Manual Chart 1-104.12 (see attached)
Gutter Flow Length	58	Ft	
Gutter Flow Time	0	Min	
Check Assumption:			
$T_c = T_i + T_f$	1	Min	
Does it match assumption?	yes	use T_C=5min mimimum	

Flow Rate:

Q=CIA **0.3 CFS**

URBAN AREAS OVERLAND TIME OF FLOW CURVES

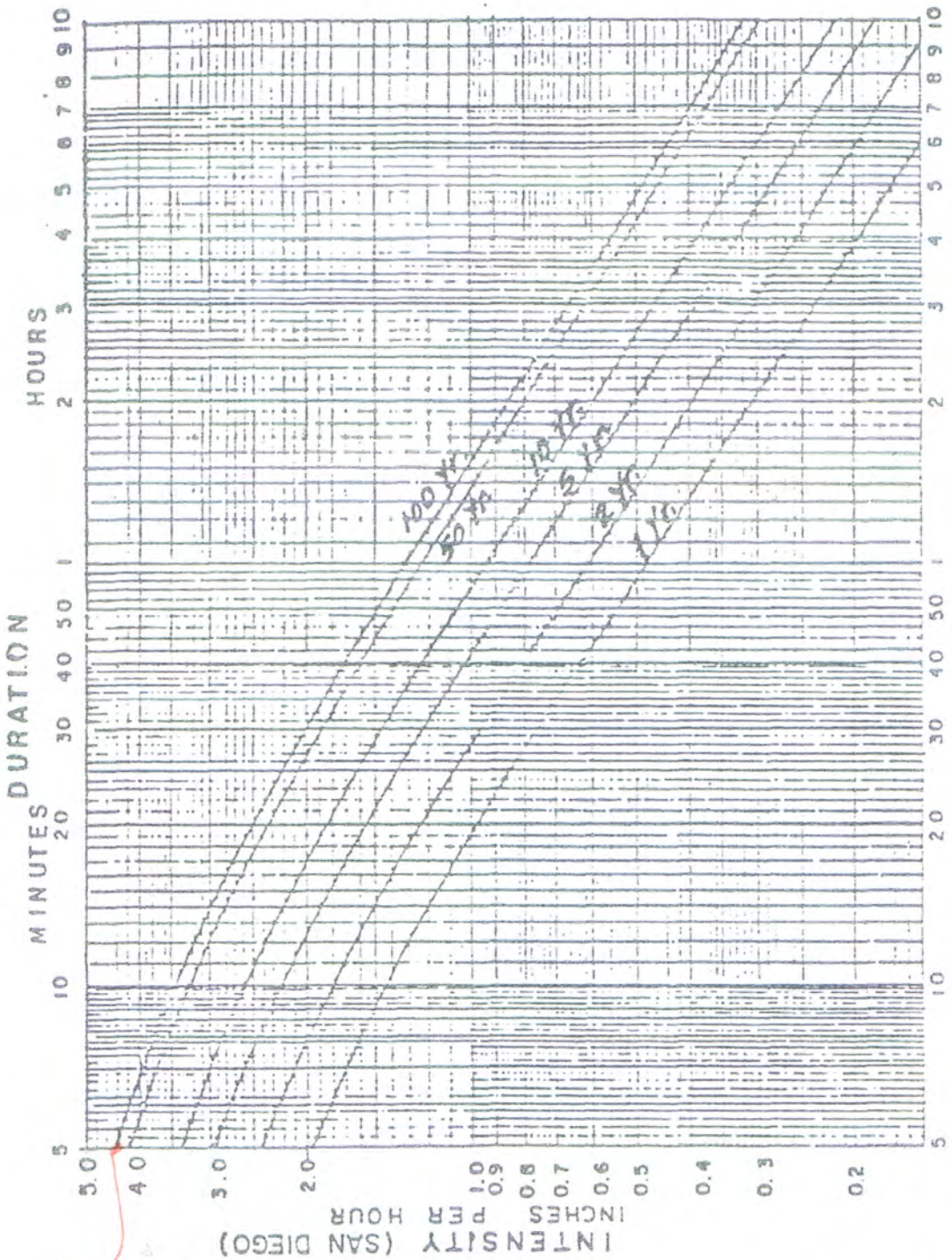


Surface Flow Time Curves

EXAMPLE:

GIVEN: LENGTH OF FLOW = 400 FT.
SLOPE = 1.0 %
COEFFICIENT OF RUNOFF C = .70

READ: OVERLAND FLOWTIME = 15 MINUTES



I = 4.4 in/hr

T_c = 5 min
100 yr storm

RAINFALL

INTENSITY - DURATION - FREQUENCY

CURVES

for

COUNTY OF SAN DIEGO

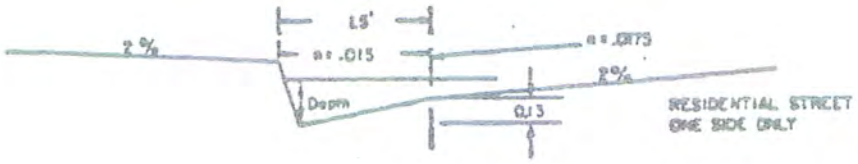
ELEV.	FACTOR
0—1500	1.00
1500—3000	1.25
3000—4000	1.42
4000—5000	1.60
5000—6000	1.70
DESERT	1.25

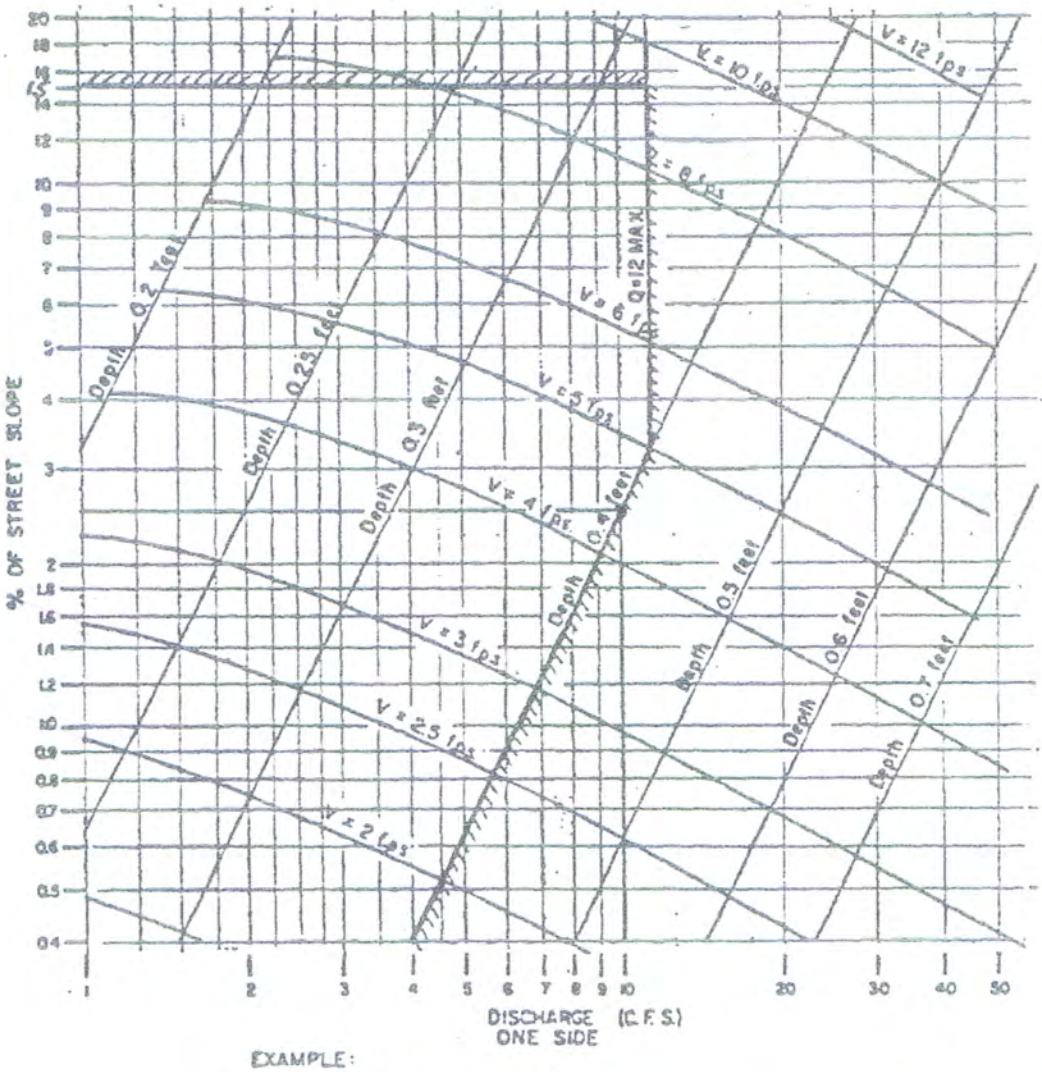
To obtain correct intensity, multiply intensity on chart by factor for design elevation.

APPENDIX I

Basin 3P

CHART I-104.12





EXAMPLE:

Given: Q = 10 S = 2.5%
Chart gives: Depth = 0.4, Velocity = 4.4 f.p.s.

Q = 0.13 cfs
Save = 1.5'/.

use V = 2.3 fps

REV.		CITY OF SAN DIEGO - DESIGN GUIDE	SHT. NO.
		GUTTER AND ROADWAY DISCHARGE - VELOCITY CHART	

Basin 3P

Basin 4P

Land Use	Runoff Coefficient C	Area (AC)			
Mixed	0.82	0.02	C=.9(% Impervious) + CP(1-% impervious)		
			% Imperv	0.85	
			Cp	0.35	SD County Hydrology Manual - Table 3-1
			Soil Type	D	SD County Hydrology Manual - Appendix A
			C=	0.82	

$T_c = T_i + T_f$ Time of concentraion = overland flow time + street gutter flow time

* no concentrated flow (street gutter flow)

Overland Flow Time:

Overland distance	14	Ft	
Slope	2	%	
Runoff Coefficient	0.82		
Overland Flow Time	2	min	City Manual APP I-E (see attached)

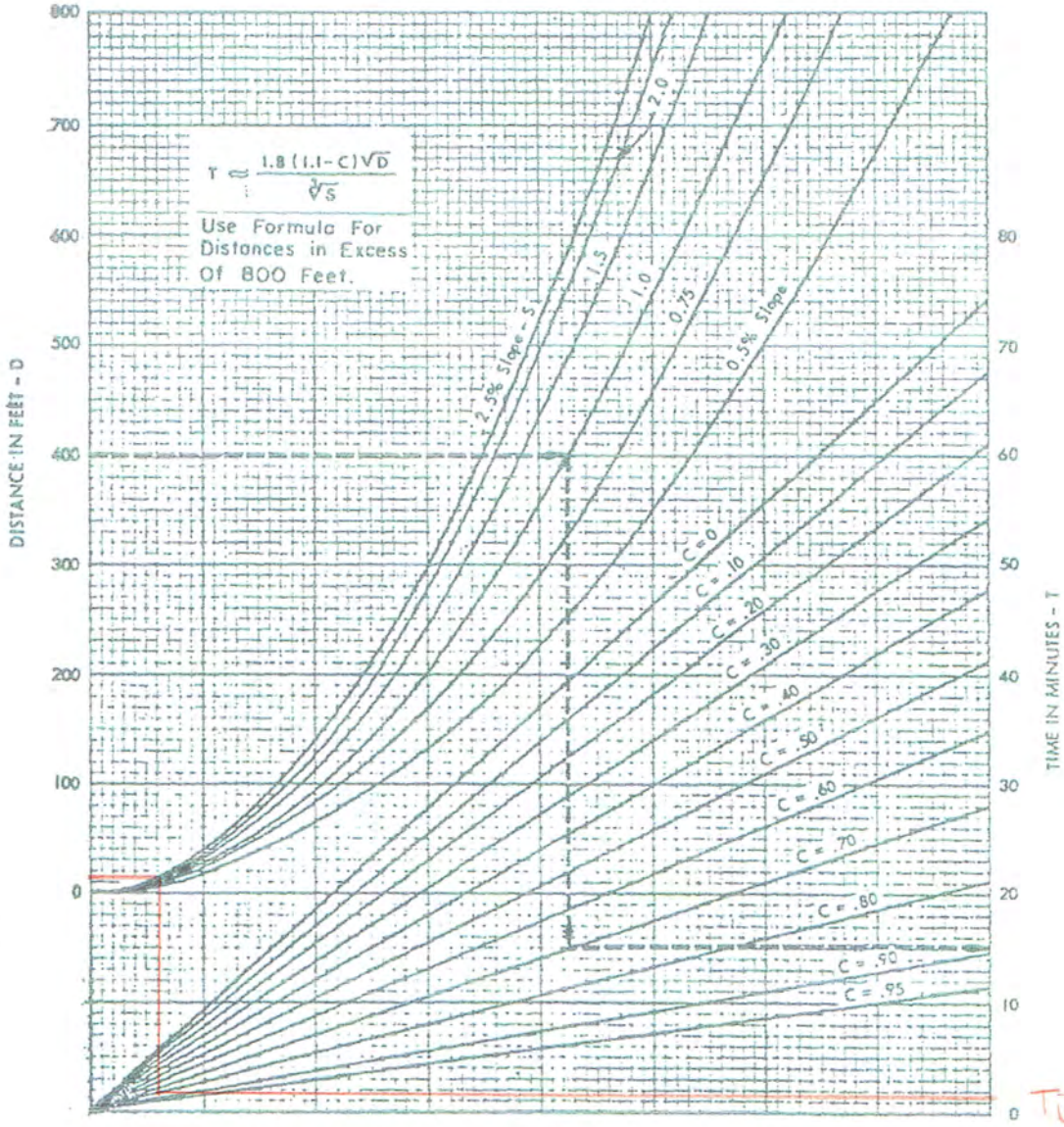
Street Gutter Flow Time:

Assume T_c = 5 Min			
I_{100} =	4.4	in/hr	City Manual APP I (see attached)
$Q_{100} = CI_{100}A$	0.1	CFS	
S_{ave} (gutter slope)		%	
V		FPS	City Manual Chart 1-104.12 (see attached)
Gutter Flow Length		Ft	
Gutter Flow Time	-	Min	
Check Assumption:			
$T_c = T_i + T_f$	5	Min	
Does it match assumption?	yes	use T_C=5min mimimum	

Flow Rate:

Q=CIA **0.1** **CFS**

URBAN AREAS OVERLAND TIME OF FLOW CURVES



Surface Flow Time Curves

T_L = 2 min

L = 14 ft
S = 2%
C = 0.82

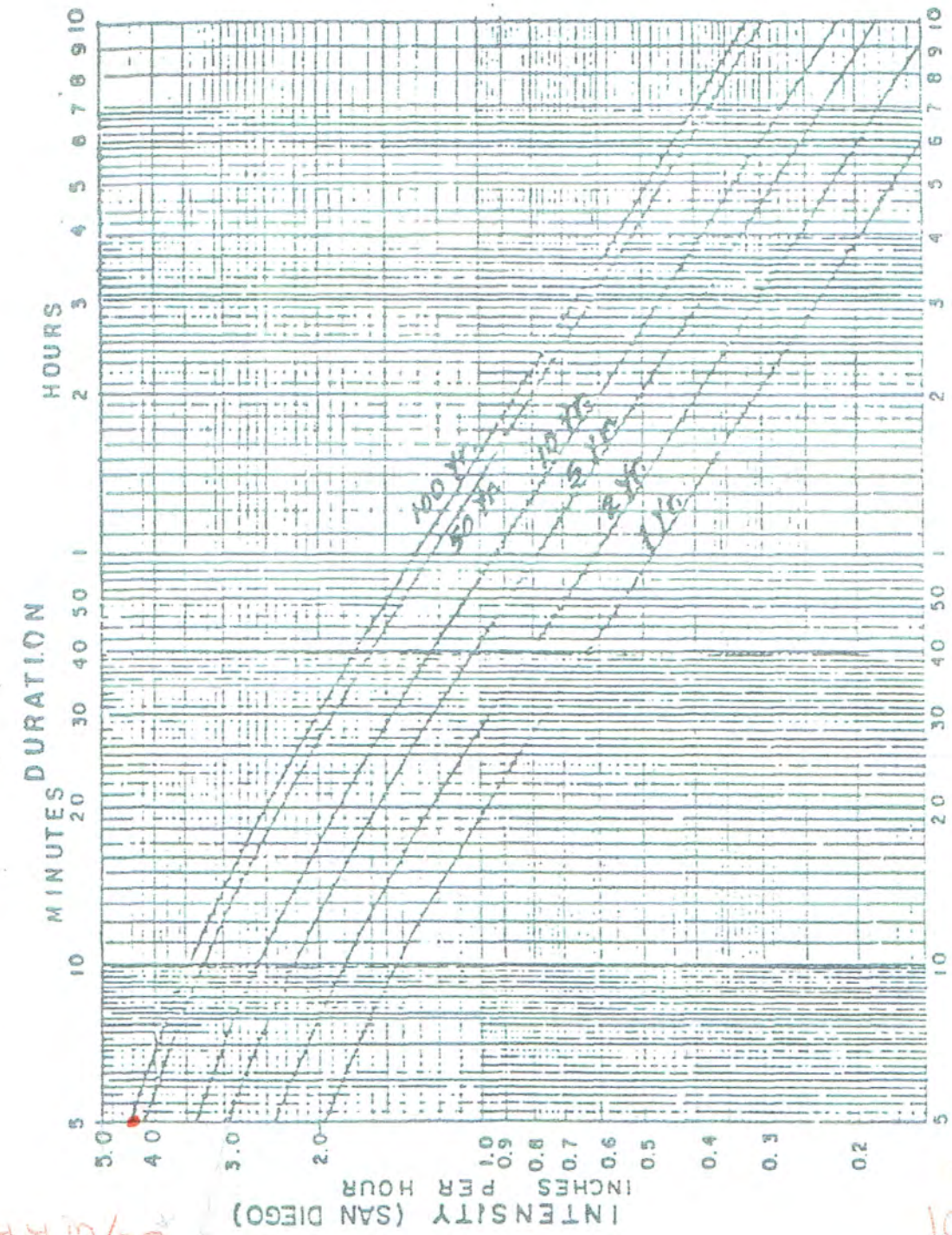
EXAMPLE:

GIVEN: LENGTH OF FLOW = 400 FT.
SLOPE = 1.0 %
COEFFICIENT OF RUNOFF C = .70

READ: OVERLAND FLOWTIME = 15 MINUTES

I - E

Basin 4P



$T_c = 5$ min

100 yr storm

$I = 4.4$ in/hr

RAINFALL

INTENSITY - DURATION - FREQUENC

CURVES

for

COUNTY OF SAN DIEGO

ELEV.	FACTOR
0–1500	1.00
1500–3000	1.25
3000–4000	1.42
4000–5000	1.60
5000–6000	1.70
DESERT	1.25

To obtain correct intensity, multiply intensity on chart by factor for design elevation.

