MONTEZUMA ROAD HOTEL

AIR QUALITY STUDY

Prepared for:

KLR Planning
San Diego, CA

Prepared by:

BIRDSEYE
PLANNING GROUP

October 2018

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Montezuma Road Hotel Project
City of San Diego, California

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Appendix A CalEEMod Air Emissions Model Results –Summer Construction and Operation Emissions

Montezuma Road Hotel Project
San Diego, California

AIR QUALITY STUDY

This report is an analysis of the potential air quality impacts associated with the proposed Montezuma Road Hotel Project (proposed project) in the City of San Diego. This report has been prepared by Birdseye Planning Group (BPG) under contract to KLR Planning, to support preparation of the environmental documentation pursuant to the California Environmental Quality Act (CEQA). This study analyzes the potential for permanent impacts associated with operation of the proposed project and temporary impacts associated with construction activity within proximity to the construction area.

PROJECT DESCRIPTION

The *Montezuma Road Hotel* project site encompasses approximately 1.8 acres, located at 6650 Montezuma Road within the College Area community planning area. The project site is situated north of Montezuma Road and west of Bowman Lane. The Friends of the College-Rolando Public Library is located adjacent to the west of the project site with no access or parking from Montezuma Road. Single-family residential development is located to the north, and a Ralphs shopping center is next to the property to the east. The project site is currently vacant, with the recent demolition of a church that was previously located on the project site. Regional access to the site is provided by Interstate 8 (I-8), located approximately 2.2 miles north of the project site. Local access is provided via El Cajon Boulevard, connected to the east end of Montezuma Road and located less than 0.1 mile southwest of the project site. Direct access to the site is via Montezuma Road.

The project proposes an Amendment to the College Area Community Plan and a Rezone. The proposed amendment to the College Area Community Plan would change the current land use designation from *Low/Medium Density Residential [10 – 15 dwelling units per acre (du/ac)]* and *General Commercial Residential (75 – 110 du/ac)* to *Residential Medium with Commercial (15-29 du/ac)* to allow redevelopment of the project site with a maximum 125-room hotel or a base density of 55-multifamily residential units. The proposed rezone would change the existing RM-1-1 zone to CV-1-1. The purpose of the CV zones is to provide areas for establishments catering to the lodging, dining, and recreational needs of both tourists and the local population. The CV zones are intended for areas located near employment centers and areas with recreational resources or other visitor attractions. The CV-1-1 is intended to accommodate a mix of large-scale, visitor serving uses and residential uses and permits a maximum density of 1 dwelling unit for each 1,500 square feet of lot area. The Community Plan Amendment would also allow for a shared access and parking agreement with the City of San Diego to provide additional parking to serve the adjacent public library.

The proposed project would begin construction in mid-2019 and be completed by late 2020. The site is shown in Figure 1 – Vicinity Map. A site plan is provided as Figure 2.

REGULATORY SETTING

Air pollutants are regulated at the national, State, and air basin level; each agency has a different degree of control. The United States Environmental Protection Agency (USEPA) regulates at the national level; the California Air Resources Control Board (CARB) regulates at the State level; and the San Diego Air Pollution Control District (SDAPCD) regulates air quality in San Diego County.

The federal and state governments have been empowered by the federal and state Clean Air Acts to regulate the emission of airborne pollutants and have established ambient air quality standards for the protection of public health. The USEPA is the federal agency designated to administer national air quality regulations, while CARB is the state equivalent in the California Environmental Protection Agency. Local control over air quality management is provided by CARB through multi-county and county-level Air Pollution Control Districts (APCDs) (also referred to as Air Quality Management Districts). CARB establishes statewide air quality standards and is responsible for the control of mobile emission sources, while the local APCDs are responsible for enforcing standards and regulating stationary sources. CARB has established 15 air basins statewide. The City of San Diego is located in the San Diego Air Basin (SDAB), which is under the jurisdiction of the SDAPCD.

California Air Resources Board

CARB, which became part of the California EPA (CalEPA) in 1991, is responsible for ensuring implementation of the California Clean Air Act (CCAA), meeting state requirements of the federal Clean Air Act and establishing California Ambient Air Quality Standards (CAAQSs). It is also responsible for setting emission standards for vehicles sold in California and for other emission sources such as consumer products and certain off-road equipment. CARB also established passenger vehicle fuel specifications and oversees the functions of local air pollution control districts and air quality management districts, which in turn administer air quality activities at the regional and county level. The CCAA is administered by CARB at the state level and by the Air Quality Management Districts at the regional level. Both state and federal standards are summarized in Table 1. The federal "primary" standards have been established to protect the public health. The federal "secondary" standards are intended to protect the nation's welfare and account for air pollutant effects on soil, water, visibility, materials, vegetation, and other aspects of the general welfare.

San Diego Air Pollution Control District

The SDAPCD was created to protect the public from the harmful effects of air pollution, achieve and maintain air quality standards, foster community involvement and develop and implement

Figure 1—Vicinity Map

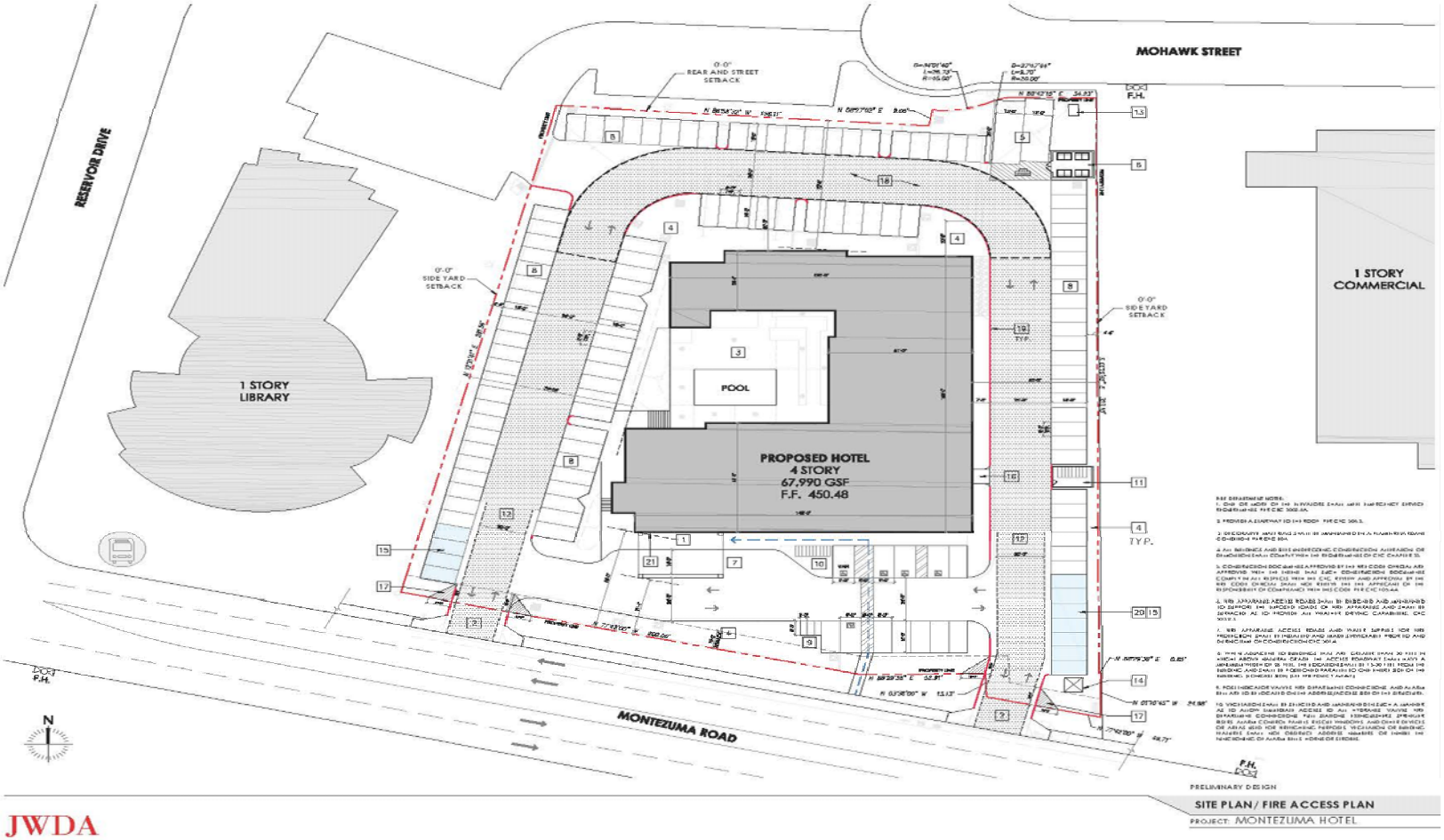

Figure 2 — Site Plan

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cost-effective programs that meet state and federal mandates while considering environmental and economic impacts.

Specifically, the SDAPCD is responsible for monitoring air quality and planning, implementing, and enforcing programs designed to attain and maintain state and federal ambient air quality standards in the district. Programs developed include air quality rules and regulations that regulate stationary source emissions, including area sources, point sources, and certain mobile source emissions. The SDAPCD is also responsible for establishing permitting requirements for stationary sources and ensuring that new, modified or relocated stationary sources do not create net emissions increases; and thus, are consistent with the region's air quality goals. The

Table 1
Current Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Primary Standards	California Standard
Ozone	1-Hour	---	0.09 ppm
	8-Hour	0.070 μg/m^3	0.070 μg/m^3
PM_{10}	24-Hour	150 μg/m^3	50 μg/m^3
	Annual	---	20 μg/m^3
$PM_{2.5}$	24-Hour	35 μg/m^3	---
	Annual	12 μg/m^3	12 μg/m^3
Carbon Monoxide	8-Hour	9.0 ppm	9.0 ppm
	1-Hour	35.0 ppm	20.0 ppm
Nitrogen Dioxide	Annual	0.053 ppm	0.030 ppm
	1-Hour	0.100 ppm	0.18 ppm
Sulfur Dioxide	24-Hour	---	0.04 ppm
	3-Hour	0.5 ppm (secondary)	---
	1-Hour	0.075 ppm (primary)	0.25 ppm
Lead	30-Day Average	---	1.5 μg/m^3
	3-Month Average	0.15 μg/m^3	---

ppm = parts per million
μg/m^3 = micrograms per cubic meter
Source: California Air Resources Board, http://www.arb.ca.gov/research/aaqs/aaqs2.pdf September 22, 2016.

SDAPCD provides significance thresholds in Regulation II, Rule 20.2, Table 20-2-1. "AQIA Trigger Levels." These trigger levels were established for stationary sources of air pollution and are commonly used for environmental evaluations. The SDAPCD enforces air quality rules and regulations through a variety of means, including inspections, educational or training programs, or fines, when necessary.

State Implementation Plan/Air Quality Management Plan/Regional Air Quality Strategy

The federal Clean Air Act Amendments (CAAA) mandate that states submit and implement a State Implementation Plan (SIP) for areas not meeting air quality standards. SIPs are comprehensive plans that describe how an area will attain national and state ambient air quality standards. SIPs are a compilation of new and previously submitted plans, programs (i.e., monitoring, modeling and permitting programs), district rules, state regulations and federal controls and include pollution control measures that demonstrate how the standards will be met through those measures.

State law makes CARB the lead agency for all purposes related to the SIP. Local air districts and other agencies prepare SIP elements and submit them to CARB for review and approval. CARB forwards SIP revisions to the USEPA for approval and publication in the Federal Register. Thus, the Regional Air Quality Strategy (RAQS) and Air Quality Management Plan (AQMP) prepared by SDAPCD and referenced herein become part of the SIP as the material relates to efforts ongoing in San Diego to achieve the national and state ambient air quality standards. The most recent SIP element for San Diego County was submitted in December 2016. The document identifies control measures and associated emission reductions necessary to demonstrate attainment of the 2008 Federal 8-hour ozone standard by July 20, 2018.

The San Diego RAQS was developed pursuant to California Clean Air Act (CCAA) requirements. The RAQS was initially adopted in 1991 and was updated in 1995, 1998, 2001, 2004, 2009 and 2016. The RAQS can be found at the following: http://www.sdapcd.org/content/dam/sdc/apcd/PDF/Air%20Quality%20Planning/2016%20RAQS.pdf. The RAQS identifies feasible emission control measures to provide progress in San Diego County toward attaining the State ozone standard. The pollutants addressed in the RAQS are volatile organic compounds (VOC) and oxides of nitrogen (NOx), precursors to the photochemical formation of ozone (the primary component of smog). The RAQS was initially adopted by the San Diego County Air Pollution Control Board on June 30, 1992, and amended on March 2, 1993, in response to ARB comments. At present, no attainment plan for particulate matter less than 10 microns in diameter (PM_{10}) or particulate matter less than 2.5 microns in diameter ($PM_{2.5}$) is required by the state regulations; however, SDAPCD has adopted measures to reduce particulate matter in San Diego County. These measures range from regulation against open burning to incentive programs that introduce cleaner technology. These measures can be found in a report titled *"Measures to Reduce Particulate Matter in San Diego County"* December 2005 and can be found at:
http://www.sdapcd.org/content/dam/sdc/apcd/PDF/Air%20Quality%20Planning/PM-Measures.pdf.

The RAQS relies on information from CARB and San Diego Association of Governments (SANDAG), including mobile and area source emissions, as well as information regarding projected growth in the County, to estimate future emissions and then determine strategies necessary for the reduction of emissions through regulatory controls. CARB mobile source emission projections and SANDAG growth projections are based on population and vehicle

trends as well as land use plans developed by the cities and the County as part of the development of the individual General Plans. As such, projects that propose development consistent with the growth anticipated by the general plans would be consistent with the RAQS. If a project proposes development which is less dense than anticipated within the General Plan, the project would likewise be consistent with the RAQS. If a project proposes development that is greater than that anticipated in the General Plan and SANDAG's growth projections, the project might conflict with the RAQS and SIP; and thus, have a potentially significant impact on air quality.

Under state law, the SDAPCD is required to prepare an AQMP for pollutants for which the SDAB is designated non-attainment. Each iteration of the SDAPCD's AQMP is an update of the previous plan and has a 20-year horizon. Currently the SDAPCD has implemented a 2012 8-hour National Ozone Implementation/Maintenance Plan, a 2007 8-hour Ozone Plan, and a 2004 Carbon Monoxide Plan. The SDAPCD adopted the 2008 8-hour Ozone Attainment Plan for San Diego County on December 16, 2016. CARB adopted the ozone plan as a revision to the California SIP on March 23, 2017. The ozone plan was submitted to the USEPA for review on April 12, 2017. Comments from the USEPA are pending. These plans are available for download on the ARB website located at the following URL: http://www.arb.ca.gov/planning/sip/planarea/sansip.htm.

ENVIRONMENTAL SETTING

REGIONAL CLIMATE

The weather of San Diego County is profoundly influenced by the Pacific Ocean and its semi-permanent high-pressure systems that result in dry, warm summers and mild, occasionally wet winters. The average minimum temperature for January ranges from the mid-40s to the high-50s degrees Fahrenheit (4 to 15 degrees Celsius) across the county. July maximum temperatures average in the mid-80s to the high-90s degrees Fahrenheit (high-20s to the high-30s degrees Celsius). Most of the county's precipitation falls from November to April, with infrequent (approximately 10 percent) precipitation during the summer. The average seasonal precipitation along the coast is approximately 10 inches (254 millimeters); the amount increases with elevations as moist air is lifted over the mountains.

The interaction of ocean, land, and the Pacific High-Pressure Zone maintains clear skies for much of the year and drives the prevailing winds. Local terrain is often the dominant factor inland and winds in inland mountainous areas tend to blow upwards in the valleys during the day and down the hills and valleys at night.

In conjunction with the onshore/offshore wind patterns, there are two types of temperature inversions (reversals of the normal decrease of temperature with height), which occur within the region that affect atmospheric dispersive capability and that act to degrade local air quality. In the summer, an inversion at about 1,100 to 2,500 feet (335 to 765 meters) is formed over the

entire coastal plain when the warm air mass over land is undercut by a shallow layer of cool marine air flowing onshore. The prevailing sunny days in this region further exacerbate the smog problem by inducing additional adverse photochemical reactions. During the winter, a nightly shallow inversion layer (usually at about 800 feet or 243 meters) forms between the cooled air at the ground and the warmer air above, which can trap vehicular pollutants. The days of highest Carbon Monoxide (CO) concentrations occur during the winter months.
The predominant onshore/offshore wind pattern is sometimes interrupted by so-called Santa Ana conditions, when high pressure over the Nevada-Utah region overcomes the prevailing westerly wind direction. This draws strong, steady, hot, and dry winds from the east over the mountains and out to sea. Strong Santa Ana winds tend to blow pollutants out over the ocean, producing clear days. However, at the onset or breakdown of these conditions or if the Santa Ana is weak, prevailing northwesterly winds are reestablished which send polluted air from the Los Angeles basin ashore in the SDAB. "Smog transport from the South Coast Air Basin (the metropolitan areas of Los Angeles, Orange, San Bernardino, and Riverside counties) is a key factor on more than half the days San Diego exceeds clean air standards" (San Diego Air Pollution Control District, 2010).

Pollutants

The SDAPCD is required to monitor air pollutant levels to ensure that air quality standards are met and, if they are not met, to develop strategies to meet the standards. Depending on whether the standards are met or exceeded, the local air basin is classified as being in "attainment" or "non-attainment." San Diego County is listed as a federal non-attainment area for ozone (eight hour) and a state non-attainment area for ozone (one hour and eight-hour standards), PM_{10} and $PM_{2.5}$. As shown in Table 2, the SDAB is in attainment for the state and federal standards for nitrogen dioxide, carbon monoxide, sulfur dioxide and lead. Characteristics of ozone, carbon monoxide, nitrogen dioxide, and suspended particulates are described below.

Table 2
San Diego County Attainment Status

Criteria Pollutant	Federal Designation	State Designation
Ozone (one hour)	Attainment*	Non-Attainment
Ozone (eight hour)	Non-Attainment	Non-Attainment
Carbon Monoxide	Attainment	Attainment
PM_{10}	Unclassifiable**	Non-Attainment
$PM_{2.5}$	Attainment	Non-Attainment
Nitrogen Dioxide	Attainment	Attainment
Sulfur Dioxide	Attainment	Attainment
Lead	Attainment	Attainment
Sulfates	No Federal Standard	Attainment
Hydrogen Sulfide	No Federal Standard	Unclassified
Visibility	No Federal Standard	Unclassified

Table 2
San Diego County Attainment Status

Criteria Pollutant	Federal Designation	State Designation

** The federal 1-hour standard of 12 ppm was in effect from 1979 through June 1, 2005. The revoked standard is referenced here because it was used for such a long period and because this benchmark is addressed in State Implementation Plans (SIPs).*
*** At the time of designation, if the available data does not support a designation of attainment or non-attainment, the area is designated as unclassifiable.*
Source: San Diego Air Pollution Control District. June, 2016. http://www.sandiegocounty.gov/content/sdc/apcd/en/air-quality-planning/attainment-status.html

Ozone. Ozone is produced by a photochemical reaction (triggered by sunlight) between nitrogen oxides (NO_X) and reactive organic gases (ROG)[1]. Nitrogen oxides are formed during the combustion of fuels, while reactive organic compounds are formed during combustion and evaporation of organic solvents. Because ozone requires sunlight to form, it mostly occurs in concentrations considered serious between the months of April and October. Ozone is a pungent, colorless, toxic gas with direct health effects on humans including respiratory and eye irritation and possible changes in lung functions. Groups most sensitive to ozone include children, the elderly, people with respiratory disorders, and people who exercise strenuously outdoors.

Carbon Monoxide. Carbon monoxide (CO) is a local pollutant that is found in high concentrations only near the source. The major source of carbon monoxide, a colorless, odorless, poisonous gas, is automobile exhaust. Elevated CO concentrations; therefore, are usually only found near areas of high traffic volumes operating in congested conditions. Carbon monoxide health effects are related to blood hemoglobin. At high concentrations, carbon monoxide reduces the amount of oxygen in the blood, causing heart difficulties in people with chronic diseases, reduced lung capacity and impaired mental abilities.

Nitrogen Dioxide. Nitrogen dioxide (NO_2) is a by-product of fuel combustion, with the primary source being motor vehicles and industrial boilers and furnaces. The principal form of nitrogen oxide produced by combustion is nitric oxide (NO), but NO reacts rapidly to form NO_2, creating the mixture of NO and NO_2 commonly called NO_X. Nitrogen dioxide is an acute irritant. A relationship between NO_2 and chronic pulmonary fibrosis may exist and an increase in bronchitis in young children at concentrations below 0.3 parts per million (ppm) may occur. Nitrogen dioxide absorbs blue light and causes a reddish-brown cast to the atmosphere and reduced visibility. It can also contribute to the formation of PM_{10} and acid rain.

Suspended Particulates. PM_{10} is particulate matter measuring no more than 10 microns in diameter, while $PM_{2.5}$ is fine particulate matter measuring no more than 2.5 microns in

[1] *Organic compound precursors of ozone are routinely described by a number of variations of three terms: hydrocarbons (HC), organic gases (OG), and organic compounds (OC). These terms are often modified by adjectives such as total, reactive, or volatile, and result in a rather confusing array of acronyms: HC, THC (total hydrocarbons), RHC (reactive hydrocarbons), TOG (total organic gases), ROG (reactive organic gases), TOC (total organic compounds), ROC (reactive organic compounds), and VOC (volatile organic compounds). While most of these differ in some significant way from a chemical perspective, from an air quality perspective two groups are important: non-photochemically reactive in the lower atmosphere, or photochemically reactive in the lower atmosphere (HC, RHC, ROG, ROC, and VOC).*

diameter. Suspended particulates are mostly dust particles, nitrates and sulfates. Both PM_{10} and $PM_{2.5}$ are by-products of fuel combustion and wind erosion of soil and unpaved roads, and are directly emitted into the atmosphere through these processes. Suspended particulates are also created in the atmosphere through chemical reactions. The characteristics, sources, and potential health effects associated with the small particulates (those between 2.5 and 10 microns in diameter) and fine particulates ($PM_{2.5}$) can be very different. The small particulates generally come from windblown dust and dust kicked up from mobile sources. The fine particulates are generally associated with combustion processes as well as being formed in the atmosphere as a secondary pollutant through chemical reactions. Fine particulate matter is more likely to penetrate deeply into the lungs and poses a health threat to all groups, but particularly to the elderly, children, and those with respiratory problems. More than half of the small and fine particulate matter that is inhaled into the lungs remains there. These materials can damage health by interfering with the body's mechanisms for clearing the respiratory tract or by acting as carriers of an absorbed toxic substance.

SENSITIVE RECEPTORS

Sensitive receptors include, but are not limited to, hospitals, schools, daycare facilities, elderly housing and convalescent facilities. These are areas where the occupants are more susceptible to the adverse effects of exposure to air pollutants. Ambient air quality standards have been established to represent the levels of air quality considered sufficient, with an adequate margin of safety, to protect public health and welfare. They are designed to protect that segment of the public most susceptible to respiratory distress, such as children; the elderly; persons engaged in strenuous work or exercise and people with cardiovascular and chronic respiratory diseases. The nearest receptors are the single-family residences located adjacent to and north of the site and the multifamily residences located across Montezuma Road to the south of the site.

Monitored Air Quality

The SDAPCD monitors air quality conditions at locations throughout the SDAB. For this analysis, data from the San Diego Beardsley Street monitoring station west of the site were used to characterize existing ozone and $PM_{2.5}$ conditions in the vicinity of the project site. A summary of the data recorded at the Beardsley Street monitoring station from 2014 through 2016 is presented in Table 3.

Table 3
Ambient Air Quality Data

Pollutant	2014	2015	2016
Ozone, ppm - Worst 8-Hour Average	0.073	0.067	0.061
Number of days of State 1-hour exceedances (>0.09 ppm)	2	0	0
Number of days of Federal exceedances (>0.070 ppm)[1]	1	0	0
Particulate Matter <10 microns, $\mu g/m^3$ Worst 24 Hours*	41	54	51

Table 3
Ambient Air Quality Data

Pollutant	2014	2015	2016
Number of samples of State exceedances (>50 μg/m^3)	0	5.7	*
Number of samples of Federal exceedances (>150 μg/m^3)	0	0	*
Particulate Matter <2.5 microns, μg/m^3 Worst 24 Hours	37.2	44.9	34.4
Number of samples of State exceedances (>50 μg/m^3)	No Data	No Data	No Data
Number of samples of Federal exceedances (>150 μg/m^3)	1	0	*

[1] – Federal O3 standard reduced from 75 ppm to 70 ppm in October, 2015
*Insufficient data to determine number of exceedances
Data from the 1110 Beardsley Street Station in San Diego.
Source: California Air Resources Board, 2014, 2015, 2016 Air Quality Data Summaries available at: http://www.arb.ca.gov/adam/topfour/topfourdisplay.php Accessed March 8, 2018.

AIR QUALITY IMPACT ANALYSIS

METHODOLOGY AND SIGNIFICANCE THRESHOLDS

Air quality modeling was performed in general accordance with the methodologies outlined in the SDAPCD 2009 RAQS to identify both construction and operational emissions associated with the proposed project. All emissions were calculated using the California Emissions Estimator Model (CalEEMod) software version 2016.3.2 which incorporates current air emission data, planning methods and protocol approved by CARB.

Construction activities would include demolition and removal of any surface material, grading, construction of the buildings/utilities and related improvements as well as paving parking areas and application of architectural coating (i.e., paint). Construction activities would require the use of equipment that would generate criteria air pollutant emissions. For modeling purposes, it was assumed that all construction equipment used would be diesel-powered. Construction emissions associated with development of the proposed project were quantified by estimating the types of equipment, including the number of individual pieces of equipment, that would be used on-site during each of the construction phases as well as off-site haul trips to remove demolition debris. Construction emissions are analyzed using the regional thresholds established by the SDAPCD and published under Rule 20-2.

Operational emissions include mobile source emissions, energy emissions and area source emissions. Mobile source emissions are generated by motor vehicle trips associated with operation of the project. Emissions attributable to energy use include electricity and natural gas consumption for space and water heating. Area source emissions are generated by landscape maintenance equipment, use of consumer products and painting. To determine whether a

regional air quality impact would occur, the increase in emissions would be compared with the SDAPCD recommended regional thresholds for operational emissions.

Thresholds of Significance. Based on City of San Diego Significance Determination Thresholds Guidelines, a project would have a significant air quality impact if it would:

a) *Conflict with or obstruct implementation of the applicable air quality plan;*
b) *Violate any air quality standard or contribute substantially to an existing or projected air quality violation;*
c) *Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors);*
d) *Expose sensitive receptors to substantial pollutant concentrations;*
e) *Create objectionable odors affecting a substantial number of people. or*
f) *Release substantial quantities of air contaminants beyond the boundaries of the premises upon which the stationary source emitting the contaminants is located.*

A significant adverse air quality impact may occur when a project individually or cumulatively interferes with progress toward the attainment of the ozone standard by generating emissions that equal or exceed the established long term quantitative thresholds for pollutants or exceed a state or federal ambient air quality standard for any criteria pollutant.

As referenced, the SDAPCD has established thresholds in Rule 20.2 for new or modified stationary sources (SDAPCD, 2015). With the exception of Volatile Organic Compounds (VOCs) and $PM_{2.5}$ thresholds, the City of San Diego screening quantities shown in the *California Environmental Quality Act Significance Determination Thresholds,* Table A-2, (City of San Diego, 2016) incorporate screening level thresholds from Rule 20.2 for use in air quality reports and for determining CEQA air quality impacts. The City does not show a standard for $PM_{2.5}$ but does include a threshold for Reactive Organic Gas/Volatile Organic Compounds (ROG/VOC) emissions. Collectively, the standards shown in Table A-2 of the City's 2016 CEQA Determination Thresholds and the $PM_{2.5}$ threshold shown in Table 20.2-1 of SDAPCD Rule 20.2, are used herein to determine whether project emissions would cause a significant air quality impact. The construction and operational emission thresholds for pollutants evaluated are as follows:

- Carbon Monoxide (CO) - 550 pounds/day;
- Nitrogen Oxides (NOx) - 100 pounds/day;
- Particulate Matter (PM_{10}) - 100 pounds/day;
- Particulate Matter ($PM_{2.5}$) - 67 pounds/day;
- Sulfur Oxides (SOx) - 250 pounds/day; and
- Volatile Organic Compounds(VOCs)/Reactive Organic Gases(ROGs) - 137 pounds/day.

CONSTRUCTION EMISSIONS

Project construction would generate temporary air pollutant emissions. These impacts are associated with fugitive dust (PM_{10} and $PM_{2.5}$) from soil disturbance and exhaust emissions (NO_x and CO) from heavy construction vehicles. For the purpose of estimating emissions, it was assumed that the approximately 1.86-acre site would be disturbed daily during overall construction. The number of haul trips to remove demolition debris were estimated based on CalEEMod default values. The former church building that had been on the site was removed; thus, construction would generally consist of removing asphalt and other debris, site preparation, construction of the building and related improvements, paving and painting. Site preparation and grading would involve the greatest concentration of heavy equipment use and the highest potential for fugitive dust emissions. The project would be required to comply with SDAPCD Rules 52 and 54 which identify measures to reduce fugitive dust and is required to be implemented at all construction sites located within the SDAB. Therefore, the following conditions, which are required to reduce fugitive dust in compliance with SDAPCD Rules 52 and 54, were included in CalEEMod for site preparation and grading phases of construction.

1. **Minimization of Disturbance.** Construction contractors should minimize the area disturbed by clearing, grading, earth moving, or excavation operations to prevent excessive amounts of dust.

2. **Soil Treatment.** Construction contractors should treat all graded and excavated material, exposed soil areas and active portions of the construction site, including unpaved on-site roadways to minimize fugitive dust. Treatment shall include, but not necessarily be limited to, periodic watering, application of environmentally safe soil stabilization materials, and/or roll compaction as appropriate. Watering shall be done as often as necessary, and at least twice daily, preferably in the late morning and after work is done for the day. Note – it was assumed watering would occur three times daily for modeling purposes.

3. **Soil Stabilization.** Construction contractors should monitor all graded and/or excavated inactive areas of the construction site at least weekly for dust stabilization. Soil stabilization methods, such as water and roll compaction, and environmentally safe dust control materials shall be applied to portions of the construction site that are inactive for over four days. If no further grading or excavation operations are planned for the area, the area shall be seeded and watered until landscape growth is evident, or periodically treated with environmentally safe dust suppressants, to prevent excessive fugitive dust.

4. **No Grading During High Winds.** Construction contractors should stop all clearing, grading, earth moving, and excavation operations during periods of high winds (20 miles per hour or greater, as measured continuously over a one-hour period).

5. **Street Sweeping.** Construction contractors should sweep all on-site driveways and adjacent streets and roads at least once per day, preferably at the end of the day, if visible soil material is carried over to adjacent streets and roads.

Construction is assumed to begin in mid-2019 and be completed in late 2020. In addition to SDAPCD Rules 52 and 54 requirements, emissions modeling also accounts for the use of low-VOC paint (150 g/L for non-flat coatings) as required by SDAPCD Rule 67. Table 4 summarizes the estimated maximum daily emissions of pollutants occurring during the construction period.

As shown in Table 4, construction of the proposed project would not exceed the SDAPCD regional construction emission thresholds for daily emissions. Thus, the project construction would not conflict with the SIP, RAQS or AQMP, violate an air quality standard or contribute to an existing or projected violation, result in a cumulatively considerable increase in ozone or particulate matter emissions or expose receptors to substantial pollutant concentrations (thresholds a-f).

Table 4
Estimated Maximum Daily Construction Emissions

Construction Phase		Maximum Emissions (lbs/day)				
	ROG	NO_x	CO	SOx	PM_{10}	$PM_{2.5}$
2019 Maximum lbs/day	2.5	22.7	15.6	0.03	3.2	1.9
2020 Maximum lbs/day	28.1	17.0	15.1	0.03	1.3	0.9
City of San Diego Screening Thresholds	*137*	*100*	*550*	*250*	*100*	67
Threshold Exceeded 2019	**No**	**No**	**No**	**No**	**No**	**No**
Threshold Exceeded 2020	**No**	**No**	**No**	**No**	**No**	**No**

See Appendix for CalEEMod ver. 2016.3.2 computer model output. Summer emissions shown.

LONG-TERM REGIONAL (OPERATIONAL) IMPACTS

Regional Pollutant Emissions

Table 5 summarizes emissions associated with operation of the proposed project. Operational emissions include emissions from electricity consumption (energy sources), vehicle trips (mobile sources), area sources, landscape equipment and evaporative emissions as the structures are repainted over the life of the project. The majority of operational emissions are associated with vehicle trips to and from the project site. As shown in Table 5, the net change in emissions would not exceed the SDAPCD thresholds for ROG, NO_X, CO, SO_X, PM_{10} or $PM_{2.5}$. Therefore, the project's regional air quality impacts (including impacts related to criteria pollutants, sensitive receptors and violations of air quality standards per threshold c-f) would be less than significant.

Table 5
Estimated Operational Emissions

	Estimated Emissions (lbs/day)					
	ROG	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Proposed Project						
Area	1.7	0.01	.02	0.0	0.01	0.01
Energy	0.11	1.0	0.8	0.01	0.08	0.08
Mobile	1.7	6.6	17.0	0.05	4.1	1.1
Maximum lbs/day	**3.6**	**7.7**	**17.9**	**0.05**	**4.2**	**1.2**
SDAPCD Thresholds	*137*	*100*	*550*	*250*	*100*	67
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

See Appendix for CalEEMod ver. 2016.3.1 computer model output for the demolition of existing development. Summer emissions shown.

Objectionable Odors

The proposed project would involve the use of diesel powered construction equipment. Diesel exhaust may be noticeable temporarily at adjacent properties; however, construction activities would be temporary. The project does not include industrial or agricultural uses that are typically associated with objectionable odors. Therefore, impacts associated with objectionable odors (significance threshold e) would be less than significant.

Local Carbon Monoxide Emissions

As previously discussed, carbon monoxide is a colorless, odorless, poisonous gas that may be found in high concentrations near areas of high traffic volumes. CO emissions are a function of vehicle idling time, meteorological conditions, and traffic flow. The SDAB is in attainment of state and federal CO standards. The Beardsley Street monitoring site is the closest station to the project site that provides CO data. The maximum 8-hour average CO level recorded in 2012 (the last year data were recorded) was 1.81 parts per million (ppm). Concentrations are below 9 ppm, the state and federal 8-hour standard.

Although CO is not a regional air quality concern in SDAB, elevated CO levels can occur at or near intersections that experience severe traffic congestion. A localized air quality impact is considered significant if the additional CO emissions resulting from the project create a “hot spot” where the California 1-hour standard of 20.0 ppm or the 8-hour standard of 9 ppm is exceeded. This can occur at severely congested intersections during cold winter temperatures. Screening for elevated CO levels is recommended for severely congested intersections experiencing levels of service E or F with project traffic where a significant project traffic impact may occur. The potential for CO hotspots is based on the University of California Davis CO Protocol defined in the Transportation Project-Level Carbon Monoxide Protocol Revised December 1997 UCD-ITS-RR-97. Section 4.7 of the protocol provides specific criteria for

performing a screening level CO review for projects within a CO attainment area. Specifically, project-related traffic that would worsen the LOS at intersections operating at LOS E or F, would be subject to a detailed evaluation. If not, no further review is necessary.

The Traffic Impact Assessment prepared for the project (LOS Engineering, February 2018) indicated that all intersections evaluated would operate at LOS C or better with the addition of project traffic. Receptors would not be exposed to substantial pollutant concentrations (threshold d and f) related to CO hotspots. No further evaluation with respect to CO hotspots is required.

SIP/AQMP/RAQS Consistency

As noted, the RAQS relies on information from CARB and SANDAG, including projected growth in the County, mobile, area and all other source emissions to project future emissions and determine from that the strategies necessary for the reduction of stationary source emissions through regulatory controls. Projects that propose development that is consistent with the growth anticipated by the general plan is consistent with the SIP, AQMP and RAQS.

The project proposes an Amendment to the College Area Community Plan and a Rezone. The proposed amendment to the College Area Community Plan would change the current land use designation from *Low/Medium Density Residential [10 – 15 dwelling units per acre (du/ac)]* and *General Commercial Residential (75 – 110 du/ac)* to *Residential Medium with Commercial (15-29 du/ac)* to allow redevelopment of the project site with a maximum 125-room hotel or a base density of 55-multifamily residential units. The proposed rezone would change the existing RM-1-1 zone to CV-1-1. The project would be a new hotel. It would not induce growth or otherwise add more housing units than allowed under current zoning. The project would be consistent with the SIP, AQMP and RAQS and significance threshold (a - air quality plans) referenced above. Impacts related to this threshold would be less than significant.

REFERENCES

California Air Resources Board. *Ambient Air Quality Standards.* Updated May 2016. http://www.arb.ca.gov/research/aaqs/aaqs2.pdf

California Air Resources Board, *San Diego Air Quality Management Plans*, December 2016 http://www.arb.ca.gov/planning/sip/planarea/sansip.htm

California Air Resources Board. *2014, 2015, & 2016 Annual Air Quality Data Summaries.* http://www.arb.ca.gov/adam/topfour/topfour1.php. Accessed May 30, 2017.

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City of San Diego, *California Environmental Quality Act Significance Determination Thresholds*, Development Services Department, January 2011.

LOS Engineering, Inc. Montezuma Road Hotel Traffic Study, February 2018.

San Diego Air Pollution Control District. *Smog in San Diego Fact Sheet*. January 2010.

San Diego Air Pollution Control District. *Regional Air Quality Strategy*, December 2016. http://www.sdapcd.org/content/dam/sdc/apcd/PDF/Air%20Quality%20Planning/2016%20RAQS.pdf.

University of California Davis, *Transportation Project-Level Carbon Monoxide Protocol Revised*, December 1997.

Appendix A

CalEEMod Air Emission Model Results –
Summer Emissions for Construction and Operation

Montezuma Road Hotel

San Diego County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	125.00	Space	1.13	50,000.00	0
Hotel	125.00	Room	0.71	67,990.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2020
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	720.49	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Acreage and square footage adjusted to reflect project size.

Construction Phase - Construction duration estimated.

Grading - Area graded assumes entire site would be disturbed

Vehicle Trips - A total of 9 daily trips per room assumed for weekday conditions to match traffic report.

Construction Off-road Equipment Mitigation -

Mobile Land Use Mitigation -

Mobile Commute Mitigation -

Area Mitigation - Assumes 150 g/litre for non-flat coatings per SDAPCD Rule 67.

Water Mitigation -

Waste Mitigation -

Table Name	Column Name	Default Value	New Value
tblAreaMitigation	UseLowVOCPaintNonresidentialExteriorValue	250	150
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	250	150
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True
tblAreaMitigation	UseLowVOCPaintParkingValue	250	150
tblConstructionPhase	NumDays	10.00	60.00
tblConstructionPhase	NumDays	10.00	20.00
tblGrading	AcresOfGrading	1.50	1.86
tblLandUse	LandUseSquareFeet	181,500.00	67,990.00
tblLandUse	LotAcreage	4.17	0.71
tblVehicleTrips	WD_TR	8.17	9.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	2.5559	22.7107	15.6423	0.0317	5.8653	1.2871	6.7481	2.9711	1.2024	3.7833	0.0000	3,015.5538	3,015.5538	0.6047	0.0000	3,026.6854
2020	28.1553	17.0543	15.1512	0.0315	0.5394	0.8093	1.3487	0.1460	0.7815	0.9275	0.0000	2,981.2092	2,981.2092	0.4387	0.0000	2,991.8413
Maximum	**28.1553**	**22.7107**	**15.6423**	**0.0317**	**5.8653**	**1.2871**	**6.7481**	**2.9711**	**1.2024**	**3.7833**	**0.0000**	**3,015.5538**	**3,015.5538**	**0.6047**	**0.0000**	**3,026.6854**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	2.5559	22.7107	15.6423	0.0317	2.3276	1.2871	3.2104	1.1694	1.2024	1.9816	0.0000	3,015.5538	3,015.5538	0.6047	0.0000	3,026.6854
2020	28.1553	17.0543	15.1512	0.0315	0.5394	0.8093	1.3487	0.1460	0.7815	0.9275	0.0000	2,981.2092	2,981.2092	0.4387	0.0000	2,991.8413
Maximum	**28.1553**	**22.7107**	**15.6423**	**0.0317**	**2.3276**	**1.2871**	**3.2104**	**1.1694**	**1.2024**	**1.9816**	**0.0000**	**3,015.5538**	**3,015.5538**	**0.6047**	**0.0000**	**3,026.6854**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**55.24**	**0.00**	**43.69**	**57.80**	**0.00**	**38.25**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.9163	2.4000e-004	0.0257	0.0000		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005		0.0547	0.0547	1.5000e-004		0.0584
Energy	0.1173	1.0660	0.8954	6.4000e-003		0.0810	0.0810		0.0810	0.0810		1,279.1543	1,279.1543	0.0245	0.0235	1,286.7557
Mobile	1.8491	7.0420	18.3887	0.0571	4.5326	0.0558	4.5884	1.2115	0.0523	1.2638		5,797.3905	5,797.3905	0.3229		5,805.4616
Total	**3.8827**	**8.1082**	**19.3098**	**0.0635**	**4.5326**	**0.1369**	**4.6695**	**1.2115**	**0.1334**	**1.3449**		**7,076.5995**	**7,076.5995**	**0.3475**	**0.0235**	**7,092.2757**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.7398	2.4000e-004	0.0257	0.0000		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005		0.0547	0.0547	1.5000e-004		0.0584
Energy	0.1173	1.0660	0.8954	6.4000e-003		0.0810	0.0810		0.0810	0.0810		1,279.1543	1,279.1543	0.0245	0.0235	1,286.7557
Mobile	1.7896	6.6822	17.0297	0.0519	4.0793	0.0509	4.1302	1.0904	0.0477	1.1381		5,264.6083	5,264.6083	0.2987		5,272.0745
Total	**3.6467**	**7.7484**	**17.9508**	**0.0583**	**4.0793**	**0.1320**	**4.2113**	**1.0904**	**0.1288**	**1.2192**		**6,543.8173**	**6,543.8173**	**0.3233**	**0.0235**	**6,558.8886**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**6.08**	**4.44**	**7.04**	**8.28**	**10.00**	**3.56**	**9.81**	**10.00**	**3.43**	**9.35**	**0.00**	**7.53**	**7.53**	**6.96**	**0.00**	**7.52**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	9/2/2019	9/27/2019	5	20	
2	Site Preparation	Site Preparation	9/28/2019	10/1/2019	5	2	
3	Grading	Grading	10/2/2019	10/7/2019	5	4	
4	Building Construction	Building Construction	10/8/2019	7/13/2020	5	200	
5	Paving	Paving	7/14/2020	8/10/2020	5	20	
6	Architectural Coating	Architectural Coating	7/28/2020	10/19/2020	5	60	

Acres of Grading (Site Preparation Phase): 1

Acres of Grading (Grading Phase): 1.86

Acres of Paving: 1.13

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 101,985; Non-Residential Outdoor: 33,995; Striped Parking Area: 3,000 (Architectural Coating – sqft)

OffRoad Equipment

Montezuma Road Hotel - San Diego County, Summer

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Rubber Tired Dozers	1	7.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Graders	1	6.00	187	0.41
Grading	Rubber Tired Dozers	1	6.00	247	0.40
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Building Construction	Cranes	1	6.00	231	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	6.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	5	13.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	8.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	50.00	19.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	13.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	10.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2950	22.6751	14.8943	0.0241		1.2863	1.2863		1.2017	1.2017		2,360.7198	2,360.7198	0.6011		2,375.7475
Total	**2.2950**	**22.6751**	**14.8943**	**0.0241**		**1.2863**	**1.2863**		**1.2017**	**1.2017**		**2,360.7198**	**2,360.7198**	**0.6011**		**2,375.7475**

3.2 Demolition - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0510	0.0356	0.4022	1.1400e-003	0.1068	7.6000e-004	0.1076	0.0283	7.0000e-004	0.0290		113.1260	113.1260	3.6100e-003		113.2163
Total	**0.0510**	**0.0356**	**0.4022**	**1.1400e-003**	**0.1068**	**7.6000e-004**	**0.1076**	**0.0283**	**7.0000e-004**	**0.0290**		**113.1260**	**113.1260**	**3.6100e-003**		**113.2163**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2950	22.6751	14.8943	0.0241		1.2863	1.2863		1.2017	1.2017	0.0000	2,360.7197	2,360.7197	0.6011		2,375.7475
Total	**2.2950**	**22.6751**	**14.8943**	**0.0241**		**1.2863**	**1.2863**		**1.2017**	**1.2017**	**0.0000**	**2,360.7197**	**2,360.7197**	**0.6011**		**2,375.7475**

3.2 Demolition - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0510	0.0356	0.4022	1.1400e-003	0.1068	7.6000e-004	0.1076	0.0283	7.0000e-004	0.0290		113.1260	113.1260	3.6100e-003		113.2163
Total	**0.0510**	**0.0356**	**0.4022**	**1.1400e-003**	**0.1068**	**7.6000e-004**	**0.1076**	**0.0283**	**7.0000e-004**	**0.0290**		**113.1260**	**113.1260**	**3.6100e-003**		**113.2163**

3.3 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.7996	0.0000	5.7996	2.9537	0.0000	2.9537			0.0000			0.0000
Off-Road	1.7123	19.4821	7.8893	0.0172		0.8824	0.8824		0.8118	0.8118		1,704.9189	1,704.9189	0.5394		1,718.4044
Total	**1.7123**	**19.4821**	**7.8893**	**0.0172**	**5.7996**	**0.8824**	**6.6819**	**2.9537**	**0.8118**	**3.7655**		**1,704.9189**	**1,704.9189**	**0.5394**		**1,718.4044**

3.3 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0314	0.0219	0.2475	7.0000e-004	0.0657	4.7000e-004	0.0662	0.0174	4.3000e-004	0.0179		69.6160	69.6160	2.2200e-003		69.6716
Total	**0.0314**	**0.0219**	**0.2475**	**7.0000e-004**	**0.0657**	**4.7000e-004**	**0.0662**	**0.0174**	**4.3000e-004**	**0.0179**		**69.6160**	**69.6160**	**2.2200e-003**		**69.6716**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.2618	0.0000	2.2618	1.1519	0.0000	1.1519			0.0000			0.0000
Off-Road	1.7123	19.4821	7.8893	0.0172		0.8824	0.8824		0.8118	0.8118	0.0000	1,704.9189	1,704.9189	0.5394		1,718.4044
Total	**1.7123**	**19.4821**	**7.8893**	**0.0172**	**2.2618**	**0.8824**	**3.1442**	**1.1519**	**0.8118**	**1.9637**	**0.0000**	**1,704.9189**	**1,704.9189**	**0.5394**		**1,718.4044**

3.3 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0314	0.0219	0.2475	7.0000e-004	0.0657	4.7000e-004	0.0662	0.0174	4.3000e-004	0.0179		69.6160	69.6160	2.2200e-003		69.6716
Total	**0.0314**	**0.0219**	**0.2475**	**7.0000e-004**	**0.0657**	**4.7000e-004**	**0.0662**	**0.0174**	**4.3000e-004**	**0.0179**		**69.6160**	**69.6160**	**2.2200e-003**		**69.6716**

3.4 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.0097	0.0000	5.0097	2.5359	0.0000	2.5359			0.0000			0.0000
Off-Road	1.4197	16.0357	6.6065	0.0141		0.7365	0.7365		0.6775	0.6775		1,396.3909	1,396.3909	0.4418		1,407.4359
Total	**1.4197**	**16.0357**	**6.6065**	**0.0141**	**5.0097**	**0.7365**	**5.7462**	**2.5359**	**0.6775**	**3.2135**		**1,396.3909**	**1,396.3909**	**0.4418**		**1,407.4359**

3.4 Grading - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0314	0.0219	0.2475	7.0000e-004	0.0657	4.7000e-004	0.0662	0.0174	4.3000e-004	0.0179		69.6160	69.6160	2.2200e-003		69.6716
Total	**0.0314**	**0.0219**	**0.2475**	**7.0000e-004**	**0.0657**	**4.7000e-004**	**0.0662**	**0.0174**	**4.3000e-004**	**0.0179**		**69.6160**	**69.6160**	**2.2200e-003**		**69.6716**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.9538	0.0000	1.9538	0.9890	0.0000	0.9890			0.0000			0.0000
Off-Road	1.4197	16.0357	6.6065	0.0141		0.7365	0.7365		0.6775	0.6775	0.0000	1,396.3909	1,396.3909	0.4418		1,407.4359
Total	**1.4197**	**16.0357**	**6.6065**	**0.0141**	**1.9538**	**0.7365**	**2.6902**	**0.9890**	**0.6775**	**1.6666**	**0.0000**	**1,396.3909**	**1,396.3909**	**0.4418**		**1,407.4359**

3.4 Grading - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0314	0.0219	0.2475	7.0000e-004	0.0657	4.7000e-004	0.0662	0.0174	4.3000e-004	0.0179		69.6160	69.6160	2.2200e-003		69.6716
Total	**0.0314**	**0.0219**	**0.2475**	**7.0000e-004**	**0.0657**	**4.7000e-004**	**0.0662**	**0.0174**	**4.3000e-004**	**0.0179**		**69.6160**	**69.6160**	**2.2200e-003**		**69.6716**

3.5 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2721	15.9802	13.4870	0.0220		0.9158	0.9158		0.8846	0.8846		2,018.0224	2,018.0224	0.3879		2,027.7210
Total	**2.2721**	**15.9802**	**13.4870**	**0.0220**		**0.9158**	**0.9158**		**0.8846**	**0.8846**		**2,018.0224**	**2,018.0224**	**0.3879**		**2,027.7210**

3.5 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0875	2.3558	0.6082	5.2500e-003	0.1286	0.0164	0.1450	0.0370	0.0157	0.0527		562.4316	562.4316	0.0434		563.5172
Worker	0.1963	0.1370	1.5471	4.3700e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7000e-003	0.1116		435.0998	435.0998	0.0139		435.4472
Total	**0.2838**	**2.4928**	**2.1552**	**9.6200e-003**	**0.5394**	**0.0193**	**0.5587**	**0.1460**	**0.0184**	**0.1643**		**997.5314**	**997.5314**	**0.0573**		**998.9643**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2721	15.9802	13.4870	0.0220		0.9158	0.9158		0.8846	0.8846	0.0000	2,018.0224	2,018.0224	0.3879		2,027.7210
Total	**2.2721**	**15.9802**	**13.4870**	**0.0220**		**0.9158**	**0.9158**		**0.8846**	**0.8846**	**0.0000**	**2,018.0224**	**2,018.0224**	**0.3879**		**2,027.7210**

3.5 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0875	2.3558	0.6082	5.2500e-003	0.1286	0.0164	0.1450	0.0370	0.0157	0.0527		562.4316	562.4316	0.0434		563.5172
Worker	0.1963	0.1370	1.5471	4.3700e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7000e-003	0.1116		435.0998	435.0998	0.0139		435.4472
Total	**0.2838**	**2.4928**	**2.1552**	**9.6200e-003**	**0.5394**	**0.0193**	**0.5587**	**0.1460**	**0.0184**	**0.1643**		**997.5314**	**997.5314**	**0.0573**		**998.9643**

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.0305	14.7882	13.1881	0.0220		0.7960	0.7960		0.7688	0.7688		2,001.1595	2,001.1595	0.3715		2,010.4467
Total	**2.0305**	**14.7882**	**13.1881**	**0.0220**		**0.7960**	**0.7960**		**0.7688**	**0.7688**		**2,001.1595**	**2,001.1595**	**0.3715**		**2,010.4467**

3.5 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0710	2.1424	0.5458	5.2000e-003	0.1286	0.0105	0.1391	0.0370	0.0100	0.0471		558.6762	558.6762	0.0412		559.7065
Worker	0.1835	0.1236	1.4173	4.2300e-003	0.4107	2.8800e-003	0.4136	0.1090	2.6600e-003	0.1116		421.3735	421.3735	0.0126		421.6881
Total	**0.2545**	**2.2660**	**1.9631**	**9.4300e-003**	**0.5394**	**0.0134**	**0.5527**	**0.1460**	**0.0127**	**0.1587**		**980.0497**	**980.0497**	**0.0538**		**981.3946**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.0305	14.7882	13.1881	0.0220		0.7960	0.7960		0.7688	0.7688	0.0000	2,001.1595	2,001.1595	0.3715		2,010.4467
Total	**2.0305**	**14.7882**	**13.1881**	**0.0220**		**0.7960**	**0.7960**		**0.7688**	**0.7688**	**0.0000**	**2,001.1595**	**2,001.1595**	**0.3715**		**2,010.4467**

3.5 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0710	2.1424	0.5458	5.2000e-003	0.1286	0.0105	0.1391	0.0370	0.0100	0.0471		558.6762	558.6762	0.0412		559.7065
Worker	0.1835	0.1236	1.4173	4.2300e-003	0.4107	2.8800e-003	0.4136	0.1090	2.6600e-003	0.1116		421.3735	421.3735	0.0126		421.6881
Total	**0.2545**	**2.2660**	**1.9631**	**9.4300e-003**	**0.5394**	**0.0134**	**0.5527**	**0.1460**	**0.0127**	**0.1587**		**980.0497**	**980.0497**	**0.0538**		**981.3946**

3.6 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8402	8.4514	8.8758	0.0135		0.4695	0.4695		0.4328	0.4328		1,296.9461	1,296.9461	0.4111		1,307.2246
Paving	0.1480					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9882**	**8.4514**	**8.8758**	**0.0135**		**0.4695**	**0.4695**		**0.4328**	**0.4328**		**1,296.9461**	**1,296.9461**	**0.4111**		**1,307.2246**

3.6 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0477	0.0321	0.3685	1.1000e-003	0.1068	7.5000e-004	0.1075	0.0283	6.9000e-004	0.0290		109.5571	109.5571	3.2700e-003		109.6389
Total	**0.0477**	**0.0321**	**0.3685**	**1.1000e-003**	**0.1068**	**7.5000e-004**	**0.1075**	**0.0283**	**6.9000e-004**	**0.0290**		**109.5571**	**109.5571**	**3.2700e-003**		**109.6389**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8402	8.4514	8.8758	0.0135		0.4695	0.4695		0.4328	0.4328	0.0000	1,296.9461	1,296.9461	0.4111		1,307.2246
Paving	0.1480					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9882**	**8.4514**	**8.8758**	**0.0135**		**0.4695**	**0.4695**		**0.4328**	**0.4328**	**0.0000**	**1,296.9461**	**1,296.9461**	**0.4111**		**1,307.2246**

3.6 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0477	0.0321	0.3685	1.1000e-003	0.1068	7.5000e-004	0.1075	0.0283	6.9000e-004	0.0290		109.5571	109.5571	3.2700e-003		109.6389
Total	**0.0477**	**0.0321**	**0.3685**	**1.1000e-003**	**0.1068**	**7.5000e-004**	**0.1075**	**0.0283**	**6.9000e-004**	**0.0290**		**109.5571**	**109.5571**	**3.2700e-003**		**109.6389**

3.7 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	26.8405					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9928
Total	**27.0827**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**		**281.4481**	**281.4481**	**0.0218**		**281.9928**

3.7 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0367	0.0247	0.2835	8.5000e-004	0.0822	5.8000e-004	0.0827	0.0218	5.3000e-004	0.0223		84.2747	84.2747	2.5200e-003		84.3376
Total	**0.0367**	**0.0247**	**0.2835**	**8.5000e-004**	**0.0822**	**5.8000e-004**	**0.0827**	**0.0218**	**5.3000e-004**	**0.0223**		**84.2747**	**84.2747**	**2.5200e-003**		**84.3376**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	26.8405					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109	0.0000	281.4481	281.4481	0.0218		281.9928
Total	**27.0827**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**	**0.0000**	**281.4481**	**281.4481**	**0.0218**		**281.9928**

3.7 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0367	0.0247	0.2835	8.5000e-004	0.0822	5.8000e-004	0.0827	0.0218	5.3000e-004	0.0223		84.2747	84.2747	2.5200e-003		84.3376
Total	**0.0367**	**0.0247**	**0.2835**	**8.5000e-004**	**0.0822**	**5.8000e-004**	**0.0827**	**0.0218**	**5.3000e-004**	**0.0223**		**84.2747**	**84.2747**	**2.5200e-003**		**84.3376**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Transit Accessibility

Transit Subsidy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.7896	6.6822	17.0297	0.0519	4.0793	0.0509	4.1302	1.0904	0.0477	1.1381		5,264.6083	5,264.6083	0.2987		5,272.0745
Unmitigated	1.8491	7.0420	18.3887	0.0571	4.5326	0.0558	4.5884	1.2115	0.0523	1.2638		5,797.3905	5,797.3905	0.3229		5,805.4616

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Hotel	1,125.00	1,023.75	743.75	2,006,463	1,805,816
Parking Lot	0.00	0.00	0.00		
Total	1,125.00	1,023.75	743.75	2,006,463	1,805,816

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Hotel	9.50	7.30	7.30	19.40	61.60	19.00	58	38	4
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Hotel	0.588316	0.042913	0.184449	0.110793	0.017294	0.005558	0.015534	0.023021	0.001902	0.002024	0.006181	0.000745	0.001271
Parking Lot	0.588316	0.042913	0.184449	0.110793	0.017294	0.005558	0.015534	0.023021	0.001902	0.002024	0.006181	0.000745	0.001271

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.1173	1.0660	0.8954	6.4000e-003		0.0810	0.0810		0.0810	0.0810		1,279.1543	1,279.1543	0.0245	0.0235	1,286.7557
NaturalGas Unmitigated	0.1173	1.0660	0.8954	6.4000e-003		0.0810	0.0810		0.0810	0.0810		1,279.1543	1,279.1543	0.0245	0.0235	1,286.7557

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Hotel	10872.8	0.1173	1.0660	0.8954	6.4000e-003		0.0810	0.0810		0.0810	0.0810		1,279.1543	1,279.1543	0.0245	0.0235	1,286.7557
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.1173**	**1.0660**	**0.8954**	**6.4000e-003**		**0.0810**	**0.0810**		**0.0810**	**0.0810**		**1,279.1543**	**1,279.1543**	**0.0245**	**0.0235**	**1,286.7557**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Hotel	10.8728	0.1173	1.0660	0.8954	6.4000e-003		0.0810	0.0810		0.0810	0.0810		1,279.1543	1,279.1543	0.0245	0.0235	1,286.7557
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.1173**	**1.0660**	**0.8954**	**6.4000e-003**		**0.0810**	**0.0810**		**0.0810**	**0.0810**		**1,279.1543**	**1,279.1543**	**0.0245**	**0.0235**	**1,286.7557**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.7398	2.4000e-004	0.0257	0.0000		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005		0.0547	0.0547	1.5000e-004		0.0584
Unmitigated	1.9163	2.4000e-004	0.0257	0.0000		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005		0.0547	0.0547	1.5000e-004		0.0584

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.4412					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.4727					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.4200e-003	2.4000e-004	0.0257	0.0000		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005		0.0547	0.0547	1.5000e-004		0.0584
Total	**1.9163**	**2.4000e-004**	**0.0257**	**0.0000**		**9.0000e-005**	**9.0000e-005**		**9.0000e-005**	**9.0000e-005**		**0.0547**	**0.0547**	**1.5000e-004**		**0.0584**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.2647					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.4727					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.4200e-003	2.4000e-004	0.0257	0.0000		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005		0.0547	0.0547	1.5000e-004		0.0584
Total	**1.7399**	**2.4000e-004**	**0.0257**	**0.0000**		**9.0000e-005**	**9.0000e-005**		**9.0000e-005**	**9.0000e-005**		**0.0547**	**0.0547**	**1.5000e-004**		**0.0584**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

MONTEZUMA ROAD HOTEL

GREENHOUSE GAS STUDY

Prepared for:

KLR Planning
San Diego, CA

Prepared by:

BIRDSEYE
PLANNING GROUP

October 2018

GREENHOUSE GAS STUDY

MONTEZUMA ROAD HOTEL

Prepared for

KLR Planning
San Diego, CA

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October 2018

Montezuma Road Hotel Project
City of San Diego, California

GREENHOUSE GAS STUDY

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Appendix A CalEEMod Air Emissions Model Results for Annual Construction and Operation Emissions for Build Out of Existing Land Use and the Proposed Project

Montezuma Road Hotel Project
San Diego, California

GREENHOUSE GAS STUDY

1.0 INTRODUCTION

This report is an analysis of the potential greenhouse gas impacts associated with the proposed Montezuma Road Hotel Project (proposed project) in the City of San Diego. This report has been prepared by Birdseye Planning Group (BPG) under contract to KLR Planning, to support preparation of the environmental documentation pursuant to the California Environmental Quality Act (CEQA). This study analyzes the potential for permanent impacts associated with operation of the proposed project and temporary impacts associated with construction activity within proximity to the construction area.

1.1 PROJECT DESCRIPTION

The *Montezuma Road Hotel* project site encompasses approximately 1.8 acres, located at 6650 Montezuma Road within the College Area community planning area. The project site is situated north of Montezuma Road and west of Bowman Lane. The Friends of the College-Rolando Public Library is located adjacent to the west of the project site with no access or parking from Montezuma Road. Single-family residential development is located to the north, and a Ralphs shopping center is next to the property to the east. The project site is currently vacant, with the recent demolition of a church that was previously located on the project site. Regional access to the site is provided by Interstate 8 (I-8), located approximately 2.2 miles north of the project site. Local access is provided via El Cajon Boulevard, connected to the east end of Montezuma Road and located less than 0.1 mile southwest of the project site. Direct access to the site is via Montezuma Road.

The project proposes an Amendment to the College Area Community Plan and a Rezone. The proposed amendment to the College Area Community Plan would change the current land use designation from *Low/Medium Density Residential [10 – 15 dwelling units per acre (du/ac)]* and *General Commercial Residential (75 – 110 du/ac)* to *Residential Medium with Commercial (15-29 du/ac)* to allow redevelopment of the project site with a maximum 125-room hotel or a base density of 55-multifamily residential units. The proposed rezone would change the existing RM-1-1 zone to CV-1-1. The purpose of the CV zones is to provide areas for establishments catering to the lodging, dining, and recreational needs of both tourists and the local population. The CV zones are intended for areas located near employment centers and areas with recreational resources or other visitor attractions. The CV-1-1 is intended to accommodate a mix of large-scale, visitor serving uses and residential uses and permits a maximum density of 1 dwelling unit for each 1,500 square feet of lot area. The Community Plan Amendment would also allow for a shared

access and parking agreement with the City of San Diego to provide additional parking to serve the adjacent public library.

The proposed project would begin construction in mid-2019 and be completed by late 2020. The site is shown in Figure 1 – Vicinity Map. A site plan is provided as Figure 2.

1.2 GREENHOUSE GAS ANALYSIS OVERVIEW

To evaluate the potential for the project to result in a significant GHG impact, the City of San Diego Significance Determination Thresholds were used. A project's significance as evaluated by consistency with the Climate Action Plan (CAP) is generally evaluated in three steps: (1) consistency with existing land use; (2) consistency with CAP strategies; and (3) consistency with the City of Villages strategy, the Mobility Element, pedestrian improvements, the Bicycle Master Plan, and transit-oriented development in a Transit Priority Area.

Step 1 consists of an evaluation to determine the project's consistency with the existing Community Plan land use designations, and zoning designations for the site. If the project would be consistent with existing Community Plan, and zoning designations for the site, or if the project can demonstrate consistency with existing land uses by comparing GHG emissions generated by the proposed project with those that would be generated under existing land use designations, then the answer to Step 1 would be "yes." Because the proposed project would involve a change in the community plan land use designation and zoning of the project site, this analysis presents maximum buildout of both the allowed uses under the site's existing land use designation, as well as the buildout of the proposed project, to analyze the potential for the project to generate GHG emissions in excess of those calculated in the City's CAP. If emissions associated with the proposed project are projected to be equal to or less that build out of the site assuming the existing land use, then the project is considered consistent with the CAP.

A consistency analysis pursuant to Step 2 of the CAP is provided in Section 6.2. Step 3 of the CAP is not applicable to the proposed project because the project site is not located within a TPA.

Buildout of the Existing Land Use and Zoning Designations

The project site is in the College Area Community Plan area and is zoned RM-1-1. The College Area Community Plan designates the project site as Low/Medium Density Residential [10 – 15 dwelling units per acre (du/ac)] and General Commercial Residential (75 – 110 du/ac). Because a church had previously been located on the site, the build out scenario assumes build out of the site as a church as a worst-case use. The maximum building size based on the current FAR is about 60,766 square feet. (1.86 x 43560 x 0.75 = 60,766.) Based on the City's Trip Generation Manual, a church (house of worship) would generate 15 trips per 1,000 square feet (911 trips) on

Figure 1—Vicinity Map

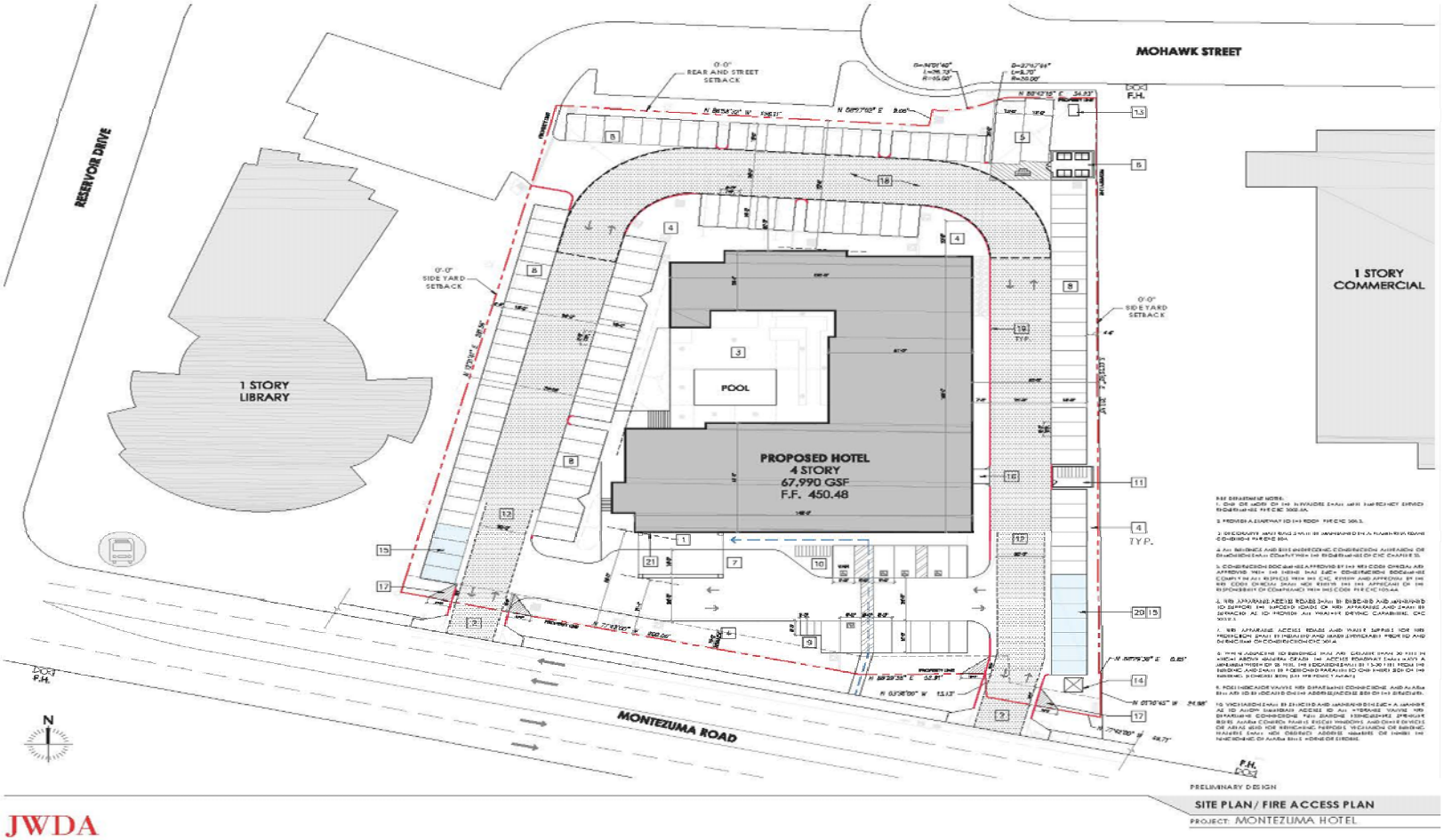

Figure 2 — Site Plan

N

non-assembly days and 60 trips per 1,000 square feet (3,646) on days of assembly. For modeling purposes, it was assumed that that church holds services two days per week.

Buildout of the Proposed Project

The project proposes an amendment to the College Area Community Plan to change the current land use designation to General Commercial with Residential (45-75 du/ac) and a rezone to CV-1-1. The proposed project would construct and operate a new hotel with 125 rooms located at 6650 Montezuma Road in San Diego, California. As proposed, the hotel would be a 64,990 square foot, four-story structure with an outdoor pool area. A total of 125 surface parking spaces would be provided along with 3 motorcycle space, and 14 bicycle spaces.

2.0 ENVIRONMENTAL SETTING

2.1 CLIMATE CHANGE OVERVIEW

Climate change refers to any significant change in measures of climate, such as temperature, precipitation, or wind patterns that last for an extended period of time. The earth's temperature depends on the balance between energy entering and leaving the planet's system. Many factors, both natural and human, can cause changes in earth's energy balance, including variations in the sun's energy that reaches Earth, changes in the reflectivity of Earth's atmosphere and surface, and changes in the greenhouse effect, which affects the amount of heat retained by earth's atmosphere (EPA 2017a).

The greenhouse effect is the trapping and buildup of heat in the atmosphere (troposphere) near the earth's surface. The greenhouse effect traps heat in the troposphere through a threefold process as follows: short-wave radiation emitted by the sun is absorbed by the earth, the earth emits a portion of this energy in the form of long-wave radiation, and GHGs in the upper atmosphere absorb this long-wave radiation and emit it into space and toward earth. The greenhouse effect is a natural process that contributes to regulating the earth's temperature. Human activities that emit additional GHGs to the atmosphere increase the amount of infrared radiation absorbed before escaping into space; thus, enhancing the greenhouse effect and causing the earth's surface temperature to rise.

The scientific record of the earth's climate shows that the climate system varies naturally over a wide range of time scales, and that in general, climate changes prior to the Industrial Revolution in the 1700s can be explained by natural causes, such as changes in solar energy, volcanic eruptions, and natural changes in GHG concentrations. However, recent climate changes, specifically the warming observed over the past century, cannot be explained by natural causes alone. Rather, human activity may have been the dominant cause of warming since the mid-twentieth century and are thought to be a significant driver of observed climate change (IPCC 2013; EPA 2017a). Human influence on the climate system is evident from the increasing GHG concentrations in the atmosphere, positive radiative forcing, observed warming and improved understanding of the climate system (IPCC 2014). The atmospheric concentrations of GHGs

have increased primarily from fossil fuel emissions and secondarily from emissions associated with land use changes (IPCC 2014). Continued emissions of GHGs may cause further warming and changes in all components of the climate system.

2.2 GREENHOUSE GASES

A GHG is any gas that absorbs infrared radiation in the atmosphere. GHGs include but are not limited to carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), ozone (O_3), water vapor, hydrofluorocarbons (HFCs), hydrochlorofluorocarbons (HCFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).[1] Some GHGs, such as CO_2, CH_4, and N_2O, occur naturally and are emitted to the atmosphere through natural processes and human activities. Of these gases, CO_2 and CH_4 are most associated with human activities. Manufactured GHGs, which have a greater heat absorption potential than CO_2, include fluorinated gases, such as HFCs, HCFCs, PFCs, and SF_6, which are associated with certain industrial products and processes. A summary of the most common GHGs and their sources is included in the following text.[2]

Carbon Dioxide. CO2 is a naturally occurring gas that is also a by-product of human activities and is the principal anthropogenic (human-caused) GHG that affects the earth's radiative balance. Natural sources of CO2 include respiration of bacteria, plants, animals, and fungus; evaporation from oceans; volcanic out-gassing; and decomposition of dead organic matter. Human activities that generate CO2 are from the combustion of fuels such as coal, oil, natural gas, and wood and changes in land use.

Methane. CH4 is produced through both natural and human activities. CH4 is a flammable gas and is the main component of natural gas. CH4 is produced through anaerobic (without oxygen) decomposition of waste in landfills, flooded rice fields, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, and incomplete fossil fuel combustion.

Nitrous Oxide. N2O is produced through natural and human activities, primarily through agricultural activities and natural biological processes, although fuel burning and other processes also create N2O. Sources of N2O include soil cultivation practices (microbial processes in soil and water), especially the use of commercial and organic fertilizers and manure management; industrial processes (such as in nitric acid production, nylon production, and fossil-fuel-fired power plants); vehicle emissions; and use of N2O as a propellant (such as in rockets, race cars, and aerosol sprays).

Fluorinated Gases. Fluorinated gases (also referred to as F-gases) are synthetic, powerful GHGs emitted from many industrial processes. Fluorinated gases are commonly used as substitutes

[1] California Health and Safety Code, Section 38505, identifies the following seven GHGs that the California Air Resources Board (CARB) is responsible for monitoring and regulating to reduce emissions: CO_2, CH_4, N_2O, SF_6, HFCs, PFCs, and NF_3.

[2] The descriptions of GHGs are summarized from the Second Assessment Report from the Intergovernmental Panel on Climate Change (IPCC) (1995), the IPCC's Fourth Assessment Report (2007), the Glossary of Terms Used in GHG Inventories from the California Air Resources Board (CARB) (2015), and the Glossary of Climate Change Terms from the U.S. Environmental Protection Agency (EPA) (2016b).

for stratospheric O3-depleting substances (e.g., CFCs, HCFCs, and halons). The most prevalent fluorinated gases include the following:

- **Hydrofluorocarbons.** HFCs are compounds containing only hydrogen, fluorine, and carbon atoms. HFCs are synthetic chemicals used as alternatives to O3-depleting substances in serving many industrial, commercial, and personal needs. HFCs are emitted as by-products of industrial processes and are used in manufacturing.

- **Perfluorocarbons.** PFCs are a group of human-made chemicals composed of carbon and fluorine only. These chemicals were introduced as alternatives, with HFCs, to the O3depleting substances. The two main sources of PFCs are primary aluminum production and semiconductor manufacturing. Because PFCs have stable molecular structures and do not break down through the chemical processes in the lower atmosphere, these chemicals have long lifetimes, ranging between 10,000 and 50,000 years.

- **Sulfur Hexafluoride.** SF6 is a colorless gas soluble in alcohol and ether and slightly soluble in water. SF6 is used for insulation in electric power transmission and distribution equipment, semiconductor manufacturing, the magnesium industry, and as a tracer gas for leak detection.

- **Nitrogen Trifluoride.** NF3 is used in the manufacture of a variety of electronics, including semiconductors and flat panel displays.

Chlorofluorocarbons. CFCs are synthetic chemicals that have been used as cleaning solvents, refrigerants, and aerosol propellants. CFCs are chemically unreactive in the lower atmosphere (troposphere), and the production of CFCs was prohibited in 1987 due to the chemical destruction of stratospheric O3.

Hydrochlorofluorocarbons. HCFCs are a large group of compounds whose structure is very close to that of CFCs—containing hydrogen, fluorine, chlorine, and carbon atoms—but includes one or more hydrogen atoms. Like HFCs, HCFCs are used in refrigerants and propellants. HCFCs were also used in place of CFCs for some applications; however, their use in general is being phased out.

Black Carbon. Black carbon is a component of fine particulate matter, which has been identified as a leading environmental risk factor for premature death. It is produced from the incomplete combustion of fossil fuels and biomass burning, particularly from older diesel engines and forest fires. Black carbon warms the atmosphere by absorbing solar radiation, influences cloud formation, and darkens the surface of snow and ice, which accelerates heat absorption and melting. Black carbon is a short-lived species that varies spatially, which makes it difficult to quantify its global warming potential (GWP). Diesel particulate matter emissions are a major source of black carbon and are toxic air contaminants that have been regulated and controlled in California for several decades to protect public health. In relation to declining diesel particulate matter from the regulations of the California Air Resources Board (CARB) pertaining to diesel

engines, diesel fuels, and burning activities, CARB estimates that annual black carbon emissions in California have reduced by 70% between 1990 and 2010, with 95% control expected by 2020 (CARB 2014).

Water Vapor. The primary source of water vapor is evaporation from the ocean, with additional vapor generated by sublimation (change from solid to gas) from ice and snow, evaporation from other water bodies, and transpiration from plant leaves. Water vapor is the most important, abundant, and variable GHG in the atmosphere.

Ozone. Tropospheric O3, which is created by photochemical reactions involving gases from both natural sources and human activities, acts as a GHG. Stratospheric O3, which is created by the interaction between solar ultraviolet radiation and molecular oxygen, plays a decisive role in the stratospheric radiative balance. Depletion of stratospheric O3 resulting from chemical reactions that may be enhanced by climate change results in an increased ground-level flux of ultraviolet-B radiation.

Aerosols. Aerosols are suspensions of particulate matter in a gas emitted into the air through burning biomass (plant material) and fossil fuels. Aerosols can warm the atmosphere by absorbing and emitting heat and can cool the atmosphere by reflecting light.

3.0 POTENTIAL EFFECTS OF CLIMATE CHANGE

Globally, climate change has the potential to affect numerous environmental resources through uncertain impacts related to future air temperatures and precipitation patterns. The 2014 IPCC Synthesis Report indicated that warming of the climate system is unequivocal, and that many of the observed changes since the 1950s are unprecedented. Signs that global climate change has occurred include warming of the atmosphere and ocean, diminished amounts of snow and ice, and rising sea levels (IPCC 2014).

In California, climate change impacts have the potential to affect sea-level rise, agriculture, snowpack and water supply, forestry, wildfire risk, public health, and electricity demand and supply (CCCC 2006). The primary effect of global climate change has been a 0.2°C (0.36°F) rise in average global tropospheric temperature per decade, determined from meteorological measurements worldwide between 1990 and 2005. Scientific modeling predicts that continued emissions of GHGs at or above current rates would induce more extreme climate changes during the twenty-first century than were observed during the twentieth century. A warming of about 0.2°C per decade is projected.

An increase in annual average temperature is a reasonably foreseeable effect of climate change. In California, statewide average temperatures increased by about 1.7°F from 1895 to 2011, and warming was observed to be greatest in the Sierra Nevada Region of California (CCCC 2012). By 2050, California is projected to warm by approximately 2.7°F above 2000 averages, a threefold increase in the rate of warming over the last century. By 2100, average temperatures could increase by 4.1°F to 8.6°F, depending on emissions levels.

Model projections for precipitation over California continue to show the Mediterranean pattern of wet winters and dry summers with seasonal, year-to-year, and decade-to-decade variability. However, climate models indicate a shift toward drier conditions by the mid-to-late twenty-first century in Central California, and most notably in Southern California. By the late century, all projections show drying, and half of them suggest that 30-year average precipitation will decline by more than 10% below the historical average (CCCC 2012).

4.0 REGULATORY SETTING

4.1 FEDERAL

Massachusetts v. EPA. In Massachusetts v. EPA (April 2007), the U.S. Supreme Court directed the EPA administrator to determine whether GHG emissions from new motor vehicles cause or contribute to air pollution that may reasonably be anticipated to endanger public health or welfare, or the science is too uncertain to make a reasoned decision. In December 2009, the administrator signed a final rule with the following two distinct findings regarding GHGs under Section 202(a) of the federal Clean Air Act:

- The administrator found that elevated concentrations of GHGs—CO2, CH4, N2O, HFCs, PFCs, and SF6—in the atmosphere threaten the public health and welfare of current and future generations. This is the "endangerment finding."
- The administrator further found the combined emissions of GHGs—CO_2, CH_4, N_2O, and HFCs—from new motor vehicles and new motor vehicle engines contribute to the GHG air pollution that endangers public health and welfare. This is the "cause or contribute finding."

These two findings were necessary to establish the foundation for regulation of GHGs from new motor vehicles as air pollutants under the Clean Air Act.

Energy Independence and Security Act. The Energy Independence and Security Act of 2007 (December 2007), among other key measures, would do the following, which would aid in the reduction of national GHG emissions (HR 6):

- Increase the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard requiring fuel producers to use at least 36 billion gallons of biofuel in 2022.
- Set a target of 35 miles per gallon for the combined fleet of cars and light trucks by model year 2020 and direct the National Highway Traffic Safety Administration (NHTSA) to establish a fuel economy program for medium- and heavy-duty trucks and create a separate fuel economy standard for work trucks.
- Prescribe or revise standards affecting regional efficiency for heating and cooling products and procedures for new or amended standards, energy conservation, energy efficiency labeling for consumer electronic products, residential boiler efficiency, electric motor efficiency, and home appliances.

Federal Vehicle Standards. In response to the U.S. Supreme Court ruling discussed above, the Bush Administration issued Executive Order (EO) 13432 in 2007 directing the EPA, the U.S. Department of Transportation, and the U.S. Department of Energy to establish regulations that reduce GHG emissions from motor vehicles, non-road vehicles, and non-road engines by 2008. In 2009, the NHTSA issued a final rule regulating fuel efficiency and GHG emissions from cars and light-duty trucks for Model Year 2011, and in 2010, the EPA and NHTSA issued a final rule regulating cars and light-duty trucks for Model Years 2012–2016.

In 2010, President Obama issued a memorandum directing the U.S. Department of Transportation, U.S. Department of Energy, EPA, and NHTSA to establish additional standards regarding fuel efficiency and GHG reduction, clean fuels, and advanced vehicle infrastructure. In response to this directive, EPA and NHTSA proposed stringent, coordinated federal GHG and fuel economy standards for light-duty vehicles for Model Years 2017–2025. The proposed standards projected to achieve 163 grams/mile of CO_2 in Model Year 2025 on an average industry fleet-wide basis, which is equivalent to 54.5 miles per gallon if this level were achieved solely through fuel efficiency. The final rule was adopted in 2012 for Model Years 2017–2021, and NHTSA intends to set standards for Model Years 2022–2025 in a future rulemaking.
In addition to these regulations applicable to cars and light-duty trucks, in 2011, EPA and NHTSA announced fuel economy and GHG standards for medium- and heavy-duty trucks for Model Years 2014–2018. The standards for CO_2 emissions and fuel consumption are tailored to three main vehicle categories: combination tractors, heavy-duty pickup trucks and vans, and vocational vehicles. According to the EPA, this regulatory program will reduce GHG emissions and fuel consumption for the affected vehicles by 6%–23% over the 2010 baselines.

In August 2016, EPA and NHTSA announced the adoption of the phase two program related to the fuel economy and GHG standards for medium- and heavy-duty trucks. The phase two program will apply to Model Year 2018–2027 vehicles for certain trailers, and Model Years 2021–2027 for semitrucks, large pickup trucks, vans, and all types and sizes of buses and work trucks. The final standards are expected to lower CO_2 emissions by approximately 1.1 billion MT and reduce oil consumption by up to two billion barrels over the lifetime of the vehicles sold under the program (EPA and NHTSA 2016).

Clean Power Plan and New Source Performance Standards for Electric Generating Units. In October 2015, EPA published a final rule (effective December 2015) establishing the Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units (80 FR 64510–64660), also known as the Clean Power Plan. These guidelines prescribe how states must develop plans to reduce GHG emissions from existing fossil-fuel-fired electric generating units. The guidelines establish CO_2 emission performance rates representing the best system of emission reduction for the following two subcategories of existing fossil-fuel-fired electric generating units: (1) fossil-fuel-fired electric utility steam-generating units and (2) stationary combustion turbines. Concurrently, the EPA published a final rule in October 2015 establishing Standards of Performance for Greenhouse Gas Emissions from New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units (80 FR 64661–65120). The rule prescribes CO_2 emission standards for newly constructed, modified, and reconstructed

affected fossil-fuel-fired electric utility generating units. Implementation of the Clean Power Plan has been stayed by the U.S. Supreme Court pending resolution of several lawsuits; additionally, President Trump has called upon the EPA to review the Clean Power Plan.

4.2 STATE

The statewide GHG emissions regulatory framework is summarized below by category: state climate change targets, building energy, renewable energy and energy procurement, mobile sources, solid waste, water, and other state regulations and goals. The following text describes EOs, legislation, regulations, and other plans and policies that would directly or indirectly reduce GHG emissions or address climate change issues.

State Climate Change Targets

Executive Order S-3-05. EO S-3-05 (June 2005) established the following statewide goals: GHG emissions should be reduced to 2000 levels by 2010, 1990 levels by 2020, and 80% below 1990 levels by 2050.

Assembly Bill 32 and CARB's Scoping Plan. To further the goals established in EO S-3-05, the Legislature passed Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006. AB 32 requires California to reduce its GHG emissions to 1990 levels by 2020. Under AB 32, CARB is responsible for and is recognized as having the expertise to carry out and develop the programs and requirements necessary to achieve the GHG emissions reduction mandate of AB 32. Under AB 32, CARB must adopt regulations requiring the reporting and verification of statewide GHG emissions from specified sources. This program is used to monitor and enforce compliance with established standards. CARB also is required to adopt rules and regulations to achieve the maximum technologically feasible and cost-effective GHG emission reductions. AB 32 authorized CARB to adopt market-based compliance mechanisms to meet the specified requirements. Finally, CARB is ultimately responsible for monitoring compliance and enforcing any rule, regulation, order, emission limitation, emission reduction measure, or market-based compliance mechanism adopted.

In 2007, CARB approved a limit on the statewide GHG emissions level for year 2020 consistent with the determined 1990 baseline (427 MMT CO_2E). CARB's adoption of this limit is in accordance with Health and Safety Code, Section 38550.

Further, in 2008, CARB adopted the Scoping Plan in accordance with Health and Safety Code, Section 38561. The Scoping Plan establishes an overall framework for the measures that will be adopted to reduce California's GHG emissions for various emission sources/sectors to 1990 levels by 2020. The Scoping Plan evaluates opportunities for sector-specific reductions, integrates all CARB and Climate Action Team early actions and additional GHG reduction features by both entities, identifies additional measures to be pursued as regulations, and outlines the role of a cap-and-trade program. The key elements of the Scoping Plan include the following (CARB 2008):

1. Expanding and strengthening existing energy efficiency programs, as well as building and appliance standards;
2. Achieving a statewide renewable energy mix of 33%;
3. Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system and caps sources contributing 85% of California's GHG emissions;
4. Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets;
5. Adopting and implementing measures pursuant to existing state laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard; and
6. Creating targeted fees, including a public goods charge on water use, fees on high GWP gases, and a fee to fund the administrative costs of the State of California's long-term commitment to AB 32 implementation.

In the Scoping Plan (CARB 2008), CARB determined that achieving the 1990 emissions level in 2020 would require a reduction in GHG emissions of approximately 28.5% from the otherwise projected 2020 emissions level (i.e., those emissions that would occur in 2020) absent GHG reducing laws and regulations (referred to as Business-As-Usual (BAU)). To calculate this percentage reduction, CARB assumed that all new electricity generation would be supplied by natural gas plants, no further regulatory action would impact vehicle fuel efficiency, and building energy efficiency codes would be held at 2005 standards.

In the 2011 Final Supplement to the AB 32 Scoping Plan Functional Equivalent Document (CARB 2011a), CARB revised its estimates of the projected 2020 emissions level in light of the economic recession and the availability of updated information about GHG reduction regulations. Based on the new economic data, CARB determined that achieving the 1990 emissions level by 2020 would require a reduction in GHG emissions of 21.7% (down from 28.5%) from the BAU conditions. When the 2020 emissions level projection was updated to account for newly implemented regulatory measures, including Pavley I (model years 2009–2016) and the Renewables Portfolio Standard (RPS) (12% to 20%), CARB determined that achieving the 1990 emissions level in 2020 would require a reduction in GHG emissions of 16% (down from 28.5%) from the BAU conditions.

In 2014, CARB adopted the First Update to the Climate Change Scoping Plan: Building on the Framework (First Update; CARB 2014). The stated purpose of the First Update is to "highlight California's success to date in reducing its GHG emissions and lay the foundation for establishing a broad framework for continued emission reductions beyond 2020, on the path to 80% below 1990 levels by 2050" (CARB 2014). The First Update found that California is on track to meet the 2020 emissions reduction mandate established by AB 32 and noted that California could reduce emissions further by 2030 to levels needed to stay on track to reduce emissions to 80% below 1990 levels by 2050 if the state realizes the expected benefits of existing policy goals.

In conjunction with the First Update, CARB identified "six key focus areas comprising major components of the state's economy to evaluate and describe the larger transformative actions that will be needed to meet the state's more expansive emission reduction needs by 2050" (CARB 2014). Those six areas are (1) energy, (2) transportation (vehicles/equipment, sustainable communities, housing, fuels, and infrastructure), (3) agriculture, (4) water, (5) waste management, and (6) natural and working lands. The First Update identifies key recommended actions for each sector that will facilitate achievement of EO S-3-05's 2050 reduction goal (CARB 2014).

Based on CARB's research efforts presented in the First Update, it has a "strong sense of the mix of technologies needed to reduce emissions through 2050" (CARB 2014). Those technologies include energy demand reduction through efficiency and activity changes; large-scale electrification of on-road vehicles, buildings, and industrial machinery; decarbonizing electricity and fuel supplies; and the rapid market penetration of efficient and clean energy technologies. As part of the First Update, CARB recalculated the state's 1990 emissions level using more recent GWPs identified by the IPCC. Using the recalculated 1990 emissions level (431 MMT CO_2E) and the revised 2020-emissions-level projection identified in the 2011 Final Supplement, CARB determined that achieving the 1990 emissions level by 2020 would require a reduction in GHG emissions of approximately 15% (instead of 28.5% or 16%) from the BAU conditions (CARB 2014).

In January 2017, CARB released, *The 2017 Climate Change Scoping Plan Update (*Second Update; CARB 2017b), for public review and comment. This update proposes CARB's strategy for achieving the state's 2030 GHG target as established in Senate Bill (SB) 32 (discussed below), including continuing the Cap-and-Trade Program through 2030, and includes a new approach to reduce GHGs from refineries by 20%. The Second Update incorporates approaches to cutting short-lived climate pollutants (SLCPs) under the Short-Lived Climate Pollutant Reduction Strategy (a planning document that was adopted by CARB in March 2017), acknowledges the need for reducing emissions in agriculture, and highlights the work underway to ensure that California's natural and working lands increasingly sequester carbon. During development of the Second Update, CARB held a number of public workshops in the Natural and Working Lands, Agriculture, Energy, and Transportation sectors to inform development of the 2030 Scoping Plan Update (CARB 2016). The Second Update has not been considered by CARB's Governing Board at the time this analysis was prepared.

Executive Order B-30-15. EO B-30-15 (April 2015) identified an interim GHG reduction target in support of targets previously identified under S-3-05 and AB 32. EO B-30-15 set an interim target goal of reducing statewide GHG emissions to 40% below 1990 levels by 2030 to keep California on its trajectory toward meeting or exceeding the long-term goal of reducing statewide GHG emissions to 80% below 1990 levels by 2050 as set forth in EO S-3-05. To facilitate achievement of this goal, EO B-30-15 calls for an update to CARB's Scoping Plan to express the 2030 target in terms of MMT CO2E. EO B-30-15 also calls for state agencies to continue to develop and implement GHG emission reduction programs in support of the

reduction targets. EO B-30-15 does not require local agencies to take any action to meet the new interim GHG reduction target.

Senate Bill 32 and Assembly Bill 197. SB 32 and AB 197 (enacted in 2016) are companion bills that set new statewide GHG reduction targets, make changes to CARB's membership, increase legislative oversight of CARB's climate change–based activities, and expand dissemination of GHG and other air quality–related emissions data to enhance transparency and accountability. More specifically, SB 32 codified the 2030 emissions reduction goal of EO B-30-15 by requiring CARB to ensure that statewide GHG emissions are reduced to 40% below 1990 levels by 2030. AB 197 established the Joint Legislative Committee on Climate Change Policies, consisting of at least three members of the Senate and three members of the Assembly, in order to provide ongoing oversight over implementation of the state's climate policies. AB 197 added two members of the Legislature to CARB as nonvoting members; requires CARB to make available and update (at least annually via its website) emissions data for GHGs, criteria air pollutants, and toxic air contaminants from reporting facilities; and requires CARB to identify specific information for GHG emissions reduction measures when updating the Scoping Plan.

Senate Bill 605 and Senate Bill 1383. SB 605 (2014) requires CARB to complete a comprehensive strategy to reduce emissions of SLCPs in the state, and SB 1383 (2016) requires CARB to approve and implement that strategy by January 1, 2018. SB 1383 also establishes specific targets for the reduction of SLCPs (40% below 2013 levels by 2030 for CH4 and HFCs, and 50% below 2013 levels by 2030 for anthropogenic black carbon) and provides direction for reductions from dairy and livestock operations and landfills. Accordingly, and as mentioned above, CARB adopted its Short-Lived Climate Pollutant Reduction Strategy (CARB 2017c) in March 2017. The SLCP Reduction Strategy (CARB 2017c) establishes a framework for the statewide reduction of emissions of black carbon, CH4, and fluorinated gases.

Building Energy

California Code of Regulations

Title 24, Part 6. Title 24 of the California Code of Regulations was established in 1978 and serves to enhance and regulate California's building standards. While not initially promulgated to reduce GHG emissions, Part 6 of Title 24 specifically establishes Building Energy Efficiency Standards that are designed to ensure new and existing buildings in California achieve energy efficiency and preserve outdoor and indoor environmental quality. These energy efficiency standards are reviewed every few years by the Building Standards Commission and the California Energy Commission (CEC) (and revised if necessary) (California Public Resources Code, Section 25402(b)(1)). The regulations receive input from members of industry, as well as the public, with the goal of "reducing of wasteful, uneconomic, inefficient, or unnecessary consumption of energy" (California Public Resources Code, Section 25402). These regulations are carefully scrutinized and analyzed for technological and economic feasibility (California Public Resources Code, Section 25402(d)) and cost effectiveness (California Public Resources Code, Sections 25402(b)(2) and (b)(3)). These standards are updated to consider and incorporate

new energy efficient technologies and construction methods. As a result, these standards save energy, increase electricity supply reliability, increase indoor comfort, avoid the need to construct new power plants, and help preserve the environment.

The 2016 Title 24 standards are the currently applicable building energy efficiency standards and became effective on January 1, 2017. In general, single-family homes built to the 2016 standards are anticipated to use approximately 28% less energy for lighting, heating, cooling, ventilation, and water heating than those built to the 2013 standards, and nonresidential buildings built to the 2016 standards will use an estimated 5% less energy than those built to the 2013 standards (CEC 2015a).

Title 24, Part 11. In addition to the CEC's efforts, in 2008, the California Building Standards Commission adopted the nation's first green building standards. The California Green Building Standards Code (Part 11 of Title 24) is commonly referred to as "CALGreen," and establishes minimum mandatory standards and voluntary standards pertaining to the planning and design of sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and interior air quality. The CALGreen standards took effect in January 2011 and instituted mandatory minimum environmental performance standards for all ground-up, new construction of commercial, low-rise residential, and state-owned buildings and schools and hospitals. The CALGreen 2016 standards became effective on January 1, 2017. The mandatory standards require the following (24 CCR Part 11):

- Mandatory reduction in indoor water use through compliance with specified flow rates for plumbing fixtures and fittings;
- Mandatory reduction in outdoor water use through compliance with a local water efficient landscaping ordinance or the California Department of Water Resources' Model Water Efficient Landscape Ordinance;
- Diversion of 65% of construction and demolition waste from landfills;
- Mandatory inspections of energy systems to ensure optimal working efficiency;
- Inclusion of electric vehicle charging stations or designated spaces capable of supporting future charging stations; and
- Low-pollutant-emitting exterior and interior finish materials, such as paints, carpets, vinyl flooring, and particle board.

The CALGreen standards also include voluntary efficiency measures that are provided at two separate tiers and implemented at the discretion of local agencies and applicants. CALGreen's Tier 1 standards call for a 15% improvement in energy requirements, stricter water conservation, 65% diversion of construction and demolition waste, 10% recycled content in building materials, 20% permeable paving, 20% cement reduction, and cool/solar-reflective roofs. CALGreen's more rigorous Tier 2 standards call for a 30% improvement in energy requirements, stricter water conservation, 75% diversion of construction and demolition waste,

15% recycled content in building materials, 30% permeable paving, 25% cement reduction, and cool/solar-reflective roofs (24 CCR Part 11).

The California Public Utilities Commission, CEC, and CARB also have a shared, established goal of achieving zero net energy (ZNE) for new construction in California. The key policy timelines include the following: (1) all new residential construction in California will be ZNE by 2020, and (2) all new commercial construction in California will be ZNE by 2030 (CPUC 2013).[3] As most recently defined by the CEC in its 2015 Integrated Energy Policy Report (CEC 2015b), a ZNE code building is "one where the value of the energy produced by on-site renewable energy resources is equal to the value of the energy consumed annually by the building" using the CEC's Time Dependent Valuation metric.

Title 20. Title 20 of the California Code of Regulations requires manufacturers of appliances to meet state and federal standards for energy and water efficiency. Performance of appliances must be certified through the CEC to demonstrate compliance with standards. New appliances regulated under Title 20 include refrigerators, refrigerator-freezers, and freezers; room air conditioners and room air-conditioning heat pumps; central air conditioners; spot air conditioners; vented gas space heaters; gas pool heaters; plumbing fittings and plumbing fixtures; fluorescent lamp ballasts; lamps; emergency lighting; traffic signal modules; dishwaters; clothes washers and dryers; cooking products; electric motors; low voltage dry-type distribution transformers; power supplies; televisions and consumer audio and video equipment; and battery charger systems. Title 20 presents protocols for testing for each type of appliance covered under the regulations and appliances must meet the standards for energy performance, energy design, water performance, and water design. Title 20 contains three types of standards for appliances: federal and state standards for federally regulated appliances, state standards for federally regulated appliances, and state standards for non-federally regulated appliances.

Other Regulations

Senate Bill 1. SB 1 (2006) established a $3 billion rebate program to support the goal of the state to install rooftop solar energy systems with a generation capacity of 3,000 megawatts through 2016. SB 1 added sections to the California Public Resources Code, including Chapter 8.8 (California Solar Initiative), that require building projects applying for ratepayer-funded incentives for photovoltaic systems to meet minimum energy efficiency levels and performance requirements. Section 25780 states that it is a goal of the state to establish a self-sufficient solar industry in which solar energy systems are a viable mainstream option for homes and businesses within 10 years of adoption, and to place solar energy systems on 50% of new homes within 13 years of adoption. SB 1, also termed "GoSolarCalifornia," was previously titled "Million Solar Roofs."

[3] It is expected that achievement of the ZNE goal will occur through revisions to the Title 24 standards.

Assembly Bill 1470. This bill established the Solar Water Heating and Efficiency Act of 2007. The bill makes findings and declarations of the Legislature relating to the promotion of solar water-heating systems and other technologies that reduce natural gas demand. The bill defines several terms for purposes of the act. The bill requires the commission to evaluate the data available from a specified pilot program, and if it makes a specified determination, to design and implement a program of incentives for the installation of 200,000 solar water-heating systems in homes and businesses throughout the state by 2017.

Assembly Bill 1109. Enacted in 2007, AB 1109 required the CEC to adopt minimum energy efficiency standards for general purpose lighting and to reduce electricity consumption by 50% for indoor residential lighting and 25% for indoor commercial lighting.

Renewable Energy and Energy Procurement

Senate Bill 1078. SB 1078 (2002) established the RPS program, which requires an annual increase in renewable generation by the utilities equivalent to at least 1% of sales, with an aggregate goal of 20% by 2017. This goal was subsequently accelerated, requiring utilities to obtain 20% of their power from renewable sources by 2010.

Senate Bill 1368. SB 1368 (2006) requires the CEC to develop and adopt regulations for GHG emission performance standards for the long-term procurement of electricity by local publicly owned utilities. These standards must be consistent with the standards adopted by the California Public Utilities Commission. This effort will help protect energy customers from financial risks associated with investments in carbon-intensive generation by allowing new capital investments in power plants whose GHG emissions are as low as or lower than new combined-cycle natural gas plants by requiring imported electricity to meet GHG performance standards in California and by requiring that the standards be developed and adopted in a public process.

Senate Bill X1 2. SB X1 2 (2011) expanded the RPS by establishing that 20% of the total electricity sold to retail customers in California per year by December 31, 2013, and 33% by December 31, 2020, and in subsequent years be secured from qualifying renewable energy sources. Under the bill, a renewable electrical generation facility is one that uses biomass, solar thermal, photovoltaic, wind, geothermal, fuel cells using renewable fuels, small hydroelectric generation of 30 megawatts or less, digester gas, municipal solid waste conversion, landfill gas, ocean wave, ocean thermal, or tidal current, and that meets other specified requirements with respect to its location. In addition to the retail sellers previously covered by the RPS, SB X1 2 added local, publicly owned electric utilities to the RPS.

Senate Bill 350. SB 350 (2015) further expanded the RPS by establishing that 50% of the total electricity sold to retail customers in California per year by December 31, 2030, be secured from qualifying renewable energy sources. In addition, SB 350 includes the goal to double the energy-efficiency savings in electricity and natural gas final end uses (such as heating, cooling, lighting, or class of energy uses on which an energy-efficiency program is focused) of retail customers through energy conservation and efficiency. The bill also requires the California Public Utilities

Commission, in consultation with the CEC, to establish efficiency targets for electrical and gas corporations consistent with this goal.

Mobile Sources

Assembly Bill 1493. AB 1493 was enacted in July 2002 in a response to the transportation sector accounting for more than half of California's CO2 emissions. AB 1493 required CARB to set GHG emission standards for passenger vehicles, light-duty trucks, and other vehicles determined by the state board to be vehicles that are primarily used for noncommercial personal transportation in the state. The bill required that CARB set GHG emission standards for motor vehicles manufactured in 2009 and all subsequent model years. CARB adopted the standards in September 2004. When fully phased in, the near-term (2009–2012) standards will result in a reduction of approximately 22% in GHG emissions compared to the emissions from the 2002 fleet, while the mid-term (2013–2016) standards will result in a reduction of approximately 30%.

Executive Order S-1-07. Issued on January 18, 2007, EO S-1-07 sets a declining Low Carbon Fuel Standard for GHG emissions measured in CO2E grams per unit of fuel energy sold in California. The target of the Low Carbon Fuel Standard is to reduce the carbon intensity of California passenger vehicle fuels by at least 10% by 2020. The carbon intensity measures the amount of GHG emissions in the lifecycle of a fuel, including extraction/feedstock production, processing, transportation, and final consumption, per unit of energy delivered. CARB adopted the implementing regulation in April 2009. The regulation is expected to increase the production of biofuels, including those from alternative sources, such as algae, wood, and agricultural waste.

Senate Bill 375. SB 375 (2008) addresses GHG emissions associated with the transportation sector through regional transportation and sustainability plans. SB 375 required CARB to adopt regional GHG reduction targets for the automobile and light-truck sector for 2020 and 2035. Regional metropolitan planning organizations are then responsible for preparing a Sustainable Communities Strategy (SCS) within their Regional Transportation Plan (RTP). The goal of the SCS is to establish a forecasted development pattern for the region that, after considering transportation measures and policies, will achieve, if feasible, the GHG reduction targets. If a SCS is unable to achieve the GHG reduction target, a metropolitan planning organization must prepare an Alternative Planning Strategy demonstrating how the GHG reduction target would be achieved through alternative development patterns, infrastructure, or additional transportation measures or policies.

Pursuant to California Government Code, Section 65080(b)(2)(K), a sustainable communities strategy does not (1) regulate the use of land; (2) supersede the land use authority of cities and counties; or (3) require that a city's or county's land use policies and regulations, including those in a general plan, be consistent with it. Nonetheless, SB 375 makes regional and local planning agencies responsible for developing those strategies as part of the federally required metropolitan transportation planning process and the state-mandated housing element process.

In 2010, CARB adopted the SB 375 targets for the regional metropolitan planning organizations. The targets for the San Diego Association of Governments (SANDAG) are a 7% reduction in emissions per capita by 2020 and a 13% reduction by 2035.

SANDAG completed and adopted its 2050 RTP/SCS in October 2011. In November 2011, CARB, by resolution, accepted SANDAG's GHG emissions quantification analysis and determination that, if implemented, the 2050 RTP/SCS would achieve CARB's 2020 and 2035 GHG emissions reduction targets for the region.

After SANDAG's 2050 RTP/SCS was adopted, a lawsuit was filed by the Cleveland National Forest Foundation and others. The matter is pending before the California Supreme Court (Case No. S223603) for determination of whether an Environmental Impact Report for a regional transportation plan must include an analysis of the plan's consistency with the GHG reduction goals reflected in EO S-3-05 to comply with CEQA.

Although the Environmental Impact Report for SANDAG's 2050 RTP/SCS is pending before the California Supreme Court, in 2015, SANDAG adopted the next iteration of its RTP/SCS in accordance with statutorily mandated timelines, and no subsequent litigation challenge was filed. More specifically, in October 2015, SANDAG adopted San Diego Forward: The Regional Plan.

Like the 2050 RTP/SCS, this planning document meets CARB's 2020 and 2035 reduction targets for the region (SANDAG 2015). In December 2015, CARB, by resolution, accepted SANDAG's GHG emissions quantification analysis and determination that, if implemented, the RTP/SCS would achieve CARB's 2020 and 2035 GHG emissions reduction targets for the region.

Advanced Clean Cars Program. In January 2012, CARB approved the Advanced Clean Cars Program, a new emissions-control program for Model Years 2015–2025. The program combines the control of smog- and soot-causing pollutants and GHG emissions into a single coordinated package. The package includes elements to reduce smog-forming pollution, reduce GHG emissions, promote clean cars, and provide the fuels for clean cars (CARB 2011b). To improve air quality, CARB has implemented new emission standards to reduce smog-forming emissions beginning with Model Year 2015 vehicles. It is estimated that in 2025, cars will emit 75% less smog-forming pollution than the average new car sold before 2012. To reduce GHG emissions, CARB, in conjunction with the EPA and the NHTSA, has adopted new GHG standards for Model Year 2017–2025 vehicles; the new standards are estimated to reduce GHG emissions by 34% in 2025. The Zero Emissions Vehicle (ZEV) Program will act as the focused technology of the Advanced Clean Cars Program by requiring manufacturers to produce increasing numbers of ZEVs and plug-in hybrid electric vehicles in Model Years 2018–2025. The Clean Fuels Outlet regulation will ensure that fuels such as electricity and hydrogen are available to meet the fueling needs of the new advanced technology vehicles as they come to the market.

Executive Order B-16-12. EO B-16-12 (2012) directs state entities under the Governor's direction and control to support and facilitate development and distribution ZEVs. This EO also sets a

long-term target of reaching 1.5 million ZEVs on California's roadways by 2025. On a statewide basis, EO B-16-12 also establishes a GHG emissions reduction target from the transportation sector equaling 80% less than 1990 levels by 2050. To further this EO, the Governor convened an Interagency Working Group on ZEVs that has published multiple reports regarding the progress made on the penetration of ZEVs in the statewide vehicle fleet.

Assembly Bill 1236. AB 1236 (2015), as enacted in California's Planning and Zoning Law, requires local land use jurisdictions to approve applications for the installation of electric vehicle charging stations, as defined, through the issuance of specified permits unless there is substantial evidence in the record that the proposed installation would have a specific, adverse impact on the public health or safety, and there is no feasible method to satisfactorily mitigate or avoid the specific, adverse impact. The bill provides for appeal of that decision to the planning commission as specified. The bill requires local land use jurisdictions with a population of 200,000 or more residents to adopt an ordinance by September 30, 2016, that creates an expedited and streamlined permitting process for electric vehicle charging stations as specified. Prior to this statutory deadline, in August 2016, the County Board of Supervisors adopted Ordinance No. 10437 (N.S.) adding a section to its County Code related to the expedited processing of electric vehicle charging stations permits consistent with AB 1236.

Senate Bill 350. In 2015, SB 350—the Clean Energy and Pollution Reduction Act—was enacted into law. As one of its elements, SB 350 establishes a statewide policy for widespread electrification of the transportation sector, recognizing that such electrification is required for achievement of the state's 2030 and 2050 reduction targets (California Public Utilities Code, Section 740.12).

Solid Waste

Assembly Bill 939. In 1989, AB 939, known as the Integrated Waste Management Act (California Public Resources Code, Sections 40000 et seq.), was passed because of the increase in waste stream and the decrease in landfill capacity. The statute established the California Integrated Waste Management Board, which oversees a disposal reporting system. AB 939 mandated a reduction of waste being disposed where jurisdictions were required to meet diversion goals of all solid waste through source reduction, recycling, and composting activities of 25% by 1995 and 50% by the year 2000.

Assembly Bill 341. AB 341 (2011) amended the California Integrated Waste Management Act of 1989 to include a provision declaring that it is the policy goal of the state that no less than 75% of solid waste be generated be source-reduced, recycled, or composted by the year 2020 and annually thereafter. In addition, AB 341 required the California Department of Resources Recycling and Recovery to develop strategies to achieve the state's policy goal. The California Department of Resources Recycling and Recovery has conducted multiple workshops and published documents that identify priority strategies that they would assist the state in reaching the 75% goal by 2020.

Water

Executive Order B-29-15. In response to the ongoing drought in California, EO B-29-15 (April 2015) set a goal of achieving a statewide reduction in potable urban water usage of 25% relative to water use in 2013. The term of the EO extended through February 28, 2016, although many of the directives have since become permanent water-efficiency standards and requirements. The EO includes specific directives that set strict limits on water usage in the state. In response to EO B-29-15, the California Department of Water Resources has modified and adopted a revised version of the Model Water Efficient Landscape Ordinance that, among other changes, significantly increases the requirements for landscape water use efficiency and broadens its applicability to include new development projects with smaller landscape areas.

Other State Regulations and Goals

Senate Bill 97. SB 97 (Dutton) (August 2007) directed the Governor's Office of Planning and Research to develop guidelines under CEQA for the mitigation of GHG emissions. In 2008, OPR issued a technical advisory as interim guidance regarding the analysis of GHG emissions in CEQA documents. The advisory indicated that the lead agency should identify and estimate a project's GHG emissions, including those associated with vehicular traffic, energy consumption, water usage, and construction activities (OPR 2008). The advisory further recommended that the lead agency should determine the significance of the impacts and impose all mitigation measures necessary to reduce GHG emissions to a level that is less than significant. The California Natural Resources Agency adopted the CEQA Guidelines amendments in December 2009, which became effective in March 2010.

Under the amended CEQA Guidelines, a lead agency has the discretion to determine whether to use a quantitative or qualitative analysis or apply performance standards to determine the significance of GHG emissions resulting from a particular project (14 CCR 15064.4(a)). The CEQA Guidelines require a lead agency to consider the extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions (14 CCR 15064.4(b)). The CEQA Guidelines also allow a lead agency to consider feasible means of mitigating the significant effects of GHG emissions, including reductions in emissions through the implementation of project features or off-site measures. The adopted amendments do not establish a GHG emission threshold; instead they allow a lead agency to develop, adopt, and apply its own thresholds of significance or those developed by other agencies or experts. The California Natural Resources Agency also acknowledges that a lead agency may consider compliance with regulations or requirements when implementing AB 32 in determining the significance of a project's GHG emissions (CNRA 2009).

Executive Order S-13-08. EO S-13-08 (November 2008) is intended to hasten California's response to the impacts of global climate change, particularly sea-level rise. Therefore, the EO directs state agencies to take specified actions to assess and plan for such impacts. The final 2009 California Climate Adaptation Strategy: A Report to the Governor of the State of California in

Response to Executive Order S-13-2008 (CNRA 2009) was issued in December 2009, and an update, Safeguarding California: Reducing Climate Risk – An Update to the 2009 California Climate Adaptation Strategy (CNRA 2014), followed in July 2014. To assess the state's vulnerability, the reports summarizes key climate change impacts to the state for the following areas: agriculture, biodiversity and habitat, emergency management, energy, forestry, ocean and coastal ecosystems and resources, public health, transportation, and water. Issuance of the Safeguarding California: Implementation Action Plans followed in March 2016 (CNRA 2016). Currently, a draft of the Safeguarding California Plan: 2017 Update is being prepared to communicate current and needed actions that state government should take to build climate change resiliency (CNRA 2017).

State of the State Address - 2015. In January 2015, in his inaugural address and annual report to the Legislature, Governor Jerry Brown established supplementary goals that would further reduce GHG emissions over the next 15 years. These goals include an increase in California's renewable energy portfolio from 33% to 50%, a reduction in vehicle petroleum use for cars and trucks by up to 50%, measures to double the efficiency of existing buildings, and the decrease emissions associated with heating fuels.

State of the State Address - 2016. In his January 2016 address, Governor Brown established a statewide goal to bring per capita GHG emission down to two tons per person, which reflects the goal of the Global Climate Leadership Memorandum of Understanding (Under 2 MOU) to limit global warming to less than 2°C by 2050. The Under 2 MOU agreement pursues emission reductions of 80% to 95% below 1990 levels by 2050 and/or reach a per capita annual emissions goal of less than 2 MT by 2050. A total of 135 jurisdictions representing 32 countries and 6 continents, including California, have signed or endorsed the Under 2 MOU (Under2 Coalition 2016).

4.3 LOCAL

City of San Diego

On January 29, 2002, the City Council unanimously approved the San Diego Sustainable Community Program. Actions identified include the following (City of San Diego 2005):

1. Participation in the Cities for Climate Protection program coordinated through the International Council of Local Environmental Initiatives;
2. Establishment of a 15% GHG reduction goal set for 2010, using 1990 as a baseline; and
3. Direction to use the recommendations of a scientific Ad Hoc Advisory Committee as a means to improve the GHG Emission Reduction Action Plan within the City organization and to identify additional community actions.

In 2005, the City released a Climate Protection Action Plan. This plan includes many of the recommendations provided by the Ad Hoc Advisory Committee and City staff (City of San Diego 2005). By implementing these recommendations, the City could directly address the

challenges relating to mitigation for state and federal O_3 standards, nonattainment (with associated health benefits) and enhanced economic prosperity, specifically related to the tourism and agricultural sectors.

The Climate Protection Action Plan evaluated citywide GHG emissions, specifically the following: (1) the GHG projection in 2010 resulting from no action taken to curb emissions, (2) the GHG emissions reductions due to City actions implemented between 1990 and 2003, and (3) the GHG reductions needed by 2010 to achieve 15% reduction. The Climate Protection Action Plan did not recommend or require specific strategies or measures for projects within the City to reduce emissions (City of San Diego 2005).

In December 2015, the City adopted its Final CAP (City of San Diego 2015a). A Program Environmental Impact Report was prepared for the City's Draft CAP, which was certified in December 2015 (City of San Diego 2015b). With implementation of the CAP, the City intends to reduce emissions 15% below the baseline, to approximately 11.1 MMT CO_2E, by 2020; 40% below the baseline, to approximately 7.8 MMT CO_2E, by 2030; and 50% below the baseline, to approximately 6.5 MMT CO_2E, by 2035. With implementation of the CAP, it is anticipated that the City would exceed its reduction target by 1.3 MMT CO_2E in 2020, 176,528 MT CO_2E in 2030, and 127,135 MT CO_2E in 2035. The CAP relies on significant City and regional actions, continued implementation of federal and state mandates, and five local strategies with associated action steps for target attainment. The City has identified the following five strategies to reduce GHG emissions to achieve the 2020 and 2035 targets:

1. Energy- and water-efficient buildings;
2. Clean and renewable energy;
3. Bicycling, walking, transit, and land use;
4. Zero waste (gas and waste management); and
5. Climate resiliency.

Implementation of the CAP is divided into three actions:

1. Early actions (Adoption of the CAP–December 31, 2017);
2. Mid-term actions (January 1, 2018–December 31, 2020); and
3. Longer-term actions (2021–2035).