APPENDIX I

Basin 4P

Basin 5P

Land Use	Runoff Coefficient C	Area (AC)
Asphalt	0.95	0.04

$T_c = T_i + T_f$ Time of concentraion = overland flow time + street gutter flow time

* no concentrated flow (street gutter flow)

Overland Flow Time:

Overland distance	14	Ft	
Slope	2	%	
Runoff Coefficient	0.95		
Overland Flow Time	1	min	City Manual APP I-E (see attached)

Street Gutter Flow Time:

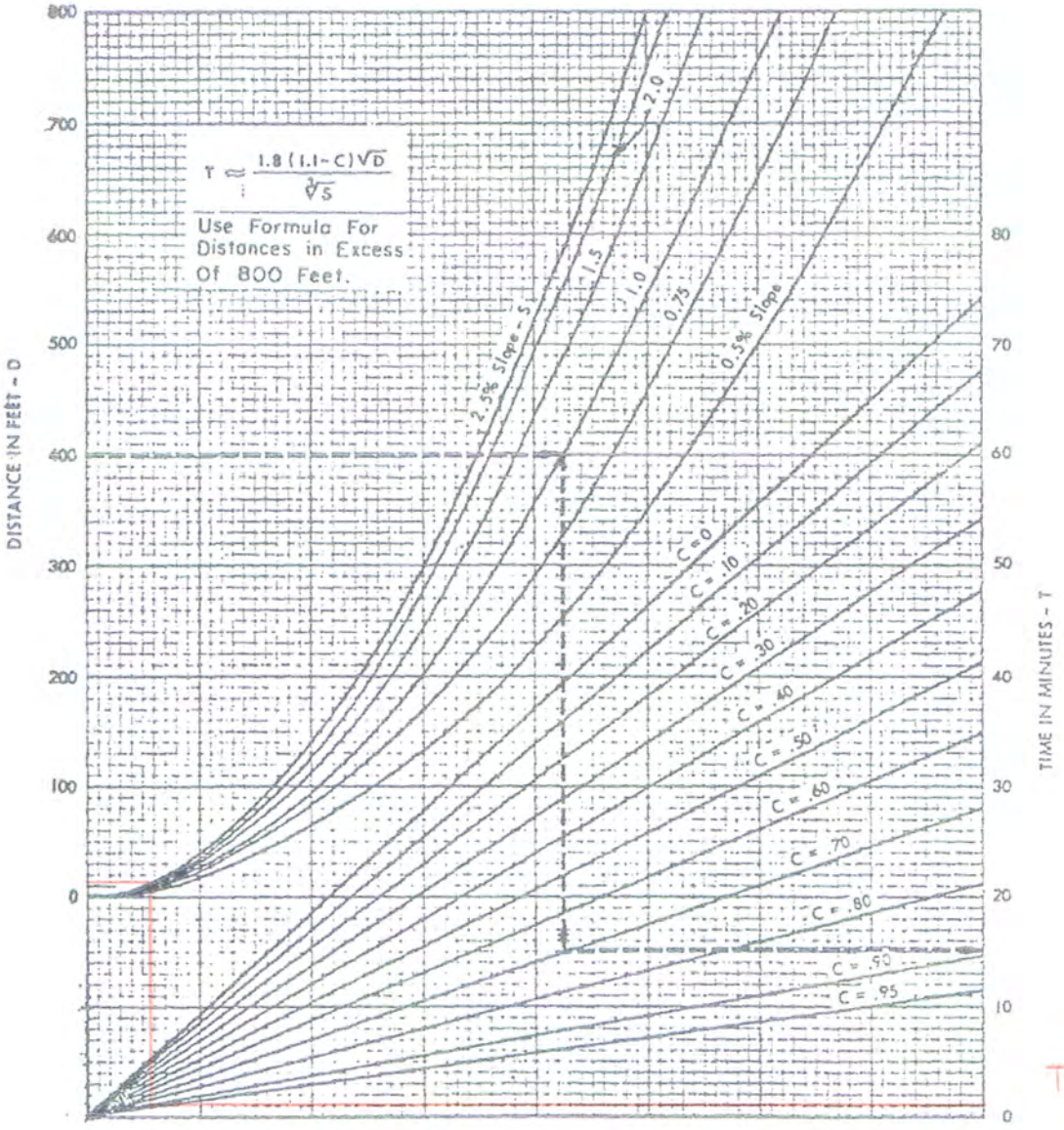
Assume T_c = 5 Min

I_{100} =	4.4	in/hr	City Manual APP I (see attached)
$Q_{100} = CI_{100}A$	0.2	CFS	
S_{ave} (gutter slope)		%	
V		FPS	City Manual Chart 1-104.12 (see attached)
Gutter Flow Length		Ft	
Gutter Flow Time	-	Min	
Check Assumption:			
$T_c = T_i + T_f$	1	Min	
Does it match assumption?	yes	use T_C=5min mimimum	

Flow Rate:

Q=CIA **0.2 CFS**

URBAN AREAS OVERLAND TIME OF FLOW CURVES



Surface Flow Time Curves

EXAMPLE:

GIVEN: LENGTH OF FLOW = 400 FT.
SLOPE = 1.0 %
COEFFICIENT OF RUNOFF C = .70

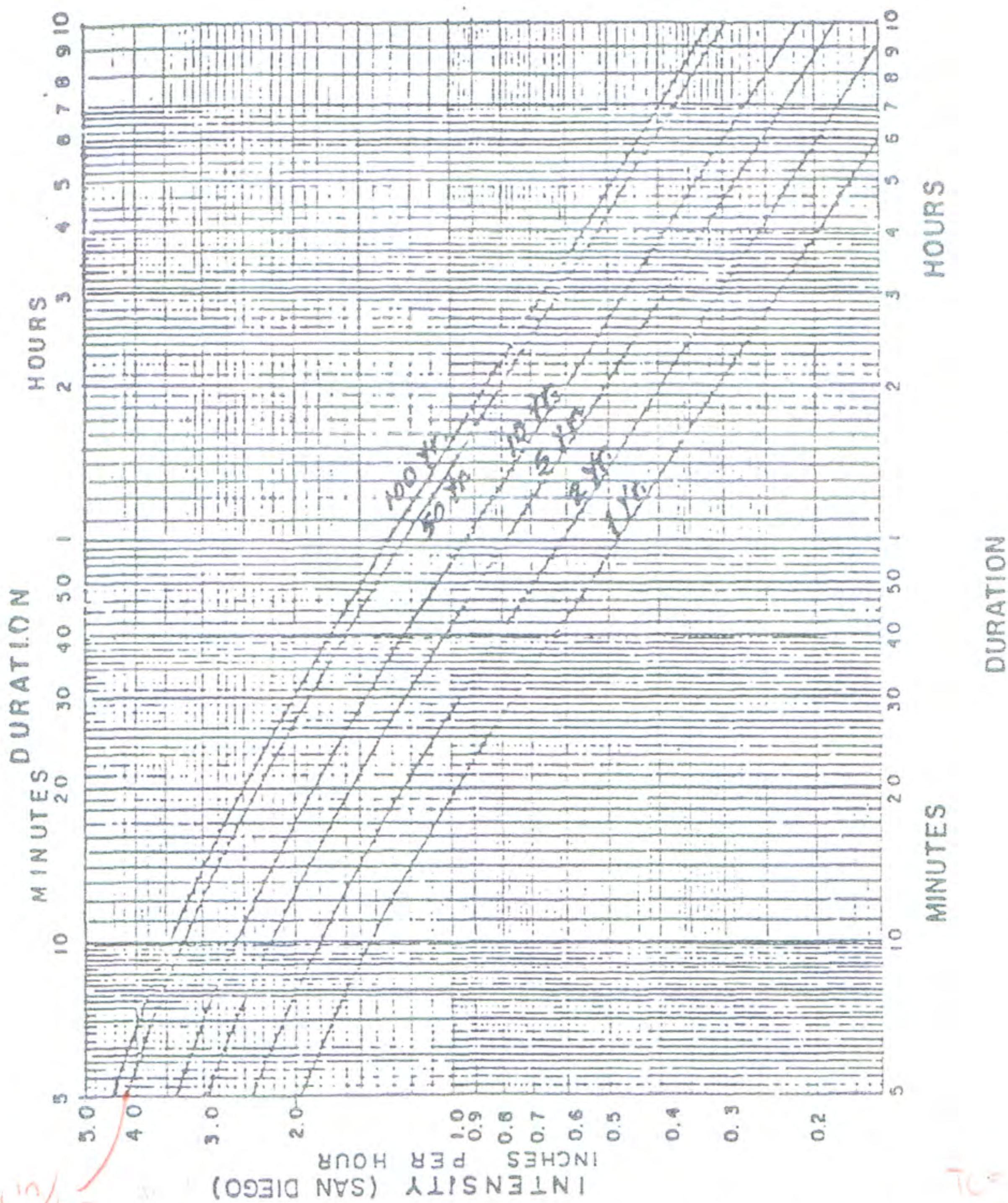
READ: OVERLAND FLOWTIME = 15 MINUTES

Tc = 1 min

L = 1414 ft
S = 2 %
C = 0.95

I-E

Basin 5P



Tc=5 min
100 yr storm

RAINFALL

INTENSITY - DURATION - FREQUENC

CURVES

for

COUNTY OF SAN DIEGO

ELEV.	FACTOR
0–1500	1.00
1500–3000	1.25
3000–4000	1.42
4000–5000	1.60
5000–6000	1.70
DESERT	1.25

To obtain correct intensity, multiply intensity on chart by factor for design elevation.

APPENDIX I

Basin 5P

Basin 6P

Land Use	Runoff Coefficient C	Area (AC)			
Mixed	0.82	0.20	C=.9(% Impervious) + CP(1-% impervious)		
			% Imperv	0.85	
			Cp	0.35	SD County Hydrology Manual - Table 3-1
			Soil Type	D	SD County Hydrology Manual - Appendix A
		C=	0.82		

$T_c = T_i + T_f$ Time of concentraion = overland flow time + concentrated flow time

Overland Flow Time:

Overland distance	42	Ft	
Slope	2	%	
Runoff Coefficient	0.82		
Overland Flow Time	3	min	City Manual APP I-E (see attached)

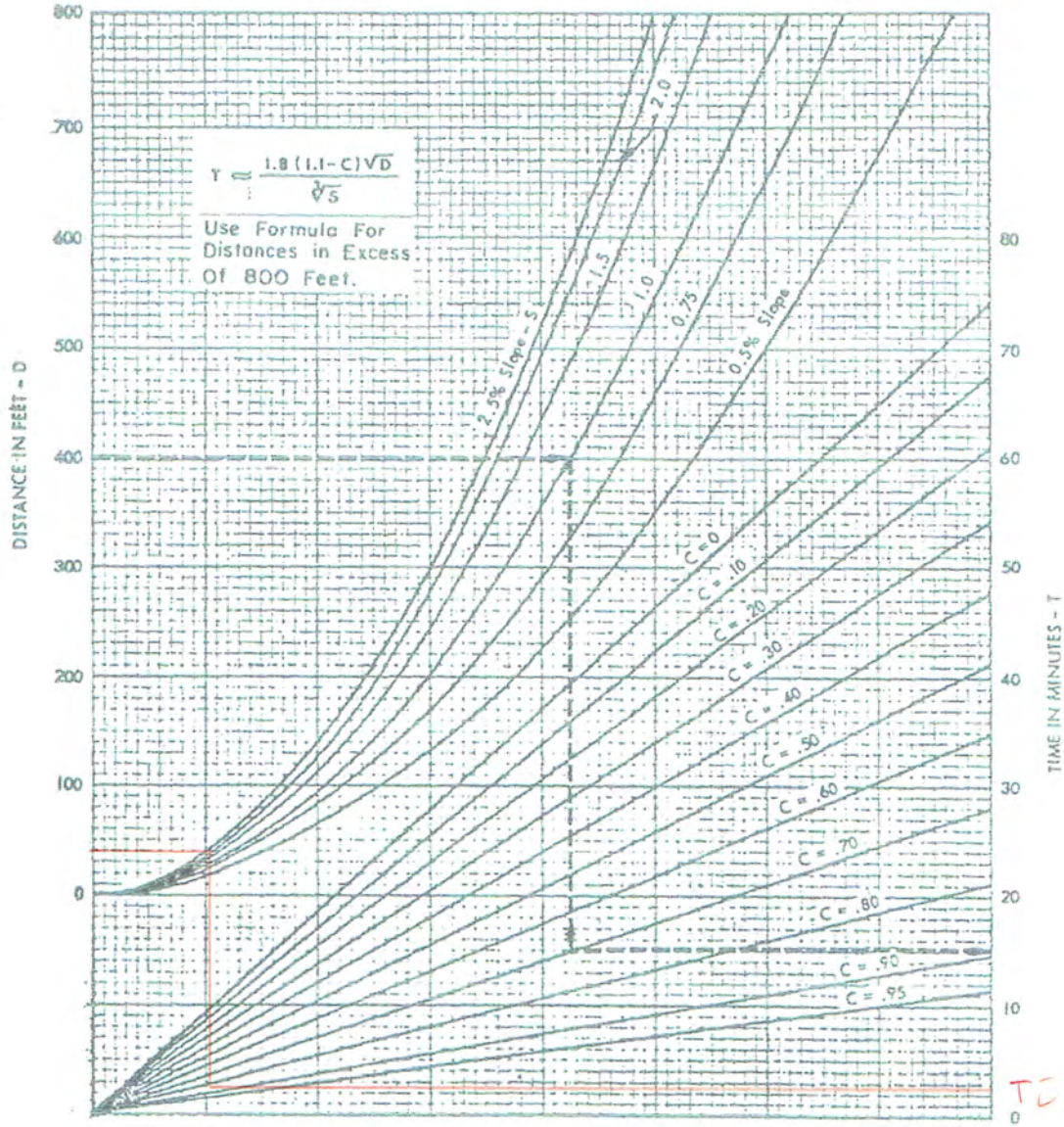
Concentrated Flow Time:

Assume T_c = 7 Min			
I_{100} =	4	in/hr	City Manual APP I (see attached)
$Q_{100} = CI_{100}A$	0.7	CFS	
S_{ave} (gutter slope)	0.50	%	
V	1.4	FPS	City Manual Chart 1-104.12 (see attached)
Gutter Flow Length	318	Ft	
Gutter Flow Time	4	Min	
Check Assumption:			
$T_c = T_i + T_f$	7	Min	
Does it match assumption?	yes		

Flow Rate:

Q=CIA **0.7 CFS**

URBAN AREAS OVERLAND TIME OF FLOW CURVES



Surface Flow Time Curves

TC = 3 min

L = 42 ft
S = 2%
C = .82

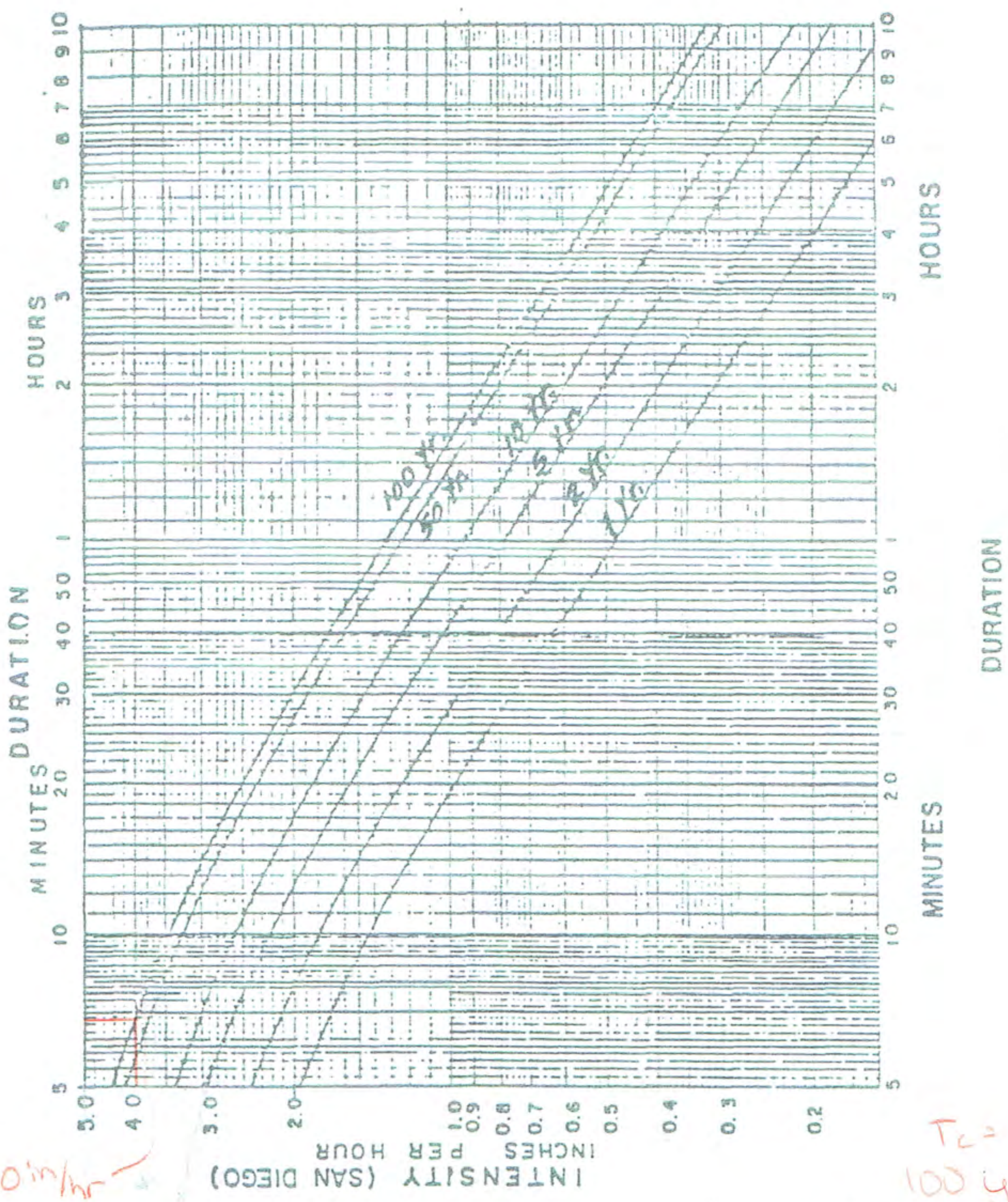
EXAMPLE:

GIVEN: LENGTH OF FLOW = 400 FT.
SLOPE = 1.0 %
COEFFICIENT OF RUNOFF C = .70

READ: OVERLAND FLOWTIME = 15 MINUTES

I - E

Basin 6P



I=4.0 in/hr

Tc = 7 min
100 yr storm

ELEV.	FACTOR
0—1500	1.00
1500—3000	1.25
3000—4000	1.42
4000—5000	1.60
5000—6000	1.70
DESERT	1.25

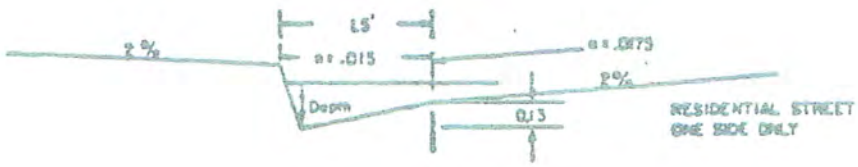
To obtain correct intensity, multiply intensity on chart by factor for design elevation.

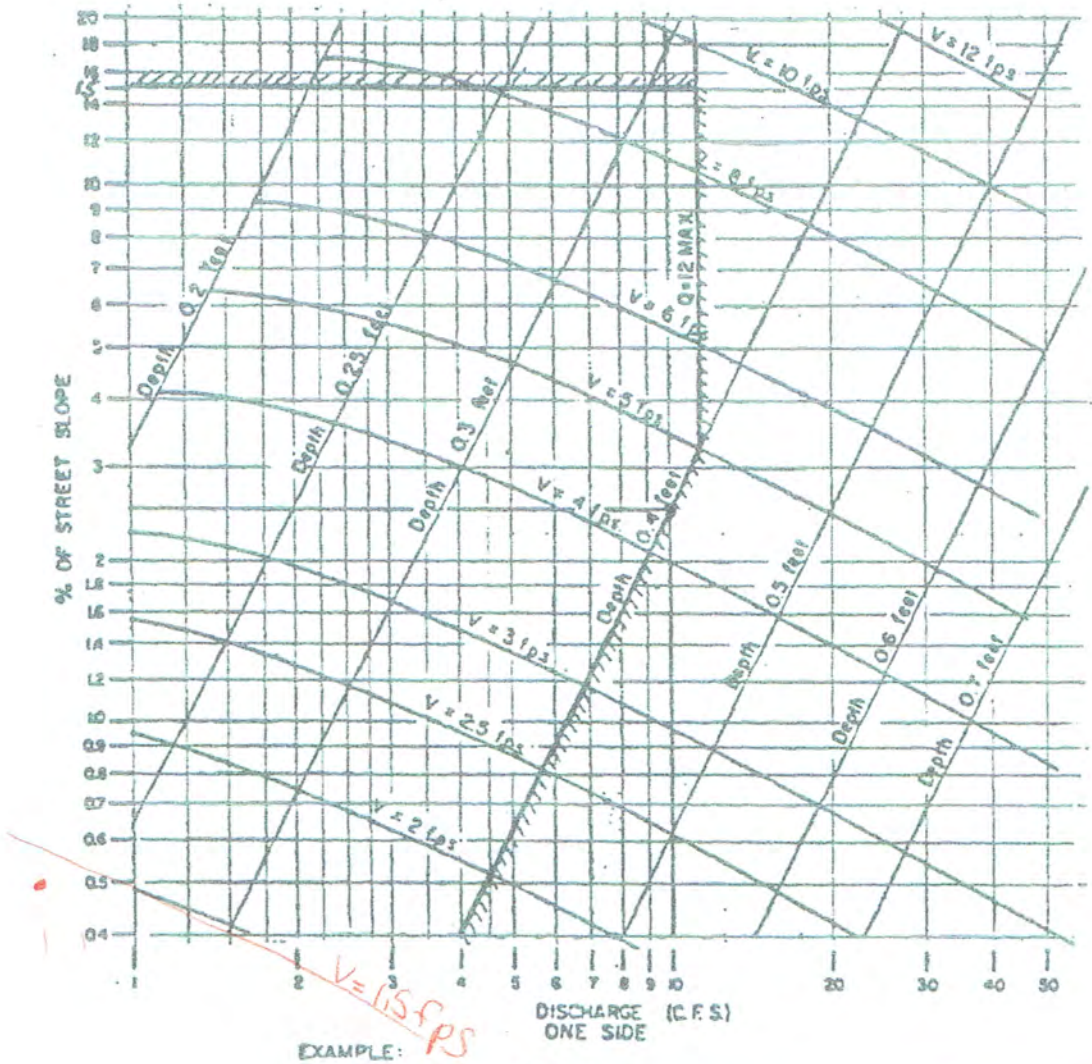
RAINFALL INTENSITY - DURATION - FREQUENC CURVES for COUNTY OF SAN DIEGO

APPENDIX I

Basin 6P

CHART I-104.12





EXAMPLE:

Given: Q = 10 S = 2.5%

Chart gives: Depth = 0.4, Velocity = 4.4 fps

Q = 0.7 cfs

Save = 0.5'

use V = 1.4 fps

REV.		CITY OF SAN DIEGO - DESIGN GUIDE	SHT. NO.
		GUTTER AND ROADWAY DISCHARGE - VELOCITY CHART	

Basin 6P

Basin 7P

Land Use	Runoff Coefficient C	Area (AC)			
Mixed	0.53	1.20	C=.9(% Impervious) + CP(1-% impervious)		
			% Imperv	0.33	
			Cp	0.35	SD County Hydrology Manual - Table 3-1
			Soil Type	D	SD County Hydrology Manual - Appendix A
			C=	0.53	

$T_c = T_i + T_f$ Time of concentraion = overland flow time + concentrated flow time

Overland Flow Time:

Overland distance	14	Ft	
Slope	2	%	
Runoff Coefficient	0.53		
Overland Flow Time	3	min	City Manual APP I-E (see attached)

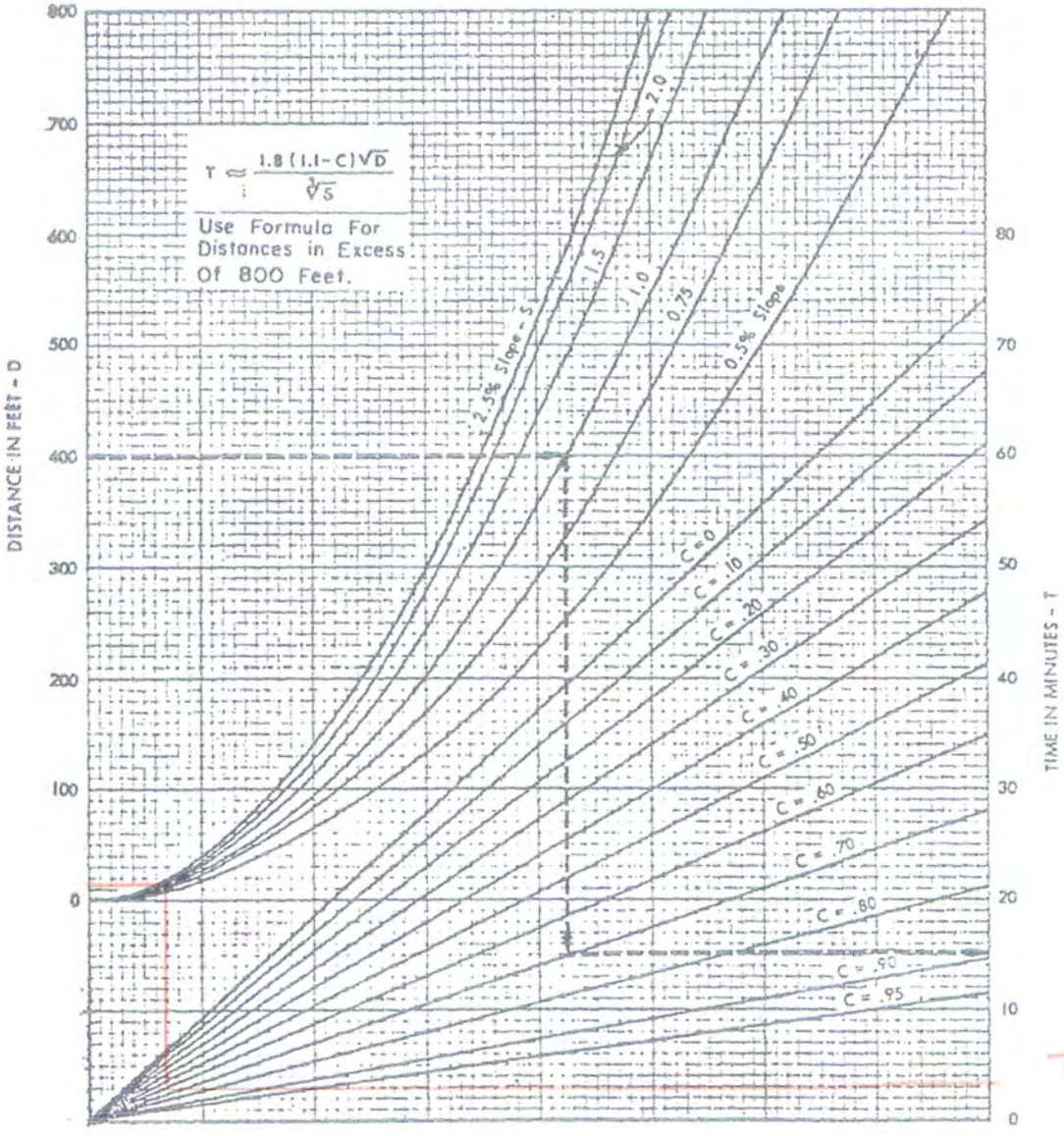
Concentrated Flow Time:

Assume T_c = 7 Min			
I_{100} =	4.1	in/hr	City Manual APP I (see attached)
$Q_{100} = CI_{100}A$	2.6	CFS	
S_{ave} (concentrated slope)	0.50	%	
V	1.8	FPS	City Manual Chart 1-104.12 (see attached)
Gutter Flow Length	450	Ft	
Gutter Flow Time	4	Min	
Check Assumption:			
$T_c = T_i + T_f$	7	Min	
Does it match assumption?	yes		

Flow Rate:

Q=CIA **2.6** **CFS**

URBAN AREAS OVERLAND TIME OF FLOW CURVES



Surface Flow Time Curves

$T_t = 3 min$

$L = 14 ft$

$S = 2\%$

$C = 0.53$

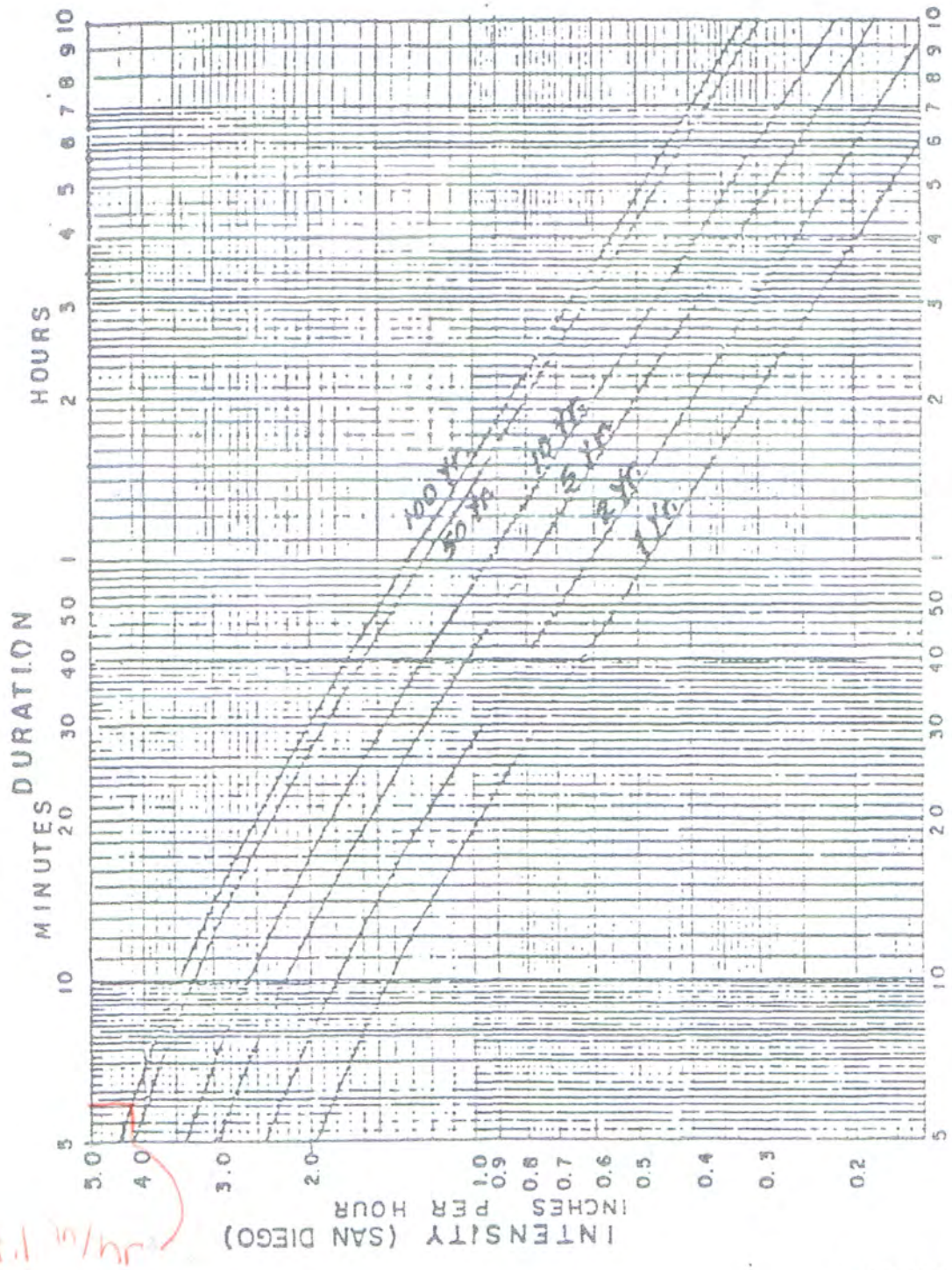
EXAMPLE:

GIVEN: LENGTH OF FLOW = 400 FT.
SLOPE = 1.0 %
COEFFICIENT OF RUNOFF C = .70

READ: OVERLAND FLOWTIME = 15 MINUTES

I-E

Basin TP



I = 4.1 in/hr

Tc = 7 min
100 yr storm

RAINFALL

INTENSITY - DURATION - FREQUENCY

CURVES

for

COUNTY OF SAN DIEGO

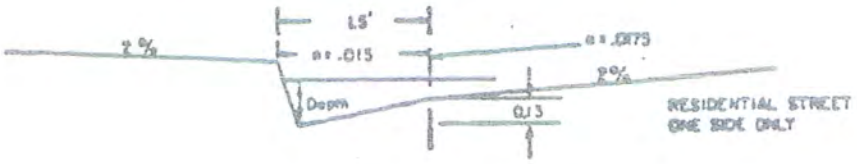
ELEV.	FACTOR
0–1500	1.00
1500–3000	1.25
3000–4000	1.42
4000–5000	1.60
5000–6000	1.70
DESERT	1.25

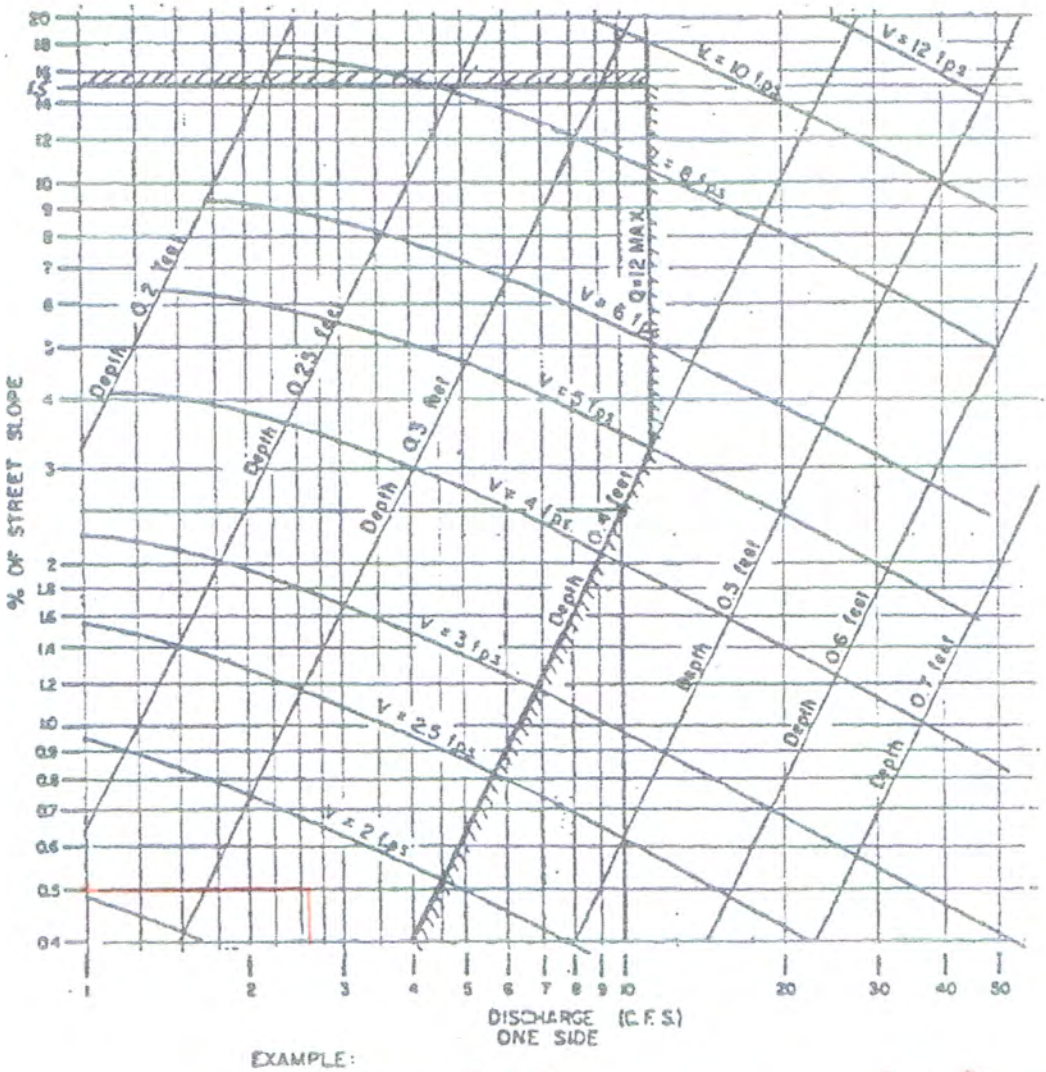
To obtain correct intensity, multiply intensity on chart by factor for design elevation.

APPENDIX I

Bus. n 7P

CHART I-104.12





EXAMPLE:

Given: Q = 10 S = 2.5%
Chart gives: Depth = 0.4, Velocity = 4.4 f.p.s.

Q = 2.6 cfs
Save = 0.5'

use V = 1.8 fps

REV.		CITY OF SAN DIEGO - DESIGN GUIDE	SHT. NO.
		GUTTER AND ROADWAY DISCHARGE - VELOCITY CHART	

Basin 7P

Basin 8P

Land Use	Runoff Coefficient C	Area (AC)	
Natural	0.35	0.01	SD County Hydrology Manual - Table 3-1

$T_c = T_i + T_f$ Time of concentraion = overland flow time + street gutter flow time

* no concentrated flow (street gutter flow)

Overland Flow Time:

Overland distance	14	Ft	
Slope	0.60	%	
Runoff Coefficient	0.35		
Overland Flow Time	7	min	City Manual APP I-E (see attached)

Street Gutter Flow Time:

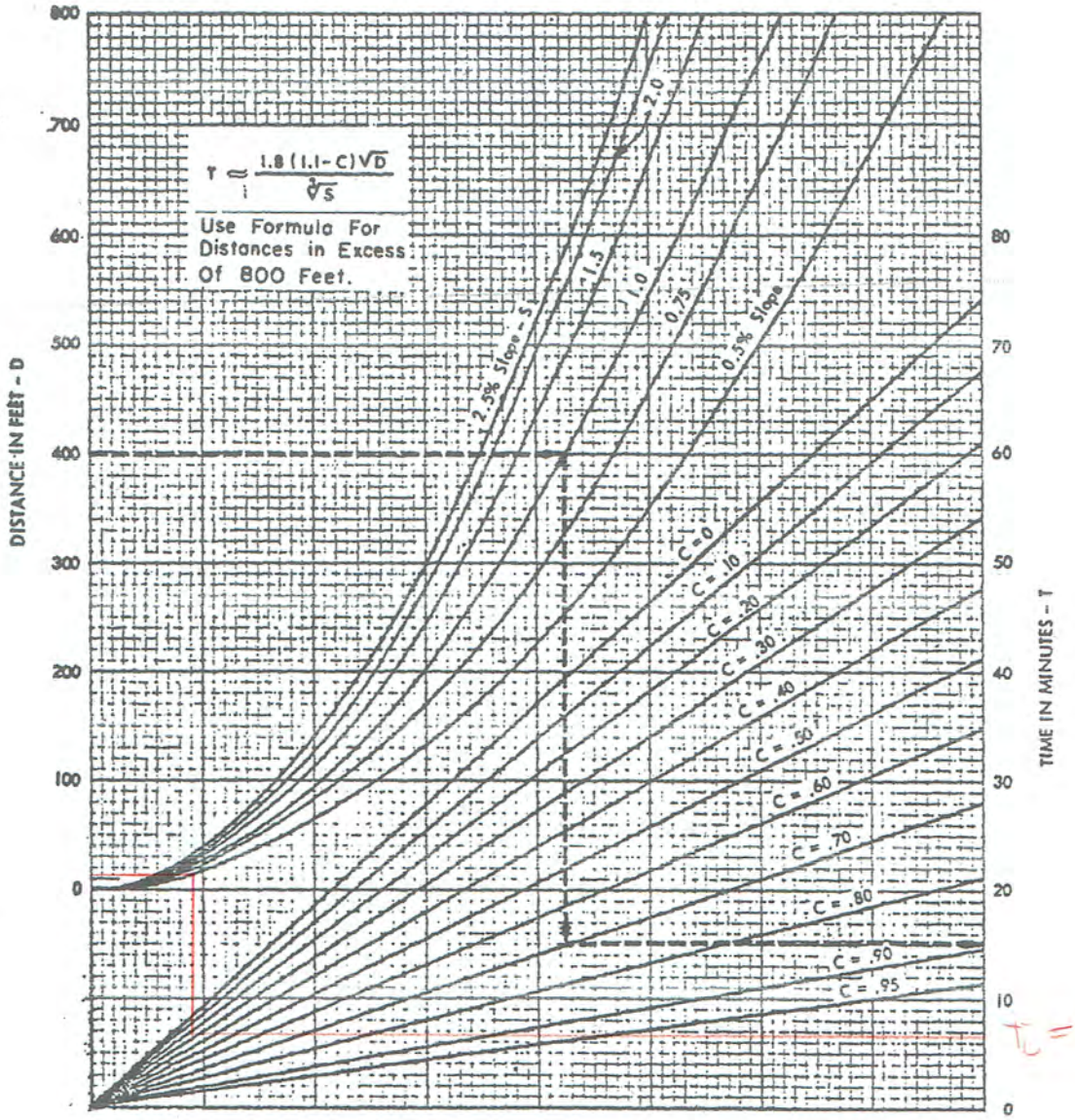
Assume T_c = 8 Min

I_{100} =	3.9	in/hr	City Manual APP I (see attached)
$Q_{100} = CI_{100}A$	0.01	CFS	
S_{ave} (gutter slope)	0.60	%	
V	1.5	FPS	City Manual Chart 1-104.12 (see attached)
Gutter Flow Length	66	Ft	
Gutter Flow Time	1	Min	
Check Assumption:			
$T_c = T_i + T_f$	8	Min	
Does it match assumption?	yes		

Flow Rate:

Q=CIA **0.01 CFS**

URBAN AREAS OVERLAND TIME OF FLOW CURVES



Surface Flow Time Curves

$T_C = 7$ min

L = 14 ft
S = 0.6%
C = .35

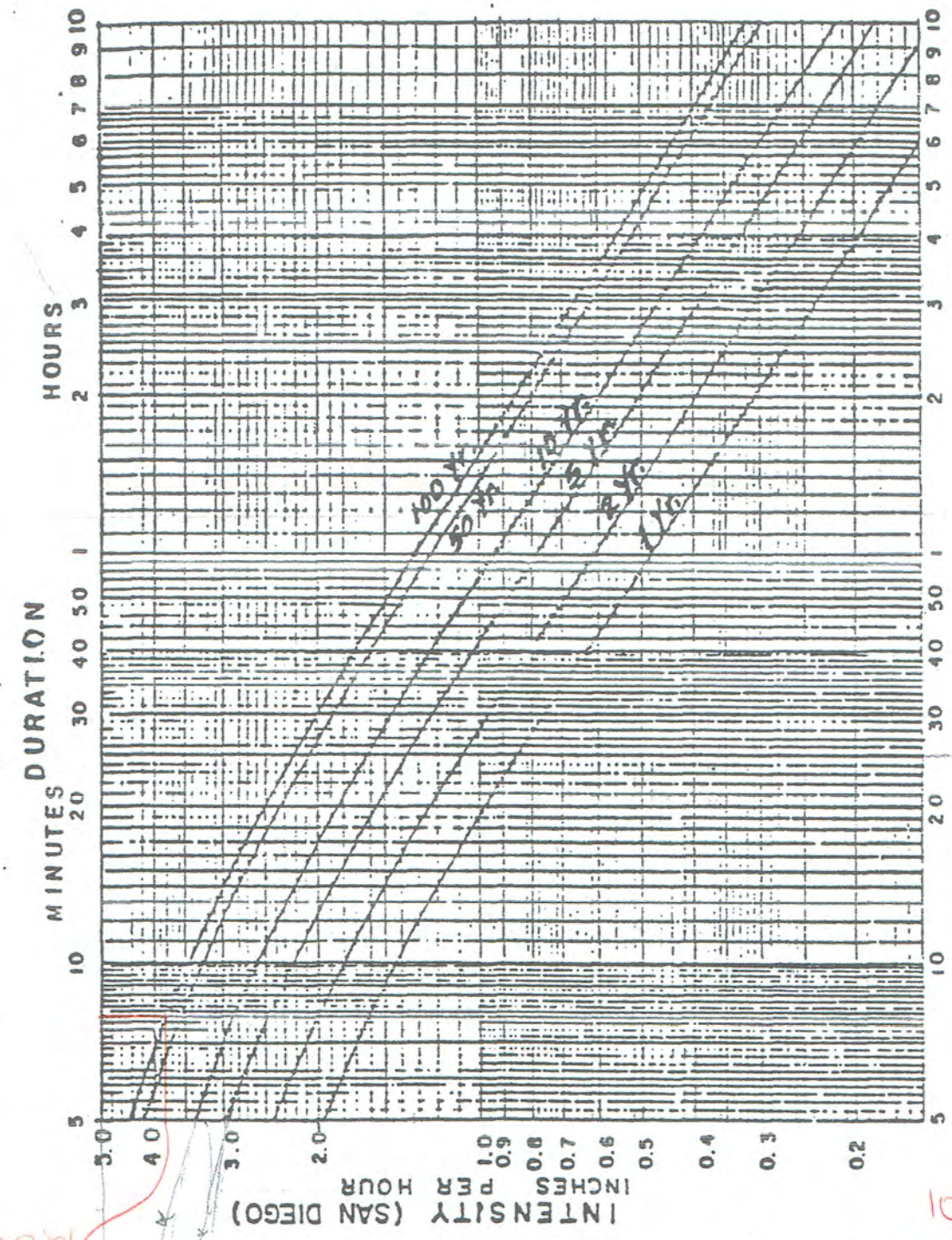
EXAMPLE:

GIVEN: LENGTH OF FLOW = 400 FT.
SLOPE = 1.0 %
COEFFICIENT OF RUNOFF C = .70

READ: OVERLAND FLOWTIME = 15 MINUTES

I - E

Basin 8P



ELEV.	FACTOR
0—1500	1.00
1500—3000	1.25
3000—4000	1.42
4000—5000	1.60
5000—6000	1.70
DESERT	1.25

To obtain correct intensity, multiply intensity on chart by factor for design elevation.