The 2015 CAP demonstrates that the City acknowledges the existing and potential impacts of a changing climate and is committed to keeping it in the forefront of decision making. Successful implementation of the CAP will prepare for anticipated climate change impacts in the coming decades, help the State of California achieve its reduction target by contributing the City's fair share of GHG reductions and have a positive impact on the regional economy.
The CAP meets the requirements set forth in CEQA Guidelines, Section 15183.5, whereby a lead agency (e.g., the City) may analyze and mitigate the significant effects of GHG emissions at a programmatic level, such as in a general plan, a long-range development plan, or a separate plan, to reduce GHG emissions. The CAP Consistency Checklist (City of San Diego 2017a),

which was adopted by the City Council on July 12, 2016, and subsequently updated February 2017, is intended to provide a streamlined review process for the GHG emissions analysis of proposed new development projects that are subject to discretionary review and trigger environmental review pursuant to CEQA.

4.4 THRESHOLDS OF SIGNIFICANCE

To address GHG CEQA threshold GHG-1, the City's CAP Consistency Checklist was followed. The CAP Consistency Checklist is the primary document used by the City to ensure project-by-project consistency with the underlying assumptions in the CAP and to ensure that the City would achieve its emission reduction targets identified in the CAP. The CAP Consistency Checklist includes a three-step process to determine if the project would result in a GHG impact. Step 1 consists of an evaluation to determine the project's consistency with existing General Plan, Community Plan, and zoning designations for the site. If the applicant is able to answer "yes" to Step 1 and demonstrate that the proposed project would be consistent with existing General Plan, Community Plan, and zoning designations for the site, or the applicant can demonstrate the project's consistency with existing land uses by comparing the proposed project's GHG emissions with those that would be generated under existing land uses, then the applicant may proceed to Step 2. If the applicant must answer "no" to Step 1, and the proposed project would result in a more GHG-intensive land use than those assumptions utilized in development of the CAP, then the project would be deemed inconsistent with the CAP and GHG impacts as identified under CEQA would be considered significant and unavoidable.

To address Step 1, this analysis compares the potential emissions of the buildout of the allowed uses under the existing land use designation and the proposed project. The existing land use represents the buildout assumptions used in the City's CAP to estimate likely future emissions and provide a framework for necessary reductions for meeting state goals.

Step 2 of the CAP includes the list of GHG reduction measures each project would be required to implement. Regardless of whether the applicant would answer "yes" or "no" to Step 1 regarding the project, implementation of the measures listed in Step 2 would be required for all projects.

Step 3 would only be applicable for projects that would not be consistent with existing land use designations and would not be consistent with planned site land use GHG emissions but would be located in a TPA as defined by the City's Planning Department. In accordance with SB 743, TPAs are defined as "an area within one-half mile of a major transit stop that is existing or planned, if the planned stop is scheduled to be completed within the planning horizon included in a Transportation Improvement Program adopted pursuant to Section 450.216 or 450.322 of Title 23 of the Code of Federal Regulations" (City of San Diego 2016). Appendix B of the CAP includes a map of TPAs as designated by the City (refer to Appendix B, Transit Priority Areas per SB 743, in the CAP). The TPAs map is based on the adopted San Diego Forward: The Regional Plan (SANDAG 2015). The project site is not located within a TPA; thus, Step 3 is not applicable.

Section 450.216 of the CAP addresses development and content of the statewide transportation improvement program. Statewide transportation improvement programs cover a period of at least 4 years. Section 450.322 of the CAP refers to development and content of the metropolitan transportation plan. The RTP/SCS has at least a 20-year planning horizon. "Major Transit Stop," as defined in Section 21064.3 of the CAP, means "a site containing an existing rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service of 15 minutes or less during the morning and afternoon peak commute periods" (City of San Diego 2016a).

Global climate change is inherently cumulative impact; a project participates in this potential impact through its incremental contribution combined with the cumulative increase of all other sources of GHGs. The City's CAP consistency Checklist also serves as the significance determination threshold for cumulative impacts related to climate change.

5.0 ANALYSIS METHODOLOGY AND ASSUMPTIONS

CalEEMod, Version 2016.3.2,[4] was used to estimate potential project-generated operational GHG emissions from area sources (landscape maintenance), energy sources (natural gas and electricity), mobile sources, solid waste, and water supply and wastewater treatment for the following scenarios:

- Buildout of the existing land use and zoning designations; and
- Buildout of the proposed project.

Emissions from each category are discussed in the following text with respect to each scenario. Operational Year 2020 was assumed consistent with the Traffic Impact Analysis "opening day" assessment.

5.1 BUILDOUT OF THE EXISTING LAND USE AND ZONING DESIGNATIONS

For the purpose of this analysis, it is assumed that the site would be built out with a church building as a worst-case use as that was the former use of the site. As described, the maximum building size based on the current FAR and would be approximately 60,766 square feet. Based on the City's Trip Generation Manual (City of San Diego, 2003), a church (house of worship) would generate 15 trips per 1,000 square feet (911 trips) on non-assembly days and 60 trips per 1,000 square feet (3,646) on days of assembly. For modeling purposes, it was assumed that that church holds services two days per week and that the assembly day trips occur on one service day and one-half of the assembly day trips (1,823 trips) occur on the other service day.

[4] CalEEMod is a statewide land use emissions computer model designed to provide a uniform platform to calculate construction and operational emissions from land use development projects. The model was developed for the California Air Pollution Control Officers Association in collaboration with multiple air districts across the state. Numerous lead agencies in the state, including the San Diego Air Pollution Control District, use CalEEMod to estimate GHG emissions.

Area Sources

CalEEMod was used to estimate operational emissions from area sources, including emissions from hearths and landscape maintenance equipment. Emissions associated with natural gas usage in space heating, water heating, and stoves are calculated in the building energy use module of CalEEMod, as described in the following text.

Landscape maintenance includes fuel combustion emissions from equipment such as lawn mowers, rototillers, shredders/grinders, blowers, trimmers, chainsaws, and hedge trimmers. The emissions associated with landscape equipment use are estimated based on CalEEMod default values for emission factors (grams per square foot of nonresidential building space per day) and number of summer days (when landscape maintenance would generally be performed) and winter days. Default CalEEMod assumptions were used to estimate area source emissions.

Energy Sources

Energy sources include emissions associated with building electricity and natural gas consumption (non-hearth). Electricity use would contribute indirectly to GHGs since GHG emissions occur at the site of the generating plant, which is typically off-site. The CalEEMod emission factors were adjusted to reflect the forecasted renewable mix in 2020 in accordance with the state RPS goals. Annual natural gas (non-hearth) and electricity emissions were estimated in CalEEMod using these emissions factors for San Diego Gas & Electric (SDG&E), which would be the electricity and natural gas provider.

The estimation of operational energy emissions was based on CalEEMod defaults and total area (i.e., square footage) of the development. The energy intensity value (electricity and natural gas usage per square foot/year) for nonresidential buildings is calculated based on the California Commercial End-Use Survey database. Emissions are calculated by multiplying the energy use by the utility carbon intensity (pounds of GHGs per kilowatt-hour for electricity or 1,000 Btu for natural gas) for CO_2 and other GHGs. Annual natural gas (non-hearth) and electricity emissions were estimated in CalEEMod using the emissions factors for SDG&E.

Mobile Sources

Mobile sources would primarily be motor vehicles (automobiles and light-duty trucks) traveling to and from the site. As discussed, trip generation rates were obtained from the City of San Diego Trip Generation Manual. It was assumed the daily trip rate (911) occur 5 days out of the week. As referenced, a trip rate of 3,646 was assumed for one day to account for multiple services. A trip rate of 1,823 (3,646/2) was assumed for one day to account for mid-week and/or evening services.

Regulatory measures related to mobile sources include AB 1493 (Pavley) and federal standards. AB 1493 required that CARB establish GHG emission standards for automobiles, light-duty

trucks, and other vehicles determined by CARB to be vehicles that are primarily used for noncommercial personal transportation in the state. In addition, the NHTSA and EPA have established corporate fuel economy standards and GHG emission standards, respectively, for automobiles and light-, medium-, and heavy-duty vehicles. Implementation of these standards and fleet turnover (replacement of older vehicles with newer vehicles) will gradually reduce mobile emissions. The effectiveness of fuel economy improvements was evaluated by using the CalEEMod emission factors for motor vehicles in 2020 to the extent it was captured in EMFAC 2014.

The Low Carbon Fuel Standard calls for a 10% reduction in the carbon intensity of motor vehicle fuels by 2020, which would further reduce GHG emissions. However, the carbon intensity reduction associated with the Low Carbon Fuel Standard was not assumed in EMFAC 2014; and thus, was not included in CalEEMod, Version 2016.3.2.

Solid Waste

The project would generate solid waste; and therefore, result in CO_2E emissions associated with landfill off-gassing. CalEEMod default values for solid waste generation were used to estimate GHG emissions associated with solid waste. Per AB 341 (requiring mandatory commercial recycling beginning July 1, 2012), commercial developments, such as the proposed project, would be required to provide recycling services (City of San Diego 2017b). Both the City's Zero Waste Plan and AB 341 attempt to achieve a 75% diversion rate by 2020. It was assumed that both buildout of the project site under current zoning and the proposed project would meet the 75% recycling goal by opening year (2020).

Water and Wastewater

Supply, conveyance, treatment, and distribution of water for the project would require the use of electricity, which would result in associated indirect GHG emissions. Similarly, wastewater generated by the project would require the use of electricity for conveyance and treatment, along with GHG emissions generated during wastewater treatment. Water consumption estimates for both indoor and outdoor water use and associated electricity consumption from water use and wastewater generation were estimated using CalEEMod default values with a 20% reduction to account for the Model Water Landscape Efficiency Ordinance.

5.2 BUILDOUT OF THE PROPOSED PROJECT

Operation of the proposed project would result in GHG emissions from area sources (landscape maintenance), energy sources (electrical generation, natural gas consumption), mobile sources (vehicular traffic), solid waste, and water supply (including wastewater generation). As discussed under mobile sources, an operational year of 2020 was assumed, consistent with the traffic report prepared by LOS Engineers, Inc., (February 2018). Per the construction schedule assumptions, construction of the project is assumed to be complete in 2020. Construction was

assumed to begin in mid-2018 and finish by late 2019 so an operational year of 2020 accurately represents the anticipated operational year.

Area Sources

Default CalEEMod assumptions were used to estimate area source emissions for the proposed project.

Energy Sources

GHG energy emissions from building energy use were estimated assuming a 5% improvement over the default values in CalEEMod and the installation of solar panels to provide at least 35% of the electrical energy demand. In addition, modeling assumed the use of high efficiency lighting to reflect the 2013 Title 24 California Energy Code. This improvement represents compliance with the 2016 Title 34 standards, which became effective January 1, 2017.

Mobile Sources

The proposed project would impact air quality through the vehicular traffic generated by the proposed project. The project trip generation for the project was calculated using trip rates from the city of San Diego *Trip Generation Manual*, May 2003. The project is calculated to generate 1,125 ADT with 90 AM peak hour trips (36 inbound and 54 outbound) and 102 PM peak hour trips (41 inbound and 61 outbound).

Project-related traffic was assumed to include a mixture of vehicles in accordance with the model outputs for traffic. Emission factors representing the vehicle mix and emissions for 2020 were used to estimate emissions associated with full buildout of the proposed project.

Solid Waste

As described above for the existing land use build out scenario, a 75% diversion was assumed for 2020 to demonstrate compliance with AB 341 and the City's Zero Waste Plan goal. (City of San Diego 2015d).

Water and Wastewater

The project would include installation of low-flow bathroom and kitchen faucets, low-flow toilets, and low-flow showers. With regard to outdoor water, the project would install water-efficient devices and landscaping in accordance with applicable ordinances, including use of drought-tolerant plant species appropriate to the climate and region. It is assumed that no turf would be installed to reduce water use associated with landscaping. It was assumed that the project applicant would apply a water conservation strategy resulting in a 20% reduction in indoor water use per CALGreen requirements for plumbing fixtures and fittings and a minimum 20% reduction in outdoor water use.

6.0 IMPACT ANALYSIS

Would the proposed project generate GHG emissions, either directly or indirectly that may have a significant impact on the environment?

The City's CAP was adopted to ensure that emissions from activities in the City would not exceed established state targets. The CAP assumes a baseline level of construction and buildout of the land use and zoning in place at the time the CAP was adopted. Revisions to land use designations required to accommodate new project proposals, could result in the approval of projects that result in greater emissions than what was assumed in the CAP. This can be caused by allowing projects with higher density or vehicle trips than what was envisioned. For comparison purposes, potential emissions from build out of the project site under the existing land use designation are compared with the proposed project and presented in Section 6.1, Step 1 Consistency. The CAP also requires design strategies to reduce the project's operational demand for energy, water, and vehicle trips. The project's consistency with these strategies as well as measures required to reduce project emissions to less than or equal to build out under current land use designations are also provided in Section 6.2, Step 2 Consistency.

6.1 STEP 1 LAND USE CONSISTENCY

The proposed project would not be consistent with Step 1 of the CAP Consistency Checklist. The project proposes an Amendment to the College Area Community Plan and a Rezone. The proposed amendment to the College Area Community Plan would change the current land use designation from *Low/Medium Density Residential [10 – 15 dwelling units per acre (du/ac)]* and *General Commercial Residential (75 – 110 du/ac)* to *Residential Medium with Commercial (15-29 du/ac)* to allow redevelopment of the project site with a maximum 125-room hotel or a base density of 55-multifamily residential units. The proposed rezone would change the existing RM-1-1 zone to CV-1-1. The project would retain the General Plan land use designation.

Table 1 presents the operational GHG emissions from buildout of the existing land use. As described in Section 5.1, Buildout of the Existing Land Use and Zoning Designations, buildout was modeled as a 60,766 square feet church with a 125-space parking lot. As shown in Table 1, annual emissions from buildout of the existing land use would be approximately 1,239.2 MT CO_2E per year.

Table 1: Estimated Annual Existing Land Use Buildout Operational GHG Emissions

Emission Source	CO_2	CH_4	N_2O	CO_2E
	Metric Tons per Year			
Area	0.01	0.01	0.00	0.02
Energy	206.3	0.01	0.01	207.1
Mobile	969.8	0.05	0.00	971.2
Solid waste	17.5	1.0	0.00	43.5
Water supply and wastewater	15.5	0.05	0.01	17.2
Total	1,121.2	1.15	0.02	1,239.2

CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2E = carbon dioxide equivalent.
Mobile emissions are based on an average daily traffic (ADT) of 911 trips for 5 days, 1,823 trips for one day and 3,646 trips for one day each week.
Emissions estimates are based on a buildout year of 2020.
Totals may not sum due to rounding. See Appendix A for detailed esults.

The estimated operational project-generated GHG emissions from area sources, energy usage, motor vehicles, solid waste generation, water supply, and wastewater treatment, considering the project design features, in 2020 (i.e., first full year of project operation) are shown in Table 2.

Table 2: Proposed Project Buildout Operational GHG Emissions

Emission Source	CO_2	CH_4	N_2O	CO_2E
	Metric Tons per Year			
Area	0.01	0.01	0.00	0.01
Energy	390.5	0.01	0.01	392.3
Mobile	781.0	0.04	0.00	782.2
Solid waste	3.4	0.2	0.00	8.6
Water supply and wastewater	12.6	0.08	0.01	15.3
Total	1,187.6	0.34	0.02	1,198.5

See Appendix A for detailed results. CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2E = carbon dioxide equivalent.
Emissions estimates are based on a buildout year of 2020. Totals may not sum due to rounding.

As shown in Tables 3 and 4, with the incorporation of measures to reduce energy emissions, GHG emissions associated with the proposed project would be approximately 41 MT annually less than the build out scenario under the existing land use designation. Therefore, pursuant to the City's CAP Consistency Checklist, the project would not have an adverse impact to GHG emissions.

6.2 STEP 2 CONSISTENCY CHECKLIST

The proposed project would be consistent with Step 2 of the CAP Consistency Checklist. Step 2 evaluates the proposed project's consistency with the CAP Consistency Checklist. For informational purposes, estimated project-generated emissions are provided in Chapter 7. The proposed project's consistency with the five CAP strategies and the CAP Consistency Checklist is presented in Table 3.

Table 3: Consistency with the CAP Strategies and Step 2 Checklist Items

CAP Consistency Checklist Item	Consistency Evaluation
Strategy 1: Energy- and Water-Efficient Buildings	
Checklist Requirement: 1. Cool/Green Roofs • Would the project include roofing materials with a minimum 3-year aged solar reflection and thermal emittance or solar reflection index equal to or greater than the values specified in the voluntary measures under California Green Building Standards Code?; OR • Would the project roof construction have a thermal mass over the roof membrane, including areas of vegetated (green) roofs, weighing at least 25 pounds per square foot as specified in the voluntary measures under California Green Building Standards Code?; OR • Would the project include a combination of the above two options?	**Consistent**. The application will provide a single ply roofing membrane with an aged SRI equal to or greater than .55

CAP Consistency Checklist Item	Consistency Evaluation
Checklist Requirement: 2. Plumbing Fixtures and Fittings With respect to plumbing fixtures or fittings provided as part of the project, would those low-flow fixtures/appliances be consistent with each of the following: <u>Residential buildings</u>: • Kitchen faucets: maximum flow rate not to exceed 1.5 gallons per minute at 60 pounds per square inch; • Standard dishwashers: 4.25 gallons per cycle; • Compact dishwashers: 3.5 gallons per cycle; and • Clothes washers: water factor of 6 gallons per cubic feet of drum capacity? <u>Nonresidential buildings</u>: • Plumbing fixtures and fittings that do not exceed the maximum flow rate specified in Table A5.303.2.3.1 (voluntary measures) of the California Green Building Standards Code; and • Appliances and fixtures for commercial applications that meet the provisions of Section A5.303.3 (voluntary measures) of the California Green Building Standards Code?	**Consistent**. The proposed project would include the required flow rates and appliances that meet the voluntary measures portion of the California Green Building Standards Code for non-residential buildings. Fixtures installed with the project are as follows: • Water closets 1.28 gpf • Urinals wall mounted .125 gpf • Showerheads 1.8 gpm @ 80 psi • Restroom faucets .35 gpm @ 60 psi • Wash fountain 1.8 gpm • Kitchen faucets 1.6 gpm
Strategy 3: Bicycling, Walking, Transit and Land Use	
Checklist Requirement: 3. Electric Vehicle Charging • Multiple-family projects of 17 dwelling units or less: Would 3% of the total parking spaces required, or a minimum of one space, whichever is greater, be provided with a listed cabinet, box or enclosure connected to a conduit linking the parking spaces with the electrical service, in a manner approved by the building and safety official, to allow for the future installation of electric vehicle supply equipment to provide electric vehicle charging stations at such time as it is needed for use by residents?	**Consistent**. The applicant will provide wiring and cabinet infrastructure for future installation of a minimum of 7 EVC parking spaces.

<table>
<tr><th>CAP Consistency Checklist Item</th><th>Consistency Evaluation</th></tr>
<tr><td>• Multiple-family projects of more than 17 dwelling units: Of the total required listed cabinets, boxes or enclosures, would 50% have the necessary electric vehicle supply equipment installed to provide active electric vehicle charging stations ready for use by residents?
• Non-residential projects: Of the total required listed cabinets, boxes or enclosures, would 50% have the necessary electric vehicle supply equipment installed to provide active electric vehicle charging stations ready for use?</td><td></td></tr>
<tr><td>Checklist Requirement:
4. Bicycle Parking Spaces

Would the project provide more short- and long-term bicycle parking spaces than required in the City's Municipal Code (Chapter 14, Article 2, Division 5)?</td><td>Consistent. The project is required to provide seven short-term bicycle parking spaces and seven long-term bicycle parking spaces. The project would provide 10 short-term and eight long-term parking spaces</td></tr>
<tr><td>Checklist Requirement:
5. Shower Facilities

If the project includes nonresidential development that would accommodate over 10 tenant occupants (employees), would the project include changing/shower facilities in accordance with the voluntary measures under the California Green Building Standards Code as shown in the table [Table 3a] below?
Table 3a
Shower Facility Requirements
<table>
<tr><th>Number of Tenant Occupants (Employees)</th><th>Shower/Changing Facilities Required</th><th>Two-Tier (12" × 15" × 72") Personal Effects Lockers Required</th></tr>
<tr><td>0–10</td><td>0</td><td>0</td></tr>
<tr><td>11–50</td><td>1 shower stall</td><td>2</td></tr>
<tr><td>51–100</td><td>1 shower stall</td><td>3</td></tr>
<tr><td>101–200</td><td>1 shower stall</td><td>4</td></tr>
<tr><td>Over 200</td><td>1 shower stall plus 1 additional shower stall for each 200 additional tenant/occupants</td><td>1 two-tier locker plus 1 two-tier locker for each 50 additional tenant/occupants</td></tr>
</table></td><td>**Consistent**. The applicant will provide 1 shower stall and a minimum of 2 two-tier personal effects lockers for employees.</td></tr>
</table>

<table>
<tr><th>CAP Consistency Checklist Item</th><th>Consistency Evaluation</th></tr>
<tr><td>

Checklist Requirement:
6. Designated Parking Spaces

If the project includes an employment use in a TPA, would the project provide designated parking for a combination of low-emitting, fuel-efficient, and carpool/vanpool vehicles in accordance with the table [Table 3b] below?

Table 3b
Parking Requirements

<table>
<tr><th>Number of Required Parking Spaces</th><th>Number of Designated Parking Spaces</th></tr>
<tr><td>0–9</td><td>0</td></tr>
<tr><td>10–25</td><td>2</td></tr>
<tr><td>26–50</td><td>4</td></tr>
<tr><td>51–75</td><td>6</td></tr>
<tr><td>76–100</td><td>9</td></tr>
<tr><td>101–150</td><td>11</td></tr>
<tr><td>151–200</td><td>18</td></tr>
<tr><td>201 and over</td><td>At least 10% of total</td></tr>
</table>

This measure does not cover electric vehicles. See Question 4 for electric vehicle parking requirements.

Note: Vehicles bearing Clean Air Vehicle stickers from expired HOV lane programs may be considered eligible for designated parking spaces. The required designated parking spaces are to be provided within the overall minimum parking requirement, not in addition to it.

</td><td>

Not Applicable. The applicant would provide 11 spaces will be designated for low emitting, fuel-efficient, and vanpool vehicles with signage and/or striping

</td></tr>
<tr><td>

Checklist Requirement:
7. Transportation Demand Management Program

If the project would accommodate over 50 tenant-occupants (employees), would it include a Transportation Demand Management Program that would be applicable to existing tenants and future tenants that includes:

At least one of the following components:

- Parking cash out program?
- Parking management plan that includes charging employees market-rate for single-occupancy vehicle

</td><td>

Not Applicable. The proposed hotel project would not accommodate over 50 tenant occupants. Therefore, a Transportation Demand Management Program is not required.

</td></tr>
</table>

CAP Consistency Checklist Item	Consistency Evaluation
parking and providing reserved, discounted, or free spaces for registered carpools or vanpools? • Unbundled parking whereby parking spaces would be leased or sold separately from the rental or purchase fees for the development for the life of the development? And at least three of the following components: Commitment to maintaining an employer network in the SANDAG iCommute program and promoting its RideMatcher service to tenants/employees? On-site carsharing vehicle(s) or bikesharing? Flexible or alternative work hours? Telework program? Transit, carpool, and vanpool subsidies? Pre-tax deduction for transit or vanpool fares and bicycle commute costs Access to services that reduce the need to drive, such as cafes, commercial stores, banks, post offices, restaurants, gyms, or childcare, either onsite or within 1,320 feet (1/4 mile) of the structure/use?	

Sources: City of San Diego 2015a, 2017a.

As summarized in Table 3, the project would be consistent with applicable CAP Consistency Checklist items and would be consistent with the City's CAP with respect to planning and land use strategies. The project would not impede the City's ability to implement the actions identified in the CAP to achieve the CAP's targets and associated GHG emission reductions. Therefore, the project would result in a less than significant impact on climate change with regard to Step 2 of the City's CAP Consistency Checklist.

6.3 STEP 3 CONSISTENCY

Because the project site is not located in a TPA, as defined by SB 743 as a quarter mile from an existing or planned transit stop, Step 3 is not applicable.

6.4 CAP CONSISTENCY CONCLUSION

Per the Step 1 consistency analysis, emissions from the proposed project would be less than the worst-case buildout of the land use inventoried in the CAP; thus, GHG emissions would be less than significant. Regarding Step 2 consistency, the project would be consistent with applicable CAP Consistency Checklist items and is consistent with the City's CAP with respect to planning and land use strategies. Step 3 consistency is not applicable to the project.

Because the project would be consistent with Steps 1 and 2, the proposed project would be consistent with the City of San Diego Climate Action Plan. GHG impacts would be less than significant.

7.0 PROPOSED PROJECT CONSTRUCTION EMISSIONS

Construction of the proposed project would result in short-term GHG emissions through the use of construction equipment, off-site trucks hauling construction materials, and worker trips. Emissions from construction of the proposed project are not required to determine compliance with the City's CAP; however, they are presented below for disclosure.

For the purposes of modeling, and consistent with the air quality analysis, it was assumed that construction of the proposed project would begin in September 2019. Construction of the project from start to finish is estimated to take approximately 15 months.

The construction phasing and equipment mix used for estimating the construction emissions of the project was calculated using CalEEMod 2016.3.2 default values (Appendix A). For the analysis, it was generally assumed that heavy construction equipment would be operating at the site for approximately 8 hours per day, 5 days per week (22 days per month), during project construction. Construction-worker trip, vendor trip, and haul truck trip estimates by construction phase were also calculated using CalEEMod defaults. Table 4 presents construction emissions for the project in 2019 and 2020 from on-site and off-site emission sources.

Table 4: Estimated Annual Proposed Project Construction GHG Emissions

Year	CO_2	CH_4	N_2O	CO_2E
	Metric Tons per Year			
2019	109.2	0.01	0.00	109.7
2020	208.7	0.03	0.00	209.5
Total	317.9	0.04	0.00	319.2
Amortized Construction Emissions over 30 years				10.64

CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2E = carbon dioxide equivalent. See Appendix A for detailed results.

As shown in Table 6, the estimated GHG emissions generated during project construction would be approximately 319.2 MT CO_2E. Estimated project-generated construction emissions amortized over 30 years would be approximately 10.64 MT CO_2E per year. As referenced, emissions from construction of the proposed project are not required to determine compliance with the City's CAP. They are provided herein the purpose of disclosure.

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Appendix A

CalEEMod Air Emission Model Results –
Annual Emissions for Construction and Operation

Montezuma Road Hotel

San Diego County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	125.00	Space	1.13	50,000.00	0
Hotel	125.00	Room	0.71	67,990.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2020
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	720.49	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Acreage and square footage adjusted to reflect project size.

Construction Phase - Construction duration estimated.

Grading - Area graded assumes entire site would be disturbed

Vehicle Trips - A total of 9 daily trips per room assumed for weekday conditions to match traffic report.

Construction Off-road Equipment Mitigation -

Mobile Land Use Mitigation -

Mobile Commute Mitigation -

Area Mitigation - Assumes 150 g/litre for non-flat coatings per SDAPCD Rule 67.

Energy Mitigation -

Water Mitigation -

Waste Mitigation -

Table Name	Column Name	Default Value	New Value
tblAreaMitigation	UseLowVOCPaintNonresidentialExteriorValue	250	150
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	250	150
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True
tblAreaMitigation	UseLowVOCPaintParkingValue	250	150
tblAreaMitigation	UseLowVOCPaintResidentialExteriorValue	250	150
tblAreaMitigation	UseLowVOCPaintResidentialInteriorValue	250	150
tblConstructionPhase	NumDays	10.00	60.00
tblConstructionPhase	NumDays	10.00	20.00
tblGrading	AcresOfGrading	1.50	1.86
tblLandUse	LandUseSquareFeet	181,500.00	67,990.00
tblLandUse	LotAcreage	4.17	0.71
tblVehicleTrips	WD_TR	8.17	9.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.1061	0.8435	0.6501	1.2600e-003	0.0331	0.0438	0.0769	0.0127	0.0417	0.0545	0.0000	109.2966	109.2966	0.0191	0.0000	109.7745
2020	0.9829	1.3240	1.2048	2.4300e-003	0.0401	0.0643	0.1044	0.0109	0.0620	0.0729	0.0000	208.7465	208.7465	0.0313	0.0000	209.5282
Maximum	**0.9829**	**1.3240**	**1.2048**	**2.4300e-003**	**0.0401**	**0.0643**	**0.1044**	**0.0127**	**0.0620**	**0.0729**	**0.0000**	**208.7465**	**208.7465**	**0.0313**	**0.0000**	**209.5282**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.1061	0.8435	0.6501	1.2600e-003	0.0235	0.0438	0.0672	7.8200e-003	0.0417	0.0496	0.0000	109.2965	109.2965	0.0191	0.0000	109.7744
2020	0.9829	1.3240	1.2048	2.4300e-003	0.0401	0.0643	0.1044	0.0109	0.0620	0.0729	0.0000	208.7464	208.7464	0.0313	0.0000	209.5280
Maximum	**0.9829**	**1.3240**	**1.2048**	**2.4300e-003**	**0.0401**	**0.0643**	**0.1044**	**0.0109**	**0.0620**	**0.0729**	**0.0000**	**208.7464**	**208.7464**	**0.0313**	**0.0000**	**209.5280**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**13.18**	**0.00**	**5.32**	**20.76**	**0.00**	**3.85**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**9-2-2019**	**12-1-2019**	0.7146	0.7146
2	**12-2-2019**	**3-1-2020**	0.6480	0.6480
3	**3-2-2020**	**6-1-2020**	0.6359	0.6359
4	**6-2-2020**	**9-1-2020**	0.7559	0.7559
5	**9-2-2020**	**9-30-2020**	0.2986	0.2986
		Highest	0.7559	0.7559

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.3495	2.0000e-005	2.3100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.4700e-003	4.4700e-003	1.0000e-005	0.0000	4.7700e-003
Energy	0.0214	0.1945	0.1634	1.1700e-003		0.0148	0.0148		0.0148	0.0148	0.0000	505.2430	505.2430	0.0159	6.3300e-003	507.5251
Mobile	0.2982	1.2363	3.1158	9.3400e-003	0.7562	9.5600e-003	0.7658	0.2025	8.9600e-003	0.2115	0.0000	860.0806	860.0806	0.0501	0.0000	861.3318
Waste						0.0000	0.0000		0.0000	0.0000	13.8927	0.0000	13.8927	0.8210	0.0000	34.4186
Water						0.0000	0.0000		0.0000	0.0000	1.0060	14.7724	15.7783	0.1039	2.5600e-003	19.1399
Total	**0.6691**	**1.4308**	**3.2815**	**0.0105**	**0.7562**	**0.0244**	**0.7806**	**0.2025**	**0.0238**	**0.2263**	**14.8987**	**1,380.1004**	**1,394.9991**	**0.9909**	**8.8900e-003**	**1,422.4201**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.3173	2.0000e-005	2.3100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.4700e-003	4.4700e-003	1.0000e-005	0.0000	4.7700e-003
Energy	0.0205	0.1867	0.1568	1.1200e-003		0.0142	0.0142		0.0142	0.0142	0.0000	390.5033	390.5033	0.0114	5.2900e-003	392.3641
Mobile	0.2882	1.1713	2.9016	8.4800e-003	0.6806	8.7200e-003	0.6893	0.1823	8.1800e-003	0.1905	0.0000	781.0870	781.0870	0.0464	0.0000	782.2470
Waste						0.0000	0.0000		0.0000	0.0000	3.4732	0.0000	3.4732	0.2053	0.0000	8.6046
Water						0.0000	0.0000		0.0000	0.0000	0.8048	11.8179	12.6227	0.0831	2.0500e-003	15.3119
Total	**0.6260**	**1.3580**	**3.0607**	**9.6000e-003**	**0.6806**	**0.0229**	**0.7035**	**0.1823**	**0.0224**	**0.2047**	**4.2780**	**1,183.4126**	**1,187.6905**	**0.3462**	**7.3400e-003**	**1,198.5324**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**6.44**	**5.09**	**6.73**	**8.66**	**10.00**	**5.87**	**9.87**	**10.00**	**5.77**	**9.56**	**71.29**	**14.25**	**14.86**	**65.06**	**17.44**	**15.74**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	9/2/2019	9/27/2019	5	20	
2	Site Preparation	Site Preparation	9/28/2019	10/1/2019	5	2	
3	Grading	Grading	10/2/2019	10/7/2019	5	4	
4	Building Construction	Building Construction	10/8/2019	7/13/2020	5	200	
5	Paving	Paving	7/14/2020	8/10/2020	5	20	
6	Architectural Coating	Architectural Coating	7/28/2020	10/19/2020	5	60	

Acres of Grading (Site Preparation Phase): 1

Acres of Grading (Grading Phase): 1.86

Acres of Paving: 1.13

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 101,985; Non-Residential Outdoor: 33,995; Striped Parking Area: 3,000 (Architectural Coating – sqft)

<u>OffRoad Equipment</u>

Montezuma Road Hotel - San Diego County, Annual

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Rubber Tired Dozers	1	7.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Graders	1	6.00	187	0.41
Grading	Rubber Tired Dozers	1	6.00	247	0.40
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Building Construction	Cranes	1	6.00	231	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	6.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	5	13.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	8.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	50.00	19.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	13.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	10.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0230	0.2268	0.1489	2.4000e-004		0.0129	0.0129		0.0120	0.0120	0.0000	21.4161	21.4161	5.4500e-003	0.0000	21.5524
Total	**0.0230**	**0.2268**	**0.1489**	**2.4000e-004**		**0.0129**	**0.0129**		**0.0120**	**0.0120**	**0.0000**	**21.4161**	**21.4161**	**5.4500e-003**	**0.0000**	**21.5524**

3.2 Demolition - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.1000e-004	3.9000e-004	3.8000e-003	1.0000e-005	1.0400e-003	1.0000e-005	1.0500e-003	2.8000e-004	1.0000e-005	2.8000e-004	0.0000	0.9731	0.9731	3.0000e-005	0.0000	0.9738
Total	**5.1000e-004**	**3.9000e-004**	**3.8000e-003**	**1.0000e-005**	**1.0400e-003**	**1.0000e-005**	**1.0500e-003**	**2.8000e-004**	**1.0000e-005**	**2.8000e-004**	**0.0000**	**0.9731**	**0.9731**	**3.0000e-005**	**0.0000**	**0.9738**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0230	0.2268	0.1489	2.4000e-004		0.0129	0.0129		0.0120	0.0120	0.0000	21.4161	21.4161	5.4500e-003	0.0000	21.5524
Total	**0.0230**	**0.2268**	**0.1489**	**2.4000e-004**		**0.0129**	**0.0129**		**0.0120**	**0.0120**	**0.0000**	**21.4161**	**21.4161**	**5.4500e-003**	**0.0000**	**21.5524**

3.2 Demolition - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.1000e-004	3.9000e-004	3.8000e-003	1.0000e-005	1.0400e-003	1.0000e-005	1.0500e-003	2.8000e-004	1.0000e-005	2.8000e-004	0.0000	0.9731	0.9731	3.0000e-005	0.0000	0.9738
Total	**5.1000e-004**	**3.9000e-004**	**3.8000e-003**	**1.0000e-005**	**1.0400e-003**	**1.0000e-005**	**1.0500e-003**	**2.8000e-004**	**1.0000e-005**	**2.8000e-004**	**0.0000**	**0.9731**	**0.9731**	**3.0000e-005**	**0.0000**	**0.9738**

3.3 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					5.8000e-003	0.0000	5.8000e-003	2.9500e-003	0.0000	2.9500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.7100e-003	0.0195	7.8900e-003	2.0000e-005		8.8000e-004	8.8000e-004		8.1000e-004	8.1000e-004	0.0000	1.5467	1.5467	4.9000e-004	0.0000	1.5589
Total	**1.7100e-003**	**0.0195**	**7.8900e-003**	**2.0000e-005**	**5.8000e-003**	**8.8000e-004**	**6.6800e-003**	**2.9500e-003**	**8.1000e-004**	**3.7600e-003**	**0.0000**	**1.5467**	**1.5467**	**4.9000e-004**	**0.0000**	**1.5589**

3.3 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-005	2.0000e-005	2.3000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0599	0.0599	0.0000	0.0000	0.0599
Total	**3.0000e-005**	**2.0000e-005**	**2.3000e-004**	**0.0000**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0599**	**0.0599**	**0.0000**	**0.0000**	**0.0599**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.2600e-003	0.0000	2.2600e-003	1.1500e-003	0.0000	1.1500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.7100e-003	0.0195	7.8900e-003	2.0000e-005		8.8000e-004	8.8000e-004		8.1000e-004	8.1000e-004	0.0000	1.5467	1.5467	4.9000e-004	0.0000	1.5589
Total	**1.7100e-003**	**0.0195**	**7.8900e-003**	**2.0000e-005**	**2.2600e-003**	**8.8000e-004**	**3.1400e-003**	**1.1500e-003**	**8.1000e-004**	**1.9600e-003**	**0.0000**	**1.5467**	**1.5467**	**4.9000e-004**	**0.0000**	**1.5589**

3.3 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-005	2.0000e-005	2.3000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0599	0.0599	0.0000	0.0000	0.0599
Total	**3.0000e-005**	**2.0000e-005**	**2.3000e-004**	**0.0000**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0599**	**0.0599**	**0.0000**	**0.0000**	**0.0599**

3.4 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0100	0.0000	0.0100	5.0700e-003	0.0000	5.0700e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.8400e-003	0.0321	0.0132	3.0000e-005		1.4700e-003	1.4700e-003		1.3600e-003	1.3600e-003	0.0000	2.5336	2.5336	8.0000e-004	0.0000	2.5536
Total	**2.8400e-003**	**0.0321**	**0.0132**	**3.0000e-005**	**0.0100**	**1.4700e-003**	**0.0115**	**5.0700e-003**	**1.3600e-003**	**6.4300e-003**	**0.0000**	**2.5336**	**2.5336**	**8.0000e-004**	**0.0000**	**2.5536**

3.4 Grading - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.0000e-005	5.0000e-005	4.7000e-004	0.0000	1.3000e-004	0.0000	1.3000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1198	0.1198	0.0000	0.0000	0.1199
Total	**6.0000e-005**	**5.0000e-005**	**4.7000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.1198**	**0.1198**	**0.0000**	**0.0000**	**0.1199**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.9100e-003	0.0000	3.9100e-003	1.9800e-003	0.0000	1.9800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.8400e-003	0.0321	0.0132	3.0000e-005		1.4700e-003	1.4700e-003		1.3600e-003	1.3600e-003	0.0000	2.5336	2.5336	8.0000e-004	0.0000	2.5536
Total	**2.8400e-003**	**0.0321**	**0.0132**	**3.0000e-005**	**3.9100e-003**	**1.4700e-003**	**5.3800e-003**	**1.9800e-003**	**1.3600e-003**	**3.3400e-003**	**0.0000**	**2.5336**	**2.5336**	**8.0000e-004**	**0.0000**	**2.5536**

3.4 Grading - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.0000e-005	5.0000e-005	4.7000e-004	0.0000	1.3000e-004	0.0000	1.3000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1198	0.1198	0.0000	0.0000	0.1199
Total	**6.0000e-005**	**5.0000e-005**	**4.7000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.1198**	**0.1198**	**0.0000**	**0.0000**	**0.1199**

3.5 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0693	0.4874	0.4114	6.7000e-004		0.0279	0.0279		0.0270	0.0270	0.0000	55.8369	55.8369	0.0107	0.0000	56.1053
Total	**0.0693**	**0.4874**	**0.4114**	**6.7000e-004**		**0.0279**	**0.0279**		**0.0270**	**0.0270**	**0.0000**	**55.8369**	**55.8369**	**0.0107**	**0.0000**	**56.1053**

3.5 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.7100e-003	0.0727	0.0195	1.6000e-004	3.8500e-003	5.0000e-004	4.3500e-003	1.1100e-003	4.8000e-004	1.5900e-003	0.0000	15.3960	15.3960	1.2400e-003	0.0000	15.4269
Worker	6.0100e-003	4.6100e-003	0.0446	1.3000e-004	0.0122	9.0000e-005	0.0123	3.2500e-003	8.0000e-005	3.3300e-003	0.0000	11.4146	11.4146	3.7000e-004	0.0000	11.4238
Total	**8.7200e-003**	**0.0774**	**0.0642**	**2.9000e-004**	**0.0161**	**5.9000e-004**	**0.0167**	**4.3600e-003**	**5.6000e-004**	**4.9200e-003**	**0.0000**	**26.8106**	**26.8106**	**1.6100e-003**	**0.0000**	**26.8507**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0693	0.4874	0.4114	6.7000e-004		0.0279	0.0279		0.0270	0.0270	0.0000	55.8369	55.8369	0.0107	0.0000	56.1052
Total	**0.0693**	**0.4874**	**0.4114**	**6.7000e-004**		**0.0279**	**0.0279**		**0.0270**	**0.0270**	**0.0000**	**55.8369**	**55.8369**	**0.0107**	**0.0000**	**56.1052**

3.5 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.7100e-003	0.0727	0.0195	1.6000e-004	3.8500e-003	5.0000e-004	4.3500e-003	1.1100e-003	4.8000e-004	1.5900e-003	0.0000	15.3960	15.3960	1.2400e-003	0.0000	15.4269
Worker	6.0100e-003	4.6100e-003	0.0446	1.3000e-004	0.0122	9.0000e-005	0.0123	3.2500e-003	8.0000e-005	3.3300e-003	0.0000	11.4146	11.4146	3.7000e-004	0.0000	11.4238
Total	**8.7200e-003**	**0.0774**	**0.0642**	**2.9000e-004**	**0.0161**	**5.9000e-004**	**0.0167**	**4.3600e-003**	**5.6000e-004**	**4.9200e-003**	**0.0000**	**26.8106**	**26.8106**	**1.6100e-003**	**0.0000**	**26.8507**

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1411	1.0278	0.9166	1.5300e-003		0.0553	0.0553		0.0534	0.0534	0.0000	126.1718	126.1718	0.0234	0.0000	126.7573
Total	**0.1411**	**1.0278**	**0.9166**	**1.5300e-003**		**0.0553**	**0.0553**		**0.0534**	**0.0534**	**0.0000**	**126.1718**	**126.1718**	**0.0234**	**0.0000**	**126.7573**

3.5 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.0300e-003	0.1505	0.0400	3.6000e-004	8.7600e-003	7.3000e-004	9.5000e-003	2.5300e-003	7.0000e-004	3.2300e-003	0.0000	34.8429	34.8429	2.6700e-003	0.0000	34.9097
Worker	0.0128	9.4800e-003	0.0930	2.8000e-004	0.0279	2.0000e-004	0.0281	7.4000e-003	1.8000e-004	7.5900e-003	0.0000	25.1894	25.1894	7.6000e-004	0.0000	25.2083
Total	**0.0178**	**0.1600**	**0.1330**	**6.4000e-004**	**0.0366**	**9.3000e-004**	**0.0376**	**9.9300e-003**	**8.8000e-004**	**0.0108**	**0.0000**	**60.0323**	**60.0323**	**3.4300e-003**	**0.0000**	**60.1180**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1411	1.0278	0.9166	1.5300e-003		0.0553	0.0553		0.0534	0.0534	0.0000	126.1716	126.1716	0.0234	0.0000	126.7572
Total	**0.1411**	**1.0278**	**0.9166**	**1.5300e-003**		**0.0553**	**0.0553**		**0.0534**	**0.0534**	**0.0000**	**126.1716**	**126.1716**	**0.0234**	**0.0000**	**126.7572**

3.5 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.0300e-003	0.1505	0.0400	3.6000e-004	8.7600e-003	7.3000e-004	9.5000e-003	2.5300e-003	7.0000e-004	3.2300e-003	0.0000	34.8429	34.8429	2.6700e-003	0.0000	34.9097
Worker	0.0128	9.4800e-003	0.0930	2.8000e-004	0.0279	2.0000e-004	0.0281	7.4000e-003	1.8000e-004	7.5900e-003	0.0000	25.1894	25.1894	7.6000e-004	0.0000	25.2083
Total	**0.0178**	**0.1600**	**0.1330**	**6.4000e-004**	**0.0366**	**9.3000e-004**	**0.0376**	**9.9300e-003**	**8.8000e-004**	**0.0108**	**0.0000**	**60.0323**	**60.0323**	**3.4300e-003**	**0.0000**	**60.1180**

3.6 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	8.4000e-003	0.0845	0.0888	1.4000e-004		4.7000e-003	4.7000e-003		4.3300e-003	4.3300e-003	0.0000	11.7657	11.7657	3.7300e-003	0.0000	11.8589
Paving	1.4800e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**9.8800e-003**	**0.0845**	**0.0888**	**1.4000e-004**		**4.7000e-003**	**4.7000e-003**		**4.3300e-003**	**4.3300e-003**	**0.0000**	**11.7657**	**11.7657**	**3.7300e-003**	**0.0000**	**11.8589**

3.6 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.8000e-004	3.5000e-004	3.4800e-003	1.0000e-005	1.0400e-003	1.0000e-005	1.0500e-003	2.8000e-004	1.0000e-005	2.8000e-004	0.0000	0.9423	0.9423	3.0000e-005	0.0000	0.9431
Total	**4.8000e-004**	**3.5000e-004**	**3.4800e-003**	**1.0000e-005**	**1.0400e-003**	**1.0000e-005**	**1.0500e-003**	**2.8000e-004**	**1.0000e-005**	**2.8000e-004**	**0.0000**	**0.9423**	**0.9423**	**3.0000e-005**	**0.0000**	**0.9431**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	8.4000e-003	0.0845	0.0888	1.4000e-004		4.7000e-003	4.7000e-003		4.3300e-003	4.3300e-003	0.0000	11.7657	11.7657	3.7300e-003	0.0000	11.8589
Paving	1.4800e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**9.8800e-003**	**0.0845**	**0.0888**	**1.4000e-004**		**4.7000e-003**	**4.7000e-003**		**4.3300e-003**	**4.3300e-003**	**0.0000**	**11.7657**	**11.7657**	**3.7300e-003**	**0.0000**	**11.8589**

3.6 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.8000e-004	3.5000e-004	3.4800e-003	1.0000e-005	1.0400e-003	1.0000e-005	1.0500e-003	2.8000e-004	1.0000e-005	2.8000e-004	0.0000	0.9423	0.9423	3.0000e-005	0.0000	0.9431
Total	**4.8000e-004**	**3.5000e-004**	**3.4800e-003**	**1.0000e-005**	**1.0400e-003**	**1.0000e-005**	**1.0500e-003**	**2.8000e-004**	**1.0000e-005**	**2.8000e-004**	**0.0000**	**0.9423**	**0.9423**	**3.0000e-005**	**0.0000**	**0.9431**

3.7 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.8052					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.2700e-003	0.0505	0.0549	9.0000e-005		3.3300e-003	3.3300e-003		3.3300e-003	3.3300e-003	0.0000	7.6598	7.6598	5.9000e-004	0.0000	7.6746
Total	**0.8125**	**0.0505**	**0.0549**	**9.0000e-005**		**3.3300e-003**	**3.3300e-003**		**3.3300e-003**	**3.3300e-003**	**0.0000**	**7.6598**	**7.6598**	**5.9000e-004**	**0.0000**	**7.6746**

3.7 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1100e-003	8.2000e-004	8.0300e-003	2.0000e-005	2.4100e-003	2.0000e-005	2.4200e-003	6.4000e-004	2.0000e-005	6.6000e-004	0.0000	2.1746	2.1746	7.0000e-005	0.0000	2.1763
Total	**1.1100e-003**	**8.2000e-004**	**8.0300e-003**	**2.0000e-005**	**2.4100e-003**	**2.0000e-005**	**2.4200e-003**	**6.4000e-004**	**2.0000e-005**	**6.6000e-004**	**0.0000**	**2.1746**	**2.1746**	**7.0000e-005**	**0.0000**	**2.1763**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.8052					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.2700e-003	0.0505	0.0549	9.0000e-005		3.3300e-003	3.3300e-003		3.3300e-003	3.3300e-003	0.0000	7.6598	7.6598	5.9000e-004	0.0000	7.6746
Total	**0.8125**	**0.0505**	**0.0549**	**9.0000e-005**		**3.3300e-003**	**3.3300e-003**		**3.3300e-003**	**3.3300e-003**	**0.0000**	**7.6598**	**7.6598**	**5.9000e-004**	**0.0000**	**7.6746**

3.7 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1100e-003	8.2000e-004	8.0300e-003	2.0000e-005	2.4100e-003	2.0000e-005	2.4200e-003	6.4000e-004	2.0000e-005	6.6000e-004	0.0000	2.1746	2.1746	7.0000e-005	0.0000	2.1763
Total	**1.1100e-003**	**8.2000e-004**	**8.0300e-003**	**2.0000e-005**	**2.4100e-003**	**2.0000e-005**	**2.4200e-003**	**6.4000e-004**	**2.0000e-005**	**6.6000e-004**	**0.0000**	**2.1746**	**2.1746**	**7.0000e-005**	**0.0000**	**2.1763**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Density

Increase Diversity

Increase Transit Accessibility

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.2882	1.1713	2.9016	8.4800e-003	0.6806	8.7200e-003	0.6893	0.1823	8.1800e-003	0.1905	0.0000	781.0870	781.0870	0.0464	0.0000	782.2470
Unmitigated	0.2982	1.2363	3.1158	9.3400e-003	0.7562	9.5600e-003	0.7658	0.2025	8.9600e-003	0.2115	0.0000	860.0806	860.0806	0.0501	0.0000	861.3318

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Hotel	1,125.00	1,023.75	743.75	2,006,463	1,805,816
Parking Lot	0.00	0.00	0.00		
Total	1,125.00	1,023.75	743.75	2,006,463	1,805,816

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Hotel	9.50	7.30	7.30	19.40	61.60	19.00	58	38	4
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Hotel	0.588316	0.042913	0.184449	0.110793	0.017294	0.005558	0.015534	0.023021	0.001902	0.002024	0.006181	0.000745	0.001271
Parking Lot	0.588316	0.042913	0.184449	0.110793	0.017294	0.005558	0.015534	0.023021	0.001902	0.002024	0.006181	0.000745	0.001271

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

Percent of Electricity Use Generated with Renewable Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	187.3002	187.3002	7.5400e-003	1.5600e-003	187.9535
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	293.4646	293.4646	0.0118	2.4400e-003	294.4882
NaturalGas Mitigated	0.0205	0.1867	0.1568	1.1200e-003		0.0142	0.0142		0.0142	0.0142	0.0000	203.2031	203.2031	3.8900e-003	3.7300e-003	204.4106
NaturalGas Unmitigated	0.0214	0.1945	0.1634	1.1700e-003		0.0148	0.0148		0.0148	0.0148	0.0000	211.7783	211.7783	4.0600e-003	3.8800e-003	213.0368

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Hotel	3.96858e+006	0.0214	0.1945	0.1634	1.1700e-003		0.0148	0.0148		0.0148	0.0148	0.0000	211.7783	211.7783	4.0600e-003	3.8800e-003	213.0368
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0214**	**0.1945**	**0.1634**	**1.1700e-003**		**0.0148**	**0.0148**		**0.0148**	**0.0148**	**0.0000**	**211.7783**	**211.7783**	**4.0600e-003**	**3.8800e-003**	**213.0368**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Hotel	3.80788e+006	0.0205	0.1867	0.1568	1.1200e-003		0.0142	0.0142		0.0142	0.0142	0.0000	203.2031	203.2031	3.8900e-003	3.7300e-003	204.4106
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0205**	**0.1867**	**0.1568**	**1.1200e-003**		**0.0142**	**0.0142**		**0.0142**	**0.0142**	**0.0000**	**203.2031**	**203.2031**	**3.8900e-003**	**3.7300e-003**	**204.4106**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Hotel	880471	287.7455	0.0116	2.4000e-003	288.7491
Parking Lot	17500	5.7192	2.3000e-004	5.0000e-005	5.7391
Total		**293.4646**	**0.0118**	**2.4500e-003**	**294.4882**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Hotel	561744	183.5827	7.3900e-003	1.5300e-003	184.2231
Parking Lot	11375	3.7175	1.5000e-004	3.0000e-005	3.7304
Total		**187.3002**	**7.5400e-003**	**1.5600e-003**	**187.9535**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.3173	2.0000e-005	2.3100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.4700e-003	4.4700e-003	1.0000e-005	0.0000	4.7700e-003
Unmitigated	0.3495	2.0000e-005	2.3100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.4700e-003	4.4700e-003	1.0000e-005	0.0000	4.7700e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0805					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2688					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.2000e-004	2.0000e-005	2.3100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.4700e-003	4.4700e-003	1.0000e-005	0.0000	4.7700e-003
Total	**0.3495**	**2.0000e-005**	**2.3100e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**4.4700e-003**	**4.4700e-003**	**1.0000e-005**	**0.0000**	**4.7700e-003**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0483					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2688					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.2000e-004	2.0000e-005	2.3100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.4700e-003	4.4700e-003	1.0000e-005	0.0000	4.7700e-003
Total	**0.3173**	**2.0000e-005**	**2.3100e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**4.4700e-003**	**4.4700e-003**	**1.0000e-005**	**0.0000**	**4.7700e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Turf Reduction

Use Water Efficient Irrigation System

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	12.6227	0.0831	2.0500e-003	15.3119
Unmitigated	15.7783	0.1039	2.5600e-003	19.1399

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Hotel	3.17085 / 0.352316	15.7783	0.1039	2.5600e-003	19.1399
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**15.7783**	**0.1039**	**2.5600e-003**	**19.1399**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Hotel	2.53668 / 0.281853	12.6227	0.0831	2.0500e-003	15.3119
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**12.6227**	**0.0831**	**2.0500e-003**	**15.3119**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	3.4732	0.2053	0.0000	8.6046
Unmitigated	13.8927	0.8210	0.0000	34.4186

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Hotel	68.44	13.8927	0.8210	0.0000	34.4186
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**13.8927**	**0.8210**	**0.0000**	**34.4186**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Hotel	17.11	3.4732	0.2053	0.0000	8.6046
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**3.4732**	**0.2053**	**0.0000**	**8.6046**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Montezuma Church

San Diego County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Place of Worship	60.78	1000sqft	0.73	60,776.00	0
Parking Lot	125.00	Space	1.13	50,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2020
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	720.49	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Lot size adjusted to fit project site.

Construction Phase - Painting phase extended

Architectural Coating - VOC limited to 150 g/L per SDAPCD

Vehicle Trips - Default trip generation modifed to reflect City of San Diego rates

Construction Off-road Equipment Mitigation -

Mobile Land Use Mitigation -

Area Mitigation - Use of low VOC paint assumed consistent with SDAPCD requirements

Water Mitigation -

Waste Mitigation -

Energy Mitigation -

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	150.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	150.00
tblArchitecturalCoating	EF_Parking	250.00	150.00
tblAreaMitigation	UseLowVOCPaintNonresidentialExteriorValue	250	150
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	250	150
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True
tblAreaMitigation	UseLowVOCPaintParkingValue	250	150
tblAreaMitigation	UseLowVOCPaintResidentialExteriorValue	250	150
tblAreaMitigation	UseLowVOCPaintResidentialInteriorValue	250	150
tblConstDustMitigation	WaterExposedAreaPM10PercentReduction	61	6.1
tblConstDustMitigation	WaterExposedAreaPM25PercentReduction	61	6.1
tblConstructionPhase	NumDays	10.00	30.00
tblLandUse	LandUseSquareFeet	60,780.00	60,776.00
tblLandUse	LotAcreage	1.40	0.73
tblVehicleTrips	ST_TR	10.37	30.00
tblVehicleTrips	SU_TR	36.63	60.00
tblVehicleTrips	WD_TR	9.11	15.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.1056	0.8394	0.6464	1.2400e-003	0.0320	0.0437	0.0757	0.0124	0.0417	0.0542	0.0000	107.8014	107.8014	0.0190	0.0000	108.2771
2020	0.6010	1.2474	1.1191	2.2600e-003	0.0361	0.0602	0.0963	9.7800e-003	0.0581	0.0679	0.0000	194.0214	194.0214	0.0289	0.0000	194.7431
Maximum	**0.6010**	**1.2474**	**1.1191**	**2.2600e-003**	**0.0361**	**0.0602**	**0.0963**	**0.0124**	**0.0581**	**0.0679**	**0.0000**	**194.0214**	**194.0214**	**0.0289**	**0.0000**	**194.7431**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.1056	0.8394	0.6464	1.2400e-003	0.0311	0.0437	0.0748	0.0120	0.0417	0.0537	0.0000	107.8013	107.8013	0.0190	0.0000	108.2770
2020	0.6010	1.2474	1.1191	2.2600e-003	0.0361	0.0602	0.0963	9.7800e-003	0.0581	0.0679	0.0000	194.0212	194.0212	0.0289	0.0000	194.7429
Maximum	**0.6010**	**1.2474**	**1.1191**	**2.2600e-003**	**0.0361**	**0.0602**	**0.0963**	**0.0120**	**0.0581**	**0.0679**	**0.0000**	**194.0212**	**194.0212**	**0.0289**	**0.0000**	**194.7429**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**1.40**	**0.00**	**0.55**	**2.21**	**0.00**	**0.40**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**9-2-2019**	**12-1-2019**	0.7116	0.7116
2	**12-2-2019**	**3-1-2020**	0.6434	0.6434
3	**3-2-2020**	**6-1-2020**	0.6314	0.6314
4	**6-2-2020**	**9-1-2020**	0.7330	0.7330
5	**9-2-2020**	**9-30-2020**	0.0661	0.0661
		Highest	0.7330	0.7330

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.3129	2.0000e-005	1.7200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.3200e-003	3.3200e-003	1.0000e-005	0.0000	3.5400e-003
Energy	3.7900e-003	0.0344	0.0289	2.1000e-004		2.6200e-003	2.6200e-003		2.6200e-003	2.6200e-003	0.0000	208.2653	208.2653	7.5900e-003	2.1100e-003	209.0837
Mobile	0.4024	1.6636	4.1822	0.0125	1.0101	0.0128	1.0229	0.2705	0.0120	0.2825	0.0000	1,150.2948	1,150.2948	0.0671	0.0000	1,151.9732
Waste						0.0000	0.0000		0.0000	0.0000	70.3262	0.0000	70.3262	4.1562	0.0000	174.2302
Water						0.0000	0.0000		0.0000	0.0000	0.6033	18.8926	19.4960	0.0627	1.6200e-003	21.5471
Total	**0.7191**	**1.6980**	**4.2129**	**0.0127**	**1.0101**	**0.0154**	**1.0255**	**0.2705**	**0.0146**	**0.2851**	**70.9296**	**1,377.4560**	**1,448.3856**	**4.2936**	**3.7300e-003**	**1,556.8378**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.2841	2.0000e-005	1.7200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.3200e-003	3.3200e-003	1.0000e-005	0.0000	3.5400e-003
Energy	3.7200e-003	0.0338	0.0284	2.0000e-004		2.5700e-003	2.5700e-003		2.5700e-003	2.5700e-003	0.0000	206.3647	206.3647	7.5300e-003	2.0900e-003	207.1748
Mobile	0.3796	1.5151	3.6927	0.0105	0.8373	0.0109	0.8482	0.2243	0.0102	0.2345	0.0000	969.8237	969.8237	0.0588	0.0000	971.2938
Waste						0.0000	0.0000		0.0000	0.0000	17.5816	0.0000	17.5816	1.0390	0.0000	43.5576
Water						0.0000	0.0000		0.0000	0.0000	0.4827	15.1141	15.5968	0.0502	1.3000e-003	17.2377
Total	**0.6674**	**1.5489**	**3.7228**	**0.0107**	**0.8373**	**0.0135**	**0.8508**	**0.2243**	**0.0128**	**0.2370**	**18.0642**	**1,191.3058**	**1,209.3700**	**1.1556**	**3.3900e-003**	**1,239.2674**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**7.20**	**8.78**	**11.63**	**15.51**	**17.10**	**12.65**	**17.04**	**17.10**	**12.58**	**16.87**	**74.53**	**13.51**	**16.50**	**73.09**	**9.12**	**20.40**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	9/2/2019	9/27/2019	5	20	
2	Site Preparation	Site Preparation	9/28/2019	10/1/2019	5	2	
3	Grading	Grading	10/2/2019	10/7/2019	5	4	
4	Building Construction	Building Construction	10/8/2019	7/13/2020	5	200	
5	Paving	Paving	7/14/2020	7/27/2020	5	10	
6	Architectural Coating	Architectural Coating	7/28/2020	9/7/2020	5	30	

Acres of Grading (Site Preparation Phase): 1

Acres of Grading (Grading Phase): 1.5

Acres of Paving: 1.13

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 91,164; Non-Residential Outdoor: 30,388; Striped Parking Area: 3,000 (Architectural Coating – sqft)

OffRoad Equipment

Montezuma Church - San Diego County, Annual

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Rubber Tired Dozers	1	7.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Graders	1	6.00	187	0.41
Grading	Rubber Tired Dozers	1	6.00	247	0.40
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Building Construction	Cranes	1	6.00	231	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	6.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	5	13.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	8.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	47.00	18.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	13.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	9.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0230	0.2268	0.1489	2.4000e-004		0.0129	0.0129		0.0120	0.0120	0.0000	21.4161	21.4161	5.4500e-003	0.0000	21.5524
Total	**0.0230**	**0.2268**	**0.1489**	**2.4000e-004**		**0.0129**	**0.0129**		**0.0120**	**0.0120**	**0.0000**	**21.4161**	**21.4161**	**5.4500e-003**	**0.0000**	**21.5524**

3.2 Demolition - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.1000e-004	3.9000e-004	3.8000e-003	1.0000e-005	1.0400e-003	1.0000e-005	1.0500e-003	2.8000e-004	1.0000e-005	2.8000e-004	0.0000	0.9731	0.9731	3.0000e-005	0.0000	0.9738
Total	**5.1000e-004**	**3.9000e-004**	**3.8000e-003**	**1.0000e-005**	**1.0400e-003**	**1.0000e-005**	**1.0500e-003**	**2.8000e-004**	**1.0000e-005**	**2.8000e-004**	**0.0000**	**0.9731**	**0.9731**	**3.0000e-005**	**0.0000**	**0.9738**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0230	0.2268	0.1489	2.4000e-004		0.0129	0.0129		0.0120	0.0120	0.0000	21.4161	21.4161	5.4500e-003	0.0000	21.5524
Total	**0.0230**	**0.2268**	**0.1489**	**2.4000e-004**		**0.0129**	**0.0129**		**0.0120**	**0.0120**	**0.0000**	**21.4161**	**21.4161**	**5.4500e-003**	**0.0000**	**21.5524**

3.2 Demolition - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.1000e-004	3.9000e-004	3.8000e-003	1.0000e-005	1.0400e-003	1.0000e-005	1.0500e-003	2.8000e-004	1.0000e-005	2.8000e-004	0.0000	0.9731	0.9731	3.0000e-005	0.0000	0.9738
Total	**5.1000e-004**	**3.9000e-004**	**3.8000e-003**	**1.0000e-005**	**1.0400e-003**	**1.0000e-005**	**1.0500e-003**	**2.8000e-004**	**1.0000e-005**	**2.8000e-004**	**0.0000**	**0.9731**	**0.9731**	**3.0000e-005**	**0.0000**	**0.9738**

3.3 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					5.8000e-003	0.0000	5.8000e-003	2.9500e-003	0.0000	2.9500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.7100e-003	0.0195	7.8900e-003	2.0000e-005		8.8000e-004	8.8000e-004		8.1000e-004	8.1000e-004	0.0000	1.5467	1.5467	4.9000e-004	0.0000	1.5589
Total	**1.7100e-003**	**0.0195**	**7.8900e-003**	**2.0000e-005**	**5.8000e-003**	**8.8000e-004**	**6.6800e-003**	**2.9500e-003**	**8.1000e-004**	**3.7600e-003**	**0.0000**	**1.5467**	**1.5467**	**4.9000e-004**	**0.0000**	**1.5589**

3.3 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-005	2.0000e-005	2.3000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0599	0.0599	0.0000	0.0000	0.0599
Total	**3.0000e-005**	**2.0000e-005**	**2.3000e-004**	**0.0000**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0599**	**0.0599**	**0.0000**	**0.0000**	**0.0599**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					5.4500e-003	0.0000	5.4500e-003	2.7700e-003	0.0000	2.7700e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.7100e-003	0.0195	7.8900e-003	2.0000e-005		8.8000e-004	8.8000e-004		8.1000e-004	8.1000e-004	0.0000	1.5467	1.5467	4.9000e-004	0.0000	1.5589
Total	**1.7100e-003**	**0.0195**	**7.8900e-003**	**2.0000e-005**	**5.4500e-003**	**8.8000e-004**	**6.3300e-003**	**2.7700e-003**	**8.1000e-004**	**3.5800e-003**	**0.0000**	**1.5467**	**1.5467**	**4.9000e-004**	**0.0000**	**1.5589**

3.3 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-005	2.0000e-005	2.3000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0599	0.0599	0.0000	0.0000	0.0599
Total	**3.0000e-005**	**2.0000e-005**	**2.3000e-004**	**0.0000**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0599**	**0.0599**	**0.0000**	**0.0000**	**0.0599**

3.4 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					9.8300e-003	0.0000	9.8300e-003	5.0500e-003	0.0000	5.0500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.8400e-003	0.0321	0.0132	3.0000e-005		1.4700e-003	1.4700e-003		1.3600e-003	1.3600e-003	0.0000	2.5336	2.5336	8.0000e-004	0.0000	2.5536
Total	**2.8400e-003**	**0.0321**	**0.0132**	**3.0000e-005**	**9.8300e-003**	**1.4700e-003**	**0.0113**	**5.0500e-003**	**1.3600e-003**	**6.4100e-003**	**0.0000**	**2.5336**	**2.5336**	**8.0000e-004**	**0.0000**	**2.5536**

3.4 Grading - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.0000e-005	5.0000e-005	4.7000e-004	0.0000	1.3000e-004	0.0000	1.3000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1198	0.1198	0.0000	0.0000	0.1199
Total	**6.0000e-005**	**5.0000e-005**	**4.7000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.1198**	**0.1198**	**0.0000**	**0.0000**	**0.1199**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					9.2300e-003	0.0000	9.2300e-003	4.7400e-003	0.0000	4.7400e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.8400e-003	0.0321	0.0132	3.0000e-005		1.4700e-003	1.4700e-003		1.3600e-003	1.3600e-003	0.0000	2.5336	2.5336	8.0000e-004	0.0000	2.5536
Total	**2.8400e-003**	**0.0321**	**0.0132**	**3.0000e-005**	**9.2300e-003**	**1.4700e-003**	**0.0107**	**4.7400e-003**	**1.3600e-003**	**6.1000e-003**	**0.0000**	**2.5336**	**2.5336**	**8.0000e-004**	**0.0000**	**2.5536**

3.4 Grading - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.0000e-005	5.0000e-005	4.7000e-004	0.0000	1.3000e-004	0.0000	1.3000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1198	0.1198	0.0000	0.0000	0.1199
Total	**6.0000e-005**	**5.0000e-005**	**4.7000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.1198**	**0.1198**	**0.0000**	**0.0000**	**0.1199**

3.5 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0693	0.4874	0.4114	6.7000e-004		0.0279	0.0279		0.0270	0.0270	0.0000	55.8369	55.8369	0.0107	0.0000	56.1053
Total	**0.0693**	**0.4874**	**0.4114**	**6.7000e-004**		**0.0279**	**0.0279**		**0.0270**	**0.0270**	**0.0000**	**55.8369**	**55.8369**	**0.0107**	**0.0000**	**56.1053**

3.5 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.5700e-003	0.0689	0.0185	1.5000e-004	3.6400e-003	4.8000e-004	4.1200e-003	1.0500e-003	4.6000e-004	1.5100e-003	0.0000	14.5857	14.5857	1.1700e-003	0.0000	14.6150
Worker	5.6500e-003	4.3400e-003	0.0419	1.2000e-004	0.0115	8.0000e-005	0.0116	3.0500e-003	8.0000e-005	3.1300e-003	0.0000	10.7297	10.7297	3.5000e-004	0.0000	10.7383
Total	**8.2200e-003**	**0.0733**	**0.0605**	**2.7000e-004**	**0.0151**	**5.6000e-004**	**0.0157**	**4.1000e-003**	**5.4000e-004**	**4.6400e-003**	**0.0000**	**25.3154**	**25.3154**	**1.5200e-003**	**0.0000**	**25.3533**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0693	0.4874	0.4114	6.7000e-004		0.0279	0.0279		0.0270	0.0270	0.0000	55.8369	55.8369	0.0107	0.0000	56.1052
Total	**0.0693**	**0.4874**	**0.4114**	**6.7000e-004**		**0.0279**	**0.0279**		**0.0270**	**0.0270**	**0.0000**	**55.8369**	**55.8369**	**0.0107**	**0.0000**	**56.1052**

3.5 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.5700e-003	0.0689	0.0185	1.5000e-004	3.6400e-003	4.8000e-004	4.1200e-003	1.0500e-003	4.6000e-004	1.5100e-003	0.0000	14.5857	14.5857	1.1700e-003	0.0000	14.6150
Worker	5.6500e-003	4.3400e-003	0.0419	1.2000e-004	0.0115	8.0000e-005	0.0116	3.0500e-003	8.0000e-005	3.1300e-003	0.0000	10.7297	10.7297	3.5000e-004	0.0000	10.7383
Total	**8.2200e-003**	**0.0733**	**0.0605**	**2.7000e-004**	**0.0151**	**5.6000e-004**	**0.0157**	**4.1000e-003**	**5.4000e-004**	**4.6400e-003**	**0.0000**	**25.3154**	**25.3154**	**1.5200e-003**	**0.0000**	**25.3533**

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1411	1.0278	0.9166	1.5300e-003		0.0553	0.0553		0.0534	0.0534	0.0000	126.1718	126.1718	0.0234	0.0000	126.7573
Total	**0.1411**	**1.0278**	**0.9166**	**1.5300e-003**		**0.0553**	**0.0553**		**0.0534**	**0.0534**	**0.0000**	**126.1718**	**126.1718**	**0.0234**	**0.0000**	**126.7573**

3.5 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.7700e-003	0.1426	0.0379	3.4000e-004	8.3000e-003	7.0000e-004	9.0000e-003	2.4000e-003	6.7000e-004	3.0600e-003	0.0000	33.0091	33.0091	2.5300e-003	0.0000	33.0723
Worker	0.0120	8.9100e-003	0.0874	2.6000e-004	0.0262	1.9000e-004	0.0264	6.9600e-003	1.7000e-004	7.1300e-003	0.0000	23.6781	23.6781	7.1000e-004	0.0000	23.6958
Total	**0.0168**	**0.1515**	**0.1253**	**6.0000e-004**	**0.0345**	**8.9000e-004**	**0.0354**	**9.3600e-003**	**8.4000e-004**	**0.0102**	**0.0000**	**56.6871**	**56.6871**	**3.2400e-003**	**0.0000**	**56.7682**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1411	1.0278	0.9166	1.5300e-003		0.0553	0.0553		0.0534	0.0534	0.0000	126.1716	126.1716	0.0234	0.0000	126.7572
Total	**0.1411**	**1.0278**	**0.9166**	**1.5300e-003**		**0.0553**	**0.0553**		**0.0534**	**0.0534**	**0.0000**	**126.1716**	**126.1716**	**0.0234**	**0.0000**	**126.7572**

3.5 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.7700e-003	0.1426	0.0379	3.4000e-004	8.3000e-003	7.0000e-004	9.0000e-003	2.4000e-003	6.7000e-004	3.0600e-003	0.0000	33.0091	33.0091	2.5300e-003	0.0000	33.0723
Worker	0.0120	8.9100e-003	0.0874	2.6000e-004	0.0262	1.9000e-004	0.0264	6.9600e-003	1.7000e-004	7.1300e-003	0.0000	23.6781	23.6781	7.1000e-004	0.0000	23.6958
Total	**0.0168**	**0.1515**	**0.1253**	**6.0000e-004**	**0.0345**	**8.9000e-004**	**0.0354**	**9.3600e-003**	**8.4000e-004**	**0.0102**	**0.0000**	**56.6871**	**56.6871**	**3.2400e-003**	**0.0000**	**56.7682**

3.6 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	4.2000e-003	0.0423	0.0444	7.0000e-005		2.3500e-003	2.3500e-003		2.1600e-003	2.1600e-003	0.0000	5.8829	5.8829	1.8600e-003	0.0000	5.9295
Paving	1.4800e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**5.6800e-003**	**0.0423**	**0.0444**	**7.0000e-005**		**2.3500e-003**	**2.3500e-003**		**2.1600e-003**	**2.1600e-003**	**0.0000**	**5.8829**	**5.8829**	**1.8600e-003**	**0.0000**	**5.9295**

3.6 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.4000e-004	1.8000e-004	1.7400e-003	1.0000e-005	5.2000e-004	0.0000	5.2000e-004	1.4000e-004	0.0000	1.4000e-004	0.0000	0.4712	0.4712	1.0000e-005	0.0000	0.4715
Total	**2.4000e-004**	**1.8000e-004**	**1.7400e-003**	**1.0000e-005**	**5.2000e-004**	**0.0000**	**5.2000e-004**	**1.4000e-004**	**0.0000**	**1.4000e-004**	**0.0000**	**0.4712**	**0.4712**	**1.0000e-005**	**0.0000**	**0.4715**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	4.2000e-003	0.0423	0.0444	7.0000e-005		2.3500e-003	2.3500e-003		2.1600e-003	2.1600e-003	0.0000	5.8828	5.8828	1.8600e-003	0.0000	5.9295
Paving	1.4800e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**5.6800e-003**	**0.0423**	**0.0444**	**7.0000e-005**		**2.3500e-003**	**2.3500e-003**		**2.1600e-003**	**2.1600e-003**	**0.0000**	**5.8828**	**5.8828**	**1.8600e-003**	**0.0000**	**5.9295**

3.6 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.4000e-004	1.8000e-004	1.7400e-003	1.0000e-005	5.2000e-004	0.0000	5.2000e-004	1.4000e-004	0.0000	1.4000e-004	0.0000	0.4712	0.4712	1.0000e-005	0.0000	0.4715
Total	**2.4000e-004**	**1.8000e-004**	**1.7400e-003**	**1.0000e-005**	**5.2000e-004**	**0.0000**	**5.2000e-004**	**1.4000e-004**	**0.0000**	**1.4000e-004**	**0.0000**	**0.4712**	**0.4712**	**1.0000e-005**	**0.0000**	**0.4715**

3.7 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.4330					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.6300e-003	0.0253	0.0275	4.0000e-005		1.6600e-003	1.6600e-003		1.6600e-003	1.6600e-003	0.0000	3.8299	3.8299	3.0000e-004	0.0000	3.8373
Total	**0.4366**	**0.0253**	**0.0275**	**4.0000e-005**		**1.6600e-003**	**1.6600e-003**		**1.6600e-003**	**1.6600e-003**	**0.0000**	**3.8299**	**3.8299**	**3.0000e-004**	**0.0000**	**3.8373**

3.7 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-004	3.7000e-004	3.6100e-003	1.0000e-005	1.0800e-003	1.0000e-005	1.0900e-003	2.9000e-004	1.0000e-005	2.9000e-004	0.0000	0.9786	0.9786	3.0000e-005	0.0000	0.9793
Total	**5.0000e-004**	**3.7000e-004**	**3.6100e-003**	**1.0000e-005**	**1.0800e-003**	**1.0000e-005**	**1.0900e-003**	**2.9000e-004**	**1.0000e-005**	**2.9000e-004**	**0.0000**	**0.9786**	**0.9786**	**3.0000e-005**	**0.0000**	**0.9793**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.4330					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.6300e-003	0.0253	0.0275	4.0000e-005		1.6600e-003	1.6600e-003		1.6600e-003	1.6600e-003	0.0000	3.8299	3.8299	3.0000e-004	0.0000	3.8373
Total	**0.4366**	**0.0253**	**0.0275**	**4.0000e-005**		**1.6600e-003**	**1.6600e-003**		**1.6600e-003**	**1.6600e-003**	**0.0000**	**3.8299**	**3.8299**	**3.0000e-004**	**0.0000**	**3.8373**

3.7 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-004	3.7000e-004	3.6100e-003	1.0000e-005	1.0800e-003	1.0000e-005	1.0900e-003	2.9000e-004	1.0000e-005	2.9000e-004	0.0000	0.9786	0.9786	3.0000e-005	0.0000	0.9793
Total	**5.0000e-004**	**3.7000e-004**	**3.6100e-003**	**1.0000e-005**	**1.0800e-003**	**1.0000e-005**	**1.0900e-003**	**2.9000e-004**	**1.0000e-005**	**2.9000e-004**	**0.0000**	**0.9786**	**0.9786**	**3.0000e-005**	**0.0000**	**0.9793**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Density

Increase Transit Accessibility

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.3796	1.5151	3.6927	0.0105	0.8373	0.0109	0.8482	0.2243	0.0102	0.2345	0.0000	969.8237	969.8237	0.0588	0.0000	971.2938
Unmitigated	0.4024	1.6636	4.1822	0.0125	1.0101	0.0128	1.0229	0.2705	0.0120	0.2825	0.0000	1,150.2948	1,150.2948	0.0671	0.0000	1,151.9732

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Parking Lot	0.00	0.00	0.00		
Place of Worship	911.70	1,823.40	3646.80	2,680,080	2,221,678
Total	911.70	1,823.40	3,646.80	2,680,080	2,221,678

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Place of Worship	9.50	7.30	7.30	0.00	95.00	5.00	64	25	11

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Parking Lot	0.588316	0.042913	0.184449	0.110793	0.017294	0.005558	0.015534	0.023021	0.001902	0.002024	0.006181	0.000745	0.001271
Place of Worship	0.588316	0.042913	0.184449	0.110793	0.017294	0.005558	0.015534	0.023021	0.001902	0.002024	0.006181	0.000745	0.001271

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	169.5718	169.5718	6.8300e-003	1.4100e-003	170.1632
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	170.7735	170.7735	6.8700e-003	1.4200e-003	171.3691
NaturalGas Mitigated	3.7200e-003	0.0338	0.0284	2.0000e-004		2.5700e-003	2.5700e-003		2.5700e-003	2.5700e-003	0.0000	36.7929	36.7929	7.1000e-004	6.7000e-004	37.0116
NaturalGas Unmitigated	3.7900e-003	0.0344	0.0289	2.1000e-004		2.6200e-003	2.6200e-003		2.6200e-003	2.6200e-003	0.0000	37.4918	37.4918	7.2000e-004	6.9000e-004	37.7146

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Place of Worship	702571	3.7900e-003	0.0344	0.0289	2.1000e-004		2.6200e-003	2.6200e-003		2.6200e-003	2.6200e-003	0.0000	37.4918	37.4918	7.2000e-004	6.9000e-004	37.7146
Total		**3.7900e-003**	**0.0344**	**0.0289**	**2.1000e-004**		**2.6200e-003**	**2.6200e-003**		**2.6200e-003**	**2.6200e-003**	**0.0000**	**37.4918**	**37.4918**	**7.2000e-004**	**6.9000e-004**	**37.7146**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Place of Worship	689473	3.7200e-003	0.0338	0.0284	2.0000e-004		2.5700e-003	2.5700e-003		2.5700e-003	2.5700e-003	0.0000	36.7929	36.7929	7.1000e-004	6.7000e-004	37.0116
Total		**3.7200e-003**	**0.0338**	**0.0284**	**2.0000e-004**		**2.5700e-003**	**2.5700e-003**		**2.5700e-003**	**2.5700e-003**	**0.0000**	**36.7929**	**36.7929**	**7.1000e-004**	**6.7000e-004**	**37.0116**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Parking Lot	17500	5.7192	2.3000e-004	5.0000e-005	5.7391
Place of Worship	505049	165.0543	6.6400e-003	1.3700e-003	165.6300
Total		**170.7735**	**6.8700e-003**	**1.4200e-003**	**171.3691**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Parking Lot	17500	5.7192	2.3000e-004	5.0000e-005	5.7391
Place of Worship	501372	163.8526	6.6000e-003	1.3600e-003	164.4241
Total		**169.5718**	**6.8300e-003**	**1.4100e-003**	**170.1632**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.2841	2.0000e-005	1.7200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.3200e-003	3.3200e-003	1.0000e-005	0.0000	3.5400e-003
Unmitigated	0.3129	2.0000e-005	1.7200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.3200e-003	3.3200e-003	1.0000e-005	0.0000	3.5400e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0722					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2406					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.6000e-004	2.0000e-005	1.7200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.3200e-003	3.3200e-003	1.0000e-005	0.0000	3.5400e-003
Total	**0.3129**	**2.0000e-005**	**1.7200e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**3.3200e-003**	**3.3200e-003**	**1.0000e-005**	**0.0000**	**3.5400e-003**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0433					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2406					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.6000e-004	2.0000e-005	1.7200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.3200e-003	3.3200e-003	1.0000e-005	0.0000	3.5400e-003
Total	**0.2841**	**2.0000e-005**	**1.7200e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**3.3200e-003**	**3.3200e-003**	**1.0000e-005**	**0.0000**	**3.5400e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	15.5968	0.0502	1.3000e-003	17.2377
Unmitigated	19.4960	0.0627	1.6200e-003	21.5471

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Place of Worship	1.90174 / 2.97452	19.4960	0.0627	1.6200e-003	21.5471
Total		**19.4960**	**0.0627**	**1.6200e-003**	**21.5471**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Place of Worship	1.52139 / 2.37961	15.5968	0.0502	1.3000e-003	17.2377
Total		**15.5968**	**0.0502**	**1.3000e-003**	**17.2377**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	17.5816	1.0390	0.0000	43.5576
Unmitigated	70.3262	4.1562	0.0000	174.2302

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Place of Worship	346.45	70.3262	4.1562	0.0000	174.2302
Total		**70.3262**	**4.1562**	**0.0000**	**174.2302**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Place of Worship	86.6125	17.5816	1.0390	0.0000	43.5576
Total		**17.5816**	**1.0390**	**0.0000**	**43.5576**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

CLIMATE ACTION PLAN CONSISTENCY CHECKLIST INTRODUCTION

In December 2015, the City adopted a Climate Action Plan (CAP) that outlines the actions that City will undertake to achieve its proportional share of State greenhouse gas (GHG) emission reductions. The purpose of the Climate Action Plan Consistency Checklist (Checklist) is to, in conjunction with the CAP, provide a streamlined review process for proposed new development projects that are subject to discretionary review and trigger environmental review pursuant to the California Environmental Quality Act (CEQA).[1]

Analysis of GHG emissions and potential climate change impacts from new development is required under CEQA. The CAP is a plan for the reduction of GHG emissions in accordance with CEQA Guidelines Section 15183.5. Pursuant to CEQA Guidelines Sections 15064(h)(3), 15130(d), and 15183(b), a project's incremental contribution to a cumulative GHG emissions effect may be determined not to be cumulatively considerable if it complies with the requirements of the CAP.

This Checklist is part of the CAP and contains measures that are required to be implemented on a project-by-project basis to ensure that the specified emissions targets identified in the CAP are achieved. Implementation of these measures would ensure that new development is consistent with the CAP's assumptions for relevant CAP strategies toward achieving the identified GHG reduction targets. Projects that are consistent with the CAP as determined through the use of this Checklist may rely on the CAP for the cumulative impacts analysis of GHG emissions. Projects that are not consistent with the CAP must prepare a comprehensive project-specific analysis of GHG emissions, including quantification of existing and projected GHG emissions and incorporation of the measures in this Checklist to the extent feasible. Cumulative GHG impacts would be significant for any project that is not consistent with the CAP.

The Checklist may be updated to incorporate new GHG reduction techniques or to comply with later amendments to the CAP or local, State, or federal law.

[1] Certain projects seeking ministerial approval may be required to complete the Checklist. For example, projects in a Community Plan Implementation Overlay Zone may be required to use the Checklist to qualify for ministerial level review. See Supplemental Development Regulations in the project's community plan to determine applicability.

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CAP CONSISTENCY CHECKLIST SUBMITTAL APPLICATION

- The Checklist is required only for projects subject to CEQA review.[2]
- If required, the Checklist must be included in the project submittal package. Application submittal procedures can be found in Chapter 11: Land Development Procedures of the City's Municipal Code.
- The requirements in the Checklist will be included in the project's conditions of approval.
- The applicant must provide an explanation of how the proposed project will implement the requirements described herein to the satisfaction of the Planning Department.

Application Information

Contact Information

Project No./Name: Montezuma Road Hotel

Property Address: 6650 Montezuma Road

Applicant Name/Co.: Shahin Edalatdju, 52 Falcon LLC

Contact Phone: (619) 701-2559 Contact Email: eagle1105@pacbell.net

Was a consultant retained to complete this checklist? ■ Yes ☐ No If Yes, complete the following

Consultant Name: Karen Ruggels Contact Phone: (619) 578-9505

Company Name: KLR PLANNING Contact Email: karen@klrplanning.com

Project Information

1. What is the size of the project (acres)? 1.86
2. Identify all applicable proposed land uses:
   - ☐ Residential (indicate # of single-family units):
   - ☐ Residential (indicate # of multi-family units):
   - ☐ Commercial (total square footage):
   - ☐ Industrial (total square footage):
   - ■ Other (describe): Hotel
3. Is the project or a portion of the project located in a Transit Priority Area? ☐ Yes ■ No
4. Provide a brief description of the project proposed:

See Attachment A - Project Description.

[2] Certain projects seeking ministerial approval may be required to complete the Checklist. For example, projects in a Community Plan Implementation Overlay Zone may be required to use the Checklist to qualify for ministerial level review. See Supplemental Development Regulations in the project's community plan to determine applicability.

ATTACHMENT A

MONTEZUMA ROAD HOTEL PROJECT
PROJECT DESCRIPTION

The *Montezuma Road Hotel* project site encompasses approximately 1.8 acres, located at 6650 Montezuma Road within the College Area community planning area. The project site is situated north of Montezuma Road and west of Bowman Lane. The Friends of the College-Rolando Public Library is located adjacent to the west of the project site with no access or parking from Montezuma Road. Single-family residential development is located to the north, and a Ralphs shopping center is next to the property to the east. The project site is currently vacant, with the recent demolition of a church that was previously located on the project site. Regional access to the site is provided by Interstate 8 (I-8), located approximately 2.2 miles north of the project site. Local access is provided via El Cajon Boulevard, connected to the east end of Montezuma Road and located less than 0.1 mile southwest of the project site. Direct access to the site is via Montezuma Road.

The project proposes an **Amendment to the College Area Community Plan** and a **Rezone**. The proposed amendment to the College Area Community Plan would change the current land use designation from *Low/Medium Density Residential [10 – 15 dwelling units per acre (du/ac)] and General Commercial Residential (75 – 110 du/ac)* to *Residential Medium with Commercial (15-29 du/ac)* to allow redevelopment of the project site with a maximum 125-room hotel or a base density of 55-multifamily residential units. The proposed rezone would change the existing RM-1-1 zone to CV-1-1. The purpose of the CV zones is to provide areas for establishments catering to the lodging, dining, and recreational needs of both tourists and the local population. The CV zones are intended for areas located near employment centers and areas with recreational resources or other visitor attractions. The CV-1-1 is intended to accommodate a mix of large-scale, visitor serving uses and residential uses and permits a maximum density of 1 dwelling unit for each 1,500 square feet of lot area. The Community Plan Amendment would also allow for a shared access and parking agreement with the City of San Diego to provide additional parking to serve the adjacent public library.

CAP CONSISTENCY CHECKLIST QUESTIONS

Step 1: Land Use Consistency

The first step in determining CAP consistency for discretionary development projects is to assess the project's consistency with the growth projections used in the development of the CAP. This section allows the City to determine a project's consistency with the land use assumptions used in the CAP.

Step 1: Land Use Consistency		
Checklist Item (Check the appropriate box and provide explanation and supporting documentation for your answer)	Yes	No
A. Is the proposed project consistent with the existing General Plan and Community Plan land use and zoning designations?;[3] OR, B. If the proposed project is not consistent with the existing land use plan and zoning designations, and includes a land use plan and/or zoning designation amendment, would the proposed amendment result in an increased density within a Transit Priority Area (TPA)[4] and implement CAP Strategy 3 actions, as determined in Step 3 to the satisfaction of the Development Services Department?; OR, C. If the proposed project is not consistent with the existing land use plan and zoning designations, does the project include a land use plan and/or zoning designation amendment that would result in an equivalent or less GHG-intensive project when compared to the existing designations?	☑	☐

If "***Yes***," proceed to Step 2 of the Checklist. For question B above, complete Step 3. For question C above, provide estimated project emissions under both existing and proposed designation(s) for comparison. Compare the maximum buildout of the existing designation and the maximum buildout of the proposed designation.

If "***No***," in accordance with the City's Significance Determination Thresholds, the project's GHG impact is significant. The project must nonetheless incorporate each of the measures identified in Step 2 to mitigate cumulative GHG emissions impacts unless the decision maker finds that a measure is infeasible in accordance with CEQA Guidelines Section 15091. Proceed and complete Step 2 of the Checklist.

The project would meet Land Use Consistency Checklist Item "C". The project site is in the College Area Community Plan area and is zoned RM-1-1. The College Area Community Plan designates the project site as Low/Medium Density Residential [10 – 15 dwelling units per acre (du/ac)] and General Commercial Residential (75 – 110 du/ac). The project proposes an amendment to the College Area Community Plan to change the current land use designation to Residential Medium with Commercial, (15-29 DU/AC), and to rezone the property to CV-1-1. A Greenhouse Gas Study (Birdseye Planning Group, June 2018) has been prepared for the project. As presented in the Study, emissions from the proposed project would be less than the worst-case buildout of the land use inventoried in the CAP with the provision that 35% of the project's energy needs would be provided by solar. Thus, GHG emissions would be less than significant, and the project results in less GHG emissions when compared to the existing designations.

[3] This question may also be answered in the affirmative if the project is consistent with SANDAG Series 12 growth projections, which were used to determine the CAP projections, as determined by the Planning Department.

[4] This category applies to all projects that answered in the affirmative to question 3 on the previous page: Is the project or a portion of the project located in a transit priority area.

Step 2: CAP Strategies Consistency

The second step of the CAP consistency review is to review and evaluate a project's consistency with the applicable strategies and actions of the CAP. Step 2 only applies to development projects that involve permits that would require a certificate of occupancy from the Building Official or projects comprised of one and two family dwellings or townhouses as defined in the California Residential Code and their accessory structures.[5] All other development projects that would not require a certificate of occupancy from the Building Official shall implement Best Management Practices for construction activities as set forth in the Greenbook (for public projects).

Step 2: CAP Strategies Consistency			
Checklist Item (Check the appropriate box and provide explanation for your answer)	Yes	No	N/A
Strategy 1: Energy & Water Efficient Buildings			
1. *Cool/Green Roofs*. • Would the project include roofing materials with a minimum 3-year aged solar reflection and thermal emittance or solar reflection index equal to or greater than the values specified in the voluntary measures under California Green Building Standards Code (Attachment A)?; OR • Would the project roof construction have a thermal mass over the roof membrane, including areas of vegetated (green) roofs, weighing at least 25 pounds per square foot as specified in the voluntary measures under California Green Building Standards Code?; OR • Would the project include a combination of the above two options? Check "N/A" only if the project does not include a roof component. The project will include roofing materials with a minimum 3-year aged solar reflection and thermal emittance or solar reflection index equal to or greater than the values specified in the voluntary measures under California Green Building Standards Code. See Attachment A.	☒	☐	☐

[5] Actions that are not subject to Step 2 would include, for example: 1) discretionary map actions that do not propose specific development, 2) permits allowing wireless communication facilities, 3) special events permits, 4) use permits or other permits that do not result in the expansion or enlargement of a building (e.g., decks, garages, etc.), and 5) non-building infrastructure projects such as roads and pipelines. Because such actions would not result in new occupancy buildings from which GHG emissions reductions could be achieved, the items contained in Step 2 would not be applicable.

2. *Plumbing fixtures and fittings* With respect to plumbing fixtures or fittings provided as part of the project, would those low-flow fixtures/appliances be consistent with each of the following: Residential buildings: • Kitchen faucets: maximum flow rate not to exceed 1.5 gallons per minute at 60 psi; • Standard dishwashers: 4.25 gallons per cycle; • Compact dishwashers: 3.5 gallons per cycle; and • Clothes washers: water factor of 6 gallons per cubic feet of drum capacity? Nonresidential buildings: • Plumbing fixtures and fittings that do not exceed the maximum flow rate specified in Table A5.303.2.3.1 (voluntary measures) of the California Green Building Standards Code (See Attachment A); and • Appliances and fixtures for commercial applications that meet the provisions of Section A5.303.3 (voluntary measures) of the California Green Building Standards Code (See Attachment A)? Check "N/A" only if the project does not include any plumbing fixtures or fittings. The proposed project would include the required flow rates and appliances that meet the voluntary measures portion of the California Green Building Standards Code for non-residential buildings. Fixtures installed with the project are as follows: - Water closets 1.28 gpf - Urinals wall mounted .125 gpf - Showerheads 1.8 gpm @ 80 psi - Restroom faucets .35 gpm @ 60 psi - Wash fountain 1.8 gpm - Kitchen faucets 1.6 gpm	☑	☐	☐

Strategy 3: Bicycling, Walking, Transit & Land Use			
3. *Electric Vehicle Charging* • Multiple-family projects of 17 dwelling units or less: Would 3% of the total parking spaces required, or a minimum of one space, whichever is greater, be provided with a listed cabinet, box or enclosure connected to a conduit linking the parking spaces with the electrical service, in a manner approved by the building and safety official, to allow for the future installation of electric vehicle supply equipment to provide electric vehicle charging stations at such time as it is needed for use by residents? • Multiple-family projects of more than 17 dwelling units: Of the total required listed cabinets, boxes or enclosures, would 50% have the necessary electric vehicle supply equipment installed to provide active electric vehicle charging stations ready for use by residents? • Non-residential projects: Of the total required listed cabinets, boxes or enclosures, would 50% have the necessary electric vehicle supply equipment installed to provide active electric vehicle charging stations ready for use? Check "N/A" only if the project is a single-family project or would not require the provision of listed cabinets, boxes, or enclosures connected to a conduit linking the parking spaces with electrical service, e.g., projects requiring fewer than 10 parking spaces. Pursuant to the SDMC and the UBC, the project is required to provide infrastructure for a minimum of seven parking spaces for electric vehicle charging. The project is in conformance with code requirements.	☑	☐	☐
Strategy 3: Bicycling, Walking, Transit & Land Use (Complete this section if project includes non-residential or mixed uses)			
4. *Bicycle Parking Spaces* Would the project provide more short- and long-term bicycle parking spaces than required in the City's Municipal Code (Chapter 14, Article 2, Division 5)?[6] Check "N/A" only if the project is a residential project. The project is required to provide seven short-term bicycle parking spaces and seven long-term bicycle parking spaces. The project would provide 10 short-term and eight long-term parking spaces.	☑	☐	☐

[6] Non-portable bicycle corrals within 600 feet of project frontage can be counted towards the project's bicycle parking requirements.

5. *Shower facilities*

If the project includes nonresidential development that would accommodate over 10 tenant occupants (employees), would the project include changing/shower facilities in accordance with the voluntary measures under the California Green Building Standards Code as shown in the table below?

Number of Tenant Occupants (Employees)	Shower/Changing Facilities Required	Two-Tier (12" X 15" X 72") Personal Effects Lockers Required
0-10	0	0
11-50	1 shower stall	2
51-100	1 shower stall	3
101-200	1 shower stall	4
Over 200	1 shower stall plus 1 additional shower stall for each 200 additional tenant-occupants	1 two-tier locker plus 1 two-tier locker for each 50 additional tenant-occupants

Check "N/A" only if the project is a residential project, or if it does not include nonresidential development that would accommodate over 10 tenant occupants (employees).

Because the project could generate 11-50 employees, the project would be required to provide one shower stall and two tow-tier personal effects lockers. The project would provide one shower stall and one two two-tier personal effects lockers for employees.

☑ ☐ ☐

6. *Designated Parking Spaces*

If the project includes a nonresidential use in a TPA, would the project provide designated parking for a combination of low-emitting, fuel-efficient, and carpool/vanpool vehicles in accordance with the following table?

Number of Required Parking Spaces	Number of Designated Parking Spaces
0-9	0
10-25	2
26-50	4
51-75	6
76-100	9
101-150	11
151-200	18
201 and over	At least 10% of total

This measure does not cover electric vehicles. See Question 4 for electric vehicle parking requirements.

Note: Vehicles bearing Clean Air Vehicle stickers from expired HOV lane programs may be considered eligible for designated parking spaces. The required designated parking spaces are to be provided within the overall minimum parking requirement, not in addition to it.

Check "N/A" only if the project is a residential project, or if it does not include nonresidential use in a TPA.

The project site is not located in a TPA. The applicant would provide 11 spaces that will be designated for low emitting, fuel-efficient, and vanpool vehicles with signage and/or striping.

☐	☐	☑

7. *Transportation Demand Management Program* If the project would accommodate over 50 tenant-occupants (employees), would it include a transportation demand management program that would be applicable to existing tenants and future tenants that includes: At least one of the following components: • Parking cash out program • Parking management plan that includes charging employees market-rate for single-occupancy vehicle parking and providing reserved, discounted, or free spaces for registered carpools or vanpools • Unbundled parking whereby parking spaces would be leased or sold separately from the rental or purchase fees for the development for the life of the development And at least three of the following components: • Commitment to maintaining an employer network in the SANDAG iCommute program and promoting its RideMatcher service to tenants/employees • On-site carsharing vehicle(s) or bikesharing • Flexible or alternative work hours • Telework program • Transit, carpool, and vanpool subsidies • Pre-tax deduction for transit or vanpool fares and bicycle commute costs • Access to services that reduce the need to drive, such as cafes, commercial stores, banks, post offices, restaurants, gyms, or childcare, either onsite or within 1,320 feet (1/4 mile) of the structure/use? Check "N/A" only if the project is a residential project or if it would not accommodate over 50 tenant-occupants (employees). The proposed hotel project would not accommodate over 50 tenant occupants. Therefore, a Transportation Demand Management Program is not required.	☐	☐	☑

Step 3: Project CAP Conformance Evaluation (if applicable)

N/A

The third step of the CAP consistency review only applies if Step 1 is answered in the affirmative under option B. The purpose of this step is to determine whether a project that is located in a TPA but that includes a land use plan and/or zoning designation amendment is nevertheless consistent with the assumptions in the CAP because it would implement CAP Strategy 3 actions. In general, a project that would result in a reduction in density inside a TPA would not be consistent with Strategy 3.The following questions must each be answered in the affirmative and fully explained.

1. **Would the proposed project implement the General Plan's City of Villages strategy in an identified Transit Priority Area (TPA) that will result in an increase in the capacity for transit-supportive residential and/or employment densities?**

   Considerations for this question:
   - Does the proposed land use and zoning designation associated with the project provide capacity for transit-supportive residential densities within the TPA?
   - Is the project site suitable to accommodate mixed-use village development, as defined in the General Plan, within the TPA?
   - Does the land use and zoning associated with the project increase the capacity for transit-supportive employment intensities within the TPA?

2. **Would the proposed project implement the General Plan's Mobility Element in Transit Priority Areas to increase the use of transit?**

   Considerations for this question:
   - Does the proposed project support/incorporate identified transit routes and stops/stations?
   - Does the project include transit priority measures?

3. **Would the proposed project implement pedestrian improvements in Transit Priority Areas to increase walking opportunities?**

   Considerations for this question:
   - Does the proposed project circulation system provide multiple and direct pedestrian connections and accessibility to local activity centers (such as transit stations, schools, shopping centers, and libraries)?
   - Does the proposed project urban design include features for walkability to promote a transit supportive environment?

4. **Would the proposed project implement the City of San Diego's Bicycle Master Plan to increase bicycling opportunities?**

   Considerations for this question:
   - Does the proposed project circulation system include bicycle improvements consistent with the Bicycle Master Plan?
   - Does the overall project circulation system provide a balanced, multimodal, "complete streets" approach to accommodate mobility needs of all users?

5. **Would the proposed project incorporate implementation mechanisms that support Transit Oriented Development?**

   Considerations for this question:
   - Does the proposed project include new or expanded urban public spaces such as plazas, pocket parks, or urban greens in the TPA?
   - Does the land use and zoning associated with the proposed project increase the potential for jobs within the TPA?
   - Do the zoning/implementing regulations associated with the proposed project support the efficient use of parking through mechanisms such as: shared parking, parking districts, unbundled parking, reduced parking, paid or time-limited parking, etc.?

6. **Would the proposed project implement the Urban Forest Management Plan to increase urban tree canopy coverage?**

   Considerations for this question:
   - Does the proposed project provide at least three different species for the primary, secondary and accent trees in order to accommodate varying parkway widths?
   - Does the proposed project include policies or strategies for preserving existing trees?
   - Does the proposed project incorporate tree planting that will contribute to the City's 20% urban canopy tree coverage goal?

CLIMATE ACTION PLAN CONSISTENCY CHECKLIST
ATTACHMENT A

This attachment provides performance standards for applicable Climate Action Pan (CAP) Consistency Checklist measures.

Table 1 Roof Design Values for Question 1: Cool/Green Roofs supporting Strategy 1: Energy & Water Efficient Buildings of the Climate Action Plan

Land Use Type	Roof Slope	Minimum 3-Year Aged Solar Reflectance	Thermal Emittance	Solar Reflective Index
Low-Rise Residential	≤ 2:12	0.55	0.75	64
	> 2:12	0.20	0.75	16
High-Rise Residential Buildings, Hotels and Motels	≤ 2:12	0.55	0.75	64
	> 2:12	0.20	0.75	16
Non-Residential	≤ 2:12	0.55	0.75	64
	> 2:12	0.20	0.75	16

Source: Adapted from the California Green Building Standards Code (CALGreen) Tier 1 residential and non-residential voluntary measures shown in Tables A4.106.5.1 and A5.106.11.2.2, respectively. Roof installation and verification shall occur in accordance with the CALGreen Code.

CALGreen does not include recommended values for low-rise residential buildings with roof slopes of ≤ 2:12 for San Diego's climate zones (7 and 10). Therefore, the values for climate zone 15 that covers Imperial County are adapted here.

Solar Reflectance Index (SRI) equal to or greater than the values specified in this table may be used as an alternative to compliance with the aged solar reflectance values and thermal emittance.

Table 2	Fixture Flow Rates for Non-Residential Buildings related to Question 2: Plumbing Fixtures and Fittings supporting Strategy 1: Energy & Water Efficient Buildings of the Climate Action Plan
Fixture Type	**Maximum Flow Rate**
Showerheads	1.8 gpm @ 80 psi
Lavatory Faucets	0.35 gpm @60 psi
Kitchen Faucets	1.6 gpm @ 60 psi
Wash Fountains	1.6 [rim space(in.)/20 gpm @ 60 psi]
Metering Faucets	0.18 gallons/cycle
Metering Faucets for Wash Fountains	0.18 [rim space(in.)/20 gpm @ 60 psi]
Gravity Tank-type Water Closets	1.12 gallons/flush
Flushometer Tank Water Closets	1.12 gallons/flush
Flushometer Valve Water Closets	1.12 gallons/flush
Electromechanical Hydraulic Water Closets	1.12 gallons/flush
Urinals	0.5 gallons/flush

Source: Adapted from the California Green Building Standards Code (CALGreen) Tier 1 non-residential voluntary measures shown in Tables A5.303.2.3.1 and A5.106.11.2.2, respectively. See the California Plumbing Code for definitions of each fixture type.

Where complying faucets are unavailable, aerators rated at 0.35 gpm or other means may be used to achieve reduction.

Acronyms:
gpm = gallons per minute
psi = pounds per square inch (unit of pressure)
in. = inch

Table 3	**Standards for Appliances and Fixtures for Commercial Application related to Question 2: Plumbing Fixtures and Fittings supporting Strategy 1: Energy & Water Efficient Buildings of the Climate Action Plan**	
Appliance/Fixture Type	Standard	
Clothes Washers	Maximum Water Factor (WF) that will reduce the use of water by 10 percent below the California Energy Commissions' WF standards for commercial clothes washers located in Title 20 of the *California Code of Regulations*.	
Conveyor-type Dishwashers	0.70 maximum gallons per rack (2.6 L) (High-Temperature)	0.62 maximum gallons per rack (4.4 L) (Chemical)
Door-type Dishwashers	0.95 maximum gallons per rack (3.6 L) (High-Temperature)	1.16 maximum gallons per rack (2.6 L) (Chemical)
Undercounter-type Dishwashers	0.90 maximum gallons per rack (3.4 L) (High-Temperature)	0.98 maximum gallons per rack (3.7 L) (Chemical)
Combination Ovens	Consume no more than 10 gallons per hour (38 L/h) in the full operational mode.	
Commercial Pre-rinse Spray Valves (manufactured on or after January 1, 2006)	Function at equal to or less than 1.6 gallons per minute (0.10 L/s) at 60 psi (414 kPa) and • Be capable of cleaning 60 plates in an average time of not more than 30 seconds per plate. • Be equipped with an integral automatic shutoff. • Operate at static pressure of at least 30 psi (207 kPa) when designed for a flow rate of 1.3 gallons per minute (0.08 L/s) or less.	

Source: Adapted from the California Green Building Standards Code (CALGreen) Tier 1 non-residential voluntary measures shown in Section A5.303.3. See the California Plumbing Code for definitions of each appliance/fixture type.

Acronyms:
L = liter
L/h = liters per hour
L/s = liters per second
psi = pounds per square inch (unit of pressure)
kPa = kilopascal (unit of pressure)

Priority Development Project (PDP)
Storm Water Quality Management Plan (SWQMP)

MONTEZUMA HOTEL

PTS 574562

I.O. 24007373

☐ **Check if electing for offsite alternative compliance**

Engineer of Work:

SON P. NGUYEN, R.C.E. 86249

Provide Wet Signature and Stamp Above Line

Prepared For:

52 BLUE FALCON LLC

13612 CALVADOS PLACE

SAN DIEGO, CA 92128

(619) 701-2559

Prepared By:

SNIPES-DYE ASSOCIATES

8348 CENTER DRIVE, SUITE G

LA MESA, CA 91942

(619) 697-9234

Date:

June 8, 2018

Approved by: City of San Diego Date

The City of SAN DIEGO

Priority Development Project (PDP)
Storm Water Quality Management Plan (SWQMP)

MONTEZUMA HOTEL

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Engineer of Work:

REGISTERED PROFESSIONAL ENGINEER
SON P. NGUYEN
C 86249
Exp. 03/31/19
CIVIL
STATE OF CALIFORNIA

6-19-18

SON P. NGUYEN, R.C.E. 86249

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Date

The City of SAN DIEGO

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Project Name: MONTEZUMA HOTEL

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    - Maintenance Agreement (Form DS-3247) (when applicable)
- Attachment 4: Copy of Plan Sheets Showing Permanent Storm Water BMPs
- Attachment 5: Project's Drainage Report
- Attachment 6: Project's Geotechnical and Groundwater Investigation Report

Acronyms

APN	Assessor's Parcel Number
ASBS	Area of Special Biological Significance
BMP	Best Management Practice
CEQA	California Environmental Quality Act
CGP	Construction General Permit
DCV	Design Capture Volume
DMA	Drainage Management Areas
ESA	Environmentally Sensitive Area
GLU	Geomorphic Landscape Unit
GW	Ground Water
HMP	Hydromodification Management Plan
HSG	Hydrologic Soil Group
HU	Harvest and Use
INF	Infiltration
LID	Low Impact Development
LUP	Linear Underground/Overhead Projects
MS4	Municipal Separate Storm Sewer System
N/A	Not Applicable
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
PDP	Priority Development Project
PE	Professional Engineer
POC	Pollutant of Concern
SC	Source Control
SD	Site Design
SDRWQCB	San Diego Regional Water Quality Control Board
SIC	Standard Industrial Classification
SWPPP	Stormwater Pollutant Protection Plan
SWQMP	Storm Water Quality Management Plan
TMDL	Total Maximum Daily Load
WMAA	Watershed Management Area Analysis
WPCP	Water Pollution Control Program
WQIP	Water Quality Improvement Plan

Certification Page

Project Name: MONTEZUMA HOTEL
Permit Application PTS #574562

I hereby declare that I am the Engineer in Responsible Charge of design of storm water BMPs for this project, and 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 the requirements of the Storm Water Standards, which is based on the requirements of SDRWQCB Order No. R9-2013-0001 as amended by R9-2015-0001 and R9-2015-0100 (MS4 Permit).

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

Engineer of Work's Signature

86249

PE#

03-31-2019

Expiration Date

Son P. Nguyen

Print Name

Snipes-Dye Associates

Company

June 8, 2018

Date

REGISTERED PROFESSIONAL ENGINEER
SON P. NGUYEN
C 86249
Exp. 03/31/19
CIVIL
STATE OF CALIFORNIA

Engineer's Stamp

Certification Page

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Engineer of Work's Signature

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Expiration Date

Son P. Nguyen

Print Name

Snipes-Dye Associates

Company

June 8, 2018

Date

Engineer's Stamp

Project Name: MONTEZUMA HOTEL

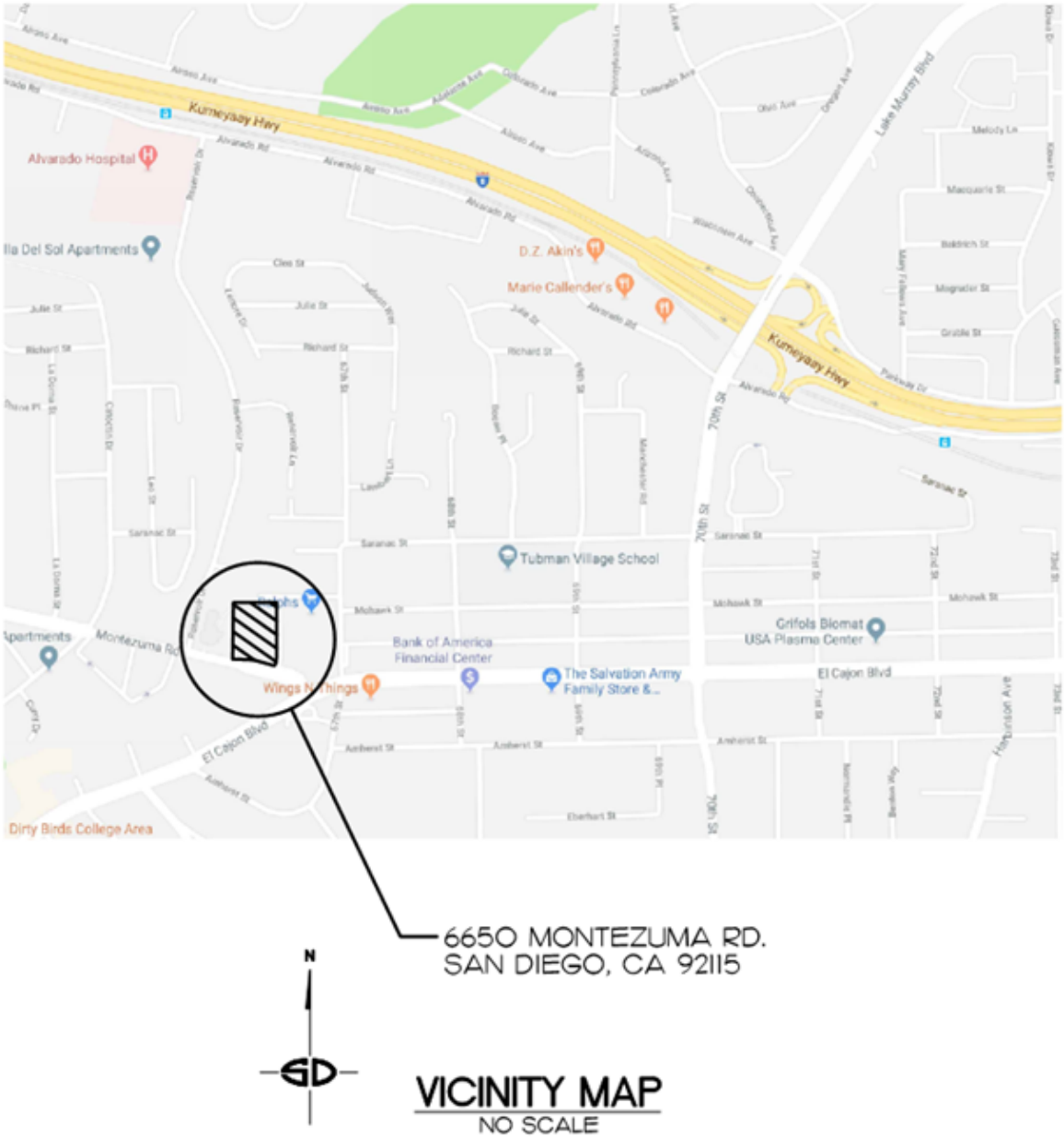
Submittal Record

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

Submittal Number	Date	Project Status	Changes
1	03-28-18	☑ **Preliminary Design/Planning/CEQA** ☐ **Final Design**	**Initial Submittal**
2	06-11-18	☑ **Preliminary Design/Planning/CEQA** ☐ **Final Design**	Second Submittal
3		☐ **Preliminary Design/Planning/CEQA** ☐ **Final Design**	
4		☐ **Preliminary Design/Planning/CEQA** ☐ **Final Design**	

Project Vicinity Map

Project Name: MONTEZUMA HOTEL
Permit Application 574562



City of San Diego Form DS-560 Storm Water Requirements Applicability Checklist

Attach DS-560 form.

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
October 2016

Project Address: 6650 Montezuma Road, San Diego, CA 92115

Project Number *(for City Use Only)*: 574562

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 projects 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 resulting 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 below, 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 Priority

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

Clear Page 2

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.

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 and check the box labeled "Priority Development Project".

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

Clear Page 3

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 PERMANENT 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 ☒

Ramón Esquer	Design Engineer
Name of Owner or Agent *(Please Print)*	Title
Ramón Esquer	03/07/2018
Signature	Date

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Applicability of Permanent, Post-Construction Storm Water BMP Requirements	Form I-1
Project Identification	
Project Name: MONTEZUMA HOTEL	
Permit Application Number:574562	Date:June 8, 2018
Determination of Requirements	

The purpose of this form is to identify permanent, post-construction requirements that apply to the project. This form serves as a short summary of applicable requirements, in some cases referencing separate forms that will serve as the backup for the determination of requirements.

Answer each step below, starting with **Step 1** and progressing through each step until reaching "Stop". Refer to the manual sections and/or separate forms referenced in each step below.