RAINFALL

INTENSITY - DURATION - FREQUENCY

CURVES

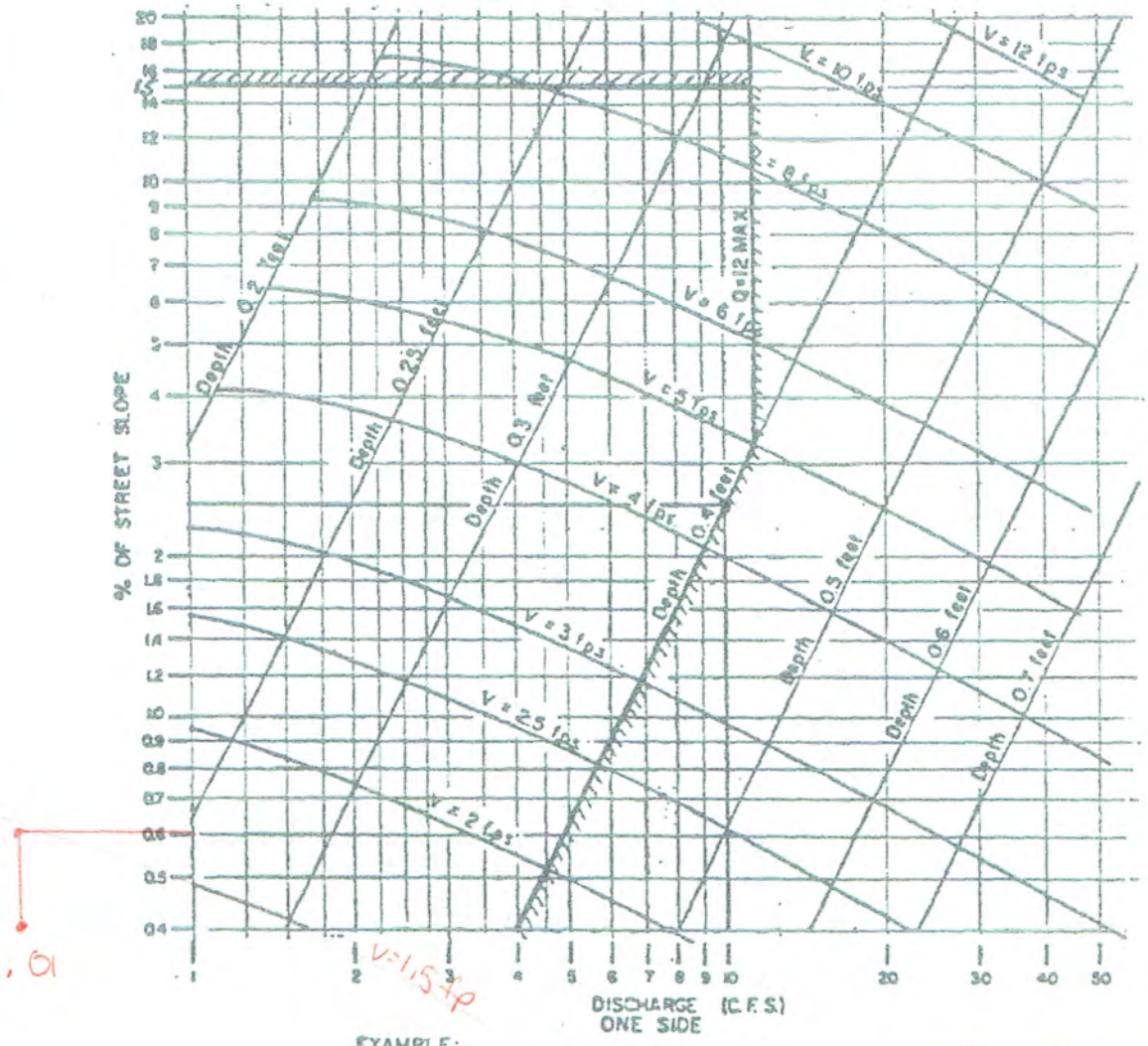
for

COUNTY OF SAN DIEGO

APPENDIX I

Basin 8P

CHART I-104.12



EXAMPLE:

Given: Q = 10 S = 2.5 %
Chart gives: Depth = 0.4, Velocity = 4.4 fps

Q = 0.01 cfs
Save = 0.16'.

use V = 1.5 fps

REV.		CITY OF SAN DIEGO - DESIGN GUIDE	SHT. NO.
		GUTTER AND ROADWAY DISCHARGE - VELOCITY CHART	

Basin 8P

APPENDIX E

Basin 1P

Land Use	Runoff Coefficient C	Area (AC)
AC	0.95	1.3

$T_c = T_i + T_f$ Time of concentraion = overland flow time + street gutter flow time

Overland Flow Time:

Overland distance	25	Ft	
Slope	2	%	
Runoff Coefficient	0.95		
Overland Flow Time	2	min	City Manual APP I-E (see attached)

Street Gutter Flow Time:

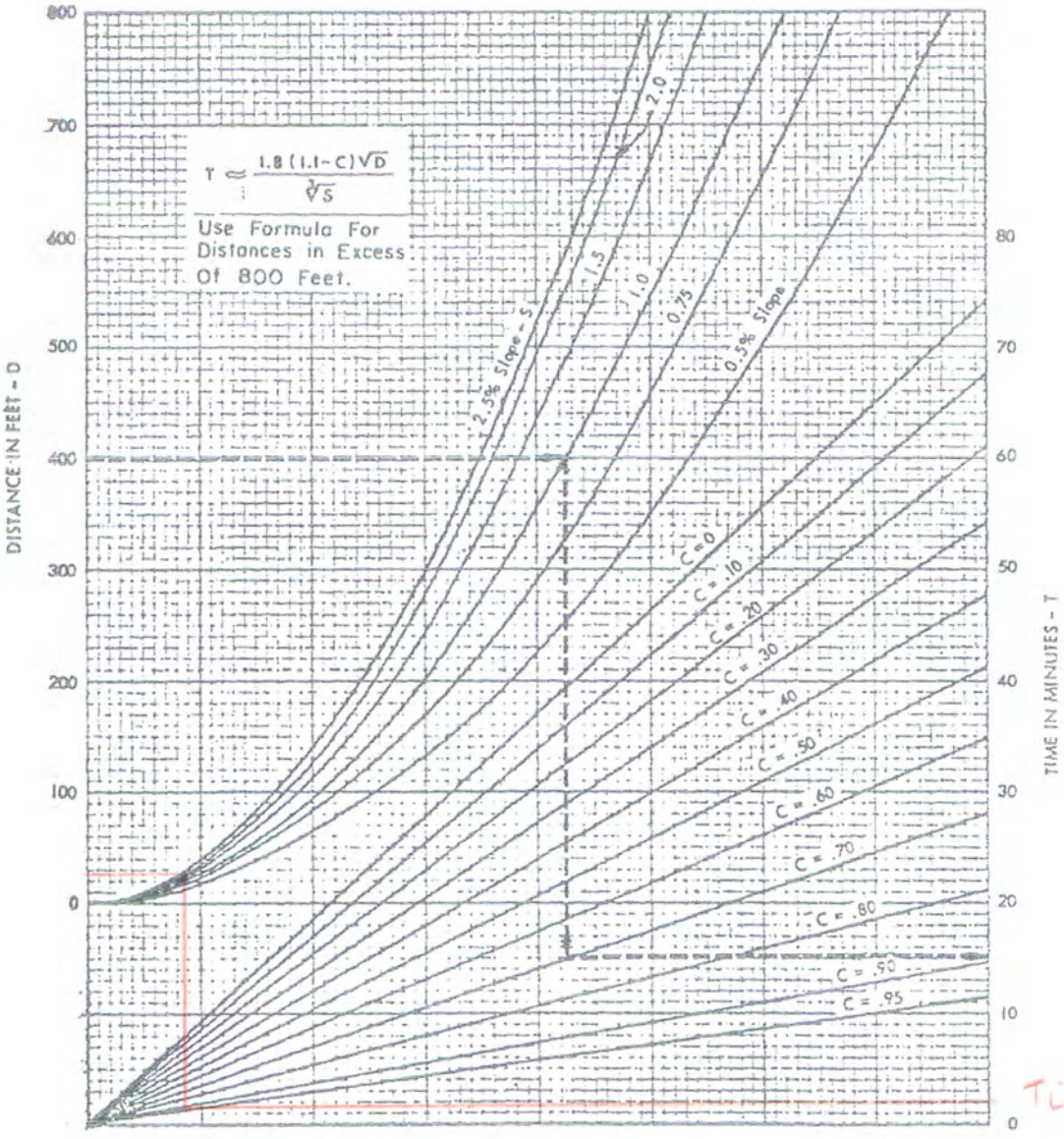
Assume T_c = 26 Min

I_{100} =	2.2	in/hr	City Manual APP I (see attached)
$Q_{100} = CI_{100}A$	2.7	CFS	
S_{ave} (gutter slope)	0.67	%	7A Asbuilts (261+79 28.22' to 291+04 8.49')
V=	2	FPS	City Manual Chart 1-104.12 (see attached)
Gutter Flow Length	2925	Ft	
Gutter Flow Time	24	Min	
Check Assumption:			
$T_c = T_i + T_f$	26	Min	
Does it match assumption?	yes		

Flow Rate:

Q=CIA	**2.7**	**CFS**

URBAN AREAS OVERLAND TIME OF FLOW CURVES



Surface Flow Time Curves

TC = 2 min

L = 25 ft
S = 2%
C = 0.95

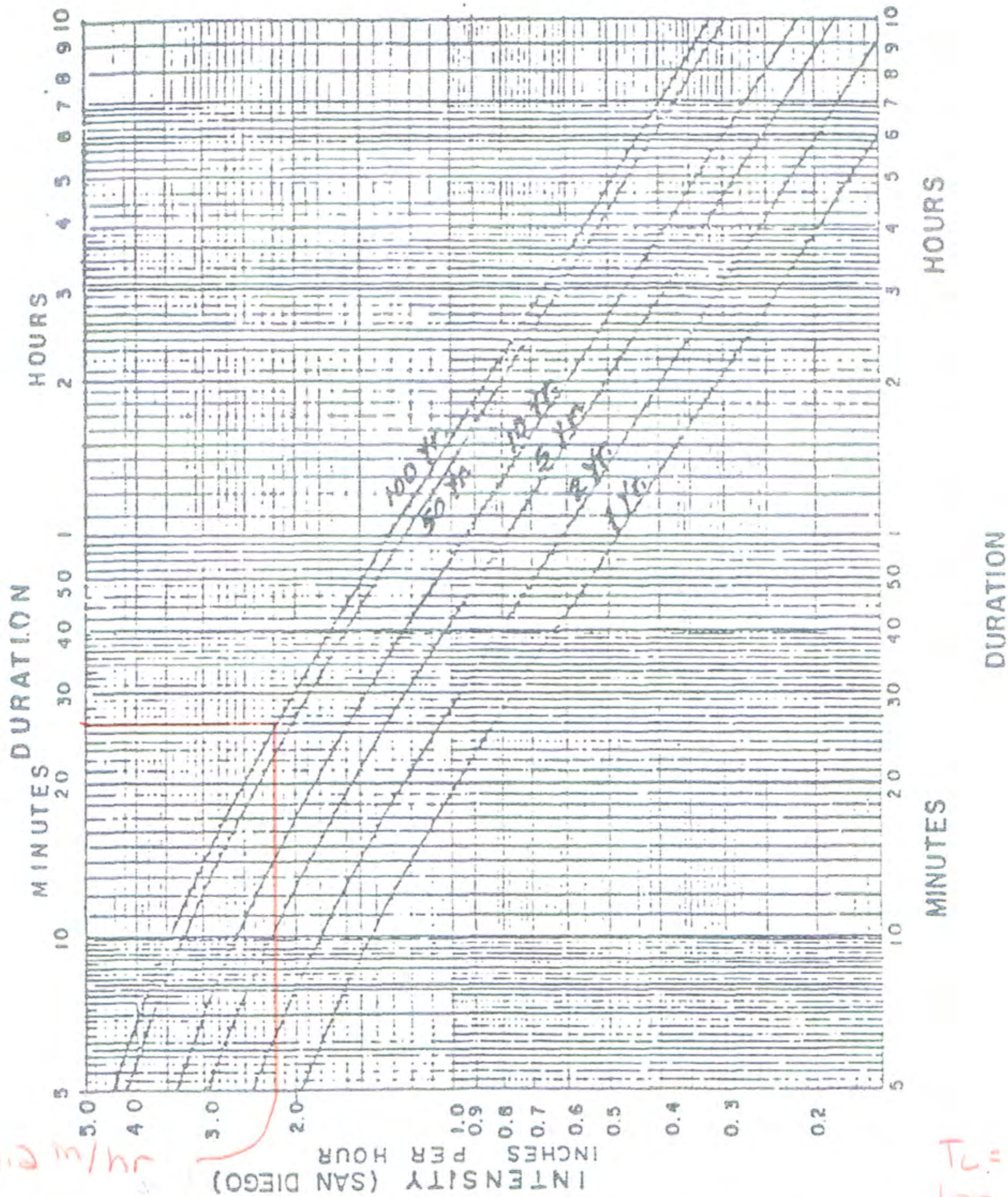
EXAMPLE:

GIVEN: LENGTH OF FLOW = 400 FT.
SLOPE = 1.0 %
COEFFICIENT OF RUNOFF C = .70

READ: OVERLAND FLOWTIME = 15 MINUTES

I-E

Basin 1P



I = 2.2 in/hr

Tc = 26 min
100 year Storm

RAINFALL

INTENSITY - DURATION - FREQUENC

CURVES

for

COUNTY OF SAN DIEGO

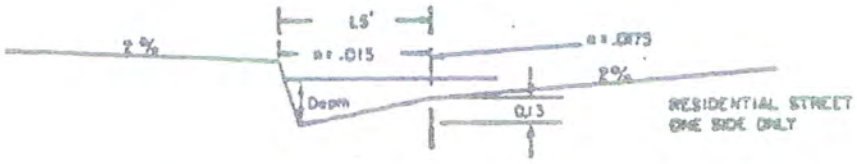
ELEV.	FACTOR
0-1500	1.00
1500-3000	1.25
3000-4000	1.42
4000-5000	1.60
5000-6000	1.70
DESERT	1.25

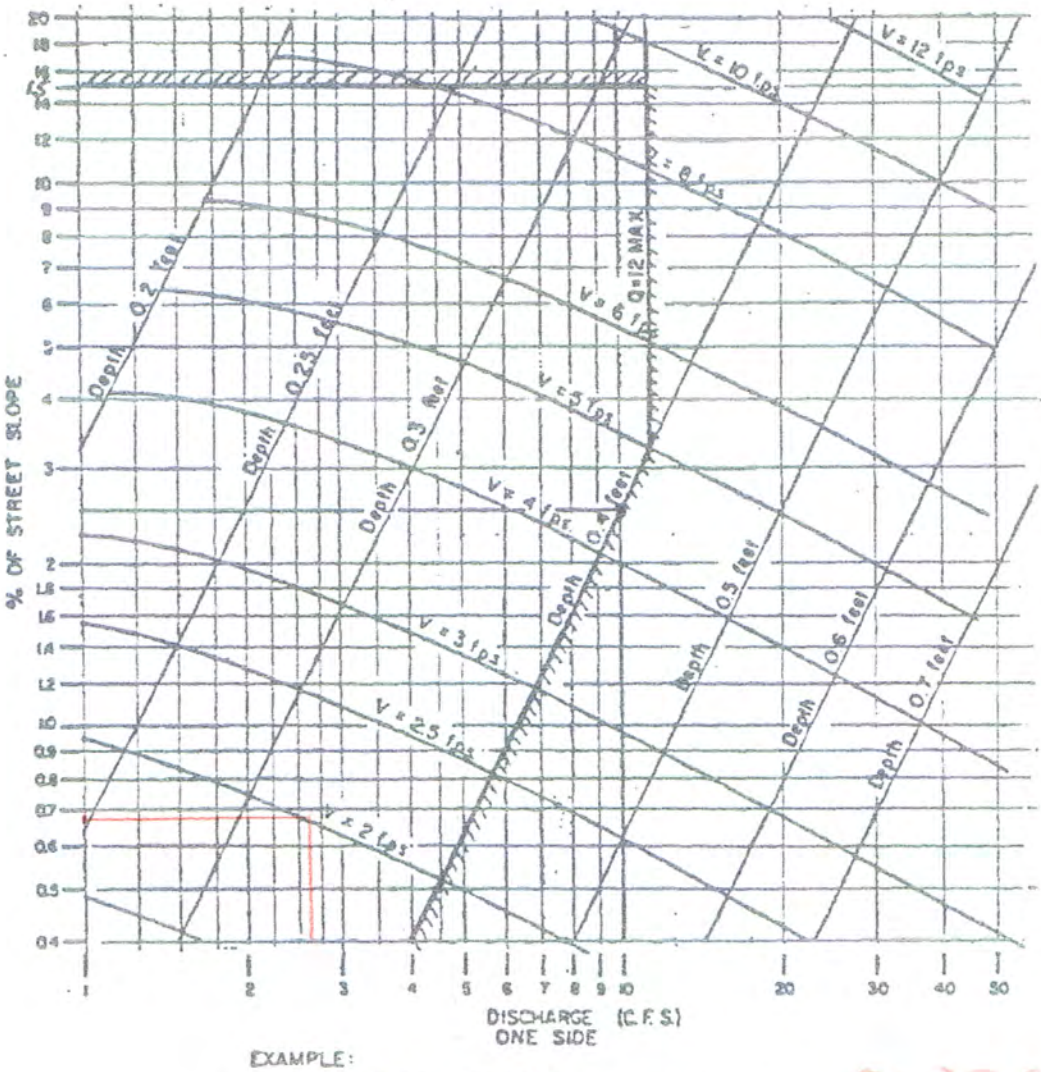
To obtain correct intensity, multiply intensity on chart by factor for design elevation.

APPENDIX I

Basin 1P

CHART I-104.12





EXAMPLE:

Given: Q = 10 S = 2.5%
Chart gives: Depth = 0.4, Velocity = 4.4 f.p.s.

Q = 2.7 cfs
Save = 0.167'/.

use V = 2 fps

REV.		CITY OF SAN DIEGO - DESIGN GUIDE	SHT. NO.
		GUTTER AND ROADWAY DISCHARGE - VELOCITY CHART	

Basin 1P

Appendix 2

Preliminary Improvement Plans

GENERAL NOTES

1. APPROVAL OF THESE PLANS BY THE CITY ENGINEER DOES NOT AUTHORIZE ANY WORK TO BE PERFORMED UNTIL A NOTICE TO PROCEED HAS BEEN ISSUED.
2. THE APPROVAL OF THIS PLAN OR ISSUANCE OF A PERMIT BY THE CITY OF SAN DIEGO DOES NOT AUTHORIZE THE SUBDIVIDER AND OWNER TO VIOLATE ANY FEDERAL, STATE OR CITY LAWS, ORDINANCES, REGULATIONS, OR POLICIES, INCLUDING, BUT NOT LIMITED TO, THE FEDERAL ENDANGERED SPECIES ACT OF 1973 AND AMENDMENTS THERETO (16 USC SECTION 1531 ET.SEQ.)
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SURVEY MONUMENTS AND/OR VERTICAL CONTROL BENCHMARKS WHICH ARE DISTURBED OR DESTROYED BY CONSTRUCTION. A LAND SURVEYOR MUST FIELD LOCATE, REFERENCE, AND/OR PRESERVE ALL HISTORICAL OR CONTROLLING MONUMENTS PRIOR TO ANY EARTHWORK. IF DESTROYED, A LAND SURVEYOR SHALL REPLACE SUCH MONUMENTS WITH APPROPRIATE MONUMENTS. A CORNER RECORD OR RECORD OF SURVEY, AS APPROPRIATE, SHALL BE FILED AS REQUIRED BY THE PROFESSIONAL LAND SURVEYORS ACT, SECTION 8771 OF THE BUSINESS AND PROFESSIONS CODE OF THE STATE OF CALIFORNIA. IF ANY VERTICAL CONTROL IS TO BE DISTURBED OR DESTROYED, THE CITY OF SAN DIEGO FIELD SURVEY SECTION MUST BE NOTIFIED, IN WRITING, AT LEAST 3 DAYS PRIOR TO THE CONSTRUCTION. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE COST OF REPLACING ANY VERTICAL CONTROL BENCHMARKS DESTROYED BY THE CONSTRUCTION.
4. IMPORTANT NOTICE: SECTION 4216 OF THE GOVERNMENT CODE REQUIRES A DIG ALERT IDENTIFICATION NUMBER BE ISSUED BEFORE A "PERMIT TO EXCAVATE" WILL BE VALID. FOR YOUR DIG ALERT I.D. NUMBER, CALL UNDERGROUND SERVICE ALERT, TOLL FREE 1-800-422-4133, TWO DAYS BEFORE YOU DIG.
5. CONTRACTOR SHALL IMPLEMENT AN EROSION AND SEDIMENT CONTROL PROGRAM DURING THE PROJECT GRADING AND/OR CONSTRUCTION ACTIVITIES. THE PROGRAM SHALL MEET ALL APPLICABLE REQUIREMENTS OF THE STATE WATER RESOURCE CONTROL BOARD AND THE CITY OF SAN DIEGO MUNICIPAL CODE AND STORM WATER STANDARDS MANUAL.
6. "PUBLIC IMPROVEMENT SUBJECT TO DESUETUDE OR DAMAGE." IF REPAIR OR REPLACEMENT OF SUCH PUBLIC IMPROVEMENTS IS REQUIRED, THE OWNER SHALL OBTAIN THE REQUIRED PERMITS FOR WORK IN THE PUBLIC RIGHT-OF-WAY, SATISFACTORY TO THE PERMIT-ISSUING AUTHORITY.
7. ALL EXISTING AND/OR PROPOSED PUBLIC UTILITY SYSTEM AND SERVICE FACILITIES SHALL BE INSTALLED UNDERGROUND IN ACCORDANCE WITH SECTION 144.0240 OF THE MUNICIPAL CODE.
8. PRIOR TO ANY DISTURBANCE TO THE SITE, EXCLUDING UTILITY MARK-OUTS AND SURVEYING, THE CONTRACTOR SHALL MAKE ARRANGEMENTS FOR A PRE-CONSTRUCTION MEETING WITH THE CITY OF SAN DIEGO FIELD ENGINEERING DIVISION (858) 627-3200.
9. DEVIATIONS FROM THESE SIGNED PLANS WILL NOT BE ALLOWED UNLESS A CONSTRUCTION CHANGE IS APPROVED BY THE CITY ENGINEER OR THE CHANGE IS REQUIRED BY THE CITY INSPECTOR.
10. AS-BUILT DRAWINGS MUST BE SUBMITTED TO THE RESIDENT ENGINEER PRIOR TO ACCEPTANCE OF THIS PROJECT BY THE CITY OF SAN DIEGO.
11. AN AS-GRADED GEOTECHNICAL REPORT AND A SET OF THE REDLINE GRADING PLANS SHALL BE SUBMITTED AT AREA 3 ON THE THIRD FLOOR OF DEVELOPMENT SERVICES WITHIN 30 CALENDAR DAYS OF THE COMPLETION OF GRADING. AN ADDITIONAL SET SHALL BE PROVIDED TO THE RESIDENT ENGINEER OF THE FIELD ENGINEERING DIVISION AT 9485 AERO DR.
12. THE AREA WHICH IS DEFINED AS A NON GRADING AREA AND WHICH IS NOT TO BE DISTURBED SHALL BE STAKED PRIOR TO START OF THE WORK. THE PERMIT APPLICANT AND ALL OF THEIR REPRESENTATIVES OR CONTRACTORS SHALL COMPLY WITH THE REQUIREMENTS FOR PROTECTION OF THIS AREA AS REQUIRED BY ANY APPLICABLE AGENCY. ISSUANCE OF THE CITY'S GRADING PERMIT SHALL NOT RELIEVE THE APPLICANT OR ANY OF THEIR REPRESENTATIVES OR CONTRACTORS FROM COMPLYING WITH ANY STATE OR FEDERAL REQUIREMENTS BY AGENCIES INCLUDING BUT NOT LIMITED TO CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, CALIFORNIA DEPARTMENT OF FISH AND GAME. COMPLIANCE MAY INCLUDE OBTAINING PERMITS, OTHER AUTHORIZATIONS, OR COMPLIANCE WITH MANDATES BY ANY APPLICABLE STATE OR FEDERAL AGENCY.
13. CONTRACTOR SHALL REMOVE AND REPLACE ALL UTILITY BOXES SERVING AS HANDHOLES THAT ARE NOT IN "AS-NEW" CONDITION IN PROPOSED SIDEWALK. DAMAGED BOXES, OR THOSE THAT ARE NOT IN COMPLIANCE WITH CURRENT CODE SHALL BE REMOVED AND REPLACED WITH NEW BOXES, INCLUDING WATER, SEWER, TRAFFIC SIGNALS, STREET LIGHTS, DRY UTILITIES-SDG&E, COX, ETC. ALL NEW METAL LIDS SHALL BE SLIP RESISTANT (FRICTION FACTOR >/= 0.50) AND INSTALLED FLUSH WITH PROPOSED SIDEWALK GRADE. IF A SLIP RESISTANT METAL LID IS NOT COMMERCIALLY AVAILABLE FOR THAT USE, NEW BOXES AND LIDS SHALL BE INSTALLED.

GROUND WATER DISCHARGE NOTES

1. ALL GROUND WATER EXTRACTIONS AND SIMILAR WASTE DISCHARGES TO SURFACE WATERS NOT TRIBUTARY TO THE SAN DIEGO BAY ARE PROHIBITED UNTIL IT CAN BE DEMONSTRATED THAT THE OWNER HAS APPLIED AND OBTAINED AUTHORIZATION FROM THE STATE OF CALIFORNIA VIA AN OFFICIAL "ENROLLMENT LETTER" FROM THE REGIONAL WATER QUALITY CONTROL BOARD IN ACCORDANCE WITH THE TERMS, PROVISIONS AND CONDITIONS OF STATE ORDER NO R9-2008-0002 NPDES CAG919002.
2. THE ESTIMATED MAXIMUM DISCHARGE RATES MUST NOT EXCEED THE LIMITS SET IN THE OFFICIAL "ENROLLMENT LETTER" FROM THE REGIONAL BOARD UNLESS PRIOR NOTIFICATION AND SUBSEQUENT AUTHORIZATION HAS BEEN OBTAINED, AND DISCHARGE OPERATIONS MODIFIED TO ACCOMMODATE THE INCREASED RATES.
3. ALL GROUND WATER EXTRACTIONS AND SIMILAR WASTE DISCHARGES TO SURFACE WATERS TRIBUTARY TO THE SAN DIEGO BAY ARE PROHIBITED UNTIL IT CAN BE DEMONSTRATED THAT THE OWNER HAS APPLIED AND OBTAINED AUTHORIZATION FROM THE STATE OF CALIFORNIA VIA AN OFFICIAL "ENROLLMENT LETTER" FROM THE REGIONAL WATER QUALITY CONTROL BOARD IN ACCORDANCE WITH THE TERMS, PROVISIONS AND CONDITIONS OF STATE ORDER NO R9-2007-0034 NPDES NO. CAG919001.

POST-CONSTRUCTION PERMANENT BMP OPERATION & MAINTENANCE PROCEDURE DETAILS

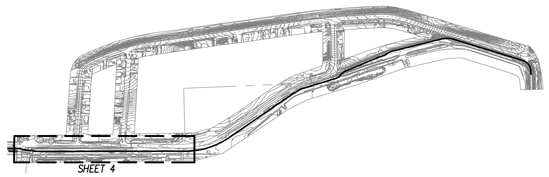
STORM WATER MANAGEMENT AND DISCHARGE CONTROL MAINTENANCE AGREEMENT APPROVAL NO.:

O&M RESPONSIBLE PARTY DESIGNEE: PROPERTY OWNER / HOA / CITY / OTHER

BMP DESCRIPTION	INSPECTION FREQUENCY	MAINTENANCE FREQUENCY	MAINTENANCE METHOD	QUANTITY	SHEET NUMBER(S)
SITE DESIGN					
SOURCE CONTROL					
TREATMENT CONTROL					
HMP FACILITY					

IMPROVEMENT PLANS FOR:

BAYSHORE BIKEWAY SEGMENT 8B



KEY MAP

1"=500'

STREET NAME	STATION LIMITS	AS-BUILT PAVEMENT STRUCTURAL SECTION AC (IN.)	CTB (IN.)	PCC (IN.)

NOTE:
STREET SUBGRADE SOIL SAMPLES ARE TO BE TAKEN FOR "R" VALUE ANALYSIS BY A PRIVATE GEOTECHNICAL ENGINEERING FIRM AND UNDER THE DIRECTION OF THE RESIDENT ENGINEER. THESE ANALYSIS ARE TO BE PERFORMED BY A CERTIFIED PRIVATE GEOTECHNICAL FIRM TO DETERMINE THE PAVEMENT SECTION(S) DURING CONSTRUCTION. A PAVEMENT SECTION LETTER WILL BE ISSUED BY THE CITY.

DECLARATION OF RESPONSIBLE CHARGE

I HEREBY DECLARE THAT I AM THE ENGINEER OF WORK FOR THIS PROJECT, THAT I HAVE EXERCISED RESPONSIBLE CHARGE OVER THE DESIGN OF THE PROJECT AS DEFINED IN SECTION 6703 OF THE BUSINESS AND PROFESSIONS CODE, AND THAT THE DESIGN IS CONSISTENT WITH CURRENT STANDARDS.

I UNDERSTAND THAT THE CHECK OF PROJECT DRAWINGS AND SPECIFICATIONS BY THE CITY OF SAN DIEGO IS CONFINED TO A REVIEW ONLY AND DOES NOT RELIEVE ME, AS ENGINEER OF WORK, OF MY RESPONSIBILITIES FOR PROJECT DESIGN.

ANDREA L. FITZGERALD R.C.E. NO. 75617 EXP. 06-30-16 DATE

REFERENCE DRAWINGS

REFERENCE DRAWING DESCRIPTION

BASIS OF COORDINATES

THE BASIS OF COORDINATES FOR THIS SURVEY IS THE NORTH AMERICAN DATUM OF 1983 (NAD 83) CALIFORNIA STATE PLANE COORDINATE SYSTEM OF 1983 (CCS83) ZONE 6 (EPOCH 1991.35) BASED LOCALLY UPON THE FOLLOWING CONTROL POINTS PER THE CITY OF SAN DIEGO RECORD OF SURVEY NO. 14492.

STATION	NORTHING	EASTING
183	1800668.84	6303116.36
185	1793285.14	6303839.67

BENCHMARK

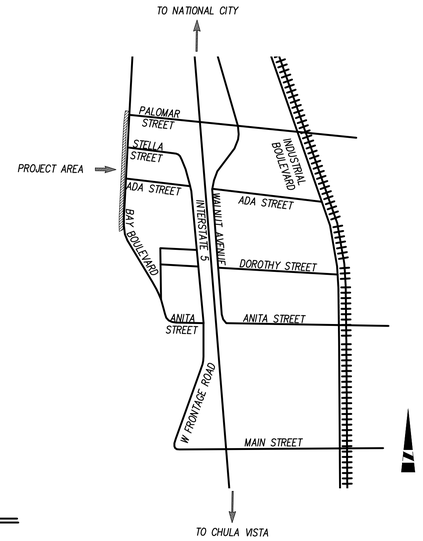
ELEVATIONS SHOWN HEREON ARE IN TERMS OF THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29) BASED LOCALLY UPON THE FOLLOWING BENCHMARK PER ROS 14492.

BENCHMARK	ELEVATION
183	58.28'

3.5" CALTRANS BRASS DISK IN CONC. WALK, SOUTH SIDE OF PALOMAR STREET BRIDGE ON EAST SIDE OF I-15

STORM WATER PROTECTION NOTES

1. THIS PROJECT IS SUBJECT TO MUNICIPAL STORM WATER PERMIT ORDER NO.___R9-2007-001____; AND RISK LEVEL/TYPE: CHECK ONE BELOW
   - ☒ WPCP
   - ☐ CGP RISK LEVEL 1
   - ☐ CGP RISK LEVEL 2
   - ☐ CGP RISK LEVEL 3
   - ☐ CGP LUP TYPE 1
   - ☐ CGP LUP TYPE 2
   - ☐ CGP LUP TYPE 3
2. CHECK ONE
   - ☐ THIS PROJECT WILL EXCEED THE MAXIMUM DISTURBED AREA LIMIT, THEREFORE A WEATHER TRIGGERED ACTION PLAN (WTAP) IS REQUIRED.
   - ☐ THIS PROJECT WILL FOLLOW PHASED GRADING NOT TO EXCEED FIVE (5) ACRES PER PHASE.
   - ☒ NOT APPLICABLE
3. THE CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OF THE WPCP OR SWPPP AS APPLICABLE.



VICINITY MAP

NO SCALE

WORK TO BE DONE

THE IMPROVEMENTS CONSIST OF THE FOLLOWING WORK TO BE DONE ACCORDING TO THESE PLANS AND THE SPECIFICATIONS AND STANDARD DRAWINGS OF THE CITY OF SAN DIEGO.

STANDARD SPECIFICATIONS:

DOCUMENT NO.	DESCRIPTION
PITS070112-01	STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (GREENBOOK), 2012 EDITION
PITS070112-02	CITY OF SAN DIEGO STANDARD SPECIFICATIONS FOR PUBLICWORKS CONSTRUCTION (WHITEBOOK), 2012 EDITION
PITS070112-04	CALIFORNIA DEPARTMENT OF TRANSPORTATION MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, 2012 EDITION
PITS070112-06	CALIFORNIA DEPARTMENT OF TRANSPORTATION U.S CUSTOMARY STANDARD SPECIFICATIONS, 2010 EDITION

STANDARD DRAWINGS:

DOCUMENT NO.	DESCRIPTION
PITS070112-03	CITY OF SAN DIEGO STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION, 2012 EDITION
PITS070112-05	CALIFORNIA DEPARTMENT OF TRANSPORTATION U.S CUSTOMARY STANDARD PLANS, 2010 EDITION

LEGEND

PROPOSED IMPROVEMENTS

IMPROVEMENT	STANDARD DWGS.	SYMBOL
ASPHALT CONCRETE (AC) (SCHEDULE J PAVING)	SDG-113	
PORTLAND CEMENT CONCRETE (PCC) (SCHEDULE J PAVING)	SDG-113	
CURB RAMP	SDG-132	
BIOSWALE		

EXISTING IMPROVEMENTS

ITEM	STANDARD DWGS.	SYMBOL
CURB RAMP	-	
TRAFFIC SIGNAL	-	(TS)

SHEET INDEX

ENGINEERING PERMIT NO:_____

CONSTRUCTION SITE STORM WATER PRIORITY:_____

811 Know what's below. Call before you dig.

TITLE SHEET FOR:
BAYSHORE BIKEWAY SEGMENT 8B

CITY OF SAN DIEGO, CALIFORNIA
Development Service Department
SHEET 1 OF 9 SHEETS

I.O. NO. _____
PROJECT NO. _____
V.T.M. _____

FOR CITY ENGINEER _____ DATE _____

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	QIC			
AS-BUILTS				

CONTRACTOR _____ DATE STARTED _____
INSPECTOR _____ DATE COMPLETED _____

XXXX-XXXX NAD83 COORDINATES
XXX-XXXX LAMBERT COORDINATES

1-D

CONSTRUCTION CHANGE TABLE

CHANGE	DATE	EFFECTED OR ADDED SHEET NUMBERS	APPROVAL NO.	PROJECT NO.

0 1/2 1

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

QIC
Quality Infrastructure Corporation
7777 Alvarado Road, Suite 606
La Mesa, CA 91942
619-741-9400
www.qualityinfrastructure.com

REGISTERED PROFESSIONAL ENGINEER
ANDREA L. FITZGERALD
No. 75617
Exp. 06/30/16
CIVIL
STATE OF CALIFORNIA

		DATE
DESIGNED BY	A. FITZGERALD	xx/xx
DRAWN BY	A. RIVERA	xx/xx
CHECKED BY	K. BRADBURY	xx/xx
SANDAG PRJ ENG	O. ATAYEE	xx/xx

SANDAG

SCALE: AS SHOWN
CONTRACT NO. 5001914
DRAWING NO. —
SHEET NO. 1

NOT FOR CONSTRUCTION - 06/03/2016

STRIPING AND SIGNING GENERAL NOTES

1. INSTALLATION OF ALL STRIPING, SIGNS AND PAVEMENT MARKERS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
2. ALL STRIPING AND SIGNING SHALL CONFORM TO THE MOST RECENTLY ADOPTED EDITION OF THE FOLLOWING MANUALS:

DESCRIPTION	EDITION	DOCUMENT NO.
STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (THE "GREENBOOK")	2012	PITS070112-01
CITY OF SAN DIEGO STANDARD DRAWINGS	2012	PITS070112-03
CALIFORNIA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (CA MUTCD)	2012	PITS070112-06

3. ALL SIGNING AND STRIPING IS SUBJECT TO APPROVAL OF THE CITY ENGINEER PRIOR TO INSTALLATION AND/OR REMOVAL.
4. THE CONTRACTOR SHALL REMOVE ALL CONFLICTING STRIPING, PAVEMENT MARKINGS AND LEGENDS BY SANDBLASTING AND/OR GRINDING WITH THE SEAL. ANY DEBRIS SHALL BE PROMPTLY REMOVED BY THE CONTRACTOR.
5. SIGN POSTS SHALL BE INSTALLED WITH SQUARE PERFORATED STEEL TUBING WITH A BREAKAWAY BASE PER CITY OF SAN DIEGO STANDARD DRAWING M-45.
6. ALL RAISED MEDIAN NOSES SHALL BE PAINTED YELLOW.
7. ALL SIGNS SHOWN ON THE STRIPING AND SIGNING PLANS SHALL BE BE NEW SIGNS PROVIDED AND INSTALLED BY THE CONTRACTOR, EXCEPT FOR EXISTING SIGNS SPECIFICALLY INDICATED TO BE RELOCATED OR TO REMAIN.
8. STRIPED CROSSWALKS SHALL HAVE AN INSIDE DIMENSION OF 10 FEET UNLESS INDICATED OTHERWISE.
9. ALL LIMIT LINES/STOP LINES, CROSSWALK LINES, PAVEMENT LEGENDS, AND ARROWS (EXCEPT WITHIN BIKE LANES) SHALL BE THERMOPLASTIC.
10. THE CONTRACTOR SHALL NOTIFY THE CITY TRAFFIC ENGINEER AT (858) 495-4741 A MINIMUM OF (5) WORKING DAYS PRIOR TO AND UPON COMPLETION OF STRIPING AND SIGNING.