Step	Answer	Progression
Step 1: Is the project a "development project"? See Section 1.3 of the manual (Part 1 of Storm Water Standards) for guidance.	☑ Yes	Go to **Step 2**.
	☐ No	**Stop**. Permanent BMP requirements do not apply. No SWQMP will be required. Provide discussion below.
Discussion / justification if the project is not a "development project" (e.g., the project includes *only* interior remodels within an existing building):		
Step 2: Is the project a Standard Project, PDP, or PDP Exempt? To answer this item, see Section 1.4 of the manual in its entirety for guidance AND complete Form DS-560, Storm Water Requirements Applicability Checklist.	☐ Standard Project	**Stop.** Standard Project requirements apply
	☑ PDP	PDP requirements apply, including PDP SWQMP. Go to **Step 3**.
	☐ PDP Exempt	**Stop.** Standard Project requirements apply. Provide discussion and list any additional requirements below.
Discussion / justification, and additional requirements for exceptions to PDP definitions, if applicable:		

Project Name: MONTEZUMA HOTEL

Form I-1 Page 2 of 2		
Step	**Answer**	**Progression**
Step 3. Is the project subject to earlier PDP requirements due to a prior lawful approval? See Section 1.10 of the manual (Part 1 of Storm Water Standards) for guidance.	☐ Yes	Consult the City Engineer to determine requirements. Provide discussion and identify requirements below. Go to **Step 4**.
	☑ No	BMP Design Manual PDP requirements apply. Go to **Step 4**.
Discussion / justification of prior lawful approval, and identify requirements (<u>not required if prior lawful approval does not apply</u>):		
Step 4. Do hydromodification control requirements apply? See Section 1.6 of the manual (Part 1 of Storm Water Standards) for guidance.	☑ Yes	PDP structural BMPs required for pollutant control (Chapter 5) and hydromodification control (Chapter 6). Go to **Step 5**.
	☐ No	**Stop**. PDP structural BMPs required for pollutant control (Chapter 5) only. Provide brief discussion of exemption to hydromodification control below.
Discussion / justification if hydromodification control requirements do <u>not</u> apply:		
Step 5. Does protection of critical coarse sediment yield areas apply? See Section 6.2 of the manual (Part 1 of Storm Water Standards) for guidance.	☐ Yes	Management measures required for protection of critical coarse sediment yield areas (Chapter 6.2). **Stop**.
	☑ No	Management measures not required for protection of critical coarse sediment yield areas. Provide brief discussion below. **Stop**.
Discussion / justification if protection of critical coarse sediment yield areas does <u>not</u> apply: Based on WMAA maps there are no critical coarse sediment yield areas located within or upstream area draining through the project footprint. See Attachment 2 section of this report for a copy of the WMAA map for this site.		

HMP Exemption Exhibit

Attach a HMP Exemption Exhibit that shows direct storm water runoff discharge from the project site to HMP exempt area. Include project area, applicable underground storm drain line and/or concrete lined channels, outfall information and exempt waterbody.
Reference applicable drawing number(s).

Exhibit must be provided on 11"x17" or larger paper.

NOT APPLICABLE

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Project Name: MONTEZUMA HOTEL

Site Information Checklist For PDPs	Form I-3B
Project Summary Information	
Project Name	MONTEZUMA HOTEL
Project Address	6650 MONTEZUMA ROAD SAN DIEGO, CA 92115
Assessor's Parcel Number(s) (APN(s))	468-120-06-00
Permit Application Number	574562
Project Watershed	Select One: ☐ San Dieguito River ☐ Penasquitos ☐ Mission Bay ☑ San Diego River ☐ San Diego Bay ☐ Tijuana River
Hydrologic subarea name with Numeric Identifier up to two decimal places (9XX.XX)	MISSION SAN DIEGO HSA (907.11)
Project Area (total area of Assessor's Parcel(s) associated with the project or total area of the right-of-way)	1. Acres (81,020 Square Feet)
Area to be disturbed by the project (Project Footprint)	1. Acres (81,0 Square Feet)
Project Proposed Impervious Area (subset of Project Footprint)	1 Acres (67,69 Square Feet)
Project Proposed Pervious Area (subset of Project Footprint)	0 Acres (13,32 Square Feet)
Note: Proposed Impervious Area + Proposed Pervious Area = Area to be Disturbed by the Project. This may be less than the Project Area.	
The proposed increase or decrease in impervious area in the proposed condition as compared to the pre-project condition	+12 %

Project Name: MONTEZUMA HOTEL

Form I-3B Page 2 of 11
Description of Existing Site Condition and Drainage Patterns
Current Status of the Site (select all that apply): ☑ Existing development ☐ Previously graded but not built out ☐ Agricultural or other non-impervious use ☐ Vacant, undeveloped/natural Description / Additional Information: The project site is currently vacant, with recent demolition of a church that was previously located on the project site.
Existing Land Cover Includes (select all that apply): ☑ Vegetative Cover ☑ Non-Vegetated Pervious Areas ☑ Impervious Areas Description / Additional Information: The site impervious areas mainly consist of building rooftops and asphalt pavement, while landscaping is found within the courtyard area located towards the center of the site and a few planter areas around the church building and parking lot area. The portion
Underlying Soil belongs to Hydrologic Soil Group (select all that apply): ☐ NRCS Type A ☐ NRCS Type B ☐ NRCS Type C ☑ NRCS Type D
Approximate Depth to Groundwater: ☐ Groundwater Depth < 5 feet ☐ 5 feet < Groundwater Depth < 10 feet ☐ 10 feet < Groundwater Depth < 20 feet ☑ Groundwater Depth > 20 feet
Existing Natural Hydrologic Features (select all that apply): ☐ Watercourses ☐ Seeps ☐ Springs ☐ Wetlands ☑ None Description / Additional Information:

Form I-3B Page 3 of 11

Description of Existing Site Topography and Drainage

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

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

Descriptions/Additional Information

The general topography of the site consists of flat to gently sloping land that drains in a general north direction. Most of the site storm water runoff consists of surface flows that enter curb inlets that direct flow into private storm drain systems that eventually connect to an existing off-site public storm drain system north of the site. This existing public storm drain system is categorized as urban. The southerly portion of the site also consists of surface flows that discharge into the street gutter system on Montezuma Road where it eventually directed to the existing public storm drain system. Please refer to "Preliminary Drainage/Hydrology Study" dated June 7, 2018 prepared by Snipes-Dye Associates for Pre-Development Drainage Map for location of discharge points for the site. The table below is a summary of the peak discharges for the Pre-Development and Post-Development conditions.

PRE & POST DEVELOPMENT 100-YR. PEAK DISCHARGES

BASIN	PRE-DEVELOPMENT			POST DEVELOPMENT			
	TIME OF CONCENTRATION Tc (IN MINUTES)	AREA A (IN ACRES)	DISCHARGE Q100 (IN CFS)	TIME OF CONCENTRATION Tc (IN MINUTES)	AREA A (IN ACRES)	DISCHARGE Q100 (IN CFS)	POST-DEVELOPMENT MITIGATION Q100 (IN CFS)
A	6.00	0.32	1.56	6.00	0.14	0.75	0.02
B	17.78	0.51	0.80	6.00	0.47	2.60	0.05
C	6.00	0.04	0.19	6.00	0.64	3.70	0.08
C2	--	--	--	8.11	0.05	0.13	0.13
D	7.76	0.30	1.26	8.72	0.55	2.29	0.06
E	7.53	0.68	2.61	--	--	--	--
TOTAL	--	1.85	6.42	--	1.85	9.47	0.34

Project Name: MONTEZUMA HOTEL

Form I-3B Page 4 of 11
Description of Proposed Site Development and Drainage Patterns
Project Description / Proposed Land Use and/or Activities: The project proposes the construction of 5-story hotel building and asphalt paved parking lot that runs along the perimeter of the site.
List/describe proposed impervious features of the project (e.g., buildings, roadways, parking lots, courtyards, athletic courts, other impervious features): The proposed construction of the 5-story building over the portion of the existing asphalt parking will create the increase of approximately 9,650 SF of impervious surface (12% increase) over the approximate 58,043 SF of existing impervious surface site. Majority of the new impervious surface area consists of the building roof tops and asphalt pavement.
List/describe proposed pervious features of the project (e.g., landscape areas): The project proposes a total of four landscaped biofiltration with partial retention basins. Three of which are located along the north and south sides of the proposed building. There will intermittent planter areas within the proposed parking lot areas.
Does the project include grading and changes to site topography? ☐ Yes ☑ No Description / Additional Information: Grading will be minimal to maintain similar topography as in the current condition.

Project Name: MONTEZUMA HOTEL

Form I-3B Page 5 of 11

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

☑ Yes

☐ No

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

Description / Additional Information:

Site drainage will consist of surface flow picked up by the gutter system along the parking lot areas that will be directed to the proposed biofiltration with partial retention basins. The runoff from the proposed hotel building rooftops will also be directed to the basins through roof drains that will connect to a private storm drain and into the basin. Any peak discharges exceeding the low flow threshold for hydromodification management in the proposed biofiltration basins will overflow in 48" catch basins and will be directed to a proposed 6"/12" storm drain system. The north parking lot area will drain in a northwest direction and enter a proposed curb inlet basin where it will be pumped to one the biofiltration basins. Eventually all the overflow from all four proposed biofiltraton with partial retention basins will outlet into a proposed storm drain cleanout that will connect to an existing 18" public storm drain system. The table below is a summary of the peak discharges for the Pre-Development and Post-Development conditions.

	PRE & POST DEVELOPMENT 100-YR. PEAK DISCHARGES						
	PRE-DEVELOPMENT			POST DEVELOPMENT			
BASIN	TIME OF CONCENTRATION Tc (IN MINUTES)	AREA A (IN ACRES)	DISCHARGE Q100 (IN CFS)	TIME OF CONCENTRATION Tc (IN MINUTES)	AREA A (IN ACRES)	DISCHARGE Q100 (IN CFS)	POST-DEVELOPMENT MITIGATION Q100 (IN CFS)
A	6.00	0.32	1.56	6.00	0.14	0.75	0.02
B	17.78	0.51	0.80	6.00	0.47	2.60	0.05
C	6.00	0.04	0.19	6.00	0.64	3.70	0.08
C2	--	--	--	8.11	0.05	0.13	0.13
D	7.76	0.30	1.26	8.72	0.55	2.29	0.06
E	7.53	0.68	2.61	--	--	--	--
TOTAL	--	1.85	6.42	--	1.85	9.47	0.34

Project Name: MONTEZUMA HOTEL

Form I-3B Page 6 of 11

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

- ☑ Onsite storm drain inlets
- ☑ Interior floor drains and elevator shaft sump pumps
- ☐ Interior parking garages
- ☑ Need for future indoor & structural pest control
- ☑ Landscape/outdoor pesticide use
- ☑ Pools, spas, ponds, decorative fountains, and other water features
- ☑ Food service
- ☑ Refuse areas
- ☐ Industrial processes
- ☐ Outdoor storage of equipment or materials
- ☐ Vehicle and equipment cleaning
- ☐ Vehicle/equipment repair and maintenance
- ☐ Fuel dispensing areas
- ☐ Loading docks
- ☑ Fire sprinkler test water
- ☑ Miscellaneous drain or wash water
- ☑ Plazas, sidewalks, and parking lots

Description/Additional Information:

All items not selected are not being proposed as part of this project.

Project Name: MONTEZUMA HOTEL

Form I-3B Page 7 of 11
Identification and Narrative of Receiving Water
Narrative describing flow path from discharge location(s), through urban storm conveyance system, to receiving creeks, rivers, and lagoons and ultimate discharge location to Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable) Site drainage will be directed to an existing public storm drain system to the north of the site where it will be discharge into Alvarado Creek located northwest of the site, thence into the San Diego River, thence west to the Pacific Ocean. The San Diego River is approximately 16 miles of river reach listed on the 303(d) impaired and threatened waters list. To comply with the Clean Water Act (CWA), water quality objectives must be met to maintain listed 303(d) primary pollutants at target levels.
Provide a summary of all beneficial uses of receiving waters downstream of the project discharge locations Agricultural Supply (AGR): Uses for farming, horticultural and ranching. Industrial Service Supply (IND): Uses for industrial activities. Contact Water Recreation (REC1): Uses for contact water activities. Non-contact Water Recreation (REC-2): Uses for non-contact recreational activities. Preservation of Biological Habitats of Special Significance (BIOL): Uses for refuges, parks, sanctuaries reserves. Warm Freshwater Habitat (WARM): Uses to preservation or enhancement of aquatic habitats, vegetation, fish or wildlife, including
Identify all ASBS (areas of special biological significance) receiving waters downstream of the project discharge locations The subject site does not discharge into an area of special biological significance.
Provide distance from project outfall location to impaired or sensitive receiving waters The project is approximately 9.5 miles from the mouth of the San Diego River at the Pacific Ocean.
Summarize information regarding the proximity of the permanent, post-construction storm water BMPs to the City's Multi-Habitat Planning Area and environmentally sensitive lands The proposed biofiltration with partial retention basins are located outside of the City's Multi-Habitat Planning Area and environmentally sensitive lands.

Project Name: MONTEZUMA HOTEL

Form I-3B Page 8 of 11		
Identification of Receiving Water Pollutants of Concern		
List any 303(d) impaired water bodies within the path of storm water from the project site to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable), identify the pollutant(s)/stressor(s) causing impairment, and identify any TMDLs and/or Highest Priority Pollutants from the WQIP for the impaired water bodies:		
303(d) Impaired Water Body (Refer to Appendix K)	**Pollutant(s)/Stressor(s) (Refer to Appendix K)**	**TMDLs/WQIP Highest Priority Pollutant (Refer to Table 1-4 in Chapter 1)**
San Diego River (Lower)	Enterococcus, Total Coliform,	Indicator Bacteria
	Low Dissolved Oxygen,	
	Manganes, Nitrogen,	
	Phosphorus, Total Dissolved	
	Solids, Toxicity	

Identification of Project Site Pollutants*			
*Identification of project site pollutants is only required if flow-thru treatment BMPs are implemented onsite in lieu of retention or biofiltration BMPs (note the project must also participate in an alternative compliance program unless prior lawful approval to meet earlier PDP requirements is demonstrated) Identify pollutants anticipated from the project site based on all proposed use(s) of the site (see Appendix B.6):			
Pollutant	**Not Applicable to the Project Site**	**Anticipated from the Project Site**	**Also a Receiving Water Pollutant of Concern**
Sediment	☑	☐	☐
Nutrients	☑	☐	☐
Heavy Metals	☑	☐	☐
Organic Compounds	☑	☐	☐
Trash & Debris	☑	☐	☐
Oxygen Demanding Substances	☑	☐	☐
Oil & Grease	☑	☐	☐
Bacteria & Viruses	☑	☐	☐
Pesticides	☑	☐	☐

Form I-3B Page 9 of 11

Hydromodification Management Requirements

Do hydromodification management requirements apply (see Section 1.6)?

☑ Yes, hydromodification management flow control structural BMPs required.

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

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

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

Description / Additional Information (to be provided if a 'No' answer has been selected above):

Note: If "No" answer has been selected the SWQMP must include an exhibit that shows the storm water conveyance system from the project site to an exempt water body. The exhibit should include details about the conveyance system and the outfall to the exempt water body.

Critical Coarse Sediment Yield Areas*

*This Section only required if hydromodification management requirements apply

Based on Section 6.2 and Appendix H does CCSYA exist on the project footprint or in the upstream area draining through the project footprint?

☐ Yes

☑ No

Discussion / Additional Information:

Based on WMAA maps there are no critical coarse sediment yield areas located within the project footprint or upstream area draining through the project footprint. See Attachment 2 of this report for a copy of the WMAA Critical Coarse Sediment Yield Area Map.

Form I-3B Page 10 of 11
Flow Control for Post-Project Runoff*   ***This Section only required if hydromodification management requirements apply**
List and describe point(s) of compliance (POCs) for flow control for hydromodification management (see Section 6.3.1). For each POC, provide a POC identification name or number correlating to the project's HMP Exhibit and a receiving channel identification name or number correlating to the project's HMP Exhibit.   The point of compliance (P.O.C.) for post-project flow control for hydromodification management is approximately 0,5 mile northwest of the project site. The receiving channel is Alvarado Creek (907.11).
Has a geomorphic assessment been performed for the receiving channel(s)?   ☑ No, the low flow threshold is $0.1Q_2$ (default low flow threshold)   ☐ Yes, the result is the low flow threshold is $0.1Q_2$ ☐ Yes, the result is the low flow threshold is $0.3Q_2$ ☐ Yes, the result is the low flow threshold is $0.5Q_2$ If a geomorphic assessment has been performed, provide title, date, and preparer:
Discussion / Additional Information: (optional)

Project Name: MONTEZUMA HOTEL

Form I-3B Page 11 of 11
Other Site Requirements and Constraints
When applicable, list other site requirements or constraints that will influence storm water management design, such as zoning requirements including setbacks and open space, or local codes governing minimum street width, sidewalk construction, allowable pavement types, and drainage requirements. N/A. There are no other site requirements or constraints influencing storm water management.
Optional Additional Information or Continuation of Previous Sections As Needed
This space provided for additional information or continuation of information from previous sections as needed.

Project Name: MONTEZUMA HOTEL

Source Control BMP Checklist for PDPs	Form I-4B		
Source Control BMPs			
All development projects must implement source control BMPs where applicable and feasible. See Chapter 4 and Appendix E of the BMP Design Manual (Part 1 of the Storm Water Standards) for information to implement source control BMPs shown in this checklist. Answer each category below pursuant to the following. • "Yes" means the project will implement the source control BMP as described in Chapter 4 and/or Appendix E of the BMP Design Manual. Discussion / justification is not required. • "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided. • "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project has no outdoor materials storage areas). Discussion / justification may be provided.			
Source Control Requirement	**Applied?**		
4.2.1 Prevention of Illicit Discharges into the MS4	☑ Yes	☐ No	☐ N/A
Discussion / justification if 4.2.1 not implemented:			
4.2.2 Storm Drain Stenciling or Signage	☑ Yes	☐ No	☐ N/A
Discussion / justification if 4.2.2 not implemented:			
4.2.3 Protect Outdoor Materials Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐ Yes	☐ No	☑ N/A
Discussion / justification if 4.2.3 not implemented: The project has no outdoor materials storage areas.			
4.2.4 Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐ Yes	☐ No	☑ N/A
Discussion / justification if 4.2.4 not implemented: The project has no outdoor work areas.			
4.2.5 Protect Trash Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☑ Yes	☐ No	☐ N/A
Discussion / justification if 4.2.5 not implemented:			

Project Name: MONTEZUMA HOTEL

Form I-4B Page 2 of 2			
Source Control Requirement	Applied?		
4.2.6 Additional BMPs Based on Potential Sources of Runoff Pollutants (must answer for each source listed below)			
On-site storm drain inlets	☑ Yes	☐ No	☐ N/A
Interior floor drains and elevator shaft sump pumps	☑ Yes	☐ No	☐ N/A
Interior parking garages	☐ Yes	☐ No	☑ N/A
Need for future indoor & structural pest control	☑ Yes	☐ No	☐ N/A
Landscape/Outdoor Pesticide Use	☑ Yes	☐ No	☐ N/A
Pools, spas, ponds, decorative fountains, and other water features	☑ Yes	☐ No	☐ N/A
Food service	☑ Yes	☐ No	☐ N/A
Refuse areas	☑ Yes	☐ No	☐ N/A
Industrial processes	☐ Yes	☐ No	☑ N/A
Outdoor storage of equipment or materials	☐ Yes	☐ No	☑ N/A
Vehicle/Equipment Repair and Maintenance	☐ Yes	☐ No	☑ N/A
Fuel Dispensing Areas	☐ Yes	☐ No	☑ N/A
Loading Docks	☑ Yes	☐ No	☐ N/A
Fire Sprinkler Test Water	☑ Yes	☐ No	☐ N/A
Miscellaneous Drain or Wash Water	☑ Yes	☐ No	☐ N/A
Plazas, sidewalks, and parking lots	☑ Yes	☐ No	☐ N/A
SC-6A: Large Trash Generating Facilities	☐ Yes	☐ No	☑ N/A
SC-6B: Animal Facilities	☐ Yes	☐ No	☑ N/A
SC-6C: Plant Nurseries and Garden Centers	☐ Yes	☐ No	☑ N/A
SC-6D: Automotive Facilities	☐ Yes	☐ No	☑ N/A

Discussion / justification if 4.2.6 not implemented. Clearly identify which sources of runoff pollutants are discussed. Justification must be provided for all "No" answers shown above.

All items selected as "N/A" do not apply, because these features are not being proposed as part of this project.

Project Name: MONTEZUMA HOTEL

Site Design BMP Checklist for PDPs	Form I-5B

Site Design BMPs

All development projects must implement site design BMPs where applicable and feasible. See Chapter 4 and Appendix E of the BMP Design Manual (Part 1 of Storm Water Standards) for information to implement site design BMPs shown in this checklist.

Answer each category below pursuant to the following.

- "Yes" means the project will implement the site design BMP as described in Chapter 4 and/or Appendix E of the BMP Design Manual. Discussion / justification is not required.
- "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.
- "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project site has no existing natural areas to conserve). Discussion / justification may be provided.

A site map with implemented site design BMPs must be included at the end of this checklist.

Site Design Requirement	Applied?		
4.3.1 Maintain Natural Drainage Pathways and Hydrologic Features	☐ Yes	☐ No	☑ N/A
Discussion / justification if 4.3.1 not implemented: There are no existing natural drainage pathways and hydrologic features at the project site			
1-1 Are existing natural drainage pathways and hydrologic features mapped on the site map?	☐ Yes	☐ No	☑ N/A
1-2 Are trees implemented? If yes, are they shown on the site map?	☐ Yes	☐ No	☑ N/A
1-3 Implemented trees meet the design criteria in 4.3.1 Fact Sheet (e.g. soil volume, maximum credit, etc.)?	☐ Yes	☐ No	☑ N/A
1-4 Is tree credit volume calculated using Appendix B.2.2.1 and SD-1 Fact Sheet in Appendix E?	☐ Yes	☐ No	☑ N/A
4.3.2 Have natural areas, soils and vegetation been conserved?	☐ Yes	☐ No	☑ N/A
Discussion / justification if 4.3.2 not implemented: The whole site will be re-developed and re-landscaped.			

Project Name: MONTEZUMA HOTEL

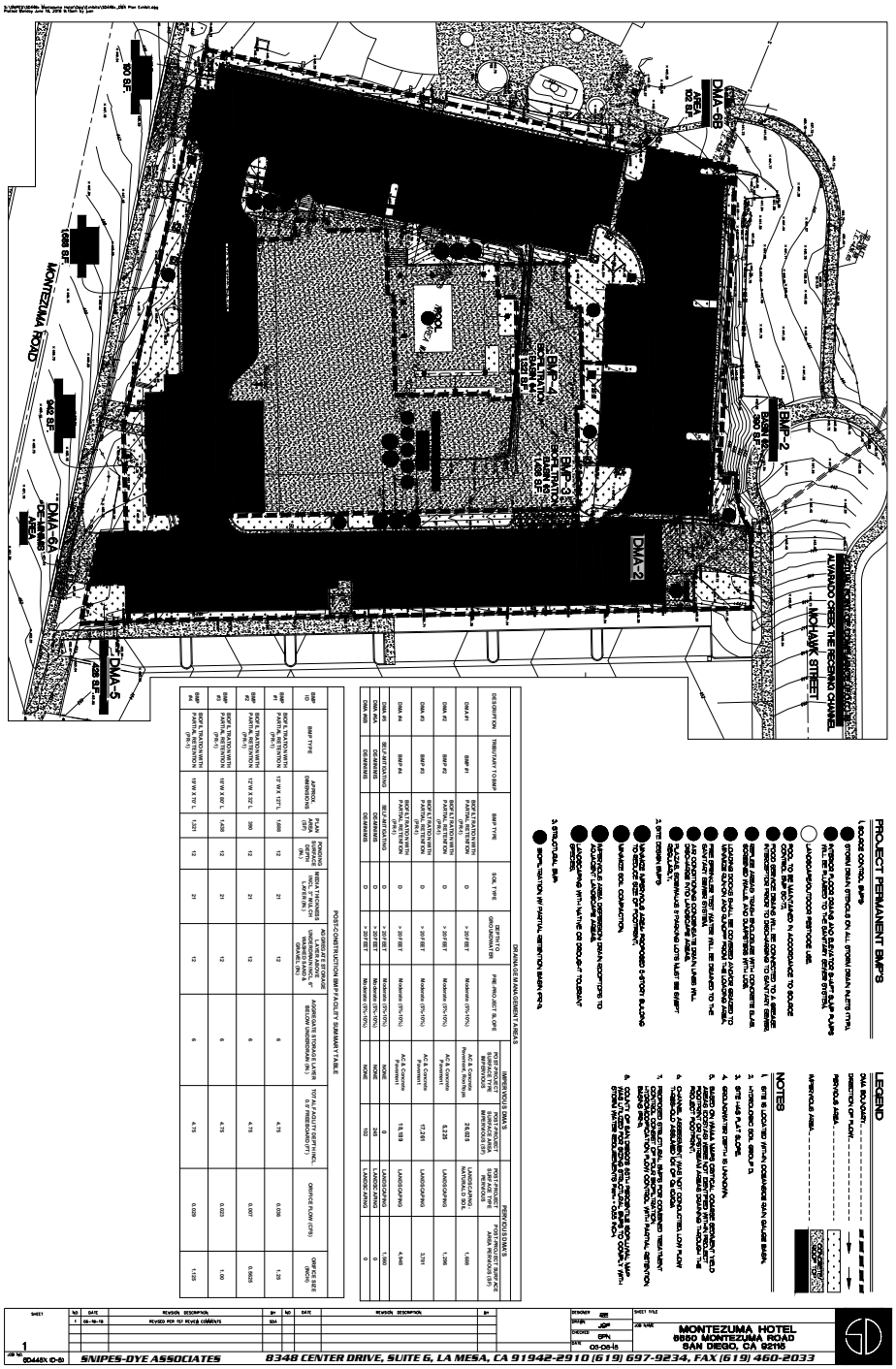
Form I-5B Page 2 of 4			
Site Design Requirement	Applied?		
4.3.3 Minimize Impervious Area	☑ Yes	☐ No	☐ N/A
Discussion / justification if 4.3.3 not implemented: Proposed 5-story buildings to reduce the size of the building footprint.			
4.3.4 Minimize Soil Compaction	☑ Yes	☐ No	☐ N/A
Discussion / justification if 4.3.4 not implemented: Minimum soil compaction over the landscape strip along Montezuma Road property frontage and adjacent to the northerly side of the proposed building.			
4.3.5 Impervious Area Dispersion	☑ Yes	☐ No	☐ N/A
Discussion / justification if 4.3.5 not implemented: Building rooftops will be directed to the landscape/biofiltration with partial retention basin located af the property frontage along Montezuma Road..			
5-1 Is the pervious area receiving runon from impervious area identified on the site map?	☐ Yes	☑ No	☐ N/A
5-2 Does the pervious area satisfy the design criteria in 4.3.5 Fact Sheet in Appendix E (e.g. maximum slope, minimum length, etc.)	☐ Yes	☑ No	☐ N/A
5-3 Is impervious area dispersion credit volume calculated using Appendix B.2.1.1 and 4.3.5 Fact Sheet in Appendix E?	☐ Yes	☑ No	☐ N/A

Project Name: MONTEZUMA HOTEL

Form I-5B Page 3 of 4			
Site Design Requirement	Applied?		
4.3.6 Runoff Collection	☐ Yes	☑ No	☐ N/A
Discussion / justification if 4.3.6 not implemented: The project does not propose any runoff collection.			
6a-1 Are green roofs implemented in accordance with design criteria in 4.3.6A Fact Sheet? If yes, are they shown on the site map?	☐ Yes	☐ No	☑ N/A
6a-2 Is the green roof credit volume calculated using Appendix B.2.1.2 and 4.3.6A Fact Sheet in Appendix E?	☐ Yes	☐ No	☑ N/A
6b-1 Are permeable pavements implemented in accordance with design criteria in 4.3.6B Fact Sheet? If yes, are they shown on the site map?	☐ Yes	☐ No	☑ N/A
6b-2 Is the permeable pavement credit volume calculated using Appendix B.2.1.3 and 4.3.6B Fact Sheet in Appendix E?	☐ Yes	☐ No	☑ N/A
4.3.7 Landscaping with Native or Drought Tolerant Species	☑ Yes	☐ No	☐ N/A
Discussion / justification if 4.3.7 not implemented:			
4.3.8 Harvest and Use Precipitation	☐ Yes	☑ No	☐ N/A
Discussion / justification if 4.3.8 not implemented: Harvest and reuse not feasible.			
8-1 Are rain barrels implemented in accordance with design criteria in 4.3.8 Fact Sheet? If yes, are they shown on the site map?	☐ Yes	☑ No	☐ N/A
8-2 Is the rain barrel credit volume calculated using Appendix B.2.2.2 and 4.3.8 Fact Sheet in Appendix E?	☐ Yes	☑ No	☐ N/A

Form I-5B Page 4 of 4

Insert Site Map with all site design BMPs identified:



Project Name: MONTEZUMA HOTEL

Summary of PDP Structural BMPs	Form I-6

PDP Structural BMPs

All PDPs must implement structural BMPs for storm water pollutant control (see Chapter 5 of the BMP Design Manual, Part 1 of Storm Water Standards). Selection of PDP structural BMPs for storm water pollutant control must be based on the selection process described in Chapter 5. PDPs subject to hydromodification management requirements must also implement structural BMPs for flow control for hydromodification management (see Chapter 6 of the BMP Design Manual). Both storm water pollutant control and flow control for hydromodification management can be achieved within the same structural BMP(s).

PDP structural BMPs must be verified by the City at the completion of construction. This includes requiring the project owner or project owner's representative to certify construction of the structural BMPs (complete Form DS-563). PDP structural BMPs must be maintained into perpetuity (see Chapter 7 of the BMP Design Manual).

Use this form to provide narrative description of the general strategy for structural BMP implementation at the project site in the box below. Then complete the PDP structural BMP summary information sheet (page 3 of this form) for each structural BMP within the project (copy the BMP summary information page as many times as needed to provide summary information for each individual structural BMP).

Describe the general strategy for structural BMP implementation at the site. This information must describe how the steps for selecting and designing storm water pollutant control BMPs presented in Section 5.1 of the BMP Design Manual were followed, and the results (type of BMPs selected). For projects requiring hydromodification flow control BMPs, indicate whether pollutant control and flow control BMPs are integrated or separate.

Step 1A: Evaluated drainage management areas within site. DMA #1 thru DMA #4 were determined to be tributary to BMP #1 thru BMP #4, respectively. DMA#5 was determined to be self-mitigating, while DMAs #6A & #6B were determined to be de-minimis areas.
Step 1B: Design Capture Volume was determined for DMA #1, DMA #2, DMA #3, and DMA #4.
Step 2: Harvest and use was determined to be not feasible.
Step 3A/B: Determination of infiltration feasibility using Worksheet C.4-1" Categorization of Infiltration Feasibility Condition". Although Full Infiltration was determined to be infeasible, Partial Infiltration was determined to be feasible.
Step 4: Selected biofiltration with partial retention BMPs. All BMP facilities (BMP #1 thru BMP #4) were sized to meet combined treatment and hydromodification control requirements in accordance with the 2018 City of San Diego Storm Water Standards.

(Continue on page 2 as necessary.)

Project Name: MONTEZUMA HOTEL

Form I-6 Page 2 of
(Continued from page 1)

Project Name: MONTEZUMA HOTEL

Form I-6 Page of (Copy as many as needed)	
Structural BMP Summary Information	
Structural BMP ID No.BMP #1	
Construction Plan Sheet No.NOT APPLICABLE	
Type of Structural BMP: ☐ Retention by harvest and use (e.g. HU-1, cistern) ☐ Retention by infiltration basin (INF-1) ☐ Retention by bioretention (INF-2) ☐ Retention by permeable pavement (INF-3) ☑ Partial retention by biofiltration with partial retention (PR-1) ☐ Biofiltration (BF-1) ☐ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) ☐ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) ☐ Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) ☐ Detention pond or vault for hydromodification management ☐ Other (describe in discussion section below)	
Purpose: ☐ Pollutant control only ☐ Hydromodification control only ☑ Combined pollutant control and hydromodification control ☐ Pre-treatment/forebay for another structural BMP ☐ Other (describe in discussion section below)	
Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification form DS-563	Son P. Nguyen 8348 Center Drive La Mesa, CA 91942 (619) 697-9234
Who will be the final owner of this BMP?	52 Blue Falcon LLC
Who will maintain this BMP into perpetuity?	52 Blue Falcon LLC or future property owner
What is the funding mechanism for maintenance?	Property owner to maintain

Project Name: MONTEZUMA HOTEL

Form I-6 Page of (Copy as many as needed)
Structural BMP ID No.BMP #1
Construction Plan Sheet No.NOT APPLICABLE
Discussion (as needed; must include worksheets showing BMP sizing calculations in the SWQMPs):

Project Name: MONTEZUMA HOTEL

Form I-6 Page of (Copy as many as needed)	
Structural BMP Summary Information	
Structural BMP ID No. BMP #2	
Construction Plan Sheet No. NOT APPLICABLE	
Type of Structural BMP: ☐ Retention by harvest and use (e.g. HU-1, cistern) ☐ Retention by infiltration basin (INF-1) ☐ Retention by bioretention (INF-2) ☐ Retention by permeable pavement (INF-3) ☑ Partial retention by biofiltration with partial retention (PR-1) ☐ Biofiltration (BF-1) ☐ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) ☐ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) ☐ Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) ☐ Detention pond or vault for hydromodification management ☐ Other (describe in discussion section below)	
Purpose: ☐ Pollutant control only ☐ Hydromodification control only ☑ Combined pollutant control and hydromodification control ☐ Pre-treatment/forebay for another structural BMP ☐ Other (describe in discussion section below)	
Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification form DS-563	Son P. Nguyen 8348 Center Drive La Mesa, CA 91942 (619) 697-9234
Who will be the final owner of this BMP?	52 Blue Falcon LLC
Who will maintain this BMP into perpetuity?	52 Blue Falcon LLC or future property owner
What is the funding mechanism for maintenance?	Property owner to maintain

Project Name: MONTEZUMA HOTEL

Form I-6 Page of (Copy as many as needed)
Structural BMP ID No. BMP #2
Construction Plan Sheet No. NOT APPLICABLE
Discussion (as needed; must include worksheets showing BMP sizing calculations in the SWQMPs):

Project Name: MONTEZUMA HOTEL

Form I-6 Page of (Copy as many as needed)	
Structural BMP Summary Information	
Structural BMP ID No. BMP #3	
Construction Plan Sheet No. NOT APPLICABLE	
Type of Structural BMP: ☐ Retention by harvest and use (e.g. HU-1, cistern) ☐ Retention by infiltration basin (INF-1) ☐ Retention by bioretention (INF-2) ☐ Retention by permeable pavement (INF-3) ☑ Partial retention by biofiltration with partial retention (PR-1) ☐ Biofiltration (BF-1) ☐ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) ☐ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) ☐ Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) ☐ Detention pond or vault for hydromodification management ☐ Other (describe in discussion section below)	
Purpose: ☐ Pollutant control only ☐ Hydromodification control only ☑ Combined pollutant control and hydromodification control ☐ Pre-treatment/forebay for another structural BMP ☐ Other (describe in discussion section below)	
Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification form DS-563	Son P. Nguyen 8348 Center Drive La Mesa, CA 91942 (619) 697-9234
Who will be the final owner of this BMP?	52 Blue Falcon LLC
Who will maintain this BMP into perpetuity?	52 Blue Falcon LLC or future property owner
What is the funding mechanism for maintenance?	Property owner to maintain

Project Name: MONTEZUMA HOTEL

Form I-6 Page of (Copy as many as needed)
Structural BMP ID No. BMP #3
Construction Plan Sheet No. NOT APPLICABLE
Discussion (as needed; must include worksheets showing BMP sizing calculations in the SWQMPs):

Project Name: MONTEZUMA HOTEL

Form I-6 Page of (Copy as many as needed)	
Structural BMP Summary Information	
Structural BMP ID No. BMP #4	
Construction Plan Sheet No. NOT APPLICABLE	
Type of Structural BMP: ☐ Retention by harvest and use (e.g. HU-1, cistern) ☐ Retention by infiltration basin (INF-1) ☐ Retention by bioretention (INF-2) ☐ Retention by permeable pavement (INF-3) ☑ Partial retention by biofiltration with partial retention (PR-1) ☐ Biofiltration (BF-1) ☐ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) ☐ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) ☐ Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) ☐ Detention pond or vault for hydromodification management ☐ Other (describe in discussion section below)	
Purpose: ☐ Pollutant control only ☐ Hydromodification control only ☑ Combined pollutant control and hydromodification control ☐ Pre-treatment/forebay for another structural BMP ☐ Other (describe in discussion section below)	
Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification form DS-563	Son P. Nguyen 8348 Center Drive La Mesa, CA 91942 (619) 697-9234
Who will be the final owner of this BMP?	52 Blue Falcon LLC
Who will maintain this BMP into perpetuity?	52 Blue Falcon LLC or future property owner
What is the funding mechanism for maintenance?	Property owner to maintain

Project Name: MONTEZUMA HOTEL

Form I-6 Page of (Copy as many as needed)
Structural BMP ID No. BMP #4
Construction Plan Sheet No. NOT APPLICABLE
Discussion (as needed; must include worksheets showing BMP sizing calculations in the SWQMPs):

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Attachment 1
Backup For PDP Pollutant Control BMPs

This is the cover sheet for Attachment 1.

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Project Name: MONTEZUMA HOTEL

Indicate which Items are Included:

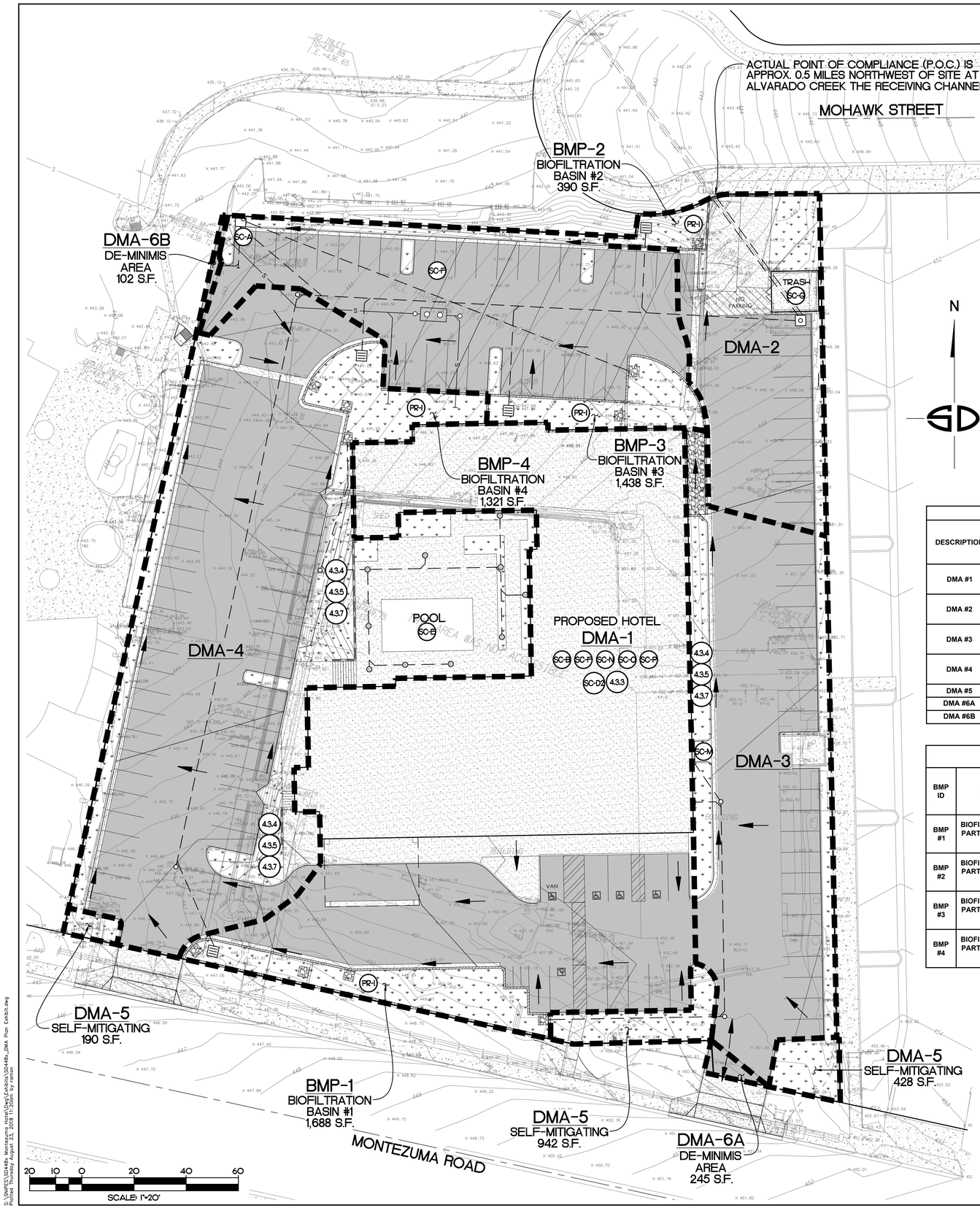
Attachment Sequence	Contents	Checklist
Attachment 1a	DMA Exhibit (Required) See DMA Exhibit Checklist.	☑ Included
Attachment 1b	Tabular Summary of DMAs Showing DMA ID matching DMA Exhibit, DMA Area, and DMA Type (Required)* *Provide table in this Attachment OR on DMA Exhibit in Attachment 1a	☑ Included on DMA Exhibit in Attachment 1a ☐ Included as Attachment 1b, separate from DMA Exhibit
Attachment 1c	Form I-7, Harvest and Use Feasibility Screening Checklist (Required unless the entire project will use infiltration BMPs) Refer to Appendix B.3-1 of the BMP Design Manual to complete Form I-7.	☑ Included ☐ Not included because the entire project will use infiltration BMPs
Attachment 1d	Infiltration Feasibility Information. Contents of Attachment 1d depend on the infiltration condition: • No Infiltration Condition: ○ Infiltration Feasibility Condition Letter (***Note: must be stamped and signed by licensed geotechnical engineer***) ○ Form I-8A (optional) ○ Form I-8B (optional) • Partial Infiltration Condition: ○ Infiltration Feasibility Condition Letter (***Note: must be stamped and signed by licensed geotechnical engineer***) ○ Form I-8A ○ Form I-8B • Full Infiltration Condition: ○ Form I-8A ○ Form I-8B ○ Worksheet C.4-3 ○ Form I-9 Refer to Appendices C and D of the BMP Design Manual for guidance.	☑ Included ☐ Not included because the entire project will use harvest and use BMPs
Attachment 1e	Pollutant Control BMP Design Worksheets / Calculations (Required) Refer to Appendices B and E of the BMP Design Manual for structural pollutant control BMP design guidelines and site design credit calculations	☑ Included

Project Name: MONTEZUMA HOTEL

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

The DMA Exhibit must identify:

- [x] Underlying hydrologic soil group
- [x] Approximate depth to groundwater
- [x] Existing natural hydrologic features (watercourses, seeps, springs, wetlands)
- [ ] Critical coarse sediment yield areas to be protected
- [x] Existing topography and impervious areas
- [x] Existing and proposed site drainage network and connections to drainage offsite
- [x] Proposed grading
- [x] Proposed impervious features
- [ ] Proposed design features and surface treatments used to minimize imperviousness
- [x] Drainage management area (DMA) boundaries, DMA ID numbers, and DMA areas (square footage or acreage), and DMA type (i.e., drains to BMP, self-retaining, or self-mitigating)
- [x] Potential pollutant source areas and corresponding required source controls (see Chapter 4, Appendix E.1, and Form I-3B)
- [x] Structural BMPs (identify location, type of BMP, size/detail, and include cross-section)



PROJECT PERMANENT BMP'S

1. SOURCE CONTROL BMP'S:

- SC-A STORM DRAIN STENCILS ON ALL STORM DRAIN INLETS (TYP.).
- SC-B INTERIOR FLOOR DRAINS AND ELEVATOR SHAFT SUMP PUMPS WILL BE PLUMBED TO THE SANITARY SEWER SYSTEM.
- SC-D2 LANDSCAPE/OUTDOOR PESTICIDE USE.
- SC-E POOL TO BE MAINTAINED IN ACCORDANCE TO SOURCE CONTROL BMP SC-72.
- SC-F FOOD SERVICE DRAINS WILL BE CONNECTED TO A GREASE INTERCEPTOR PRIOR TO DISCHARGING TO SANITARY SEWER.
- SC-G REFUSE AREAS: TRASH ENCLOSURE WITH CONCRETE SLAB, SCREENED WALLS, AND DUMPSTERS WITH LIDS.
- SC-M LOADING DOCKS SHALL BE COVERED AND/OR GRADED TO MINIMIZE RUN-ON AND RUNOFF FROM THE LOADING AREA.
- SC-N FIRE SPRINKLER TEST WATER WILL BE DRAINED TO THE SANITARY SEWER SYSTEM.
- SC-O AIR CONDITIONING CONDENSATE DRAIN LINES WILL DISCHARGE INTO LANDSCAPE AREAS.
- SC-P PLAZAS, SIDEWALKS & PARKING LOTS MUST BE SWEPT REGULARLY.

2. SITE DESIGN BMP'S:

- 4.3.3 MINIMIZE IMPERVIOUS AREA: PROPOSED 5-STORY BUILDING TO REDUCE SIZE OF FOOTPRINT.
- 4.3.4 MINIMIZE SOIL COMPACTION.
- 4.3.5 IMPERVIOUS AREA DISPERSION: DRAIN ROOFTOPS TO ADJACENT LANDSCAPE AREAS.
- 4.3.7 LANDSCAPING WITH NATIVE OR DROUGHT TOLERANT SPECIES.

3. STRUCTURAL BMP:

- PR-1 BIOFILTRATION W/ PARTIAL RETENTION BASIN (PR-1).

LEGEND

DMA BOUNDARY
DIRECTION OF FLOW
PERVIOUS AREA
IMPERVIOUS AREA — CONCRETE/ROOF TOP — A.C. PAVEMENT

NOTES

1. SITE IS LOCATED WITHIN OCEANSIDE RAIN GAUGE BASIN.
2. HYDROLOGIC SOIL GROUP D.
3. SITE HAS FLAT SLOPE.
4. GROUNDWATER DEPTH IS UNKNOWN.
5. BASED ON WMAA MAPS CRITICAL COARSE SEDIMENT YIELD AREAS (CCSYAS) WERE NOT IDENTIFIED WITHIN PROJECT FOOTPRINT OR UPSTREAM AREAS DRAINING THROUGH THE PROJECT FOOTPRINT.
6. CHANNEL ASSESSMENT WAS NOT CONDUCTED. LOW FLOW THRESHOLD ASSUMED 10% OF Q_2 ($Q_{1.5}$).
7. PROPOSED STRUCTURAL BMP'S FOR COMBINED TREATMENT CONTROL CONSIST OF FOUR BIOFILTRATION HYDROMODIFICATION FLOW CONTROL WITH PARTIAL RETENTION BASINS (PR-1).
8. COUNTY OF SAN DIEGO'S 85TH PERCENTILE ISOPLUVIAL MAP WAS UTILIZED FOR SIZING STRUCTURAL BMPS TO COMPLY WITH STORM WATER REQUIREMENTS P_{85TH} = 0.55 INCH.

DRAINAGE MANAGEMENT AREAS

DESCRIPTION	TRIBUTARY TO BMP	BMP TYPE	SOIL TYPE	DEPTH TO GROUNDWATER	PRE-PROJECT SLOPE	IMPERVIOUS DMA'S		PERVIOUS DMA'S	
						POST-PROJECT SURFACE TYPE IMPERVIOUS	POST-PROJECT SURFACE AREA IMPERVIOUS (SF)	POST-PROJECT SURFACE TYPE PERVIOUS	POST-PROJECT SURFACE AREA PERVIOUS (SF)
DMA #1	BMP #1	BIOFILTRATION WITH PARTIAL RETENTION (PR-1)	D	> 20 FEET	Moderate (5%-10%)	AC & Concrete Pavement, Rooftops	26,025	LANDSCAPING - NATURAL D SOIL	1,688
DMA #2	BMP #2	BIOFILTRATION WITH PARTIAL RETENTION (PR-1)	D	> 20 FEET	Moderate (5%-10%)	AC & Concrete Pavement	5,225	LANDSCAPING	1,296
DMA #3	BMP #3	BIOFILTRATION WITH PARTIAL RETENTION (PR-1)	D	> 20 FEET	Moderate (5%-10%)	AC & Concrete Pavement	17,261	LANDSCAPING	3,781
DMA #4	BMP #4	BIOFILTRATION WITH PARTIAL RETENTION (PR-1)	D	> 20 FEET	Moderate (5%-10%)	AC & Concrete Pavement	18,189	LANDSCAPING	4,948
DMA #5	SELF-MITIGATING	SELF-MITIGATING	D	> 20 FEET	Moderate (5%-10%)	NONE	0	LANDSCAPING	1,560
DMA #6A	DE-MINIMIS	DE-MINIMIS	D	> 20 FEET	Moderate (5%-10%)	NONE	245	LANDSCAPING	0
DMA #6B	DE-MINIMIS	DE-MINIMIS	D	> 20 FEET	Moderate (5%-10%)	NONE	102	LANDSCAPING	0

POST-CONSTRUCTION BMP FACILITY SUMMARY TABLE

BMP ID	BMP TYPE	APPROX. DIMENSIONS	PLAN AREA (SF)	PONDING SURFACE DEPTH (IN.)	MEDIA THICKNESS INCL. 3" MULCH LAYER (IN.)	AGGREGATE STORAGE LAYER ABOVE UNDERDRAIN INCL. 6" WASHED SAND & GRAVEL (IN.)	AGGREGATE STORAGE LAYER BELOW UNDERDRAIN (IN.)	TOTAL FACILITY DEPTH INCL. 0.5' FREEBOARD (FT)	ORIFICE FLOW (CFS)	ORIFICE SIZE (INCH)
BMP #1	BIOFILTRATION WITH PARTIAL RETENTION (PR-1)	13' W X 127' L	1,688	12	21	12	6	4.75	0.036	1.25
BMP #2	BIOFILTRATION WITH PARTIAL RETENTION (PR-1)	12' W X 32' L	390	12	21	12	6	4.75	0.007	0.5625
BMP #3	BIOFILTRATION WITH PARTIAL RETENTION (PR-1)	18' W X 80' L	1,438	12	21	12	6	4.75	0.023	1.00
BMP #4	BIOFILTRATION WITH PARTIAL RETENTION (PR-1)	19' W X 70' L	1,321	12	21	12	6	4.75	0.029	1.125

MONTEZUMA HOTEL
DMA EXHIBIT

SHEET TITLE: DMA EXHIBIT
JOB NAME: MONTEZUMA HOTEL, 6650 MONTEZUMA ROAD, SAN DIEGO, CA 92115

DESIGNER: RE
DRAWN: JGF
CHECKED: SPN
DATE: 03-06-18

NO	DATE	REVISION DESCRIPTION	BY
1	06-18-18	REVISED PER 1ST REVIEW COMMENTS	SDA
2	07-27-18	REVISED PER 2ND REVIEW COMMENTS	SDA

SNIPES-DYE ASSOCIATES
8348 CENTER DRIVE, SUITE G, LA MESA, CA 91942-2910 (619) 697-9234, FAX (619) 460-2033

SHEET 1 OF 1 SHEETS
JOB NO. SD448X (D-8)

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Plotted Thursday, August 23, 2018 11:20am by ramon

Project Name: MONTEZUMA HOTEL

Tabular Summary of DMAs								Worksheet B-1	
DMA Unique Identifier	Area (acres)	Impervious Area (acres)	% Imp	HSG	Area Weighted Runoff Coefficient	DCV (cubic feet)	Treated By (BMP ID)	Pollutant Control Type	Drains to (POC ID)
1	0.636	0.597	93.9%	D	0.85	1,081	BMP #1	Biofilt. w/ Pt. Ret.	POC #1
2	0.150	0.120	80.2%	D	0.74	222	BMP #2	Biofilt. w/ Pt. Ret.	POC #1
3	0.483	0.396	82.0%	D	0.76	728	BMP #3	Biofilt. w/ Pt. Ret.	POC #1
4	0.531	0.418	78.7%	D	0.73	772	BMP #4	Biofilt. w/ Pt. Ret.	POC #1
Self-mitigating	0.07	0	0	D	N/A	N/A	N/A	N/A	N/A
De-Minimis	0.01	0.01	100%	D	N/A	N/A	N/A	N/A	N/A
Pool	0.02	0	0	N/A	N/A	N/A	N/A	N/A	N/A
Summary of DMA Information (Must match project description and SWQMP Narrative)									
No. of DMAs	Total DMA Area (acres)	Total Impervious Area (acres)	% Imp		Area Weighted Runoff Coefficient	Total DCV (cubic feet)	Total Area Treated (acres)		No. of POCs
4	1.83	1.53	84.2		0.78	2,803	1.83		1

Where: DMA = Drainage Management Area; Imp = Imperviousness; HSG = Hydrologic Soil Group; DCV= Design Capture Volume; BMP = Best Management Practice; POC = Point of Compliance; ID = identifier; No. = Number

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The City of SAN DIEGO	Project Name	MONTEZUMA HOTEL	
	BMP ID	1	
Sizing Method for Pollutant Removal Criteria		**Worksheet B.5-1**	
1	Area draining to the BMP	27713	sq. ft.
2	Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2)	0.85	
3	85th percentile 24-hour rainfall depth	0.55	inches
4	Design capture volume [Line 1 x Line 2 x (Line 3/12)]	1080	cu. ft.
BMP Parameters			
5	Surface ponding [6 inch minimum, 12 inch maximum]	12	inches
6	Media thickness [18 inches minimum], also add mulch layer and washed ASTM 33 fine aggregate sand thickness to this line for sizing calculations	24	inches
7	Aggregate storage (also add ASTM No 8 stone) above underdrain invert (12 inches typical) – use 0 inches if the aggregate is not over the entire bottom surface area	12	inches
8	Aggregate storage below underdrain invert (3 inches minimum) – use 0 inches if the aggregate is not over the entire bottom surface area	6	inches
9	Freely drained pore storage of the media	0.2	in/in
10	Porosity of aggregate storage	0.4	in/in
11	Media filtration rate to be used for sizing (maximum filtration rate of 5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate (includes infiltration into the soil and flow rate through the outlet structure) which will be less than 5 in/hr.)	5	in/hr.
Baseline Calculations			
12	Allowable routing time for sizing	6	hours
13	Depth filtered during storm [Line 11 x Line 12]	30	inches
14	Depth of Detention Storage [Line 5 + (Line 6 x Line 9) + (Line 7 x Line 10) + (Line 8 x Line 10)]	24	inches
15	Total Depth Treated [Line 13 + Line 14]	54	inches
Option 1 – Biofilter 1.5 times the DCV			
16	Required biofiltered volume [1.5 x Line 4]	1619	cu. ft.
17	Required Footprint [Line 16/ Line 15] x 12	360	sq. ft.
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
18	Required Storage (surface + pores) Volume [0.75 x Line 4]	810	cu. ft.
19	Required Footprint [Line 18/ Line 14] x 12	405	sq. ft.
Footprint of the BMP			
20	BMP Footprint Sizing Factor (Default 0.03 or an alternative minimum footprint sizing factor from Line 11 in Worksheet B.5-4)	0.03	
21	Minimum BMP Footprint [Line 1 x Line 2 x Line 20]	707	sq. ft.
22	Footprint of the BMP = Maximum(Minimum(Line 17, Line 19), Line 21)	707	sq. ft.
23	Provided BMP Footprint	1688	sq. ft.
24	Is Line 23 ≥ Line 22?	**Yes, Performance Standard is Met**	

The City of SAN DIEGO	Project Name	MONTEZUMA HOTEL	
	BMP ID	2	
Sizing Method for Pollutant Removal Criteria		**Worksheet B.5-1**	
1	Area draining to the BMP	6521	sq. ft.
2	Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2)	0.74	
3	85th percentile 24-hour rainfall depth	0.55	inches
4	Design capture volume [Line 1 x Line 2 x (Line 3/12)]	221	cu. ft.
BMP Parameters			
5	Surface ponding [6 inch minimum, 12 inch maximum]	12	inches
6	Media thickness [18 inches minimum], also add mulch layer and washed ASTM 33 fine aggregate sand thickness to this line for sizing calculations	24	inches
7	Aggregate storage (also add ASTM No 8 stone) above underdrain invert (12 inches typical) – use 0 inches if the aggregate is not over the entire bottom surface area	12	inches
8	Aggregate storage below underdrain invert (3 inches minimum) – use 0 inches if the aggregate is not over the entire bottom surface area	6	inches
9	Freely drained pore storage of the media	0.2	in/in
10	Porosity of aggregate storage	0.4	in/in
11	Media filtration rate to be used for sizing (maximum filtration rate of 5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate (includes infiltration into the soil and flow rate through the outlet structure) which will be less than 5 in/hr.)	5	in/hr.
Baseline Calculations			
12	Allowable routing time for sizing	6	hours
13	Depth filtered during storm [Line 11 x Line 12]	30	inches
14	Depth of Detention Storage [Line 5 + (Line 6 x Line 9) + (Line 7 x Line 10) + (Line 8 x Line 10)]	24	inches
15	Total Depth Treated [Line 13 + Line 14]	54	inches
Option 1 – Biofilter 1.5 times the DCV			
16	Required biofiltered volume [1.5 x Line 4]	332	cu. ft.
17	Required Footprint [Line 16/ Line 15] x 12	74	sq. ft.
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
18	Required Storage (surface + pores) Volume [0.75 x Line 4]	166	cu. ft.
19	Required Footprint [Line 18/ Line 14] x 12	83	sq. ft.
Footprint of the BMP			
20	BMP Footprint Sizing Factor (Default 0.03 or an alternative minimum footprint sizing factor from Line 11 in Worksheet B.5-4)	0.03	
21	Minimum BMP Footprint [Line 1 x Line 2 x Line 20]	145	sq. ft.
22	Footprint of the BMP = Maximum(Minimum(Line 17, Line 19), Line 21)	145	sq. ft.
23	Provided BMP Footprint	222	sq. ft.
24	Is Line 23 ≥ Line 22?	**Yes, Performance Standard is Met**	

The City of SAN DIEGO	Project Name	MONTEZUMA HOTEL	
	BMP ID	3	
Sizing Method for Pollutant Removal Criteria		**Worksheet B.5-1**	
1	Area draining to the BMP	23137	sq. ft.
2	Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2)	0.76	
3	85th percentile 24-hour rainfall depth	0.55	inches
4	Design capture volume [Line 1 x Line 2 x (Line 3/12)]	806	cu. ft.
BMP Parameters			
5	Surface ponding [6 inch minimum, 12 inch maximum]	12	inches
6	Media thickness [18 inches minimum], also add mulch layer and washed ASTM 33 fine aggregate sand thickness to this line for sizing calculations	24	inches
7	Aggregate storage (also add ASTM No 8 stone) above underdrain invert (12 inches typical) – use 0 inches if the aggregate is not over the entire bottom surface area	12	inches
8	Aggregate storage below underdrain invert (3 inches minimum) – use 0 inches if the aggregate is not over the entire bottom surface area	6	inches
9	Freely drained pore storage of the media	0.2	in/in
10	Porosity of aggregate storage	0.4	in/in
11	Media filtration rate to be used for sizing (maximum filtration rate of 5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate (includes infiltration into the soil and flow rate through the outlet structure) which will be less than 5 in/hr.)	5	in/hr.
Baseline Calculations			
12	Allowable routing time for sizing	6	hours
13	Depth filtered during storm [Line 11 x Line 12]	30	inches
14	Depth of Detention Storage [Line 5 + (Line 6 x Line 9) + (Line 7 x Line 10) + (Line 8 x Line 10)]	24	inches
15	Total Depth Treated [Line 13 + Line 14]	54	inches
Option 1 – Biofilter 1.5 times the DCV			
16	Required biofiltered volume [1.5 x Line 4]	1209	cu. ft.
17	Required Footprint [Line 16/ Line 15] x 12	269	sq. ft.
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
18	Required Storage (surface + pores) Volume [0.75 x Line 4]	604	cu. ft.
19	Required Footprint [Line 18/ Line 14] x 12	302	sq. ft.
Footprint of the BMP			
20	BMP Footprint Sizing Factor (Default 0.03 or an alternative minimum footprint sizing factor from Line 11 in Worksheet B.5-4)	0.03	
21	Minimum BMP Footprint [Line 1 x Line 2 x Line 20]	528	sq. ft.
22	Footprint of the BMP = Maximum(Minimum(Line 17, Line 19), Line 21)	528	sq. ft.
23	Provided BMP Footprint	728	sq. ft.
24	Is Line 23 ≥ Line 22?	**Yes, Performance Standard is Met**	

The City of SAN DIEGO	Project Name	MONTEZUMA HOTEL	
	BMP ID	4	
Sizing Method for Pollutant Removal Criteria		**Worksheet B.5-1**	
1	Area draining to the BMP	23137	sq. ft.
2	Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2)	0.73	
3	85th percentile 24-hour rainfall depth	0.55	inches
4	Design capture volume [Line 1 x Line 2 x (Line 3/12)]	774	cu. ft.
BMP Parameters			
5	Surface ponding [6 inch minimum, 12 inch maximum]	12	inches
6	Media thickness [18 inches minimum], also add mulch layer and washed ASTM 33 fine aggregate sand thickness to this line for sizing calculations	24	inches
7	Aggregate storage (also add ASTM No 8 stone) above underdrain invert (12 inches typical) – use 0 inches if the aggregate is not over the entire bottom surface area	12	inches
8	Aggregate storage below underdrain invert (3 inches minimum) – use 0 inches if the aggregate is not over the entire bottom surface area	6	inches
9	Freely drained pore storage of the media	0.2	in/in
10	Porosity of aggregate storage	0.4	in/in
11	Media filtration rate to be used for sizing (maximum filtration rate of 5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate (includes infiltration into the soil and flow rate through the outlet structure) which will be less than 5 in/hr.)	5	in/hr.
Baseline Calculations			
12	Allowable routing time for sizing	6	hours
13	Depth filtered during storm [Line 11 x Line 12]	30	inches
14	Depth of Detention Storage [Line 5 + (Line 6 x Line 9) + (Line 7 x Line 10) + (Line 8 x Line 10)]	24	inches
15	Total Depth Treated [Line 13 + Line 14]	54	inches
Option 1 – Biofilter 1.5 times the DCV			
16	Required biofiltered volume [1.5 x Line 4]	1161	cu. ft.
17	Required Footprint [Line 16/ Line 15] x 12	258	sq. ft.
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
18	Required Storage (surface + pores) Volume [0.75 x Line 4]	581	cu. ft.
19	Required Footprint [Line 18/ Line 14] x 12	290	sq. ft.
Footprint of the BMP			
20	BMP Footprint Sizing Factor (Default 0.03 or an alternative minimum footprint sizing factor from Line 11 in Worksheet B.5-4)	0.03	
21	Minimum BMP Footprint [Line 1 x Line 2 x Line 20]	507	sq. ft.
22	Footprint of the BMP = Maximum(Minimum(Line 17, Line 19), Line 21)	507	sq. ft.
23	Provided BMP Footprint	772	sq. ft.
24	Is Line 23 ≥ Line 22?	**Yes, Performance Standard is Met**	

DMA #1

Design Capture Volume		Worksheet B.2-1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.55	inches
2	Area tributary to BMP (s)	A=	0.64	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.85	unitless
4	Trees Credit Volume Note: In the SWQMP list the number of trees, size of each tree, amount of soil volume installed for each tree, contributing area to each tree and the inlet opening dimension for each tree.	TCV=	0	cubic-feet
5	Rain barrels Credit Volume Note: In the SWQMP list the number of rain barrels, size of each rain barrel and the use of the captured storm water runoff.	RCV=	0	cubic-feet
6	Calculate DCV = (3630 x C x d x A) – TCV - RCV	DCV=	1081	cubic-feet

DMA #2

Design Capture Volume		Worksheet B.2-1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.55	inches
2	Area tributary to BMP (s)	A=	0.15	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.74	unitless
4	Trees Credit Volume Note: In the SWQMP list the number of trees, size of each tree, amount of soil volume installed for each tree, contributing area to each tree and the inlet opening dimension for each tree.	TCV=	0	cubic-feet
5	Rain barrels Credit Volume Note: In the SWQMP list the number of rain barrels, size of each rain barrel and the use of the captured storm water runoff.	RCV=	0	cubic-feet
6	Calculate DCV = (3630 x C x d x A) – TCV - RCV	DCV=	222	cubic-feet

DMA #3

Design Capture Volume		Worksheet B.2-1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.55	inches
2	Area tributary to BMP (s)	A=	0.48	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.76	unitless
4	Trees Credit Volume Note: In the SWQMP list the number of trees, size of each tree, amount of soil volume installed for each tree, contributing area to each tree and the inlet opening dimension for each tree.	TCV=	0	cubic-feet
5	Rain barrels Credit Volume Note: In the SWQMP list the number of rain barrels, size of each rain barrel and the use of the captured storm water runoff.	RCV=	0	cubic-feet
6	Calculate DCV = (3630 x C x d x A) – TCV - RCV	DCV=	728	cubic-feet

DMA #4

Design Capture Volume		Worksheet B.2-1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.55	inches
2	Area tributary to BMP (s)	A=	0.53	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.73	unitless
4	Trees Credit Volume Note: In the SWQMP list the number of trees, size of each tree, amount of soil volume installed for each tree, contributing area to each tree and the inlet opening dimension for each tree.	TCV=	0	cubic-feet
5	Rain barrels Credit Volume Note: In the SWQMP list the number of rain barrels, size of each rain barrel and the use of the captured storm water runoff.	RCV=	0	cubic-feet
6	Calculate DCV = (3630 x C x d x A) – TCV - RCV	DCV=	772	cubic-feet

Storm Water Pollutant Control Hydrologic Calculations and Sizing Methods

Runoff Factor

Equation B.1-2: Estimating Runoff Factor for Area

$$C = \sum CxAx / \sum Ax$$

where:

Cx = Runoff factor for
Ax = Tributary area X

These runoff factors apply to areas receiving direct rainfall only. For conditions in which runoff is routed onto a surface from an adjacent surface, see Section B.2 for determining composite runoff factors for these areas.

Table B.1-1: Runoff factors for surfaces draining to BMPs – Pollutant Control BMPs

Surface	Runoff Factor
Roofs	0.90
Concrete or Asphalt	0.90
Unit Pavers (grouted)	0.90
Decomposed Granite	0.30
Cobbles or Crushed Aggregate	0.30
Amended, Mulched Soils or Landscape	0.10
Compacted Soil (e.g., unpaved parking)	0.30
Natural (A Soil)	0.10
Natural (B Soil)	0.14
Natural (C Soil)	0.23
Natural (D Soil)	0.30

DMA ID.	Pervious Surface	$C_{pervious}$	$A_{pervious}$ (SF)	Impervious Surface	$C_{impervious}$	$A_{impervious}$ (SF)	$C=\sum CxAx/\sum Ax$
1	Landscape	0.10	1,688	Roof/Pavement	0.90	26,025	0.85
2	Landscape	0.10	1,296	Asphalt/Concrete	0.90	5,225	0.74
3	Landscape	0.10	3,781	Aspalt/Concrete	0.90	17,261	0.76
4	Landscape	0.10	4,948	Asphalt/Concrete	0.90	18,189	0.73
Overall	Landscape	0.10	12,588	Roof/Pavement	0.90	68,065	0.78

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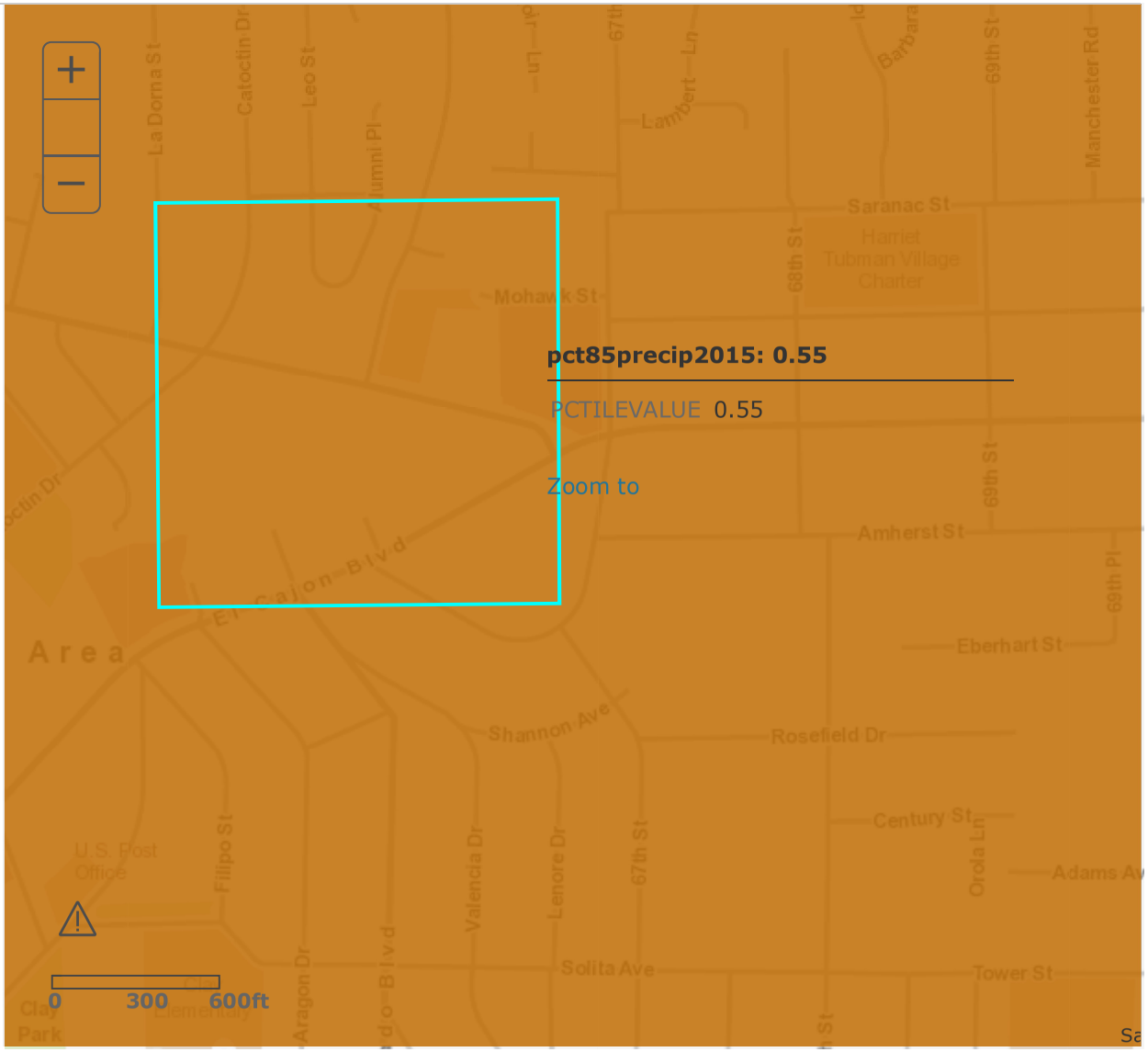
Home 85th percentile precipitation

Details | Basemap | Print | Measure | 665

Contents

- [x] Map Notes
- [x] 85th percentile precipitation
  - SanGIS Basemap



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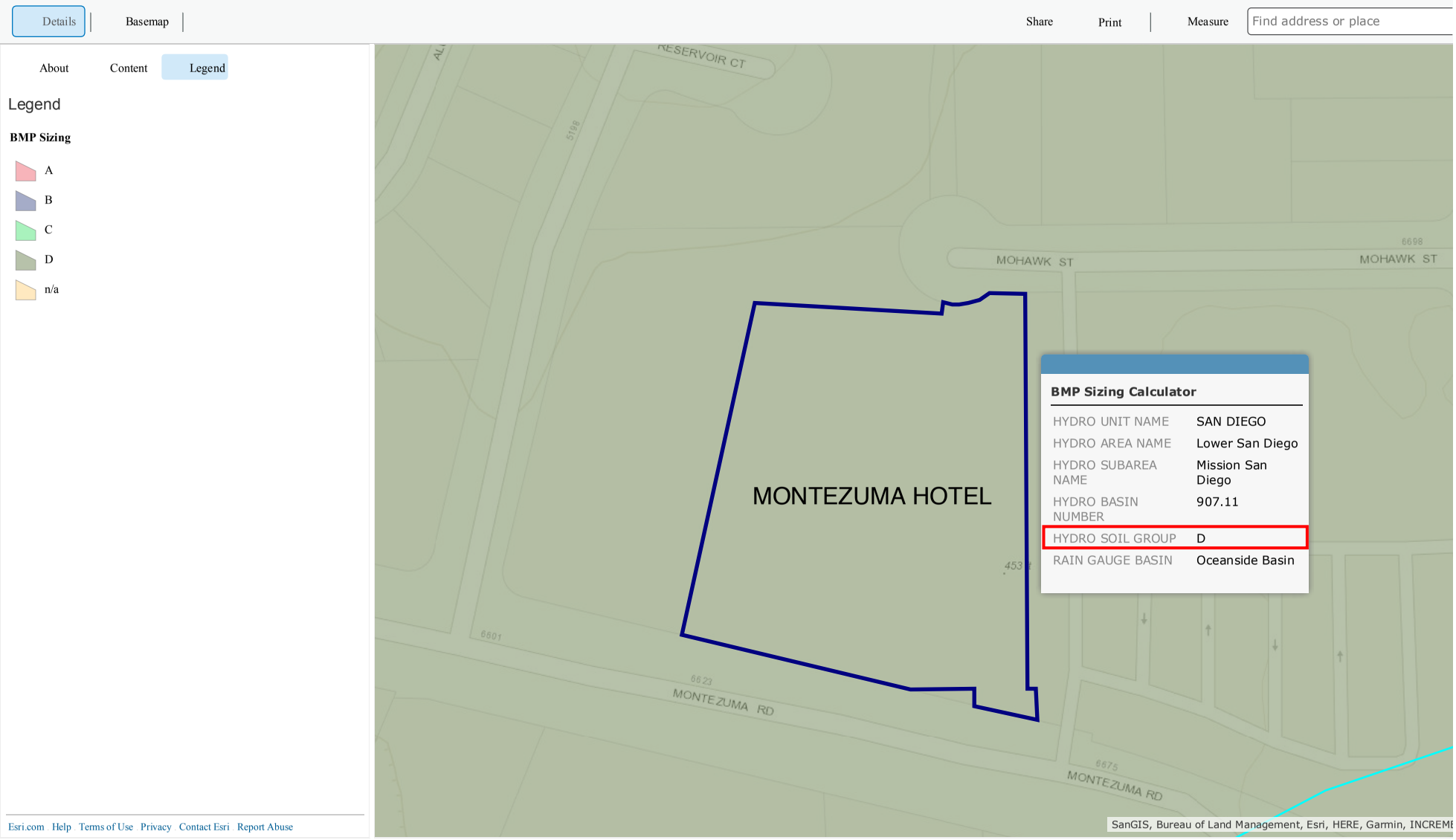
BMP Sizing Calculator

SOIL TYPE

MONTEZUMA HOTEL



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Harvest and Use Feasibility Checklist	Worksheet B.3-1 : Form I-7

1. Is there a demand for harvested water (check all that apply) at the project site that is reliably present during the wet season?

☑ Toilet and urinal flushing
☑ Landscape irrigation
☐ Other:_____

2. If there is a demand; estimate the anticipated average wet season demand over a period of 36 hours. Guidance for planning level demand calculations for toilet/urinal flushing and landscape irrigation is provided in Section B.3.2.
[Provide a summary of calculations here]

Per Table B.3-1 of BMP Design Manual, total use per resident is 9.3 gal/day, therefore:
Toilet & Urinal Flushing Demand
125 units x 2 residents/unit x 9.3 gpd/resident x 1.5 days x 1cf/7.48 gal = 466 cf
Landscape Irrigation Demand
ETWU = (Landscape Area)*(1470 Gallons/Irrigated Acre per 36 hr period)/(7.48 gal/cu-ft)
= (0.29 ac)*(1470)/7.48 = 58 cf

3. Calculate the DCV using worksheet B-2.1.
DCV = 2,833 (cubic feet)
[Provide a summary of calculations here]

Total Demand = 524 cf < 708 cf (0.25 DCV)

3a. Is the 36-hour demand greater than or equal to the DCV?	3b. Is the 36-hour demand greater than 0.25DCV but less than the full DCV?	3c. Is the 36-hour demand less than 0.25DCV?
☐ Yes / ☑ No ⇨ ⇩	☐ Yes / ☑ No ⇨ ⇩	☑ Yes ⇩
Harvest and use appears to be feasible. Conduct more detailed evaluation and sizing calculations to confirm that DCV can be used at an adequate rate to meet drawdown criteria.	Harvest and use may be feasible. Conduct more detailed evaluation and sizing calculations to determine feasibility. Harvest and use may only be able to be used for a portion of the site, or (optionally) the storage may need to be upsized to meet long term capture targets while draining in longer than 36 hours.	Harvest and use is considered to be infeasible.

Is harvest and use feasible based on further evaluation?
☐ Yes, refer to Appendix E to select and size harvest and use BMPs.
☑ No, select alternate BMPs.

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Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions[1]	Worksheet C.4-1: Form I-8A[2]
Part 1 - Full Infiltration Feasibility Screening Criteria	
DMA(s) Being Analyzed:	Project Phase:
DMAs #1 thru #4	Preliminary Design

Criteria 1: Infiltration Rate Screening	
1A	Is the mapped hydrologic soil group according to the NRCS Web Soil Survey or UC Davis Soil Web Mapper Type A or B and corroborated by available site soil data[3]? ○ Yes; the DMA may feasibly support full infiltration. Answer "Yes" to Criteria 1 Result or continue to Step 1B if the applicant elects to perform infiltration testing. ○ No; the mapped soil types are A or B but is not corroborated by available site soil data (continue to Step 1B). ○ No; the mapped soil types are C, D, or "urban/unclassified" and is corroborated by available site soil data. Answer "No" to Criteria 1 Result. ○ No; the mapped soil types are C, D, or "urban/unclassified" but is not corroborated by available site soil data (continue to Step 1B).
1B	Is the reliable infiltration rate calculated using planning phase methods from Table D.3-1? ○ Yes; Continue to Step 1C. ○ No; Skip to Step 1D.
1C	Is the reliable infiltration rate calculated using planning phase methods from Table D.3-1 greater than 0.5 inches per hour? ○ Yes; the DMA may feasibly support full infiltration. Answer "Yes" to Criteria 1 Result. ○ No; full infiltration is not required. Answer "No" to Criteria 1 Result.
1D	**Infiltration Testing Method.** Is the selected infiltration testing method suitable during the design phase (see Appendix D.3)? Note: Alternative testing standards may be allowed with appropriate rationales and documentation. ○ Yes; continue to Step 1E. ○ No; select an appropriate infiltration testing method.

[1] Note that it is not required to investigate each and every criterion in the worksheet, a single "no" answer in Part 1, Part 2, Part 3, or Part 4 determines a full, partial, or no infiltration condition.

[2] This form must be completed each time there is a change to the site layout that would affect the infiltration feasibility condition. Previously completed forms shall be retained to document the evolution of the site storm water design.

[3] Available data includes site-specific sampling or observation of soil types or texture classes, such as obtained from borings or test pits necessary to support other design elements.

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions	Worksheet C.4-1: Form I-8A[2]
1E	**Number of Percolation/Infiltration Tests.** Does the infiltration testing method performed satisfy the minimum number of tests specified in Table D.3-2? ○ Yes; continue to Step 1F. ○ No; conduct appropriate number of tests.
IF	**Factor of Safety.** Is the suitable Factor of Safety selected for full infiltration design? See guidance in D.5; Tables D.5-1 and D.5-2; and Worksheet D.5-1 (Form I-9). ○ Yes; continue to Step 1G. ○ No; select appropriate factor of safety.
1G	**Full Infiltration Feasibility.** Is the average measured infiltration rate divided by the Factor of Safety greater than 0.5 inches per hour? ○ Yes; answer "Yes" to Criteria 1 Result. ○ No; answer "No" to Criteria 1 Result.
Criteria 1 Result	Is the estimated reliable infiltration rate greater than 0.5 inches per hour within the DMA where runoff can reasonably be routed to a BMP? ○ Yes; the DMA may feasibly support full infiltration. Continue to Criteria 2. ◉ No; full infiltration is not required. Skip to Part 1 Result.
Summarize infiltration testing methods, testing locations, replicates, and results and summarize estimates of reliable infiltration rates according to procedures outlined in D.5. Documentation should be included in project geotechnical report.	

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[2]	
Criteria 2: Geologic/Geotechnical Screening			
2A	If all questions in Step 2A are answered "Yes," continue to Step 2B. For any "No" answer in Step 2A answer "No" to Criteria 2, and submit an "Infiltration Feasibility Condition Letter" that meets the requirements in Appendix C.1.1. The geologic/geotechnical analyses listed in Appendix C.2.1 do not apply to the DMA because one of the following setbacks cannot be avoided and therefore result in the DMA being in a no infiltration condition. The setbacks must be the closest horizontal radial distance from the surface edge (at the overflow elevation) of the BMP.		
2A-1	Can the proposed full infiltration BMP(s) avoid areas with existing fill materials greater than 5 feet thick below the infiltrating surface?	○ Yes	○ No
2A-2	Can the proposed full infiltration BMP(s) avoid placement within 10 feet of existing underground utilities, structures, or retaining walls?	○ Yes	○ No
2A-3	Can the proposed full infiltration BMP(s) avoid placement within 50 feet of a natural slope (>25%) or within a distance of 1.5H from fill slopes where H is the height of the fill slope?	○ Yes	○ No
2B	When full infiltration is determined to be feasible, a geotechnical investigation report must be prepared that considers the relevant factors identified in Appendix C.2.1. If all questions in Step 2B are answered "Yes," then answer "Yes" to Criteria 2 Result. If there are "No" answers continue to Step 2C.		
2B-1	**Hydroconsolidation.** Analyze hydroconsolidation potential per approved ASTM standard due to a proposed full infiltration BMP. Can full infiltration BMPs be proposed within the DMA without increasing hydroconsolidation risks?	○ Yes	○ No
2B-2	**Expansive Soils.** Identify expansive soils (soils with an expansion index greater than 20) and the extent of such soils due to proposed full infiltration BMPs. Can full infiltration BMPs be proposed within the DMA without increasing expansive soil risks?	○ Yes	○ No

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[2]	
2B-3	**Liquefaction**. If applicable, identify mapped liquefaction areas. Evaluate liquefaction hazards in accordance with Section 6.4.2 of the City of San Diego's Guidelines for Geotechnical Reports (2011 or most recent edition). Liquefaction hazard assessment shall take into account any increase in groundwater elevation or groundwater mounding that could occur as a result of proposed infiltration or percolation facilities. Can full infiltration BMPs be proposed within the DMA without increasing liquefaction risks?	○ Yes	○ No
2B-4	**Slope Stability**. If applicable, perform a slope stability analysis in accordance with the ASCE and Southern California Earthquake Center (2002) Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Landslide Hazards in California to determine minimum slope setbacks for full infiltration BMPs. See the City of San Diego's Guidelines for Geotechnical Reports (2011) to determine which type of slope stability analysis is required. Can full infiltration BMPs be proposed within the DMA without increasing slope stability risks?	○ Yes	○ No
2B-5	**Other Geotechnical Hazards.** Identify site-specific geotechnical hazards not already mentioned (refer to Appendix C.2.1). Can full infiltration BMPs be proposed within the DMA without increasing risk of geologic or geotechnical hazards not already mentioned?	○ Yes	○ No
2B-6	**Setbacks.** Establish setbacks from underground utilities, structures, and/or retaining walls. Reference applicable ASTM or other recognized standard in the geotechnical report. Can full infiltration BMPs be proposed within the DMA using established setbacks from underground utilities, structures, and/or retaining walls?	○ Yes	○ No

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[2]	
2C	**Mitigation Measures.** Propose mitigation measures for each geologic/geotechnical hazard identified in Step 2B. Provide a discussion of geologic/geotechnical hazards that would prevent full infiltration BMPs that cannot be reasonably mitigated in the geotechnical report. See Appendix C.2.1.8 for a list of typically reasonable and typically unreasonable mitigation measures. Can mitigation measures be proposed to allow for full infiltration BMPs? If the question in Step 2 is answered "Yes," then answer "Yes" to Criteria 2 Result. If the question in Step 2C is answered "No," then answer "No" to Criteria 2 Result.	○ Yes	○ No
Criteria 2 Result	Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geologic or geotechnical hazards that cannot be reasonably mitigated to an acceptable level?	○ Yes	○ No
Summarize findings and basis; provide references to related reports or exhibits.			

Part 1 Result – Full Infiltration Geotechnical Screening [4]	Result
If answers to both Criteria 1 and Criteria 2 are "Yes", a full infiltration design is potentially feasible based on Geotechnical conditions only. If either answer to Criteria 1 or Criteria 2 is "No", a full infiltration design is not required.	○ Full infiltration Condition ⊙ Complete Part 2

[4] To be completed using gathered site information and best professional judgement considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by City Engineer to substantiate findings.

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions	Worksheet C.4-1: Form I-8A[2]
Part 2 – Partial vs. No Infiltration Feasibility Screening Criteria	
DMA(s) Being Analyzed:	Project Phase:
DMAs #1 thru #4	Preliminary Design

Criteria 3 : Infiltration Rate Screening	
3A	**NRCS Type C, D, or "urban/unclassified":** Is the mapped hydrologic soil group according to the NRCS Web Soil Survey or UC Davis Soil Web Mapper is Type C, D, or "urban/unclassified" and corroborated by available site soil data? ○ Yes; the site is mapped as C soils and a reliable infiltration rate of 0.15 in/hr. is used to size partial infiltration BMPS. Answer "Yes" to Criteria 3 Result. ◉ Yes; the site is mapped as D soils or "urban/unclassified" and a reliable infiltration rate of 0.05 in/hr. is used to size partial infiltration BMPS. Answer "Yes" to Criteria 3 Result. ○ No; infiltration testing is conducted (refer to Table D.3-1), continue to Step 3B.
3B	**Infiltration Testing Result:** Is the reliable infiltration rate (i.e. average measured infiltration rate/2) greater than 0.05 in/hr. and less than or equal to 0.5 in/hr? ○ Yes; the site may support partial infiltration. Answer "Yes" to Criteria 3 Result. ○ No; the reliable infiltration rate (i.e. average measured rate/2) is less than 0.05 in/hr., partial infiltration is not required. Answer "No" to Criteria 3 Result.
Criteria 3 Result	Is the estimated reliable infiltration rate (i.e., average measured infiltration rate/2) greater than or equal to 0.05 inches/hour and less than or equal to 0.5 inches/hour at any location within each DMA where runoff can reasonably be routed to a BMP? ◉ Yes; Continue to Criteria 4. ○ No: Skip to Part 2 Result.
Summarize infiltration testing and/or mapping results (i.e. soil maps and series description used for infiltration rate).	

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[2]	
Criteria 4: Geologic/Geotechnical Screening			
4A	If all questions in Step 4A are answered "Yes," continue to Step 2B. For any "No" answer in Step 4A answer "No" to Criteria 4 Result, and submit an "Infiltration Feasibility Condition Letter" that meets the requirements in Appendix C.1.1. The geologic/geotechnical analyses listed in Appendix C.2.1 do not apply to the DMA because one of the following setbacks cannot be avoided and therefore result in the DMA being in a no infiltration condition. The setbacks must be the closest horizontal radial distance from the surface edge (at the overflow elevation) of the BMP.		
4A-1	Can the proposed partial infiltration BMP(s) avoid areas with existing fill materials greater than 5 feet thick?	⦿ Yes	○ No
4A-2	Can the proposed partial infiltration BMP(s) avoid placement within 10 feet of existing underground utilities, structures, or retaining walls?	⦿ Yes	○ No
4A-3	Can the proposed partial infiltration BMP(s) avoid placement within 50 feet of a natural slope (>25%) or within a distance of 1.5H from fill slopes where H is the height of the fill slope?	⦿ Yes	○ No
4B	When full infiltration is determined to be feasible, a geotechnical investigation report must be prepared that considers the relevant factors identified in Appendix C.2.1. If all questions in Step 4B are answered "Yes," then answer "Yes" to Criteria 4 Result. If there are any "No" answers continue to Step 4C.		
4B-1	**Hydroconsolidation.** Analyze hydroconsolidation potential per approved ASTM standard due to a proposed full infiltration BMP. Can partial infiltration BMPs be proposed within the DMA without increasing hydroconsolidation risks?	⦿ Yes	○ No
4B-2	**Expansive Soils.** Identify expansive soils (soils with an expansion index greater than 20) and the extent of such soils due to proposed full infiltration BMPs. Can partial infiltration BMPs be proposed within the DMA without increasing expansive soil risks?	⦿ Yes	○ No
4B-3	**Liquefaction**. If applicable, identify mapped liquefaction areas. Evaluate liquefaction hazards in accordance with Section 6.4.2 of the City of San Diego's Guidelines for Geotechnical Reports (2011). Liquefaction hazard assessment shall take into account any increase in groundwater elevation or groundwater mounding that could occur as a result of proposed infiltration or percolation facilities. Can partial infiltration BMPs be proposed within the DMA without increasing liquefaction risks?	⦿ Yes	○ No

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[2]	
4B-4	**Slope Stability**. If applicable, perform a slope stability analysis in accordance with the ASCE and Southern California Earthquake Center (2002) Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Landslide Hazards in California to determine minimum slope setbacks for full infiltration BMPs. See the City of San Diego's Guidelines for Geotechnical Reports (2011) to determine which type of slope stability analysis is required. Can partial infiltration BMPs be proposed within the DMA without increasing slope stability risks?	⊙ Yes	○ No
4B-5	**Other Geotechnical Hazards.** Identify site-specific geotechnical hazards not already mentioned (refer to Appendix C.2.1). Can partial infiltration BMPs be proposed within the DMA without increasing risk of geologic or geotechnical hazards not already mentioned?	⊙ Yes	○ No
4B-6	**Setbacks.** Establish setbacks from underground utilities, structures, and/or retaining walls. Reference applicable ASTM or other recognized standard in the geotechnical report. Can partial infiltration BMPs be proposed within the DMA using recommended setbacks from underground utilities, structures, and/or retaining walls?	⊙ Yes	○ No
4C	**Mitigation Measures.** Propose mitigation measures for each geologic/geotechnical hazard identified in Step 4B. Provide a discussion on geologic/geotechnical hazards that would prevent partial infiltration BMPs that cannot be reasonably mitigated in the geotechnical report. See Appendix C.2.1.8 for a list of typically reasonable and typically unreasonable mitigation measures. Can mitigation measures be proposed to allow for partial infiltration BMPs? If the question in Step 4C is answered "Yes," then answer "Yes" to Criteria 4 Result. If the question in Step 4C is answered "No," then answer "No" to Criteria 4 Result.	⊙ Yes	○ No
Criteria 4 Result	Can infiltration of greater than or equal to 0.05 inches/hour and less than or equal to 0.5 inches/hour be allowed without increasing the risk of geologic or geotechnical hazards that cannot be reasonably mitigated to an acceptable level?	⊙ Yes	○ No

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions	Worksheet C.4-1: Form I-8A[2]
Summarize findings and basis; provide references to related reports or exhibits.	

Part 2 – Partial Infiltration Geotechnical Screening Result[5]	Result
If answers to both Criteria 3 and Criteria 4 are "Yes", a partial infiltration design is potentially feasible based on geotechnical conditions only. If answers to either Criteria 3 or Criteria 4 is "No", then infiltration of any volume is considered to be infeasible within the site.	⦿ Partial Infiltration Condition ○ No Infiltration Condition

[5] To be completed using gathered site information and best professional judgement considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by City Engineer to substantiate findings.

Categorization of Infiltration Feasibility Condition based on Groundwater and Water Balance Conditions	Worksheet C.4-2: Form I-8B[2]
Part 1 - Full Infiltration Feasibility Screening Criteria	
DMA(s) Being Analyzed:	Project Phase:
DMAs #1 thru #4	Preliminary Design

Criteria 1: Groundwater Screening	
1A	**Groundwater Depth.** Is the depth to seasonally high groundwater tables (normal high depth during the wet season) beneath the base of any full infiltration BMP greater than 10 feet? ○ Yes; continue to Step 1B. ○ No; The depth to groundwater is less than or equal to 10 feet, but site layout changes or reasonable mitigation measures can be proposed to support full infiltration BMPs. Continue to step 1B. ○ No; The depth to groundwater is less than or equal to 10 feet and site layout changes or reasonable mitigation measures cannot be proposed to support full infiltration BMPs. Answer "No" for Criteria 1 Result.
1B	**Contaminated Soil/Groundwater.** Are proposed full infiltration BMPs at least 250 feet away from contaminated soil or groundwater sites? This can be confirmed using GeoTracker (geotracker.waterboards.ca.gov) to identify open contaminated sites. The setbacks must be the closest horizontal radial distance from the surface edge (at the overflow elevation) of the BMP. ○ Yes; continue to Step 1C. ○ No; However, site layout changes or reasonable mitigation measures can be proposed to support full infiltration BMPs. Continue to Step 1C. ○ No; Site layout changes or reasonable mitigation measures cannot be proposed to support full infiltration BMPs. Answer "No" to Criteria 1 Result.

[1] Note that it is not required to investigate each and every criterion in the worksheet, a single "no" answer in Part 1, Part 2, part 3, or Part 4 determines a full, partial, or no infiltration condition.

[2] This form must be completed each time there is a change to the site layout that would affect the infiltration feasibility condition. Previously completed forms shall be retained to document the evolution of the site storm water design.

Categorization of Infiltration Feasibility Condition based on Groundwater and Water Balance Conditions	Worksheet C.4-2: Form I-8B[2]
1C	**Inadequate Soil Treatment Capacity.** Are full infiltration BMPs proposed in DMA soils that have adequate soil treatment capacity? The DMA has adequate soil treatment capacity if **ALL** of the following criteria (detailed in C.2.2.1) for all soil layers beneath the infiltrating surface are met: • USDA texture class is sandy loam or loam or silt loam or silt or sandy clay loam or clay loam or silty clay loam or sandy clay or silty clay or clay; and • Cation Exchange Capacity (CEC) greater than 5 milliequivalents/100g; and • Soil organic matter is greater than 1%; and • Groundwater table is equal to or greater than 10 feet beneath the base of the full infiltration BMP. ○ Yes; continue to Step 1D. ○ No; However, site layout changes or reasonable mitigation measures can be proposed to support full infiltration BMPs. Continue to Step 1D. ○ No; Site layout changes or reasonable mitigation measures cannot be proposed to support full infiltration BMPs. Answer "No" to Criteria 1 Result.
1D	**Other Groundwater Contamination Hazards.** Are there site-specific groundwater contamination hazards not already mentioned (refer to Appendix C.2.2) that can be reasonably mitigated to support full infiltration BMPs? ○ Yes; there are other contamination hazards identified that can be mitigated. Answer "Yes" to Criteria 1 Result. ○ No; there are other contamination hazards identified that cannot be mitigated. Answer "No" to Criteria 1 Result. ○ N/A; no contamination hazards are identified. Answer "Yes" to Criteria 1 Result.
Criteria 1 Result	Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination that cannot be reasonably mitigated to an acceptable level? See Appendix C.2.2.8 for a list of typically reasonable and typically unreasonable mitigation measures. ○ Yes; Continue to Part 1, Criteria 2. ○ No; Continue to Part 1 Result.

Categorization of Infiltration Feasibility Condition based on Groundwater and Water Balance Conditions	Worksheet C.4-2: Form I-8B[2]
Summarize groundwater quality and any mitigation measures proposed. Documentation should focus on groundwater table, mapped soil types and contaminated site locations.	

Categorization of Infiltration Feasibility Condition based on Groundwater and Water Balance Conditions	Worksheet C.4-2: Form I-8B[2]
Criteria 2: Water Balance Screening	
2A	**Ephemeral Stream Setback.** Does the proposed full infiltration BMP meet both the following? • The full infiltration BMP is located at least 250 feet away from an ephemeral stream; **AND** • The bottom surface of the full infiltration BMP is at a depth 20 feet or greater from seasonally high groundwater tables. ○ Yes; Answer "Yes" to Criteria 2 Result. ○ No; Continue to Step 2B.
2B	**Mitigation Measures.** Can site layout changes be proposed to support full infiltration BMPs? ○ Yes; the site can be reconfigured to mitigate potential water balance issues. Answer "Yes" to Criteria 2 Result. ○ No; the site cannot be reconfigured to mitigate potential water balance issues. Continue to Step 2C and provide discussion.
2C	**Additional studies.** Do additional studies support full infiltration BMPs? In the event that water balance effects are used to reject full infiltration (anticipated to be rare), additional analysis shall be completed and documented by a qualified professional indicating the site-specific information evaluated and the technical basis for this finding. ○ Yes; Answer "Yes" to Criteria 2 Result. ○ No; Answer "No" to Criteria 2 Result.
Criteria 2 Result	Can infiltration greater than 0.5 inches per hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams? ○ Yes; Continue to Part 1 Result. ○ No; Continue to Part 1 Result.

Categorization of Infiltration Feasibility Condition based on Groundwater and Water Balance Conditions	Worksheet C.4-2: Form I-8B[2]
Summarize potential water balance effects. Documentation should focus on mapping and soil data regarding proximity to ephemeral streams and groundwater depth.	

Part 1 – Full Infiltration Groundwater and Water Balance Screening Result[3]	Result
If answers to Criteria 1 and 2 are "Yes", a full infiltration design is potentially feasible. The feasibility screening category is Full Infiltration based on groundwater conditions. If answer to Criteria 1 or Criteria 2 is "No", infiltration may be possible to some extent but would not generally be feasible or desirable to achieve a "full infiltration" design based on groundwater conditions. Proceed to Part 2.	○ Full Infiltration ⊙ Complete Part 2

[3] To be completed using gathered site information and best professional judgement considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by City Engineer to substantiate findings.

Categorization of Infiltration Feasibility Condition based on Groundwater and Water Balance Conditions	Worksheet C.4-2: Form I-8B[2]
Part 2 – Partial vs. No Infiltration Feasibility Screening Criteria	
DMA(s) Being Analyzed:	**Project Phase:**
DMAs #1 thru #4	Preliminary Design
Criteria 3: Groundwater Screening	
Contaminated Soil/Groundwater. Are partial infiltration BMPs proposed at least 100 feet away from contaminated soil or groundwater sites? This can be confirmed using GeoTracker (geotracker.waterboards.ca.gov) to identify open contaminated sites. This criterion is intentionally a smaller radius than full infiltration, as the potential quantity of infiltration from partial infiltration BMPs is smaller. ◉ Yes; Answer "Yes" to Criteria 3 Result. ○ No; However, site layout changes can be proposed to avoid contaminated soils or soils that lack adequate treatment capacity. Select "Yes" to Criteria 3 Result. It is a requirement for the SWQMP preparer to identify potential mitigation measures. ○ No; Contaminated soils or soils that lack adequate treatment capacity cannot be avoided and partial infiltration BMPs are not feasible. Select "No" to Criteria 3 Result.	
Criteria 3 Result: Can infiltration of greater than or equal to 0.05 inches/hour and less than or equal to 0.5 inches/hour be allowed without increasing risk of groundwater contamination that cannot be reasonably mitigated to an acceptable level? ◉ Yes; Continue to Part 2, Criteria 4. ○ No; Skip to Part 2 Result.	
Summarize findings and basis. Documentation should focus on mapped soil types and contaminated site locations.	

Categorization of Infiltration Feasibility Condition based on Groundwater and Water Balance Conditions	Worksheet C.4-2: Form I-8B[2]
Criteria 4: Water Balance Screening	
Additional studies. In the event that water balance effects are used to reject partial infiltration (anticipated to be rare), a qualified professional must provide an analysis of the incremental effects of partial infiltration BMPs on the water balance compared to incidental infiltration under a no infiltration scenario (e.g. precipitation, irrigation, etc.).	
Criteria 4 Result: Can infiltration of greater than or equal to 0.05 inches/hour and less than or equal to 0.5 inches/hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams? ◉ Yes: Continue to Part 2 Result. ○ No: Continue to Part 2 Result.	
Summarize potential water balance effects. Documentation should focus on mapping and soil data regarding proximity to ephemeral streams and groundwater depth.	
Part 2 – Partial Infiltration Groundwater and Water Balance Screening Result[4]	**Result**
If answers to Criteria 3 and Criteria 4 are "Yes", a partial infiltration design is potentially feasible. The feasibility screening category is Partial Infiltration based on groundwater and water balance conditions. If answer to Criteria 3 or Criteria 4 is "No", then infiltration of any volume is considered to be infeasible within the site. The feasibility screening category is No Infiltration based on groundwater or water balance condition.	◉ Partial Infiltration Condition ○ No Infiltration Condition

[4] To be completed using gathered site information and best professional judgement considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by City Engineer to substantiate findings.

Infiltration and Groundwater Protection		Worksheet C.4-3	
Criteria	**Question**	**Yes**	**No**
1	Will the storm water runoff undergo pretreatment such as sedimentation or filtration prior to infiltration?	☉	○
2	Are pollution prevention and source control BMPs implemented at a level appropriate to protect groundwater quality for areas draining to infiltration BMPs?	☉	○
3	Is the vertical distance from the base of the full infiltration BMP to the seasonal high groundwater mark greater than 10 feet? This vertical distance may be reduced when the groundwater basin does not support beneficial uses and the groundwater quality is maintained	☉	○
4	Does the soil through which infiltration is to occur have physical and chemical characteristics that are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses? Refer to Appendix C.3.1.	☉	○
5	Is the following statement true? Full infiltration BMPs are not used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities, unless source control BMPs to prevent exposure of high threat activities are implemented, or runoff from such activities is first treated or filtered to remove pollutants prior to infiltration.	☉	○
6	Is the full infiltration BMP located at a distance greater than 100 feet horizontally from any water supply well?	☉	○

Basis and Documentation:
Full infiltration not feasible since project site is underlain by Type D soils. Refer to Attachment 6 of this report for a copy of NRCS Soils Report.

All the answers for Criteria 1 to 6 must be "Yes" for acceptance of a full infiltration BMP.

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Attachment 2
Backup for PDP Hydromodification Control Measures

This is the cover sheet for Attachment 2.

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

Project Name: MONTEZUMA HOTEL

Indicate which Items are Included:

Attachment Sequence	Contents	Checklist
Attachment 2a	Hydromodification Management Exhibit (Required)	☑ Included See Hydromodification Management Exhibit Checklist.
Attachment 2b	Management of Critical Coarse Sediment Yield Areas (WMAA Exhibit is required, additional analyses are optional) See Section 6.2 of the BMP Design Manual.	☑ Exhibit showing project drainage boundaries marked on WMAA Critical Coarse Sediment Yield Area Map (Required) Optional analyses for Critical Coarse Sediment Yield Area Determination ☐ 6.2.1 Verification of Geomorphic Landscape Units Onsite ☐ 6.2.2 Downstream Systems Sensitivity to Coarse Sediment ☐ 6.2.3 Optional Additional Analysis of Potential Critical Coarse Sediment Yield Areas Onsite
Attachment 2c	Geomorphic Assessment of Receiving Channels (Optional) See Section 6.3.4 of the BMP Design Manual.	☑ Not Performed ☐ Included ☐ Submitted as separate stand-alone document
Attachment 2d	Flow Control Facility Design and Structural BMP Drawdown Calculations (Required) Overflow Design Summary for each structural BMP See Chapter 6 and Appendix G of the BMP Design Manual	☑ Included ☐ Submitted as separate stand-alone document

Project Name: MONTEZUMA HOTEL

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

The Hydromodification Management Exhibit must identify:

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

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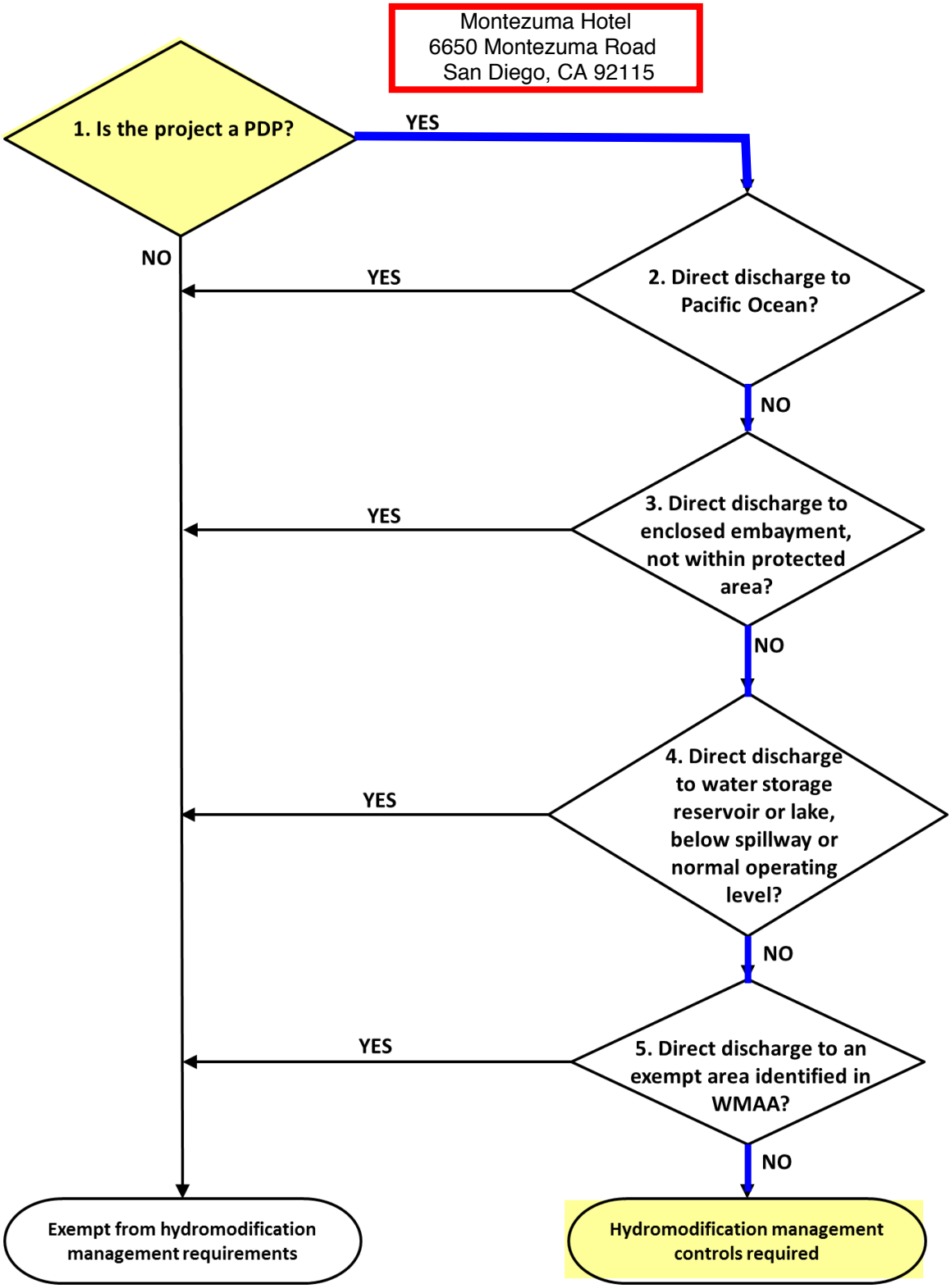

*Direct discharge refers to an uninterrupted hardened conveyance system; Note to be used in conjunction with Node Descriptions.

Figure 1-2. Applicability of Hydromodification Management BMP Requirements

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Worksheet G.2-1: Sizing Factors Worksheet

Site Information			
Project Name:	Montezuma Hotel	**Hydrologic Unit**	San Diego River (907.11)
Project Applicant:	52 Blue Falcon LLC	**Rain Gauge:**	Oceanside
Jurisdiction:	City of San Diego	**Total Project Area:**	1.86 acres
Assessor's Parcel Number:	468-120-06-00	**Low Flow Threshold:**	**$0.1Q_2$**
BMP Name:	**BMP #1**	**BMP Type:**	Biofiltration w/ Partial Retention

Areas Draining to BMP						Sizing Factors		Minimum BMP Size	
DMA Name	**Area (sf)**	**Soil Type**	**Slope**	**Post Project Surface Type**	**Runoff Factor (From Table G.2-1)**	**Surface Area**	**Volume**	**Surface Area (sf)**	**Volume (cf)**
DMA #1	1,688	D	Moderate	Landscape	0.10	0.07	N/A	12	N/A
DMA #1	26,025	D	Moderate	AC Pave., Conc.	0.90	0.07	N/A	1,640	N/A
Total DMA Area	27,713						**Minimum BMP Size***	1,651	N/A
							Proposed BMP Size*	1,688	N/A

***Minimum BMP Size = Total of rows above.**

***Proposed BMP Size ≥ Minimum BMP size.**

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Worksheet G.2-1: Sizing Factors Worksheet

Site Information			
Project Name:	Montezuma Hotel	**Hydrologic Unit**	San Diego River (907.11)
Project Applicant:	52 Blue Falcon LLC	**Rain Gauge:**	Oceanside
Jurisdiction:	City of San Diego	**Total Project Area:**	1.86 acres
Assessor's Parcel Number:	468-120-06-00	**Low Flow Threshold:**	**$0.1Q_2$**
BMP Name:	**BMP #2**	**BMP Type:**	Biofiltration w/ Partial Retention

Areas Draining to BMP						Sizing Factors		Minimum BMP Size	
DMA Name	**Area (sf)**	**Soil Type**	**Slope**	**Post Project Surface Type**	**Runoff Factor (From Table G.2-1)**	**Surface Area**	**Volume**	**Surface Area (sf)**	**Volume (cf)**
DMA #2	1,296	D	Moderate	Landscape	0.10	0.07	N/A	9	N/A
DMA #2	5,225	D	Moderate	AC Pave., Conc.	0.90	0.07	N/A	329	N/A
Total DMA Area	6,521						**Minimum BMP Size***	338	N/A
							Proposed BMP Size*	390	N/A

***Minimum BMP Size = Total of rows above.**

***Proposed BMP Size ≥ Minimum BMP size.**

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Worksheet G.2-1: Sizing Factors Worksheet

Site Information			
Project Name:	Montezuma Hotel	**Hydrologic Unit**	San Diego River (907.11)
Project Applicant:	52 Blue Falcon LLC	**Rain Gauge:**	Oceanside
Jurisdiction:	City of San Diego	**Total Project Area:**	1.86 acres
Assessor's Parcel Number:	468-120-06-00	**Low Flow Threshold:**	**$0.1Q_2$**
BMP Name:	**BMP #3**	**BMP Type:**	Biofiltration w/ Partial Retention

Areas Draining to BMP						Sizing Factors		Minimum BMP Size	
DMA Name	**Area (sf)**	**Soil Type**	**Slope**	**Post Project Surface Type**	**Runoff Factor (From Table G.2-1)**	**Surface Area**	**Volume**	**Surface Area (sf)**	**Volume (cf)**
DMA #3	3,781	D	Moderate	Landscape	0.10	0.07	N/A	26	N/A
DMA #3	17,261	D	Moderate	AC Pave., Conc.	0.90	0.07	N/A	1,087	N/A
Total DMA Area	21,042						**Minimum BMP Size***	1,114	N/A
							Proposed BMP Size*	1,438	N/A

***Minimum BMP Size = Total of rows above.**

***Proposed BMP Size ≥ Minimum BMP size.**

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Worksheet G.2-1: Sizing Factors Worksheet

Site Information			
Project Name:	Montezuma Hotel	**Hydrologic Unit**	San Diego River (907.11)
Project Applicant:	52 Blue Falcon LLC	**Rain Gauge:**	Oceanside
Jurisdiction:	City of San Diego	**Total Project Area:**	1.86 acres
Assessor's Parcel Number:	468-120-06-00	**Low Flow Threshold:**	**$0.1Q_2$**
BMP Name:	**BMP #4**	**BMP Type:**	Biofiltration w/ Partial Retention

Areas Draining to BMP						Sizing Factors		Minimum BMP Size	
DMA Name	**Area (sf)**	**Soil Type**	**Slope**	**Post Project Surface Type**	**Runoff Factor (From Table G.2-1)**	**Surface Area**	**Volume**	**Surface Area (sf)**	**Volume (cf)**
DMA #4	4,948	D	Moderate	Landscape	0.10	0.07	N/A	35	N/A
DMA #4	18,189	D	Moderate	AC Pave., Conc.	0.90	0.07	N/A	1,146	N/A
Total DMA Area	23,137						**Minimum BMP Size***	1,181	N/A
							Proposed BMP Size*	1,321	N/A

***Minimum BMP Size = Total of rows above.**

***Proposed BMP Size ≥ Minimum BMP size.**

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civil engineer shall provide the necessary surface area of the BMP and the underdrain and orifice detail on the plans.

Additional steps to use this BMP as a combined pollutant control and flow control BMP:

The BMP sized using the sizing factors in Table G.2-4 meets both pollutant control and flow control requirements.