TRAFFIC CONTROL NOTES

1. VALIDATION: THE TRAFFIC CONTROL PLAN IS NOT VALID UNTIL WORK DATES AND WORK HOURS ARE APPROVED. THE CONTRACTOR SHALL SUBMIT TWO (2) REDUCED COPIES OF TRAFFIC CONTROL PLANS (11"X17") TO THE TRAFFIC CONTROL PERMIT COUNTER, 3RD FLOOR DEVELOPMENT SERVICES CENTER, 1222 FIRST AVENUE, SAN DIEGO. THE CONTRACTOR SHALL OBTAIN A TRAFFIC CONTROL PERMIT A MINIMUM OF TWO (2) WORKING DAYS PRIOR TO STARTING WORK, AND A MINIMUM OF FIVE (5) DAYS IF WORK WILL AFFECT A BUS STOP OR AN EXISTING TRAFFIC SIGNAL, OR IF WORK WILL REQUIRE A ROAD OR ALLEY CLOSURE.
2. CONTRACTOR SHALL NOTIFY THE CITY TRAFFIC ENGINEER AT (858) 495-4741 A MINIMUM OF FIVE (5) WORKING DAYS PRIOR TO ANY CONSTRUCTION WORK AFFECTING TRAFFIC SIGNALS.
3. STANDARDS: THE TRAFFIC CONTROL PLAN SHALL CONFORM TO THE MOST RECENT ADOPTED EDITION OF EACH OF THE FOLLOWING MANUALS:

DESCRIPTION	EDITION	DOCUMENT NO.
STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (THE "GREENBOOK")	2012	PITS070112-01
CITY OF SAN DIEGO STANDARD DRAWINGS	2012	PITS070112-03
CALIFORNIA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD)	2012	PITS070112-06

4. NOTIFICATIONS: THE CONTRACTOR SHALL NOTIFY THE FOLLOWING AGENCIES A MINIMUM OF FIVE (5) WORKING DAYS PRIOR TO ANY EXCAVATION, CONSTRUCTION, OR TRAFFIC CONTROL AFFECTING THE AGENCIES LISTED BELOW:

FIRE DEPARTMENT DISPATCH	(STREET OR ALLEY CLOSURE)	(858) 573-1300
POLICE DEPARTMENT DISPATCH	(STREET OR ALLEY CLOSURE)	(619) 531-2000
ENVIRONMENTAL SERVICES	(REFUSE COLLECTION)	(858) 492-5060
STREET DIVISION	(TRAFFIC SIGNALS)	(619) 527-7500
METROPOLITAN TRANSIT SYSTEM (MTS)	(BUS STOPS)	(619) 238-0100 EXT. 6451
METROPOLITAN TRANSIT SYSTEM (MTS)	(TAXI ZONES)	(619) 235-2644
METROPOLITAN TRANSIT SYSTEM (MTS)	(TROLLEY LINES)	(619) 595-4930
UNDERGROUND SERVICE ALERT	(ANY EXCAVATION)	(800) 422-4133

THE CONTRACTOR SHALL NOTIFY PROPERTY OWNERS AND TENANTS A MINIMUM OF FIVE (5) WORKING DAYS PRIOR TO CLOSURE OF DRIVEWAYS. THE CONTRACTOR SHALL POST SIGNS NOTIFYING THE PUBLIC A MINIMUM OF FIVE (5) WORKING DAYS PRIOR TO CLOSURE OF STREETS.

THE CONTRACTOR SHALL NOTIFY ENGINEERING FIELD DIVISION AT (858) 627-3200 AND ARRANGE FOR INSPECTION A MINIMUM OF FIVE (5) WORKING DAYS PRIOR TO STARTING ANY WORK INVOLVING NIGHTTIME OR WEEKEND HOURS.

5. POSTING PARKING RESTRICTIONS: THE CONTRACTOR SHALL POST TOW-AWAY/NO PARKING SIGNS TWENTY FOUR (24) HOURS IN ADVANCE OF PARKING REMOVAL. SIGNS SHALL INDICATE SPECIFIC DAYS, DATES AND TIMES OF RESTRICTIONS. PARKING METERS SHALL BE BAGGED WHERE APPLICABLE.
6. EXCAVATIONS: EXCEPT WHEN OTHERWISE SHOWN ON THE PLANS, ALL TRENCHES SHALL BE BACKFILLED OR TRENCH-PLATED AT THE END OF EACH WORKDAY. AN ASPHALT RAMP SHALL BE PLACED AROUND EACH TRENCH PLATE TO PREVENT THE PLATE FROM BEING DISLODGED. CONTRACTOR SHALL MONITOR PLATES DURING NON-WORKING HOURS TO ENSURE THAT THEY DO NOT BECOME DISLODGED. UPON COMPLETION OF EXCAVATION BACKFILL, THE CONTRACTOR SHALL PROVIDE A SATISFACTORY SURFACE FOR TRAFFIC. WHEN CONSTRUCTION OPERATIONS ARE NOT ACTIVELY IN PROGRESS, THE CONTRACTOR SHALL MAINTAIN ALL TRAVEL LANES, BIKE LANES, AND PEDESTRIAN WALKWAYS IN THE RIGHT-OF-WAY EXCEPT WHEN OTHERWISE SHOWN ON THE PLANS.
7. COVERED PEDESTRIAN WALKWAY: THE CONTRACTOR SHALL CONTACT CITY RESIDENT ENGINEER AT (619) 627-3200 FOR INSPECTION OF ANY COVERED PEDESTRIAN WALKWAY DURING CONSTRUCTION OF SUCH WALKWAY.
8. RESTORATION OF ROADWAY: THE CONTRACTOR SHALL REPAIR OR REPLACE ALL EXISTING IMPROVEMENTS WITHIN THE RIGHT-OF-WAY NOT DESIGNATED FOR PERMANENT REMOVAL (TRAFFIC SIGNS, PAVEMENT MARKERS, PAVEMENT MARKINGS, LEGENDS, CURB MARKINGS, LOOP DETECTORS, TRAFFIC SIGNAL EQUIPMENT, ETC.) WHICH ARE DAMAGED OR REMOVED AS A RESULT OF OPERATIONS. REPAIRS AND REPLACEMENTS SHALL BE AT LEAST EQUAL TO EXISTING IMPROVEMENT.
9. CHANGE IN WORK: THE CITY ENGINEER RESERVES THE RIGHT TO OBSERVE THESE TRAFFIC CONTROL PLANS IN OPERATION AND TO MAKE ANY CHANGES AS FIELD CONDITIONS WARRANT. ANY CHANGES SHALL BE DOCUMENTED AND SUPERSEDE THESE PLANS.

EROSION AND SEDIMENT CONTROL NOTES

TEMPORARY EROSION/SEDIMENT CONTROL, PRIOR TO COMPLETION OF FINAL IMPROVEMENTS, SHALL BE PERFORMED BY THE CONTRACTOR OR QUALIFIED PERSON AS INDICATED BELOW:

1. ALL REQUIREMENTS OF THE CITY OF SAN DIEGO "LAND DEVELOPMENT MANUAL, STORM WATER STANDARDS" MUST BE INCORPORATED INTO THE DESIGN AND CONSTRUCTION OF THE PROPOSED GRADING/IMPROVEMENTS CONSISTENT WITH THE APPROVED STORM WATER POLLUTION PREVENTION PLAN (SWPPP), WATER QUALITY TECHNICAL REPORT (WQTR), AND/OR WATER POLLUTION CONTROL PLAN (WPCP).
2. FOR STORM DRAIN INLETS, PROVIDE A GRAVEL BAG SILT BASIN IMMEDIATELY UPSTREAM OF INLET AS INDICATED ON DETAILS.
3. FOR INLETS LOCATED AT SUMPS ADJACENT TO TOP OF SLOPES, THE CONTRACTOR SHALL ENSURE THAT WATER DRAINING TO THE SUMP IS DIRECTED INTO THE INLET AND THAT A MINIMUM OF 1.00' FREEBOARD EXISTS AND IS MAINTAINED ABOVE THE TOP OF THE INLET. IF FREEBOARD IS NOT PROVIDED BY GRADING SHOWN ON THESE PLANS, THE CONTRACTOR SHALL PROVIDE IT VIA TEMPORARY MEASURES, I.E. GRAVEL BAGS OR DIKES.
4. THE CONTRACTOR OR QUALIFIED PERSON SHALL BE RESPONSIBLE FOR CLEANUP OF SILT AND MUD ON ADJACENT STREET(S) AND STORM DRAIN SYSTEM DUE TO CONSTRUCTION ACTIVITY.
5. THE CONTRACTOR OR QUALIFIED PERSON SHALL CHECK AND MAINTAIN ALL LINED AND UNLINED DITCHES AFTER EACH RAINFALL.
6. THE CONTRACTOR SHALL REMOVE SILT AND DEBRIS AFTER EACH MAJOR RAINFALL.
7. EQUIPMENT AND WORKERS FOR EMERGENCY WORK SHALL BE MADE AVAILABLE AT ALL TIMES DURING THE RAINY SEASON. ALL NECESSARY MATERIALS SHALL BE STOCKPILED ON SITE AT CONVENIENT LOCATIONS TO FACILITATE RAPID CONSTRUCTION OF TEMPORARY DEVICES WHEN RAIN IS IMMINENT.
8. THE CONTRACTOR SHALL RESTORE ALL EROSION/SEDIMENT CONTROL DEVICES TO WORKING ORDER TO THE SATISFACTION OF THE CITY ENGINEER OR RESIDENT ENGINEER AFTER EACH RUN-OFF PRODUCING RAINFALL.
9. THE CONTRACTOR SHALL INSTALL ADDITIONAL EROSION/SEDIMENT CONTROL MEASURES AS MAY BE REQUIRED BY THE RESIDENT ENGINEER DUE TO UNCOMPLETED GRADING OPERATIONS OR UNFORESEEN CIRCUMSTANCES, WHICH MAY ARISE.
10. THE CONTRACTOR SHALL BE RESPONSIBLE AND SHALL TAKE NECESSARY PRECAUTIONS TO PREVENT PUBLIC TRESPASS ONTO AREAS WHERE IMPOUNDED WATERS CREATE A HAZARDOUS CONDITION.
11. ALL EROSION/SEDIMENT CONTROL MEASURES PROVIDED PER THE APPROVED GRADING PLAN SHALL BE INCORPORATED HEREON. ALL EROSION/SEDIMENT CONTROL FOR INTERIM CONDITIONS SHALL BE DONE TO THE SATISFACTION OF THE RESIDENT ENGINEER.
12. GRADED AREAS AROUND THE PROJECT PERIMETER MUST DRAIN AWAY FROM THE FACE OF THE SLOPE AT THE CONCLUSION OF EACH WORKING DAY.
13. ALL REMOVABLE PROTECTIVE DEVICES SHOWN SHALL BE IN PLACE AT THE END OF EACH WORKING DAY WHEN RAIN IS IMMINENT.
14. THE CONTRACTOR SHALL ONLY GRADE, INCLUDING CLEARING AND GRUBBING, FOR THE AREAS FOR WHICH THE CONTRACTOR OR QUALIFIED PERSON CAN PROVIDE EROSION/SEDMENT CONTROL MEASURES.
15. THE CONTRACTOR SHALL ARRANGE FOR WEEKLY MEETINGS DURING OCTOBER 1ST TO APRIL 30TH FOR PROJECT TEAM (GENERAL CONTRACTOR, QUALIFIED PERSON, EROSION CONTROL SUBCONTRACTOR, IF ANY, ENGINEER OF WORK, OWNER/DEVELOPER AND THE RESIDENT ENGINEER) TO EVALUATE THE ADEQUACY OF THE EROSION/SEDIMENT CONTROL MEASURES AND OTHER RELATED CONSTRUCTION ACTIVITIES.

MINIMUM POST-CONSTRUCTION MAINTENANCE PLAN

AT THE COMPLETION OF THE WORK SHOWN, THE FOLLOWING PLAN SHALL BE FOLLOWED TO ENSURE WATER QUALITY CONTROL IS MAINTAINED FOR THE LIFE OF THE PROJECT:

1. STABILIZATION: ALL PLANTED SLOPES AND OTHER VEGETATED AREAS SHALL BE INSPECTED PRIOR TO OCTOBER 1 OF EACH YEAR AND AFTER MAJOR RAINFALL EVENTS (MORE THAN 1/2 INCH) AND REPAIRED AS NEEDED UNTIL A NOTICE OF TERMINATION (NOT) IS FILED.
2. STRUCTURAL PRACTICES: DESILTING BASINS, DIVERSION DITCHES, DOWNDRAINS, INLETS, OUTLET PROTECTION MEASURES, AND OTHER PERMANENT WATER QUALITY AND SEDIMENT AND EROSION CONTROLS SHALL BE INSPECTED PRIOR TO OCTOBER 1ST OF EACH YEAR AND MAJOR RAINFALL EVENTS (MORE THAN 1/2 INCH). REPAIRS AND REPLACEMENTS SHALL BE MADE AS NEEDED AND RECORDED IN THE MAINTENANCE LOG IN PERPETUITY.
3. OPERATION AND MAINTENANCE FUNDING: POST-CONSTRUCTION MANAGEMENT MEASURES ARE THE RESPONSIBILITY OF THE DEVELOPER UNTIL THE TRANSFER OF RESPECTIVE SITES TO HOME BUILDERS, INDIVIDUAL OWNERS, HOMEOWNERS ASSOCIATIONS, SCHOOL DISTRICTS, OR LOCAL AGENCIES AND/OR GOVERNMENTS. AT THAT TIME, THE NEW OWNERS SHALL ASSUME RESPONSIBILITY FOR THEIR RESPECTIVE PORTIONS OF THE DEVELOPMENT.

PERMANENT POST-CONSTRUCTION BMP NOTES

1. OPERATION AND MAINTENANCE SHALL BE SECURED BY AN EXECUTED AND RECORDED STORM WATER MANAGEMENT AND DISCHARGE CONTROL MAINTENANCE AGREEMENT (SWMDCMA), OR ANOTHER MECHANISM APPROVED BY THE CITY ENGINEER, THAT ASSURES ALL PERMANENT BMP'S WILL BE MAINTAINED IN PERPETUITY, PER THE LAND DEVELOPMENT MANUAL, STORM WATER STANDARDS.
2. ANY MODIFICATION(S) TO THE PERMANENT POST CONSTRUCTION BMP DEVICES/STRUCTURES SHOWN ON PLAN REQUIRES A CONSTRUCTION CHANGE TO BE PROCESSED AND APPROVED THROUGH DEVELOPMENT SERVICES DEPARTMENT BY THE ENGINEER OF WORK. APPROVAL OF THE CONSTRUCTION CHANGE IS REQUIRED PRIOR TO CONSTRUCTION OF THE PERMANENT BMP.

TRUCK HAUL NOTES

THE CONTRACTOR SHALL SUBMIT A TRUCK HAUL ROUTE PLAN (11"X17") FOR APPROVAL PRIOR TO STARTING EXPORT OR IMPORT OF MATERIAL. THE PLAN SHOULD BE SUBMITTED TO THE TRAFFIC CONTROL PERMIT COUNTER, 3RD FLOOR, BOOTH 22, BUILDING, SAFETY & CONSTRUCTION DIVISION, DEVELOPMENT SERVICES CENTER, 1222 FIRST AVENUE, SAN DIEGO (619) 446-5150. CONTRACTOR SHALL OBTAIN A TRAFFIC CONTROL PERMIT A MINIMUM OF FIVE (5) WORKING DAYS PRIOR TO STARTING WORK.

CURB RAMP NOTE

THE REQUIRED DETECTABLE WARNING (TRUNCATED DOMES) ON CURB RAMPS ARE TO COMPLY WITH THE CITY STANDARDS (SDG-130) AND SPECIFICATIONS. A 12"X12" (MIN.) SAMPLE OF THE DETECTABLE WARNING, THE PRODUCTS' TEST REPORT AND A COPY OF THE MANUFACTURER'S INSTALLATION INSTRUCTION MUST BE SUBMITTED TO THE DESIGNATED CITY RESIDENT ENGINEER FOR REVIEW PRIOR TO INSTALLATION. FAILURE TO COMPLY WITH THE STANDARDS, SPECIFICATIONS AND SAMPLE SUBMITTAL REVIEW PROCESS WILL RESULT IN THE REMOVAL OR REPLACEMENT OF THE DETECTABLE WARNING AND/OR CURB RAMP(S) AT CONTRACTOR AND/OR OWNER'S EXPENSE.

811 Know what's below. Call before you dig.

GENERAL NOTES FOR:
BAYSHORE BIKEWAY
SEGMENT 8B

CITY OF SAN DIEGO, CALIFORNIA
Development Service Department
SHEET 2 OF 9 SHEETS

I.O. NO. _____
PROJECT NO. _____
V.T.M. _____

FOR CITY ENGINEER _____ DATE _____

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	QIC			
AS-BUILTS				

CONTRACTOR _____ DATE STARTED _____
INSPECTOR _____ DATE COMPLETED _____

XXXX-XXXX
NAD83 COORDINATES
XXX-XXXX
LAMBERT COORDINATES
2-D

CONSTRUCTION CHANGE TABLE

CHANGE	DATE	EFFECTED OR ADDED SHEET NUMBERS	APPROVAL NO.	PROJECT NO.

0 1/2 1

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

QIC

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www.qualityinfrastructure.com

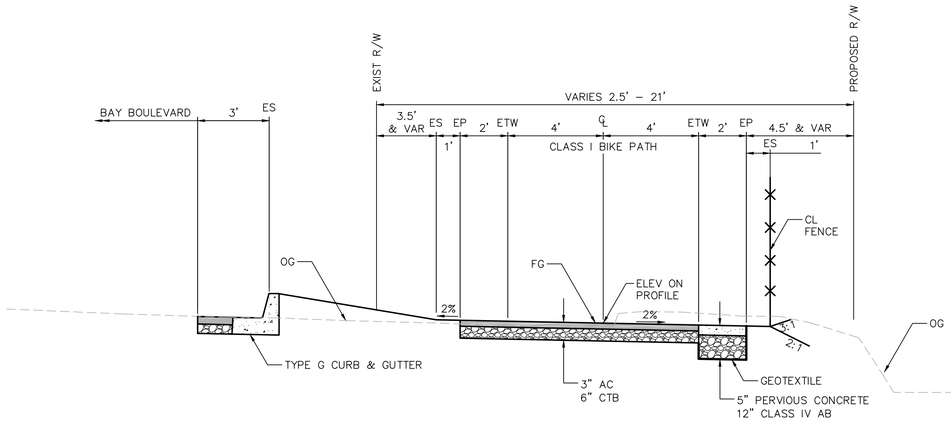
REGISTERED PROFESSIONAL ENGINEER
ANDREA L. FITZGERALD
No. 75617
Exp. 06/30/16
CIVIL
STATE OF CALIFORNIA

		DATE
DESIGNED BY	A. FITZGERALD	xx/xx
DRAWN BY	A. RIVERA	xx/xx
CHECKED BY	K. BRADBURY	xx/xx
SANDAG PRJ ENG	O. ATAYEE	xx/xx

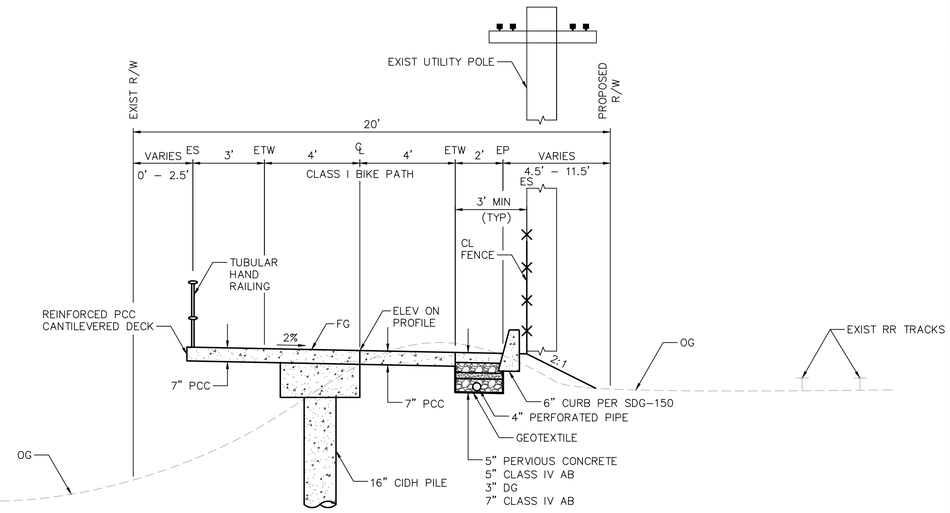
SANDAG

SCALE: AS SHOWN
CONTRACT NO. 5001914
DRAWING NO. —
SHEET NO. 2

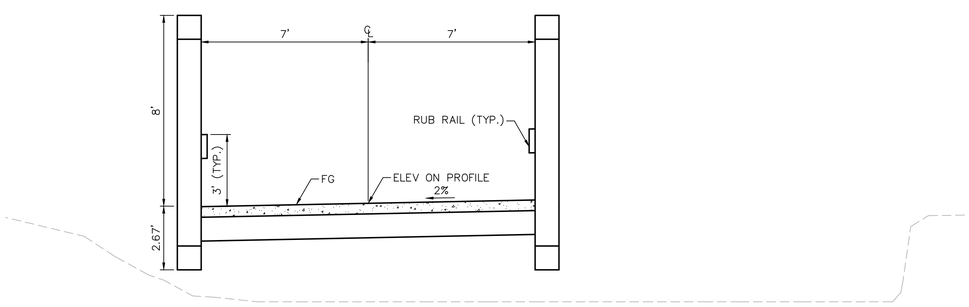
NOT FOR CONSTRUCTION - 06/03/2016



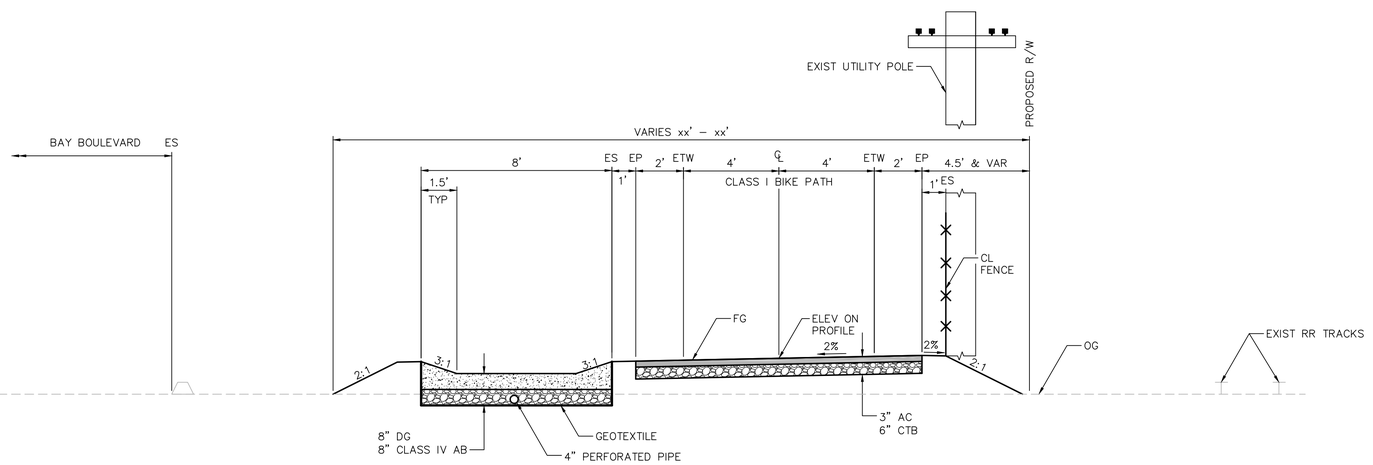
290+40.20 TO 290+72.18



291+43.18 TO 298+20



290+72.18 TO 291+43.18



298+20 TO 302+50

SCALE: 1"=3'

811 Know what's below. Call before you dig.

TYPICAL SECTIONS FOR:
BAYSHORE BIKEWAY SEGMENT 8B

CITY OF SAN DIEGO, CALIFORNIA
Development Service Department
SHEET 3 OF 9 SHEETS

I.O. NO. _____
PROJECT NO. _____
V.T.M. _____

FOR CITY ENGINEER _____ DATE _____

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	QIC			
AS-BUILTS				

XXXX-XXXX NAD83 COORDINATES
XXX-XXXX LAMBERT COORDINATES

CONTRACTOR _____ DATE STARTED _____
INSPECTOR _____ DATE COMPLETED _____

3-D

CONSTRUCTION CHANGE TABLE

CHANGE	DATE	EFFECTED OR ADDED SHEET NUMBERS	APPROVAL NO.	PROJECT NO.

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

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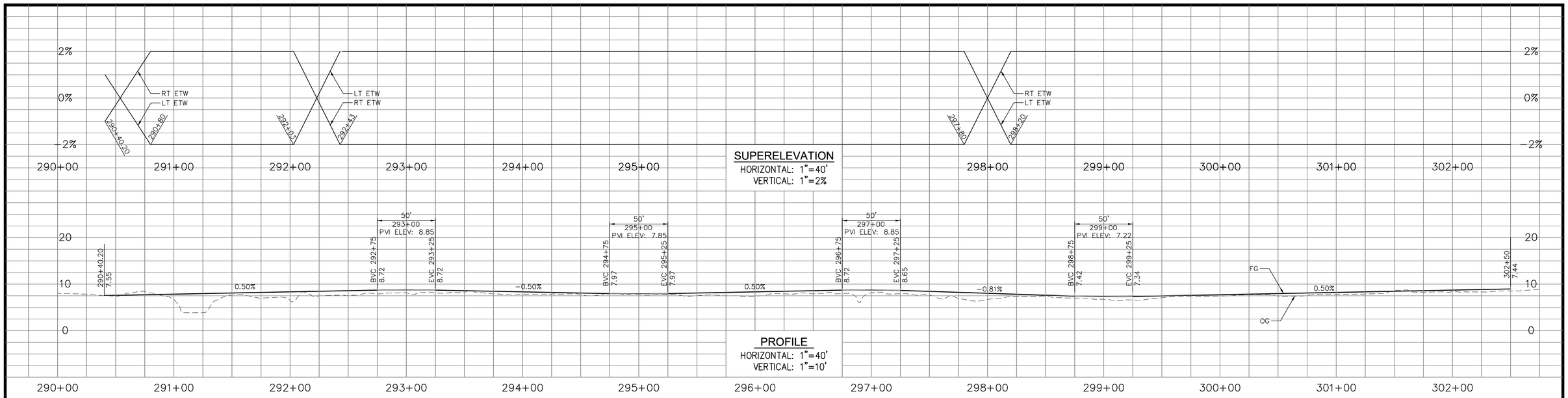
REGISTERED PROFESSIONAL ENGINEER
ANDREA L. FITZGERALD
No. 75617
Exp. 06/30/16
CIVIL
STATE OF CALIFORNIA

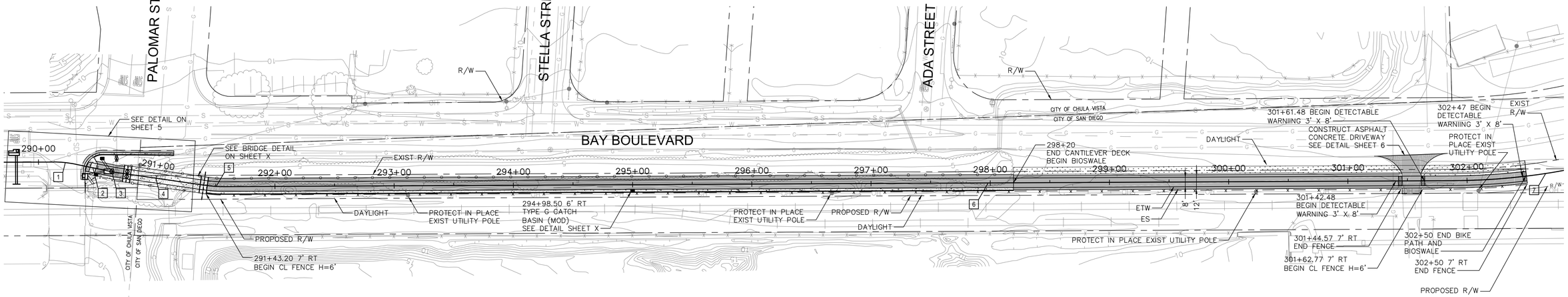
		DATE
DESIGNED BY	A. FITZGERALD	xx/xx
DRAWN BY	A. RIVERA	xx/xx
CHECKED BY	K. BRADBURY	xx/xx
SANDAG PRJ ENG	O. ATAYEE	xx/xx

SANDAG

SCALE: AS SHOWN
CONTRACT NO. 5001914
DRAWING NO. —
SHEET NO. 3

NOT FOR CONSTRUCTION - 06/03/2016





PLAN
1"=40'

CENTERLINE DATA					
NO	BEARING/DELTA	RADIUS	LENGTH	BEGIN CURVE	END CURVE
1	11°49'34"	90'	18.58'	290+12.53	290+31.11
2	S 14°33'47" W	-	30.77'		
3	3°22'17"	90'	5.30'	290+61.88	290+67.18
4	S 11°11'29" W	-	76.02'		
5	8°28'10"	90'	13.30'	291+43.20	291+56.51
6	S 2°43'19" W	-	1031.41'		
7	6°31'48"	540'	61.59'	301+87.92	302+50

DESIGN STANDARDS PER CALTRANS HIGHWAY DESIGN MANUAL, CHAPTER 1000	
DESIGN SPEED	20 MPH
BIKE PATH WIDTH	8 FEET
SHOULDER WIDTH	2 FEET
MINIMUM HORIZONTAL CURVE RADIUS	90 FEET
MINIMUM STOPPING SIGHT DISTANCE	125 FEET

N

40 0 40 80 FEET
1"=40'

811 Know what's below. Call before you dig.

IMPROVEMENT PLANS FOR:
BAYSHORE BIKEWAY SEGMENT 8B

CITY OF SAN DIEGO, CALIFORNIA
Development Service Department
SHEET 4 OF 9 SHEETS

I.O. NO. _____
PROJECT NO. _____
V.T.M. _____

FOR CITY ENGINEER _____ DATE _____

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	QIC			
AS-BUILTS				

CONTRACTOR _____ DATE STARTED _____
INSPECTOR _____ DATE COMPLETED _____

XXXX-XXXX NAD83 COORDINATES
XXX-XXXX LAMBERT COORDINATES

4-D

CONSTRUCTION CHANGE TABLE

CHANGE	DATE	EFFECTED OR ADDED SHEET NUMBERS	APPROVAL NO.	PROJECT NO.

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

QIC
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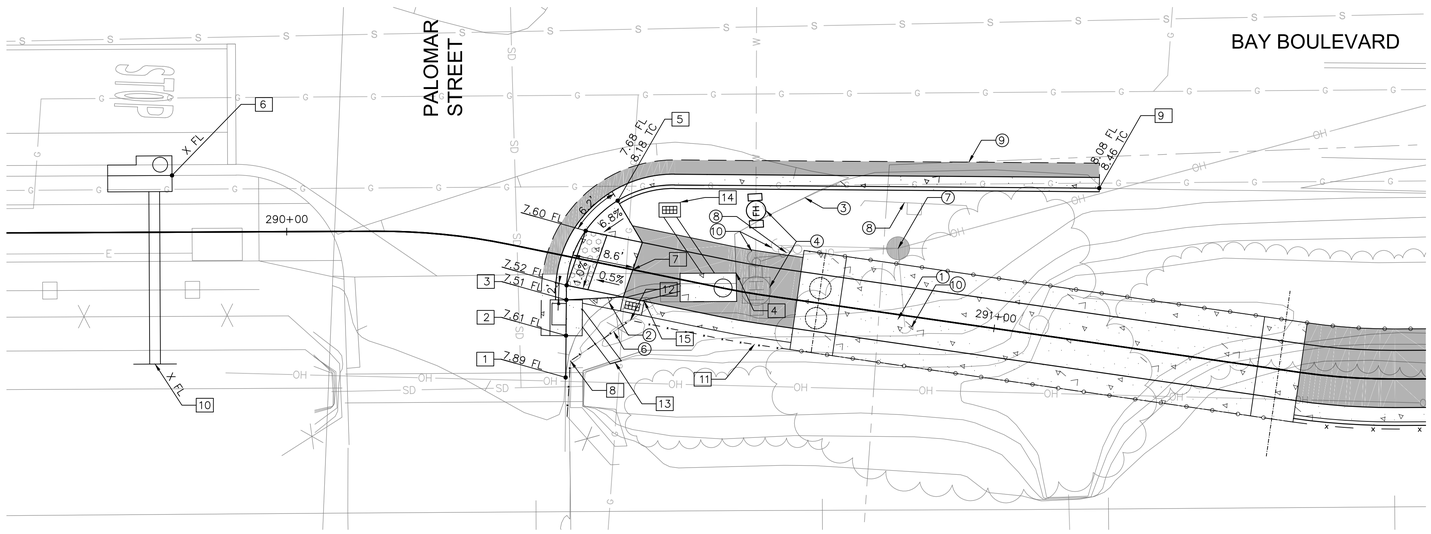
REGISTERED PROFESSIONAL ENGINEER
ANDREA L. FITZGERALD
No. 75617
Exp. 06/30/16
CIVIL
STATE OF CALIFORNIA

	DATE
DESIGNED BY A. FITZGERALD	xx/xx
DRAWN BY A. RIVERA	xx/xx
CHECKED BY K. BRADBURY	xx/xx
SANDAG PRJ ENG O. ATAYEE	xx/xx

SANDAG

SCALE: AS SHOWN
CONTRACT NO. 5001914
DRAWING NO. —
SHEET NO. 4

NOT FOR CONSTRUCTION - 06/03/2016



PLAN
1"=10'

N

40 0 40 80 FEET
1"=40'

CONSTRUCTION NOTES

1. REMOVE TREE
2. REMOVE CURB
3. REMOVE AC DIKE
4. RESET FIRE HYDRANT
5.
6. REMOVE FENCE
7. PROTECT IN PLACE EXIST UTILITY POLE
8. REMOVE SIGN
9. SAWCUT LINE
10. RELOCATE GUY WIRE (BY OTHERS)

CONSTRUCTION DATA TABLE

NO.	STATION	OFFSET	DESCRIPTION
1	290+42.67	16.65' RT	BEGIN 6" CURB PER SDG-150
2	290+42.42	15.36' RT	END 6" CURB
3	290+41.03	8.95' RT	CURB INLET TYPE C L=4' PER SDD-117, BEGIN CURB RAMP TYPE A PER SDG-132
4	290+63.12	2.42' LT	CATCH BASIN - TYPE F (MODIFIED) PER SDD-119 SEE DETAIL X
5	290+44.84	9.01' LT	END CURB RAMP, BEGIN CURB & GUTTER TYPE G PER SDG-151
6	289+84	8' LT	CURB INLET TYPE C L=9' PER SDD-117
7	290+48.84	0' RT	BEGIN BIKE PATH
8	290+43.95	21.93' RT	BEGIN CHAINLINK FENCE H=6'
9	291+11.77	21.49' LT	END CURB & GUTTER
10	289+81.51	18.43' RT	CONSTRUCT HEADWALL PER SDRSD XX, CONNECT X' RCP TO HEADWALL PER SDRSD XX
11	290+49.10	7' RT	END CHAINLINK FENCE, BEGIN TUBULAR HAND RAILING
12	290+49.92	7' RT	ANGLE POINT CHAINLINK FENCE
13	290+49.10	13.16' RT	CONNECT X" RCP TO EXISTING HEADWALL PER SDRSD XX
14	290+53.50	10.50' LT	CONSTRUCT TYPE I CATCH BASIN (MOD) PER DETAIL SHEET X, CONNECT X' RCP TO TYPE F CATCH BASIN
15	290+51.29	4' RT	CONSTRUCT TYPE I CATCH BASIN (MOD) PER DETAIL SHEET X, CONNECT X' RCP TO TYPE F CATCH BASIN

IMPROVEMENT PLANS FOR:
BAYSHORE BIKEWAY SEGMENT 8B

CITY OF SAN DIEGO, CALIFORNIA
Development Service Department
SHEET 5 OF 9 SHEETS

I.O. NO. _____
PROJECT NO. _____
V.T.M. _____

FOR CITY ENGINEER _____ DATE _____

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	QIC			
AS-BUILTS				

CONTRACTOR _____ DATE STARTED _____
INSPECTOR _____ DATE COMPLETED _____

XXXX-XXXX NAD83 COORDINATES
XXX-XXXX LAMBERT COORDINATES

5-D

811 Know what's below. Call before you dig.

CONSTRUCTION CHANGE TABLE

CHANGE	DATE	EFFECTED OR ADDED SHEET NUMBERS	APPROVAL NO.	PROJECT NO.

0 1/2 1
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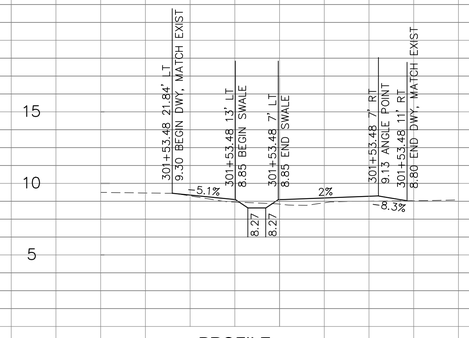
CIVIL
STATE OF CALIFORNIA

	DATE
DESIGNED BY A. FITZGERALD	xx/xx
DRAWN BY A. RIVERA	xx/xx
CHECKED BY K. BRADBURY	xx/xx
SANDAG PRJ ENG O. ATAYEE	xx/xx

SANDAG

SCALE: AS SHOWN
CONTRACT NO. 5001914
DRAWING NO. —
SHEET NO. 5

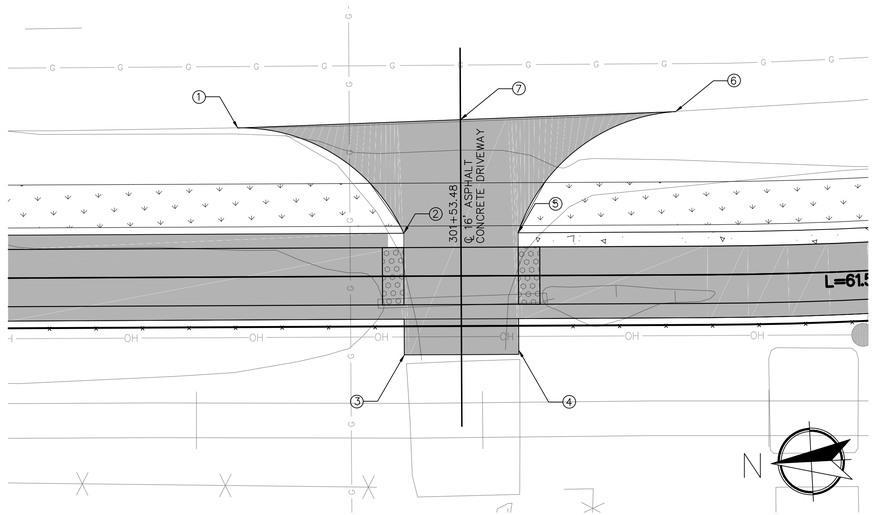
NOT FOR CONSTRUCTION - 06/03/2016



PROFILE
HORIZONTAL: 1"=40'
VERTICAL: 1"=10'

PROFILE
HORIZONTAL: 1"=10'
VERTICAL: 1"=5'

ADD DRAINAGE PROFILES



DETAIL
1"=10'

DRIVEWAY DATA TABLE

NO.	STATION	OFFSET	DESCRIPTION
①	301+22.35	20.83 LT	BEGIN DWY, BEGIN CURVE R=25'
②	301+45.48	6.00 LT	END CURVE
③	301+45.48	11.00 RT	END DWY
④	301+61.48	11.00 RT	END DWY
⑤	301+61.48	6.00 LT	BEGIN CURVE R=25'
⑥	31+83.56	22.82' LT	END DWY, END CURVE
⑦	301+53.48	21.84' LT	CENTERLINE BEGIN DRIVEWAY

811 Know what's below. Call before you dig.

IMPROVEMENT PLANS FOR:
BAYSHORE BIKEWAY SEGMENT 8B

CITY OF SAN DIEGO, CALIFORNIA
Development Service Department
SHEET 6 OF 9 SHEETS

I.O. NO. _____
PROJECT NO. _____
V.T.M. _____

FOR CITY ENGINEER _____ DATE _____

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	QIC			
AS-BUILTS				

CONTRACTOR _____ DATE STARTED _____
INSPECTOR _____ DATE COMPLETED _____

XXXX-XXXX NAD83 COORDINATES
XXX-XXXX LAMBERT COORDINATES

6-D

CONSTRUCTION CHANGE TABLE

CHANGE	DATE	EFFECTED OR ADDED SHEET NUMBERS	APPROVAL NO.	PROJECT NO.