Table G.2-4: Sizing Factors for Hydromodification Flow Control Biofiltration with Partial Retention BMPs Designed Using Sizing Factor Method

Lower Flow Threshold	Soil Group	Slope	Aggregate below low orifice invert (inches)	Rain Gauge	A
$0.1Q_2$	A	Flat	18	Lindbergh	0.080
$0.1Q_2$	A	Moderate	18	Lindbergh	0.080
$0.1Q_2$	A	Steep	18	Lindbergh	0.080
$0.1Q_2$	B	Flat	18	Lindbergh	0.065
$0.1Q_2$	B	Moderate	18	Lindbergh	0.065
$0.1Q_2$	B	Steep	18	Lindbergh	0.060
$0.1Q_2$	C	Flat	6	Lindbergh	0.050
$0.1Q_2$	C	Moderate	6	Lindbergh	0.050
$0.1Q_2$	C	Steep	6	Lindbergh	0.050
$0.1Q_2$	D	Flat	3	Lindbergh	0.050
$0.1Q_2$	D	Moderate	3	Lindbergh	0.050
$0.1Q_2$	D	Steep	3	Lindbergh	0.050
$0.1Q_2$	A	Flat	18	Oceanside	0.080
$0.1Q_2$	A	Moderate	18	Oceanside	0.075
$0.1Q_2$	A	Steep	18	Oceanside	0.075
$0.1Q_2$	B	Flat	18	Oceanside	0.070
$0.1Q_2$	B	Moderate	18	Oceanside	0.070
$0.1Q_2$	B	Steep	18	Oceanside	0.070
$0.1Q_2$	C	Flat	6	Oceanside	0.070
$0.1Q_2$	C	Moderate	6	Oceanside	0.070
$0.1Q_2$	C	Steep	6	Oceanside	0.070
$0.1Q_2$	D	Flat	3	Oceanside	0.070
$0.1Q_2$	D	Moderate	3	Oceanside	0.070
$0.1Q_2$	D	Steep	3	Oceanside	0.070
$0.1Q_2$	A	Flat	18	L Wohlford	0.110
$0.1Q_2$	A	Moderate	18	L Wohlford	0.110

Lower Flow Threshold	Soil Group	Slope	Aggregate below low orifice invert (inches)	Rain Gauge	A
$0.1Q_2$	A	Steep	18	L Wohlford	0.105
$0.1Q_2$	B	Flat	18	L Wohlford	0.090
$0.1Q_2$	B	Moderate	18	L Wohlford	0.085
$0.1Q_2$	B	Steep	18	L Wohlford	0.085
$0.1Q_2$	C	Flat	6	L Wohlford	0.065
$0.1Q_2$	C	Moderate	6	L Wohlford	0.065
$0.1Q_2$	C	Steep	6	L Wohlford	0.065
$0.1Q_2$	D	Flat	3	L Wohlford	0.060
$0.1Q_2$	D	Moderate	3	L Wohlford	0.060
$0.1Q_2$	D	Steep	3	L Wohlford	0.060

Q_2 = 2-year pre-project flow rate based upon partial duration analysis of long-term hourly rainfall records

A = Surface area (at surface of the BMP before any ponding occurs) sizing factor for flow control

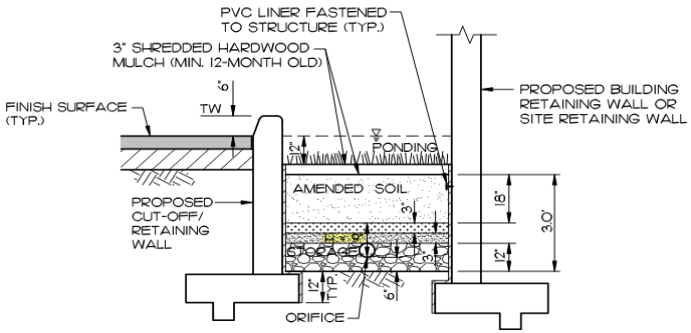
Sizing Low Flow Orifice

(1) $Q = C_d \times A \times (2gH)^{0.5}$ Orifice Discharge Equation

C_d = Orifice Coefficient = 0.60 (sharp, clean edge)
H = Water Head above orifice
g = Gravitational Acceleration = 32.2 ft/s^2
A = Area of the Orifice

(2) $A = [0.1Q_2 \times A_{DMA}]/C_d \times (2gH)^{0.5}$

Q_2 = 2-year Storm Unit Runoff (Per Table G.2-2 of 2018 City of San Diego Storm Water Standards)
A_{DMA} = Area of the Drainage Management Area (DMA)



DMA	Rain Gauge	Soil Type	Slope	H (ft)	Q_2 Unit Runoff (cfs/acre)	A_{DMA} (SF)	A_{DMA} (Acres)	$0.1Q_2$	Max. Orifice Area ($inch^2$)	Orifice Diameter (inches)	Q_{10} Unit Runoff (cfs/acre)	Q_{10} (cfs)
1	Oceanside	D	Moderate	0.75	0.575	27712	0.64	0.0366	1.26	**1.27**	0.999	0.6355

Table G.2-2: Unit Runoff Ratios for Sizing Factor Method

Rain Gauge	Soil	Slope	Q_2 (cfs/acre)	Q_{10} (cfs/ac)
Oceanside	B	Low	0.377	0.875
Oceanside	B	Moderate	0.391	0.879
Oceanside	B	Steep	0.395	0.881
Oceanside	C	Low	0.488	0.981
Oceanside	C	Moderate	0.497	0.985
Oceanside	C	Steep	0.499	0.986
Oceanside	D	Low	0.571	0.998
Oceanside	D	Moderate	0.575	0.999
Oceanside	D	Steep	0.576	0.999

FLOW CONTROL FOR BMP NO. 1		
Lower Flow Threshold =	0.0366	cfs
Peak Q_{10} =	0.6355	cfs
Max Orifice Diameter Allowed =	1.269	inch
Proposed Diameter =	1.250	inch

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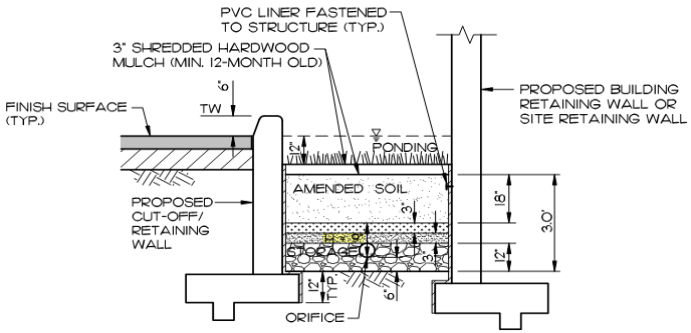
Sizing Low Flow Orifice

(1) $Q = C_d \times A \times (2gH)^{0.5}$ Orifice Discharge Equation

C_d = Orifice Coefficient = 0.60 (sharp, clean edge)
H = Water Head above orifice
g = Gravitational Acceleration = 32.2 ft/s^2
A = Area of the Orifice

(2) $A = [0.1Q_2 \times A_{DMA}]/C_d \times (2gH)^{0.5}$

Q_2 = 2-year Storm Unit Runoff (Per Table G.2-2 of 2018 City of San Diego Storm Water Standards)
A_{DMA} = Area of the Drainage Management Area (DMA)



DMA	Rain Gauge	Soil Type	Slope	H (ft)	Q_2 Unit Runoff (cfs/acre)	A_{DMA} (SF)	A_{DMA} (Acres)	$0.1Q_2$	Max. Orifice Area (inch^2)	Orifice Diameter (inches)	Q_{10} Unit Runoff (cfs/acre)	Q_{10} (cfs)
2	Oceanside	D	Moderate	0.75	0.575	6521	0.15	0.0086	0.30	**0.62**	0.999	0.1496

Table G.2-2: Unit Runoff Ratios for Sizing Factor Method

Rain Gauge	Soil	Slope	Q_2 (cfs/acre)	Q_{10} (cfs/ac)
Oceanside	B	Low	0.377	0.875
Oceanside	B	Moderate	0.391	0.879
Oceanside	B	Steep	0.395	0.881
Oceanside	C	Low	0.488	0.981
Oceanside	C	Moderate	0.497	0.985
Oceanside	C	Steep	0.499	0.986
Oceanside	D	Low	0.571	0.998
Oceanside	D	Moderate	0.575	0.999
Oceanside	D	Steep	0.576	0.999

FLOW CONTROL FOR BMP NO. 1		
Lower Flow Threshold =	0.0086	cfs
Peak Q_{10} =	0.1496	cfs
Max Orifice Diameter Allowed =	0.615	inch
Proposed Diameter =	0.5625	inch

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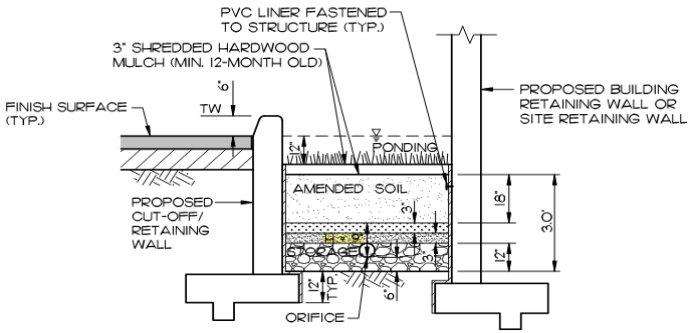
Sizing Low Flow Orifice

(1) $Q = C_d \times A \times (2gH)^{0.5}$ Orifice Discharge Equation

C_d = Orifice Coefficient = 0.60 (sharp, clean edge)
H = Water Head above orifice
g = Gravitational Acceleration = 32.2 ft/s^2
A = Area of the Orifice

(2) $A = [0.1Q_2 \times A_{DMA}]/C_d \times (2gH)^{0.5}$

Q_2 = 2-year Storm Unit Runoff (Per Table G.2-2 of 2018 City of San Diego Storm Water Standards)
A_{DMA} = Area of the Drainage Management Area (DMA)



DMA	Rain Gauge	Soil Type	Slope	H (ft)	Q_2 Unit Runoff (cfs/acre)	A_{DMA} (SF)	A_{DMA} (Acres)	$0.1Q_2$	Max. Orifice Area ($inch^2$)	Orifice Diameter (inches)	Q_{10} Unit Runoff (cfs/acre)	Q_{10} (cfs)
3	Oceanside	D	Moderate	0.75	0.575	21042	0.48	0.0278	0.96	**1.11**	0.999	0.4826

Table G.2-2: Unit Runoff Ratios for Sizing Factor Method

Rain Gauge	Soil	Slope	Q_2 (cfs/acre)	Q_{10} (cfs/ac)
Oceanside	B	Low	0.377	0.875
Oceanside	B	Moderate	0.391	0.879
Oceanside	B	Steep	0.395	0.881
Oceanside	C	Low	0.488	0.981
Oceanside	C	Moderate	0.497	0.985
Oceanside	C	Steep	0.499	0.986
Oceanside	D	Low	0.571	0.998
Oceanside	D	Moderate	0.575	0.999
Oceanside	D	Steep	0.576	0.999

FLOW CONTROL FOR BMP NO. 1		
Lower Flow Threshold =	0.0278	cfs
Peak Q_{10} =	0.4826	cfs
Max Orifice Diameter Allowed =	1.105	inch
Proposed Diameter =	1.00	inch

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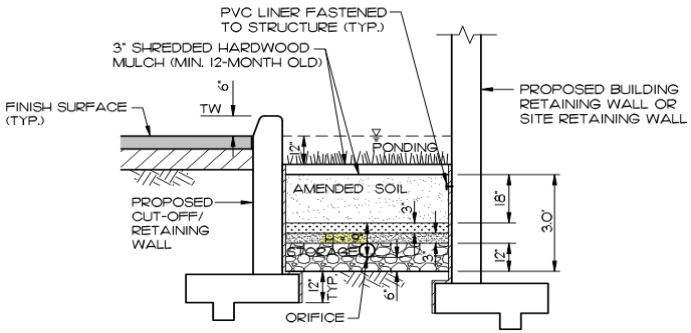
Sizing Low Flow Orifice

(1) $Q = C_d \times A \times (2gH)^{0.5}$ Orifice Discharge Equation

C_d = Orifice Coefficient = 0.60 (sharp, clean edge)
H = Water Head above orifice
g = Gravitational Acceleration = 32.2 ft/s^2
A = Area of the Orifice

(2) $A = [0.1Q_2 \times A_{DMA}]/C_d \times (2gH)^{0.5}$

Q_2 = 2-year Storm Unit Runoff (Per Table G.2-2 of 2018 City of San Diego Storm Water Standards)
A_{DMA} = Area of the Drainage Management Area (DMA)



DMA	Rain Gauge	Soil Type	Slope	H (ft)	Q_2 Unit Runoff (cfs/acre)	A_{DMA} (SF)	A_{DMA} (Acres)	$0.1Q_2$	Max. Orifice Area (inch^2)	Orifice Diameter (inches)	Q_{10} Unit Runoff (cfs/acre)	Q_{10} (cfs)
4	Oceanside	D	Moderate	0.75	0.575	23137	0.53	0.0305	1.05	**1.16**	0.999	0.5306

Table G.2-2: Unit Runoff Ratios for Sizing Factor Method

Rain Gauge	Soil	Slope	Q_2 (cfs/acre)	Q_{10} (cfs/ac)
Oceanside	B	Low	0.377	0.875
Oceanside	B	Moderate	0.391	0.879
Oceanside	B	Steep	0.395	0.881
Oceanside	C	Low	0.488	0.981
Oceanside	C	Moderate	0.497	0.985
Oceanside	C	Steep	0.499	0.986
Oceanside	D	Low	0.571	0.998
Oceanside	D	Moderate	0.575	0.999
Oceanside	D	Steep	0.576	0.999

FLOW CONTROL FOR BMP NO. 1		
Lower Flow Threshold =	0.0305	cfs
Peak Q_{10} =	0.5306	cfs
Max Orifice Diameter Allowed =	1.159	inch
Proposed Diameter =	1.125	inch

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G.2.1 Unit Runoff Ratios

Table G.2-2 presents unit runoff ratios for calculating pre-development Q_2, to be used when applicable to determine the lower flow threshold for low flow orifice sizing for biofiltration with partial retention, biofiltration, or cistern BMPs. There is no low flow orifice in the infiltration BMP. The unit runoff ratios are updated from the previously reported BMP Sizing Calculator methodology ratios to account for changes in modeling methodologies. Unit runoff ratios for "urban" and "impervious" cover categories were not transferred to this manual due to the requirement to control runoff to pre-development condition (see Chapter 6.3.3).

How to use the unit runoff ratios:

Obtain unit runoff ratio from Table G.2-2 based on the project's rainfall basin, hydrologic soil group, and pre-development slope (for redevelopment projects, pre-development slope may be considered if historic topographic information is available, otherwise use pre-project slope). Multiply the area tributary to the structural BMP (A, acres) by the unit runoff ratio (Q_2, cfs/acre) to determine the pre-development Q_2 to determine the lower flow threshold, to use for low flow orifice sizing.

Table G.2-2: Unit Runoff Ratios for Sizing Factor Method

Rain Gauge	Soil	Slope	Q_2 (cfs/acre)	Q_{10} (cfs/ac)
Lake Wohlford	A	Low	0.256	0.518
Lake Wohlford	A	Moderate	0.275	0.528
Lake Wohlford	A	Steep	0.283	0.531
Lake Wohlford	B	Low	0.371	0.624
Lake Wohlford	B	Moderate	0.389	0.631
Lake Wohlford	B	Steep	0.393	0.633
Lake Wohlford	C	Low	0.490	0.729
Lake Wohlford	C	Moderate	0.495	0.733
Lake Wohlford	C	Steep	0.496	0.735
Lake Wohlford	D	Low	0.548	0.784
Lake Wohlford	D	Moderate	0.554	0.788
Lake Wohlford	D	Steep	0.556	0.788
Oceanside	A	Low	0.256	0.679
Oceanside	A	Moderate	0.277	0.694
Oceanside	A	Steep	0.285	0.700

Rain Gauge	Soil	Slope	Q_2 (cfs/acre)	Q_{10} (cfs/ac)
Oceanside	B	Low	0.377	0.875
Oceanside	B	Moderate	0.391	0.879
Oceanside	B	Steep	0.395	0.881
Oceanside	C	Low	0.488	0.981
Oceanside	C	Moderate	0.497	0.985
Oceanside	C	Steep	0.499	0.986
Oceanside	D	Low	0.571	0.998
Oceanside	D	Moderate	0.575	0.999
Oceanside	D	Steep	0.576	0.999
Lindbergh	A	Low	0.057	0.384
Lindbergh	A	Moderate	0.073	0.399
Lindbergh	A	Steep	0.082	0.403
Lindbergh	B	Low	0.199	0.496
Lindbergh	B	Moderate	0.220	0.509
Lindbergh	B	Steep	0.230	0.513
Lindbergh	C	Low	0.335	0.601
Lindbergh	C	Moderate	0.349	0.610
Lindbergh	C	Steep	0.354	0.613
Lindbergh	D	Low	0.429	0.751
Lindbergh	D	Moderate	0.437	0.753
Lindbergh	D	Steep	0.439	0.753

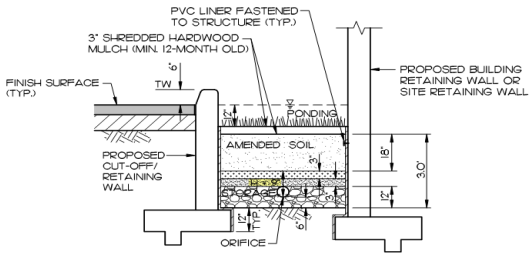
Drawdown Time Calculations

Low Flow Orifice Discharge

1) $Q = C_d \times A \times (2gH)^{0.5}$

Orifice Discharge Equation

C_d = Orifice Coefficient = 0.60 (sharp, clean edge)
H = Water Head above orifice
g = Gravitational Acceleration = 32.2 ft/s^2
A = Area of the Orifice



BMP	Orifice Coefficient Cd	Orifice Diameter (inches)	Max. Orifice Area ($inch^2$)	Gravitational Acceleration ft/s^2	H (in)	H (ft)	Orifice Discharge Q (cfs)
1	0.6	1.25	1.23	32.2	9	0.75	0.036
2	0.6	0.5625	0.25	32.2	9	0.75	0.007
3	0.6	1.00	0.79	32.2	9	0.75	0.023
4	0.6	1.1250	0.99	32.2	9	0.75	0.029

Surface Ponding Volume

2) $V = (A_{Top\ of\ Basin} + A_{Bottom\ of\ Basin})/2 \times$ Ponding Depth

Surface Ponding Volume

C_d = Orifice Coefficient = 0.60 (sharp, clean edge)
H = Water Head above orifice
g = Gravitational Acceleration = 32.2 ft/s^2
A = Area of the Orifice

BMP	$A_{Top\ of\ Basin}$ (sf)	$A_{Bottom\ of\ Basin}$ (sf)	Ponding Depth (in)	Surface Ponding Volume (cf)
1	1688	1688	12	1688.0
2	390	390	12	390.0
3	1438	1438	12	1438.0
4	1321	1321.0	12	1321.0

Drawdown Time

3) $D = V / Q_{Orifice}$

Drawdown Time

BMP	Surface Ponding Volume (cf)	$Q_{orifice}$ (cfs)	Drawdown Time (hours)	Conclusion
1	1688.0	0.036	13.2	< 96 hours - No Vector Control Required
2	390.0	0.007	15.1	< 96 hours - No Vector Control Required
3	1438.0	0.023	17.6	< 96 hours - No Vector Control Required
4	1321.0	0.029	12.8	< 96 hours - No Vector Control Required

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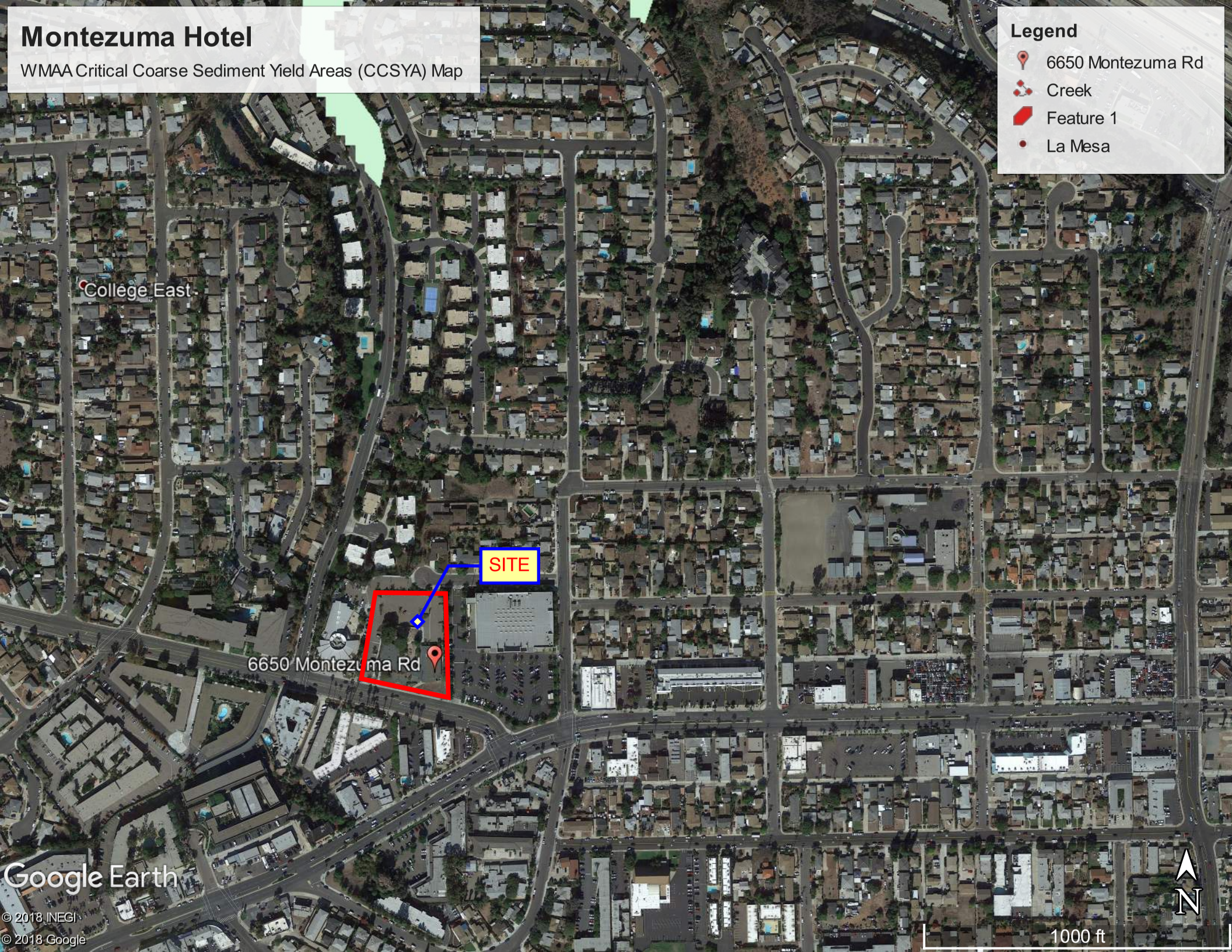
Montezuma Hotel

WMAA Critical Coarse Sediment Yield Areas (CCSYA) Map



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Attachment 3
Structural BMP Maintenance Information

This is the cover sheet for Attachment 3.

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Project Name: MONTEZUMA HOTEL

Indicate which Items are Included:

Attachment Sequence	Contents	Checklist
Attachment 3	Maintenance Agreement (Form DS-3247) (when applicable)	☐ Included ☑ Not applicable

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

Attachment 3: For private entity operation and maintenance, Attachment 3 must include a Storm Water Management and Discharge Control Maintenance Agreement (Form DS-3247). The following information must be included in the exhibits attached to the maintenance agreement:

- ☐ Vicinity map
- ☐ Site design BMPs for which DCV reduction is claimed for meeting the pollutant control obligations.
- ☐ BMP and HMP location and dimensions
- ☐ BMP and HMP specifications/cross section/model
- ☐ Maintenance recommendations and frequency
- ☐ LID features such as (permeable paver and LS location, dim, SF).

OPERATION AND MAINTENANCE PLAN
for
Biofiltration Basins with Partial Retention

I. Introduction

The proposed development consists of the construction of a 5-story hotel building with asphalt paved parking lot. Based on the uses of the site, the anticipated pollutants generated by the project consist of sediment, heavy metals, organic compounds, trash & debris, oil & grease, and bacteria & viruses.

The selected structural BMPs for this project consists of four biofiltration basins with partial retention, which are based on the feasibility due to the site conditions. The anticipated pollutants shall be removed from runoff by filtration through the vegetation, sedimentation and absorption to soil particles, and infiltration through the engineered soil.

The proposed facilities consist of excavated detention basins which are backfilled with 18-inch engineered soil with underlying sub-drain system and vegetation over the surface. They are designed to pond runoff after rainfall events, gradually allowing water to infiltrate into the soil and controlled discharge offsite through the sub-drain system. The engineered soil is designed to have an infiltration rate of minimum 5 inches per hour, as well as providing an appropriate planting medium. Vegetation pretreats the runoff by capturing and removing larger sediment particles or debris.

These facilities will need adequate maintenance to function as designed.

II. Responsibility for Maintenance

The responsibilities of maintenance for the structural BMP is the Owner or Tenant.

III. Inspection and Maintenance Checklist

Inspection and Maintenance Checklists and Report Form for the BMPs are attached in Attachment A. The Source Control BMP fact sheets in Attachment B provide information for the Tenant to train the care-takers.

IV. Inspection and Maintenance Schedule

At the minimum, the BMPs shall be inspected monthly, after each major rain event, pre-rainy season and after rainy season. Below is Table 7-2 from the City of San Diego Storm Water Standards: BMP Design Manual which lists the maintenance indicators and the required actions for the selected structural BMP.

Table 7-2. Maintenance Indicators and Actions for Vegetated BMPs

Typical Maintenance Indicator(s) for Vegetated BMPs	Maintenance Actions
Accumulation of sediment, litter, or debris	Remove and properly dispose of accumulated materials, without damage to the vegetation.
Poor vegetation establishment	Re-seed, re-plant, or re-establish vegetation per original plans.
Overgrown vegetation	Mow or trim as appropriate, but not less than the design height of the vegetation per original plans when applicable (e.g. a vegetated swale may require a minimum vegetation height).
Erosion due to concentrated irrigation flow	Repair/re-seed/re-plant eroded areas and adjust the irrigation system.
Erosion due to concentrated storm water runoff flow	Repair/re-seed/re-plant eroded areas, and make appropriate corrective measures such as adding erosion control blankets, adding stone at flow entry points, or minor re-grading to restore proper drainage according to the original plan. If the issue is not corrected by restoring the BMP to the original plan and grade, the City Engineer shall be contacted prior to any additional repairs or reconstruction.
Standing water in vegetated swales	Make appropriate corrective measures such as adjusting irrigation system, removing obstructions of debris or invasive vegetation, loosening or replacing top soil to allow for better infiltration, or minor re-grading for proper drainage. If the issue is not corrected by restoring the BMP to the original plan and grade, the City Engineer shall be contacted prior to any additional repairs or reconstruction.
Standing water in bioretention, biofiltration with partial retention, or biofiltration areas, or flow-through planter boxes for longer than 96 hours following a storm event*	Make appropriate corrective measures such as adjusting irrigation system, removing obstructions of debris or invasive vegetation, clearing underdrains (where applicable), or repairing/replacing clogged or compacted soils.
Obstructed inlet or outlet structure	Clear obstructions.
Damage to structural components such as weirs, inlet or outlet structures	Repair or replace as applicable.
*These BMPs typically include a surface ponding layer as part of their function which may take 96 hours to drain following a storm event.	

V. Records

Each owner shall maintain records of the self certification forms for a minimum of 5-year period, excepting the initial year, the period of warranty.

ATTACHMENT A

ANNUAL REPORT FORM

INSPECTION AND MAINTENANCE CHECKLIST:

1. BIOFILTRATION WITH PARTIAL RETENTION (PR-1)
2. BIOFILTRATION WITH PARTIAL RETENTION BMP MAINTENANCE FACT SHEET

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E.17 PR-1 Biofiltration with Partial Retention

Location: 805 and Bonita Road, Chula Vista, CA.

MS4 Permit Category
NA
Manual Category
Partial Retention
Applicable Performance Standard
Pollutant Control Flow Control
Primary Benefits
Volume Reduction Treatment Peak Flow Attenuation

Description

Biofiltration with partial retention (partial infiltration and biofiltration) facilities are vegetated surface water systems that filter water through vegetation, and soil or engineered media prior to infiltrating into native soils, discharge via underdrain, or overflow to the downstream conveyance system. Where feasible, these BMPs have an elevated underdrain discharge point that creates storage capacity in the aggregate storage layer. Biofiltration with partial retention facilities are commonly incorporated into the site within parking lot landscaping, along roadsides, and in open spaces. They can be constructed in ground or partially aboveground, such as planter boxes with open bottoms to allow infiltration. Treatment is achieved through filtration, sedimentation, sorption, infiltration, biochemical processes and plant uptake.

Typical biofiltration with partial retention components include:

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

Design Adaptations for Project Goals

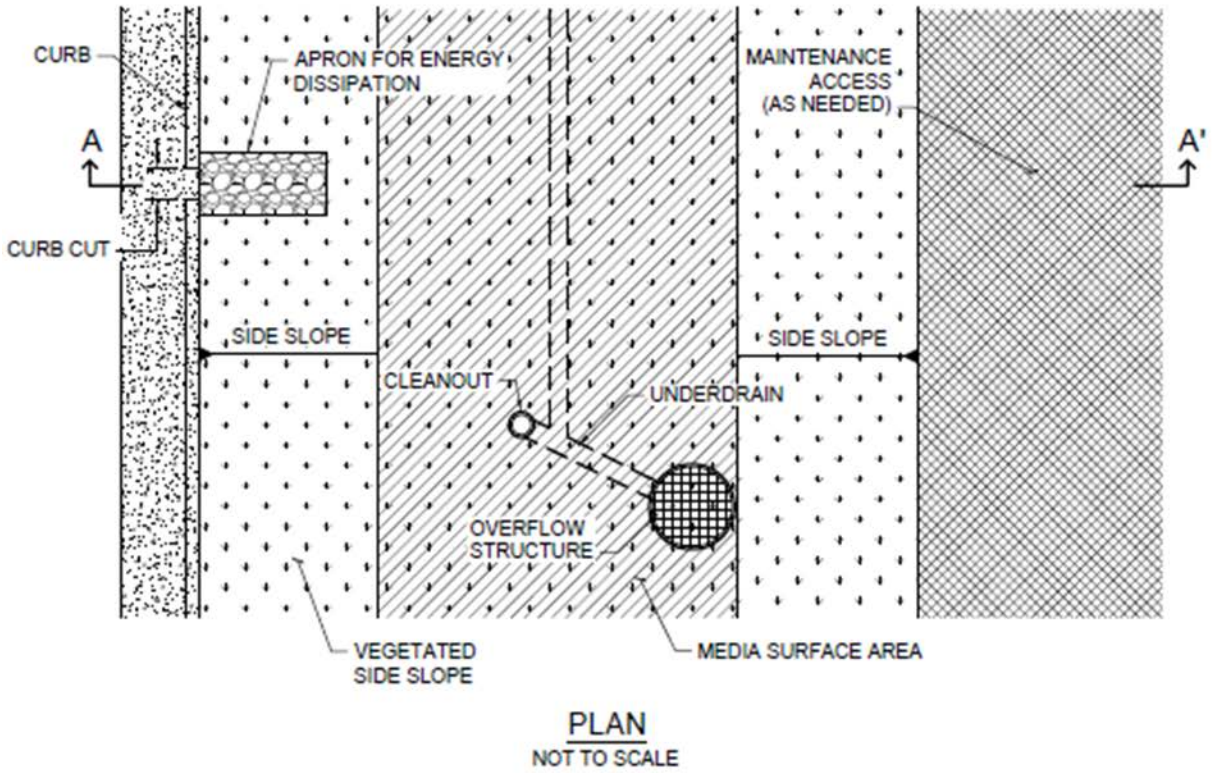
Partial infiltration BMP with biofiltration treatment for storm water pollutant control. Biofiltration with partial retention can be designed so that a portion of the DCV is infiltrated by providing infiltration storage below the underdrain invert. The infiltration storage depth should be determined by the volume that can be reliably infiltrated within drawdown time limitations. Water discharged through the underdrain is considered biofiltration treatment. Storage provided above the underdrain within surface ponding, media, and aggregate storage is included in the biofiltration treatment volume.

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

Recommended Siting Criteria

	Siting Criteria	Intent/Rationale
☐	Placement observes geotechnical recommendations regarding potential hazards (e.g., slope stability, landslides, liquefaction zones) and setbacks (e.g., slopes, foundations, utilities).	Must not negatively impact existing site geotechnical concerns.
☐	Selection and design of basin is based on infiltration feasibility criteria and appropriate design infiltration rate (See Appendix C and D).	Must operate as a partial infiltration design and must be supported by drainage area and in-situ infiltration rate feasibility findings.
☐	Contributing tributary area shall be ≤ 5 acres (≤ 1 acre preferred).	Bigger BMPs require additional design features for proper performance. Contributing tributary area greater than 5 acres may be allowed at the discretion of the City Engineer if the following conditions are met: 1) incorporate design features (e.g. flow spreaders) to minimizing short circuiting of flows in the BMP and 2) incorporate additional design features requested by the City Engineer for proper performance of the regional BMP.
☐	Finish grade of the facility is ≤ 2%.	Flatter surfaces reduce erosion and channelization within the facility.

Example Schematic Design – Plan and Section View



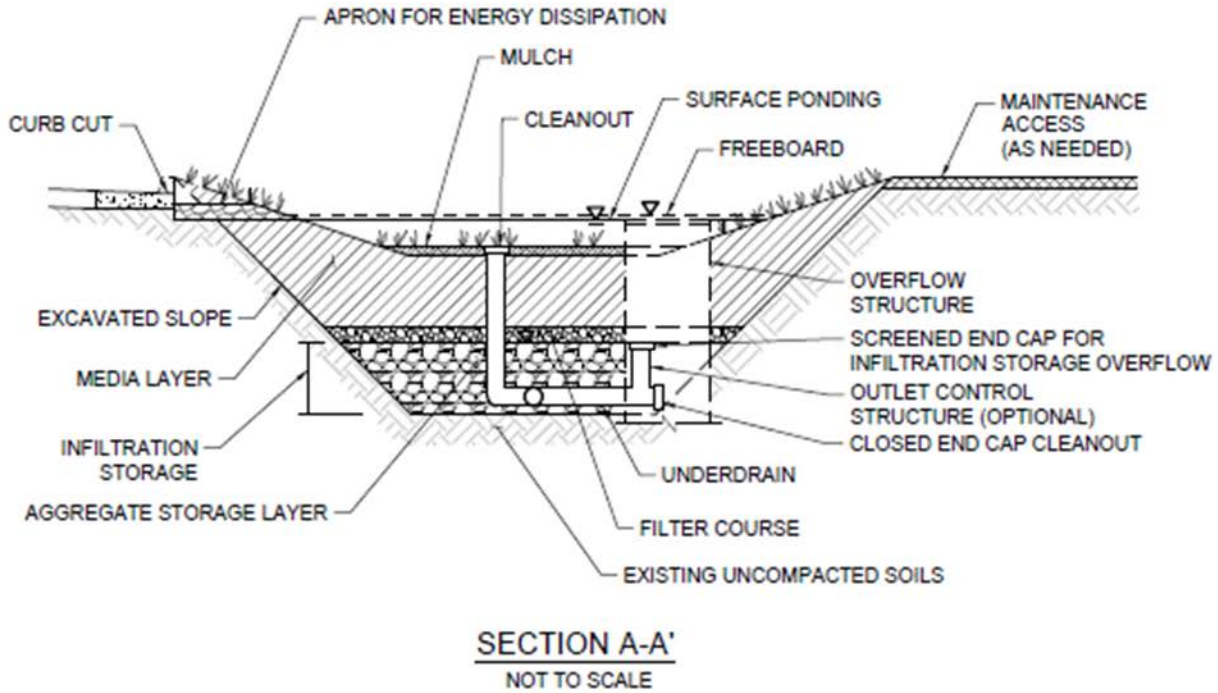


Figure E.17-1 : Typical Plan and Section View of a Biofiltration with Partial Retention BMP

Recommended BMP Component Dimensions

BMP Component	Dimension	Intent/Rationale
Freeboard	≥ 2 inches	Freeboard provides room for head over overflow structures and minimizes risk of uncontrolled surface discharge.
Surface Ponding	≥ 6 and ≤ 12 inches	The minimum ponding depth is required so that the runoff is uniformly spread throughout the basin (minimizes the likelihood of short circuiting). Deep surface ponding raises safety concerns. When the BMP is adjoining walkways the minimum surface ponding depth can be reduced to 4 inches. Surface ponding depth greater than 12 inches (for additional pollutant control or surface outlet structures or flow-control orifices) may be allowed at the discretion of the City Engineer if the following conditions are met: 1) surface ponding depth drawdown time is less than 24 hours; and 2) safety issues and fencing requirements are considered (typically ponding greater than 18" will require a fence) and 3) potential for elevated clogging risk is evaluated (Worksheet B.5.4).
Ponding Area Side Slopes	3H:1V or shallower	Gentler side slopes are safer, less prone to erosion, able to establish vegetation more quickly and easier to maintain.
Mulch	≥3 inches	Mulch will suppress weeds and maintain moisture for plant growth.
Media Layer	≥ 18 inches	A deep media layer provides additional filtration and supports plants with deeper roots. Where the minimum of 18 inches is used, only shallow-rooted species shall be planted. A minimum 24-inch media layer depth is recommended to support vegetation, with a minimum 36-inch media layer depth recommended for trees.
Filter Course	6 inches	To reduce clogging potential, a two-layer filter course (aka choking stone system) is used consisting of one 3" layer of clean and washed ASTM 33 Fine Aggregate Sand overlying a 3" layer of ASTM No 8 Stone (Appendix F.4). This specification has been developed to maintain permeability while limiting the migration of media material into the stone reservoir and underdrain system.
Underdrain Diameter	≥ 8 inches	Minimum diameter required for maintenance by City crews. For privately maintained BMPs, a minimum underdrain diameter of 6 inches is allowed.
Cleanout Diameter	≥ 8 inches	Facilitates simpler cleaning, when needed. For privately maintained BMPs, cleanout diameter of 6 inches is allowed.

Deviations to the recommended BMP component dimensions may be approved at the discretion of the City Engineer if it is determined to be appropriate.

Design Criteria and Considerations

Biofiltration with partial retention must meet the following design criteria and considerations. Deviations from the below criteria may be approved at the discretion of the City Engineer if it is determined to be appropriate:

	Design Criteria	Intent/Rationale
Surface Ponding		
☐	Surface ponding is limited to a 24-hour drawdown time.	Surface ponding limited to 24 hours for plant health. Surface ponding drawdown time greater than 24-hours but less than 96 hours may be allowed at the discretion of the City Engineer if certified by a landscape architect or agronomist.
Vegetation		
☐	Plantings are suitable for the climate and expected ponding depth. A plant list to aid in selection can be found in Appendix E.26	Plants suited to the climate and ponding depth are more likely to survive.
☐	An irrigation system with a connection to water supply should be provided as needed.	Seasonal irrigation might be needed to keep plants healthy.
Mulch		
☐	A minimum of 3 inches of well-aged, shredded hardwood mulch that has been stockpiled or stored for at least 12 months is provided. Mulch must be non-floating to avoid clogging of overflow structure.	Mulch will suppress weeds and maintain moisture for plant growth. Aging mulch kills pathogens and weed seeds and allows the beneficial microbes to multiply.
Media Layer		
☐	Media maintains a minimum filtration rate of 5 in/hr over lifetime of facility. Additional Criteria for media hydraulic conductivity described in the bioretention soil media model specification (Appendix F.3)	A filtration rate of at least 5 inches per hour allows soil to drain between events, and allows flows to relatively quickly enter the aggregate storage layer, thereby minimizing bypass. The initial rate should be higher than long term target rate to account for clogging over time. However an excessively high initial rate can have a negative impact on treatment performance, therefore an upper limit is needed.

	Design Criteria	Intent/Rationale
☐	Media shall be a minimum 18 inches deep for filtration purposes, with a minimum 24-inch media layer depth recommended to support vegetation and a minimum 36-inch media layer depth recommended for trees. Media shall meet the following specifications: Model bioretention soil media specification provided in Appendix F.3 or County of San Diego Low Impact Development Handbook: Appendix G - Bioretention Soil Specification (June 2014, unless superseded by more recent edition). Alternatively, for proprietary designs and custom media mixes not meeting the media specifications, the media meets the pollutant treatment performance criteria in Section F.1.	A deep media layer provides additional filtration and supports plants with deeper roots. Standard specifications shall be followed. For non-standard or proprietary designs, compliance with Appendix F.1 ensures that adequate treatment performance will be provided.
☐	Media surface area is 3% of contributing area times adjusted runoff factor or greater. Unless demonstrated that the BMP surface area can be smaller than 3%.	Greater surface area to tributary area ratios: a) maximizes volume retention as required by the MS4 Permit and b) decrease loading rates per square foot and therefore increase longevity. Adjusted runoff factor is to account for site design BMPs implemented upstream of the BMP (such as rain barrels, impervious area dispersion, etc.). Refer to Appendix B.2 guidance. Refer to Appendix B.5 for guidance to support use of smaller than 3% footprint.
☐	Where receiving waters are impaired or have a TMDL for nutrients, the system is designed with nutrient sensitive media design (see fact sheet BF-2).	Potential for pollutant export is partly a function of media composition; media design must minimize potential for export of nutrients, particularly where receiving waters are impaired for nutrients.
Filter Course Layer		
☐	A filter course is used to prevent migration of fines through layers of the facility. Filter fabric is not used.	Migration of media can cause clogging of the aggregate storage layer void spaces or subgrade and can result in poor water quality performance for turbidity and suspended solids. Filter fabric is more likely to clog.
☐	Filter course is washed and free of fines.	Washing aggregate will help eliminate fines that could clog the facility
☐	To reduce clogging potential, a two-layer filter course (aka choking stone system) is used consisting of one 3" layer of clean and washed ASTM 33 Fine Aggregate Sand overlying a 3" layer of ASTM No 8 Stone (Appendix F.4)	This specification has been developed to maintain permeability while limiting the migration of media material into the stone reservoir and underdrain system.

	Design Criteria	Intent/Rationale
Aggregate Storage Layer		
☐	ASTM #57 open graded stone is used for the storage layer and a two layer filter course (detailed above) is used above this layer	This layer provides additional storage capacity. ASTM #8 stone provides an acceptable choking/bridging interface with the particles in ASTM #57 stone.
Inflow, Underdrain, and Outflow Structures		
☐	Inflow, underdrains and outflow structures are accessible for inspection and maintenance.	Maintenance will prevent clogging and ensure proper operation of the flow control structures.
☐	Inflow velocities are limited to 3 ft/s or less or use energy dissipation methods. (e.g., riprap, level spreader) for concentrated inflows.	High inflow velocities can cause erosion, scour and/or channeling.
☐	Curb cut inlets are at least 18 inches wide, have a 4-6 inch reveal (drop) and an apron and energy dissipation as needed.	Inlets must not restrict flow and apron prevents blockage from vegetation as it grows in. Energy dissipation prevents erosion.
☐	Underdrain outlet elevation should be a minimum of 3 inches above the bottom elevation of the aggregate storage layer.	A minimal separation from subgrade or the liner lessens the risk of fines entering the underdrain and can improve hydraulic performance by allowing perforations to remain unblocked.
☐	Minimum underdrain diameter is 8 inches.	Minimum diameter required for maintenance by City crews. For privately maintained BMPs, a minimum underdrain diameter of 6 inches is allowed.
☐	Underdrains are made of slotted, PVC pipe conforming to ASTM D 3034 or equivalent or corrugated, HDPE pipe conforming to AASHTO 252M or equivalent.	Slotted underdrains provide greater intake capacity, clog resistant drainage, and reduced entrance velocity into the pipe, thereby reducing the chances of solids migration.
☐	An underdrain cleanout with a minimum 8-inch diameter and lockable cap is placed every 50 feet as required based on underdrain length.	Properly spaced cleanouts will facilitate underdrain maintenance. For privately maintained BMPs, cleanout diameter of 6 inches is allowed.
☐	Overflow is safely conveyed to a downstream storm drain system or discharge point. Size overflow structure to pass 100-year peak flow for on-line infiltration basins and water quality peak flow for off-line basins.	Planning for overflow lessens the risk of property damage due to flooding.

Conceptual Design and Sizing Approach for Storm Water Pollutant Control Only

To design biofiltration with partial retention and an underdrain for storm water pollutant control only (no flow control required), the following steps should be taken:

1. Verify that siting and design criteria have been met, including placement requirements, contributing tributary area, maximum side and finish grade slopes, and the recommended media surface area tributary ratio.
2. Calculate the DCV per **Appendix B** based on expected site design runoff for tributary areas.
3. Generalized sizing procedure is presented in **Appendix B.5**. The surface ponding should be verified to have a maximum 24-hour drawdown time. Surface ponding drawdown time greater than 24-hours but less than 96 hours may be allowed at the discretion of the City Engineer if certified by a landscape architect or agronomist.

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

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

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

PR-1

Biofiltration with Partial Retention

BMP MAINTENANCE FACT SHEET
FOR
STRUCTURAL BMP PR-1 BIOFILTRATION WITH PARTIAL RETENTION

Biofiltration with partial retention facilities are vegetated surface water systems that filter water through vegetation and soil or engineered media prior to infiltrating into native soils, discharge via underdrain, or overflow to the downstream conveyance system. These BMPs have an elevated underdrain discharge point that creates storage capacity in the aggregate storage layer. Typical biofiltration with partial retention components include:

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

Normal Expected Maintenance

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

Non-Standard Maintenance or BMP Failure

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

- The BMP is not drained between storm events. Surface ponding longer than approximately 24 hours following a storm event may be detrimental to vegetation health, and surface ponding longer than approximately 96 hours following a storm event poses a risk of vector (mosquito) breeding. Poor drainage can result from clogging of the media layer, filter course, aggregate storage layer, underdrain, or outlet structure. The specific cause of the drainage issue must be determined and corrected.
- Sediment, trash, or debris accumulation greater than 25% of the surface ponding volume within one month. This means the load from the tributary drainage area is too high, reducing BMP function or clogging the BMP. This would require pretreatment measures within the tributary area draining to the BMP to intercept the materials. Pretreatment components, especially for sediment, will extend the life of components that are more expensive to replace such as media, filter course, and aggregate layers.

- Erosion due to concentrated storm water runoff flow that is not readily corrected by adding erosion control blankets, adding stone at flow entry points, or minor re-grading to restore proper drainage according to the original plan. If the issue is not corrected by restoring the BMP to the original plan and grade, the [City Engineer] shall be contacted prior to any additional repairs or reconstruction.

Other Special Considerations

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

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

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

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

References

American Mosquito Control Association.
http://www.mosquito.org/
California Storm Water Quality Association (CASQA). 2003. Municipal BMP Handbook.
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County of San Diego. 2014. Low Impact Development Handbook.
http://www.sandiegocounty.gov/content/sdc/dpw/watersheds/susmp/lid.html
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PR-1

Biofiltration with Partial Retention

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

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

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

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

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

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

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

PR-1

Biofiltration with Partial Retention

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

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

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

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

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

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

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ATTACHMENT B

SOURCE CONTROL BMP FACT SHEETS: (OBTAINED FROM THE CALIFORNIA STORMWATER BMP HANDBOOK)

3. NON-STORMWATER DISCHARGES SC-10
4. SPILL PREVENTION, CONTROL & CLEANUP SC-11
5. OUTDOOR LOADING/UNLOADING SC-30
6. BUILDING AND GROUNDS MAINTENANCE SC-41
7. DRAINAGE SYSTEM MAINTENANCE SC-44
8. HOUSEKEEPING PRACTICES SC-60
9. PLAZA AND SIDEWALK CLEANING SC-71
10. FOUNTAIN AND POOL MAINTENANCE SC-72
11. LANDSCAPE MAINTENANCE SC-73

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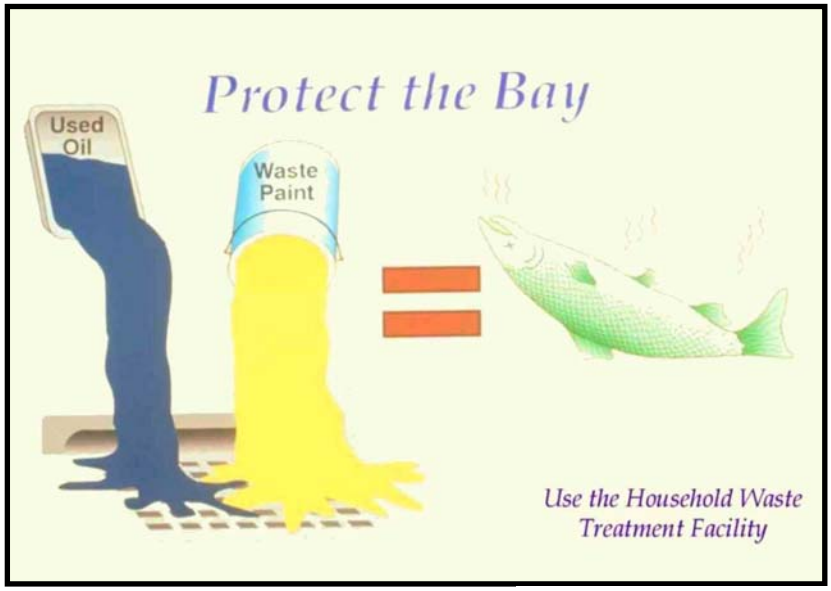
Non-Stormwater Discharges SC-10



Graphic by: Margie Winter

Objectives

- Contain
- Educate
- Reduce/Minimize

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	☑
Oil and Grease	☑
Organics	☑
Oxygen Demanding	☑

Description

Non-stormwater discharges are those flows that do not consist entirely of stormwater. For municipalities non-stormwater discharges present themselves in two situations. One is from fixed facilities owned and/or operated by the municipality. The other situation is non-stormwater discharges that are discovered during the normal operation of a field program. Some non-stormwater discharges do not include pollutants and may be discharged to the storm drain. These include uncontaminated groundwater and natural springs. There are also some non-stormwater discharges that typically do not contain pollutants and may be discharged to the storm drain with conditions. These include car washing, and surface cleaning. However, there are certain non-stormwater discharges that pose environmental concern. These discharges may originate from illegal dumping or from internal floor drains, appliances, industrial processes, sinks, and toilets that are connected to the nearby storm drainage system. These discharges (which may include: process waste waters, cooling waters, wash waters, and sanitary wastewater) can carry substances (such as paint, oil, fuel and other automotive fluids, chemicals and other pollutants) into storm drains. The ultimate goal is to effectively eliminate non-stormwater discharges to the stormwater drainage system through implementation of measures to detect, correct, and enforce against illicit connections and illegal discharges.

Approach

The municipality must address non-stormwater discharges from its fixed facilities by assessing the types of non-stormwater discharges and implementing BMPs for the discharges determined to pose environmental concern. For field programs

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

the field staff must be trained to now what to look for regarding non-stormwater discharges and the procedures to follow in investigating the detected discharges.

Suggested Protocols

Fixed Facility

General

- Post "No Dumping" signs with a phone number for reporting dumping and disposal. Signs should also indicate fines and penalties for illegal dumping.
- Stencil storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as "Dump No Waste Drains to Stream" stenciled next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.
- Landscaping and beautification efforts of hot spots might also discourage future dumping, as well as provide open space and increase property values.
- Lighting or barriers may also be needed to discourage future dumping.

Illicit Connections

- Locate discharges from the fixed facility drainage system to the municipal storm drain system through review of "as-built" piping schematics.
- Use techniques such as smoke testing, dye testing and television camera inspection (as noted below) to verify physical connections.
- Isolate problem areas and plug illicit discharge points.

Visual Inspection and Inventory

- Inventory and inspect each discharge point during dry weather.
- Keep in mind that drainage from a storm event can continue for several days following the end of a storm and groundwater may infiltrate the underground stormwater collection system. Also, non-stormwater discharges are often intermittent and may require periodic inspections.

Review Infield Piping

- Review the "as-built" piping schematic as a way to determine if there are any connections to the stormwater collection system.
- Inspect the path of floor drains in older buildings.

Smoke Testing

- Smoke testing of wastewater and stormwater collection systems is used to detect connections between the two systems.

- During dry weather the stormwater collection system is filled with smoke and then traced to sources. The appearance of smoke at the base of a toilet indicates that there may be a connection between the sanitary and the stormwater system.

Dye Testing

- A dye test can be performed by simply releasing a dye into either your sanitary or process wastewater system and examining the discharge points from the stormwater collection system for discoloration.

TV Inspection of Storm Sewer

- TV Cameras can be employed to visually identify illicit connections to the fixed facility storm drain system.

Illegal Dumping

- Regularly inspect and clean up hot spots and other storm drainage areas where illegal dumping and disposal occurs.
- Clean up spills on paved surfaces with as little water as possible. Use a rag for small spills, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to a certified laundry (rags) or disposed of as hazardous waste.
- Never hose down or bury dry material spills. Sweep up the material and dispose of properly.
- Use adsorbent materials on small spills rather than hosing down the spill. Remove the adsorbent materials promptly and dispose of properly.
- For larger spills, a private spill cleanup company or Hazmat team may be necessary.
- See fact sheet SC-11 Spill Prevention, Control, and Clean Up.

Field Program

General

- Develop clear protocols and lines of communication for effectively prohibiting non-stormwater discharges, especially ones that involve more than one jurisdiction and those that are not classified as hazardous, which are often not responded to as effectively as they need to be.
- Stencil storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as “Dump No Waste Drains to Stream” stenciled next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.
- See SC-74 Stormwater Drainage System Maintenance for additional information.

Field Inspection

- Regularly inspect and clean up hot spots and other storm drainage areas where illegal dumping and disposal occurs.
- During routine field program maintenance field staff should look for evidence of illegal discharges or illicit connection:
  - Is there evidence of spills such as paints, discoloring, etc.
  - Are there any odors associated with the drainage system
  - Record locations of apparent illegal discharges/illicit connections and notify appropriate investigating agency.
- If trained, conduct field investigation of non-stormwater discharges to determine whether they pose a threat to water quality.

Recommended Complaint Investigation Equipment

- Field Screening Analysis
  - pH paper or meter
  - Commercial stormwater pollutant screening kit that can detect for reactive phosphorus, nitrate nitrogen, ammonium nitrogen, specific conductance, and turbidity
  - Sample jars
  - Sample collection pole
  - A tool to remove access hole covers
- Laboratory Analysis
  - Sample cooler
  - Ice
  - Sample jars and labels
  - Chain of custody forms.
- Documentation
  - Camera
  - Notebook
  - Pens
  - Notice of Violation forms

- Educational materials

Reporting

- A database is useful for defining and tracking the magnitude and location of the problem.
- Report prohibited non-stormwater discharges observed during the course of normal daily activities so they can be investigated, contained and cleaned up or eliminated.
- Document that non-stormwater discharges have been eliminated by recording tests performed, methods used, dates of testing, and any onsite drainage points observed.
- Maintain documentation of illicit connection and illegal dumping incidents, including significant conditionally exempt discharges that are not properly managed.

Enforcement

- Educate the responsible party if identified on the impacts of their actions, explain the stormwater requirements, and provide information regarding Best Management Practices (BMP), as appropriate. Initiate follow-up and/or enforcement procedures.
- If an illegal discharge is traced to a commercial, residential or industrial source, conduct the following activities or coordinate the following activities with the appropriate agency:
  - Contact the responsible party to discuss methods of eliminating the non-stormwater discharge, including disposal options, recycling, and possible discharge to the sanitary sewer (if within POTW limits).
  - Provide information regarding BMPs to the responsible party, where appropriate.
  - Begin enforcement procedures, if appropriate.
  - Continue inspection and follow-up activities until the illicit discharge activity has ceased.
- If an illegal discharge is traced to a commercial or industrial activity, coordinate information on the discharge with the jurisdiction's commercial and industrial facility inspection program.

Training

- Train technical staff to identify and document illegal dumping incidents.
- Well-trained employees can reduce human errors that lead to accidental releases or spills. The employee should have the tools and knowledge to immediately begin cleaning up a spill if one should occur. Employees should be familiar with the Spill Prevention Control and Countermeasure Plan.
- Train employees to identify non-stormwater discharges and report them to the appropriate departments.
- Train staff who have the authority to conduct surveillance and inspections, and write citations for those caught illegally dumping.

- Train municipal staff responsible for surveillance and inspection in the following:
  - OSHA-required Health and Safety Training (29 CFR 1910.120) plus annual refresher training (as needed).
  - OSHA Confined Space Entry training (Cal-OSHA Confined Space, Title 8 and federal OSHA 29 CFR 1910.146).
  - Procedural training (field screening, sampling, smoke/dye testing, TV inspection).
- Educate the identified responsible party on the impacts of his or her actions.

Spill Response and Prevention

- See SC-11 Spill Prevention Control and Clean Up

Other Considerations

- The elimination of illegal dumping is dependent on the availability, convenience, and cost of alternative means of disposal. The cost of fees for dumping at a proper waste disposal facility are often more than the fine for an illegal dumping offense, thereby discouraging people from complying with the law. The absence of routine or affordable pickup service for trash and recyclables in some communities also encourages illegal dumping. A lack of understanding regarding applicable laws or the inadequacy of existing laws may also contribute to the problem.
- Municipal codes should include sections prohibiting the discharge of soil, debris, refuse, hazardous wastes, and other pollutants into the storm drain system.
- Many facilities do not have accurate, up-to-date schematic drawings.
- Can be difficult to locate illicit connections especially if there is groundwater infiltration.

Requirements

Costs

- Eliminating illicit connections can be expensive especially if structural modifications are required such re-plumbing cross connections under an existing slab.
- Minor cost to train field crews regarding the identification of non-stormwater discharges. The primary cost is for a fully integrated program to identify and eliminate illicit connections and illegal dumping. However, by combining with other municipal programs (i.e. pretreatment program) cost may be lowered.
- Municipal cost for containment and disposal may be borne by the discharger.

Maintenance

Not applicable

Supplemental Information

Further Detail of the BMP

What constitutes a "non-stormwater" discharge?

- Non-stormwater discharges are discharges not made up entirely of stormwater and include water used directly in the manufacturing process (process wastewater), air conditioning condensate and coolant, non-contact cooling water, cooling equipment condensate, outdoor secondary containment water, vehicle and equipment wash water, landscape irrigation, sink and drinking fountain wastewater, sanitary wastes, or other wastewaters.

Permit Requirements

- Current municipal NPDES permits require municipalities to effectively prohibit non-stormwater discharges unless authorized by a separate NPDES permit or allowed in accordance with the current NPDES permit conditions. Typically the current permits allow certain non-stormwater discharges in the storm drain system as long as the discharges are not significant sources of pollutants. In this context the following non-stormwater discharges are typically allowed:
  - Diverted stream flows;
  - Rising found waters;
  - Uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20));
  - Uncontaminated pumped ground water;
  - Foundation drains;
  - Springs;
  - Water from crawl space pumps;
  - Footing drains;
  - Air conditioning condensation;
  - Flows from riparian habitats and wetlands;
  - Water line and hydrant flushing ;
  - Landscape irrigation;
  - Planned and unplanned discharges from potable water sources;
  - Irrigation water;
  - Individual residential car washing; and
  - Lawn watering.

Municipal facilities subject to industrial general permit requirements must include a certification that the stormwater collection system has been tested or evaluated for the presence of non-stormwater discharges. The state's General Industrial Stormwater Permit requires that non-stormwater discharges be eliminated prior to implementation of the facility's SWPPP.

Illegal Dumping

- Establish a system for tracking incidents. The system should be designed to identify the following:
  - Illegal dumping hot spots
  - Types and quantities (in some cases) of wastes
  - Patterns in time of occurrence (time of day/night, month, or year)
  - Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills)
  - Responsible parties

Outreach

One of the keys to success of reducing or eliminating illegal dumping is increasing the number of people on the street who are aware of the problem and who have the tools to at least identify the incident, if not correct it. There we a number of ways of accomplishing this:

- Train municipal staff from all departments (public works, utilities, street cleaning, parks and recreation, industrial waste inspection, hazardous waste inspection, sewer maintenance) to recognize and report the incidents.
- Deputize municipal staff who may come into contact with illegal dumping with the authority to write illegal dumping tickets for offenders caught in the act (see below).
- Educate the public. As many as 3 out of 4 people do not understand that in most communities the storm drain does not go to the wastewater treatment plant. Unfortunately, with the heavy emphasis in recent years on public education about solid waste management, including recycling and household hazardous waste, the sewer system (both storm and sanitary) has been the likely recipient of cross-media transfers of waste.
- Provide the public with a mechanism for reporting incidents such as a hot line and/or door hanger (see below).
- Help areas where incidents occur more frequently set up environmental watch programs (like crime watch programs).
- Train volunteers to notice and report the presence and suspected source of an observed pollutant to the appropriate public agency.

What constitutes a "non-stormwater" discharge?

- Non-stormwater discharges are discharges not made up entirely of stormwater and include water used directly in the manufacturing process (process wastewater), air conditioning condensate and coolant, non-contact cooling water, cooling equipment condensate, outdoor secondary containment water, vehicle and equipment wash water, landscape irrigation, sink and drinking fountain wastewater, sanitary wastes, or other wastewaters.

Permit Requirements

- Current municipal NPDES permits require municipalities to effectively prohibit non-stormwater discharges unless authorized by a separate NPDES permit or allowed in accordance with the current NPDES permit conditions. Typically the current permits allow certain non-stormwater discharges in the storm drain system as long as the discharges are not significant sources of pollutants. In this context the following non-stormwater discharges are typically allowed:

  - Diverted stream flows;
  - Rising found waters;
  - Uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20));
  - Uncontaminated pumped ground water;
  - Foundation drains;
  - Springs;
  - Water from crawl space pumps;
  - Footing drains;
  - Air conditioning condensation;
  - Flows from riparian habitats and wetlands;
  - Water line and hydrant flushing ;
  - Landscape irrigation;
  - Planned and unplanned discharges from potable water sources;
  - Irrigation water;
  - Individual residential car washing; and
  - Lawn watering.

Municipal facilities subject to industrial general permit requirements must include a certification that the stormwater collection system has been tested or evaluated for the presence

of non-stormwater discharges. The state's General Industrial Stormwater Permit requires that non-stormwater discharges be eliminated prior to implementation of the facility's SWPPP.

Storm Drain Stenciling

- Stencil storm drain inlets with a message to prohibit illegal dumpings, especially in areas with waste handling facilities.
- Encourage public reporting of improper waste disposal by a HOTLINE number stenciled onto the storm drain inlet.
- See Supplemental Information section of this fact sheet for further detail on stenciling program approach.

Oil Recycling

- Contract collection and hauling of used oil to a private licensed used oil hauler/recycler.
- Comply with all applicable state and federal regulations regarding storage, handling, and transport of petroleum products.
- Create procedures for collection such as; collection locations and schedule, acceptable containers, and maximum amounts accepted.
- The California Integrated Waste Management Board has a Recycling Hotline, (800) 553-2962, that provides information and recycling locations for used oil.

Household Hazardous Waste

- Provide household hazardous waste (HHW) collection facilities. Several types of collection approaches are available including permanent, periodic, or mobile centers, curbside collection, or a combination of these systems.

Training

- Train municipal employees and contractors in proper and consistent methods for waste disposal.
- Train municipal employees to recognize and report illegal dumping.
- Train employees and subcontractors in proper hazardous waste management.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- Federal Regulations (RCRA, SARA, CERCLA) and state regulations exist regarding the disposal of hazardous waste.
- Municipalities are required to have a used oil recycling element and a HHW element within their integrated waste management plan.
- Significant liability issues are involved with the collection, handling, and disposal of HHW.

Examples

The City of Palo Alto has developed a public participation program for reporting dumping violations. When a concerned citizen or public employee encounters evidence of illegal dumping, a door hanger (similar in format to hotel "Do Not Disturb" signs) is placed on the front doors in the neighborhood. The door hanger notes that a violation has occurred in the neighborhood, informs the reader why illegal dumping is a problem, and notes that illegal dumping carries a significant financial penalty. Information is also provided on what citizens can do as well as contact numbers for more information or to report a violation.

The Port of Long Beach has a state of the art database incorporating storm drain infrastructure, potential pollutant sources, facility management practices, and a pollutant tracking system.

The State Department of Fish and Game has a hotline for reporting violations called CalTIP (1-800-952-5400). The phone number may be used to report any violation of a Fish and Game code (illegal dumping, poaching, etc.).

The California Department of Toxic Substances Control's Waste Alert Hotline, 1-800-69TOXIC, can be used to report hazardous waste violations.

References and Resources

http://www.stormwatercenter.net/

California's Nonpoint Source Program Plan http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Stormwater Pollution Control Manual - http://dnr.metrokc.gov/wlr/dss/spcm.htm

Orange County Stormwater Program,
http://www.ocwatersheds.com/stormwater/swp_introduction.asp

San Diego Stormwater Co-permittees Jurisdictional Urban Runoff Management Program
(http://www.projectcleanwater.org)

Santa Clara Valley Urban Runoff Pollution Prevention Program
http://www.scvurppp-w2k.com/pdf%20documents/PS_ICID.PDF

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Spill Prevention, Control & Cleanup SC-11

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Description

Spills and leaks, if not properly controlled, can adversely impact the storm drain system and receiving waters. Due to the type of work or the materials involved, many activities that occur either at a municipal facility or as a part of municipal field programs have the potential for accidental spills and leaks. Proper spill response planning and preparation can enable municipal employees to effectively respond to problems when they occur and minimize the discharge of pollutants to the environment.

Targeted Constituents

Sediment	
Nutrients	☑
Trash	
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑
Oxygen Demanding	☑

Approach

- An effective spill response and control plan should include:
  - Spill/leak prevention measures;
  - Spill response procedures;
  - Spill cleanup procedures;
  - Reporting; and
  - Training
- A well thought out and implemented plan can prevent pollutants from entering the storm drainage system and can be used as a tool for training personnel to prevent and control future spills as well.

Pollution Prevention

- Develop and implement a Spill Prevention Control and Response Plan. The plan should include:

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- A description of the facility, the address, activities and materials involved
- Identification of key spill response personnel
- Identification of the potential spill areas or operations prone to spills/leaks
- Identification of which areas should be or are bermed to contain spills/leaks
- Facility map identifying the key locations of areas, activities, materials, structural BMPs, etc.
- Material handling procedures
- Spill response procedures including:
    - Assessment of the site and potential impacts
    - Containment of the material
    - Notification of the proper personnel and evacuation procedures
    - Clean up of the site
    - Disposal of the waste material and
    - Proper record keeping

- Product substitution – use less toxic materials (i.e. use water based paints instead of oil based paints)
- Recycle, reclaim, or reuse materials whenever possible. This will reduce the amount of materials that are brought into the facility or into the field.

Suggested Protocols

Spill/Leak Prevention Measures

- If possible, move material handling indoors, under cover, or away from storm drains or sensitive water bodies.
- Properly label all containers so that the contents are easily identifiable.
- Berm storage areas so that if a spill or leak occurs, the material is contained.
- Cover outside storage areas either with a permanent structure or with a seasonal one such as a tarp so that rain can not come into contact with the materials.
- Check containers (and any containment sumps) often for leaks and spills. Replace containers that are leaking, corroded, or otherwise deteriorating with containers in good condition. Collect all spilled liquids and properly dispose of them.

- Store, contain and transfer liquid materials in such a manner that if the container is ruptured or the contents spilled, they will not discharge, flow or be washed into the storm drainage system, surface waters, or groundwater.
- Place drip pans or absorbent materials beneath all mounted taps and at all potential drip and spill locations during the filling and unloading of containers. Any collected liquids or soiled absorbent materials should be reused/recycled or properly disposed of.
- For field programs, only transport the minimum amount of material needed for the daily activities and transfer materials between containers at a municipal yard where leaks and spill are easier to control.
- If paved, sweep and clean storage areas monthly, do not use water to hose down the area unless all of the water will be collected and disposed of properly.
- Install a spill control device (such as a tee section) in any catch basins that collect runoff from any storage areas if the materials stored are oil, gas, or other materials that separate from and float on water. This will allow for easier cleanup if a spill occurs.
- If necessary, protect catch basins while conducting field activities so that if a spill occurs, the material will be contained.

Training

- Educate employees about spill prevention, spill response and cleanup on a routine basis.
- Well-trained employees can reduce human errors that lead to accidental releases or spills:
  - The employees should have the tools and knowledge to immediately begin cleaning up a spill if one should occur.
  - Employees should be familiar with the Spill Prevention Control and Countermeasure Plan if one is available.
- Training of staff from all municipal departments should focus on recognizing and reporting potential or current spills/leaks and who they should contact.
- Employees responsible for aboveground storage tanks and liquid transfers for large bulk containers should be thoroughly familiar with the Spill Prevention Control and Countermeasure Plan and the plan should be readily available.

Spill Response and Prevention

- Identify key spill response personnel and train employees on who they are.
- Store and maintain appropriate spill cleanup materials in a clearly marked location near storage areas; and train employees to ensure familiarity with the site's spill control plan and/or proper spill cleanup procedures.
- Locate spill cleanup materials, such as absorbents, where they will be readily accessible (e.g. near storage and maintenance areas, on field trucks).

SC-11 Spill Prevention, Control & Cleanup

- Follow the Spill Prevention Control and Countermeasure Plan if one is available.
- If a spill occurs, notify the key spill response personnel immediately. If the material is unknown or hazardous, the local fire department may also need to be contacted.
- If safe to do so, attempt to contain the material and block the nearby storm drains so that the area impacted is minimized. If the material is unknown or hazardous wait for properly trained personnel to contain the materials.
- Perform an assessment of the area where the spill occurred and the downstream area that it could impact. Relay this information to the key spill response and clean up personnel.

Spill Cleanup Procedures

- Small non-hazardous spills
  - Use a rag, damp cloth or absorbent materials for general clean up of liquids
  - Use brooms or shovels for the general clean up of dry materials
  - If water is used, it must be collected and properly disposed of. The wash water can not be allowed to enter the storm drain.
  - Dispose of any waste materials properly
  - Clean or dispose of any equipment used to clean up the spill properly
- Large non-hazardous spills
  - Use absorbent materials for general clean up of liquids
  - Use brooms, shovels or street sweepers for the general clean up of dry materials
  - If water is used, it must be collected and properly disposed of. The wash water can not be allowed to enter the storm drain.
  - Dispose of any waste materials properly
  - Clean or dispose of any equipment used to clean up the spill properly
- For hazardous or very large spills, a private cleanup company or Hazmat team may need to be contacted to assess the situation and conduct the cleanup and disposal of the materials.
- Chemical cleanups of material can be achieved with the use of absorbents, gels, and foams. Remove the adsorbent materials promptly and dispose of according to regulations.
- If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to a certified laundry (rags) or disposed of as hazardous waste.

Reporting

- Report any spills immediately to the identified key municipal spill response personnel.

- Report spills in accordance with applicable reporting laws. Spills that pose an immediate threat to human health or the environment must be reported immediately to the Office of Emergency Service (OES)
- Spills that pose an immediate threat to human health or the environment may also need to be reported within 24 hours to the Regional Water Quality Control Board.
- Federal regulations require that any oil spill into a water body or onto an adjoining shoreline be reported to the National Response Center (NRC) at 800-424-8802 (24 hour)
- After the spill has been contained and cleaned up, a detailed report about the incident should be generated and kept on file (see the section on Reporting below). The incident may also be used in briefing staff about proper procedures

Other Considerations

- A Spill Prevention Control and Countermeasure Plan (SPCC) is required for facilities that are subject to the oil pollution regulations specified in Part 112 of Title 40 of the Code of Federal Regulations or if they have a storage capacity of 10,000 gallons or more of petroleum. (Health and Safety Code 6.67)
- State regulations also exist for storage of hazardous materials (Health & Safety Code Chapter 6.95), including the preparation of area and business plans for emergency response to the releases or threatened releases.
- Consider requiring smaller secondary containment areas (less than 200 sq. ft.) to be connected to the sanitary sewer, if permitted to do so, prohibiting any hard connections to the storm drain.

Requirements

Costs

- Will vary depending on the size of the facility and the necessary controls.
- Prevention of leaks and spills is inexpensive. Treatment and/or disposal of wastes, contaminated soil and water is very expensive

Maintenance

- This BMP has no major administrative or staffing requirements. However, extra time is needed to properly handle and dispose of spills, which results in increased labor costs

Supplemental Information

Further Detail of the BMP

Reporting

Record keeping and internal reporting represent good operating practices because they can increase the efficiency of the response and containment of a spill. A good record keeping system helps the municipality minimize incident recurrence, correctly respond with appropriate containment and cleanup activities, and comply with legal requirements.

SC-11 Spill Prevention, Control & Cleanup

A record keeping and reporting system should be set up for documenting spills, leaks, and other discharges, including discharges of hazardous substances in reportable quantities. Incident records describe the quality and quantity of non-stormwater discharges to the storm drain.

These records should contain the following information:

- Date and time of the incident
- Weather conditions
- Duration of the spill/leak/discharge
- Cause of the spill/leak/discharge
- Response procedures implemented
- Persons notified
- Environmental problems associated with the spill/leak/discharge

Separate record keeping systems should be established to document housekeeping and preventive maintenance inspections, and training activities. All housekeeping and preventive maintenance inspections should be documented. Inspection documentation should contain the following information:

- The date and time the inspection was performed
- Name of the inspector
- Items inspected
- Problems noted
- Corrective action required
- Date corrective action was taken

Other means to document and record inspection results are field notes, timed and dated photographs, videotapes, and drawings and maps.

Examples

The City of Palo Alto includes spill prevention and control as a major element of its highly effective program for municipal vehicle maintenance shops.

References and Resources

King County Stormwater Pollution Control Manual - http://dnr.metrokc.gov/wlr/dss/spcm.htm

Orange County Stormwater Program
http://www.ocwatersheds.com/stormwater/swp_introduction.asp

San Diego Stormwater Co-permittees Jurisdictional Urban Runoff Management Program (URMP)
http://www.projectcleanwater.org/pdf/Model%20Program%20Municipal%20Facilities.pdf

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Outdoor Loading/Unloading SC-30

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Description

The loading/unloading of materials usually takes place outside on docks or terminals; therefore, materials spilled, leaked, or lost during loading/unloading may collect in the soil or on other surfaces and have the potential to be carried away by stormwater runoff or when the area is cleaned. Additionally, rainfall may wash pollutants from machinery used to unload or move materials. Loading and unloading of material may include package products, barrels, and bulk products. Implementation of the following protocols will prevent or reduce the discharge of pollutants to stormwater from outdoor loading/unloading of materials.

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑
Oxygen Demanding	☑

Approach

Pollution Prevention

- Keep accurate maintenance logs to evaluate materials removed and improvements made.
- Park tank trucks or delivery vehicles in designated areas so that spills or leaks can be contained.
- Limit exposure of materials with the potential to contaminate stormwater.
- Prevent stormwater runon.
- Regularly check equipment for leaks.

Suggested Protocols

Loading and Unloading – General Guidelines

- Develop an operations plan that describes procedures for loading and/or unloading.
- Do not conduct loading and unloading during wet weather, whenever possible.
- Cover designated loading/unloading areas to reduce exposure of materials to rain.
- A seal or door skirt between delivery vehicles and building can reduce or prevent exposure to rain.
- Design loading/unloading area to prevent stormwater runon which would include grading or berming the area, and positioning roof downspouts so they direct stormwater away from the loading/unloading areas.
- If feasible, load and unload all materials and equipment in covered areas such as building overhangs at loading docks.
- Load/unload only at designated loading areas.
- Use drip pans underneath hose and pipe connections and other leak-prone spots during liquid transfer operations, and when making and breaking connections. Several drip pans should be stored in a covered location near the liquid transfer area so that they are always available, yet protected from precipitation when not in use. Drip pans can be made specifically for railroad tracks. Drip pans must be cleaned periodically, and drip collected materials must be disposed of properly.
- Pave loading areas with concrete instead of asphalt.
- Avoid placing storm drains in the area.
- Grade and/or berm he loading/ unloading area to a drain that is connected to a dead-end sump.

Inspection

- Check loading and unloading equipment regularly for leaks, including valves, pumps, flanges and connections.
- Look for dust or fumes during loading or unloading operations.

Training

- Train employees (e.g. fork lift operators) and contractors on proper spill containment and cleanup.
- Employees trained in spill containment and cleanup should be present during the loading/unloading.
- Train employees in proper handling techniques during liquid transfers to avoid spills.

- Make sure forklift operators are properly trained on loading and unloading procedures.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup
- Keep your spill prevention Control and countermeasure (SPCC) Plan up-to-date, and implement accordingly.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- Space, material characteristics and/or time limitations may preclude all transfers from being performed indoors or under cover.

Requirements

Costs

- Should be low except when covering a large loading/unloading area.

Maintenance

- Conduct regular inspections and make repairs as necessary. The frequency of repairs will depend on the age of the facility.
- Check loading and unloading equipment regularly for leaks.
- Regular broom dry-sweeping of area.
- Conduct major clean-out of loading and unloading area and sump prior to October 1 of each year.

Supplemental Information

Further Detail of the BMP

Special Circumstances for Indoor Loading/Unloading of Materials

As appropriate loading or unloading of liquids should occur indoors so that any spills that are not completely retained can be discharged to the sanitary sewer, treatment plant, or treated in a manner consistent with local sewer authorities and permit requirements.

- For loading and unloading tank trucks to above and below ground storage tanks, the following procedures should be used:
    - The area where the transfer takes place should be paved. If the liquid is reactive with the asphalt, Portland cement should be used to pave the area.
    - Transfer area should be designed to prevent runon of stormwater from adjacent areas. Sloping the pad and using a curb, like a speed bump, around the uphill side of the transfer area should reduce run-on.

- Transfer area should be designed to prevent runoff of spilled liquids from the area. Sloping the area to a drain should prevent runoff. The drain should be connected to a dead-end sump or to the sanitary sewer (if allowed). A positive control valve should be installed on the drain.

- For transfer from rail cars to storage tanks that must occur outside, use the following procedures:

  - Drip pans should be placed at locations where spillage may occur, such as hose connections, hose reels, and filler nozzles, Use drip pans when making and breaking connections.

  - Drip pan systems should be installed between the rails to collect spillage from tank cars.

References and Resources

http://www.stormwatercenter.net/

King County - ftp://dnr.metrokc.gov/wlr/dss/spcm/Chapter%203.PDF

Orange County Stormwater Program
http://www.ocwatersheds.com/StormWater/swp_introduction.asp

San Diego Stormwater Co-permittees Jurisdictional Urban Runoff Management Program (URMP) -
http://www.projectcleanwater.org/pdf/Model%20Program%20Municipal%20Facilities.pdf

Building & Grounds Maintenance SC-41

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	☑
Oil and Grease	☑
Organics	☑
Oxygen Demanding	☑

Description

Stormwater runoff from building and grounds maintenance activities can be contaminated with toxic hydrocarbons in solvents, fertilizers and pesticides, suspended solids, heavy metals, and abnormal pH. Utilizing the following protocols will prevent or reduce the discharge of pollutants to stormwater from building and grounds maintenance activities by washing and cleaning up with as little water as possible, following good landscape management practices, preventing and cleaning up spills immediately, keeping debris from entering the storm drains, and maintaining the stormwater collection system.

Approach

Pollution Prevention

- Switch to non-toxic chemicals for maintenance when possible.
- Choose cleaning agents that can be recycled.
- Encourage proper lawn management and landscaping, including use of native vegetation.
- Encourage use of Integrated Pest Management techniques for pest control.
- Encourage proper onsite recycling of yard trimmings.
- Recycle residual paints, solvents, lumber, and other material as much as possible.

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Suggested Protocols

Pressure Washing of Buildings, Rooftops, and Other Large Objects

- In situations where soaps or detergents are used and the surrounding area is paved, pressure washers must use a waste water collection device that enables collection of wash water and associated solids. A sump pump, wet vacuum or similarly effective device must be used to collect the runoff and loose materials. The collected runoff and solids must be disposed of properly.
- If soaps or detergents are not used, and the surrounding area is paved, wash water runoff does not have to be collected but must be screened. Pressure washers must use filter fabric or some other type of screen on the ground and/or in he catch basin to trap the particles in wash water runoff.
- If you are pressure washing on a grassed area (with or without soap), runoff must be dispersed as sheet flow as much as possible, rather than as a concentrated stream. The wash runoff must remain on the grass and not drain to pavement. Ensure that this practice does not kill grass.

Landscaping Activities

- Do not apply any chemicals (insecticide, herbicide, or fertilizer) directly to surface waters, unless the application is approved and permitted by the state.
- Dispose of grass clippings, leaves, sticks, or other collected vegetation as garbage, or by composting. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Use mulch or other erosion control measures on exposed soils.
- Check irrigation schedules so pesticides will not be washed away and to minimize non-stormwater discharge.

Building Repair, Remodeling, and Construction

- Do not dump any toxic substance or liquid waste on the pavement, the ground, or toward a storm drain.
- Use ground or drop cloths underneath outdoor painting, scraping, and sandblasting work, and properly dispose of collected material daily.
- Use a ground cloth or oversized tub for activities such as paint mixing and tool cleaning.
- Clean paint brushes and tools covered with water-based paints in sinks connected to sanitary sewers or in portable containers that can be dumped into a sanitary sewer drain. Brushes and tools covered with non-water-based paints, finishes, or other materials must be cleaned in a manner that enables collection of used solvents (e.g., paint thinner, turpentine, etc.) for recycling or proper disposal.

- Use a storm drain cover, filter fabric, or similarly effective runoff control mechanism if dust, grit, wash water, or other pollutants may escape the work area and enter a catch basin. The containment device(s) must be in place at the beginning of the work day, and accumulated dirty runoff and solids must be collected and disposed of before removing the containment device(s) at the end of the work day.
- If you need to de-water an excavation site, you may need to filter the water before discharging to a catch basin or off-site. In which case you should direct the water through hay bales and filter fabric or use other sediment filters or traps.
- Store toxic material under cover with secondary containment during precipitation events and when not in use. A cover would include tarps or other temporary cover material.

Mowing, Trimming, and Planting

- Dispose of leaves, sticks, or other collected vegetation as garbage, by composting or at a permitted landfill. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Use mulch or other erosion control measures when soils are exposed.
- Place temporarily stockpiled material away from watercourses and drain inlets, and berm or cover stockpiles to prevent material releases to the storm drain system.
- Consider an alternative approach when bailing out muddy water; do not put it in the storm drain, pour over landscaped areas.
- Use hand or mechanical weeding where practical.

Fertilizer and Pesticide Management

- Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of fertilizers and pesticides and training of applicators and pest control advisors.
- Follow manufacturers' recommendations and label directions. Pesticides must never be applied if precipitation is occuring or predicted. Do not apply insecticides within 100 feet of surface waters such as lakes, ponds, wetlands, and streams.
- Use less toxic pesticides that will do the job, whenever possible. Avoid use of copper-based pesticides if possible.
- Do not use pesticides if rain is expected.
- Do not mix or prepare pesticides for application near storm drains.
- Use the minimum amount needed for the job.
- Calibrate fertilizer distributors to avoid excessive application.
- Employ techniques to minimize off-target application (e.g. spray drift) of pesticides, including consideration of alternative application techniques.

- Apply pesticides only when wind speeds are low.
- Work fertilizers into the soil rather than dumping or broadcasting them onto the surface.
- Irrigate slowly to prevent runoff and then only as much as is needed.
- Clean pavement and sidewalk if fertilizer is spilled on these surfaces before applying irrigation water.
- Dispose of empty pesticide containers according to the instructions on the container label.
- Use up the pesticides. Rinse containers, and use rinse water as product. Dispose of unused pesticide as hazardous waste.
- Implement storage requirements for pesticide products with guidance from the local fire department and County Agricultural Commissioner. Provide secondary containment for pesticides.

Inspection

- Inspect irrigation system periodically to ensure that the right amount of water is being applied and that excessive runoff is not occurring. Minimize excess watering, and repair leaks in the irrigation system as soon as they are observed.

Training

- Educate and train employees on use of pesticides and in pesticide application techniques to prevent pollution.
- Train employees and contractors in proper techniques for spill containment and cleanup.
- Be sure the frequency of training takes into account the complexity of the operations and the nature of the staff.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup
- Keep your Spill Prevention Control and countermeasure (SPCC) plan up-to-date, and implement accordingly.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- Alternative pest/weed controls may not be available, suitable, or effective in many cases.

Requirements

Costs

- Overall costs should be low in comparison to other BMPs.

Maintenance

- Sweep paved areas regularly to collect loose particles, and wipe up spills with rags and other absorbent material immediately, do not hose down the area to a storm drain.

Supplemental Information

Further Detail of the BMP

Fire Sprinkler Line Flushing

Building fire sprinkler line flushing may be a source of non-stormwater runoff pollution. The water entering the system is usually potable water though in some areas it may be non-potable reclaimed wastewater. There are subsequent factors that may drastically reduce the quality of the water in such systems. Black iron pipe is usually used since it is cheaper than potable piping but it is subject to rusting and results in lower quality water. Initially the black iron pipe has an oil coating to protect it from rusting between manufacture and installation; this will contaminate the water from the first flush but not from subsequent flushes. Nitrates, poly-phosphates and other corrosion inhibitors, as well as fire suppressants and antifreeze may be added to the sprinkler water system. Water generally remains in the sprinkler system a long time, typically a year, between flushes and may accumulate iron, manganese, lead, copper, nickel and zinc. The water generally becomes anoxic and contains living and dead bacteria and breakdown products from chlorination. This may result in a significant BOD problem and the water often smells. Consequently dispose fire sprinkler line flush water into the sanitary sewer. Do not allow discharge to storm drain or infiltration due to potential high levels of pollutants in fire sprinkler line water.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

King County - ftp://dnr.metrokc.gov/wlr/dss/spcm/Chapter%203.PDF

Orange County Stormwater Program
http://www.ocwatersheds.com/StormWater/swp_introduction.asp

Mobile Cleaners Pilot Program: Final Report. 1997. Bay Area Stormwater Management Agencies Association (BASSMA) http://www.basmaa.org/

Pollution from Surface Cleaning Folder. 1996. Bay Area Stormwater Management Agencies Association (BASMAA) http://www.basmaa.org/

San Diego Stormwater Co-permittees Jurisdictional Urban Runoff Management Program (URMP) -
http://www.projectcleanwater.org/pdf/Model%20Program%20Municipal%20Facilities.pdf

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Drainage System Maintenance SC-44

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize

Description

As a consequence of its function, the stormwater conveyance system collects and transports urban runoff and stormwater that may contain certain pollutants. The protocols in this fact sheet are intended to reduce pollutants reaching receiving waters through proper conveyance system operation and maintenance.

Targeted Constituents

Sediment	✓
Nutrients	
Trash	✓
Metals	
Bacteria	✓
Oil and Grease	
Organics	

Approach

Pollution Prevention

Maintain catch basins, stormwater inlets, and other stormwater conveyance structures on a regular basis to remove pollutants, reduce high pollutant concentrations during the first flush of storms, prevent clogging of the downstream conveyance system, restore catch basins' sediment trapping capacity, and ensure the system functions properly hydraulically to avoid flooding.

Suggested Protocols

Catch Basins/Inlet Structures

- Staff should regularly inspect facilities to ensure compliance with the following:
  - Immediate repair of any deterioration threatening structural integrity.
  - Cleaning before the sump is 40% full. Catch basins should be cleaned as frequently as needed to meet this standard.
  - Stenciling of catch basins and inlets (see SC34 Waste Handling and Disposal).

- Clean catch basins, storm drain inlets, and other conveyance structures before the wet season to remove sediments and debris accumulated during the summer.
- Conduct inspections more frequently during the wet season for problem areas where sediment or trash accumulates more often. Clean and repair as needed.
- Keep accurate logs of the number of catch basins cleaned.
- Store wastes collected from cleaning activities of the drainage system in appropriate containers or temporary storage sites in a manner that prevents discharge to the storm drain.
- Dewater the wastes if necessary with outflow into the sanitary sewer if permitted. Water should be treated with an appropriate filtering device prior to discharge to the sanitary sewer. If discharge to the sanitary sewer is not allowed, water should be pumped or vacuumed to a tank and properly disposed. Do not dewater near a storm drain or stream.

Storm Drain Conveyance System

- Locate reaches of storm drain with deposit problems and develop a flushing schedule that keeps the pipe clear of excessive buildup.
- Collect and pump flushed effluent to the sanitary sewer for treatment whenever possible.

Pump Stations

- Clean all storm drain pump stations prior to the wet season to remove silt and trash.
- Do not allow discharge to reach the storm drain system when cleaning a storm drain pump station or other facility.
- Conduct routine maintenance at each pump station.
- Inspect, clean, and repair as necessary all outlet structures prior to the wet season.

Open Channel

- Modify storm channel characteristics to improve channel hydraulics, increase pollutant removals, and enhance channel/creek aesthetic and habitat value.
- Conduct channel modification/improvement in accordance with existing laws. Any person, government agency, or public utility proposing an activity that will change the natural (emphasis added) state of any river, stream, or lake in California, must enter into a Steam or Lake Alteration Agreement with the Department of Fish and Game. The developer-applicant should also contact local governments (city, county, special districts), other state agencies (SWRCB, RWQCB, Department of Forestry, Department of Water Resources), and Federal Corps of Engineers and USFWS.

Illicit Connections and Discharges

- Look for evidence of illegal discharges or illicit connections during routine maintenance of conveyance system and drainage structures:
  - Is there evidence of spills such as paints, discoloring, etc?

- Are there any odors associated with the drainage system?
- Record locations of apparent illegal discharges/illicit connections?
- Track flows back to potential dischargers and conduct aboveground inspections. This can be done through visual inspection of upgradient manholes or alternate techniques including zinc chloride smoke testing, fluorometric dye testing, physical inspection testing, or television camera inspection.
- Eliminate the discharge once the origin of flow is established.

- Stencil or demarcate storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as "Dump No Waste Drains to Stream" stenciled next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.
- Refer to fact sheet SC-10 Non-Stormwater Discharges.

Illegal Dumping

- Inspect and clean up hot spots and other storm drainage areas regularly where illegal dumping and disposal occurs.
- Establish a system for tracking incidents. The system should be designed to identify the following:
  - Illegal dumping hot spots
  - Types and quantities (in some cases) of wastes
  - Patterns in time of occurrence (time of day/night, month, or year)
  - Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills)
  - Responsible parties
- Post "No Dumping" signs in problem areas with a phone number for reporting dumping and disposal. Signs should also indicate fines and penalties for illegal dumping.
- Refer to fact sheet SC-10 Non-Stormwater Discharges.

Training

- Train crews in proper maintenance activities, including record keeping and disposal.
- Allow only properly trained individuals to handle hazardous materials/wastes.
- Have staff involved in detection and removal of illicit connections trained in the following:
  - OSHA-required Health and Safety Training (29 CFR 1910.120) plus annual refresher training (as needed).

- OSHA Confined Space Entry training (Cal-OSHA Confined Space, Title 8 and Federal OSHA 29 CFR 1910.146).
- Procedural training (field screening, sampling, smoke/dye testing, TV inspection).

Spill Response and Prevention

- Investigate all reports of spills, leaks, and/or illegal dumping promptly.
- Clean up all spills and leaks using "dry" methods (with absorbent materials and/or rags) or dig up, remove, and properly dispose of contaminated soil.
- Refer to fact sheet SC-11 Spill Prevention, Control, and Cleanup.

Other Considerations (Limitations and Regulations)

- Clean-up activities may create a slight disturbance for local aquatic species. Access to items and material on private property may be limited. Trade-offs may exist between channel hydraulics and water quality/riparian habitat. If storm channels or basins are recognized as wetlands, many activities, including maintenance, may be subject to regulation and permitting.
- Storm drain flushing is most effective in small diameter pipes (36-inch diameter pipe or less, depending on water supply and sediment collection capacity). Other considerations associated with storm drain flushing may include the availability of a water source, finding a downstream area to collect sediments, liquid/sediment disposal, and prohibition against disposal of flushed effluent to sanitary sewer in some areas.
- Regulations may include adoption of substantial penalties for illegal dumping and disposal.
- Local municipal codes may include sections prohibiting discharge of soil, debris, refuse, hazardous wastes, and other pollutants into the storm drain system.

Requirements

Costs

- An aggressive catch basin cleaning program could require a significant capital and O&M budget.
- The elimination of illegal dumping is dependent on the availability, convenience, and cost of alternative means of disposal. The primary cost is for staff time. Cost depends on how aggressively a program is implemented. Other cost considerations for an illegal dumping program include:
  - Purchase and installation of signs.
  - Rental of vehicle(s) to haul illegally-disposed items and material to landfills.
  - Rental of heavy equipment to remove larger items (e.g., car bodies) from channels.
  - Purchase of landfill space to dispose of illegally-dumped items and material.

- Methods used for illicit connection detection (smoke testing, dye testing, visual inspection, and flow monitoring) can be costly and time-consuming. Site-specific factors, such as the level of impervious area, the density and ages of buildings, and type of land use will determine the level of investigation necessary.

Maintenance

- Two-person teams may be required to clean catch basins with vactor trucks.
- Teams of at least two people plus administrative personnel are required to identify illicit discharges, depending on the complexity of the storm sewer system.
- Arrangements must be made for proper disposal of collected wastes.
- Technical staff are required to detect and investigate illegal dumping violations.

Supplemental Information

Further Detail of the BMP

Storm Drain Flushing

Flushing is a common maintenance activity used to improve pipe hydraulics and to remove pollutants in storm drainage systems. Flushing may be designed to hydraulically convey accumulated material to strategic locations, such as an open channel, another point where flushing will be initiated, or the sanitary sewer and the treatment facilities, thus preventing resuspension and overflow of a portion of the solids during storm events. Flushing prevents "plug flow" discharges of concentrated pollutant loadings and sediments. Deposits can hinder the designed conveyance capacity of the storm drain system and potentially cause backwater conditions in severe cases of clogging.

Storm drain flushing usually takes place along segments of pipe with grades that are too flat to maintain adequate velocity to keep particles in suspension. An upstream manhole is selected to place an inflatable device that temporarily plugs the pipe. Further upstream, water is pumped into the line to create a flushing wave. When the upstream reach of pipe is sufficiently full to cause a flushing wave, the inflated device is rapidly deflated with the assistance of a vacuum pump, thereby releasing the backed up water and resulting in the cleaning of the storm drain segment.

To further reduce impacts of stormwater pollution, a second inflatable device placed well downstream may be used to recollect the water after the force of the flushing wave has dissipated. A pump may then be used to transfer the water and accumulated material to the sanitary sewer for treatment. In some cases, an interceptor structure may be more practical or required to recollect the flushed waters.

It has been found that cleansing efficiency of periodic flush waves is dependent upon flush volume, flush discharge rate, sewer slope, sewer length, sewer flow rate, sewer diameter, and population density. As a rule of thumb, the length of line to be flushed should not exceed 700 feet. At this maximum recommended length, the percent removal efficiency ranges between 65-75% for organics and 55-65% for dry weather grit/inorganic material. The percent removal efficiency drops rapidly beyond that. Water is commonly supplied by a water truck, but fire hydrants can also supply water. To make the best use of water, it is recommended that reclaimed water be used or that fire hydrant line flushing coincide with storm sewer flushing.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

Ferguson, B.K. 1991. Urban Stream Reclamation, p. 324-322, Journal of Soil and Water Conservation.

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Oregon Association of Clean Water Agencies. Oregon Municipal Stormwater Toolbox for Maintenance Practices. June 1998.

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net

United States Environmental Protection Agency (USEPA). 2002. Pollution Prevention/Good Housekeeping for Municipal Operations Storm Drain System Cleaning. On line:
http://www.epa.gov/npdes/menuofbmps/poll_16.htm

Housekeeping Practices SC-60

Description

Promote efficient and safe housekeeping practices (storage, use, and cleanup) when handling potentially harmful materials such as fertilizers, pesticides, cleaning solutions, paint products, automotive products, and swimming pool chemicals. Related information is provided in BMP fact sheets SC-11 Spill Prevention, Control & Cleanup and SC-34 Waste Handling & Disposal.

Approach

Pollution Prevention

- Purchase only the amount of material that will be needed for foreseeable use. In most cases this will result in cost savings in both purchasing and disposal. See SC-61 Safer Alternative Products for additional information.

- Be aware of new products that may do the same job with less environmental risk and for less or the equivalent cost. Total cost must be used here; this includes purchase price, transportation costs, storage costs, use related costs, clean up costs and disposal costs.

Suggested Protocols

General

- Keep work sites clean and orderly. Remove debris in a timely fashion. Sweep the area.

- Dispose of wash water, sweepings, and sediments, properly.

- Recycle or dispose of fluids properly.

- Establish a daily checklist of office, yard and plant areas to confirm cleanliness and adherence to proper storage and security. Specific employees should be assigned specific inspection responsibilities and given the authority to remedy any problems found.

- Post waste disposal charts in appropriate locations detailing for each waste its hazardous nature (poison, corrosive, flammable), prohibitions on its disposal (dumpster, drain, sewer) and the recommended disposal method (recycle, sewer, burn, storage, landfill).

- Summarize the chosen BMPs applicable to your operation and post them in appropriate conspicuous places.

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	☑
Oil and Grease	☑
Organics	☑
Oxygen Demanding	☑

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- Require a signed checklist from every user of any hazardous material detailing amount taken, amount used, amount returned and disposal of spent material.
- Do a before audit of your site to establish baseline conditions and regular subsequent audits to note any changes and whether conditions are improving or deteriorating.
- Keep records of water, air and solid waste quantities and quality tests and their disposition.
- Maintain a mass balance of incoming, outgoing and on hand materials so you know when there are unknown losses that need to be tracked down and accounted for.
- Use and reward employee suggestions related to BMPs, hazards, pollution reduction, work place safety, cost reduction, alternative materials and procedures, recycling and disposal.
- Have, and review regularly, a contingency plan for spills, leaks, weather extremes etc. Make sure all employees know about it and what their role is so that it comes into force automatically.

Training

- Train all employees, management, office, yard, manufacturing, field and clerical in BMPs and pollution prevention and make them accountable.
- Train municipal employees who handle potentially harmful materials in good housekeeping practices.
- Train personnel who use pesticides in the proper use of the pesticides. The California Department of Pesticide Regulation license pesticide dealers, certify pesticide applicators and conduct onsite inspections.
- Train employees and contractors in proper techniques for spill containment and cleanup. The employee should have the tools and knowledge to immediately begin cleaning up a spill if one should occur.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup.
- Keep your Spill Prevention Control and Countermeasure (SPCC) plant up-to-date, and implement accordingly.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- There are no major limitations to this best management practice.
- There are no regulatory requirements to this BMP. Existing regulations already require municipalities to properly store, use, and dispose of hazardous materials

Requirements

Costs

- Minimal cost associated with this BMP. Implementation of good housekeeping practices may result in cost savings as these procedures may reduce the need for more costly BMPs.

Maintenance

- Ongoing maintenance required to keep a clean site. Level of effort is a function of site size and type of activities.

Supplemental Information

Further Detail of the BMP

- The California Integrated Waste Management Board's Recycling Hotline, 1-800-553-2962, provides information on household hazardous waste collection programs and facilities.

Examples

There are a number of communities with effective programs. The most pro-active include Santa Clara County and the City of Palo Alto, the City and County of San Francisco, and the Municipality of Metropolitan Seattle (Metro).

References and Resources

British Columbia Lake Stewardship Society. Best Management Practices to Protect Water Quality from Non-Point Source Pollution. March 2000.
http://www.nalms.org/bclss/bmphome.html#bmp

King County Stormwater Pollution Control Manual - http://dnr.metrokc.gov/wlr/dss/spcm.htm

Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities, Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality Control Board. July, 1998, Revised by California Coastal Commission, February 2002.

Orange County Stormwater Program
http://www.ocwatersheds.com/stormwater/swp_introduction.asp

San Mateo STOPPP - (http://stoppp.tripod.com/bmp.html)

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Plaza and Sidewalk Cleaning SC-71

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	☑
Oil and Grease	☑
Organics	☑
Oxygen Demanding	☑

Description

Pollutants on sidewalks and other pedestrian traffic areas and plazas are typically due to littering and vehicle use. This fact sheet describes good housekeeping practices that can be incorporated into the municipality's existing cleaning and maintenance program.

Approach

Pollution Prevention

- Use dry cleaning methods whenever practical for surface cleaning activities.
- Use the least toxic materials available (e.g. water based paints, gels or sprays for graffiti removal).

Suggested Protocols

Surface Cleaning

- Regularly broom (dry) sweep sidewalk, plaza and parking lot areas to minimize cleaning with water.
- Dry cleanup first (sweep, collect, and dispose of debris and trash) when cleaning sidewalks or plazas, then wash with or without soap.
- Block the storm drain or contain runoff when cleaning with water. Discharge wash water to landscaping or collect water and pump to a tank or discharge to sanitary sewer if allowed. (Permission may be required from local sanitation district.)

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- Block the storm drain or contain runoff when washing parking areas, driveways or drive-throughs. Use absorbents to pick up oil; then dry sweep. Clean with or without soap. Collect water and pump to a tank or discharge to sanitary sewer if allowed. Street Repair and Maintenance.

Graffiti Removal

- Avoid graffiti abatement activities during rain events.
- Implement the procedures under Painting and Paint Removal in SC-70 Roads, Streets, and Highway Operation and Maintenance fact sheet when graffiti is removed by painting over.
- Direct runoff from sand blasting and high pressure washing (with no cleaning agents) into a dirt or landscaped area after treating with an appropriate filtering device.
- Plug nearby storm drain inlets and vacuum/pump wash water to the sanitary sewer if authorized to do so if a graffiti abatement method generates wash water containing a cleaning compound (such as high pressure washing with a cleaning compound). Ensure that a non-hazardous cleaning compound is used or dispose as hazardous waste, as appropriate.

Surface Removal and Repair

- Schedule surface removal activities for dry weather if possible.
- Avoid creating excess dust when breaking asphalt or concrete.
- Take measures to protect nearby storm drain inlets prior to breaking up asphalt or concrete (e.g. place hay bales or sand bags around inlets). Clean afterwards by sweeping up as much material as possible.
- Designate an area for clean up and proper disposal of excess materials.
- Remove and recycle as much of the broken pavement as possible to avoid contact with rainfall and stormwater runoff.
- When making saw cuts in pavement, use as little water as possible. Cover each storm drain inlet completely with filter fabric during the sawing operation and contain the slurry by placing straw bales, sandbags, or gravel dams around the inlets. After the liquid drains or evaporates, shovel or vacuum the slurry residue from the pavement or gutter and remove from site.
- Always dry sweep first to clean up tracked dirt. Use a street sweeper or vacuum truck. Do not dump vacuumed liquid in storm drains. Once dry sweeping is complete, the area may be hosed down if needed. Wash water should be directed to landscaping or collected and pumped to the sanitary sewer if allowed.

Concrete Installation and Repair

- Schedule asphalt and concrete activities for dry weather.

- Take measures to protect any nearby storm drain inlets and adjacent watercourses, prior to breaking up asphalt or concrete (e.g. place san bags around inlets or work areas).
- Limit the amount of fresh concrete or cement mortar mixed, mix only what is needed for the job.
- Store concrete materials under cover, away from drainage areas. Secure bags of cement after they are open. Be sure to keep wind-blown cement powder away from streets, gutters, storm drains, rainfall, and runoff.
- Return leftover materials to the transit mixer. Dispose of small amounts of hardened excess concrete, grout, and mortar in the trash.
- Do not wash sweepings from exposed aggregate concrete into the street or storm drain. Collect and return sweepings to aggregate base stockpile, or dispose in the trash.
- Protect applications of fresh concrete from rainfall and runoff until the material has dried.
- Do not allow excess concrete to be dumped onsite, except in designated areas.
- Wash concrete trucks off site or in designated areas on site designed to preclude discharge of wash water to drainage system.

Controlling Litter

- Post "No Littering" signs and enforce anti-litter laws.
- Provide litter receptacles in busy, high pedestrian traffic areas of the community, at recreational facilities, and at community events.
- Cover litter receptacles and clean out frequently to prevent leaking/spillage or overflow.
- Clean parking lots on a regular basis with a street sweeper.

Training

- Provide regular training to field employees and/or contractors regarding surface cleaning and proper operation of equipment.
- Train employee and contractors in proper techniques for spill containment and cleanup.
- Use a training log or similar method to document training.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- Limitations related to sweeping activities at large parking facilities may include current sweeper technology to remove oil and grease.
- Surface cleaning activities that require discharges to the local sewering agency will require coordination with the agency.
- Arrangements for disposal of the swept material collected must be made, as well as accurate tracking of the areas swept and the frequency of sweeping.

Requirements

Costs

- The largest expenditures for sweeping and cleaning of sidewalks, plazas, and parking lots are in staffing and equipment. Sweeping of these areas should be incorporated into street sweeping programs to reduce costs.

Maintenance

Not applicable

Supplemental Information

Further Detail of the BMP

Community education, such as informing residents about their options for recycling and waste disposal, as well as the consequences of littering, can instill a sense of citizen responsibility and potentially reduce the amount of maintenance required by the municipality.

Additional BMPs that should be considered for parking lot areas include:

- Allow sheet runoff to flow into biofilters (vegetated strip and swale) and infiltration devices.
- Utilize sand filters or oleophilic collectors for oily waste in low concentrations.
- Arrange rooftop drains to prevent drainage directly onto paved surfaces.
- Design lot to include semi-permeable hardscape.
- Structural BMPs such as storm drain inlet filters can be very effective in reducing the amount of pollutants discharged from parking facilities during periods of rain.

References and Resources

Bay Area Stormwater Management Agencies Association (BASMAA). 1996. Pollution From Surface Cleaning Folder http://www.basmaa.org

Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities. Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality Control Board. July. 1998.

Oregon Association of Clean Water Agencies. Oregon Municipal Stormwater Toolbox for Maintenance Practices. June 1998.

Orange County Stormwater Program
http://www.ocwatersheds.com/stormwater/swp_introduction.asp

Santa Clara Valley Urban Runoff Pollution Prevention Program. 1997 Urban Runoff Management Plan. September 1997, updated October 2000.

Santa Clara Valley Urban Runoff Pollution Prevention Program. Maintenance Best Management Practices for the Construction Industry. Brochures: Landscaping, Gardening, and Pool; Roadwork and Paving; and Fresh Concrete and Mortar Application. June 2001.

San Diego Stormwater Co-permittees Jurisdictional Urban Runoff Management Plan. 2001. Municipal Activities Model Program Guidance. November.

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Fountain & Pool Maintenance SC-72

Description

The primary pollutant of concern in municipal swimming pool water is chlorine or chloramine used as a disinfectant. This water, if discharged to the storm drain system, can be toxic to aquatic life. In lakes, lagoons, and fountains, the pollutants of concern are chemical algaecides that are added to control algae mainly for aesthetic reasons (visual and odor). Following the procedures noted in this fact sheet will reduce the pollutants in this discharge.

Approach

Pollution Prevention

- Prevent algae problems with regular cleaning, consistent adequate chlorine levels, and well-maintained water filtration and circulation systems.
- Manage pH and water hardness to minimize corrosion of copper pipes.

Suggested Protocols

Pools and Fountains

- Do not use copper-based algaecides. Control algae with chlorine or other alternatives, such as sodium bromide.
- Do not discharge water to a street or storm drain when draining pools or fountains; discharge to the sanitary sewer if permitted to do so. If water is dechlorinated with a neutralizing chemical or by allowing chlorine to dissipate for a few days (do not use the facility during this time), the water may be recycled/reused by draining it gradually onto a landscaped area. Water must be tested prior to discharge to ensure that chlorine is not present.
- Prevent backflow if draining a pool to the sanitary sewer by maintaining an "air gap" between the discharge line and the sewer line (do not seal the connection between the hose and sewer line). Be sure to call the local wastewater treatment plant for further guidance on flow rate restrictions, backflow prevention, and handling special cleaning waste (such as acid wash). Discharge flows should be kept to the low levels typically possible through a garden hose. Higher flow rates may be prohibited by local ordinance.
- Provide drip pans or buckets beneath drain pipe connections to catch leaks. This will be especially pertinent if pool or spa water that has not been dechlorinated is pumped through piping to a discharge location.

Objectives

- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	
Bacteria	☑
Oil and Grease	
Organics	☑
Oxygen Demanding	☑

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- Never clean a filter in the street or near a storm drain.
- Rinse cartridge filters onto a dirt area, and spade filter residue into soil.
- Backwash diatomaceous earth filters onto dirt. Dispose of spent diatomaceous earth in the garbage. Spent diatomaceous earth cannot be discharged to surface waters, storm drainage systems, septic systems, or on the ground.
- If there is not a suitable dirt area discharge filter backwash or rinsewater to the sanitary sewer if permitted to do so by the local sewering agency.

Lakes and Lagoons

- Reduce fertilizer use in areas around the water body. High nitrogen fertilizers can produce excess growth requiring more frequent mowing or trimming, and may contribute to excessive algae growth.
- To control bacteria, discourage the public from feeding birds and fish (i.e. place signs that prohibit feeding of waterfowl).
- Consider introducing fish species that consume algae. Contact the California Department of Fish and Game for more information on this issue.
- Mechanically remove pond scum (blue-green algae) using a 60 micron net.
- Educate the public on algae and that no controls are necessary for certain types of algae that are beneficial to the water body.
- Control erosion by doing the following:
  - Maintain vegetative cover on banks to prevent soil erosion. Apply mulch or leave clippings to serve as additional cover for soil stabilization and to reduce the velocity of stormwater runoff.
  - Areas should be designed (sloped) to prevent runoff and erosion and to promote better irrigation practices.
  - Provide energy dissipaters (e.g. riprap) along banks to minimize potential for erosion.
  - Confine excavated materials to surfaces away from lakes. Material must be covered if rain is expected.
- Conduct inspections to detect illegal dumping of clippings/cuttings in or near a lake. Materials found should be picked up and properly disposed of.
- Avoid landscape wastes in and around lakes should be avoided by either using bagging equipment or by manually picking up the material. Collect trash and debris from within water bodies where feasible
- Provide and maintain trash receptacles near recreational water bodies to hold refuse generated by the public.

- Increase trash collection during peak visitation months (generally June, July and August).

Training

- Train maintenance personnel to test chlorine levels and to apply neutralizing chemicals.
- Train personnel regarding proper maintenance of pools, ponds and lakes.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- Managers of pools located in sensitive areas or adjacent to shorelines should check with the appropriate authorities to determine if code requirements apply.
- Cleanup activities at lakes and lagoons may create a slight disturbance for local aquatic species. If the lake is recognized as a wetland, many activities, including maintenance, may be subject to regulation and permitting.

Requirements

Costs

- The maintenance of pools and lakes is already a consideration of most municipal public works departments. Therefore the cost associated with this BMP is minimal and only reflects an increase in employee training and public outreach.

Maintenance

Not applicable

Supplemental Information

Further Detail of the BMP

When dredging is conducted, adhere to the following:

- Dredge with shovels when laying/maintaining pipes.
- To determine amount to dredge, determine rate of volume loss due to sediments.
- For large lakes, dredge every 10 years.
- When dredging small lakes, drain lake.
- When dredging large lakes, use vacuum equipment.
- After dredging test sediment piles for proper disposal. Dredged sediment can be used as fill, or may have to be land filled.

References and Resources

King County Stormwater Pollution Control Manual. Best Management Practices for Businesses. 1995. King County Surface Water Management. July. On-line: http://dnr.metrokc.gov/wlr/dss/spcm.htm

Los Angeles County Stormwater Quality. Public Agency Activities Model Program. On-line: http://ladpw.org/wmd/npdes/public_TC.cfm

Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities. Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality Control Board. July. 1998.

Orange County Stormwater Program
http://www.ocwatersheds.com/StormWater/swp_introduction.asp

Santa Clara Valley Urban Runoff Pollution Prevention Program. Maintenance Best Management Practices for the Construction Industry. Brochures: Landscaping, Gardening, and Pool; Roadwork and Paving; and Fresh Concrete and Mortar Application. June 2001.

Landscape Maintenance SC-73

Objectives

- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	
Bacteria	
Oil and Grease	
Organics	
Oxygen Demanding	☑

Description

Landscape maintenance activities include vegetation removal; herbicide and insecticide application; fertilizer application; watering; and other gardening and lawn care practices. Vegetation control typically involves a combination of chemical (herbicide) application and mechanical methods. All of these maintenance practices have the potential to contribute pollutants to the storm drain system. The major objectives of this BMP are to minimize the discharge of pesticides, herbicides and fertilizers to the storm drain system and receiving waters; prevent the disposal of landscape waste into the storm drain system by collecting and properly disposing of clippings and cuttings, and educating employees and the public.

Approach

Pollution Prevention

- Implement an integrated pest management (IPM) program. IPM is a sustainable approach to managing pests by combining biological, cultural, physical, and chemical tools.
- Choose low water using flowers, trees, shrubs, and groundcover.
- Consider alternative landscaping techniques such as naturescaping and xeriscaping.
- Conduct appropriate maintenance (i.e. properly timed fertilizing, weeding, pest control, and pruning) to help preserve the landscapes water efficiency.

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- Consider grass cycling (grass cycling is the natural recycling of grass by leaving the clippings on the lawn when mowing. Grass clippings decompose quickly and release valuable nutrients back into the lawn).

Suggested Protocols

Mowing, Trimming, and Weeding

- Whenever possible use mechanical methods of vegetation removal (e.g mowing with tractor-type or push mowers, hand cutting with gas or electric powered weed trimmers) rather than applying herbicides. Use hand weeding where practical.
- Avoid loosening the soil when conducting mechanical or manual weed control, this could lead to erosion. Use mulch or other erosion control measures when soils are exposed.
- Performing mowing at optimal times. Mowing should not be performed if significant rain events are predicted.
- Mulching mowers may be recommended for certain flat areas. Other techniques may be employed to minimize mowing such as selective vegetative planting using low maintenance grasses and shrubs.
- Collect lawn and garden clippings, pruning waste, tree trimmings, and weeds. Chip if necessary, and compost or dispose of at a landfill (see waste management section of this fact sheet).
- Place temporarily stockpiled material away from watercourses, and berm or cover stockpiles to prevent material releases to storm drains.

Planting

- Determine existing native vegetation features (location, species, size, function, importance) and consider the feasibility of protecting them. Consider elements such as their effect on drainage and erosion, hardiness, maintenance requirements, and possible conflicts between preserving vegetation and the resulting maintenance needs.
- Retain and/or plant selected native vegetation whose features are determined to be beneficial, where feasible. Native vegetation usually requires less maintenance (e.g., irrigation, fertilizer) than planting new vegetation.
- Consider using low water use groundcovers when planting or replanting.

Waste Management

- Compost leaves, sticks, or other collected vegetation or dispose of at a permitted landfill. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Place temporarily stockpiled material away from watercourses and storm drain inlets, and berm or cover stockpiles to prevent material releases to the storm drain system.
- Reduce the use of high nitrogen fertilizers that produce excess growth requiring more frequent mowing or trimming.

- Avoid landscape wastes in and around storm drain inlets by either using bagging equipment or by manually picking up the material.

Irrigation

- Where practical, use automatic timers to minimize runoff.
- Use popup sprinkler heads in areas with a lot of activity or where there is a chance the pipes may be broken. Consider the use of mechanisms that reduce water flow to sprinkler heads if broken.
- Ensure that there is no runoff from the landscaped area(s) if re-claimed water is used for irrigation.
- If bailing of muddy water is required (e.g. when repairing a water line leak), do not put it in the storm drain; pour over landscaped areas.
- Irrigate slowly or pulse irrigate to prevent runoff and then only irrigate as much as is needed.
- Apply water at rates that do not exceed the infiltration rate of the soil.

Fertilizer and Pesticide Management

- Utilize a comprehensive management system that incorporates integrated pest management (IPM) techniques. There are many methods and types of IPM, including the following:
  - Mulching can be used to prevent weeds where turf is absent, fencing installed to keep rodents out, and netting used to keep birds and insects away from leaves and fruit.
  - Visible insects can be removed by hand (with gloves or tweezers) and placed in soapy water or vegetable oil. Alternatively, insects can be sprayed off the plant with water or in some cases vacuumed off of larger plants.
  - Store-bought traps, such as species-specific, pheromone-based traps or colored sticky cards, can be used.
  - Slugs can be trapped in small cups filled with beer that are set in the ground so the slugs can get in easily.
  - In cases where microscopic parasites, such as bacteria and fungi, are causing damage to plants, the affected plant material can be removed and disposed of (pruning equipment should be disinfected with bleach to prevent spreading the disease organism).
  - Small mammals and birds can be excluded using fences, netting, tree trunk guards.
  - Beneficial organisms, such as bats, birds, green lacewings, ladybugs, praying mantis, ground beetles, parasitic nematodes, trichogramma wasps, seed head weevils, and spiders that prey on detrimental pest species can be promoted.
- Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of fertilizers and pesticides and training of applicators and pest control advisors.

- Use pesticides only if there is an actual pest problem (not on a regular preventative schedule).
- Do not use pesticides if rain is expected. Apply pesticides only when wind speeds are low (less than 5 mph).
- Do not mix or prepare pesticides for application near storm drains.
- Prepare the minimum amount of pesticide needed for the job and use the lowest rate that will effectively control the pest.
- Employ techniques to minimize off-target application (e.g. spray drift) of pesticides, including consideration of alternative application techniques.
- Fertilizers should be worked into the soil rather than dumped or broadcast onto the surface.
- Calibrate fertilizer and pesticide application equipment to avoid excessive application.
- Periodically test soils for determining proper fertilizer use.
- Sweep pavement and sidewalk if fertilizer is spilled on these surfaces before applying irrigation water.
- Purchase only the amount of pesticide that you can reasonably use in a given time period (month or year depending on the product).
- Triple rinse containers, and use rinse water as product. Dispose of unused pesticide as hazardous waste.
- Dispose of empty pesticide containers according to the instructions on the container label.

Inspection

- Inspect irrigation system periodically to ensure that the right amount of water is being applied and that excessive runoff is not occurring. Minimize excess watering, and repair leaks in the irrigation system as soon as they are observed.
- Inspect pesticide/fertilizer equipment and transportation vehicles daily.

Training

- Educate and train employees on use of pesticides and in pesticide application techniques to prevent pollution. Pesticide application must be under the supervision of a California qualified pesticide applicator.
- Train/encourage municipal maintenance crews to use IPM techniques for managing public green areas.
- Annually train employees within departments responsible for pesticide application on the appropriate portions of the agency's IPM Policy, SOPs, and BMPs, and the latest IPM techniques.

- Employees who are not authorized and trained to apply pesticides should be periodically (at least annually) informed that they cannot use over-the-counter pesticides in or around the workplace.
- Use a training log or similar method to document training.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup
- Have spill cleanup materials readily available and in a know in location
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- The Federal Pesticide, Fungicide, and Rodenticide Act and California Title 3, Division 6, Pesticides and Pest Control Operations place strict controls over pesticide application and handling and specify training, annual refresher, and testing requirements. The regulations generally cover: a list of approved pesticides and selected uses, updated regularly; general application information; equipment use and maintenance procedures; and record keeping. The California Department of Pesticide Regulations and the County Agricultural Commission coordinate and maintain the licensing and certification programs. All public agency employees who apply pesticides and herbicides in "agricultural use" areas such as parks, golf courses, rights-of-way and recreation areas should be properly certified in accordance with state regulations. Contracts for landscape maintenance should include similar requirements.
- All employees who handle pesticides should be familiar with the most recent material safety data sheet (MSDS) files.
- Municipalities do not have the authority to regulate the use of pesticides by school districts, however the California Healthy Schools Act of 2000 (AB 2260) has imposed requirements on California school districts regarding pesticide use in schools. Posting of notification prior to the application of pesticides is now required, and IPM is stated as the preferred approach to pest management in schools.

Requirements

Costs

Additional training of municipal employees will be required to address IPM techniques and BMPs. IPM methods will likely increase labor cost for pest control which may be offset by lower chemical costs.

Maintenance

Not applicable

Supplemental Information

Further Detail of the BMP

Waste Management

Composting is one of the better disposal alternatives if locally available. Most municipalities either have or are planning yard waste composting facilities as a means of reducing the amount of waste going to the landfill. Lawn clippings from municipal maintenance programs as well as private sources would probably be compatible with most composting facilities

Contractors and Other Pesticide Users

Municipal agencies should develop and implement a process to ensure that any contractor employed to conduct pest control and pesticide application on municipal property engages in pest control methods consistent with the IPM Policy adopted by the agency. Specifically, municipalities should require contractors to follow the agency's IPM policy, SOPs, and BMPs; provide evidence to the agency of having received training on current IPM techniques when feasible; provide documentation of pesticide use on agency property to the agency in a timely manner.

References and Resources

King County Stormwater Pollution Control Manual. Best Management Practices for Businesses. 1995. King County Surface Water Management. July. On-line: http://dnr.metrokc.gov/wlr/dss/spcm.htm

Los Angeles County Stormwater Quality Model Programs. Public Agency Activities http://ladpw.org/wmd/npdes/model_links.cfm

Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities. Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality Control Board. July. 1998.

Orange County Stormwater Program http://www.ocwatersheds.com/StormWater/swp_introduction.asp

Santa Clara Valley Urban Runoff Pollution Prevention Program. 1997 Urban Runoff Management Plan. September 1997, updated October 2000.

United States Environmental Protection Agency (USEPA). 2002. Pollution Prevention/Good Housekeeping for Municipal Operations Landscaping and Lawn Care. Office of Water. Office of Wastewater Management. On-line: http://www.epa.gov/npdes/menuofbmps/poll_8.htm

Attachment 4
Copy of Plan Sheets Showing Permanent Storm Water BMPs

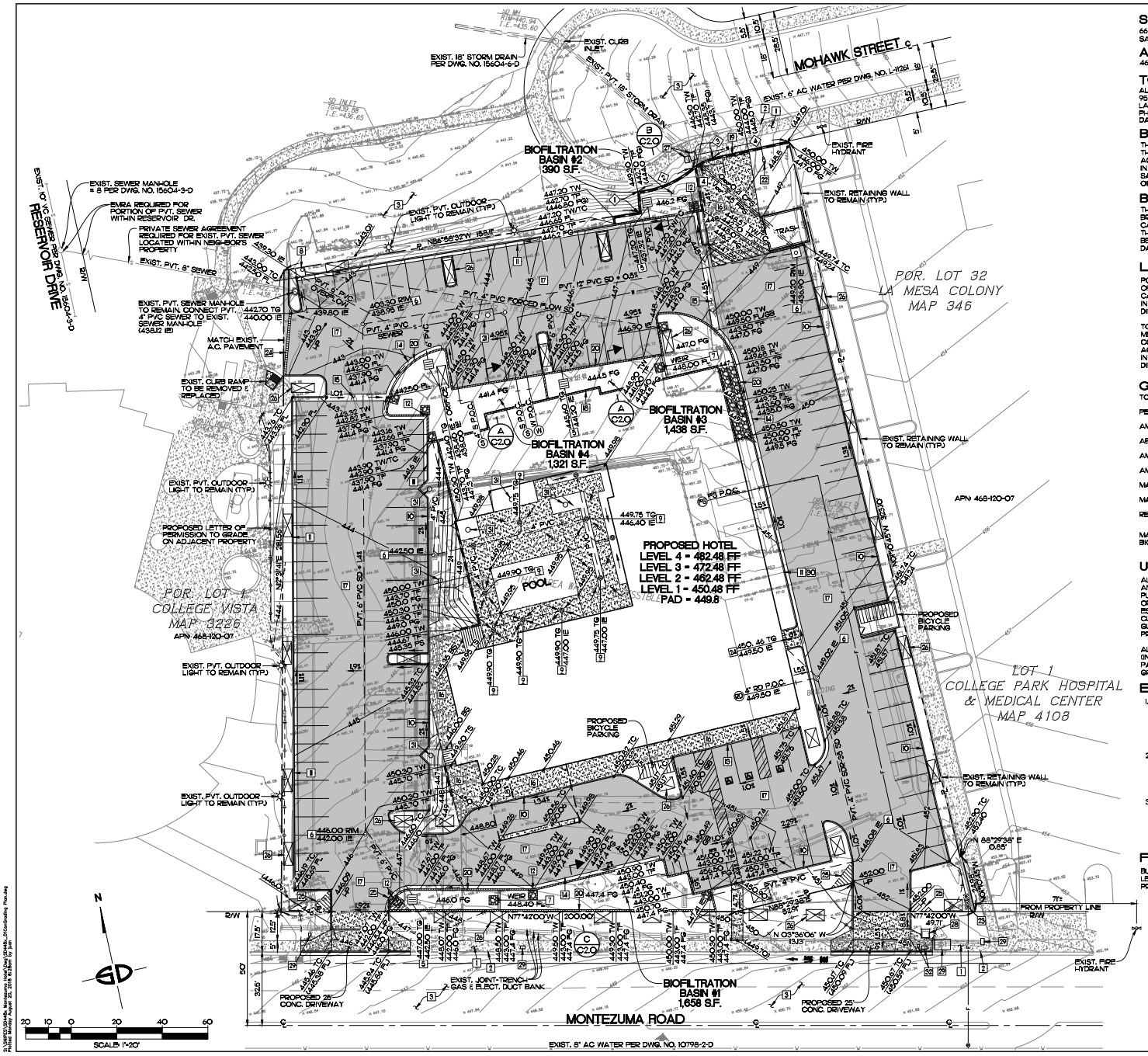
This is the cover sheet for Attachment 4.

Project Name: MONTEZUMA HOTEL

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

The plans must identify:

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



SITE ADDRESS
6650 MONTEZUMA ROAD
SAN DIEGO, CA 92115

A.P.N.
468-120-06

TOPOGRAPHIC SOURCE
ALTA LAND SURVEYING, INC.
9517 GROSSMONT SUMMIT DR.
LA MESA, CA 91941
PH (619) 713-2582
DATED JANUARY 25, 2017

BASIS OF BEARINGS
THE BASIS OF BEARINGS FOR THIS SURVEY IS THE EAST LINE OF LOT 1 OF COLLEGE VISTA ACCORDING TO MAP THEREOF NO. 3226, FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO, COUNTY ON MAY 4, 1955, I.E. NORTH 01°10'45" WEST

BENCHMARK
THE BENCHMARK USED FOR THIS SURVEY IS THE BRASS PLUG AT THE SOUTHWEST CORNER OF EL CAJON BLVD AND 67TH STREET AS PUBLISHED IN THE CITY OF SAN DIEGO VERTICAL CONTROL BENCHBOOK, OCTOBER 2011, ELEVATION 459.889, DATUM MSL.

LEGAL DESCRIPTION
PORTION OF LOT 1 OF COLLEGE VISTA, IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO MAP NO. 3226, FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY ON MAY 4, 1955.

TOGETHER WITH A PORTION OF LOT 33 OF THE LA MESA COLONY, IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO THE MAP THEREOF NO. 346, FILED IN THE OFFICE OF THE RECORDER OF SAID SAN DIEGO COUNTY, MARCH 8, 1887.

GRADING TABULATION

TOTAL SITE ARE TO BE GRADED:	1.86 AC.
PERCENT OF TOTAL SITE TO BE GRADED:	100%
AMOUNT OF CUT:	2,000 C.Y.
ABOUNT OF FILL:	1,000 C.Y.
AMOUNT OF IMPORT MATERIAL:	N/A
AMOUNT OF EXPORT MATERIAL:	1,000 C.Y.
MAXIMUM HEIGHT OF FILL SLOPES:	6 FT. (2H MAX)
MAXIMUM HEIGHT OF CUT SLOPES:	N/A
RETAINING / CRIB WALLS:	TOTAL LENGTH: 81' MAX. HEIGHT: 6'
MAXIMUM HEIGHT OF CUT FOR BIOFILTRATION BASIN:	4.6'

UTILITY NOTES
ALL PROPOSED WATER AND SEWER FACILITIES (PUBLIC AND PRIVATE) WITHIN THE PUBLIC RIGHT-OF-WAY OR PUBLIC EASEMENT MUST BE DESIGNED, CONSTRUCTED, OR ABANDONED IN ACCORDANCE WITH THE CRITERIA ESTABLISHED WITHIN THE CITY OF SAN DIEGO'S CURRENT WATER AND SEWER FACILITY DESIGN GUIDELINES, REGULATIONS, STANDARDS, AND PRACTICES PERTAINING THERETO.

ALL WATER LINES SERVING THIS DEVELOPMENT (INCLUDING DOMESTIC, IRRIGATION, AND FIRE) MUST PASS THROUGH A PERMITTED, PRIVATE ABOVE GROUND, BACKFLOW PREVENTION DEVICE (BPPD).

EASEMENTS
1. PUBLIC STREET AND INCIDENTAL PURPOSES EASEMENT GRANTED TO CITY OF SAN DIEGO, RECORDED DECEMBER 3, 1948 IN BOOK 3037, PAGE 361 , O.R. (LOCATION OF EASEMENT CANNOT BE DETERMINED FROM RECORD INFORMATION)
2. POLES, WIRES AND INCIDENTAL PURPOSES EASEMENT GRANTED TO SDG&E, RECORDED NOVEMBER 5, 1953 IN BOOK 5039, PAGE 251, O.R. (LOCATION OF EASEMENT CANNOT BE DETERMINED FROM RECORD INFORMATION)
3. PUBLIC UTILITIES, IGRESS & EGRESS AND INCIDENTAL PURPOSES EASEMENT GRANTED TO SDG&E, RECORDED SEPTEMBER 8, 1982 AS INSTRUMENT NO. 82-277806, O.R. (LOCATION OF EASEMENT CANNOT BE DETERMINED FROM RECORD INFORMATION)

FIRE NOTE
BUILDING ADDRESS NUMBERS SHALL BE VISIBLE AND LEGIBLE FROM THE STREET OR ROAD FRONTING THE PROPERTY.

AREA CALCS
1. PROJECT SITE = 81,020 S.F. (1.86 AC.)
2. DISTURBED AREA = 81,020 S.F. (1.86 AC.)
3. PRE-CONSTRUCTION = 58,043 S.F. IMPERVIOUS 22,977 S.F. PERVIOUS
4. POST-CONSTRUCTION 67,693 S.F. IMPERVIOUS 13,327 S.F. PERVIOUS

KEY NOTES
1. EXISTING CONC. SIDEWALK TO REMAIN.
2. EXISTING CONC. CURB/GUTTER TO REMAIN.
3. EXISTING A.C. PAVEMENT TO REMAIN.
4. CONNECT TO EXIST. 18" STORM DRAIN PIPE (436.35 IE±).
5. PROPOSED 48" CATCH BASIN (BMP OUTLET STRUCTURE).
6. PROPOSED PVT. SD CLEANOUT.
7. PROPOSED PVT. CHECK DAM W/ WEIR & ROCK SPLASH PAD.
8. PROPOSED PVT. CURB INLET W/ SUMP PUMP AND OVERFLOW WEIR.
9. PROPOSED PVT. AREA DRAIN.
10. PROPOSED PVT. 6" CONC. CURB.
11. PROPOSED PVT. 6" CONC. CURB/GUTTER.
12. PROPOSED PVT. DEPRESSED CURB TO DRAIN.
13. PROPOSED PVT. 0"-HEIGHT CONC. CURB.
14. PROPOSED PVT. CONC. GUTTER.
15. PROPOSED PVT. 3' CONCRETE SWALE.
16. PROPOSED PVT. CONCRETE PAVEMENT.
17. PROPOSED PVT. A.C. PAVEMENT.
18. PROPOSED BUILDING WALL.
19. PROPOSED RETAINING WALL.
20. PROPOSED CUT-OFF/RETAINING WALL.
21. PROPOSED PVT. GREASE INTERCEPTOR.
22. PROPOSED PVT. WATER BACKFLOW PREVENTER.
23. PROPOSED PVT. FIRE BACKFLOW PREVENTER.
24. PROPOSED PVT. TRENCH DRAIN.
25. NO OBSTRUCTION INCLUDING LANDSCAPING OR SOLID WALL IN THE VISIBILITY AREA SHALL EXCEED 2-FEET IN HEIGHT.
26. PROPOSED TREE W/ ROOT ZONE (5'X5' OR 4'X10').
27. EXISTING WATER METERS TO REMAIN.
28. EXISTING TRANSFORMER TO REMAIN & PROTECT IN-PLACE.
29. EXISTING UTILITY RISERS AND VAULTS TO REMAIN.
30. PROPOSED RED PAINTED FIRE LANE CURB.
31. PROPOSED TREE OR PALM TREE.
32. ADJUST EXIST. VAULTS TO FINISH SURFACE, TYPICAL.

BOUNDARY DATA

◇	DELTA/BRG	RADIUS	LENGTH
1	N 06°24'02" E	--	9.06'
2	Δ = 33°54'24'	45.16'	26.73'
3	Δ = 27°47'44'	20.00'	9.70'
4	N 89°42'15" E	--	34.23'

ABBREVIATIONS
BS - DENOTES BOTTOM OF STEP
FF - DENOTES FINISH FLOOR
FG - DENOTES FINISH GRADE
FS - DENOTES FIRE SERVICE
GB - DENOTES GRADE BREAK
HP - DENOTES HIGH POINT
IE - DENOTES INVERT ELEVATION
POC - DENOTES POINT OF CONNECTION
PVT. - DENOTES PRIVATE
RD - DENOTES ROOF DRAIN
S - DENOTES SEWER
SD - DENOTES STORM DRAIN
SF - DENOTES SQUARE FEET
TC - DENOTES TOP OF CURB
TF - DENOTES TOP OF FOOTING
TS - DENOTES TOP OF STEP
TG - DENOTES TOP OF GRATE
TW - DENOTES TOP OF WALL
W - DENOTES WATER

ENGINEER OF WORK
Snipes-Dye associates
civil engineers and land surveyors
8348 CENTER DRIVE, STE. G, LA MESA, CA 91942
TELEPHONE (619) 697-9234 FAX (619) 460-2033
SON P. NGUYEN R.C.E. 56249
EXPIRES 03-31-19
REGISTERED PROFESSIONAL ENGINEER SON P. NGUYEN C 56249 Exp. 03-31-19 CIVIL STATE OF CALIFORNIA

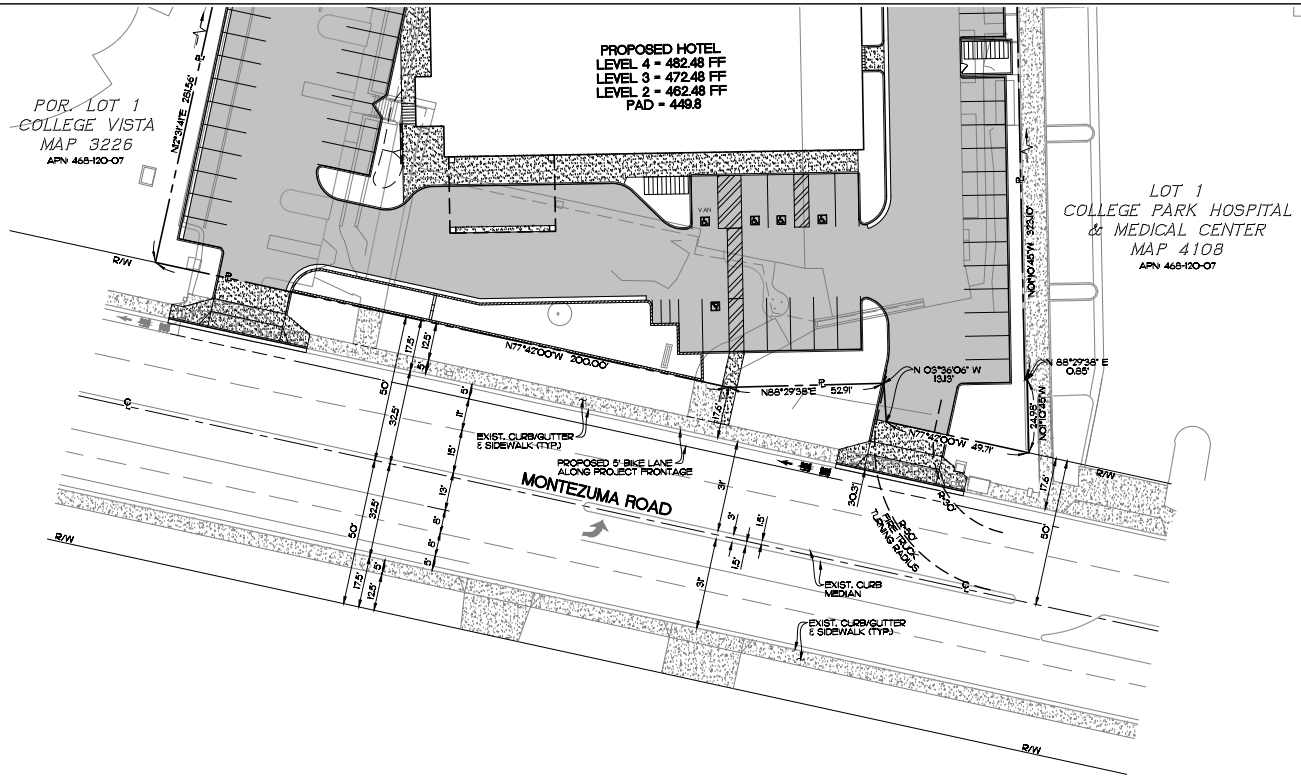
NO	DATE	REVISION DESCRIPTION	BY
1	08-27-18	REVISED PER 1ST REVIEW COMMENTS.	SDA
2	07-27-19	REVISED PER 2ND REVIEW COMMENTS.	SDA
3	08-30-19	REVISED PER 3RD REVIEW COMMENTS.	SDA

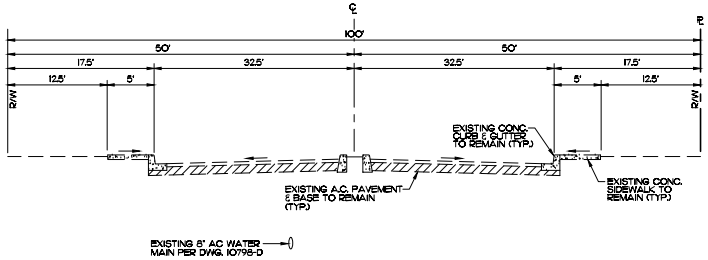
SHEET C1.0 1 OF 2 SHEETS
JOB NO. SD448X (C-B)

SNIPES-DYE ASSOCIATES 8348 CENTER DRIVE, SUITE G, LA MESA, CA 91942-2910 (619) 697-9234, FAX (619) 460-2033

SHEET TITLE	CONCEPTUAL GRADING PLAN
JOB NAME	MONTEZUMA HOTEL 6650 MONTEZUMA ROAD SAN DIEGO, CA 92115
DESIGNER	SPN
DRAWN	JGP
CHECKED	SPN
DATE	02-20-18

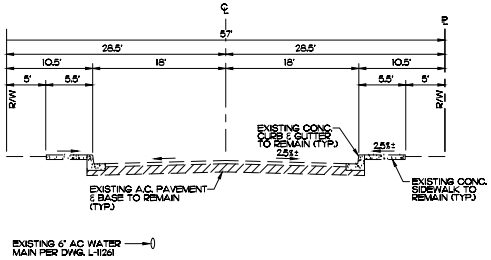
NO	DATE	REVISION DESCRIPTION	BY





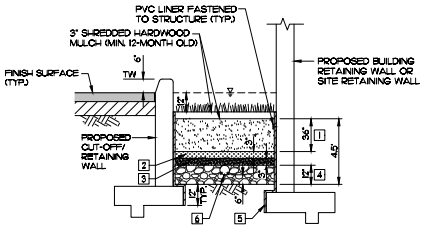
TYPICAL SECTION - MONTEZUMA ROAD

NO SCALE



TYPICAL SECTION - MOHAWK STREET

NO SCALE



KEY NOTES

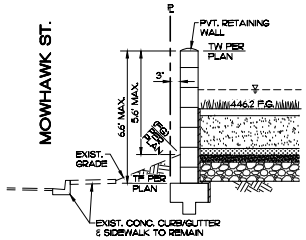
1. BIORETENTION SOIL MEDIA (BSM) (5in/hr MIN. PERCOLATION RATE) PER BSM MIXTURE RKG-1T
2. 3" CLEAN & WASHED ASTM 33 FINE AGGREGATE SAND
3. 3" LAYER OF ASTM 8 STONE
4. ASTM 57 OPEN GRADED STONE (3/4" WASHED CRUSHED ROCK)
5. IMPERMEABLE LINER (30 MIL PVC GEOMEMBRANE BY EPI OR APPROVED EQUAL) PER MANUFACTURER'S SPECIFICATIONS
6. PVT. 6" PVC PERFORATED PIPE

BSM MIXTURE		
BMP COMPOSITION	ASTM C33 SAND	COMPOST[1]
VOLUME	70% - 85%	15% - 30%

1. ORGANIC MATERIAL CONTENT SHALL BE 35% - 75% BY DRY WEIGHT.
2. FOR BSM SPECIFICATIONS, SEE APPENDIX F.3 OF THE CITY OF SAN DIEGO 2016 STORM WATER STANDARDS.

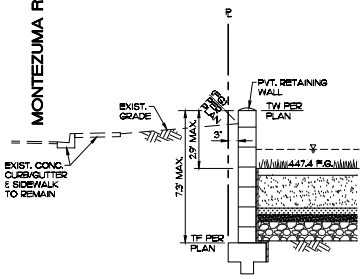
A - TYPICAL SECTION - BIOFILTRATION BASIN W/ PARTIAL RETENTION

NO SCALE



B - TYPICAL SECTION - PVT. RETAINING WALL

NO SCALE



C - TYPICAL SECTION - PVT. RETAINING WALL

NO SCALE

N

SCALE: 1"=20'

ENGINEER OF WORK

Snipes-Dye associates
civil engineers and land surveyors
8348 CENTER DRIVE, STE. G, LA MESA, CA 91942
TELEPHONE (619) 697-9234 FAX (619) 460-2033
SON P. NGUYEN R.C.E. 56249
EXPIRES 03-31-19

REGISTERED PROFESSIONAL ENGINEER — SON P. NGUYEN — C 56249 — Exp. 03-31-19 — CIVIL — STATE OF CALIFORNIA

NO.	DATE	REVISION DESCRIPTION	BY
1	08-07-18	REVISED PER 1ST REVIEW COMMENTS.	SDA
2	07-27-18	REVISED PER 2ND REVIEW COMMENTS.	SDA
3	08-30-18	REVISED PER 3RD REVIEW COMMENTS.	SDA

SHEET TITLE: SITE PLAN

JOB NAME: MONTEZUMA HOTEL
6650 MONTEZUMA ROAD
SAN DIEGO, CA 92115

DESIGNER: SPN
DRAWN: JGP
CHECKED: SPN
DATE: 02-20-18

SHEET: C2.0

2 OF 2 SHEETS

JOB NO.: SD448X (C-B)

SNIPES-DYE ASSOCIATES 8348 CENTER DRIVE, SUITE G, LA MESA, CA 91942-2910 (619) 697-9234, FAX (619) 460-2033

Attachment 5
Drainage Report

Attach project's drainage report. Refer to Drainage Design Manual to determine the reporting requirements.

REFER TO **"PRELIMINARY HYDROLOGY/DRAINAGE STUDY FOR MONTEZUMA HOTEL"**, DATED MARCH 8, 2018
REVISED JUNE 7, 2018
PREPARED BY SNIPES-DYE ASSOCIATES

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Attachment 6
Geotechnical and Groundwater Investigation Report

Attach project's geotechnical and groundwater investigation report. Refer to Appendix C.4 to determine the reporting requirements.

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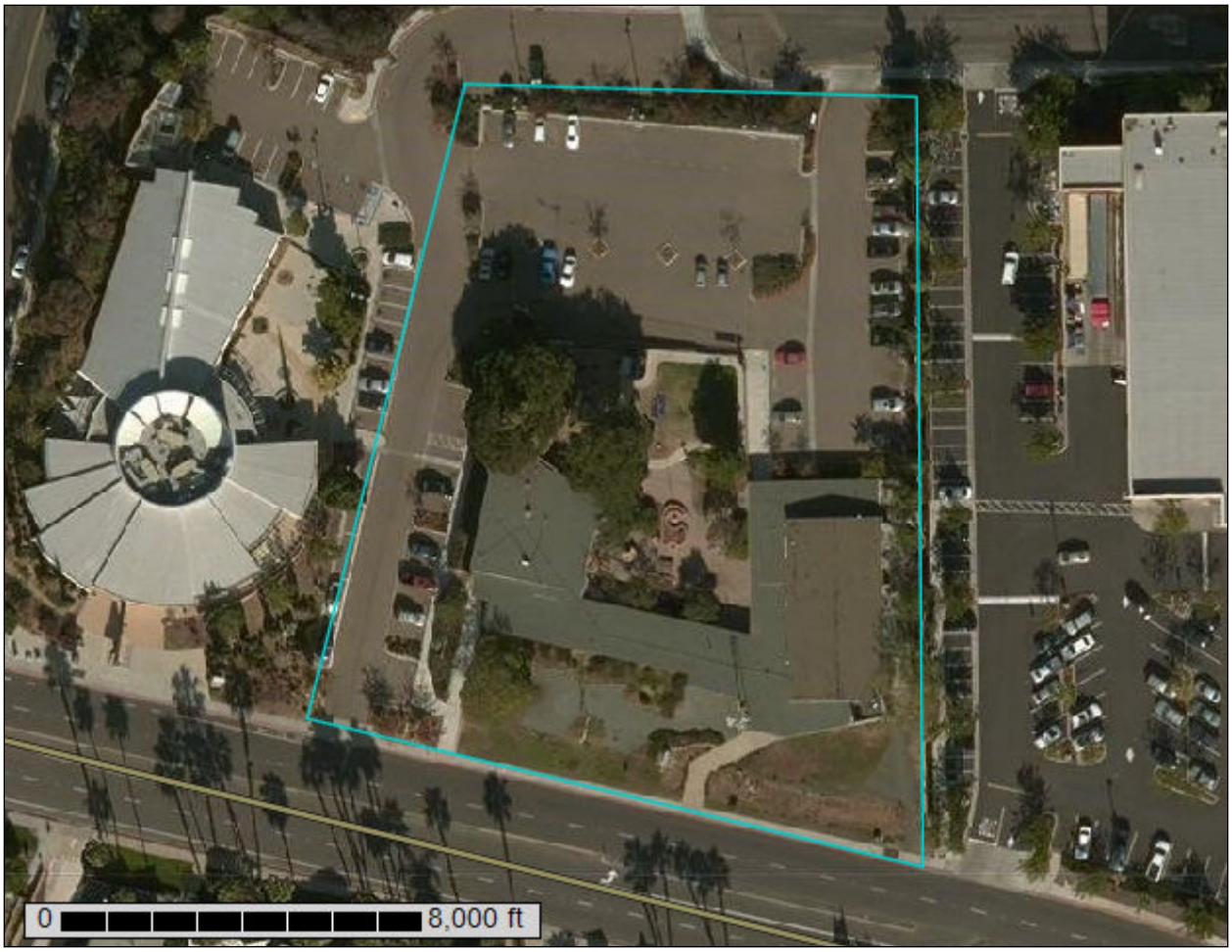
United States Department of Agriculture

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for San Diego County Area, California

Montezuma Hotel



March 7, 2018

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: San Diego County Area, California
Survey Area Data: Version 12, Sep 13, 2017

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

Date(s) aerial images were photographed: Dec 7, 2014—Jan 4, 2015

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
RhC	Redding-Urban land complex, 2 to 9 percent slopes	1.9	100.0%
Totals for Area of Interest		**1.9**	**100.0%**

Map Unit Descriptions

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

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

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

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

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

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

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

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

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

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

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

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

San Diego County Area, California

RhC—Redding-Urban land complex, 2 to 9 percent slopes

Map Unit Setting

National map unit symbol: hbg1
Elevation: 100 to 1,500 feet
Mean annual precipitation: 14 to 25 inches
Mean annual air temperature: 61 to 63 degrees F
Frost-free period: 230 to 320 days
Farmland classification: Not prime farmland

Map Unit Composition

Redding and similar soils: 50 percent
Urban land: 30 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Redding

Setting

Landform: Marine terraces
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from mixed sources

Typical profile

H1 - 0 to 15 inches: gravelly loam
H2 - 15 to 30 inches: gravelly clay loam, gravelly clay
H2 - 15 to 30 inches: indurated
H3 - 30 to 45 inches:

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: About 15 inches to abrupt textural change; 20 to 45 inches to duripan
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 1.8 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Hydric soil rating: No

Description of Urban Land

Typical profile

H1 - 0 to 6 inches: variable

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydric soil rating: No

Minor Components

Oliventain

Percent of map unit: 5 percent
Hydric soil rating: No

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MONTEZUMA ROAD HOTEL PROJECT

NOISE STUDY

Prepared for:

KLR Planning
San Diego, CA

Prepared by:

BIRDSEYE
PLANNING GROUP

October 2018

MONTEZUMA ROAD HOTEL
SAN DIEGO, CALIFORNIA
Noise Study

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MONTEZUMA ROAD HOTEL
SAN DIEGO, CALIFORNIA
NOISE STUDY

This report is an analysis of the potential noise impacts associated with the proposed Montezuma Road Hotel Project (proposed project) in the City of San Diego. This report has been prepared by Birdseye Planning Group (BPG) under contract to KLR Planning, to support preparation of the environmental documentation pursuant to the California Environmental Quality Act (CEQA). This study analyzes the potential for permanent impacts associated with operation of the proposed project and temporary impacts associated with construction activity within proximity to the construction area.

PROJECT DESCRIPTION

The *Montezuma Road Hotel* project site encompasses approximately 1.8 acres, located at 6650 Montezuma Road within the College Area community planning area. The project site is situated north of Montezuma Road and west of Bowman Lane. The Friends of the College-Rolando Public Library is located adjacent to the west of the project site with no access or parking from Montezuma Road. Single-family residential development is located to the north, and a Ralphs shopping center is next to the property to the east. The project site is currently vacant, with the recent demolition of a church that was previously located on the project site. Regional access to the site is provided by Interstate 8 (I-8), located approximately 2.2 miles north of the project site. Local access is provided via El Cajon Boulevard, connected to the east end of Montezuma Road and located less than 0.1 mile southwest of the project site. Direct access to the site is via Montezuma Road.

The project proposes an Amendment to the College Area Community Plan and a Rezone. The proposed amendment to the College Area Community Plan would change the current land use designation from *Low/Medium Density Residential [10 – 15 dwelling units per acre (du/ac)]* and *General Commercial Residential (75 – 110 du/ac)* to *Residential Medium with Commercial (15-29 du/ac)* to allow redevelopment of the project site with a maximum 125-room hotel or a base density of 55-multifamily residential units. The proposed rezone would change the existing RM-1-1 zone to CV-1-1. The purpose of the CV zones is to provide areas for establishments catering to the lodging, dining, and recreational needs of both tourists and the local population. The CV zones are intended for areas located near employment centers and areas with recreational resources or other visitor attractions. The CV-1-1 is intended to accommodate a mix of large-scale, visitor serving uses and residential uses and permits a maximum density of 1 dwelling unit for each 1,500 square feet of lot area. The Community Plan Amendment would also allow for a shared access and parking agreement with the City of San Diego to provide additional parking to serve the adjacent public library.

The proposed project would begin construction in mid-2019 and be completed by late 2020. The site is shown in Figure 1 – Vicinity Map. A site plan is provided as Figure 2.

SETTING

Overview of Sound Measurement

Noise level (or volume) is generally measured in decibels (dB) using the A-weighted sound pressure level (dBA). The A-weighting scale is an adjustment to the actual sound pressure levels to be consistent with that of human hearing response, which is most sensitive to frequencies around 4,000 Hertz (about the highest note on a piano) and less sensitive to low frequencies (below 100 Hertz). Sound pressure level is measured on a logarithmic scale with the 0 dB level based on the lowest detectable sound pressure level that people can perceive (an audible sound that is not zero sound pressure level). Based on the logarithmic scale, a doubling of sound energy is equivalent to an increase of 3 dBA, and a sound that is 10 dBA less than the ambient sound level has no effect on ambient noise. Because of the nature of the human ear, a sound must be about 10 dBA greater than the reference sound to be judged as twice as loud. In general, a 3 dBA change in community noise levels is noticeable, while 1-2 dB changes generally are not perceived. Quiet suburban areas typically have noise levels in the range of 40-50 dBA, while arterial streets are in the 50-60+ dBA range. Normal conversational levels are in the 60-65 dBA range, and ambient noise levels greater than 65 dBA can interrupt conversations. Noise levels typically attenuate (or drop off) at a rate of 6 dBA per doubling of distance from point sources (i.e., industrial machinery). Noise from lightly traveled roads typically attenuates at a rate of about 4.5 dBA per doubling of distance. Noise from heavily traveled roads typically attenuates at about 3 dBA per doubling of distance. Noise levels may also be reduced by intervening structures; generally, a single row of buildings between the receptor and the noise source reduces the noise level by about 5 dBA, while a solid wall or berm reduces noise levels by 5 to 10 dBA. The manner in which older homes in California were constructed (approximately 30 years old or older) generally provides a reduction of exterior-to-interior noise levels of about 20 to 25 dBA with closed windows. The exterior-to-interior reduction of newer residential units and office buildings construction to California Energy Code standards is generally 30 dBA or more (Harris, Miller, Miller and Hanson, 2006).

In addition to the actual instantaneous measurement of sound levels, the duration of sound is important since sounds that occur over a long period of time are more likely to be an annoyance or cause direct physical damage or environmental stress. One of the most frequently used noise metrics that considers both duration and sound power level is the equivalent noise level (Leq). The Leq is defined as the single steady A-weighted level that is equivalent to the same amount of energy as that contained in the actual fluctuating levels over a period of time (essentially, the average noise level). Typically, Leq is summed over a one-hour period. Lmax is the highest RMS (root mean squared) sound pressure level within the measuring period, and Lmin is the lowest RMS sound pressure level within the measuring period.

Figure 1—Vicinity Map

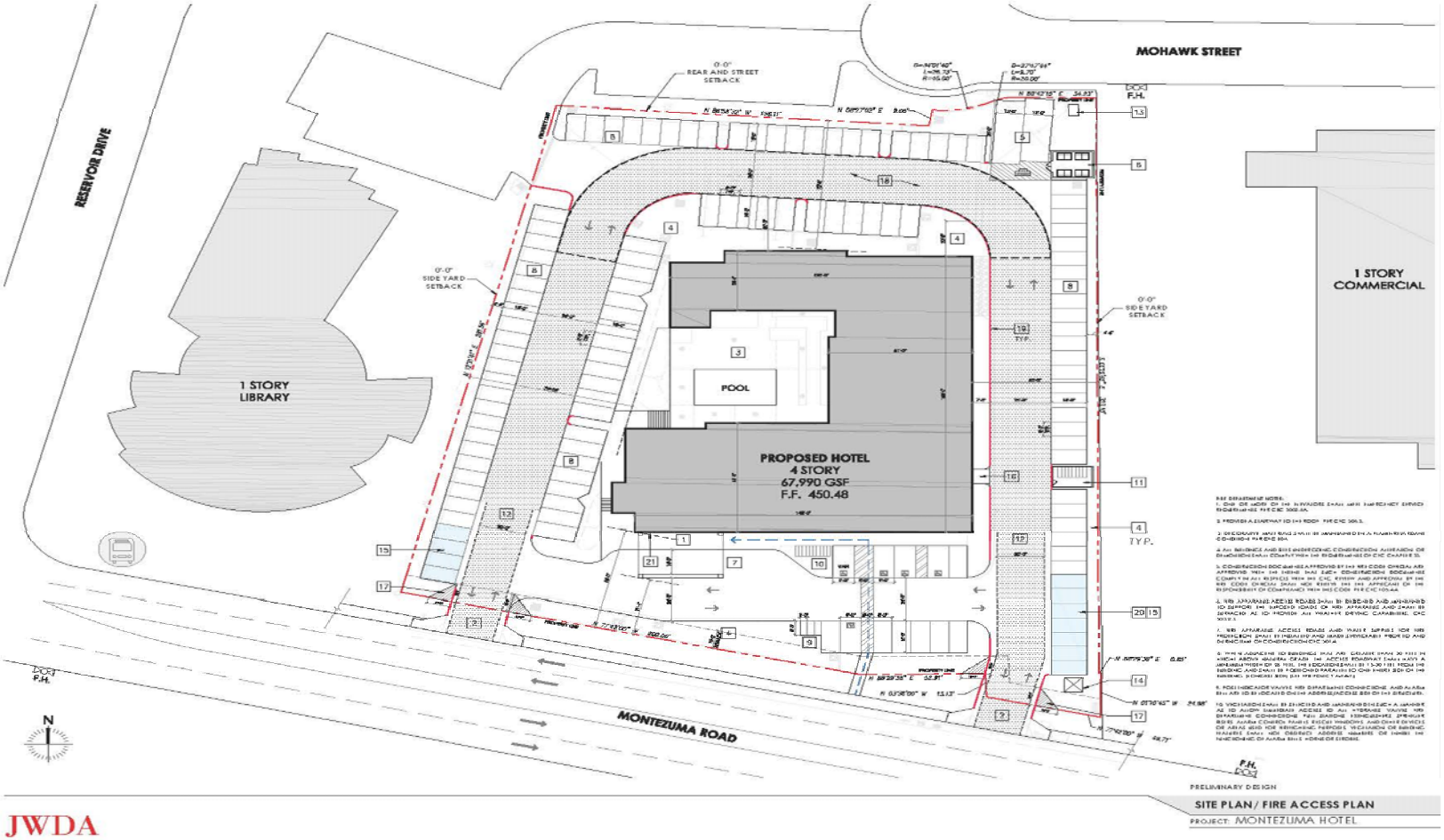

Figure 2 — Site Plan

N

The time period in which noise occurs is also important since noise that occurs at night tends to be more disturbing than that which occurs during the day. Community noise is usually measured using Day-Night Average Level (Ldn), which is the 24-hour average noise level with a 10-dBA penalty for noise occurring during nighttime (10 p.m. to 7 a.m.) hours, or Community Noise Equivalent Level (CNEL), which is the 24-hour average noise level with a 5 dBA penalty for noise occurring from 7 p.m. to 10 p.m. and a 10 dBA penalty for noise occurring from 10 p.m. to 7 a.m. Noise levels described by Ldn and CNEL usually do not differ by more than 1 dB. Daytime Leq levels are louder than Ldn or CNEL levels; thus, if the Leq meets noise standards, the Ldn and CNEL are also met. Table 1 shows sounds levels of typical noise sources in Leq.

Sensitive Receptors

Noise exposure goals for various types of land uses reflect the varying noise sensitivities associated with each of these uses. Urban areas contain a variety of land use and development types that are noise sensitive including residences, schools, churches, hospitals and convalescent care facilities. Nearby sensitive receptors are single-family residences located to the north of the site, multifamily apartments located south of the site along the south side of Montezuma Road. The project will also be a sensitive receptor at completion.

Project Site Setting

The project area is located in the urbanized College East community within the City of San Diego. Thus, the most common and primary sources of noise in the project site vicinity are motor vehicles (e.g., automobiles and trucks) on Montezuma Road. Project-related noise will be generated by traffic operating on Montezuma Road adjacent to and south of the project site. Traffic noise is of concern because where a high number of individual events occur, it can create a sustained noise level. Other noise sources in the area are primarily associated with pedestrian activity and neighboring commercial uses; however, these sources do not noticeably contribute to the ambient noise environment.

Table 1. Sound Levels of Typical Noise Sources and Noise Environments

Noise Source (at Given Distance)	Noise Environment	A-Weighted Sound Level (Decibels)	Human Judgment of Noise Loudness (Relative to Reference Loudness of 70 Decibels*)
Military Jet Takeoff with Afterburner (50 ft)	Carrier Flight Deck	140	128 times as loud
Civil Defense Siren (100 ft)		130	64 times as loud
Commercial Jet Take-off (200 ft)		120	32 times as loud **Threshold of Pain**

Pile Driver (50 ft)	Rock Music Concert Inside Subway Station (New York)	110	16 times as loud
Ambulance Siren (100 ft) Newspaper Press (5 ft) Gas Lawn Mower (3 ft)		100	8 times as loud **Very Loud**
Food Blender (3 ft) Propeller Plane Flyover (1,000 ft) Diesel Truck (150 ft)	Boiler Room Printing Press Plant	90	4 times as loud
Garbage Disposal (3 ft)	Noisy Urban Daytime	80	2 times as loud
Passenger Car, 65 mph (25 ft) Living Room Stereo (15 ft) Vacuum Cleaner (10 ft)	Commercial Areas	70	Reference Loudness **Moderately Loud**
Normal Speech (5 ft) Air Conditioning Unit (100 ft)	Data Processing Center Department Store	60	1/2 as loud
Light Traffic (100 ft)	Large Business Office Quiet Urban Daytime	50	1/4 as loud
Bird Calls (distant)	Quiet Urban Nighttime	40	1/8 as loud **Quiet**
Soft Whisper (5 ft)	Library and Bedroom at Night Quiet Rural Nighttime	30	1/16 as loud
	Broadcast and Recording Studio	20	1/32 as loud **Just Audible**
		0	1/64 as loud **Threshold of Hearing**

Source: Compiled by dBF Associates, Inc., 2016

To gather data on the general noise environment at the project site, a weekday morning 15-minute noise measurement was taken on March 14, 2018. The monitoring site is located along Montezuma Road in the parking lot adjacent to and west of the project site. This site represents ambient noise at the project site, the College-Rolando Library located adjacent to and west of the site and the apartment complexes located across Montezuma Road and south of the site. Existing noise at this site was measured for model calibration purposes. The monitoring location is shown in Figure 3. The measurements were taken using an ANSI Type II integrating sound level meter. The predominant noise source was traffic. The temperature during monitoring was 60 degrees Fahrenheit with 98% cloud cover and >5 mile per hour wind.

During monitoring, 246 cars/light trucks, 5 medium (two-axles and six wheels) and zero heavy (18-wheel) trucks passed the site. Background noise included pedestrian activity. Noise from El Cajon Boulevard was audible during breaks in the traffic along Montezuma Road but contribute negligibly to noise levels at sensitive properties located in proximity to the site. Thus, measured noise are representative of noise levels occurring at the project site during a typical daytime

Figure 3—Monitoring Location

scenario with neighboring facilities open. Table 2 identifies the noise measurement locations and measured noise levels. As shown, the Leq was 61.0. The monitoring data sheet is provided as Appendix A.

Table 2
Noise Monitoring Results

Measurement Location	Primary Noise Source	Sample Time	Leq (dBA)
1. Adjacent to and west of project site along north side of Montezuma Road.	Traffic and pedestrian activity	Weekday morning	61.0

Source: Field visit using ANSI Type II Integrating sound level meter.

Regulatory Setting

The Federal Noise Control Act (1972) addressed the issue of noise as a threat to human health and welfare. To implement the Federal Noise Control Act, the U.S. Environmental Protection Agency (EPA) undertook a number of studies related to community noise in the 1970s. The EPA found that 24-hour averaged noise levels less than 70 dBA would avoid measurable hearing loss, levels of less than 55 dBA outdoors and 45 dBA indoors would prevent activity interference and annoyance (EPA 1972).

The U.S. Department of Housing and Urban Development (HUD) published a Noise Guidebook for use in implementing the Department's noise policy. In general, HUD's goal is exterior noise levels that are less than or equal to 55 dBA Ldn. The goal for interior noise levels is 45 dBA Ldn. HUD suggests that attenuation be employed to achieve this level, where feasible, with a special focus on sensitive areas of homes, such as bedrooms (HUD 2009).

Title 24 of the California Code of Regulations (CCR) establishes standards governing interior noise levels that apply to all new single-family and multi-family residential units in California. These standards require that acoustical studies be performed before construction at building locations where the existing Ldn exceeds 60 dBA. Such acoustical studies are required to establish mitigation measures that will limit maximum Ldn levels to 45 dBA in any habitable room. Although there are no generally applicable interior noise standards pertinent to all uses, many communities in California have adopted an Ldn of 45 as an upper limit on interior noise in all residential units.

In addition, the State of California General Plan Guidelines (OPR 2003), provides guidance for noise compatibility. The guidelines also present adjustment factors that may be used to arrive at noise acceptability standards that reflect the noise control goals of the community, the particular community's sensitivity to noise, and the community's assessment of the relative importance of noise pollution.

City of San Diego General Plan Noise Element

The City of San Diego requires new projects to meet exterior noise level standards as established in the Noise Element of the General Plan [City of San Diego 2008, Amended 2015: Policy NE-A.4]. Sound levels up to 60 dBA CNEL are considered compatible with outdoor areas of frequent use (patios, balconies, parks, swimming pools, etc.). The building structure must attenuate exterior noise in occupied areas to 45 dBA CNEL or below. General Plan Noise Element Table NE-3: Land Use – Noise Compatibility Guidelines is presented as Table 3. For purposes of this analysis, the project site and neighboring habitable structures are evaluated herein.

CEQA Significance Thresholds

The California Environmental Quality Act (CEQA) Significance Determination Thresholds (City of San Diego 2016) addresses traffic noise, as specified in Table K-2: Traffic Noise Significance Thresholds (dB(A) CNEL). Relevant portions are reproduced in Table 4.

Noise Ordinance

City of San Diego Municipal Code Section 59.5.0401: Sound Level Limits states:

(a) It shall be unlawful for any person to cause noise by any means to the extent that the one-hour average sound level exceeds the applicable limit given in the following table [reproduced as Table 5], at any location in the City of San Diego on or beyond the boundaries of the property on which the noise is produced. The noise subject to these limits is that part of the total noise at the specified location that is due solely to the action of said person.

(b) The sound level limit at a location on a boundary between two zoning districts is the arithmetic mean of the respective limits for the two districts. Permissible construction noise level limits shall be governed by Section 59.5.0404 of this article.

City of San Diego Municipal Code Section 59.5.0404: Construction Noise (b) states:

> … it shall be unlawful for any person… to conduct any construction activity so as to cause, at or beyond the property lines of any property zoned residential, an average sound level greater than 75 decibels during the 12-hour period from 7:00 a.m. to 7:00 p.m. (City of San Diego 2010).

Construction is prohibited on legal holidays and Sundays as specified in Section 21.04 of the San Diego Municipal Code.

Table 3
City of San Diego Land Use – Noise Compatibility Guidelines

Land Use Category	Exterior Noise Exposure (dBA CNEL)				
		60	65	70	75
Parks and Recreational					
Parks, Active and Passive Recreation					
Outdoor Spectator Sports, Golf Courses; Water Recreational Facilities; Indoor Recreation Facilities					
Agricultural					
Crop Raising and Farming; Community Garden, -Aquaculture, Dairies; Horticulture Nurseries & Greenhouses; Animal Raising, Maintain & Keeping; Commercial Stables					
Residential					
Single Dwelling Units; Mobile Homes		45			
Multiple Dwelling Units *For uses affected by aircraft noise, refer to Policies NE-D.2. & NE-D.3.		45	45*		
Institutional					
Hospitals; Nursing Facilities; Intermediate Care Facilities; Kindergarten through Grade 12 Educational Facilities; Libraries; Museums; Child Care Facilities		45			
Other Educational Facilities Including Vocational/Trade Schools; Colleges and Universities		45	45		
Cemeteries					
Retail Sales					
Building Supplies/Equipment; Food, Beverages & Groceries; Pets & Pet Supplies; Sundries, Pharmaceutical & Convenience Sales; Wearing Apparel & Accessories			50	50	
Commercial Services					
Building Services; Business Support; Eating & Drinking; Financial Institutions; Maintenance & Repair; Personal Services Assembly & Entertainment (includes public and religious assembly); Radio & Television Studios; Golf Course Support			50	50	
Visitor Accommodations		45	45	45	
Offices					
Business & Professional; Government; Medical, Dental & Health Practitioner; Regional & Corporate Headquarters					
Vehicle and Vehicular Equipment Sales and Service Use					
Commercial or Personal Vehicle Repair & Maintenance; Commercial or Personal Vehicle Sales & Rentals; Vehicle Equipment & Supplies Sales & Rentals; Vehicle Parking					

Land Use Category	Exterior Noise Exposure (dBA CNEL)				
	60	65	70	75	
Wholesale, Distribution, Storage Use Category					
Equipment & Materials Storage Yards; Moving & Storage Facilities; Warehouse; Wholesale Distribution					
Industrial					
Heavy Manufacturing; Light Manufacturing; Marine Industry; Trucking & Transportation Terminals; Mining & Extractive Industries					
Research & Development				50	

	Compatible	**Indoor Uses**	Standard constructions methods should attenuate exterior noise to an acceptable indoor noise level. Refer to Section I.
		Outdoor Uses	Activities associated with the land use may be carried out.
45, 50	**Conditionally Compatible**	**Indoor Uses**	Building structure must attenuate exterior noise to the indoor noise level indicated by the number (45 or 50) for occupied areas. Refer to Section I.
		Outdoor Uses	Feasible noise mitigation techniques should be analyzed and incorporated to make the outdoor activities acceptable. Refer to Section I.
	Incompatible	**Indoor Uses**	New construction should not be undertaken.
		Outdoor Uses	Sever noise interference makes outdoor activities unacceptable.

Source: General Plan Noise Element Table NE-3: Land Use – Noise Compatibility Guidelines amended 2015.

Table 4
City of San Diego Traffic Noise Significance Thresholds (dBA CNEL)

Structure or Proposed Use that would be impacted by Traffic Noise	Interior Space	Exterior Useable Space[1]
Single-family detached	45 dB	65 dB
Multi-family, schools, libraries, hospitals, day care, hotels, motels, parks, convalescent homes	Development Services Department (DSD) ensures 45 dB pursuant to Title 24	65 dB
Offices, Churches, Business, Professional Uses	n/a	70 dB
Commercial, Retail, Industrial, Outdoor Spectator Sports Uses	n/a	75 dB

Source: City of San Diego Traffic Noise Significance Thresholds, 2016

[1] If a project is currently at or exceeds the significance thresholds for traffic noise described above and noise levels would result in less than a 3-dB increase, then the impact is not considered significant.

Table 5
City of San Diego Applicable Limits

Land Use	Time of Day	One-Hour Average Sound Level (decibels)
1. Single Family Residential	7:00 a.m. to 7:00 p.m 7:00 p.m. to 10:00 p.m 10:00 p.m. to 7:00 a.m.	50 45 40
2. Multi-Family Residential (Up to a maximum density of 1/2000)	7:00 a.m. to 7:00 p.m 7:00 p.m. to 10:00 p.m 10:00 p.m. to 7:00 a.m.	55 50 45
3. All other Residential	7:00 a.m. to 7:00 p.m 7:00 p.m. to 10:00 p.m 10:00 p.m. to 7:00 a.m.	60 55 50
4. Commercial	7:00 a.m. to 7:00 p.m 7:00 p.m. to 10:00 p.m 10:00 p.m. to 7:00 a.m.	65 60 60
5. Industrial or Agricultural	any time	75

Source: City of San Diego Municipal Code Section 59.5.0401, 2010

Vibration Standards

Vibration is a unique form of noise as the energy is transmitted through buildings, structures and the ground whereas audible noise energy is transmitted through the air. Thus, vibration is generally felt rather than heard. The ground motion caused by vibration is measured as particle velocity in inches per second and is referenced as vibration decibels (VdB). The vibration velocity level threshold of perception for humans is approximately 65 VdB. A vibration velocity of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels.

The City of San Diego General Plan Noise Element and municipal code do not provide vibration standards. The Federal Transit Administration's (FTA) *Transit Noise and Vibration Impact Assessment* (May 2006) uses a threshold of 65 VdB for buildings where low ambient vibration is essential for interior operations. These buildings include hospitals and recording studios. A threshold of 72 VdB is used for residences and buildings where people normally sleep (i.e., hotels and rest homes). A threshold of 75 VdB is used for institutional land uses where activities occur primarily during the daytime (i.e., churches and schools). The threshold used for the proposed project is 72 VdB.

Construction activities such as blasting, pile driving, demolition, excavation or drilling have the potential to generate ground vibrations near structures. With respect to ground-borne vibration impacts on structures, the FTA states that ground-borne vibration levels in excess of 100 VdB would damage fragile buildings and levels in excess of 95 VdB would damage extremely fragile historic buildings. No historic buildings are located within the project area; thus, 100 VdB is

used to quantify potential vibration impacts to neighboring structures. Construction activities referenced above that would generate significant vibration levels are not proposed. However, to provide information for use in completing the CEQA evaluation, construction-related vibration impacts are evaluated using the above referenced criteria.

IMPACT ANALYSIS

Methodology and Significance Thresholds

Construction noise estimates are based upon noise levels reported by the FTA, Office of Planning and Environment, and the distance to nearby sensitive receptors. Reference noise levels from that document were used to estimate noise levels at nearby sensitive receptors based on a standard noise attenuation rate of 6 dB per doubling of distance (line-of-sight method of sound attenuation).

The project trip generation for the project was calculated using trip rates from the city of San Diego *Trip Generation Manual*, May 2003. The project is calculated to generate 1,125 ADT with 90 AM peak hour trips (36 inbound and 54 outbound) and 102 PM peak hour trips (41 inbound and 61outbound) (LOS Engineering, February 2018).

Traffic volumes would be concentrated on Montezuma Road and disperse primarily to El Cajon Boulevard to the east. Metropolitan Transit System (MTS) provides bus service as Route 14 on Montezuma Road along the project frontage. MTS Bus Route 14 has a scheduled service along Montezuma Road with service headways of approximately 60 minutes on weekdays with no service noted for Saturday or Sunday. Traffic noise related impacts are addressed herein based on the difference in volumes between existing conditions and when volumes associated with the proposed project are added to the baseline. Because the Leq is less than the 65-dBA exterior standard for hotels, potential impacts are determined based on whether project traffic would cause the current Leq (61 dBA) to increase to 65 dBA or greater.

Temporary Construction Noise

The main sources of noise during construction activities would include heavy machinery used during clearing the site, as well as equipment used for construction. The building has been removed from the site; however, concrete pads, exterior stairs and related improvements remain on the site. Initial construction activities would be associated with clearing the site. Table 6 shows the typical noise levels associated with heavy construction equipment. As shown, average noise levels associated with the use of heavy equipment at construction sites can range from about 81 to 95 dBA at 25 feet from the source, depending upon the types of equipment in operation at any given time and phase of construction.

Table 6
Typical Construction Equipment Noise Levels

Equipment Onsite	Typical Level (dBA) 25 Feet from the Source	Typical Level (dBA) 50 Feet from the Source	Typical Level (dBA) 100 Feet from the Source
Air Compressor	84	78	64
Backhoe	84	78	64
Bobcat Tractor	84	78	64
Concrete Mixer	85	79	73
Bulldozer	88	82	76
Jack Hammer	95	89	83
Pavement Roller	86	80	74
Street Sweeper	88	82	76
Man Lift	81	75	69
Dump Truck	82	76	70

Source: Hanson, Towers and Meister, May 2006
Noise levels based on FHWA Roadway Construction Noise Model (2006) Users Guide Table 1.
Noise levels based on actual maximum measured noise levels at 50 feet (Lmax).
Noise levels assume a noise attenuation rate of 6 dBA per doubling of distance.

As referenced above, the City of San Diego limits the average sound level from construction noise to 75 decibels at any property zoned residential during the 12-hour period from 7:00 a.m. to 7:00 p.m. Noise-sensitive uses near the project site are residences to the north along Mohawk Street and multifamily residences in Reservoir Court and multifamily residences to the south across Montezuma Road (Aztec Pacific Apartments and Diplomat Apartments). This analysis assumes the College-Rolando library located adjacent to and west of the site is also a sensitive receptor. The average distance from the center of the site to the nearest receiver north and south of the site approximately 250 feet. The distance from the center of the site to the library is approximately 160 feet. It is assumed demolition, grading and site preparation work would require the use of heavy equipment. Building construction and finishing would utilize hand tools; however, equipment would also be required to deliver materials to the project site and work areas.

Based on EPA noise emissions, empirical data and the amount of equipment needed for construction of the proposed project, worst-case noise levels from the construction equipment would occur during demolition and grading activities. The anticipated equipment used on-site would include a dozer, backhoe/tractor and a grader. Due to size of the site (i.e., 1.86 acres) and related physical constraints and normal site preparation operations, the equipment will be spread out over the site and likely only used for specific operations. As referenced, the average distance from the center of the site and residential properties to the north and south is 250 feet and 160 feet from the library to the west. However, construction operations are expected occur near the site boundaries which is approximately 120 feet from the residential receivers and 60 feet from the library.

Construction Noise Levels

The project site is 1.86 acres in size which limits the amount and type of equipment that can operate on the site at any one time. If during site preparation and grading, a bulldozer (82 dBA), a backhoe (78 dBA) and a dump truck (82 dBA) were working simultaneously generally in the center of the site over an 8-hour work day, the 8-hour Leq would be approximately 86 dBA at 50 feet. For reference purposes, noise levels associated with the above construction scenario are shown at varying distances in Table 7. As shown, noise levels would attenuate to 72 dBA or less at 100 feet or more from the active construction area. Thus, no significant impacts would result from construction noise.

Table 7
Typical Maximum Construction Noise Levels at Various Distances from Project Construction

Distance from Construction	Maximum Noise Level at Receptor (dBA)
25 feet	88
50 feet	85
100 feet	72
250 feet	66
500 feet	60
1,000 feet	54

Temporary Construction-Related Vibration

Activities associated with a hotel do not generate vibration. Thus, this discussion focuses on temporary vibration caused by construction. As referenced, the closest residences are located approximately 250 feet north and south of the center of the site. The nearest sensitive receiver is located approximately 160 feet west of the site. Table 8 shows construction equipment could reach 75 VdB at 100 feet from the source assuming a large bulldozer is used during grading. As referenced, 72 VdB is the threshold for human perception; thus, while construction activities would be temporary, vibration may be perceptible at adjacent receivers depending on the location and type of equipment in operation.

As referenced, construction activities such as blasting, pile driving, demolition, excavation or drilling have the potential to generate ground vibrations near structures. With respect to ground-borne vibration impacts on structures, the FTA states that ground-borne vibration levels in excess of 100 VdB would damage fragile buildings and levels in excess of 95 VdB would damage extremely fragile historic buildings. No historic buildings are located within the project area nor are construction activities that would generate significant vibration levels required for the proposed project. Construction would occur during daytime hours which

would minimize sleep disturbance; however, to avoid perceptible vibration occurring at neighboring receivers, small dozers and similar equipment be used in proximity to the receivers north and west of the site during demolition and grading. **Temporary vibration impacts would be less than significant.**

Table 8
Vibration Source Levels for Construction Equipment

Equipment	Approximate VdB				
	25 Feet	50 Feet	60 Feet	75 Feet	100 Feet
Large Bulldozer	87	81	79	77	75
Loaded Trucks	86	80	78	76	74
Jackhammer	79	73	71	69	67
Small Bulldozer	58	52	50	48	46

Source: Federal Railroad Administration, 1998

Long-Term Operational Noise Exposure

Long-term operation of the proposed project was evaluated for potential exterior traffic related impacts caused by increased traffic volumes associated with the project as well as interior noise levels caused by traffic. In addition, a discussion regarding potential noise levels associated with roof top Heating, Ventilation and Air Conditioning (HVAC) is provided.

Exterior Traffic Noise. Traffic is the primary noise source that would be generated by the proposed project. Existing measured noise levels are lower than the residential standard (65 dBA) at the multifamily residences located along Montezuma Road south of the site. Whether a traffic-related noise impact would occur is based on whether project traffic, when added to the existing traffic, would cause the Leq to exceed the 65-dBA exterior standard referenced in Table 4 above.

The roadway network adjacent to the project site (Montezuma Road) was modeled using the Federal Highway Administration Traffic Noise Model (TNM) version 2.5 software (see Appendix A). Because the library adjacent to the site and apartments located south of the site are most exposed to traffic noise, these locations are the focus of the operational analysis. The model calculates traffic noise at receiver locations based on traffic volumes, travel speed, mix of vehicle types operating on the roadways (i.e., cars/trucks, medium trucks and heavy trucks) and related factors. Traffic volumes and vehicle mix used to calibrate TNM were based on vehicle counts obtained during the monitoring period. The 15 minute counts were multiplied by four to obtain hourly traffic counts. The model was calibrated to calculate noise levels that are +/- 2 dBA those measured on-site and reported in Table 2.

Traffic volumes for peak hour existing and project operation were obtained from the Trip

Generation Memorandum (LOS Engineering, February 2018). Evening (PM) peak hour project trips for existing conditions were modeled to determine baseline noise conditions. Project trips were then added to the baseline trips to determine whether the Leq at neighboring receivers would exceed 65 dBA as a result of project-related traffic. As referenced, the project would generate 1,125 ADT. Peak hour volumes are estimated to be 90 AM peak hour trips (36 inbound and 54 outbound), and 102 PM peak hour trips (41 inbound and 61 outbound). The PM peak hour trips were used in the analysis. Noise levels were calculated at the following receivers and are intended to represent conditions at multiple receivers within proximity to these locations:

1. College-Rolando Library 6600 Montezuma Road (west of the site);
2. Aztec Pacific Apartments at 6663 Montezuma Road (south of the site); and
3. Single-family residences north of project site along Mohawk Street.

The receiver locations are shown in Figure 4. As shown in Table 9, the daytime hourly average (Leq) does not exceed the 65-dBA standard at the receivers modeled under baseline conditions.

Table 9
Modeled Noise Levels

Receptor	Existing Leq	Exceed Standard?	With Project Leq	dBA Change	Significant Impact
Site 1	62.6	No	62.9	+0.3	No
Site 2	64.1	No	64.3	+0.2	No
Site 3	56.5	No	56.8	+0.2	No

As shown, noise levels at all receivers modeled are less than the 65-dBA standard under existing conditions. The proposed project would increase noise levels at Site 1 by 0.3 dBA and at Sites 2 and 3 by 0.2 dBA. Project operation would not cause noise levels at either receiver or representative receivers along Montezuma Road to exceed 65 dBA. **No significant or adverse traffic noise impact would result from the proposed project.**

Exterior Use Noise (HVAC). The HVAC system proposed for use on the site has not been specified and noise levels vary depending on the system size. However, it is assumed that one or more HVAC compressor units will be installed on the roof-top of the proposed hotel to ventilate the common areas. Individual HVAC units would also be installed in each room. Noise from rooftop HVAC units would be attenuated by the roof structure, insulation and crawl space; and thus, would not be audible in the top floor units. HVAC noise levels can be expected to range from 60 to 70 dBA at 5 feet from the roof top equipment and ventilation openings (Illingsworth & Rodkin, 2011). Assuming HVAC units are installed at the center of the roof top, or an average of 250 feet from the closest receivers to the north along Mohawk Street and south and 160 feet east of the adjacent library, a 70-dBA reference noise level would attenuate to 52 dBA at 40 feet from the source. **HVAC noise would be less than the 65 dBA criteria at the project property line.**

Figure 4—Receiver Locations

Interior Traffic Noise. California Energy Code Title 24 standards specify construction methods and materials that result in energy efficient structures and up to a 30-dBA reduction in exterior noise levels (assuming windows are closed). This includes operation of mechanical ventilation (e.g. heating and air conditioning), in combination with standard building construction and design features that include dual-glazed windows with a minimum Sound Transmission Class (STC) rating of 26 or higher. When windows are open, the insertion loss drops to about 10 dBA. Assuming windows are closed, interior noise levels at residences along Montezuma Road would be approximately 34 dBA. The STC rating of the windows in the adjacent library are unknown; however, noise levels post-construction wouldn't noticeably change from existing conditions. In all cases modeled, the existing interior noise levels would not noticeably change with the addition of project traffic.

Airport Land Use Compatibility Plan Compatibility. Gillespie Field is the nearest airport and is located approximately 6 miles northeast of the project site. Based on the noise contour maps provided in the Gillespie Field Airport Land Use Compatibility Plan (County of San Diego 2010), the project site is located outside the 60 dBA CNEL contours and is not affected by airport noise. For this reason, the project site is not located in an area that is affected by aircraft noise; and thus, compatibility with an adopted Airport Land Use Compatibility Plan is not required.

CONCLUSION

The proposed project would not have a significant or adverse impact cause by construction noise. No mitigation would be required. The existing 65 dBA Leq exterior standard is not exceeded under existing conditions at either receiver modeled which are representative of residential receivers and sensitive properties located along Montezuma Road in proximity to the project site. Project-related traffic would have no negligible effect on noise levels. The highest modeled increase would be +0.3 dBA at Receiver 1, the College-Rolando Library located adjacent to and west of the site. The proposed building would provide shielding from Montezuma Avenue for receivers located north of the site and may contribute to a reduction in traffic related noise levels relative to existing conditions. Assuming a 30-dBA reduction in noise levels between exterior and interior levels, the interior standard would be met at all residential receivers modeled with operation of the proposed project. Interior noise levels at the College-Rolando Library would not noticeably change from existing conditions. Thus, a **less than significant** operational noise impact would occur.

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Appendix A

Monitoring Data Sheet and Modeling Results

FIELD NOISE MEASUREMENT DATA

Project Name: MONTEZUMA ROAD motel
Page 1 of
Project #:
Day / Date WED 3/14
My Name.

Sound Level Meter	Calibrator	Weather Meter
Model # RION	Model #	Model # Serial #
Serial # 00593619	Serial #	
Weighting: (A) / C / Flat	Pre-Test: dBA SPL	Terrain: (Hard) / Soft / Mixed
Response: (Slow) / Fast / Impl	Post-Test: dBA SPL	Topo: (Flat) / Hilly (describe)
Windscreen: (Yes) / No		Wind: (Steady) / Gusty

ID	Time Start	Time Stop	Leq	Lmin	Lmax	L10	L50	L90	Wind Spd/ Dir (mph)	Temp (°F)	RH (%)	Bar Psr (in Hg)	Cloud Cover (%)
1	7:37	7:52	66.0	45.3	72.0	69.0	58.5	50.2	>5 mph	60			90%

Roadway Name MONTEZUMA ROAD
Speed (post/obs) 25-45
Number of Lanes 4
Width (pave/row) 56 - center turn
1- or 2- way 2
Grade 0%
Bus Stops NO
Stoplights YES
Street Parking NO
Automobiles 246
Medium Trucks 5
Heavy Trucks 0

Location(s) / GPS Reading(s):

Other Noise Sources: distant (aircraft) / (roadway traffic) / trains / landscaping / rustling leaves / children playing / dogs barking / birds vocalizing

Notes and Sketches on Reverse

<Organization?>
<Analysis By?>

20 June 2018
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: <Project Name?>
RUN: Montezuma w/ Project
BARRIER DESIGN: INPUT HEIGHTS

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

ATMOSPHERICS: 68 deg F, 50% RH

Receiver												
Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Aztec Pacific	1	1	0.0	64.1	66	64.1	10	----	64.1	0.0	8	-8.0
Rolando Library	2	1	0.0	62.6	66	62.6	10	----	62.6	0.0	8	-8.0
Mohawk Street	3	1	0.0	56.5	66	56.5	10	----	56.5	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	3	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

<Organization?>
<Analysis By?>

20 June 2018
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: <Project Name?>
RUN: Montezuma w/ Project
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver												
Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Aztec Pacific	1	1	0.0	64.3	66	64.3	10	----	64.3	0.0	8	-8.0
Rolando Library	2	1	0.0	62.9	66	62.9	10	----	62.9	0.0	8	-8.0
Mohawk Street	3	1	0.0	56.8	66	56.8	10	----	56.8	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	3	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Montezuma Hotel (125 Rooms)
City of San Diego (PTS 574562)
6650 Montezuma Road
San Diego, California

February 15, 2018
Fourth Revision September 28, 2018

Transportation Impact Study

Prepared for:
Blue Falcon LLC
13612 Calvados Place
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EXP. 3/31/2020
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STATE OF CALIFORNIA

SEALED ON 9/28/2018

Job #1802

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Executive Summary

The project is a hotel with 125 rooms located at 6650 Montezuma Road in San Diego, California. The project site was previously occupied by the College Lutheran Church; however, the Church was being demolished during data collection, thus a trip credit was not applied in this analysis. The hotel is planned to open by the year 2020. Project access is from two driveways on Montezuma Road to which one driveway will be shared with a City Library immediately west of the project site. The project requires an Amendment to the College Area Community Plan and a Rezone. The proposed amendment to the College Area Community Plan would change the current land use designation from *Low/Medium Density Residential [10 – 15 dwelling units per acre (du/ac)] and General Commercial Residential (75 – 110 du/ac)* to *General Commercial with Residential,* Medium-Medium High (15-45 DU/AC) to allow redevelopment of the project site with a maximum 125-room hotel. The proposed rezone would change the existing RM-1-1 zone to CV-1-1.

The project trip generation was calculated using trip rates from the City of San Diego *Trip Generation Manual*, May 2003. The project is calculated to generate 1,125 ADT at a rate of 9 trips per room with 90 AM peak hour trips (36 inbound and 54 outbound) and 102 PM peak hour trips (41 inbound and 61 outbound).

The minimum required parking for the site is 125 spaces based on a City rate of 1 space per hotel room. The project is proposed with 125 parking spaces, 3 motorcycle spaces, 10 short-term bicycle spaces and 8 long-term bicycle spaces. The applicant currently has a temporary shared parking agreement with the adjacent Library for 31 parking spaces. A new shared parking agreement is proposed with an allocation of 25 hotel spaces for Library patrons. The allocation of 25 parking spaces results in a daytime balance of parking demands based on the City of San Diego hourly accumulation table and ITE hourly parking accumulation table for the Library. The Library hours of operation vary with a range of 9:30 AM to 8:00 PM Monday through Friday, Saturday hours of 9:30 AM to 6:00 PM, and closed on Sundays.

The following scenarios were analyzed: Existing, Existing with Project, Near Term, Near Term with Project (Opening Day 2020), Horizon Year 2050, and Horizon Year 2050 with Project Conditions. For each scenario, the findings include:

1) Under existing conditions, all of the study intersections and segments were calculated to operate at LOS C or better.
2) Under existing with project conditions, all of the study intersections and segments were calculated to operate at LOS C or better. <u>There are no significant direct impacts because the addition of project traffic does not degrade a facility from acceptable LOS to unacceptable LOS.</u>
3) Under near term conditions, all of the study intersections and segments were calculated to operate at LOS C or better.
4) Under near term with project conditions, all of the study intersections and segments were calculated to operate at LOS C or better. <u>There are no significant direct impacts because the addition of project traffic does not degrade a facility from acceptable LOS to unacceptable LOS.</u>

5) Under horizon year 2050 conditions, all of the study intersections and segments were calculated to operate at LOS C or better.
6) Under horizon year 2050 with project conditions, all of the study intersections and segments were calculated to operate at LOS C or better. There are no significant cumulative impacts because the addition of project traffic does not degrade a facility from acceptable LOS to unacceptable LOS.

The project has no calculated traffic impacts based on the City's significance criteria; therefore, mitigation measures are not required.

The project with 125 on-site parking spaces meets City minimum requirements for the hotel. The project applicant proposed to provide a shared parking allocation of 25 hotel spaces for Library use during current Library hours of operation. The project site also is planned with 3 motorcycle spaces, 10 short-term bicycle spaces and 8 long-term bicycle spaces.

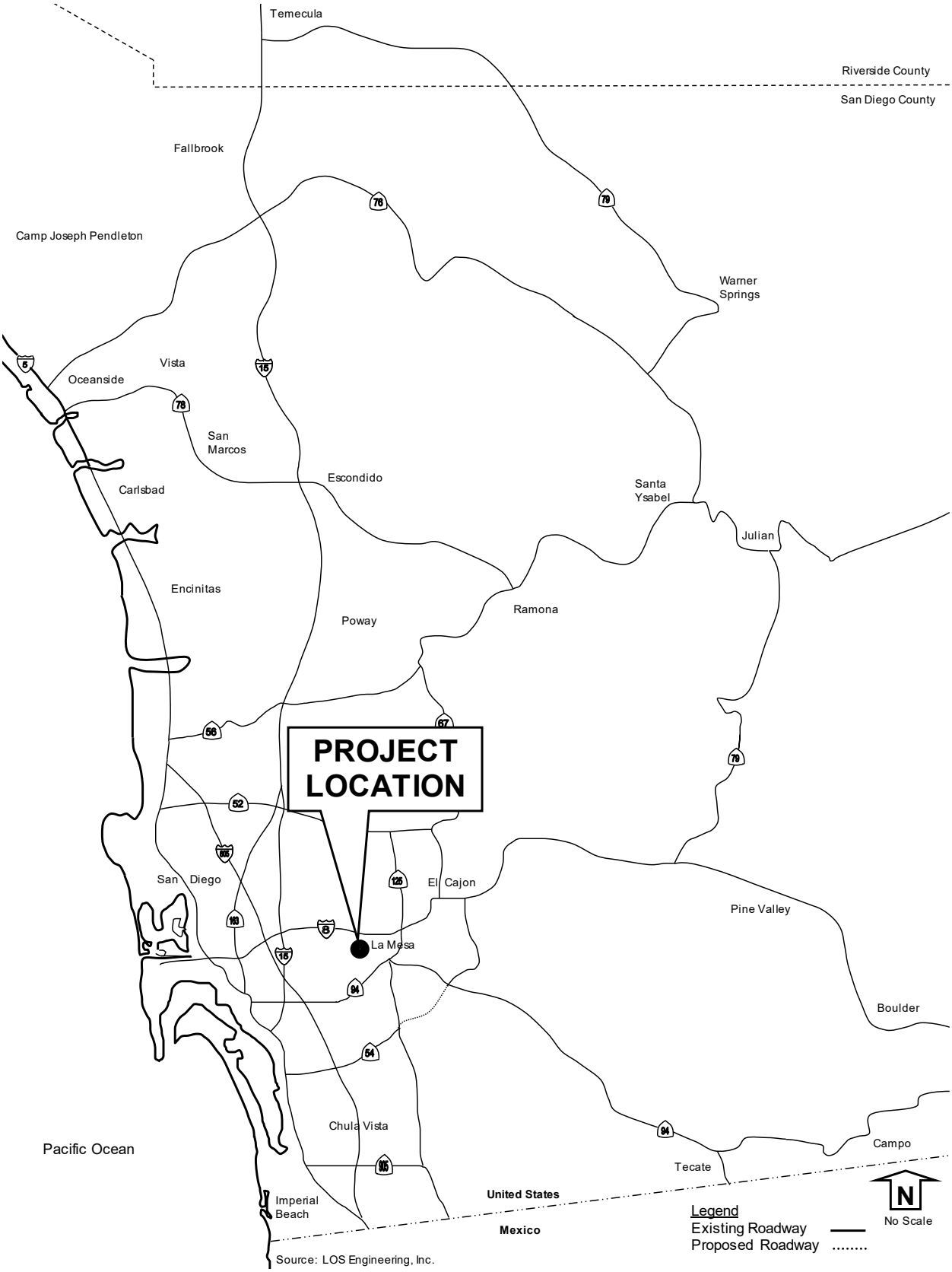
1.0 Introduction

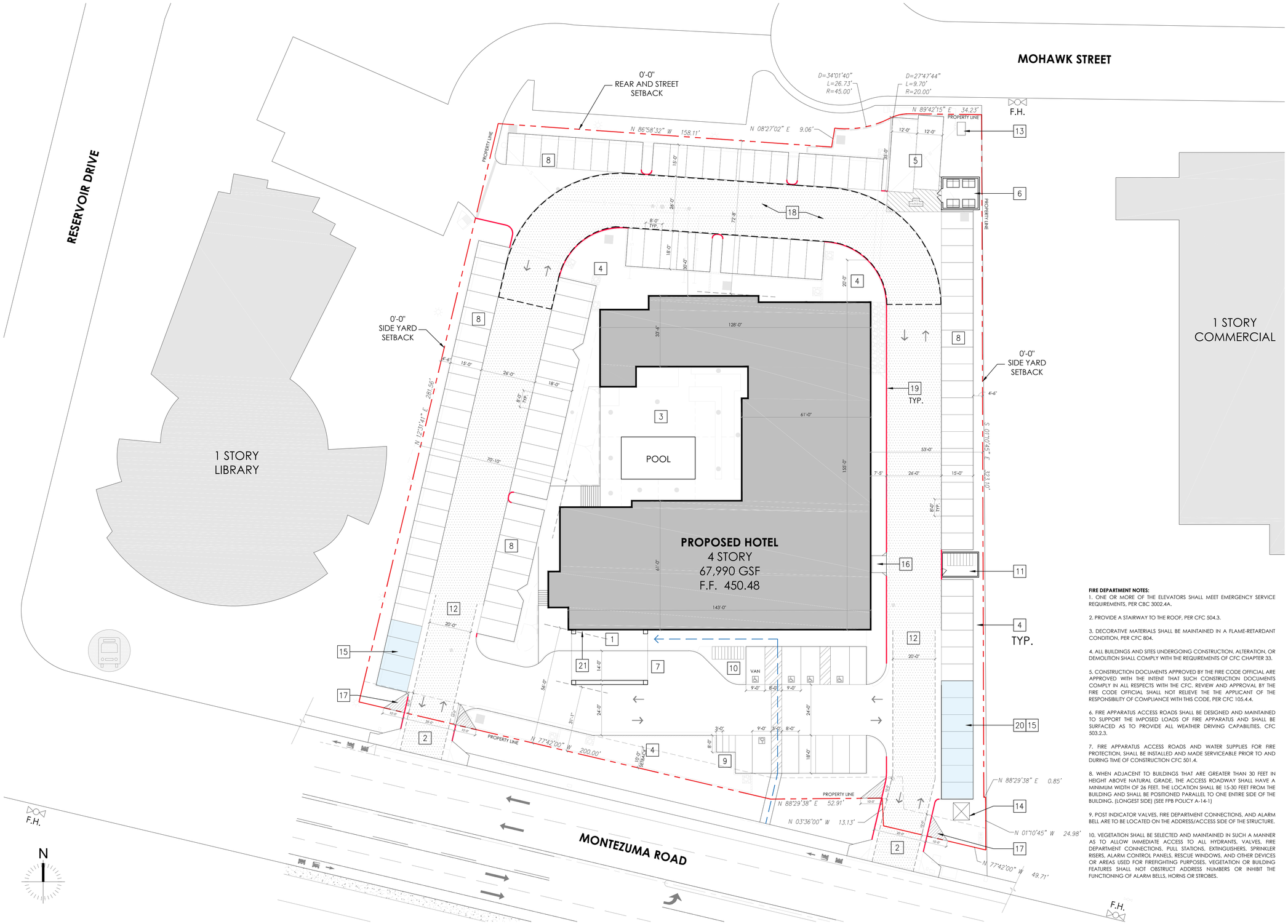
The project is a hotel with 125 rooms located at 6650 Montezuma Road in San Diego, California. The project site was previously occupied by the College Lutheran Church; however, the Church was being demolished during data collection, thus a trip credit was not applied in this analysis. The hotel is planned to open by the year 2020. The project requires an Amendment to the College Area Community Plan and a Rezone. The proposed amendment to the College Area Community Plan would change the current land use designation from *Low/Medium Density Residential [10 – 15 dwelling units per acre (du/ac)] and General Commercial Residential (75 – 110 du/ac)* to *General Commercial with Residential,* Medium-Medium High (15-45 DU/AC) to allow redevelopment of the project site with a maximum 125-room hotel. The proposed rezone would change the existing RM-1-1 zone to CV-1-1. The location of the project is shown in **Figure 1**. A site plan is shown following Figure 1 and is noted as **Figure 2**.

The purpose of this study is to analyze how the proposed project traffic will affect the study roadways and intersections during weekday daily, AM peak hour and PM peak hour conditions when the project is completed. This report includes the following chapters:

1.0 Introduction
2.0 Study Methodology
3.0 Existing Conditions
4.0 Project Description
5.0 Existing with Project Conditions
6.0 Near Term without Project Conditions
7.0 Near Term (Opening Day 2020) with Project Conditions
8.0 Horizon Year 2050 without Project Conditions
9.0 Horizon Year 2050 with Project Conditions
10.0 Summary of Potential Impacts
11.0 Parking
12.0 Transportation Demand Management
13.0 Construction Traffic
14.0 Conclusion
15.0 References and List of Preparers

Figure 1: Project Location





KEY NOTES

1. HOTEL ENTRANCE
2. VEHICULAR ENTRY
3. COURTYARD
4. LANDSCAPING (SEE LANDSCAPE PLANS)
5. 12' x 35' LOADING SPACE
6. TRASH / RECYCLING ENCLOSURE (245 SF) (244 SF MIN. AS REQ. PER M.C. 142.0830, TABLE 142-08C)
7. GUEST DROP OFF AREA
8. SURFACE PARKING
9. MOTORCYCLE PARKING (3 SPACES)
10. SHORT TERM BICYCLE PARKING (10 SPACES)
11. LONG TERM BICYCLE PARKING (8 SPACES)
12. FIRE LANE - 20' WIDE MIN., 26' WIDE ADJACENT TO BLDG.
13. WATER UTILITIES
14. ELECTRICAL TRANSFORMER
15. CLEAN AIR/ VANPOOL/ EV PARKING (11 TOTAL)
16. SERVICE ENTRANCE WITH CURB RAMP
17. VISIBILITY AREA (NO STRUCTURES OR SHRUBS ABV. 24" IN HEIGHT)
18. AERIAL ACCESS TO BUILDING
19. RED CURB (NO PARKING PER CITY OF S.D. FIRE DEPT. POLICY A-14-1)
20. ELECTRIC VEHICLE CHARGING (7 TOTAL) (CHARGING STATION AT 4 SPACES PLUS INFRASTRUCTURE FOR FUTURE INSTALLATION AT 3 SPACES)
21. BUILDING ADDRESS NUMBERS (PER SDMC 95.0209)

LEGEND

- PROPERTY LINE
- NO PARKING AREA
- ACCESS AISLE AREA
- ACCESSIBLE PARKING STALL
- VEHICULAR PARKING CIRCULATION
- STREET CIRCULATION
- F.H. — EXISTING FIRE HYDRANT
- FIRE LANE
- ACCESSIBLE PEDESTRIAN CONNECTION FROM PUBLIC STREET
- MTS BUS STOP (340' FROM PROPESED PROJECT FRONT DOOR)

FIRE DEPARTMENT NOTES:

1. ONE OR MORE OF THE ELEVATORS SHALL MEET EMERGENCY SERVICE REQUIREMENTS, PER CBC 3002.4A.

2. PROVIDE A STAIRWAY TO THE ROOF, PER CFC 504.3.

3. DECORATIVE MATERIALS SHALL BE MAINTAINED IN A FLAME-RETARDANT CONDITION, PER CFC 804.

4. ALL BUILDINGS AND SITES UNDERGOING CONSTRUCTION, ALTERATION, OR DEMOLITION SHALL COMPLY WITH THE REQUIREMENTS OF CFC CHAPTER 33.

5. CONSTRUCTION DOCUMENTS APPROVED BY THE FIRE CODE OFFICIAL ARE APPROVED WITH THE INTENT THAT SUCH CONSTRUCTION DOCUMENTS COMPLY IN ALL RESPECTS WITH THE CFC. REVIEW AND APPROVAL BY THE FIRE CODE OFFICIAL SHALL NOT RELIEVE THE THE APPLICANT OF THE RESPONSIBILITY OF COMPLIANCE WITH THIS CODE, PER CFC 105.4.4.

6. FIRE APPARATUS ACCESS ROADS SHALL BE DESIGNED AND MAINTAINED TO SUPPORT THE IMPOSED LOADS OF FIRE APPARATUS AND SHALL BE SURFACED AS TO PROVIDE ALL WEATHER DRIVING CAPABILITIES, CFC 503.2.3.

7. FIRE APPARATUS ACCESS ROADS AND WATER SUPPLIES FOR FIRE PROTECTION, SHALL BE INSTALLED AND MADE SERVICEABLE PRIOR TO AND DURING TIME OF CONSTRUCTION CFC 501.4.

8. WHEN ADJACENT TO BUILDINGS THAT ARE GREATER THAN 30 FEET IN HEIGHT ABOVE NATURAL GRADE, THE ACCESS ROADWAY SHALL HAVE A MINIMUM WIDTH OF 26 FEET. THE LOCATION SHALL BE 15-30 FEET FROM THE BUILDING AND SHALL BE POSITIONED PARALLEL TO ONE ENTIRE SIDE OF THE BUILDING. (LONGEST SIDE) (SEE FPB POLICY A-14-1)

9. POST INDICATOR VALVES, FIRE DEPARTMENT CONNECTIONS, AND ALARM BELL ARE TO BE LOCATED ON THE ADDRESS/ACCESS SIDE OF THE STRUCTURE.

10. VEGETATION SHALL BE SELECTED AND MAINTAINED IN SUCH A MANNER AS TO ALLOW IMMEDIATE ACCESS TO ALL HYDRANTS, VALVES, FIRE DEPARTMENT CONNECTIONS, PULL STATIONS, EXTINGUISHERS, SPRINKLER RISERS, ALARM CONTROL PANELS, RESCUE WINDOWS, AND OTHER DEVICES OR AREAS USED FOR FIREFIGHTING PURPOSES. VEGETATION OR BUILDING FEATURES SHALL NOT OBSTRUCT ADDRESS NUMBERS OR INHIBIT THE FUNCTIONING OF ALARM BELLS, HORNS OR STROBES.

PRELIMINARY DESIGN

SITE PLAN/ FIRE ACCESS PLAN

FIGURE 2

PROJECT: MONTEZUMA HOTEL / JOB NO: 3360 / DATE: SEPT 26 2018

MONTEZUMA ROAD, SAN DIEGO, CA

JWDA

2.0 Study Methodology

The parameters by which this transportation impact analysis was prepared included the determination of what transportation facilities are to be analyzed, the scenarios to be analyzed and the methods required for analysis. The analysis is based on the *2010 Highway Capacity Manual* (HCM) operations analysis using Level of Service (LOS) evaluation criteria and the threshold for determining an impact is based on the City of San Diego traffic impact significance thresholds.

2.1 Study Area Criteria

The project study area is generally determined by the City of San Diego *Traffic Impact Study Manual* (July 1998), which notes the study area is typically determined by the extent of 50 peak hour directional trips. The manual also states "At a minimum, any traffic impact study must address site access and adjacent intersections, plus the first major signalized intersection in each direction from the site. Beyond this minimum requirement, all known congested or potentially congested locations that may be impacted by the proposed development should be studied". The following intersections were included in this study based on the above criteria and based on coordination with City of San Diego staff:

1) Montezuma Road/Reservoir Drive (signalized)
2) Montezuma Road/Shared Project and Library Driveway (unsignalized)
3) Montezuma Road/Project East Driveway (unsignalized)
4) Montezuma Road/El Cajon Boulevard (signalized)
5) El Cajon Boulevard/67th Street (signalized)

The following street segments were also analyzed as part of this study:

1) Montezuma Road between Reservoir Drive and the Project Site
2) Montezuma Road between the Project Site and El Cajon Boulevard

Traffic counts were collected on Wednesday January 24, 2018 (one week after SDSU started their spring semester). The counts, SDSU calendar, and intersection signal timing sheets are included in **Appendix A.**

2.2 Scenario Criteria

The following study scenarios were based on coordination with City staff:

1) Existing without Project Conditions
2) Existing with Project Conditions
3) Near Term without Project Conditions
4) Near Term with Project (Opening Day 2020) Conditions
5) Horizon Year 2050 without Project Conditions
6) Horizon Year 2050 with Project Conditions

2.3 Traffic Analysis Criteria

The traffic analyses prepared for this study were based on the *2010 Highway Capacity Manual* (HCM) operations analysis using Level of Service (LOS) evaluation criteria. The operating conditions of the study intersections were measured using the HCM LOS designations, which ranges from A through F. LOS A represents the best operating condition and LOS F denotes the worst operating condition. For this traffic study, the intersections were analyzed using the City of San Diego criteria. The City of San Diego also requires a traffic study checklist, which is included in **Appendix B**. The LOS criteria for each roadway component are described below.

2.3.1 Intersections

The study intersections were analyzed based on the **operational analysis** outlined in the 2010 HCM. This process defines LOS in terms of **average control delay** per vehicle, which is measured in seconds. LOS at the intersections were calculated using the computer software program Synchro 10 (Trafficware Corporation). The HCM LOS for the range of delay by seconds for un-signalized and signalized intersections is described in **Table 1**.

TABLE 1: INTERSECTION LEVEL OF SERVICE DEFINITIONS (HCM 2010)

Level of Service	Un-Signalized (TWSC and AWSC) Control Delay (seconds/vehicle)	Signalized Control Delay (seconds/vehicle)
A	0-10	≤ 10
B	> 10-15	> 10-20
C	> 15-25	> 20-35
D	> 25-35	> 35-55
E	> 35-50	> 55-80
F	> 50	> 80

TWSC: Two Way Stop Control. AWSC: All Way Stop Control. Source: Highway Capacity Manual 2010 (exhibit 19-1 for two way stop control, exhibit 20-2 for all way stop control, and exhibit 18-4 for signalized intersections).

Please note the intersections of Montezuma Road/El Cajon Boulevard and El Cajon Boulevard/67th Street are clustered and controlled by a single controller. The HCM 2010 computation algorithm does not support clustered intersections; therefore, these two locations were analyzed using HCM 2000 LOS.

2.3.2 Street Segments

The street segments were analyzed based on the functional classification of the roadway using the City of San Diego *Average Daily Vehicle Trips* capacity lookup table. The roadway segment capacity and LOS standards used to analyze street segments are summarized in **Table 2**.

TABLE 2: STREET SEGMENT DAILY CAPACITY AND LOS (CITY OF SAN DIEGO)

Circulation Element Road Classification	LOS A	LOS B	LOS C	LOS D	LOS E
Expressway – 6 Lanes	<30,000	<42,000	<60,000	<70,000	<80,000
Prime Arterial – 6 Lanes	<25,000	<35,000	<50,000	<55,000	<60,000
Major Arterial – 6 Lanes	<20,000	<28,000	<40,000	<45,000	<50,000
Major Arterial – 4 Lanes	<15,000	<21,000	<30,000	<35,000	<40,000
Collector – 4 Lanes	<10,000	<14,000	<20,000	<25,000	<30,000
Collector (no Center Ln) – 4 Lanes Collector (with TWLTL) – 2 Lanes	<5,000	<7,000	<10,000	<13,000	<15,000
Collector – 2 Lanes (no fronting property)	<4,000	<5,500	<7,500	<9,000	<10,000
Collector – 2 Lanes (commercial-industrial fronting)	<2,500	<3,500	<5,000	<6,500	<8,000
Collector – 2 Lanes (multi-family)	<2,500	<3,500	<5,000	<6,500	<8,000
Sub-Collector – 2 Lanes (multi-family)			<2,200		

Source: City of San Diego *Traffic Impact Study Manual* July 1998, page 8.

2.4 Traffic Significance Criteria

A project is considered to have caused a significant impact if the new project traffic degrades a facility from acceptable LOS to unacceptable LOS or decreases the operations on the surrounding roadways by the City of San Diego defined thresholds as shown in **Table 3**.

TABLE 3: CITY OF SAN DIEGO TRAFFIC IMPACT SIGNIFICANCE THRESHOLDS

Level of Service with Project	Allowable Increase Due to Project Impacts[1]				
	Freeways	Roadway Segments		Intersections	Ramp Metering
	V/C	V/C	Speed (mph)	Delay (sec.)	Delay (min.)
E[2]	0.01	0.02	1.0	2.0	2.0[3]
F[2]	0.005	0.01	0.5	1.0	1.0[3]

Source: City of San Diego. Notes: [1] If a proposed project's traffic impact exceeds the values shown in the table, then the impacts are deemed "significant." The project applicant shall identify "feasible mitigations" to achieve LOS D or better. [2] The acceptable Level of Service (LOS) standard for roadways and intersections in San Diego is LOS D. However, for undeveloped locations, the goal is to achieve a LOS C. [3] The impact is only considered significant if the total delay exceeds 15 minutes AND freeway is operating at LOS E/F. Delay measured in seconds. V/C = Volume to Capacity Ratio (capacity at LOS E should be used). Speed = Arterial speed measured in miles per hour for CMP analyses.

If a significant impact is calculated due to the addition of project traffic, then feasible mitigation is required to reduce the facility to the pre-project conditions or better.

2.5 Congestion Management Program Criteria

The San Diego Association of Governments (SANDAG) has the following statement on their website regarding the Congestion Management Program (CMP):

> "In October 2009, the San Diego region elected to be exempt from the State CMP and, since this decision, SANDAG has been abiding by 23 CFR 450.320 to ensure the region's continued compliance with the federal congestion management process."

3.0 Existing Conditions

This section describes the study area street system, daily volumes, and LOS.

3.1 Existing Street System

In the vicinity of the project, the following roadway was analyzed as part of this study:

Montezuma Road from Reservoir Drive to El Cajon Boulevard is classified as a 4-Lane Major in the *College Area Community Plan* (excerpts included in **Appendix C**). A functional capacity of 30,000 ADT (LOS E) was applied to this study segment of Montezuma Road to match the existing conditions. Montezuma Road from Reservoir Drive to the shared Library/Project driveway is constructed as a 4 lane roadway (2 travel lanes and bike lanes in each direction) and a center Two Way Left Turn Lane (TWLTL). Between the shared Library/Project driveway and El Cajon Boulevard, the roadway is constructed with 4 lanes (2 travel lanes and red curb in each direction), a center TWLTL for approximately 130 feet that becomes a raised median to El Cajon Boulevard, an eastbound striped bike lane that extend easterly from the shared Library/Project driveway for approximately 100 feet and then there is no bike lane delineation for the remainder of the roadway segment to El Cajon Blvd, and no delineation (striping nor signage) of a westbound bike lane. On-street parking is prohibited on both sides of the roadway (red curb) and the posted speed limit is 35 Miles per Hour (MPH).

3.2 Multi-Modal Transportation

This section describes the existing multi-modal transportation element near the project site.

3.2.1 Transit

Metropolitan Transit System (MTS) provides bus service as Route 14 on Montezuma Road along the project frontage and as Route 1 on El Cajon Boulevard near the project site. MTS Bus Route 14 along Montezuma Road has a bus stop for eastbound service approximately 725 from the project's front door, a bus stop for westbound service approximately 340 feet from the project's front door, with scheduled service headways of approximately 60 minutes on weekdays with no service noted for Saturday or Sunday. MTS Bus Route 1 along El Cajon Blvd has a bus stop for eastbound service approximately 690 feet from the project's front door, a bus stop for westbound service approximately 970 feet from the project's front door, with scheduled service headways of approximately 15 minutes on weekdays and service headways of approximately 30 minutes on Saturday and Sunday. A route map and specific service times and frequency are outlined in the bus schedule included in **Appendix D**.

3.2.2 Bicycle

The City of San Diego *Bicycle Master Plan*, December 2013 shows a Class II bike route along Montezuma Road between Reservoir Drive and El Cajon Boulevard. The *College Area Community*

Plan shows Class II bike lanes on Montezuma Road between Reservoir Drive and El Cajon Boulevard.

Class II bike lanes were observed on Montezuma Road between Reservoir Drive and the Project shared Library driveway (on the southside of Montezuma Road there is approximately 175 feet from Reservoir Dr to the shared Library driveway and then approximately 100 feet east of the shared Library driveway while the northside of Montezuma Road has approximately 160 feet of striped bike lane). The short segment of Class II bike lane that is striped on the south side of Montezuma Road extends about 100 feet east of the shared Library driveway while the remaining roadway easterly to El Cajon Blvd does not have striping to delineate a Class II bike lane. Class II bike lanes are striped on both sides between Reservoir Drive and College Avenue on Montezuma Road. Excerpts from the City of San Diego *Bicycle Master Plan Update* and the *College Area Community Plan* are included in **Appendix E**.

3.2.3 Pedestrian

Contiguous sidewalks (approximately 5 feet in width) exist on both sides of Montezuma Road between Reservoir Drive and El Cajon Boulevard.

3.2.4 Multi-Modal Summary Map

The existing roadway conditions along with the bus route and bus stops are shown in **Figure 3**.

3.3 Existing Traffic Volumes and LOS Analysis

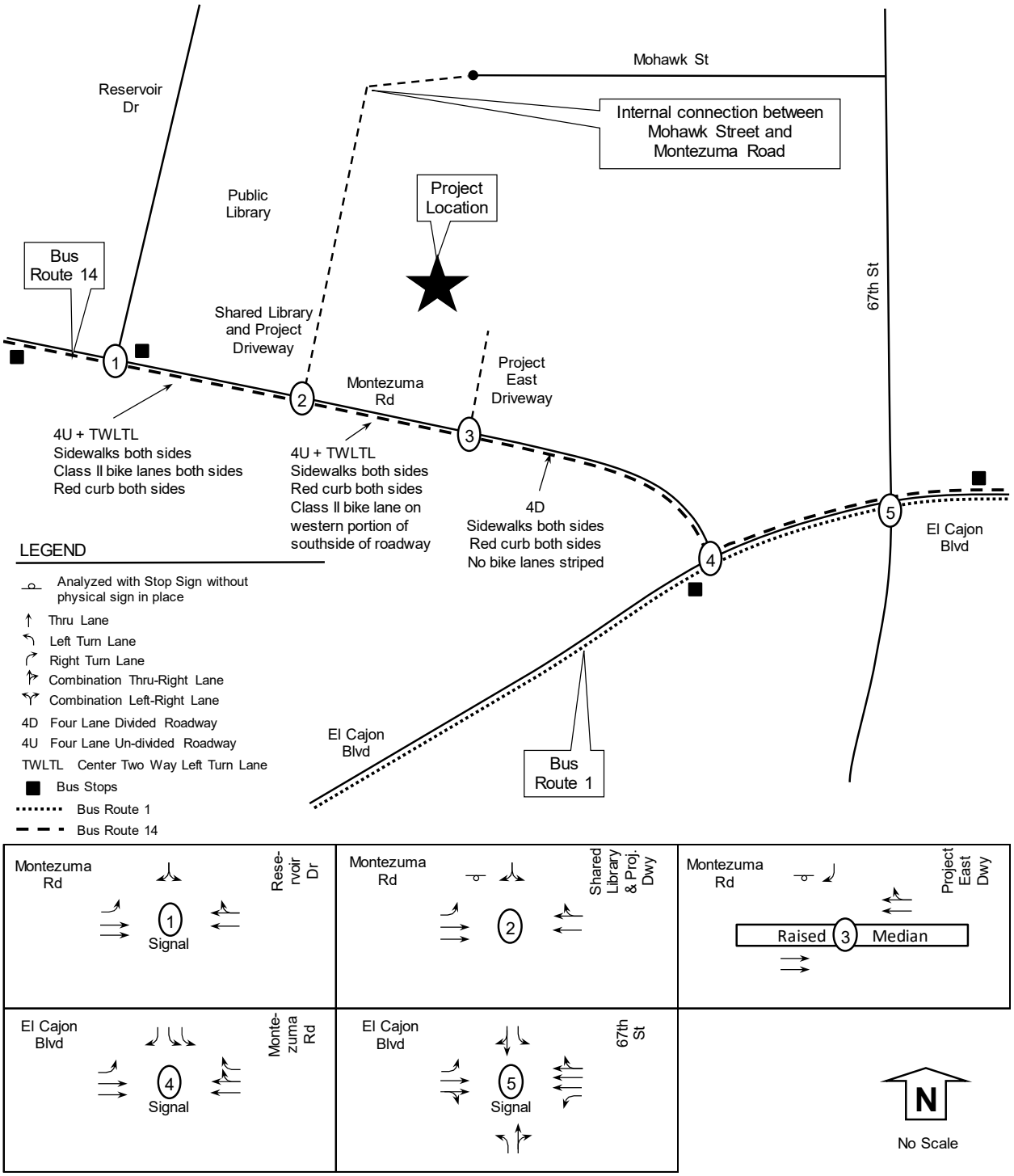
Intersection counts were collected between 7:00 AM to 9:00 AM for the AM commuter period and from 4:00 PM to 6:00 PM for the PM commuter period on Wednesday, 1/24/18 (one week after SDSU started their spring semester on 1/17/18). The count dates are noted in parentheses for the study intersections below:

1) Montezuma Road/Reservoir Drive (Wednesday, 1/24/2018)
2) Montezuma Road/Shared Project and Library Driveway (Wednesday, 1/24/2018; the Library was open and Library patrons were using the shared driveway when data was collected)
3) Montezuma Road/Project East Driveway (from adjacent driveway count, <u>since the driveway does not currently exist</u>)
4) Montezuma Road/El Cajon Boulevard (Wednesday, 1/24/2018)
5) El Cajon Boulevard/67th Street (Wednesday, 1/24/2018)

The following street segment volumes were also collected on Wednesday, 1/24/18:

1) Montezuma Road between Reservoir Drive and the Project
2) Montezuma Road between the Project and El Cajon Boulevard

Figure 3: Existing Multi-Modal Conditions



The existing weekday daily, and peak hour volumes are shown in **Figure 4**. The LOS calculated for the intersections and roadway segments are included in **Tables 4 and 5**. Intersection LOS calculations are included in **Appendix F**.

TABLE 4: EXISTING INTERSECTION LEVEL OF SERVICE

Intersection and (Analysis)[1]	Movement	Study Period	Existing Delay[2]	Existing LOS[3]
1) Montezuma Rd	All	AM	9.2	A
at Reservoir Dr (S)	All	PM	8.2	A
2) Montezuma Rd	EB L	AM	0.1	A
at shared Project	SB LR	AM	12.1	B
and Library Dwy (U)	EB L	PM	0.1	A
	SB LR	PM	10.5	B
3) Montezuma Rd	WB R	AM	0.0	A
at East Project	SB R	AM	0.0	A
Dwy (U)	WB R	PM	0.0	A
	SB R	PM	0.0	A
4) Montezuma Rd	All	AM	13.7	B
at El Cajon Blvd (S)	All	PM	20.1	C
5) El Cajon Blvd	All	AM	25.0	C
at 67th St (S)	All	PM	16.9	B

Notes: 1) Intersection Analysis - (S) Signalized, (U) Unsignalized. 2) Delay - HCM Average Control Delay in seconds. 3) LOS: Level of Service.

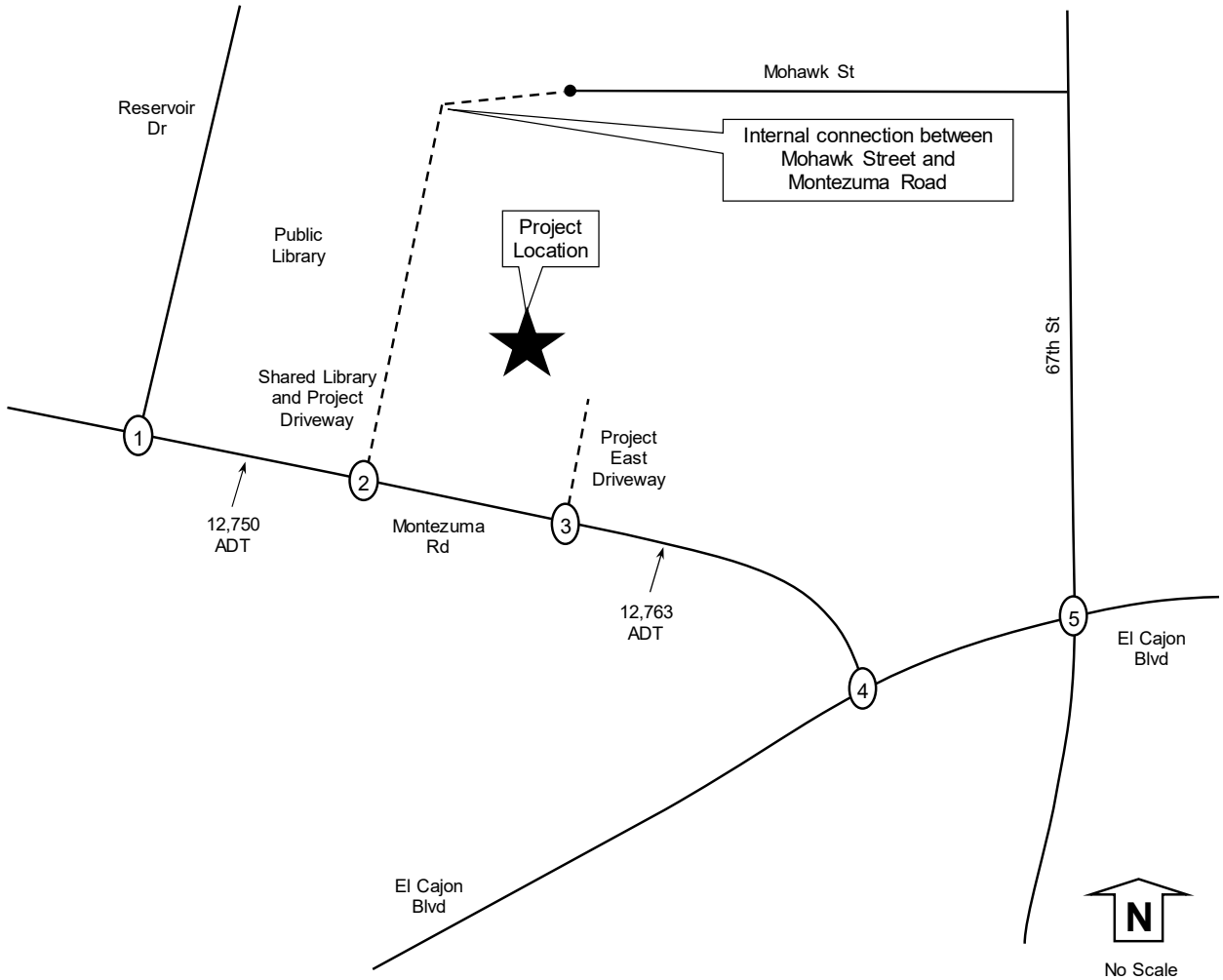
TABLE 5: EXISTING SEGMENT VOLUMES AND LEVEL OF SERVICE

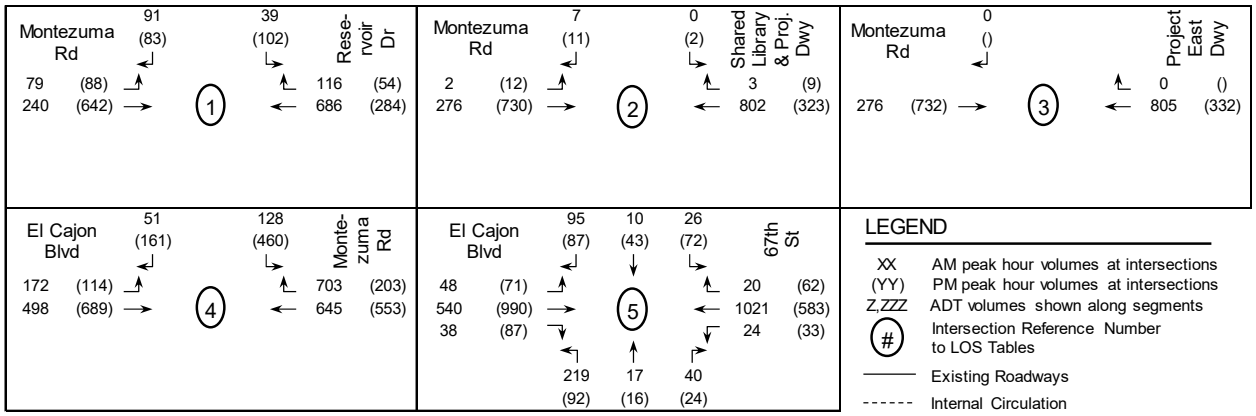
Segment	Mobility Classification (as built)	LOS E Capacity	Existing Daily Volume	Existing V/C	Existing LOS
Montezuma Road					
Reservoir Dr to Project Driveway	4 Lane Major (4U+TWLTL)	30,000	12,750	0.425	B
Project Driveway to El Cajon Blvd	4 Lane Major (4U)	30,000	12,763	0.425	B

Notes: 4U+TWLTL = 4 un-divided lanes + two way left turn lane. Daily volume is a 24 hour volume. LOS: Level of Service. V/C: Volume to Capacity Ratio.

Under existing conditions, all of the study intersections and segments were calculated to operate at LOS C or better.

Figure 4: Existing Volumes





4.0 Project Description

The project is a hotel with 125 rooms located at 6650 Montezuma Road in San Diego, California. The project site was previously occupied by the College Lutheran Church; however, the Church was being demolished during data collection, thus a trip credit was not applied in this analysis. The hotel is planned to open by the year 2020.

The project requires an Amendment to the College Area Community Plan and a Rezone. The proposed amendment to the College Area Community Plan would change the current land use designation from *Low/Medium Density Residential [10 – 15 dwelling units per acre (du/ac)] and General Commercial Residential (75 – 110 du/ac)* to *General Commercial with Residential,* Medium-Medium High (15-45 DU/AC) to allow redevelopment of the project site with a maximum 125-room hotel. The proposed rezone would change the existing RM-1-1 zone to CV-1-1.

4.1 Project Trip Generation

The project trip generation for the project was calculated using trip rates from the City of San Diego *Trip Generation Manual*, May 2003. The trip generation for the hotel is based on a motel rate of 9 trips/room because the proposed hotel will not have convention facilities or restaurant; instead the hotel may have a small board room and breakfast bar for guest use only; therefore, the motel rate correctly represents the project. Using the motel rate, the project is calculated to generate 1,125 ADT with 90 AM peak hour trips (36 inbound and 54 outbound) and 102 PM peak hour trips (41 inbound and 61 outbound) as shown in **Table 6**.

TABLE 6: PROJECT TRIP GENERATION

Proposed							AM				PM	
Land Use	Rate	Size & Units	ADT	%	Split		IN	OUT	%	Split	IN	OUT
Motel	9 /Room	125 Rooms	**1,125**	8%	0.4	0.6	**36**	**54**	9%	0.4 0.6	**41**	**61**

Source: City of San Diego *Trip Generation Manual*, May 2003. ADT-Average Daily Traffic; Split-percent inbound and outbound.

4.2 Project Access

Project access is from two driveways on Montezuma Road to which one driveway is shared with the College-Rolando Library immediately west of the project site. The project site shares on-site circulation with the adjacent Library. The Library has a connection with Mohawk Street. Most if not all of the Project traffic is anticipated to use Montezuma Road to access the site; however, there is a chance that some project traffic may use the Library's driveway on Mohawk Street to access the Project. To be conservative, 100% of the hotel project traffic is anticipated to use Montezuma Road.

4.3 Project Trip Distribution and Assignment

The distribution was based on surrounding traffic patterns, proximity of San Diego State University, and coordination with City engineering staff. The project distribution is shown in **Figure 5** while the trip assignment is shown in **Figure 6.**

Figure 5: Project Distribution

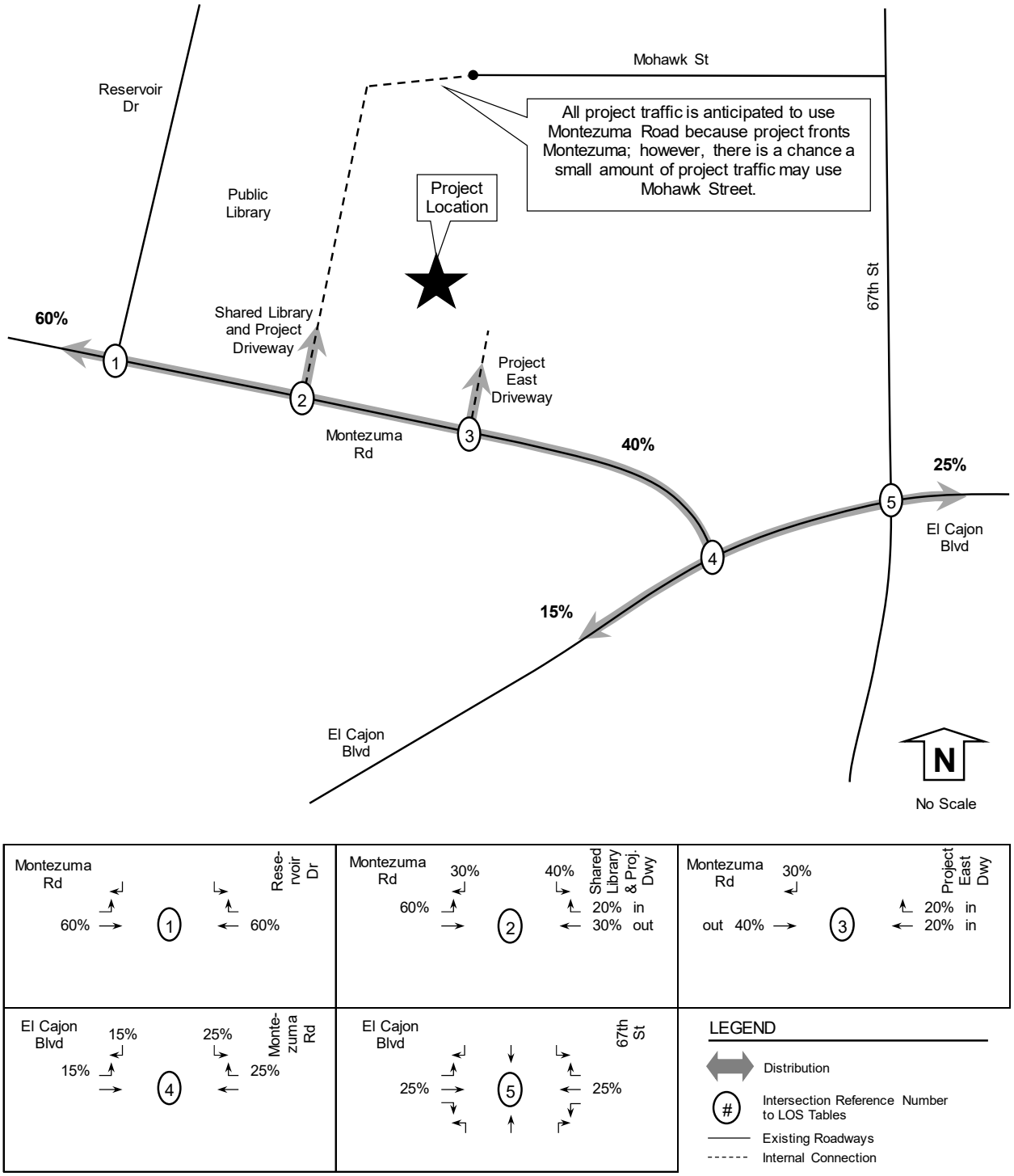
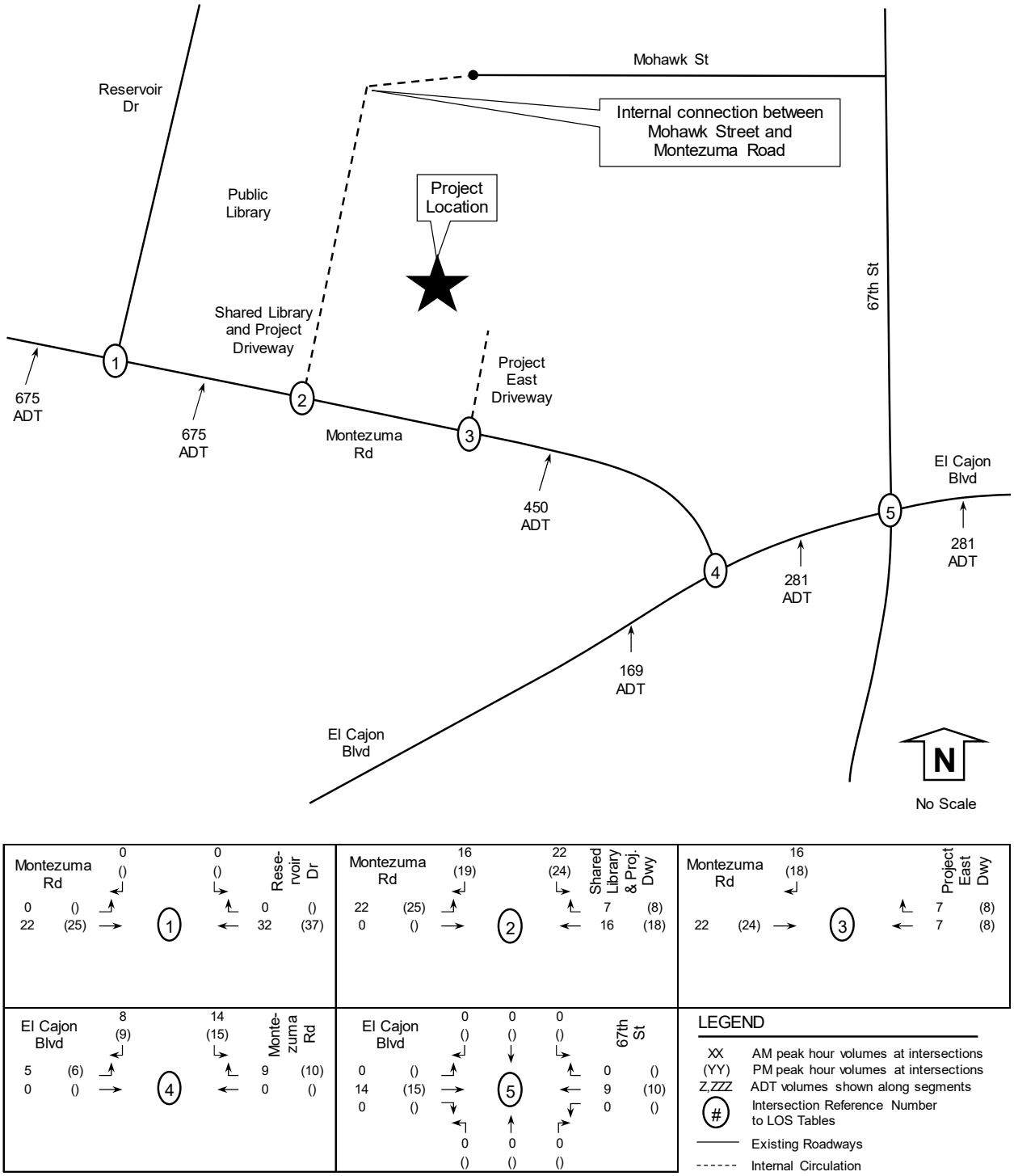


Figure 6: Project Assignment



5.0 Existing with Project Conditions

This scenario accounts for the addition of project traffic onto existing conditions. The traffic volumes are shown in **Figure 7.** The LOS calculated for the study intersections and segments are included in **Tables 7 and 8**. Intersection LOS calculations are included in **Appendix G**.

TABLE 7: EXISTING WITH PROJECT INTERSECTION LEVEL OF SERVICE

Intersection and (Analysis)[1]	Movement	Study Period	Existing Delay[2]	Existing LOS[3]	Existing + Project Delay[2]	Existing + Project LOS[3]	Delta[4]	Direct Impact?[5]
1) Montezuma Rd	All	AM	9.2	A	9.2	A	0.0	No
at Reservoir Dr (S)	All	PM	8.2	A	8.3	A	0.1	No
2) Montezuma Rd	EB L	AM	0.1	A	0.8	A	0.7	No
at shared Project	SB LR	AM	12.1	B	17.4	C	5.3	No
and Library Dwy (U)	EB L	PM	0.1	A	0.4	A	0.3	No
	SB LR	PM	10.5	B	13.2	B	2.7	No
3) Montezuma Rd	WB R	AM	DNE	NA	0.0	A	0.0	No
at East Project	SB R	AM	DNE	NA	12.5	B	12.5	No
Dwy (U)	WB R	PM	DNE	NA	0.0	A	0.0	No
	SB R	PM	DNE	NA	10.3	B	10.3	No
4) Montezuma Rd	All	AM	13.7	B	14.3	B	0.6	No
at El Cajon Blvd (S)	All	PM	20.1	C	20.5	C	0.4	No
5) El Cajon Blvd	All	AM	25.0	C	25.2	C	0.2	No
at 67th St (S)	All	PM	16.9	B	17.0	B	0.1	No

Notes: 1) Intersection Analysis - (S) Signalized, (U) Unsignalized. 2) Delay - HCM Average Control Delay in seconds. 3) LOS: Level of Service. 4) Delta is the increase in delay from project. 5) Direct Impact if project traffic exceeds threshold.

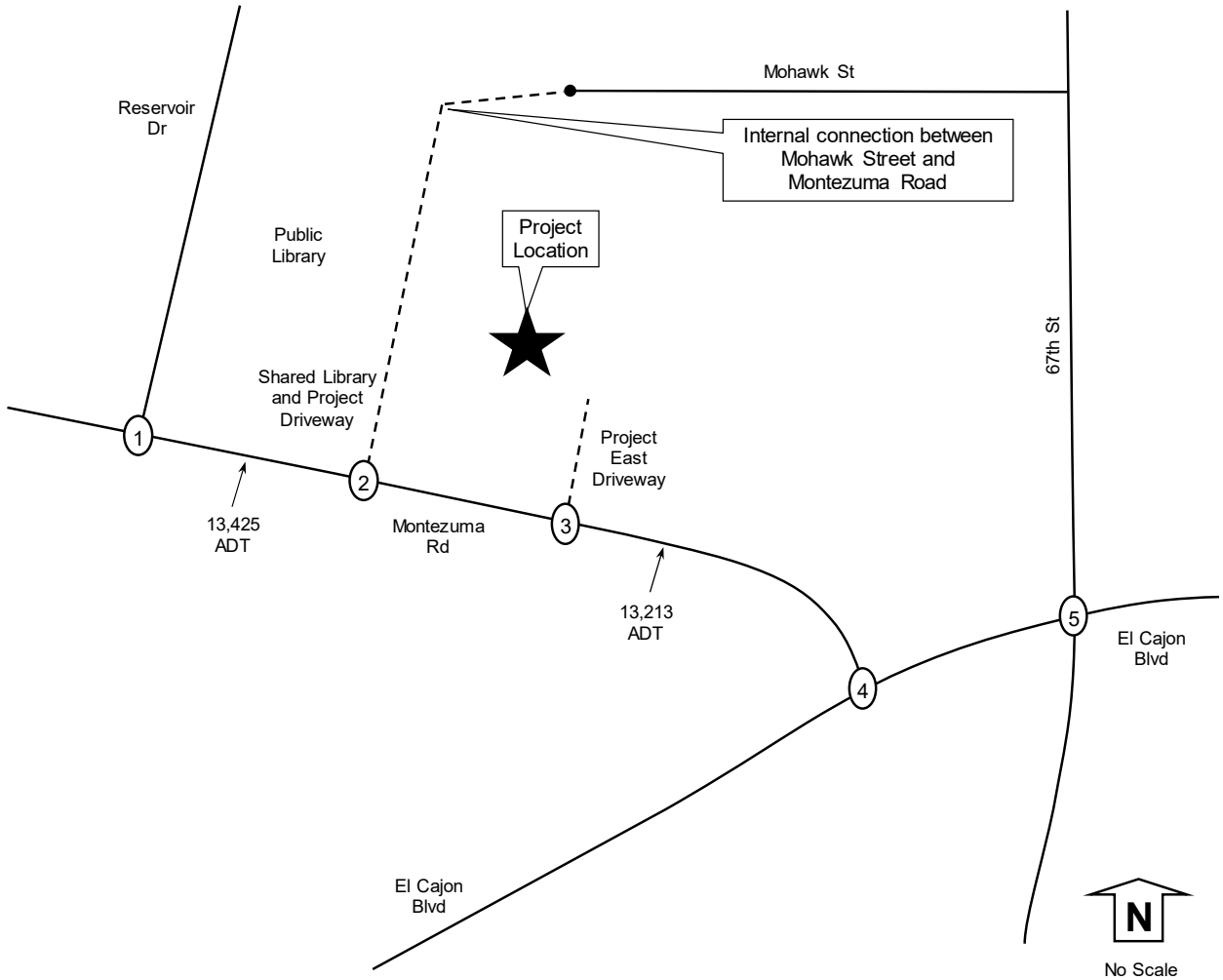
TABLE 8: EXISTING WITH PROJECT SEGMENT VOLUMES AND LEVEL OF SERVICE

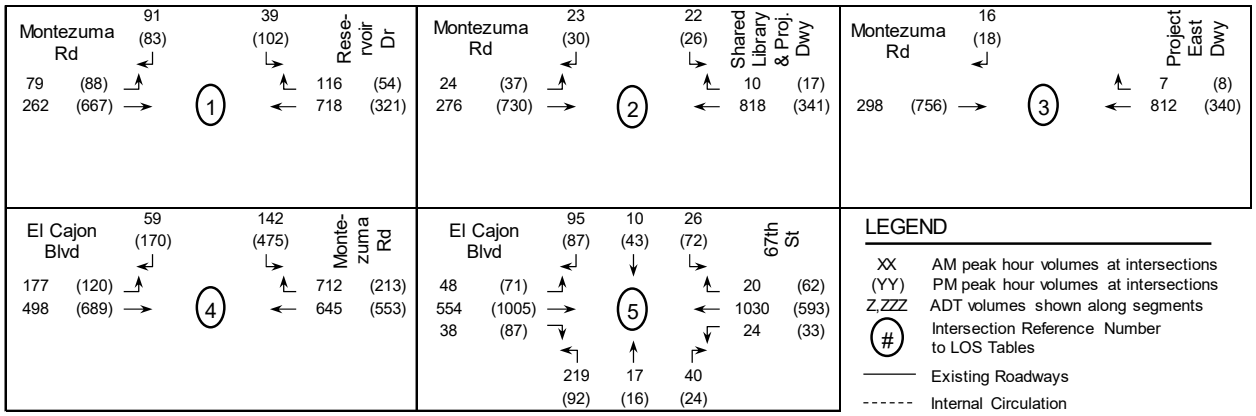
Segment	Mobility Classification (as built)	LOS E Capacity	Existing Daily Volume	Existing V/C	Existing LOS	Project Daily Volume	Existing + Project Daily Volume	Existing + Project V/C	Existing + Project LOS	Change in V/C	Direct Impact?
Montezuma Road											
Reservoir Dr to Project Driveway	4 Lane Major (4U+TWLTL)	30,000	12,750	0.425	B	675	13,425	0.448	B	0.023	No
Project Driveway to El Cajon Blvd	4 Lane Major (4U)	30,000	12,763	0.425	B	450	13,213	0.440	B	0.015	No

Notes: 4U+TWLTL = 4 un-divided lanes + two way left turn lane. Daily volume is a 24 hour volume. LOS: Level of Service. V/C: Volume to Capacity Ratio.

Under existing with project conditions, all of the study intersections and segments were calculated to operate at LOS C or better. There are no significant direct impacts because the addition of project traffic does not degrade a facility from acceptable LOS to unacceptable LOS.

Figure 7: Existing with Project Volumes





6.0 Near Term without Project Conditions

Near term without project conditions describe the anticipated roadway operations for opening day anticipated to be year 2020. City of San Diego engineering staff were consulted to determine if any "deemed complete" cumulative project applications were near the project site that may add traffic to the study area. Staff identified the San Diego State University expansion plans to which near term cumulative volumes were obtained from the SDSU website (cumulative project details included in **Appendix H**). Additionally, a growth factor was applied to existing volumes to augment near term conditions.

The growth factor was calculated based on the ADT increase expected between year 2018 and year 2050 on Montezuma Road. The Series 12 year 2050 volumes for Montezuma Road are reported by SANDAG at 15,600 ADT while Series 13 year 2050 volumes are 10,700 ADT. Using the higher Series 12 volume, a growth factor of 18.3% was calculated between year 2018 and year 2050 (SANDAG ADTs and growth calculation included in **Appendix I**). For near term condition, the 32 year growth factor of 18.3% translates to approximately 0.6% per year (18.3% divided by 32 years). For the near term year 2020 conditions, a growth factor of 1.2% was applied to existing volumes (2 years times 0.6% per year). The cumulative volumes along with the 1.2% growth factor are shown in **Figure 8**. The near term without project volumes are shown in **Figure 9**.

The LOS calculated for the study intersections and segments are included in **Tables 9 and 10**. Intersection LOS calculations are included in **Appendix J**.

TABLE 9: NEAR TERM WITHOUT PROJECT INTERSECTION LEVEL OF SERVICE

Intersection and (Analysis)[1]	Movement	Peak Hour	Near Term Delay[2]	Near Term LOS[3]
1) Montezuma Rd	All	AM	9.3	A
at Reservoir Dr (S)	All	PM	8.2	A
2) Montezuma Rd	EB L	AM	0.1	A
at shared Project	SB LR	AM	12.2	B
and Library Dwy (U)	EB L	PM	0.1	A
	SB LR	PM	10.6	B
3) Montezuma Rd	WB R	AM	0.0	A
at East Project	SB R	AM	0.0	A
Dwy (U)	WB R	PM	0.0	A
	SB R	PM	0.0	A
4) Montezuma Rd	All	AM	14.1	B
at El Cajon Blvd (S)	All	PM	20.5	C
5) El Cajon Blvd	All	AM	25.5	C
at 67th St (S)	All	PM	17.1	B

Notes: 1) Intersection Analysis - (S) Signalized, (U) Unsignalized. 2) Delay - HCM Average Control Delay in seconds. 3) LOS: Level of Service.

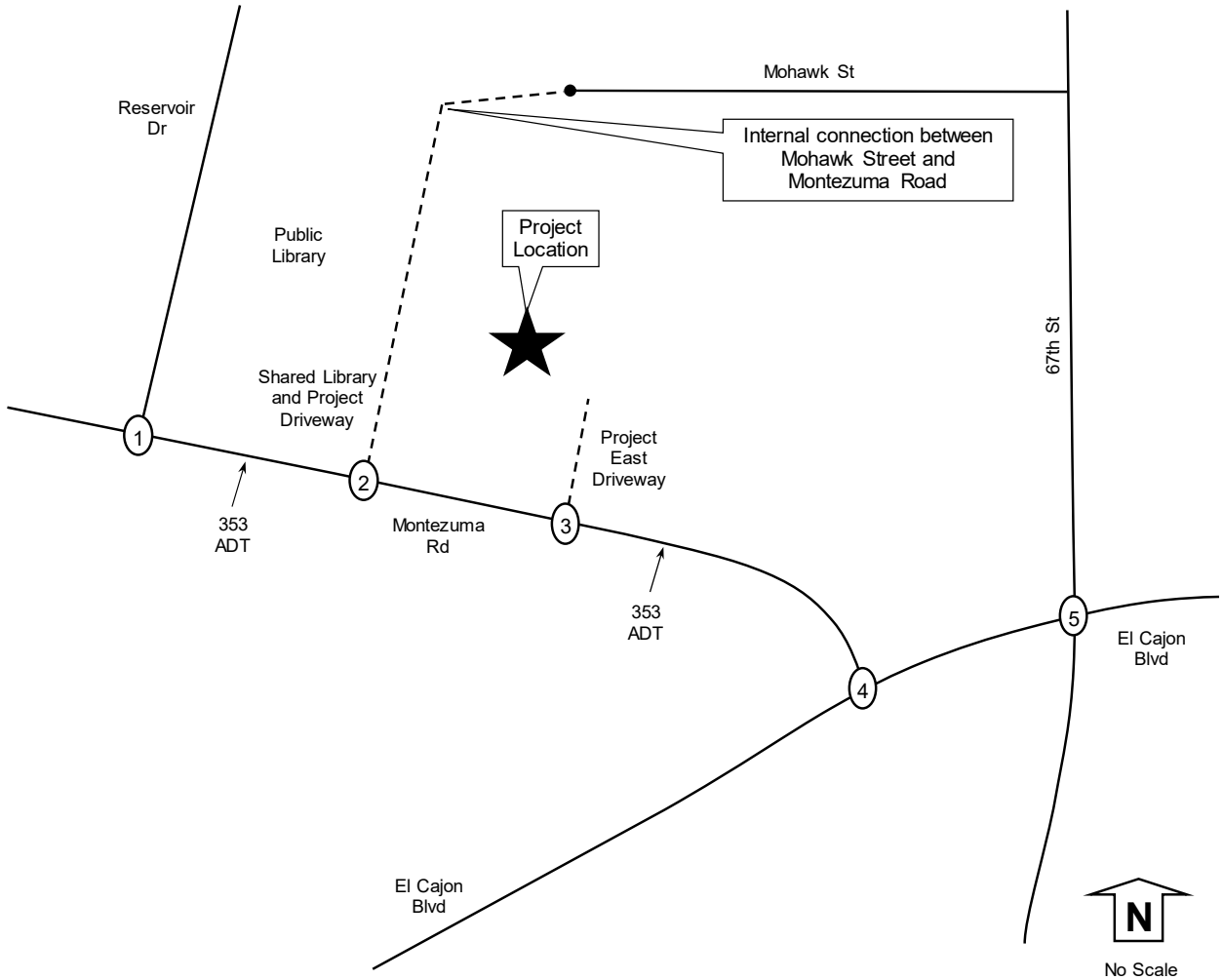
TABLE 10: NEAR TERM WITHOUT PROJECT SEGMENT VOLUMES AND LEVEL OF SERVICE

Daily	Mobility Classification (as built)	LOS E Capacity	Near Term Daily Volume	Near Term V/C	Near Term LOS
Montezuma Road					
Reservoir Dr to Project Driveway	4 Lane Major (4U+TWLTL)	30,000	13,103	0.437	B
Project Driveway to El Cajon Blvd	4 Lane Major (4U)	30,000	13,116	0.437	B

Notes: 4U+TWLTL = 4 un-divided lanes + two way left turn lane. Daily volume is a 24 hour volume. LOS: Level of Service. V/C: Volume to Capacity Ratio.

Under near term conditions, all of the study intersections and segments were calculated to operate at LOS C or better.

Figure 8: Cumulative with Growth Factor Volumes



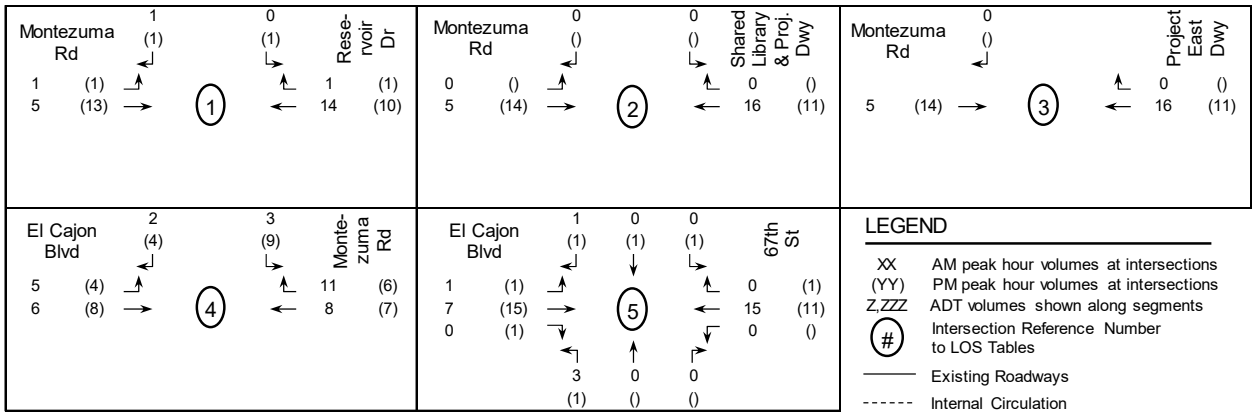
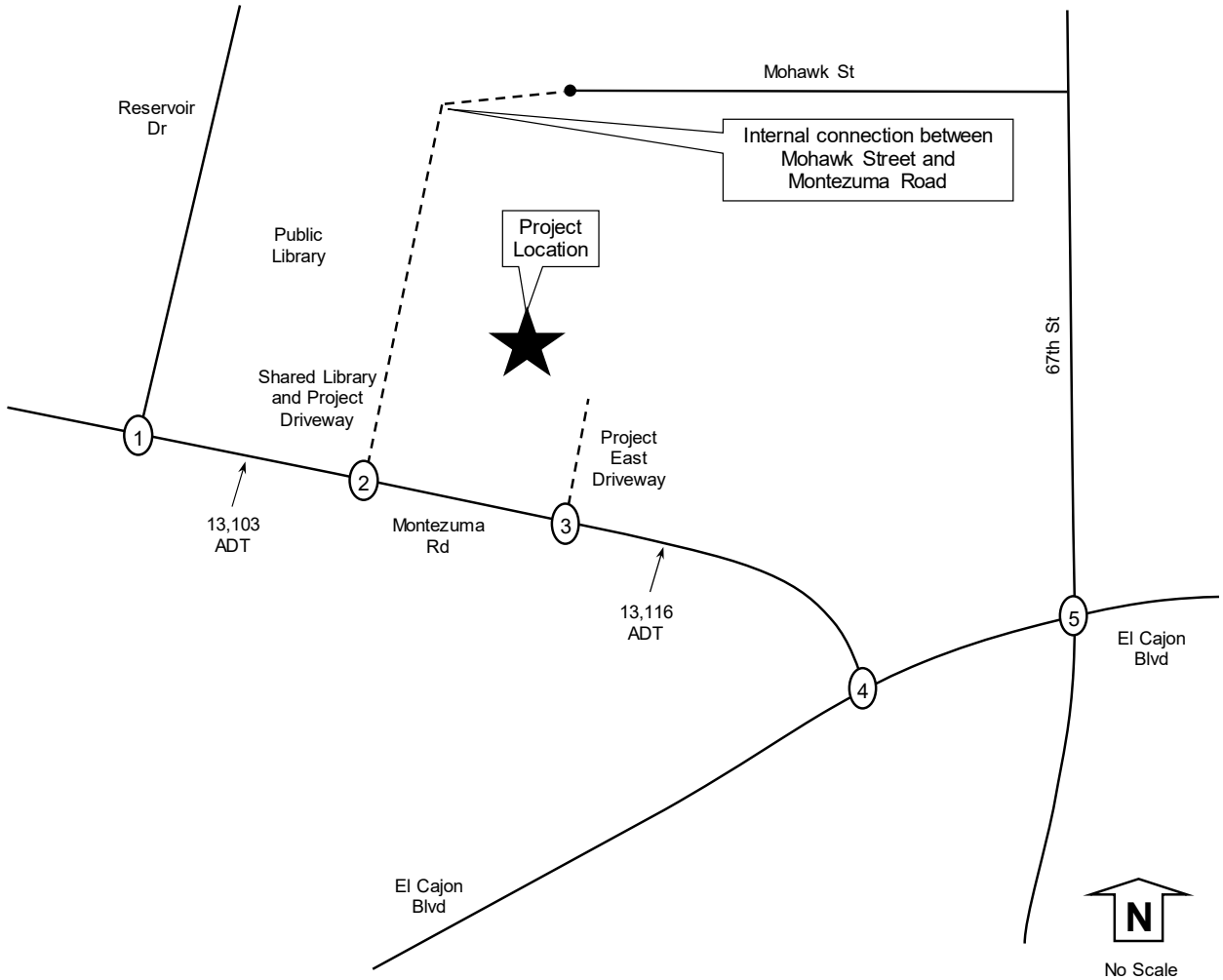
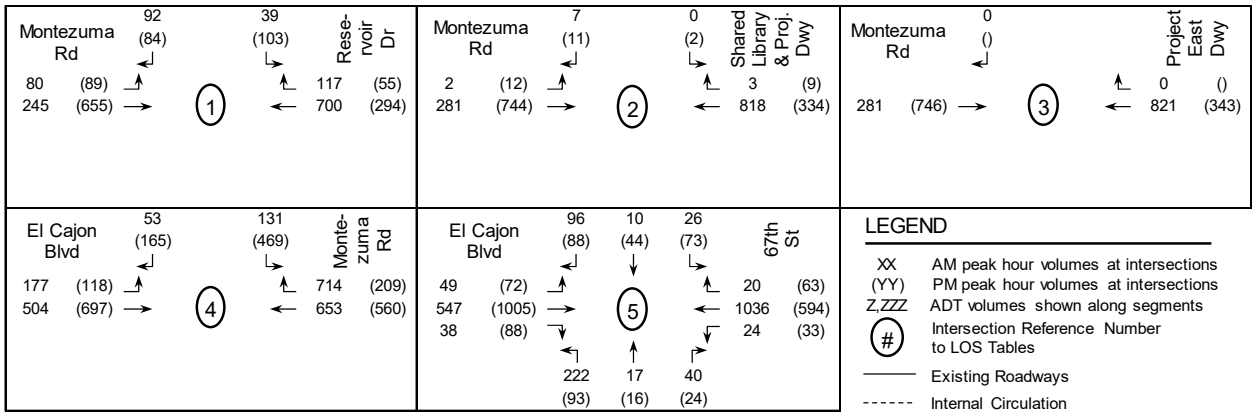


Figure 9: Near Term without Project Volumes





7.0 Near Term with Project Conditions

The near term with project conditions describe the anticipated roadway operations during opening day of the project. Near term with project traffic volumes are shown in **Figure 10.** The LOS calculated for the study intersections and segments are included in **Tables 11 and 12**. Intersection LOS calculations are included in **Appendix K**.

TABLE 11: NEAR TERM WITH PROJECT INTERSECTION LEVEL OF SERVICE

Intersection and	Movement	Peak	Near Term		Near Term + Project			
(Analysis)[1]		Hour	Delay[2]	LOS[3]	Delay[2]	LOS[3]	Delta[4]	Direct Impact[5]
1) Montezuma Rd	All	AM	9.3	A	9.3	A	0.0	No
at Reservoir Dr (S)	All	PM	8.2	A	8.4	A	0.2	No
2) Montezuma Rd	EB L	AM	0.1	A	0.8	A	0.7	No
at shared Project	SB LR	AM	12.2	B	17.7	C	5.5	No
and Library Dwy (U)	EB L	PM	0.1	A	0.4	A	0.3	No
	SB LR	PM	10.6	B	13.4	B	2.8	No
3) Montezuma Rd	WB R	AM	0.0	A	0.0	A	0.0	No
at East Project	SB R	AM	0.0	A	12.6	B	12.6	No
Dwy (U)	WB R	PM	0.0	A	0.0	A	0.0	No
	SB R	PM	0.0	A	10.4	B	10.4	No
4) Montezuma Rd	All	AM	14.1	B	14.6	B	0.5	No
at El Cajon Blvd (S)	All	PM	20.5	C	20.8	C	0.3	No
5) El Cajon Blvd	All	AM	25.5	C	25.7	C	0.2	No
at 67th St (S)	All	PM	17.1	B	17.1	B	0.0	No

Notes: 1) Intersection Analysis - (S) Signalized, (U) Unsignalized. 2) Delay - HCM Average Control Delay in seconds. 3) LOS: Level of Service. 4) Delta is the increase in delay from project. 5) Direct Impact if project traffic exceeds threshold.

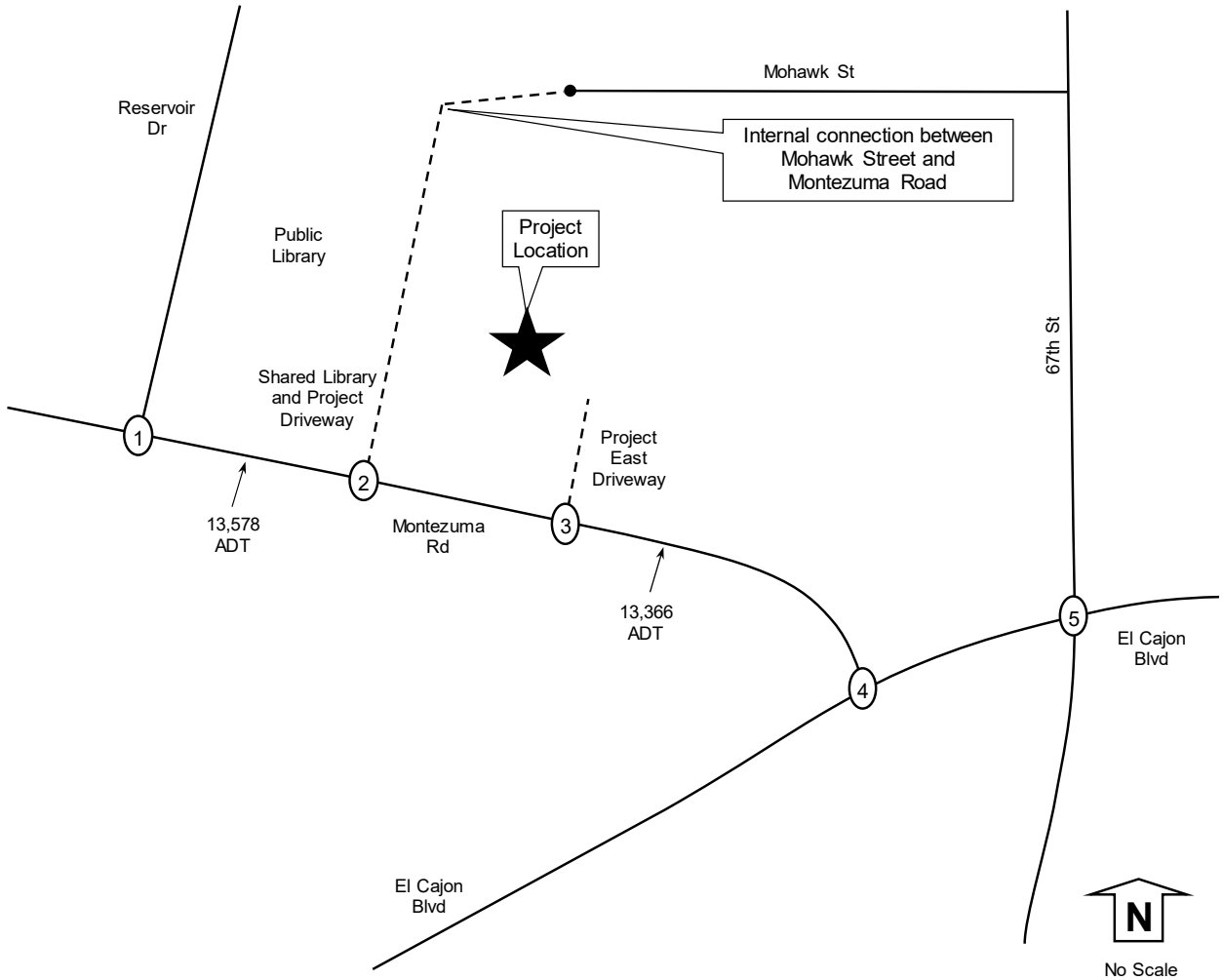
TABLE 12: NEAR TERM WITH PROJECT SEGMENT VOLUMES AND LEVEL OF SERVICE

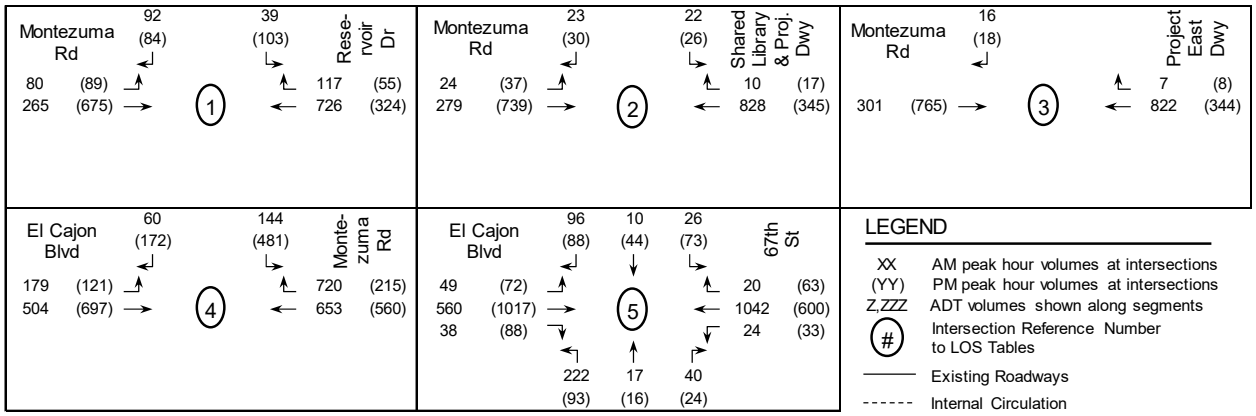
Segment	Mobility Classification (as built)	LOS E Capacity	Near Term Daily Volume	Near Term V/C	Near Term LOS	Project Daily Volume	Near Term + Project Daily Volume	Near Term + Project V/C	Near Term + Project LOS	Change in V/C	Direct Impact?
Montezuma Road											
Reservoir Dr to Project Driveway	4 Lane Major (4U+TWLTL)	30,000	13,103	0.437	B	675	13,778	0.459	B	0.023	No
Project Driveway to El Cajon Blvd	4 Lane Major (4U)	30,000	13,116	0.437	B	450	13,566	0.452	B	0.015	No

Notes: 4U+TWLTL = 4 un-divided lanes + two way left turn lane. Daily volume is a 24 hour volume. LOS: Level of Service. V/C: Volume to Capacity Ratio.

Under near term with project conditions, all of the study intersections and segments were calculated to operate at LOS C or better. <u>There are no significant direct impacts because the addition of project traffic does not degrade a facility from acceptable LOS to unacceptable LOS.</u>

Figure 10: Near Term with Project Volumes





8.0 Horizon Year 2050 without Project Conditions

Horizon Year 2050 without project conditions were analyzed based on an 18.3% growth factor calculated between year 2018 existing ADTs and SANDAG Series 12 year 2050 ADTs as described in Section 6. The horizon year 2050 volumes are shown in **Figure 11.**

The existing roadway geometric conditions were held constant for the 2050 analysis because the city web source of San Diego *College Area Public Facilities Financing Plan FY 2014* did not show any planned improvements to the study roadways or segments. The year 2050 roadways conditions as used for the analysis are shown in **Figure 12**.

The LOS calculated for the study intersections and segments are included in **Tables 13 and 14**. Intersection LOS calculations are included in **Appendix L**.

TABLE 13: HORIZON YEAR 2050 WITHOUT PROJECT INTERSECTION LEVEL OF SERVICE

Intersection and (Analysis)[1]	Movement	Study Period	Horizon Year (2050) Delay[2]	LOS[3]
1) Montezuma Rd	All	AM	10.7	B
at Reservoir Dr (S)	All	PM	9.0	A
2) Montezuma Rd	EB L	AM	0.2	A
at shared Project	SB LR	AM	16.3	C
and Library Dwy (U)	EB L	PM	0.1	A
	SB LR	PM	11.9	B
3) Montezuma Rd	WB R	AM	0.0	A
at East Project	SB R	AM	0.0	A
Dwy (U)	WB R	PM	0.0	A
	SB R	PM	0.0	A
4) Montezuma Rd	All	AM	17.0	B
at El Cajon Blvd (S)	All	PM	23.8	C
5) El Cajon Blvd	All	AM	30.1	C
at 67th St (S)	All	PM	19.0	B

Notes: 1) Intersection Analysis - (S) Signalized, (U) Unsignalized. 2) Delay - HCM Average Control Delay in seconds. 3) LOS: Level of Service.

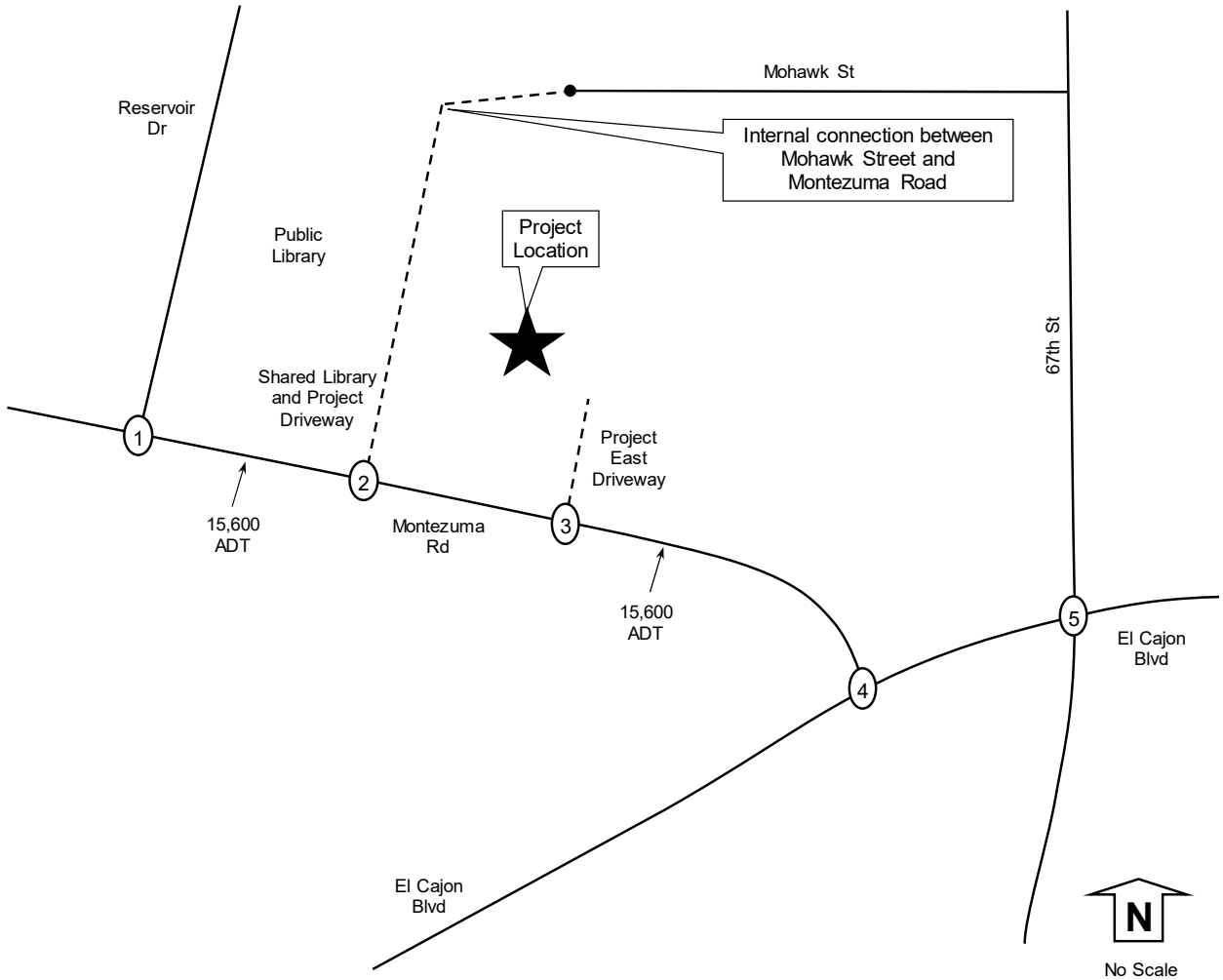
TABLE 14: HORIZON YEAR 2050 WITHOUT PROJECT SEGMENT VOLUMES AND LEVEL OF SERVICE

Segment	Mobility Classification (as built)	LOS E Capacity	Horizon Year (2050) Daily Volume	V/C	LOS
Montezuma Road					
Reservoir Dr to Project Driveway	4 Lane Major (4U+TWLTL)	30,000	15,600	0.520	C
Project Driveway to El Cajon Blvd	4 Lane Major (4U)	30,000	15,600	0.520	C

Notes: 4U+TWLTL = 4 un-divided lanes + two way left turn lane. Daily volume is a 24 hour volume. LOS: Level of Service. V/C: Volume to Capacity Ratio.

Under horizon year 2050 conditions, all of the study intersections and segments were calculated to operate at LOS C or better.

Figure 11: Horizon Year 2050 without Project Volumes



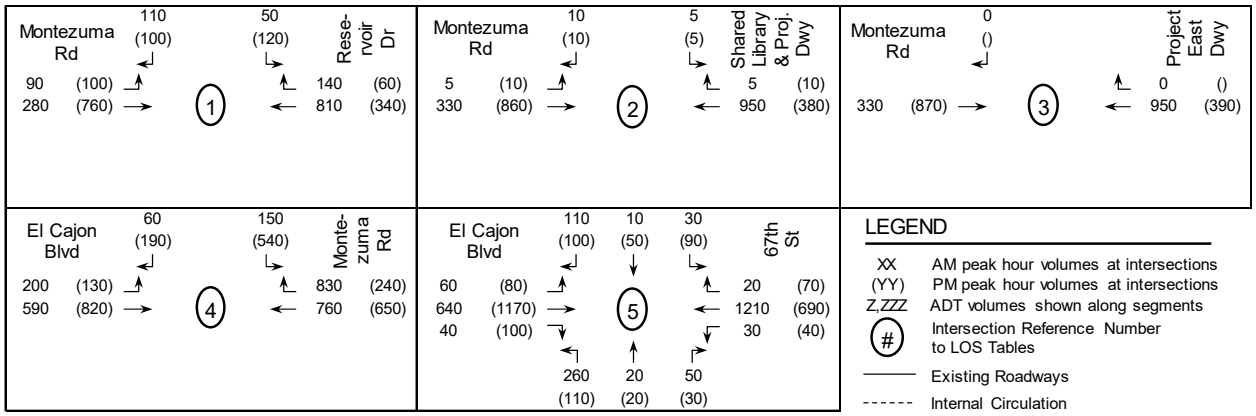
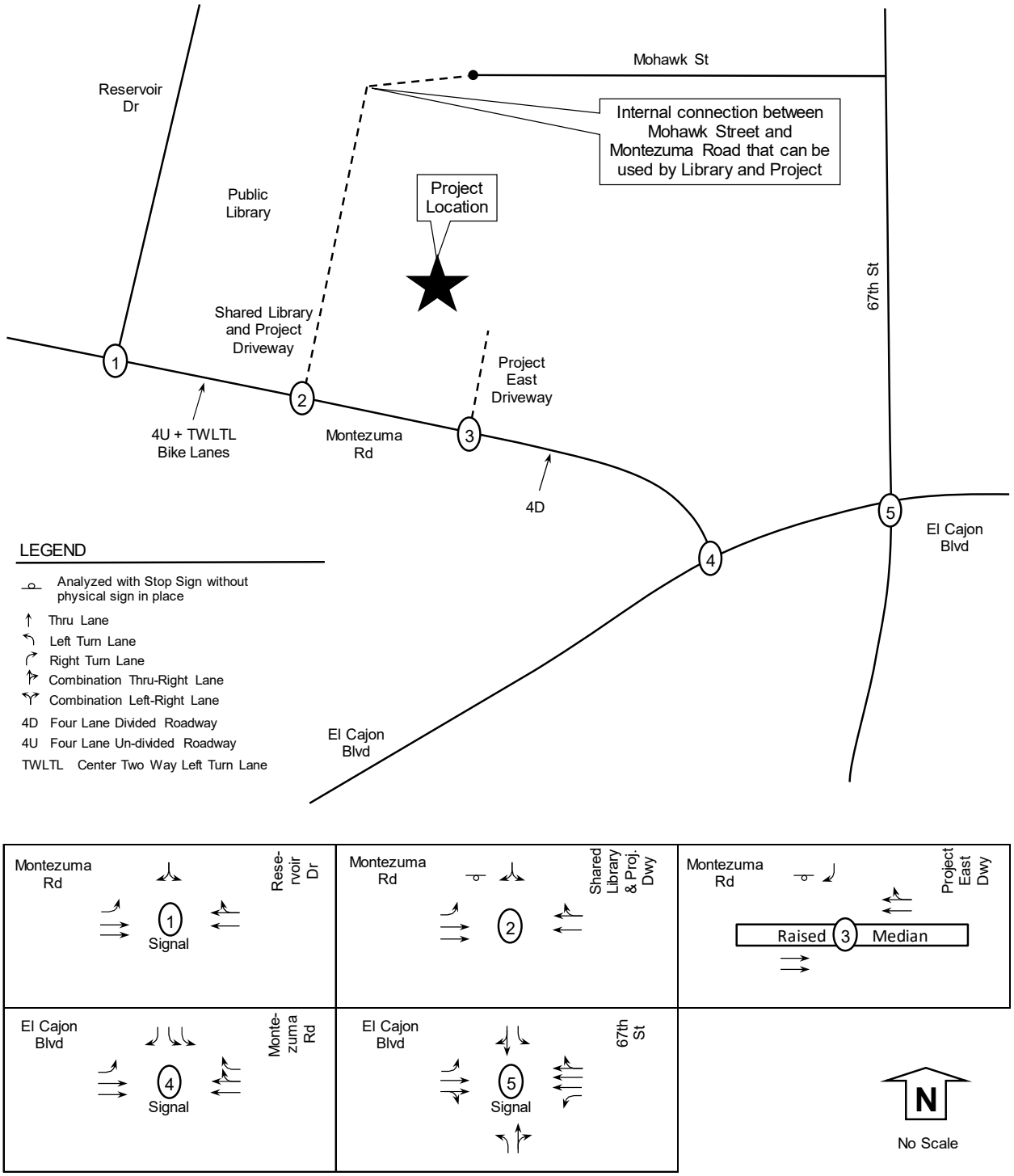


Figure 12: Horizon Year 2050 Analysis Roadway Geometry



9.0 Horizon Year 2050 with Project Conditions

The Horizon Year 2050 with the project conditions were analyzed by adding the project traffic onto horizon year 2050 volumes. The horizon year 2050 volumes with project traffic are shown in **Figure 13.** The LOS calculated for the study intersections and segments are included in **Tables 15 and 16**. LOS calculations are included in **Appendix M**.

TABLE 15: HORIZON YEAR 2050 WITH PROJECT INTERSECTION LEVEL OF SERVICE

Intersection and	Movement	Study	Horizon Year (2050)		Horizon Year (2050) + Project			
(Analysis)[1]		Period	Delay[2]	LOS[3]	Delay[2]	LOS[3]	Delta[4]	Cumulative Impact?[5]
1) Montezuma Rd	All	AM	10.7	B	10.8	B	0.1	No
at Reservoir Dr (S)	All	PM	9.0	A	9.1	A	0.1	No
2) Montezuma Rd	EB L	AM	0.2	A	0.9	A	0.7	No
at shared Project	SB LR	AM	16.3	C	21.5	C	5.2	No
and Library Dwy (U)	EB L	PM	0.1	A	0.3	A	0.2	No
	SB LR	PM	11.9	B	14.5	B	2.6	No
3) Montezuma Rd	WB R	AM	DNE	NA	0.0	A	0.0	No
at East Project	SB R	AM	DNE	NA	13.5	B	13.5	No
Dwy (U)	WB R	PM	DNE	NA	0.0	A	0.0	No
	SB R	PM	DNE	NA	10.6	B	10.6	No
4) Montezuma Rd	All	AM	17.0	B	17.6	B	0.6	No
at El Cajon Blvd (S)	All	PM	23.8	C	24.6	C	0.8	No
5) El Cajon Blvd	All	AM	30.1	C	30.3	C	0.2	No
at 67th St (S)	All	PM	19.0	B	19.1	B	0.1	No

Notes: 1) Intersection Analysis - (S) Signalized, (U) Unsignalized. 2) Delay - HCM Average Control Delay in seconds. 3) LOS: Level of Service. 4) Delta is the increase in delay from project. 5) Cumulative Impact if project traffic exceeds threshold.

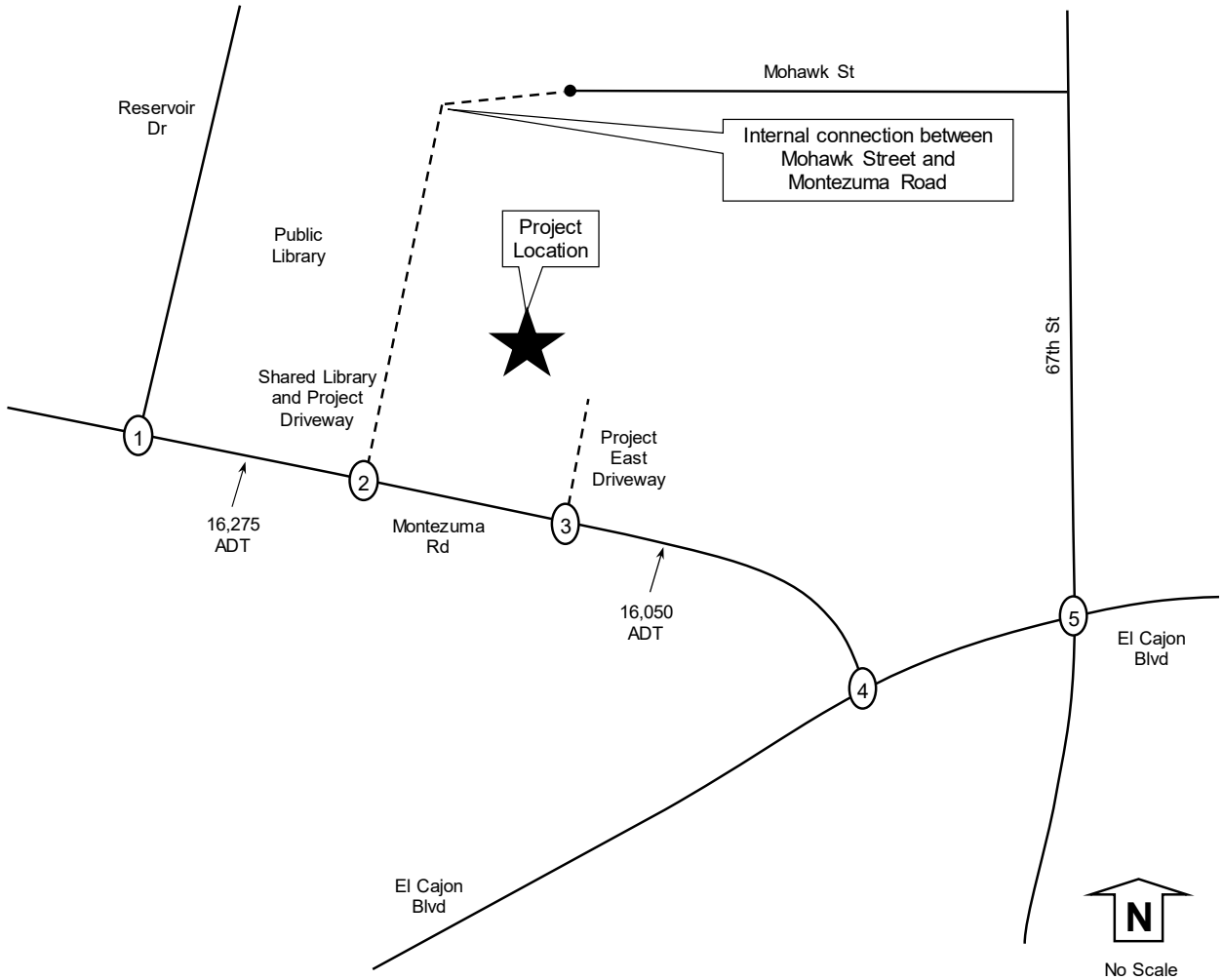
TABLE 16: HORIZON YEAR 2050 WITH PROJECT SEGMENT VOLUMES AND LEVEL OF SERVICE

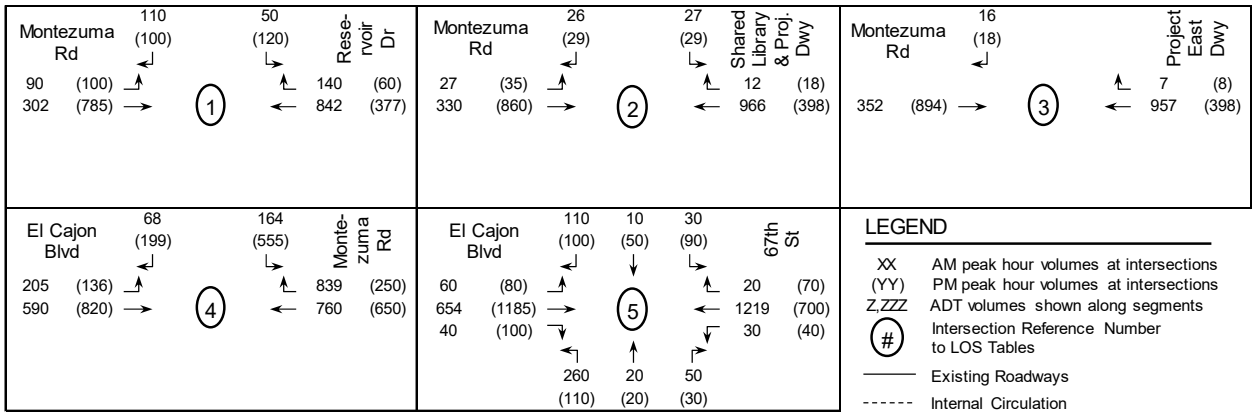
Segment	Mobility Classification (as built)	LOS E Capacity	Horizon Year (2050) Daily Volume	V/C	LOS	Project Daily Volume	Horizon Year (2050) + Project Daily Volume	V/C	LOS	Change In V/C	Cumulative Impact?
Montezuma Road											
Reservoir Dr to Project Driveway	4 Lane Major (4U+TWLTL)	30,000	15,600	0.520	C	675	16,275	0.543	C	0.023	No
Project Driveway to El Cajon Blvd	4 Lane Major (4U)	30,000	15,600	0.520	C	450	16,050	0.535	C	0.015	No

Notes: 4U+TWLTL = 4 un-divided lanes + two way left turn lane. Daily volume is a 24 hour volume. LOS: Level of Service. V/C: Volume to Capacity Ratio.

Under horizon year 2050 with project conditions, all of the study intersections and segments were calculated to operate at LOS C or better. There are no significant cumulative impacts because the addition of project traffic does not degrade a facility from acceptable LOS to unacceptable LOS.

Figure 13: Horizon Year 2050 with Project Volumes





10.0 Summary of Potential Impacts

The project has no calculated traffic impacts (based on the significance criteria); therefore, mitigation measures are not required. A summary table of the findings is shown in **Table 17.**

TABLE 17: DIRECT AND CUMULATIVE IMPACT SUMMARY

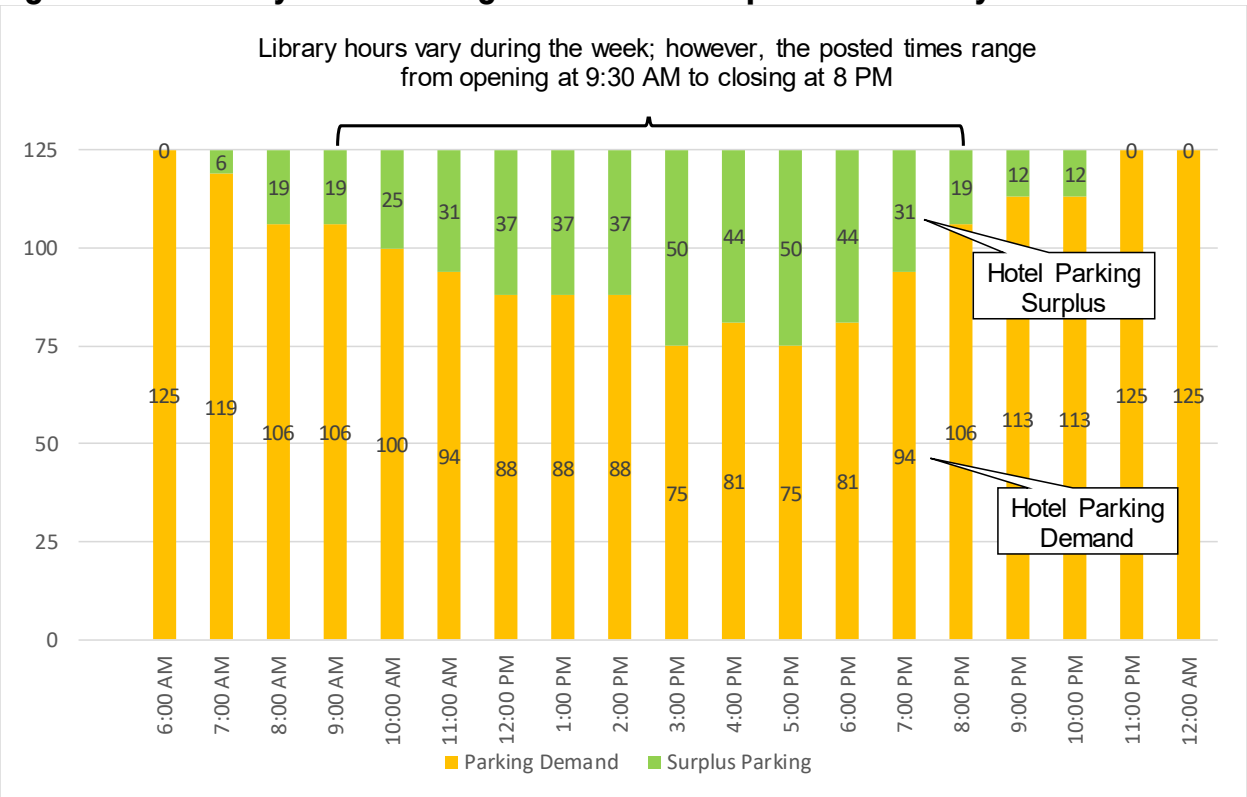
Roadway Facility	Existing and Near Term Direct Impacts	Mitigation
Intersection	None	None
Segment	None	None
Roadway Facility	**Horizon Year 2050 Plus Project Cumulative Impacts**	**Mitigation**
Intersection	None	None
Segment	None	None

11.0 Project Parking

The site currently has a temporary shared parking agreement with the adjacent Library. This parking analysis is only for the hotel. A parking analysis is not provided for the Library as the Library is not part of this project.

The hotel parking demand would peak at night while the Library parking demand peaks during the day, therefore, shared parking is applicable for the proposed mix of hotel and Library uses. The hotel with 125 rooms requires 125 parking spaces based on City code. The weekday hotel parking demands (based on the City of San Diego hourly parking use – included in **Appendix N**) along with the Library hours of operation (vary during the week with posted times ranging from 9:30 AM opening to 8:00 PM closing) are shown in **Figure 14**.

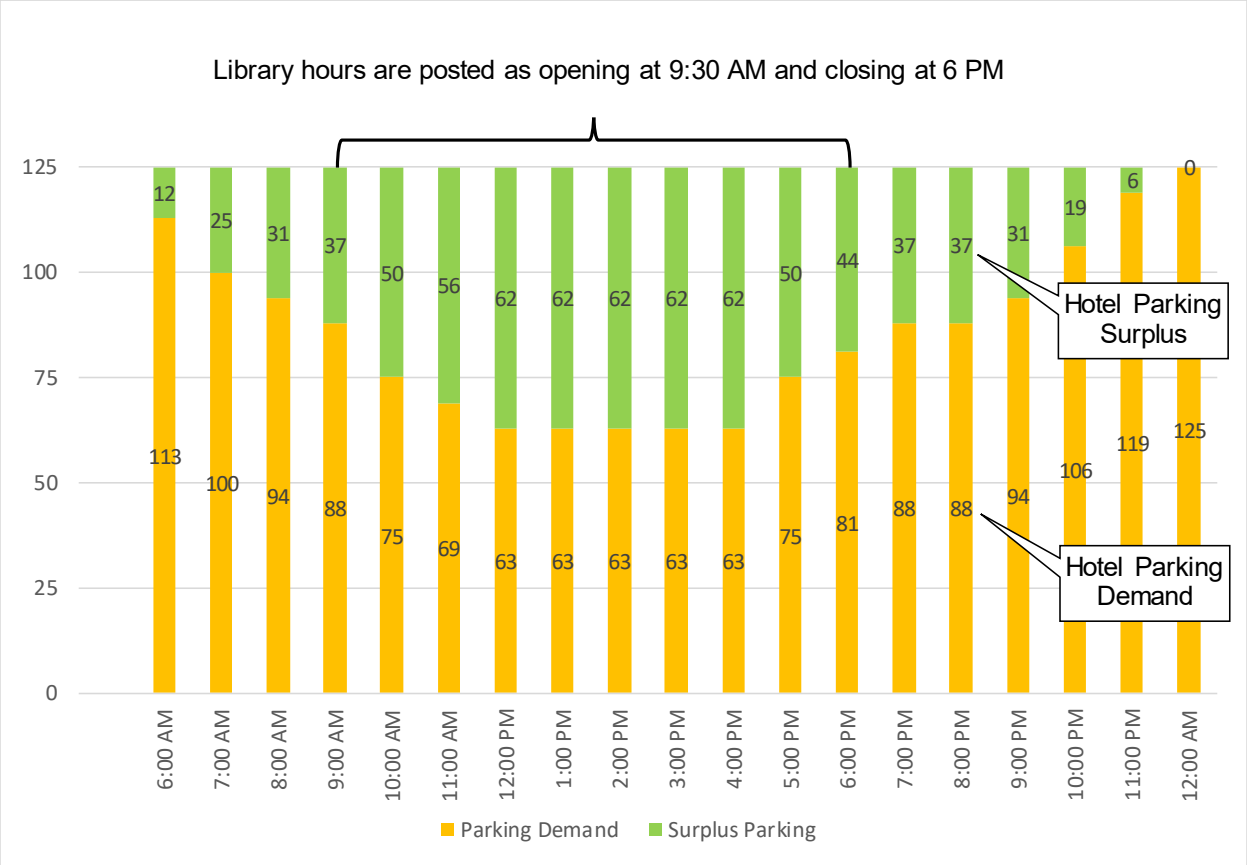
Figure 14: Weekday Hotel Parking Demand and Surplus with Library Hours



As shown above, the hotel would be expected to have available parking ranging from 19 to 50 open spaces during weekday daytime hours when the Library is open.

The Saturday expected hotel parking demands along with Library hours of operation (opening at 9:30 AM and closing at 6:00 PM) are shown in **Figure 15**.

Figure 15: Saturday Hotel Parking Demand and Surplus with Library Hours



As shown above, the hotel would be expected to have available parking ranging from 37 to 62 open spaces during Saturday daytime hours when the Library is open.

The weekday has fewer surplus hotel parking spaces; therefore, the calculation of shared parking spaces for the Library is based on weekday conditions. Using the City of San Diego shared parking analysis for the hotel hourly parking demands (Municipal Code 142.0545) and Institute of Transportation Engineers (ITE) for the Library hourly parking demands, the parking supply and demand balances with a shared parking allocation of 27 spaces at the peak 7pm Library demand per ITE as shown in **Table 18**. ITE documented lower Library parking demands outside the 7pm peak; therefore, the critical demand was based on the 100% Library parking demand at 7pm. For example, at 8pm the Library demand is 72% of 27 balanced spaces that equals 19 Library plus 106 hotel spaces for a combined 125 spaces that matches the hotel supply. <u>However, to be conservative, it is recommended that the shared parking allocation be set at 25 spaces.</u> Copies of the City of San Diego Municipal Code with hourly parking accumulation and ITE hourly parking demands are included in **Appendix N**.

TABLE 18: WEEKDAY SHARED PARKING ANALYSIS

San Diego Municipal Code Article 2 Division 5 Parking Requirements					
Land Use Variable Parking Rate Parking Spaces:	Hotel 125 Rooms 1 space per room 125		Library Proposed Shared Parking 27		**Parking Demand Totals** *152*
City of San Diego and ITE hourly parking demands					
Time	Weekday Usage	Parking Demand	Weekday Usage	Parking Demand	Hourly Demand
6:00 AM	100%	125	0%	0	125
7:00 AM	95%	119	0%	0	119
8:00 AM	85%	106	16%	4	110
9:00 AM	85%	106	45%	12	118
10:00 AM	80%	100	52%	14	114
11:00 AM	75%	94	70%	19	113
12:00 PM	70%	88	58%	16	104
1:00 PM	70%	88	79%	21	109
2:00 PM	70%	88	78%	21	109
3:00 PM	60%	75	84%	23	98
4:00 PM	65%	81	58%	16	97
5:00 PM	60%	75	49%	13	88
6:00 PM	65%	81	50%	14	95
7:00 PM	75%	94	100%	27	121
8:00 PM	85%	106	72%	19	125
9:00 PM	90%	113	0%	0	113
10:00 PM	90%	113	0%	0	113
11:00 PM	100%	125	0%	0	125
12:00 AM	100%	125	0%	0	125
Source:	City of San Diego		ITE		
				Highest 24 hour demand using shared parking:	125
				Parking Supply:	125
				Calculated Parking Shortage:	**0**

Notes: City of San Diego Shared Parking from Municipal Code Chapter 14 dated December 2017 and ITE hourly demands for Library.

In summary, the project is proposed with 125 parking spaces, 3 motorcycle spaces, 10 short-term bicycle spaces and 8 long-term bicycle spaces. The applicant currently has a temporary shared parking agreement with the adjacent Library for 31 parking spaces. A new shared parking agreement is proposed with an allocation of 25 hotel spaces for Library patrons. The allocation of 25 parking spaces results in a daytime balance of parking demands based on the City of San Diego hourly accumulation table and ITE hourly parking accumulation table for the Library. The Library hours of operation vary with a range of 9:30 AM to 8:00 PM Monday through Friday, Saturday hours of 9:30 AM to 6:00 PM, and closed on Sundays.

12.0 Transportation Demand Management

A Transportation Demand Management (TDM) plan will provide the means to disseminate information to help employees learn about and use alternative forms of transportation other than single occupancy vehicles. The project will:

1) Provide information about the existing icommute program (www.icommutesd.com),
2) Encourage carpooling through requesting employees to coordinate between colleagues and to visit the aforementioned icommute program website,
3) Encourage transit usage by asking employees to use public transit,
4) Display maps, routes, and schedules for public transit near the site, and
5) Encourage bike usage by providing 10 short-term and 8 long-term bicycle parking spaces, 1 shower stall and a minimum of 2 two-tier personal effects lockers for employees.

13.0 Project Construction Traffic

According to the applicant, the construction traffic is currently estimated to occur over a time period of approximately 18 months. Construction worker parking and laydown area are anticipated to be immediately adjacent to or within the construction work area. There is additional public parking directly east of the property, accessed from Bowman Lane. During grading operations, it is anticipated to have 10-15 workers on site. During vertical construction periods between 35 and 50 workers would start at 7:00 AM with 25 to 40 leaving between 3:00 and 3:30 PM with the balance leaving after 3:30 PM. However, there may be times when a few trades will need to work overtime and end later (construction can occur up to 7 pm).

On an average day, 15 construction workers and 5 deliveries are anticipated to occur starting around 7:00 AM and ending around 3:30 PM with a total estimated 50 ADT (30 construction worker ADT plus 10 deliveries x 2.0 Passenger Car Equivalent [PCE] for 20 deliver ADT).

TABLE 19: CONSTRUCTION TRIP GENERATION (AVERAGE CONSTRUCTION DAY)

Construction Component	Passenger Car Equivalent	ADT	7-8 AM IN	7-8 AM OUT	3-4 PM IN	3-4 PM OUT
Construction (15 workers)	1.0	30	15	0	0	15
Truck Deliveries (5 trucks)	2.0	20	2	0	0	2
Average Construction Traffic:		50	17	0	0	17

Source: Client provided average construction worker and truck volumes. ADT-Average Daily Traffic.

The average construction traffic trip generation is lower than the project trip generation; therefore, there are no construction traffic impacts because the project with higher trip generation was calculated within this study to have no traffic impacts.

14.0 Conclusion

The project is a hotel with 125 rooms located at 6650 Montezuma Road in San Diego, California. The project site was previously occupied by the College Lutheran Church; however, the Church was being demolished during data collection, thus a trip credit was not applied in this analysis. The hotel is planned to open by the year 2020. Project access is from two driveways on Montezuma Road to which one driveway is shared with the College-Rolando Library immediately west of the project site. The project requires an Amendment to the College Area Community Plan and a Rezone. The proposed amendment to the College Area Community Plan would change the current land use designation from *Low/Medium Density Residential [10 – 15 dwelling units per acre (du/ac)] and General Commercial Residential (75 – 110 du/ac)* to *General Commercial with Residential,* Medium-Medium High (15-45 DU/AC) to allow redevelopment of the project site with a maximum 125-room hotel. The proposed rezone would change the existing RM-1-1 zone to CV-1-1.

The project trip generation for the project was calculated using trip rates from the City of San Diego *Trip Generation Manual*, May 2003. The project is calculated to generate 1,125 ADT with 90 AM peak hour trips (36 inbound and 54 outbound) and 102 PM peak hour trips (41 inbound and 61 outbound).

The minimum required parking for the site is 125 spaces based on a City rate of 1 space per hotel room. The project is proposed with 125 parking spaces, 3 motorcycle spaces, 10 short-term bicycle spaces and 8 long-term bicycle spaces. The applicant currently has a temporary shared parking agreement with the adjacent Library for 31 parking spaces. A new shared parking agreement is proposed with an allocation of 25 hotel spaces for Library patrons. The allocation of 25 parking spaces results in a daytime balance of parking demands based on the City of San Diego hourly accumulation table and ITE hourly parking accumulation table for the Library. The Library hours of operation vary with a range of 9:30 AM to 8:00 PM Monday through Friday, Saturday hours of 9:30 AM to 6:00 PM, and closed on Sundays.

The following scenarios were analyzed: Existing, Existing with Project, Near Term, Near Term with Project, Horizon Year 2050, and Horizon Year 2050 with Project Conditions. For each scenario, the findings include:

1) Under existing conditions, all of the study intersections and segments were calculated to operate at LOS C or better.
2) Under existing with project conditions, all of the study intersections and segments were calculated to operate at LOS C or better. <u>There are no significant direct impacts because the addition of project traffic does not degrade a facility from acceptable LOS to unacceptable LOS.</u>
3) Under near term conditions, all of the study intersections and segments were calculated to operate at LOS C or better.
4) Under near term with project conditions, all of the study intersections and segments were calculated to operate at LOS C or better. <u>There are no significant direct impacts because the</u>

addition of project traffic does not degrade a facility from acceptable LOS to unacceptable LOS.

5) Under horizon year 2050 conditions, all of the study intersections and segments were calculated to operate at LOS C or better.
6) Under horizon year 2050 with project conditions, all of the study intersections and segments were calculated to operate at LOS C or better. There are no significant cumulative impacts because the addition of project traffic does not degrade a facility from acceptable LOS to unacceptable LOS.

The project has no calculated traffic impacts based on the significance criteria; therefore, mitigation measures are not required.

The project with 125 on-site parking spaces meets City minimum requirements for the hotel. The project applicant proposed to provide a shared parking allocation of 25 hotel spaces for Library use during current Library hours of operation. The project site also is planned with 3 motorcycle spaces, 10 short-term bicycle spaces and 8 long-term bicycle spaces.

15.0 References and List of Preparers

15.1 References

City of San Diego *Traffic Impact Study Manual,* July 1998.

San Diego Traffic Engineers' Council (SANTEC). March 2, 2002. *SANTEC/ITE Guidelines for Traffic Impact Studies in the San Diego Region.*

Trafficware Corporation, 2006. Synchro Version 10 computer software.

Transportation Research Board National Research Council Washington, D.C. *Highway Capacity Manual 2000 and 2010*. CD ROM.

15.2 List of Preparers

Justin Rasas, P.E. (TR 2135), LOS Engineering, Inc. Author

Appendix A

Count Data, SDSU Calendar, and Signal Timing Sheets

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878

City of San Diego
Montezuma Road
B/ Reservoir Drive - Project Driveway

File Name 001
Site Code: 143-18058
24 Hour Directional Volume Count

Date:	Eastbound				Westbound					
1/24/2018	15 Minute Totals		Hourly Totals		15 Minute Totals		Hourly Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	13	116			17	75				
12:15	13	93			9	83				
12:30	5	81			7	87				
12:45	9	69	40	359	6	84	39	329	79	688
1:00	6	97			6	95				
1:15	9	88			2	85				
1:30	6	75			9	85				
1:45	5	99	26	359	2	70	19	335	45	694
2:00	4	128			2	80				
2:15	8	104			2	74				
2:30	2	81			3	60				
2:45	7	103	21	416	4	82	11	296	32	712
3:00	6	114			2	86				
3:15	5	117			6	109				
3:30	1	153			1	119				
3:45	3	194	15	578	3	91	12	405	27	983
4:00	2	171			4	87				
4:15	1	169			3	86				
4:30	4	157			2	95				
4:45	3	173	10	670	8	81	17	349	27	1019
5:00	6	191			10	82				
5:15	5	154			10	86				
5:30	9	204			29	94				
5:45	13	137	33	686	33	90	82	352	115	1038
6:00	12	135			35	77				
6:15	15	106			74	80				
6:30	18	129			130	89				
6:45	26	126	71	496	151	72	390	318	461	814
7:00	28	154			210	107				
7:15	31	106			213	85				
7:30	56	69			233	91				
7:45	42	75	157	404	213	64	869	347	1026	751
8:00	58	57			195	51				
8:15	49	60			195	47				
8:30	72	68			221	59				
8:45	100	61	279	246	159	37	770	194	1049	440
9:00	62	56			101	39				
9:15	61	65			89	47				
9:30	41	63			92	35				
9:45	74	78	238	262	81	39	363	160	601	422
10:00	81	159			67	31				
10:15	50	91			72	32				
10:30	56	39			84	30				
10:45	62	36	249	325	67	29	290	122	539	447
11:00	92	26			68	23				
11:15	72	21			74	15				
11:30	71	14			75	13				
11:45	78	10	313	71	77	12	294	63	607	134
Totals	1452	4872			3156	3270				
Combined Totals		6324				6426				
ADT										12750
AM Peak Hour	1100	AM			700	AM				
Volume	313				869					
P.H.F.	0.851				0.932					
PM Peak Hour		445	PM			315	PM			
Volume		722				406				
P.H.F.		0.885				0.853				
Percentage	23.0%	77.0%			49.1%	50.9%				

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Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878

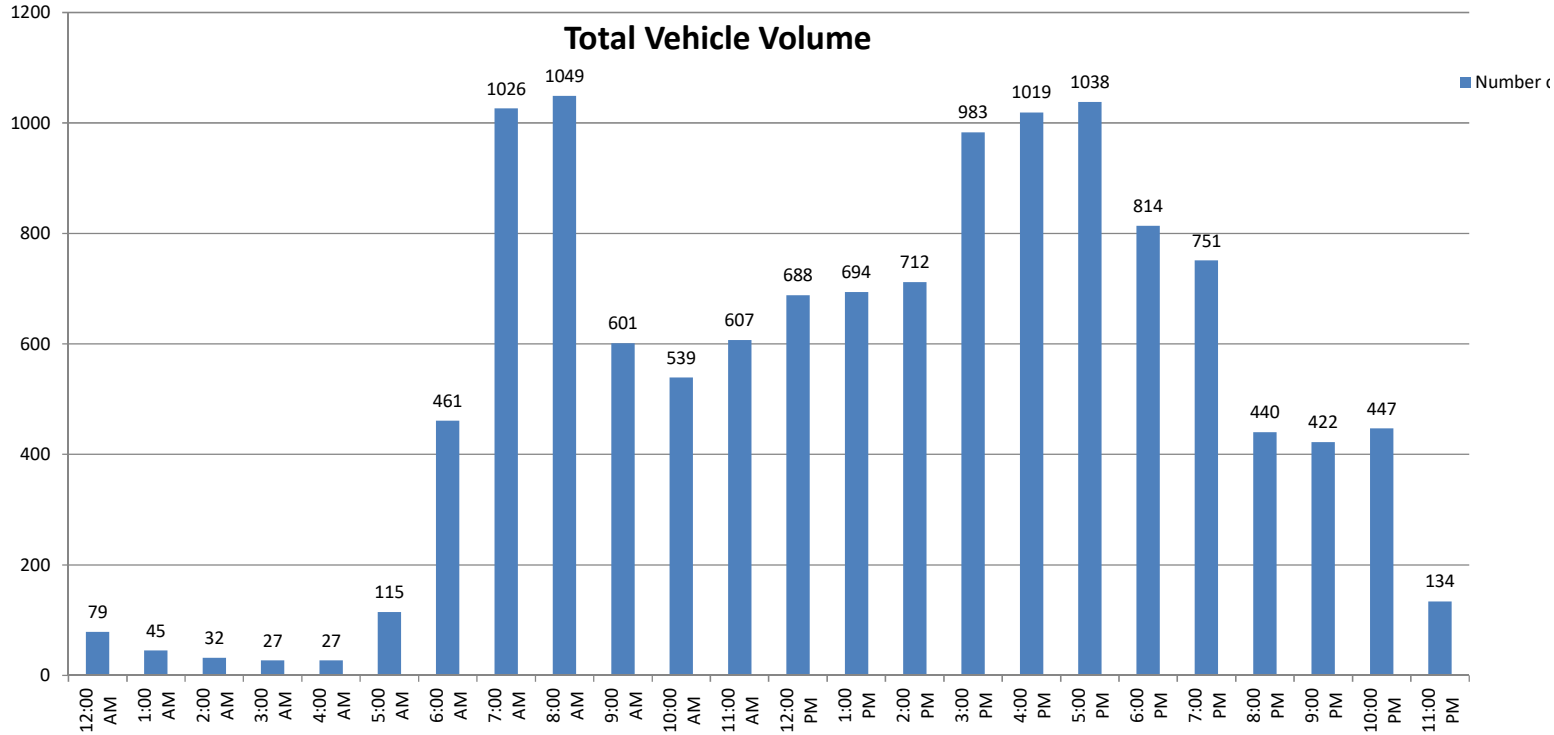
24 Hour Volume Plot

Montezuma Road

B/ Reservoir Drive - Project Driveway

1/24/2018

Start Time	1/24/2018
12:00 AM	79
1:00 AM	45
2:00 AM	32
3:00 AM	27
4:00 AM	27
5:00 AM	115
6:00 AM	461
7:00 AM	1026
8:00 AM	1049
9:00 AM	601
10:00 AM	539
11:00 AM	607
12:00 PM	688
1:00 PM	694
2:00 PM	712
3:00 PM	983
4:00 PM	1019
5:00 PM	1038
6:00 PM	814
7:00 PM	751
8:00 PM	440
9:00 PM	422
10:00 PM	447
11:00 PM	134
Total	12750



Volumes represent the combined totals for both directions

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878

City of San Diego
Montezuma Road
B/ Project Driveway - El Cajon Boulevard

File Name 002
Site Code: 143-18058
24 Hour Directional Volume Count

Date:	Eastbound				Westbound					
1/24/2018	15 Minute Totals		Hourly Totals		15 Minute Totals		Hourly Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	13	105			17	82				
12:15	12	101			10	80				
12:30	5	79			6	90				
12:45	8	71	38	356	7	79	40	331	78	687
1:00	5	87			3	95				
1:15	9	88			4	82				
1:30	6	80			8	96				
1:45	5	113	25	368	2	71	17	344	42	712
2:00	3	111			2	76				
2:15	8	107			2	72				
2:30	3	83			1	64				
2:45	2	100	16	401	2	81	7	293	23	694
3:00	3	119			0	90				
3:15	5	114			4	116				
3:30	2	150			4	127				
3:45	3	202	13	585	3	88	11	421	24	1006
4:00	4	175			2	80				
4:15	5	157			2	83				
4:30	3	164			4	97				
4:45	7	157	19	653	8	83	16	343	35	996
5:00	7	191			12	78				
5:15	3	159			11	90				
5:30	10	201			24	93				
5:45	9	150	29	701	31	95	78	356	107	1057
6:00	15	122			33	78				
6:15	10	115			68	78				
6:30	20	124			142	99				
6:45	18	130	63	491	146	65	389	320	452	811
7:00	31	149			229	109				
7:15	31	107			219	87				
7:30	57	67			226	94				
7:45	42	73	161	396	224	59	898	349	1059	745
8:00	51	58			188	48				
8:15	48	58			194	51				
8:30	75	70			247	57				
8:45	96	60	270	246	150	41	779	197	1049	443
9:00	65	57			94	41				
9:15	60	59			86	46				
9:30	47	62			100	38				
9:45	73	85	245	263	71	37	351	162	596	425
10:00	72	156			69	30				
10:15	53	81			79	32				
10:30	54	41			76	30				
10:45	63	34	242	312	67	29	291	121	533	433
11:00	87	26			76	25				
11:15	76	20			77	14				
11:30	67	14			78	14				
11:45	82	9	312	69	79	12	310	65	622	134
Totals	1433	4841			3187	3302				
Combined Totals		6274				6489				
ADT										12763
AM Peak Hour	1100	AM			700	AM				
Volume	312				898					
P.H.F.	0.897				0.980					
PM Peak Hour		445	PM			300	PM			
Volume		708				421				
P.H.F.		0.881				0.829				
Percentage	22.8%	77.2%			49.1%	50.9%				

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Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878

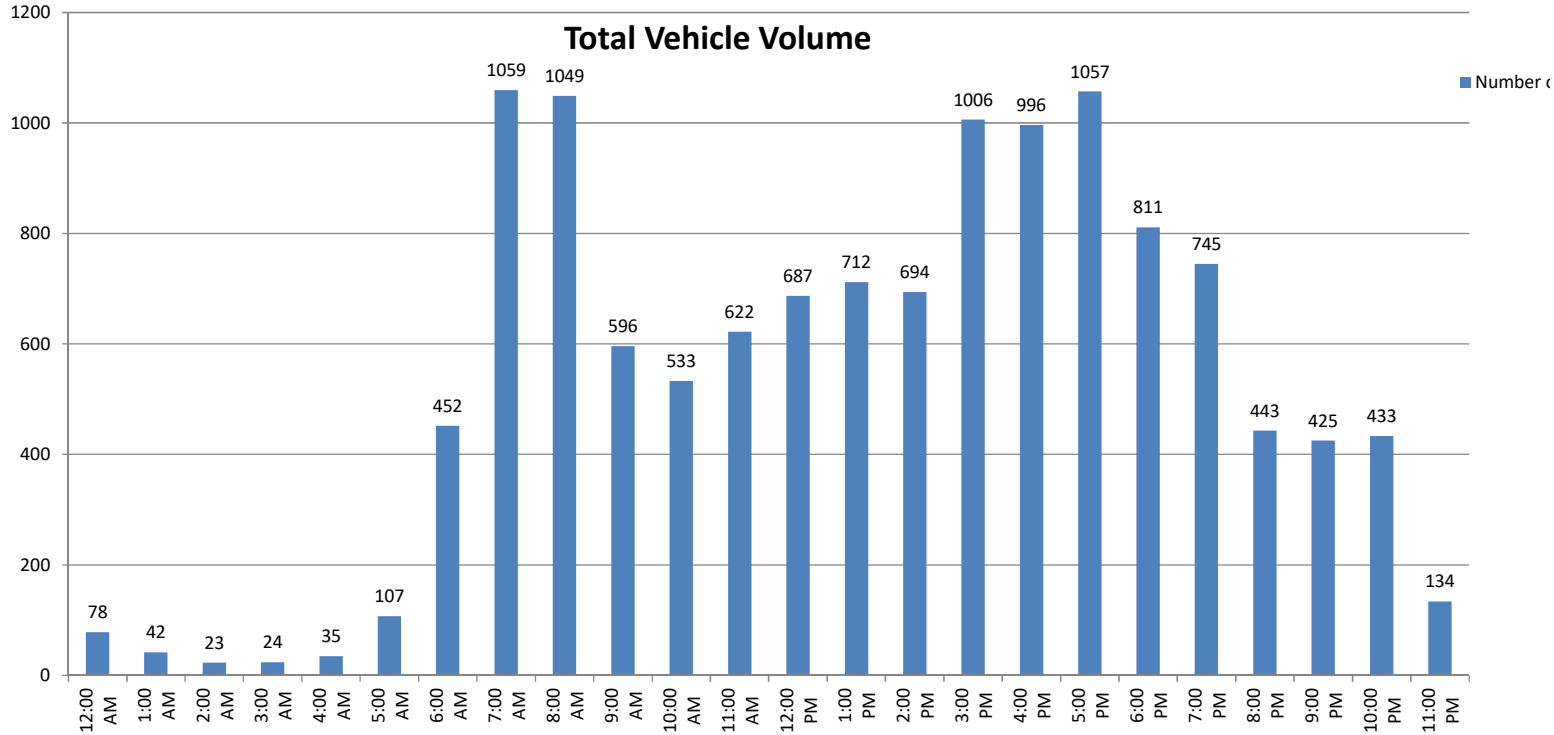
24 Hour Volume Plot

Montezuma Road

B/ Project Driveway - El Cajon Boulevard

1/24/2018

Start Time	1/24/2018
12:00 AM	78
1:00 AM	42
2:00 AM	23
3:00 AM	24
4:00 AM	35
5:00 AM	107
6:00 AM	452
7:00 AM	1059
8:00 AM	1049
9:00 AM	596
10:00 AM	533
11:00 AM	622
12:00 PM	687
1:00 PM	712
2:00 PM	694
3:00 PM	1006
4:00 PM	996
5:00 PM	1057
6:00 PM	811
7:00 PM	745
8:00 PM	443
9:00 PM	425
10:00 PM	433
11:00 PM	134
Total	12763



Volumes represent the combined totals for both directions

PO Box 1178
Corona, CA 92880
951-268-6268

Location: San Diego
N/S: Reservoir Drive
E/W: Montezuma Road

Date: 1/24/18
Day: WEDNESDAY
Project # 143-18058

TURNING MOVEMENT COUNT

Count Period: **7:00 AM to 9:00 AM**
Peak Hour: **8:00 AM to 9:00 AM**

Vehicle Counts

	Reservoir Drive Northbound			Reservoir Drive Southbound			Montezuma Road Eastbound			Montezuma Road Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	0	0	0	7	0	13	15	22	0	0	192	44	293
7:15 AM	0	0	0	3	0	10	17	27	0	0	184	36	277
7:30 AM	0	0	0	7	0	10	22	49	0	0	192	42	322
7:45 AM	0	0	0	5	0	19	23	36	0	0	180	48	311
8:00 AM	0	0	0	9	0	15	11	50	0	0	159	33	277
8:15 AM	0	0	0	10	0	19	13	37	0	0	179	21	280
8:30 AM	0	0	0	6	0	26	31	63	0	0	213	34	373
8:45 AM	0	0	0	14	0	31	24	90	0	0	135	28	322
TOTAL VOLUMES:	0	0	0	61	0	143	156	374	0	0	1434	286	2455

AM Peak Hr Begins at: 800 AM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	0	0	39	0	91	79	240	0	0	686	116	1252

PEAK HR FACTOR:	0.000	0.722	0.700	0.813	0.839

Bicycle Counts

	Reservoir Drive Northbound			Reservoir Drive Southbound			Montezuma Road Eastbound			Montezuma Road Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	0	0	0	0	0	0	0	2	0	0	2	0	4
7:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	7	0	7
7:45 AM	0	0	0	0	0	0	0	0	0	0	2	0	2
8:00 AM	0	0	0	0	0	0	0	2	0	0	1	1	4
8:15 AM	0	0	0	0	0	0	0	1	0	0	3	0	4
8:30 AM	0	0	0	0	0	0	0	1	0	0	2	0	3
8:45 AM	0	0	0	0	0	0	0	1	0	0	3	0	4
TOTAL VOLUMES:	0	0	0	0	0	0	0	7	0	0	21	1	29

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	0	0	0	0	0	0	5	0	0	9	1	15

Pedestrian Counts

	Reservoir Drive North Leg	Reservoir Drive South Leg	Montezuma Road East Leg	Montezuma Road West Leg	TOTAL
7:00 AM	2	1	1	0	4
7:15 AM	1	1	2	0	4
7:30 AM	1	0	3	0	4
7:45 AM	4	3	5	0	12
8:00 AM	4	2	1	0	7
8:15 AM	7	2	2	0	11
8:30 AM	6	2	6	0	14
8:45 AM	3	3	0	0	6
TOTAL VOLUMES:	28	14	20	0	62

	North Leg	South Leg	East Leg	West Leg	TOTAL
PEAK VOLUMES:	20	9	9	0	38

PO Box 1178
Corona, CA 92880
951-268-6268

Location: San Diego
N/S: Reservoir Drive
E/W: Montezuma Road

Date: 1/24/18
Day: WEDNESDAY
Project # 143-18058

TURNING MOVEMENT COUNT

Count Period: **4:00 PM to 6:00 PM**
Peak Hour: **4:45 PM to 5:45 PM**

Vehicle Counts

	Reservoir Drive Northbound			Reservoir Drive Southbound			Montezuma Road Eastbound			Montezuma Road Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	0	0	0	24	0	32	37	156	0	0	70	10	329
4:15 PM	0	0	0	19	0	17	27	153	0	0	71	19	306
4:30 PM	0	0	0	22	0	17	26	134	0	0	81	17	297
4:45 PM	0	0	0	22	0	22	18	153	0	0	67	13	295
5:00 PM	0	0	0	29	0	23	26	166	0	0	72	14	330
5:15 PM	0	0	0	17	0	20	18	148	0	0	77	12	292
5:30 PM	0	0	0	34	0	18	26	175	0	0	68	15	336
5:45 PM	0	0	0	8	0	24	21	127	0	0	79	19	278
TOTAL VOLUMES:	0	0	0	175	0	173	199	1212	0	0	585	119	2463

PM Peak Hr Begins at: 445 PM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	0	0	102	0	83	88	642	0	0	284	54	1253

PEAK HR FACTOR:	0.000	0.889	0.908	0.949	0.932

Bicycle Counts

	Reservoir Drive Northbound			Reservoir Drive Southbound			Montezuma Road Eastbound			Montezuma Road Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	0	0	0	0	0	0	2	2	0	0	1	0	5
4:15 PM	0	0	0	0	0	0	1	2	0	0	1	0	4
4:30 PM	0	0	0	0	0	0	0	6	0	0	0	0	6
4:45 PM	0	0	0	0	0	1	2	2	0	0	0	1	6
5:00 PM	0	0	1	0	0	0	0	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	1	4	0	0	0	0	5
5:30 PM	0	0	0	0	0	0	0	1	0	0	2	0	3
5:45 PM	0	0	0	0	0	0	0	2	0	0	0	0	2
TOTAL VOLUMES:	0	0	1	0	0	1	6	19	0	0	4	1	32

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	0	1	0	0	1	3	7	0	0	2	1	15

Pedestrian Counts

	Reservoir Drive North Leg	Reservoir Drive South Leg	Montezuma Road East Leg	Montezuma Road West Leg	TOTAL
4:00 PM	3	2	1	0	6
4:15 PM	6	5	3	0	14
4:30 PM	6	2	5	0	13
4:45 PM	3	0	4	0	7
5:00 PM	2	2	7	1	12
5:15 PM	3	2	7	0	12
5:30 PM	5	8	4	0	17
5:45 PM	5	3	9	0	17
TOTAL VOLUMES:	33	24	40	1	98

	North Leg	South Leg	East Leg	West Leg	TOTAL
PEAK VOLUMES:	13	12	22	1	48

PO Box 1178
Corona, CA 92880
951-268-6268

Location: San Diego
N/S: Library Driveway
E/W: Montezuma Road

Date: 1/24/18
Day: WEDNESDAY
Project # 143-18058

TURNING MOVEMENT COUNT

Count Period: **7:00 AM to 9:00 AM**
Peak Hour: **8:00 AM to 9:00 AM**

Vehicle Counts

	Library Driveway Northbound			Library Driveway Southbound			Montezuma Road Eastbound			Montezuma Road Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	0	0	0	0	0	0	0	29	0	0	229	0	258
7:15 AM	0	0	0	0	0	2	0	31	0	0	223	0	256
7:30 AM	0	0	0	0	0	2	0	56	0	0	235	0	293
7:45 AM	0	0	0	0	0	0	1	40	0	0	224	0	265
8:00 AM	0	0	0	0	0	1	1	58	0	0	198	0	258
8:15 AM	0	0	0	0	0	0	0	47	0	0	201	1	249
8:30 AM	0	0	0	0	0	5	1	69	0	0	236	2	313
8:45 AM	0	0	0	0	0	1	0	102	0	0	167	0	271
TOTAL VOLUMES:	0	0	0	0	0	11	3	432	0	0	1713	3	2163

AM Peak Hr Begins at: 800 AM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	0	0	0	0	7	2	276	0	0	802	3	1090

PEAK HR FACTOR:	0.000	0.350	0.681	0.846	0.871

Bicycle Counts

	Library Driveway Northbound			Library Driveway Southbound			Montezuma Road Eastbound			Montezuma Road Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	0	0	0	0	0	0	0	2	0	0	0	0	2
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	2	0	0	0	0	2
8:15 AM	0	0	0	0	0	0	0	1	0	0	0	0	1
8:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	1
8:45 AM	0	0	0	0	0	0	0	1	0	0	1	0	2
TOTAL VOLUMES:	0	0	0	0	0	0	0	7	0	0	1	0	8

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	0	0	0	0	0	0	5	0	0	1	0	6

Pedestrian Counts

	Library Driveway North Leg	Library Driveway South Leg	Montezuma Road East Leg	Montezuma Road West Leg	TOTAL
7:00 AM	2	0	0	0	2
7:15 AM	3	0	0	0	3
7:30 AM	5	0	0	0	5
7:45 AM	6	0	0	0	6
8:00 AM	6	0	0	0	6
8:15 AM	8	0	0	1	9
8:30 AM	8	0	0	0	8
8:45 AM	3	0	0	0	3
TOTAL VOLUMES:	41	0	0	1	42

	North Leg	South Leg	East Leg	West Leg	TOTAL
PEAK VOLUMES:	25	0	0	1	26

PO Box 1178
Corona, CA 92880
951-268-6268

Location: San Diego
N/S: Library Driveway
E/W: Montezuma Road

Date: 1/24/18
Day: WEDNESDAY
Project # 143-18058

TURNING MOVEMENT COUNT

Count Period: **4:00 PM to 6:00 PM**
Peak Hour: **4:45 PM to 5:45 PM**

Vehicle Counts

	Library Driveway Northbound			Library Driveway Southbound			Montezuma Road Eastbound			Montezuma Road Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	0	0	0	2	0	6	5	172	0	0	78	2	265
4:15 PM	0	0	0	1	0	7	3	168	0	0	84	0	263
4:30 PM	0	0	0	1	0	2	0	149	0	0	96	3	251
4:45 PM	0	0	0	1	0	2	1	182	0	0	76	2	264
5:00 PM	0	0	0	0	0	1	3	189	0	0	83	3	279
5:15 PM	0	0	0	1	0	4	4	151	0	0	81	1	242
5:30 PM	0	0	0	0	0	4	4	208	0	0	83	3	302
5:45 PM	0	0	0	5	0	1	3	144	0	0	95	1	249
TOTAL VOLUMES:	0	0	0	11	0	27	23	1363	0	0	676	15	2115

PM Peak Hr Begins at: 445 PM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	0	0	2	0	11	12	730	0	0	323	9	1087

PEAK HR FACTOR:	0.000	0.650	0.875	0.965	0.900

Bicycle Counts

	Library Driveway Northbound			Library Driveway Southbound			Montezuma Road Eastbound			Montezuma Road Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	0	0	0	0	0	0	0	2	0	0	1	0	3
4:15 PM	0	0	0	0	0	0	0	2	0	0	0	0	2
4:30 PM	0	0	0	0	0	0	0	6	0	0	0	0	6
4:45 PM	0	0	0	0	0	0	0	3	0	0	0	0	3
5:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	4	0	0	0	0	4
5:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	3	0	0	0	0	3
TOTAL VOLUMES:	0	0	0	0	0	0	0	22	0	0	1	0	23

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	0	0	0	0	0	0	9	0	0	0	0	9

Pedestrian Counts

	Library Driveway North Leg	Library Driveway South Leg	Montezuma Road East Leg	Montezuma Road West Leg	TOTAL
4:00 PM	5	0	0	2	7
4:15 PM	10	0	0	0	10
4:30 PM	6	0	0	0	6
4:45 PM	8	0	0	0	8
5:00 PM	10	0	0	0	10
5:15 PM	12	0	0	1	13
5:30 PM	6	1	1	1	9
5:45 PM	7	0	0	0	7
TOTAL VOLUMES:	64	1	1	4	70

	North Leg	South Leg	East Leg	West Leg	TOTAL
PEAK VOLUMES:	36	1	1	2	40

PO Box 1178
Corona, CA 92880
951-268-6268

Location: San Diego
N/S: Montezuma Road
E/W: El Cajon Boulevard

Date: 1/24/18
Day: WEDNESDAY
Project # 143-18058

TURNING MOVEMENT COUNT

Count Period: **7:00 AM to 9:00 AM**
Peak Hour: **7:30 AM to 8:30 AM**

Vehicle Counts

	Montezuma Road Northbound			Montezuma Road Southbound			El Cajon Boulevard Eastbound			El Cajon Boulevard Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	0	0	0	17	0	8	46	78	0	0	112	174	435
7:15 AM	0	0	0	19	0	6	37	100	0	0	135	170	467
7:30 AM	0	0	0	35	0	11	33	123	0	0	143	207	552
7:45 AM	0	0	0	33	0	8	46	127	0	0	168	178	560
8:00 AM	0	0	0	31	0	15	45	130	0	0	172	155	548
8:15 AM	0	0	0	29	0	17	48	118	0	0	162	163	537
8:30 AM	0	0	0	43	0	17	48	116	0	0	102	170	496
8:45 AM	0	0	0	68	0	29	41	104	0	0	155	115	512
TOTAL VOLUMES:	0	0	0	275	0	111	344	896	0	0	1149	1332	4107

AM Peak Hr Begins at: 730 AM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	0	0	128	0	51	172	498	0	0	645	703	2197

PEAK HR FACTOR:	0.000	0.973	0.957	0.963	0.981

Bicycle Counts

	Montezuma Road Northbound			Montezuma Road Southbound			El Cajon Boulevard Eastbound			El Cajon Boulevard Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	0	0	0	2	0	0	0	0	0	0	0	2	4
7:15 AM	0	0	0	0	0	0	1	1	0	0	0	0	2
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	4	4
7:45 AM	0	0	0	0	0	0	1	0	0	0	0	1	2
8:00 AM	0	0	0	2	0	0	0	1	0	0	1	2	6
8:15 AM	0	0	0	0	0	0	0	2	0	0	5	1	8
8:30 AM	0	0	0	1	0	0	0	0	0	0	0	2	3
8:45 AM	0	0	0	1	0	0	1	1	0	0	2	1	6
TOTAL VOLUMES:	0	0	0	6	0	0	3	5	0	0	8	13	35

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	0	0	2	0	0	1	3	0	0	6	8	20

Pedestrian Counts

	Montezuma Road North Leg	Montezuma Road South Leg	El Cajon Boulevard East Leg	El Cajon Boulevard West Leg	TOTAL
7:00 AM	0	0	3	0	3
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	1	1
7:45 AM	1	0	0	1	2
8:00 AM	2	0	0	2	4
8:15 AM	1	0	0	1	2
8:30 AM	2	0	1	4	7
8:45 AM	2	0	0	2	4
TOTAL VOLUMES:	8	0	4	11	23

	North Leg	South Leg	East Leg	West Leg	TOTAL
PEAK VOLUMES:	4	0	0	5	9

PO Box 1178
Corona, CA 92880
951-268-6268

Location: San Diego
N/S: Montezuma Road
E/W: El Cajon Boulevard

Date: 1/24/18
Day: WEDNESDAY
Project # 143-18058

TURNING MOVEMENT COUNT

Count Period: **4:00 PM to 6:00 PM**
Peak Hour: **5:00 PM to 6:00 PM**

Vehicle Counts

	Montezuma Road Northbound			Montezuma Road Southbound			El Cajon Boulevard Eastbound			El Cajon Boulevard Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	0	0	0	127	0	36	48	186	0	0	149	43	589
4:15 PM	0	0	0	112	0	36	30	167	0	0	137	39	521
4:30 PM	0	0	0	106	0	36	41	178	0	0	126	66	553
4:45 PM	0	0	0	105	0	38	24	157	0	0	145	41	510
5:00 PM	0	0	0	130	0	36	34	193	0	0	119	43	555
5:15 PM	0	0	0	115	0	40	21	156	0	0	127	56	515
5:30 PM	0	0	0	109	0	49	39	187	0	0	159	51	594
5:45 PM	0	0	0	106	0	36	20	153	0	0	148	53	516
TOTAL VOLUMES:	0	0	0	910	0	307	257	1377	0	0	1110	392	4353

PM Peak Hr Begins at: 500 PM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	0	0	460	0	161	114	689	0	0	553	203	2180

PEAK HR FACTOR:	0.000	0.935	0.884	0.900	0.918

Bicycle Counts

	Montezuma Road Northbound			Montezuma Road Southbound			El Cajon Boulevard Eastbound			El Cajon Boulevard Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	0	0	0	1	0	1	0	0	0	0	0	1	3
4:15 PM	0	0	0	2	0	0	0	1	0	0	0	1	4
4:30 PM	0	0	0	5	0	0	0	0	0	0	2	1	8
4:45 PM	0	0	0	3	0	0	0	1	0	0	1	1	6
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	3	0	0	0	2	0	0	0	0	5
5:30 PM	0	0	0	1	0	0	0	0	0	0	1	0	2
5:45 PM	0	0	0	3	0	0	0	1	0	0	1	0	5
TOTAL VOLUMES:	0	0	0	18	0	1	0	5	0	0	5	4	33

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	0	0	7	0	0	0	3	0	0	2	0	12

Pedestrian Counts

	Montezuma Road North Leg	Montezuma Road South Leg	El Cajon Boulevard East Leg	El Cajon Boulevard West Leg	TOTAL
4:00 PM	2	0	0	1	3
4:15 PM	3	0	0	4	7
4:30 PM	3	0	0	3	6
4:45 PM	11	0	0	7	18
5:00 PM	8	0	0	2	10
5:15 PM	4	0	0	1	5
5:30 PM	4	0	0	1	5
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	35	0	0	19	54

	North Leg	South Leg	East Leg	West Leg	TOTAL
PEAK VOLUMES:	16	0	0	4	20

PO Box 1178
Corona, CA 92880
951-268-6268

Location: San Diego
N/S: 67th Street
E/W: El Cajon Boulevard

Date: 1/24/18
Day: WEDNESDAY
Project # 143-18058

TURNING MOVEMENT COUNT

Count Period: **7:00 AM to 9:00 AM**
Peak Hour: **7:30 AM to 8:30 AM**

Vehicle Counts

	67th Street Northbound			67th Street Southbound			El Cajon Boulevard Eastbound			El Cajon Boulevard Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	46	2	3	8	1	25	1	87	5	5	215	5	403
7:15 AM	53	4	7	9	1	16	4	107	8	4	241	6	460
7:30 AM	63	5	4	10	0	15	8	143	4	4	267	2	525
7:45 AM	57	3	11	4	2	30	13	136	13	3	252	1	525
8:00 AM	47	7	10	6	5	25	20	130	9	12	256	10	537
8:15 AM	52	2	15	6	3	25	7	131	12	5	246	7	511
8:30 AM	44	5	7	10	0	17	3	148	6	5	204	6	455
8:45 AM	32	4	8	11	1	16	8	151	10	6	221	9	477
TOTAL VOLUMES:	394	32	65	64	13	169	64	1033	67	44	1902	46	3893

AM Peak Hr Begins at: 730 AM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	219	17	40	26	10	95	48	540	38	24	1021	20	2098

PEAK HR FACTOR:	0.958	0.910	0.966	0.958	0.977

Bicycle Counts

	67th Street Northbound			67th Street Southbound			El Cajon Boulevard Eastbound			El Cajon Boulevard Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	0	0	0	0	1	0	0	2	0	0	2	0	5
7:15 AM	1	0	0	0	0	0	0	2	0	0	0	0	3
7:30 AM	1	1	0	0	0	1	0	0	0	0	1	0	4
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	1	0	0	0	1	0	0	3	0	0	2	0	7
8:15 AM	1	0	0	0	0	1	0	2	0	0	3	0	7
8:30 AM	2	0	0	1	0	0	0	2	0	0	0	0	5
8:45 AM	2	0	0	0	0	0	0	1	0	0	1	0	4
TOTAL VOLUMES:	8	1	0	1	2	2	0	12	0	0	9	0	35

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	3	1	0	0	1	2	0	5	0	0	6	0	18

Pedestrian Counts

	67th Street North Leg	67th Street South Leg	El Cajon Boulevard East Leg	El Cajon Boulevard West Leg	TOTAL
7:00 AM	0	1	3	0	4
7:15 AM	0	0	1	0	1
7:30 AM	2	2	4	0	8
7:45 AM	1	5	11	0	17
8:00 AM	1	2	1	0	4
8:15 AM	8	2	9	0	19
8:30 AM	5	4	6	0	15
8:45 AM	4	1	3	0	8
TOTAL VOLUMES:	21	17	38	0	76

	North Leg	South Leg	East Leg	West Leg	TOTAL
PEAK VOLUMES:	12	11	25	0	48

PO Box 1178
Corona, CA 92880
951-268-6268

Location: San Diego
N/S: 67th Street
E/W: El Cajon Boulevard

Date: 1/24/18
Day: WEDNESDAY
Project # 143-18058

TURNING MOVEMENT COUNT

Count Period: **4:00 PM to 6:00 PM**
Peak Hour: **5:00 PM to 6:00 PM**

Vehicle Counts

	67th Street Northbound			67th Street Southbound			El Cajon Boulevard Eastbound			El Cajon Boulevard Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	17	6	6	13	8	9	6	278	26	12	169	8	558
4:15 PM	14	8	6	15	11	25	14	238	24	5	140	15	515
4:30 PM	26	9	10	17	15	11	13	243	24	8	156	13	545
4:45 PM	23	4	12	13	13	10	11	235	19	5	154	12	511
5:00 PM	22	4	7	17	12	15	26	278	24	7	128	6	546
5:15 PM	32	5	7	14	9	15	13	247	14	10	135	17	518
5:30 PM	15	5	7	15	13	33	17	247	30	6	165	19	572
5:45 PM	23	2	3	26	9	24	15	218	19	10	155	20	524
TOTAL VOLUMES:	172	43	58	130	90	142	115	1984	180	63	1202	110	4289

PM Peak Hr Begins at: 500 PM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	92	16	24	72	43	87	71	990	87	33	583	62	2160

PEAK HR FACTOR:	0.750	0.828	0.875	0.892	0.944

Bicycle Counts

	67th Street Northbound			67th Street Southbound			El Cajon Boulevard Eastbound			El Cajon Boulevard Westbound			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	1
4:15 PM	0	0	0	0	0	0	0	2	1	0	1	0	4
4:30 PM	0	1	0	0	1	0	0	1	1	0	0	0	4
4:45 PM	0	1	0	0	0	0	0	2	3	0	1	0	7
5:00 PM	0	0	0	1	0	0	0	0	0	0	0	1	2
5:15 PM	0	1	0	0	0	0	0	2	1	0	0	0	4
5:30 PM	0	1	0	0	0	0	0	0	1	0	1	0	3
5:45 PM	0	0	0	0	0	0	0	2	0	0	1	0	3
TOTAL VOLUMES:	0	4	0	1	1	1	0	9	7	0	4	1	28

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES:	0	2	0	1	0	0	0	4	2	0	2	1	12

Pedestrian Counts

	67th Street North Leg	67th Street South Leg	El Cajon Boulevard East Leg	El Cajon Boulevard West Leg	TOTAL
4:00 PM	4	3	4	0	11
4:15 PM	5	1	6	0	12
4:30 PM	3	3	7	0	13
4:45 PM	6	5	4	0	15
5:00 PM	5	1	4	0	10
5:15 PM	4	2	0	0	6
5:30 PM	3	0	6	0	9
5:45 PM	3	0	9	0	12
TOTAL VOLUMES:	33	15	40	0	88

	North Leg	South Leg	East Leg	West Leg	TOTAL
PEAK VOLUMES:	15	3	19	0	37

SDSU Academic/Holiday Calendar
2017-2018

Summer 2017

Date	**Holiday/Activity**
Mon, May 22, 2017	First day of Summer term
Mon, May 22, 2017	First day of classes
Mon, May 29, 2017	Memorial Day (Campus closed)
Tues, July 4, 2017	Independence Day (Campus closed)
Wed, August 16, 2017	Last day of classes (Final examinations are the last day of classes for each summer session)
Mon, August 21, 2017	Last day of Summer term, grades due from instructors (11 pm deadline)

SENATE APPROVED 10/6/2015

Fall 2017

Date	**Holiday/Activity**
Tues, August 22, 2017	First day of Fall semester
Mon, August 28, 2017	First day of classes
Mon, September 4, 2017	Labor Day (Campus closed)
Fri, November 10, 2017	Veterans Day Observed (Campus closed)
Wed, November 22, 2017	No Class (Campus open)
Thurs, November 23 - Fri, November 24, 2017	Thanksgiving Break: (Campus closed) 11/23 Thanksgiving Day 11/24 * Admission Day
Thurs, December 14, 2017	Last day of classes
Fri, December 15 – Thurs, December 21, 2017	Final Examinations
Mon, December 25 – Thurs, December 28, 2017	Winter Break: (Campus closed) 12/25 Christmas Day 12/26 * Lincoln's Birthday 12/27 * Columbus Day 12/28 * Washington's Birthday
Fri, December 29, 2017	Last day of Fall semester, grades due from instructors (11 pm Deadline)
Mon, January 1, 2018	New Year's Day (Campus closed)

SENATE APPROVED 10/6/2015

Spring 2018

Date	Holiday/Activity
Mon, January 15, 2018	Martin Luther King, Jr. Day (Campus closed)
Tues, January 16, 2018	First Day of Spring semester
Wed, January 17, 2018	First day of classes
Fri, March 16, 2018	NCAA Tournament (Non Instruction Day)
Mon, March 26 – Fri, March 30, 2018	Spring Break
Fri, March 30, 2018	Cesar Chavez Day Observed (Campus closed)
Thurs, May 3, 2018	Last day of classes
Fri, May 4 -Thurs, May 10, 2018	Final Examinations
Thurs, May 10, 2018	IVC Commencement
Fri, May 11 – Sun, May 13, 2018	Commencement – San Diego Campus
Thurs, May 17, 2018	Last day of spring semester, grades due from instructors (11 pm Deadline)

*= Re-scheduled holiday

SENATE APPROVED 10/6/2015

INTERSECTION: MONTEZUMA RD & RESERVOIR RD

Group Assignment:
Field Master Assignment:
System Reference Number:

N/S Street Name: RESERVOIR
E/W Street Name: MONTEZUMA

Last Database Change:

Change Record		
Timing Sheet By	Approved By	Date
M CASTRO	[signature]	6/21/2017

Free Lag <C/1+F+0> _2_4_6

Notes:

Manual Plan
0 = Automatic
1-9 = Plan 1-9
14 = Free
15 = Flash

Manual Offset
0 = Automatic
1 = Offset A
2 = Offset B
3 = Offset C

Drop Number	6	<C/0+0+0>
Zone Number	6	<C/0+0+1>
Area Number	2	<C/0+0+2>
Area Address	150	<C/0+0+3>
QuicNet Channel	COM111	(QuicNet)

Communication Addresses

Manual Plan	0	<C/0+A+1>
Manual Offset	0	<C/0+B+1>

Manual Selection

Flash Start	0	<F/1+0+E>
Red Revert	5.0	<F/1+0+F>
All Red Start	0.0	<F/1+C+0>
FYA Red Revert	0.0	<F/1+0+5>
OVLP CHG Red	0.0	<F/1+0+3>

Start / Revert Times

Exclusive Walk	0	<F/1+0+0>
Exclusive FDW	0	<F/1+0+1>
All Red Clear	0.0	<F/1+0+2>

Exclusive Ped Phase
(Outputs specified in Assignable Outputs at E/127+A+E & F)

Row	Column Numbers → / Phase Names →	1	2 (MONTEZUMA)	3	4 (RESERVOIR)	5	6 (MONTEZUMA)	7	8
						PPLT			
0	Ped Walk				7		7		
1	Ped FDW				17		12		
2	Min Green		10		4	4	10		
3	Type 3 Disconnect								
4	Added per Vehicle								
5	Veh Extension		4.7		2.0	2.0	4.7		
6	Max Gap		4.7		2.0	2.0	4.7		
7	Min Gap		0.2		2.0	2.0	0.2		
8	Max Limit		60		40	30	60		
9	Max Limit 2								
A	Adv. / Delay Walk				7				
B	PE Min Ped FDW				1		1		
C	Cond Serv Check								
D	Reduce Every		0.7				0.7		
E	Yellow Change		4.3		3.9	3.4	4.3		
F	Red Clear		1.0		1.0	1.0	1.0		

Phase Timing - Bank 1 <F/1+Phase+Row>

	9	A	B	C	D
	---	---	---	---	---
Phase 1					
Phase 2					
Phase 3					
Phase 4					
Phase 5					
Phase 6					
Phase 7					
Phase 8					

Max Initial
Alternate Walk
Alternate FDW
Alternate Initial
Alternate Extension

Alternate Timing <F/1+Column+Phase>

	E
RR-1 Delay	
RR-1 Clear	
EV-A Delay	0
EV-A Clear	0
EV-B Delay	0
EV-B Clear	0
EV-C Delay	0
EV-C Clear	0
EV-D Delay	
EV-D Clear	
RR-2 Delay	
RR-2 Clear	
View EV Delay	---
View EV Clear	---
View RR Delay	---
View RR Clear	---

Preempt Timing <F/1+E+Row>

	F	Row
Permit	_2_456__	0
Red Lock		1
Yellow Lock		2
Min Recall	_2__6__	3
Ped Recall		4
View Set Peds	__4_6__	5
Rest In Walk		6
Red Rest		7
Dual Entry		8
Max Recall		9
Soft Recall		A
Max 2		B
Cond. Service		C
Man Cntrl Calls	12345678	
Yellow Start	_2__6__	
First Phases	__4__	

Phase Functions <F/1+F+Row>

How to Set Page Access Code: F/1 -- C + 0 + F = 1

SENT TO
STREET DIV.
FOR

INTERSECTION: 67th Street at El Cajon Bl/Montezuma Rd

233 Program

Group Assignment:
Field Master Assignment:
System Reference Number:

N/S Street: 67th St
E/W Street: El Cajon

Last Database Change:

Timing sheets by: DRH
Approved by: EFF
Timing implemented on: / /2012 - 4/3/13

El Cajon | El Cajon | Montezuma | 67th

Row	Phase Numbers--->	1	2	3	4	5	6	7	8
0	Ped Walk		7				7	7	7
1	Ped FDW		9				17	20	20
2	Min Green	4	7			4	7	7	4
3	Type 3 Disconnect								
4	Added per Vehicle								
5	Veh Extension	2.0	3.0			2.0	3.0	2.5	2.0
6	Max Gap	2.0	3.0			2.0	3.0	2.5	2.0
7	Min Gap	2.0	0.2			2.0	0.2	0.2	2.0
8	Max Limit	30	60			30	60	60	40
9	Max Limit 2								
A	Adv. / Delay Walk								
B	PE Min Ped FDW		1				1	1	1
C	Cond Serv Check								
D	Reduce Every		1.1				1.1	1.3	
E	Yellow Change	3.4	3.9			3.4	3.9	3.9	3.9
F	Red Clear	1.0	1.0			1.0	1.0	1.0	1.0

Phase Timing - Bank 1 <F/1+Phase+Row>

Current Calculated Cycle Length: C/0 + B + F

	9	A	B	C	D
Phase 1					
Phase 2					
Phase 3					
Phase 4					
Phase 5					
Phase 6					
Phase 7					
Phase 8					
Max Initial					
Alternate Walk					
Alternate FDW					
Alternate Initial					
Alternate Extension					

Alternate Timing <F/1+Column+Phase>

	E
RR-1 Delay	
RR-1 Clear	
EV-A Delay	0
EV-A Clear	0
EV-B Delay	0
EV-B Clear	0
EV-C Delay	0
EV-C Clear	0
EV-D Delay	0
EV-D Clear	0
RR-2 Delay	
RR-2 Clear	
View EV Delay	- - -
View EV Clear	- - -
View RR Delay	- - -
View RR Clear	- - -

Preempt Timing <F/1+E+Row>

	F	Row
Permit	12__5678	0
Red Lock		1
Yellow Lock		2
Min Recall	_2__6__	3
Ped Recall		4
View Set Peds		5
Rest In Walk		6
Red Rest		7
Double Entry		8
Max Recall		9
Soft Recall		A
Max 2		B
Cond. Service		C
Man Cntrl Calls		D
Yellow Start	_2__6__	E
First Phases	_____8	F

Phase Functions <F/1+F+Row>

Drop Number	5	<C/0+0+0>
Zone Number	5	<C/0+0+1>
Area Number	2	<C/0+0+2>
Area Address	61	<C/0+0+3>
QuicNet Channel (COM)	111	(QuicNet)

Communication Addresses

(Outputs specified in Assignable Outputs at E/127+A+E & F)

Exclusive Walk	0	<F/1+0+0:
Exclusive FDW	0	<F/1+0+1
All Red Clear	0.0	<F/1+0+2

Exclusive Ped Phase

Manual Plan
0 = Automatic
1-9 = Plan 1-9
14 = Free
15 = Flash

Flash Start	0	<F/1+0+E>
Red Revert	3.0	<F/1+0+F>
All Red Start	0.0	<F/1+C+0>

Start / Revert Times

Manual Offset
0 = Automatic
1 = Offset A
2 = Offset B
3 = Offset C

Manual Plan	14	<C/0+A+
Manual Offset	0	<C/0+B+

Manual Selection

Notes: Allow EB-NB LT at 67th during phase 7

Assign loop #5 to I9U, T6-7&8
Assign loop #14 to J9U, T7-7&8

Reland phase 5 ...

Free Lag	_2_5_8	<C/1+F+0>

How to Set Page Access Code:

Appendix B

City of San Diego Traffic Study Checklist

CITY OF SAN DIEGO
TRANSPORTATION DEVELOPMENT SECTION
TRAFFIC IMPACT STUDY
SCREEN CHECK

To be completed by City Staff:
Date Received _____
Reviewer _____
Date Screen Check _____

To be completed by consultant (including page #):
Name of Traffic Study MONTEZUMA HOTEL
Consultant LOS ENGINEERING, INC.
Date Submitted FEB 2018

Indicate Page # in report:		Satisfactory YES	NO	NOT REQUIRED
pg. ii	1. Table of contents, list of figures and list of tables.	☐	☐	
pg. iv	2. Executive summary.	☐	☐	
pg. 2, 10	3. Map of the proposed project location	☐	☐	
	4. General project description and background information:			
pg. 13	a. Proposed project description (acres, dwelling units....)	☐	☐	
pg. 13	b. Total trip generation of proposed project.	☐	☐	
pg. 13	c. Community plan assumption for the proposed site.	☐	☐	
pg. 7	d. Discuss how project affects the Congestion Management program.	☐	☐	
pg. 8	5. Parking, transit and on-site circulation discussions are included.	☐	☐	
pg. 12	6. Map of the Transportation Impact Study Area and specific intersections studied in the traffic report.	☐	☐	
pg. 8	7. Existing Transportation Conditions:			
10	a. Figure identifying roadway conditions including raised medians, median openings, separate left and right turn lanes, roadway and intersection dimensions, bike lanes, parking, number of travel lanes, posted speed, intersection controls, turn restrictions and intersection lane configurations.	☐	☐	
12	b. Figure indicating the daily (ADT) and peak hour volumes.	☐	☐	
11	c. Figure or table showing level of service (LOS) for intersections during peak hours and roadway sections within the study area (analysis sheets included in the appendix).	☐	☐	
	8. Project Trip Generation:			
pg. 13	Table showing the calculated project generated daily (ADT) and the peak hour volumes.	☐	☐	
pg. 14	9. Project Trip Distribution using the current TRANPLAN Computer Traffic Model (provide a computer plot) or manual assignment if previously approved. (Identify which method was used.)	☐	☐	
	10. Project Traffic Assignment:			
pg. 15	a. Figure indicating the daily (ADT) and peak hour volumes.	☐	☐	
pg. NA	b. Figure showing pass-by-trip adjustments, if cumulative trip rates are used.	☐	☐	☐
	11. Existing + Other Pending Projects:			
pg. 22	a. Figure indicating the daily (ADT) and peak hour volumes.	☐	☐	
pg. 21	b. Figure or table showing the projected LOS for intersections during peak hours and roadway sections within the study area (analysis sheets included in the appendix).	☐	☐	
pg. NA	c. Traffic signal warrant analysis for appropriate locations (signal warrants included in the appendix).	☐	☐	

		Satisfactory YES	NO	NOT REQUIRED
	12. Existing + Other Pending Projects + Project (short term cumulative):			
pg. 23	a. Figure or table showing the projected LOS for intersections during peak hours and roadway sections with the project (analysis sheets included in the appendix).	☐	☐	
pg. 24	b. Figure showing other projects that were included in the study, and the assignment of their site traffic.	☐	☐	
pg. NA	c. Traffic signal warrant analysis for appropriate locations (signal warrants in the appendix).	☐	☐	
	13. Build-out Transportation Conditions (if project conforms to the community plan):			
pg. NA	a. Build-out ADT and street classification that reflect the community plan.	☐	☐	☐
pg. NA	b. Figure or table showing the build-out LOS for intersections during peak hours and roadway sections with the project (analysis sheets included in the appendix).	☐	☐	☐
pg. NA	c. Traffic signal warrant analysis at appropriate locations (signal warrants included in the appendix).	☐	☐	☐
	14. Build-out Transportation Conditions (if project does not conform to the community plan).			
pg. 25	a. Build-out ADT and street classification as shown in the community plan.	☐	☐	☐
pg. 26	b. Build-out ADT and street classification for two scenarios: with the proposed project and with the land use assumed in the community plan.	☐	☐	☐
pg. 28	c. Figure or table showing the build-out LOS for intersections during peak hours and roadway sections for two scenarios: with the proposed project and with the land use assumed in the community plan (analysis sheets included in the appendix).	☐	☐	☐
pg. NA	d. Traffic signal warrant analysis at appropriate locations with the land use assumed in the community plan (signal warrants included in the appendix).	☐	☐	☐
pg. 19, 23, 28	15. A summary table showing the comparison of Existing, Existing + Other Pending Projects, Existing + Other Pending Projects + Proposed Project, and Buildout, LOS on roadway sections and intersections during peak hours.	☐	☐	
	16. Transportation Mitigation Measures.			
pg. 30	a. Table identifying the mitigations required that are the responsibility of the developer and others. A phasing plan is required if mitigations are proposed in phases.	☐	☐	
pg. NA	b. Figure showing all proposed mitigations that include: intersection lane configurations, lane widths, raised medians, median openings, roadway and intersection dimensions, right-of-way, offset, etc.	☐	☐	
pg. UPON FINAL VERSION	17. The traffic study is signed by a California Registered Traffic Engineer.	☐	☐	
pg. 4	18. The Highway Capacity Manual Operational Method or other approved method is used at appropriate locations within the study area.	☐	☐	
pg. 7	19. Analysis complies with Congestion Management requirements.	☐	☐	☐
pg. NA	20. Appropriate freeway analysis is included.	☐	☐	☐
pg. NA	21. Appropriate freeway ramp metering analysis is included.	☐	☐	☐

THE TRAFFIC STUDY SCREEN CHECK FOR THE SUBJECT PROJECT IS:

_____ Approved

_____ Not approved because the following items are missing:

_____

_____

_____

_____

_____

Appendix C

City of San Diego Community Plan Excerpts

COLLEGE AREA COMMUNITY PLAN

1989

THE CITY OF SAN DIEGO

College Area

Community Plan

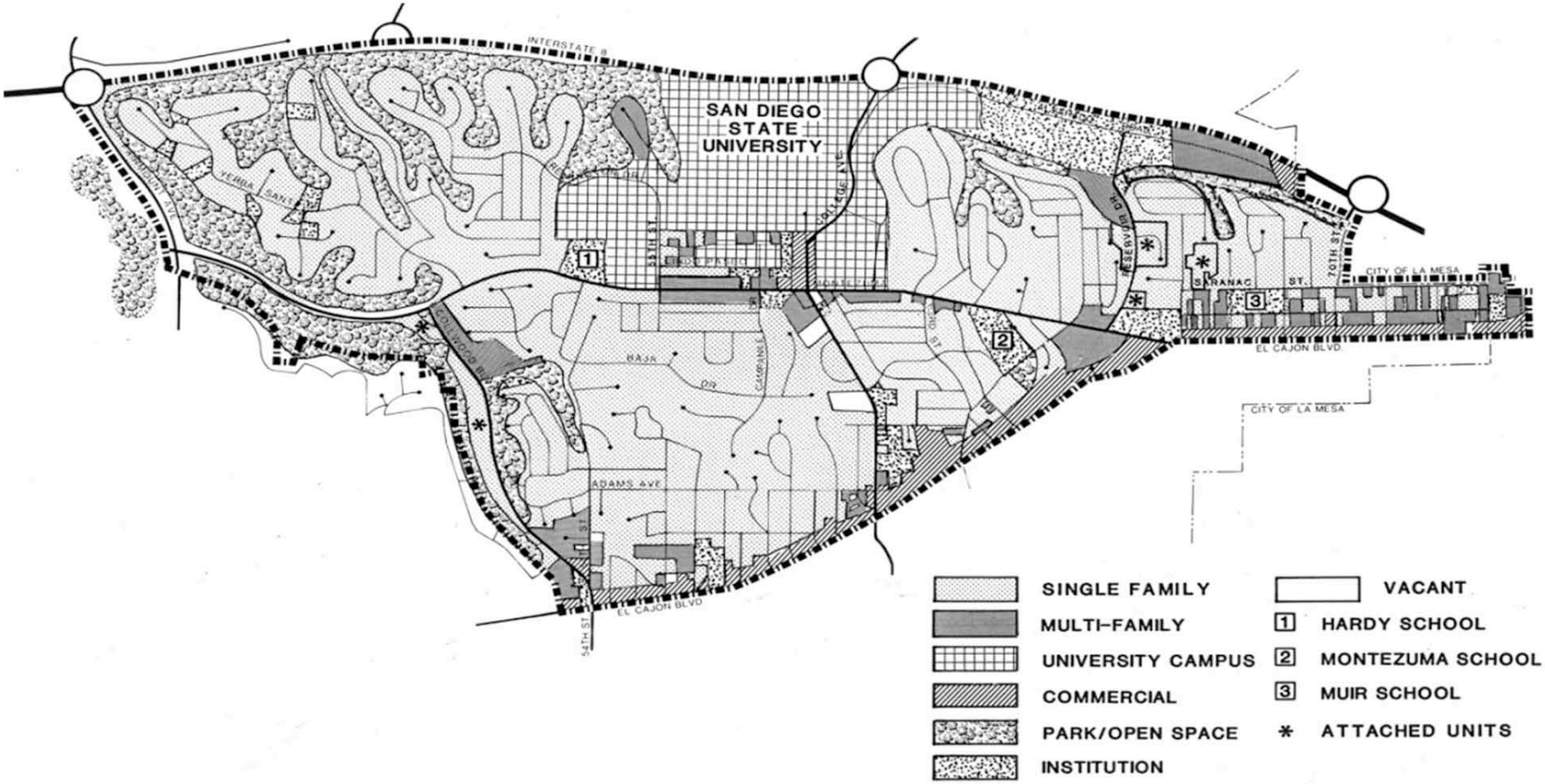
City of San Diego Planning Department
202 C Street, MS 4A
San Diego, CA 92101

Printed on recycled paper.
This information, or this document (or portions thereof), will be made available in alternative formats upon request.

College Area Community Plan

The following information has been incorporated into this September 2005 posting of this Plan:

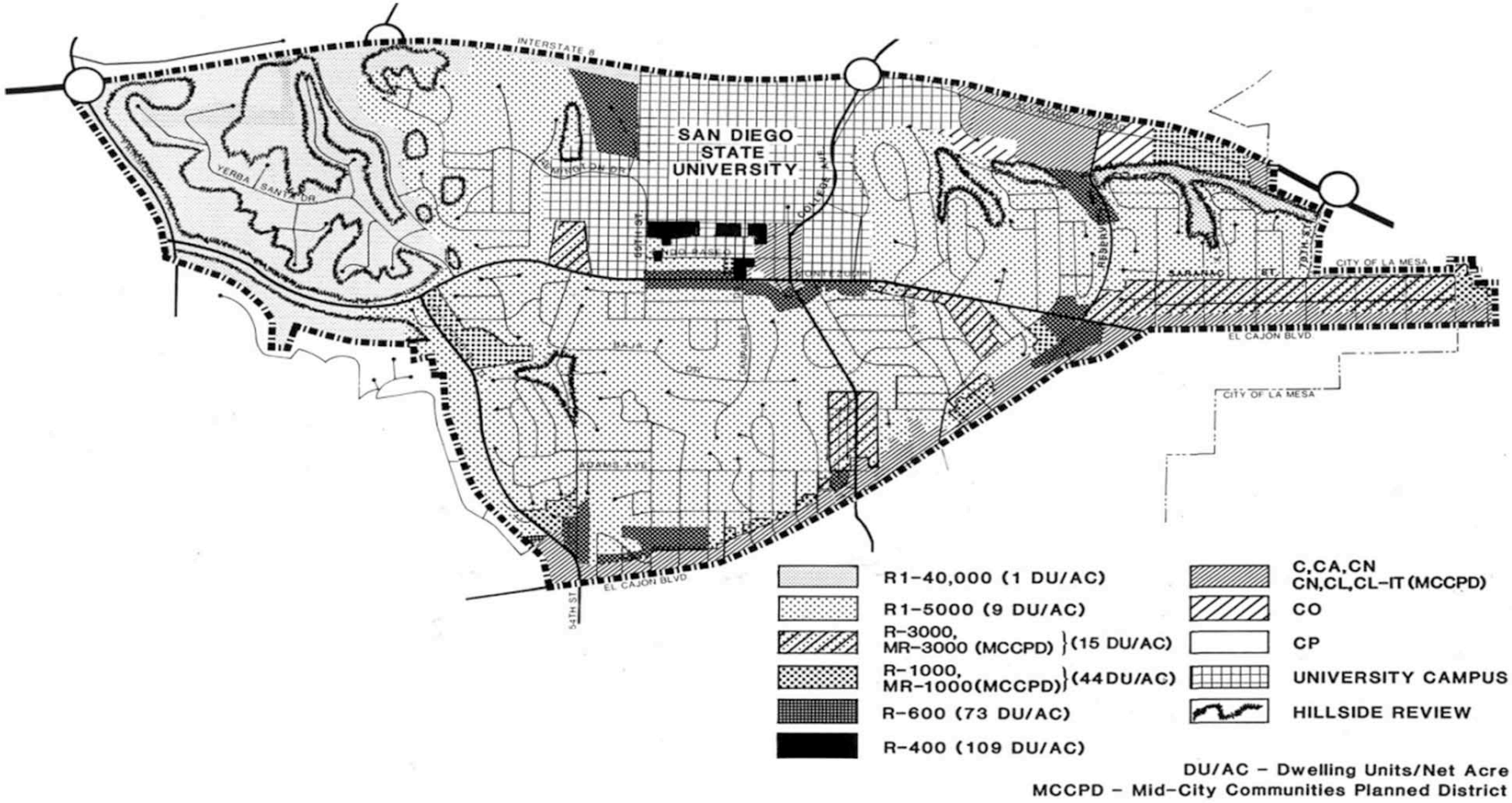
Amendment	Date Approved by Planning Commission	Resolution Number	Date Adopted by City Council	Resolution Number
Adoption of the College Area Community Plan	January 12, 1989	0354-PC	May 2, 1989	R-273373
College Community Redevelopment Plan (SDSU Element)	September 16, 1993	—	October 12, 1993	R-282800 R-282801
Mission Valley East Trolley Extension	March 2, 2000	2931-PC	August 5, 2002	R-296980



Generalized Existing Land Use - 1988

College Area Community Plan

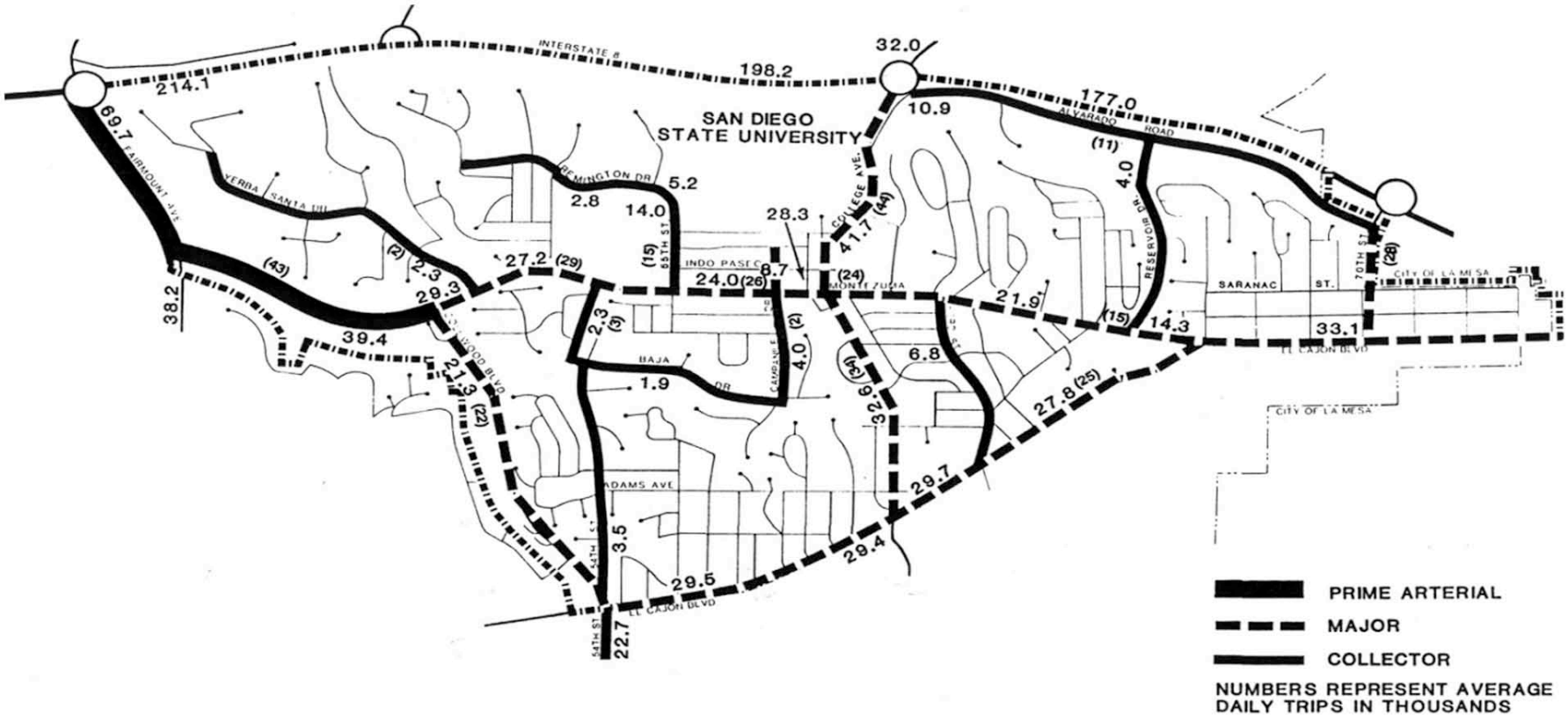
3 FIGURE



Existing Zoning - 1988

College Area Community Plan

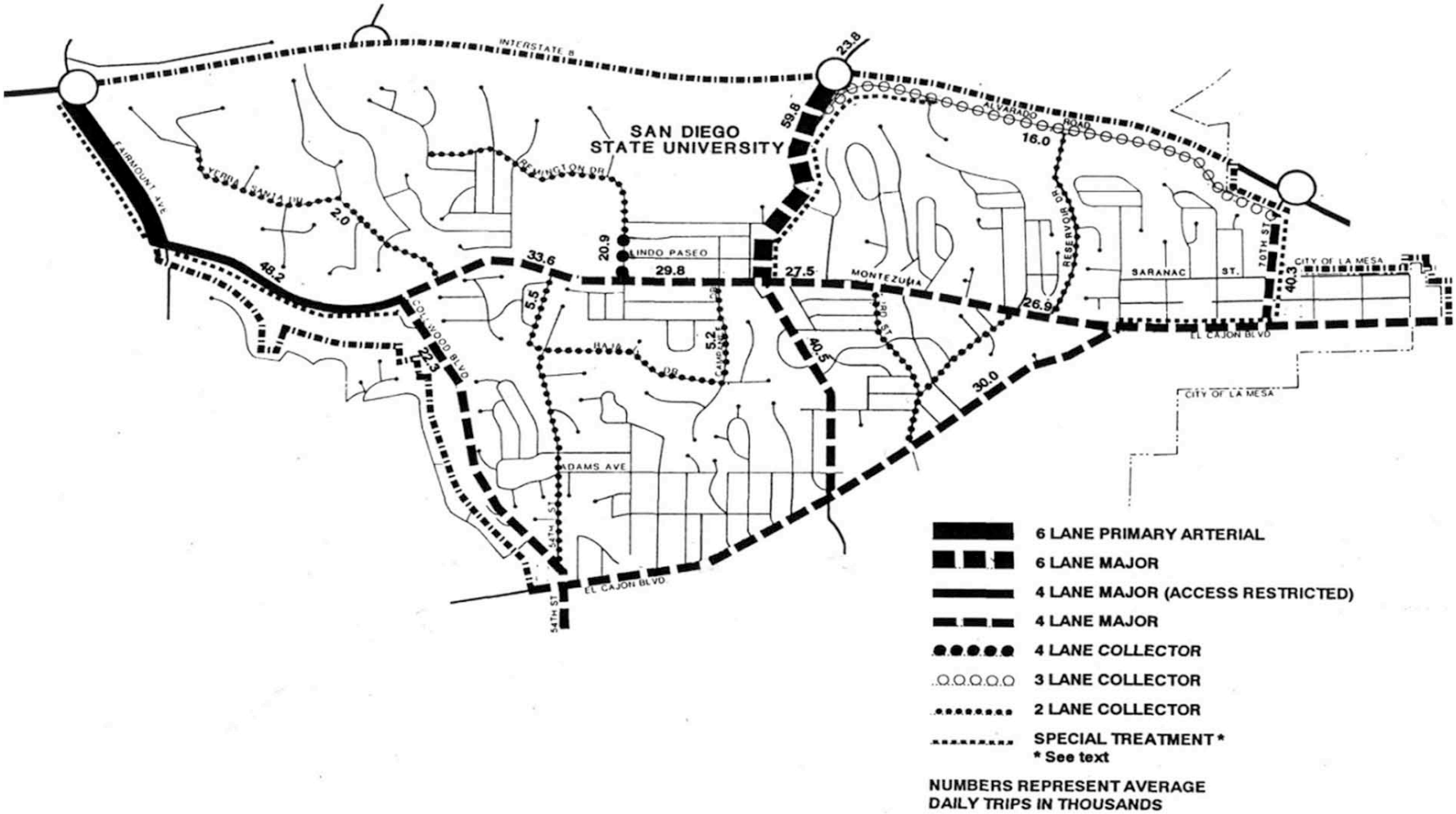
4
FIGURE



Existing Street Classifications and Traffic Volumes - 1986 (1992)

10 FIGURE

College Area Community Plan



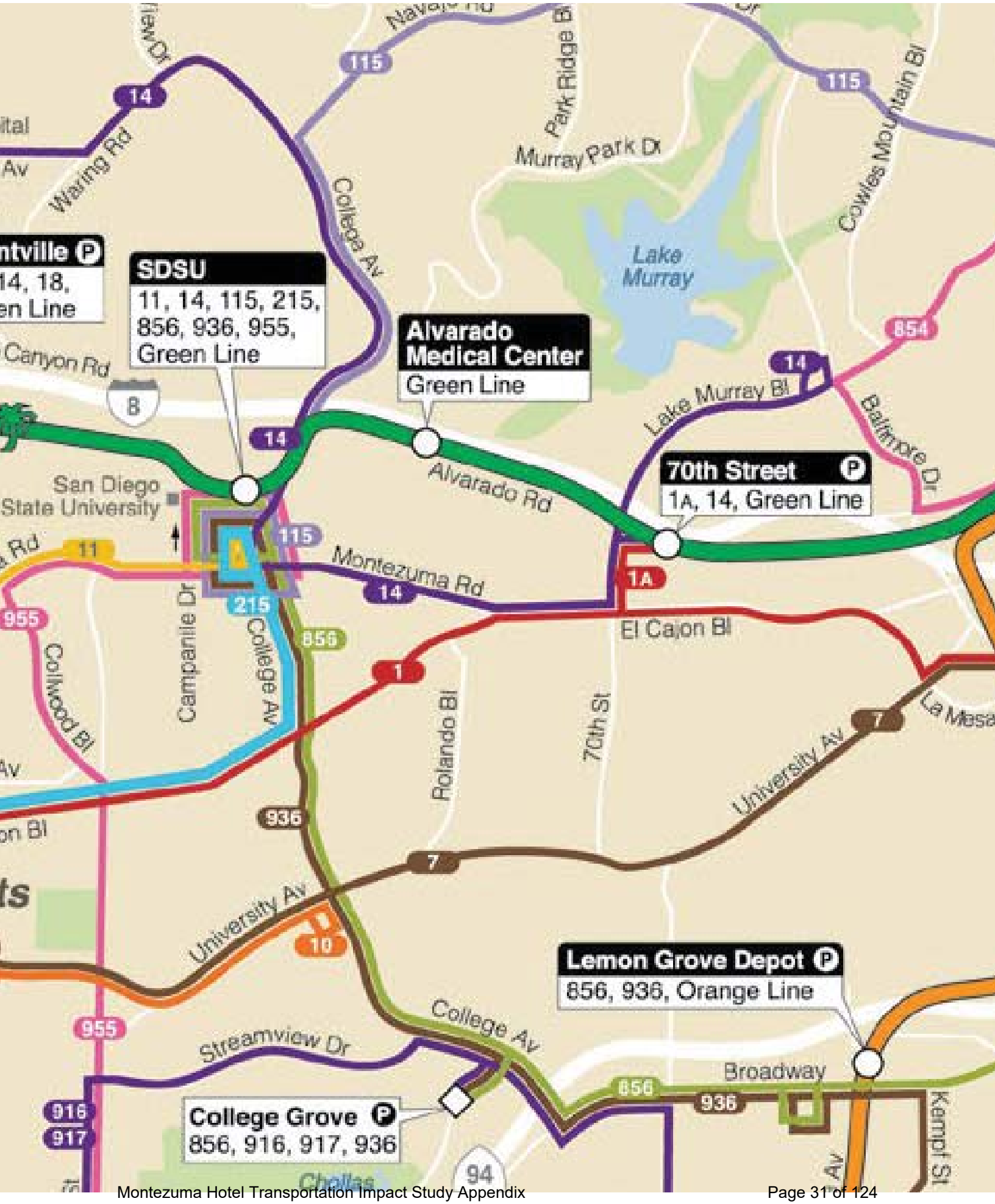
Future Street Classifications and Traffic Volumes

College Area Community Plan

11 FIGURE

Appendix D

Transit Map and Schedule


SDSU
11, 14, 115, 215, 856, 936, 955, Green Line
Alvarado Medical Center
Green Line
70th Street
1A, 14, Green Line
Lemon Grove Depot
856, 936, Orange Line
College Grove
856, 916, 917, 936
Lake Murray
Murray Park Dr
Park Ridge Bl
Cowles Mountain Bl
Waring Rd
College Av
Canyon Rd
Lake Murray Bl
Baltimore Dr
Alvarado Rd
San Diego State University
Montezuma Rd
El Cajon Bl
Campanile Dr
Collwood Bl
Rolando Bl
70th St
University Av
La Mesa
Streamview Dr
Broadway
Kempf St
Chollas
14
115
854
8
11
955
215
856
1
1A
7
936
10
916
917
94

CASH FARES / *Tarifas en efectivo*

Exact fare, please / *Favor de pagar la cantidad exacta*

Day Pass (Regional) / *Pase diario (Regional)* Compass Card required ($2) / *Se requiere un Compass Card ($2)*	**$5.00**
One-Way Fare / *Tarifa de una direccíon*	**$2.25**
Senior (60+)/Disabled/Medicare *Mayores de 60 años/Discapacitados/Medicare*	**$1.10***
Children 5 & under / *Niños de 5 años o menos* Up to two children ride free per paying adult / *Máximo dos niños viajan gratis por cada adulto*	**FREE / *GRATIS***

MONTHLY PASSES / *Pases mensual*

Adult / *Adulto*	**$72.00**
Senior (60+)/Disabled/Medicare *Mayores de 60 años/Discapacitados/Medicare*	**$18.00***
Youths (18 and under) *Jóvenes (18 años o menos)*	**$36.00***

*I.D. required for discount fare or pass.
**Se requiere identificación para tarifas o pases de descuento.*

DAY PASS (REGIONAL) / *Pase diario (Regional)*

All passes are sold on Compass Card, which can be reloaded and reused for up to five years. Compass Cards are available for $2 at select outlets. A $5 Day Pass requires a Compass Card. A paper Day Pass can be purchased on board buses for an additional $2 fee.

Todos los pases se venden en el Compass Card, el cual puede ser recargado y reutilizado por hasta cinco años. Compass Cards están disponibles por $2 en selectas sucursales. Un pase de un día por $5 requiere un Compass Card. Un pase de un día de papel se puede obtener a bordo los autobuses por un costo adicional de $2.

DIRECTORY / *Directorio*

Regional Transit Information *Información de transporte público regional*	**511** or/ó **(619) 233-3004**
TTY/TDD (teletype for hearing impaired) *Teletipo para sordos*	**(619) 234-5005** or/ó **(888) 722-4889**
InfoExpress (24-hour info via Touch-Tone phone) *Información las 24 horas (via teléfono de teclas)*	**(619) 685-4900**
Customer Service / Suggestions *Servicio al cliente / Sugerencias*	**(619) 557-4555**
SafeWatch	**(619) 557-4500**
Lost & Found *Objetos extraviados*	**(619) 427-5660** or/ó **(800) 409-3310**
The Transit Store	**(619) 234-1060** 1st & Broadway, Downtown San Diego M–F 9am–5pm
For MTS online trip planning *Planificación de viajes por Internet*	**www.sdmts.com**

For more information on riding MTS services, pick up a Rider's Guide on a bus or at The Transit Store, or visit **www.sdmts.com**.

*Para obtener más información sobre el uso de los servicios de MTS, recoja un 'Rider's Guide' en un autobús o en The Transit Store, o visita a **www.sdmts.com**.*

Thank you for riding MTS! ***¡Gracias por viajar con MTS!***

Effective JUNE 8, 2014

1

Hillcrest – Grossmont Transit Ctr. (1) or 70th St. Trolley (1A)

via El Cajon Bl.

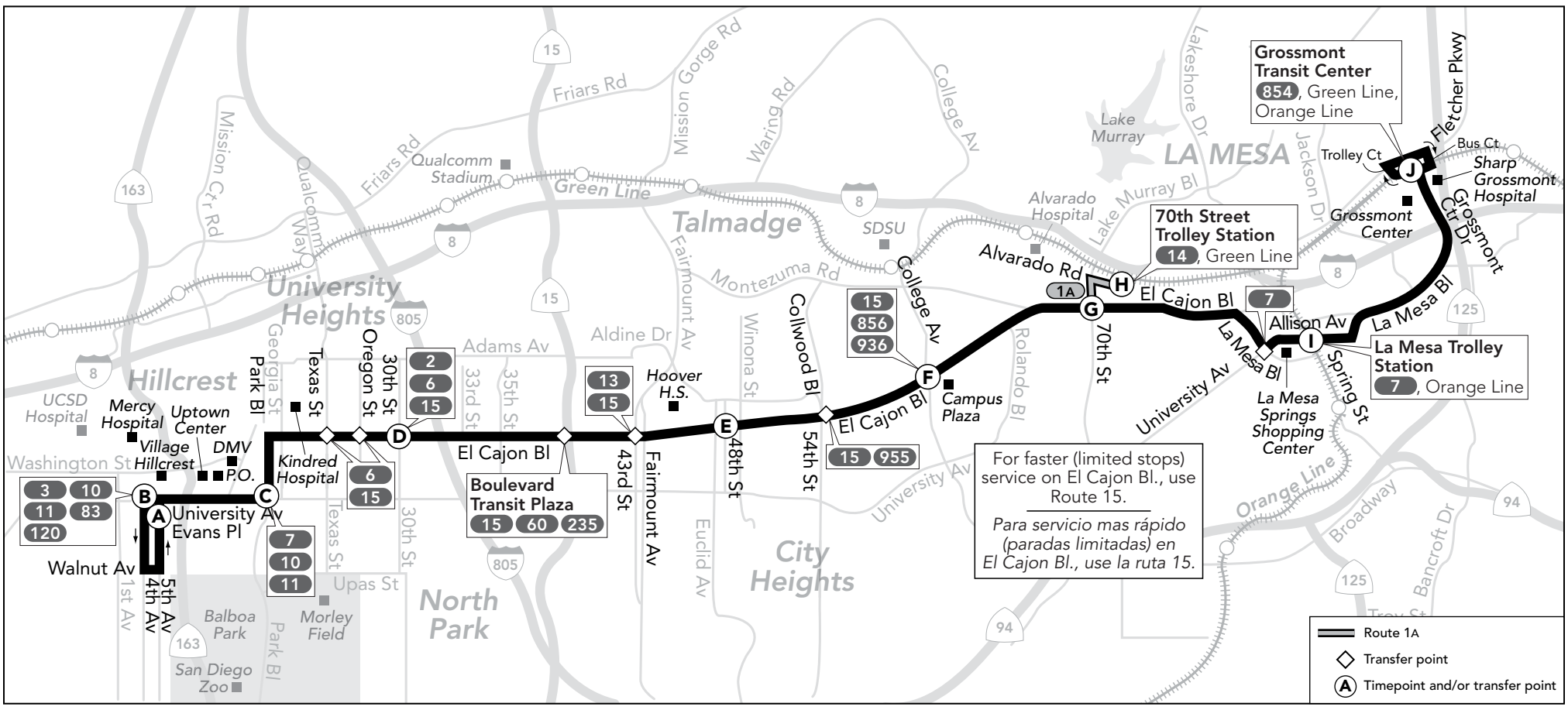
DESTINATIONS

- Downtown La Mesa
- Grossmont Center
- Hillcrest DMV
- Sharp Grossmont Hospital
- Uptown Shopping Center

TROLLEY CONNECTIONS
70th St.
La Mesa Bl.
Grossmont

MTS Metropolitan Transit System

Alternative formats available upon request. Please call: (619) 557-4555 / *Formato alternativo disponible al preguntar. Favor de llamar: (619) 557-4555*



For faster (limited stops) service on El Cajon Bl., use Route 15.

Para servicio mas rápido (paradas limitadas) en El Cajon Bl., use la ruta 15.

A Saturday or Sunday schedule will be operated on the following holidays and observed holidays >>> New Year's Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Thanksgiving, Christmas
Se operará con horario de sábado o domingo durante los siguientes días festivos y feriados observados

Route 1 – Sunday / *domingo*

Hillcrest ➡ City Heights ➡ La Mesa

(A) 5th Av. & Evans Pl. **DEPART**	(B) 5th Av. & University Av.	(C) Park Bl. & University Av.	(D) El Cajon Bl. & 30th St.	(E) El Cajon Bl. & 48th St.	(F) El Cajon Bl. & College Av.	(G) El Cajon Bl. & 70th St.	(H) 70th St. Trolley Station	(I) La Mesa Bl. Trolley Station	(J) Grossmont Transit Ctr. **ARRIVE**
6:28a	6:29a	6:33a	6:41a	6:51a	6:58a	7:05a	—	7:13a	7:21a
7:32	7:33	7:39	7:47	7:58	8:06	8:13	—	8:21	8:30
8:15	8:16	8:23	8:32	8:45	8:54	9:01	—	9:09	9:20
8:45	8:46	8:53	9:02	9:15	9:24	9:31	—	9:39	9:50
9:12	9:13	9:20	9:29	9:42	9:51	9:58	—	10:06	10:17
9:39	9:40	9:47	9:57	10:11	10:20	10:27	—	10:35	10:46
10:04	10:05	10:12	10:22	10:36	10:45	10:53	—	11:02	11:13
10:29	10:30	10:38	10:49	11:04	11:14	11:22	—	11:31	11:43
10:59	11:00	11:08	11:19	11:34	11:44	11:52	—	**12:01p**	**12:13p**
11:29	11:30	11:38	11:49	**12:04p**	**12:14p**	**12:22p**	—	**12:31**	**12:43**
11:59	**12:00p**	**12:09p**	**12:20p**	**12:36**	**12:46**	**12:54**	—	**1:03**	**1:15**
12:29p	**12:30**	**12:39**	**12:50**	**1:06**	**1:16**	**1:24**	—	**1:33**	**1:45**
12:59	**1:00**	**1:09**	**1:20**	**1:36**	**1:46**	**1:54**	—	**2:03**	**2:15**
1:29	**1:30**	**1:39**	**1:50**	**2:06**	**2:16**	**2:24**	—	**2:33**	**2:45**
1:59	**2:00**	**2:09**	**2:20**	**2:36**	**2:46**	**2:54**	—	**3:03**	**3:15**
2:29	**2:30**	**2:39**	**2:50**	**3:06**	**3:16**	**3:24**	—	**3:33**	**3:45**
2:59	**3:00**	**3:09**	**3:20**	**3:36**	**3:46**	**3:54**	—	**4:03**	**4:15**
3:29	**3:30**	**3:39**	**3:50**	**4:06**	**4:16**	**4:24**	—	**4:33**	**4:45**
3:59	**4:00**	**4:09**	**4:20**	**4:36**	**4:46**	**4:54**	—	**5:03**	**5:15**
4:29	**4:30**	**4:39**	**4:50**	**5:06**	**5:16**	**5:24**	—	**5:33**	**5:45**
4:59	**5:00**	**5:08**	**5:18**	**5:33**	**5:42**	**5:50**	—	**5:58**	**6:08**
5:47	**5:48**	**5:56**	**6:05**	**6:18**	**6:26**	**6:33**	—	**6:41**	**6:51**
6:34	**6:35**	**6:43**	**6:52**	**7:05**	**7:13**	**7:20**	—	**7:28**	—
7:34	**7:35**	**7:42**	**7:50**	**7:59**	**8:06**	**8:13**	—	**8:20**	—
8:34	**8:35**	**8:42**	**8:50**	**8:59**	**9:06**	**9:13**	—	**9:20**	—

La Mesa ➡ City Heights ➡ Hillcrest

(J) Grossmont Transit Ctr. **DEPART**	(I) La Mesa Bl. Trolley Station	(H) 70th St. Trolley Station	(G) El Cajon Bl. & 70th St.	(F) El Cajon Bl. & College Av.	(E) El Cajon Bl. & 48th St.	(D) El Cajon Bl. & 30th St.	(C) Park Bl. & University Av.	(B) 4th Av. & University Av.	(A) 5th Av. & Evans Pl. **ARRIVE**
—	5:37a	—	5:44a	5:48a	5:55a	6:04a	6:11a	6:16a	6:19a
—	6:37	—	6:45	6:48	6:55	7:04	7:11	7:16	7:19
7:31a	7:42	—	7:50	7:56	8:05	8:17	8:24	8:31	8:34
8:40	8:51	—	9:00	9:06	9:15	9:28	9:36	9:43	9:46
9:40	9:51	—	10:00	10:06	10:16	10:30	10:38	10:45	10:48
10:10	10:21	—	10:30	10:36	10:46	11:00	11:08	11:15	11:18
10:38	10:50	—	11:00	11:07	11:17	11:31	11:39	11:46	11:49
11:02	11:14	—	11:24	11:31	11:41	11:55	**12:03p**	**12:11p**	**12:15p**
11:30	11:42	—	11:52	11:59	**12:09p**	**12:23p**	**12:31**	**12:39**	**12:43**
12:00p	**12:12p**	—	**12:22p**	**12:29p**	**12:39**	**12:53**	**1:01**	**1:09**	**1:13**
12:30	**12:42**	—	**12:52**	**12:59**	**1:09**	**1:23**	**1:31**	**1:39**	**1:43**
1:00	**1:12**	—	**1:22**	**1:29**	**1:39**	**1:53**	**2:01**	**2:09**	**2:13**
1:30	**1:42**	—	**1:52**	**1:59**	**2:09**	**2:23**	**2:31**	**2:39**	**2:43**
2:00	**2:12**	—	**2:22**	**2:29**	**2:39**	**2:53**	**3:01**	**3:09**	**3:13**
2:30	**2:42**	—	**2:52**	**2:59**	**3:09**	**3:23**	**3:31**	**3:39**	**3:43**
3:00	**3:12**	—	**3:22**	**3:29**	**3:39**	**3:53**	**4:01**	**4:09**	**4:13**
3:30	**3:42**	—	**3:52**	**3:59**	**4:09**	**4:23**	**4:31**	**4:39**	**4:43**
4:00	**4:12**	—	**4:22**	**4:29**	**4:39**	**4:53**	**5:01**	**5:09**	**5:13**
4:30	**4:42**	—	**4:52**	**4:59**	**5:09**	**5:23**	**5:31**	**5:39**	**5:43**
5:00	**5:12**	—	**5:22**	**5:29**	**5:39**	**5:53**	**6:01**	**6:09**	**6:13**
5:30	**5:42**	—	**5:52**	**5:59**	**6:09**	**6:23**	**6:31**	**6:39**	**6:43**
6:18	**6:30**	—	**6:39**	**6:45**	**6:53**	**7:05**	**7:12**	**7:20**	**7:23**
7:18	**7:30**	—	**7:39**	**7:45**	**7:53**	**8:05**	**8:12**	**8:20**	**8:23**

The schedules and other information shown in this timetable are subject to change. MTS does not assume responsibility for errors in timetables nor for any inconvenience caused by delayed buses.
Los horarios e información que se muestran en este itinerario están sujetos a cambios. MTS no asume responsabilidad por errores en los itinerarios, ni por ningún perjuicio que se origine por los autobuses demorados.

Route 1 – Monday through Friday / *lunes a viernes*

Hillcrest ➡ City Heights ➡ La Mesa

	Ⓐ 5th Av. & Evans Pl. **DEPART**	Ⓑ 5th Av. & University Av.	Ⓒ Park Bl. & University Av.	Ⓓ El Cajon Bl. & 30th St.	Ⓔ El Cajon Bl. & 48th St.	Ⓕ El Cajon Bl. & College Av.	Ⓖ El Cajon Bl. & 70th St.	Ⓗ 70th St. Trolley Station	Ⓘ La Mesa Bl. Trolley Station	Ⓙ Grossmont Transit Ctr. **ARRIVE**
	4:49a	4:50a	4:53a	5:01a	5:10a	5:17a	5:24a	—	5:32a	5:39a
	5:19	5:20	5:23	5:31	5:40	5:47	5:54	—	6:02	6:09
	5:44	5:45	5:48	5:56	6:05	6:12	6:19	—	6:27	6:34
	6:04	6:05	6:09	6:17	6:27	6:34	6:41	—	6:49	6:57
1A	6:22	6:23	6:27	6:35	6:45	6:52	6:59	7:02a	—	—
	6:37	6:38	6:42	6:50	7:02	7:10	7:17	—	7:25	7:34
1A	6:51	6:52	6:57	7:05	7:17	7:25	7:32	7:36	—	—
	7:05	7:06	7:12	7:21	7:33	7:41	7:48	—	7:57	8:06
1A	7:20	7:21	7:27	7:36	7:48	7:56	8:03	8:07	—	—
	7:35	7:36	7:42	7:51	8:03	8:11	8:18	—	8:27	8:36
1A	7:50	7:51	7:57	8:06	8:18	8:26	8:33	8:37	—	—
	8:05	8:06	8:12	8:21	8:33	8:41	8:48	—	8:57	9:06
1A	8:20	8:21	8:27	8:36	8:48	8:56	9:03	9:07	—	—
	8:35	8:36	8:42	8:51	9:03	9:11	9:18	—	9:27	9:36
1A	8:50	8:51	8:57	9:06	9:18	9:26	9:33	9:37	—	—
	9:05	9:06	9:13	9:22	9:35	9:43	9:51	—	10:01	10:10
1A	9:22	9:23	9:30	9:39	9:52	10:01	10:09	10:13	—	—
	9:37	9:38	9:45	9:54	10:07	10:16	10:24	—	10:34	10:43
1A	9:52	9:53	10:00	10:09	10:22	10:31	10:39	10:43	—	—
	10:07	10:08	10:15	10:24	10:37	10:46	10:54	—	11:04	11:13
1A	10:22	10:23	10:30	10:39	10:52	11:01	11:09	11:13	—	—
	10:37	10:38	10:46	10:56	11:10	11:19	11:27	—	11:38	11:49
1A	10:52	10:53	11:01	11:11	11:25	11:34	11:42	11:46	—	—
	11:07	11:08	11:16	11:26	11:40	11:49	11:57	—	12:08p	12:19p
1A	11:22	11:23	11:31	11:41	11:55	12:04p	12:12p	12:16p	—	—
	11:37	11:38	11:46	11:56	12:10p	12:19	12:27	—	12:38	12:49
	11:56	11:57	12:06p	12:17p	12:32	12:42	12:50	—	1:01	1:13
1A	12:14p	12:15p	12:24	12:35	12:50	1:00	1:08	1:12	—	—
	12:29	12:30	12:39	12:50	1:05	1:15	1:23	—	1:34	1:46
1A	12:44	12:45	12:54	1:05	1:20	1:30	1:38	1:42	—	—
	12:59	1:00	1:09	1:20	1:35	1:45	1:53	—	2:04	2:16
1A	1:14	1:15	1:24	1:35	1:50	2:00	2:08	2:12	—	—
	1:29	1:30	1:39	1:50	2:05	2:15	2:23	—	2:34	2:46
1A	1:44	1:45	1:54	2:05	2:20	2:30	2:38	2:42	—	—
	1:59	2:00	2:09	2:20	2:35	2:45	2:53	—	3:04	3:16
1A	2:14	2:15	2:24	2:35	2:50	3:00	3:08	3:12	—	—
	2:29	2:30	2:39	2:50	3:06	3:16	3:25	—	3:36	3:49
1A	2:44	2:45	2:54	3:05	3:21	3:31	3:39	3:43	—	—
	2:59	3:00	3:09	3:20	3:36	3:46	3:55	—	4:06	4:19
1A	3:14	3:15	3:24	3:35	3:51	4:01	4:10	4:14	—	—
	3:29	3:30	3:39	3:50	4:06	4:16	4:25	—	4:36	4:49
1A	3:44	3:45	3:54	4:05	4:21	4:31	4:40	4:44	—	—
	3:59	4:00	4:09	4:20	4:36	4:46	4:55	—	5:06	5:19
1A	4:14	4:15	4:24	4:35	4:51	5:01	5:10	5:14	—	—
	4:29	4:30	4:39	4:50	5:06	5:16	5:25	—	5:36	5:49
1A	4:44	4:45	4:54	5:05	5:21	5:31	5:40	5:44	—	—
	4:59	5:00	5:09	5:19	5:34	5:43	5:52	—	6:02	6:14
1A	5:14	5:15	5:24	5:34	5:49	5:58	6:07	6:11	—	—
	5:29	5:30	5:39	5:49	6:04	6:13	6:22	—	6:32	6:44
1A	5:44	5:45	5:54	6:04	6:19	6:28	6:37	6:41	—	—
	6:04	6:05	6:13	6:23	6:36	6:44	6:53	—	7:02	7:14
1A	6:24	6:25	6:33	6:42	6:54	7:02	7:10	7:13	—	—
	6:44	6:45	6:53	7:02	7:14	7:22	7:30	—	7:38	7:49
	7:04	7:05	7:13	7:22	7:34	7:42	7:50	—	7:58	8:07
	7:34	7:35	7:42	7:50	7:59	8:06	8:13	—	8:20	8:28
	8:08	8:09	8:16	8:24	8:33	8:40	8:47	—	8:54	9:02
	8:38	8:39	8:46	8:54	9:03	9:10	9:17	—	9:24	9:32
	9:08	9:09	9:16	9:24	9:33	9:40	9:47	—	9:54	10:02
	9:44	9:45	9:51	9:59	10:08	10:15	10:21	—	10:28	10:35
	10:14	10:15	10:20	10:27	10:36	10:43	10:49	—	10:56	11:03
	10:44	10:45	10:50	10:57	11:06	11:13	11:19	—	11:26	11:33
	11:14	11:15	11:20	11:27	11:36	11:43	11:49	—	11:56	—

La Mesa ➡ City Heights ➡ Hillcrest

Ⓙ Grossmont Transit Ctr. **DEPART**	Ⓘ La Mesa Bl. Trolley Station	Ⓗ 70th St. Trolley Station	Ⓖ El Cajon Bl. & 70th St.	Ⓕ El Cajon Bl. & College Av.	Ⓔ El Cajon Bl. & 48th St.	Ⓓ El Cajon Bl. & 30th St.	Ⓒ Park Bl. & University Av.	Ⓑ 4th Av. & University Av.	Ⓐ 5th Av. & Evans Pl. **ARRIVE**
—	—	4:55a	4:59a	5:03a	5:10a	5:19a	5:26a	5:31a	5:34a
—	—	5:10	5:14	5:18	5:25	5:34	5:41	5:46	5:49
5:15a	5:25a	—	5:32	5:36	5:44	5:53	6:00	6:06	6:09
—	—	5:44	5:48	5:53	6:02	6:11	6:18	6:25	6:28
5:45	5:55	—	6:03	6:08	6:17	6:27	6:34	6:41	6:44
—	—	6:18	6:23	6:28	6:37	6:48	6:55	7:02	7:05
6:20	6:30	—	6:38	6:43	6:52	7:03	7:10	7:17	7:20
—	—	6:48	6:53	6:59	7:08	7:20	7:27	7:35	7:38
6:48	6:59	—	7:08	7:14	7:23	7:36	7:43	7:51	7:54
—	—	7:18	7:23	7:29	7:39	7:52	7:59	8:07	8:10
7:17	7:28	—	7:38	7:44	7:54	8:07	8:14	8:22	8:25
—	—	7:48	7:53	7:59	8:09	8:22	8:29	8:37	8:40
7:47	7:58	—	8:08	8:14	8:24	8:37	8:44	8:52	8:55
—	—	8:18	8:23	8:29	8:39	8:52	9:00	9:08	9:11
8:16	8:28	—	8:38	8:44	8:54	9:07	9:15	9:23	9:27
—	—	8:48	8:53	8:59	9:09	9:22	9:30	9:38	9:42
8:46	8:58	—	9:08	9:14	9:24	9:37	9:45	9:53	9:57
—	—	9:18	9:23	9:29	9:39	9:52	10:00	10:08	10:12
9:16	9:28	—	9:38	9:44	9:54	10:07	10:15	10:23	10:27
—	—	9:48	9:53	9:59	10:09	10:22	10:30	10:38	10:42
9:46	9:58	—	10:08	10:14	10:24	10:37	10:45	10:53	10:57
—	—	10:20	10:25	10:31	10:41	10:54	11:02	11:11	11:15
10:19	10:32	—	10:42	10:48	10:58	11:11	11:20	11:29	11:33
—	—	10:54	10:59	11:05	11:15	11:28	11:37	11:46	11:50
10:53	11:06	—	11:16	11:22	11:32	11:45	11:54	12:03p	12:07p
—	—	11:26	11:31	11:37	11:47	12:00p	12:09p	12:18	12:22
11:27	11:40	—	11:50	11:56	12:06p	12:19	12:28	12:37	12:41
—	—	12:04p	12:09p	12:15p	12:25	12:38	12:47	12:56	1:00
12:01p	12:14p	—	12:24	12:30	12:40	12:53	1:02	1:11	1:15
—	—	12:34	12:39	12:45	12:55	1:08	1:17	1:26	1:30
12:31	12:44	—	12:54	1:00	1:10	1:23	1:32	1:41	1:45
—	—	1:04	1:09	1:15	1:25	1:38	1:47	1:56	2:00
1:00	1:13	—	1:24	1:30	1:40	1:53	2:02	2:11	2:15
—	—	1:34	1:39	1:45	1:55	2:08	2:17	2:26	2:30
1:30	1:43	—	1:54	2:00	2:10	2:23	2:32	2:41	2:45
—	—	2:04	2:09	2:15	2:25	2:38	2:47	2:56	3:00
2:00	2:13	—	2:24	2:30	2:40	2:53	3:02	3:11	3:15
—	—	2:34	2:39	2:45	2:55	3:08	3:17	3:26	3:30
2:30	2:43	—	2:54	3:00	3:10	3:23	3:32	3:41	3:45
—	—	3:04	3:09	3:15	3:25	3:38	3:47	3:56	4:00
3:00	3:13	—	3:24	3:30	3:40	3:54	4:03	4:12	4:16
—	—	3:34	3:39	3:46	3:56	4:10	4:19	4:28	4:32
3:29	3:43	—	3:54	4:01	4:11	4:25	4:34	4:43	4:47
—	—	4:04	4:09	4:16	4:26	4:40	4:49	4:58	5:02
3:59	4:13	—	4:24	4:31	4:41	4:55	5:04	5:13	5:17
—	—	4:34	4:39	4:46	4:56	5:10	5:19	5:28	5:32
4:29	4:43	—	4:54	5:01	5:11	5:25	5:34	5:43	5:47
—	—	5:04	5:09	5:15	5:25	5:39	5:48	5:57	6:01
5:00	5:14	—	5:24	5:30	5:40	5:53	6:01	6:10	6:14
—	—	5:34	5:39	5:45	5:55	6:08	6:16	6:25	6:29
5:30	5:44	—	5:54	6:00	6:10	6:23	6:31	6:40	6:44
—	—	6:05	6:09	6:15	6:24	6:37	6:45	6:54	6:58
6:02	6:15	—	6:24	6:30	6:39	6:52	6:59	7:08	7:12
—	—	6:35	6:39	6:45	6:53	7:06	7:13	7:22	7:26
6:33	6:45	—	6:54	7:00	7:08	7:20	7:27	7:36	7:39
—	—	7:05	7:09	7:15	7:23	7:35	7:42	7:50	7:53
7:03	7:15	—	7:24	7:30	7:38	7:50	7:57	8:05	8:08
7:26	7:38	—	7:47	7:53	8:01	8:13	8:20	8:28	8:31
8:01	8:12	—	8:20	8:25	8:33	8:45	8:51	8:58	9:01
8:38	8:49	—	8:57	9:02	9:10	9:22	9:28	9:35	9:38
9:10	9:20	—	9:28	9:33	9:39	9:50	9:56	10:02	10:05
9:40	9:50	—	9:58	10:03	10:09	10:20	10:26	10:32	10:35
10:10	10:20	—	10:28	10:33	10:39	10:50	10:56	11:02	11:05
10:42	10:51	—	10:58	11:02	11:07	11:17	11:23	11:28	—
11:12	11:21	—	11:28	11:32	11:37	11:47	11:53	11:58	—
11:42	11:51	—	11:58	12:02a	12:07a	12:17a	12:23a	12:28a	—

Route 1 – Saturday / *sábado*

Hillcrest ➡ City Heights ➡ La Mesa

Ⓐ 5th Av. & Evans Pl. **DEPART**	Ⓑ 5th Av. & University Av.	Ⓒ Park Bl. & University Av.	Ⓓ El Cajon Bl. & 30th St.	Ⓔ El Cajon Bl. & 48th St.	Ⓕ El Cajon Bl. & College Av.	Ⓖ El Cajon Bl. & 70th St.	Ⓗ 70th St. Trolley Station	Ⓘ La Mesa Bl. Trolley Station	Ⓙ Grossmont Transit Ctr. **ARRIVE**
5:24a	5:25a	5:28a	5:36a	5:45a	5:52a	5:59a	—	6:07a	6:14a
6:24	6:25	6:29	6:37	6:47	6:54	7:01	—	7:09	7:17
6:54	6:55	7:00	7:08	7:19	7:27	7:34	—	7:42	7:51
7:24	7:25	7:30	7:38	7:49	7:57	8:04	—	8:12	8:21
7:54	7:55	8:01	8:09	8:21	8:29	8:36	—	8:44	8:55
8:24	8:25	8:32	8:41	8:54	9:03	9:10	—	9:18	9:29
8:54	8:55	9:02	9:11	9:24	9:33	9:40	—	9:48	9:59
9:27	9:28	9:35	9:45	9:59	10:08	10:16	—	10:25	10:36
9:59	10:00	10:07	10:17	10:31	10:40	10:48	—	10:57	11:08
10:29	10:30	10:38	10:49	11:04	11:14	11:22	—	11:31	11:43
10:59	11:00	11:08	11:19	11:34	11:44	11:52	—	12:01p	12:13p
11:29	11:30	11:38	11:49	12:04p	12:14p	12:22p	—	12:31	12:43
11:59	12:00p	12:09p	12:20p	12:36	12:46	12:54	—	1:03	1:15
12:29p	12:30	12:39	12:50	1:06	1:16	1:24	—	1:33	1:45
12:59	1:00	1:09	1:20	1:36	1:46	1:54	—	2:03	2:15
1:29	1:30	1:39	1:50	2:06	2:16	2:24	—	2:33	2:45
1:59	2:00	2:09	2:20	2:36	2:46	2:54	—	3:03	3:15
2:29	2:30	2:39	2:50	3:06	3:16	3:24	—	3:33	3:45
2:59	3:00	3:09	3:20	3:36	3:46	3:54	—	4:03	4:15
3:29	3:30	3:39	3:50	4:06	4:16	4:24	—	4:33	4:45
3:59	4:00	4:09	4:20	4:36	4:46	4:54	—	5:03	5:15
4:29	4:30	4:39	4:50	5:06	5:16	5:24	—	5:33	5:45
4:59	5:00	5:08	5:18	5:33	5:42	5:50	—	5:58	6:09
5:29	5:30	5:38	5:48	6:03	6:12	6:20	—	6:28	6:39
5:59	6:00	6:08	6:17	6:30	6:38	6:45	—	6:53	7:04
6:29	6:30	6:38	6:47	7:00	7:08	7:15	—	7:23	7:34
6:59	7:00	7:07	7:16	7:28	7:35	7:42	—	7:49	7:59
7:29	7:30	7:37	7:46	7:58	8:05	8:12	—	8:19	8:28
8:01	8:02	8:09	8:17	8:26	8:33	8:40	—	8:47	8:55
8:31	8:32	8:39	8:47	8:56	9:03	9:10	—	9:17	9:25
9:08	9:09	9:16	9:24	9:33	9:40	9:47	—	9:54	10:02
9:44	9:45	9:51	9:59	10:08	10:15	10:21	—	10:28	10:35
10:14	10:15	10:20	10:27	10:36	10:43	10:49	—	10:56	11:03
10:44	10:45	10:50	10:57	11:06	11:13	11:19	—	11:26	11:33
11:14	11:15	11:20	11:27	11:36	11:43	11:49	—	11:56	—

La Mesa ➡ City Heights ➡ Hillcrest

Ⓙ Grossmont Transit Ctr. **DEPART**	Ⓘ La Mesa Bl. Trolley Station	Ⓗ 70th St. Trolley Station	Ⓖ El Cajon Bl. & 70th St.	Ⓕ El Cajon Bl. & College Av.	Ⓔ El Cajon Bl. & 48th St.	Ⓓ El Cajon Bl. & 30th St.	Ⓒ Park Bl. & University Av.	Ⓑ 4th Av. & University Av.	Ⓐ 5th Av. & Evans Pl. **ARRIVE**
5:40a	5:49a	—	5:56a	6:00a	6:07a	6:16a	6:23a	6:28a	6:31a
6:40	6:50	—	6:58	7:02	7:10	7:20	7:27	7:33	7:36
7:10	7:20	—	7:28	7:33	7:42	7:53	8:00	8:07	8:10
7:40	7:51	—	7:59	8:05	8:14	8:26	8:33	8:40	8:43
8:10	8:21	—	8:29	8:35	8:44	8:56	9:03	9:10	9:13
8:40	8:51	—	9:00	9:06	9:15	9:28	9:36	9:43	9:46
9:10	9:21	—	9:30	9:36	9:45	9:58	10:06	10:13	10:16
9:40	9:51	—	10:00	10:06	10:16	10:30	10:38	10:45	10:48
10:10	10:21	—	10:30	10:36	10:46	11:00	11:08	11:15	11:18
10:38	10:50	—	11:00	11:07	11:17	11:31	11:39	11:46	11:49
11:02	11:14	—	11:24	11:31	11:41	11:55	12:03p	12:11p	12:15p
11:30	11:42	—	11:52	11:59	12:09p	12:23p	12:31	12:39	12:43
12:00p	12:12p	—	12:22p	12:29p	12:39	12:53	1:01	1:09	1:13
12:30	12:42	—	12:52	12:59	1:09	1:23	1:31	1:39	1:43
1:00	1:12	—	1:22	1:29	1:39	1:53	2:01	2:09	2:13
1:30	1:42	—	1:52	1:59	2:09	2:23	2:31	2:39	2:43
2:00	2:12	—	2:22	2:29	2:39	2:53	3:01	3:09	3:13
2:30	2:42	—	2:52	2:59	3:09	3:23	3:31	3:39	3:43
3:00	3:12	—	3:22	3:29	3:39	3:53	4:01	4:09	4:13
3:30	3:42	—	3:52	3:59	4:09	4:23	4:31	4:39	4:43
4:00	4:12	—	4:22	4:29	4:39	4:53	5:01	5:09	5:13
4:30	4:42	—	4:52	4:59	5:09	5:23	5:31	5:39	5:43
5:00	5:12	—	5:22	5:29	5:39	5:53	6:01	6:09	6:13
5:30	5:42	—	5:52	5:59	6:09	6:23	6:31	6:39	6:43
6:00	6:12	—	6:21	6:28	6:37	6:50	6:57	7:05	7:09
6:30	6:42	—	6:51	6:57	7:05	7:17	7:24	7:32	7:35
7:00	7:12	—	7:21	7:27	7:35	7:47	7:54	8:02	8:05
7:30	7:42	—	7:51	7:57	8:05	8:17	8:24	8:32	8:35
8:00	8:11	—	8:19	8:24	8:32	8:44	8:50	8:57	9:00
8:38	8:49	—	8:57	9:02	9:10	9:22	9:28	9:35	9:38
9:10	9:20	—	9:28	9:33	9:39	9:50	9:56	10:02	10:05
9:40	9:50	—	9:58	10:03	10:09	10:20	10:26	10:32	10:35
10:10	10:20	—	10:28	10:33	10:39	10:50	10:56	11:02	11:05
10:42	10:51	—	10:58	11:02	11:07	11:17	11:23	11:28	—
11:12	11:21	—	11:28	11:32	11:37	11:47	11:53	11:58	—

1A = Route 1A trips terminate at 70th St. Trolley Station / *Viajes de Ruta 1A terminan en 70th St. Trolley Station*

CASH FARES / *Tarifas en efectivo*

Exact fare, please / *Favor de pagar la cantidad exacta*

Day Pass (Regional) / *Pase diario (Regional)* Compass Card required ($2) / *Se requiere un Compass Card ($2)*	**$5.00**
One-Way Fare / *Tarifa de una direccíon*	**$2.25**
Senior (60+)/Disabled/Medicare *Mayores de 60 años/Discapacitados/Medicare*	**$1.10***
Children 5 & under / *Niños de 5 años o menos* Up to two children ride free per paying adult / *Máximo dos niños viajan gratis por cada adulto*	**FREE** / ***GRATIS***

MONTHLY PASSES / *Pases mensual*

Adult / *Adulto*	**$72.00**
Senior (60+)/Disabled/Medicare *Mayores de 60 años/Discapacitados/Medicare*	**$18.00***
Youths (18 and under) *Jóvenes (18 años o menos)*	**$36.00***

*I.D. required for discount fare or pass.
**Se requiere identificación para tarifas o pases de descuento.*

DAY PASS (REGIONAL) / ***Pase diario (Regional)***

All passes are sold on Compass Card, which can be reloaded and reused for up to five years. Compass Cards are available for $2 at select outlets. A $5 Day Pass requires a Compass Card. A paper Day Pass can be purchased on board buses for an additional $2 fee.

Todos los pases se venden en el Compass Card, el cual puede ser recargado y reutilizado por hasta cinco años. Compass Cards están disponibles por $2 en selectas sucursales. Un pase de un día por $5 requiere un Compass Card. Un pase de un día de papel se puede obtener a bordo los autobuses por un costo adicional de $2.

DIRECTORY / *Directorio*

Regional Transit Information *Información de transporte público regional*	**511** or/ó **(619) 233-3004**
TTY/TDD (teletype for hearing impaired) *Teletipo para sordos*	**(619) 234-5005** or/ó **(888) 722-4889**
InfoExpress (24-hour info via Touch-Tone phone) *Información las 24 horas (via teléfono de teclas)*	**(619) 685-4900**
Customer Service / Suggestions *Servicio al cliente / Sugerencias*	**(619) 557-4555**
SafeWatch	**(619) 557-4500**
Lost & Found *Objetos extraviados*	**(877) 841-3278**
The Transit Store	**(619) 234-1060** 1st & Broadway, Downtown San Diego M–F 9am–5pm
For MTS online trip planning *Planificación de viajes por Internet*	**www.sdmts.com**

For more information on riding MTS services, pick up a Rider's Guide on a bus or at The Transit Store, or visit **www.sdmts.com**.

*Para obtener más información sobre el uso de los servicios de MTS, recoja un 'Rider's Guide' en un autobús o en The Transit Store, o visita a **www.sdmts.com**.*

Thank you for riding MTS! ***¡Gracias por viajar con MTS!***

Effective JANUARY 25, 2015

14

Grantville Trolley – Lake Murray Bl.

via Kaiser Hospital / SDSU

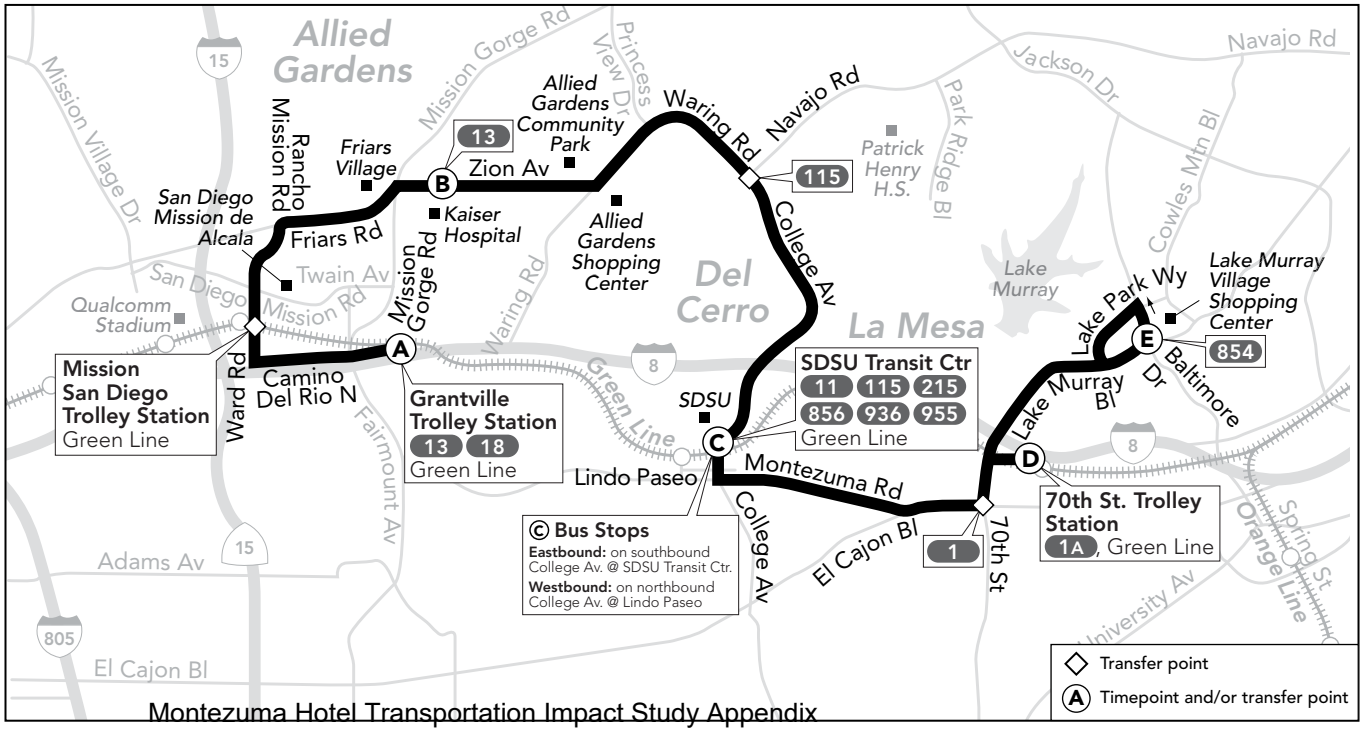
DESTINATIONS

- Allied Gardens Community Park
- Kaiser Hospital
- SD Mission de Alcala
- SDSU

TROLLEY CONNECTIONS

Grantville
Mission San Diego
SDSU
70th St.

MTS Metropolitan Transit System



Plan your trip!

On the web
Visit **www.sdmts.com** and click on ***Travel Planner***

On the phone
Dial 511 and say "public transportation"

On the go
Use the Google Maps app on your smartphone

Alternative formats available upon request. Please call: (619) 557-4555 ***Formato alternativo disponible al preguntar. Favor de llamar: (619) 557-4555***

Route 14 – Monday through Friday / *lunes a viernes*

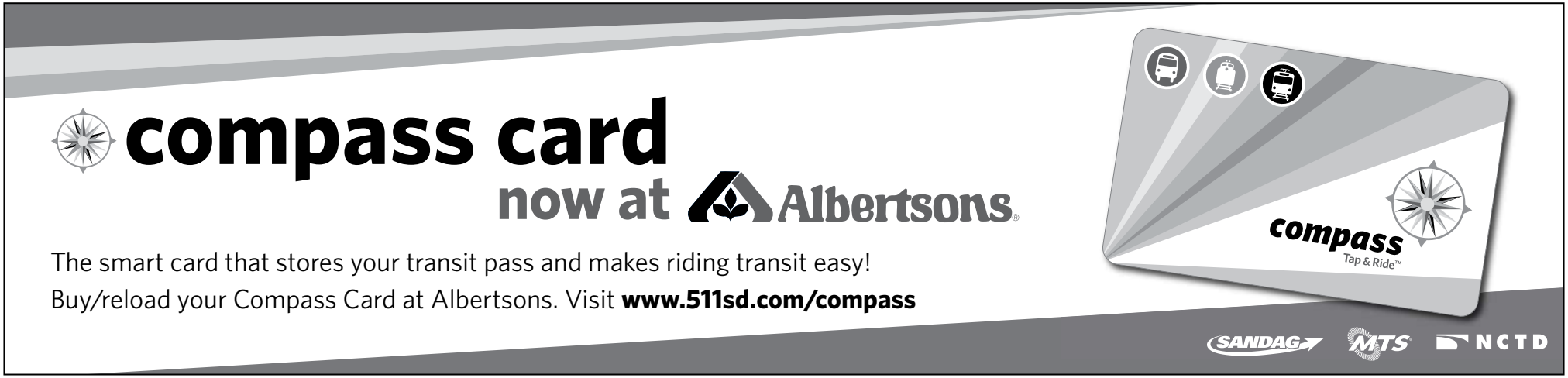
Grantville ➡ La Mesa

Ⓐ Grantville Trolley Station **DEPART**	Ⓑ Kaiser Hospital	Ⓒ SDSU Transit Center (College Av.)	Ⓓ 70th Street Trolley Station	Ⓔ Baltimore Dr. & Lake Murray Bl. **ARRIVE**
5:45a	5:56a	6:10a	6:22a	6:29a
6:44	6:56	7:11	7:24	7:32
7:37	7:49	8:04	8:17	8:25
8:37	8:49	9:04	9:17	9:25
9:37	9:50	10:03	10:15	10:23
10:37	10:50	11:03	11:15	11:23
11:37	11:50	**12:03p**	**12:15p**	**12:23p**
12:37p	**12:50p**	**1:04**	**1:17**	**1:26**
1:37	**1:50**	**2:04**	**2:17**	**2:26**
2:37	**2:50**	**3:04**	**3:17**	**3:26**
3:37	**3:50**	**4:04**	**4:17**	**4:26**
4:37	**4:50**	**5:04**	**5:17**	**5:26**
5:37	**5:50**	**6:04**	**6:17**	**6:26**
6:38	**6:50**	**7:03**	**7:16**	**7:24**

La Mesa ➡ Grantville

Ⓔ Baltimore Dr. & Lake Murray Bl. **DEPART**	Ⓓ 70th Street Trolley Station	Ⓒ SDSU (College Av. & Lindo Paseo)	Ⓑ Kaiser Hospital	Ⓐ Grantville Trolley Station **ARRIVE**
6:38a	6:46a	6:57a	7:10a	7:23a
7:38	7:47	7:59	8:12	8:25
8:34	8:43	8:55	9:08	9:21
9:36	9:44	9:56	10:08	10:21
10:36	10:44	10:56	11:08	11:21
11:36	11:44	11:56	**12:08p**	**12:21p**
12:34p	**12:42p**	**12:55p**	**1:08**	**1:23**
1:34	**1:42**	**1:55**	**2:08**	**2:23**
2:34	**2:42**	**2:55**	**3:08**	**3:23**
3:34	**3:42**	**3:55**	**4:08**	**4:23**
4:34	**4:42**	**4:55**	**5:08**	**5:23**
5:36	**5:44**	**5:57**	**6:10**	**6:25**

Route 14 does not operate on weekends or on the following holidays and observed holidays
La ruta 14 no ofrece servicio durante el fin de semana ó durante los siguientes días festivos y feriados observados >>> New Year's Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Thanksgiving, Christmas

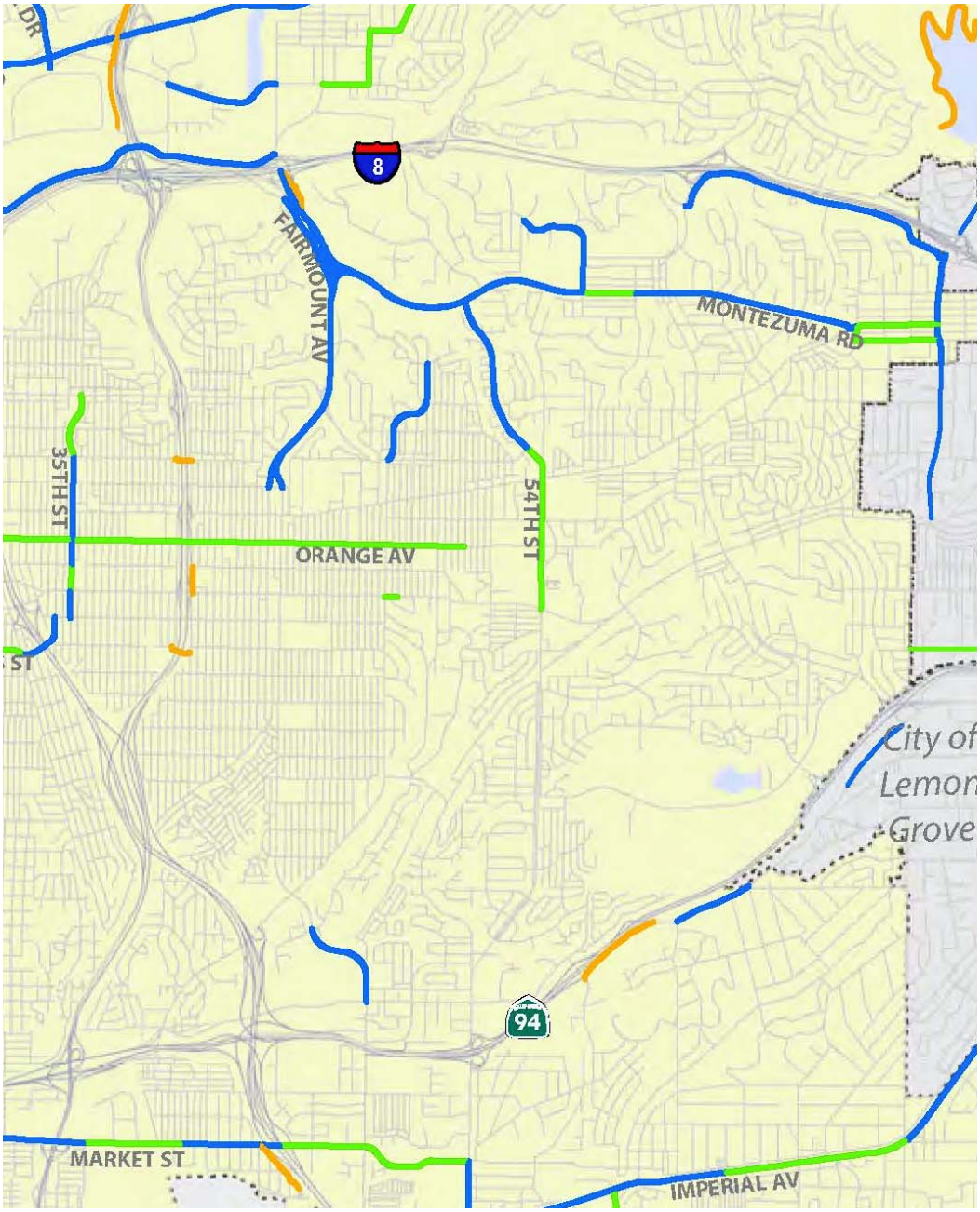


The schedules and other information shown in this timetable are subject to change. MTS does not assume responsibility for errors in timetables nor for any inconvenience caused by delayed buses.
Los horarios e información que se indican en este itinerario pueden cambiar. MTS no asume responsabilidad por errores en los itinerarios, ni por ningún perjuicio que se origine por los autobuses demorados.

Appendix E

City of San Diego *Bicycle Master Plan* and Community Plan Excerpts

Existing Bicycle Routes



Existing Bikeways

- Class I - Bike Path
- Class II - Bike Lane
- Class III - Bike Route
- Freeway Shoulder

Figure 3-4:
San Diego Existing Bikeways (South)

Proposed Bicycle Routes

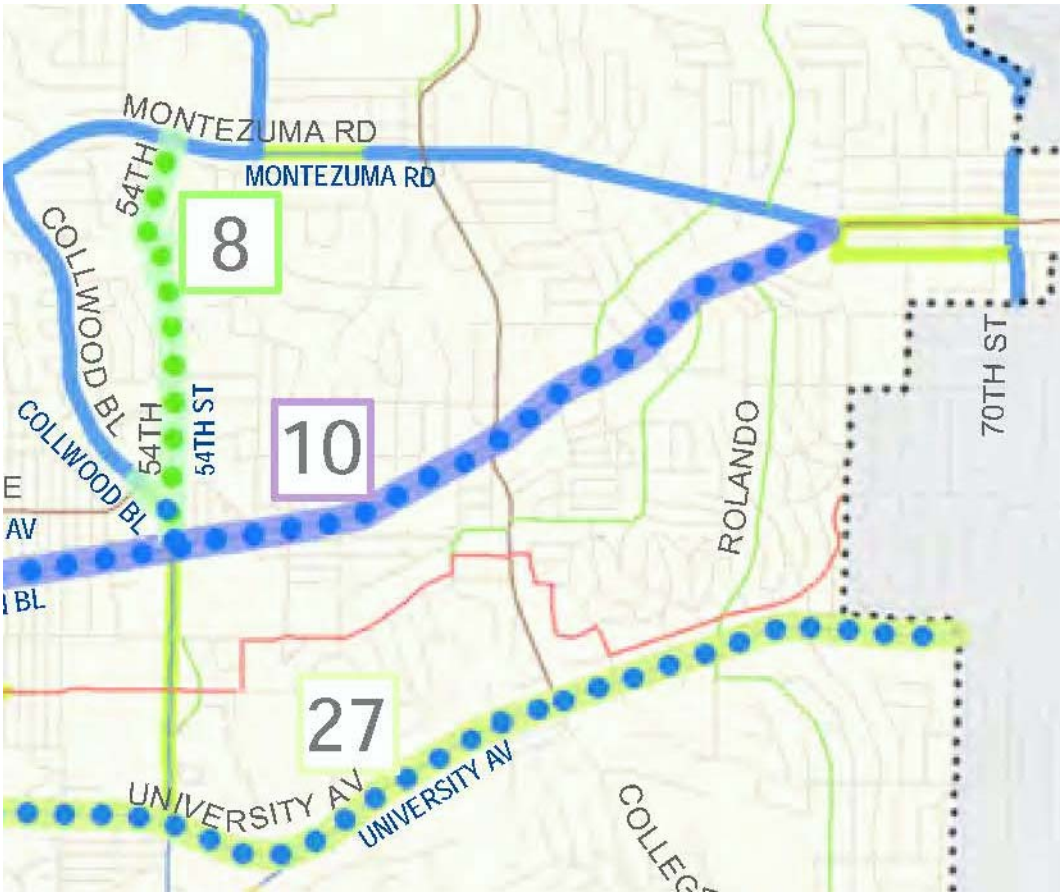


FIGURE 6-5:
SAN DIEGO BICYCLE MASTER PLAN

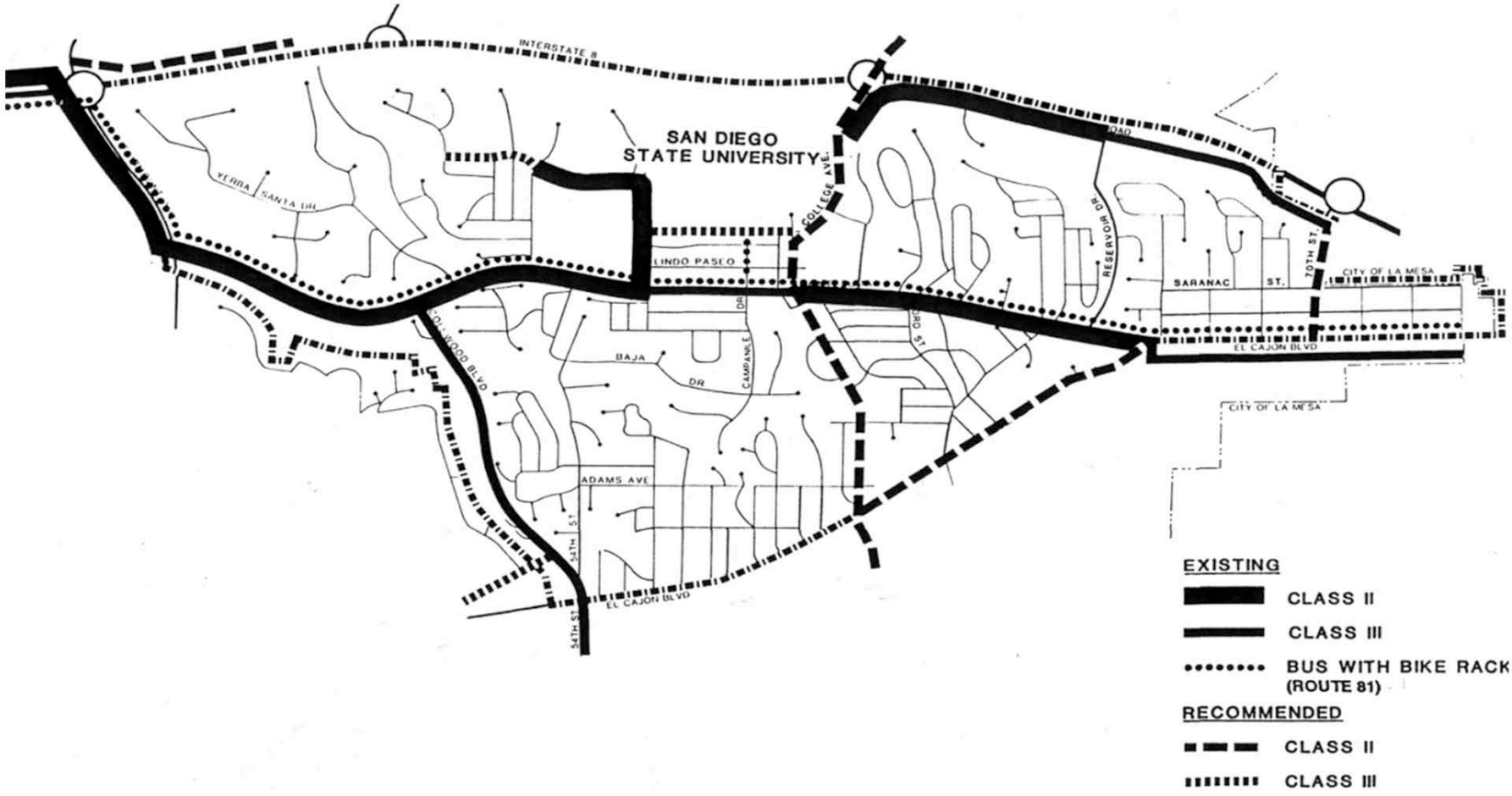
PROPOSED HIGH PRIORITY PROJECTS
(SOUTH CITY)

High Priority Proposed Projects

- Class I
- Class II
- Class III
- Cycle Track
- Bicycle Boulevard

Ranking of High Priority Proposed Project

Existing Facility	Proposed Facility
Class I	Class I
Class II	Class II
Class III	Class III
Freeway Shoulder	Cycle Track
	Bicycle Boulevard
	Class II or III



Bicycle Facilities **17**

College Area Community Plan FIGURE

Appendix F

Existing LOS Calculations

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	79	240	686	116	39	91
Future Volume (veh/h)	79	240	686	116	39	91
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			0.95	1.00	0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	94	286	817	138	46	108
Adj No. of Lanes	1	2	2	0	0	0
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	436	2315	1529	258	68	159
Arrive On Green	0.06	0.65	0.51	0.51	0.14	0.14
Sat Flow, veh/h	1774	3632	3099	508	470	1103
Grp Volume(v), veh/h	94	286	481	474	155	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1770	1744	1583	0
Q Serve(g_s), s	1.1	1.5	9.2	9.2	4.7	0.0
Cycle Q Clear(g_c), s	1.1	1.5	9.2	9.2	4.7	0.0
Prop In Lane	1.00			0.29	0.30	0.70
Lane Grp Cap(c), veh/h	436	2315	900	887	228	0
V/C Ratio(X)	0.22	0.12	0.53	0.53	0.68	0.00
Avail Cap(c_a), veh/h	670	4611	1814	1788	913	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	5.6	3.3	8.4	8.4	20.5	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.9	0.9	1.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.7	4.6	4.6	2.1	0.0
LnGrp Delay(d),s/veh	5.7	3.3	9.3	9.3	21.8	0.0
LnGrp LOS	A	A	A	A	C	
Approach Vol, veh/h		380	955		155	
Approach Delay, s/veh		3.9	9.3		21.8	
Approach LOS		A	A		C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		38.3		12.1	7.3	31.0		
Change Period (Y+Rc), s		5.3		4.9	4.4	5.3		
Max Green Setting (Gmax), s		65.7		29.1	9.6	51.7		
Max Q Clear Time (g_c+I1), s		3.5		6.7	3.1	11.2		
Green Ext Time (p_c), s		3.7		0.2	0.1	14.4		

Intersection Summary	
HCM 2010 Ctrl Delay	9.2
HCM 2010 LOS	A

Notes

LOS Engineering, Inc.

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	276	802	3	0	7
Future Vol, veh/h	2	276	802	3	0	7
Conflicting Peds, #/hr	25	0	0	25	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	317	922	3	0	8

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	950	0	-	0	1112	488
Stage 1	-	-	-	-	949	-
Stage 2	-	-	-	-	163	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	719	-	-	-	203	526
Stage 1	-	-	-	-	337	-
Stage 2	-	-	-	-	849	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	704	-	-	-	194	515
Mov Cap-2 Maneuver	-	-	-	-	279	-
Stage 1	-	-	-	-	329	-
Stage 2	-	-	-	-	831	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	12.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	704	-	-	-	515
HCM Lane V/C Ratio	0.003	-	-	-	0.016
HCM Control Delay (s)	10.1	-	-	-	12.1
HCM Lane LOS	B	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↱			↱
Traffic Vol, veh/h	0	276	805	0	0	0
Future Vol, veh/h	0	276	805	0	0	0
Conflicting Peds, #/hr	0	0	0	25	0	25
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	300	875	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	488
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	526
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	504
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	-	-	0
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	-

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	172	498	645	703	128	51
Future Volume (vph)	172	498	645	703	128	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9	4.9	4.9	4.0	4.0
Lane Util. Factor	1.00	0.95	0.91	0.91	0.97	1.00
Frpb, ped/bikes	1.00	1.00	0.99	0.98	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.95	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3213	1411	3433	1514
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3539	3213	1411	3433	1514
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	181	524	679	740	135	54
RTOR Reduction (vph)	0	0	43	171	0	48
Lane Group Flow (vph)	181	524	939	266	135	6
Confl. Peds. (#/hr)				4		5
Confl. Bikes (#/hr)				10		10
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6 8		7	
Permitted Phases				6 8		7
Actuated Green, G (s)	13.9	44.7	60.2	60.2	11.4	11.4
Effective Green, g (s)	13.9	44.7	60.2	60.2	11.4	11.4
Actuated g/C Ratio	0.14	0.45	0.61	0.61	0.12	0.12
Clearance Time (s)	4.4	4.9			4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	249	1601	1957	859	396	174
v/s Ratio Prot	c0.10	0.15	c0.29		c0.04	
v/s Ratio Perm				0.19		0.00
v/c Ratio	0.73	0.33	0.48	0.31	0.34	0.04
Uniform Delay, d1	40.6	17.4	10.7	9.3	40.2	38.8
Progression Factor	1.00	1.00	0.12	1.04	1.00	1.00
Incremental Delay, d2	10.1	0.1	0.1	0.2	0.5	0.1
Delay (s)	50.7	17.5	1.4	9.8	40.8	38.9
Level of Service	D	B	A	A	D	D
Approach Delay (s)		26.0	4.0		40.2	
Approach LOS		C	A		D	

Intersection Summary			
HCM 2000 Control Delay	13.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	98.8	Sum of lost time (s)	18.2
Intersection Capacity Utilization	49.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	540	38	24	1021	20	219	17	40	26	10	95
Future Volume (vph)	48	540	38	24	1021	20	219	17	40	26	10	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	4.9		4.9	4.9		4.9	4.9	
Lane Util. Factor	1.00	0.95		1.00	0.91		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.97		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.97	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.90		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3491		1770	5065		1770	1611		1725	1579	
Flt Permitted	0.95	1.00		0.95	1.00		0.68	1.00		0.72	1.00	
Satd. Flow (perm)	1770	3491		1770	5065		1270	1611		1303	1579	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	51	568	40	25	1075	21	231	18	42	27	11	100
RTOR Reduction (vph)	0	5	0	0	2	0	0	33	0	0	77	0
Lane Group Flow (vph)	51	603	0	25	1094	0	231	27	0	27	34	0
Confl. Peds. (#/hr)			11			12			25	25		
Confl. Bikes (#/hr)			10			10			10			10
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2 7		1	6			8			8	
Permitted Phases							8			8		
Actuated Green, G (s)	13.9	56.1		2.2	33.0		22.3	22.3		22.3	22.3	
Effective Green, g (s)	13.9	56.1		2.2	33.0		22.3	22.3		22.3	22.3	
Actuated g/C Ratio	0.14	0.57		0.02	0.33		0.23	0.23		0.23	0.23	
Clearance Time (s)	4.4			4.4	4.9		4.9	4.9		4.9	4.9	
Vehicle Extension (s)	3.0			3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	249	1982		39	1691		286	363		294	356	
v/s Ratio Prot	0.03	c0.17		c0.01	c0.22			0.02			0.02	
v/s Ratio Perm							c0.18			0.02		
v/c Ratio	0.20	0.30		0.64	0.65		0.81	0.08		0.09	0.09	
Uniform Delay, d1	37.6	11.2		47.9	28.0		36.2	30.1		30.2	30.3	
Progression Factor	1.28	0.19		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.1		30.7	0.9		15.3	0.1		0.1	0.1	
Delay (s)	48.3	2.2		78.7	28.8		51.5	30.2		30.4	30.4	
Level of Service	D	A		E	C		D	C		C	C	
Approach Delay (s)		5.7			29.9			47.1			30.4	
Approach LOS		A			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	25.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	98.8	Sum of lost time (s)	18.2
Intersection Capacity Utilization	56.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	88	642	284	54	102	83
Future Volume (veh/h)	88	642	284	54	102	83
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99			0.95	1.00	0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	95	690	305	58	110	99
Adj No. of Lanes	1	2	2	0	0	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.84
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	548	1754	888	166	183	164
Arrive On Green	0.07	0.50	0.30	0.30	0.21	0.21
Sat Flow, veh/h	1774	3632	3041	551	856	770
Grp Volume(v), veh/h	95	690	181	182	210	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1770	1729	1634	0
Q Serve(g_s), s	1.1	4.3	2.8	2.9	4.1	0.0
Cycle Q Clear(g_c), s	1.1	4.3	2.8	2.9	4.1	0.0
Prop In Lane	1.00			0.32	0.52	0.47
Lane Grp Cap(c), veh/h	548	1754	533	521	349	0
V/C Ratio(X)	0.17	0.39	0.34	0.35	0.60	0.00
Avail Cap(c_a), veh/h	1114	5521	1852	1810	1869	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	6.5	5.5	9.5	9.6	12.4	0.0
Incr Delay (d2), s/veh	0.1	0.3	0.7	0.7	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	2.1	1.5	1.5	1.9	0.0
LnGrp Delay(d),s/veh	6.5	5.8	10.2	10.3	13.1	0.0
LnGrp LOS	A	A	B	B	B	
Approach Vol, veh/h		785	363		210	
Approach Delay, s/veh		5.9	10.3		13.1	
Approach LOS		A	B		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		22.7		12.4	6.8	15.9		
Change Period (Y+Rc), s		5.3		4.9	4.4	5.3		
Max Green Setting (Gmax), s		54.7		40.1	13.6	36.7		
Max Q Clear Time (g_c+I1), s		6.3		6.1	3.1	4.9		
Green Ext Time (p_c), s		10.4		0.3	0.1	4.1		

Intersection Summary	
HCM 2010 Ctrl Delay	8.2
HCM 2010 LOS	A

Notes

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Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	12	730	323	9	2	11
Future Vol, veh/h	12	730	323	9	2	11
Conflicting Peds, #/hr	36	0	0	36	1	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	811	359	10	2	12

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	405	0	-	0	833	223
Stage 1	-	-	-	-	400	-
Stage 2	-	-	-	-	433	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1150	-	-	-	307	780
Stage 1	-	-	-	-	646	-
Stage 2	-	-	-	-	621	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1116	-	-	-	286	755
Mov Cap-2 Maneuver	-	-	-	-	406	-
Stage 1	-	-	-	-	619	-
Stage 2	-	-	-	-	602	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	10.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1116	-	-	-	667
HCM Lane V/C Ratio	0.012	-	-	-	0.022
HCM Control Delay (s)	8.3	-	-	-	10.5
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↱			↱
Traffic Vol, veh/h	0	732	332	0	0	0
Future Vol, veh/h	0	732	332	0	0	0
Conflicting Peds, #/hr	0	0	0	36	0	36
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	796	361	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	253
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	746
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	702
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	-	-	0
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	-

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	114	689	553	203	460	161
Future Volume (vph)	114	689	553	203	460	161
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9	4.9	4.9	4.0	4.0
Lane Util. Factor	1.00	0.95	0.91	0.91	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.98	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.99	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3370	1411	3433	1514
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3539	3370	1411	3433	1514
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	124	749	601	221	500	175
RTOR Reduction (vph)	0	0	3	95	0	118
Lane Group Flow (vph)	124	749	620	104	500	57
Confl. Peds. (#/hr)				4		16
Confl. Bikes (#/hr)				10		10
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6 8		7	
Permitted Phases				6 8		7
Actuated Green, G (s)	10.2	31.4	47.0	47.0	19.4	19.4
Effective Green, g (s)	10.2	31.4	47.0	47.0	19.4	19.4
Actuated g/C Ratio	0.11	0.35	0.52	0.52	0.22	0.22
Clearance Time (s)	4.4	4.9			4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	200	1236	1761	737	740	326
v/s Ratio Prot	c0.07	c0.21	c0.18		c0.15	
v/s Ratio Perm				0.07		0.04
v/c Ratio	0.62	0.61	0.35	0.14	0.68	0.17
Uniform Delay, d1	38.0	24.1	12.5	11.1	32.4	28.7
Progression Factor	1.00	1.00	0.12	0.00	1.00	1.00
Incremental Delay, d2	5.6	0.8	0.1	0.1	2.5	0.3
Delay (s)	43.6	25.0	1.7	0.1	34.8	29.0
Level of Service	D	C	A	A	C	C
Approach Delay (s)		27.6	1.3		33.3	
Approach LOS		C	A		C	

Intersection Summary			
HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	89.9	Sum of lost time (s)	18.2
Intersection Capacity Utilization	48.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	71	990	87	33	583	62	92	16	24	72	43	87
Future Volume (vph)	71	990	87	33	583	62	92	16	24	72	43	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	4.9		4.9	4.9		4.9	4.9	
Lane Util. Factor	1.00	0.95		1.00	0.91		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.97		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.98	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.91		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3486		1770	4983		1770	1651		1738	1650	
Flt Permitted	0.95	1.00		0.95	1.00		0.63	1.00		0.73	1.00	
Satd. Flow (perm)	1770	3486		1770	4983		1166	1651		1334	1650	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	76	1053	93	35	620	66	98	17	26	77	46	93
RTOR Reduction (vph)	0	6	0	0	12	0	0	21	0	0	75	0
Lane Group Flow (vph)	76	1140	0	35	674	0	98	22	0	77	64	0
Confl. Peds. (#/hr)			3			15			19	19		
Confl. Bikes (#/hr)			10			10			10			10
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2 7		1	6			8			8	
Permitted Phases							8			8		
Actuated Green, G (s)	10.2	50.8		3.1	24.3		17.8	17.8		17.8	17.8	
Effective Green, g (s)	10.2	50.8		3.1	24.3		17.8	17.8		17.8	17.8	
Actuated g/C Ratio	0.11	0.57		0.03	0.27		0.20	0.20		0.20	0.20	
Clearance Time (s)	4.4			4.4	4.9		4.9	4.9		4.9	4.9	
Vehicle Extension (s)	3.0			3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	200	1969		61	1346		230	326		264	326	
v/s Ratio Prot	c0.04	c0.33		0.02	0.14			0.01			0.04	
v/s Ratio Perm							c0.08			0.06		
v/c Ratio	0.38	0.58		0.57	0.50		0.43	0.07		0.29	0.20	
Uniform Delay, d1	36.9	12.6		42.7	27.7		31.6	29.3		30.7	30.1	
Progression Factor	1.18	0.20		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.3		12.4	0.3		1.3	0.1		0.6	0.3	
Delay (s)	44.7	2.8		55.1	28.0		32.8	29.4		31.3	30.4	
Level of Service	D	A		E	C		C	C		C	C	
Approach Delay (s)		5.4			29.3			31.8			30.7	
Approach LOS		A			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	16.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	89.9	Sum of lost time (s)	18.2
Intersection Capacity Utilization	65.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Appendix G

Existing with Project LOS Calculations

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	79	262	718	116	39	91
Future Volume (veh/h)	79	262	718	116	39	91
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			0.95	1.00	0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	94	312	855	138	46	108
Adj No. of Lanes	1	2	2	0	0	0
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	426	2337	1571	254	67	158
Arrive On Green	0.06	0.66	0.52	0.52	0.14	0.14
Sat Flow, veh/h	1774	3632	3123	489	470	1103
Grp Volume(v), veh/h	94	312	499	494	155	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1770	1749	1583	0
Q Serve(g_s), s	1.1	1.7	9.8	9.8	4.8	0.0
Cycle Q Clear(g_c), s	1.1	1.7	9.8	9.8	4.8	0.0
Prop In Lane	1.00			0.28	0.30	0.70
Lane Grp Cap(c), veh/h	426	2337	918	907	227	0
V/C Ratio(X)	0.22	0.13	0.54	0.54	0.68	0.00
Avail Cap(c_a), veh/h	652	4474	1760	1740	886	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	5.7	3.3	8.4	8.4	21.1	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.9	1.0	1.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.8	5.0	4.9	2.2	0.0
LnGrp Delay(d),s/veh	5.8	3.3	9.3	9.3	22.5	0.0
LnGrp LOS	A	A	A	A	C	
Approach Vol, veh/h		406	993		155	
Approach Delay, s/veh		3.9	9.3		22.5	
Approach LOS		A	A		C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		39.6		12.4	7.4	32.3		
Change Period (Y+Rc), s		5.3		4.9	4.4	5.3		
Max Green Setting (Gmax), s		65.7		29.1	9.6	51.7		
Max Q Clear Time (g_c+I1), s		3.7		6.8	3.1	11.8		
Green Ext Time (p_c), s		4.1		0.2	0.0	15.1		

Intersection Summary	
HCM 2010 Ctrl Delay	9.2
HCM 2010 LOS	A

Notes

LOS Engineering, Inc.

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	24	276	818	10	22	23
Future Vol, veh/h	24	276	818	10	22	23
Conflicting Peds, #/hr	25	0	0	25	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	28	317	940	11	25	26

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	976	0	-	0	1186	501
Stage 1	-	-	-	-	971	-
Stage 2	-	-	-	-	215	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	703	-	-	-	181	515
Stage 1	-	-	-	-	328	-
Stage 2	-	-	-	-	800	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	688	-	-	-	166	504
Mov Cap-2 Maneuver	-	-	-	-	256	-
Stage 1	-	-	-	-	308	-
Stage 2	-	-	-	-	783	-

Approach	EB	WB	SB
HCM Control Delay, s	0.8	0	17.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	688	-	-	-	342
HCM Lane V/C Ratio	0.04	-	-	-	0.151
HCM Control Delay (s)	10.5	-	-	-	17.4
HCM Lane LOS	B	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↱			↱
Traffic Vol, veh/h	0	298	812	7	0	16
Future Vol, veh/h	0	298	812	7	0	16
Conflicting Peds, #/hr	0	0	0	25	0	25
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	324	883	8	0	17

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	496
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	519
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	498
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	12.5
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	498
HCM Lane V/C Ratio	-	-	-	0.035
HCM Control Delay (s)	-	-	-	12.5
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	177	498	645	712	142	59
Future Volume (vph)	177	498	645	712	142	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9	4.9	4.9	4.0	4.0
Lane Util. Factor	1.00	0.95	0.91	0.91	0.97	1.00
Frpb, ped/bikes	1.00	1.00	0.99	0.98	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.95	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3211	1411	3433	1515
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3539	3211	1411	3433	1515
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	186	524	679	749	149	62
RTOR Reduction (vph)	0	0	44	174	0	55
Lane Group Flow (vph)	186	524	942	268	149	7
Confl. Peds. (#/hr)				4		5
Confl. Bikes (#/hr)				10		10
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6 8		7	
Permitted Phases				6 8		7
Actuated Green, G (s)	14.1	44.8	60.2	60.2	11.7	11.7
Effective Green, g (s)	14.1	44.8	60.2	60.2	11.7	11.7
Actuated g/C Ratio	0.14	0.45	0.61	0.61	0.12	0.12
Clearance Time (s)	4.4	4.9			4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	251	1596	1946	855	404	178
v/s Ratio Prot	c0.11	0.15	c0.29		c0.04	
v/s Ratio Perm				0.19		0.00
v/c Ratio	0.74	0.33	0.48	0.31	0.37	0.04
Uniform Delay, d1	40.8	17.6	10.9	9.5	40.4	38.8
Progression Factor	1.00	1.00	0.11	1.10	1.00	1.00
Incremental Delay, d2	11.2	0.1	0.1	0.2	0.6	0.1
Delay (s)	52.0	17.7	1.4	10.6	41.0	38.9
Level of Service	D	B	A	B	D	D
Approach Delay (s)		26.7	4.2		40.4	
Approach LOS		C	A		D	

Intersection Summary			
HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	99.3	Sum of lost time (s)	18.2
Intersection Capacity Utilization	50.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	554	38	24	1030	20	219	17	40	26	10	95
Future Volume (vph)	48	554	38	24	1030	20	219	17	40	26	10	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	4.9		4.9	4.9		4.9	4.9	
Lane Util. Factor	1.00	0.95		1.00	0.91		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.97		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.97	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.90		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3492		1770	5065		1770	1611		1725	1579	
Flt Permitted	0.95	1.00		0.95	1.00		0.68	1.00		0.72	1.00	
Satd. Flow (perm)	1770	3492		1770	5065		1268	1611		1303	1579	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	51	583	40	25	1084	21	231	18	42	27	11	100
RTOR Reduction (vph)	0	4	0	0	2	0	0	33	0	0	77	0
Lane Group Flow (vph)	51	619	0	25	1103	0	231	27	0	27	34	0
Confl. Peds. (#/hr)			11			12			25	25		
Confl. Bikes (#/hr)			10			10			10			10
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2 7		1	6			8			8	
Permitted Phases							8			8		
Actuated Green, G (s)	14.1	56.5		2.2	32.9		22.4	22.4		22.4	22.4	
Effective Green, g (s)	14.1	56.5		2.2	32.9		22.4	22.4		22.4	22.4	
Actuated g/C Ratio	0.14	0.57		0.02	0.33		0.23	0.23		0.23	0.23	
Clearance Time (s)	4.4			4.4	4.9		4.9	4.9		4.9	4.9	
Vehicle Extension (s)	3.0			3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	251	1986		39	1678		286	363		293	356	
v/s Ratio Prot	0.03	c0.18		c0.01	c0.22			0.02			0.02	
v/s Ratio Perm							c0.18			0.02		
v/c Ratio	0.20	0.31		0.64	0.66		0.81	0.08		0.09	0.09	
Uniform Delay, d1	37.6	11.2		48.2	28.4		36.4	30.3		30.4	30.4	
Progression Factor	1.25	0.19		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.1		30.7	0.9		15.3	0.1		0.1	0.1	
Delay (s)	47.6	2.3		78.9	29.3		51.7	30.4		30.5	30.5	
Level of Service	D	A		E	C		D	C		C	C	
Approach Delay (s)		5.7			30.4			47.3			30.5	
Approach LOS		A			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	25.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	99.3	Sum of lost time (s)	18.2
Intersection Capacity Utilization	56.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	88	667	321	54	102	83
Future Volume (veh/h)	88	667	321	54	102	83
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99			0.95	1.00	0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	95	717	345	58	110	99
Adj No. of Lanes	1	2	2	0	0	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.84
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	531	1754	907	151	183	164
Arrive On Green	0.07	0.50	0.30	0.30	0.21	0.21
Sat Flow, veh/h	1774	3632	3105	500	856	770
Grp Volume(v), veh/h	95	717	201	202	210	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1770	1742	1634	0
Q Serve(g_s), s	1.1	4.5	3.1	3.2	4.1	0.0
Cycle Q Clear(g_c), s	1.1	4.5	3.1	3.2	4.1	0.0
Prop In Lane	1.00			0.29	0.52	0.47
Lane Grp Cap(c), veh/h	531	1754	533	525	349	0
V/C Ratio(X)	0.18	0.41	0.38	0.39	0.60	0.00
Avail Cap(c_a), veh/h	1097	5521	1852	1823	1869	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	6.5	5.6	9.7	9.7	12.4	0.0
Incr Delay (d2), s/veh	0.1	0.3	0.8	0.9	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	2.2	1.6	1.6	1.9	0.0
LnGrp Delay(d),s/veh	6.6	5.9	10.5	10.5	13.1	0.0
LnGrp LOS	A	A	B	B	B	
Approach Vol, veh/h		812	403		210	
Approach Delay, s/veh		6.0	10.5		13.1	
Approach LOS		A	B		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		22.7		12.4	6.8	15.9		
Change Period (Y+Rc), s		5.3		4.9	4.4	5.3		
Max Green Setting (Gmax), s		54.7		40.1	13.6	36.7		
Max Q Clear Time (g_c+I1), s		6.5		6.1	3.1	5.2		
Green Ext Time (p_c), s		10.9		0.3	0.1	4.6		

Intersection Summary	
HCM 2010 Ctrl Delay	8.3
HCM 2010 LOS	A

Notes

LOS Engineering, Inc.

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	37	730	341	17	26	30
Future Vol, veh/h	37	730	341	17	26	30
Conflicting Peds, #/hr	36	0	0	36	1	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	41	811	379	19	29	33

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	434	0	-	0	914	237
Stage 1	-	-	-	-	425	-
Stage 2	-	-	-	-	489	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1122	-	-	-	272	764
Stage 1	-	-	-	-	627	-
Stage 2	-	-	-	-	582	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1088	-	-	-	246	740
Mov Cap-2 Maneuver	-	-	-	-	364	-
Stage 1	-	-	-	-	585	-
Stage 2	-	-	-	-	565	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	13.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1088	-	-	-	500
HCM Lane V/C Ratio	0.038	-	-	-	0.124
HCM Control Delay (s)	8.4	-	-	-	13.2
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↱			↱
Traffic Vol, veh/h	0	756	340	8	0	18
Future Vol, veh/h	0	756	340	8	0	18
Conflicting Peds, #/hr	0	0	0	36	0	36
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	822	370	9	0	20

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	262
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	737
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	693
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10.3
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	693
HCM Lane V/C Ratio	-	-	-	0.028
HCM Control Delay (s)	-	-	-	10.3
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	120	689	553	213	475	170
Future Volume (vph)	120	689	553	213	475	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9	4.9	4.9	4.0	4.0
Lane Util. Factor	1.00	0.95	0.91	0.91	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.98	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.99	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3369	1411	3433	1514
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3539	3369	1411	3433	1514
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	130	749	601	232	516	185
RTOR Reduction (vph)	0	0	3	100	0	122
Lane Group Flow (vph)	130	749	621	109	516	63
Confl. Peds. (#/hr)				4		16
Confl. Bikes (#/hr)				10		10
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6 8		7	
Permitted Phases				6 8		7
Actuated Green, G (s)	10.4	31.8	47.4	47.4	19.4	19.4
Effective Green, g (s)	10.4	31.8	47.4	47.4	19.4	19.4
Actuated g/C Ratio	0.11	0.35	0.52	0.52	0.21	0.21
Clearance Time (s)	4.4	4.9			4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	203	1243	1764	739	735	324
v/s Ratio Prot	c0.07	c0.21	c0.18		c0.15	
v/s Ratio Perm				0.08		0.04
v/c Ratio	0.64	0.60	0.35	0.15	0.70	0.20
Uniform Delay, d1	38.3	24.2	12.6	11.1	32.9	29.1
Progression Factor	1.00	1.00	0.12	0.00	1.00	1.00
Incremental Delay, d2	6.7	0.8	0.1	0.1	3.0	0.3
Delay (s)	45.0	25.0	1.6	0.1	35.9	29.4
Level of Service	D	C	A	A	D	C
Approach Delay (s)		27.9	1.2		34.2	
Approach LOS		C	A		C	

Intersection Summary			
HCM 2000 Control Delay	20.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	90.5	Sum of lost time (s)	18.2
Intersection Capacity Utilization	49.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	71	1005	87	33	593	62	92	16	24	72	43	87
Future Volume (vph)	71	1005	87	33	593	62	92	16	24	72	43	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	4.9		4.9	4.9		4.9	4.9	
Lane Util. Factor	1.00	0.95		1.00	0.91		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.97		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.98	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.91		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3487		1770	4984		1770	1651		1738	1650	
Flt Permitted	0.95	1.00		0.95	1.00		0.62	1.00		0.73	1.00	
Satd. Flow (perm)	1770	3487		1770	4984		1164	1651		1334	1650	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	76	1069	93	35	631	66	98	17	26	77	46	93
RTOR Reduction (vph)	0	5	0	0	12	0	0	21	0	0	75	0
Lane Group Flow (vph)	76	1157	0	35	685	0	98	22	0	77	64	0
Confl. Peds. (#/hr)			3			15			19	19		
Confl. Bikes (#/hr)			10			10			10			10
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2 7		1	6			8			8	
Permitted Phases							8			8		
Actuated Green, G (s)	10.4	51.2		3.1	24.5		18.0	18.0		18.0	18.0	
Effective Green, g (s)	10.4	51.2		3.1	24.5		18.0	18.0		18.0	18.0	
Actuated g/C Ratio	0.11	0.57		0.03	0.27		0.20	0.20		0.20	0.20	
Clearance Time (s)	4.4			4.4	4.9		4.9	4.9		4.9	4.9	
Vehicle Extension (s)	3.0			3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	203	1972		60	1349		231	328		265	328	
v/s Ratio Prot	c0.04	c0.33		0.02	0.14			0.01			0.04	
v/s Ratio Perm							c0.08			0.06		
v/c Ratio	0.37	0.59		0.58	0.51		0.42	0.07		0.29	0.20	
Uniform Delay, d1	37.0	12.8		43.1	27.9		31.7	29.4		30.8	30.2	
Progression Factor	1.17	0.20		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.3		13.6	0.3		1.3	0.1		0.6	0.3	
Delay (s)	44.2	2.9		56.7	28.2		33.0	29.5		31.4	30.5	
Level of Service	D	A		E	C		C	C		C	C	
Approach Delay (s)		5.4			29.6			31.9			30.8	
Approach LOS		A			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	17.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	90.5	Sum of lost time (s)	18.2
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Appendix H

Cumulative Project Details

LINSCOTT LAW & GREENSPAN
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Providing Mobility Solutions for 50 YEARS 1966-2016

TRANSPORTATION IMPACT ANALYSIS

SDSU MASTER PLAN UPDATE

San Diego, California
~~January 9~~April 30, 2018

LLG Ref. 3-16-2604

Linscott, Law & Greenspan, Engineers
4542 Ruffner Street
Suite 100
San Diego, CA 92111
858.300.8800 T
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www.llgengineers.com

TABLE 12–1A
NEAR-TERM PROJECT TRIP GENERATION (YEAR 2022)

Trip Generation Project Components	Size		Daily Trip Ends (ADT[a])		AM Peak Hour				PM Peak Hour			
			Rate	Volume	% of ADT	In:Out Split	Volume In	Volume Out	% of ADT	In:Out Split	Volume In	Volume Out
SDSU Student Headcount Increase												
Non-Resident Student Headcount Increase [b]	1,466	Students	2.47 /Student [c]	3,621	5%	90:10	163	18	7%	30:70	76	177
Resident Student Headcount Increase	628	Students	0.64 /Student [d]	402	5%	90:10	18	2	7%	30:70	8	20
Subtotal	*2,094*	*Students*	–	*4,023*			*181*	*20*			*84*	*197*
Adobe Falls Faculty/Staff Housing												
Upper Village Town homes	48	DU	8 /DU [e]	384	8%	20:80	6	25	10%	70:30	27	11
Total			—	**4,407**	—	—	**187**	**45**	—	—	**111**	**208**

Footnotes:

a. Average Daily Traffic

b. Near-Term (Year 2022) student headcount increase calculated as 2,094 students (35,535 minus 33,441 equals 2,094 students). It should be noted that 70% of the student headcount increase are assumed to consist of non-resident students, and 30% of the student headcount increase will consist of resident students.

c. SDSU rates are based on actual counts taken in November 2006. This rate includes SDSU faculty, staff, vendors, visitors, and students.

d. The resident student rate is based on the Community College Redevelopment EIR that assumed 4.4 trips per student dwelling unit (with a reduction of 2.8 trips per DU based on students with new commute but would instead relocate and occupy the on-campus housing).

e. Rates were taken from the City of San Diego Trip Generation Manual, May 2003.

General Notes:

1. DU = Dwelling Units

TABLE 12–1B
SHIFT FROM DRIVING TO TROLLEY (NEAR-TERM)

SDSU boardings Increase (Near-Term)	2,460 students [a]
79% boardings are not transfers	1,943 students [b]
Vehicle Occupancy Rate	1,620 students [c]
95 % of shift to trolley is from private vehicle	1,538 students [d]
Total ADT diverted from private vehicle to trolley	3,076 (5 % during AM peak = 154 trips and 7 % during PM peak = 215 trips)

Footnotes:

a. Source: SANDAG Trolley Boarding Data

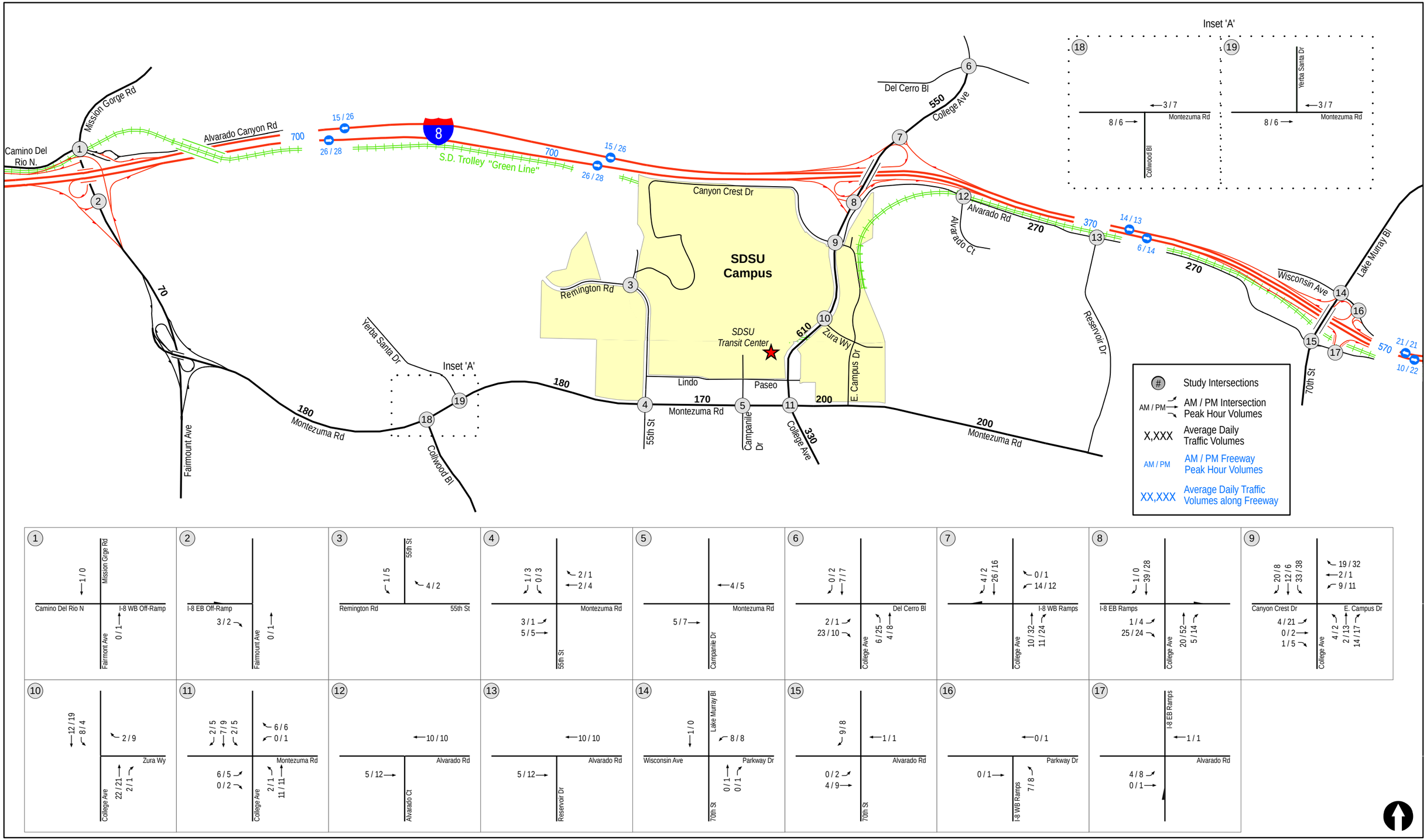
b. Source: SANDAG

c. Accounts for fact that not all drivers that shift from trolley were driving alone, some carpool (5% assumed).

d. Accounts for fact that some future users of trolley would shift from other transit opportunities, and not from personal vehicles

TABLE 12–1C
NET INCREASE IN TRAFFIC (NEAR-TERM)

1. Proposed project trips (without any increased trolley usage) = 4,407 ADT
2. Future Shift from driving to trolley = 3,076 ADT
3. Net increase in traffic = 1,331 ADT (78 AM peak hour trips and 104 PM peak hour trips)



LINSCOTT LAW & GREENSPAN engineers

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Figure 8-4

Near-Term (Year 2022) Total Project Traffic Volumes

SDSU MASTER PLAN UPDATE

LINSCOTT LAW & GREENSPAN
engineers

Providing Mobility Solutions for 50 YEARS 1966-2016

TRANSPORTATION IMPACT ANALYSIS

SDSU MASTER PLAN UPDATE

San Diego, California
January 9, 2018

LLG Ref. 3-16-2604

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TABLE 8–1A
NEAR-TERM PROJECT TRIP GENERATION (YEAR 2022)

Trip Generation Project Components	Size		Daily Trip Ends (ADT[a])		AM Peak Hour				PM Peak Hour			
			Rate	Volume	% of ADT	In:Out Split	Volume In	Volume Out	% of ADT	In:Out Split	Volume In	Volume Out
SDSU Student Headcount Increase												
Non-Resident Student Headcount Increase [b]	1,466	Students	2.47 /Student [c]	3,621	5%	90:10	163	18	7%	30:70	76	177
Resident Student Headcount Increase	628	Students	0.64 /Student [d]	402	5%	90:10	18	2	7%	30:70	8	20
Subtotal	*2,094*	*Students*	–	*4,023*			*181*	*20*			*84*	*197*
Adobe Falls Faculty/Staff Housing												
Upper Village Town homes	48	DU	8 /DU [e]	384	8%	20:80	6	25	10%	70:30	27	11
Alvarado Hotel	120	Room	10 /Room [e]	1,200	6%	60:40	43	29	8%	60:40	58	38
Total			—	**5,607**	—	—	**230**	**74**	—	—	**169**	**246**

Footnotes:

a. Average Daily Traffic

b. Near-Term (Year 2022) student headcount increase calculated as 2,094 students (35,535 minus 33,441 equals 2,094 students). It should be noted that 70% of the student headcount increase are assumed to consist of non-resident students, and 30% of the student headcount increase will consist of resident students.

c. SDSU rates are based on actual counts taken in November 2006. This rate includes SDSU faculty, staff, vendors, visitors, and students.

d. The resident student rate is based on the Community College Redevelopment EIR that assumed 4.4 trips per student dwelling unit (with a reduction of 2.8 trips per DU based on students with new commute but would instead relocate and occupy the on-campus housing).

e. Rates were taken from the City of San Diego Trip Generation Manual, May 2003.

General Notes:

1. DU = Dwelling Units

TABLE 8–1B
SHIFT FROM DRIVING TO TROLLEY (NEAR-TERM)

SDSU boardings Increase (Near-Term)	2,460 students [a]
79% boardings are not transfers	1,943 students [b]
Vehicle Occupancy Rate	1,620 students [c]
95 % of shift to trolley is from private vehicle	1,538 students [d]
Total ADT diverted from private vehicle to trolley	3,076 (5 % during AM peak = 154 trips and 7 % during PM peak = 215 trips)

Footnotes:

a. Source: SANDAG Trolley Boarding Data

b. Source: SANDAG

c. Accounts for fact that not all drivers that shift from trolley were driving alone, some carpool (5% assumed).

d. Accounts for fact that some future users of trolley would shift from other transit opportunities, and not from personal vehicles

TABLE 8–1C
NET INCREASE IN TRAFFIC (NEAR-TERM)

1. Proposed project trips (without any increased trolley usage) = 5,607 ADT
2. Future Shift from driving to trolley = 3,076 ADT
3. Net increase in traffic = 2,531 ADT (150 AM peak hour trips and 200 PM peak hour trips)

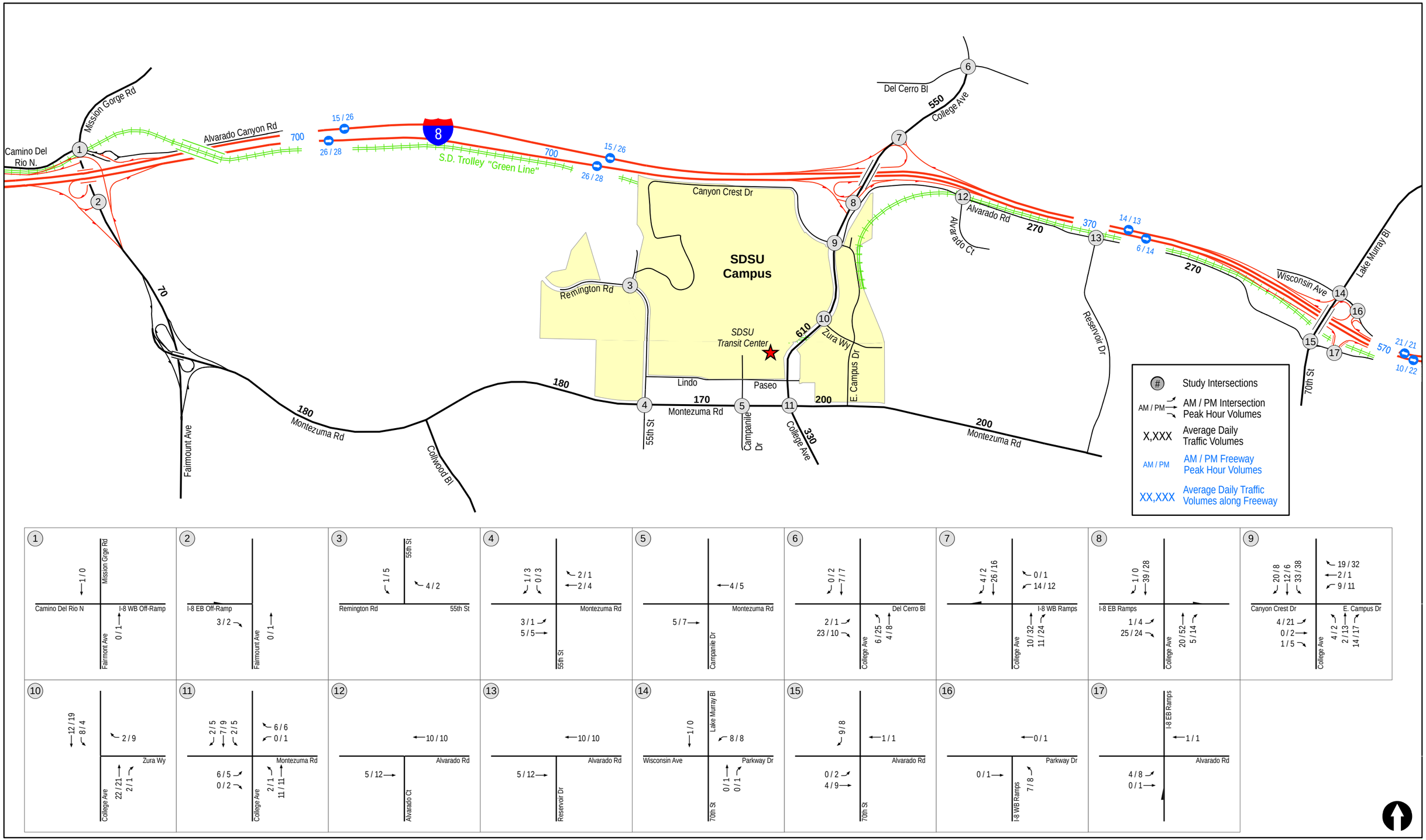

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Figure 8-4

Near-Term (Year 2022) Total Project Traffic Volumes

Appendix I

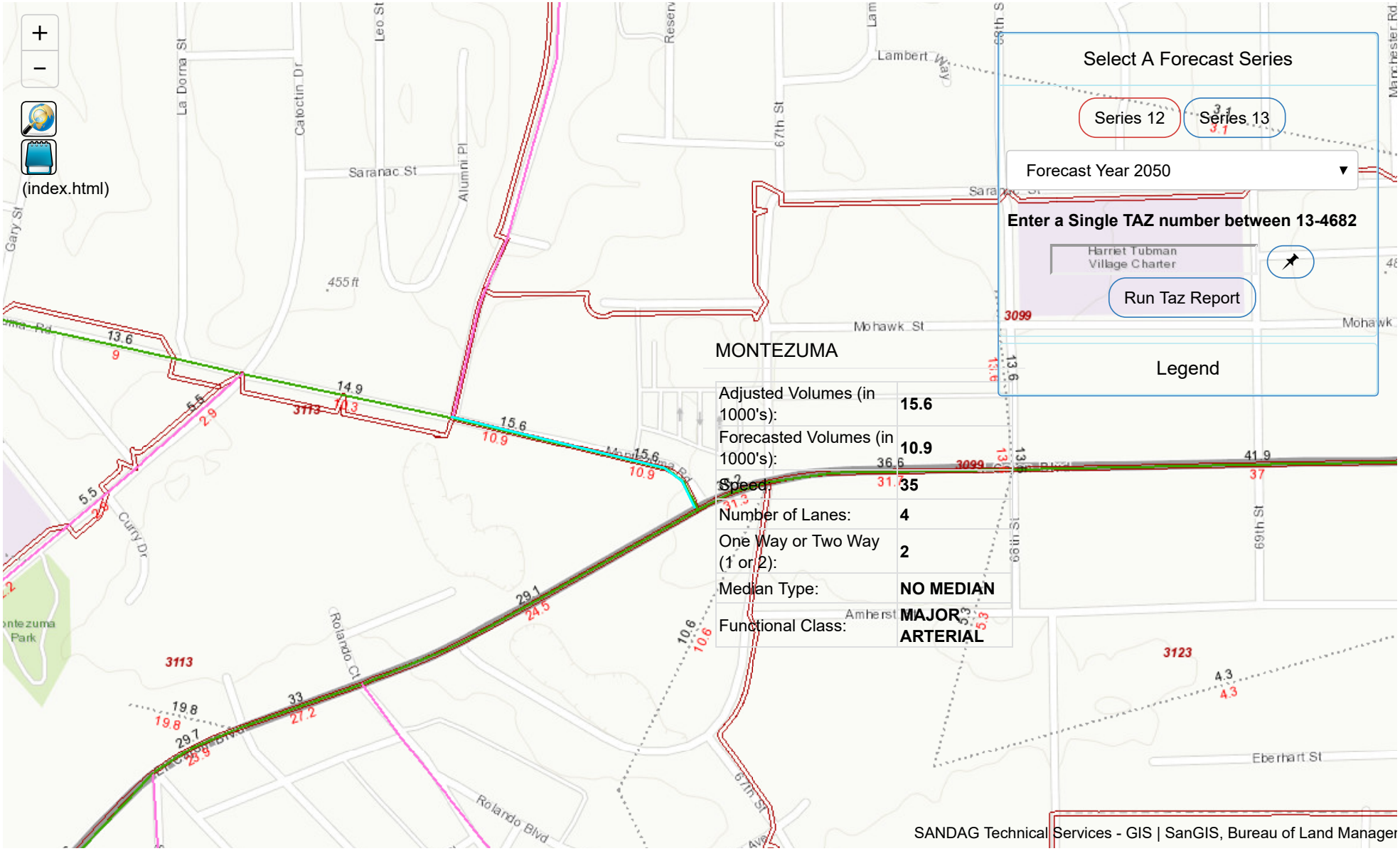
SANDAG ADTs and Growth Rate

Traffic Volume Growth Factor

Calculated from an average increase/decrease in 2018 ADTs vs. SANDAG 2050 ADTs.
SANDAG 2050 ADTs (shown on next page)

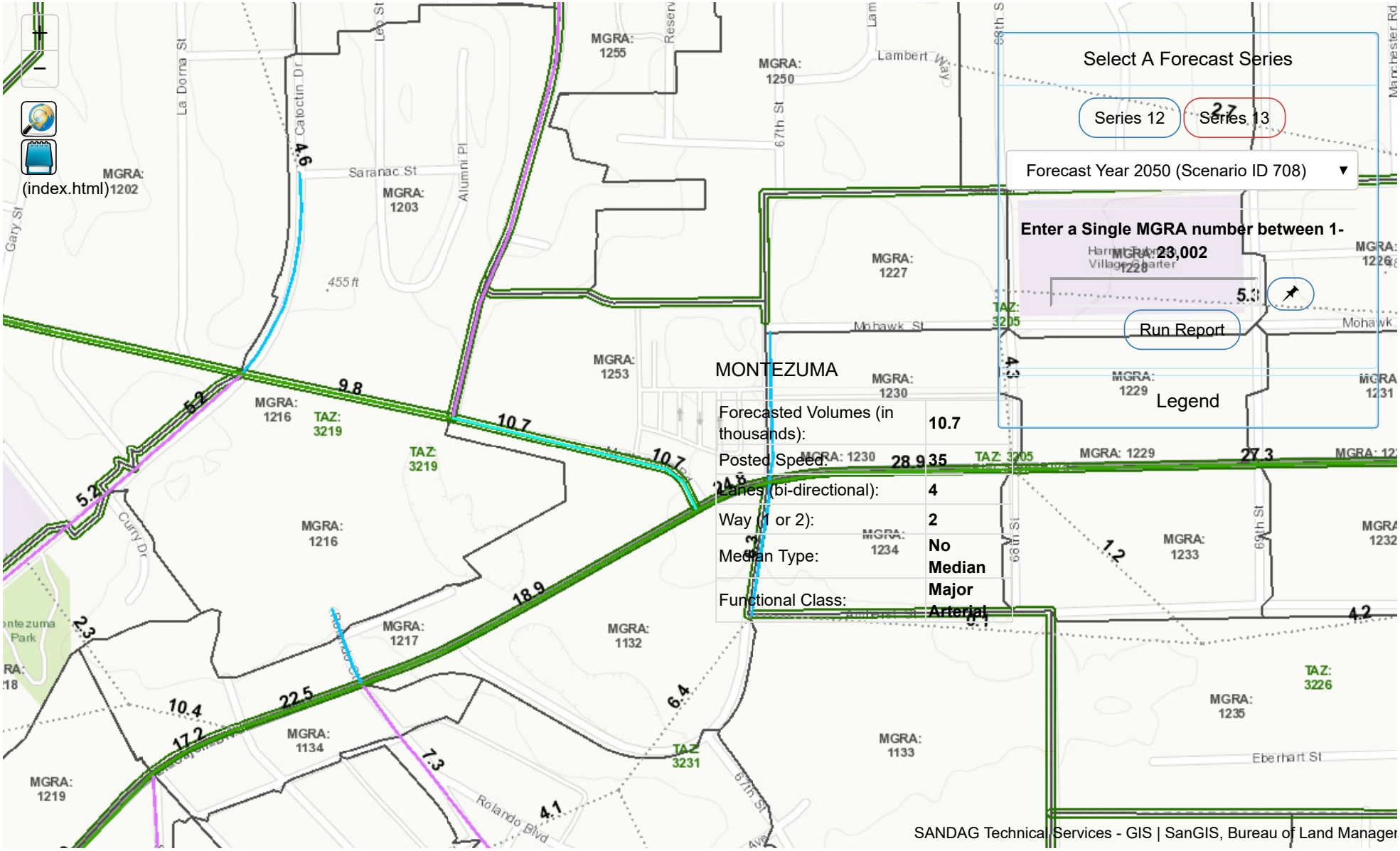
Segment	Existing Year 2018	SANDAG Series 12 Year 2050	Percent Change
Montezuma Road			
Reservoir Dr to Project Driveway	12,750	15,600	18.3%
Project Driveway to El Cajon Blvd	12,763	15,600	18.2%
		Average	**18.3%**

-->



(index.html)
Select A Forecast Series
Series 12
Series 13
Forecast Year 2050
Enter a Single TAZ number between 13-4682
Harriet Tubman Village Charter
Run Taz Report
Legend
MONTEZUMA
Adjusted Volumes (in 1000's): 15.6
Forecasted Volumes (in 1000's): 10.9
Speed: 35
Number of Lanes: 4
One Way or Two Way (1 or 2): 2
Median Type: NO MEDIAN
Functional Class: MAJOR ARTERIAL
Saranac St
Mohawk St
Lambert Way
Rolando Ct
Rolando Blvd
Eberhart St
Curry Dr
Montezuma Park
SANDAG Technical Services - GIS | SanGIS, Bureau of Land Manager

-->



Select A Forecast Series
Series 12
Series 13
Forecast Year 2050 (Scenario ID 708)
Enter a Single MGRA number between 1-23,002
Run Report
Legend
MONTEZUMA
Forecasted Volumes (in thousands): 10.7
Posted Speed: 35
Lanes (bi-directional): 4
Way (1 or 2): 2
Median Type: No Median
Functional Class: Major Arterial
(index.html)
MGRA: 1202
MGRA: 1203
MGRA: 1255
MGRA: 1250
MGRA: 1227
MGRA: 1228
MGRA: 1226
MGRA: 1253
MGRA: 1230
MGRA: 1229
MGRA: 1231
MGRA: 1216
MGRA: 1217
MGRA: 1132
MGRA: 1134
MGRA: 1219
MGRA: 1133
MGRA: 1234
MGRA: 1233
MGRA: 1235
TAZ: 3219
TAZ: 3205
TAZ: 3226
TAZ: 3231
Saranac St
Mohawk St
Eberhart St
Rolando Blvd
Curry Dr
Lambert Way
Manchester Rd
SANDAG Technical Services - GIS | SanGIS, Bureau of Land Manager

Appendix J

Near Term LOS Calculations

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	80	245	700	117	39	92
Future Volume (veh/h)	80	245	700	117	39	92
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			0.95	1.00	0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	95	292	833	139	46	110
Adj No. of Lanes	1	2	2	0	0	0
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	430	2322	1544	258	67	161
Arrive On Green	0.06	0.66	0.51	0.51	0.14	0.14
Sat Flow, veh/h	1774	3632	3105	503	464	1109
Grp Volume(v), veh/h	95	292	489	483	157	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1770	1745	1582	0
Q Serve(g_s), s	1.1	1.6	9.6	9.6	4.8	0.0
Cycle Q Clear(g_c), s	1.1	1.6	9.6	9.6	4.8	0.0
Prop In Lane	1.00			0.29	0.29	0.70
Lane Grp Cap(c), veh/h	430	2322	907	894	229	0
V/C Ratio(X)	0.22	0.13	0.54	0.54	0.68	0.00
Avail Cap(c_a), veh/h	660	4535	1784	1760	898	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	5.7	3.3	8.4	8.4	20.8	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.9	0.9	1.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.8	4.9	4.8	2.2	0.0
LnGrp Delay(d),s/veh	5.8	3.4	9.4	9.4	22.2	0.0
LnGrp LOS	A	A	A	A	C	
Approach Vol, veh/h		387	972		157	
Approach Delay, s/veh		3.9	9.4		22.2	
Approach LOS		A	A		C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		38.9		12.3	7.4	31.6		
Change Period (Y+Rc), s		5.3		4.9	4.4	5.3		
Max Green Setting (Gmax), s		65.7		29.1	9.6	51.7		
Max Q Clear Time (g_c+I1), s		3.6		6.8	3.1	11.6		
Green Ext Time (p_c), s		3.8		0.2	0.1	14.7		

Intersection Summary	
HCM 2010 Ctrl Delay	9.3
HCM 2010 LOS	A

Notes

LOS Engineering, Inc.

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	281	818	3	0	7
Future Vol, veh/h	2	281	818	3	0	7
Conflicting Peds, #/hr	25	0	0	25	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	323	940	3	0	8

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	968	0	-	0	1133	497
Stage 1	-	-	-	-	967	-
Stage 2	-	-	-	-	166	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	707	-	-	-	197	519
Stage 1	-	-	-	-	329	-
Stage 2	-	-	-	-	846	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	692	-	-	-	188	508
Mov Cap-2 Maneuver	-	-	-	-	272	-
Stage 1	-	-	-	-	321	-
Stage 2	-	-	-	-	828	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	12.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	692	-	-	-	508
HCM Lane V/C Ratio	0.003	-	-	-	0.016
HCM Control Delay (s)	10.2	-	-	-	12.2
HCM Lane LOS	B	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↱			↱
Traffic Vol, veh/h	0	281	821	0	0	0
Future Vol, veh/h	0	281	821	0	0	0
Conflicting Peds, #/hr	0	0	0	25	0	25
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	305	892	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	496
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	519
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	498
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	-	-	0
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	-

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	177	504	653	714	131	53
Future Volume (vph)	177	504	653	714	131	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9	4.9	4.9	4.0	4.0
Lane Util. Factor	1.00	0.95	0.91	0.91	0.97	1.00
Frpb, ped/bikes	1.00	1.00	0.99	0.98	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.95	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3212	1411	3433	1515
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3539	3212	1411	3433	1515
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	186	531	687	752	138	56
RTOR Reduction (vph)	0	0	44	174	0	49
Lane Group Flow (vph)	186	531	951	270	138	7
Confl. Peds. (#/hr)				4		5
Confl. Bikes (#/hr)				10		10
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6 8		7	
Permitted Phases				6 8		7
Actuated Green, G (s)	14.1	44.8	60.5	60.5	11.7	11.7
Effective Green, g (s)	14.1	44.8	60.5	60.5	11.7	11.7
Actuated g/C Ratio	0.14	0.45	0.61	0.61	0.12	0.12
Clearance Time (s)	4.4	4.9			4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	250	1591	1951	857	403	177
v/s Ratio Prot	c0.11	0.15	c0.30		c0.04	
v/s Ratio Perm				0.19		0.00
v/c Ratio	0.74	0.33	0.49	0.31	0.34	0.04
Uniform Delay, d1	41.0	17.7	10.9	9.5	40.4	39.0
Progression Factor	1.00	1.00	0.12	1.08	1.00	1.00
Incremental Delay, d2	11.4	0.1	0.1	0.2	0.5	0.1
Delay (s)	52.4	17.9	1.4	10.4	40.9	39.0
Level of Service	D	B	A	B	D	D
Approach Delay (s)		26.8	4.2		40.4	
Approach LOS		C	A		D	

Intersection Summary			
HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	99.6	Sum of lost time (s)	18.2
Intersection Capacity Utilization	50.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	547	38	24	1036	20	222	17	40	26	10	96
Future Volume (vph)	49	547	38	24	1036	20	222	17	40	26	10	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	4.9		4.9	4.9		4.9	4.9	
Lane Util. Factor	1.00	0.95		1.00	0.91		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.97		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.97	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.90		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3491		1770	5066		1770	1611		1725	1579	
Flt Permitted	0.95	1.00		0.95	1.00		0.68	1.00		0.72	1.00	
Satd. Flow (perm)	1770	3491		1770	5066		1264	1611		1303	1579	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	52	576	40	25	1091	21	234	18	42	27	11	101
RTOR Reduction (vph)	0	5	0	0	2	0	0	32	0	0	78	0
Lane Group Flow (vph)	52	611	0	25	1110	0	234	28	0	27	34	0
Confl. Peds. (#/hr)			11			12			25	25		
Confl. Bikes (#/hr)			10			10			10			10
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2 7		1	6			8			8	
Permitted Phases							8			8		
Actuated Green, G (s)	14.1	56.5		2.2	32.9		22.7	22.7		22.7	22.7	
Effective Green, g (s)	14.1	56.5		2.2	32.9		22.7	22.7		22.7	22.7	
Actuated g/C Ratio	0.14	0.57		0.02	0.33		0.23	0.23		0.23	0.23	
Clearance Time (s)	4.4			4.4	4.9		4.9	4.9		4.9	4.9	
Vehicle Extension (s)	3.0			3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	250	1980		39	1673		288	367		296	359	
v/s Ratio Prot	0.03	c0.18		c0.01	c0.22			0.02			0.02	
v/s Ratio Perm							c0.19			0.02		
v/c Ratio	0.21	0.31		0.64	0.66		0.81	0.08		0.09	0.09	
Uniform Delay, d1	37.8	11.3		48.3	28.6		36.4	30.2		30.3	30.3	
Progression Factor	1.27	0.19		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.1		30.7	1.0		15.9	0.1		0.1	0.1	
Delay (s)	48.5	2.2		79.1	29.6		52.3	30.3		30.5	30.5	
Level of Service	D	A		E	C		D	C		C	C	
Approach Delay (s)		5.8			30.7			47.8			30.5	
Approach LOS		A			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	25.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	99.6	Sum of lost time (s)	18.2
Intersection Capacity Utilization	56.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	89	655	294	55	103	84
Future Volume (veh/h)	89	655	294	55	103	84
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99			0.95	1.00	0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	96	704	316	59	111	100
Adj No. of Lanes	1	2	2	0	0	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.84
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	542	1752	889	163	184	166
Arrive On Green	0.07	0.50	0.30	0.30	0.21	0.21
Sat Flow, veh/h	1774	3632	3050	543	856	771
Grp Volume(v), veh/h	96	704	187	188	212	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1770	1731	1634	0
Q Serve(g_s), s	1.2	4.4	2.9	3.0	4.1	0.0
Cycle Q Clear(g_c), s	1.2	4.4	2.9	3.0	4.1	0.0
Prop In Lane	1.00			0.31	0.52	0.47
Lane Grp Cap(c), veh/h	542	1752	532	520	351	0
V/C Ratio(X)	0.18	0.40	0.35	0.36	0.60	0.00
Avail Cap(c_a), veh/h	1106	5509	1848	1808	1865	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	6.5	5.6	9.6	9.6	12.5	0.0
Incr Delay (d2), s/veh	0.1	0.3	0.7	0.8	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	2.1	1.5	1.5	1.9	0.0
LnGrp Delay(d),s/veh	6.6	5.9	10.3	10.4	13.1	0.0
LnGrp LOS	A	A	B	B	B	
Approach Vol, veh/h		800	375		212	
Approach Delay, s/veh		6.0	10.4		13.1	
Approach LOS		A	B		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		22.7		12.4	6.8	15.9		
Change Period (Y+Rc), s		5.3		4.9	4.4	5.3		
Max Green Setting (Gmax), s		54.7		40.1	13.6	36.7		
Max Q Clear Time (g_c+I1), s		6.4		6.1	3.2	5.0		
Green Ext Time (p_c), s		10.6		0.3	0.1	4.3		

Intersection Summary	
HCM 2010 Ctrl Delay	8.2
HCM 2010 LOS	A

Notes

LOS Engineering, Inc.

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	12	744	334	9	2	11
Future Vol, veh/h	12	744	334	9	2	11
Conflicting Peds, #/hr	36	0	0	36	1	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	827	371	10	2	12

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	417	0	-	0	853	229
Stage 1	-	-	-	-	412	-
Stage 2	-	-	-	-	441	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1138	-	-	-	298	774
Stage 1	-	-	-	-	637	-
Stage 2	-	-	-	-	616	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1104	-	-	-	277	750
Mov Cap-2 Maneuver	-	-	-	-	399	-
Stage 1	-	-	-	-	610	-
Stage 2	-	-	-	-	598	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	10.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1104	-	-	-	661
HCM Lane V/C Ratio	0.012	-	-	-	0.022
HCM Control Delay (s)	8.3	-	-	-	10.6
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↱			↱
Traffic Vol, veh/h	0	746	343	0	0	0
Future Vol, veh/h	0	746	343	0	0	0
Conflicting Peds, #/hr	0	0	0	36	0	36
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	811	373	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	259
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	740
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	696
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	-	-	0
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	-

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	118	697	560	209	469	165
Future Volume (vph)	118	697	560	209	469	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9	4.9	4.9	4.0	4.0
Lane Util. Factor	1.00	0.95	0.91	0.91	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.98	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.99	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3369	1411	3433	1514
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3539	3369	1411	3433	1514
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	128	758	609	227	510	179
RTOR Reduction (vph)	0	0	3	97	0	119
Lane Group Flow (vph)	128	758	629	107	510	60
Confl. Peds. (#/hr)				4		16
Confl. Bikes (#/hr)				10		10
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6 8		7	
Permitted Phases				6 8		7
Actuated Green, G (s)	10.3	31.8	47.6	47.6	19.4	19.4
Effective Green, g (s)	10.3	31.8	47.6	47.6	19.4	19.4
Actuated g/C Ratio	0.11	0.35	0.53	0.53	0.21	0.21
Clearance Time (s)	4.4	4.9			4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	201	1242	1770	741	735	324
v/s Ratio Prot	c0.07	c0.21	c0.19		c0.15	
v/s Ratio Perm				0.08		0.04
v/c Ratio	0.64	0.61	0.36	0.14	0.69	0.19
Uniform Delay, d1	38.4	24.3	12.5	11.0	32.9	29.1
Progression Factor	1.00	1.00	0.12	0.00	1.00	1.00
Incremental Delay, d2	6.5	0.9	0.1	0.1	2.8	0.3
Delay (s)	44.8	25.2	1.7	0.1	35.7	29.4
Level of Service	D	C	A	A	D	C
Approach Delay (s)		28.0	1.3		34.1	
Approach LOS		C	A		C	

Intersection Summary			
HCM 2000 Control Delay	20.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	90.6	Sum of lost time (s)	18.2
Intersection Capacity Utilization	49.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	72	1005	88	33	594	63	93	16	24	73	44	88
Future Volume (vph)	72	1005	88	33	594	63	93	16	24	73	44	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	4.9		4.9	4.9		4.9	4.9	
Lane Util. Factor	1.00	0.95		1.00	0.91		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.97		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.98	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.91		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3486		1770	4983		1770	1651		1738	1651	
Flt Permitted	0.95	1.00		0.95	1.00		0.62	1.00		0.73	1.00	
Satd. Flow (perm)	1770	3486		1770	4983		1156	1651		1333	1651	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	77	1069	94	35	632	67	99	17	26	78	47	94
RTOR Reduction (vph)	0	6	0	0	12	0	0	21	0	0	75	0
Lane Group Flow (vph)	77	1157	0	35	687	0	99	22	0	78	66	0
Confl. Peds. (#/hr)			3			15			19	19		
Confl. Bikes (#/hr)			10			10			10			10
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2 7		1	6			8			8	
Permitted Phases							8			8		
Actuated Green, G (s)	10.3	51.2		3.1	24.6		18.1	18.1		18.1	18.1	
Effective Green, g (s)	10.3	51.2		3.1	24.6		18.1	18.1		18.1	18.1	
Actuated g/C Ratio	0.11	0.57		0.03	0.27		0.20	0.20		0.20	0.20	
Clearance Time (s)	4.4			4.4	4.9		4.9	4.9		4.9	4.9	
Vehicle Extension (s)	3.0			3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	201	1970		60	1353		230	329		266	329	
v/s Ratio Prot	c0.04	c0.33		0.02	0.14			0.01			0.04	
v/s Ratio Perm							c0.09			0.06		
v/c Ratio	0.38	0.59		0.58	0.51		0.43	0.07		0.29	0.20	
Uniform Delay, d1	37.2	12.8		43.1	27.9		31.7	29.4		30.8	30.2	
Progression Factor	1.18	0.20		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.3		13.6	0.3		1.3	0.1		0.6	0.3	
Delay (s)	44.8	2.9		56.7	28.2		33.0	29.5		31.4	30.5	
Level of Service	D	A		E	C		C	C		C	C	
Approach Delay (s)		5.5			29.5			32.0			30.8	
Approach LOS		A			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	17.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	90.6	Sum of lost time (s)	18.2
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Appendix K

Near Term with Project LOS Calculations

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	80	267	732	117	39	92
Future Volume (veh/h)	80	267	732	117	39	92
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			0.95	1.00	0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	95	318	871	139	46	110
Adj No. of Lanes	1	2	2	0	0	0
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	420	2344	1585	253	67	160
Arrive On Green	0.06	0.66	0.52	0.52	0.14	0.14
Sat Flow, veh/h	1774	3632	3128	484	464	1109
Grp Volume(v), veh/h	95	318	508	502	157	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1770	1750	1582	0
Q Serve(g_s), s	1.1	1.8	10.2	10.2	5.0	0.0
Cycle Q Clear(g_c), s	1.1	1.8	10.2	10.2	5.0	0.0
Prop In Lane	1.00			0.28	0.29	0.70
Lane Grp Cap(c), veh/h	420	2344	924	914	229	0
V/C Ratio(X)	0.23	0.14	0.55	0.55	0.69	0.00
Avail Cap(c_a), veh/h	642	4401	1732	1712	871	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	5.8	3.3	8.5	8.5	21.5	0.0
Incr Delay (d2), s/veh	0.1	0.0	1.0	1.0	1.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.9	5.2	5.1	2.3	0.0
LnGrp Delay(d),s/veh	5.9	3.4	9.4	9.4	22.8	0.0
LnGrp LOS	A	A	A	A	C	
Approach Vol, veh/h		413	1010		157	
Approach Delay, s/veh		3.9	9.4		22.8	
Approach LOS		A	A		C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		40.3		12.5	7.4	32.9		
Change Period (Y+Rc), s		5.3		4.9	4.4	5.3		
Max Green Setting (Gmax), s		65.7		29.1	9.6	51.7		
Max Q Clear Time (g_c+I1), s		3.8		7.0	3.1	12.2		
Green Ext Time (p_c), s		4.2		0.2	0.1	15.4		

Intersection Summary	
HCM 2010 Ctrl Delay	9.3
HCM 2010 LOS	A

Notes

LOS Engineering, Inc.

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	24	281	834	10	22	23
Future Vol, veh/h	24	281	834	10	22	23
Conflicting Peds, #/hr	25	0	0	25	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	28	323	959	11	25	26

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	995	0	-	0	1208	510
Stage 1	-	-	-	-	990	-
Stage 2	-	-	-	-	218	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	691	-	-	-	176	509
Stage 1	-	-	-	-	320	-
Stage 2	-	-	-	-	797	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	677	-	-	-	162	498
Mov Cap-2 Maneuver	-	-	-	-	250	-
Stage 1	-	-	-	-	300	-
Stage 2	-	-	-	-	780	-

Approach	EB	WB	SB
HCM Control Delay, s	0.8	0	17.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	677	-	-	-	335
HCM Lane V/C Ratio	0.041	-	-	-	0.154
HCM Control Delay (s)	10.5	-	-	-	17.7
HCM Lane LOS	B	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↱			↱
Traffic Vol, veh/h	0	303	828	7	0	16
Future Vol, veh/h	0	303	828	7	0	16
Conflicting Peds, #/hr	0	0	0	25	0	25
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	329	900	8	0	17

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	504
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	513
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	492
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	12.6
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	492
HCM Lane V/C Ratio	-	-	-	0.035
HCM Control Delay (s)	-	-	-	12.6
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	182	504	653	723	145	61
Future Volume (vph)	182	504	653	723	145	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9	4.9	4.9	4.0	4.0
Lane Util. Factor	1.00	0.95	0.91	0.91	0.97	1.00
Frpb, ped/bikes	1.00	1.00	0.99	0.98	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.95	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3211	1411	3433	1515
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3539	3211	1411	3433	1515
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	192	531	687	761	153	64
RTOR Reduction (vph)	0	0	45	178	0	56
Lane Group Flow (vph)	192	531	954	271	153	8
Confl. Peds. (#/hr)				4		5
Confl. Bikes (#/hr)				10		10
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6 8		7	
Permitted Phases				6 8		7
Actuated Green, G (s)	14.4	45.0	60.4	60.4	11.8	11.8
Effective Green, g (s)	14.4	45.0	60.4	60.4	11.8	11.8
Actuated g/C Ratio	0.14	0.45	0.60	0.60	0.12	0.12
Clearance Time (s)	4.4	4.9			4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	255	1594	1941	853	405	178
v/s Ratio Prot	c0.11	0.15	c0.30		c0.04	
v/s Ratio Perm				0.19		0.00
v/c Ratio	0.75	0.33	0.49	0.32	0.38	0.04
Uniform Delay, d1	41.0	17.7	11.1	9.7	40.7	39.0
Progression Factor	1.00	1.00	0.12	1.15	1.00	1.00
Incremental Delay, d2	11.9	0.1	0.1	0.2	0.6	0.1
Delay (s)	52.9	17.9	1.4	11.2	41.3	39.1
Level of Service	D	B	A	B	D	D
Approach Delay (s)		27.2	4.5		40.6	
Approach LOS		C	A		D	

Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	99.9	Sum of lost time (s)	18.2
Intersection Capacity Utilization	51.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	561	38	24	1045	20	222	17	40	26	10	96
Future Volume (vph)	49	561	38	24	1045	20	222	17	40	26	10	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	4.9		4.9	4.9		4.9	4.9	
Lane Util. Factor	1.00	0.95		1.00	0.91		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.97		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.97	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.90		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3492		1770	5066		1770	1611		1724	1579	
Flt Permitted	0.95	1.00		0.95	1.00		0.68	1.00		0.72	1.00	
Satd. Flow (perm)	1770	3492		1770	5066		1263	1611		1303	1579	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	52	591	40	25	1100	21	234	18	42	27	11	101
RTOR Reduction (vph)	0	4	0	0	2	0	0	32	0	0	78	0
Lane Group Flow (vph)	52	627	0	25	1119	0	234	28	0	27	34	0
Confl. Peds. (#/hr)			11			12			25	25		
Confl. Bikes (#/hr)			10			10			10			10
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2 7		1	6			8			8	
Permitted Phases							8			8		
Actuated Green, G (s)	14.4	56.8		2.2	32.8		22.7	22.7		22.7	22.7	
Effective Green, g (s)	14.4	56.8		2.2	32.8		22.7	22.7		22.7	22.7	
Actuated g/C Ratio	0.14	0.57		0.02	0.33		0.23	0.23		0.23	0.23	
Clearance Time (s)	4.4			4.4	4.9		4.9	4.9		4.9	4.9	
Vehicle Extension (s)	3.0			3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	255	1985		38	1663		286	366		296	358	
v/s Ratio Prot	0.03	c0.18		c0.01	c0.22			0.02			0.02	
v/s Ratio Perm							c0.19			0.02		
v/c Ratio	0.20	0.32		0.66	0.67		0.82	0.08		0.09	0.09	
Uniform Delay, d1	37.7	11.3		48.5	28.9		36.6	30.3		30.5	30.5	
Progression Factor	1.25	0.19		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.1		34.3	1.1		16.4	0.1		0.1	0.1	
Delay (s)	47.6	2.3		82.7	30.0		53.1	30.4		30.6	30.6	
Level of Service	D	A		F	C		D	C		C	C	
Approach Delay (s)		5.7			31.2			48.4			30.6	
Approach LOS		A			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	25.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	99.9	Sum of lost time (s)	18.2
Intersection Capacity Utilization	56.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	89	680	331	55	103	84
Future Volume (veh/h)	89	680	331	55	103	84
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99			0.95	1.00	0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	96	731	356	59	111	100
Adj No. of Lanes	1	2	2	0	0	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.84
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	529	1767	927	152	183	165
Arrive On Green	0.07	0.50	0.31	0.31	0.21	0.21
Sat Flow, veh/h	1774	3632	3112	494	856	771
Grp Volume(v), veh/h	96	731	207	208	212	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1770	1743	1634	0
Q Serve(g_s), s	1.2	4.6	3.3	3.3	4.2	0.0
Cycle Q Clear(g_c), s	1.2	4.6	3.3	3.3	4.2	0.0
Prop In Lane	1.00			0.28	0.52	0.47
Lane Grp Cap(c), veh/h	529	1767	543	535	350	0
V/C Ratio(X)	0.18	0.41	0.38	0.39	0.61	0.00
Avail Cap(c_a), veh/h	1084	5433	1823	1796	1839	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	6.5	5.6	9.7	9.7	12.6	0.0
Incr Delay (d2), s/veh	0.1	0.3	0.8	0.9	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	2.3	1.7	1.7	1.9	0.0
LnGrp Delay(d),s/veh	6.6	5.9	10.5	10.6	13.3	0.0
LnGrp LOS	A	A	B	B	B	
Approach Vol, veh/h		827	415		212	
Approach Delay, s/veh		6.0	10.5		13.3	
Approach LOS		A	B		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		23.1		12.5	6.9	16.2		
Change Period (Y+Rc), s		5.3		4.9	4.4	5.3		
Max Green Setting (Gmax), s		54.7		40.1	13.6	36.7		
Max Q Clear Time (g_c+I1), s		6.6		6.2	3.2	5.3		
Green Ext Time (p_c), s		11.1		0.3	0.1	4.8		

Intersection Summary	
HCM 2010 Ctrl Delay	8.4
HCM 2010 LOS	A

Notes

LOS Engineering, Inc.

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	37	744	352	17	26	30
Future Vol, veh/h	37	744	352	17	26	30
Conflicting Peds, #/hr	36	0	0	36	1	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	41	827	391	19	29	33

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	446	0	-	0	934	243
Stage 1	-	-	-	-	437	-
Stage 2	-	-	-	-	497	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1111	-	-	-	264	758
Stage 1	-	-	-	-	619	-
Stage 2	-	-	-	-	577	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1078	-	-	-	239	734
Mov Cap-2 Maneuver	-	-	-	-	358	-
Stage 1	-	-	-	-	578	-
Stage 2	-	-	-	-	560	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	13.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1078	-	-	-	493
HCM Lane V/C Ratio	0.038	-	-	-	0.126
HCM Control Delay (s)	8.5	-	-	-	13.4
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↱			↱
Traffic Vol, veh/h	0	770	351	8	0	18
Future Vol, veh/h	0	770	351	8	0	18
Conflicting Peds, #/hr	0	0	0	36	0	36
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	837	382	9	0	20

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	268
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	730
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	687
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10.4
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	687
HCM Lane V/C Ratio	-	-	-	0.028
HCM Control Delay (s)	-	-	-	10.4
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	124	697	560	219	484	174
Future Volume (vph)	124	697	560	219	484	174
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9	4.9	4.9	4.0	4.0
Lane Util. Factor	1.00	0.95	0.91	0.91	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.98	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.99	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3368	1411	3433	1514
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3539	3368	1411	3433	1514
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	135	758	609	238	526	189
RTOR Reduction (vph)	0	0	3	102	0	122
Lane Group Flow (vph)	135	758	630	112	526	67
Confl. Peds. (#/hr)				4		16
Confl. Bikes (#/hr)				10		10
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6 8		7	
Permitted Phases				6 8		7
Actuated Green, G (s)	10.5	32.0	47.6	47.6	19.4	19.4
Effective Green, g (s)	10.5	32.0	47.6	47.6	19.4	19.4
Actuated g/C Ratio	0.12	0.35	0.52	0.52	0.21	0.21
Clearance Time (s)	4.4	4.9			4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	204	1247	1765	739	733	323
v/s Ratio Prot	c0.08	c0.21	c0.19		c0.15	
v/s Ratio Perm				0.08		0.04
v/c Ratio	0.66	0.61	0.36	0.15	0.72	0.21
Uniform Delay, d1	38.4	24.2	12.6	11.2	33.2	29.4
Progression Factor	1.00	1.00	0.12	0.00	1.00	1.00
Incremental Delay, d2	7.8	0.8	0.1	0.1	3.4	0.3
Delay (s)	46.3	25.1	1.6	0.1	36.5	29.7
Level of Service	D	C	A	A	D	C
Approach Delay (s)		28.3	1.2		34.7	
Approach LOS		C	A		C	

Intersection Summary			
HCM 2000 Control Delay	20.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	90.8	Sum of lost time (s)	18.2
Intersection Capacity Utilization	49.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	72	1020	88	33	604	63	93	16	24	73	44	88
Future Volume (vph)	72	1020	88	33	604	63	93	16	24	73	44	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	4.9		4.9	4.9		4.9	4.9	
Lane Util. Factor	1.00	0.95		1.00	0.91		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.97		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.98	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.91		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3487		1770	4984		1770	1651		1738	1651	
Flt Permitted	0.95	1.00		0.95	1.00		0.62	1.00		0.73	1.00	
Satd. Flow (perm)	1770	3487		1770	4984		1155	1651		1333	1651	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	77	1085	94	35	643	67	99	17	26	78	47	94
RTOR Reduction (vph)	0	5	0	0	12	0	0	21	0	0	75	0
Lane Group Flow (vph)	77	1174	0	35	698	0	99	22	0	78	66	0
Confl. Peds. (#/hr)			3			15			19	19		
Confl. Bikes (#/hr)			10			10			10			10
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2 7		1	6			8			8	
Permitted Phases							8			8		
Actuated Green, G (s)	10.5	51.4		3.1	24.6		18.1	18.1		18.1	18.1	
Effective Green, g (s)	10.5	51.4		3.1	24.6		18.1	18.1		18.1	18.1	
Actuated g/C Ratio	0.12	0.57		0.03	0.27		0.20	0.20		0.20	0.20	
Clearance Time (s)	4.4			4.4	4.9		4.9	4.9		4.9	4.9	
Vehicle Extension (s)	3.0			3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	204	1973		60	1350		230	329		265	329	
v/s Ratio Prot	c0.04	c0.34		0.02	0.14			0.01			0.04	
v/s Ratio Perm							c0.09			0.06		
v/c Ratio	0.38	0.59		0.58	0.52		0.43	0.07		0.29	0.20	
Uniform Delay, d1	37.1	12.9		43.2	28.1		31.8	29.5		30.9	30.3	
Progression Factor	1.16	0.20		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.4		13.6	0.3		1.3	0.1		0.6	0.3	
Delay (s)	44.1	3.0		56.8	28.4		33.1	29.6		31.5	30.6	
Level of Service	D	A		E	C		C	C		C	C	
Approach Delay (s)		5.5			29.7			32.1			30.9	
Approach LOS		A			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	17.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	90.8	Sum of lost time (s)	18.2
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Appendix L

Horizon Year LOS Calculations

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	90	280	810	140	50	110
Future Volume (veh/h)	90	280	810	140	50	110
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			0.96	1.00	0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	107	333	964	167	60	131
Adj No. of Lanes	1	2	2	0	0	0
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	375	2360	1614	279	82	179
Arrive On Green	0.06	0.67	0.54	0.54	0.16	0.16
Sat Flow, veh/h	1774	3632	3087	518	497	1086
Grp Volume(v), veh/h	107	333	569	562	192	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1770	1743	1591	0
Q Serve(g_s), s	1.5	2.1	13.3	13.3	6.9	0.0
Cycle Q Clear(g_c), s	1.5	2.1	13.3	13.3	6.9	0.0
Prop In Lane	1.00			0.30	0.31	0.68
Lane Grp Cap(c), veh/h	375	2360	954	939	263	0
V/C Ratio(X)	0.29	0.14	0.60	0.60	0.73	0.00
Avail Cap(c_a), veh/h	558	3837	1510	1487	764	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	6.9	3.7	9.5	9.5	24.0	0.0
Incr Delay (d2), s/veh	0.2	0.1	1.1	1.1	1.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	1.0	6.6	6.5	3.1	0.0
LnGrp Delay(d),s/veh	7.1	3.8	10.6	10.6	25.5	0.0
LnGrp LOS	A	A	B	B	C	
Approach Vol, veh/h		440	1131		192	
Approach Delay, s/veh		4.6	10.6		25.5	
Approach LOS		A	B		C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		45.7		14.9	7.7	38.0		
Change Period (Y+Rc), s		5.3		4.9	4.4	5.3		
Max Green Setting (Gmax), s		65.7		29.1	9.6	51.7		
Max Q Clear Time (g_c+I1), s		4.1		8.9	3.5	15.3		
Green Ext Time (p_c), s		4.4		0.3	0.1	17.4		

Intersection Summary	
HCM 2010 Ctrl Delay	10.7
HCM 2010 LOS	B

Notes

LOS Engineering, Inc.

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	330	950	5	5	10
Future Vol, veh/h	5	330	950	5	5	10
Conflicting Peds, #/hr	25	0	0	25	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	379	1092	6	6	11

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1123	0	-	0	1322	574
Stage 1	-	-	-	-	1120	-
Stage 2	-	-	-	-	202	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	618	-	-	-	148	462
Stage 1	-	-	-	-	274	-
Stage 2	-	-	-	-	812	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	605	-	-	-	140	452
Mov Cap-2 Maneuver	-	-	-	-	224	-
Stage 1	-	-	-	-	266	-
Stage 2	-	-	-	-	795	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	16.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	605	-	-	-	337
HCM Lane V/C Ratio	0.009	-	-	-	0.051
HCM Control Delay (s)	11	-	-	-	16.3
HCM Lane LOS	B	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↱			↱
Traffic Vol, veh/h	0	330	950	0	0	0
Future Vol, veh/h	0	330	950	0	0	0
Conflicting Peds, #/hr	0	0	0	25	0	25
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	359	1033	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	567
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	467
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	448
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	-	-	0
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	-

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	200	590	760	830	150	60
Future Volume (vph)	200	590	760	830	150	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9	4.9	4.9	4.0	4.0
Lane Util. Factor	1.00	0.95	0.91	0.91	0.97	1.00
Frpb, ped/bikes	1.00	1.00	0.99	0.98	1.00	0.95
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.95	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3212	1411	3433	1512
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3539	3212	1411	3433	1512
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	211	621	800	874	158	63
RTOR Reduction (vph)	0	0	44	203	0	56
Lane Group Flow (vph)	211	621	1114	313	158	7
Confl. Peds. (#/hr)				4		5
Confl. Bikes (#/hr)				10		10
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6 8		7	
Permitted Phases				6 8		7
Actuated Green, G (s)	15.1	41.6	60.9	60.9	11.0	11.0
Effective Green, g (s)	15.1	41.6	60.9	60.9	11.0	11.0
Actuated g/C Ratio	0.15	0.41	0.61	0.61	0.11	0.11
Clearance Time (s)	4.4	4.9			4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	266	1467	1950	856	376	165
v/s Ratio Prot	c0.12	0.18	c0.35		c0.05	
v/s Ratio Perm				0.22		0.00
v/c Ratio	0.79	0.42	0.57	0.37	0.42	0.04
Uniform Delay, d1	41.1	20.8	11.8	9.9	41.7	39.9
Progression Factor	1.00	1.00	0.16	1.87	1.00	1.00
Incremental Delay, d2	14.9	0.2	0.2	0.1	0.8	0.1
Delay (s)	56.0	21.0	2.1	18.8	42.4	40.0
Level of Service	E	C	A	B	D	D
Approach Delay (s)		29.9	7.2		41.8	
Approach LOS		C	A		D	

Intersection Summary			
HCM 2000 Control Delay	17.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	100.3	Sum of lost time (s)	18.2
Intersection Capacity Utilization	56.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	640	40	30	1210	20	260	20	50	30	10	110
Future Volume (vph)	60	640	40	30	1210	20	260	20	50	30	10	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	4.9		4.9	4.9		4.9	4.9	
Lane Util. Factor	1.00	0.95		1.00	0.91		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.97		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.97	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.89		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3496		1770	5068		1770	1606		1725	1577	
Flt Permitted	0.95	1.00		0.95	1.00		0.66	1.00		0.71	1.00	
Satd. Flow (perm)	1770	3496		1770	5068		1223	1606		1287	1577	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	63	674	42	32	1274	21	274	21	53	32	11	116
RTOR Reduction (vph)	0	4	0	0	1	0	0	39	0	0	86	0
Lane Group Flow (vph)	63	712	0	32	1294	0	274	35	0	32	41	0
Confl. Peds. (#/hr)			11			12			25	25		
Confl. Bikes (#/hr)			10			10			10			10
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2 7		1	6			8			8	
Permitted Phases							8			8		
Actuated Green, G (s)	15.1	52.6		3.4	29.9		26.1	26.1		26.1	26.1	
Effective Green, g (s)	15.1	52.6		3.4	29.9		26.1	26.1		26.1	26.1	
Actuated g/C Ratio	0.15	0.52		0.03	0.30		0.26	0.26		0.26	0.26	
Clearance Time (s)	4.4			4.4	4.9		4.9	4.9		4.9	4.9	
Vehicle Extension (s)	3.0			3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	266	1833		60	1510		318	417		334	410	
v/s Ratio Prot	0.04	c0.20		c0.02	c0.26			0.02			0.03	
v/s Ratio Perm							c0.22			0.02		
v/c Ratio	0.24	0.39		0.53	0.86		0.86	0.08		0.10	0.10	
Uniform Delay, d1	37.5	14.2		47.7	33.2		35.4	28.1		28.1	28.2	
Progression Factor	1.45	0.18		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.1		8.8	5.0		20.6	0.1		0.1	0.1	
Delay (s)	54.8	2.7		56.5	38.2		55.9	28.1		28.3	28.3	
Level of Service	D	A		E	D		E	C		C	C	
Approach Delay (s)		7.0			38.6			50.0			28.3	
Approach LOS		A			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	30.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	100.3	Sum of lost time (s)	18.2
Intersection Capacity Utilization	60.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	100	760	340	60	120	100
Future Volume (veh/h)	100	760	340	60	120	100
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99			0.95	1.00	0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	108	817	366	65	129	119
Adj No. of Lanes	1	2	2	0	0	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.84
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	530	1819	1001	176	198	183
Arrive On Green	0.07	0.51	0.34	0.34	0.23	0.23
Sat Flow, veh/h	1774	3632	3077	523	847	782
Grp Volume(v), veh/h	108	817	215	216	249	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1770	1738	1635	0
Q Serve(g_s), s	1.4	5.9	3.7	3.8	5.6	0.0
Cycle Q Clear(g_c), s	1.4	5.9	3.7	3.8	5.6	0.0
Prop In Lane	1.00			0.30	0.52	0.48
Lane Grp Cap(c), veh/h	530	1819	593	583	382	0
V/C Ratio(X)	0.20	0.45	0.36	0.37	0.65	0.00
Avail Cap(c_a), veh/h	1004	4793	1608	1579	1624	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	6.9	6.2	10.2	10.2	14.0	0.0
Incr Delay (d2), s/veh	0.1	0.3	0.7	0.7	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	2.9	1.9	1.9	2.6	0.0
LnGrp Delay(d),s/veh	6.9	6.5	10.8	10.9	14.7	0.0
LnGrp LOS	A	A	B	B	B	
Approach Vol, veh/h		925	431		249	
Approach Delay, s/veh		6.6	10.9		14.7	
Approach LOS		A	B		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		26.1		14.3	7.2	18.8		
Change Period (Y+Rc), s		5.3		4.9	4.4	5.3		
Max Green Setting (Gmax), s		54.7		40.1	13.6	36.7		
Max Q Clear Time (g_c+I1), s		7.9		7.6	3.4	5.8		
Green Ext Time (p_c), s		12.9		0.4	0.1	5.0		

Intersection Summary	
HCM 2010 Ctrl Delay	9.0
HCM 2010 LOS	A

Notes

LOS Engineering, Inc.

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	860	380	10	5	10
Future Vol, veh/h	10	860	380	10	5	10
Conflicting Peds, #/hr	36	0	0	36	1	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	956	422	11	6	11

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	469	0	-	0	965	255
Stage 1	-	-	-	-	464	-
Stage 2	-	-	-	-	501	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1089	-	-	-	253	744
Stage 1	-	-	-	-	599	-
Stage 2	-	-	-	-	574	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1056	-	-	-	236	720
Mov Cap-2 Maneuver	-	-	-	-	363	-
Stage 1	-	-	-	-	575	-
Stage 2	-	-	-	-	557	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	11.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1056	-	-	-	542
HCM Lane V/C Ratio	0.011	-	-	-	0.031
HCM Control Delay (s)	8.4	-	-	-	11.9
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↱			↱
Traffic Vol, veh/h	0	870	390	0	0	0
Future Vol, veh/h	0	870	390	0	0	0
Conflicting Peds, #/hr	0	0	0	36	0	36
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	946	424	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	284
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	713
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	671
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	-	-	0
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	-

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	130	820	650	240	540	190
Future Volume (vph)	130	820	650	240	540	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9	4.9	4.9	4.0	4.0
Lane Util. Factor	1.00	0.95	0.91	0.91	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.98	1.00	0.95
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.99	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3370	1411	3433	1511
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3539	3370	1411	3433	1511
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	141	891	707	261	587	207
RTOR Reduction (vph)	0	0	3	108	0	121
Lane Group Flow (vph)	141	891	730	127	587	86
Confl. Peds. (#/hr)				4		16
Confl. Bikes (#/hr)				10		10
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6 8		7	
Permitted Phases				6 8		7
Actuated Green, G (s)	10.7	33.0	50.9	50.9	19.2	19.2
Effective Green, g (s)	10.7	33.0	50.9	50.9	19.2	19.2
Actuated g/C Ratio	0.11	0.35	0.54	0.54	0.20	0.20
Clearance Time (s)	4.4	4.9			4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	201	1241	1822	763	700	308
v/s Ratio Prot	c0.08	c0.25	c0.22		c0.17	
v/s Ratio Perm				0.09		0.06
v/c Ratio	0.70	0.72	0.40	0.17	0.84	0.28
Uniform Delay, d1	40.2	26.5	12.7	10.9	36.0	31.6
Progression Factor	1.00	1.00	0.12	0.00	1.00	1.00
Incremental Delay, d2	10.5	2.0	0.1	0.1	8.7	0.5
Delay (s)	50.7	28.5	1.6	0.1	44.6	32.1
Level of Service	D	C	A	A	D	C
Approach Delay (s)		31.6	1.2		41.4	
Approach LOS		C	A		D	

Intersection Summary			
HCM 2000 Control Delay	23.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	94.1	Sum of lost time (s)	18.2
Intersection Capacity Utilization	54.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	1170	100	40	690	70	110	20	30	90	50	100
Future Volume (vph)	80	1170	100	40	690	70	110	20	30	90	50	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	4.9		4.9	4.9		4.9	4.9	
Lane Util. Factor	1.00	0.95		1.00	0.91		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.98	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.91		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3488		1770	4987		1770	1652		1737	1652	
Flt Permitted	0.95	1.00		0.95	1.00		0.59	1.00		0.72	1.00	
Satd. Flow (perm)	1770	3488		1770	4987		1091	1652		1321	1652	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	85	1245	106	43	734	74	117	21	32	96	53	106
RTOR Reduction (vph)	0	5	0	0	12	0	0	25	0	0	77	0
Lane Group Flow (vph)	85	1346	0	43	796	0	117	28	0	96	82	0
Confl. Peds. (#/hr)			3			15			19	19		
Confl. Bikes (#/hr)			10			10			10			10
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2 7		1	6			8			8	
Permitted Phases							8			8		
Actuated Green, G (s)	10.7	52.2		3.1	25.4		20.6	20.6		20.6	20.6	
Effective Green, g (s)	10.7	52.2		3.1	25.4		20.6	20.6		20.6	20.6	
Actuated g/C Ratio	0.11	0.55		0.03	0.27		0.22	0.22		0.22	0.22	
Clearance Time (s)	4.4			4.4	4.9		4.9	4.9		4.9	4.9	
Vehicle Extension (s)	3.0			3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	201	1934		58	1346		238	361		289	361	
v/s Ratio Prot	0.05	c0.39		c0.02	0.16			0.02			0.05	
v/s Ratio Perm							c0.11			0.07		
v/c Ratio	0.42	0.70		0.74	0.59		0.49	0.08		0.33	0.23	
Uniform Delay, d1	38.8	15.2		45.1	29.8		32.2	29.2		31.0	30.2	
Progression Factor	1.16	0.24		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.7		39.6	0.7		1.6	0.1		0.7	0.3	
Delay (s)	45.8	4.4		84.7	30.5		33.8	29.3		31.6	30.5	
Level of Service	D	A		F	C		C	C		C	C	
Approach Delay (s)		6.8			33.3			32.4			30.9	
Approach LOS		A			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	94.1	Sum of lost time (s)	18.2
Intersection Capacity Utilization	72.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Appendix M

Horizon Year with Project LOS Calculations

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	90	302	842	140	50	110
Future Volume (veh/h)	90	302	842	140	50	110
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			0.96	1.00	0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	107	360	1002	167	60	131
Adj No. of Lanes	1	2	2	0	0	0
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	365	2377	1648	274	82	178
Arrive On Green	0.05	0.67	0.55	0.55	0.16	0.16
Sat Flow, veh/h	1774	3632	3108	502	497	1086
Grp Volume(v), veh/h	107	360	588	581	192	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1770	1747	1591	0
Q Serve(g_s), s	1.5	2.3	14.0	14.1	7.1	0.0
Cycle Q Clear(g_c), s	1.5	2.3	14.0	14.1	7.1	0.0
Prop In Lane	1.00			0.29	0.31	0.68
Lane Grp Cap(c), veh/h	365	2377	968	955	262	0
V/C Ratio(X)	0.29	0.15	0.61	0.61	0.73	0.00
Avail Cap(c_a), veh/h	543	3738	1471	1452	744	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	7.1	3.7	9.6	9.6	24.7	0.0
Incr Delay (d2), s/veh	0.2	0.1	1.2	1.2	1.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	1.1	7.0	6.9	3.2	0.0
LnGrp Delay(d),s/veh	7.3	3.8	10.7	10.8	26.2	0.0
LnGrp LOS	A	A	B	B	C	
Approach Vol, veh/h		467	1169		192	
Approach Delay, s/veh		4.6	10.7		26.2	
Approach LOS		A	B		C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		47.1		15.1	7.8	39.3		
Change Period (Y+Rc), s		5.3		4.9	4.4	5.3		
Max Green Setting (Gmax), s		65.7		29.1	9.6	51.7		
Max Q Clear Time (g_c+I1), s		4.3		9.1	3.5	16.1		
Green Ext Time (p_c), s		4.8		0.3	0.1	17.9		

Intersection Summary	
HCM 2010 Ctrl Delay	10.8
HCM 2010 LOS	B

Notes

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Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	27	330	966	12	27	26
Future Vol, veh/h	27	330	966	12	27	26
Conflicting Peds, #/hr	25	0	0	25	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	31	379	1110	14	31	30

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1149	0	-	0	1394	587
Stage 1	-	-	-	-	1142	-
Stage 2	-	-	-	-	252	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	604	-	-	-	133	453
Stage 1	-	-	-	-	266	-
Stage 2	-	-	-	-	767	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	591	-	-	-	121	444
Mov Cap-2 Maneuver	-	-	-	-	205	-
Stage 1	-	-	-	-	247	-
Stage 2	-	-	-	-	751	-

Approach	EB	WB	SB
HCM Control Delay, s	0.9	0	21.5
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	591	-	-	-	279
HCM Lane V/C Ratio	0.053	-	-	-	0.218
HCM Control Delay (s)	11.4	-	-	-	21.5
HCM Lane LOS	B	-	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	0.8

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↱			↱
Traffic Vol, veh/h	0	352	957	7	0	16
Future Vol, veh/h	0	352	957	7	0	16
Conflicting Peds, #/hr	0	0	0	25	0	25
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	383	1040	8	0	17

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	574
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	462
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	443
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	13.5
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	443
HCM Lane V/C Ratio	-	-	-	0.039
HCM Control Delay (s)	-	-	-	13.5
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	205	590	760	839	164	68
Future Volume (vph)	205	590	760	839	164	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9	4.9	4.9	4.0	4.0
Lane Util. Factor	1.00	0.95	0.91	0.91	0.97	1.00
Frpb, ped/bikes	1.00	1.00	0.99	0.98	1.00	0.95
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.95	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3211	1411	3433	1512
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3539	3211	1411	3433	1512
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	216	621	800	883	173	72
RTOR Reduction (vph)	0	0	45	205	0	64
Lane Group Flow (vph)	216	621	1117	316	173	8
Confl. Peds. (#/hr)				4		5
Confl. Bikes (#/hr)				10		10
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6 8		7	
Permitted Phases				6 8		7
Actuated Green, G (s)	15.2	41.7	60.9	60.9	11.0	11.0
Effective Green, g (s)	15.2	41.7	60.9	60.9	11.0	11.0
Actuated g/C Ratio	0.15	0.42	0.61	0.61	0.11	0.11
Clearance Time (s)	4.4	4.9			4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	267	1469	1947	855	376	165
v/s Ratio Prot	c0.12	0.18	c0.35		c0.05	
v/s Ratio Perm				0.22		0.01
v/c Ratio	0.81	0.42	0.57	0.37	0.46	0.05
Uniform Delay, d1	41.2	20.8	11.9	10.0	41.9	40.0
Progression Factor	1.00	1.00	0.16	1.98	1.00	1.00
Incremental Delay, d2	16.3	0.2	0.2	0.1	0.9	0.1
Delay (s)	57.5	21.0	2.1	19.9	42.8	40.1
Level of Service	E	C	A	B	D	D
Approach Delay (s)		30.4	7.6		42.0	
Approach LOS		C	A		D	

Intersection Summary			
HCM 2000 Control Delay	17.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	100.4	Sum of lost time (s)	18.2
Intersection Capacity Utilization	57.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	654	40	30	1219	20	260	20	50	30	10	110
Future Volume (vph)	60	654	40	30	1219	20	260	20	50	30	10	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	4.9		4.9	4.9		4.9	4.9	
Lane Util. Factor	1.00	0.95		1.00	0.91		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.97		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.97	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.89		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3496		1770	5068		1770	1606		1725	1577	
Flt Permitted	0.95	1.00		0.95	1.00		0.66	1.00		0.71	1.00	
Satd. Flow (perm)	1770	3496		1770	5068		1223	1606		1287	1577	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	63	688	42	32	1283	21	274	21	53	32	11	116
RTOR Reduction (vph)	0	4	0	0	1	0	0	39	0	0	86	0
Lane Group Flow (vph)	63	726	0	32	1303	0	274	35	0	32	41	0
Confl. Peds. (#/hr)			11			12			25	25		
Confl. Bikes (#/hr)			10			10			10			10
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2 7		1	6			8			8	
Permitted Phases							8			8		
Actuated Green, G (s)	15.2	52.7		3.4	29.9		26.1	26.1		26.1	26.1	
Effective Green, g (s)	15.2	52.7		3.4	29.9		26.1	26.1		26.1	26.1	
Actuated g/C Ratio	0.15	0.52		0.03	0.30		0.26	0.26		0.26	0.26	
Clearance Time (s)	4.4			4.4	4.9		4.9	4.9		4.9	4.9	
Vehicle Extension (s)	3.0			3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	267	1835		59	1509		317	417		334	409	
v/s Ratio Prot	0.04	c0.21		c0.02	c0.26			0.02			0.03	
v/s Ratio Perm							c0.22			0.02		
v/c Ratio	0.24	0.40		0.54	0.86		0.86	0.08		0.10	0.10	
Uniform Delay, d1	37.5	14.3		47.7	33.3		35.5	28.1		28.2	28.2	
Progression Factor	1.42	0.19		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.1		9.8	5.4		20.9	0.1		0.1	0.1	
Delay (s)	53.8	2.9		57.5	38.7		56.4	28.2		28.3	28.3	
Level of Service	D	A		E	D		E	C		C	C	
Approach Delay (s)		6.9			39.1			50.4			28.3	
Approach LOS		A			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	30.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	100.4	Sum of lost time (s)	18.2
Intersection Capacity Utilization	61.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	100	785	377	60	120	100
Future Volume (veh/h)	100	785	377	60	120	100
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99			0.95	1.00	0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	108	844	405	65	129	119
Adj No. of Lanes	1	2	2	0	0	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.84
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	519	1846	1053	167	197	182
Arrive On Green	0.07	0.52	0.35	0.35	0.23	0.23
Sat Flow, veh/h	1774	3632	3129	483	847	781
Grp Volume(v), veh/h	108	844	234	236	249	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1770	1748	1635	0
Q Serve(g_s), s	1.4	6.2	4.1	4.2	5.7	0.0
Cycle Q Clear(g_c), s	1.4	6.2	4.1	4.2	5.7	0.0
Prop In Lane	1.00			0.28	0.52	0.48
Lane Grp Cap(c), veh/h	519	1846	614	606	380	0
V/C Ratio(X)	0.21	0.46	0.38	0.39	0.65	0.00
Avail Cap(c_a), veh/h	979	4667	1566	1547	1581	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	6.9	6.2	10.2	10.2	14.4	0.0
Incr Delay (d2), s/veh	0.1	0.3	0.7	0.8	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	3.0	2.1	2.2	2.6	0.0
LnGrp Delay(d),s/veh	7.0	6.6	10.9	11.0	15.1	0.0
LnGrp LOS	A	A	B	B	B	
Approach Vol, veh/h		952	470		249	
Approach Delay, s/veh		6.6	11.0		15.1	
Approach LOS		A	B		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		26.9		14.5	7.2	19.7		
Change Period (Y+Rc), s		5.3		4.9	4.4	5.3		
Max Green Setting (Gmax), s		54.7		40.1	13.6	36.7		
Max Q Clear Time (g_c+I1), s		8.2		7.7	3.4	6.2		
Green Ext Time (p_c), s		13.4		0.4	0.1	5.4		

Intersection Summary	
HCM 2010 Ctrl Delay	9.1
HCM 2010 LOS	A

Notes

LOS Engineering, Inc.

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	35	860	398	18	29	29
Future Vol, veh/h	35	860	398	18	29	29
Conflicting Peds, #/hr	36	0	0	36	1	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	39	956	442	20	32	32

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	498	0	-	0	1045	269
Stage 1	-	-	-	-	488	-
Stage 2	-	-	-	-	557	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1062	-	-	-	224	729
Stage 1	-	-	-	-	583	-
Stage 2	-	-	-	-	537	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1030	-	-	-	203	706
Mov Cap-2 Maneuver	-	-	-	-	325	-
Stage 1	-	-	-	-	544	-
Stage 2	-	-	-	-	521	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	14.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1030	-	-	-	445
HCM Lane V/C Ratio	0.038	-	-	-	0.145
HCM Control Delay (s)	8.6	-	-	-	14.5
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↱			↱
Traffic Vol, veh/h	0	894	398	8	0	18
Future Vol, veh/h	0	894	398	8	0	18
Conflicting Peds, #/hr	0	0	0	36	0	36
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	972	433	9	0	20

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	293
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	703
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	661
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10.6
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	661
HCM Lane V/C Ratio	-	-	-	0.03
HCM Control Delay (s)	-	-	-	10.6
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	136	820	650	250	555	199
Future Volume (vph)	136	820	650	250	555	199
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9	4.9	4.9	4.0	4.0
Lane Util. Factor	1.00	0.95	0.91	0.91	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.98	1.00	0.95
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.99	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3369	1411	3433	1511
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3539	3369	1411	3433	1511
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	148	891	707	272	603	216
RTOR Reduction (vph)	0	0	3	113	0	123
Lane Group Flow (vph)	148	891	731	132	603	93
Confl. Peds. (#/hr)				4		16
Confl. Bikes (#/hr)				10		10
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6 8		7	
Permitted Phases				6 8		7
Actuated Green, G (s)	10.9	33.4	51.1	51.1	19.2	19.2
Effective Green, g (s)	10.9	33.4	51.1	51.1	19.2	19.2
Actuated g/C Ratio	0.12	0.35	0.54	0.54	0.20	0.20
Clearance Time (s)	4.4	4.9			4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	204	1250	1821	762	697	306
v/s Ratio Prot	c0.08	c0.25	c0.22		c0.18	
v/s Ratio Perm				0.09		0.06
v/c Ratio	0.73	0.71	0.40	0.17	0.87	0.30
Uniform Delay, d1	40.4	26.4	12.7	11.0	36.4	32.0
Progression Factor	1.00	1.00	0.11	0.00	1.00	1.00
Incremental Delay, d2	12.1	2.0	0.1	0.1	10.9	0.6
Delay (s)	52.4	28.4	1.6	0.1	47.3	32.5
Level of Service	D	C	A	A	D	C
Approach Delay (s)		31.8	1.2		43.4	
Approach LOS		C	A		D	

Intersection Summary			
HCM 2000 Control Delay	24.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	94.5	Sum of lost time (s)	18.2
Intersection Capacity Utilization	55.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	1185	100	40	700	70	110	20	30	90	50	100
Future Volume (vph)	80	1185	100	40	700	70	110	20	30	90	50	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	4.9		4.9	4.9		4.9	4.9	
Lane Util. Factor	1.00	0.95		1.00	0.91		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.98	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.91		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3488		1770	4988		1770	1652		1737	1652	
Flt Permitted	0.95	1.00		0.95	1.00		0.58	1.00		0.72	1.00	
Satd. Flow (perm)	1770	3488		1770	4988		1088	1652		1321	1652	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	85	1261	106	43	745	74	117	21	32	96	53	106
RTOR Reduction (vph)	0	5	0	0	12	0	0	25	0	0	77	0
Lane Group Flow (vph)	85	1362	0	43	807	0	117	28	0	96	82	0
Confl. Peds. (#/hr)			3			15			19	19		
Confl. Bikes (#/hr)			10			10			10			10
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2 7		1	6			8			8	
Permitted Phases							8			8		
Actuated Green, G (s)	10.9	52.6		3.1	25.6		20.6	20.6		20.6	20.6	
Effective Green, g (s)	10.9	52.6		3.1	25.6		20.6	20.6		20.6	20.6	
Actuated g/C Ratio	0.12	0.56		0.03	0.27		0.22	0.22		0.22	0.22	
Clearance Time (s)	4.4			4.4	4.9		4.9	4.9		4.9	4.9	
Vehicle Extension (s)	3.0			3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	204	1941		58	1351		237	360		287	360	
v/s Ratio Prot	0.05	c0.39		c0.02	0.16			0.02			0.05	
v/s Ratio Perm							c0.11			0.07		
v/c Ratio	0.42	0.70		0.74	0.60		0.49	0.08		0.33	0.23	
Uniform Delay, d1	38.8	15.2		45.3	30.0		32.4	29.4		31.2	30.4	
Progression Factor	1.15	0.25		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.7		39.6	0.7		1.6	0.1		0.7	0.3	
Delay (s)	45.4	4.5		84.9	30.7		34.0	29.5		31.9	30.7	
Level of Service	D	A		F	C		C	C		C	C	
Approach Delay (s)		6.9			33.4			32.6			31.1	
Approach LOS		A			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	19.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	94.5	Sum of lost time (s)	18.2
Intersection Capacity Utilization	72.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Appendix N

City of San Diego and ITE Parking Rates

§142.0545 Shared Parking Requirements

(a) Approval Criteria. In all zones except single unit residential zones, *shared parking* may be approved through a Building Permit subject to the following requirements.

(1) *Shared parking* requests shall be for two or more different land uses located adjacent or near to one another, subject to the standards in this section.

(2) All *shared parking* facilities shall be located within a 1200-foot horizontal distance of the uses served.

(3) Parties involved in the shared use of a parking facility shall provide an agreement for the shared use in a form that is acceptable to the City Attorney.

(4) *Shared parking* facilities shall provide *signs* on the *premises* indicating the availability of the facility for patrons of the participating uses.

(5) Modifications to the *structure* in which the uses are located or changes in tenant occupancy require review by the City Manager for compliance with this section.

(b) Shared Parking Formula. *Shared parking* is based upon the variations in the number of parking spaces needed (parking demand) over the course of the day for each of the proposed uses. The hour in which the highest number of parking spaces is needed (peak parking demand) for the proposed *development*, based upon the standards in this section, determines the minimum number of required *off-street parking spaces* for the proposed *development*.

(1) The *shared parking* formula is as follows:

A, B, C	=	proposed uses to share parking spaces
PA	=	parking demand in the peak hour for Use A
PB	=	parking demand in the peak hour for Use B
PC	=	parking demand in the peak hour for Use C
HA%	=	the percentage of peak parking demand for Use A in Hour H

HB% = the percentage of peak parking demand for Use B in Hour H

HC% = the percentage of peak parking demand for Use C in Hour H

P(A, B, C) = peak parking demand for Uses A, B and C combined

Formula:
P(A, B, C) = (PA x HA%) + (PB x HB%) + (PC x HC%), where H = that hour of the day (H) that maximizes P(A, B, C)

(2) Table 142-05I contains the peak parking demand for selected uses, expressed as a ratio of parking spaces to *floor* area.

(3) Table 142-05J contains the percentage of peak parking demand that selected uses generate for each hour of the day (hourly accumulation curve), in some cases separated into weekdays and Saturdays. The period during which a use is expected to generate its peak parking demand is indicated as 100 percent, and the period during which no parking demand is expected is indicated with "-".

(4) The parking demand that a use generates in a particular hour of the day is determined by multiplying the peak parking demand for the use by the percentage of peak parking demand the use generates in that hour.

(5) The parking demand of the proposed *development* in a particular hour of the day is determined by adding together the parking demand for each use in that hour.

(6) The minimum number of required *off-street parking spaces* for the proposed *development* is the highest hourly parking demand.

(7) The *applicant* may request approval of *shared parking* based on the latest Urban Land Institute Parking Study or equivalent study as an alternative to the parking demand rates provided in Tables 142-05I and 142-05J if the *applicant* provides evidence to the satisfaction of the City Engineer that the alternative parking demand rates more accurately represent the parking demand and peak parking demand for the *development*.

(c) Single Use Parking Ratios. *Shared parking* is subject to the parking ratios in Table 142-05I.

Table 142-05I
Parking Ratios for Shared Parking

Use	**Peak Parking Demand** (Ratio of spaces per 1,000 square feet of floor area unless otherwise noted. Floor area includes gross floor area plus below grade *floor* area and excludes floor area devoted to parking)	**Transit Area**[1]
Office (except medical office)		
Weekday	3.3	2.8
Saturday	0.5	0.5
Medical office		
Weekday	4.0	3.4
Saturday	0.5	0.5
Retail sales	5.0	4.3
Eating & drinking establishment	15.0	12.8
Cinema 1-3 screens	1 space per 3 seats	.85 spaces per 3 seats
4 or more screens	1 space per 3.3 seats	.85 spaces per 3.3 seats
Visitor accommodations through *Multiple Dwelling Units*	1 space per *guest room*	1 space per *guest room*
Conference room	10.0	10.0
Multiple dwelling units	(see Section 142.0525)	

Footnote for Table 142-05I

1 *Transit Area*. The *transit area* peak parking demand applies in the *Transit Area* Overlay Zone (see Chapter 13, Article 2, Division 10).

(d) Hourly Accumulation Rates. Table 142-05J contains, for each hour of the day shown in the left column, the percentage of peak demand for each of the uses, separated in some cases into weekdays and Saturdays.

Table 142-05J
Representative Hourly Accumulation by Percentage of Peak Hour

Hour of Day	**Office** (Except Medical Office)		**Medical Office**		**Retail Sales**		**Eating & Drinking establishment.**		**Cinema**	
	Weekday	Saturday	Weekday	Saturday	Weekday	Saturday	Weekday	Saturday	Weekday	Saturday
6 a.m.	5%	-	5%	-	-	-	15%	20%	-	-
7 a.m.	15	30%	20	20%	10%	5%	55%	35%	-	-
8 a.m.	55	50	65	40	30	30	80	55	-	-
9 a.m	90	80	90	80	50	50	65	70	-	-
10 a.m.	100	90	100	95	70	75	25	30	5%	-
11 a.m.	100	100	100	100	80	90	65	40	5	-
Noon	90	100	80	100	100	95	100	60	30	30%
1 p.m.	85	85	65	95	95	100	80	65	70	70
2 p.m.	90	75	80	85	85	100	55	60	70	70
3 p.m.	90	70	80	95	80	90	35	60	70	70
4 p.m.	85	65	80	50	75	85	30	50	70	70
5 p.m.	55	40	50	45	80	75	45	65	70	70
6 p.m.	25	35	15	45	80	65	65	85	80	80
7 p.m.	15	25	10	40	75	60	55	100	100	90
8 p.m.	5	20	5	5	60	55	55	100	100	100
9 p.m.	5	-	5	-	45	45	45	85	100	100
10 p.m.	5	-	5	-	30	35	35	75	100	100
11p.m.	-	-	-	-	15	15	15	30	80	80
Midnight	-	-	-	-	-	-	5	25	70	70

Hour of Day	**Visitor Accommodations**					
	Guest Room		**Eating & Drinking Establishment**		**Conference Room**	**Exhibit Hall and Convention Facility**
	Weekday	Saturday	Weekday	Saturday	Daily	Daily
6 a.m.	100%	90%	15%	20%	-	-
7 a.m.	95	80	55	35	--	-
8 a.m.	85	75	80	55	50%	50%
9 a.m	85	70	65	70	100	100
10 a.m.	80	60	25	30	100	100
11 a.m.	75	55	65	40	100	100
Noon	70	50	100	60	100	100
1 p.m.	70	50	80	65	100	100
2 p.m.	70	50	55	60	100	100
3 p.m.	60	50	40	60	100	100
4 p.m.	65	50	30	50	100	100
5 p.m.	60	60	45	65	100	100
6 p.m.	65	65	65	85	100	100
7 p.m.	75	70	55	100	100	100
8 p.m.	85	70	55	100	100	100
9 p.m.	90	75	45	85	100	100
10p.m.	90	85	35	75	50	50
11p.m.	100	95	15	30	-	-
Midnight	100	100	10	25	-	-

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Publication No. IR-034C
First Printing
1000/AGS/0810

ISBN-13: 978-1-933452-55-5
ISBN-10: 1-933452-55-2
Printed in the United States of America

Land Use: 590
Library

Description

A library can be either a public or private facility that consists of shelved books, reading rooms or areas and, sometimes, meeting rooms.

Database Description

The database consisted of all suburban sites with the exception of one urban site. Parking demand at the urban site differed from the suburban sites and, therefore, the data were analyzed separately.

- Average parking supply ratio: 3.5 spaces per 1,000 square feet (sq. ft.) gross floor area GFA (seven study sites).
- Average number of employees: 32 (two study sites).

For two suburban sites, parking demand was observed on a weekday, Saturday and Sunday. For those particular sites, peak parking demand rates were 3.14, 2.22 and 2.72 vehicles per 1,000 sq. ft. GFA, respectively.

The urban site that was submitted had significantly different parking characteristics. The site was 400,000 sq. ft. GFA and had approximately 400 employees. The peak parking supply ratios were 0.4 spaces per 1,000 sq. ft. GFA and 0.4 spaces per employee. It was surveyed between 1:00 and 2:00 p.m. on a weekday and had parking demand ratios of 0.42 vehicles per 1,000 sq. ft. GFA and 0.43 vehicles per employee.

The following table presents the time-of-day distribution of weekday parking demand.

Based on Vehicles per 1,000 sq. ft. GFA (Suburban Sites)	***Weekday***	
Hour Beginning	Percent of Peak Period	Number of Data Points*
12:00–4:00 a.m.	–	0
5:00 a.m.	–	0
6:00 a.m.	–	0
7:00 a.m.	–	0
8:00 a.m.	16	1
9:00 a.m.	45	1
10:00 a.m.	52	2
11:00 a.m.	70	2
12:00 p.m.	58	2
1:00 p.m.	79	2
2:00 p.m.	78	2
3:00 p.m.	84	2
4:00 p.m.	58	2
5:00 p.m.	49	2
6:00 p.m.	50	2
7:00 p.m.	100	2
8:00 p.m.	72	2
9:00 p.m.	–	0
10:00 p.m.	–	0
11:00 p.m.	–	0

* Subset of database

WASTE MANAGEMENT PLAN

FOR

Montezuma Hotel

San Diego, California

Project No. 574562

Prepared for:

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March 2018

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1.0 INTRODUCTION

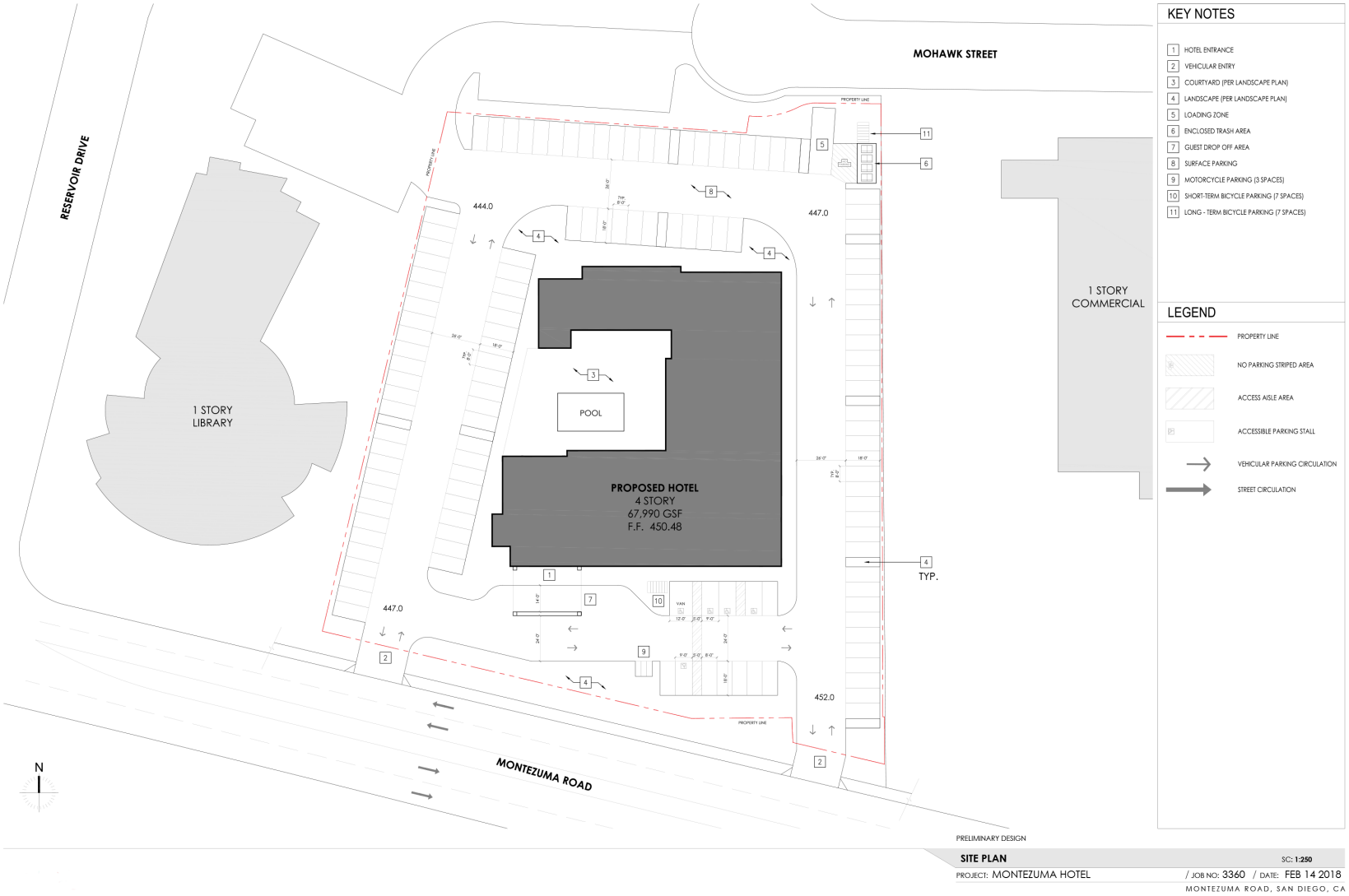
The purpose of this Waste Management Plan (WMP) for the *Montezuma Road Hotel Project* in the City of San Diego is to provide analysis of the solid waste impacts anticipated for the *Montezuma Road Hotel Project*. The goal of this WMP is to identify sufficient measures to minimize potential impacts of the *Montezuma Road Hotel Project* on solid waste services such that significant impacts are avoided. Two acceptable approaches to managing waste are to reduce the tons disposed to 60 tons or less, or to provide diversion of 75 percent or more, thus meeting the goal established by Assembly Bill 341.

The approximately 1.8-acre *Montezuma Road Hotel Project* site is located at 6650 Montezuma Road in the College Area community. (See Figure 1, *Montezuma Road Hotel Project Location Map and Aerial*.) The project site is situated north of Montezuma road and west of Bowman Lane. The Friends of the College-Rolando Public Library is located adjacent to the west of the project site. Single-family residential development is located to the north, and a Ralphs shopping center is next to the property to the east. The project site is currently vacant, with the recent demolition of a church that was previously located on the project site.

The proposed project involves the construction of a 67,990 square foot, four-story hotel, which would provide approximately 125 guest rooms, a lobby, a breakfast room, and hotel-associated amenities. No conference space is proposed. Access to the project site would be provided by two new driveways off Montezuma Road, which would allow for off-street circulation around the hotel. (See Figure 2, *Montezuma Road Hotel Project Site Plan*.)

Figure 1
Montezuma Road Hotel - Project Location Map and Aerial

Figure 2
Montezuma Road Hotel Project Site Plan



This WMP consists of two sections corresponding to the implementation of site development: the *Construction Phase* and the *Occupancy Phase* (post-construction). The WMP addresses the projected amount of waste that could be generated by the project based on current City generation rates and estimates; waste reduction goals; and recommended techniques to achieve the waste reduction goals, such as recycling. Construction of the project is anticipated to take approximately 12 – 18 months. Construction would take place in one phase and is estimated to begin mid-2019.

Waste disposal sites and recycling methods and opportunities may change from those available today; however, it is not expected that waste diversion and disposal sites listed in Table 3, *Minimum Exterior Refuse and Recyclable Material Storage Areas for Commercial Development,* would change by the time the project is anticipated to begin construction. This WMP includes the following general information known at the time the WMP was prepared:

- Projected waste generation calculations and identification of types of waste materials generated;
- Source separation techniques for waste generated;
- How materials will be re-used on-site;
- Name and location of current recycling, re-use, and landfill facilities where waste will be disposed of if not re-used on-site;
- A "buy recycled" program;
- Measures to be implemented directed at reducing construction debris;
- Method(s) for communicating waste reduction and recycling goals to subcontractors;
- A general time line for construction and development; and
- A list of required progress and inspections by City staff, based on current ordinances.

2.0 BACKGROUND

In 1989, the California Legislature passed Assembly Bill (AB) 939: Integrated Waste Management Act, which mandated that all cities reduce waste disposed in landfills from generators within their borders by 50 percent by the year 2000. AB 939 required all local governments to prepare a Source Reduction and Recycling Element, which incorporates waste management policies and programs to achieve the mandated waste reduction. Since 1990, the City has diverted more than 50 percent of its generated waste stream from disposal. This bill specified that solid waste should be considered by the equation GENERATED = DISPOSED + DIVERTED. "Diverted" materials are put into a *hierarchy* in the law, as follows:

- First *source reduction*, such as using a reusable bag, making double-sided copies, or other measure that stops waste at the source.
- Secondary measures include *recycling* and *composting*. Because these measures often have transportation and processing impacts, they are considered less preferable than source reduction.
- In the Public Resources Code, various methods of *transformation* for energy production are limited to ten percent of the total waste reduction target.

In 2008, SB 1016 was chaptered. Known as the Solid Waste Disposal Measurement Act, SB 1016 maintained the 50 percent diversion requirement, but changed to a disposal-based measurement system, expressed as the 50 percent Equivalent Per Capita Disposal Target. This built upon AB 939 by implementing a simplified and timelier indicator of jurisdiction performance that focuses on reported disposal at Board-permitted disposal facilities. This established a goal of not recycling more, but disposing of less. AB 341: Jobs and Recycling, chaptered in 2011, was intended to create green jobs by expanding recycling to every multi-family dwelling and business. It charged CalRecycle with responsibility for ensuring that the State is diverting at least 75 percent of solid waste that is generated within the State by 2020. SB 1016 establishes that compliance with State law is measured by reducing the amount of waste material requiring disposal, and AB 341 increases the diversion target to 75 percent.

Additional local regulation pertaining to solid waste management includes the City of San Diego's Municipal Code Ch.14 Art. 2 Div. 8: §142.0810, §142.0820, Ch. 6 Art. 6 Div. 7; §66.0706, §66.0709, §66.0710; and Ch. 6 Art. 6 Div. 6; §66.0711, §66.0604, §66.0606. These statues designate refuse and recycling space allocation requirements for:

- on-site refuse and recyclable material storage requirements,
- diversion of construction and demolition debris regulations, and
- diversion of recyclable materials generated from residential facilities, businesses, commercial/institutional facilities, apartments, condominiums, and special events requiring a City permit.

The City of San Diego has established a threshold of 40,000 square feet of development as generating sufficient waste (60 tons) to have a potentially cumulatively significant impact on solid waste services. The *Montezuma Road Hotel Project* as proposed exceeds this threshold. The purpose of this WMP is to identify measures that would be implemented to reduce this potential solid waste impacts such that significant impacts are avoided.

The City Recycling Ordinance is found in Municipal Code section 66.0701 et. seq. It requires the provision of recycling service for all single-family residences; and commercial facilities and multifamily residences with service for four cubic yards or more. In addition, the ordinance also requires development of educational materials to ensure occupants are informed about the City's ordinance and recycling services including information on types of recyclable materials accepted.

Construction and Demolition (C&D) Debris Diversion Deposit Program applies to all applicants for building, demolition, and removal permits. This ordinance requires that the applicant post a deposit (Table 1, *C&D Debris Deposit Table*). The deposit is not returned until the applicant demonstrates that a minimum amount of the material generated has been diverted from disposal in landfills. Mixed construction debris recycling facilities in San Diego are evaluated quarterly to determine how much of the throughput is recycled, and how much is a "residual" material requiring disposal. Facilities that accept mixed debris typically achieve a 68 percent or less diversion rate. Single materials recyclers, such as metal recyclers, often achieve a nearly 100 percent diversion rate. When comingled materials are sent to a mixed facility, the 75 percent diversion goal established by AB 341 will not be met. Depending on the project, to ensure that the overall diversion goal is attained, some materials must often be separated and trucked to facilities with higher diversion rates, such as aggregate and metal recyclers.

Table 1
C&D Debris Deposit Table

Building Category	Sq. Ft. Subject to Ordinance*	Deposit per Sq. Ft.	Range of Deposits
Residential New Construction	500-125,000 detached 500-100,000 attached	$0.40	$200-$50,000 $200-$40,000
Non-residential New Construction	1,000-25,000 commercial 1,000-75,000 industrial	$0.20	$200-$5,000 $200-$15,000
Non-residential Alterations	286 with no maximum	$0.70	$200 and up
Residential Demolition	286 with no maximum	$0.70	$200 and up
Non-residential Demolition	1,000 with no maximum	$0.20	$200 and up
Roof Tear-off	All projects	-	$200
Residential Alterations	500 and above	-	$1,000

* Projects under the minimum square footage subject to the ordinance are exempt from the C&D debris recycling deposit.

2.1 Refuse and Recyclable Material Storage Area Requirements

The *Montezuma Road Hotel Project* would develop in one phase over an approximate 12 – 18 month period. Development is anticipated to begin mid-2019. Because the *Montezuma Road Hotel Project* includes non-residential development, exterior refuse and recyclable material storage areas will be provided in accordance with City regulations per Chapter 14, Article 2, Division 8: Refuse and Recyclable Material Storage Regulations, §142.0830.

2.2 Refuse and Recyclable Material Storage Areas for *Montezuma Road Hotel Project*

The *Montezuma Road Hotel Project* would develop a hotel with a total of 128 rooms. Table 2, *Minimum Exterior and Recyclable Material Storage Areas for Non-Residential Development*, shows the required amount of refuse and recyclable storage areas for the project. As shown in Table 2, the project would be required to provide 288 square feet each of refuse and recyclable material storage area, for a total of 576 square feet of material storage area.

Table 2
Minimum Refuse and Recyclable Material Storage Areas for Non-Residential Development

Structure Floor Area (square feet)	Minimum Refuse Storage Area per Development (square feet)	Minimum Recyclable Material Storage Area per Development (square feet)	Total Minimum Storage Area per Development (square feet)
0-5,000	12	12	24
5,001-10,000	24	24	48
10,001-25,000	48	48	96
25,001-50,000	96	96	192
50,001-75,000	144	144	288
75,001-100,000	192	192	384
100,001+	Every additional 25,000 sq. ft. shall require an additional 48 sq. ft. for solid waste and 48 sq. ft. for recyclables.		

Source: City of San Diego Municipal Code, Chapter 14, Article 2, Division 8: Refuse and Recyclable Material Storage Regulations, §142.0820, Table 142-08B, effective January 1, 2000.

3.0 EXISTING CONDITIONS

The *Montezuma Road Hotel Project* site encompasses approximately 1.8 acres of previously graded and developed land. The project site is situated north of Montezuma road and west of Bowman Lane, with the Friends of the College-Rolando Public Library located adjacent to the west of the project site. Single-family residential development is located to the north, and a Ralphs shopping center is next to the property to the east. The project site is currently vacant, with recent demolition of a church previously located on the project site.

4.0 PROPOSED CONDITIONS

The proposed project involves construction of a four-story, 128-room hotel with associated parking. (See Figure 2, *Montezuma Road Hotel Project Site Plan.*)

Construction will be completed in one phase over a 12 – 18 month period with construction anticipated to begin in mid-2019. Construction practices will comply with local, State, and Federal regulations regarding handling of building materials to ensure waste minimization requirements are met.

5.0 GRADING

The proposed project would involve grading of the previously disturbed project site. The entire 1.8 acres of total site area would be graded. Grading for the proposed project would include 2,000 cubic yards of cut and 1,000 cubic yards of fill. The project would require 1,000 cubic yards of export. The maximum height of fill slopes would be six feet, and there would be no cut slopes.

The project would require approximately 2,000 cubic yards of cut and 1,000 cubic yards of fill. Approximately 1,000 cubic yards of material would be exported. Table 3, *Montezuma Road Hotel Project Waste Generation – Grading*, summarizes the type and amount of demolition materials, as well as diversion/disposal.

Table 3
Montezuma Road Hotel Project Waste Generation - Grading

Material Type	Estimated Waste Quantity (cubic yard)	Handling	Estimated Diversion (cubic yards)	Estimate Disposal (cubic yards)
Exported Earth	1,000	**Miramar Landfill** 5180 Convoy Street San Diego, CA 92111 (100% diversion)	1,000	-

6.0 CONSTRUCTION WASTE

Construction activities would generate packaging materials and unpainted wood, including wood pallets, and other miscellaneous debris. Construction debris would be separated on-site into material-specific containers to facilitate reuse and recycling and to increase the efficiency of waste reclamation and/or would be collected by a contracted waste hauler and separated at the facility. Source separation of materials at the construction site is essential to (1) ensure appropriate waste diversion rate, (2) minimize costs associated with transportation and disposal, and (3) facilitate compliance with the C&D ordinance. The types of construction waste anticipated to be generated include:

- Asphalt and Concrete
- Brick/Masonry/Tile
- Cardboard
- Carpet, Padding/Foam
- Drywall
- Landscape Debris
- Mixed C&D Debris
- Roofing Materials
- Scrap Metal
- Unpainted Wood and Pallets
- Garbage/Trash

Materials to be recycled would be redirected to appropriate recipients selected from ESD's directory of facilities that recycle construction materials, scrap metal, and yard waste.

6.1 Recycled Construction Materials

The *Montezuma Road Hotel Project* will implement a target of 20 percent recycled material.

6.2 Managing Construction Material

Construction would occur over a period of approximately 12 – 18 months. ESD staff would be present for an early pre-construction meeting to evaluate waste segregation, signage, and salvage. In accordance with State diversion targets, a minimum of 75 percent of construction materials will be recycled. Materials to be recycled would be redirected to appropriate recipients selected from ESD's directory of facilities that recycle demolition materials, scrap metal, and yard waste.

To facilitate management of construction materials, the developer shall identify one person or agency connected with the proposed development to act as Solid Waste Management Coordinator, whose responsibility it becomes to work with all contractors and subcontractors to ensure material separation and coordinate proper disposal and diversion of waste generated. The Solid Waste Management Coordinator will help to ensure all diversion practices outlined in this Waste Management Plan are upheld and communicate goals to all contractors involved efficiently.

The responsibilities of the Solid Waste Management Coordinator, include, but are not limited to, the following:

- Review the Solid Waste Management Plan including responsibilities of Solid Waste Management Coordinator.
- Review and update procedures as needed for material separation and verify availability of containers and bins needed to avoid delays.
- Review and update procedures for periodic solid waste collection and transportation to recycling and disposing facilities.
- The authority to issue stop work orders if proper procedures are not being allowed.

The contractors will perform daily inspections of the construction site to ensure compliance with the requirements of the Waste Management Plan and all other applicable laws and ordinances and report directly to Solid Waste Management Coordinator. Daily inspections will include verifying the availability and number of dumpsters based on amount of debris being generated, correct labeling of dumpsters, proper sorting and segregation materials, and salvaging of excess materials. Additionally, the following apply:

- Solid waste management coordinator will be responsible for educating contractors and subcontractors regarding waste management plan requirements and ensuring that contractors and subcontractors carry out the measures described in the WMP.
- Solid waste management coordinator will ensure ESD attendance at a Precon and assure compliance with segregation requirements, and verification of recycled content in base materials.
- Recycling areas will be clearly identified with large signs, approved by ESD, and sufficient amounts of material-specific bins will be provided for necessary segregation.

- Recycling bins will be placed in areas that are readily accessible to contractors/subcontractors and in areas that will minimize misuse or contamination by employees and the public.
- Solid waste management coordinator will be responsible for ensuring that contamination rates in bins remain below 5 percent by weight of the bin.

Table 4, *Montezuma Road Hotel Project Waste Generation – Construction*, is included below to summarize the types of waste generated, the approximately amount of each waste type diverted, and the approximate overall amount remaining to be disposed of in landfills. Construction waste processing facilities that may be used for the construction phase include but are not limited to those facilities listed in Table 4. Because certified diversion rates and authorized facilities are updated quarterly and the decision on which facility will be contracted for waste hauling will be made at the time of construction based on market conditions and the facility's certified rate, the developer reserves the right to select any authorized facility as long as the facility is City-certified to meet minimum diversion requirements.

Table 4
Montezuma Road Hotel Project Waste Generation – Construction

Material Type	Estimated Waste Quantity (tons)	Handling	Estimated Diversion (tons)	Estimated Disposal (tons)
CONSTRUCTION WASTE				
Asphalt and Concrete	64.7	**Hanson Aggregates** 9229 Harris Plant Road San Diego, CA 92126 (100% diversion)	64.7	0
Brick/Masonry/ Tile	18.5	**Vulcan Carroll Canyon Landfill and Recycle Site** 10051 Black Mountain Road San Diego, CA 92126 (100% diversion)	18.5	0
Cardboard	1.8	**Allan Company** 6733 Consolidated Way San Diego, CA 92121 (100% diversion)	1.27	0.53
Carpet, Padding/Foam	0.9	**DFS Flooring** 10178 Willow Creek Road San Diego, CA 92131 (100% diversion)	0.9	0
Drywall	12.93	**EDCO Station Transfer and Buy Back Center** 8184 Commercial Street La Mesa, CA 91942 (70% diversion)	9.05	3.88
Landscape Debris	1.85	**Miramar Greenery** 5180 Convoy Street San Diego, CA 92111 (100% diversion)	1.85	0
Mixed C&D Debris	55.44	**Otay C&D/Inert Debris Processing Facility** 1700 Maxwell Road Chula Vista, CA 91913 (76% diversion)	41.58	13.86
Roofing Materials	0.9	**LEED Recycling** 8725 Miramar Place San Diego, CA 92121 (100% diversion)	0.9	0
Scrap Metal	4.49	**Allan Company** 6733 Consolidated Way San Diego, CA 92121 (100% diversion)	3.14	1.35
Unpainted Wood & Pallets	22.2	**Miramar Greenery** 5180 Convoy Street San Diego, CA 92111	22.2	0

		(100% diversion)		
Garbage/Trash	0.9	**Miramar Landfill** 5180 Convoy Street San Diego, CA 92111 (0% diversion)	0	0.9
TOTAL	**184.61**		**164.09**	**20.52**

Construction debris will be separated onsite into material-specific containers, corresponding to the materials types in Table 4, to facilitate reuse and recycling and to increase the efficiency of waste reclamation. The *Montezuma Road Hotel Project* will implement a target of 20 percent recycled material and 75 percent for landfill diversion. As shown in Table 3, 89 percent of the construction materials generated by the project are expected to be diverted from landfills.

7.0 OCCUPANCY PHASE

While the construction phase for the *Montezuma Road Hotel Project* occurs as a one-time waste generation event as construction of the project proceeds, tenant/owner occupancy requires an on-going plan to manage waste disposal to meet the waste reduction goals established by the City and State.

7.1 Solid Waste Recycling

The following table expresses the anticipated refuse and recyclable storage requirements based on Table 142-08B and 142.08C of the City of San Diego Municipal Code.

Table 5
Minimum Exterior and Recyclable Material Storage Areas for the Montezuma Hotel Project

Land Use	Gross Floor Area	Minimum Refuse Storage Area (square feet)	Minimum Recyclable Material Storage Area (square feet)	Total Minimum Storage Area (square feet)
Commercial (Hotel)	67,990	144	144	244

As shown in Table 6, *Estimated Solid Waste Generation from the Montezuma Road Hotel Project*, during occupancy, the expected generated waste per year from the *Montezuma Road Hotel Project* when fully occupied would be approximately 161.3 tons.

Table 6
Estimated Solid Waste Generation from the Montezuma Road Hotel Project – Occupancy Phase

Use	Intensity	Waste Generation Rate	Estimated Waste Generated (tons/year)
Commercial (Hotel)	67,990 sq. ft.	13 lb/1000 sq. ft./day	161.3

On-site recycling services shall be provided to all employees and guests at the hotel. The hotel will be serviced by a solid waste collection service that participates in a recycling program by separating recyclable materials from other solid waste and recycling the recyclable materials. Recycling services are required by Section 66.0707 of the City of San Diego Land Development Code. Based on current requirements, these services shall include the following:

- Collection of recyclable materials as frequently as necessary to meet demand;
- Collection of plastic bottles and jars, paper, newspaper, metal containers, cardboard, and glass containers;
- Collection of other recyclable materials for which markets exist, such as scrap metal, wood pallets;
- Collection of food waste for recycling by composting, where available (prior to issuance of building and occupancy permits, the project proponent will meet with representatives from ESD to ensure that their educational materials and haulers can comply with the requirements for this service);
- Use of recycling receptacles or containers which comply with the standards in the Container and Signage Guidelines established by the City of San Diego Environmental Services Department;
- Designated recycling collection and storage areas; and
- Signage on all recycling receptacles, containers, chutes, and/or enclosures which complies with the standards described in the Container and Signage Guidelines established by the City of San Diego Environmental Services Department.

As required by Section 66.0707 of the City of San Diego Land Development Code, the building management or other designated personnel shall ensure that guests and employees are educated about the recycling services as follows:

- Information, including the types of recyclable materials accepted, the location of recycling containers, and the guests and employees responsibility to recycle shall be distributed to all guests and employees annually;
- All new guests and employees shall be given information and instructions upon occupancy; and
- All guests and employees shall be given information and instructions upon any change in recycling service to the commercial facility.

7.2 Landscaping and Green Waste Recycling

Plant material selection will be guided by the macro-and micro-climate characteristics of the project site and surrounding region to encourage long-term sustainability without the excessive use of water pesticides and fertilizers. Irrigation of these areas, where practical, will utilize reclaimed water applied via low precipitation rate spray heads, drip emitters, or other highly efficient systems. Landscape maintenance would include the collection of green waste and disposal of green waste at recycling centers that accept green waste. This will help further reduce the waste generated by developments within *Montezuma Hotel Project* during the occupancy phases.

8.0 CONCLUSION

The City of San Diego Development Services Department is requiring that this WMP be prepared and submitted to the City of San Diego's ESD. Since the project is in the design phase, this is only a preliminary plan, which specifies the intent to meet the requirements of PRC 939 and City ordinances.

This WMP will be implemented to the fullest degree of accuracy and efficiency. Additionally, the project will be required to adhere to City ordinances, including the *Construction and Demolition Debris Diversion Deposit Program*, the City's *Recycling Ordinance*, and the *Refuse and Recyclable Materials Storages Regulations*. The WMP for the *Montezuma Hotel Project* is designed to implement and adhere to all city ordnance and regulations with regards to waste management. The measures in the WMP would ensure that significant impacts relative to solid waste are avoided.

Prior to the issuance of any grading or construction permits, the Solid Waste Coordinator will ensure ESD's attendance at a precon. The Solid Waste Coordinator will ensure that 1) the proposed approach to contractor education is approved, 2) the written specifications for base materials, concrete pavers, decomposed granite, and mulch, is approved, and 3) that the ESD inspector approves the separate waste containers, signage, and hauling contract(s) for the following materials:

- Asphalt/concrete
- Brick/masonry/tile
- Cardboard
- Carpet/padding/foam
- Drywall
- Landscape debris
- Mixed C&D debris
- Scrap metal
- UNTREATED woodwaste
- Refuse

The project would be designed to achieve 75+ percent of construction waste to be source reduced and/or recycled. While diversion activities during occupancy may not fully achieve this goal, the project incorporates several measures above and beyond the requirements of local ordinance.

- First, the project exceeds ordinance requirements and even the State waste reduction target during construction.
- Second, the project includes landscaping that will reduce yardwaste, and will provide transportation to a composting facility for the yard waste that is produced. The project proponent will ensure that ESD reviews the landscaping plans and hauling contract for the facility to verify that waste reduction goals are met.
- Third, the project would include Cal-Green measures to reduce waste, including separate Rubbish and Recycle chutes.

The project would target 20 percent of solid waste to be recycled material and 75 percent for landfill diversion. These measures ensure that the waste generated by the project will be properly managed and that solid waste services will not be impacted.

The following measures apply to the project to reduce cumulative impacts on solid waste to below a level of significance:

1.0 Prior to Permit Issuance or Bid opening/Bid award

A. LDR Plan check

1. Prior to the issuance of any construction permit, including but is not limited to, demolition, grading, building or any other construction permit, the Assistant Deputy Director (ADD) Environmental Designee shall verify that the all the requirements of the Refuse & Recyclable Materials Storage Regulations and all of the requirements of the waste management plan are shown and noted on the appropriate construction documents. All requirements, notes and graphics shall be in substantial conformance with the conditions and exhibits of the associated discretionary approval.

The construction documents shall include a waste management plan.

Notification shall be sent to:

MMC Environmental Review Specialist
Development Service Department
9601 Ridgehaven Court
Ste. 220, MS 1102 B
San Diego, California 92123 1636
(619) 980 7122

Environmental Services Department (ESD)
9601 Ridgehaven Court
Ste. 210, MS 1102 A
San Diego, California 92123 1636
(858) 573-1236

II. Prior to Start of Construction

A. Grading and Building Permit - Prior to issuance of any grading or building permit, the permittee shall be responsible to arrange a preconstruction meeting to coordinate the implementation of the WMP. The Precon Meeting that shall include: the Construction Manager, Building/Grading Contractor; MMC; and ESD and the Building Inspector and/or the RE (whichever is applicable) to verify that implementation of the waste management plan shall be performed in compliance with the plan approved by LDR and the San Diego ESD, to ensure that impacts to solid waste facilities are below a level of significance.

1. At the Precon Meeting, the Permittee shall submit reduced copies (11" x 17") of the approved waste management plan, the RE, BI, MMC, and ESD.
2. Prior to the start of construction, the Permittee/Construction Manager shall submit a construction schedule to the RE, BI, MMC, and ESD.

III. During Construction

The Permittee/Construction Manager shall call for inspections by the RE/BI and both MMC and ESD, who will periodically visit the demolition/construction site to verify implementation of the waste management plan. The Consultant Site Visit Record (CSVR) shall be used to document the Daily Waste Management Activity/progress.

IV. Post Construction

A. For any demolition or construction permit, a final results report shall be submitted to both MMC and ESD for review and approval to the satisfaction of the City. MMC will coordinate the approval with ESD and issue the approval notification. ESD will review/approve City Recycling Ordinance-required educational materials prior to occupancy.