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

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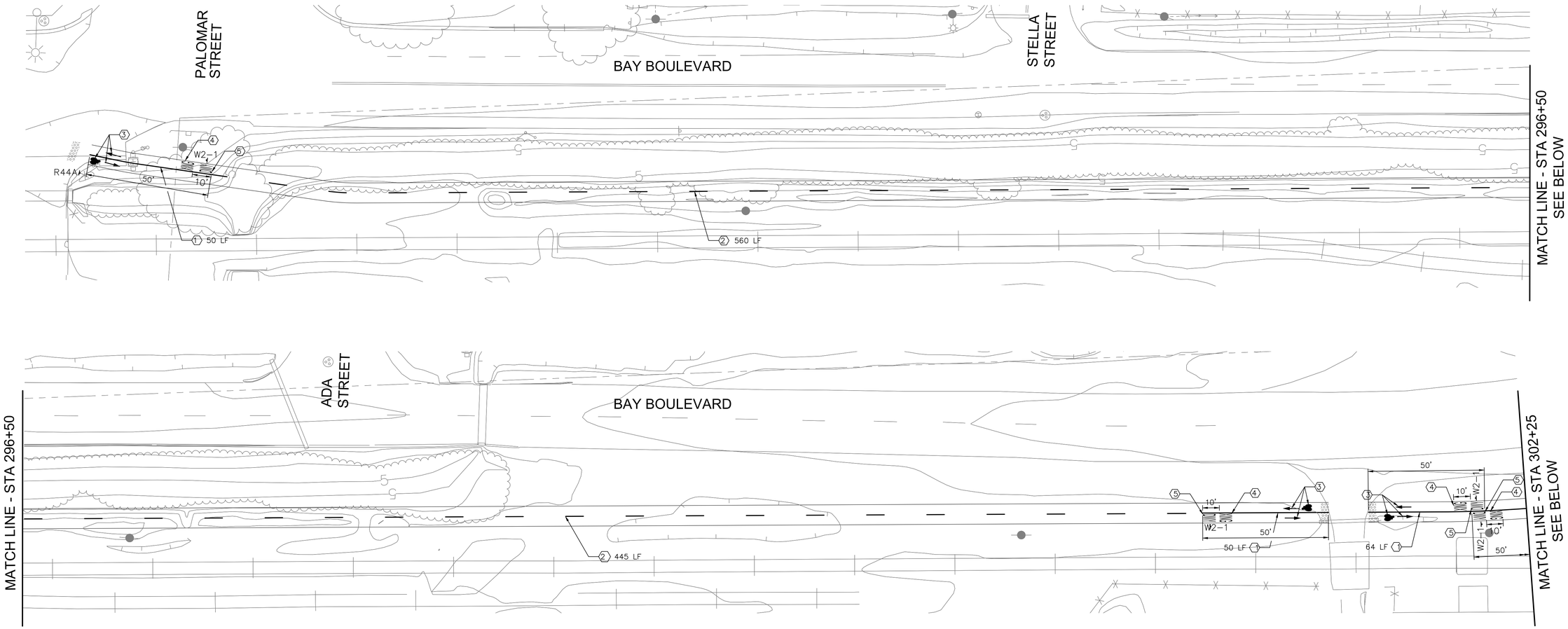
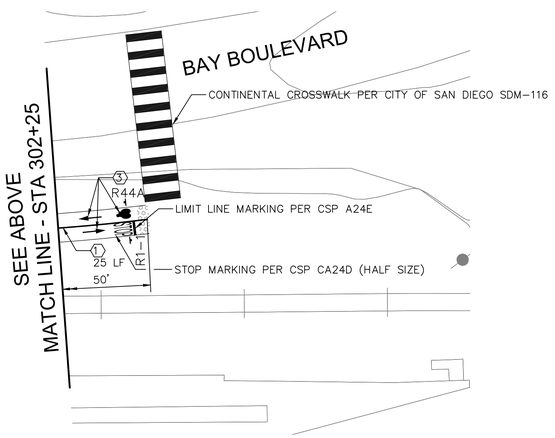
STATE OF CALIFORNIA

		DATE
DESIGNED BY	A. FITZGERALD	xx/xx
DRAWN BY	A. RIVERA	xx/xx
CHECKED BY	K. BRADBURY	xx/xx
SANDAG PRJ ENG	O. ATAYEE	xx/xx

SCALE: AS SHOWN
CONTRACT NO. 5001914
DRAWING NO. —
SHEET NO. 6

NOT FOR CONSTRUCTION - 06/03/2016





NOTES

1. 4" YELLOW STRIPE PER FIGURE 9C-2 CHAPTER 9C - MARKINGS (2012 CA MUTCD). SEE DETAIL 'B' THIS SHEET.
2. 4" YELLOW SKIP STRIPE PER FIGURE 9C-2 CHAPTER 9C - MARKINGS (2012 CA MUTCD). SEE DETAIL 'A' THIS SHEET.
3. INSTALL PAVEMENT LEGENDS AS INDICATED PER DETAIL 'C' THIS SHEET.
4. XING MARKING PER CSP A24D (HALF SIZE).
5. DWY MARKING IS MODIFIED FWY MARKING PER CSP A24E (HALF SIZE).

SIGNS

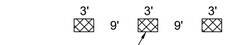
R1-1

W2-1

R44A

DETAIL 'A'

NOT TO SCALE



DETAIL 'B'

NOT TO SCALE

DETAIL 'C'

NOT TO SCALE

40 0 40 80 FEET

1"=40'

811 Know what's below. Call before you dig.

SIGNING AND STRIPING FOR:
BAYSHORE BIKEWAY
SEGMENT 8B

CITY OF SAN DIEGO, CALIFORNIA
Development Service Department
SHEET 7 OF 9 SHEETS

I.O. NO.
PROJECT NO.
V.T.M.

FOR CITY ENGINEER ____ DATE ____

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	QIC			
AS-BUILTS				

CONTRACTOR ____ DATE STARTED ____
INSPECTOR ____ DATE COMPLETED ____

XXXX-XXXX NADB3 COORDINATES
XXX-XXXX LAMBERT COORDINATES

7 -D

CONSTRUCTION CHANGE TABLE

CHANGE	DATE	EFFECTED OR ADDED SHEET NUMBERS	APPROVAL NO.	PROJECT NO.

0 1/2 1

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

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STATE OF CALIFORNIA

		DATE
DESIGNED BY	A. FITZGERALD	xx/xx
DRAWN BY	A. RIVERA	xx/xx
CHECKED BY	K. BRADBURY	xx/xx
SANDAG PRJ ENG	O. ATAYEE	xx/xx

SANDAG

SCALE: AS SHOWN
CONTRACT NO. 5001914
DRAWING NO. —
SHEET NO. 7

NOT FOR CONSTRUCTION - 06/03/2016

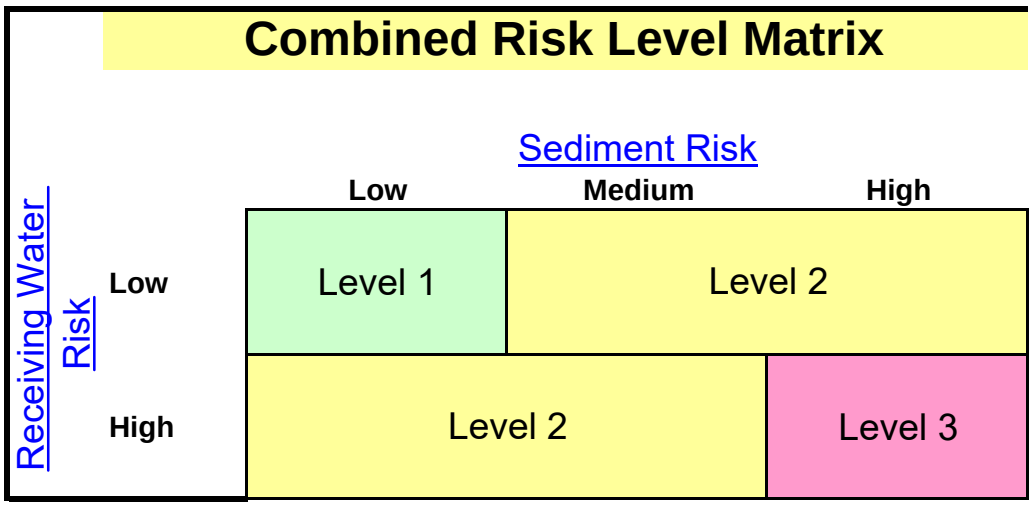
Appendix 3

Risk Level Assessment

	A	B	C
1	**Sediment Risk Factor Worksheet**		**Entry**
2	**A) R Factor**		
3	Analyses of data indicated that when factors other than rainfall are held constant, soil loss is directly proportional to a rainfall factor composed of total storm kinetic energy (E) times the maximum 30-min intensity (I30) (Wischmeier and Smith, 1958). The numerical value of R is the average annual sum of EI30 for storm events during a rainfall record of at least 22 years. "Isoerodent" maps were developed based on R values calculated for more than 1000 locations in the Western U.S. Refer to the link below to determine the R factor for the project site.		
4	http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm		
5	**R Factor Value**		7.73
6	**B) K Factor (weighted average, by area, for all site soils)**		
7	The soil-erodibility factor K represents: (1) susceptibility of soil or surface material to erosion, (2) transportability of the sediment, and (3) the amount and rate of runoff given a particular rainfall input, as measured under a standard condition. Fine-textured soils that are high in clay have low K values (about 0.05 to 0.15) because the particles are resistant to detachment. Coarse-textured soils, such as sandy soils, also have low K values (about 0.05 to 0.2) because of high infiltration resulting in low runoff even though these particles are easily detached. Medium-textured soils, such as a silt loam, have moderate K values (about 0.25 to 0.45) because they are moderately susceptible to particle detachment and they produce runoff at moderate rates. Soils having a high silt content are especially susceptible to erosion and have high K values, which can exceed 0.45 and can be as large as 0.65. Silt-size particles are easily detached and tend to crust, producing high rates and large volumes of runoff. Use Site-specific data must be submitted.		
8	Site-specific K factor guidance		
9	**K Factor Value**		0.32
10	**C) LS Factor (weighted average, by area, for all slopes)**		
11	The effect of topography on erosion is accounted for by the LS factor, which combines the effects of a hillslope-length factor, L, and a hillslope-gradient factor, S. Generally speaking, as hillslope length and/or hillslope gradient increase, soil loss increases. As hillslope length increases, total soil loss and soil loss per unit area increase due to the progressive accumulation of runoff in the downslope direction. As the hillslope gradient increases, the velocity and erosivity of runoff increases. Use the LS table located in separate tab of this spreadsheet to determine LS factors. Estimate the weighted LS for the site prior to construction.		
12	LS Table		
13	**LS Factor Value**		0.05
14			
15	**Watershed Erosion Estimate (=RxKxLS) in tons/acre**		0.12368
16	**Site Sediment Risk Factor**		**Low**
17	Low Sediment Risk: < 15 tons/acre		
18	Medium Sediment Risk: >=15 and <75 tons/acre		
19	High Sediment Risk: >= 75 tons/acre		
20			

Receiving Water (RW) Risk Factor Worksheet	Entry	Score
A. Watershed Characteristics	**yes/no**	
A.1. Does the disturbed area discharge (either directly or indirectly) to a **303(d)-listed waterbody impaired by sediment** (For help with impaired waterbodies please visit the link below) or has a **USEPA approved TMDL implementation plan for sediment**?:	**no**	**Low**
http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml		
OR		
A.2. Does the disturbed area discharge to a waterbody with designated beneficial uses of SPAWN & COLD & MIGRATORY? (For help please review the appropriate Regional Board Basin Plan)		
http://www.waterboards.ca.gov/waterboards_map.shtml		
Region 1 Basin Plan		
Region 2 Basin Plan		
Region 3 Basin Plan		
Region 4 Basin Plan		
Region 5 Basin Plan		
Region 6 Basin Plan		
Region 7 Basin Plan		
Region 8 Basin Plan		
Region 9 Basin Plan		

Combined Risk Level Matrix



Project Sediment Risk:	**Low**
Project RW Risk:	**Low**
Project Combined Risk:	**Level 1**

Appendix 4

City of San Diego Storm Water Applicability Checklist (DS-560)

THE CITY OF SAN DIEGO
City of San Diego
Development Services
1222 First Ave., MS-302
San Diego, CA 92101
(619) 446-5000

Storm Water Requirements Applicability Checklist

FORM
DS-560
FEBRUARY 2016

Project Address: Bay Boulevard between Palomar Street and South Bay Salt Works

Project Number *(for City Use Only):*

SECTION 1. Construction Storm Water BMP Requirements:

All construction sites are required to implement construction BMPs in accordance with the performance standards in the Storm Water Standards Manual. Some sites are additionally required to obtain coverage under the State Construction General Permit (CGP)[1] , which is administered by the State Water Resources Control Board.

For all project complete PART A: If project is required to submit a SWPPP or WPCP, continue to PART B.

PART A: Determine Construction Phase Storm Water Requirements.

1. Is the project subject to California's statewide General NPDES permit for Storm Water Discharges Associated with Construction Activities, also known as the State Construction General Permit (CGP)? (Typically projects with land disturbance greater than or equal to 1 acre.)

☑ Yes; SWPPP required, skip questions 2-4 ☐ No; next question

2. Does the project propose construction or demolition activity, including but not limited to, clearing, grading, grubbing, excavation, or any other activity that results in ground disturbance and contact with storm water runoff?

☐ Yes; WPCP required, skip 3-4 ☐ No; next question

3. Does the project propose routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility? (Projects such as pipeline/utility replacement)

☐ Yes; WPCP required, skip 4 ☐ No; next question

4. Does the project only include the following Permit types listed below?
   - Electrical Permit, Fire Alarm Permit, Fire Sprinkler Permit, Plumbing Permit, Sign Permit, Mechanical Permit, Spa Permit.
   - Individual Right of Way Permits that exclusively include only ONE of the following activities: water service, sewer lateral, or utility service.
   - Right of Way Permits with a project footprint less than 150 linear feet that exclusively include only ONE of the following activities: curb ramp, sidewalk and driveway apron replacement, pot holing, curb and gutter replacement, and retaining wall encroachments.

   ☐ Yes; no document required

   Check one of the boxes to the right, and continue to PART B:

   ☐ If you checked "Yes" for question 1, **a SWPPP is REQUIRED. Continue to PART B**

   ☐ If you checked "No" for question 1, and checked "Yes" for question 2 or 3, **a WPCP is REQUIRED.** If the project proposes less than 5,000 square feet of ground disturbance AND has less than a 5-foot elevation change over the entire project area, a Minor WPCP may be required instead. **Continue to PART B.**

   ☐ If you checked "No" for all questions 1-3, and checked "Yes" for question 4 PART B **does not apply and no document is required. Continue to Section 2.**

1. More information on the City's construction BMP requirements as well as CGP requirements can be found at: www.sandiego.gov/stormwater/regulations/index.shtml

PART B: Determine Construction Site Priorit

This prioritization must be completed within this form, noted on the plans, and included in the SWPPP or WPCP. The city reserves the right to adjust the priority of projects both before and after construction. Construction projects are assigned an inspection frequency based on if the project has a "high threat to water quality." The City has aligned the local definition of "high threat to water quality" to the risk determination approach of the State Construction General Permit (CGP). The CGP determines risk level based on project specific sediment risk and receiving water risk. Additional inspection is required for projects within the Areas of Special Biological Significance (ASBS) watershed. **NOTE:** The construction priority does **NOT** change construction BMP requirements that apply to projects; rather, it determines the frequency of inspections that will be conducted by city staff.

Complete PART B and continued to Section 2

1. ☐ **ASBS**

a. Projects located in the ASBS watershed.

2. ☐ **High Priority**

a. Projects 1 acre or more determined to be Risk Level 2 or Risk Level 3 per the Construction General Permit and not located in the ASBS watershed.

b. Projects 1 acre or more determined to be LUP Type 2 or LUP Type 3 per the Construction General Permit and not located in the ASBS watershed.

3. ☑ **Medium Priority**

a. Projects 1 acre or more but not subject to an ASBS or high priority designation.

b. Projects determined to be Risk Level 1 or LUP Type 1 per the Construction General Permit and not located in the ASBS watershed.

4. ☐ **Low Priority**

a. Projects requiring a Water Pollution Control Plan but not subject to ASBS, high, or medium priority designation.

SECTION 2. Permanent Storm Water BMP Requirements.

Additional information for determining the requirements is found in the Storm Water Standards Manual.

PART C: Determine if Not Subject to Permanent Storm Water Requirements.

Projects that are considered maintenance, or otherwise not categorized as "new development projects" or "redevelopment projects" according to the Storm Water Standards Manual are not subject to Permanent Storm Water BMPs.

If "yes" is checked for any number in Part C, proceed to Part F and check "Not Subject to Permanent Storm Water BMP Requirements".

If "no" is checked for all of the numbers in Part C continue to Part D.

1.	Does the project only include interior remodels and/or is the project entirely within an existing enclosed structure and does not have the potential to contact storm water?	☐ Yes	☑ No
2.	Does the project only include the construction of overhead or underground utilities without creating new impervious surfaces?	☐ Yes	☑ No
3.	Does the project fall under routine maintenance? Examples include, but are not limited to: roof or exterior structure surface replacement, resurfacing or reconfiguring surface parking lots or existing roadways without expanding the impervious footprint, and routine replacement of damaged pavement (grinding, overlay, and pothole repair).	☐ Yes	☑ No

PART D: PDP Exempt Requirements.

PDP Exempt projects are required to implement site design and source control BMPs.

If "yes" was checked for any questions in Part D, continue to Part F and check the box labeled "PDP Exempt."

If "no" was checked for all questions in Part D, continue to Part E.

1. Does the project ONLY include new or retrofit sidewalks, bicycle lanes, or trails that:
   - Are designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas? Or;
   - Are designed and constructed to be hydraulically disconnected from paved streets and roads? Or;
   - Are designed and constructed with permeable pavements or surfaces in accordance with the Green Streets guidance in the City's Storm Water Standards manual?

   ☑ Yes; PDP exempt requirements apply ☐ No; next question

2. Does the project ONLY include retrofitting or redeveloping existing paved alleys, streets or roads designed and constructed in accordance with the Green Streets guidance in the City's Storm Water Standards Manual?

   ☐ Yes; PDP exempt requirements apply ☐ No; project not exempt. PDP requirements apply

PART E: Determine if Project is a Priority Development Project (PDP).
Projects that match one of the definitions below are subject to additional requirements including preparation of a Storm Water Quality Management Plan (SWQMP).

If "yes" is checked for any number in PART E, continue to PART F.

If "no" is checked for every number in PART E, continue to PART F and check the box labeled "Standard Development Project".

1.	**New Development that creates 10,000 square feet or more of impervious surfaces collectively over the project site.** This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.	☐ Yes ☐ No
2.	**Redevelopment project that creates and/or replaces 5,000 square feet or more of impervious surfaces on an existing site of 10,000 square feet or more of impervious surfaces**. This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.	☐ Yes ☐ No
3.	**New development or redevelopment of a restaurant.** Facilities that sell prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC 5812), and where the land development creates and/or replace 5,000 square feet or more of impervious surface.	☐ Yes ☐ No
4.	**New development or redevelopment on a hillside.** The project creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site) and where the development will grade on any natural slope that is twenty-five percent or greater.	☐ Yes ☐ No
5.	**New development or redevelopment of a parking lot that creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site).**	☐ Yes ☐ No
6.	**New development or redevelopment of streets, roads, highways, freeways, and driveways.** The project creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site).	☐ Yes ☐ No

7. **New development or redevelopment discharging directly to an Environmentally Sensitive Area.** The project creates and/or replaces 2,500 square feet of impervious surface (collectively over project site), and discharges directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands). ❑ Yes ❑ No

8. **New development or redevelopment projects of a retail gasoline outlet (RGO) that create and/or replaces 5,000 square feet of impervious surface.** The development project meets the following criteria: (a) 5,000 square feet or more or (b) has a projected Average Daily Traffic (ADT) of 100 or more vehicles per day. ❑ Yes ❑ No

9. **New development or redevelopment projects of an automotive repair shops that creates and/or replaces 5,000 square feet or more of impervious surfaces.** Development projects categorized in any one of Standard Industrial Classification (SIC) codes 5013, 5014, 5541, 7532-7534, or 7536-7539. ❑ Yes ❑ No

10. **Other Pollutant Generating Project.** The project is not covered in the categories above, results in the disturbance of one or more acres of land and is expected to generate pollutants post construction, such as fertilizers and pesticides. This does not include projects creating less than 5,000 sf of impervious surface and where added landscaping does not require regular use of pesticides and fertilizers, such as slope stabilization using native plants. Calculation of the square footage of impervious surface need not include linear pathways that are for infrequent vehicle use, such as emergency maintenance access or bicycle pedestrian use, if they are built with pervious surfaces of if they sheet flow to surrounding pervious surfaces. ❑ Yes ❑ No

PART F: Select the appropriate category based on the outcomes of PART C through PART E.

1. The project is **NOT SUBJECT TO STORM WATER REQUIREMENTS**. ❑

2. The project is a **STANDARD DEVELOPMENT PROJECT**. Site design and source control BMP requirements apply. See the Storm Water Standards Manual for guidance. ❑

3. The project is **PDP EXEMPT**. Site design and source control BMP requirements apply. See the Storm Water Standards Manual for guidance. ☑

4. The project is a **PRIORITY DEVELOPMENT PROJECT**. Site design, source control, and structural pollutant control BMP requirements apply. See the Storm Water Standards Manual for guidance on determining if project requires a hydromodification plan management ❑

Name of Owner or Agent *(Please Print):* Title:

Signature: Date: