VIA VAIL APARTMENTS

Initial Study

Lead Agency:

City of Rancho Mirage

69-825 Highway 111

Rancho Mirage, California 92270

Prepared by:

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June, 2024

ENVIRONMENTAL INITIAL STUDY
VIA VAIL APARTMENTS

Project Title:	Via Vail Apartments
City Project No:	Preliminary Development Plan Case No. PDP24-0002 Environmental Assessment Case No. EA24-0005
Lead Agency Name and Address:	City of Rancho Mirage 69-825 Highway 111 Rancho Mirage, California 92270 Phone: (760) 328-2266
Applicant:	The Pacific Companies
Contact Person:	Pilar Lopez-Senior Planner
Phone Number:	(760) 328-2266 EXT 208
Project Location:	South of Via Vail, East of Key Largo Avenue, West of Monterey Avenue
Accessor Parcel Number:	Parcel A-1 of APN: 685-090-011
General Plan Designation:	Residential High-Density (R-H), Affordable Housing Overlay (AHO)
Zoning Designation:	Residential High-Density (R-H), Affordable Housing Overlay (AHO)

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CHAPTER 1: PROJECT DESCRIPTION

The Vial Vail Apartments (Project) is proposing an affordable housing development on an existing vacant, undeveloped parcel (Parcel A-1 of APN 685-090-011) located in the City of Rancho Mirage, Coachella Valley, Riverside County. The Project will be required to submit an Environmental Assessment (Case No. EA24-0005) and Preliminary Development Plan (Case No. PDP24-0002) for City Council approval.

The Project site is located on the southern side of Via Vail, between Monterey Avenue and Key Largo Avenue in Rancho Mirage. The site consists of a ±10 acre-sized parcel, shaped in an irregular configuration and consisting of undeveloped desert lands, spare vegetation, and at an elevation of ±302 feet above mean sea level. The subject property is located on the northeastern portion of a larger parcel of land that measures ±52 acres in size. The larger parcel is a City owned property known as the Monterey and Dinah Shore Land Holding and is intended for future single- and multi-family housing for very low- and low-income earning households. In alignment with the intended land use, the Project is proposing the development of a multifamily affordable housing project.

The site is designated for Residential High Density (R-H) with an Affordable Housing Overlay (AHO). The R-H zone allows for the development of high density single- and multi-family residential homes including apartments and mobile homes that encompass traits of a planned community. Similar residential developments such as affordable housing and senior living are allowed and preferred in an R-H zone. As per the Affordable Housing Overlay, development standards are subject to change if the proposed modifications increase development efficiency and are considered appropriate or necessary by the City Council. Additionally, these affordable housing projects are subject to density bonuses and incentives as outlined by the City's Municipal Code Section 17.22.020. The Project proposes development designs that are consistent with the AHO. Table 1, Rancho Mirage Development Standards Code Analysis identifies the Project's proposed design in comparison with the City's development standards.

Table 1
Rancho Mirage Development Standards Code Analysis

Category	Municipal Code	Proposed Design
Zoning	Residential High Density (R-H), Affordable Housing Overlay (AHO)	Residential High Density (R-H), Affordable Housing Overlay (AHO)
Lot Area		439,270 sf (10 ac)
Lot Coverage	35%	38%
Building Height/Number of Stories	20' 1 story	30' max 2-stories
Residential Density	4-9 DU/AC AHO allows up to 28 du/ac	23.6 DU/AC
Setbacks	Front: 20 ft Side: 10 ft Street side: 15 ft Rear: 20 ft, minimum distance between structures: 20' setback shall be increased at a minimum of 2' for each	Front: 7 ft to 20ft Side: 20 ft Rear: 10 ft.

Table 1
Rancho Mirage Development Standards Code Analysis

Category	Municipal Code	Proposed Design
	1' of additional building height above 20' which shall be measured from property line to each portion of the building that exceeds 20'	
Open Space	300 sf private outdoor living space per unit	62-100 sf of private open space provided per unit.
Off-Street Parking Standards	1 br: 1 covered for each unit and 1 off-street guest space for every 2 units 2 br or more: 2 covered for each unit and 1 off-street guest space for 2 units	1 stall per 1 br 2 stalls per 2 br, 3 br
Parking Design Standards	Standard Driveway (2-way) width: 24 ft Standard Stall: 9' x 18' Parallel Stall: 9' x 26' (4' space every 2 stalls)	Complies
Minimum Area for Apartments in R-H	1 br: 850 sf 2 br: 900 sf 3 br: 1000 sf 4 br: 1,200 sf	1 br: 616 sf to 647 sf 2 br: 866 sf 3 br: 1,175 sf 4 br: 1,300 sf
Bicycle Parking	Short Term Bicycle Parking: 5% of motorized vehicle parking Long Term Bicycle Parking: 5% of motorized vehicle parking	Short Term Bicycle Parking= 19 bikes minimum Long Term Bicycle Parking= 19 bikes
(') = feet DU/AC = dwelling units per acre br = bedroom		

The Project proposes 15 two-story residential buildings with tuck-under parking, a total of 236 apartment style units, a clubhouse building, outdoor recreational spaces including a swimming pool and playground, and onsite parking.

Housing Units: The site will consist of 15 two-story apartment buildings for a total of 236 dwelling units. All of the dwelling units except the manager's unit are designated for affordable housing. Of the 236 dwelling units, 100 units will be one-bedroom apartments, 62 will be two bedroom apartments, and 74 will be three bedroom apartments. A maximum of two occupants per one-bedroom unit, four occupants per two bedroom unit, and six occupants per three bedroom unit will be allowed. The Project will have a density capacity of approximately 24 DU/AC which is above the allowed 9 DU/AC for a R-H land use but below the AHO maximum density, which is ≤28 DU/AC.

The two-story residential buildings will reach a maximum height of approximately 29 feet which is above the allowed one-story, 20 feet maximum height. However, the Project's increase in building height and additional story is allowed by Municipal Code Section 17.22.030(D).

Club House: Located within the site's southwest quadrant, the Club House is designed to be a communal space where amenities including a laundry room, mail/parcel room, fitness room, clubroom, leasing space, and two office spaces located and accessible to residents only. The Club House will reach a maximum height of 21 feet.

Recreational Space: Outdoor recreational spaces including a swimming pool, lounge, picnic table area, and playground will be located within the Club House vicinity in the west portion of the site. The pool will include an outdoor shower and pool equipment shed located to the southwest. The picnic tables will be located east of the pool and lounge areas will surround the pool. The playground will be located north of the swimming pool and will be designed for children below the age of 12. These outdoor recreational spaces will be accessible via sidewalk and driveway.

Parking: Onsite parking will also be provided and consists of 205 garage spaces and 166 open parking stalls, including carport, ADA, EV, vans, and postal service spaces.

Proposed architecture is consistent with Rancho Mirage's modern desert aesthetic as it makes use of natural materials and earth tones. The use of native desert vegetation such as Date Palms, and grass for play areas allow the development to blend with the desert environment. Additionally, the Project's proposal for high density residential use is appropriate within an urbanized residential and commercial/retail area of Rancho Mirage.

Overall, the Project is compatible and consistent with the R-H land use and zoning designation under the AHO overlay. All development standards and regulations are satisfied under the Affordable Housing Overlay.

Project Location

Located in an urbanized region of Rancho Mirage, the Project's vicinity currently includes the Rancho Mirage Dog Park to the west, vacant, undeveloped lands immediately west, and single family residential properties, beyond Key Largo Avenue; vacant, undeveloped lands occur immediately east; the Monterey Marketplace Shopping Center to the north, beyond the future extension of Via Vail; and undeveloped, vacant lands to the south and single family residential properties beyond.

Although the Project's immediate surroundings consist of vacant, unoccupied lands, new residential and commercial developments have been approved or are in the process of approval. For instance, to the west of the Project, a future 25-acre community park which encompasses the Dog Park will run along Key Largo Avenue. To the south, a 5-acre affordable housing project is being proposed, and to the southeast (south of the Monterey Marketplace Shopping Center), a 35-acre mixed-use specific plan has been approved.

Access and Parking

The Project proposes the use of a northwest entry/exit point off the proposed extension of Via Vail as a secondary access point, and the main entry towards the southeast side of the site off Via Vail. A 20-foot setback along Via Vail will act as a buffer to separate the housing development from ongoing traffic. Parking will be provided onsite and will consist of 205 garage spaces, 102 open parking spaces, 64 carport spaces, and 9 handicapped spaces. Residents, visitors, and personnel will have access to these parking spaces.

Utilities

The following agencies and companies will provide services to the Project:

1. Sanitary Sewer: Coachella Valley Water District
2. Solid Waste: Burrtec Waste Industry Inc.
3. Water: Coachella Valley Water District
4. Electricity: Imperial Irrigation District
5. Gas: Southern California Gas
6. Telephone/cable: Frontier, Spectrum
7. Storm Drains: City of Rancho Mirage
8. Transit Service: SunLine Transit Agency

Environmental Setting and Surrounding Land Uses

The Project site is located on an existing vacant, undeveloped parcel (APN-685-090-003). Within the Project's vicinity there are vacant, undeveloped lands, residential neighborhoods, and large commercial plazas. The Project site is north of Dick Kelly Drive (unpaved extension), south and west of Via Vail, east of Key Largo Avenue, and west of Monterey Avenue.

North: Via Vail (proposed improvement and extension, accessible from Key Largo Avenue), vacant properties, and Monterey Marketplace Shopping Center (a large commercial/retail center with parking lots and driveways)

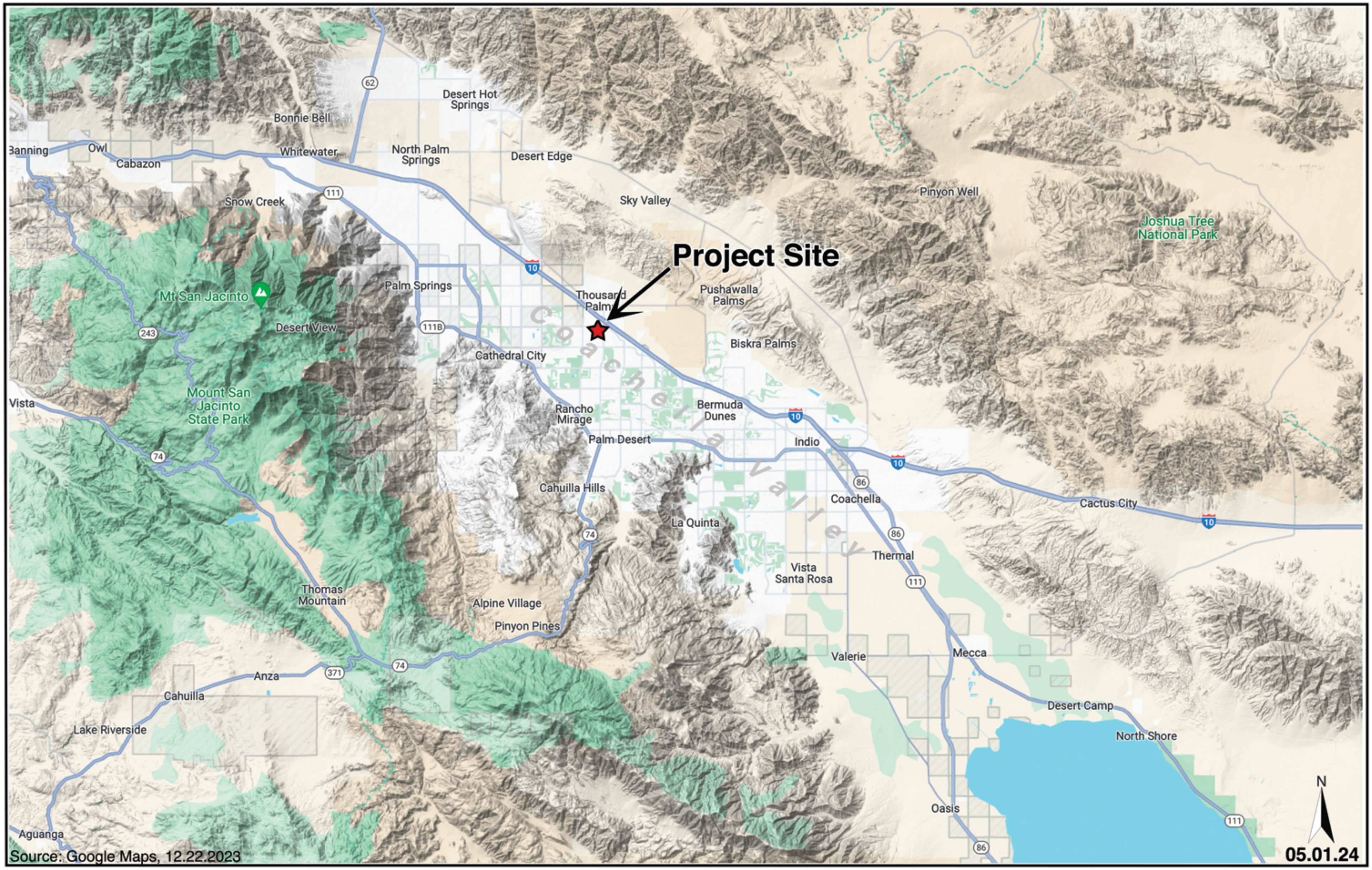
South: Vacant, undeveloped desert lands

East: Vacant, undeveloped desert lands, and a portion of the Monterey Marketplace Shopping Center

West: Rancho Mirage Dog Park, vacant, undeveloped desert lands, and residential properties along Key Largo Avenue.

Other public agencies whose approval is required

None Required.



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Via Vail Apartments
Regional Location Map
Rancho Mirage, California

Exhibit
1

Source: ESRI, 05.01.24.

05.01.24

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Via Vail Apartments
Vicinity Map
Rancho Mirage, California

Exhibit
2

Source: ESRI, 05.01.24.

05.01.24

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Via Vail Apartments
Project Location Map
Rancho Mirage, California

Exhibit
3

Source: The Pacific Companies, 04.18.2024.

05.01.24

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Via Vail Apartments
Site Plan
Rancho Mirage, California

Exhibit
4

FRONT ELEVATION 1

LEFT ELEVATION 2

RIGHT ELEVATION 3

Source: The Pacific Companies, 04.18.2024.

05.01.24

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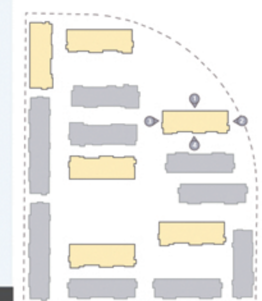
Via Vail Apartments
Building A Elevations
Rancho Mirage, California

Exhibit
5a

FRONT ELEVATION 1

LEFT ELEVATION 2

RIGHT ELEVATION 3



Source: The Pacific Companies, 04.18.2024.

05.01.24

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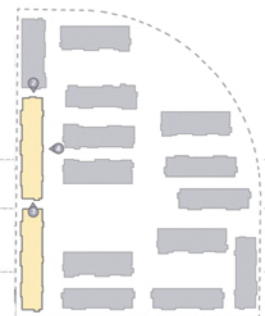
Via Vail Apartments
Building B Elevations
Rancho Mirage, California

Exhibit
5b

FRONT ELEVATION 1



LEFT ELEVATION 2

RIGHT ELEVATION 3

Source: The Pacific Companies, 04.18.2024.

05.01.24

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Via Vail Apartments
Building C Elevations
Rancho Mirage, California

Exhibit
5c

FRONT ELEVATION 1

LEFT ELEVATION 2

RIGHT ELEVATION 3

Source: The Pacific Companies, 04.18.2024.

05.01.24

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Via Vail Apartments
Building D Elevations
Rancho Mirage, California

Exhibit
5d

FRONT ELEVATION 1

LEFT ELEVATION 2

RIGHT ELEVATION 3

Source: The Pacific Companies, 04.18.2024.

05.01.24

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Via Vail Apartments
Building E Elevations
Rancho Mirage, California

Exhibit
5e

Source: The Pacific Companies, 04.18.2024.

05.01.24

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Via Vail Apartments
Club House Elevations
Rancho Mirage, California

Exhibit
5f

Source: The Pacific Companies, 04.18.2024

PLANT SCHEDULE

PHOTO | SYMBOL | BOTANICAL NAME

TREES

- ACACIA ANEURA
- CHAMAEROPS HUMILIS
- DALBERGIA SISSOO
- LYSILOMA MICROPHYLLA
- PARKINSONIA X 'DESERT MUSEUM'
- PINUS CANARIENSIS PROVIDES AN EVERGREEN SCREEN
- PINUS PINEA PROVIDES AN EVERGREEN SCREEN

- PISTACIA X 'RED PUSH'
- PROSOPIS GLANDULOSA
- QUERCUS AGRIFOLIA PROVIDES AN EVERGREEN SCREEN
- SOPHORA SECUNDIFLORA
- TIPUANA TIPU
- X CHITALPA TASHKENTENSIS 'PINK DAWN'

PALMS

- PHOENIX DACTYLIFERA

05.01.24

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Via Vail Apartments
Conceptual Landscape Plan
Rancho Mirage, California

Exhibit
6

CHAPTER 2: ENVIRONMENTAL ANALYSIS AND DETERMINATION

Environmental Factors Potentially Affected:

The environmental factors checked below would be potentially affected by this Project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

☐	Aesthetics	☐	Agriculture and Forestry Resources	☐	Air Quality
☐	Biological Resources	☐	Cultural Resources	☐	Energy
☐	Geology / Soils	☐	Greenhouse Gas Emissions	☐	Hazards & Hazardous Materials
☐	Hydrology / Water Quality	☐	Land Use / Planning	☐	Mineral Resources
☐	Noise	☐	Population / Housing	☐	Public Services
☐	Recreation	☐	Transportation	☐	Tribal Cultural Resources
☐	Utilities / Service Systems	☐	Wildfire	☐	Mandatory Findings of Significance

Evaluation of Environmental Impacts:

1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project specific screening analysis).

2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

4) "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from "Earlier Analyses," as described in (5) below, may be cross-referenced).

5) Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:

a) Earlier Analysis Used. Identify and state where they are available for review.

b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.

c) Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.

8) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.

9) The explanation of each issue should identify: a) the significance criteria or threshold, if any, used to evaluate each question; and b) the mitigation measure identified, if any, to reduce the impact to less than significance.

Determination: (To be completed by the Lead Agency) On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Pilar Lopéz, Senior Planner
City of Rancho Mirage

6/10/2024
Date:

Environmental Checklist and Discussion:

The following checklist evaluates the proposed Project's potential adverse impacts. For those environmental topics for which a potential adverse impact may exist, a discussion of the existing site environment related to the topic is presented followed by an analysis of the Project's potential adverse impacts. When the Project does not have any potential for adverse impacts for an environmental topic, the reasons why there are no potential adverse impacts are described.

1 - Aesthetics

AESTHETICS -- Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☒	☐
d) Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

Sources: City of Rancho Mirage General Plan (2017); Palm Desert Municipal Code; Project's Site Plan and Landscape and Architectural Design Plans; Google Earth Pro.

1.1 Setting

The City of Rancho Mirage, including the Project site, is located in the Coachella Valley. The Valley is geographically bound by steep mountains including the San Jacinto Mountains and the Santa Rosa Mountains to the west; the San Bernardino Mountains and the Little San Bernardino

Mountains on the north; the Cottonwood Mountains and the Mecca Hills on the east; and the Salton Sea to the south. The City consists of desert landscape and dramatic views of the surrounding mountains.

The proposed Project is located within Rancho Mirage's northwestern portion, where development consists of single-family homes to the south and west and a commercial/retail plaza to the north. The Project site is a vacant, undeveloped parcel shaped in an irregular configuration and consists of the northeasterly 10± acres of a larger City-owned parcel of land that totals approximately 52 acres in size. The surrounding area to the south, west, and east is undeveloped and vacant desert lands.

The Project is located in a Residential High Density (R-H) land use and zoning designation with an Affordable Housing Overlay (AHO).

The Project's development would result in the construction and operation of 15 multifamily residential apartment buildings with tuck-under parking, a Club House, outdoor recreational spaces, including a swimming pool and playground, and onsite parking. The building's exterior will consist of warm earth tones with the use of stone veneer and porcelain wood tiles covering a portion the building's façade, and paint colors that complement the mix of textures. Additionally, the buildings have a simplistic yet dimensional design which is reminiscent of Rancho Mirage's overarching mid-century modern aesthetic.

The Project makes use of native plant for landscaping. Plants such as Fan Palms and Honey Mesquite are widely used in Rancho Mirage and other cities in the Coachella Valley, helping to further incorporate the Project into the surrounding environment.

1.2 Discussion of Impacts:

a) **LESS THAN SIGNIFICANT IMPACT:** The Project site is currently vacant. The Project proposes the development of a multi-family apartment complex in 15 two-story buildings distributed throughout the site. The two-story buildings will reach a maximum height of 27 feet (See Exhibits 5a-5f). The building square footage occupies most of the site's acreage and the remaining space is distributed between the Club House, outdoor recreational spaces, landscape/hardscape, pedestrian sidewalks, parking areas and access roads.

The primary scenic resources in the Project area are the Santa Rosa Mountains to the south and southeast. The Santa Rose Mountains will remain a scenic vista for residential properties located to the west of the site because the Project's distance of ±940 feet to the nearest single-family home and the location of the mountains to the west and southwest assures no visual loss of the Mountains.

Additionally, the commercial/retail plaza located north of the site will not be significantly impacted from the lack of visibility of the Mountains since there are no viewsheds to the south; therefore, the Project's impacts to the commercial/retail land use is negligible. However, the Project is anticipated to cause some visual obstruction to the Rancho Mirage Dog Park located on the corner of Key Largo Avenue and Via Vail.

At Project buildout, new residential structures will be placed along the western, southern, and part of the northern boundary and will reach a maximum height of approximately 29 feet. The Rancho Mirage Dog Park, located immediately northwest of the Project, will experience a loss of visibility of the southeastern portion of the Santa Rosa Mountains because of its proximity to the site which blocks portions of the mid- and top mountain ranges. However, from the Dog Park, views of the mountain to the south will remain unobstructed.

Overall, the Project will not result in a visual obstruction to the residential development on the west because of the Project's relative distance, and the Project's location east of the residential neighborhoods, which will leave west and southwest views unimpeded. However, the Project will reduce some Rancho Mirage Dog Park views of the Santa Rosa Mountains to the southeast. Given the Project's limited view obstruction of the City's scenic vistas, impacts are expected to be less than significant.

b) **NO IMPACT:** The Project site is not located near an existing or proposed state scenic corridor such as Highway 111. There are no designated scenic highways in the vicinity of the Project site. There are no scenic resources such as trees, rock outcropping, or historical buildings located onsite. No impact to these resources will occur.

c) **LESS THAN SIGNIFICANT IMPACT:** The Project is located within an urbanized portion of Rancho Mirage. The surrounding environment consist predominantly of residential properties to the west and south, along with commercial/retail plazas to the north and east, as well as a public park to the northwest and a planned community park to the west.

The proposed Project will include multi-family residential apartment buildings, a Club House, outdoor recreational spaces including a swimming pool and playground, and onsite parking. All but the managers' units will be utilized for affordable housing. As such, the Project will be consistent with the General Plan and Zoning Ordinance land use and development standards which have been modified in accordance with the AHO. The density of the Project is consistent with the AHO, and the development standards are necessary to allow the density, while being consistent with the standards in a higher density project. Because the Zoning Ordinance provisions for the AHO allow flexibility, the Project's impacts associated with City policies and standards will be less than significant.

As mentioned above, onsite structures will consist of natural material and earth tones which will complement the native desert landscape and surrounding mountain views. For this reason, the Project is anticipated to have less than significant impact on scenic quality and would not conflict with applicable regulations.

d) **LESS THAN SIGNIFICANT IMPACT:** The construction of the Project will generate light and glare primarily from landscaping lighting, safety and security lighting on building exteriors, and vehicles accessing the site. Rancho Mirage regulates lighting levels and does not allow lighting to become a source of light pollution. Therefore, lighting is required to comply with Municipal Code Section 17.18.050 (Exterior glare, heat, and light) which mandates the exterior use of light to be focused downward by a shield. The implementation of the City's regulations will ensure that light and glare are limited to the greatest extent possible. Therefore, the Project is not anticipated to contribute significantly to light or glare. Less than significant impacts will occur.

1.3 Mitigation Measures: None required.

2 - Agriculture and Forestry Resources

AGRICULTURE AND FORESTRY RESOURCES – In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of forest land, timberland, or timberland zoned Timberland Production?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?	☐	☐	☐	☒

Sources: City of Rancho Mirage, Land Use Element (2017); California Important Farmland Finder, https://maps.conservation.ca.gov/DLRP/CIFF/ (accessed March 2024).

2.1 Setting

The City of Rancho Mirage is identified as an “urban and built-up” region, meaning the City is in urban development, according to the California Important Farmland Finder. The City’s General Plan Land Use Element supports the classification since all land uses and zoning designations are for non-agricultural and non-farmland uses. Currently, no agricultural or farmland resources or prime forestry are located in Rancho Mirage or within the Project's area.

2.2 Discussion of Impacts:

a-e) NO IMPACT:

Farmlands: The City of Rancho Mirage does not contain State-designated important farmland or prime farmland. The combination of geomorphic and geographic factors such as dry climate conditions, low annual precipitation (4 to 6 inches of rainfall annually)[1], and the lack of agricultural resources has rendered Rancho Mirage unfit for farmland production. There are no existing farmlands within the City's limit.[2] For this reason, the Project's development is not expected to convert or degrade prime farmlands, unique farmlands, or farmlands of statewide importance to non-agricultural use. No impact is expected.

Williamson Act: The Project site is located on a vacant, undeveloped parcel, approximately 10 acres in size and zoned R-H with an AHO overlay. The site is surrounded by vacant, undeveloped lands as well as residential communities to the south and west, and commercial/retail plazas to the north. No Williamson Act contracts are assigned to lands within the Project's vicinity. No impact will occur.

Forestry Lands: Rancho Mirage's desert environment is unable to sustain timberland, timberland production, or forest lands. There are no timberland, timberland production, or forestry uses designated in the Rancho Mirage General Plan. The Project will not conflict with existing zoning for forestry lands or timberland zones or convert potential lands for non-forestry land use. No impacts will occur.

Overall, the proposed site is designated for R-H/AHO because of its prime location within a highly developed area of Rancho Mirage. No agricultural, farmland, forestry or timberland resources or lands will be impacted or converted as a result of the Project's development. No impact is expected.

2.3 Mitigation Measures: None required.

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1 City of Rancho Mirage General Plan, Safety Element, 2017.
2 City of Rancho Mirage General Plan, Housing Element, 2017.

3 - Air Quality

AIR QUALITY – Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	☐	☐	☒	☐
c) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	☒	☐

Sources: SCAQMD Air Quality Management Plan (2022); Coachella Valley PM10 State Implementation Plan (2003); EPA, Ground-level Ozone Basics (accessed April 2024); California Emission Estimator Model (Appendix A); Urban Crossroads, Via Vail Village Traffic Scope Letter and VMT Screening Scope (Appendix E); SCAQMD Final Localized Significant Threshold Methodology, Appendix C (revised July 2008); Project materials; Google Earth Pro.

3.1 Setting

The South Coast Air Quality Management District (SCAQMD) is responsible for the Riverside County portion of the Salton Sea Air Basin (SSAB) that encompasses the Coachella Valley. Existing air quality conditions are measured according to criteria air pollutants at established air quality monitoring stations throughout the SCAQMD jurisdiction. There are three permanent air quality monitoring stations in the Coachella Valley located in Palm Springs (AQS Station ID 060655001), Indio (AQS Station ID 060652002), and Mecca (Saul Martinez- AQS Station ID 060652005).

To comply with the National Ambient Air Quality Standard (NAAQS) and the California Ambient Air Quality Standard (CAAQS), SCAQMD adopts an Air Quality Management Plan (AQMP) which is updated periodically to identify emissions and implement effective reduction strategies to comply with standards in a timely manner. The 2022 AQMP is the latest adopted plan by the SCAQMD to target nonattainment areas that exceed the NAAQS and are thereby required to reduce emissions within the timeframe determined appropriate by the U.S. Environmental

Protection Agency (EPA). The 2022 AQMP builds on measures already established from previous AQMPs by including regulations, accelerated deployment cleaner technologies, best management practices, co-benefits from existing programs, incentives, and other measures to achieve attainment. Moreover, the 2022 AQMP is a guide for the State Implementation Plan (SIP) for attainment of air quality standards.

Particulate Matter (PM10)

Particulate matter or particulate pollution are microscopic solid particles and liquid droplets found in the air with a diameter of generally 2.5 (PM2.5) and 10 (PM10). These particles are generated by a variety of sources including, but not limited to construction sites, unpaved roads, automobiles, and industries. The EPA regulates particulate matter and implements national and regional rules to reduce emissions of pollutants that form PM2.5 and PM10 in order for local and regional governments to meet air quality standards.

The 2022 AQMP states that for the years between 2018 to 2020, the Coachella Valley was in attainment with the State's PM2.5 standards with an annual average of 8.4 microgrammes per cubic meter (µg/m3).[3] The Valley however exceeded the State's PM10 standard by nearly twice the allowed amount with an annual average of 39 µg/m3 for 2018-2022.[4] Man-made sources including direct emissions, industrial facilities, and fugitive dust resulting from unpaved roads and construction operations are typical PM10 polluters in the Coachella Valley. High wind natural events are also known to contribute to PM10 emissions.

The federal Clean Air Act (CAA) requires those states with nonattainment areas to design and submit a SIP to demonstrate how these areas will attain NAAQS. The SIP consists of implementation strategies including modeling, rules, regulations, and programs aimed at reducing air pollutant emissions.

The 2003 Coachella Valley PM10 State Implementation Plan (CVSIP) is the latest approved plan. The 2003 CVSIP outlines past and present PM10 inventory and estimates future emissions with the implementation of dust control strategies in addition to new control measures to demonstrate attainment of the standard. The following is a list of proposed actions to control and reduce man-made PM10 emitting sources:

- Additional stabilizing or paving of unpaved surfaces, including parking lots;
- A prohibition on building new unpaved roads;
- Requiring more detailed dust control plans for builders in the Valley that specify the use of more aggressive and frequent watering, soil stabilization, win screens, and phased development (as opposed to mass grading) to minimize fugitive dust;
- Designating a worker to monitor dust control at construction sites; and
- Testing requirements for soil and road surface.

Additionally, Rancho Mirage Municipal Code Section 7.01.041 outlines PM10 fugitive dust control requirements during construction and demolition activities to ensure PM10 emissions are reduced to the greatest extent possible.

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3 SCAQMD, Air Quality Management Plan, "2018-2020 PM2.5 Annual Design Value by Basin and County", Table 2-9, 2022.

4 SCAQMD, Air Quality Management Plan, "2018-2020 Annual PM10 Design Values by Basin and County", Table 2-13, 2022.

Ozone and Ozone Precursors

Ozone, unlike other pollutants, is not emitted, rather it is created in the atmosphere. Ozone is formed by the chemical reaction between nitrogen oxide (NOx) and volatile organic compounds (VOCs) in the presence of sunlight. These pollutants are emitted by cars, power plants, industrial boilers, refineries, chemical plants, and other sources. Once in the atmosphere, ozone reduces the region's air quality causing a variety of harmful effects to human health and the environment.[5] Ozone can be transported long distances by wind thus expanding its reach and impact.

In August 2018, the EPA designated the Coachella Valley a "Severe-15" nonattainment area for the 2015 8-hour ozone standard.[6] The Coachella Valley is located downwind from the South Coast Air Basin (SCAB). As such when high levels of ozone are formed in the SCAB they are transported to the Valley. The SCAQMD notes that the Coachella Valley has a limited impact on ozone levels in comparison with the transport of ozone generated in SCAB. Nonetheless, the Valley must substantially reduce NOx (key pollutant controlling formation of ozone) to attain the standard by August 2038 as required by the EPA. The SCAQMD as well as SCAB are taking action to reduce emissions by implementing planned regulations and programs, respectively, and thus improve ozone air quality in the Coachella Valley to reach attainment.

Regional Significant Threshold Criteria

SCAQMD has established short-term construction and long-term operation threshold to set a maximum amount of air pollutants a project is allowed to generate at each stage of development. Table 2 identifies the established construction and operation thresholds against which the proposed Project emissions are measured.

Table 2
SCAQMD Air Quality Significant Threshold

Emission Source	CO	VOC	NOx	SOx	PM10	PM2.5
Construction (pounds/day)	550	75	100	150	150	55
Operation (pounds/day)	550	55	50	150	150	55
Source: South Coast AQMD, https://www.aqmd.gov/docs/default-source/ceqa/handbook/south-coast-aqmd-air-quality-significance-thresholds.pdf?sfvrsn=25 (accessed April 2024).						

A Project-specific California Emission Estimator Model (CalEEMod) model run was prepared in April 2024 (Appendix A). The following analysis of potential impacts to air quality associated with the Project construction and operation is based on results from CalEEMod.

3.2 Discussion of Impacts:

a) **NO IMPACT:** The Project site is located within the Salton Sea Air Basin and is subject to SCAQMD's 2022 Air Quality Management Plan and the 2003 Coachella Valley PM10 State Implementation Plan. As discussed above, these plans stringently regulate and limit

[5] EPA, Ground-level Ozone Basics, https://www.epa.gov/ground-level-ozone-pollution/ground-level-ozone-basics, accessed April 2024.
[6] SCAQMD, Air Quality Management Plan, 2022.

the sources of emission in the Coachella Valley and implement comprehensive strategies to reduce pollutants and, in turn, improve air quality to appropriate levels for federal and state attainment. The AQMP is based, in part, on the land use plans of the jurisdiction in the region. Additionally, conformity with growth forecasts can assure the Project's consistency with air quality plans and standards. The Southern California Association of Governance (SCAG) projects a population size of 25,200 by 2045 for the City of Rancho Mirage.

The Project is expected to contribute to Rancho Mirage's population growth as it proposes permanent housing within a previously unpopulated area. The City 2017 General Plan Land Use map designates the Project's parcel an R-H area with an AHO. The Project is consistent with the land use designation and permitted uses. The proposed residential density is approximately 24 DU/AC which is within the allowed density capacity range of 5-28 DU/AC for a R-H/AHO parcel. The Project will be part of the City's anticipated population growth and residential land use as predicted in the City General Plan and SCAG analysis. The Project will implement all plans, policies, and rules to be in compliance with state and regional air quality standards. The Project will therefore be consistent with the 2022 AQMD and 2003 CVSIP. No impacts are anticipated.

b) **LESS THAN SIGNIFICANT IMPACT:** As previously discussed, the SSAB portion of the Coachella Valley is classified as "nonattainment" area for PM10 emissions and ozone. As a result, the Project is required to strictly regulate and limit PM10 and ozone emitting sources at every stage of construction and operation, in addition to carbon monoxide (CO), nitrous oxides (NOx) and volatile/reactive organic compounds/gases (VOC or ROG) to ensure emissions do not exceed SCAQMD thresholds (See Table 2).

The Project site consists of a vacant undeveloped parcel designated for high density residential use and located in a developed portion of Rancho Mirage. The Project includes the development of permanent multifamily apartment buildings with amenities centralized within or in proximality to the planned Club House and onsite parking. No structures exist onsite therefore no demolition is required prior to construction. A two-year construction period is assumed for operation in 2026.

Criteria air pollutants will be released during both construction and operation phases of the Project. Table 3 summarizes short term construction related emissions and Table 4 summarizes ongoing emission generated during operation.

<u>Construction Emissions</u>
For purposes of analysis, it is assumed that construction will occur over a 24-month period starting mid-2024 with buildout by 2026. The analysis assumes a cut of 36,640.32 cubic yards and fill of 65,128.41 cubic yards of dirt/soil as per the Project's preliminary grading plan. Construction includes multiple phases of the Project's development including site preparation, grading, paving, building construction, and application of architectural coatings. During construction, the Project will not exceed SCAQMD thresholds for any criteria pollutant as shown in Table 3.

Table 3
Maximum Daily Construction Emissions Summary

Construction Emissions	CO	VOC	NOx	SOx	PM10	PM2.5
Daily Maximum	42.60	6.44	36.1	0.05	9.49	5.47
SCAQMD Thresholds	550	75	100	150	150	55
Exceeds?	No	No	No	No	No	No
Source: California Emission Estimator Model, Version 2022.1.1.22 (Appendix A)						

The data reflects the maximum daily unmitigated emissions over a 24-month construction period including winter and summer weather conditions. Highest pollutant emissions typically occur during the summer months and thus these daily maximums are considered the worst-case-scenarios. Given the criteria pollutant thresholds, the Project construction emissions are not expected to surpass the permitted thresholds. Additionally, the Project will implement architectural coating standards and fugitive dust control measures required by SCAQMD under Rule 403 and Rule 1113, and best management practices (BMPs) to further reduce emissions. Therefore, construction related emissions are expected to have less than significant impacts.

Operation Emissions

The Project will operate 15 multifamily residential buildings for a total of 236 apartment units varying in residential capacity. In relation to the residential use, complementary amenities including recreational spaces will be provided onsite. For purpose of the analysis, a population of 892 residents is assumed. Additionally, the Project is anticipated to generate a total of 1,135 trips-ends per day according to the traffic report prepared by Urban Crossroads (Appendix E). During operation, the Project will not exceed SCAQMD thresholds for any criteria pollutant as shown in Table 4.

Table 4
Maximum Daily Operation Emission Summary

Construction Emissions[1]	CO	VOC	NOx	SOx	PM10	PM2.5
Daily Maximum	69.70	9.74	6.89	0.14	11.50	3.04
SCAQMD Thresholds	550	55	55	150	150	55
Exceeds?	No	No	No	No	No	No
Source: California Emission Estimator Model, Version 2022.1.1.22 (Appendix A)						

The data reflects emissions regarding the use of mobile (vehicle) and stationary sources (electricity and natural gas). Of the two sources, a combined maximum daily unmitigated emissions is projected to occur over the life of the Project. Given the Project's long-term operation, emissions are not expected to exceed SCAQMD thresholds. Nonetheless, the Project currently plans to provide 19 electrical vehicles charging stations onsite as a cleaner non-emitting alternative from gasoline fueled vehicles, and will provide solar panels for electric generation, as required by the Building Code. Operational emissions are therefore expected to be reduced as sources are reduced. Impacts related to operational emissions will be less than significant.

Cumulative Contributions

The Coachella Valley portion of the SSAB currently exceeds the NAAQS for PM10 and ozone. Therefore, the Valley is classified as a "nonattainment" area by the EPA. Cumulative air quality analysis evaluates emissions on a regional scale, given the nature of pollutant emissions and aggregated impacts from surrounding jurisdictions and air management districts. Any development project or activity located within the SCAQMD jurisdiction of the Salton Sea Air Basin that results in the emission of PM10, ozone, or ozone precursors will contribute, to some extent, to regional nonattainment designation of PM10 and ozone.

As shown in the tables above, Project related PM10, CO, NOx and VOC/ROG emissions are projected to be well below established SCAQMD thresholds. For this reason, the proposed residential project will result in incremental, but not cumulatively significant impacts on regional PM10 or ozone levels.

Summary

The Project, located in the Salton Sea Air Basin part of the Coachella Valley, is required to comply with SCAQMD's rules and criteria pollutant thresholds in order to reduce impacts from Project-induced emissions. As shown in Table 3 and Table 4, both construction and operation of the proposed development will generate emissions below the SCAQMD thresholds, and neither will violate any air quality standard or contribute substantially to an existing or projected air quality violation. Impacts related to the Project's construction and operation will be less than significant and the Project is not expected to contribute to a substantial cumulative air quality impact from a nonattainment standpoint. Less than significant impacts are anticipated overall.

c) **LESS THAN SIGNIFICANT IMPACT:** Sensitive receptors are children, the elderly, asthmatics, and other individuals with a heightened risk of negative health outcomes associated with the exposure to air pollution. The location of these sensitive receptors includes hospitals, schools, retirement communities, and day care facilities as determined by the California Health and Safety Code Section 42705.5(a)(5).

The Project is located within the northeastern region of Rancho Mirage, where residential development predominates to the west and south beyond vacant undeveloped parcels, and commercial/retail plazas are located to the north and east beyond Monterey Avenue. The nearest sensitive receptors to the Project are residential properties located ±940 feet to the northwest of the Project site.

The AQMD Handbook displays a Localized Significant Threshold (LST) Lookup Table that predicts a project's air quality impacts to sensitive receptors. Based on the Project's size and proximity to existing housing, the 5-acre tables at a distance of 200 meters were used to provide conservative air quality analysis of construction impacts. Table 5 shows onsite emissions concentrations for the Project's construction will not exceed LST thresholds.

Table 5
Localized Significant Thresholds Emissions Comparison with Daily Maximum Construction Emissions

Construction	CO	NOx	PM10	PM2.5
Maximum Emissions	42.60	36.1	9.49	5.47
LST Threshold	10,178	547	112	37
Exceeds?	No	No	No	No
Source: California Emission Estimator Model, Version 2022.1.1.22 (Appendix A); SCAQMD Final Localized Significant Threshold Methodology, Appendix C (revised July 2008).				

The Project site will include residential buildings and complementary amenities. No major stationary polluters such as landfills, chemical plants, oil fields, and refineries will occur onsite, therefore a LST analysis was not required or performed for the Project operation. Less than significant impacts will occur.

<u>Health Impacts</u>
As shown in Table 3 and Table 4, the Project will not exceed SCAQMD thresholds for criteria pollutants during construction or operation. As such, the Project will not violate the 2022 AQMP, 2003 CVSIP, or contribute substantially to an existing or projected air quality violation.

Although the Project will emit below the thresholds for air pollutants, it is not possible to calculate the degree to which exposure to various levels of criteria pollutant emissions will impact an individual's health. There are several variables that make accurate predictions of a Project-specific health impact difficult:

- Not all individuals will be affected equally due to medical history. Some may have medical pre-dispositions, and diet and exercise levels tend to vary across a population;
- Due to the dispersing nature of pollutants via wind, it is difficult to locate and identify which group of individuals will be impacted, either directly or indirectly;
- There are currently no approved methodologies or studies to base assumptions on, such as baseline health level or emission level-to-health risk ratios.

Due to the resource limitation, the extent to which the Project poses a health risk is uncertain. However, because the Project will not exceed SCAQMD thresholds, it is anticipated that the Project's emissions of criteria pollutants will cause less than significant health impacts.

d) **LESS THAN SIGNIFICANT IMPACT:** The occurrence and severity of odor impacts depends on a number of factors including the nature, frequency, and intensity of the source; wind speed and direction; and the sensitivity of the receptors. Although severe odor does not cause physical harm, it can contribute to distress and unpleasantness among the public leading to citizen complaints to local governments and regulatory agencies.

The Project plans to develop an affordable housing project within a previously undeveloped vacant parcel. Throughout the Project's construction and operation, the development is not expected to generate objectionable odors. Short-term odor associated with paving and construction activities will occur within the site and will disperse below detectable levels, especially given the distance to the closest home. At buildout, residential units will generate typical odors from cooking and other household activities but will not generate objectionable odor. For these reasons, impacts to air quality related to odors are expected to be less than significant.

3.3 Mitigation Measures: None required.

4 - Biological Resources

BIOLOGICAL RESOURCES – Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Wildlife or US Fish and Wildlife Service?	☐	☐	☐	☒
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☒
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☒	☐	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

Sources: City of Rancho Mirage General Plan (2017); WSP USA Environmental and Infrastructure Inc., Biological Resource Assessment and Coachella Valley Multiple Species Habitat Conservation Plan Report (Appendix B); Coachella Valley Resources Conservation District, Coachella Valley (accessed March 2024); Coachella Valley Multiple Species Habitat Conservation Plan (2007).

4.1 Setting

The Coachella Valley is a southwest-northeast trending valley depression surrounded by steep mountain ranges including the San Jacinto Mountains to the west, Santa Rosa Mountains to the southwest, Little San Bernardino Mountains to the north, and San Bernardino Mountains to the northwest. The Valley forms the lower region of the Colorado Desert and is part of the Whitewater watershed that drains into the Salton Sea.

The region is characterized by dry hot summer months, strong winds, and low annual precipitation. These conditions create a unique and fragile desert biome suitable for a diverse subset of wildlife and plant species, of which, 27 are federally and state listed species of concern and include the desert tortoise, bighorn sheep, Coachella Valley fringe-toed lizard, desert pupfish, and the Coachella Valley milkvetch.[7]

The regulatory framework governing the Project's impacts to the region's biological resources include the Endangered Species Act (ESA), the California Endangered Species Act (CESA), and the Coachella Valley Multiple Species Habitat Conservation Plan (CVMSHCP). These policies/program aim to assure all development impacts are avoided or minimized to the greatest extent practical for the protection and conservation of endangered, threatened, and special status species, and sensitive habitats.

The ESA protects species whose population has been on the decline, habitat is being fragmented, or are being impacted by the physical changes brought by climate change. The ESA prohibits the "take" of any endangered or threated species. Similarly, the CESA protects all federally listed species, in addition to candidate species who unless addressed can become an endangered or threatened species in the future. The federal and state Endangered Species Acts impose development restrictions to ensure all listed species are being protected as the built environment grows and encroaches in their habitat.

The CVMSHCP is a joint habitat conservation plan/natural community conservation plan aimed at allowing economic growth to occur while maintaining and enhancing biological diversity. The CVMSHCP governs the Coachella Valley, including all its cities. The conservation plan upholds the ESA and CESA and adds special status species identified by CVMSHCP as species of local concern.

CVMSHCP categorizes Rancho Mirage as Level 2 land meaning the focus of development regulations is to maintain natural value since impact to natural qualities do not occur. The City Rancho Mirage, including the Project site, are not located in a conservation area (Level 1) by the CVMSHCP.[8]

A site-specific biological assessment was conducted to determine the value of biological resources (soils, vegetation, and topography) that constitutes the onsite habitat, detect the presence of wildlife occurring at the site and neighboring areas, survey the occurrence or potential occurrence of federal, state, and locally listed species, and offer mitigation measures if deemed

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7 Coachella Valley Resource Conservation District, "Coachella Valley", https://www.coachellavalleyrcd.org/coachella-valley, accessed March 2024.

8 Coachella Valley Multiple Species Habitat Conservation Plan, "Plan Area Profile", accessed March 2024.

necessary. WSP USA Environmental and Infrastructure Inc. conducted the biological assessment in which a literature review, field assessment, and specific surveys were performed (See Appendix B). The following are the results of the report.

4.2 Discussion of Impacts:

a) **LESS THAN SIGNIFICANT IMPACT WITH MITIGATION INCORPORATION:** Rancho Mirage forms the central region of the Coachella Valley, and it is characterized by low elevation, mild winters, and extreme aridity. These conditions allow for five distinct habitats to occur within the City: (1) Blowsand Habitats, (2) Alluvial Plains Habitat, (3) Desert Dry Wash Habitat, (4) Desert Fan Palm Oasis Woodland, and (5) Rocky Slopes Habitat. A diverse set of desert vegetation and wildlife species have adapted to these habitats based on conditions including climate, varied terrain, adequate space, a dependable food and water supply, soils for healthy plant growth, and shelter and nesting sites. According to the City 2017 General Plan, these biological resources are found towards the southern end of the City limit and within the San Jacinto Mountains and the San Rosa Mountains Conversation Area.[9]

The Project proposes the development of 15 two-story residential buildings across a 10± acre parcel.

A field assessment was conducted on February 8th, 2024 by a WSP Senior Wildlife Biologist. General weather and site conditions were clear and warm, temperature ranged from 52 to 61 degrees Fahrenheit. Winds were calm, with speeds measuring 0 to 2 miles per hour.

From observation, the entire property shows signs of disturbance including tire tracks, dog prints and scat, trash, and human footprints. Although the site is highly disturbed, fourteen plant species and five bird species were observed, and six special status species have a low to very low potential of occurrence.

<u>Vegetation:</u> The field assessment identified scrub including creosote bush, four-wing saltbush, dyebush, and athel. Annual species observed include desert dicoria, Spanish needles, narrow leaved forget me not, fanleaf crinklemat, Sahara mustard, old han schismus, red stemmed filaree, sandpaper plant, desert sand verbena, and browneyes.

<u>Wildlife:</u> The vertebrate wildlife observed were common species to desert scrub and/or developed areas of the Coachella Valley. Wildlife observed onside were five bird species including (1) American crow, (2) House finch, (3) Verdin, (4) Costa's hummingbird, and (5) Say's phoebe. No mammals, reptiles, or rodents were identified during the field assessment. Additionally, no burrowing owls were observed at the time of the assessment and their presence is unlikely to occur due to the site's sandy surface providing an unsuitable burrowing substrate. No active nesting birds were found onsite or within adjacent areas.

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9 City of Rancho Mirage General Plan, "Conservation Management Areas", Exhibit 16, 2017.

Special Status Species: A total of 25 special status species have the potential to occur in the area, with nineteen of these being absent due to lack of habitat or other factors (please see Appendix B). Six out of the nineteen special status species have a low to very low probability of occurrence on the Project site. These include (1) Coachella Valley milkvetch, (2) Coachella giant sand treader cricket, (3) Coachella Valley Jerusalem cricket, (4) burrowing owl, (5) Palm Springs pocket mouse, and (6) Coachella Valley (Palm Springs) round-tailed ground squirrel. These special status species have a low to very low probability of occurrence. The Coachella Valley milkvetch occurs in aeolian sand habitats such as the Project site; however, due to the parcel's high disturbance and isolation, the probability of the CVMSCHP protected plant species from occurring is low. The Coachella Valley giant sand treader cricket and the Coachella Valley Jerusalem cricket have a low probability of occurrence because there is marginal habitat found onsite and the degree of disturbance makes it unlikely for the two invertebrate species listed under the CVMSCHP to occur. The burrowing owl is a federal, state, and CVMCHP protected bird species, with a low probability of occurrence because the Project site is isolated from other open areas and there are high levels of human and dog activity which would discouraging owls. The Palm Springs pocket mouse and the Coachella Valley (Palm Springs) round-tailed ground squirrel share a similar habitat which aligns with the desert conditions onsite; however, the two federal, state, and CVMSCHP protected mammal species have a low probability of occurrence due to the parcel's isolation and human and dog disturbance.

The report concluded that no sensitive species (threatened, endangered, candidate, or special status species) were observed within the Project area. And no burrowing owls were actively observed, nor was any sign detected. The Project is therefore not expected to substantially impact any species protected by the ESA, CESA, or CVMSHCP.

Burrowing owls nest and roost underground and are uniquely vulnerable to ground disturbance related to construction activities. Although no suitable burrows or individuals were identified, pre-construction surveys for burrowing owls will be required to ensure impacts to the sensitive species are less than significant. Implementation of Mitigation Measure BIO-1 assures impacts to the burrowing owl remains less than significant.

Overall, the onsite habitat sustains native desert vegetation and wildlife which are not designated as species of federal, state, or regional concern. Special status species have a low to very low potential of occurrence which may be considered negligeable because of the site's existing conditions as a fragmented desert habitat with high levels of disturbance from human activities and surrounding development. Nonetheless, a pre-construction burrowing owl survey must be conducted (BIO-1) to ensure no burrowing owl is located onsite prior to construction activities, including grading and building construction. With mitigation, the Project is not expected to substantially impact directly or indirectly species protected by the ESA, CESA, or CVMSHCP. Impacts will be less than significant with mitigation.

b-c) **NO IMPACT:** The Project consists of vacant desert lands sandy, aeolian surface soils. There are no dry lakes, wetlands, or bodies of water that would constitute waters of the U.S. on the site. The Project will not affect wetlands through direct removal, filling, or hydrological interruption of any wetlands. Additionally, no riparian habitat or other sensitive natural community protected by the California Department of Fish and Wildlife, or U.S. Fish and Wildlife Service occurs onsite. No impact will occur.

d) **LESS THAN SIGNIFICANT IMPACT WITH MITIGATION INCORPORATION:** There are no wildlife corridors crossing in proximity to the site. The Project is in a highly developed area and between residential and commercial/retail land uses. The Project is not expected to block or modify the migratory patterns of birds since the site's existing habitat is highly disturbed and a nonideal habitat for nesting. No nests were observed during the field assessment. Nonetheless, migratory birds were observed onsite. For this reason, the site may offer limited nesting sites for birds protected by the Migratory Bird Treaty Act (MBTA). Compliance with the MBTA, provided in Mitigation Measure BIO-2, will ensure impacts to sensitive species are reduced to less than significant levels.

e-f) **NO IMPACT:** The Project is governed by the ESA, CESA, CVMSHCP, MBTA, and the Rancho Mirage General Plan and Municipal Codes regarding biological and ecological conservation. These regulatory standards aim at protecting federally, state, or locally listed wildlife or plant species against the physically impacts from development. The City's General Plan outlines objectives and policies/programs to which compliance is required by all new development including the Project.

Goal 3. The protection and preservation of biological resources in Rancho Mirage, especially sensitive and special status wildlife species, and their natural habitats.

3.1D Require new development to prepare wildlife and plant surveys and implement requirement of the CVMSHCP/NCPP.

3.3 Encourage the use of naturally occurring desert plant materials in landscaping for development projects, to the greatest extent possible, and discourage the use of non-native plant materials that are harmful to native plant and animal species.

3.3A Request that developers salvage naturally occurring desert plant materials, to the greatest extent possible, for integration into project landscaping as a wat to provide or enhance wildlife habitat and to extend the local desert environment into the urban design of Rancho Mirage. Incorporation of these indigenous materials shall be integrated into project landscape plans and shall be submitted to the City for approval.

The Project is subject to these local policies, programs, and Ordinances including Section 3.29.147(B) which requires all residential development to pay a development mitigation fee to assist in the financial cost of conserving the lands necessary to implement the CVMSHCP. The Project will pay development mitigation fees and comply with all federal, state, and regional policies, programs, and Municipal Code appropriate to the development. The Project will not violate or conflict with any policies, programs, or codes that protect biological species or any habitat conservation plan or natural community conservation plan. No impacts are anticipated.

4.3 Mitigation Measures:

BIO-1: Burrowing Owl

To mitigate potential impacts to burrowing owl, two pre-construction surveys must be conducted in accordance with California Department of Fish and Wildlife protocol. The first survey must occur between 14 to 30 days prior to ground disturbance and the second survey must occur within 24 hours of the initiation of ground disturbance activities.

- If no owls are detected during those surveys, ground disturbance may proceed without further consideration of this species.
- If burrowing owls are detected during the survey, avoidance and minimization measures will be required. A Burrowing Owl Relocation and Management Plan will be prepared to establish the standard procedure for how the burrowing owl will be actively or passively relocated per the California Department of Fish and Wildlife guidelines.

BIO-2: Migratory Bird Treaty Act

If ground disturbance or tree or plant removal is proposed between February 1st and August 31st, a qualified biologist must conduct a nesting bird survey within 7 to 10 days of initiation of grading onsite, focusing on MBTA covered species. If active nests are reported, then species-specific measures must be prepared. At a minimum, grading in the vicinity of a nest must be postponed until the young birds have fledged. For construction that occurs between September 1st and January 31st, no pre-removal nesting bird survey is required.

- In the event active songbird nests are found, exclusionary fencing must be placed 200 feet around the nest until such time as nestlings have fledged. Nests of raptors must be provided a 500-foot buffer.

5 - Cultural Resources

CULTURAL RESOURCES – Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☐	☒
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☒	☐	☐
c) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐

Sources: City of Rancho Mirage General Plan Updated Environmental Impact Report (2005); CRM TECH, Historical/Archaeological Resources Survey Report (Appendix C).

5.1 Setting

Prehistorical Context

Cultural development in the Coachella Valley is estimated to have occurred during the Paleoindian Period (8,000 to 12,000 years ago), the Early to Late Archaic Period (8,000 to 4,000 years ago), and the Late Prehistorical Period (1,500 years ago to Spanish mission).

The Paleoindian period consisted of small mobile bands of hunters and gathers who depended on a variety of small and large game animals in addition to wild plants for subsistence. Artifacts of the period were typically simple stone tools.

The Early Archaic period experienced a decrease in population density. Nonetheless, there were remaining indigenous groups in the area that relied heavily on foraging and hunting. The low population density continued onto the Late Archaic period. Small groups settled near available seasonal food resources and depended on opportunistic hunting of animals. Ground stone artifacts for food processing were prominent during the time.

The Late Prehistoric period saw the continuation of seasonal settlements. These indigenous groups were associated with the Patayan cultural pattern and relied heavily on the availability of seasonal wild plants and animal resources. Ceramics and bow/arrow were introduced to the region at this time.

Ethnohistoric Context

The Coachella Valley, located in the lower region of the Colorado Desert, served as a historical center for Native American settlement. Many Indian villages occupied by the Cahuilla people occurred during the mid-19th century. The Cahuilla Tribe was geographically divided and classified according to their respective settings: The Pass Cahuilla of the San Gorgonio-Palm Spring area, the Mountain Cahuilla of the San Jacinto and Santa Rosa Mountains, and the Cahuilla Valley, and the Desert Cahuilla of the eastern Coachella Valley.

The Cahuilla subsistence consisted of the surrounding landscape and hunting and gathering of wild plants and cultivated food. Due to the arid desert environment and seasonal mobility system, the Cahuilla also relied on the exploitation of natural resources available at a given time. The Cahuilla diet included seeds, roots, wild fruits, and mesquite and screw beans, as well as medicinal plants and common game animals including deer, antelope, big horn sheep, and rabbits. Common tools used included moans and metates, mortars and pestles, hammerstones, fire drills, awls, arrow-straighter, and stone knives and scrapers. These tools were made from locally sourced materials and materials obtained through trade and travel.

Historical Context

From 1823 to 1825, the first noted European explorers traveled through the Coachella Valley in search of a route to Yuma. Non-Indians typically traveled along established routes such as the Bradshaw Trail, which became the main thoroughfare between coastal southern California and the Colorado River.

In the 1870s, non-Indian settlement began with the establishment of railroad stations along the Southern Pacific Railroad which only spread settlement in the 1880s after public lands were claimed under the Homestead Act, the Desert Land Act, and other federal land laws. Farming became the dominant economic activity in the Valley. Later, starting in the 1920s, the development of industries including equestrian camps, resorts, hotels, and country clubs began to appear and increase the Coachella Valley's popularity as a sought-after destination. Rancho Mirage, in particular, experienced rapid growth with the development of the Thunderbird County Club and the Tamarisk Country Club. This trend has largely contributed to Rancho Mirage's reputation as the "country club city".

5.2 Discussion of Impacts:

a) **NO IMPACT:** A Project-specific analysis, including a field survey was conducted by CRM TECH on February 27, 2024 (Appendix C). CRM TECH conducted a field survey on February 27, 2024. During the survey, observations consisted of good to excellent (95 to 100%) ground visibility and sparse vegetation, apart from a portion of the Project's area was obstructed by large creosote bushes. The parcel's ±10 acres were systemically examined for evidence of human activities dating to the prehistoric or historic periods. Additionally, historical background research was performed including the review of sources from the State of California Native American Heritage Commission (NAHC), literature of local historical context, historical maps, and aerial/satellite photographs of the Project's vicinity.

Eastern Information Center (EIC) Record Search

EIC records indicate there is 15 cultural resources within a one-mile radius of the Project site. Of these cultural resources, four are prehistoric sites, six are historical-period sites, and five are isolates (i.e., localities with less than three artifacts). The nearest historic site is Site 33-017008, located approximately 1,000 feet northwest of the Project vicinity and consisting of remains of a shed of unknown age. The research concludes that none of the 15 sites or isolates require further consideration.

Field Survey Results
The field survey yielded no evidence of historical resources, nor did it demonstrate the potential for significant historical resources to occur onsite as defined by CEQA Section 15054.5(b). No buildings, structures, objects, sites, features, or artifacts of historic origin were identified during the field survey.

Based on the historical background search and the field survey no historical resources are located within or in proximity to the Project site. Therefore, the Project is expected to cause no impacts to historic resources.

b) **LESS THAN SIGNIFICANT IMPACT WITH MITIGATION INCORPORATED:** On February 5, 2024, CRM TECH submitted a written request to NAHC for records in the Commission's Scared Lands Files. NAHC is the State of California's trustee agency for the protection of tribal cultural resources as defined by California Public Resources Code Section 21074. NAHC has the responsibility to identify and catalogue properties of Native America cultural value. The Sacred Lands Files did not identify any cultural resources or sites of value in the Project's vicinity. Nonetheless, local Native American groups were consulted for further information. The Cultural Resource Analyst for the Agua Caliente Band of Cahuilla Indians (ACBCI) Historical Preservation Office responded by stating that the Project is located within a Traditional Used Area.

All of Rancho Mirage including the Project site is designated a Traditional Use Area by the ACBCI. The Whitewater River had previously been an area where the Tribe would gather to fish and prepare food. Approximately 100 feet wide of either side of the River is considered a sensitive zone for cultural resources where there is a likelihood for cultural resources being uncovered by development.

As described above, the field survey identified no resources on the surface of the site, and the records search found no identified resources on the property.

Based on the findings, the Project cultural resources study concluded that no further cultural resources investigation is required unless the Project's development plans undergo changes as to include areas not covered by this study. Although cultural resources are not expected to be uncovered during the Project's development, the Project is located within a Traditional Use Area of the Cahuilla people. The Agua Caliente Band of Cahuilla Indians (ACBCI), responded to the City's request for consultation under AB 52 (please also see Section 18, Tribal Cultural Resources). The ACBCI requested the presence of archaeological and Tribal monitors to assure that no buried resources are impacted by Project earth moving activities. To ensure any potential impacts are reduced to less than significant levels, the implementation of CUL-1 and CUL-2 is required. These mitigation measures assure that impacts associated with cultural and Tribal cultural resources will be reduced to less than significant levels.

c) **LESS THAN SIGNIFICANT IMPACT WITH MITIGATION INCORPORATED:** The likelihood of human remains being uncovered during the Project's construction is low to very low because the Project site is not located near a known Native American burial site. However, in the event of remains being uncovered during construction activities, all construction activities will stop immediately as mandated by California Health and Safety Code Section 7050.5 and the CEQA Guidelines Section 15064.5. A County Coroner will be contacted to examine and determine the significance of the remains. If the remains are believed to be Native American, the Native American Heritage Commission will be contacted and notified of the findings. The ACBCI requested that this requirement of law be made a mitigation measure. CUL-3 is therefore provided below to assure that impacts to buried remains are less than significant.

5.3 Mitigation Measures:

CUL-1: The Agua Caliente Band of Cahuilla Indians must be notified a minimum of 30 days prior to any earth-moving activities including grading, grubbing, trenching, or excavations at the site. All earth-moving activities including grading, grubbing, trenching, or excavations at the site shall be monitored by a qualified archaeologist and/or approved Agua Caliente Native American Cultural Resource Monitor(s).

CUL-2: A qualified archaeologist and approved Agua Caliente Native American Cultural Resource Monitor(s) shall provide preconstruction training for all earthmoving construction personnel prior to the start of any ground-disturbing activities, regarding how to recognize the types of Tribal Cultural Resources and/or archaeological resources that may be encountered and to instruct personnel about actions to be taken in the event of a discovery. Should cultural materials be discovered, they shall be recorded and evaluated in the field. The monitors shall be prepared to recover artifacts to avoid construction delays but must have the power to temporarily halt or divert construction equipment to allow for controlled archaeological recovery if a substantial cultural deposit is encountered. If artifacts are discovered, these shall be cataloged and analyzed. The archaeologist and monitor shall determine and implement the best course of action for the treatment and disposition of the artifacts. Preservation in place of the cultural resources is the preferred course of action. If deemed necessary by the qualified archaeologist and approved Agua Caliente Native American Cultural Resource Monitor, the artifacts shall be prepared for permanent curation in a repository with permanent storage. Only non-destructive methods shall be allowed in regards to Tribal Cultural Resources. Archaeological site records shall be prepared to document the cultural remains discovered during monitoring and submitted to the California Historical Resources Information System.

CUL-3: In the unexpected event human remains are uncovered during construction activities, all construction work taking place within the vicinity of the discovered remains must cease and the necessary steps to ensure the integrity of the immediate area must be taken. The County Coroner must be notified within 24 hours of the discovery of human remains. If the remains discovered are determined by the Coroner to be of Native American descent, the Coroner shall contact the Native American Heritage Commission (NAHC) within 24 hours. The NAHC would in turn contact the Most Likely Descendant (MLD) would determine further action to be taken. The MLD would have 48 hours to access the site and make a recommendation regarding disposition of the remains.

6 - Energy

ENERGY – Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	☒	☐
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☒	☐

Sources: City of Rancho Mirage General Plan (2017); League of California Cities, Southern California Edison (accessed April 2024); Southern California Edison, 2022 Power Content Label (accessed April 2024); Imperial Irrigation District, About IID Energy (accessed April 2024); Southern California Gas, Natural Gas Pipeline Map (accessed April 2024); Urban Crossroads, Via Vail Traffic Scoping Letter and VMT Screening Scope (Appendix E).

6.1 Setting

Electricity

A large portion of Rancho Mirage receives electrical power from Southern California Edison (SCE), while a subarea of the City receives electricity from the Imperial Irrigation District (IID).

SCE is one of the largest utility providers in California, serving approximately 15 million people and encompassing a 5,000 square mile area of central, coastal, and southern California.[10] As of 2022, SCE's energy sources range between nonrenewables such as fossil fuel (coal and natural gas) and renewable sources including nuclear, hydroelectric, solar and wind.[11] In Rancho Mirage, SCE operates an electrical power system consisting of transmission lines and three substation service facilities located at Highway 111 east of Thunderbird Cove, Clancy Lane at Monterey Avenue, and Plumley Road south of 35th Avenue.

IID is a not-for-profit utility district servicing a population of approximately 150,000 people within a 6,471 square mile area encompassing Imperial County and parts of Riverside and San Diego counties. IID exceeds all Renewable Portfolio Standards by relying on renewable sources

10 League of California Cities, "Southern California Edison", https://www.calcities.org/partner/edison, accessed April 2024.

11 Southern California Edison, "2022 Power Content Label", https://www.sce.com/sites/default/files/custom-files/PDF_Files/SCE_2022_Power_Content_Label_B%26W.pdf, accessed April 2024.

including biomass, biowaste, geothermal, hydroelectric, solar and wind for energy generation.[12] In Rancho Mirage, areas in the northeast of the City which includes the Project site are serviced by IID.

Natural Gas

Southern California Gas (SCG) provides natural gas to Rancho Mirage via its regional and local distribution lines. These distribution lines transport natural gas from Texas to the Coachella Valley through three east-west trending transmission lines crossing the Valley near and parallel to Interstate 10 and continuing west to Los Angeles.[13] In the City, natural gas is predominantly used by residential, commercial, and industrial land users. The Project will be serviced by SCG for natural gas needs.

6.2 Discussion of Impacts:

a-b) **LESS THAN SIGNIFICANT IMPACT:** The Project will utilize energy resources during construction and operation activities. Construction related demand comes from the operation of construction equipment and the manufacturing of construction material. Operation related demand comes from building and site lighting, HVAC system, and use of electricity and natural gas for residential activities.

During construction and operation, the Project will generate fuel consumption including gasoline and diesel. As a result, construction components including equipment, fuel, materials, and management practices would be subject to current SCAQMD rules and regulations to reduce their potential for environmental impact. The Project will also be required to comply with the state Low Carbon Fuel Standard for construction equipment and heavy-duty vehicle efficiency standards. These standards are implemented to increase fuel efficiency and, in return, reduce wasteful fuel consumption and construction related pollutant emissions. Therefore, the Project's use of fuel is not anticipated to interfere with fuel efficiency standards either directly or indirectly, or result in wasteful, inefficient, or unnecessary consumption of energy sources during construction.

At buildout, the Project would have been constructed in accordance with the most current Building Code, California Green Building Code, and Energy Code which by design will implement the most efficient construction/building technologies to benefit the buildings' operation, ensure energy efficiency, and reduce wasteful and unnecessary consumption of energy resources. The Project is required to comply with these codes which ensures the no energy overconsumption or waste occurs during the Project's long-term operation.

A site-specific CalEEMod was performed (See Appendix A) in which results determined that the proposed residential project would consume 1,615,843 kWh per year of electricity, and 4,004,973 kBTU per year in natural gas. Actual consumption of energy is expected to be reduced with the use of energy efficient appliances. The Project will comply with all

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12 Imperial Irrigation District, About IID Energy, https://www.iid.com/energy/about-iid-energy#:~:text=Located%20in%20a%20region%20with,%2C%20hydroelectric%2C%20solar%20and%20wind, accessed April 2024.

13 Southern California Gas, Gas Transmission Pipeline Interactive Map, Riverside, https://socalgas.maps.arcgis.com/apps/webappviewer/index.html?id=aaebac8286ea4e4b8e425e47771b8138, accessed April 2024.

state Building Codes and Green Building Codes regarding renewable energy and energy efficiency as required by law, including the installation of solar panels within the Project.

Additionally, SCG and IID as utility provides are responsible to apply all laws and standards to ensure developments are consistent with State and regional energy efficiency goals and policies. Therefore, the Project is expected to be consistent with any state and regional energy standard and plan and thus ensure energy efficiency is applied at all stages of the development. Less than significant impacts will occur.

6.3 Mitigation Measures: None required.

7 - Geology and Soils

GEOLOGY AND SOILS – Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
iv) Landslides?	☐	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☒	☐
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☒

Sources: City of Rancho Mirage General Plan (2017); City of Rancho Mirage General Plan Updated Environmental Impact Report (2005); U.S. Geological Survey (accessed April 2024); Petra Geoscience, Design Phase Geotechnical Investigation Report (Appendix D); Google Earth Pro.

7.1 Setting

The Coachella Valley, part of the western end of the Colorado Desert Province, is a northwest-southeast trending valley depression, consisting of a climate and environment typical for southern California desert country. The Valley is surrounded by steep mountains including the San Jacinto and the Santa Rosa Mountains to the west; the San Bernardino and the Little San Bernardino Mountains on the north; the Cottonwood Mountains and the Mecca Hills on the east; and the Salton Sea to the south. The elevation on the Valley floor ranges from 1,600 feet above sea level at the western end, near the City of Palm Springs, to 250 feet below sea level at the Salton Sea.[14]

According to the Rancho Mirage General Plan Environmental Impact Report (EIR), the City is vulnerable to multiple geological hazards including strong ground shaking, seismic induced settlement, seismic induced landslides, collapsible and expansive soil, ground subsidence, and windblown sand hazards.

Strong Ground Shaking

The Coachella Valley is a seismically active area with numerous active faults. The San Andres fault zone is the most prominent fault within the Coachella Valley and is considered “active” for showing geological evidence of surface displacement within the past 11,000 years (Holocene epoch). The San Andreas fault is a strike-slip fault where the Northern American and Northern Pacific tectonic plates meet and create a fault boundary running for more than 800 miles, starting at the Gulf of California and continuing northwest through the Coachella Valley and north. In the worst-case-scenario, the San Andreas fault has the potential to generate an 8.0 magnitude earthquake which could damage underground infrastructure, cause buildings to collapse, and trigger catastrophic geographical hazards throughout the City of Rancho Mirage.

Due to the City’s proximity to the Banning fault and the Garnet Hill fault, the City is susceptible to strong ground shaking from either fault. The Banning fault is an active right-lateral strike slip-thrust fault part of the northern segment of the San Andres fault zone.[15] The Garnet Hill, part of the southern strand of the San Andreas fault, is a right lateral strike fault.[16] These faults are located north of Interstate-10 and south of the Little San Bernardino Mountains, outside Rancho Mirage’s Sphere of Influence (SOI). In the event of surface displacement, both faults have the capacity to generate a ≤7.0 magnitude earthquake which has the potential to cause severe property damage and potential loss of life.

Other regional faults include the Palm Canyon fault and the Deep Canyon fault located in the Santa Rosa Mountains, beyond the Rancho Mirage city limit to the south. Additionally, the San Jacinto fault and the San Gorgonio Pass fault are secondary sources of strong ground shaking and seismically induced hazards in Rancho Mirage.

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14 Coachella Valley Resource Conservation District, “Coachella Valley”, https://www.coachellavalleyrcd.org/coachella-valley, accessed April 2024.

15 Southern California Earthquake Data Center, “Banning Fault Zone”, https://scedc.caltech.edu/earthquake/banning.html, accessed April 2024.

16 Southern California Earthquake Data Center, “Garnet Hill Fault”, https://scedc.caltech.edu/earthquake/garnethill.html, accessed April 2024.

Seismically Induced Liquefaction

Areas where groundwater is within 50 feet of the surface and seismic events generating a Modified Mercalli Intensity value of seven or greater can occur are highly susceptible to seismic induced liquefaction.

Most of Rancho Mirage's developed area is classified as "moderately" susceptible to liquefaction[17] because the City's surface consists of fine-grained sediment. However, the probability of liquefaction to occur in the City is low because groundwater depth exceeds 50 feet. Nonetheless, seismically induce liquefaction has a potential to occur in or adjacent to the Whitewater River if the surface sediment becomes saturated at the time of an earthquake.[18] The Project site is located approximately 4 miles north of the Whitewater River.

Seismically Induced Settlement

Recently deposited sediments by wind or water are typically loose. In the event of seismic shaking, the loose soil becomes compacted resulting in local or regional settlement of the ground surface. According to the Rancho Mirage 2017 General Plan, most of the City's developed area is highly susceptible to seismically induced settlement. The Project site is located within a highly susceptible area for seismically induced settlement as depicted in the City General Plan.[19]

Seismically Induced Landslides

With several faults occurring to the north and south of the City limit, there is a high potential for seismically induced rock falls and landslides. Seismically induced landslides are likely to occur at the southern portion of the City, along the Santa Rosa Mountains and neighboring canyons. Most of the developed area in Rancho Mirage, including the Project, is in a low-risk zone for rock falls and landslides because of distance from mountain slopes.

Collapsible and Expansive Soil

The potential for collapsible and expansive soil is moderate to high for recently deposited sediments (Holocene aged) laid by wind or water. When saturated, collapsible soils become rearranged and lose cementation, resulting in a substantial and rapid settlement. Rancho Mirage's surface soils consist predominantly of younger alluvial sediment causing the City's developed area to be prone to collapse.

Wind Erosion

Most of Rancho Mirage is highly susceptible to wind erosion because of the Coachella Valley's extreme aridity and the San Gorgonio Pass creating strong and persistent winds in the Valley. A large portion of the City's developed area, encompassing the Project site, is identified as a "Very Severe" wind erosion hazard zone.[20] The remaining developed area is classified as a "Severe" or "Moderate" for wind erosion.

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[17] City of Rancho Mirage General Plan, "Areas Susceptible to Liquefaction", Exhibit 22, 2017.
[18] City of Rancho Mirage General Plan Environmental Impact Report, "Geology and Soils", Oct. 2005.
[19] City of Rancho Mirage General Plan, "Seismically Induced Settlement Susceptibility", Exhibit 23, 2017.
[20] City of Rancho Mirage General Plan, "Wind Erosion Hazard", Exhibit 25, 2017.

Paleontological Resources

Paleontological resources are fossil remains of past life that once occupied the region. These resources are often discovered under older alluvial sediment. According to the City's 2005 General Plan EIR, the majority of Rancho Mirage is in an area with low sensitivity for paleontological resources.

A site-specific geotechnical report was performed by Petra Geoscience to determine the Project's susceptibility to local geological hazards (Appendix D). The report includes the findings from a field survey conducted on February 16, 2024, and testing regarding the engineering properties of onsite soil and percolation. The following discussion is based on the findings of Petra Geoscience report.

7.2 Discussion of Impacts:

a.i) **NO IMPACT:** The site is not located on or near a Fault Hazard Zone as defined by the Alquist-Priolo Earthquake Fault Zoning Act. According to the Project geotechnical report, no evidence for faulting was observed within the site during the field survey. The nearest fault to the Project is Garnet Hill fault, part of the southern strand of the San Andreas fault system, located approximately 3.30 miles northwest of the site. No fault related surface ruptures are expected to occur on the Project site.

a.ii) **LESS THAN SIGNIFICANT IMPACT:** The Project site is in a region with numerous active earthquake faults. The San Andres fault zone is the most prominent fault in the Coachella Valley and has a probable magnitude range of 6.6-8.0 on the Richter scale. The Project would be exposed to strong ground shaking in the event of an earthquake on a nearby fault, thus exposing occupants and structures to related risks. However, the Project will be required to comply with state and local seismic building codes to avoid or reduce the potential risk of strong ground shaking and ensure the safety of occupants onsite. The design and construction of the Project under the most recent building codes are expected to reduce impacts related to strong ground shaking to less than significant levels.

a.iii) **NO IMPACT:** As described above, the majority of Rancho Mirage's developed area is not susceptible to liquefaction unless adjacent to the Whitewater River. The Project is not adjacent to the Whitewater River; therefore, the Project's soil will not be susceptible to liquefaction in the event of saturation. Furthermore, the Project geotechnical report concluded that the site's groundwater is located approximately 160 feet below the ground surface. Due to the site's very deep ground water table the potential for liquefaction at the site is negligible.

Seismically induced hazards include dry sand settlement. Petra Geoscience performed a Project-specific settlement analysis where loose and medium dense poorly graded dune sand was encountered below the ground surface to the depth of ±10 feet which appears to be prone to dry sand settlement during seismic shaking. The Project will be required to prepare final, project-specific geotechnical analyses in conjunction with building permits which would include recommendations for over-excavation to remove unstable surface soils, and compaction of clean fill, which will eliminate the potential for settlement. Therefore, the Project will not adversely affect the geological stability of site or neighboring properties. No impacts are expected.

a.iiiv) NO IMPACT: Based on observations during the field survey and the Project's distance from mountain slopes, the potential for landslide at the site is considered negligible. No impacts are anticipated.

b) LESS THAN SIGNIFICANT IMPACT: According to the City General Plan Wind Erosion Hazard map (Exhibit 25), the subject property is in a "Very Severe" wind erosion hazard area. The proposed development of residential apartment buildings and improvement of Via Vail will result in ground disturbance from preparation and grading, which has the potential to increase the risk of wind induced soil erosion. At buildout, the Project will include new structures, paved surfaces, and landscaping that will stabilize the soil onsite and resist erosion. To ensure erosion is reduced to the greatest extent possible, the Project will be required to develop and implement a site-specific dust control mitigation plan as part of the grading permit to minimize impacts caused by blowing dust and sand during construction (also see Air Quality above). Adherence to these standards will assure that the Project does not increase the risk of soil erosion in the region.

The Project will install onsite drainage retention facilities to retain groundwater onsite and have the capacity to accommodate a 100-year storm event as required. Furthermore, the Project will be required to implement best management practices as identified by the Project's hydrology report and water quality management plan. These Project site designs and actions will ensure no erosion or siltation due to storm water on or off site will occur as a result of the development. Less than significant impact will occur.

c) LESS THAN SIGNIFICANT IMPACT:

Subsidence
Ground subsidence is the gradual settling or sinking of the ground surface. Regional subsidence is caused by the decline of groundwater levels. No documented subsidence has occurred in the vicinity of the Project site. The Coachella Valley Water District, in partnership with the Desert Water Agency, works on recharging the Whitewater River Subbasin as well as reducing groundwater demand by providing recycled water for irrigation needs as stated in the Coachella Valley Water District 2020 Regional Urban Water Management Plan. The Project will no conflict with existing plans focused on reducing the risk of subsidence in the region. As a result, the Project's susceptibility to subsidence is less than significant.

Landslide and Rockfall
See Response VII.a.iv, above.

Liquefaction and Dry Sand Settlement
See Response VII.a.iii, above.

Hydrocollapsible Soils
Hydrocollapsible soils are subject to collapse when exposed to water. The Project's surface consists of native soil in which the upper 3 to 4 feet was found to be dry and very loose to loose. No trace of collapsible soil was identified onsite. The Project's risk to hazards regarding collapsible soil is negligible. Less than significant impacts will occur.

d) **LESS THAN SIGNIFICANT IMPACT:** According to the City's 2017 General Plan EIR, there appears to be no expansive soil within the City limits. Nonetheless, the geotechnical report includes minimum requirements for design and construction of footings and slabs on-grade, which will be incorporated into Project construction plans. Compliance with these recommendations will ensure the impacts are less than significant regarding expansive soil.

e) **NO IMPACT:** The development of permanent residential apartment buildings will include the connection to existing sewer system in proximity to the site. The Project has not proposed the use of septic tanks. The Project will not result in the use in new septic tank or alternative wastewater disposal system. No impact will occur.

f) **NO IMPACT:** As mentioned above, Rancho Mirage has a low paleontological sensitivity. The Project site occurs in an area of young windblown soils, and is not known to have unique paleontological or geologic features. No impact will occur.

7.3 Mitigation Measures: None required.

8 – Greenhouse Gas Emissions

GREENHOUSE EMISSIONS – Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

Sources: City of Rancho Mirage General Plan (2017); CalEEMod Version 2022.1.1.22 (Appendix A); Project materials.

8.1 Setting

Greenhous gases (GHG) occur naturally in the atmosphere to preserve energy from sunlight. These naturally occurring GHG, such as water vapor, carbon dioxide (CO2), methane (CH4), and ozone absorb and re-radiate energy to warm the planet, thus making Earth habitable. However, with the introduction of human activities, the concentration of greenhouse gases has sharply increased to the extent of altering Earth's climate and weather patterns, known as global climate change or global warming. Cardon dioxide (CO2), nitrous oxide (N2O), and methane (CH4), along with synthetic fluorinated compounds are largely contributing to the greenhouse effect and Earth's imbalance. Carbon dioxide is the most significant greenhouse gas as it accounts for 80% of global human-caused emissions and has the longest global atmospheric lifetime of any GHG, ranging from 300 to 1,000 years.

State laws, such as Assembly Bill 32 (AB 32) and Senate Bill 32 (SB 32), require all cities to reduce greenhouse gas emissions to 1990 levels by the year 2020. SB 32 is the extension of AB 32 which requires the state to reduce greenhouse gas emissions to 40% below 1990 levels by 2030.

Rancho Mirage's 2013 Sustainability Plan (RMSP) is a comprehensive plan to reduce GHG emissions at a local scale. The 2013 Sustainability Plan considers the City's projected population growth and future developments as a measure to reduce greenhouse gas emissions below the City's 2010 GHG Inventory baseline of "business as usual". The RMSP aims to be consistent with the goals of AB 32 by reducing GHG emissions to 1990 levels.

Additionally, Rancho Mirage's 2013 Energy Action Plan (RMEAP) is a strategic plan to reduce energy consumption, operation costs, and increase energy awareness. The plan focuses on enhancing energy efficiency which assists the City in moving towards its 10% energy reduction target by 2015.

GHG Thresholds

In December of 2008, the SCAQMD Governing Board adopted a GHG emission threshold of 10,000 metric tons of carbon dioxide equivalent (MTCO2e) per year which only applies to stationary industrial facilities where SCAQMD is the lead agency. This threshold was adopted based on previous threshold recommendations for all projects using a tiered approach.

All projects within SCAQMD jurisdiction must be considered significant if they could not comply with at least one of the following "tiered" tests:

- Tier 1: Is there an applicable exemption?
- Tier 2: Is the project compliant with a greenhouse gas reduction plan that is, at a minimum, consistent with the goals of AB 32?
- Tier 3: Is the project below an absolute threshold (10,000 MTCO2e/year for industrial projects; 3,000 MTCO2e/year for residential and commercial projects)?
- Tier 4: Is the project below a (yet to be set) performance threshold?
- Tier 5: Would the project achieve a screening level with offsite mitigation?

The following analysis is based on the tier system approach.

8.2 Discussion of Impacts:

a-b) **LESS THAN SIGNIFICANT IMPACT:** The proposed development is anticipated to generate GHG emissions during construction and operation. A Project-specific CalEEMod model was performed to calculate the GHG emissions from the proposed development (Appendix A). Construction GHG emissions include the use of construction equipment and transportation of construction materials and personnel. Operational GHG emissions consist of a variety of sources including area sources, energy usage, mobile sources, waste, and water.

Applicable standard requirements and best management practices were included in the model, such as the preparation of a fugitive dust control and management plan in conformance with SCAQMD Rule 403 and low-polluting architectural paint and coating per SCAQMD Rule 1113.

Construction
For purposes of analysis, a two-year period starting from mid-2024 to full buildout by 2026 is assumed. During this time, construction activities will result in short term GHG emissions associated with the operation of construction equipment, employee commutes, material hauling, and other ground disturbances. Construction emissions are projected as follows: 404 MTCO2e/year for 2024, 699 MTCO2e/year for 2025, and 407 MTCO2e/year for 2026. The Project's construction will emit a total of 1,510 MTCO2e/year over a 24-month construction period. To determine if construction-related GHG emissions will result in cumulative impact, buildout GHG emissions were amortized over a 30-year period and added to annual operational emissions to be compared to applicable GHG threshold (See Table 7).

Operation

At buildout, the Project will consist of 15 permanent multifamily apartment buildings and a Club House with recreational space. There will be six GHG emitting sources during the Project's long-term operation. These sources include mobile source, area source, energy usage, water, waste, and refrigeration. During operation, the Projected is estimated to generate 2,714.82 MTCO2e/year. Table 6 showcase each emission source in relation to its projected annual GHG emissions.

Table 6
Total Operation Greenhouse Gas Emissions

Emission Source	CO2e Emissions (metric tons per year)
Mobile	2,186
Area	2.93
Energy	442
Water	20
Waste	63.70
Refrigerator	0.19
TOTAL	2,714.82
Source: California Emission Estimator Model, Version 2022.1.1.22 (Appendix A).	

Table 7
Projected Greenhouse Gas Emission Summary

Phase	CO2e Emissions (metric tons per year)
Construction (2024-2026)	
Construction Total	1,510
Operation	
Construction: 30-year amortized[1]	50.33
Annual Operation	2,714.82
Total Operation	2,765.15
SCAQMD Threshold (Mixed Use)	3,000
Exceeds?	No
[1]Buildout construction GHG emissions were amortized over 30 years then added to buildout GHG emissions. 1,510/30= 50.33 Source: California Emission Estimator Model, Version 2022.1.1.22 (Appendix A); SCAQMD Interim CEAQ GHG Significant Threshold for Stationary Sources, Rules, and Plans (December 2008).	

Table 7 displays the total of (amortized) construction and operational emissions for the Project. Annual GHG emissions are estimated to be 2,765.15 MTCO2e/year. Under SCAQMD's Tier 3, residential development has a GHG thresholds of 3,000 MTCO2e/year which the Project GHG emissions fall below. As mentioned above, the Project will be subject to the Rancho Mirage 2013 Sustainability Plan and the City's 2013 Energy Action Plan. As per the 2013 Sustainability Plan, the Project will be required to conform according to the AB 32 goal of reducing GHG emissions below 1990 levels and thus satisfying Tier

2. All Project components, including equipment, fuels, materials, and best managements practices would be subject to current and future City and SCAQMD rules and regulations related to GHGs. These standards ensure that the Project's GHG emissions do not substantially impact the environment. Therefore, less than significant impact will occur as a result of the Project's construction and operation.

8.3 Mitigation Measures: None required.

9 - Hazards and Hazardous Materials

HAZARDS AND HAZARDOUS MATERIALS – Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
g) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☒

Sources: City of Rancho Mirage General Plan (2017); California Department of Toxic Substance Control, Cortese List (accessed April 2024); State Water Resources Control Board GeoTracker (accessed April 2024); Google Earth Pro.

9.1 Setting

Rancho Mirage has identified hazardous/toxic material generators within the city limit including commercial, quasi-industrial, and medical operations. All of these potentially hazardous sites are considered "small quantity generators" by the City General Plan. Rancho Mirage is not included in the Cortese List. And no active clean-up sites are found in the City.

The Project site is surrounded by vacant, undeveloped land to the south, east and west; residential properties to the south and east; and a commercial/retail plaza to the north. Additionally, the site is bound by Key Largo Avenue to the west, Monterey Avenue to the east, and the proposed extension of Via Vail to the north and east. The site is a vacant, undeveloped parcel with evidence of prior disturbance from surrounding development and off-road vehicle use. No chemical or hazardous waste disposal has been documented onsite. There are no known underground tanks or buried materials on the Project site.

9.2 Discussion of Impacts:

a-b) **LESS THAN SIGNIFICANT IMPACT:** The development of the Project is not expected to transport, use, store, or dispose of hazardous material in a significant quantity. Hazardous materials found onsite are likely to consist to household products such as cleaning material. None of these chemicals will be used in a sufficient quality to pose a threat to humans or cause a foreseeable chemical release into the environment.

During construction, the Project will require the use of heavy construction equipment which uses small amounts of oil and fuel and other potential flammable substances. Refueling and minor maintenance onsite could result in fuel and oil spills. The contractor will be required to identify a staging area for storing materials and will be subject to State law regarding the handling, storage, and use of hazardous material during construction.

There are no identified hazardous sites within the Project's area. The Project will not contain hazardous material or substances in large quantity to pose a risk of explosion or accidental release of hazardous substances. The use and handling of construction related hazardous material will occur in accordance with federal, state, and local laws that ensure the proper transportation, use, storage, and disposal of hazardous material to safeguard the public and the environment. Additionally, the City offers local facilities to properly dispose of household hazardous waste and reduce potential impacts. The Project is expected to generate less than significant impacts.

c) **NO IMPACT:** There are no schools within the Project's vicinity. The nearest is Rancho Mirage High School, located at 31001 Rattler Road, approximately 2.70 miles northwest of the Project site. As discussed above, impacts associated with hazardous materials onsite are expected to be less than significant. Given the distance of the Project to Rancho Mirage High School, potential impacts are considered negligible. No impact will occur.

d) **NO IMPACT:** The Project site is not located on or adjacent to a listed hazardous material site according to the California Department of Toxic Substance Control (Cortese List) and State Water Resources Control Board GeoTracker database. The Project is not expected to create a significant hazard to the public or environment. No impact will occur.

e) **NO IMPACT:** The proposed Project is not located in an airport land use plan or within 2 miles of a public or private airstrip. The site is approximately 6 miles west of the Palm Springs International Airport. Therefore, the Project will not result in a safety hazard or excessive noise for occupants onsite. No impact is anticipated.

f) **NO IMPACT:** In the event of an emergency evacuation, designated evacuation routes in Rancho Mirage include Interstate-10 and Highway-111. Major and minor arterial roadways such as Monterey Avenue, Dinah Shore Drive, Bob Hope Drive, and General Ford Drive are secondary evacuation routes. The Project site is located within less than a mile distance of secondary evacuation routes and ± 0.70 miles north of Interstate-10.

In addition to the Project's development, the improvement and extension of Via Vial is proposed to provide access to the site and serve as a direct emergency route. The design and construction of Via Vail will be in accordance with the City's Circulation Plan and Municipal Code. The Project will be required to comply with police and fire department regulations to assure adequate emergency access and vehicle turn-around space. For these reasons, the Project is not expected to cause a physical interference with the local emergency response or evacuation plan. No impact will occur.

g) **NO IMPACT:** According to the local Fire Hazard Severity Map, the Project site is not located within or in proximity to a Very High Fire Hazard Severity Zone (VHFHSZ).[21] The Project is not located on or adjacent to a wildfire hazard zone. The site's surrounding area is vacant and undeveloped desert land that does not constitute a fire fuel source. The development will not expose people or structures to a significant risk related to wildfire hazards. No impact is expected.

9.3 Mitigation Measures: None required.

[21] City of Rancho Mirage General Plan, "Fire Hazard Severity Zone Map", Exhibit 27, 2022.

10 - Hydrology and Water Quality

HYDROLOGY AND WATER QUALITY – Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Violate any water quality standards or waste discharge requirements?	☐	☐	☒	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☒	☐
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or through the addition of impervious surfaces, in a manner which would: i) Result in substantial erosion or siltation on- or off-site?	☐	☐	☒	☐
ii) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite?	☐	☐	☒	☐
iii) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☒	☐
iv) Impede or redirect flood flows?	☐	☐	☒	☐
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☐	☒
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☐	☒

Sources: City of Rancho Mirage General Plan (2017); Coachella Valley Regional Urban Water Management Plan (2020); Atlas Civil Design, Preliminary Drainage Study (April 2024); Pacific Companies, Water Quality Management Plan (April 2024).

10.1 Setting

Groundwater is the primary source of domestic water supply in the Coachella Valley and accessed from the Coachella Valley Groundwater Basin which consists of 4 subbasins including the Indio/ Whitewater River, Mission Creek, Desert Hot Springs, and the San Gorgonio Pass Subbasin. The Indio/Whitewater River Subbasin, which has a storage capacity of ±10 million-acre feet (af) in the first 700 feet of saturated deposits[22], underlies the City of Rancho Mirage.

The Coachella Valley Water District (CVWD) is a major water utility provider in the Valley. CVWD provides domestic water to cities including Palm Desert, Rancho Mirage, Cathedral City, Indian Wells, and La Quinta, encompassing a population size of approximately 290,000 people. Currently, CVWD services Rancho Mirage water demands related to residential, commercial, and industrial land uses.

Domestic Water

The Project site is located within the CVWD service area for domestic water. CVWD operates and manages an underground water system in Rancho Mirage consisting of 57 wells, 9 aboveground storage reservoirs (water tanks) and an extensive system of distribution lines. CVWD's system of wells accesses the Indio/Whitewater River Subbasin. In addition to groundwater, CVDW imports water brought to the region by regional canals which recharges the aquifer at basins in the west of the Valley (Whitewater, northwest of Palm Springs) and East Valley (Dike No. 4 and Martinez Canyon). In general, CVWD has a total daily water demand capacity of 244 million gallons and an average storage capacity of 153.2 million gallons.

Most recently, CVWD adopted the 2020 Coachella Valley Regional Urban Water Management Plan (UWMP). The UWMP is a region-specific plan analyzing current water supply and estimates water supply based on variables including population growth and city buildout. CVWD is required to periodically update the Plan.

The Project site is currently undeveloped, vacant desert land. Residential and commercial/retail development occur around the site to the north, south, and west. Existing infrastructure including a CVWD water pipeline is located underneath Key Largo Avenue to the north[23], less than a mile from the Project. Prior to operation, the Project will be connected to the existing water service system to adequately provide domestic water onsite for residential, landscape, and recreational (pool) use.

Wastewater Treatment Provider and Sewer System

The CVWD also provides wastewater treatment services to Rancho Mirage, including the Project site. The subject property is located in the northeastern region of Rancho Mirage where there is a mix of sewer system and septic tanks. The Project will be connected to the existing sewer system servicing the residential properties in vicinity to the site. CVWD's wastewater treatment system consists of 6 water reclamation plants, more than 1,000 miles of sewer pipelines, and more than 30 lift stations that collect and transport wastewater to the nearest water reclamation

22 California Department of Water Resources, Coachella Valley Groundwater Basin, Indio Subbasin, updated February 2004.

23 City of Rancho Mirage General Plan, Public Service and Facilities Element, Water Lines (Exhibit 29), 2017.

facility. For Rancho Mirage, all wastewater is collected and routed to CVWD's Cook Street treatment plant in Palm Desert, which has a total daily capacity of 18 million gallons per day (mgd) including 15 mgd tertiary treatment capacity as of 2019.

The Colorado River Basin Regional Water Quality Control Board (CRBRWQB) regulates wastewater treatment requirements for the City. CVWD adheres to all federal, state, and agency standards for recycled water and provides nonportable water to golf, farm, and large landscape areas for irrigation purposes.

Flood Control

Rancho Mirage's annual rainfall is very low, ranging from 4 to 6 inches per year. Nevertheless, the region is subject to unpredictable seasonal rainfall creating flood hazards. Areas of potential flooding are within distance from the Whitewater River and its tributaries, mountain canyons, and alluvial fans, as well as runoff associated with the Indio Hills drainage. According to the City General Plan Flood Map, the 100-year flood zone is generally confined to the Whitewater River channel crossing the southern region of the City. The 500-year flood zone overlaps the Whitewater River channel to include areas south and north of the 100-year flood zone. The Project site is located approximately 2 miles northeast of the nearest flood hazard zone. Additionally, the site is within FEMA Zone X, designated as an area for minimal flood hazard.

In response to the risk of flood hazards, the City has implemented flood hazard reduction measures by adopting local floodplain management ordinance and the 2014 Whitewater River Region Stormwater Management Plan (SMP). The 2014 SMP is a comprehensive plan designed to manage and control stormwater runoff to the maximum extent practical.

10.2 Discussion of Impacts:

a) **LESS THAN SIGNIFICANT IMPACT:** At buildout, the Project site will consist of high density multifamily residential apartment buildings, a Club House, outdoor recreational spaces, and open parking spaces. In terms of infrastructure, the Project will result in the construction of onsite drainage system including curbs, gutters, pipes and retention basins, and underground stormwater storage system.

According to the site-specific preliminary drainage study, the Project's stormwater system will be adequately designed to meet Rancho Mirage retention requirements of a 100-year storm duration between 1, 3, 6, and 24-hours. Additionally, the Project will be required to comply with the National Pollution Discharge Elimination System (NPDES) standards to protect against runoff pollution during construction and operation. A best management practice (BMP) maintenance program will be established to assure ongoing implementation. Impacts associated with water quality are expected to be less than significant.

b) **LESS THAN SIGNIFICANT IMPACT:** As mentioned above, the Coachella Valley Water District will provide domestic water and wastewater treatment services to the Project site. Construction-related water demand is expected to be temporary and limited to spraying on the ground surface or construction equipment for dust control purposes. During operation, water demand will come from apartment units, drought-tolerate landscaping, and public spaces and facilities including the swimming pool.

The CVWD's 2020 UWMP is a water management plan that along with analyzing current water supplies, also calculates future water production and supply by accounting for population growth and city buildout. According to the Plan, CVWD's 2045 retail water demand is 164,966 AFY.[24] CVWD's supply of domestic water is anticipated to fulfill the demand requirement for the year 2045 and ensures full reliability of water supplies during normal conditions.

Once operational, the Project is expected to increase the regional water demand by 64.98 AFY, which is less than once percent (0.039%) of the 2045 projected water demand (See Table 8). Estimated water demand may be subject to change as the Project plans to include drought-tolerate landscaping and will be required to include water efficient fixtures and equipment which will further reduce the Project's water demand. Therefore, the Project is not anticipated to become a source of groundwater depletion to the extent of conflicting with sustainable urban water management. Less than significant impacts will occur.

Table 8
Estimated Water Demand at Project Buildout

Land Use	Indoor/Outdoor Area	Daily Water Demand (gallons/day)	Annual Water Demand (acre foot/year)
Residential	236 units	49,060*	54.95
Native desert landscaping	163,273 SF	9,542.45	10
Community pool	226	32.29	0.04
	TOTAL	58,634.74	64.98
*Per CVWD factors, 55 gpd per occupant, assumed at 892 residents, based on max. allowable residents per unit by number of bedrooms.			

c.i-iii) LESS THAN SIGNIFICANT IMPACT: The subject property is vacant undeveloped desert land covered by sparse desert vegetation, at an elevation that falls from the southwest to the northeast at an average grade of 3%. No rivers or streams are located on or adjacent to the Project site. Currently, the site receives significant runoff from surrounding vacant lands including land to the west and south of the site that drain through the property towards the north. Onsite improvements will include landscape, pedestrian hardscape, and vehicular hardscape areas which are impermeable surfaces. As a result, the proposed Project is anticipated to increase surface runoff.

The Project's Preliminary Drainage Study divided the site into ten tributary areas. Five of these areas will drain to regional retention basins and the other areas will consist of swales or a drainage pipeline system. The site will be graded to direct drainage as surface flow toward the retention basins and the underground pipe system. Four retention basins, three located offsite to the south and west, and the other located onsite to the northeast along Via Vail will provide drainage to the Project.

[24] Coachella Valley Water District, "Regional Urban Water Management Plan", Table 4-25, 2020.

According to the Preliminary Drainage Study, the design of the retention basins adequately meets the City's requirement for retention of flows for a 100-year storm. The Project's design complies with City requirements and conditions of CVWD approval for discharge and relevant standard requirements, which assures impacts associated with storm water retention remain less than significant.

To reduce the discharge of pollutants into stormwater runoff from the site, the Project must implement Best Management Practices (BMPs) included in the Preliminary Water Quality Management Plan (WQMP). The implementation of BMPs address pollutants of concern by reducing the amount of pollutants entering retention basins, as well as reducing short- and long-term water quality impacts caused by the construction and operation of the proposed Project.

The Project's pollutant of concern include, but are not limited to, bacteria, viruses, trash and debris, toxic organic compounds, and oil and grease. The onsite retention/infiltration basin are designed to exceed the BMP volume and will be highly effective at addressing pollutants of concern; therefore, the Project will not contribute to water impairment. The implementation of BMPs and approval of the WQMP will reduce impacts to surface water by reducing siltation and eliminating pollutants in storm water; therefore, impacts associated with surface water pollution are anticipated to be less than significant.

c.iv) **LESS THAN SIGNIFICANT IMPACT:** The Project site is located in a FEMA Zone X, designated as an area with minimal flood hazard. Additionally, the City General Plan flood hazard map indicates that the Project area is not within a local 100-year or 500-year flood hazard zone.[25] The nearest flood zone is approximately 2 miles northeast of the site. The implementation of the proposed onsite drainage retention facilities will further ensure that the Project will have less than significant impact on impeding or redirecting flood flows.

d) **NO IMPACT:** The Project site is in the desert region of southern California where large bodies of water are not within proximity. The nearest is the Pacific Ocean, located ±98 miles to the west of the proposed site. Given the Project's distance to the Pacific Ocean, impacts related to tsunami and seiche are considered negligible. No impacts will occur.

e) **NO IMPACT:** As previously discussed, the Project will be required to comply with all applicable water quality standards and design and implement a water quality management plan approved by the City and the Regional Water Quality Control Board for construction and long-term operation. Adherence to the City's standard requirements related to water quality ensure no impact to a water quality control plan will occur.

10.3 Mitigation Measures: None required.

[25] City of Rancho Mirage General Plan, "Flood Map", Exhibit 26, 2017.

11 - Land Use and Planning

LAND USE AND URBAN PLANNING – Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Physically divide an established community?	☐	☐	☐	☒
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒

Sources: City of Rancho Mirage General Plan (2017); Project materials; Google Earth Pro.

11.1 Setting

The Project is in an urbanized/developed portion of Rancho Mirage. The surrounding area consists of undeveloped, vacant desert land to the south, east, and west. The Monterey Marketplace Shopping Center is located to the north, and the Rancho Mirage Dog Park is located to the northwest, along with residential properties beyond Key Largo Avenue. The Project site is currently undeveloped, unoccupied desert land, zoned for Residential High-Density (R-H) with an Affordable Housing Overlay (AHO). The neighboring area is zoned for Open Space/Public Park, Residential High Density, Residential Very Low Density, and Community Commercial.

The Project proposes a multi-family residential development on ±10 acres where all (100%) 236 dwelling units will be reserved for affordable housing. The R-H land use allows for high density single- and multi-family residential dwelling units and are best suited for affordable housing and senior living, where high density is appropriate and necessary. In addition, an AHO allows for the creative and efficient development of affordable residential properties as identified in the most current City General Plan Housing Element. The Project is consistent and compliant with all R-H/AHO permitted land uses and development standards included in the City's General Plan and Municipal Code.

11.2 Discussion of Impacts:

a) **NO IMPACT:** The subject property is in a residential and commercial/retail area of Rancho Mirage. Currently the site is vacant, undeveloped land. There is no established community occurring within the boundaries of the Project. No physical division to an existing residential community will occur because of the Project's development.

b) **NO IMPACT:** The Project is located within an urbanized area of the City's northeastern region. Under the City's General Plan Land Use Map and Zoning Ordinance, the Project site is designated R-H/AHO due to its proximity to commercial facilities and major roadways. The Project will comply with all relevant development standards and regulations under the City's General Plan and zoning ordinance to ensure development impacts are avoided or minimized to the greatest extent. The Project will implement the City's Housing Element, and contribute to the City's Regional Housing Needs Assessment. The Project is consistent with the City's land use/zoning designation and compatible with the surrounding area. The Project will not conflict with planning regulations or development standards or cause significant environmental impacts associated with such violations. No impacts are anticipated.

11.3 Mitigation Measures: None required.

12 - Mineral Resources

MINERAL RESOURCES – Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

Sources: City of Rancho Mirage General Plan (2017); Project materials.

12.1 Setting

Rancho Mirage consists of limited mineral resources generally including sand and gravel. These sediments are collectively known as aggregate and are important components to construction materials including asphalt, concrete, road base, stucco, and plaster. Currently no mines or extraction sites are located within the City of Rancho Mirage.

12.2 Discussion of Impacts:

a-b) **NO IMPACT:** The Project site consists predominantly of sandy soil. There are no permitted mining operations in the vicinity of the Project site or within the City of Rancho Mirage. The surrounding urban development is planned for residential and commercial land use and is not zoned for mineral resource extraction. Impact to mineral resources as a result of the Project's development is very low because of the limited to no significant mineral resources found in the City. No impacts are expected.

12.3 Mitigation Measures: None required.

13 - Noise

NOISE – Would the project result in:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

Sources: City of Rancho Mirage General Plan (2017); City of Rancho Mirage General Plan Updated Environmental Impact Report (2005).

13.1 Setting

Noise

The main source of noise in Rancho Mirage stems from motor vehicles traffic. According to the City 2017 General Plan Noise Element, the Interstate-10/ Southern Pacific Railroad corridor causes a substantial impact on the noise environment in the City's northern portion. Noise disturbance is largely contributed by high traffic volume on Interstate-10 and to a lesser extent on Highway-111 and major arterial roadways including Monterey Avenue, Dinah Shore Drive, and General Ford Drive. Secondary sources of noise pollution include aircraft and stationary sources such as the operation of mechanical equipment, or the use of HVAC units, and chillers in commercial land uses.

Sensitive receptors to noise are residential properties, schools, libraries, hospitals, and outdoor activity areas. To assure these sensitive land uses are protected from existing and future noise sources, the City General Plan establishes an average exterior noise standards specific to land use. Normal acceptable noise levels for residential low density is 50 dBA, for medium and high density is 55 dBA, and for commercial office and mixed use industrial is 60 dBA. The Project's parcel is designated RH/AHO. The allowed noise levels do not include construction-related noise since construction activities generate temporary noise.

Vibration

The City does not have vibration standards for new development or existing land uses. The California Department of Transportation (CalTrans) sets vibration standards regarding construction activities. The Project will be subject to CalTrans vibration thresholds.

13.2 Discussion of Impacts:

a) **LESS THAN SIGNIFICANT IMPACT:** The subject property is located within a developed portion of Rancho Mirage where residential properties are located to the south and east, and a commercial retail plaza is to the north. The site is between Monterey Avenue (major arterial roadway) to the east and Key Largo Avenue (local street) to the west. Currently, the parcel is vacant and does not contribute to the local noise.

Construction Noise

The Project's development will result in temporary construction noise. Construction activities including the site's grading, construction of buildings, paving or concrete pouring for parking lots, roadways, and other hard surfaces will generate noise. Heavy construction equipment can generate the highest noise level onsite, ranging from 70 to 90 dBA at a distance of 50 feet from the source. However, these sources are mobile and will not create a source of constant noise at any one location on the site.

The Project's surrounding area consists of undeveloped vacant land immediately to the south, east and west. The nearest sensitive land use are single-family residential properties beyond Key Largo Avenue to the west and northwest, approximately 940 feet from the site. The residential properties could experience a noise level substantially lower than the 70 to 90 dBA range with the use of heavy construction equipment due to the distance to these properties. In addition, construction activities will occur between less sensitive daytime hours of 7 am to 6 pm and construction equipment will not be focused on the site's western boundary. Therefore, receptive noise levels within these residential properties are anticipated to be less than significant.

Noise from construction activities will cease once the Project is in operation. Construction noise is exempt from the noise standard set forth in the City Municipal Code Section 8.45.030. Nonetheless, construction is generally restricted during appropriate daytime hours on Monday through Saturday. In accordance with these limitations, construction generated noise will have less than significant impacts on nearby sensitive receptors.

Operational Noise

The Project will result in the development of 15 permanent multifamily residential buildings, a Club House, outdoor recreational spaces including a pool and playground, and the improvement of Via Vail. The Project is likely to become a source of noise due to traffic, residential related activities, and the operation of mechanical equipment. The principal noise source will be from vehicles traveling via Key Largo Avenue and the proposed extension of Via Vail to access the site. Limited noise will be emitted by onsite mechanical equipment. The proposed Project is consistent with the surrounding land uses; therefore, the Project's operation is not expected to substantially increase the ambient noise levels over existing conditions for the area.

Under the R-H land use noise standard, the Project is required to reduce exterior noise to 60 dBA between the hours of 7am-6pm, 55 dBA between 6pm-10 pm, and 50 dBA between 10pm- 7am. The surrounding area is generally quiet, but major sources of noise in the region include Monterey Avenue and Dinah Shore Drive, to the north and east of the site, respectively. According to the City 2005 General Plan EIR, arterial roadways segments range from approximately 71 dBA to about 79 dBA at a distance of 50 feet from the centerline of the road. The Project is at a distance of at least 1,000 feet from Monterey Avenue and Dinah Shore Drive. Therefore, the likelihood of the Project being impacted from traffic noise emitted from these major arterial roadways is low to very low. Furthermore, the Project's design includes a setback of 20 feet and landscaping throughout the site's northern boundary to act as a buffer zone, reducing noise reception from ongoing traffic within the site's vicinity.

At buildout, the Project will be surrounded by residential and commercial/retail use. Noise impacts associated with the Project and its long-term operation are expected to be less than significant.

b) **LESS THAN SIGNIFICANT IMPACT:** The operation of multifamily residential apartment units is not expected to generate groundborne vibration. However, construction activities could generate temporary and short-term vibration from the use of heavy equipment. The Project does not require the use of equipment such as pile drivers, which are known to generate substantial construction vibrations. The highest degree of groundborne vibration could be generated during the paving phase of construction due to the operation of vibratory rollers. According to the Federal Transit Administration (FTA) data, vibration velocities from vibratory roller operations are estimated to be approximately 0.1980 inches per second PPV at 26 feet from the source of activity. The nearest existing structure is approximately 940 feet from where a vibratory roller may be used. The susceptibility to groundborne vibration will be less than the Caltrans significant threshold of 0.3 inches per second PPV for structures and 0.2 inches per second PPV for human annoyance. Therefore, impacts are expected to be less than significant.

c) **NO IMPACT:** No commercial or general airport is located within Rancho Mirage. The Palm Springs International Airport is located approximately 6 miles west of the proposed site. The airport's relative distance to the Project in conjunction with the Palm Springs Airport Master Plan, assures noise level impacts to the area are negligible. No impacts will occur.

13.3 Mitigation Measures: None Required.

14 - Population and Housing

POPULATION AND HOUSING – Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

Sources: U.S. Census Bureau; Southern California Associate of Government, Current Context Demographics and Growth Forecast (Sept. 2020).

14.1 Setting

Based on estimates by the U.S. Census Bureau, the City of Rancho Mirage sustained a population size of 16,992 in 2022. Middle aged men, above the age of 64, represented the majority of residents. On average, there were 1.83 persons per housing unit in a City with 8,735 occupied households. The median annual household income was $105,557.26. The City is projected to reach a population size of 25,200 by 2045 and 13,000 housing units in the same year, according to the Southern California Associated of Government (SCAG).[27]

14.2 Discussion of Impacts:

a) **NO IMPACT:** The Project is expected to contribute to the City's population growth. The Project proposes the construction of 236 units. The Project will increase occupancy within a previously unpopulated area. The Project will increase the City's population of permanent residents, which the City's 2017 General Plan has accounted for and has planned by proposing future improvements of infrastructure and utilities to accommodate its growing population. For this reason, the Project will not induce an unplanned population growth. No impacts will occur.

b) **NO IMPACT:** Currently, the Project site and surrounding area to the south, east, and west are vacant, undeveloped desert lands. There are no existing homes within the Project's vicinity which would be displaced by the Project's development. No displacement or environmental impacts associated with the construction of replacement housing will occur.

14.3 Mitigation Measures: None required.

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[26] U.S. Census Bureau, "Rancho Mirage" https://www.census.gov/quickfacts/ranchomiragecitycalifornia, accessed March 2024.

[27] Southern California Associate of Government, "Current Context Demographics and Growth Forecast", https://scag.ca.gov/sites/main/files/, September 2020.

15 - Public Services

PUBLIC SERVICES – Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
i) Fire protection?	☐	☐	☒	☐
ii) Police protection?	☐	☐	☒	☐
iii) Schools?	☐	☐	☒	☐
iv) Parks?	☐	☐	☒	☐
v) Other public facilities?	☐	☐	☒	☐

Sources: City of Rancho Mirage General Plan (2017); Project materials; Google Earth Pro.

15.1 Setting

Fire Protection Services

The Riverside County Fire Department provides fire protection services to Rancho Mirage under contract with the California Department of Forestry. There are two fire stations located within the City's limit: Station No. 50 and Station No. 69. Station No. 69 is the nearest fire station to the site, located at 71751 General Ford Drive. The fire station is equipped with one medic engine and one medic unit. A total of three firefighters and two firefighters/paramedics are on duty at this station at all hours of the day.

Police Protection Services

Police protection in Rancho Mirage is outsourced to the Riverside County Sheriff's Department which operates out of the Palm Desert Police Station, located at 73705 General Ford Drive. The Palm Desert Station provides protection services to a permanent population size of approximately 51,509. Currently, the Police contract consists of 80 sworn deputy sheriff's positions and several non-sworn support positions to assist with the daily operation and field service.

Schools

The City is serviced by two school districts: the Palm Springs Unified School District, which services the majority of Rancho Mirage, and the Desert Sands Unified School District. Currently, the Palm Springs Unified School District operates one elementary school and high school in the City. There are no Desert Sands Unified schools in Rancho Mirage. There are no schools within the Project's vicinity. The nearest is Rancho Mirage High School, located at 31001 Rattler Road.

Parks

The Rancho Mirage Parks and Trails Commission manages and operates five parks, including a mix of mini and local parks; and six trails that connect the parks with other open spaces in the City. The Rancho Mirage Dog Park is the nearest park to the site, located at 34100 Key Largo Avenue, immediately west of the Project.

Other Facilities

Other public facilities open to the public include the Rancho Mirage Library and Observatory, located at 71100 Highway-111 and the Rancho Mirage City Hall, located at 69825 Highway-111.

15.2 Discussion of Impacts:

a.i-v) LESS THAN SIGNIFICANT IMPACT:

Fire Protection Services

Rancho Mirage Fire Station No. 69 will provide fire protection services including fire protection, fire prevention, rescue, medical emergency service, and public service assistance to the Project. The Fire Station is approximately 2 miles south of the site and the Project is accessible via the intersection of Key Largo Avenue-Via Vail which will connect to the Project. A typical response time is within five minutes, including firefighters and certified paramedics.[28]

The Project is expected to increase the demand for fire protection services in the area because the development will create permanent residential structures. To reduce potential impacts to the efficiency and capacity of the local Fire Station, the Project will adhere to all state and local (Municipal Code and RCFD) fire standards. The Project will be required to pay a development impact fee to contributes its fair share of costs for future fire facilities, personnel, and apparatus. Less than significant impacts are anticipated for these reasons.

Police Protection Service

The Palm Desert Police Department is located approximately 2 miles southeast of the site and accessible via the interception of Key Largo Avenue-Via Vail (future extension). The Police response time in Rancho Mirage for Priority 1 calls is 5.9 minutes.[29]

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28 City of Rancho Mirage General Plan, "Public Service and Facilities Element", (2017).
29 City of Rancho Mirage General Plan, "Public Service and Facilities Element", (2017).

The Project proposes the development of new permanent residential structures. The increase in residents in the area will increase the demand of policing services above the existing levels. The Project will be required to comply with all Police Department regulations and procedures, and the Project plans will be reviewed by the Police Department for adequate emergency access. It is not expected for a new police station to be constructed to properly service the area or the site. No environmental impact associated with the expansion or construction of services will occur. Less than significant impacts are anticipated.

Schools

Intended for residential use, the Project is likely to increase the number of students enrolled in nearby schools including the Rancho Mirage High School. As a result, the Project will be required to pay the State mandated development impact fee of $4.79 per square foot.[30] The development fee will reduce potential impacts to less than significant levels.

Parks/ Other Public Facilities

The Project site is immediately adjacent to the Rancho Mirage Dog Park on the west side. A future community park, including the dog park, along Key Largo Avenue has been proposed but no official development plans have been approved. The Project, east of the dog park, will consists of permanent residential structures and a centralized amenities building encompassing recreational facilities such as fitness room, two clubrooms, and an outdoor pool. The Project is likely to increase the volume of residents to the local parks but not to the extent of degrading the physical conditions of these facilities. No expansion or construction of new parks is required. The Project is expected to cause less than significant impacts.

The Rancho Mirage Library and Observatory and City Hall are less than 4 miles southwest of the site. The Project is proposing a residential development that will increase the number of permanent residents in the area. Public facilities such as the public library and City Hall are likely to experience an increase in visitors. However, the Project does not warrant the expansion or construction of public facilities to adequately service the Project's residents. Less than significant impacts are anticipated.

15.3 Mitigation Measures: None required.

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30 Palm Springs Unified School District, https://www.psusd.us/Page/2400, accessed March 2024.

16 - Recreation

RECREATION – Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☒	☐
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?	☐	☐	☐	☒

Source: City of Rancho Mirage General Plan, Conservation and Open Space (2017); Project materials; Google Earth Pro.

16.1 Setting

The Rancho Mirage Parks and Trails Commission manages five parks, including a mix of mini and local parks; and six hiking trails that connect the parks with other open spaces in the City. The Rancho Mirage Dog Park is the nearest outdoor recreational space in proximity to the site, located adjacent to the Project on the northwest. Other recreational facilities include the Rancho Mirage Library and Observatory which are located along the Santa Rosa Mountains and Highway-111, less than 4 miles southwest of the site.

16.2 Discussion of Impacts:

a) **LESS THAN SIGNIFICANT IMPACT:** As a result of the Project, multi-family residential structures and a Club House with complementary amenities will occur onsite. The Project plans to include amenities such as a fitness room, clubrooms, office spaces, an outdoor swimming pool, and playground. These onsite recreational spaces are intended to reduce potential impacts to neighborhood and regional public facilities. The volume of new visitors to public facilities outside of the Project is not expected to substantially degrade the physical conditions of these facilities. For this reason, less than significant impacts will occur.

b) **NO IMPACT:** The Project includes recreational facilities. These amenities are intended to minimize potential impacts to public creational facilities. The Project does not warrant the need for the construction or expansion of recreational facilities to adequately service the public. No environmental impacts associated with these facilities will occur as a result of the Project. No impacts are anticipated.

16.3 Mitigation Measures**:** None required.

17 - Transportation

TRANSPORTATION – Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☐	☒	☐
b) Conflict or be inconsistent with CEQA Guidelines § 15064.3, subdivision (b)?	☐	☐	☒	☐
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☒	☐
d) Result in inadequate emergency access?	☐	☐	☒	☐

Source: "Via Vail Village Traffic Analysis," and VMT Screening letter prepared by Urban Crossroads (Appendix E).

17.1 Setting

The City's General Plan establishes standards and policies related to traffic operations. The Circulation Element establishes a street classification system based on cross sections and the configuration and width of right-of-way features, such as medians, bike lanes, landscaped parkways, and sidewalks. In the Project area, Monterey Avenue and Dinah Shore Drive are classified as Major Arterials, and both Key Largo and Via Vail are unclassified, meaning that they are local streets according to the General Plan.

The General Plan has established Level of Service (LOS) D as the upper range of acceptable circulation movements on City. Under current conditions, intersections in the Project area operate at acceptable LOS – all intersections operate at LOS C or better, with the exception of Shopper's Lane/Dinah Shore and Monterey/Dinah Shore, which operate at LOS D in the evening peak hour.

Transit services are provided by the SunLine Transit Agency, a joint powers authority composed of Valley cities. SunLine's Route 4 operates on Dinah Shore Drive immediately north of the Project, including bus stops for each direction of travel at Monterey Marketplace, approximately 1,100 feet northeast of the Project site.

The City's system of bike lanes is incomplete in the Project area. There are existing bike lanes on Monterey Avenue, south of Monterey Marketplace, and on Dinah Shore Drive, east of Monterey

Avenue. No bike lanes exist on Dinah Shore west of Monterey in the vicinity of the proposed Project.

Effective July 1, 2020, the California Environmental Quality Act (CEQA) Guidelines require lead agencies to adopt Vehicle Miles Traveled (VMT) as a replacement for automobile delay-based LOS as the measure for identifying transportation impacts for land use projects. City of Rancho Mirage Resolution 2021-06 (City Guidelines) aligns the City's VMT analysis policy with SB 743 and the City's goals as set forth in the General Plan Update (2017).

17.2 Discussion of Impacts:

a) **LESS THAN SIGNIFICANT IMPACT:** The following discussion and analysis are based on the Project specific Traffic Analysis prepared for the proposed Project[31] The complete report is provided in Appendix E. The Traffic Analysis assumed that the City will condition the Project to build Via Vail as a local street, including a 60 foot cross-section, with 40 feet of pavement, curb, gutter, sidewalk and parkway.

The proposed Project was analyzed by using the Institute of Transportation Engineers' "Trip Generation, 11th Edition," using land use category 223, Affordable Housing. On that basis, as shown in Table 9, the Project will generate 1,135 daily trips, 85 of which will occur in the morning peak hour, and 109 in the evening peak hour.

Table 9
Trip Generation Summary

Trip Generation Rates[1]

Land Use	ITE LU Code	Quantity[2]		AM Peak Hour In	Out	Total	PM Peak Hour In	Out	Total	Daily
Affordable Housing	223	236	DU	0.10	0.26	0.36	0.27	0.19	0.46	4.81

Trip Generation Results

Land Use	ITE LU Code	Quantity[2]		AM PeakHour In	Out	Total	PM PeakHour In	Out	Total	Daily
Affordable Housing	223	236	DU	24	61	85	64	45	109	1,135

[1] Trip Generation Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, 11th Edition (2021).
[2] DU = Dwelling Unit

The trips generated by the Project were then distributed on the City's roadway network in order to determine the impacts on 5 area intersections and the Project's main access point. In addition to ambient growth, the analysis added cumulative projects in the area, including two planned affordable housing projects south of the proposed Project on Via Vail. This analysis resulted in an opening year traffic analysis for the Project which represents conservative conditions, since all cumulative projects in the area may or may not be constructed in the future. As shown in Table 10, all studied intersections will operate at acceptable levels, consistent with the City's General Plan policies.

[31] "Via Vail Village Traffic Analysis," prepared by Urban Crossroads, May 21, 2024.

Table 10
Intersection Analysis
Opening Year: Existing Plus Ambient Plus Cumulative Plus Project Conditions

			Intersection Approach Lanes[2]												Delay[3] (secs.)		Level of Service	
		Traffic	Northbound			Southbound			Eastbound			Westbound						
#	Intersection	Control[1]	L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
1	Key Largo Av. / Dinah Shore Dr.	TS	1	0	1	0	0	0	1	3	0	1	3	0	18.2	15.8	B	B
2	Key Largo Av. / Via Vail	CSS	0.5	0.5	d	0.5	0.5	d	0	1!	0	0	1!	0	11.8	22.6	B	C
3	Miriam Wy. / Dinah Shore Dr.	TS	1	1	0	1	1	0	2	3	0	1	3	1	6.6	25.0	A	C
4	Shoppers Ln. / Dinah Shore Dr.	TS	1	1	0	2	1	0	2	3	0	1	3	1	27.1	46.6	C	D
5	Monterey Av. / Dinah Shore Dr.	TS	2	3	0	2	3	1>>	2	2	1	2	2	1	42.1	53.7	D	D
6	Via Vail / Project Entry	**CSS**	**0.5**	**0.5**	0	0	**1**	0	0	**1!**	0	0	0	0	9.9	10.3	A	B

1 TS = Traffic Signal; CSS = Cross-street Stop
2 When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.
L = Left; T = Through; R = Right; d = Defacto Right Turn Lane; 0.5 = Shared Lane; 1! = Shared Left/Through/Right lane;
>> = Free-Right Turn; **1** = Improvement
3 Per the Highway Capacity Manual (7th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown. Delay and level of service is calculated using Synchro 12 analysis software.

The study also included a traffic signal warrant analysis, and found that under both opening year and opening year plus cumulative conditions, warrants were not met for traffic signals at any of the studied intersections.

Finally, the study conducted a queuing analysis for both the intersection of Key Largo/Via Vail and Via Vail at the Project entry in the southeastern portion of the Project. That analysis found that there was no need for additional queuing storage at Key Largo/Via Vail, and that Via Vail will operate adequately at the Project entry with one northbound shared through/left lane and one southbound through/right lane. The City will condition the Project to construct these improvements, and install cross-street stop signs as provided in the Traffic Study. With the implementation of City requirements for street construction and conditions of approval, the Project will have less than significant impacts on General Plan Circulation Element policies.

b) **LESS THAN SIGNIFICANT IMPACT:** Section 15064.3, subdivision (b) of the CEQA Guidelines establishes guidelines for implementing Senate Bill 743, requiring the provisions of an alternative to LOS for evaluating transportation impacts. Alternate measurements of transportation impacts may include “vehicle miles traveled, vehicle miles traveled per capita, automobile trip generation rates, or automobile trips generated.”[32] The City adopted regulations and thresholds pertaining to vehicle miles traveled (VMT) and the reduction of GHG emissions, which is modeled on the County of Riverside Transportation Analysis Guidelines for Level of Service, Vehicles Miles Traveled. The City adopted Resolution 2021-06 to formalize its VMT policy. These guidelines are based on

32 California Public Resources Code Section 21099(b)(1) (2021).

the Governor's Office of Planning and Research Technical Advisory on Evaluating Transportation Impacts on CEQA.

The City's policy establishes guidelines which, if met, exclude a Project from submitting detailed VMT analysis. These criteria include the following:

- Small Projects
- Projects near high quality transit
- Affordable housing
- Projects in an area under VMT thresholds as shown on screening maps (Low VMT Area)

The Project proposes the development of 236 units of housing affordable to lower income households, and thus is presumed to have a less than significant impact relating to VMT analysis. As discussed above, the proposed Project is consistent with the General Plan, and is anticipated to have no significant impact on traffic flows and LOS. Therefore, it can be concluded that the Project will not conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b). Impacts will be less than significant.

c, d) **LESS THAN SIGNIFICANT IMPACT:** Access points to the proposed Project will be provided on Via Vail, at the northwest and southeast corners of the site. Regional access to the site will be provided via Dinah Shore Drive, Monterey Avenue and Interstate 10. Emergency vehicles will have access to the site via Key Largo and Via Vail, and eventually will be able to access the southerly extension of this street. The design of the access points will be reviewed by the Police and Fire Departments as well as the City Engineer to assure adequate sight lines and turning movements.

The City standards require the installation of sidewalks along Via Vail. In addition, as recommended in the Traffic Analysis, the City will condition the Project to provide an on-street bike lane and no parking on Via Vail, particularly along that portion of the roadway that curves from an east-west to a north-south direction. This requirement will assure that the lowered visibility associated with the curvature of the road does not pose a hazard.

The proposed Project will therefore not result in increased hazards due to geometric design features or inadequate emergency access.

17.3 Mitigation Measures: None required.

18 - Tribal Cultural Resources

TRIBAL CULTURAL RESOURCES – Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code § 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section5020.1(k), or	☐	☒	☐	☐
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code § 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code § 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☒	☐	☐

Source: Agua Caliente Band of Cahuilla Indian, A People's Journey (accessed March 2024); Agua Caliente Band of Cahuilla Indian, Cahuilla Territory (accessed March 2024); Cahuilla Band of Indians, The Culture of Cahuilla Band of Indians (accessed March 2024); City of Rancho Mirage General Plan Environmental Impact Report (2005); CRM TECH, Historical/Archeological Resources Survey Report (Appendix C).

18.1 Setting

Rancho Mirage has served as the home of the Cahuilla People for the past 3,000 years. [33] The Cahuilla People are the first known inhabitants of the Coachella Valley. The region provided the Cahuilla tall mountains, deep valleys, rocky canyons, passes and arid deserts lands for sustenance and shelter. The Cahuilla People evolved into three distinct groups identified by their respective geographical zones: Mountain, Pass, and Desert.

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33 Augustine Band of Cahuilla Indians, "The Cahuilla People", https://augustinetribe-nsn.gov/cahuilla-people/, accessed March 2024.

The Mountain Cahuilla occupied the San Jacinto Mountain. The Pass Cahuilla lived in the San Gorgonio Pass, a corridor that cross between the San Bernardino Mountains to the north and the San Jacinto Mountains to the south. The Desert Cahuilla occupied the lower area of the Coachella Valley and areas near the Salton Sea. Although these groups were geographically separated and spoke different dialects of their native language, they shared traditions, beliefs, and practiced similar lifestyles.[34]

The Desert Cahuilla encompasses most of the northwest region of valley floor that is now the cities of Palm Springs, Cathedral, Rancho Mirage, and unincorporated areas of Riverside County. The Desert Cahuilla relied heavily on hunting, gathering, and agriculture. They lived in small, dispersed communities and had a systematic decision-making process and resource management that centered on community. They were skilled basket weavers, and their baskets were used for a variety of purposes including food storage and transportation.[35]

At the time of the first contact with European settlers in the late 18th century, the Desert Cahuilla population occupied their ancestral lands but the Spanish began to protest their claim for economic opportunities including the establishment of trade routes from Mexico and setting up mission to practice Catholicism. After the Mexican Revolution began in 1810, the Mexican government gained much of California and began to take Cahuilla lands and grant them to their own people for farming and ranching. The exploitation and displacement of the Cahuilla became exacerbated with the wave of new settlers taking over more of Indian lands, streams, and resources in the 1840's. In response to the Native Indian conflicts, the Indian Rights Association was created to protect lands for native tribes. The organization proposed reserving parcels of land, starting with the Desert Cahuilla, including the Agua Caliente Band of Cahuilla Indians (ACBCI).

The federal government, under executive order, established the first Indian reservation for the ACBCI in 1877 and expanded the initial order the following year. Today, approximately 31,000 reservation acres and 7,000 off-reservation lands make up ACBCI's lands. The reservation extends across parts of Riverside County and the cities of Palm Springs, Cathedral, and Rancho Mirage in a checkerboard pattern of landholding that includes tribal trust land, allotted trust land, and fee lands.[36]

A total of six Cahuilla cultural heritage sites have been identified in Rancho Mirage and one in the City's Sphere of Influence (SOI). These sites include the Bradley Canyon Trail, Magnesia Spring, Edom Hill/Indian Hills, and Bradley Canyon. Additionally, all of Rancho Mirage is located within a Tribe designated Traditional Use Area.

18.2 Discussion of Impacts:

a-b) **LESS THAN SIGNIFICANT IMPACT WITH MITIGATION INCORPORATED:** On February 5, 2024, CRM TECH submitted a request to the State of California Native American Heritage Commission (NAHC) for records search in the commission's Sacred Land Files. Additional information on potential Native American cultural resources in the

[34] Agua Caliente Band of Cahuilla Indians, "A People's Journey" https://aguacaliente.org/documents/OurStory-10.pdf, accessed March 2024.
[35] Cahuilla Band of Indians, "The Culture of Cahuilla Band of Indians", https://cahuilla-nsn.gov/about/culture/, accessed March 2024.
[36] Agua Caliente Band of Cahuilla Indian, "Cahuilla Territory", https://aguacaliente.org/documents/Cahuilla_Territory.pdf, 2022.

vicinity was derived from Agua Caliente Band of Cahuilla Indians. From the research, the archeologist determined that no Native American cultural resources occur in the Project's vicinity. However, the Project is located in a Tribe Traditional Use Area and thus mitigation measures must be applied to ensure no cultural resources are damaged during ground disturbance related to the Project's construction.

The City conducted Tribal consultation pursuant to AB 52 by sending out consultation request letters on April 24, 2024. The City received two responses to these letters. The first, submitted by the Augustine Band of Cahuilla Indians, indicated that they did not have resources in the area, but requested that they be provided information should resources be found on the site. They declined consultation. The second, received from the ACBCI, requested consultation, as well as copies of the cultural resource study and site records, which were provided to the Tribe. The City met with the ACBCI on June 1, 2024, and the Tribe requested the presence of monitors during earth moving activities. This request is reflected in the mitigation measures in Section 5.

To protect potential tribal cultural resources, Mitigation Measure CUL-1 and CUL-2 are included in Section 5, consistent with the findings of the cultural resource study to require monitoring of ground disturbance occurring in the Project's area, and the ACBCI's request for monitoring. After mitigation, impact to Tribal cultural resources are expected to be less than significant.

18.3 Mitigation Measures: See Section 5.

19 - Utilities and Service Systems

UTILITIES AND SERVICE SYSTEMS – Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☒	☐
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	☒	☐
c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the projects projected demand in addition to the providers existing commitments?	☐	☐	☒	☐
d) Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☒	☐
e) Comply with federal, state, and local management and reduction statues and regulations related to solid waste?	☐	☐	☒	☐

Sources: City of Rancho Mirage General Plan (2017); CVWD Regional Urban Water Management Plan (2020); CalRecycle Estimated Solid Waste Generation Rates (accessed April 2024); Cal Recycle Solid Waste Information System (accessed April 2024).

19.1 Setting

Domestic Water

Rancho Mirage domestic water services are provided by the Coachella Valley Water District (CVWD). The CVWD pumps water from the Whitewater River Subbasin that underlies major portions of the Coachella Valley, encompassing approximately 400 square miles. The CVWD operates and manages 95 active wells, 58 distribution reservoirs, 1,978 miles of distribution pipelines, and services a population size of 290,000 for the cities of Cathedral City, Indian Wells, La Quinta, Palm Desert, and Rancho Mirage.

The CVWD's domestic water system serving Rancho Mirage include 57 wells, 9 aboveground storage reservoirs (water tanks) and an extensive system of distribution lines throughout the City as indicated by the City 2017 General Plan, Water Lines Map.[37]

Wastewater Treatment Provider and Sewer System

Wastewater services are provided by the CVWD. The CVWD wastewater collection system includes 6 water reclamation plants from Palm Desert to Thermal, more than 1,000 miles of sewer pipelines, and more than 30 lift stations that collect and transport wastewater to the nearest water reclamation facility.

The majority of Rancho Mirage's developed area utilizes the CVWD's sewer apart from Thunderbird County Club, the Vista Del Sol corridor, and the lands in the northeast quadrant of Rancho Mirage that rely on septic tanks for water disposal.[38]

Stormwater Management

In collaboration, the Riverside Flood Control and Water Conservation District, CVWD, and Riverside County municipalities developed and implement the Updated 2015 Whitewater River Region Stormwater Management Plan (SWMP) to establish activities and programs to manage stormwater and reduce urban runoff to the maximum extent practical. Stormwater management for the Project is under the jurisdiction of the City.

Electric Power and Natural Gas

Rancho Mirage's power is sourced from electricity and natural gas. SCE and IID service Rancho Mirage with electrical power. The Project is served by IID. IID is a not-for-profit utility district servicing most of the lower Valley from Palm Desert to and Imperial County.

Southern California Gas (SCG) provides natural gas to Rancho Mirage and the City's Sphere of Influence (SOI) via its regional and local distribution lines. These distribution lines transport natural gas from Texas to the Coachella Valley through three east-west rending transmission lines crossing the Valley near and parallel to Interstate 10 and continuing west to Los Angeles.[39] In Rancho Mirage, natural gas is typically used for space heating, domestic and commercial hot water, cooking, and air conditioning.

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37 City of Rancho Mirage General Plan, "Water Lines", Exhibit 29, 2017.
38 City of Rancho Mirage General Plan, "Sewer Service", Exhibit 30, 2017.
39 Southern California Gas, "Gas Transmission Pipeline Interactive Map", https://socalgas.maps.arcgis.com/apps/webappviewer/index.html?id=aaebac8286ea4e4b8e425e47771b8138, accessed April 2024.

Solid Waste

Burrtec Waste Industries Inc. (Burrtec) provides solid waste management and disposal services to Rancho Mirage. Burrtec offers a range of residential services in addition to twice a week pick-up, including bulky item pick up, electronic waste, household hazardous waste and used motor oil disposal. Disposal of waste from commercial, construction related activities, and special events are also included.

Most trash is taken to the Edom Hill Transfer Station, located at 70100 Edom Hill Road in Cathedral City, approximately 6.70 miles northwest of the Project. The Edom Hill Transfer Station has a permitted capacity of 3,500 tones per day for general waste and 10,221 cubic yards for composting.[40] In addition, recyclable materials are collected and transferred to a Material Recovery Facility (MRF) for sorting and processing, and then shipped for repurposing. The MRF closest to Rancho Mirage is the West Valley Transfer Station/ MRF in Fontana.

19.2 Discussion of Impacts:

a-c) LESS THAN SIGNIFICANT IMPACT:

Water and Wastewater
The Project site falls within the jurisdiction of the CVWD for domestic water and wastewater treatment services. The Project is expected to be connected to the existing service system in proximity to the site. The CVWD's 2020 Regional Urban Water Management Plan shows that the district has available and is able to distribute domestic water to the Project site in the foreseeable future. The 2045 retail water demand is 164,966 AFY for residential, commercial, and industrial users within CVWD's serve area.[41] CVWD's supply of domestic water is anticipated to fulfill the demand requirement for the year 2045 and thus ensures full reliability of water supplies during normal conditions. At full buildout, the Project is expected to increase the regional water demand by 64.98 AFY, which is about 0.039% of the 2045 projected water demand (See Table 8 above).

The Project will increase the regional water demand by less than one percent. For this reason, the long-term operation of the proposed residential project will have negligible effects on the CVWD's capacity to supply domestic water adequately and effectively. Based on the 2020 Regional Urban Water Management Plan, the CVWD has available, or can supply, domestic water to its existing service area in addition to any projected city buildout in the reasonably foreseeable future.

The Project will require the construction of onsite sewer infrastructure to connect to existing wastewater system in proximity to the site. Project generated wastewater will be routed and treated at the CVWD's Wastewater Reclamation Plan (WRD)-10 in Palm Desert. WRD-10 provides wastewater services and treatment to four cities including Palm Desert, Rancho Mirage, Indian Wells, and portions of Cathedral City for a combined population size of approximately 90,000. WRP-10 is a tertiary treatment plan with a design capacity of 15 MGD. The Project is expected to generate the average wastewater factor

[40] City of Rancho Mirage General Plan, Public Service and Facilities, 2017.
[41] Coachella Valley Water District, Regional Urban Water Management Plan, Table 4-25, 2020.

for residential land use. The Project's relative size and land use is not anticipated to limit or substantial impact the CVWD's capacity to supply domestic water and wastewater services to the site or service area. Less than significant impact is expected as the result of the Project's long-term operation.

Stormwater Management
The Project site is currently undeveloped open desert land. In proximity to the site is vacant undeveloped land immediately to the south, east and west, and the Monterey Marketplace Shopping Center to the north. The proposed site receives significant runoff from surrounding vacant lands. Property to the west and to the south drain through the site towards the commercial/retail shopping center to the north.[42]

In this regard, the drainage system proposed by the Project includes four retention basins, one located onsite to the northeast adjacent to the proposed extension of Via Vail, and three located outside the Project's boundary between Rancho Mirage Dog Park and the Project site, and along the Project's western and southeastern boundary. The drainage system has been designed to withstand a 100-year storm event as required by the City. The Project does not warrant the construction or expansion of stormwater management facilities. The environmental impacts associated with said construction are negligible, thereby reducing the Project's potential impacts to less than significant levels.

Electricity and Natural Gas
Each residential unit is expected to have electrical and/or natural gas appliances including, but not limited to, a stove, space heater, and air conditioner. The Project will provide local connection to the existing IID and Southern California Gas infrastructure located within proximity.

Telecommunication
The Project will provide local connection to existing Frontier Communication and Spectrum infrastructure. The Project does not require the expansion or construction of new facilities to adequately service the site. Less than significant impacts will occur as a result.

d-e) **LESS THAN SIGNIFICANT IMPACT:** The site is currently undeveloped, vacant desert land. At buildout, the site will include 15 multifamily residential buildings constituting a total of 236 dwelling units, a centralized building with complementary amenities such as laundry room, fitness room, clubrooms, and community pool. Garage and outdoor parking will also be provided onsite.

As discussed above, Burrtec will provide solid waste treatment and disposal services to the Project. The collected waste is taken to the Edom Hill Transfer Station in Cathedral City. The Edom Hill Transfer Station has a maximum permitted capacity of ±3,500 tons per day (or ±1,277,500 tons per year).[43] The Project is estimated to increase the regional solid waste generation by 155.05 tons per year (See Table 12).

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42 Atlas Civil Design Inc., Preliminary Drainage Study, April 2024.
43 CalRecycle Solid Waste Information System Facility/Site Activity Detail. https://www2.calrecycle.ca.gov/SolidWaste/SiteActivity/Details/5189?siteID=4186, accessed April 2024.

Table 11
Estimated Solid Waste Generation at Project Buildout

Land Use	Proposed Dwelling Units	Solid Waste Generation Factor (lbs/dwelling unit/day)	Daily Solid Waste Generation (lbs/day)	Annual Solid Waste Generation (tons/year)
Multifamily Residential	236	3.60	849.60	155.05
			TOTAL (with 50% diversion)	77.53
Source: CalRecycle Estimated Solid Waste Generation Rates, https://www2.calrecycle.ca.gov/WasteCharacterization/General/Rates, accessed April 2024.				

The Project is expected to increase the landfill's service demand by less than one percent. Any recyclable material including glass, metals, paper, and plastic will be diverted and transferred to the MRF in Fontana for proper sorting and processing. Non-recyclables will be transported to the Lamb Canyon Landfill for disposal.

Burrtec is responsible for the proper management and disposal of solid waste in accordance with federal, state, and local policies and ordinance. The regional landfill facilities will not exceed capacity by extending solid waste services to the Project site. Nor is it expected for regulatory policies to be violated as a result of the Project's operation. Less than significant impacts will occur.

19.3 Mitigation Measures: None required.

20 - Wildfire

WILDFIRE – Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☐	☒
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☐	☒
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☒	☐

Sources: City of Rancho Mirage General Plan (2017); CalFire, Fire Hazard Severity Zone Map (2024); Riverside County Multi-Jurisdictional Local Hazard Mitigation Plan (2017); Google Earth Pro.

20.1 Setting

Large portions of Southern California are particularly suspectable to wildfire due to climate, topography, and vegetation. The Coachella Valley is located within the lower subarea of the Colorado Desert Province and characterized by dry hot summers, low annual precipitation, and steep mountain ranges including the San Jacinto Mountains to the southwest, the Santa Rosa Mountains to the south, the San Bernardino Mountains to the northwest and the Little San Bernardino Mountains to the north and northeast.

The California Department of Forestry and Fire Prevention (CalFire) has mapped fire hazard severity zones (FHSZ) throughout rural and developed portions of the state through its Fire and Resource Assessment Program (FRAP). A statewide overview of fire and non-fire susceptible areas are showcased in the CalFire Fire Hazard Severity Zone Map, where FHSZs are evaluated and designated “Moderate”, “High”, or “Very High” severity zones. The designation is dependent on four main criteria: (1) existing and potential fuel, (2) fire history, (3) typical local weather, and (4) assets at risk. These factors have the potential to influence the intensity and potential for wildfire in the region. The Project site is in a local responsibility area, not in or near a state responsibility area or designated a very high fire hazard severity zone (VHFHSZ).[44]

According to the local Fire Hazard Severity Map, the majority of Rancho Mirage's developed area is not located within or in proximity to a VHFHSZ.[45] There is no state responsibility area within the City. The City General Plan Safety Element states there are VHFHSZs located south of the City in a single-family residential development and undeveloped areas located outside the City limit. The Project is located on the northeastern corner of the City's boundary and is not located in proximity to a wildfire suspectable zone.

In Rancho Mirage there are two main evacuation routes: Interstate-10 and Highway-111. Major and minor arterial streets such as Monterey Avenue, Dinah Shore Drive, Bob Hope Drive, and General Ford Drive are secondary evacuation routes and are within less than a mile distance from the Project site.

20.2 Discussion of Impacts:

a-d) **NO IMPACT:** The City of Rancho Mirage adopted the 2017 Riverside County Multi-Jurisdictional Local Hazard Mitigation Plan (LHMP) which is a multi-hazard functional plan that outlines the first response, evacuation plan, and short-term relief in the event of an emergency including wildfire, flood, earthquake, or other natural and man-made events. The joined LHMP ensures a unified and coordinated effort by all cities within the County in the event of a disaster.

Rancho Mirage's developed area consists of limited undeveloped parcels. These parcels are typically characterized by sparse vegetation that provides little fuel for wildfires when the area is intermittently impact by Santa Ana conditions, including the hot, dry winds that blow across the City in the late fall.[46] The near absence of these undeveloped areas contribute to the City's low to very low probability of wildfire.

As discussed above, the Project and its surrounding area are not located within or in proximity to a VHFHSZ. Additionally, no fire severity designations are used by CalFire or the City General Plan to classify the Project's vicinity. For this reason, the Project site has a negligible risk to wildfire hazards. No slope, prevailing winds, or other factors will increase the risk of wildfire in the region because the developed area of Rancho Mirage including the Project site is not in proximity to a wildfire hazard zone. No impacts are anticipated.

20.3 Mitigation Measures: None required.

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44 California Department of Forestry and Fire Prevention, "Fire Hazard Severity Zones in State Responsibility Areas", https://calfire-forestry.maps.arcgis.com/apps/webappviewer/index.html?id=988d431a42b242b29d89597ab693d008 accessed April 2024.

45 Rancho Mirage General Plan, "Fire Hazard Severity Zone Map", Exhibit 27, 2017.

46 Rancho Mirage General Plan, "Safety Element", 2017.

21 - Mandatory Findings of Significance

MANDATORY FINDINGS OF SIGNIFICANCE	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☐	☒	☐
c) Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐

21.1 Discussion of Impacts:

a) LESS THAN SIGNIFICANT IMPACT WITH MITIGATION:

Biological Resources: The Project site is not located in a CVMSHCP conservation area and does not contain any wildlife corridors or biological linkage areas.

However, the site may provide habitat for burrowing owl and nesting birds protected by the MBTA. A pre-construction survey will be required to avoid impacts to these protected species. Additionally, the Project will be required to pay the Development Mitigation Fee to mitigate potential impacts to species covered under the CVMSHCP.

The proposed Project will not significantly reduce fish or wildlife habitat or otherwise adversely impact a fish or wildlife species. The construction of the Project has the potential to impact nesting birds and burrowing owl, but the mitigation measures included in Section 4 of this document will reduce those impacts to less than significant levels.

Cultural Resources: No historical or archaeological resources of significance are known to exist within or adjacent to the Project site. Since construction of the Project will require earth-moving activity, there is potential for unknown resources to be discovered. The mitigation measures provided in Section 5 of this document will ensure that impacts to cultural and tribal cultural resources will be less than significant in the unlikely event that resources are uncovered.

Overall, there will be no significant environmental impacts which cannot be mitigated. Project-related impacts, including cumulative impacts, will be less than significant with the implementation of mitigation measures.

b) **LESS THAN SIGNIFICANT IMPACT:** Significant cumulative impacts could occur if the Project, in conjunction with related projects, would result in impacts that would be less than significant when viewed separately, but would be significant when viewed together. In this case, the Project's impacts are individually limited and not cumulatively considerable. The proposed Project is consistent with the development envisioned for the area in the City's General Plan. All environmental impacts that could occur as a result of the Project would be less than significant with the implementation of mitigation measures included in this document, and when viewed in conjunction with other closely related past, present, or reasonably foreseeable future projects, would not be significant.

c) **LESS THAN SIGNIFICANT IMPACT:** The proposed Project will not have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly, with the implementation of the City's Municipal Code, conditions of approval, other standard requirements and requirements of law. Impacts would be less than significant.

Table 12: Mitigation Monitoring and Reporting Program			
Mitigation Measure	**Responsible Agency**	**Timing**	**Verification (Date and Initials)**
BIOLOGICAL RESOURCES			
BIO-1 Burrowing Owl To mitigate potential impacts to burrowing owl, two pre-construction surveys must be conducted in accordance with California Department of Fish and Wildlife protocol. The first survey must occur between 14 to 30 days prior to ground disturbance and the second survey must occur within 24 hours of the initiation of ground disturbance activities. If no owls are detected during those surveys, ground disturbance may proceed without further consideration of this species. If burrowing owls are detected during the survey, avoidance and minimization measures will be required. A Burrowing Owl Relocation and Management Plan will be prepared to establish the standard procedure for how the burrowing owl will be actively or passively relocated per the California Department of Fish and Wildlife guidelines. BIO-2 Migratory Bird Treaty Act If ground disturbance or tree or plant removal is proposed between February 1st and August 31st, a qualified biologist must conduct a nesting bird survey within 7 to 10 days of initiation of grading onsite, focusing on MBTA covered species. If active nests are reported, then species-specific measures must be prepared. At a minimum, grading in the vicinity of a nest must be postponed until the young birds have fledged. For construction that occurs between September 1st and January 31st, no pre-removal nesting bird survey is required. In the event active songbird nests are found, exclusionary fencing must be placed 200 feet around the nest until such time as nestlings have fledged. Nests of raptors must be provided a 500-foot buffer.	Project Biologist, Planning Department	Prior to ground disturbance	
CULTURAL & TRIBAL CULTURAL RESOURCES			
CUL-1: The Agua Caliente Band of Cahuilla Indians must be notified a minimum of 30 days prior to any earth-moving activities including grading, grubbing, trenching, or excavations at the site. All earth-moving activities including grading, grubbing, trenching, or excavations at the site shall be monitored by a qualified archaeologist and/or approved Agua Caliente Native American Cultural Resource Monitor(s). CUL-2: A qualified archaeologist and approved Agua Caliente Native American Cultural Resource Monitor(s) shall provide preconstruction training for all earthmoving construction personnel prior to the start of any ground-disturbing activities, regarding how to recognize the types of Tribal Cultural Resources and/or archaeological resources that may be encountered and to instruct personnel about actions to be taken in the event of a discovery. Should cultural materials be discovered, they shall be recorded and evaluated in the field. The monitors shall be prepared to recover artifacts to avoid construction delays but must have the power to temporarily halt or divert construction equipment to allow for controlled archaeological recovery if a substantial cultural deposit is	Project archaeologist, Tribal monitor, Planning Department	During ground disturbing activities	

Table 12: Mitigation Monitoring and Reporting Program			
Mitigation Measure	**Responsible Agency**	**Timing**	**Verification (Date and Initials)**
encountered. If artifacts are discovered, these shall be cataloged and analyzed. The archaeologist and monitor shall determine and implement the best course of action for the treatment and disposition of the artifacts. Preservation in place of the cultural resources is the preferred course of action. If deemed necessary by the qualified archaeologist and approved Agua Caliente Native American Cultural Resource Monitor, the artifacts shall be prepared for permanent curation in a repository with permanent storage. Only non-destructive methods shall be allowed in regards to Tribal Cultural Resources. Archaeological site records shall be prepared to document the cultural remains discovered during monitoring and submitted to the California Historical Resources Information System. CUL-3. In the unexpected event human remains are uncovered during construction activities, all construction work taking place within the vicinity of the discovered remains must cease and the necessary steps to ensure the integrity of the immediate area must be taken. The County Coroner must be notified within 24 hours of the discovery of human remains. If the remains discovered are determined by the Coroner to be of Native American descent, the Coroner shall contact the Native American Heritage Commission (NAHC) within 24 hours. The NAHC would in turn contact the Most Likely Descendant (MLD) would determine further action to be taken. The MLD would have 48 hours to access the site and make a recommendation regarding disposition of the remains.			

CHAPTER 3: REFERENCES

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CHAPTER 4: APPENDICES

Appendix A	CalEEMod Modeling
Appendix B	Biological Resources Assessment & Coachella Valley Multiple Species Habitat Conservation Plan Compliance Report
Appendix C	Historical/Archaeological Resources Survey Report
Appendix D	Design-Phase Geotechnical Investigation Report
Appendix E	Traffic Impact Analysis and Vehicle Miles Traveled (VMT) Screening Analysis

CHAPTER 5: REPORT PREPARERS

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Appendix A

CalEEMod Modeling

Via Vail Apartments Detailed Report

Table of Contents

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Via Vail Apartments
Construction Start Date	6/1/2024
Operational Year	2026
Lead Agency	The Pacific Companies
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	3.30
Precipitation (days)	0.80
Location	33.79898669742357, -116.39424816489105
County	Riverside-Salton Sea
City	Rancho Mirage
Air District	South Coast AQMD
Air Basin	Salton Sea
TAZ	5671
EDFZ	19
Electric Utility	Imperial Irrigation District
Gas Utility	Southern California Gas
App Version	2022.1.1.22

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description

Apartments Low Rise	236	Dwelling Unit	6.70	163,872	163,273	—	892	—
Parking Lot	367	Space	3.30	3.40	0.00	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
Unmit.	6.44	36.1	42.6	0.05	9.49	5.47	7,618
Daily, Winter (Max)	—	—	—	—	—	—	—
Unmit.	6.17	21.1	34.5	0.04	3.53	1.45	7,187
Average Daily (Max)	—	—	—	—	—	—	—
Unmit.	3.15	9.17	19.3	0.02	2.25	0.76	4,225
Annual (Max)	—	—	—	—	—	—	—
Unmit.	0.58	1.67	3.52	< 0.005	0.41	0.14	699
Exceeds (Daily Max)	—	—	—	—	—	—	—
Threshold	75.0	100	550	150	150	55.0	—
Unmit.	No	No	No	No	No	No	—
Exceeds (Average Daily)	—	—	—	—	—	—	—
Threshold	75.0	100	550	150	150	55.0	—
Unmit.	No	No	No	No	No	No	—

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—
2024	3.74	36.1	42.6	0.05	9.49	5.47	7,618
2025	6.44	13.2	34.0	0.03	3.35	1.12	6,444
2026	6.23	12.5	32.5	0.03	3.29	1.07	6,364
Daily - Winter (Max)	—	—	—	—	—	—	—
2024	2.99	21.1	34.5	0.04	3.53	1.45	7,187
2025	6.17	13.4	25.6	0.03	3.35	1.12	5,981
2026	6.07	12.6	24.7	0.03	3.29	1.07	5,911
Average Daily	—	—	—	—	—	—	—
2024	1.07	7.85	12.4	0.02	1.58	0.72	2,438
2025	3.15	9.17	19.3	0.02	2.25	0.76	4,225
2026	2.02	5.08	10.9	0.01	1.31	0.43	2,456
Annual	—	—	—	—	—	—	—
2024	0.20	1.43	2.27	< 0.005	0.29	0.13	404
2025	0.58	1.67	3.52	< 0.005	0.41	0.14	699
2026	0.37	0.93	1.99	< 0.005	0.24	0.08	407

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
Unmit.	9.74	6.54	69.7	0.14	11.5	3.04	17,264
Daily, Winter (Max)	—	—	—	—	—	—	—

Unmit.	7.67	6.89	37.4	0.13	11.5	3.03	15,631
Average Daily (Max)	—	—	—	—	—	—	—
Unmit.	8.50	6.72	49.8	0.13	11.5	3.03	16,277
Annual (Max)	—	—	—	—	—	—	—
Unmit.	1.55	1.23	9.09	0.02	2.09	0.55	2,695
Exceeds (Daily Max)	—	—	—	—	—	—	—
Threshold	55.0	55.0	550	150	150	55.0	—
Unmit.	No	No	No	No	No	No	Yes
Exceeds (Average Daily)	—	—	—	—	—	—	—
Threshold	55.0	55.0	550	150	150	55.0	—
Unmit.	No	No	No	No	No	No	Yes
Exceeds (Annual)	—	—	—	—	—	—	—
Threshold	—	—	—	—	—	—	3,000
Unmit.	—	—	—	—	—	—	No

2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
Mobile	4.69	5.40	55.9	0.14	11.4	2.95	14,172
Area	5.00	0.13	13.4	< 0.005	0.01	< 0.005	35.9
Energy	0.06	1.01	0.43	0.01	0.08	0.08	2,549
Water	—	—	—	—	—	—	121
Waste	—	—	—	—	—	—	385
Refrig.	—	—	—	—	—	—	1.17
Total	9.74	6.54	69.7	0.14	11.5	3.04	17,264

Daily, Winter (Max)	—	—	—	—	—	—	—
Mobile	3.80	5.88	37.0	0.12	11.4	2.95	12,575
Area	3.81	0.00	0.00	0.00	0.00	0.00	0.00
Energy	0.06	1.01	0.43	0.01	0.08	0.08	2,549
Water	—	—	—	—	—	—	121
Waste	—	—	—	—	—	—	385
Refrig.	—	—	—	—	—	—	1.17
Total	7.67	6.89	37.4	0.13	11.5	3.03	15,631
Average Daily	—	—	—	—	—	—	—
Mobile	4.04	5.64	42.8	0.13	11.4	2.95	13,203
Area	4.40	0.06	6.60	< 0.005	< 0.005	< 0.005	17.7
Energy	0.06	1.01	0.43	0.01	0.08	0.08	2,549
Water	—	—	—	—	—	—	121
Waste	—	—	—	—	—	—	385
Refrig.	—	—	—	—	—	—	1.17
Total	8.50	6.72	49.8	0.13	11.5	3.03	16,277
Annual	—	—	—	—	—	—	—
Mobile	0.74	1.03	7.81	0.02	2.07	0.54	2,186
Area	0.80	0.01	1.20	< 0.005	< 0.005	< 0.005	2.93
Energy	0.01	0.18	0.08	< 0.005	0.01	0.01	422
Water	—	—	—	—	—	—	20.0
Waste	—	—	—	—	—	—	63.7
Refrig.	—	—	—	—	—	—	0.19
Total	1.55	1.23	9.09	0.02	2.09	0.55	2,695

3. Construction Emissions Details

3.1. Site Preparation (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2e
Onsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Off-Road Equipment	3.65	36.0	32.9	0.05	1.60	1.47	5,314
Dust From Material Movement	—	—	—	—	7.67	3.94	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—
Off-Road Equipment	0.10	0.99	0.90	< 0.005	0.04	0.04	146
Dust From Material Movement	—	—	—	—	0.21	0.11	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.18	0.16	< 0.005	0.01	0.01	24.1
Dust From Material Movement	—	—	—	—	0.04	0.02	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Worker	0.10	0.10	1.81	0.00	0.23	0.05	269
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.04	0.00	0.01	< 0.005	6.71

Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	< 0.005	< 0.005	1.11
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.3. Grading (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2e
Onsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Off-Road Equipment	1.90	18.2	18.8	0.03	0.84	0.77	2,969
Dust From Material Movement	—	—	—	—	2.76	1.34	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—
Off-Road Equipment	0.16	1.50	1.55	< 0.005	0.07	0.06	244
Dust From Material Movement	—	—	—	—	0.23	0.11	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.27	0.28	< 0.005	0.01	0.01	40.4
Dust From Material Movement	—	—	—	—	0.04	0.02	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—
Worker	0.08	0.09	1.55	0.00	0.20	0.05	231
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—
Worker	0.01	0.01	0.09	0.00	0.02	< 0.005	17.2
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.02	0.00	< 0.005	< 0.005	2.86
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.5. Building Construction (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2e
Onsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Off-Road Equipment	1.20	11.2	13.1	0.02	0.50	0.46	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—
Off-Road Equipment	1.20	11.2	13.1	0.02	0.50	0.46	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—
Off-Road Equipment	0.37	3.47	4.06	0.01	0.15	0.14	744
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Annual	—	—	—	—	—	—	—
Off-Road Equipment	0.07	0.63	0.74	< 0.005	0.03	0.03	123
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Worker	0.94	0.97	17.6	0.00	2.22	0.52	2,616
Vendor	0.03	0.88	0.40	0.01	0.23	0.07	848
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—
Worker	0.70	1.04	10.0	0.00	2.22	0.52	2,221
Vendor	0.03	0.95	0.41	0.01	0.23	0.07	847
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—
Worker	0.25	0.30	3.85	0.00	0.69	0.16	735
Vendor	0.01	0.29	0.12	< 0.005	0.07	0.02	262
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—
Worker	0.05	0.05	0.70	0.00	0.13	0.03	122
Vendor	< 0.005	0.05	0.02	< 0.005	0.01	< 0.005	43.4
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.7. Building Construction (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2e
Onsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Off-Road Equipment	1.13	10.4	13.0	0.02	0.43	0.40	2,406

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—
Off-Road Equipment	1.13	10.4	13.0	0.02	0.43	0.40	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—
Off-Road Equipment	0.80	7.46	9.31	0.02	0.31	0.28	1,719
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—
Off-Road Equipment	0.15	1.36	1.70	< 0.005	0.06	0.05	285
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Worker	0.89	0.89	16.2	0.00	2.22	0.52	2,560
Vendor	0.03	0.84	0.37	0.01	0.23	0.07	833
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—
Worker	0.67	0.96	9.20	0.00	2.22	0.52	2,175
Vendor	0.03	0.91	0.38	0.01	0.23	0.07	831
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—
Worker	0.51	0.63	8.23	0.00	1.59	0.37	1,661
Vendor	0.02	0.64	0.27	< 0.005	0.16	0.05	594
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—
Worker	0.09	0.12	1.50	0.00	0.29	0.07	275
Vendor	< 0.005	0.12	0.05	< 0.005	0.03	0.01	98.4
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.9. Building Construction (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2e
Onsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Off-Road Equipment	1.07	9.85	13.0	0.02	0.38	0.35	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—
Off-Road Equipment	1.07	9.85	13.0	0.02	0.38	0.35	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—
Off-Road Equipment	0.44	4.09	5.38	0.01	0.16	0.14	998
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—
Off-Road Equipment	0.08	0.75	0.98	< 0.005	0.03	0.03	165
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Worker	0.77	0.81	15.1	0.00	2.22	0.52	2,506
Vendor	0.03	0.81	0.35	0.01	0.23	0.07	818
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—
Worker	0.64	0.88	8.53	0.00	2.22	0.52	2,129
Vendor	0.03	0.87	0.36	0.01	0.23	0.07	817
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—
Worker	0.28	0.33	4.43	0.00	0.92	0.22	944

Vendor	0.01	0.35	0.15	< 0.005	0.09	0.03	339
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—
Worker	0.05	0.06	0.81	0.00	0.17	0.04	156
Vendor	< 0.005	0.06	0.03	< 0.005	0.02	0.01	56.1
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.11. Paving (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2e
Onsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Off-Road Equipment	0.85	7.81	10.0	0.01	0.39	0.36	1,517
Paving	0.14	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—
Off-Road Equipment	0.85	7.81	10.0	0.01	0.39	0.36	1,517
Paving	0.14	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—
Off-Road Equipment	0.14	1.28	1.65	< 0.005	0.06	0.06	249
Paving	0.02	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.23	0.30	< 0.005	0.01	0.01	41.3
Paving	< 0.005	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Offsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Worker	0.08	0.09	1.55	0.00	0.20	0.05	231
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—
Worker	0.06	0.09	0.88	0.00	0.20	0.05	196
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—
Worker	0.01	0.01	0.18	0.00	0.03	0.01	34.5
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.03	0.00	0.01	< 0.005	5.71
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.13. Architectural Coating (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2e
Onsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Off-Road Equipment	0.13	0.88	1.14	< 0.005	0.03	0.03	134
Architectural Coatings	4.08	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—

Off-Road Equipment	0.13	0.88	1.14	< 0.005	0.03	0.03	134
Architectural Coatings	4.08	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—
Off-Road Equipment	0.05	0.37	0.48	< 0.005	0.01	0.01	56.1
Architectural Coatings	1.71	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.07	0.09	< 0.005	< 0.005	< 0.005	9.29
Architectural Coatings	0.31	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Worker	0.18	0.18	3.24	0.00	0.44	0.10	512
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—
Worker	0.13	0.19	1.84	0.00	0.44	0.10	435
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—
Worker	0.06	0.07	0.97	0.00	0.19	0.04	195
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—
Worker	0.01	0.01	0.18	0.00	0.03	0.01	32.2
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.15. Architectural Coating (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2e
Onsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.86	1.13	< 0.005	0.02	0.02	134
Architectural Coatings	4.08	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.86	1.13	< 0.005	0.02	0.02	134
Architectural Coatings	4.08	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.25	0.34	< 0.005	0.01	0.01	39.8
Architectural Coatings	1.21	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.05	0.06	< 0.005	< 0.005	< 0.005	6.60
Architectural Coatings	0.22	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Worker	0.15	0.16	3.01	0.00	0.44	0.10	501
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—
Worker	0.13	0.18	1.71	0.00	0.44	0.10	426
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—
Worker	0.04	0.05	0.63	0.00	0.13	0.03	135
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—
Worker	0.01	0.01	0.12	0.00	0.02	0.01	22.4
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
Apartments Low Rise	4.69	5.40	55.9	0.14	11.4	2.95	14,172
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.69	5.40	55.9	0.14	11.4	2.95	14,172
Daily, Winter (Max)	—	—	—	—	—	—	—
Apartments Low Rise	3.80	5.88	37.0	0.12	11.4	2.95	12,575
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Total	3.80	5.88	37.0	0.12	11.4	2.95	12,575
Annual	—	—	—	—	—	—	—
Apartments Low Rise	0.74	1.03	7.81	0.02	2.07	0.54	2,186
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.74	1.03	7.81	0.02	2.07	0.54	2,186

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	1,171
Parking Lot	—	—	—	—	—	—	91.2
Total	—	—	—	—	—	—	1,262
Daily, Winter (Max)	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	1,171
Parking Lot	—	—	—	—	—	—	91.2
Total	—	—	—	—	—	—	1,262
Annual	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	194
Parking Lot	—	—	—	—	—	—	15.1
Total	—	—	—	—	—	—	209

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—
Apartments Low Rise	0.06	1.01	0.43	0.01	0.08	0.08	1,287
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.06	1.01	0.43	0.01	0.08	0.08	1,287
Daily, Winter (Max)	—	—	—	—	—	—	—
Apartments Low Rise	0.06	1.01	0.43	0.01	0.08	0.08	1,287
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.06	1.01	0.43	0.01	0.08	0.08	1,287
Annual	—	—	—	—	—	—	—
Apartments Low Rise	0.01	0.18	0.08	< 0.005	0.01	0.01	213
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.01	0.18	0.08	< 0.005	0.01	0.01	213

4.3. Area Emissions by Source

4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Consumer Products	3.52	—	—	—	—	—	—
Architectural Coatings	0.29	—	—	—	—	—	—
Landscape Equipment	1.19	0.13	13.4	< 0.005	0.01	< 0.005	35.9
Total	5.00	0.13	13.4	< 0.005	0.01	< 0.005	35.9
Daily, Winter (Max)	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Consumer Products	3.52	—	—	—	—	—	—

Architectural Coatings	0.29	—	—	—	—	—	—
Total	3.81	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Consumer Products	0.64	—	—	—	—	—	—
Architectural Coatings	0.05	—	—	—	—	—	—
Landscape Equipment	0.11	0.01	1.20	< 0.005	< 0.005	< 0.005	2.93
Total	0.80	0.01	1.20	< 0.005	< 0.005	< 0.005	2.93

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	121
Parking Lot	—	—	—	—	—	—	0.00
Total	—	—	—	—	—	—	121
Daily, Winter (Max)	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	121
Parking Lot	—	—	—	—	—	—	0.00
Total	—	—	—	—	—	—	121
Annual	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	20.0
Parking Lot	—	—	—	—	—	—	0.00
Total	—	—	—	—	—	—	20.0

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	385
Parking Lot	—	—	—	—	—	—	0.00
Total	—	—	—	—	—	—	385
Daily, Winter (Max)	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	385
Parking Lot	—	—	—	—	—	—	0.00
Total	—	—	—	—	—	—	385
Annual	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	63.7
Parking Lot	—	—	—	—	—	—	0.00
Total	—	—	—	—	—	—	63.7

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	1.17
Total	—	—	—	—	—	—	1.17
Daily, Winter (Max)	—	—	—	—	—	—	—

Apartments Low Rise	—	—	—	—	—	—	1.17
Total	—	—	—	—	—	—	1.17
Annual	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	0.19
Total	—	—	—	—	—	—	0.19

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—

Annual	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—

Subtotal	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Site Preparation	Site Preparation	6/1/2024	6/14/2024	5.00	10.0	—
Grading	Grading	6/15/2024	7/26/2024	5.00	30.0	—
Building Construction	Building Construction	7/27/2024	7/31/2026	5.00	525	—
Paving	Paving	8/27/2024	11/18/2024	5.00	60.0	—
Architectural Coating	Architectural Coating	06/01/2025	06/01/2026	5.00	261	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Site Preparation	Rubber Tired Dozers	Diesel	Average	3.00	8.00	367	0.40

Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	4.00	8.00	84.0	0.37
Grading	Excavators	Diesel	Average	1.00	8.00	36.0	0.38
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Grading	Tractors/Loaders/Backhoes	Diesel	Average	3.00	8.00	84.0	0.37
Building Construction	Cranes	Diesel	Average	1.00	7.00	367	0.29
Building Construction	Forklifts	Diesel	Average	3.00	8.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Building Construction	Tractors/Loaders/Backhoes	Diesel	Average	3.00	7.00	84.0	0.37
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Paving	Pavers	Diesel	Average	2.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	2.00	8.00	89.0	0.36
Paving	Rollers	Diesel	Average	2.00	8.00	36.0	0.38
Architectural Coating	Air Compressors	Diesel	Average	1.00	6.00	37.0	0.48

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	18.5	LDA,LDT1,LDT2
Site Preparation	Vendor	—	10.2	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—

Grading	Worker	15.0	18.5	LDA,LDT1,LDT2
Grading	Vendor	—	10.2	HHDT,MHDT
Grading	Hauling	0.00	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	170	18.5	LDA,LDT1,LDT2
Building Construction	Vendor	25.2	10.2	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	18.5	LDA,LDT1,LDT2
Paving	Vendor	—	10.2	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	34.0	18.5	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	10.2	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)

Architectural Coating	331,841	110,614	0.00	0.00	8,625

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (cy)	Material Exported (cy)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Site Preparation	—	—	15.0	0.00	—
Grading	—	—	30.0	0.00	—
Paving	0.00	0.00	0.00	0.00	3.30

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	2	61%	61%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Apartments Low Rise	—	0%
Parking Lot	3.30	100%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2024	0.00	221	0.03	< 0.005
2025	0.00	223	0.03	< 0.005
2026	0.00	262	0.03	< 0.005

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Apartments Low Rise	1,135	1,135	1,135	414,247	15,950	15,950	15,950	5,821,926
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

Hearth Type	Unmitigated (number)
Apartments Low Rise	—
Wood Fireplaces	0
Gas Fireplaces	0
Propane Fireplaces	0
Electric Fireplaces	0
No Fireplaces	236
Conventional Wood Stoves	0
Catalytic Wood Stoves	12
Non-Catalytic Wood Stoves	12
Pellet Wood Stoves	0

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)

331840.8	110,614	0.00	0.00	8,625

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	180

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
Apartments Low Rise	1,615,843	262	0.0330	0.0040	4,004,973
Parking Lot	125,923	262	0.0330	0.0040	0.00

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Apartments Low Rise	9,599,011	3,744,789
Parking Lot	0.00	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Apartments Low Rise	204	—

Parking Lot	0.00	—

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
Apartments Low Rise	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Apartments Low Rise	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

Equipment Type	Fuel Type	Number per Day	Hours per Day	Hours per Year	Horsepower	Load Factor

5.16.2. Process Boilers

Equipment Type	Fuel Type	Number	Boiler Rating (MMBtu/hr)	Daily Heat Input (MMBtu/day)	Annual Heat Input (MMBtu/yr)

5.17. User Defined

Equipment Type	Fuel Type

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	23.4	annual days of extreme heat
Extreme Precipitation	0.00	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	0.00	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	N/A	N/A	N/A	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A

Wildfire	N/A	N/A	N/A	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	N/A	N/A	N/A	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	88.7
AQ-PM	7.34
AQ-DPM	43.4
Drinking Water	45.4
Lead Risk Housing	1.31
Pesticides	0.00
Toxic Releases	3.08
Traffic	64.6
Effect Indicators	—
CleanUp Sites	0.00

Groundwater	0.00
Haz Waste Facilities/Generators	43.3
Impaired Water Bodies	0.00
Solid Waste	0.00
Sensitive Population	—
Asthma	20.9
Cardio-vascular	16.5
Low Birth Weights	20.3
Socioeconomic Factor Indicators	—
Education	25.9
Housing	86.8
Linguistic	7.38
Poverty	21.5
Unemployment	4.23

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	47.56833055
Employed	15.56525087
Median HI	74.56691903
Education	—
Bachelor's or higher	65.96945977
High school enrollment	100
Preschool enrollment	48.45374054
Transportation	—

Auto Access	37.4566919
Active commuting	25.81804183
Social	—
2-parent households	97.56191454
Voting	86.88566662
Neighborhood	—
Alcohol availability	82.80508148
Park access	2.194276915
Retail density	35.17259079
Supermarket access	45.92583087
Tree canopy	17.8108559
Housing	—
Homeownership	83.62633132
Housing habitability	22.35339407
Low-inc homeowner severe housing cost burden	25.38175286
Low-inc renter severe housing cost burden	6.274862056
Uncrowded housing	70.21686129
Health Outcomes	—
Insured adults	97.45925831
Arthritis	0.0
Asthma ER Admissions	80.6
High Blood Pressure	0.0
Cancer (excluding skin)	0.0
Asthma	0.0
Coronary Heart Disease	0.0
Chronic Obstructive Pulmonary Disease	0.0
Diagnosed Diabetes	0.0

Life Expectancy at Birth	94.6
Cognitively Disabled	39.7
Physically Disabled	49.3
Heart Attack ER Admissions	64.0
Mental Health Not Good	0.0
Chronic Kidney Disease	0.0
Obesity	0.0
Pedestrian Injuries	19.6
Physical Health Not Good	0.0
Stroke	0.0
Health Risk Behaviors	—
Binge Drinking	0.0
Current Smoker	0.0
No Leisure Time for Physical Activity	0.0
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	0.0
Children	79.8
Elderly	0.9
English Speaking	70.5
Foreign-born	10.7
Outdoor Workers	98.2
Climate Change Adaptive Capacity	—
Impervious Surface Cover	47.2
Traffic Density	47.5
Traffic Access	23.0
Other Indices	—

Hardship	34.9
Other Decision Support	—
2016 Voting	92.5

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	7.00
Healthy Places Index Score for Project Location (b)	56.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Land Use	The Project plan set including site plan, project summary, and open space plan provided land use information. Population size is based on Project's maximum capacity.
Construction: Construction Phases	The Project site is currently undeveloped vacant desert land. No existing structures are located within the subject property and thus there is no need for demolition prior to site preparation or grading. A two year buildout is assumed for a 2026 operation.

Operations: Vehicle Data	Assume 1135 trips per day based on Traffic Scoping Letter.
Operations: Hearths	Project does not propose wood burning appliances.

Appendix B

Biological Resources Assessment & Coachella Valley
Multiple Species Habitat Conservation Plan Compliance Report

VIA VAIL PROJECT

Biological Resources Assessment & Coachella Valley Multiple Species Habitat Conservation Plan Compliance Report

RIVERSIDE COUNTY, CALIFORNIA

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Survey: March 2024

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1.0 INTRODUCTION

At the request of Terra Nova Planning and Research (Client), this biological resource assessment report (BRAR) was prepared by WSP USA Environment & Infrastructure Inc. (WSP) for the proposed Via Vail Apartment Homes Project (project site/project), located in the City of Rancho Mirage, Riverside County., California. Information contained herein is intended to be used for compliance with the Coachella Valley Multiple Species Habitat Conservation Plan (CVMSHCP), California Environmental Quality Act (CEQA), as well as federal and California Endangered Species Acts.

2.0 PROJECT LOCATION / DESCRIPTION

The purpose of the proposed project is to development of approximately 240-250 apartment homes. To document the current biological resources within the project, a general biological resources assessment is required. This will provide a detailed assessment of the existing conditions. The project is located generally located north of B Street, southwest of Via Vail and east of Key Largo Avenue, in the city of Rancho Mirage, Riverside County. (Appendix A – Figure 1). Specifically, the project site is located within Section 30; Township 4 South; Range 6 East as shown on the United States Geological Survey (USGS) *Cathedral City*, California, 7.5-minute topographic quadrangle (Appendix A – Figure 2). The geographic coordinates near the approximate center of the project area are 33.798563° north latitude and -116.393781° west longitude. The elevation of the project site ranges from approximately 286 to 305 feet above mean sea level.

3.0 REGULATORY FRAMEWORK

3.1 Federal

Endangered Species Act (ESA) – The United States Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service are the designated federal agencies accountable for administering the ESA. The ESA defines species as “endangered” or “threatened” and provides regulatory protection at the federal level.

- Section 9 of the ESA prohibits the “take” of listed (i.e., endangered or threatened) species. The ESA’s definition of take is “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in such conduct.” Recognizing that take cannot always be avoided, Section 10(a) includes provisions for take that is incidental to, but not the purpose of, otherwise lawful activities. Specifically, Section 10(a) (1) (A) permits (authorized take permits) are issued for scientific purposes. Section 10(a) (1) (B) permits (incidental take permits) are issued for the incidental take of listed species that does not jeopardize the species.
- Section 7 (a) (2) requires federal agencies to evaluate the proposed project with respect to listed or proposed listed, species and their respective critical habitat (if applicable). Federal agencies must employ programs for the conservation of listed species and are prohibited from authorizing, funding, or carrying out any action that would jeopardize a listed species or destroy or modify its “critical habitat.”

As defined by the ESA, “individuals, organizations, states, local governments, and other non-federal entities are affected by the designation of critical habitat only if their actions occur on federal lands, require a federal permit, license, or other authorization, or involve federal funding.

Section 10(a) of the ESA authorizes the issuance of incidental take permits and establishes standards for the content of habitat conservation plans (see Section 3.3 below).

Migratory Bird Treaty Act (MBTA) – Treaties signed by the U.S., Great Britain, Mexico, Japan, and the countries of the former Soviet Union make it unlawful to pursue, capture, kill, and/or possess, or attempt to engage in any such conduct to any migratory bird, nest, egg or parts thereof listed in the document. As with the ESA, the MBTA also allows the Secretary of the Interior to grant permits for the incidental take of these protected migratory bird species.

National Environmental Policy Act (NEPA) – If portions of a proposed project could fall under the jurisdiction of a federal agency (i.e., U.S. Bureau of Reclamation, U.S. Army Corps of Engineers) they are subject to environmental review pursuant to NEPA. NEPA establishes certain criteria that must be adhered to for any project that is “financed, assisted, conducted or approved” by a federal agency. The federal lead agency is required to “determine whether the proposed action will significantly affect the quality of the human environment.”

Section 404 of the Clean Water Act – This section of the Clean Water Act, administered by the U.S. Army Corps of Engineers (USACE), regulates the discharge of dredged and fill material into “waters of the United States.” The USACE has created a series of nationwide permits that authorize certain activities within waters of the U.S. provided that the proposed activity does not exceed the impact threshold of 0.5 acre for nationwide permits, takes steps to avoid impacts to wetlands and other designated U.S. waters where practicable, minimizes potential impacts to wetlands, and provides compensation for any remaining, unavoidable impacts through activities to restore or create wetlands. For projects that exceed the threshold for nationwide permits, individual permits under Section 404 can be issued. An inspection of the project site to determine presence or absence of potential jurisdictional wetlands and waters was conducted during the assessment for this project.

3.2 State

California Endangered Species Act (CESA) – This legislation is similar to the federal ESA, but it is administered by the California Department of Fish and Wildlife (CDFW – formerly Department of Fish and Game). The CDFW is authorized to enter into “memoranda of understanding” with individuals, public agencies, and other institutions to import, export, take, or possess state-listed species for scientific, educational, or management purposes. CESA prohibits the take of state-listed species except as otherwise provided in state law. Unlike the federal ESA, the CESA applies the take prohibitions to species currently petitioned for state-listing status (candidate species). State lead agencies are required to consult with CDFW to ensure that actions are not likely to jeopardize the continued existence of any state-listed species or result in the destruction or degradation of occupied habitat.

California Environmental Quality Act (CEQA) – The basic goal of CEQA is to maintain a high-quality environment now and in the future. The specific goals are for California's public agencies to:

1) identify the significant environmental effects of their actions; and, either
2) avoid those significant environmental effects, where feasible; or
3) mitigate those significant environmental effects, where feasible.

CEQA applies to "projects" proposed to be undertaken or requiring approval by state and local government agencies. Projects are activities that have the potential to have a physical impact on the environment and may include the enactment of zoning ordinances, the issuance of conditional use permits and the approval of tentative subdivision maps. Where a project requires approvals from more than one public agency, CEQA requires one of these public agencies to serve as the "lead agency."

A "lead agency" must complete the environmental review process required by CEQA. The most basic steps of the environmental review process are to:

4) Determine if the activity is a "project" subject to CEQA.
5) Determine if the "project" is exempt from CEQA.
6) Perform an Initial Study to identify the environmental impacts of the project and determine whether the identified impacts are "significant". Based on its findings of "significance", the lead agency prepares one of the following environmental review documents:
   a) Negative Declaration if it finds no "significant" impacts.
   b) Mitigated Negative Declaration if it finds "significant" impacts but revises the project to avoid or mitigate those significant impacts.
   c) Environmental Impact Report (EIR) if it finds "significant" impacts.

While there is no ironclad definition of "significance", Article 5 of the State CEQA Guidelines (California Natural Resources Agency 2014) provides criteria to lead agencies in determining whether a project may have significant effects.

The Native Plant Protection Act (NPPA) – The NPPA includes measures to preserve, protect, and enhance rare and endangered native plant species. Definitions for "rare and endangered" are different from those contained in CESA. However, the list of species afforded protection in accordance with the NPPA includes those listed as rare and endangered under CESA. NPPA provides limitations on take as follows: "no person will import into this state, or take, possess, or sell within this state" any rare or endangered native plants, except in accordance with the provisions outlined in the act. If a landowner is notified by CDFW, pursuant to section 1903.5 that a rare or endangered plant is growing on their property, the landowner shall notify CDFW at least 10 days prior to the changing of land uses to allow CDFW to salvage the plants.

Natural Community Conservation Planning (NCCP) Program – A NCCP, which is managed by the CDFW, is intended to conserve multiple species and their associated habitats, while also providing for compatible use of private lands. Through local planning, the NCCP planning process is designed to provide protection for wildlife and natural habitats before the environment becomes so fragmented or degraded by development that species listing are required under CESA. Instead of conserving small, often isolated "islands" of habitat for just one listed species, agencies, local jurisdictions, and/or other interested parties have an opportunity through the NCCP to work cooperatively to develop plans that consider broad areas of land for conservation that would provide habitat for many species. Partners enroll in the programs, and by mutual consent, areas considered to have high conservation priorities or values are set aside and protected from development. Partners may also agree to study, monitor, and develop management plans for these high value "reserve" areas. The NCCP provides an avenue for fostering economic growth by allowing approved development in areas with lower conservation value. The project site is in a combined Habitat Conservation Plan (HCP) / NCCP, see Section 3.3.

Sections 1600-1603 of the State Fish and Game Code – The California Fish and Game (Wildlife) Code, pursuant to Sections 1600 through 1603, regulates all diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake that supports fish or wildlife resources. Under state code, CDFW jurisdiction is assessed in the field based on one, or a combination, of the following criteria:

7) At minimum, intermittent, and seasonal flow through a bed or channel with banks and that also supports fish or other aquatic life.
8) A watercourse having a surface or subsurface flow regime that supports or that has supported riparian vegetation.
9) Hydrogeomorphically distinct top-of-embankment to top-of-embankment limits.

10) Outer ground cover and canopy extents of, typically, riparian associated vegetation species that would be sustained by surface and/or subsurface waters of the watercourse.

The CDFW requires that public and private interests apply for a "Streambed Alteration Agreement" for any project that may impact a streambed or wetland. The CDFW has maintained a "no net loss" policy regarding impacts to streams and waterways and requires replacement of lost habitats on at least a 1:1 ratio.

Section 2081 of the State Fish and Game Code – Under Section 2081 of the California Fish and Game Code, the CDFW authorizes individuals or public agencies to import, export, take, or possess state endangered, threatened, or candidate species in California through permits or memoranda of understanding. These acts, which are otherwise prohibited, may be authorized through permits or "memoranda of understanding" if (1) the take is incidental to otherwise lawful activities, (2) impacts of the take are minimized and fully mitigated, (3) the permit is consistent with regulations adopted in accordance with any recovery plan for the species in question, and (4) the applicant ensures suitable funding to implement the measures required by the CDFW. The CDFW shall make this determination based on the best scientific information reasonably available and shall include consideration of the species' capability to survive and reproduce.

Section 3505.5 of the State Fish and Game Code – This section makes it unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes (birds-of-prey, e.g.: owls, hawks, eagles, etc.) or to take, possess, or destroy the nest or eggs of any bird-of-prey.

Clean Water Act – The Regional Water Quality Control Board (RWQCB) regulates activities pursuant to Section 401(a)(1) of the Clean Water Act (CWA). Section 401 of the CWA specifies that certification from the State is required for any applicant requesting a federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities that may result in any discharge into navigable waters. Through the Porter Cologne Water Quality Control Act, the RWQCB asserts jurisdiction over Waters of the State of California (WSC) which is generally the same as WUS but may also include isolated waterbodies. The Porter Cologne Act defines WSC as "surface water or ground water, including saline waters, within the boundaries of the state".

3.3 Coachella Valley Multiple Species Habitat Conservation Plan

Finalized in October 2008, and amended in 2016, the CVMSHCP is a comprehensive regional plan that addresses the conservation needs of 27 species of native flora and fauna and 24 natural vegetation communities occurring throughout the Coachella Valley region of western Riverside County, California. Permits for the CVMSHCP were issued by the CDFW on September 9, 2008 and the United States Fish and Wildlife Service (USFWS) on October 1, 2008 (TE104604-0). Managed by the Coachella Valley Conservation Commission (CVCC), CVMSHCP participants include Riverside County, the Cities of Cathedral City, Coachella, Desert Hot Springs, Indian Wells, Indio, La Quinta, Palm Desert, Palm Springs, Rancho Mirage, as well as the Coachella Valley Association of Governments (CVAG), Coachella Valley Water District, Imperial Irrigation District, Mission Springs Water District and the California Department of Transportation (CVAG 2008, 2016).

The CVMSHCP serves two primary purposes: Balancing environmental protection and economic development objectives in the CVMSHCP planning area and simplifying compliance with endangered species related laws. The CVMSHCP accomplishes this by conserving unfragmented habitat to permanently protect and secure viable populations of the covered 27 species within the planning area. The covered species include those plants and animals that are either currently listed as threatened or endangered, are proposed for listing, or are believed by an appointed Scientific Advisory Committee, USFWS and CDFW, to have a high probability of being proposed for listing in the future if not conserved by the CVMSHCP. The goal of the CVMSHCP is to meet the requirements of the ESA and CESA, while at the same time allowing for the economic growth (land development) within the plan area without significant delay or hidden costs. Under the CVMSHCP, land development/mitigation fees are collected from all new development projects occurring in the plan area. The purpose of this fee is to support the assembly of a preserve system for the covered species and natural vegetation communities within areas identified as having high conservation value (CVAG 2008).

4.0 METHODS

4.1 Literature Review

In preparation for the field surveys, a literature search was conducted to identify special status biological resources known from the vicinity of the project site. In the context of this report, and for the purpose of this assessment, vicinity is defined as areas within a 5-mile radius of the project site.

The literature search included a review of the following documents:

- California Natural Diversity Data Base (CNDDB) RareFind 5 (CDFW 2023a)
- Special Animals List (CDFW 2023)
- California Native Plant Society's (CNPS) Inventory of Rare, Threatened, and Endangered Plants of California (CNPS 2023a)
- CVMSHCP (CVAG 2008)
- United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS). 2019. Web Soil Survey
- USGS 7.5' *Valerie.* quadrangle (USGS 1988)

Scientific nomenclature for this document follows standard reference sources: For plant communities, CVMSHCP (CVAG 2008), Sawyer et. al (2009), and/or Holland (1986); for flora, Jepson eFlora (2022) and the USDA NRCS PLANTS Database (2022); for amphibians, reptiles, and mammals, CDFW (2016); and for birds, California Bird Records Committee (2022).

4.2 Field Assessment

The field assessment was conducted on 8 February 2024 by WSP Senior Wildlife Biologist Dale Hameister. On-site suitable habitat was assessed based on the presence of constituent habitat elements (e.g., soils, vegetation, and topography) characteristic of the potentially occurring special status biological resources determined by the literature review. The entire site and adjacent properties were also assessed for burrowing owl (*Athene cunicularia*). Inaccessible areas were scanned for burrowing owl habitat and sign (i.e., burrows & perches with whitewash) with binoculars. All on-site flora and fauna observed or otherwise detected (e.g., vocalizations, presence of scat, tracks, and/or bones) during the assessment were recorded in field notes and are included in Appendix B. General weather and site conditions were also recorded at the beginning and end of the survey. Temperatures and wind speeds were recorded with a handheld Kestrel 2000 anemometer. Percent cloud cover was visually estimated.

5.0 RESULTS

The project site contains sandy soils the entire site comprises of highly disturbed creosote scrub. There is an active dog park to the west and a commercial development to the north of the project site. There is a small amount of undeveloped land to the south and east with residential development beyond. A small homeless camp was observed in the northeast portion of the project site and many people were using the project site to walk their dogs and let them run off leash. Representative site photos are included in Appendix C.

5.1 Coachella Valley Multiple Species Habitat Conservation Plan

The project site is located within the CVMSHCP fee area and the but is not located within or adjacent to any Conservation Areas (Figure 4, Appendix A). The development of the project site will have no effect on any CVMSHCP Conservation Areas.

5.2 Weather Conditions

Weather conditions during the field assessment were clear and warm. There was 40% cloud cover with temperatures that ranged from 52 to 61 degrees Fahrenheit. Winds were calm with wind speeds measured between 0 to 2 miles per hour.

5.3 Topography and Soils

The project site is very sandy and relatively flat with small undulating hills. One soil type, Myoma fine sand has been mapped on the project site. (USDA, NRCS. 2024) (Appendix A - Figure 3).

Typically, Myoma soils are light olive gray, moderately alkaline fine and very fine sands to a depth of about 31 inches. Below 31 inches they are strongly alkaline very fine sands.

The site does not contain active sand dunes or clay lenses.

5.4 Vegetation

The project site consists of sparse and disturbed creosote scrub. The entire property shows signs of disturbance including tire tracks, dog prints and scat, trash, and human footprints. Shrubs observed include creosote bush (*Larrea tridentata*), four-wing saltbush (*Atriplex canescens*), dyebush (*Psorothamnus emoryi*), athel (Tamarix aphylla). Annual species observed include desert dicoria (*Dicoria canescens*), Spanish needles (*Palafoxia arida*), narrow leaved forget me not (*Johnstonella angustifolia*), fanleaf crinklemat (*Tiquilia plicata*), Sahara mustard (*Brassica tournefortii),* old han schismus (*Schismus barbatus*).

5.5 Wildlife

Vertebrate wildlife directly observed and/or detected otherwise (e.g., scat, bones, tracks, feathers, burrows, etc.) were typical to species common to the region (Appendix B). This included some species common to desert scrub and/or developed areas of Coachella Valley. Wildlife observed onsite includes American crow (*Corvus brachyrhynchos*), house finch (*Haemorhous mexicanus*), Verdin (*Auriparus flaviceps*), Costa's hummingbird (*Calypte costae*), and Say's phoebe (*Sayornis saya*).

The number of species detected does not represent the total number of species that may occur on the project site. Brief, one visit assessments are limited by the seasonal timing and short duration of the survey period as well as the nocturnal, fossorial and/or migratory habits of many animals. It had rained the night before the survey, so the sandy surface was wet. There was not much evidence of rodent burrows as the sandy nature of the site would not provide a good burrowing substrate. No actively nesting birds were detected on or adjacent to the site during the assessment.

5.6 Special Status Biological Resources

Some plant and/or animal taxa are designated as having special status due to declining populations, limited geographic distributions and/or vulnerability to climate change, habitat loss and/or fragmentation. Some have been listed as threatened or endangered by the USFWS or by the CDFW and are protected by the federal and state ESAs. Others have been identified, and are managed as sensitive by the USFWS, CDFW, or by private conservation organizations, including the CNPS, but have not been formally listed as threatened or endangered. Impacts to such species can still be considered significant under the CEQA, if not avoided, minimized and/or mitigated by specific project design and implementation.

The literature review and field visit resulted in a list of 36 special status biological resources which occur or potentially occur on the project site and/or vicinity (5-mile radius) of the project site. Tables 1-5 provide a summary of these resources, their current conservation status, habitat associations and potential to occur on the project site. No species listed as threatened or endangered were observed on the site.

Table 1. Special Status Plant Species

Species	Protective Status	Habitat	Flowering Period	Occurrence Probability
Abronia villosa var. *aurita* **chaparral sand-verbena**	F: None C: None CNPS: List 1B.1 State Rank: S2 MSHCP: No	Sandy areas in chaparral and coastal sage scrub, dunes; 75-1600 m (246-5249 ft.) above mean sea level (AMSL).	January - August	**Absent** Chaparral and sage scrub habitats lacking. Records within the region may be erroneous, misidentifications of common subspecies. The common subs species is present. Taxonomy of species is questionable [A. Sanders pers. com]
Astragalus lentiginosus var. *coachellae* **Coachella Valley milkvetch**	F: END C: None CNPS List: 1B.2 State Rank: S1 MSHCP: Yes	Sandy flats, washes, alluvial fans, sand field, dunes and dune edges; windblown sand deposits 40-655 m (131-2182 ft.) AMSL, a CA endemic.	February - May	**Low** Aeolian [wind-deposited] sand habitat is present, but highly disturbed and isolated. Records in the vicinity include one from the 1990s and the remaining from 1975. Not observed during the survey.
Astragalus tricarinatus **triple-ribbed milkvetch**	F: END C: None CNPS List: 1B.2 State Rank: S2 MSHCP: Yes	Sandy or gravelly areas in Joshua tree woodland & Sonoran desert scrub, 450-1,190 m (1,476-3,904 ft.) AMSL.	February - May	**Absent** Habitat potentially suitable but site is below elevation for this species.
Chorizanthe xanti var. *leucotheca* **white-bracted spineflower**	F: None C: None CNPS List: 1B.2 State Rank: S3 MSHCP: No	Sandy or gravelly areas in Mojave desert scrub, pinyon-juniper woodland, and coastal scrub; 300-1200 m (984-4003 ft.) AMSL.	April - June	**Absent** Habitat lacking

Euphorbia misera **cliff spurge**	F: None C: None CNPS List: 2B.2 State Rank: S2 MSHCP: No	Rocky coastal bluff, coastal scrub, Mojave scrub; 10-500 m (33-1640 ft) AMSL.	December - October	**Absent** Rocky coastal bluff and Mojave Desert scrub habitat [cliffs] lacking on-site, known from adjacent steep cliffs of Whitewater Cyn. This population has declined over the years and may now be extirpated. Only a single individual found during most recent survey [CNPS 2018, CCH 2018, A. Sanders pers. com.]
Imperata brevifolia **California satintail**	F: None C: None CNPS List: 2B.1 State Rank: S3 MSHCP: No	Coastal scrub, chaparral, riparian scrub, Mojave scrub, meadows and seeps; 0-1215 m (0-3986 ft.) AMSL.	September - May	**Absent** No suitable moist habitat onsite
Nemacaulis denudata var. *gracilis* **slender cottonheads**	F: None C: None CNPS: List 2B.2 State Rank: S2 MSHCP: No	Coastal and desert dunes, in Sonoran Desert scrub (sandy); -50 to 400 m (164-1312 ft.) AMSL.	April – May (rarely March)	**Low** Habitat marginal, sandy soils are present, 1948 CNDDB record is ~4 mi. W of the site, along Hwy. 111
Penstemon pseudospectabilis ssp. *pseudospectabilis* **desert beardtongue**	F: None C: None CNPS List: 2B.2 State Rank: S3 MSHCP: No	Sandy or rocky washes in Mojave Desert scrub and Sonoran desert scrub; 80-1953 m (262 – 6407 ft.) AMSL.	January - May	**Absent** No suitable habitat
Petalonyx linearis **narrow-leaf sandpaper-plant**	F: None C: None CNPS List: 2B.3 State Rank: S3? MSHCP: No	Sandy or rocky canyons in Mojave and Sonoran desert scrubs	(Jan-Feb)Mar-May(Jun-Dec)	**Absent** Closest CNDDB record is ~5 mi. NE. of site and is from 1879.
Saltugilia latimeri **Latimer's woodland-gilia**	F: None C: None CNPS: List 1B.2 Global Rank: G3 State Rank: S3 MSHCP: No	Rocky, sandy, often granitic, sometimes washes in chaparral, Mojave desert scrub, pinyon and juniper woodland; 400-1900 m (1312-6234 ft) AMSL.	March-June	**Absent** (Suitable habitat lacking, site below known elevational range of species)
Selaginella eremophila **desert spike-moss**	F: None C: None CNPS: List 2B.2 State Rank: S2S3 MSHCP: No	Shaded areas in crevices among rocks or on gravelly soils in Sonoran desert scrub; 200-900 m (656-2953 ft.) AMSL.	June	**Absent** (Site is fully exposed to sun, shaded areas very limited)

Table 2. Special Status Vegetation Communities

Community	Protective Status (F=Federal, C=California)	Occurrence Probability
Desert Fan Palm Oasis Woodland	F: ND C: ND State rank: S3.2 CVMSHCP: No	**Absent** This habitat is not present on project site.
Southern Riparian Forest	F: ND C: ND State rank: S4 CVMSHCP: No	**Absent** This habitat is not present on project site.

Table 3. Special Status Invertebrates

Species	Protective Status (F=Federal, C=California)	Habitat	Occurrence Probability
Bombus crotchii **Crotch's bumble bee**	F: C C: C - END State Rank: S2 CVMSHCP: No	Mainly coastal California east to the Sierra-Cascade Crest and south into Baja.	**Absent** Most records are from cismontane (coastal and inland valley) California. Not expected on this site unless there were sufficient flowering plants favored by this species.
Dinacoma caseyi **Casey's June beetle**	F: END C: None State rank: S1 MSHCP: No	Known from only two main populations in the southern Palm Springs area, generally associated with Palm Canyon Wash and its associated floodplain. Needs soils that are not too rocky or compacted and difficult to burrow in.	**Absent** The site is 4.8 miles E of the currently known range of the species. Site is not located within the historic range of the species.
Danaus plexippus **Monarch Butterfly**	F: C C: CSC State Rank: S2S3 CVMSHCP: No	Can be found in a variety of areas where milkweed and flowering plants are present; milkweeds are necessary for breeding	**Absent** No milkweed present on-site. Very little remaining vegetation for nectar sources.
Macrobaenetes valgum **Coachella giant sand treader cricket**	F: None C: None State rank: S1S2 MSHCP: Yes	Wind-deposited sand dune ridges, winter rains somewhat regulate abundance	**Low** Habitat at site is marginal, very limited loose wind-deposited sand areas. Area is highly disturbed.
Stenopelmatus cahuilaensis **Coachella Valley Jerusalem cricket**	F: None C: None State rank: S1S2 MSHCP: Yes	Sand dune and sand field habitats, in the vicinity of the north base of the San Jacinto Mountains	**Low** Habitat at site is marginal, very limited loose wind-deposited sand areas. Area is highly disturbed.

Table 3. Special Status Amphibians & Reptiles

Species	Protective Status (F=Federal, C=California)	Habitat	Occurrence Probability
Anniella stebbinsi **southern California legless lizard**	F = None C = SSC NDDB Element Rank: Global = G3 State = S3 MSHCP = No	Occurs in a variety of habitats, but seems to prefer areas with loose, moist soils (high moisture content).	**Low** Some potential habitat onsite, although soil moisture is likely low
Gopherus agassizi **desert tortoise**	Fed: THR Cal: THR NDDB Element Rank: Global = G3 State = S2S3 MSHCP = Yes (Conserved Habitat on-site for this species)	Various desert communities and habitats (Mojave creosote bush scrub, Joshua tree woodland, saltbush scrub); washes, arroyos, bajadas, rocky hillsides, open flat desert	**Absent** Fine sandy soils and disturbed and isolated nature of site are not suitable habitat. Soil type would not be suitable for burrows.
Phrynosoma mcallii Flat-tailed horned lizard	F: ND C: SSC State rank: S2 CVMSHCP: Yes	Fine sand in desert washes and flats with vegetative cover and ants, generally below 600 feet elevation in Riverside, San Diego, and Imperial Counties.	**Absent** Habitat marginal and poor quality, sandy areas are surrounded by development and have been highly disturbed. CNDDB records in vicinity are historic and have been mostly developed.
Uma inornata **Coachella Valley fringe-toed lizard**	F = THR C = END NDDB Element Rank: Global = G1Q State = S1 CVMSHCP = Yes	Restricted to sandy areas in the Coachella Valley; requires fine, loose, windblown sand interspersed with hardpan and widely spaced desert shrubs	**Absent** Although loose sandy soils are present, the site is isolated and disturbed. Records in the vicinity are from the 1994 and 1975.

Table 4. Special Status Birds

Species	Status	Habitat	Probability
Aquila chrysaetos **golden eagle**	F: None C: FP,WL NDDB Element Rank: State Rank: S3 Global: G5 MSHCP: No	Forages over rolling foothills, mountain areas, sage-juniper flats, and desert. Cliff-walled canyons used for nesting, sometimes large trees in open areas	Nesting: **Absent** (Project site does not support nesting habitat. Foraging: **Low** (Do not forage in urban areas frequently)
Athene cunicularia **burrowing owl**	F = BLM Sensitive, BCC C = SSC (burrows) NDDB Element Rank: Global: G4 State: S3 MSHCP: Yes	Open, dry annual or perennial grassland, deserts & scrublands characterized by low-growing vegetation	Nesting: **Absent** No suitable burrows were observed. Foraging: **Low** Foraging habitat is available onsite and on adjacent properties, however the project site is isolated from other open areas and the site has a high level of dog activity which would discourage owls.
Dendroica petechia **yellow warbler**	F: MBTA, BCC C: SSC (nesting), F&G Code NDDB Element Rank: Global: G5 State: S3S4 MSHCP: Yes	Riparian forest and woodland; nests along Mojave River, Santa Ana River, Kern River, and many others in s. Calif.	Nesting: **Absent** No suitable habitat. Foraging: **Low** No suitable habitat.
Empidonax trailii extimus ***southwestern willow flycatcher***	F: END (subspecies), MBTA C: END (full species), F&G Code NDDB Element Rank: Global: G5T2 State: S1 MSHCP: Yes	Riparian woodlands	Nesting: **Absent** habitat lacking Foraging: **Absent** habitat lacking
Falco mexicanus **prairie falcon**	F = None, BCC C = WL NDDB Element Global = G5 State = S4 MSHCP = No	Breeding sites located on cliffs, forages far afield even to marshlands and ocean shores	Nesting: **Absent** (habitat lacking) Foraging: **Low** may forage over site

Table 4. Special Status Birds

Species	Status	Habitat	Probability
Lanius ludovicianus **loggerhead shrike**	F: MBTA, BCC C: SSC (nesting), F&G Code NDDB Element Rank: Global = G4 State = S4 MSHCP = No	Associated with a variety of vegetation communities including creosote bush scrub, Joshua tree woodland. Nests in trees and shrubs.	Nesting: **Low** low amount of nesting habitat on site Foraging: **High** (common in region)
Toxostoma lecontei **Le Conte's thrasher**	F = BLM Sensitive, BCC C = SSC (San Joaquin population only) NDDB Element Ranks: Global = G4 State = S3 MSHCP = Yes (Other Conserved Habitat and modeled habitat on-site for this species)	Desert resident, primarily of open desert wash, desert scrub, alkali desert scrub, and desert succulent scrub habitats; commonly nests in a dense, spiny shrub or densely branched cactus in desert wash habitat, usually 2-8 feet above ground	Nesting: **Absent** (Dense, spiny shrubs lacking onsite Foraging: **Low** spiny shrubs lacking onsite
Vireo bellii pusillus **least Bell's vireo**	F: END (nesting), MBTA C: END (nesting), F&G Code NDDB Element Ranks: Global = G5T2 State = S2 MSHCP = Yes	Willow riparian woodlands	Nesting: **Absent** habitat lacking Foraging: **Absent** habitat lacking

Table 5. Special Status Mammals

Species	Status	Habitat	Probability
Chaetodipus fallax pallidus **pallid San Diego pocket mouse**	F = None C = SSC NDDB Element Global = G5T34 State = S3S4 MSHCP = No	Desert border areas in desert wash, desert scrub, desert succulent scrub, pinon-juniper, etc.; sandy herbaceous areas usually in association with rocks or coarse gravel.	**Low** Onsite habitat is marginal and contains no rocky areas.
Corynorhinus townsendii **Townsend's big-eared bat**	F = None C = SSC NDDB Element Global = G3G4 State = S2 WBWG = H MSHCP = No	Generally viewed as a cave-dwelling species, but the western subspecies are also found on/in human-made structures (e.g. old mine workings and buildings). Roosts in open but extremely sensitive to human disturbance.	Roosting: **Absent** (roosting habitat not present) Foraging: **Low** Unlikely to forage due to disturbance and adjacent development.

Table 5. Special Status Mammals

Species	Status	Habitat	Probability
Neotoma lepida intermedia **San Diego desert woodrat**	F = None C = SSC NDDB Element Global = G5T3T4 State = S3S4 MSHCP = No	The most common habitats are chaparral, coastal sage scrub (including Riversidean sage scrub and Diegan coastal sage scrub) and grassland, although this subspecies also occurs in desert habitats.	**Absent** No nests were observed onsite
Ovis canadensis nelsoni pop. 2 **Peninsular bighorn sheep DPS**	F = END C = THR NDDB Element Global = G4T3Q State = S1 MSHCP = Yes	Optimal habitat includes steep-walled canyons and ridges bisected by rocky or sandy washes with available water.	**Absent** Outside of species range and no habitat present
Perognathus longimembris bangsi **Palm Springs pocket mouse**	F = BLM Sensitive C = SSC NDDB Element Global = G5T2 State = S2 MSHCP = Yes (modeled habitat present)	Desert scrub, sandy, loosely-packed soils.	**Low** Sandy areas present onsite. The project site is isolated from other open areas and the site has a high level disturbance and dog activity
Xerospermophilus tereticaudus **Coachella Valley (Palm Springs) round-tailed ground squirrel**	F = BLM Sensitive C = SSC NDDB Element Global = G5T2Q State = S2 MSHCP = Yes (modeled habitat present)	Sand fields, dunes and hummocks in Sonoran creosote bush scrub, mesquite, saltbush and desert sink scrub. Also may occur in course sandy and pebbly alluvial substrates along washes.	**Low** Sandy areas present onsite. The project site is isolated from other open areas and the site has a high level disturbance and dog activity. CNDDB record from less than 1 mi. NW of site but is from 1954. No potential burrows observed.

Definitions of occurrence probability:

Occurs: Observed on the site by WSP personnel or recorded on-site by other qualified biologists.

High: Observed in similar habitat in region by qualified biologists, or habitat on the site is a type often utilized by the species and the site is within the known range of the species.

Moderate: Reported sightings in surrounding region, or site is within the known range of the species and habitat on the site is a type occasionally used by the species.

Low: Site is within the known range of the species but habitat on the site is rarely used by the species.

Very Low: Species not expected on site, but can not be completely ruled out.

Absent: A focused study failed to detect the species, or no suitable habitat is present.

Definitions of status designations and occurrence probabilities.

Federal designations: (federal Endangered Species Act, US Fish and Wildlife Service):

- END: Federally listed, Endangered.
- THR: Federally listed, Threatened.
- BCC: Bird of Conservation Concern
- C: Candidate for Federal listing
- ND: Not designated.

State designations: (California Endangered Species Act, California Dept. of Fish and Game)

- END: State listed, Endangered.
- THR: State listed, Threatened.
- C: Candidate for State listing
- RARE: State listed as Rare (Listed "Rare" animals have been re-designated as Threatened, but Rare plants have retained the Rare designation.)
- SSC: Species of Special Concern.

WL: Watch List Species.
ND: Not designated.

CDFW CNDDB rankings: Animals
S1 = Extremely endangered: <6 viable occurrences or <1,000 individuals, or < 2,000 acres of occupied habitat
S2 = Endangered: about 6-20 viable occurrences or 1,000 - 3,000 individuals, or 2,000 to 10,000 acres of occupied habitat
S3 = Restricted range, rare: about 21-100 viable occurrences, or 3,000 – 10,000 individuals, or 10,000 – 50,000 acres of occupied habitat
S4 = Apparently secure; some factors exist to cause some concern such as narrow habitat or continuing threats
S5 = Demonstrably secure; commonly found throughout its historic range
SH = all sites are historical, this species may be extinct, further field work is needed

CDFW CNDDB rankings: Plants and Vegetation Communities
S1 = Less than 6 viable occurrences OR less than 1,000 individuals OR less than 2,000 acres
S1.1 = very threatened
S1.2 = threatened
S1.3 = no current threats known
S2 = 6-20 viable occurrences OR 1,000-3,000 individuals OR 2,000-10,000 acres
S2.1 = very threatened
S2.2 = threatened
S2.3 = no current threats known
S3 = 21-80 viable occurrences or 3,000-10,000 individuals OR 10,000-50,000 acres
S3.1 = very threatened
S3.2 = threatened
S3.3 = no current threats known
S4 = Apparently secure within California; this rank is clearly lower than S3, but factors exist to cause some concern. i.e., there is some threat, or somewhat narrow habitat.
S5 = Demonstrably secure to ineradicable in California.

California Native Plant Society (CNPS) designations:
California Rare Plant Ranks (CRPR) Note: According to the CNPS (http://www.cnps.org/programs/Rare_Plant/inventory/names.htm), ALL plants on Lists 1A, 1B, 2A, and 2B meet definitions for state listing as threatened or endangered under Secs. 2062 and 2067 (California Endangered Species Act) of the California Department of Fish and Game Code. Certain plants on Lists 3 and 4 do as well.
The CDFW (http://www.dfg.ca.gov/hcpb/species/t_e_spp/nat_plnt_consv.shtml) states that plants on Lists 1A, 1B, 2A, and 2B of the CNPS Inventory consist of plants that may qualify for listing, and recommends they be addressed in CEQA projects (CEQA Guidelines Section 15380). However, a plant need not be in the Inventory to be considered a rare, threatened, or endangered species under CEQA. In addition, CDFW recommends, and local governments may require, protection of plants which are regionally significant, such as locally rare species, disjunct populations of more common plants, or plants on the CNPS Lists 3 and 4.
List 1A: Plants presumed extinct in California.
List 1B: Plants rare and endangered in California and throughout their range.
List 2A: Plants presumed extirpated in California, but more common elsewhere.
List 2B: Plants rare, threatened, or endangered in California, but more common elsewhere.
List 3: Plants for which more information is needed.
List 4: Plants of limited distribution; a "watch list."
CA Endemic: Taxa that occur only in California
CNPS Threat Code:
.1 - Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)
.2 – Fairly endangered in California (20-80% occurrences threatened)
.3 – Not very endangered in California (<20% of occurrences threatened, or no current threats known)
Note: All List 1A (presumed extinct in California) and some List 3 (need more information- a review list) plants lacking any threat information receive no threat code extension. Also, these Threat Code guidelines represent a starting point in the assessment of threat level. Other factors, such as habitat vulnerability and specificity, distribution, and condition of occurrences, are also considered in setting the Threat Code.

Western Bat Working Group (WBWG) designations:
The Western Bat Working Group is comprised of agencies, organizations and individuals interested in bat research, management and conservation from the 13 western states and provinces. Its goals are (1) to facilitate communication among interested parties and reduce risks of species decline or extinction; (2) to provide a mechanism by which

current information on bat ecology, distribution and research techniques can be readily accessed; and (3) to develop a forum to discuss conservation strategies, provide technical assistance and encourage education programs.
H: High: Species which are imperiled or are at high risk of imperilment based on available information on distribution, status, ecology and known threats.
M: Medium: Species which warrant a medium level of concern and need closer evaluation, more research, and conservation actions of both the species and possible threats. A lack of meaningful information is a major obstacle in adequately assessing these species' status and should be considered a threat.
L: Low: Species for which most of the existing data support stable populations, and for which the potential for major changes in status in the near future is considered unlikely. There may be localized concerns, but the overall status of the species is believed to be secure. Conservation actions would still apply for these bats, but limited resources are best used on High and Medium status species.
P: Periphery: This designation indicates a species on the edge of its range, for which no other designation has been determined.

<u>CVMSHCP designations</u>
Yes: Conserved by the CVMSHCP
No: Not Specifically Conserved by the CVMSHCP
C: Considered, but not included in the CVMSHCP

5.7 Discussion of the Special-status Species Tables

Based on examination of historic aerial photography of the site (on Google Earth Pro), the California fan palm oasis has been present for many years. It is an important area for nesting birds. Enhancement of the site by removing non-native species would improve habitat for special status species.

5.7.1 CVMSHCP Covered Species

Nineteen of the species listed in Tables 1 – 3 are conserved under the CVMSHCP: Coachella Valley milk-vetch, triple-ribbed milk-vetch, Mecca aster, Little San Bernardino Mountains linanthus, Coachella giant sand treader cricket, Coachella Valley Jerusalem cricket, desert pupfish, desert tortoise, flat-tailed horned lizard, Coachella Valley fringe-toed lizard, burrowing owl, Southwestern willow flycatcher, crissal thrasher Le Contes' thrasher, Least Bell's vireo, western yellow bat, Palm Springs pocket mouse, Coachella Valley (Palm Springs) round-tailed ground squirrel, and Peninsular bighorn sheep. Six of these species are expected to have at least a low to very low probability of occurring on the project site. These include Coachella Valley milk-vetch, Coachella giant sand treader cricket, Coachella Valley Jerusalem cricket, burrowing owl, Palm Springs pocket mouse, and Coachella Valley (Palm Springs) round-tailed ground squirrel. Participation in the CVMSHCP, and participation in the plan, if required will fully mitigate project related impacts (although none are anticipated) to all of these CVMSHCP covered species with the exception of burrowing owl.

No burrows suitable for burrowing owl use were observed on or adjacent to the project site. Where accessible, adjacent vacant lands were surveyed within 500 feet of the site. No burrowing owls, their sign, or burrows capable of supporting owls were observed in this buffer area. The burrowing owl is not listed as threatened or endangered by the USFWS or CDFW. It is, however, managed as a Bird of Conservation Concern (BCC) by the USFWS and designated as a SSC by the CDFW. It is also protected from take by the MBTA and California Fish and Game Code. The burrowing owl is a covered species under the CVMSHCP, however the federal permit for the CVMSHCP does not allow take of this species under the MBTA. For these reasons, all burrowing owls must be avoided or relocated prior to any ground disturbing activities. No burrowing owls, owl sign, or suitable burrows were observed during the survey.

5.7.2 Potentially Occurring Species Not Covered Under the CVMSHCP and USFWS IPAC Species

Seven special status species that are not covered by the CVMSHCP are considered to have at least some potential (low to very low) to occur on or forage over the project site. Prairie falcon are expected to have a low probability to forage over the site (although this would be rare given the developed nature of the site and surrounding area). Prairie falcon is not listed as threatened or endangered by either State or Federal agencies but is considered a "Species of Special Concern" by the California Department of Fish and Wildlife. Slender cottonheads are expected to have a low probability of growing on this site. Slender cottonheads were not observed during the survey. This plant species is not listed as threatened or endangered and are generally not expected to occur on the site. Still, they could not be absolutely ruled out due to presence of marginally suitable habitat and the seasonal timing of the site visit.

The USFWS IPAC report generated for this project lists five sensitive wildlife species and one plant as having potential to be affected by development of this project. As discussed in Tables 1 – 3 in Section 5.6, none of the listed species are expected to occur onsite. Monarch butterflies require milkweeds for larval development and other flowering plants for adult nectar sources. No milkweed plants were observed on the site. There is no quality habitat present for desert tortoise due to the sandy nature of the soil which do not provide good burrowing substrate as well as the high level of disturbance. Suitable habitat for Coachella Valley fringe-toed lizard is present, however the site is highly disturbed and isolated from other open areas. The most recent record in the areas for Coachella Valley fringed-toed lizard are from 1994. Least Bell's vireo is absent from the site due to a lack of any suitable riparian habitat.

6.0 DISCUSSION

The proposed project includes the permanent disturbance of approximately 10 acres of disturbed creosote scrub to build 240-250 apartment homes.

6.1 Protection of Nesting Birds

All native bird species that are excluded from coverage under the CVMSHCP are still protected by the MBTA and the state Fish and Game Code. This includes virtually all native migratory and resident bird species. Avoidance of impacts to these birds is a requirement of the federal permit issued for the CVMSHCP. To avoid impacting nesting birds either avoidance of project-related disturbance during the nesting season, nesting bird surveys should be conducted by a qualified ornithologist or biologist immediately prior to on-site disturbance. If nesting birds are found, no work would be permitted near the nest until young have fledged. There is no established protocol for nest avoidance, however, when consulted the CDFW generally recommends avoidance buffers of about 500 feet for birds-of-prey and species listed as threatened or endangered, and 100–300 feet for unlisted songbirds.

6.2 Burrowing Owl

As noted above, no burrowing owls or their sign were present on site. Also, no burrows or burrow surrogates that could be used by burrowing owls were present on the site at the time of this survey. This species nests and roosts underground so is uniquely vulnerable to ground disturbing activities. Since no burrowing owl sign or suitable burrows were observed, a search for burrowing owls during the required MBTA survey prior to construction should be sufficient to ensure there are no impacts to burrowing owls. The MBTA survey should be conducted prior to initiating construction to ensure that no nesting birds have moved onto the site in the interim between this survey and project startup. Unless avoidable, all burrowing owls present must be relocated prior to any ground disturbing activities. If burrows are found on-site, a Burrowing Owl Relocation and Management Plan will be prepared to describe and outline how the burrowing owl will be actively or passively relocated per CDFW guidelines. Prior to construction, any owls occurring on-site will be relocated prior to vegetation removal or grading activities. Relocation will require prior permission from the CDFW, at a minimum. Since the burrowing owl is a covered species under the CVMSHCP, additional mitigation/conservation measures will not be required.

7.0 CONCLUSION

The project site is highly disturbed and being used as a homeless camp and for local people to run their dogs off leash. No sensitive species were observed within the project area. No nesting bird activity was observed. Suitable nesting habitat is present so a clearance nesting bird survey should be conducted prior to any ground disturbance.

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USGS 7.5' *Cathedral City, Calif.* 7.5-minute topographic quadrangles (USGS 2021)

APPENDIX A

FIGURES

Service Layer Credits: World Street Map: City of Palm Desert, City of Riverside, County of Riverside, Bureau of Land Management, Esri, HERE, Garmin, NGA, USGS, NPS
World Street Map: Esri, HERE, Garmin, NGA, USGS

Path: \\corp.pbwan.net\glb-e&i\US\USSAN600-SDG2\GIS\3554_NaturalResources\TerraNova_ViaVail\ArcPro\TerraNova_ViaVail_CoachellaValley_MSCHP\TerraNova_ViaVail_CoachellaValley_MSCHP.aprx, USMT738346 3/4/2024

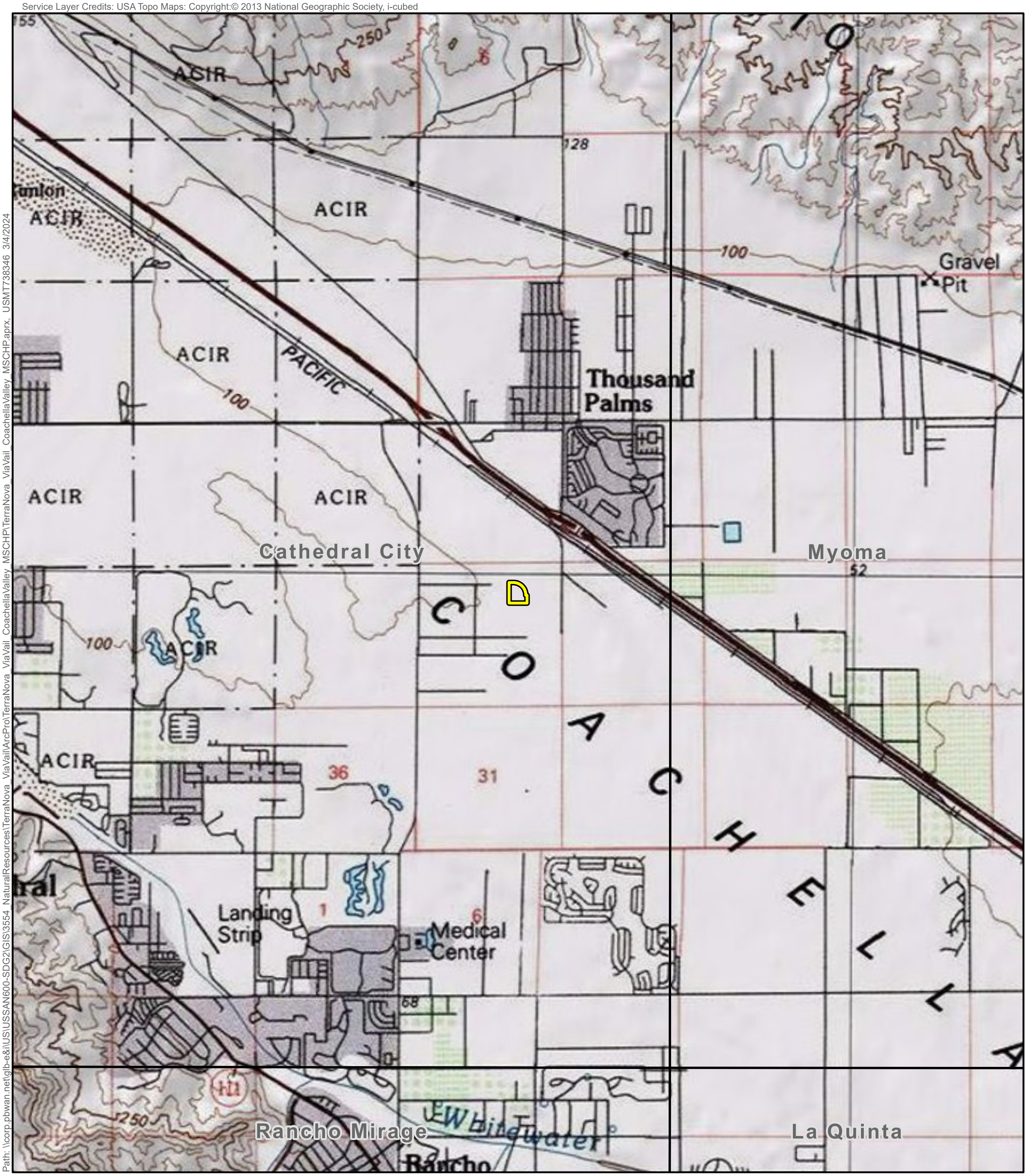
1 inch =1 miles
0 0.5 1 Miles

Project Boundary
CA Counties

FIGURE 1

Project Region
Via Vail
Coachella Valley MSHCP
Coachella Valley, CA

Service Layer Credits: USA Topo Maps: Copyright:© 2013 National Geographic Society, i-cubed



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1 inch =1 miles

0 0.5 1 Miles

Project Boundary

FIGURE 2

USGS 7.5' Topo Quad: Coachella Valley

Via Vail

Coachella Valley MSHCP

Coachella Valley, CA

Service Layer Credits: Hybrid Reference Layer: Esri Community Maps Contributors, Loma Linda University, UC Riverside, City of Palm Desert, County of Riverside, California State Parks, © OpenStreetMap, Microsoft, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau

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Project Boundary

Soils

Myoma fine sand, 5 to 15 percent slopes

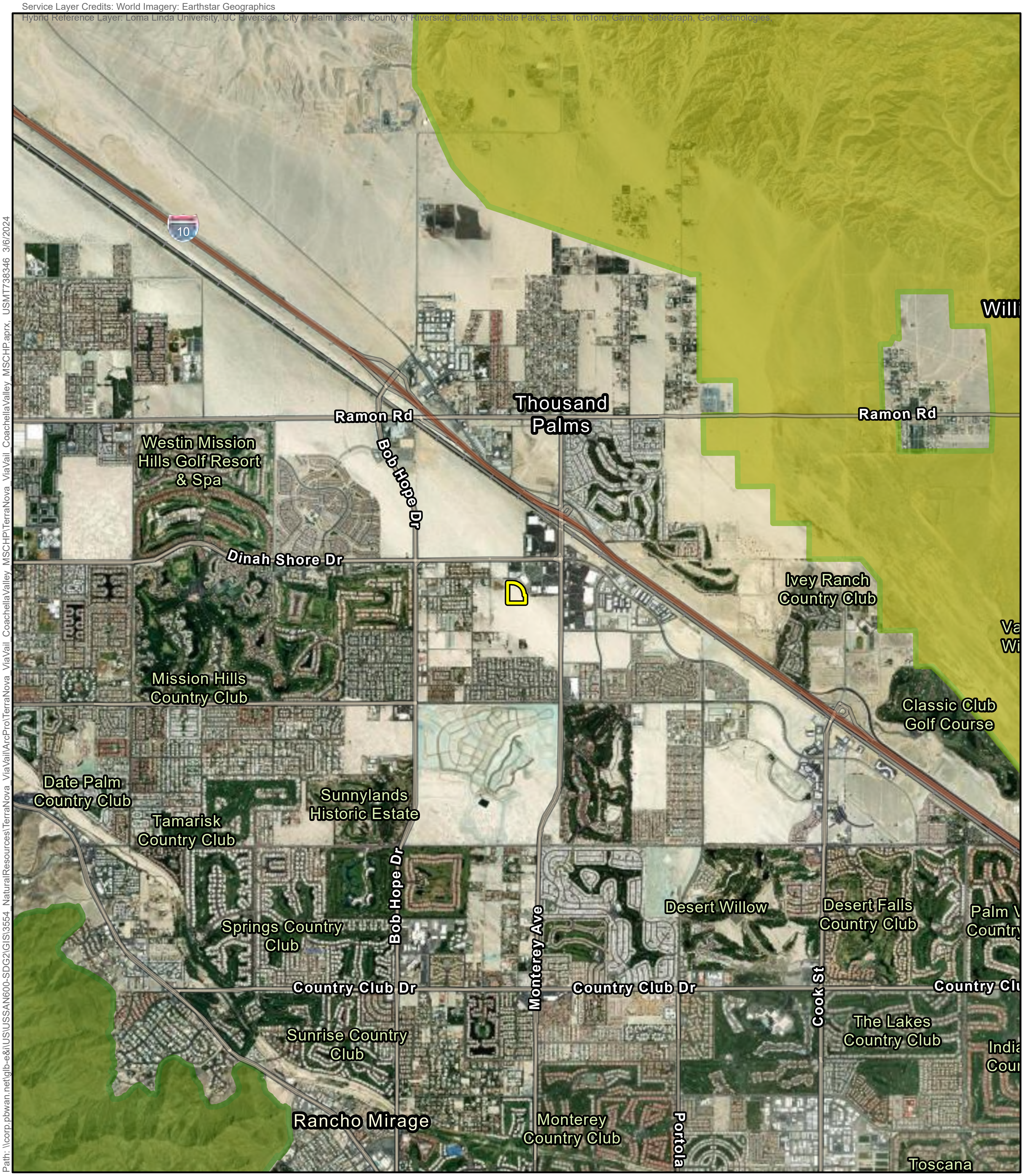
1 inch =200 feet
0 100 200 Feet

wsp

FIGURE 3

Soils
Via Vail
Coachella Valley MSHCP
Coachella Valley, CA

Service Layer Credits: World Imagery: Earthstar Geographics
Hybrid Reference Layer: Loma Linda University, UC Riverside, City of Palm Desert, County of Riverside, California State Parks, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies,



Path: \\corp.pbwan.net\glb-e&i\US\USSAN600-SDG2\GIS\3554 NaturalResources\TerraNova ViaVail\ArcPro\TerraNova ViaVail CoachellaValley MSCHP\TerraNova ViaVail CoachellaValley MSCHP.aprx USMT738346 3/6/2024

1 inch =5,000 feet
0 2,000 4,000 Feet

Project Boundary

Conservation Areas

Santa Rosa and San Jacinto Mountains

Thousand Palms

wsp

FIGURE 4

CVMSHCP
Via Vail
Coachella Valley MSHCP
Coachella Valley, CA

Project Boundary

Vegetation Community

Creosote Scrub

1 inch =200 feet
0 100 200 Feet

wsp

FIGURE 5

Vegetation Communities
Via Vail
Coachella Valley MSHCP
Coachella Valley, CA

APPENDIX B

PLANTS AND VERTEBRATE WILDLIFE OBSERVED

Plant Species Observed

Amaranthaceae	
Atriplex canescens	four-wing saltbush
Asteraceae	
Dicoria canescens	desert dicoria
Palafoxia arida	Spanish needles
Boraginaceae	
Johnstonella angustifolia	narrow leaved forget me not
Tiquilia plicata	fanleaf crinklemat
Brassicaceae	
Brassica tournefortii	Sahara mustard
Fabaceae	
Psorothamnus emoryi	dyebush
Geraniaceae	
Erodium cicutarium	red stemmed filaree
Loasaceae	
Petalonyx thurberi	sandpaper plant
Nyctaginaceae	
Abronia villosa	desert sand verbena
Onagraceae	
Chylismia claviformis ssp. *claviformis*	browneyes
Tamaricaceae	
Tamarix aphylla	Athel
Zygophyllaceae	
Larrea tridentata	creosote bush
Poaceae	
Schismus barbatus	old han schismus

Vertebrate Species Observed

Corvidae	
Corvus brachyrhynchos	American crow
Fringillidae	
Haemorhous mexicanus	house finch
Remizidae	
Auriparus flaviceps	verdin
Trochilidae	
Calypte costae	Costa's hummingbird
Tyrannidae	
Sayornis saya	Say's phoebe

APPENDIX C

SITE PHOTOS

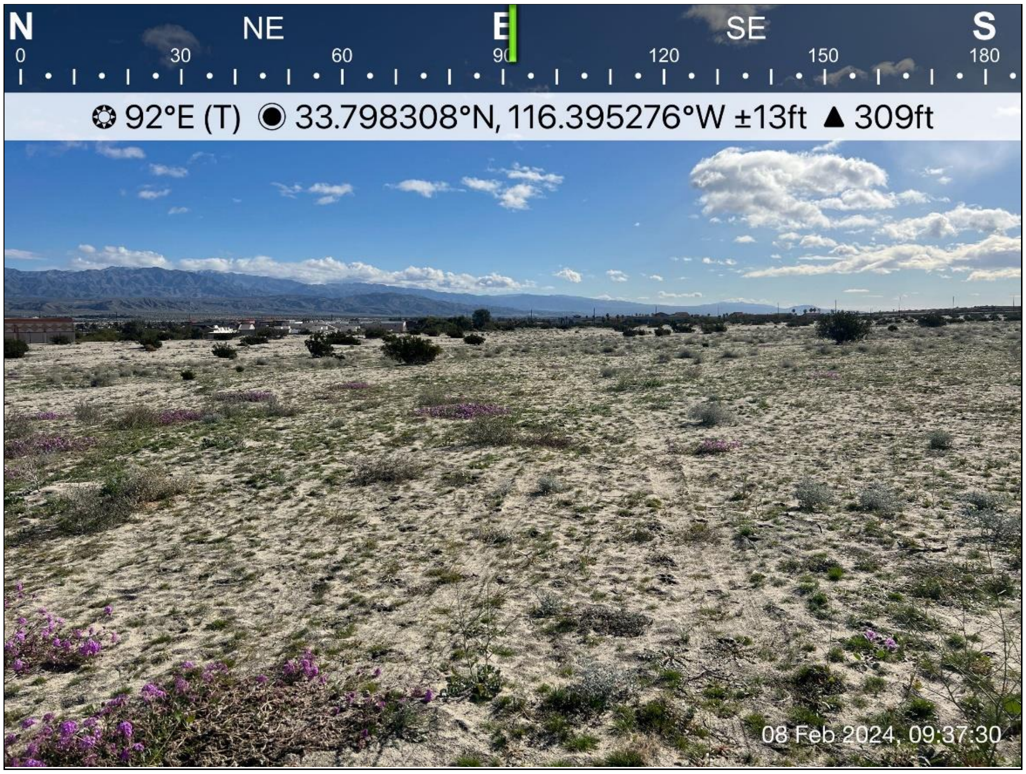


Photo 1. Looking east across the site showing disturbance from tire tracks.

Photo 2. Looking south showing a portion of the homeless camp onsite.

Photo 3. Looking west across the site shows a portion of the homeless camp.

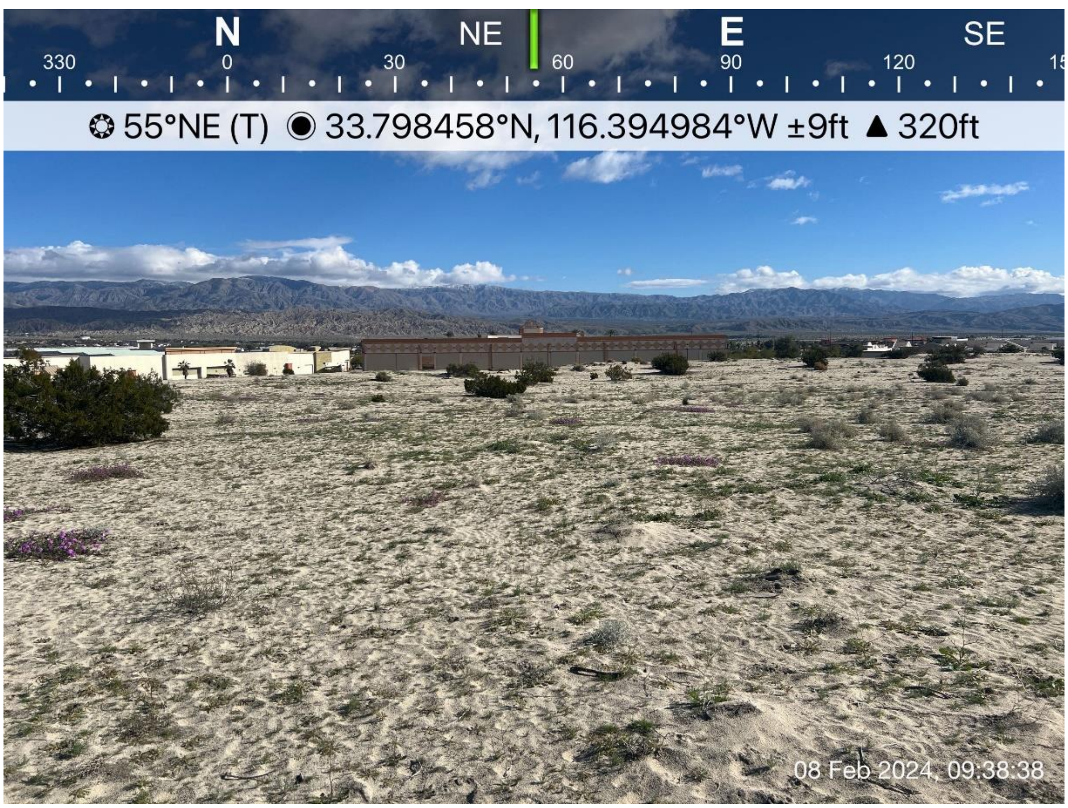


Photo 4. Looking northeast shows the adjacent commercial development.

Photo 5. Looking west showing the adjacent dog park.

Photo 6. Looking southeast showing a small athel tree onsite.

APPENDIX D

CVMSHCP Table 4-112:
Coachella Valley Native Plants Recommended for Landscaping

Coachella Valley Native Plants Recommended for Landscaping

BOTANICAL NAME	COMMON NAME
Trees	
Washingtonia filifera	California fan palm
Cercidium floridum	blue palo verde
Chilopsis linearis	desert willow
Olneya tesota	ironwood tree
Prosopis glandulosa var. *torreyana*	honey mesquite
Shrubs	
Acacia greggii	cat's claw acacia
Ambrosia dumosa	burro bush
Atriplex canescens	four wing saltbush
Atriplex lentiformis	quailbush
Atriplex polycarpa	cattle spinach
Baccharis sergiloides	squaw water-weed
Bebia juncea	sweet bush
Cassia (Senna) covesii	desert senna
Condalia parryi	crucillIo
Crossosoma bigelovii	crossosoma
Dalea emoryi	dye weed
Dalea (Psorothamnus) schottii	indigo bush
Datura meteloides	jimson weed
Encelia farinosa	brittle bush
Ephedra aspera	Mormon tea
Eriogonum fasciculatum	California buckwheat
Eriogonum wrightii membranaceum	Wright's buckwheat
Fagonia laevis	no common name
Gutierrezia sarothrae	matchweed
Haplopappus acradenius	goldenbush
Hibiscus denudatus	desert hibiscus
Hoffmannseggia microphylla	rush pea
Hymenoclea salsola	cheesebush
Hyptis emoryi	desert lavender
Isomeris arborea	bladder pod
Juniperus californica	California juniper
Krameria grayi	ratany
Krameria parvifolia	little-leaved ratany
Larrea tridentata	creosote bush
Lotus rigidus	desert rock pea
Lycium andersonii	box thorn
Petalonyx linearis	long-leaved sandpaper plant
Petalonyx thurberi	sandpaper plant
Peucephyllum schottii	pygmy cedar
Prunus fremontii	desert apricot
Rhus ovata	sugar-bush
Salazaria mexicana	paper-bag bush
Salvia apiana	white sage
Salvia eremostachya	Santa Rosa sage

Salvia vaseyi	wand sage
Simmondsia chinensis	jojoba
Sphaeralcia ambigua	globemallow (desert mallow)
Sphaeralcia ambigua rosacea	apricot mallow
Trixis californica	trixis
Zauschneria californica	California fuchsia

Groundcovers

Mirabilis bigelovii	wishbone bush (four o'clock)
Mirabilis tenuiloba	white four o'clock (thin-lobed)

Vines

Vitis girdiana	desert grape

Accent

Muhlenbergia rigens	deer grass

Herbaceous Perennials

Adiantum capillus-veneris	maiden-hair fern
Carex alma	sedge
Dalea parryi	Parry dalea
Eleocharis montevidensis	spike rush
Equisetum laevigatum	horsetail
Juncus bufonis	toad rush
Juncus effuses	juncus
Juncus macrophyllus	juncus
Juncus mexicanus	Mexican rush
Juncus xiphioides	juncus
Notholaena parryi	Parry cloak fern
Pallaea mucronata	bird-foot fern

Cacti and Succulents

Agave deserti	desert agave
Asclepias albicans	desert milkweed (buggy-whip)
Asclepias subulata	ajamete
Dudleya arizonica	live-forever
Dudleya saxosa	rock dudleya
Echinocereus engelmannii	calico hedgehog cactus
Ferocactus acanthodes	barrel cactus
Fouquieria splendens	ocotillo
Mamillaria dioica	nipple cactus
Mamillaria tetrancistra	corkseed cactus
Nolina parryi	Parry nolina
Opuntia acanthocarpa	stag-horn or deer-horn cholla
Opuntia bigelovii	teddy bear or jumping cholla
Opuntia basilaris	beavertail cactus
Opuntia echinocarpa	silver or golden cholla
Opuntia ramosissima	pencil cholla, darning needle cholla
Yucca schidigera	Mojave yucca, Spanish dagger
Yucca whipplei	Our Lord's candle

APPENDIX E

Prohibited Invasive Ornamental Plants

Prohibited Invasive Ornamental Plants

BOTANICAL NAME	COMMON NAME
Acacia spp. (all species except A. greggii)	(all species except native catclaw acacia)
Arundo donax	giant reed or arundo grass
Atriplex semibaccata	Australian saltbush
Avena barbata	slender wild oat
Avena fatua	wild oat
Brassica tournefortii	African or Saharan mustard
Bromus madritensis ssp. rubens	red brome
Bromus tectorum	cheat grass or downy brome
Cortaderia jubata [syn.C. atacamensis]	jubata grass or Andean pampas grass
Cortaderia dioica [syn. C. selloana]	pampas grass
Descurainia sophia	tansy mustard
Eichhornia crassipes	water hyacinth
Elaegnus angustifolia	Russian olive
Foeniculum vulgare	sweet fennel
Hirschfeldia incana	Mediterranean or short-pod mustard
Lepidium latifolium	perennial pepperweed
Lolium multiflorum	Italian ryegrass
Nerium oleander	oleander
Nicotiana glauca	tree tobacco
Oenothera berlandieri	Mexican evening primrose
Olea europea	European olive tree
Parkinsonia aculeata	Mexican palo verde
Pennisetum clandestinum	Kikuyu grass
Pennisetum setaceum	fountain grass
Phoenix canariensis	Canary Island date palm
Phoenix dactylifera	date palm
Ricinus communis	castorbean
Salsola tragus	Russian thistle
Schinus mole	Peruvian pepper tree
Schinus terebinthifolius	Brazilian pepper tree
Schismus arabicus	Mediterranean grass
Schismus barbatus	Saharan grass, Abu Mashi
Stipa capensis	no common name
Tamarix spp. (all species)	tamarisk or salt cedar
Taeniatherum caput-medusae	Medusa-head
Tribulus terrestris	puncturevine
Vinca major	periwinkle
Washingtonia robusta	Mexican fan palm
Yucca gloriosa	Spanish dagger

Sources: California Exotic Pest Plant Council, United States Department of Agriculture-Division of Plant Health and Pest Prevention Services, California Native Plant Society, Fremontia Vol. 26 No. 4, October 1998, The Jepson Manual; Higher Plants of California, and County of San Diego Department of Agriculture.

APPENDIX F

USFWS IPaC Report

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Carlsbad Fish And Wildlife Office
2177 Salk Avenue - Suite 250
Carlsbad, CA 92008-7385
Phone: (760) 431-9440 Fax: (760) 431-5901

In Reply Refer To: March 07, 2024
Project Code: 2024-0059071
Project Name: Via Vail Apartment Homes Project

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed, and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through IPaC by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at: https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts, see Migratory Bird Permit | What We Do | U.S. Fish & Wildlife Service (fws.gov).

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see https://www.fws.gov/library/collections/threats-birds.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/partner/council-conservation-migratory-birds.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

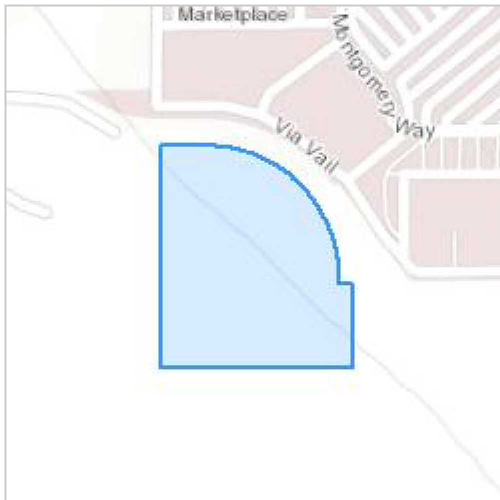
This species list is provided by:

Carlsbad Fish And Wildlife Office
2177 Salk Avenue - Suite 250
Carlsbad, CA 92008-7385
(760) 431-9440

PROJECT SUMMARY

Project Code: 2024-0059071
Project Name: Via Vail Apartment Homes Project
Project Type: Residential Construction
Project Description: The proposed project plan is to development of approximately 240-250 apartment homes.
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@33.798413499999995,-116.39367644026422,14z



Counties: Riverside County, California

ENDANGERED SPECIES ACT SPECIES

There is a total of 6 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Peninsular Bighorn Sheep *Ovis canadensis nelsoni* Population: Peninsular CA pop. There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/4970	Endangered

BIRDS

NAME	STATUS
Least Bell's Vireo *Vireo bellii pusillus* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5945	Endangered

REPTILES

NAME	STATUS
Coachella Valley Fringe-toed Lizard *Uma inornata* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2069	Threatened
Desert Tortoise *Gopherus agassizii* Population: Wherever found, except AZ south and east of Colorado R., and Mexico There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/4481	Threatened

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

FLOWERING PLANTS

NAME	STATUS
Coachella Valley Milk-vetch *Astragalus lentiginosus var. coachellae* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7426	Endangered

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency:	WSP USA
Name:	Dale Hameister
Address:	WSP USA Environment & Infrastructure Inc
Address Line 2:	862 E Hospitality Ln #350
City:	San Bernardino
State:	CA
Zip:	92408
Email	dale.hameister@wsp.com
Phone:	8312380676

Appendix C

Historical/Archaeological Resources Survey Report

HISTORICAL/ARCHAEOLOGICAL RESOURCES SURVEY REPORT

PARCEL A-1, APN 685-090-011

City of Rancho Mirage
Riverside County, California

For Submittal to:

Development Services Department, Planning Division
City of Rancho Mirage
69825 Highway 111
Rancho Mirage, CA 92270

Prepared for:

Terra Nova Planning and Research, Inc.
42635 Melanie Place, Suite 101
Palm Desert, CA 92211

Prepared by:

CRM TECH
1016 East Cooley Drive, Suite A/B
Colton, CA 92324

Bai "Tom" Tang, Principal Investigator
Michael Hogan, Principal Investigator

April 17, 2024
CRM TECH Contract No. 4098

Title:	Historical/Archaeological Resources Survey: Parcel A-1, APN 685-090-011, City of Rancho Mirage, Riverside County, California
Author(s):	Nicole Raslich, Archaeologist/Report Writer Frank Raslich, Archaeologist
Consulting Firm:	CRM TECH 1016 East Cooley Drive, Suite A/B Colton, CA 92324 (909) 824-6400
Date:	April 17, 2024
For Submittal to:	Development Services Department, Planning Division City of Rancho Mirage 69825 Highway 111 Rancho Mirage, CA 92270 (760) 328-2266
Prepared for:	Nicole Criste, Vice President Terra Nova Planning and Research, Inc. 42635 Melanie Place, Suite 101 Palm Desert, CA 92211 (760) 320-9811
Project Size:	Approximately 10 acres
USGS Quadrangle:	Cathedral City, Calif., 7.5' quadrangle (Section 30, T4S R6E, San Bernardino Baseline and Meridian)
Keywords:	Coachella Valley region, western Colorado Desert; no "historical resources" under CEQA

EXECUTIVE SUMMARY

Between February and April 2024, at the request of Terra Nova Planning and Research, Inc., CRM TECH performed a cultural resources survey on approximately 10 acres of vacant desert land in the northeastern portion of the City of Rancho Mirage, Riverside County, California. The subject property of the study consists of a portion of Assessor's Parcel No. (APN) 685-090-011 known a Parcel A-1, located to the south of Dinah Shore Drive between Monterey Avenue and Key Largo Avenue, in the northeast quarter of Section 30, T4S R6E, San Bernardino Baseline and Meridian.

The study is a part of the environmental review process for the proposed development of an apartment complex on the property. The City of Rancho Mirage, as the lead agency for the project, required the study in compliance with the California Environmental Quality Act (CEQA). The purpose of the study is to provide the City with the necessary information and analysis to determine whether the proposed project would cause substantial adverse changes to any "historical resources," as defined by CEQA, that may exist in or around the project area. In order to identify such resources, CRM TECH conducted a historical/archaeological resources records search, contacted pertinent Native American representatives, pursued historical background research, and carried out an intensive-level field survey.

Throughout the courses of these research procedures, no cultural resources of prehistoric or historic origin were encountered within or adjacent to the project area. Therefore, CRM TECH recommends to the City of Rancho Mirage a finding that the proposed project will have *No Impact* on any "historical resources." No further cultural resources investigation is recommended for the project unless development plans undergo such changes as to include areas not covered by this study. However, if buried cultural materials are discovered during any earth-moving operations associated with the project, all work in the immediate area should be halted or diverted until a qualified archaeologist can evaluate the nature and significance of the finds.

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LIST OF FIGURES

INTRODUCTION

Between February and April 2024, at the request of Terra Nova Planning and Research, Inc., CRM TECH performed a cultural resources survey on approximately 10 acres of vacant desert land in the northeastern portion of the City of Rancho Mirage, Riverside County, California (Fig. 1). The subject property of the study consists of a portion of Assessor's Parcel No. (APN) 685-090-011 known a Parcel A-1, located to the south of Dinah Shore Drive between Monterey Avenue and Key Largo Avenue, in the northeast quarter of Section 30, T4S R6E, San Bernardino Baseline and Meridian (Figs. 2, 3).

The study is a part of the environmental review process for the proposed development of an apartment complex on the property. The City of Rancho Mirage, as the lead agency for the project, required the study in compliance with the California Environmental Quality Act (CEQA; PRC §21000, et seq.). The purpose of the study is to provide the City with the necessary information and analysis to determine whether the proposed project would cause substantial adverse changes to any "historical resources," as defined by CEQA, that may exist in or around the project area.

In order to identify such resources, CRM TECH conducted a historical/archaeological resources records search, contacted pertinent Native American representatives, pursued historical background research, and carried out an intensive-level field survey. The following report is a complete account of the methods, results, and final conclusion of the study. Personnel who participated in the study are named in the appropriate sections below, and their qualifications are provided in Appendix 1.

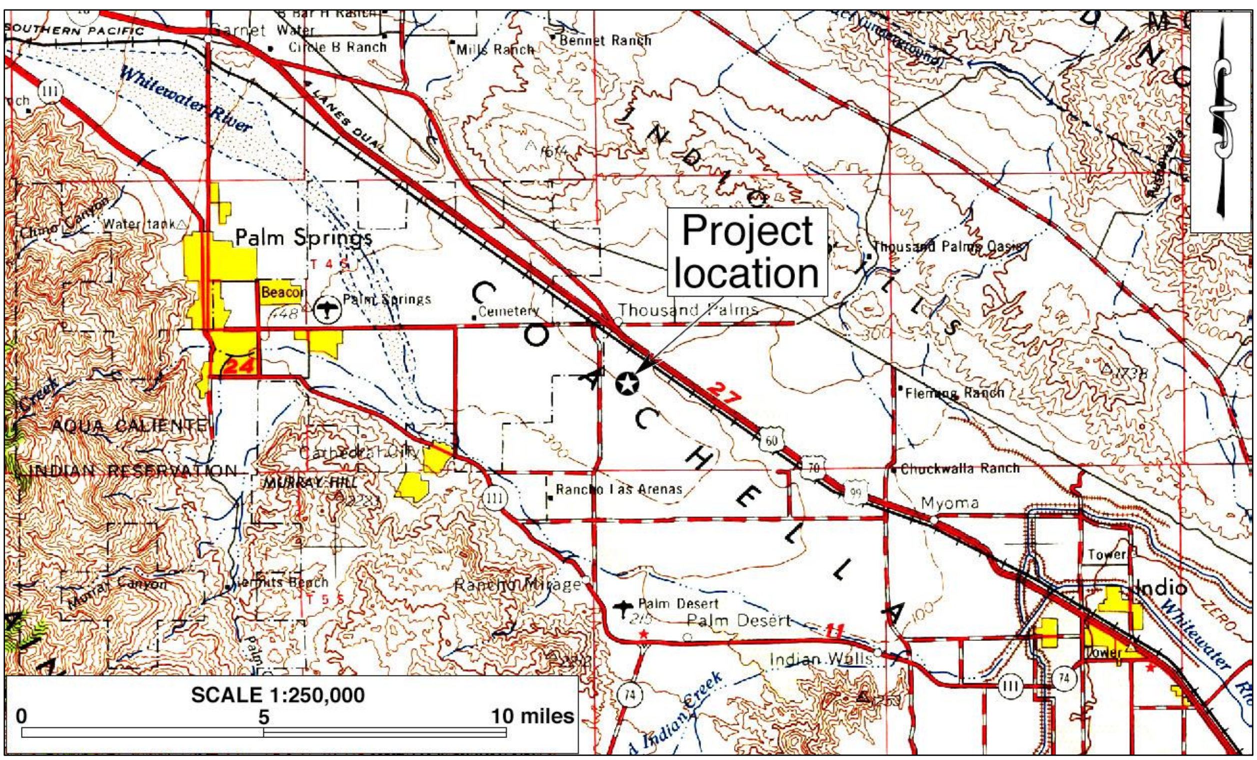

Figure 1. Project vicinity. (Based on USGS Santa Ana, Calif., 120'x60' quadrangle [USGS 1979])

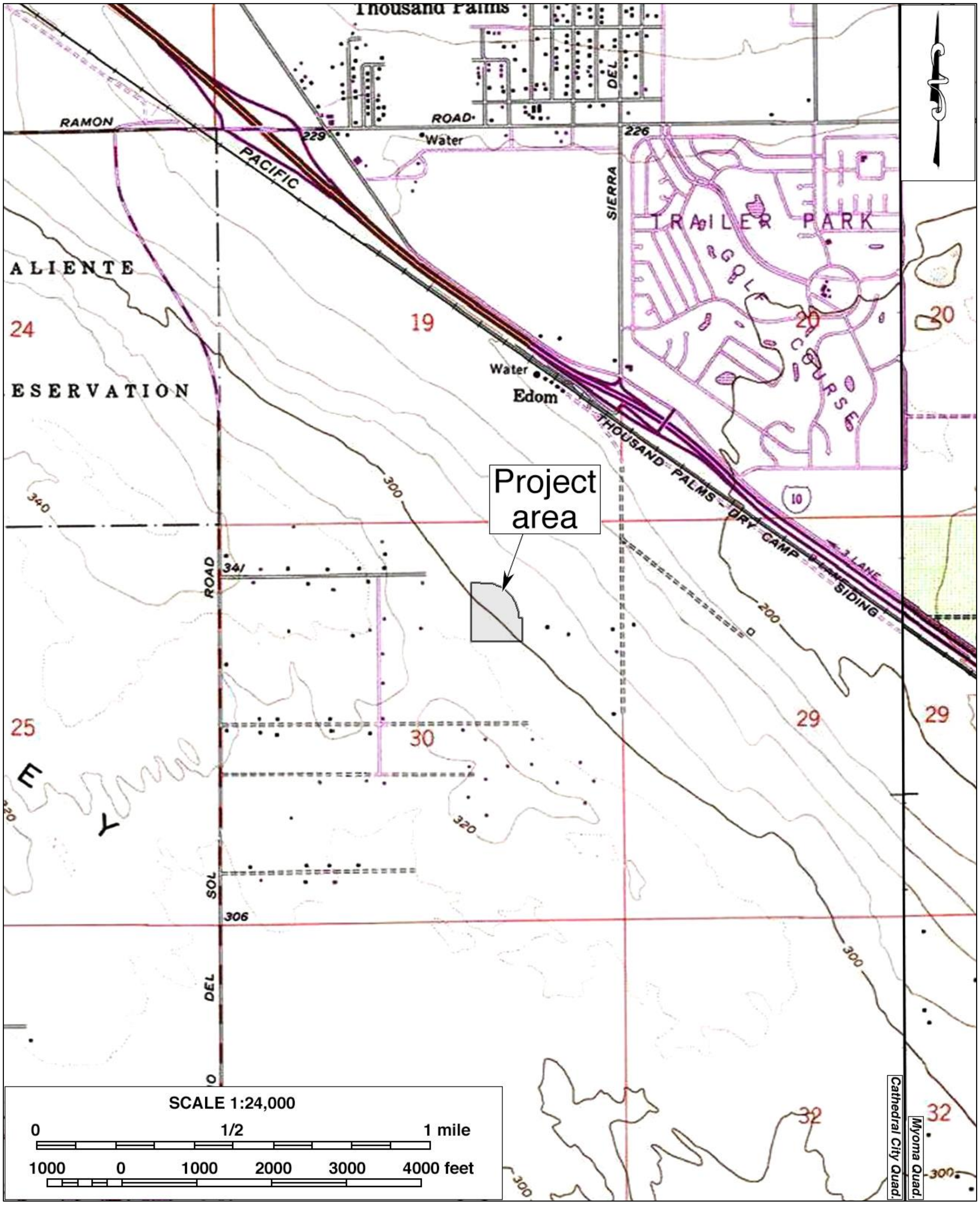

Figure 2. Project area. (Based on USGS Cathedral City and Myoma, Calif., 7.5' quadrangles [USGS 1978; 1981])

Figure 3. Recent satellite image of the project area. (Based on Google Earth imagery)]

SETTING

CURRENT NATURAL SETTING

The City of Rancho Mirage is located in the Coachella Valley, a northwest-southeast trending desert valley that constitutes the western end of the Colorado Desert. Dictated by this geographic setting, the climate and environment of the region are typical of the southern California desert country, marked by extremes in temperature and aridity. Temperatures in the region reach over 120 degrees Fahrenheit in summer, and dip to near freezing in winter. Average annual precipitation is less than five inches, and the average annual evaporation rate exceeds three feet.

The irregularly shaped project area lies on the generally level and sandy desert ridge between the San Jacinto Mountains to the southwest and the Indio Hills to the northeast. The adjacent land features the Monterey Marketplace shopping center to the north and the east and undeveloped parcels to the south and the west, with residential neighborhoods further in the latter directions (Fig. 3). Elevations in the project area range roughly from 310 feet to 290 feet above mean sea level, with the terrain sloping gently downward to the northeast.

Vegetation in the project area currently consists of a scattered growth of native plants, including creosote bushes, brittlebush, wild mustard, brown eyes, desert sand verbena, fan-leaved tiquilla, narrow-leaved cryptantha, Spanish needle, and other small desert shrubs and grasses. The surface is characterized by lightly undulating, somewhat compact sand dunes with some exposed rock and gravel and shows clear signs of prior disturbance (Fig. 4). Sources of the disturbance include past construction activities associated with existing developments to the east and the north of the project location. In the western and northwestern portion of the project area disturbances were caused by the construction of a nearby public dog park. There also exists a small homeless encampment in the northeastern portion of the project area.

Figure 4. Typical landscape in the project area, view to the southeast. (Photograph taken on February 27, 2024)

CULTURAL SETTING

Prehistoric Context

Numerous investigations on the history of cultural development in southern California have led researchers to propose a number of cultural chronologies for the desert regions. A specific cultural sequence for the Colorado Desert was offered by Schaefer (1994) on the basis of the many archaeological studies conducted in the area. The earliest time period identified is the Paleoindian (ca. 8,000 to 10,000-12,000 years ago), when “small, mobile bands” of hunters and gatherers, who relied on a variety of small and large game animals as well as wild plants for subsistence, roamed the region (Schaefer 1994:63). These small groups settled “on mesas and terraces overlooking larger washes” (Schaefer 1994:64). The artifact assemblage of that period typically consists of very simple stone tools, “cleared circles, rock rings, [and] some geoglyph types” (Schaefer 1994).

The Early Archaic Period follows and dates to ca. 8,000 to 4,000 years ago. It appears that a decrease in population density occurred at this time and that the indigenous groups of the area relied more on foraging than hunting. Very few archaeological remains have been identified to this time period. The ensuing Late Archaic Period (ca. 4,000 to 1,500 years ago) is characterized by continued low population densities and groups of “flexible” sizes that settled near available seasonal food resources and relied on “opportunistic” hunting of game animals. Groundstone artifacts for food processing were prominent during this time period.

The most recent period in Schaefer’s scheme, the Late Prehistoric, dates from ca. 1,500 years ago to the time of the Spanish missions, and saw the continuation of the seasonal settlement pattern. Peoples of the Late Prehistoric Period were associated with the Patayan cultural pattern and relied more heavily on the availability of seasonal “wild plants and animal resources” (Schaefer 1994:66). It was during this period that ceramics and the bow/arrow were introduced into the region.

The shores of Holocene Lake Cahuilla, during times of its presence, attracted much settlement and resource procurement activities. In times of the lake’s desiccation and absence, according to Schaefer (1994:66), the Native people moved away from its receding shores towards rivers, streams, and mountains. Numerous archaeological sites dating to the last high stand of Holocene Lake Cahuilla, roughly between 1600 and 1700 A.D., have been identified along its former shoreline. Testing and mitigative excavations at these sites have recovered brown and buff ware ceramics, a variety of groundstone and projectile point types, ornaments, and cremation remains.

Ethnohistoric Context

The Coachella Valley is a historical center of Native American settlement, where U.S. surveyors noted large numbers of Indian villages and *rancherías*, occupied by the Cahuilla people, in the mid-19th century. The origin of the name “Cahuilla” is unclear, but may originate from their own word *káwiya*, meaning master or boss (Bean 1978). The Takic-speaking Cahuilla are generally divided by anthropologists into three groups, according to their geographic setting: the Pass Cahuilla of the San Gorgonio Pass-Palm Springs area, the Mountain Cahuilla of the San Jacinto and Santa Rosa Mountains and the Cahuilla Valley, and the Desert Cahuilla of the eastern Coachella Valley. The basic written sources on Cahuilla culture and history include Kroeber (1925), Strong (1929), and

Bean (1978), based on information provided by such Cahuilla informants as Juan Siva, Francisco Patencio, Katherine Siva Saubel, and Mariano Saubel. The following ethnohistoric discussion is based primarily on these sources.

The Cahuilla did not have a single name that referred to an all-inclusive tribal affiliation. Instead, membership was in terms of lineages or clans. Each lineage or clan belonged to one of two main divisions of the people, known as moieties. Their moieties were named for the Wildcat, or *Tuktum*, and Coyote, or *Istam*. Members of clans in one moiety had to marry into clans from the other moiety. Individual clans had villages, or central places, and territories they called their own, for purposes of hunting game, and gathering raw materials for food, medicine, ritual, or tool use. They interacted with other clans through trade, intermarriage, and ceremonies.

Cahuilla subsistence was defined by the surrounding landscape and primarily based on the hunting and gathering of wild and cultivated foods, exploiting nearly all of the resources available in a highly developed seasonal mobility system. They were adapted to the arid conditions of the desert floor, the lacustral cycles of Holocene Lake Cahuilla, and the environments of the nearby mountains. When the lake was full, or nearly full, the Cahuilla would take advantage of the resources presented by the body of fresh water, building elaborate stone fish traps. Once the lake had desiccated, they relied on the available terrestrial resources. The cooler temperatures and resources available at higher elevations in the nearby mountains were also taken advantage of.

The Cahuilla diet included seeds, roots, wild fruits and berries, acorns, wild onions, piñon nuts, and mesquite and screw beans. Medicinal plants such as creosote, California sagebrush, yerba buena and elderberry were typically cultivated near villages (Bean and Saubel 1972). Common game animals included deer, antelope, big horn sheep, rabbits, wood rats and, when Holocene Lake Cahuilla was present, fish and waterfowl. The Cahuilla hunted with throwing sticks, clubs, nets, traps, and snares, as well as bows and arrow (Bean 1978; CSRI 2002). Common tools included manos and metates, mortars and pestles, hammerstones, fire drills, awls, arrow-straighteners, and stone knives and scrapers. These lithic tools were made from locally sourced material as well as materials procured through trade or travel. They also used wood, horn, and bone spoons and stirrers; baskets for winnowing, leaching, grinding, transporting, parching, storing, and cooking; and pottery vessels for carrying water, storage, cooking, and serving food and drink (Bean 1978; CSRI 2002).

As the landscape defined their subsistence practices, the tending and cultivation practices of the Cahuilla helped shape the landscape. Biological studies have recently found evidence that the fan palms found in the Coachella Valley and throughout the southeastern California desert (*Washingtonia filifera*) may not be relics from a paleo-tropical environment, but instead a relatively recent addition brought to the area and cultivated by native populations (Anderson 2005). The planting of palms by the Cahuilla is well-documented, as is their enhancement of palm stands through the practice of controlled burning (Anderson 2005; Bean and Saubel 1972). Burning palm stands would increase fruit yield dramatically by eliminating pests such as the palm borer beetle, date scales, and spider mites (Bean and Saubel 1972). It also prevented out-of-control wildfires by eliminating dead undergrowth before it accumulated to dangerous levels. The Cahuilla also burned stands of chia to produce higher yields, and deergrass to yield straighter, more abundant stalks for basketry (Bean and Saubel 1972; Anderson 2005).

Population data prior to European contact is almost impossible to obtain, but estimates range from 3,600 to as high as 10,000 persons covering a territory of over 2,400 square miles. During the 19th century, the Cahuilla population was decimated as a result of European diseases, most notably smallpox, for which the Native peoples had no immunity. Today, Native Americans of Pass or Desert Cahuilla heritage are mostly affiliated with one or more of the Indian reservations in and near the Coachella Valley, including Agua Caliente, Morongo, Cabazon, Torres Martinez, and Augustine. There has been a resurgence of traditional ceremonies in recent years, and the language, songs, and stories are now being taught to the youngest generations.

Historic Context

In 1823-1825, José Romero, José Maria Estudillo, and Romualdo Pacheco became the first noted European explorers to travel through the Coachella Valley when they led a series of expeditions in search of a route to Yuma (Johnston 1987:92-95). Due to its harsh environment, few non-Indians ventured into the desert valley during the Mexican and early American periods, except those who traveled along the established trails. The most important of these trails was the Cocomaricopa Trail, an ancient Indian trading route that was "discovered" in 1862 by William David Bradshaw and known after that as the Bradshaw Trail (Gunther 1984:71; Ross 1992:25). In much of the Coachella Valley, this historic wagon road traversed a similar course to that of present-day State Route 111. During the 1860s-1870s, the Bradshaw Trail served as the main thoroughfare between coastal southern California and the Colorado River, until the completion of the Southern Pacific Railroad in 1876-1877 brought an end to its heyday (Johnston 1987:185).

Non-Indian settlement in the Coachella Valley began in the 1870s with the establishment of railroad stations along the Southern Pacific Railroad, and spread further in the 1880s after public land was opened for claims under the Homestead Act, the Desert Land Act, and other federal land laws (Laflin 1998:35-36; Robinson 1948:169-171). Farming became the dominant economic activity in the valley thanks to the development of underground water sources, often in the form of artesian wells. Around the turn of the century, the date palm was introduced into the Coachella Valley, and by the late 1910s dates were the main agricultural crop and the tree an iconic image celebrating the region as the "Arabia of America" (Shields Date Gardens 1957). Then, starting in the 1920s, a new industry featuring equestrian camps, resorts, hotels, and eventually country clubs began to spread throughout the Coachella Valley, transforming it into southern California's premier winter retreat.

In the Rancho Mirage area, the first notable settlement activities occurred in the 1910s-1920s, when several date ranches were established within the present-day city boundary (Love and Tang 1996:7). In 1924, R.P. "Bert" Davie and E.E. McIntyre subdivided the Rancho Rio del Sol Estates around today's Clancy Lane, creating a small community nicknamed "Little Santa Monica" (Love and Tang 1996:8). Ten years later, Louis Blankenhorn and Laurence Macomber began a new subdivision at the mouth of Magnesia Spring Canyon, and for the first time bestowed the name Rancho Mirage on the community (Love and Tang 1996). After the end of WWII, Rancho Mirage embarked on a period of rapid growth. With the development of the Thunderbird Country Club and the Tamarisk Country Club in 1951-1952, Rancho Mirage set the trend in the post-WWII boom among the five cove communities along Highway 111 (Love and Tang 1996:8-9). This trend has continued into the present and has given rise to the City of Rancho Mirage's popular reputation as the "country club city."

RESEARCH METHODS

RECORDS SEARCH

On February 9, 2024, CRM TECH archaeologist Nina Gallardo conducted the historical/ archaeological resources records search at the Eastern Information Center (EIC), University of California, Riverside. During the records search, Gallardo examined maps and records on file for previously identified cultural resources and existing cultural resources reports within a one-mile radius of the project location. Previously identified cultural resources include properties designated as California Historical Landmarks, Points of Historical Interest, or Riverside County Historic Landmarks, as well as those listed in the National Register of Historic Places, the California Register of Historical Resources, or the California Historical Resources Inventory.

NATIVE AMERICAN PARTICIPATION

On February 5, 2024, CRM TECH submitted a written request to the State of California Native American Heritage Commission (NAHC) for a records search in the commission's Sacred Lands File. The NAHC is the State of California's trustee agency for the protection of "tribal cultural resources," as defined by California Public Resources Code §21074, and is tasked with identifying and cataloging properties of Native American cultural value throughout the state. In the meantime, CRM TECH contacted the nearby Agua Caliente Band of Cahuilla Indians for additional information on potential Native American cultural resources in the vicinity and invited tribal participation in the upcoming archaeological field survey. Responses from the NAHC and the Agua Caliente Band are attached to this report in Appendix 2 and summarized in the sections below.

HISTORICAL BACKGROUND RESEARCH

Historical background research for this study was conducted by CRM TECH archaeologist Nicole Raslich. Sources consulted during the research included published literature in local history, historical maps of the Coachella Valley area, and aerial/satellite photographs of the project vicinity. Among the maps consulted for this study were the U.S. General Land Office's (GLO) land survey plat maps dated 1856 and the U.S. Geological Survey's (USGS) topographic maps dated 1904-1981, which are available at the websites of the U.S. Bureau of Land Management and the USGS. The aerial and satellite photographs, taken in 1959-2024, are accessed at the Nationwide Environmental Title Research (NETR) Online website and through the Google Earth software.

FIELD SURVEY

On February 27, 2024, CRM TECH archaeologists Nicole Raslich and Frank Raslich carried out the field survey of the project area with the assistance of Native American monitors Luz Salazar and Xitlaly Madrigal from the Agua Caliente Band of Cahuilla Indians. The survey was conducted at an intensive level by walking a series of parallel north-south transects at 15-meter (approximately 50-foot) intervals. In this way, the entire project area was systematically and carefully examined for any evidence of human activities dating to the prehistoric or historic period (i.e., 50 years or older). Ground visibility was good to excellent (95 to 100%) as vegetation was sparse, although a small portion of the project area was obscured by large creosote bushes. In this environment, however, shifting sands are more likely to contribute to obscured cultural remains than is vegetation.

RESULTS AND FINDINGS

RECORDS SEARCH

According to EIC records, the project area had not been surveyed systematically for cultural resources prior to this study, and no cultural resources had been recorded within or adjacent to the project boundaries. Within the one-mile scope of the records search, EIC records show 40 cultural resources studies on various tracts of land and linear features, in total covering roughly 40 percent of the land surface (Fig. 5).

As a result of these past survey efforts, 15 cultural resources have been recorded into the California Historical Resources Inventory within the one-mile radius, including four prehistoric (i.e., Native American) sites, six historic-period sites, and five isolates (i.e., localities with fewer than three artifacts). The nearest among these, Site 33-017008, was located more than 1,000 feet northwest of the project area and consisted of the remains of a collapsed shed of unknown age. It was first recorded in 2007 but could no longer be found in 2017. The other 14 known cultural resources were all found at least a half-mile away from the project area. In view of their distance from the project location, none of the 15 sites or isolates requires further consideration during this study.

NATIVE AMERICAN PARTICIPATION

In response to CRM TECH's inquiry, the NAHC reported in a letter dated February 27, 2024, that the Sacred Lands File search yielded negative results for Native American cultural resources in the project vicinity. Noting that the absence of specific information would not necessarily indicate the absence of cultural resources, however, the NAHC recommended that local Native American groups be consulted for further information and provided a referral list of potential contacts in the region who may have knowledge of such resources. The NAHC's reply is attached in Appendix 2 for reference by the City of Rancho Mirage in future government-to-government consultations with the pertinent Native American representatives, if necessary.

On February 23, 2024, Claritsa Duarte, Cultural Resources Analyst with the Agua Caliente Tribal Historic Preservation Office, replied to CRM TECH in writing. In the letter, she identified the project location as a part of the tribe's Traditional Use Area and requested to review all cultural resources documentation generated for this project, including the records search results. In addition, she requested that a qualified archaeologist and an approved Agua Caliente Native American Cultural Resource Monitor be present during any ground-disturbing activities in the project area (see Appendix 2). As mentioned above, representatives of the Agua Caliente Tribal Historic Preservation Office subsequently participated in the archaeological field survey on February 27, 2024.

HISTORICAL BACKGROUND RESEARCH

Historical sources consulted for this study yielded no evidence of any settlement or development activities within the project area throughout the historic period (Figs. 6-9; NETR Online 1959-1979). In the late 19th and early 20th centuries, the nearest human-made feature known to be extant was the Southern Pacific (now Union Pacific) Railroad, which was later joined by U.S. Highway 60/70/99, the forerunner of today's Interstate Highway 10 (Figs. 7, 8). By the 1950s, some scattered buildings

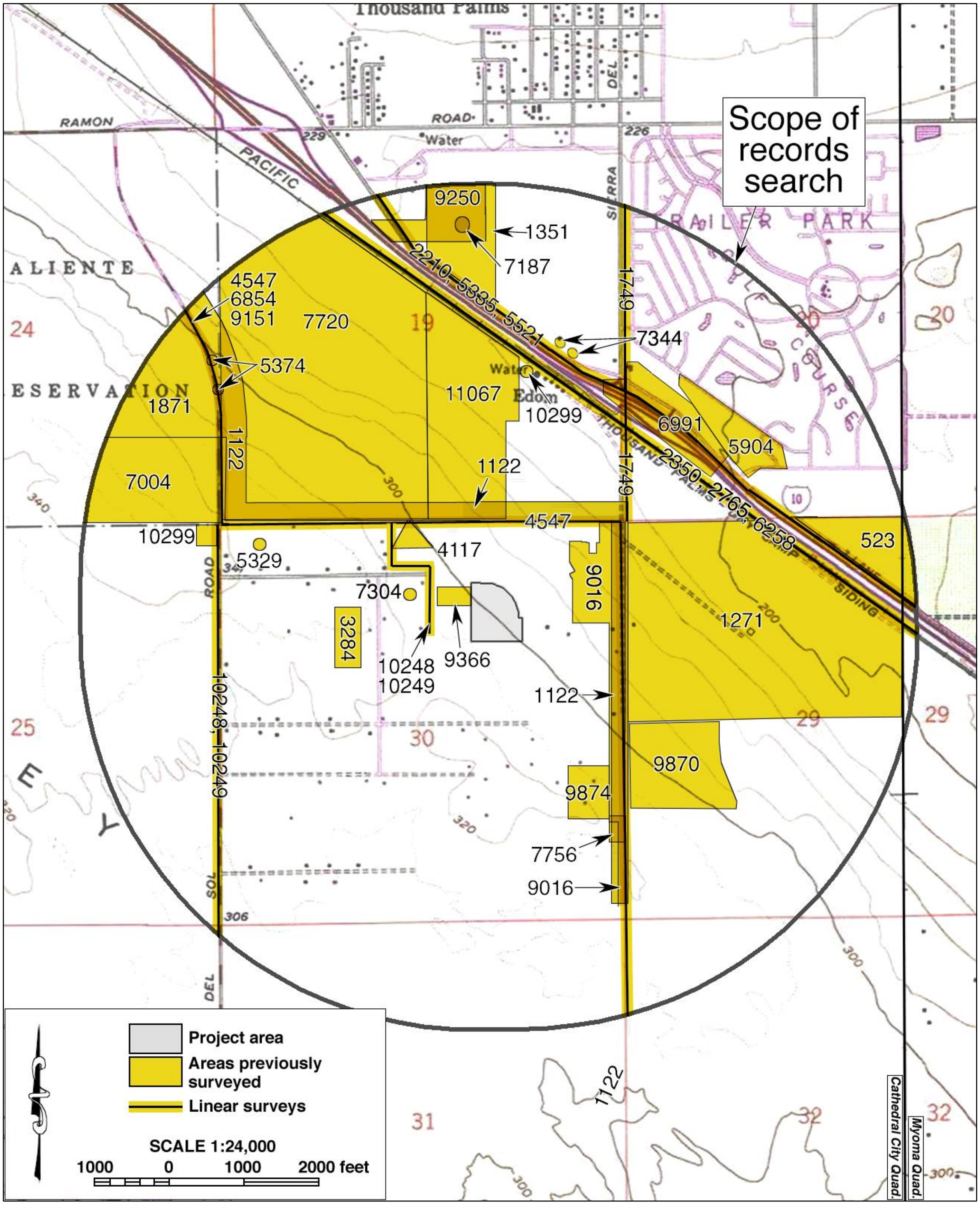

Figure 5. Previous cultural resources studies in the vicinity of the project area, listed by EIC file number. Locations of known historical/archaeological resources are not shown as a protective measure.

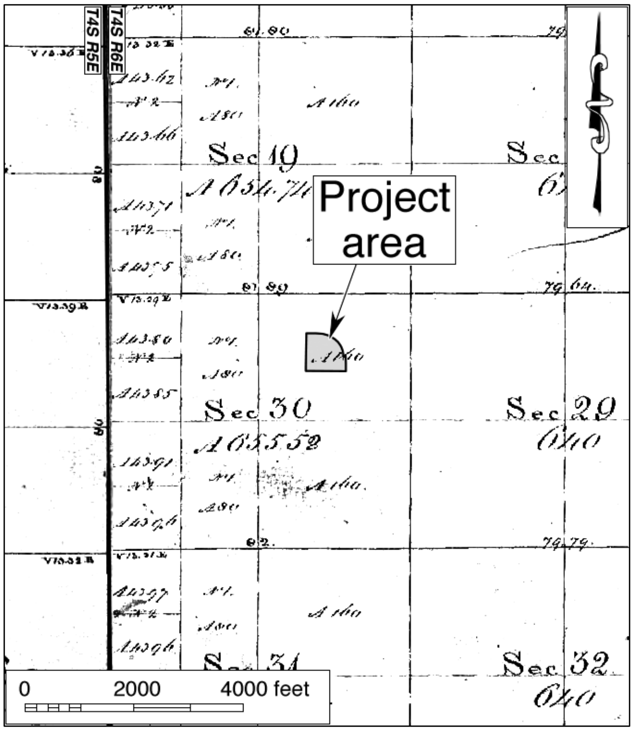

Figure 6. The project area and vicinity in 1855-1856. (Source: GLO 1856a; 1856b)

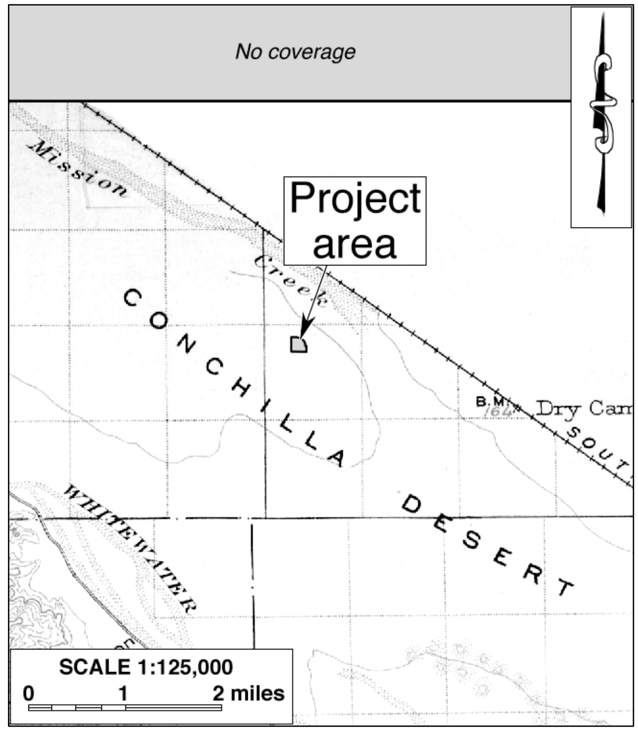

Figure 7. The project area and vicinity in 1901. (Source: USGS 1904)

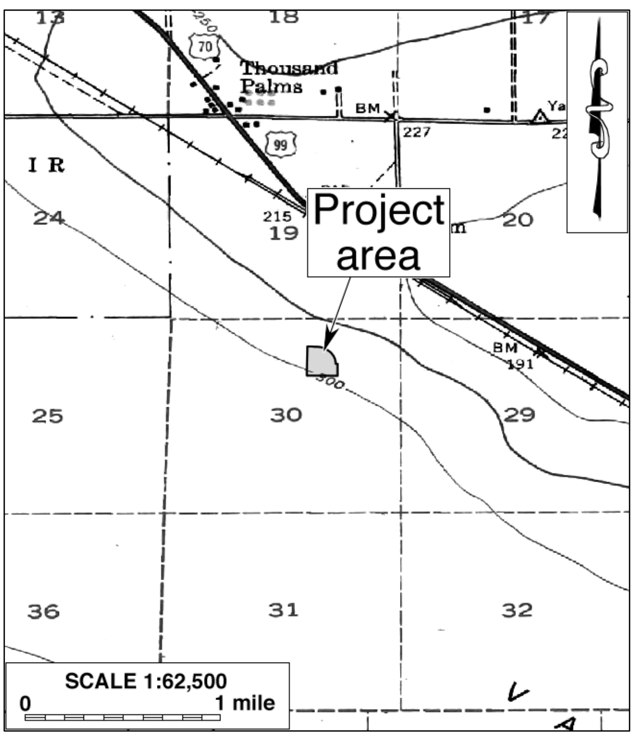

Figure 8. The project area and vicinity in 1941. (Source: USGS 1941)

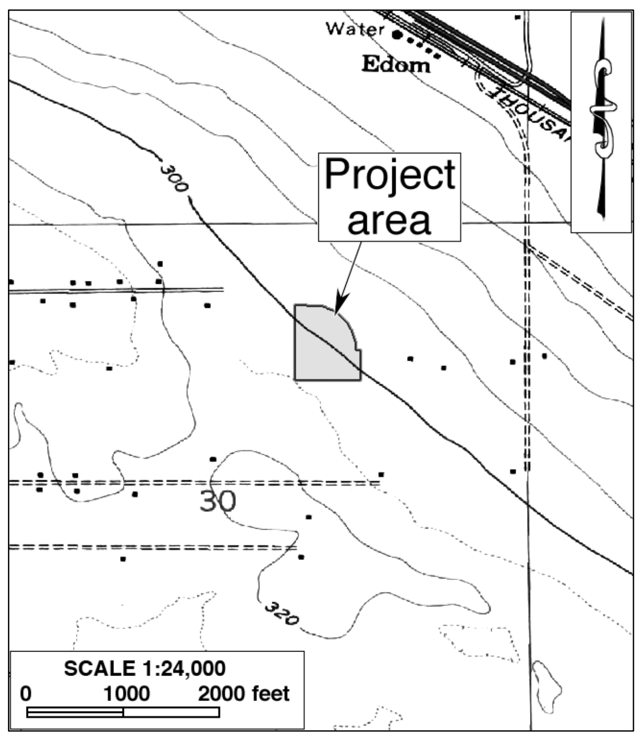

Figure 9. The project area and vicinity in 1951-1958. (Source: USGS 1958)

had appeared in the vicinity, but none of them within or adjacent to the project area (Fig. 9). In the immediate vicinity of the project area, no evidence of any settlement or development activities was observed until the Monterey Marketplace shopping center was developed on the adjacent property in the 1990s (NETR Online 1959-2002). Meanwhile, the entire project area has remained unsettled and undeveloped to the present time (NETR Online 1959-2020).

FIELD SURVEY

The field survey of the project area produced negative results for potential "historical resources." Throughout the course of the survey, no buildings, structures, objects, sites, features, or artifact deposits of prehistoric or historical origin were encountered. Scattered refuse was noted over much of the property, but all the items are clearly modern in origin, and none of them is of any historical/ archaeological interest.

DISCUSSION

The purpose of this study is to identify any cultural resources within the project area and to assist the City of Rancho Mirage in determining whether such resources meet the official definition of "historical resources," as provided in the California Public Resources Code, in particular CEQA. According to PRC §5020.1(j), "'historical resource' includes, but is not limited to, any object, building, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California."

More specifically, CEQA guidelines state that the term "historical resources" applies to any such resources listed in or determined to be eligible for listing in the California Register of Historical Resources, included in a local register of historical resources, or determined to be historically significant by the lead agency (Title 14 CCR §15064.5(a)(1)-(3)). Regarding the proper criteria for the evaluation of historical significance, CEQA guidelines mandate that "generally a resource shall be considered by the lead agency to be 'historically significant' if the resource meets the criteria for listing on the California Register of Historical Resources" (Title 14 CCR §15064.5(a)(3)). A resource may be listed in the California Register if it meets any of the following criteria:

(1) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
(2) Is associated with the lives of persons important in our past.
(3) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
(4) Has yielded, or may be likely to yield, information important in prehistory or history. (PRC §5024.1(c))

As discussed above, no potential "historical resources" were previously recorded within or adjacent to the project area, and none were found during the present survey. The Native American Sacred Lands File identified no properties of traditional cultural value in the vicinity, and no notable cultural features were known to be present in the project area throughout the historic period. Based on these findings, and in light of the criteria listed above, the present study concludes that no "historical resources" exist within or adjacent to the project area.

CONCLUSIONS AND RECOMMENDATIONS

CEQA establishes that "a project that may cause a substantial adverse change in the significance of a historical resource is a project that may have a significant effect on the environment" (PRC §21084.1). "Substantial adverse change," according to PRC §5020.1(q), "means demolition, destruction, relocation, or alteration such that the significance of a historical resource would be impaired."

In conclusion, the present study has identified no "historical resources" within or adjacent to the project area. Therefore, CRM TECH presents the following recommendations to the City of Rancho Mirage:

- The proposed project will not cause a substantial adverse change to any known "historical resources."
- No further cultural resources investigation is necessary for the project unless development plans undergo such changes as to include areas not covered by this study.
- If buried cultural materials are discovered during any earth-moving operations associated with the project, all work in the immediate area should be halted or diverted until a qualified archaeologist can evaluate the nature and significance of the find.

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1981 Map: Cathedral City, Calif. (7.5', 1:24,000); 1958 edition photorevised in 1978

APPENDIX 1:
PERSONNEL QUALIFICATIONS

PRINCIPAL INVESTIGATOR/HISTORIAN
Bai "Tom" Tang, M.A.

Education

1988-1993	Graduate Program in Public History/Historic Preservation, University of California, Riverside.
1987	M.A., American History, Yale University, New Haven, Connecticut.
1982	B.A., History, Northwestern University, Xi'an, China.
2000	"Introduction to Section 106 Review," presented by the Advisory Council on Historic Preservation and the University of Nevada, Reno.
1994	"Assessing the Significance of Historic Archaeological Sites," presented by the Historic Preservation Program, University of Nevada, Reno.

Professional Experience

2002-	Principal Investigator, CRM TECH, Riverside/Colton, California.
1993-2002	Project Historian/Architectural Historian, CRM TECH, Riverside, California.
1993-1997	Project Historian, Greenwood and Associates, Pacific Palisades, California.
1991-1993	Project Historian, Archaeological Research Unit, University of California, Riverside.
1990	Intern Researcher, California State Office of Historic Preservation, Sacramento.
1990-1992	Teaching Assistant, History of Modern World, University of California, Riverside.
1988-1993	Research Assistant, American Social History, University of California, Riverside.
1985-1988	Research Assistant, Modern Chinese History, Yale University.
1985-1986	Teaching Assistant, Modern Chinese History, Yale University.
1982-1985	Lecturer, History, Xi'an Foreign Languages Institute, Xi'an, China.

Cultural Resources Management Reports

Preliminary Analyses and Recommendations Regarding California's Cultural Resources Inventory System (with Special Reference to Condition 14 of NPS 1990 Program Review Report). California State Office of Historic Preservation working paper, Sacramento, September 1990.

Numerous cultural resources management reports with the Archaeological Research Unit, Greenwood and Associates, and CRM TECH, since October 1991.

PRINCIPAL INVESTIGATOR/ARCHAEOLOGIST
Michael Hogan, Ph.D., RPA (Registered Professional Archaeologist)

Education

1991	Ph.D., Anthropology, University of California, Riverside.
1981	B.S., Anthropology, University of California, Riverside; with honors.
1980-1981	Education Abroad Program, Lima, Peru.

2002	"Section 106—National Historic Preservation Act: Federal Law at the Local Level," UCLA Extension Course #888.
2002	"Recognizing Historic Artifacts," workshop presented by Richard Norwood, Historical Archaeologist.
2002	"Wending Your Way through the Regulatory Maze," symposium presented by the Association of Environmental Professionals.
1992	"Southern California Ceramics Workshop," presented by Jerry Schaefer.
1992	"Historic Artifact Workshop," presented by Anne Duffield-Stoll.

Professional Experience

2002-	Principal Investigator, CRM TECH, Riverside/Colton, California.
1999-2002	Project Archaeologist/Field Director, CRM TECH, Riverside, California.
1996-1998	Project Director and Ethnographer, Statistical Research, Inc., Redlands, California.
1992-1998	Assistant Research Anthropologist, University of California, Riverside.
1992-1995	Project Director, Archaeological Research Unit, U.C. Riverside.
1993-1994	Adjunct Professor, Riverside Community College, Mt. San Jacinto College, U.C. Riverside, Chapman University, and San Bernardino Valley College.
1991-1992	Crew Chief, Archaeological Research Unit, U.C. Riverside.
1984-1998	Project Director, Field Director, Crew Chief, and Archaeological Technician for various southern California cultural resources management firms.

Research Interests

Cultural Resource Management, Southern Californian Archaeology, Settlement and Exchange Patterns, Specialization and Stratification, Culture Change, Native American Culture, Cultural Diversity.

Cultural Resources Management Reports

Principal investigator for, author or co-author of, and contributor to numerous cultural resources management study reports since 1986.

Memberships

Society for American Archaeology; Society for California Archaeology; Pacific Coast Archaeological Society; Coachella Valley Archaeological Society.

PROJECT ARCHAEOLOGIST/REPORT WRITER
Nicole A. Raslich, M.A.

Education

2017-	Ph.D. candidate, Michigan State University, East Lansing.
2011	M.A., Anthropology, Michigan State University, East Lansing.
2005	B.A., Natural History of Biology and Anthropology, University of Michigan, Flint.
2022	Adult First Aid/CPR/AED Certification, American Red Cross.
2019	Grant and Research Proposal Writing for Archaeologists; SAA Online Seminar.
2014	Bruker Industries Tracer S1800 pXRF Training; presented by Dr. Bruce Kaiser, Bruker Scientific.
2013	Introduction to ArcGIS, Michigan State University, East Lansing.

Professional Experience

2022-	Project Archaeologist/Report Writer, CRM TECH, Colton, California.
2022	Archaeological Technician, Agua Caliente Band of Cahuilla Indians, Palm Springs, California.
2008-2021	Archaeological Consultant, Saginaw Chippewa Indian Tribe of Michigan.
2019	Archaeologist, Sault Tribe of Chippewa Indians and Little Traverse Bay Band of Odawa Indians
2018	Teaching Assistant, Michigan State University, East Lansing.
2017	Adjunct Professor, University of Michigan, Flint.
2015-2016	Graduate Fellow, Michigan State University Campus Archaeology Program, East Lansing.
2015	Archaeologist, Michigan State University, Illinois State Museum, and Dickson Mounds Museum.
2013-2015	Curation Research Assistant, Michigan State University Museum, East Lansing.
2008-2014	Research Assistant, Intellectual Property Issues in Cultural Heritage, Simon Frasier University, British Columbia, Canada.
2009-2012	Editorial Assistant/Copy Editor, *American Antiquity*.
2009-2011	Archaeologist/Crew Chief, Saginaw Chippewa Indian Tribe of Michigan.

Publications

2017	Preliminary Results of a Handheld X-Ray Fluorescence (pXRF) Analysis on a Marble Head Sarcophagus Sculpture from the Collection of the Kresge Art Center, Michigan State University. Submitted to Jon M. Frey, Department of Art, Art History, and Design. Michigan State University, East Lansing.
2016	Preserving Sacred Sites: Arctic Indigenous Peoples as Cultural Heritage Rights Holders (L. Heinämäki, T.M. Herrmann, and N.A. Raslich). University of Lapland Printing Centre, Rovaniemi, Finland.

PROJECT ARCHAEOLOGIST
Frank J. Raslich, M.A.

Education

2016-	Ph.D. candidate, Michigan State University, East Lansing.
2010	M.A., Anthropology, Michigan State University, East Lansing.
2005	B.A., Anthropology, University of Michigan, Flint.
2019	Grant and Research Proposal Writing for Archaeologists; Society for American Archaeology online seminar.
2014	Bruker Industries Tracer S1800 pXRF Training; presented by Dr. Bruce Kaiser, Bruker Scientific.

Professional Experience

2022-	Project Archaeologist/Report Writer, CRM TECH, Colton, California.
2022	Archaeological Monitor, Agua Caliente Band of Cahuilla Indians, Palm Springs, California.
2014-2022	Board of Directors, Ziibiwing Center of Anishinabe Culture and Lifeways, Saginaw Chippewa Indian Tribe of Michigan.
2008-2021	Archaeological Consultant, Saginaw Chippewa Indian Tribe of Michigan.
2019	Archaeologist, Sault Tribe of Chippewa Indians and Little Traverse Bay Band of Odawa Indians.
2016-2018	Adjunct Lecturer, Michigan State University, East Lansing.
2017-2018	Adjunct Lecturer, University of Michigan, Flint.
2009-2017	Teaching Assistant, Michigan State University, East Lansing.
2008-2014	Research Assistant, Intellectual Property Issues in Cultural Heritage, Simon Fraser University, British Columbia, Canada.
2010-2013	Research Assistant, Michigan State University, East Lansing.
2009-2011	Archaeologist/Crew Chief, Saginaw Chippewa Indian Tribe of Michigan.

Publications

2017	Preliminary Results of a Handheld X-Ray Fluorescence (pXRF) Analysis on a Marble Head Sarcophagus Sculpture from the Collection of the Kresge Art Center, Michigan State University. Submitted to Jon M. Frey, Department of Art, Art History, and Design, Michigan State University, East Lansing.
2013	Geochemical Analysis of the Dickenson Group of the Upper Peninsula, Michigan: A study of an Accreted Terrane of the Superior Province. Geological Society of America *Abstracts with Programs* 45:4(53).

PROJECT ARCHAEOLOGIST/NATIVE AMERICAN LIAISON
Nina Gallardo, B.A.

Education

2004 B.A., Anthropology/Law and Society, University of California, Riverside.

Professional Experience

2004- Project Archaeologist, CRM TECH, Riverside/Colton, California.

Cultural Resources Management Reports

Co-author of and contributor to numerous cultural resources management reports since 2004.

APPENDIX 2

NATIVE AMERICAN RESPONSES

AGUA CALIENTE BAND OF CAHUILLA INDIANS

TRIBAL HISTORIC PRESERVATION

03-008-2024-001

February 23, 2024

[VIA EMAIL TO:ngallardo@crmtech.us]
CRM TECH
Ms. Nina Gallardo
1016 E. Cooley Drive, Suite A/B
Colton, CA 92324

Re: Participation in Cultural Resources for Proposed Apartment Construction

Dear Ms. Nina Gallardo,

The Agua Caliente Band of Cahuilla Indians (ACBCI) appreciates your efforts to include the Tribal Historic Preservation Office (THPO) in the Proposed Apartment Construction project. The project area is not located within the boundaries of the ACBCI Reservation. However, it is within the Tribe's Traditional Use Area.A records check of the ACBCI registry indicates this area has not been surveyed for cultural resources. In consultation, the ACBCI THPO requests the following:

*Copies of any cultural resource documentation (report and site records) generated in connection with this project.

*A copy of the records search with associated survey reports and site records from the information center.

*The presence of an approved Agua Caliente Native American Cultural Resource Monitor(s) during any ground disturbing activities (including archaeological testing and surveys). Should buried cultural deposits be encountered, the Monitor may request that destructive construction halt and the Monitor shall notify a Qualified Archaeologist (Secretary of the Interior's Standards and Guidelines) to investigate and, if necessary, prepare a mitigation plan for submission to the State Historic Preservation Officer and the Agua Caliente Tribal Historic Preservation Office.

*The presence of an archaeologist that meets the Secretary of Interior's standards during any ground disturbing activities.

* ACBCI THPO staff would like to participate in the cultural resources pedestrian survey.

Again, the Agua Caliente appreciates your interest in our cultural heritage. If you have questions or require additional information, please call me at (760) 883-1134. You may also email me at ACBCI-THPO@aguacaliente.net.

Cordially,

Claritsa Duarte
Cultural Resources Analyst
Tribal Historic Preservation Office
AGUA CALIENTE BAND
OF CAHUILLA INDIANS

NATIVE AMERICAN HERITAGE COMMISSION

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

February 27, 2024

Nina Gallardo
CRM TECH

Via Email to: ngallardo@crmtech.us

Re: Proposed Apartment Construction Project, Riverside County

Dear Ms. Gallardo:

A record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed for the information you have submitted for the above referenced project. The results were negative. However, the absence of specific site information in the SLF does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Attached is a list of Native American tribes who may also have knowledge of cultural resources in the project area. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated; if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call or email to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from tribes, please notify me. With your assistance, we can assure that our lists contain current information.

If you have any questions or need additional information, please contact me at my email address: Andrew.Green@nahc.ca.gov.

Sincerely,

Andrew Green

Andrew Green
Cultural Resources Analyst

Attachment

Native American Heritage Commission
Native American Contact List
Riverside County
2/27/2024

Tribe Name	Fed (F) Non-Fed (N)	Contact Person	Contact Address	Phone #	Fax #	Email Address	Cultural Affiliation	Counties
Agua Caliente Band of Cahuilla Indians	F	Lacy Padilla, THPO Operations Manager	5401 Dinah Shore Drive Palm Springs, CA, 92264	(760) 333-5222	(760) 699-6919	ACBCI-THPO@aguacaliente.net	Cahuilla	Imperial,Riverside,San Bernardino,San Diego
Augustine Band of Cahuilla Indians	F	Tribal Operations,	84-001 Avenue 54 Coachella, CA, 92236	(760) 398-4722			Cahuilla	Imperial,Riverside,San Bernardino,San Diego
Cabazon Band of Mission Indians	F	Doug Welmas, Chairperson	84-245 Indio Springs Parkway Indio, CA, 92203	(760) 342-2593	(760) 347-7880	jstapp@cabazonindians-nsn.gov	Cahuilla	Imperial,Riverside,San Bernardino,San Diego
Cahuilla Band of Indians	F	BobbyRay Esaprza, Cultural Director	52701 CA Highway 371 Anza, CA, 92539	(951) 763-5549		besparza@cahuilla-nsn.gov	Cahuilla	Imperial,Riverside,San Bernardino,San Diego
Cahuilla Band of Indians	F	Erica Schenk, Chairperson	52701 CA Highway 371 Anza, CA, 92539	(951) 590-0942	(951) 763-2808	chair@cahuilla-nsn.gov	Cahuilla	Imperial,Riverside,San Bernardino,San Diego
Cahuilla Band of Indians	F	Anthony Madrigal, Tribal Historic Preservation Officer	52701 CA Highway 371 Anza, CA, 92539	(951) 763-5549		anthonymad2002@gmail.com	Cahuilla	Imperial,Riverside,San Bernardino,San Diego
Los Coyotes Band of Cahuilla and Cupeño Indians	F	Ray Chapparosa, Chairperson	P.O. Box 189 Warner Springs, CA, 92086-0189	(760) 782-0711	(760) 782-0712		Cahuilla	Imperial,Riverside,San Bernardino,San Diego
Morongo Band of Mission Indians	F	Robert Martin, Chairperson	12700 Pumarra Road Banning, CA, 92220	(951) 755-5110	(951) 755-5177	abrierty@morongo-nsn.gov	Cahuilla Serrano	Imperial,Los Angeles,Riverside,San Bernardino,San Diego
Morongo Band of Mission Indians	F	Ann Brierty, THPO	12700 Pumarra Road Banning, CA, 92220	(951) 755-5259	(951) 572-6004	abrierty@morongo-nsn.gov	Cahuilla Serrano	Imperial,Los Angeles,Riverside,San Bernardino,San Diego
Quechan Tribe of the Fort Yuma Reservation	F	Jill McCormick, Historic Preservation Officer	P.O. Box 1899 Yuma, AZ, 85366	(928) 261-0254		historicpreservation@quechantribe.com	Quechan	Imperial,Kern,Los Angeles,Riverside,San Bernardino,San Diego
Quechan Tribe of the Fort Yuma Reservation	F	Jordan Joaquin, President, Quechan Tribal Council	P.O.Box 1899 Yuma, AZ, 85366	(760) 919-3600		executivesecretary@quechantribe.com	Quechan	Imperial,Kern,Los Angeles,Riverside,San Bernardino,San Diego
Quechan Tribe of the Fort Yuma Reservation	F	Manfred Scott, Acting Chairman - Kw'ts'an Cultural Committee	P.O. Box 1899 Yuma, AZ, 85366	(928) 210-8739		culturalcommittee@quechantribe.com	Quechan	Imperial,Kern,Los Angeles,Riverside,San Bernardino,San Diego
Ramona Band of Cahuilla	F	John Gomez, Environmental Coordinator	P. O. Box 391670 Anza, CA, 92539	(951) 763-4105	(951) 763-4325	jgomez@ramona-nsn.gov	Cahuilla	Imperial,Riverside,San Bernardino,San Diego
Ramona Band of Cahuilla	F	Joseph Hamilton, Chairperson	P.O. Box 391670 Anza, CA, 92539	(951) 763-4105	(951) 763-4325	admin@ramona-nsn.gov	Cahuilla	Imperial,Riverside,San Bernardino,San Diego
Santa Rosa Band of Cahuilla Indians	F	Lovina Redner, Tribal Chair	P.O. Box 391820 Anza, CA, 92539	(951) 659-2700	(951) 659-2228	lsaul@santarosa-nsn.gov	Cahuilla	Imperial,Los Angeles,Orange,Riverside,San Bernardino,San Diego

Soboba Band of Luiseno Indians	F	Isaiah Vivanco, Chairperson	P.O. Box 487 San Jacinto, CA, 92581	(951) 654-5544	(951) 654-4198	ivivanco@soboba-nsn.com	Cahuilla Luiseno	Imperial,Los Angeles,Orange,Riverside,San Bernardino,San Diego
Soboba Band of Luiseno Indians	F	Jessica Valdez, Cultural Resource Specialist	P.O. Box 487 San Jacinto, CA, 92581	(951) 663-6261	(951) 654-4198	jvaldez@soboba-nsn.gov	Cahuilla Luiseno	Imperial,Los Angeles,Orange,Riverside,San Bernardino,San Diego
Soboba Band of Luiseno Indians	F	Joseph Ontiveros, Tribal Historic Preservation Officer	P.O. Box 487 San Jacinto, CA, 92581	(951) 663-5279	(951) 654-4198	jontiveros@soboba-nsn.gov	Cahuilla Luiseno	Imperial,Los Angeles,Orange,Riverside,San Bernardino,San Diego
Torres-Martinez Desert Cahuilla Indians	F	Thomas Tortez, Chairperson	P.O. Box 1160 Thermal, CA, 92274	(760) 397-0300	(760) 397-8146	thomas.tortez@tmdci.org	Cahuilla	Imperial,Riverside,San Bernardino,San Diego
Torres-Martinez Desert Cahuilla Indians	F	Mary Belardo, Cultural Committee Vice Chair	P.O. Box 1160 Thermal, CA, 92274	(760) 397-0300		belardom@gmail.com	Cahuilla	Imperial,Riverside,San Bernardino,San Diego
Torres-Martinez Desert Cahuilla Indians	F	Abraham Becerra, Cultural Coordinator	P.O. Box 1160 Thermal, CA, 92274	(760) 397-0300		abecerra@tmdci.org	Cahuilla	Imperial,Riverside,San Bernardino,San Diego
Torres-Martinez Desert Cahuilla Indians	F	Gary Resvaloso, TM MLD	P.O. Box 1160 Thermal, CA, 92274	(760) 777-0365		grestmtm@gmail.com	Cahuilla	Imperial,Riverside,San Bernardino,San Diego
Torres-Martinez Desert Cahuilla Indians	F	Alesia Reed, Cultural Committee Chairwoman	P.O. Box 1160 Thermal, CA, 92274	(760) 397-0300		lisareed990@gmail.com	Cahuilla	Imperial,Riverside,San Bernardino,San Diego

Record: PROJ-2024-001072
Report Type: List of Tribes
Counties: Riverside
NAHC Group: All

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Apartment Construction Project, Riverside County.

Appendix D

Design-Phase Geotechnical Investigation Report

PETRA GEOSCIENCES INC.

SOLID AS A ROCK

DESIGN-PHASE GEOTECHNICAL INVESTIGATION REPORT
PROPOSED RANCHO MIRAGE APARTMENTS
ASSESSOR'S PARCEL NO. 685-090-011, EAST OF RANCHO MIRAGE DOG PARK
RANCHO MIRAGE, RIVERSIDE COUNTY, CALIFORNIA

THE PACIFIC COMPANIES

March 25, 2024
J.N. 24-104

ENGINEERS + GEOLOGISTS + ENVIRONMENTAL SCIENTISTS

March 25, 2024
J.N. 24-104

THE PACIFIC COMPANIES
430 E. State Street, Ste. 100
Eagle, Idaho 83616

Attention: Mr. Darren Berbarian

Subject: Design-Phase Geotechnical Investigation, Rancho Mirage Apartments, Approximately 10 Acres East of the Rancho Mirage Dog Park, a Portion of Assessor Parcel Number 685-090-011, Rancho Mirage, Riverside County, California

Dear Mr. Berbarian:

Petra Geosciences, Inc. (Petra) is submitting herewith our geotechnical investigation report for the proposed construction of 242 apartments at the subject location in the city of Rancho Mirage. The proposed improvements will also include utilities, recreational areas, paved parking, landscaping, and on-site stormwater retention. This work was performed in general accordance with the scope of services outlined in our Proposal No. 24-104P, dated January 10, 2024. This report presents the results of our field investigation, laboratory testing, and our engineering and geologic analysis judgment, opinions, conclusions and recommendations pertaining to geotechnical design aspects of the proposed improvements.

It is a pleasure to be of service to you on this project. Should you have any questions regarding the contents of this report, or should you require additional information, please do not hesitate to contact us.

Respectfully submitted,

PETRA GEOSCIENCES, INC.

Alan Pace
Senior Associate Geologist

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DESIGN-PHASE GEOTECHNICAL INVESTIGATION REPORT
PROPOSED RANCHO MIRAGE APARTMENTS
ASSESSOR PARCEL NUMBER 685-090-011, EAST OF RANCHO MIRAGE DOG PARK
RANCHO MIRAGE, RIVERSIDE COUNTY, CALIFORNIA

PURPOSE AND SCOPE OF SERVICES

Petra Geosciences, Inc. (Petra) is presenting herein our design-phase geotechnical investigation report for an apartment buildings complex and various improvements that are currently proposed at the vacant site located in the city of Rancho Mirage, California. The improvements include the construction of a series of two-story apartment buildings and associated utilities, paved parking, landscaping, recreational areas, and on-site stormwater retention. The purposes of this investigation were to 1) obtain information regarding surface and subsurface geologic conditions within the area of the proposed construction, 2) evaluate the engineering properties of the onsite soil materials, and 3) provide conclusions and recommendations for design and construction of the proposed improvements. To accomplish these objectives, our scope of services included the following:

1. Reviewing of published and unpublished literature and maps pertaining to regional faulting, seismic hazards and soil and geologic conditions within and adjacent to the site that could influence the design of the proposed structural elements.

2. Reviewing of historical aerial photographs of the area of proposed construction.

3. Performing a subsurface investigation within the area of proposed construction. The investigation consisted of drilling 3 exploratory borings to depths of 26 to 66 feet using a hollow-stem drilling rig. Additionally, drilling 2 exploratory borings to 10 feet below ground surface using the hollow-stem auger drilling method and performing falling-head percolation test in each borehole. The boring logs are presented in Appendix A and the percolation tests results and infiltration rate calculations are presented in Appendix E.

4. Logging and field-classifying soil materials encountered in each boring in accordance with the visual-manual procedures outlined in the Unified Soil Classification System and the American Society for Testing and Materials (ASTM) Procedure D 2488-90. All field activities were performed by or under the direct observation of a State of California Certified Engineering Geologist.

5. Collecting representative bulk and relatively undisturbed soil samples for laboratory analysis. Undisturbed samples will be retrieved at 3- to 10-foot depth intervals utilizing a 2.4-inch inside diameter, modified-California split-spoon sampler. In addition, where granular soils were encountered within the saturated zone, these materials were selectively sampled using the Standard Penetration Test (SPT) method in accordance with ASTM Procedure D 1586-92.

6. Performing appropriate laboratory analysis on soil samples which included the following: in-situ and maximum dry density; in-situ and optimum moisture content; sieve analysis, remolded direct shear; collapse analysis; soluble sulfate and chloride content; general soil corrosivity (Sulfate, Chloride, pH and minimum resistivity).

7. Engineering and geologic analyses of the field and laboratory data as they pertain to the proposed construction.

8. An evaluation of faulting and seismicity of the region, and the possible impact of regional seismicity on the proposed construction.

9. Preparation of this geotechnical report presenting the results of our evaluation and recommendations for the proposed development in general conformance with the 2022 California Building Code (2022 CBC) and in accordance with applicable state and local jurisdictional requirements.

LOCATION AND SITE DESCRIPTION

The area of study considered under the scope of this investigation consists of 10 acres located to the east of the Rancho Mirage Dog Park. The location of the site with respect to nearby roadways and other landmarks is shown on the Site Location Map, Figure 1. The subject site is vacant and is bordered on the north by an existing shopping center, on the east by vacant land and Monterey Avenue, on the west by vacant land and the Rancho Mirage Dog Park, and on the south by undeveloped vacant land. The topography is approximately flat and level, with approximately 10 feet of relief from the south end of the site to the north end. The subject site's natural landscaping consists of few grasses and light desert scrub with no trees.

PROPOSED IMPROVEMENTS

Petra understands that the site is to be developed into 242 apartments. Additionally, the improvements will consist of utilities, paved parking, landscaping, and on-site storm water retention. Neither grading plans nor specific details related to the proposed improvements were provided to Petra at the time this report was prepared. Petra has received a *Draft Site Plan* (A. O. Architects, 2024) for "Via Vail Village" to use in the preparation of this report, but Petra has been advised this is subject to change. Based on the existing development and the relatively flat topography of the site, Petra assumes that earthwork is generally limited to minor cuts and fills to establish finished grade elevations. It should be noted, however, that remedial grading (i.e., excavation and re-compaction of any existing undocumented fill soils that are present on the site and loose native soils) will entail deeper cuts from exiting grades as recommended in subsequent sections of this report. No extensive subterranean construction is anticipated.

FIELD EXPLORATION AND TESTING

Subsurface Exploration

Our subsurface exploration was performed on February 16, 2024, and involved the following:

- Drilling and sampling of two relatively shallow borings (B-2 and B-3) to depths of 26 feet below the existing ground surface and one deep boring (B-1) to a depth of 66 feet below the existing ground surface. All of the borings were drilled utilizing a truck-mounted, hollow-stem auger drill rig.

- Drilling two borings to a depth of 10 feet (Borings P-1 and P-2) and performing pilot percolation tests to observe infiltration characteristics of subsurface materials that will be utilized in design of the infiltration system.

Earth materials encountered in each of the exploratory borings were field classified and logged in accordance with Unified Soil Classification System, USCS, procedures. In addition, our subsurface exploration included the collection of bulk and relatively undisturbed samples of the subsurface soils for laboratory testing purposes. Bulk samples consisted of selected earth materials obtained at various depth intervals from selected borings. Relatively undisturbed samples were collected using a 3-inch, outside-diameter, modified California split-spoon soil sampler lined with 1-inch-high brass and/or stainless steel rings. The modified sampler was driven with successive 30-inch drops of a hydraulically operated 140-pound automatic trip hammer. Blow counts for each 6-inch driving increment were recorded on the field logs. The central portions of the driven core samples were placed in sealed containers and transported to our laboratory for testing. The approximate locations of the exploratory borings are shown on the attached Boring Location Map, Figure 2, and descriptive exploration logs are presented in Appendix A.

In addition to the above sampling method, Standard Penetration Tests (SPT's) were also performed at selected depth intervals in accordance with the American Society for Testing Materials (ASTM) Standard Procedure D 1586. This method consists of mechanically driving an unlined standard split-barrel sampler 18 inches into the soil with successive 30-inch drops of the 140-pound automatic trip hammer. Blow counts for each 6-inch driving increment were recorded on the exploration logs. The number of blows required to drive the standard split-spoon sampler for the last 12 of the 18 inches was identified as the uncorrected standard penetration resistance (N). Disturbed soil samples from the unlined standard split-spoon samplers were placed in plastic bags and transported to our laboratory for testing.

Laboratory Testing

In order to evaluate the engineering properties of onsite soils, a number of laboratory tests were performed on selected samples considered representative of the materials encountered within the study area. These laboratory tests were performed shortly after completion of our field investigation and included determination of in-place dry density and moisture content, maximum dry density and optimum moisture content, sieve analysis, collapse potential, remolded shear strength, as well as chemical and electrical corrosivity potential (soluble sulfate and chloride content, pH, and minimum resistivity). A description of laboratory test methods is provided in the Laboratory Test Procedures section of this report (Appendix B). Summaries of the test data are presented on the exploration logs (Appendix A) and in Appendix B of this report.

Percolation Testing

Percolation testing was conducted in Exploratory Boring P-1 and P-2 in accordance with County of Riverside Department of Environmental Health (RCDEH) test procedures and the guidelines presented in Appendix VII of the County of Orange Technical Guidance Document for WQMPs. The Orange County Manual references the RCDEH percolation test methods as an acceptable method of obtaining site infiltration data. The “percolation rates” determined in accordance with the RCDEH test procedures are based on both horizontal (lateral) and vertical percolation. Therefore, to consider vertical percolation only, the “percolation rates” were converted to a reasonable estimate of the “infiltration rate” using the Porchet Method presented in Appendix VII of the referenced County of Orange Technical Guidance Document.

Boring P-1 and P-2 were converted to percolation test holes following the drilling of these borings by placing a three-inch (I.D.) perforated PVC pipe in the test hole. We note that in this stage and while we were taking the hollow stem auger out of the hole, it collapsed due to presence of dune sand. Consequently, the annular space around the pipe was filled with existing dune sand to the depth of approximately 5 feet below the ground and we were not able to place open-graded gravel, approximately ¾-inch, within the annular space between the pipe and boring walls and a 3-inch-thick layer of gravel below the pipe. The remainder of the annular space was backfilled with boring cuttings. Clean water was then added to the boring to pre-soak the adjacent soils prior to performing the percolation test.

The percolation tests were conducted in dune sand that exists from the near surface to below the base of the percolation tests. Borings P-1 and P-2 were drilled to total depths of approximately 10 feet. The test hole was filled with clean water to approximately 5 feet from the ground surface. The drop in water level was measured at 10-minute intervals. From these readings, the percolation characteristics of the underlying dune sand deposits were estimated. Percolation test results are presented in Appendix E and are summarized in Table 1. We note that the calculated infiltration rate presented in this table has a factor of safety of 1 and the project engineer should use an appropriate factor of safety per project Specifications.

TABLE 1

Percolation Test Results

Test No.	Soil Type[1] (USCS)	Depth of Hole (Feet)	Measured [2] Percolation Rate (Minutes/Inch)	Infiltration Rate (I_t) [3] per Porchet Method (Inches/Hour) (F.S – 1)
P-1	SP	10	0.38	13.4
P-2	SP	10	0.35	13.0

[1] Interbedded Strata – see Boring Logs, Appendix A
[2] RCDEH Test Procedure
[3] Minutes/inch converted to inches/hour per Porchet Method

FINDINGS

Regional Geologic Setting

The proposed development is located in the Coachella Valley, which is part of the Salton Trough geomorphic province of California. The Salton Trough geomorphic province encompasses the Coachella, Imperial and Mexicali Valleys, which extend from northeast of Palm Springs near San Gorgonio Pass to the Gulf of California. The geologic structure of the trough is a result of extensional forces within the earth's crust. The Coachella Valley is generally bounded by the San Jacinto and Santa Rosa Mountains on the west, the San Bernardino and the Little San Bernardino Mountains on the north, the Cottonwood Mountains and the Mecca Hills on the east, and the Salton Sea to the south. Alluvial (Streams), aeolian (wind-blown), and lacustrine (lake) sediments are the dominant geologic units of the Coachella Valley.

The watershed of the Coachella Valley empties into the Salton Sea at the lowest part of the basin. This basin was periodically filled with water to form the ancient Lake Cahuilla, depending on which side of its delta the Colorado River would drain. The sediments of the delta form a topographic high that separates the Salton basin, which is below sea level, from the Gulf of California (Sea of Cortez).

Local Geology and Subsurface Soil Conditions

In general, the soil materials underlying the site as encountered in our borings were noted to consist of very loose to very dense, poorly graded dune sand to the maximum depth explored of 66 feet. The upper 3 to 4 feet of the soil was found to be dry and very loose to loose. Soils become medium dense to dense and finer grained with depth. The moisture content of these native soils is very low and on the order of less than 0.5 percent. Laboratory testing of relatively undisturbed samples of dune sand yielded in-place dry densities ranging from 90 to 110 pounds per cubic foot.

Groundwater

Free groundwater was not encountered within any of the exploratory borings advanced onsite to the maximum depth explored of 66 feet below grades. According to a monitoring well located approximately 0.5 miles to the north, groundwater is located approximately 160 feet below the ground surface as of July 18, 2023 (CDWR Station 338086N1163878W001).

Faulting

The Coachella Valley is a seismically active area and numerous northwest-trending active faults have been documented within the area. The San Andreas fault zone is the most prominent fault within the Coachella Valley and is considered to be “active”. An “active” fault is defined as a fault that has had displacement within the Holocene epoch, or last ±11,000 years. Based on our review, the site is not located within a *Fault Hazard Zone* (Bryant and Hart, 2007), as defined by the state of California in the Alquist-Priolo Earthquake Fault Zoning Act and no evidence for faulting was observed within the site during our study.

Secondary Seismic Hazards

Seismically Induced Landsliding

The site exhibits a generally flat topography, and no landslides exist within or near the site. Based on the topography across the site, the potential for landsliding is considered negligible.

Seismically Induced Flooding

The types of seismically induced flooding that are generally considered as potential hazards to a particular site normally include flooding due to a tsunami (seismic sea wave), a seiche, or failure of a major reservoir or other water retention structure upstream of the site. The Salton Sea is situated approximately 25 miles southeast of the site with an elevation approximately 500 feet lower than the subject site. In addition, no major reservoir is located near or upstream of the site. Therefore, the potential for seiche or inundation is considered negligible. Because of the inland location of the site, flooding due to a tsunami is also considered negligible at the site.

Liquefaction and Seismically Induced Settlement

Liquefaction

Liquefaction is a soil softening dynamic response, by which an increase in the excess pore water pressure results in partial to full loss of soil shear strength and post-liquefaction dissipation of this pore water pressure results in ground settlement shortly after the earthquake. In order for liquefaction to occur, the following four factors are required: 1) saturated soil or soil situated below the groundwater table; 2) undrained loading (strong ground shaking), such as by earthquake; 3) contractive soil response during shear loading, which is often the case for a soil which is initially in a loose or uncompacted state; and 4) susceptible soil type; such as clean, uniformly graded sands, non-plastic silts, or gravels. SP117A (CGS, 2008) discusses preliminary screening methods sufficient to evaluate liquefaction potential without requiring a comprehensive liquefaction analysis; one of the considerations is the depth to groundwater. Sites with groundwater depth of around 50 feet below ground surface and deeper (including historic high ground water, current conditions, and future expectations), are considered unlikely to experience liquefaction within the upper 50 feet of the soil profile. Due to a very deep ground water table at the subject property (+160 feet) the potential for liquefaction at this site is considered negligible.

Dry Sand

Dry sand settlement can occur during moderate and large earthquakes when loose, natural or fill sandy soils are densified and settle, often unevenly across a site. In order for dry sand settlement to occur, the following four factors are required: 1) Relatively dry soil or soil situated above the groundwater table; 2) undrained loading (strong ground shaking), such as by earthquake; 3) contractive soil response during shear loading, which is often the case for a soil which is initially in a loose or uncompacted state; and 4) susceptible soil type; such as clean, uniformly graded sands. Structures situated above seismically densifying dry sandy soils may experience settlement or tilting of superstructures, or both.

Seismically Induced Settlement Parameters

Assessment of liquefaction or dry sand settlement potential for a particular site requires knowledge of a number of regional as well as site-specific parameters, including the estimated design earthquake magnitude, and the associated probable peak horizontal ground acceleration at the site, subsurface stratigraphy and soil characteristics. Parameters such as estimated probable peak horizontal ground acceleration can readily be determined using published references, or by utilizing a commercially available computer program specifically designed to perform a probabilistic analysis. In contrast, stratigraphy and soil characteristics can only be accurately determined by means of a site-specific subsurface investigation combined with appropriate laboratory analysis of representative samples of onsite soils.

<u>Seismically Induced 'Dry Sand' Settlement</u>

Propagating earthquake waves induces shearing stresses and strains in soil materials during strong ground shaking. This process rearranges the structure of granular soils such that there is an increase in density, with a corresponding decrease in volume, which results in vertical settlement. Seismically induced settlement has been well documented in wet, sandy deposits undergoing liquefaction (see Tokimatsu and Seed, 1987) and in relatively dry sediments as well (Stewart et al, 1996). Specific methods to analyze potential wet and dry dynamic settlement are reported in Tokimatsu and Seed (1987), Pradel (1998), and Stewart et al. (2001; 2002). Most of the referenced papers focus on the seismic effects on dry, clean sands of a uniform grain size, though several reports extend the literature to fine-grained soils (Stewart et al., 2001 & 2002). State guidelines for evaluating dynamic settlement are provided in the California Geological Survey Special Publication 117A (CGS, 2008).

To evaluate the potential for earthquake-induced dry sand settlement at the site and its impact on the proposed improvements, we performed a settlement analysis of the data from our 66 feet deep boring B-1 using LiqSVs program (Geologismiki, Version 2.3.2.9). LiqSVs is a software that evaluates liquefaction potential and calculates the settlement of soil deposits due to seismic loads. For the purpose of dry sand settlement analyses, we considered a design groundwater level at a depth of 160 feet below the existing ground surface, peak ground acceleration for maximum considered earthquake (PGA_M) in the site vicinity to be approximately 0.879g, and a predominant earthquake magnitude of 7.49 Mw.

The results of our analysis indicate that the loose and medium dense poorly graded dune sand encountered below the ground surface to the depth of approximately 10 feet in our borings appear to be prone to dry sand settlement during seismic shaking. Assuming that the upper 4 feet of soil will be replaced with a non-susceptible soil to dynamic settlement, we estimate that total dynamic settlement up to about 1½ to 2-inches is possible at the ground surface within our borings due to dry sand settlement from the MCE level earthquake. In our opinion, differential dry sand settlement of up to about 1½ -inch over a horizontal distance of approximately 100 feet may occur across the proposed improvements at the ground surface. A summary of our dry sand settlement analysis is presented in Appendix D. The estimated dry sand settlement should be considered during the structural design of the foundation system of the proposed improvements.

It should be noted that in the literature, prediction of the seismic settlement for unsaturated sandy soils, referred to as 'dry sand' settlement, is based on observation of performance of 5 sites that were comprised of clean sands, i.e. sands with 5 percent fines or less. However, the shallow site soils, above the assumed historic high groundwater level, are comprised of sands with substantial amounts of fines. The presence of fines influences (reduces) the settlement potential under a seismic event. To overcome this, the measured resistance parameters of soils with fines are first converted to that of clean sand values and then are used in the predictive routines. This is an indirect approach and, therefore, lacks the performance-based verification requirements. In addition, sandy deposits, especially within vadose zones, contain certain amount of pore water that, because of surface tension properties of water molecules, create tensile intra-particle forces, albeit, very weak, that are expected to reduce the particle rearrangement tendencies of sandy deposits during ground shaking. Further, sometimes the 'dry sand' seismic settlement calculation results are multiplied by factor of 2 to account for bidirectional nature of seismic waves propagations. That is, the investigators are provided with an optional factor of 2 to multiply the results of their seismic 'dry sand' calculations. It is our professional opinion that for the reasons cited herein dry sand settlement calculations are less reliable compared to that of the liquefaction settlement. It is perhaps for these and potentially other reasons that some review agencies do not require 'dry sand' settlement calculations as a part of their approval process.

CONCLUSIONS AND RECOMMENDATIONS

General Feasibility

Although the detailed development plans are not fully available, from a soils engineering and engineering geologic point of view and based on our current knowledge of the project, the subject property is considered suitable for the proposed development. It is our opinion that the proposed construction will not adversely affect the geologic stability of adjoining properties in an adverse manner provided grading and construction are performed in accordance with current standards of practice, all applicable grading ordinances and the recommendations presented in this report.

Earthwork and Grading

General Specifications

All earthwork and grading should be performed in accordance with all applicable requirements of the grading and excavation codes of the County of Riverside, and in compliance with all applicable provisions of the 2022 California Building Code (2022 CBC). Grading should also be performed in accordance with the recommendations provided in this report.

Geotechnical Observations and Testing

Prior to the start of earthwork, a meeting should be held at the site with the owner's representative, contractor and geotechnical consultant to discuss the work schedule and geotechnical aspects of the grading. Earthwork, which in this instance will generally entail removal and re-compaction of the near surface soils, should be accomplished under full-time observation and testing by the geotechnical consultant. A representative of the project geotechnical consultant should be present onsite during all earthwork operations to document placement and compaction of fills, as well as to document compliance with the other recommendations presented herein.

Demolition, Clearing and Grubbing

Following any demolition, clearing operations should also include the removal of any remaining trash, debris, vegetation and similar deleterious materials including the root balls from any trees. Any cavities or excavations created upon removal of any unknown subsurface structures or inclusions should be cleared of loose soil, shaped to provide access for backfilling and compaction equipment and then backfilled with engineered fill. Note that buried deleterious materials may be encountered within the site (i.e., buried organics or debris) due to the past site usage and may need to be removed by hand (i.e., root pickers), during grading operations.

The project geotechnical consultant should provide periodic observation and testing services during final clearing and grubbing operations to document compliance with the above recommendations. In addition, should unusual or adverse soil conditions or buried structures be encountered during grading that are not described herein, these conditions should be brought to the immediate attention of the project geotechnical consultant for corrective recommendations.

Unsuitable Soil Removals and Bottom Processing

Any existing undocumented fill and near surface native soils are considered unsuitable for support of proposed structures and should be removed to underlying competent alluvial materials as approved by the project geotechnical consultant. As such, the estimated depth of removal is recommended to be approximately 4 feet below the existing ground surface, or 3 feet below the bottom of the deepest footing, whichever is deeper. Consideration should be given to locally deepening the excavation at the location of tree roots, any underground structures, or proposed subterranean features (if any) in order to provide a uniform depth of compacted fill in all areas. Soil removals could be locally deeper depending upon the actual exposed conditions encountered during grading. At a minimum, the over-excavation should extend a distance beyond the perimeter of the supported structure equal to the depth of the over-excavation. The actual depths and horizontal limits of removals and over-excavations should be evaluated upon availability of the site grading plan and during grading on the basis of observations and testing performed by the project geotechnical consultant. Excavated soils, if found free of deleterious materials, are considered acceptable for use as compacted fill.

Prior to placing engineered fill, the exposed bottom surfaces in the removal areas should be approved by a representative of project geotechnical consultant. The exposed bottom(s) should be scarified to a minimum depth of 12 inches, moisture-conditioned or air-dried to achieve approximately two percent above optimum moisture content and then compacted with a heavy construction equipment prior to placement of fill. The minimum compaction of the upper 12 inches of the removal bottom should meet or exceed 90 percent relative compaction. The laboratory maximum dry density, the standard for determining relative compaction, and optimum moisture content for each change in soil type should be determined in accordance with Test Method ASTM D 1557.

Grading at Site Boundaries

Average remedial removals within the building pad areas, extending horizontally beyond the limits of the proposed structures a distance equal to the depth of the overexcavation, are anticipated to be on the order of 4 feet below the existing ground surface, although locally deeper over-excavation is possible. A vertical cut at the perimeter of any overexcavation area along the property lines is not expected to remain stable. As such, vertical cuts immediately adjacent to existing structures (if any) is not acceptable from geotechnical standpoint. Specific recommendations for protection of any existing structures or improvements adjacent to the recommended overexcavation, either interior or at the perimeter of the site can be provided following review of site development plans. Recommendations may include shoring and slot-cutting for areas adjacent to property boundaries and underpinning, or other methods intended to prevent settlement or distress to existing improvements.

Excavation Characteristics

Based on the observed soils types in our borings, shallow excavation of soils within the site are expected to be readily excavatable with conventional earthmoving equipment.

Fill Placement

All fill materials should be placed in approximately 6- to 8-inch-thick loose lifts, watered or air-dried as necessary to achieve a minimum moisture content at least 2 percent above the optimum moisture condition, and then compacted in-place to a minimum relative compaction of 90 percent. The laboratory maximum dry density and optimum moisture content for each change in soil type should be determined in accordance with ASTM D 1557.

Imported Soils

If imported soils are required to complete the planned grading, these soils should consist of clean materials devoid of rock exceeding a maximum dimension of 4 inches, organics, trash and other deleterious materials. To avoid making revisions to the foundation design, imported soils should also be granular and exhibit a very low expansion potential (Expansion Index 0-20). Prospective import soils should be observed at the source, tested and approved by the geotechnical consultant prior to importing the soils to the site. It is recommended that the project environmental consultant should also be notified so that they can confirm the suitability of the proposed import material from an environmental standpoint.

Volumetric Changes - Bulking, Shrinkage and Subsidence

An average shrinkage factor estimated at 15 to 20 percent is anticipated when excavated on-site soils are replaced as properly compacted fill. A subsidence, estimated at 0.15 to 0.25 feet may also occur when exposed bottom surfaces in removal areas are scarified and re-compacted as recommended herein. These estimates of shrinkage and subsidence are intended for use by project planners in estimating earthwork quantities and should not be considered absolute values. Contingencies should be made for balancing earthwork quantities based on actual shrinkage and subsidence that will occur during grading.

Temporary Excavations

Temporary excavations up to a depth of up to roughly four feet below existing grades may be required to accomplish the recommended over-excavation of existing soils. Based on the physical properties of the onsite soils, any temporary excavations exceeding 4 feet in height should be cut back to an inclination of 1.5:1 (h:v) or flatter for the duration of the over-excavation of unsuitable soil material and replacement as compacted fill, as well as placement of underground utilities. During remedial grading the estimated 1.5:1 (h:v) recommendation may possibly be flattened or steepened, depending on conditions observed by a representative of the project geotechnical consultant. Other factors which should be considered with respect to the stability of the temporary slopes include construction traffic and/or storage of materials on or near the tops of the slopes, construction scheduling, presence of nearby walls or structures adjacent to the excavation and weather conditions at the time of construction. Applicable requirements of the California Construction and General Industry Safety Orders, the Occupational Safety and Health Act, OSHA, of 1970 and the Construction Safety Act should also be followed.

Expansive Soil Conditions

Based on available data, including the non-plastic, granular nature of the soils encountered in the subsurface exploration, near-surface soils are considered Very Low in expansion potential (Expansion Index less than 20). Additional sampling and testing should be performed during site grading for determining actual expansion potential of the supporting building pad soils.

PRELIMINARY FOUNDATION DESIGN CONSIDERATIONS

Seismic Design Parameters

Earthquake loads on earthen structures and buildings are a function of ground acceleration which may be determined from the site-specific ground motion analysis. Alternatively, a design response spectrum can be developed for certain sites based on the code guidelines. To provide the design team with the parameters necessary to construct the design acceleration response spectrum for this project, we used two computer applications. Specifically, the first computer application, which was jointly developed by Structural Engineering Association of California (SEAOC) and California's Office of Statewide Health Planning and Development (OSHPD), the SEA/OSHPD Seismic Design Maps Tool website, https://seismicmaps.org, is used to calculate the ground motion parameters. The second computer application, the United Stated Geological Survey (USGS) Unified Hazard Tool website, https://earthquake.usgs.gov/hazards/interactive/, is used to estimate the earthquake magnitude and the distance to surface projection of the fault. The results obtained from these websites is presented in Appendix C.

To run the above computer applications, site latitude and longitude, seismic risk category and knowledge of site class are required. The site class definition depends on the direct measurement of certain soil properties and the ASCE 7-16 recommended procedure for calculating the average shear wave velocity within the upper 30 meters (approximately 100 feet) of site soils. Several methods exist to determine the shear wave velocity, including correlation with SPT blow counts. Based on the blow counts obtained in boring B-1 (including converting California Modified Sampler blow counts to SPT after Burmister (1948)) and Petra's knowledge of site geologic conditions, Site Class D (D – Stiff Soil as per the SEA/OSHPD software) has been assigned to the subject site.

Petra has assumed that the proposed structures should be categorized as Risk Category II pursuant to 2022 CBC Table 1604.5. If the specifics of the proposed project warrant a different Risk Category, the members of the design team responsible for this determination may assign the appropriate Risk Category. Seismic design parameters provided below are not impacted by the assumed Risk Category.

The following table, Table 2, provides parameters required to construct the seismic response coefficient, Cs, curve based on ASCE 7-16, Article 12.8 guidelines. A printout of the computer output is attached in Appendix C. The results of conversion of blow count data to small-strain shear wave velocity is also provided in Appendix C.

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TABLE 2

Seismic Design Parameters

Ground Motion Parameters	Specific Reference	Parameter Value	Unit
Site Latitude (North)	-	33.798390	°
Site Longitude (West)	-	-116.393251	°
Site Class Definition	Section 1613.2.2 (1), Chapter 20 (2)	D-Stiff (4)	-
Assumed Risk Category	Table 1604A.5 (1)	II	-
M_w - Earthquake Magnitude	USGS Unified Hazard Tool (3)	7.49 (3)	-
R – Distance to Surface Projection of Fault	USGS Unified Hazard Tool (3)	6.38 (3)	km
S_s - Mapped Spectral Response Acceleration Short Period (0.2 second)	Figure 1613.2.1(1) (1)	1.842 (4)	g
S_1 - Mapped Spectral Response Acceleration Long Period (1.0 second)	Figure 1613.2.1(2) (1)	0.77 (4)	g
F_a – Short Period (0.2 second) Site Coefficient	Table 1613A.2.3(1) (1)	1.0 (4)	-
F_v – Long Period (1.0 second) Site Coefficient	Table 1613A.2.3(2) (1)	Null (4)	-
S_{MS} – MCE_R Spectral Response Acceleration Parameter Adjusted for Site Class Effect (0.2 second)	Equation 16-36 (1)	1.842 (4)	g
S_{M1} - MCE_R Spectral Response Acceleration Parameter Adjusted for Site Class Effect (1.0 second)	Equation 16-37 (1)	Null (4)	g
S_{DS} - Design Spectral Response Acceleration at 0.2-s	Equation 16-38 (1)	1.228 (4)	g
S_{D1} - Design Spectral Response Acceleration at 1-s	Equation 16-39 (1)	Null (4)	g
$T_o = 0.2\ S_{D1}/\ S_{DS}$	Section 11.4.6 (2)	Null	s
$T_s = S_{D1}/\ S_{DS}$	Section 11.4.6 (2)	Null	s
T_L - Long Period Transition Period	Figure 22-14 (2)	8 (4)	s
PGA - Peak Ground Acceleration at MCE_G (*)	Figure 22-9 (2)	0.799 (4)	g
F_{PGA} - Site Coefficient Adjusted for Site Class Effect (2)	Table 11.8-1 (2)	1.1 (4)	-
PGA_M –Peak Ground Acceleration (2) Adjusted for Site Class Effect	Equation 11.8-1 (2)	0.879 (4)	g
Design PGA ≈ (⅔ PGA_M) - Slope Stability (†)	Similar to Eqs. 16-38 & 16-39 (2)	0.59	g
Design PGA ≈ (0.4 S_{DS}**)** – Short Retaining Walls (‡)	Equation 11.4-5 (2)	Null	g
C_{RS} - Short Period Risk Coefficient	Figure 22-18A (2)	0.892 (4)	-
C_{R1} - Long Period Risk Coefficient	Figure 22-19A (2)	0.878 (4)	-
SDC - Seismic Design Category (§)	Section 1613.2.5 (1)	Null (4)	-

References:

(1) California Building Code (CBC), 2022, California Code of Regulations, Title 24, Part 2, Volume I and II.

(2) American Society of Civil Engineers/Structural Engineering Institute (ASCE/SEI), 2016, Minimum Design Loads and Associated Criteria for Buildings and Other Structures, Standards 7-16.

(3) USGS Unified Hazard Tool - https://earthquake.usgs.gov/hazards/interactive/

(4) SEI/OSHPD Seismic Design Map Application – https://seismicmaps.org

Related References:

Federal Emergency Management Agency (FEMA), 2015, NEHERP (National Earthquake Hazards Reduction Program) Recommended Seismic Provision for New Building and Other Structures (FEMA P-1050).

Notes:

* PGA Calculated at the MCE return period of 2475 years (2 percent chance of exceedance in 50 years).

† PGA Calculated at the Design Level of ⅔ of MCE; approximately equivalent to a return period of 475 years (10 percent chance of exceedance in 50 years).

‡ PGA Calculated for short, stubby retaining walls with an infinitesimal (zero) fundamental period.

§ The designation provided herein may be superseded by the structural engineer in accordance with Section 1613.2.5.1, if applicable.

Discussion

General

Owing to the characteristics of the subsurface soils, as defined by Site Class D-Stiff Soil designation, and proximity of the site to the sources of major ground shaking, the site is expected to experience strong ground shaking during its anticipated life span. Under these circumstances, where the code-specified design response spectrum may not adequately characterize site response, the 2022 CBC typically requires a site-specific seismic response analysis to be performed. This requirement is signified/identified by the "null" values that are output using SEA/OSHPD software in determination of short period, but mostly, in determination of long period seismic parameters, see Table 2.

For conditions where a "null" value is reported for the site, a variety of design approaches are permitted by 2022 CBC and ASCE 7-16 in lieu of a site-specific seismic hazard analysis. For any specific site, these alternative design approaches, which include Equivalent Lateral Force (ELF) procedure, Modal Response Spectrum Analysis (MRSA) procedure, Linear Response History Analysis (LRHA) procedure and Simplified Design procedure, among other methods, are expected to provide results that may or may not be more economical than those that are obtained if a site-specific seismic hazards analysis is performed. These design approaches and their limitations should be evaluated by the project structural engineer.

Seismic Design Category

Please note that the Seismic Design Category, SDC, is also designated as "null" in Table 2. For Risk Category is I, II, or III structures, where the mapped spectral response acceleration parameter at 1 – second period, S_1, is greater than or equal to 0.75, the 2022 CBC, Section 1613.2.5 requires the assignment to Seismic Design Category E.

Equivalent Lateral Force Method

Should the Equivalent Lateral Force (ELF) method be used for seismic design of structural elements, the value of Constant Velocity Domain Transition Period, T_s, is estimated to be 0.71 seconds and the value of Long Period Transition Period, T_L, is provided in Table 2 for construction of Seismic Response Coefficient – Period (C_s -T) curve that is used in the ELF procedure.

As stated herein, the subject site is considered to be within a Site Class D-Stiff Soil. A site-specific ground motion hazard analysis is not required for structures on Site Class D-Stiff Soil with S1 > 0.2 provided that the Seismic Response Coefficient, Cs, is determined in accordance with ASCE 7-16, Article 12.8 and structural design is performed in accordance with Equivalent Lateral Force (ELF) procedure.

Foundation System

In consideration of the existing surficial soils and the recommended remedial grading herein, conventional shallow foundations, consisting of isolated column footings interconnected with tie beams and continuous footings, may be used for support of the proposed structures. Structural foundation loads are currently unknown but are assumed to be typical for two-story light-framed construction.

Eccentrically loaded footings should be avoided if possible. In the event that the design requires eccentric loading, the design should consider the effective footing dimensions rather than actual dimensions. Pad footings located closer than 2 x B (where B is the footing width) to an adjacent footing should be designed as a single footing. Allowable bearing capacity for square footings apply as long as L/B is less than 5 (where L is the footing length).

Allowable Soil Bearing Capacity, Anticipated Settlement and Lateral Resistance

Pad Footings

Based on the test results (ultimate friction angle of 28.5 degrees and negligible cohesion), an allowable soil bearing capacity of 2,000 pounds per square foot, including dead and live loads, may be utilized for design of 24-inch-square pad footings that are a part of the slab system and embedded a minimum of 12 inches below the lowest adjacent compacted final grade. This value may be increased by 20 percent for each foot of embedment and by 10 percent for each additional foot of width, to a maximum value of 3,500 pounds per square foot. The recommended allowable bearing value includes both dead and live loads and may be increased by one-third for short duration wind and seismic forces.

Continuous Footings

An allowable soil bearing capacity of 1,500 pounds per square foot may be utilized for design of continuous footings founded at a minimum depth of 18 inches below the lowest adjacent final grade. This value may be increased by 20 percent for each additional foot of depth and by 10 percent for each additional foot of width, to a maximum value of 3,500 pounds per square foot. The recommended allowable bearing value includes both dead and live loads and may be increased by one-third for short duration wind and seismic forces.

Estimated Static Settlement

Based on the allowable bearing values provided above, total static settlement of the footings under the anticipated loads is expected to be on the order of 1 inch. Differential settlement is expected to be less than ¾ inch over a horizontal span of 30 feet. The majority of settlement is likely to take place as footing loads are applied or shortly thereafter.

Seismically Induced Settlement

As previously noted, if remedial grading removes and replaces the upper 4 feet of existing soils as compacted fill, the total seismic settlement is estimated at approximately 2 inches. Differential seismic settlement is estimated to be around 1 ½ inches over a span of 100 feet.

Lateral Resistance

A passive earth pressure of 250 pounds per square foot per foot of depth, to a maximum value of 2,500 pounds per square foot, may be used to determine lateral bearing resistance for footings. In addition, a coefficient of friction of 0.30 times the dead load forces may be used between concrete and the supporting soils to determine lateral sliding resistance. The above values may be increased by one-third when designing for transient wind or seismic forces. It should be noted that the above values are based on the condition where footings are cast in direct contact with compacted fill or competent native soils. In cases where the footing sides are formed, all backfill placed against the footings upon removal of forms should be compacted to at least 90 percent of the applicable maximum dry density.

Guidelines for Footings and Slabs on-Grade Design and Construction

Based on the sandy nature of the material encountered in the borings and Petra's experience in the area, the site soils have expansive indices less than 20. As indicated in Section 1803.5.3 of 2022 California Building Code (2022 CBC), these soils are considered non-expansive and, as such, the design of slabs on-grade is considered to be exempt from the procedures outlined in Sections 1808.6.2 of the 2022 CBC and may be performed using any method deemed rational and appropriate by the project structural engineer. However, the following minimum recommendations are presented herein for conditions where the project design team may require geotechnical engineering guidelines for design and construction of footings and slabs on-grade the project site.

> *The design and construction guidelines that follow are based on the above soil conditions and may be considered for reducing the effects of variability in fabric, composition and, therefore, the detrimental behavior of the site soils such as excessive short- and long-term total and differential heave or settlement. These guidelines have been developed on the basis of the previous experience of this firm on projects with similar soil conditions. Although construction performed in accordance with these guidelines has been found to reduce post-construction movement and/or distress, they generally do not positively eliminate all potential effects of variability in soils characteristics and future heave or settlement.*

It should also be noted that the suggestions for dimension and reinforcement provided herein are performance-based and intended only as preliminary guidelines to achieve adequate performance under the anticipated soil conditions. However, they should not be construed as replacement for structural engineering analyses, experience and judgment. The project structural engineer, architect and/or civil engineer should make appropriate adjustments to slab and footing dimensions, and reinforcement type, size and spacing to account for internal concrete forces (e.g., thermal, shrinkage and expansion), as well as external forces (e.g., applied loads) as deemed necessary. Consideration should also be given to minimum design criteria as dictated by local building code requirements.

Conventional Slabs on-Grade System

Considering an expansion index of less than 20, we recommend that footings and floor slabs be designed and constructed in accordance with the following minimum criteria.

Footings

1. Exterior continuous footings supporting one- and two-story structures should be founded at a minimum depth of 18 inches below the lowest adjacent final grade, respectively. Interior continuous footings may be founded at a minimum depth of 12 inches below the top of the adjacent finish floor slabs.

2. In accordance with Table 1809.7 of 2022 CBC for light-frame construction, all continuous footings should have minimum widths of 12 inches for one- and two-story structures. We recommend all continuous footings should be reinforced with a minimum of two No. 4 bars, one top and one bottom.

3. A minimum 12-inch-wide grade beam founded at the same depth as adjacent footings should be provided across garage entrances or similar openings (such as large doors or bay windows). The grade beam should be reinforced with a similar manner as provided above.

4. Interior isolated pad footings, if required, should be a minimum of 24 inches square and founded at a minimum depth of 12 inches below the bottoms of the adjacent floor slabs for one- and two-story structures. Pad footings should be reinforced with No. 4 bars spaced a maximum of 18 inches on centers, both ways, placed near the bottoms of the footings.

5. Exterior isolated pad footings intended for support of roof overhangs such as second-story decks, patio covers and similar construction should be a minimum of 24 inches square and founded at a minimum depth of 18 inches below the lowest adjacent final grade. The pad footings should be reinforced with No. 4 bars spaced a maximum of 18 inches on centers, both ways, placed near the bottoms of the footings. Exterior isolated pad footings may need to be connected to adjacent pad and/or continuous footings via tie beams at the discretion of the project structural engineer.

6. The minimum footing dimensions and reinforcement recommended herein may be modified (increased or decreased subject to the constraints of Chapter 18 of the 2022 CBC) by the structural engineer responsible for foundation design based on calculations, engineering experience and judgment.

Building Floor Slabs

1. Concrete floor slabs should be a minimum 4 inches thick and reinforced with No. 3 bars spaced a maximum of 24 inches on centers, both ways. Alternatively, the structural engineer may recommend the use of prefabricated welded wire mesh for slab reinforcement. For this condition, the welded wire mesh should be of sheet type (not rolled) and should consist of 6x6/W2.9xW2.9 (per the Wire Reinforcement Institute, WRI, designation) or stronger. All slab reinforcement should be supported on concrete chairs or brick to ensure the desired placement near mid-depth. Care should be exercised to prevent warping of the welded wire mesh between the chairs in order to ensure its placement at the desired mid-slab position.

   Slab dimension, reinforcement type, size and spacing need to account for internal concrete forces (e.g., thermal, shrinkage and expansion) as well as external forces (e.g., applied loads), as deemed necessary. Consideration should also be given to using a control joint spacing on the order of 2 feet in each direction for each inch of slab thickness.

   It should be noted that some of the non-climatic site parameters, which may impact slabs on-grade performance, are not known at this time, as it is the case for many projects at the design stage. Some of these site parameters include unsaturated soils diffusion conditions pre- and post-construction (e.g., casting the slabs at the end of long, dry or wet periods, maintenance during long, dry and wet periods, etc.), landscaping, alterations in site surface gradient, irrigation, trees, etc. While the effects of any or a combination of these parameters on slab performance cannot be accurately predicted, maintaining moisture content equilibrium within the soils mass and planting trees at a distance greater than half of their mature height away from the edge of foundation may reduce the potential for the adverse impact of these site parameters on slabs on-grade performance.

2. Living area concrete floor slabs and areas to receive moisture sensitive floor covering should be underlain with a moisture vapor retarder consisting of a minimum 10-mil-thick polyethylene or polyolefin membrane that meets the minimum requirements of ASTM E96 and ASTM E1745 for vapor retarders (such as Husky Yellow Guard®, Stego® Wrap, or equivalent). All laps within the membrane should be sealed, and at least 2 inches of clean sand should be placed over the membrane to promote uniform curing of the concrete.

   In general, to reduce the potential for punctures, the membrane should be placed on a pad surface that has been graded smooth without any sharp protrusions. If a smooth surface cannot be achieved by grading, consideration should be given to lowering the pad finished grade an additional inch and then placing a 1-inch-thick leveling course of sand across the pad surface prior to the placement of the membrane. . Foot traffic on the membrane should be reduced to a minimum. Additional steps would also need to be taken to prevent puncturing of the vapor retarder during concrete placement.

   To comply with Section 1907.1.1 of the 2022 CBC, the living area concrete floor slab should also be underlain with capillary break consisting of a minimum of 4 inches of gravel or crushed stone containing not more than 10 percent of material that passes through a No. 4 sieve. The capillary break should be placed below the 10-mil moisture vapor retarder and may be considered as the structural fill recommended above.

   At the present time, some slab designers, geotechnical professionals and concrete experts view the sand layer below the slab (blotting sand) as a place for entrapment of excess moisture that could adversely impact moisture-sensitive floor coverings. As a preventive measure, the *potential for moisture intrusion into the concrete slab could be reduced if the concrete is placed directly on the vapor retarder. However, if this sand layer is omitted, appropriate curing methods must be implemented to ensure that the concrete slab cures uniformly. A qualified materials engineer or contractor with experience in slab design, construction, and curing should provide recommendations for alternative methods of curing and supervise the construction process to ensure uniform slab curing. Additional steps would also need to be taken to prevent puncturing of the vapor retarder during concrete placement.*

3. Garage floor slabs should be a minimum 4 inches thick and reinforced in a similar manner as living area floor slabs. Garage slabs should also be poured separately from adjacent wall footings with a positive separation maintained using ¾-inch-minimum felt expansion joint material. To control the propagation of shrinkage cracks, garage floor slabs should be quartered with weakened plane joints. Consideration should be given to placement of a moisture vapor retarder below the garage slab, similar to that provided in Item 2 above, should the garage slab be overlain with moisture sensitive floor covering.

4. Presaturation of the subgrade below floor slabs will not be required; however, prior to placing concrete, the subgrade below all dwelling and garage floor slab areas should be thoroughly moistened to achieve a moisture content that is at least equal to or slightly greater than optimum moisture content. This moisture content should penetrate to a minimum depth of 12 inches below the bottoms of the slabs.

5. The minimum dimensions and reinforcement recommended herein for building floor slabs may be modified (increased or decreased subject to the constraints of Chapter 18 of the 2022 CBC) by the structural engineer responsible for foundation design based on calculations, engineering experience and judgment.

Post-Tensioned Slabs on-Grade System

In consideration of the expansion index of less than 20, as predominantly exhibited by onsite soils, any rational and appropriate procedure may be chosen by the project structural engineer for the design of post-tensioned slabs on-grade. Should the design engineer choose to follow the latest Code-adopted edition of the procedure published by the Post-Tensioning Institute (PTI DC 10.5), the following minimum design criteria are provided Table 3, below.

TABLE 3

Presumptive Post-Tensioned Slab on-Grade Design Parameters for PTI Procedure

Soil Information	
Approximate Depth of Constant Suction, feet	9
Approximate Soil Suction, pF	3.9
Inferred Thornthwaite Index:	-20
Average Edge Moisture Variation Distance, e_m in feet: Center Lift Edge Lift	 9.0 4.7
Anticipated Swell, y_m in inches: Center Lift Edge Lift	 0.25 0.45

Modulus of Subgrade Reaction

The modulus of subgrade reaction for design of load bearing elements depends on the size of the element and soil-structure interaction. However, as a first level of approximation, this value may be assumed to be 125 pounds per cubic inch.

Minimum Design Recommendations

The soil values provided above may be utilized by the project structural engineer to design post-tensioned slabs on-ground in accordance with Section 1808.6.2 of the 2019 CBC and the PTI publication. Thicker floor slabs and larger footing sizes may be required for structural reasons and should govern the design if more restrictive than the minimum recommendations provided below:

1. Exterior continuous footings for one- and two-story structures should be founded at a minimum depth of 12 inches below the lowest adjacent finished ground surface. Interior footings may be founded at a minimum depth of 10 inches below the tops of the adjacent finish floor slabs.

2. In accordance with Table 1809.7 of 2019 CBC for light-frame construction, all continuous footings should have minimum widths of 12 inches for one- and two-story construction. We recommend all continuous footings should be reinforced with a minimum of two No. 4 bars, one top and one bottom. Alternatively, post-tensioned tendons may be utilized in the perimeter continuous footings in lieu of the reinforcement bars.

3. A minimum 12-inch-wide grade beam founded at the same depth as adjacent footings should be provided across the large entrances or similar openings (such as warehouse doors or bay windows). The grade beam should be reinforced in a similar manner as provided above.

4. Interior isolated pad footings, if required, should be a minimum of 24 inches square and founded at a minimum depth of 12 inches below the bottoms of the adjacent floor slabs for one- and two-story buildings. Pad footings should be reinforced with No. 4 bars spaced a maximum of 18 inches on centers, both ways, placed near the bottoms of the footings.

5. Exterior isolated pad footings intended for support of roof overhangs such as second-story decks, patio covers, and similar construction should be a minimum of 24 inches square and founded at a minimum depth of 18 inches below the lowest adjacent final grade. The pad footings should be reinforced with No. 4 bars spaced a maximum of 18 inches on centers, both ways, placed near the bottoms of the footings. Exterior isolated pad footings may need to be connected to adjacent pad and/or continuous footings via tie beams at the discretion of the project structural engineer.

6. The thickness of the floor slabs should be determined by the project structural engineer with consideration given to the expansion index of the onsite soils; however; we recommend that a minimum slab thickness of 4 inches be considered.

7. As an alternative to designing 4-inch-thick post-tensioned slabs with perimeter footings as described in Items 1 and 2 above, the structural engineer may design the foundation system using a thickened slab design. The minimum thickness of this uniformly thick slab should be 7.5 inches. The engineer in charge of post-tensioned slab design may also opt to use any combination of slab thickness and footing embedment depth as deemed appropriate based on their engineering experience and judgment.

8. Concrete floor slabs and areas to receive moisture sensitive floor covering should be underlain with a moisture vapor retarder consisting of a minimum 10-mil-thick polyethylene or polyolefin membrane that meets the minimum requirements of ASTM E96 and ASTM E1745 for vapor retarders (such as Husky Yellow Guard®, Stego® Wrap, or equivalent). All laps within the membrane should be sealed, and at least 2 inches of clean sand should be placed over the membrane to promote uniform curing of the concrete. To reduce the potential for punctures, the membrane should be placed on a pad surface that has been graded smooth without any sharp protrusions. If a smooth surface cannot be achieved by grading, consideration should be given to lowering the pad finished grade an additional inch and then placing a 1-inch-thick leveling course of sand across the pad surface prior to the placement of the membrane.

   At the present time, some slab designers, geotechnical professionals and concrete experts view the sand layer below the slab (blotting sand) as a place for entrapment of excess moisture that could adversely impact moisture-sensitive floor coverings. As a preventive measure, the potential for moisture intrusion into the concrete slab could be reduced if the concrete is placed directly on the vapor retarder. However, if this sand layer is omitted, appropriate curing methods must be implemented to ensure that the concrete slab cures uniformly. A qualified materials engineer with experience in slab design and construction should provide recommendations for alternative methods of curing and supervise the construction process to ensure uniform slab curing. Additional steps would also need to be taken to prevent puncturing of the vapor retarder during concrete placement.

9. Presaturation of the subgrade below floor slabs will not be required; however, prior to placing concrete, the subgrade below all dwelling and garage floor slab areas should be thoroughly moistened to achieve a moisture content that is at least equal to or slightly greater than optimum moisture content. This moisture content should penetrate to a minimum depth of 12 inches below the bottoms of the slabs.

10. The minimum footing dimensions and reinforcement recommended herein may be modified (increased or decreased subject to the constraints of Chapter 18 of the 2019 CBC) by the structural engineer responsible for foundation design based on calculations, engineering experience and judgment.

Foundation Excavation Observations

All footing trenches should be observed by a representative of the project geotechnical consultant to document that they have been excavated into competent bearing soils prior to the placement of forms, reinforcement or concrete. The excavations should be trimmed neat, level and square. All loose, sloughed or moisture-softened soils and/or any construction debris should be removed prior to the placing of concrete. Excavated soils derived from footing and/or utility trenches should not be placed in building slab-on-grade areas or exterior concrete flatwork areas unless the soils are compacted to at least 90 percent of maximum dry density.

General Corrosivity Screening

As a screening level study, very limited chemical and electrical tests were performed on samples considered representative of the onsite soils to identify potential corrosive characteristics of these soils. The common indicators associated with soil corrosivity include water-soluble sulfate and chloride levels, pH (a measure of acidity), and minimum electrical resistivity. Test results are presented in Table 4 below.

> *It should be noted that Petra does not practice corrosion engineering; therefore, the test results, opinion and engineering judgment provided herein should be considered as general guidelines only. Additional analyses would be warranted, especially, for cases where buried metallic building materials (such as copper and cast or ductile iron pipes) in contact with site soils are planned for the project. In many cases, the project geotechnical engineer may not be informed of these choices. Therefore, for conditions where such elements are considered, we recommend that other, relevant project design professionals (e.g., the architect, landscape architect, civil and/or structural engineer) also consider recommending a qualified corrosion engineer to conduct additional sampling and testing of near-surface soils during the final stages of site grading to provide a complete assessment of soil corrosivity. Recommendations to mitigate the detrimental effects of corrosive soils on buried metallic and other building materials that may be exposed to corrosive soils should be provided by the corrosion engineer as deemed appropriate.*

In general, a soil’s water-soluble sulfate levels and pH relate to the potential for concrete degradation; water-soluble chlorides in soils impact ferrous metals embedded or encased in concrete, e.g., reinforcing steel; and electrical resistivity is a measure of a soil’s corrosion potential to a variety of buried metals used in the building industry, such as copper tubing and cast or ductile iron pipes. Table 4, below, presents test results. with an interpretation of current code indicators and guidelines that are commonly used in this industry. The table includes the classifications of the soils as they relate to the various tests, as well as a general recommendation for possible mitigation measures in view of the potential adverse impact on various components of the proposed structures in direct contact with site soils. The guidelines provided herein should be evaluated and confirmed, or modified, in their entirety by the project structural engineer, corrosion engineer and/or the contractor responsible for concrete placement for structural concrete used in exterior and interior footings, interior slabs on-ground, garage slabs, wall foundations and concrete exposed to weather such as driveways, patios, porches, walkways, ramps, steps, curbs, etc.

TABLE 4

Soil Corrosivity Screening Results

Test	Test Results	Classification	General Recommendations
Soluble Sulfates (Cal 417)	0.0003 percent	S0(1)	Type II cement; min. f'_c = 2,500 psi; no water/cement ratio restrictions
pH (Cal 643)	9.7	Very Strongly Alkaline	A corrosion engineer should be consulted for mitigation recommendations
Soluble Chloride (Cal 422)	277.5 ppm	C1(2)	Residence: No special recommendations, f'_c (2) should not be less than 2,500 psi.
Resistivity (Cal 643)	15,000 ohm-cm	Mildly Corrosive(3)	A corrosion engineer should be consulted for long term protection of metallic elements in contact with site soils

Notes:
1. ACI 318-14, Section 19.3
2. ACI 318-14, Section 19.3
3. Pierre R. Roberge, “Handbook of Corrosion Engineering”

Post-Grading Considerations

Utility Trenches

All utility trenches backfill should be compacted to a minimum relative compaction of 90 percent. Due to the nature of the upper onsite earth materials, flooding and jetting techniques should be avoided. Therefore, trench backfill materials should be placed in lifts no greater than approximately 12 inches in thickness, watered or air-dried as necessary to achieve near optimum moisture conditions, and then mechanically compacted in place to a minimum relative compaction of 90 percent. A representative of the project geotechnical consultant should probe and test the backfills to verify adequate compaction.

As an alternative for shallow trenches where pipe or utility lines may be damaged by mechanical compaction equipment, such as under building floor slabs, imported clean sand having a sand equivalent (SE) value of 30 or greater may be utilized. The sand backfill materials should be watered to achieve near optimum moisture conditions and then tamped into place. No specific relative compaction will be required; however, observation, probing, and if deemed necessary, testing should be performed by a representative of the project geotechnical consultant to verify an adequate degree of compaction.

If clean, imported sand is to be used for backfill of exterior utility trenches, it is recommended that the upper 12 inches of trench backfill materials consist of properly compacted onsite soil materials. This is to mitigate infiltration of irrigation and rainwater into granular trench backfill materials.

Where an exterior and/or interior utility trench is proposed in a direction parallel to a building footing, the bottom of the trench should not extend below a 1:1 (horizontal to vertical) plane projected downward from the bottom edge of the adjacent footing. Where this condition occurs, the adjacent footing should be deepened or the utility constructed and the trench backfilled and compacted prior to footing construction. Where utility trenches cross under a building footing, these trenches should be backfilled with on-site soils at the point where the trench crosses under the footing to reduce the potential for water to migrate under the floor slabs.

Site Drainage

Positive surface drainage systems consisting of a combination of sloped concrete flatwork/asphalt pavement, sheet flow gradients, swales and surface area drains (where needed) should be provided around the building and within any planter areas to collect and direct all surface waters to an appropriate drainage facility as determined by the project civil engineer. The ground surfaces of planter and landscape areas that are located within 10 feet of building foundations should be sloped at a minimum gradient of 5 percent away from the foundations and towards the nearest area drains. The ground surface of planter and landscape areas that are located more than 10 feet away from building foundations may be sloped at a minimum gradient of 2 percent away from the foundations and towards the nearest area drains.

Concrete flatwork surfaces that are located within 10 feet of building foundations should be inclined at a minimum gradient of one percent away from the building foundations and towards the nearest area drains. Concrete flatwork surfaces that are located more than 10 feet away from building foundations may be sloped at a minimum gradient of 1 percent towards the nearest area drains. Surface waters should not be allowed to collect or pond against building foundations and within the level areas of the site. All drainage devices should be properly maintained throughout the lifetime of the development. Future changes to site improvements, or planting and watering practices, should not be allowed to cause over-saturation of site soils adjacent to the structures.

Bottomless Trench Drains

When gravel filled bottomless infiltration systems are constructed near foundations, a potential exists for oversaturation of the foundation soils which conflicts with the intended purpose of onsite drainage facilities.

In addition, it has been our experience that a leading cause of distress to buildings and foundations is due to poor management of water next to building foundations. Petra recommends a setback of at least 15 feet between any infiltration system and building foundations. If this setback distance cannot be maintained, then a modified foundation system may be required to alleviate any distress that could be caused by infiltration of water near the footing. A modified foundation system could consist of constructing deepened footings within 15 feet of the infiltration system and installing extra reinforcement. Design of a modified foundation system is referred to the project structural engineer.

Retaining Walls

Due to the relatively flat and level site, it is anticipated that tall retaining walls will not be necessary for this project. Shorter retaining walls may be utilized for grading and landscaping purposes. Petra should be afforded the opportunity to review all proposed retaining wall design. Retaining walls retaining less than 6 feet of soil and without additional surcharge may be designed according to the following recommendations.

Allowable Bearing Values

Proposed retaining walls should be supported on spread footings using the design criteria recommended previously for building footings; however, when calculating passive resistance, the passive earth pressure for retaining walls supported by descending slopes should be reduced to 150 pounds per square foot, per foot of depth, to a maximum value of 1,500 pounds per square foot.

Active and At-Rest Earth Pressures

1. On-Site Soils Used for Backfill
   On-site soil and bedrock materials have predominant very low expansion potentials. Therefore, for this condition, active earth pressures equivalent to fluids having densities of 35 and 51 pounds per cubic foot should be used for design of cantilevered walls retaining a level backfill and ascending 2:1 backfill, respectively. For walls that are restrained at the top, at-rest earth pressures of 53 and 78 pounds per cubic foot (equivalent fluid pressures) should be used. The above values are for retaining walls that have been supplied with a proper subdrain system (see Figure RW-1). All walls should be designed to support any adjacent structural surcharge loads imposed by other nearby walls or footings in addition to the above-recommended active and at-rest earth pressures.

2. Imported Sand, Pea Gravel, or Rock Used for Wall Backfill

   Imported clean sand exhibiting a sand equivalent value (SE) of 30 or greater, pea gravel, or crushed rock may be used for wall backfill to reduce the lateral earth pressures provided these granular backfill materials extend behind the walls to a minimum horizontal distance equal to one-half the wall height. In addition, the sand, pea gravel, or rock backfill materials should extend behind the walls to a minimum horizontal distance of 2 feet at the base of the wall or to a horizontal distance equal to the heel width of the footing, whichever is greater (see Figures RW-2 and RW-3). For the above conditions, cantilevered walls retaining a level backfill and ascending 2:1 backfill may be designed to resist active earth pressures equivalent to fluids having densities of 30 and 41 pounds per cubic foot, respectively. For walls that are restrained at the top, at-rest earth pressures equivalent to fluids having densities of 45 and 62 pounds per cubic foot are recommended for design of restrained walls supporting a level backfill and ascending 2:1 backfill, respectively. These values are also for retaining walls supplied with a proper subdrain system.

Furthermore, as with existing soil backfill, the walls should be designed to support any adjacent structural surcharge loads imposed by other nearby walls or footings in addition to the recommended active and at-rest earth pressures. All structural calculations and details should be provided to this firm for verification purposes prior to grading and construction phases.

Earthquake Loads Retaining Walls

Note 1 of Section 1803.5.12 of the 2022 CBC indicates that the dynamic seismic lateral earth pressures on foundation walls and retaining walls supporting more than 6 feet of backfill height due to design earthquake ground motions be determined. It is unlikely that any wall retaining 6 or more feet of backfill will be constructed onsite. Accordingly, dynamic seismic lateral earth pressures are not considered necessary for this project.

Subdrainage

Perforated pipe and gravel subdrains should be installed behind all retaining walls to prevent entrapment of water in the backfill (see Figures RW-1 through RW-3). Perforated pipe should consist of 4-inch-minimum diameter PVC Schedule 40, or SDR-35, with the perforations laid down. The pipe should be encased in a 1-foot-wide column of ¾-inch to 1½-inch open-graded gravel. If on-site soils are used as backfill, the open-graded gravel should extend above the wall footings to a minimum height equal to one-third the wall height or to a minimum height of 1.5 feet above the footing, whichever is greater. If imported sand, pea gravel, or crushed rock is used as backfill, subdrain details shown on Figures RW-2 and RW-3 should be utilized. The open-graded gravel should be completely wrapped in filter fabric consisting of Mirafi 140N or equivalent. Solid outlet pipes should be connected to the subdrains and then routed to a suitable area for discharge of accumulated water.

If a limited area exists behind the walls for installation of a pipe and gravel subdrain, a geotextile drain mat such as Mirafi Miradrain, or equivalent, can be used in lieu of drainage gravel. The drain mat should extend the full height and lengths of the walls and the filter fabric side of the drain mat should be placed up against the backcut. The perforated pipe drain line placed at the bottom of the drain mat should consist of 4-inch minimum diameter PVC Schedule 40 or SDR-35. The filter fabric on the drain mat should be peeled back and then wrapped around the drain line.

Waterproofing

The portions of retaining walls supporting backfill should be coated with an approved waterproofing compound or covered with a similar material to inhibit infiltration of moisture through the walls.

Wall Backfill

Where imported sand (with a Sand Equivalent of 30 or greater) or the onsite soils materials are used as backfill behind the proposed retaining walls, the backfill materials should be placed in approximately 6- to 8-inch-thick maximum lifts, watered as necessary to achieve above optimum moisture conditions, and then mechanically compacted in place to a minimum relative compaction of 90 percent. Flooding or jetting of the backfill materials should be avoided. A representative of the project geotechnical consultant should observe the backfill procedures and test the wall backfill to verify adequate compaction.

If imported pea gravel or rock is used for backfill, the gravel should be placed in approximately 2- to 3-foot-thick lifts, thoroughly wetted but not flooded, and then mechanically tamped or vibrated into place. A representative of the project geotechnical consultant should observe the backfill procedures and probe the backfill to determine that an adequate degree of compaction is achieved.

To reduce the potential for the direct infiltration of surface water into the backfill, imported sand, gravel, or rock backfill should be capped with at least 12 inches of on-site soil. Filter fabric such as Mirafi 140N or equivalent, should be placed between the soil and the imported gravel or rock to prevent fines from penetrating into the backfill.

Geotechnical Observation and Testing

All grading and construction phases associated with retaining wall construction, including backcut excavations, footing trenches, installation of the subdrainage systems, and placement of backfill should be observed and tested by a representative of the project geotechnical consultant.

Masonry Block Walls

Footings for free-standing masonry block walls and other rigid structures should be designed and reinforced utilizing the criteria recommended for conventional building foundations. Where existing surface soils are not removed and re-compacted as recommended herein, the footings should be extended through these loose surface soils and founded in underlying competent materials. Positive separations in walls should also be provided at corners and at horizontal spacing of approximately 25 feet to permit relative movement. The separations should be provided in the blocks and not extend through the footings. The footings should be poured monolithically with continuous rebars to serve as effective “grade beams” below the walls.

Where remedial grading cannot be performed due to site constraints, a reduced bearing value of 1,200 pounds per square foot should be used for 12-inch-wide continuous footings founded at a minimum depth of 12 inches below the lowest adjacent final grade. No increase in bearing value may be used for wider or deeper footings for this condition. The recommended allowable bearing value includes both dead and live loads, and may be increased by one-third for short duration wind and seismic forces. In addition, a reduced passive earth pressure of 175 pounds per square foot per foot of depth, to a maximum value of 1,750 pounds per square foot, should be used to resist lateral loads. A coefficient of friction of 0.3 times the dead load forces may still be used between concrete and the supporting soils to determine lateral sliding resistance. An increase of one-third of the above values may also be used when designing for short duration wind or seismic forces.

Exterior Concrete Flatwork

General

Near-surface compacted fill soils within the site are expected to exhibit an expansion index of 0 to 20, i.e. non-expansive. Subgrade preparation for areas not supported by the compacted fill supporting building structures should follow the guidelines presented below for pavement design and construction. We recommend that all exterior concrete flatwork such as sidewalks, patio slabs, large decorative slabs, concrete subslabs that will be covered with decorative pavers, vehicular driveways and/or access roads within and adjacent to the site be designed by the project architect and/or structural engineer with consideration given to mitigating the potential cracking and uplift that can develop in soils exhibiting expansion index values that fall in the very low category. The guidelines that follow should be considered as minimums and are subject to review and revision by the project architect, structural engineer and/or landscape consultant as deemed appropriate.

Thickness and Joint Spacing

To reduce the potential of unsightly cracking, concrete walkways, patio-type slabs, large decorative slabs and concrete subslabs to be covered with decorative pavers should be at least 4 inches thick and provided with construction joints or expansion joints every 6 feet or less. Private driveways that will be designed for the use of passenger cars for access to private garages should also be at least 4 inches thick and provided with construction joints or expansion joints every 10 feet or less. Concrete pavement that will be designed based on an unlimited number of applications of an 18-kip single-axle load in public access areas, segments of road that will be paved with concrete (such as bus stops and cross-walks) or access roads that will be subject to heavy truck loadings should have a minimum thickness of 5 inches and be provided with control joints spaced at maximum 10-foot intervals. A modulus of subgrade reaction of 125 pounds per cubic foot may be used for design of the public and access roads.

Reinforcement

All concrete flatwork having their largest plan-view panel dimension exceeding 10 feet should be reinforced with a minimum of No. 3 bars spaced 24 inches on centers, both ways. Alternatively, the slab reinforcement may consist of welded wire mesh of the sheet type (not rolled) with 6x6/W1.4xW1.4 designation in accordance with the Wire Reinforcement Institute (WRI). The reinforcement should be properly positioned near the middle of the slabs.

> *The reinforcement recommendations provided herein are intended as guidelines to achieve adequate performance for anticipated soil conditions. The project architect, civil and/or structural engineer should make appropriate adjustments in reinforcement type, size and spacing to account for concrete internal (e.g., shrinkage and thermal) and external (e.g., applied loads) forces as deemed necessary.*

Edge Beams (Optional)

Where the outer edges of concrete flatwork are to be bordered by landscaping, it is recommended that consideration be given to the use of edge beams (thickened edges) to prevent excessive infiltration and accumulation of water under the slabs. Edge beams, if used, should be 6 to 8 inches wide, extend 8 inches below the tops of the finish slab surfaces. Edge beams are not mandatory; however, their inclusion in flatwork construction adjacent to landscaped areas is intended to reduce the potential for vertical and horizontal movement and subsequent cracking of the flatwork related to uplift forces that can develop in expansive soils.

Subgrade Preparation

Compaction

To reduce the potential for distress to concrete flatwork, the subgrade soils below concrete flatwork areas to a minimum depth of 12 inches (or deeper, as either prescribed elsewhere in this report or determined in the field) should be moisture conditioned to at least equal to, or slightly greater than, the optimum moisture content and then compacted to a minimum relative compaction of 90 percent. Where concrete public roads, concrete segments of roads and/or concrete access driveways are proposed, the upper 6 inches of subgrade soil should be compacted to a minimum 95 percent relative compaction.

Pre-Moistening

As a further measure to reduce the potential for concrete flatwork cracking, subgrade soils should be thoroughly moistened prior to placing concrete. The moisture content of the soils should be at least the optimum moisture content to a minimum depth of 12 inches into the subgrade. Flooding or ponding of the subgrade is not considered feasible to achieve the above moisture conditions since this method would likely require construction of numerous earth berms to contain the water. Therefore, moisture conditioning should be achieved with sprinklers or a light spray applied to the subgrade over a period of few to several days just prior to pouring concrete. Pre-watering of the soils is intended to promote uniform curing of the concrete, reduce the development of shrinkage cracks and reduce the potential for differential expansion pressure on freshly poured flatwork. A representative of the project geotechnical consultant should observe and verify the density and moisture content of the soils, and the depth of moisture penetration prior to placing concrete.

Drainage

Drainage from patios and other flatwork areas should be directed to local area drains and/or graded earth swales designed to carry runoff water to the adjacent streets or other approved drainage structures. The concrete flatwork should be sloped at a minimum gradient of one percent, or as prescribed by project civil engineer or local codes, away from building foundations, retaining walls, masonry garden walls and slope areas.

Tree Wells

Tree wells are not recommended in concrete flatwork areas since they introduce excessive water into the subgrade soils and allow root invasion, both of which can cause heaving and cracking of the flatwork.

Swimming Pool and Spa

Allowable Bearing and Settlement

Based on the currently proposed pool location, the pool may be designed as a conventional pool shell founded on natural, medium dense dune sand. Any loose sand below the pool shell should be removed and replaced with engineered fill. Therefore, the pool shell may be designed using an allowable bearing value of 1,500 pounds per square foot. A potential for seismic differential settlement on the order of one inch to occur across the pool/spa shells should be considered in the design.

Lateral Earth Pressures

The pool walls should be designed assuming that an earth pressure equivalent to a fluid having a density of 90 pounds per cubic foot is acting on the outer surface of the pool walls. For this long-term condition, the walls should be designed using a lateral earth pressure of 62.4H pounds per square foot (where "H" equals the vertical depth in feet below the ground surface) that is acting on the inner surface of the pool walls. Pool walls should also be designed to resist lateral surcharge pressures imposed by any adjacent footings or structures in addition to the above lateral earth pressures.

Stability of Temporary Excavation

The pool excavation is expected to expose loose to medium dense dune sand soil. Based on the anticipated physical characteristics of these materials, the pool excavation sidewalls will not remain stable at a vertical gradient during construction of the pool. Therefore, the temporary excavation sidewalls should be sloped at a slope ratio of 2:1 (horizontal to vertical) or flatter before forming of the pool walls.

Temporary Access Ramps

It is essential that all backfill placed within temporary access ramps extending into the pool excavation be properly compacted and tested. This will reduce the potential for excessive settlement of the backfill and subsequent damage to pool decking or other structures placed on the backfill.

Pool Bottom

It is expected that the swimming pool bottom will rest entirely on medium dense to dense dune sand deposits. Therefore, care should be taken while excavating these structures to prevent disturbance of subgrade soils exposed at grade in the pool bottom.

Pool Decking

Pool decking should be constructed in accordance with the recommendations presented in the "Exterior Concrete Flatwork" section of this report.

Plumbing Fixtures

Leakage from the swimming pool or from any of the appurtenant plumbing could create adverse saturated conditions of the surrounding subgrade soils. Localized areas of oversaturation can lead to differential expansion (heave) of the subgrade soils and subsequent raising and shifting of concrete flatwork. Therefore, it is essential that all plumbing and pool fixtures be absolutely leak-free. For similar reasons, drainage from pool deck areas should be directed to local area drains and/or graded earth swales designed to carry runoff water to a suitable discharge point.

ACCESS ROADS

Asphalt Pavement

The proposed site improvements may include construction of new asphalt-paved roads, as well as improvements to the existing nearby access roads. We have developed the following preliminary recommendations for flexible pavement design based on an assumed R-value of 40 and using Traffic Index (TI) values of 5.0 and 6.0. The pavement design presented herein is based on the assumption that the pavement will be placed directly over engineered, compacted fill placed as specified above in the section for *Subgrade Preparation* of *Exterior Concrete Flatwork*.

R-value and traffic index parameters presented herein have been assumed. We recommend that bulk samples of the actual subgrade materials be retrieved and R-Value tested after rough grading is completed. Additionally, the project civil engineer should be consulted to determine appropriate or required TI values. Once actual as-graded testing is complete and traffic loads are confirmed, additional or modified design recommendations may be presented.

The pavement section thicknesses presented in Table 5 are considered as minimums for the subject site under the assumed conditions and may be superseded by the project requirements or jurisdictional agency specifications if more stringent.

TABLE 5

Suggested Minimum Flexible Pavement Thickness

Traffic Index	R-Value	Hot Mix Asphalt (alternative) (inches)	Aggregate Base (inches)
5.0 (Light Traffic)	40	3	4
6.0 (Truck Traffic)	40	3	6.5

Subgrade soils should be properly compacted, smooth, and non-yielding prior to pavement construction. The subgrade soils should be compacted to at least 90 percent of ASTM D 1557-07. Subgrade preparation recommendations are provided below.

Aggregate base materials may consist of Crushed Aggregate Base, Crushed Miscellaneous Base, or Processed Miscellaneous Base conforming to Section 200-2 of the Standard Specifications for Public Works Construction (Greenbook). It should be noted that base thicknesses recommended above are based on the use of Crushed Aggregate base material. For conditions where either Crushed Miscellaneous Base or Processed Miscellaneous Base Materials are used, a 10 percent increase in base section thickness should be incorporated in the design and construction of the structural pavement section.

The base materials should be brought to a uniform moisture near optimum moisture then compacted to at least 95 percent of ASTM D 1557. Asphaltic concrete materials and construction should conform to Section 203 of the Greenbook.

Subgrade drainage is an important factor that enhances pavement performance. Subgrade surfaces below the flexible pavement structural section should be sloped to direct run-off to suitable collection points and to prevent ponding. The roadways should be raised above the surrounding ground surface to facilitate drainage from the roadway.

PLAN REVIEW

This report is based certain assumptions related to the proposed development, since no plans were available for Petra's review at the time this report was prepared. We recommend that our firm be engaged to review the final design drawings, specifications and grading plan prior to any new construction. If we are not provided the opportunity to review these documents with respect to the geotechnical aspects of new construction and grading, it should not be assumed that the recommendations provided herein are wholly or in part applicable to the proposed construction.

REPORT LIMITATIONS

This report is based on Petra's understanding of the proposed project and geotechnical data as described herein. The materials encountered on the project site, described in other literature, and utilized in our laboratory investigation are believed representative of the project area, and the conclusions and recommendations contained in this report are presented on that basis. However, soil materials can vary in characteristics between points of exploration, both laterally and vertically, and those variations could affect the conclusions and recommendations contained herein. As such, observation and testing by a geotechnical consultant during the grading and construction phases of the project are essential to confirming the basis of this report. To provide the greatest degree of continuity between the design and construction phases, consideration should be given to retaining Petra Geosciences, Inc., as geotechnical engineer of record for construction services.

This report has been prepared consistent with that level of care being provided by other professionals providing similar services at the same locale and time period. The contents of this report are professional opinions and as such, are not to be considered a guarantee or warranty.

This report should be reviewed and updated after a period of one year or if the project concept changes from that described herein.

The information contained herein has not been prepared for use by parties or projects other than those named or described herein. This report may not contain sufficient information for other parties or other purposes.

This report is subject to review by the controlling authorities for this project. Should you have any questions, please do not hesitate to call.

Respectfully submitted,

PETRA GEOSCIENCES, INC.

3/25/24

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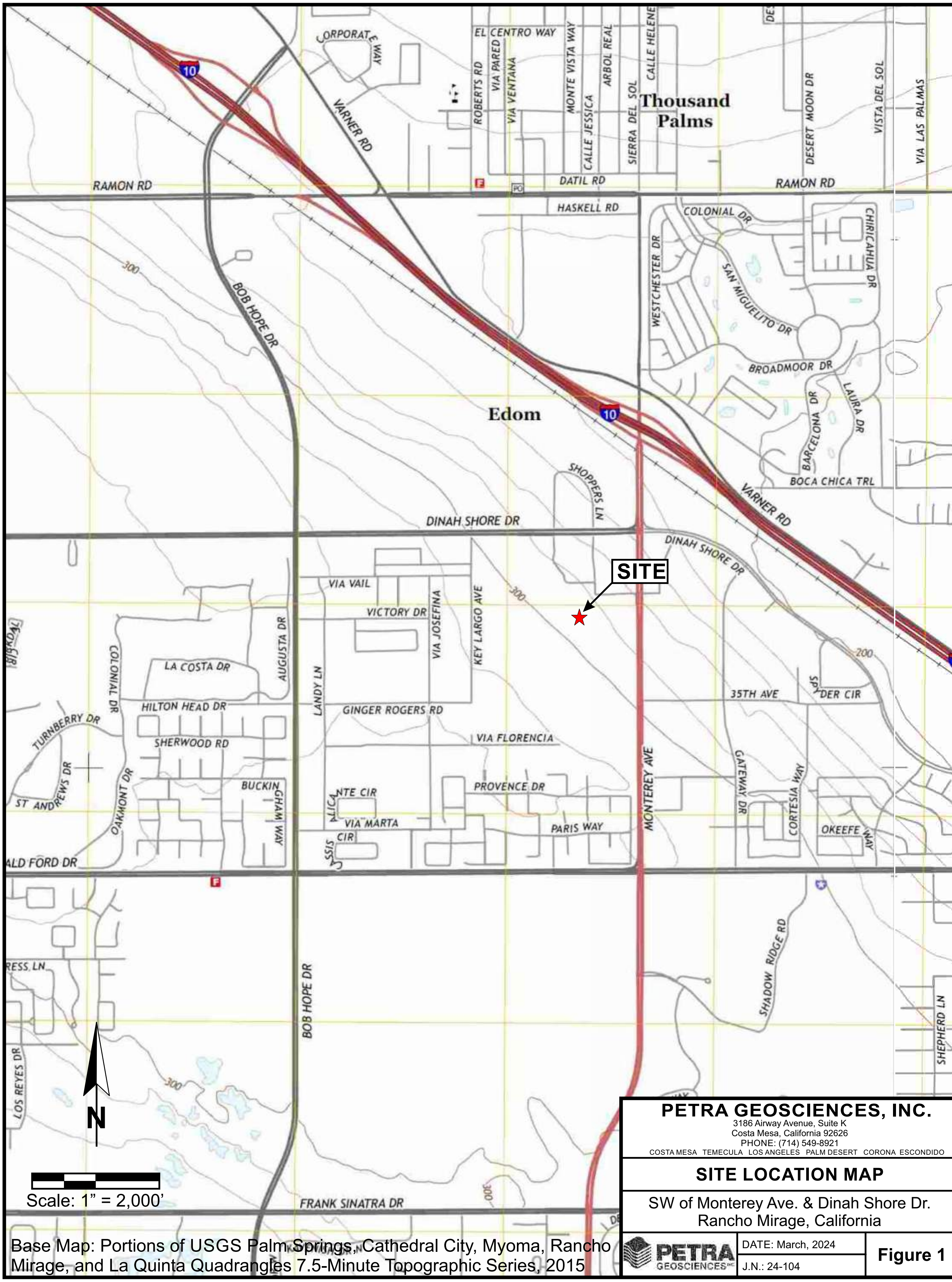
FIGURES



Scale: 1" = 2,000'

Base Map: Portions of USGS Palm Springs, Cathedral City, Myoma, Rancho Mirage, and La Quinta Quadrangles 7.5-Minute Topographic Series, 2015

PETRA GEOSCIENCES, INC.
3186 Airway Avenue, Suite K
Costa Mesa, California 92626
PHONE: (714) 549-8921
COSTA MESA TEMECULA LOS ANGELES PALM DESERT CORONA ESCONDIDO

SITE LOCATION MAP

SW of Monterey Ave. & Dinah Shore Dr.
Rancho Mirage, California

PETRA GEOSCIENCES INC	DATE: March, 2024	Figure 1
	J.N.: 24-104	

Base Map: AO Architecture Design Relationships "Via Vail Village, Rancho Mirage, California, Site Plan" JN 2023-0381, dated 3/8/2024, overlaying Google Earth, 2024.

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BORING LOCATION MAP

SW of Monterey Ave. & Dinah Shores Dr.
Rancho Mirage, California

PETRA GEOSCIENCES INC

DATE: March, 2024

J.N.: 24-104

Figure 2

APPENDIX A

BORING LOGS

Key to Soil and Bedrock Symbols and Terms

PETRA

Unified Soil Classification System

				Symbol	Description
Coarse-grained Soils > 1/2 of materials is larger than #200 sieve	The No. 200 U.S. Standard Sieve is about the smallest particle visible to the naked eye	GRAVELS more than half of coarse fraction is larger than #4 sieve	Clean Gravels (less than 5% fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines
				GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines
			Gravels with fines	GM	Silty Gravels, poorly-graded gravel-sand-silt mixtures
				GC	Clayey Gravels, poorly-graded gravel-sand-clay mixtures
		SANDS more than half of coarse fraction is smaller than #4 sieve	Clean Sands (less than 5% fines)	SW	Well-graded sands, gravelly sands, little or no fines
				SP	Poorly-graded sands, gravelly sands, little or no fines
			Sands with fines	SM	Silty Sands, poorly-graded sand-gravel-silt mixtures
				SC	Clayey Sands, poorly-graded sand-gravel-clay mixtures
Fine-grained Soils > 1/2 of materials is smaller than #200 sieve		SILTS & CLAYS Liquid Limit Less Than 50		ML	Inorganic silts & very fine sands, silty or clayey fine sands, clayey silts with slight plasticity
				CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
				OL	Organic silts & clays of low plasticity
		SILTS & CLAYS Liquid Limit Greater Than 50		MH	Inorganic silts, micaceous or diatomaceous fine sand or silt
				CH	Inorganic clays of high plasticity, fat clays
				OH	Organic silts and clays of medium-to-high plasticity
Highly Organic Soils				PT	Peat, humus swamp soils with high organic content

Grain Size

Description		Sieve Size	Grain Size	Approximate Size
Boulders		>12"	>12"	Larger than basketball-sized
Cobbles		3 - 12"	3 - 12"	Fist-sized to basketball-sized
Gravel	coarse	3/4 - 3"	3/4 - 3"	Thumb-sized to fist-sized
	fine	#4 - 3/4"	0.19 - 0.75"	Pea-sized to thumb-sized
Sand	coarse	#10 - #4	0.079 - 0.19"	Rock salt-sized to pea-sized
	medium	#40 - #10	0.017 - 0.079"	Sugar-sized to rock salt-sized
	fine	#200 - #40	0.0029 - 0.017"	Flour-sized to sugar-sized to
Fines		Passing #200	<0.0029"	Flour-sized and smaller

Modifiers

Trace	< 1 %
Few	1 - 5%
Some	5 - 12 %
Numerous	12 - 20 %

Laboratory Test Abbreviations

MAX	Maximum Dry Density	MA	Mechanical (Particle Size) Analysis
EXP	Expansion Potential	AT	Atterberg Limits
SO4	Soluble Sulfate Content	#200	#200 Screen Wash
RES	Resistivity	DSU	Direct Shear (Undisturbed Sample)
pH	Acidity	DSR	Direct Shear (Remolded Sample)
CON	Consolidation	HYD	Hydrometer Analysis
SW	Swell	SE	Sand Equivalent
CL	Chloride Content	OC	Organic Content
RV	R-Value	COMP	Mortar Cylinder Compression

Bedrock Hardness

Soft	Can be crushed and granulated by hand; "soil like" and structureless
Moderately Hard	Can be grooved with fingernails; gouged easily with butter knife; crumbles under light hammer blows
Hard	Cannot break by hand; can be grooved with a sharp knife; breaks with a moderate hammer blow
Very Hard	Sharp knife leaves scratch; chips with repeated hammer blows

Sampler and Symbol Descriptions

Approximate Depth of Groundwater Encountered

Approximate Depth of Standing Groundwater

Modified California Split Spoon Sample

No Recovery in Mod. Calif. Split Spoon Sample

Standard Penetration Test

Shelby Tube Sample

Bulk Sample

No Recovery in SPT Sampler

No Recovery in Shelby Tube

Notes:
Blows Per Foot: Number of blows required to advance sampler 1 foot (unless a lesser distance is specified). Samplers in general were driven into the soil or bedrock at the bottom of the hole with a standard (140 lb.) hammer dropping a standard 30 inches unless noted otherwise in Log Notes. Drive samples collected in bucket auger borings may be obtained by dropping non-standard weight from variable heights. When a SPT sampler is used the blow count conforms to ASTM D-1586

E X P L O R A T I O N   L O G

Project:	**Rancho Mirage Apartments**	Boring No.:	**B-1**
Location:	**Rancho Mirage**	Elevation:	**±281'**
Job No.:	**24-104**	Client: **The Pacific Companies**	Date: **2/16/2024**
Drill Method:	**8" Hollow Stem Auger**	Driving Weight: **140lbs/30"**	Logged By: **KTM**

Depth (Feet)	Lith-ology	Material Description	WATER	Samples: Blows per 6 in.	Samples: Core	Samples: Bulk	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Dry Density (pcf)	Laboratory Tests: Other Lab Tests
0		**EOLIAN DEPOSITS (Qe)** Sand (SP): Gray, slightly moist, loose, fine- to medium-grained sand. @1': Becomes moist. @2.5': Becomes medium-dense.		6 12 15					MAX, RES, pH, CL, S04, DSR
5				7 10 12			2.3	109.1	
		@7.5': No recovery.		4 10 15			1.0		
10		@10': Disturbed sample.		9 24 27			0.7		
15				27 30 36			0.5		
20				8 14 20					
25		@25': Becomes very dense.		34 50/4"			0.7		
30				17 33 33					

PLATE A-1

Petra Geosciences, Inc.

EXPLORATION LOG

Project:	Rancho Mirage Apartments		Boring No.:	B-1
Location:	Rancho Mirage		Elevation:	±281'
Job No.:	24-104	Client: The Pacific Companies	Date:	2/16/2024
Drill Method:	8" Hollow Stem Auger	Driving Weight: 140lbs/30"	Logged By:	KTM

Depth (Feet)	Lith-ology	Material Description	WATER	Samples: Blows per 6 in.	Samples: Core	Samples: Bulk	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Dry Density (pcf)	Laboratory Tests: Other Lab Tests
35				32 50/3"			1.0	97.8	
40		@40': Same as above with trace silt.		15 34 39					
45		Sand with Silt (SP-SM): Gray, dry, very dense, fine-grained sand.		31 50/3"			1.2	101.0	
50				13 33 41					
55		Sand (SP): Gray, slightly moist, very dense, fine-grained sand.		50/5"			1.2	94.6	
60				22 32 50/3"					
65		@65': Same as above.		47 50/3"			1.7	88.9	
		Total Depth= 66' No groundwater encountered Boring backfilled with cuttings.							

PLATE A-2

Petra Geosciences, Inc.

EXPLORATION LOG

Project:	**Rancho Mirage Apartments**	Boring No.:	**B-2**
Location:	**Rancho Mirage**	Elevation:	**±287'**
Job No.:	**24-104** Client: **The Pacific Companies**	Date:	**2/16/2024**
Drill Method:	**8" Hollow Stem Auger** Driving Weight: **140lbs/30"**	Logged By:	**KTM**

Depth (Feet)	Lith-ology	Material Description	WATER	Samples: Blows per 6 in.	Samples: Core	Samples: Bulk	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Dry Density (pcf)	Laboratory Tests: Other Lab Tests
0		**EOLIAN DEPOSITS (Qe)** Sand (SP): Gray, dry, loose, fine- to medium-grained sand. @0.5': Becomes mois and dark gray.							
		@2.5': Becomes medium-dense.		8 10 9	X		2.3	90.7	
5				4 8 9	X	X	3.5	96.2	COL
		@7.5': Becomes gray and dry.		7 13 15	X	X	0.6		
10				11 23 29	X		0.6		
15				13 26 30	X		0.7		
20		@20': No recovery, very dense.		30 50/5"					
25		.		43 50/4"	X		0.6		
		Total Depth= 26' No groundwater encountered Boring backfilled with cuttings.							
30									

PLATE A-3

E X P L O R A T I O N   L O G

Project: **Rancho Mirage Apartments**		Boring No.:	**B-3**
Location: **Rancho Mirage**		Elevation:	**±282'**
Job No.: **24-104**	Client: **The Pacific Companies**	Date:	**2/16/2024**
Drill Method: **8" Hollow Stem Auger**	Driving Weight: **140lbs/30"**	Logged By:	**KTM**

Depth (Feet)	Lith-ology	Material Description	WATER	Samples: Blows per 6 in.	Samples: Core	Samples: Bulk	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Dry Density (pcf)	Laboratory Tests: Other Lab Tests
0		**EOLIAN DEPOSITS (Qe)** Sand (SP): Gray, dry, loose, fine- to medium-grained sand. @0.5': Becomes mois and dark gray.							
		@2.5': Becomes medium-dense.		9 13 14			2.7	98.9	
5				8 9 11			2.8	96.8	COL
		@7.5': Becomes gray and dry.		10 15 20			0.6		
10		@10': Disturbed sample.		5 16 25			0.5		
15				16 30 34			0.5		
20		@20': No recovery, very dense.		21 42 50/4"					
25		@25': No recovery.		23 50/5"					
		Total Depth= 26' No groundwater encountered Boring backfilled with cuttings.							
30									

PLATE A-4

Petra Geosciences, Inc.

EXPLORATION LOG

Project: **Rancho Mirage Apartments**			Boring No.: **P-1**
Location: **Rancho Mirage**			Elevation: **±281'**
Job No.: **24-104**	Client: **The Pacific Companies**		Date: **2/16/2024**
Drill Method: **8" Hollow Stem Auger**	Driving Weight: **140lbs/30"**		Logged By: **KTM**

Depth (Feet)	Lith-ology	Material Description	WATER	Samples: Blows per 6 in.	Samples: Core	Samples: Bulk	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Dry Density (pcf)	Laboratory Tests: Other Lab Tests
0		**EOLIAN DEPOSITS (Qe)** Sand (SP): Gray, slightly moist, loose, fine- to medium-grained sand. @1': Becomes moist. @2.5': Becomes medium-dense.							
5									
10		Total Depth= 10' No groundwater encountered Infiltration test installed within boring Presoaked @ 9:01AM.		9 13 13 27 30 36					
15									
20									
25									
30									

PLATE A-5

EXPLORATION LOG

Project:	**Rancho Mirage Apartments**	Boring No.:	**P-2**
Location:	**Rancho Mirage**	Elevation:	**±282'**
Job No.: **24-104**	Client: **The Pacific Companies**	Date:	**2/16/2024**
Drill Method: **8" Hollow Stem Auger**	Driving Weight: **140lbs/30"**	Logged By:	**KTM**

Depth (Feet)	Lith-ology	Material Description	WATER	Samples: Blows per 6 in.	Samples: Core	Samples: Bulk	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Dry Density (pcf)	Laboratory Tests: Other Lab Tests
0		**EOLIAN DEPOSITS (Qe)** Sand (SP): Gray, slightly moist, loose, fine- to medium-grained sand. @1': Becomes moist and dark gray. @2.5': Becomes medium-dense.							
5				5 5 6					
10		@10': Becomes gray and dry. Total Depth= 10' No groundwater encountered Infiltration test installed within boring Presoaked @ 11:13AM.		8 12 14 27 30 36					HYD
15									
20									
25									
30									

APPENDIX B

LABORATORY TEST PROCEDURES

LABORATORY DATA SUMMARY

LABORATORY TESTING

Associated with the subsurface exploration was the collection of bulk and relatively undisturbed samples of soil materials for laboratory testing. The relatively undisturbed samples were obtained using a 2.4-inch, outside-diameter, modified California split-spoon soil sampler lined with 1-inch-high stainless-steel rings. The driven ring samples were placed in sealed containers and transported to our laboratory located at 1251 W. Pomona Road, Unit #103, Corona, CA 92882, for testing.

Our laboratory testing capabilities include Soil Classifications, Moisture Content and In-Situ Moisture Content and Dry Unit Weight, Grain Size Distribution, Remolded Direct Shear, Consolidation; all in accordance with the latest procedures of American Society for Testing and Materials (ASTM) and California Department of Transportation (Caltrans).

To evaluate the engineering properties of site soils, laboratory testing was performed on selected samples of soil considered representative of those encountered. Appropriate tests were assigned by the project engineer and geologist based on project plans and specifications including the level of anticipated loads, when available, and subsurface stratigraphy. Test results were reviewed by the laboratory manager and engineer-in-charge of the laboratory or his qualified designee for completeness and accuracy. A description of laboratory test procedures and summaries of the test data are presented in the following pages.

LABORATORY TEST PROCEDURES

Soil Classification

Soil materials encountered within the property were classified and described in accordance with the Unified Soil Classification System and in general accordance with the current version of Test Method ASTM D 2488. The assigned group symbols are presented in the exploration logs, Appendix A.

Moisture Content and In Situ Moisture Content and Dry Unit Weight

Moisture content of selected bulk samples and in- place moisture content and dry unit weight of selected, relatively undisturbed soil samples were determined in accordance with the current version of Test Method ASTM D 2435 and Test Method ASTM D 2216, respectively. Test data are presented in the exploration logs, Appendix A.

Laboratory Maximum Dry Unit Weight and Optimum Moisture Content

The maximum dry unit weight and optimum moisture content of the on-site soils were determined for selected bulk samples in accordance with current version of Method A of ASTM D 1557. The result of this test is presented on Plate B-1.

Corrosivity Screening

Chemical and electrical analyses were performed on selected bulk samples of onsite soils to determine their soluble sulfate content, chloride content, pH (acidity) and minimum electrical resistivity. These tests were performed in accordance with the current versions of California Test Method Nos. CTM 417 (sulfate), CTM 422 (chloride), and CTM 643 (pH and resistivity) respectively. The results of these tests are included on Plate B-1.

Direct Shear

The Coulomb shear strength parameters, i.e., angle of internal friction and cohesion, were determined for selected, relatively undisturbed and/or reconstituted-bulk samples of onsite soil. This test was performed in general accordance with the current version of Test Method ASTM D 3080. Three specimens were prepared for each test. The test specimens were inundated and then sheared under various normal loads at a constant strain rate of 0.005 inch per minute. The results of the direct shear test are graphically presented on Plate B-2.

Grain Size Distribution

Grain size analysis was performed on selected bulk samples of onsite soils in accordance with the latest versions of Test Method ASTM D 136 and/or ASTM C 117, or Test Method ASTM D 422 and/or ASTM D 6913. The test result is graphically presented on Plate B-3.

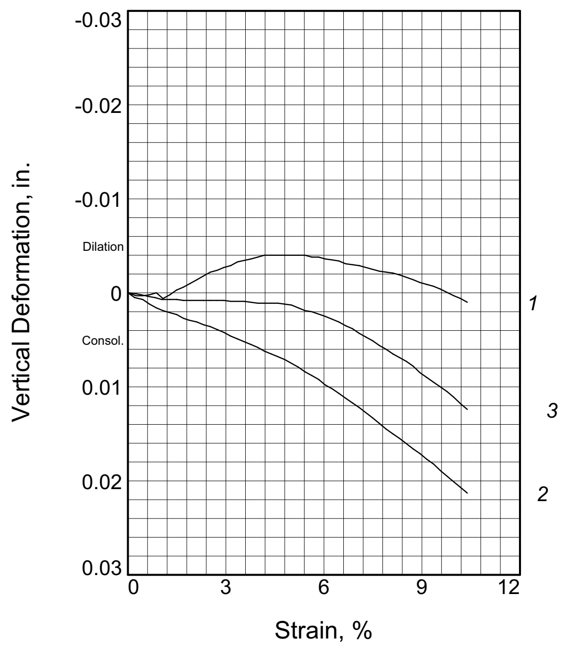
Single-Point Collapse

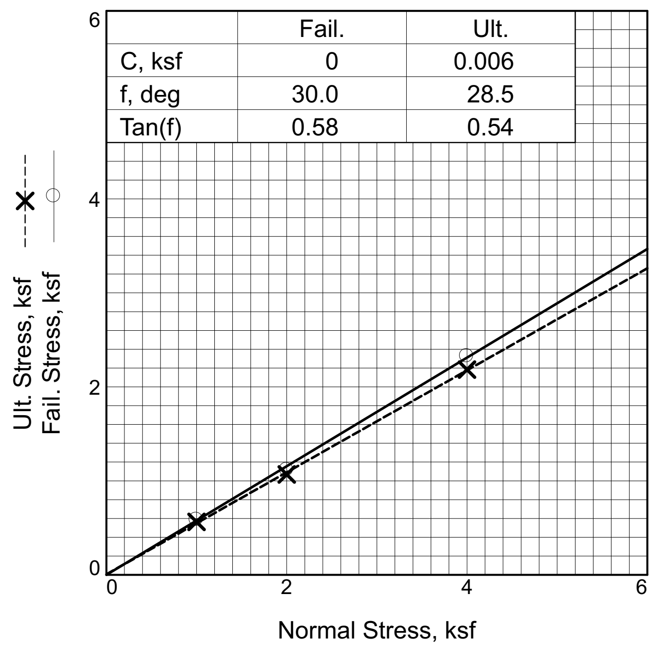
Volume change (collapse) characteristics of selected undisturbed soil samples were determined by one-dimensional single-point collapse test. This test was performed in general accordance with the latest version of the Test Method ASTM D 5333. Axial loads were applied to laterally restrained 1-inch-high samples. The resulting deformation was recorded at selected time intervals. At a load approximately corresponding to the existing overburden pressure or the anticipated future load, the test samples were inundated in order to evaluate the effect of an increase in moisture content, e.g., hydro-consolidation potential (or heave). Results of this test are graphically presented on Plate B-4 through B-5

LABORATORY DATA SUMMARY										
Boring/ Test Pit/ Sample/ Number	Sample Depth (ft.)	Soil/ Bedrock Description[1]	Compaction[2]		Corrosivity Screening				Expansion[4]	
			Maximum Dry Unit Weight (pcf)	Optimum Moisture (%)	Soluble Sulfate Content[3] (%)	Chloride Content[4] (ppm)	pH[5] (Acidity)	Minimum Resistivity[5] (Ohm-cm)	Index	Potential
B-1	0-5	SP	117.5	10.0	0.0003	2775	9.7	15000	-	-

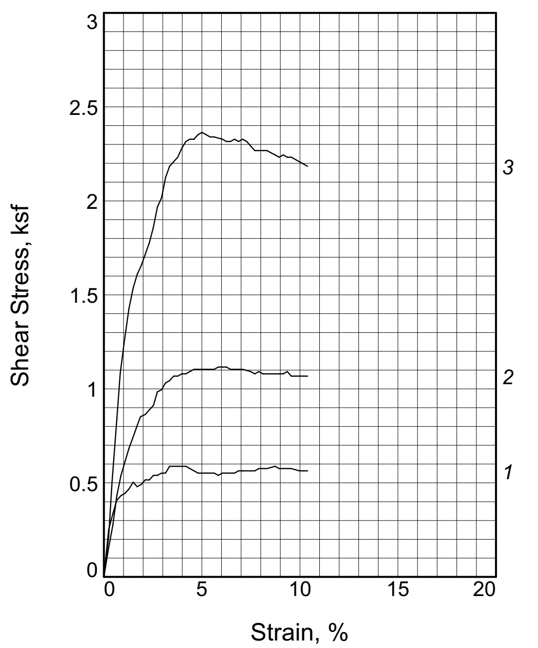
Test Procedures:

[1] Per Test Method ASTM D 2488
[2] Per Test Method ASTM D 1557
[3] Per California Test Method CTM 417
[4] Per California Test Method CTM 422
[5] Per California Test Method CTM 643
[6] Per Test Method ASTM C 117





	Fail.	Ult.
C, ksf	0	0.006
f, deg	30.0	28.5
Tan(f)	0.58	0.54



	Sample No.	1	2	3
Initial	Water Content, %	10.0	10.0	10.0
	Dry Density, pcf	105.6	105.7	105.7
	Saturation, %	46.9	46.9	47.0
	Void Ratio	0.5659	0.5653	0.5648
	Diameter, in.	2.416	2.416	2.416
	Height, in.	1.001	1.002	1.001
At Test	Water Content, %	20.1	19.4	19.4
	Dry Density, pcf	107.1	107.4	107.6
	Saturation, %	97.9	95.4	95.4
	Void Ratio	0.5448	0.5396	0.5375
	Diameter, in.	2.416	2.416	2.416
	Height, in.	0.987	0.986	0.983
	Normal Stress, ksf	1.000	2.000	4.000
	Fail. Stress, ksf	0.588	1.116	2.328
	Strain, %	8.7	5.8	7.1
	Ult. Stress, ksf	0.564	1.068	2.184
	Strain, %	10.4	10.4	10.4
	Strain rate, in./min.	0.040	0.040	0.040

Sample Type: Remoled
Description: Gray Fine to Medium Sand

Specific Gravity= 2.65
Remarks:

Figure B-2

Client: The Pacific Companies

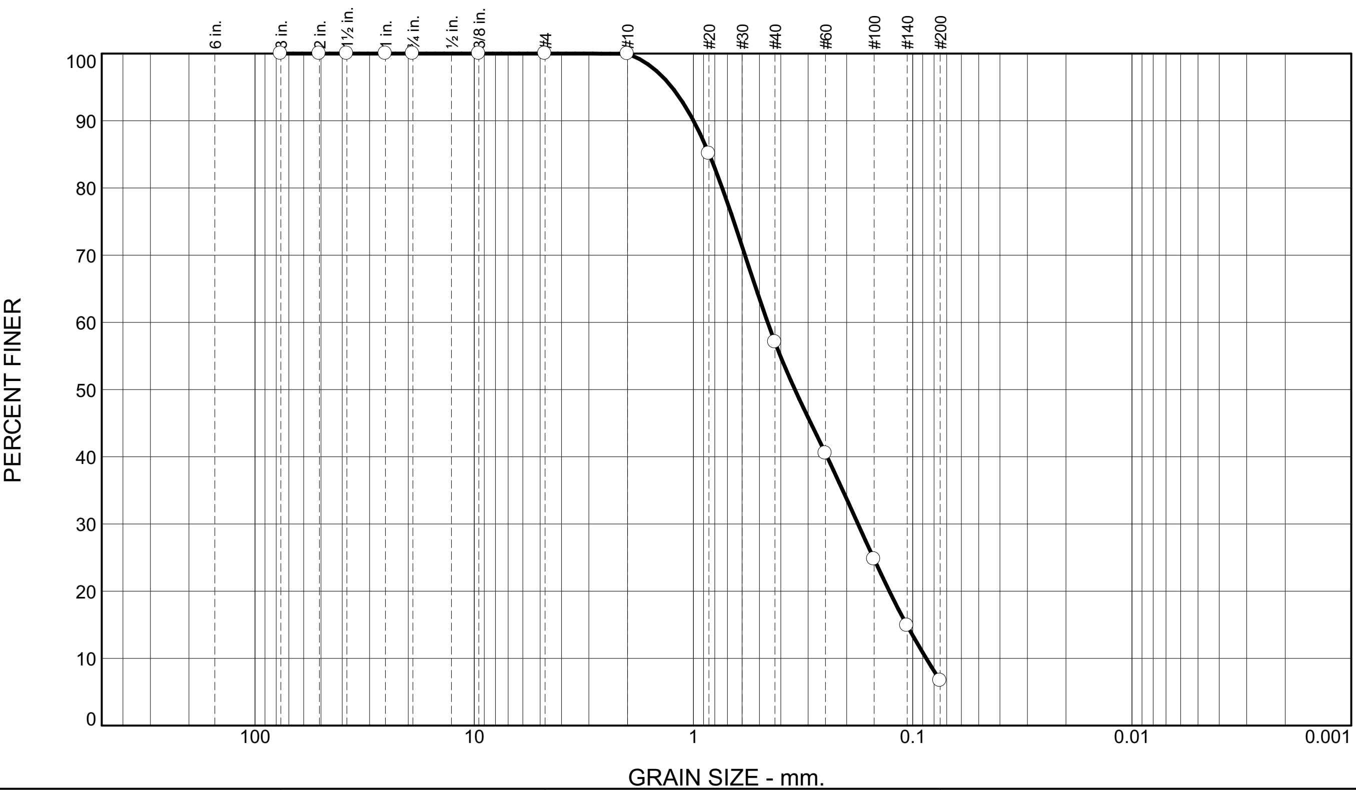
Project: Rancho Mirage Apartments

Source of Sample: 24L032 **Depth:** 0-5
Sample Number: B-1
Proj. No.: 24-104 **Date Sampled:**

PETRA GEOSCIENCES INC.

Tested By: DI

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	43.0	50.3	6.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
.75	100.0		
.375	100.0		
#4	100.0		
#10	100.0		
#20	85.1		
#40	57.0		
#60	40.5		
#100	24.8		
#140	14.9		
#200	6.7		

* (no specification provided)

Material Description

Gray Fine to Medium Sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.9994 D_{85}= 0.8469 D_{60}= 0.4590
D_{50}= 0.3448 D_{30}= 0.1777 D_{15}= 0.1065
D_{10}= 0.0868 C_u= 5.29 C_c= 0.79

Classification

USCS= AASHTO=

Remarks

Source of Sample: 24L032 **Depth:** 10
Sample Number: P-2

Date: 2/29/2024

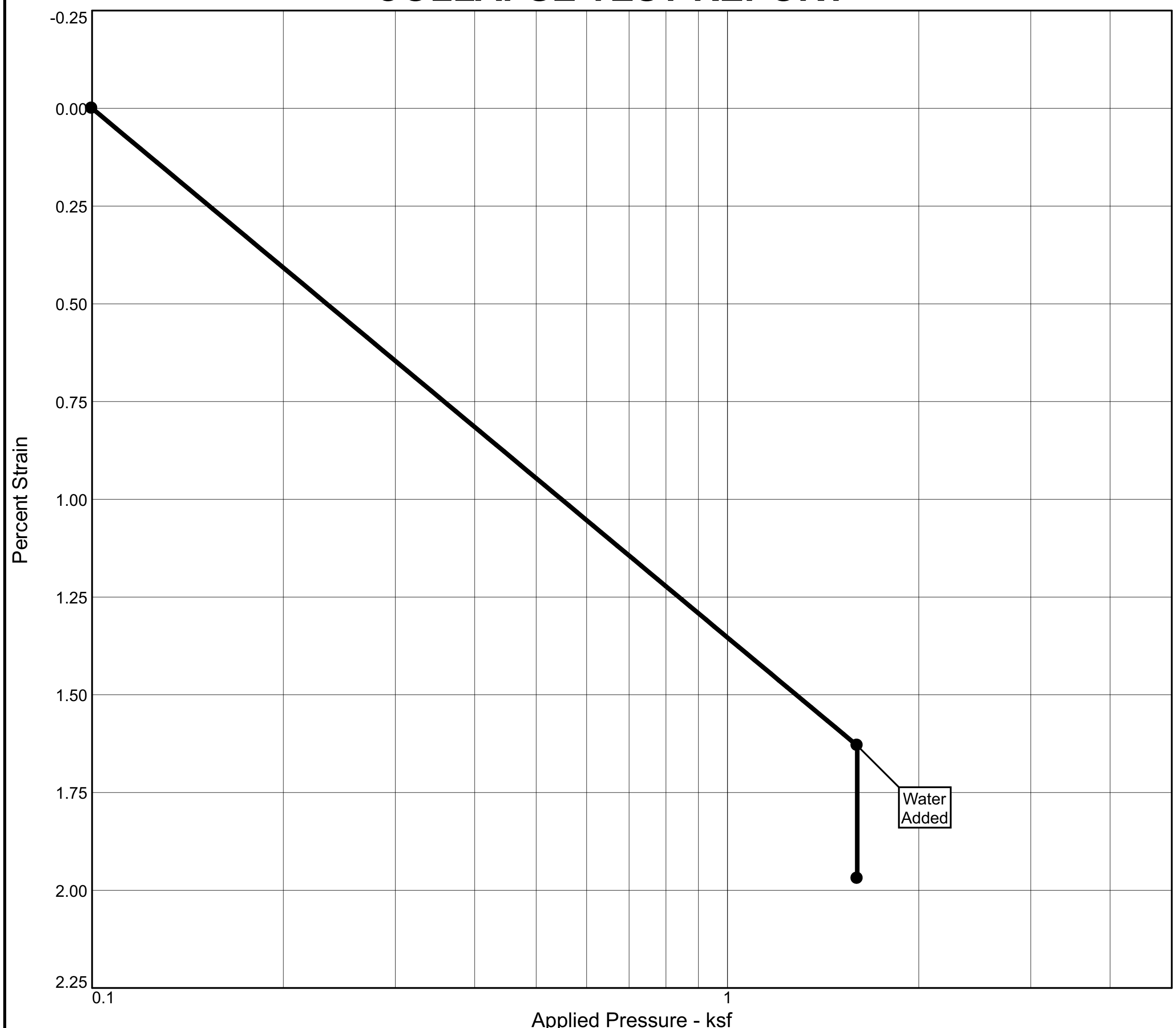
PETRA GEOSCIENCES INC.

Client: The Pacific Companies
Project: Rancho Mirage Apartments

Project No: 24-104 **Figure** B-3

Tested By: DI

COLLAPSE TEST REPORT



Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (ksf)	P_c (ksf)	C_c	C_r	Swell Press. (ksf)	Clpse. %	e_o
Sat.	Moist.											
34.1 %	3.5 %	130.1			2.65						0.3	0.272

MATERIAL DESCRIPTION	USCS	AASHTO
Light Gray Fine to Medium Sand		

Project No. 24-104 **Client:** The Pacific Companies

Project: Rancho Mirage Apartments

Source of Sample: 24L032 **Depth:** 5 **Sample Number:** B-2

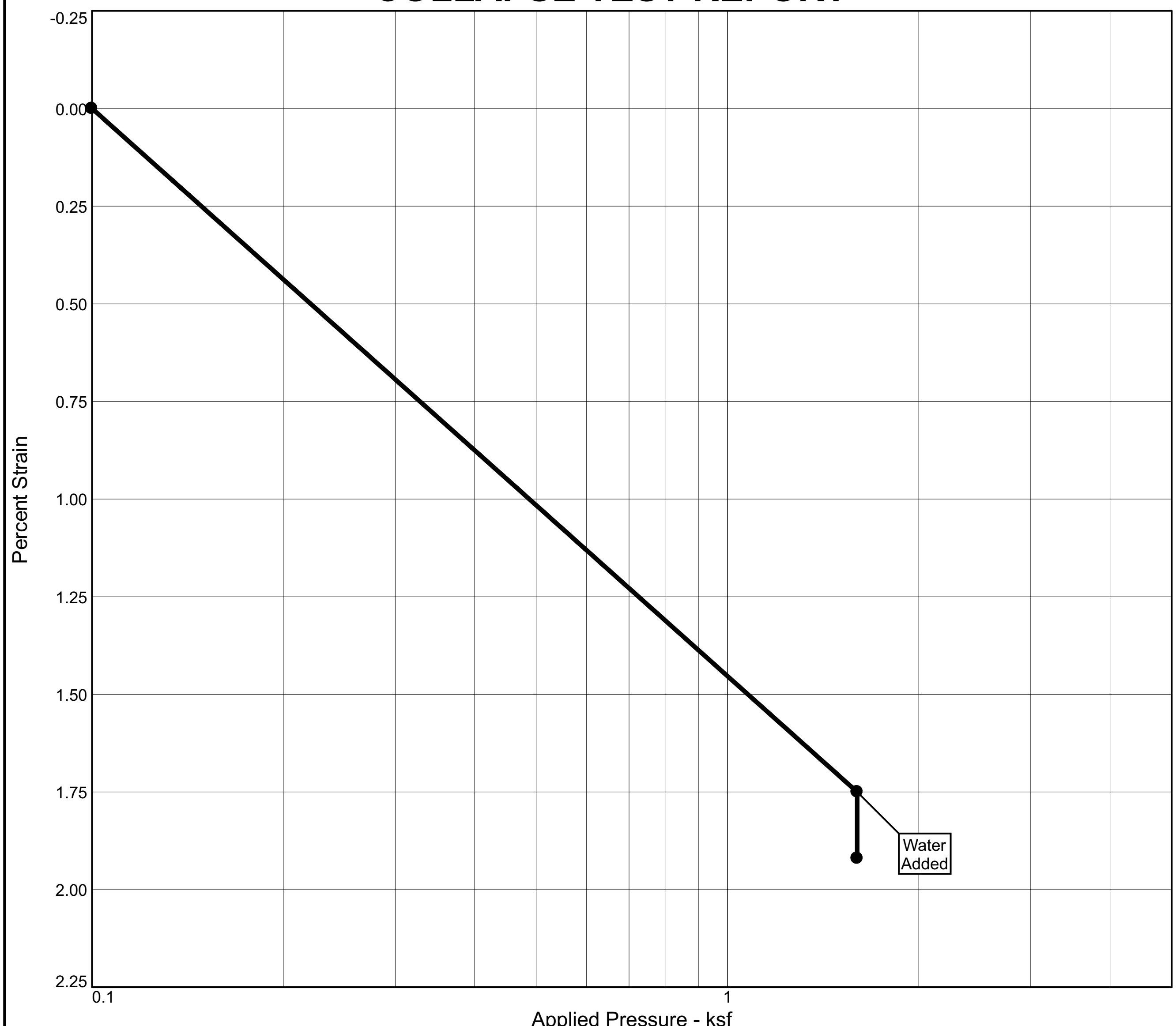
PETRA GEOSCIENCES INC.

Remarks:

Figure B-4

Tested By: DI

COLLAPSE TEST REPORT



Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (ksf)	P_c (ksf)	C_c	C_r	Swell Press. (ksf)	Clpse. %	e_o
Sat.	Moist.											
28.8 %	2.8 %	131.9			2.65						0.2	0.254

MATERIAL DESCRIPTION	USCS	AASHTO
Light Gray Fine to Medium Sand		

Project No. 24-104 **Client:** The Pacific Companies

Project: Rancho Mirage Apartments

Source of Sample: 24L032 **Depth:** 5 **Sample Number:** B-3

PETRA GEOSCIENCES INC.

Remarks:

Figure B-5

Tested By: DI

APPENDIX C

SEISMIC HAZARD ANALYSIS

SITE CLASSIFICATION DETERMINATION BASED ON BLOW COUNT, N-SPT, FOR SEISMIC DESIGN

Per Table 20.3-1 and Section 20.4.2 of ASCE 7-16

J.N: **24-104** **Project:** **Rancho Mirage apartments** **Date:** **3/16/2024**

Boring: B-1 Total Depth of Boring: 66 feet SPT Test Interval: every 5 feet

Layer No. (i)	Depth to Soil/Rock Layer		Layer Thickness (d_i)	$\sum_{i=1}^{n} d_i$	Mod. Cal. Sampler Blow Counts[1]	Equivalent N-SPT[2] (N_i)	N-SPT[3] (N_i)	$\sum_{i=1}^{n} \frac{d_i}{N_i}$
	Top	Bottom						
	ft	ft	ft	ft	blows/ft	blows/ft	blows/ft	
1	0	5	5	5.0	22	14		0.36
2	5	10	5	10.0	25	16		0.67
3	10	15	5	15.0	51	33		0.82
4	15	20	5	20.0	66	43		0.94
5	20	25	5	25.0		0	34	1.08
6	25	30	5	30.0	50	33		1.24
7	30	35	5	35.0		0	66	1.31
8	35	40	5	40.0	50	33		1.46
9	40	45	5	45.0		0	73	1.53
10	45	50	5	50.0	50	33		1.68
11	50	55	5	55.0		0	74	1.75
12	55	60	5	60.0	50	33		1.90
13	60	65	5	65.0		0	80	1.96
14	65	66	1	66.0	50	33		2.00
15	0	0	0	0.0		0		0.00

Average Field Standard Penetration Resistance (blows/ft)		Site Classification Per Table 20.3-1
$\bar{N} = \frac{\sum_{i=1}^{n} d_i}{\sum_{i=1}^{n} \frac{d_i}{N_i}} =$	**33**	**D**

1 Modified California sampler blow counts as directly measured in the field without corrections.

2 Equivalent SPT blow counts are calculated from field measured Modified California sampler blow counts using the standard Burmister formula (Burmister, 1948).
Eq. N-SPT = 0.651 x (Mod. Cal. Sampler Blow Counts)

3 Standard penetration resistance (ASTM D1586) not to exceed 100 blows /ft (305 blows /m) as directly measured in the field without corrections. When Refusal is met for a rock layer, this value shall be taken as 100 blows /ft (305 blows /m).

USGS web services were down for some period of time and as a result this tool wasn't operational, resulting in *timeout* error.
USGS web services are now operational so this tool should work as expected.

OSHPD

24-104 Rancho Mirage Apts Pacific Companies

Latitude, Longitude: 33.79839, -116.393251

Date	3/21/2024, 11:22:57 PM
Design Code Reference Document	ASCE7-16
Risk Category	II
Site Class	D - Stiff Soil

Type	Value	Description
S_S	1.842	MCE_R ground motion. (for 0.2 second period)
S_1	0.767	MCE_R ground motion. (for 1.0s period)
S_{MS}	1.842	Site-modified spectral acceleration value
S_{M1}	null -See Section 11.4.8	Site-modified spectral acceleration value
S_{DS}	1.228	Numeric seismic design value at 0.2 second SA
S_{D1}	null -See Section 11.4.8	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	null -See Section 11.4.8	Seismic design category
F_a	1	Site amplification factor at 0.2 second
F_v	null -See Section 11.4.8	Site amplification factor at 1.0 second
PGA	0.799	MCE_G peak ground acceleration
F_{PGA}	1.1	Site amplification factor at PGA
PGA_M	0.879	Site modified peak ground acceleration
T_L	8	Long-period transition period in seconds
SsRT	2.168	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	2.431	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	1.842	Factored deterministic acceleration value. (0.2 second)
S1RT	0.856	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.975	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.

Type	Value	Description
S1D	0.767	Factored deterministic acceleration value. (1.0 second)
PGAd	0.799	Factored deterministic acceleration value. (Peak Ground Acceleration)
PGA_{UH}	0.952	Uniform-hazard (2% probability of exceedance in 50 years) Peak Ground Acceleration
C_{RS}	0.892	Mapped value of the risk coefficient at short periods
C_{R1}	0.878	Mapped value of the risk coefficient at a period of 1 s
C_V	1.468	Vertical coefficient

DISCLAIMER

U.S. Geological Survey - Earthquake Hazards Program

Unified Hazard Tool

Please do not use this tool to obtain ground motion parameter values for the design code reference documents covered by the U.S. Seismic Design Maps web tools (e.g., the International Building Code and the ASCE 7 or 41 Standard). The values returned by the two applications are not identical.

Please also see the new USGS Earthquake Hazard Toolbox for access to the most recent NSHMs for the conterminous U.S. and Hawaii.

Input

Edition

Dynamic: Conterminous U.S. 2014 (…

Spectral Period

Peak Ground Acceleration

Latitude

Decimal degrees

33.79839

Time Horizon

Return period in years

2475

Longitude

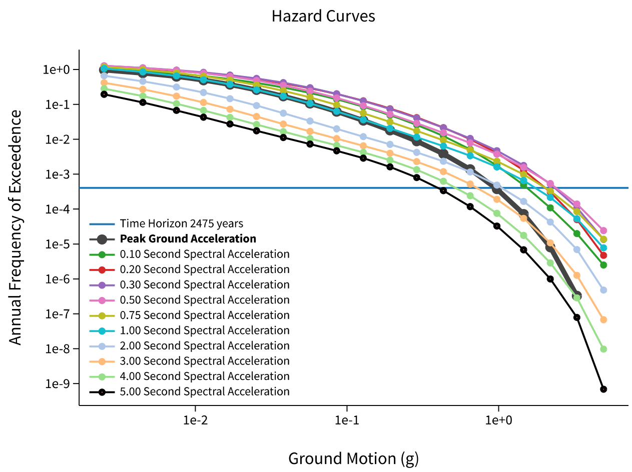
Decimal degrees, negative values for western longitudes

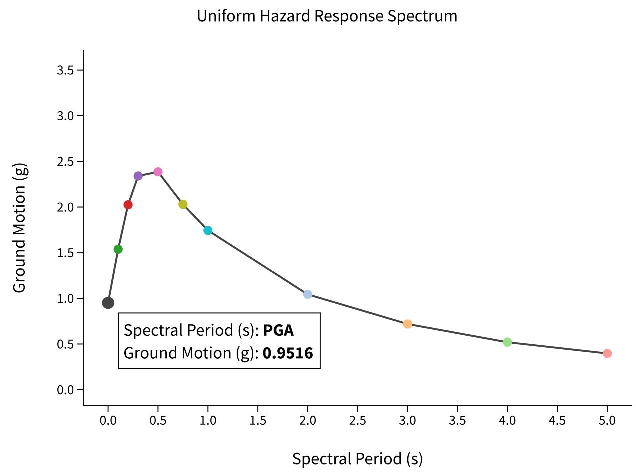
-116.393251

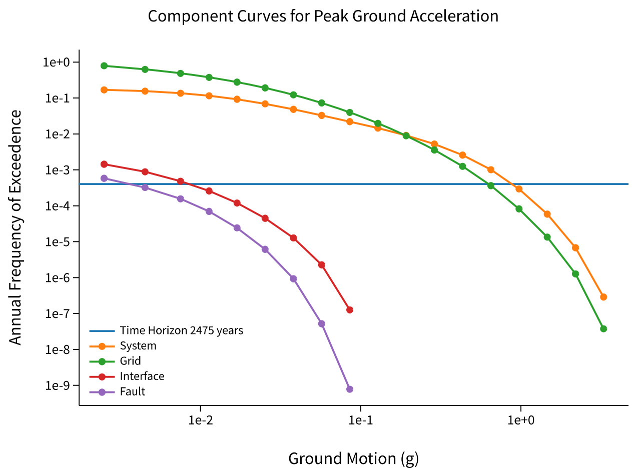
Site Class

259 m/s (Site class D)

Hazard Curve





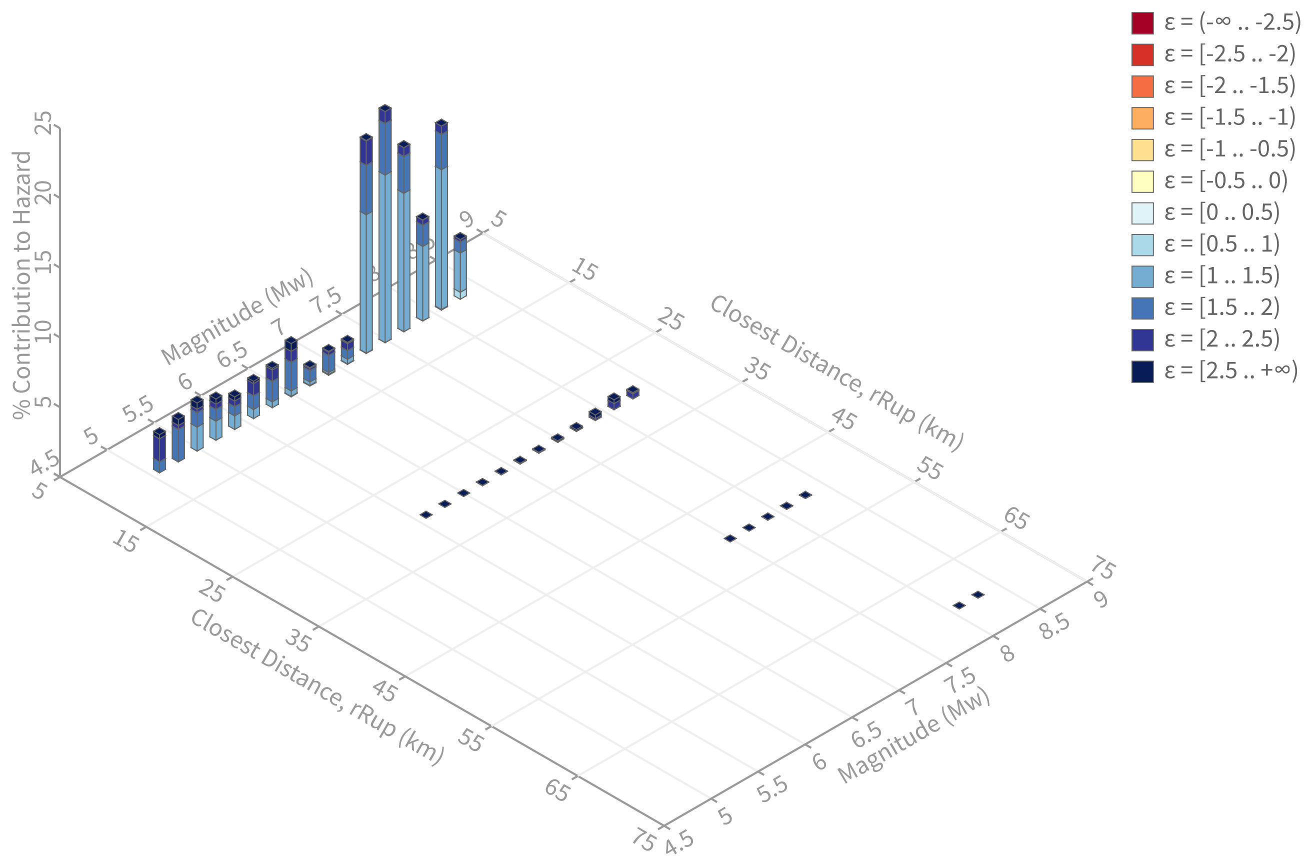


View Raw Data

^ Deaggregation

Component

Total



Summary statistics for, Deaggregation: Total

Deaggregation targets

Return period: 2475 yrs
Exceedance rate: 0.0004040404 yr^{-1}
PGA ground motion: 0.95159862 g

Recovered targets

Return period: 3256.1118 yrs
Exceedance rate: 0.00030711477 yr^{-1}

Totals

Binned: 100 %
Residual: 0 %
Trace: 0.05 %

Mean (over all sources)

m: 7.22
r: 7.3 km
ε_0: 1.58 σ

Mode (largest m-r bin)

m: 7.49
r: 6.42 km
ε_0: 1.49 σ
Contribution: 16.56 %

Mode (largest m-r-ε_0 bin)

m: 7.49
r: 6.38 km
ε_0: 1.39 σ
Contribution: 12.01 %

Discretization

r: min = 0.0, max = 1000.0, Δ = 20.0 km
m: min = 4.4, max = 9.4, Δ = 0.2
ε: min = -3.0, max = 3.0, Δ = 0.5 σ

Epsilon keys

ε0: [-∞ .. -2.5)
ε1: [-2.5 .. -2.0)
ε2: [-2.0 .. -1.5)
ε3: [-1.5 .. -1.0)
ε4: [-1.0 .. -0.5)
ε5: [-0.5 .. 0.0)
ε6: [0.0 .. 0.5)
ε7: [0.5 .. 1.0)
ε8: [1.0 .. 1.5)
ε9: [1.5 .. 2.0)
ε10: [2.0 .. 2.5)
ε11: [2.5 .. +∞]

Deaggregation Contributors

Source Set ↳ Source	Type	r	m	ε_0	lon	lat	az	%
UC33brAvg_FM31	System							38.86
San Andreas (San Gorgonio Pass-Garnet HIll) [1]		6.31	7.60	1.47	116.358°W	33.846°N	31.95	31.51
San Andreas (North Branch Mill Creek) [10]		8.06	7.88	1.31	116.344°W	33.853°N	36.70	3.98
UC33brAvg_FM32	System							38.82
San Andreas (San Gorgonio Pass-Garnet HIll) [1]		6.31	7.60	1.47	116.358°W	33.846°N	31.95	31.35
San Andreas (North Branch Mill Creek) [10]		8.06	7.85	1.32	116.344°W	33.853°N	36.70	4.19
UC33brAvg_FM31 (opt)	Grid							11.16
PointSourceFinite: -116.393, 33.803		4.92	5.66	1.61	116.393°W	33.803°N	0.00	3.73
PointSourceFinite: -116.393, 33.803		4.92	5.66	1.61	116.393°W	33.803°N	0.00	3.73
UC33brAvg_FM32 (opt)	Grid							11.16
PointSourceFinite: -116.393, 33.803		4.92	5.66	1.61	116.393°W	33.803°N	0.00	3.73
PointSourceFinite: -116.393, 33.803		4.92	5.66	1.61	116.393°W	33.803°N	0.00	3.72

*** Deaggregation of Seismic Hazard at One Period of Spectral Acceleration ***
*** Data from Dynamic: Conterminous U.S. 2014 (update) (unknown) ****
PSHA Deaggregation. %contributions.
site: Test
longitude: 116.393°W
latitude: 33.798°E
imt: Peak Ground Acceleration
vs30 = 259 m/s (Site class D)
return period: 2475 yrs.
#This deaggregation corresponds to: Total
Summary statistics for PSHA PGA deaggregation, r=distance, ε=epsilon:
Deaggregation targets:
  Return period: 2475 yrs
  Exceedance rate: 0.0004040404 yr^{-1}
  PGA ground motion: 0.95159862 g
Recovered targets:
  Return period: 3256.1118 yrs
  Exceedance rate: 0.00030711477 yr^{-1}
Totals:
  Binned: 100 %
  Residual: 0 %
  Trace: 0.05 %
Mean (over all sources):
  m: 7.22
  r: 7.3 km
  ε_0: 1.58 σ
Mode (largest m-r bin):
  m: 7.49
  r: 6.42 km
  ε_0: 1.49 σ
  Contribution: 16.56 %
Mode (largest m-r-ε_0 bin):
  m: 7.49
  r: 6.38 km
  ε_0: 1.39 σ
  Contribution: 12.01 %
Discretization:
  r: min = 0.0, max = 1000.0, Δ = 20.0 km
  m: min = 4.4, max = 9.4, Δ = 0.2
  ε: min = -3.0, max = 3.0, Δ = 0.5 σ
Epsilon keys:
  ε0: [-∞ .. -2.5)
  ε1: [-2.5 .. -2.0)
  ε2: [-2.0 .. -1.5)
  ε3: [-1.5 .. -1.0)
  ε4: [-1.0 .. -0.5)
  ε5: [-0.5 .. 0.0)
  ε6: [0.0 .. 0.5)
  ε7: [0.5 .. 1.0)
  ε8: [1.0 .. 1.5)
  ε9: [1.5 .. 2.0)
  ε10: [2.0 .. 2.5)
  ε11: [2.5 .. +∞]

Closest Distance, rRup (km)	Magnitude (Mw)	ALL_ε	ε=(-∞,-2.5)	ε=[-2.5,-2)	ε=[-2,-1.5)	ε=[-1.5,-1)	ε=[-1,-0.5)	ε=[-0.5,0)	ε=[0,0.5)	ε=[0.5,1)	ε=[1,1.5)	ε=[1.5,2)	ε=[2,2.5)	ε=[2.5,∞)
70	8.1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
70	8.3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50	7.5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50	7.7	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50	7.9	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.014
50	8.1	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005
50	8.3	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005
30	6.1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30	6.3	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003
30	6.5	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005
30	6.7	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.009
30	6.9	0.017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.014
30	7.1	0.049	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.046

30	7.3	0.054	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.050
30	7.5	0.100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.012	0.088
30	7.7	0.129	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.017	0.112
30	7.9	0.390	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.139	0.251
30	8.1	0.701	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.442	0.257
30	8.3	0.438	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.354	0.083
10	5.1	2.728	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.788	1.653	0.288
10	5.3	3.045	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.337	0.282	0.426
10	5.5	3.449	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.726	1.031	0.246	0.446
10	5.7	2.954	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.370	0.842	0.383	0.357
10	5.9	2.324	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.973	0.658	0.404	0.290
10	6.1	2.665	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.649	0.983	0.882	0.151
10	6.3	2.820	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.420	1.468	0.817	0.116
10	6.5	3.816	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.033	0.394	2.051	0.787	0.551
10	6.7	1.315	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.038	0.256	0.808	0.159	0.054
10	6.9	1.699	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.056	0.134	1.222	0.252	0.037
10	7.1	1.568	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.035	0.331	0.614	0.507	0.081
10	7.3	15.261	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.020	9.921	3.544	1.749	0.027
10	7.5	16.558	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	12.007	3.690	0.855	0.001
10	7.7	13.195	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	9.922	2.645	0.628	0.000
10	7.9	7.227	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	5.335	1.520	0.369	0.002
10	8.1	13.180	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.046	10.015	2.527	0.590	0.001
10	8.3	4.274	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.498	2.809	0.791	0.176	0.000

Principal Sources (faults, subduction, random seismicity having > 3% contribution
UC33brAvg_FM31:
  Percent Contributed: 38.86
  Distance (km): 7.4794689
  Magnitude: 7.6264235
  Epsilon (mean values): 1.5118026
San Andreas (San Gorgonio Pass-Garnet HIll) [1]:
  Percent Contributed: 31.51
  Distance (km): 6.3071287
  Magnitude: 7.6027865
  Epsilon (mean values): 1.4716375
  Azimuth: 31.951688
  Latitude: 33.845511
  Longitude: -116.35786
San Andreas (North Branch Mill Creek) [10]:
  Percent Contributed: 3.98
  Distance (km): 8.061458
  Magnitude: 7.8808645
  Epsilon (mean values): 1.3083447
  Azimuth: 36.695988
  Latitude: 33.853076
  Longitude: -116.34417
UC33brAvg_FM32:
  Percent Contributed: 38.82
  Distance (km): 7.471736
  Magnitude: 7.6219514
  Epsilon (mean values): 1.5119868
San Andreas (San Gorgonio Pass-Garnet HIll) [1]:
  Percent Contributed: 31.35
  Distance (km): 6.3071287
  Magnitude: 7.5995381
  Epsilon (mean values): 1.4730648
  Azimuth: 31.951688
  Latitude: 33.845511
  Longitude: -116.35786
San Andreas (North Branch Mill Creek) [10]:
  Percent Contributed: 4.19
  Distance (km): 8.061458
  Magnitude: 7.8501957
  Epsilon (mean values): 1.3158499
  Azimuth: 36.695988
  Latitude: 33.853076
  Longitude: -116.34417
UC33brAvg_FM31 (opt):
  Percent Contributed: 11.16
  Distance (km): 6.7098436
  Magnitude: 5.8069283

Epsilon (mean values): 1.8125077
PointSourceFinite: -116.393, 33.803:
  Percent Contributed: 3.73
  Distance (km): 4.9161769
  Magnitude: 5.6573306
  Epsilon (mean values): 1.6100538
  Azimuth: 0
  Latitude: 33.802887
  Longitude: -116.39325
PointSourceFinite: -116.393, 33.803:
  Percent Contributed: 3.73
  Distance (km): 4.9161769
  Magnitude: 5.6573306
  Epsilon (mean values): 1.6100538
  Azimuth: 0
  Latitude: 33.802887
  Longitude: -116.39325
UC33brAvg_FM32 (opt):
  Percent Contributed: 11.16
  Distance (km): 6.7090904
  Magnitude: 5.8064798
  Epsilon (mean values): 1.812569
PointSourceFinite: -116.393, 33.803:
  Percent Contributed: 3.73
  Distance (km): 4.9162728
  Magnitude: 5.6570323
  Epsilon (mean values): 1.6101632
  Azimuth: 0
  Latitude: 33.802887
  Longitude: -116.39325
PointSourceFinite: -116.393, 33.803:
  Percent Contributed: 3.72
  Distance (km): 4.9162728
  Magnitude: 5.6570323
  Epsilon (mean values): 1.6101632
  Azimuth: 0
  Latitude: 33.802887
  Longitude: -116.39325
PSHA Deaggregation. %contributions.
site: Test
longitude: 116.393°W
latitude: 33.798°E
imt: Peak Ground Acceleration
vs30 = 259 m/s (Site class D)
return period: 2475 yrs.
#This deaggregation corresponds to: GMM: Abrahamson, Silva & Kamai (2014)
Summary statistics for PSHA PGA deaggregation, r=distance, ε=epsilon:
Deaggregation targets:
  Return period: 2475 yrs
  Exceedance rate: 0.0004040404 yr^{-1}
  PGA ground motion: 0.95159862 g
Recovered targets:
  Return period: 3256.1118 yrs
  Exceedance rate: 0.00030711477 yr^{-1}
Totals:
  Binned: 21.91 %
  Residual: 0 %
  Trace: 0.05 %
Mean (over all sources):
  m: 7.12
  r: 7.67 km
  ε_0: 1.82 σ
Mode (largest m-r bin):
  m: 7.49
  r: 6.41 km
  ε_0: 1.67 σ
  Contribution: 3.53 %
Mode (largest m-r-ε_0 bin):
  m: 7.49
  r: 6.38 km

ε_0: 1.67 σ
  Contribution: 3.52 %
Discretization:
  r: min = 0.0, max = 1000.0, Δ = 20.0 km
  m: min = 4.4, max = 9.4, Δ = 0.2
  ε: min = -3.0, max = 3.0, Δ = 0.5 σ
Epsilon keys:
  ε0: [-∞ .. -2.5)
  ε1: [-2.5 .. -2.0)
  ε2: [-2.0 .. -1.5)
  ε3: [-1.5 .. -1.0)
  ε4: [-1.0 .. -0.5)
  ε5: [-0.5 .. 0.0)
  ε6: [0.0 .. 0.5)
  ε7: [0.5 .. 1.0)
  ε8: [1.0 .. 1.5)
  ε9: [1.5 .. 2.0)
  ε10: [2.0 .. 2.5)
  ε11: [2.5 .. +∞]

Closest Distance, rRup (km)	Magnitude (Mw)	ALL_ε	ε=(-∞,-2.5)	ε=[-2.5,-2)	ε=[-2,-1.5)	ε=[-1.5,-1)	ε=[-1,-0.5)	ε=[-0.5,0)	ε=[0,0.5)	ε=[0.5,1)	ε=[1,1.5)	ε=[1.5,2)	ε=[2,2.5)	ε=[2.5,∞)
70	8.1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
70	8.3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50	7.7	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50	7.9	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005
50	8.1	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002
50	8.3	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002
30	6.3	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
30	6.5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30	6.7	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002
30	6.9	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004
30	7.1	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.014
30	7.3	0.017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.017
30	7.5	0.031	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.031
30	7.7	0.045	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.042
30	7.9	0.124	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.028	0.096
30	8.1	0.226	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.083	0.143
30	8.3	0.140	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.140	0.000
10	5.1	1.128	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.266	0.617	0.246
10	5.3	0.889	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.662	0.000	0.226
10	5.5	0.706	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.501	0.036	0.168
10	5.7	0.588	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.400	0.064	0.124
10	5.9	0.476	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.309	0.081	0.086
10	6.1	0.588	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.248	0.289	0.052
10	6.3	0.657	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.245	0.383	0.029
10	6.5	0.997	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.079	0.505	0.127	0.287
10	6.7	0.313	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.068	0.179	0.047	0.019
10	6.9	0.396	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.038	0.290	0.050	0.018
10	7.1	0.378	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.018	0.207	0.139	0.014
10	7.3	3.397	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	3.089	0.300	0.000
10	7.5	3.532	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	3.520	0.011	0.000
10	7.7	2.631	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.628	0.003	0.000
10	7.9	1.386	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.356	0.029	0.000
10	8.1	2.460	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.446	0.014	0.000
10	8.3	0.779	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.779	0.000	0.000

Principal Sources (faults, subduction, random seismicity having > 3% contribution
UC33brAvg_FM31:
  Percent Contributed: 8.18
  Distance (km): 7.8932418
  Magnitude: 7.5967749
  Epsilon (mean values): 1.7334304
San Andreas (San Gorgonio Pass-Garnet HIll) [1]:
  Percent Contributed: 6.62
  Distance (km): 6.3071287
  Magnitude: 7.580625
  Epsilon (mean values): 1.6602776
  Azimuth: 31.951688
  Latitude: 33.845511
  Longitude: -116.35786

UC33brAvg_FM32:
  Percent Contributed: 8.15
  Distance (km): 7.880263
  Magnitude: 7.5917196
  Epsilon (mean values): 1.7350304
San Andreas (San Gorgonio Pass-Garnet HIll) [1]:
  Percent Contributed: 6.59
  Distance (km): 6.3071287
  Magnitude: 7.5766431
  Epsilon (mean values): 1.6617753
  Azimuth: 31.951688
  Latitude: 33.845511
  Longitude: -116.35786
UC33brAvg_FM31 (opt):
  Percent Contributed: 2.79
  Distance (km): 7.0345454
  Magnitude: 5.7300993
  Epsilon (mean values): 2.0599055
UC33brAvg_FM32 (opt):
  Percent Contributed: 2.79
  Distance (km): 7.0339141
  Magnitude: 5.7296505
  Epsilon (mean values): 2.059996
PSHA Deaggregation. %contributions.
site: Test
longitude: 116.393°W
latitude: 33.798°E
imt: Peak Ground Acceleration
vs30 = 259 m/s (Site class D)
return period: 2475 yrs.
#This deaggregation corresponds to: GMM: Boore, Stewart, Seyhan & Atkinson (2014)
Summary statistics for PSHA PGA deaggregation, r=distance, ε=epsilon:
Deaggregation targets:
  Return period: 2475 yrs
  Exceedance rate: 0.0004040404 yr^{-1}
  PGA ground motion: 0.95159862 g
Recovered targets:
  Return period: 3256.1118 yrs
  Exceedance rate: 0.00030711477 yr^{-1}
Totals:
  Binned: 43.39 %
  Residual: 0 %
  Trace: 0.07 %
Mean (over all sources):
  m: 7.15
  r: 7.5 km
  ε_0: 1.44 σ
Mode (largest m-r bin):
  m: 7.49
  r: 6.46 km
  ε_0: 1.36 σ
  Contribution: 6.48 %
Mode (largest m-r-ε_0 bin):
  m: 7.49
  r: 6.43 km
  ε_0: 1.36 σ
  Contribution: 6.45 %
Discretization:
  r: min = 0.0, max = 1000.0, Δ = 20.0 km
  m: min = 4.4, max = 9.4, Δ = 0.2
  ε: min = -3.0, max = 3.0, Δ = 0.5 σ
Epsilon keys:
  ε0: [-∞ .. -2.5)
  ε1: [-2.5 .. -2.0)
  ε2: [-2.0 .. -1.5)
  ε3: [-1.5 .. -1.0)
  ε4: [-1.0 .. -0.5)
  ε5: [-0.5 .. 0.0)
  ε6: [0.0 .. 0.5)

ε7: [0.5 .. 1.0)
ε8: [1.0 .. 1.5)
ε9: [1.5 .. 2.0)
ε10: [2.0 .. 2.5)
ε11: [2.5 .. +∞]

Closest Distance, rRup (km) Magnitude (Mw) ALL_ε ε=(-∞,-2.5) ε=[-2.5,-2) ε=[-2,-1.5) ε=[-1.5,-1) ε=[-1,-0.5) ε=[-0.5,0) ε=[0,0.5) ε=[0.5,1) ε=[1,1.5) ε=[1.5,2) ε=[2,2.5) ε=[2.5,∞)

70	8.1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
70	8.3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50	7.5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50	7.7	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50	7.9	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.009
50	8.1	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003
50	8.3	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002
30	6.1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30	6.3	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002
30	6.5	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004
30	6.7	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.007
30	6.9	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.008
30	7.1	0.031	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.028
30	7.3	0.033	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.030
30	7.5	0.064	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011	0.053
30	7.7	0.078	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011	0.066
30	7.9	0.207	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.093	0.113
30	8.1	0.357	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.349	0.006
30	8.3	0.214	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.212	0.000
10	5.1	0.964	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.522	0.434	0.008
10	5.3	1.473	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.359	0.000	0.114
10	5.5	2.080	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.726	0.001	0.210	0.143
10	5.7	1.763	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.370	0.000	0.280	0.112
10	5.9	1.332	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.973	0.000	0.264	0.095
10	6.1	1.394	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.649	0.427	0.294	0.023
10	6.3	1.368	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.401	0.762	0.157	0.048
10	6.5	1.796	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.224	0.991	0.393	0.187
10	6.7	0.539	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.109	0.385	0.029	0.017
10	6.9	0.702	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.077	0.535	0.089	0.002
10	7.1	0.657	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.301	0.106	0.250	0.000
10	7.3	5.966	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	5.450	0.111	0.400	0.000
10	7.5	6.483	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	6.448	0.016	0.016	0.000
10	7.7	5.460	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.450	0.009	0.000	0.000
10	7.9	3.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.945	0.058	0.000	0.000
10	8.1	5.550	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.046	5.470	0.033	0.000	0.000
10	8.3	1.832	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.498	1.326	0.007	0.000	0.000

Principal Sources (faults, subduction, random seismicity having > 3% contribution

UC33brAvg_FM32:
- Percent Contributed: 16.07
- Distance (km): 7.7781333
- Magnitude: 7.6213588
- Epsilon (mean values): 1.3802436

San Andreas (San Gorgonio Pass-Garnet HIll) [1]:
- Percent Contributed: 12.32
- Distance (km): 6.3071287
- Magnitude: 7.5988928
- Epsilon (mean values): 1.3398313
- Azimuth: 31.951688
- Latitude: 33.845511
- Longitude: -116.35786

San Andreas (North Branch Mill Creek) [10]:
- Percent Contributed: 2.15
- Distance (km): 8.061458
- Magnitude: 7.8457289
- Epsilon (mean values): 1.077244
- Azimuth: 36.695988
- Latitude: 33.853076
- Longitude: -116.34417

UC33brAvg_FM31:
- Percent Contributed: 16.04
- Distance (km): 7.7836471
- Magnitude: 7.6262543

  Epsilon (mean values): 1.3811849
San Andreas (San Gorgonio Pass-Garnet HIll) [1]:
  Percent Contributed: 12.37
  Distance (km): 6.3071287
  Magnitude: 7.6016337
  Epsilon (mean values): 1.3390073
  Azimuth: 31.951688
  Latitude: 33.845511
  Longitude: -116.35786
San Andreas (North Branch Mill Creek) [10]:
  Percent Contributed: 2.04
  Distance (km): 8.061458
  Magnitude: 7.8780925
  Epsilon (mean values): 1.0698215
  Azimuth: 36.695988
  Latitude: 33.853076
  Longitude: -116.34417
UC33brAvg_FM31 (opt):
  Percent Contributed: 5.64
  Distance (km): 6.6837734
  Magnitude: 5.7996289
  Epsilon (mean values): 1.6132066
PointSourceFinite: -116.393, 33.803:
  Percent Contributed: 1.97
  Distance (km): 4.9909238
  Magnitude: 5.6531474
  Epsilon (mean values): 1.4035986
  Azimuth: 0
  Latitude: 33.802887
  Longitude: -116.39325
PointSourceFinite: -116.393, 33.803:
  Percent Contributed: 1.96
  Distance (km): 4.9909238
  Magnitude: 5.6531474
  Epsilon (mean values): 1.4035986
  Azimuth: 0
  Latitude: 33.802887
  Longitude: -116.39325
UC33brAvg_FM32 (opt):
  Percent Contributed: 5.63
  Distance (km): 6.6829009
  Magnitude: 5.7992472
  Epsilon (mean values): 1.6132258
PointSourceFinite: -116.393, 33.803:
  Percent Contributed: 1.96
  Distance (km): 4.990941
  Magnitude: 5.6529116
  Epsilon (mean values): 1.4036826
  Azimuth: 0
  Latitude: 33.802887
  Longitude: -116.39325
PointSourceFinite: -116.393, 33.803:
  Percent Contributed: 1.96
  Distance (km): 4.990941
  Magnitude: 5.6529116
  Epsilon (mean values): 1.4036826
  Azimuth: 0
  Latitude: 33.802887
  Longitude: -116.39325
PSHA Deaggregation. %contributions.
site: Test
longitude: 116.393°W
latitude: 33.798°E
imt: Peak Ground Acceleration
vs30 = 259 m/s (Site class D)
return period: 2475 yrs.
#This deaggregation corresponds to: GMM: Campbell & Bozorgnia (2014)
Summary statistics for PSHA PGA deaggregation, r=distance, ε=epsilon:
Deaggregation targets:
  Return period: 2475 yrs

  Exceedance rate: 0.0004040404 yr^{-1}
  PGA ground motion: 0.95159862 g
Recovered targets:
  Return period: 3256.1118 yrs
  Exceedance rate: 0.00030711477 yr^{-1}
Totals:
  Binned: 4.01 %
  Residual: 0 %
  Trace: 0.01 %
Mean (over all sources):
  m: 7.46
  r: 6.5 km
  ε_0: 2.26 σ
Mode (largest m-r bin):
  m: 7.49
  r: 6.38 km
  ε_0: 2.25 σ
  Contribution: 0.82 %
Mode (largest m-r-ε_0 bin):
  m: 7.49
  r: 6.38 km
  ε_0: 2.25 σ
  Contribution: 0.82 %
Discretization:
  r: min = 0.0, max = 1000.0, Δ = 20.0 km
  m: min = 4.4, max = 9.4, Δ = 0.2
  ε: min = -3.0, max = 3.0, Δ = 0.5 σ
Epsilon keys:
  ε0: [-∞ .. -2.5)
  ε1: [-2.5 .. -2.0)
  ε2: [-2.0 .. -1.5)
  ε3: [-1.5 .. -1.0)
  ε4: [-1.0 .. -0.5)
  ε5: [-0.5 .. 0.0)
  ε6: [0.0 .. 0.5)
  ε7: [0.5 .. 1.0)
  ε8: [1.0 .. 1.5)
  ε9: [1.5 .. 2.0)
  ε10: [2.0 .. 2.5)
  ε11: [2.5 .. +∞]

Closest Distance, rRup (km)	Magnitude (Mw)	ALL_ε	ε=(-∞,-2.5)	ε=[-2.5,-2)	ε=[-2,-1.5)	ε=[-1.5,-1)	ε=[-1,-0.5)	ε=[-0.5,0)	ε=[0,0.5)	ε=[0.5,1)	ε=[1,1.5)	ε=[1.5,2)	ε=[2,2.5)	ε=[2.5,∞)
30	7.3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30	7.5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30	7.7	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30	7.9	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30	8.1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30	8.3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10	5.3	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002
10	5.5	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.014
10	5.7	0.024	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.024
10	5.9	0.033	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.033
10	6.1	0.063	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.044	0.020
10	6.3	0.132	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.105	0.027
10	6.5	0.213	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.027	0.162	0.024
10	6.7	0.087	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.026	0.053	0.008
10	6.9	0.100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.014	0.080	0.005
10	7.1	0.065	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.053	0.005
10	7.3	0.754	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.731	0.020
10	7.5	0.819	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.817	0.001
10	7.7	0.622	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.622	0.000
10	7.9	0.333	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.330	0.002
10	8.1	0.577	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.576	0.001
10	8.3	0.177	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.176	0.000

Principal Sources (faults, subduction, random seismicity having > 3% contribution
UC33brAvg_FM32:
  Percent Contributed: 1.8
  Distance (km): 6.5474702

Magnitude: 7.5880414
Epsilon (mean values): 2.2486496
San Andreas (San Gorgonio Pass-Garnet HIll) [1]:
Percent Contributed: 1.58
Distance (km): 6.3071287
Magnitude: 7.5611445
Epsilon (mean values): 2.2401251
Azimuth: 31.951688
Latitude: 33.845511
Longitude: -116.35786
UC33brAvg_FM31:
Percent Contributed: 1.8
Distance (km): 6.543238
Magnitude: 7.5917454
Epsilon (mean values): 2.2487949
San Andreas (San Gorgonio Pass-Garnet HIll) [1]:
Percent Contributed: 1.59
Distance (km): 6.3071287
Magnitude: 7.5647963
Epsilon (mean values): 2.2396717
Azimuth: 31.951688
Latitude: 33.845511
Longitude: -116.35786
PSHA Deaggregation. %contributions.
site: Test
longitude: 116.393°W
latitude: 33.798°E
imt: Peak Ground Acceleration
vs30 = 259 m/s (Site class D)
return period: 2475 yrs.
#This deaggregation corresponds to: GMM: Chiou & Youngs (2014)
Summary statistics for PSHA PGA deaggregation, r=distance, ε=epsilon:
Deaggregation targets:
Return period: 2475 yrs
Exceedance rate: 0.0004040404 yr^{-1}
PGA ground motion: 0.95159862 g
Recovered targets:
Return period: 3256.1118 yrs
Exceedance rate: 0.00030711477 yr^{-1}
Totals:
Binned: 30.69 %
Residual: 0 %
Trace: 0.05 %
Mean (over all sources):
m: 7.35
r: 6.88 km
ε_0: 1.52 σ
Mode (largest m-r bin):
m: 7.49
r: 6.4 km
ε_0: 1.43 σ
Contribution: 5.72 %
Mode (largest m-r-ε_0 bin):
m: 7.49
r: 6.33 km
ε_0: 1.42 σ
Contribution: 5.56 %
Discretization:
r: min = 0.0, max = 1000.0, Δ = 20.0 km
m: min = 4.4, max = 9.4, Δ = 0.2
ε: min = -3.0, max = 3.0, Δ = 0.5 σ
Epsilon keys:
ε0: [-∞ .. -2.5)
ε1: [-2.5 .. -2.0)
ε2: [-2.0 .. -1.5)
ε3: [-1.5 .. -1.0)
ε4: [-1.0 .. -0.5)
ε5: [-0.5 .. 0.0)
ε6: [0.0 .. 0.5)

ε7: [0.5 .. 1.0)
ε8: [1.0 .. 1.5)
ε9: [1.5 .. 2.0)
ε10: [2.0 .. 2.5)
ε11: [2.5 .. +∞]

Closest Distance, rRup (km)	Magnitude (Mw)	ALL_ε	ε=(-∞,-2.5)	ε=[-2.5,-2)	ε=[-2,-1.5)	ε=[-1.5,-1)	ε=[-1,-0.5)	ε=[-0.5,0)	ε=[0,0.5)	ε=[0.5,1)	ε=[1,1.5)	ε=[1.5,2)	ε=[2,2.5)	ε=[2.5,∞)
50	7.7	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50	7.9	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50	8.1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50	8.3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30	6.7	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
30	6.9	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002
30	7.1	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.003
30	7.3	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.003
30	7.5	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.004
30	7.7	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.004
30	7.9	0.060	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.018	0.042
30	8.1	0.118	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.010	0.108
30	8.3	0.084	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.082
10	5.1	0.636	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.602	0.034
10	5.3	0.682	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.316	0.281	0.085
10	5.5	0.649	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.529	0.000	0.120
10	5.7	0.578	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.442	0.040	0.096
10	5.9	0.484	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.349	0.059	0.076
10	6.1	0.619	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.308	0.255	0.056
10	6.3	0.664	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.019	0.460	0.172	0.012
10	6.5	0.810	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.033	0.091	0.527	0.106	0.053
10	6.7	0.375	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.038	0.079	0.219	0.030	0.009
10	6.9	0.501	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.056	0.019	0.383	0.033	0.011
10	7.1	0.468	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.035	0.012	0.294	0.066	0.061
10	7.3	5.144	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.015	4.464	0.341	0.319	0.006
10	7.5	5.724	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	5.557	0.153	0.011	0.000
10	7.7	4.482	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.471	0.008	0.003	0.000
10	7.9	2.505	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.389	0.105	0.010	0.000
10	8.1	4.593	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.544	0.048	0.000	0.000
10	8.3	1.487	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.482	0.005	0.000	0.000

Principal Sources (faults, subduction, random seismicity having > 3% contribution

UC33brAvg_FM31:
- Percent Contributed: 12.84
- Distance (km): 6.9669154
- Magnitude: 7.6503809
- Epsilon (mean values): 1.4305924

San Andreas (San Gorgonio Pass-Garnet HIll) [1]:
- Percent Contributed: 10.93
- Distance (km): 6.3071287
- Magnitude: 7.6230471
- Epsilon (mean values): 1.395753
- Azimuth: 31.951688
- Latitude: 33.845511
- Longitude: -116.35786

San Andreas (North Branch Mill Creek) [10]:
- Percent Contributed: 1.15
- Distance (km): 8.061458
- Magnitude: 7.8903344
- Epsilon (mean values): 1.3948841
- Azimuth: 36.695988
- Latitude: 33.853076
- Longitude: -116.34417

UC33brAvg_FM32:
- Percent Contributed: 12.79
- Distance (km): 6.9566531
- Magnitude: 7.646728
- Epsilon (mean values): 1.4317154

San Andreas (San Gorgonio Pass-Garnet HIll) [1]:
- Percent Contributed: 10.86
- Distance (km): 6.3071287
- Magnitude: 7.6197572
- Epsilon (mean values): 1.3978484

Azimuth: 31.951688
Latitude: 33.845511
Longitude: -116.35786
San Andreas (North Branch Mill Creek) [10]:
Percent Contributed: 1.21
Distance (km): 8.061458
Magnitude: 7.8634083
Epsilon (mean values): 1.4032102
Azimuth: 36.695988
Latitude: 33.853076
Longitude: -116.34417
UC33brAvg_FM31 (opt):
Percent Contributed: 2.53
Distance (km): 6.4627031
Magnitude: 5.8624827
Epsilon (mean values): 1.9411404
UC33brAvg_FM32 (opt):
Percent Contributed: 2.53
Distance (km): 6.461964
Magnitude: 5.8619303
Epsilon (mean values): 1.9413251
PSHA Deaggregation. %contributions.
site: Test
longitude: 116.393°W
latitude: 33.798°E
imt: Peak Ground Acceleration
vs30 = 259 m/s (Site class D)
return period: 2475 yrs.
#This deaggregation corresponds to: Source Type: System
Summary statistics for PSHA PGA deaggregation, r=distance, ε=epsilon:
Deaggregation targets:
Return period: 2475 yrs
Exceedance rate: 0.0004040404 yr^{-1}
PGA ground motion: 0.95159862 g
Recovered targets:
Return period: 3256.1118 yrs
Exceedance rate: 0.00030711477 yr^{-1}
Totals:
Binned: 77.68 %
Residual: 0 %
Trace: 0.04 %
Mean (over all sources):
m: 7.62
r: 7.48 km
ε_0: 1.51 σ
Mode (largest m-r bin):
m: 7.49
r: 6.42 km
ε_0: 1.49 σ
Contribution: 16.52 %
Mode (largest m-r-ε_0 bin):
m: 7.49
r: 6.38 km
ε_0: 1.39 σ
Contribution: 12 %
Discretization:
r: min = 0.0, max = 1000.0, Δ = 20.0 km
m: min = 4.4, max = 9.4, Δ = 0.2
ε: min = -3.0, max = 3.0, Δ = 0.5 σ
Epsilon keys:
ε0: [-∞ .. -2.5)
ε1: [-2.5 .. -2.0)
ε2: [-2.0 .. -1.5)
ε3: [-1.5 .. -1.0)
ε4: [-1.0 .. -0.5)
ε5: [-0.5 .. 0.0)
ε6: [0.0 .. 0.5)
ε7: [0.5 .. 1.0)
ε8: [1.0 .. 1.5)

ε9: [1.5 .. 2.0)
ε10: [2.0 .. 2.5)
ε11: [2.5 .. +∞]

Closest Distance, rRup (km)	Magnitude (Mw)	ALL_ε	ε=(-∞,-2.5)	ε=[-2.5,-2)	ε=[-2,-1.5)	ε=[-1.5,-1)	ε=[-1,-0.5)	ε=[-0.5,0)	ε=[0,0.5)	ε=[0.5,1)	ε=[1,1.5)	ε=[1.5,2)	ε=[2,2.5)	ε=[2.5,∞)
70	8.1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
70	8.3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50	7.5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50	7.7	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50	7.9	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.014
50	8.1	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005
50	8.3	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005
30	6.5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30	6.7	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
30	6.9	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004
30	7.1	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.040
30	7.3	0.047	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.046
30	7.5	0.097	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.010	0.086
30	7.7	0.129	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.017	0.112
30	7.9	0.390	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.139	0.251
30	8.1	0.701	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.442	0.257
30	8.3	0.438	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.354	0.083
10	6.1	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.015
10	6.3	0.862	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.567	0.257	0.038
10	6.5	2.433	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	1.431	0.501	0.497
10	6.7	0.515	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.450	0.043	0.017
10	6.9	1.183	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.994	0.158	0.022
10	7.1	1.277	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.254	0.498	0.451	0.074
10	7.3	15.129	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	9.882	3.501	1.721	0.025
10	7.5	16.523	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	11.995	3.678	0.849	0.000
10	7.7	13.192	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	9.920	2.644	0.627	0.000
10	7.9	7.226	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.335	1.520	0.369	0.002
10	8.1	13.180	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.046	10.015	2.527	0.590	0.001
10	8.3	4.274	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.498	2.809	0.791	0.176	0.000

Principal Sources (faults, subduction, random seismicity having > 3% contribution

UC33brAvg_FM31:
  Percent Contributed: 38.86
  Distance (km): 7.4794689
  Magnitude: 7.6264235
  Epsilon (mean values): 1.5118026

San Andreas (San Gorgonio Pass-Garnet HIll) [1]:
  Percent Contributed: 31.51
  Distance (km): 6.3071287
  Magnitude: 7.6027865
  Epsilon (mean values): 1.4716375
  Azimuth: 31.951688
  Latitude: 33.845511
  Longitude: -116.35786

San Andreas (North Branch Mill Creek) [10]:
  Percent Contributed: 3.98
  Distance (km): 8.061458
  Magnitude: 7.8808645
  Epsilon (mean values): 1.3083447
  Azimuth: 36.695988
  Latitude: 33.853076
  Longitude: -116.34417

UC33brAvg_FM32:
  Percent Contributed: 38.82
  Distance (km): 7.471736
  Magnitude: 7.6219514
  Epsilon (mean values): 1.5119868

San Andreas (San Gorgonio Pass-Garnet HIll) [1]:
  Percent Contributed: 31.35
  Distance (km): 6.3071287
  Magnitude: 7.5995381
  Epsilon (mean values): 1.4730648
  Azimuth: 31.951688
  Latitude: 33.845511
  Longitude: -116.35786

San Andreas (North Branch Mill Creek) [10]:
  Percent Contributed: 4.19
  Distance (km): 8.061458
  Magnitude: 7.8501957
  Epsilon (mean values): 1.3158499
  Azimuth: 36.695988
  Latitude: 33.853076
  Longitude: -116.34417
PSHA Deaggregation. %contributions.
site: Test
longitude: 116.393°W
latitude: 33.798°E
imt: Peak Ground Acceleration
vs30 = 259 m/s (Site class D)
return period: 2475 yrs.
#This deaggregation corresponds to: Source Type: Grid
Summary statistics for PSHA PGA deaggregation, r=distance, ε=epsilon:
Deaggregation targets:
  Return period: 2475 yrs
  Exceedance rate: 0.0004040404 yr^{-1}
  PGA ground motion: 0.95159862 g
Recovered targets:
  Return period: 3256.1118 yrs
  Exceedance rate: 0.00030711477 yr^{-1}
Totals:
  Binned: 22.32 %
  Residual: 0 %
  Trace: 0.06 %
Mean (over all sources):
  m: 5.81
  r: 6.71 km
  ε_0: 1.81 σ
Mode (largest m-r bin):
  m: 5.5
  r: 6.16 km
  ε_0: 1.75 σ
  Contribution: 3.45 %
Mode (largest m-r-ε_0 bin):
  m: 5.3
  r: 4.87 km
  ε_0: 1.77 σ
  Contribution: 2.34 %
Discretization:
  r: min = 0.0, max = 1000.0, Δ = 20.0 km
  m: min = 4.4, max = 9.4, Δ = 0.2
  ε: min = -3.0, max = 3.0, Δ = 0.5 σ
Epsilon keys:
  ε0: [-∞ .. -2.5)
  ε1: [-2.5 .. -2.0)
  ε2: [-2.0 .. -1.5)
  ε3: [-1.5 .. -1.0)
  ε4: [-1.0 .. -0.5)
  ε5: [-0.5 .. 0.0)
  ε6: [0.0 .. 0.5)
  ε7: [0.5 .. 1.0)
  ε8: [1.0 .. 1.5)
  ε9: [1.5 .. 2.0)
  ε10: [2.0 .. 2.5)
  ε11: [2.5 .. +∞]

Closest Distance, rRup (km)	Magnitude (Mw)	ALL_ε	ε=(-∞,-2.5)	ε=[-2.5,-2)	ε=[-2,-1.5)	ε=[-1.5,-1)	ε=[-1,-0.5)	ε=[-0.5,0)	ε=[0,0.5)	ε=[0.5,1)	ε=[1,1.5)	ε=[1.5,2)	ε=[2,2.5)	ε=[2.5,∞)
50	7.5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50	7.7	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50	7.9	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30	6.1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30	6.3	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003
30	6.5	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005
30	6.7	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.008

30	6.9	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.009
30	7.1	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.006
30	7.3	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.004
30	7.5	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.001
30	7.7	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30	7.9	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10	5.1	2.728	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.788	1.653	0.288
10	5.3	3.045	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.337	0.282	0.426
10	5.5	3.449	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.726	1.031	0.246	0.446
10	5.7	2.954	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.370	0.842	0.383	0.357
10	5.9	2.324	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.973	0.658	0.404	0.290
10	6.1	2.650	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.649	0.983	0.882	0.136
10	6.3	1.958	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.420	0.900	0.560	0.077
10	6.5	1.384	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.033	0.390	0.620	0.286	0.054
10	6.7	0.801	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.038	0.253	0.358	0.116	0.036
10	6.9	0.516	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.056	0.125	0.227	0.093	0.015
10	7.1	0.291	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.035	0.078	0.116	0.056	0.006
10	7.3	0.131	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.039	0.042	0.028	0.002
10	7.5	0.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.011	0.011	0.006	0.000
10	7.7	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.000
10	7.9	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Principal Sources (faults, subduction, random seismicity having > 3% contribution
UC33brAvg_FM31 (opt):
  Percent Contributed: 11.16
  Distance (km): 6.7098436
  Magnitude: 5.8069283
  Epsilon (mean values): 1.8125077
PointSourceFinite: -116.393, 33.803:
  Percent Contributed: 3.73
  Distance (km): 4.9161769
  Magnitude: 5.6573306
  Epsilon (mean values): 1.6100538
  Azimuth: 0
  Latitude: 33.802887
  Longitude: -116.39325
PointSourceFinite: -116.393, 33.803:
  Percent Contributed: 3.73
  Distance (km): 4.9161769
  Magnitude: 5.6573306
  Epsilon (mean values): 1.6100538
  Azimuth: 0
  Latitude: 33.802887
  Longitude: -116.39325
UC33brAvg_FM32 (opt):
  Percent Contributed: 11.16
  Distance (km): 6.7090904
  Magnitude: 5.8064798
  Epsilon (mean values): 1.812569
PointSourceFinite: -116.393, 33.803:
  Percent Contributed: 3.73
  Distance (km): 4.9162728
  Magnitude: 5.6570323
  Epsilon (mean values): 1.6101632
  Azimuth: 0
  Latitude: 33.802887
  Longitude: -116.39325
PointSourceFinite: -116.393, 33.803:
  Percent Contributed: 3.72
  Distance (km): 4.9162728
  Magnitude: 5.6570323
  Epsilon (mean values): 1.6101632
  Azimuth: 0
  Latitude: 33.802887
  Longitude: -116.39325

APPENDIX D

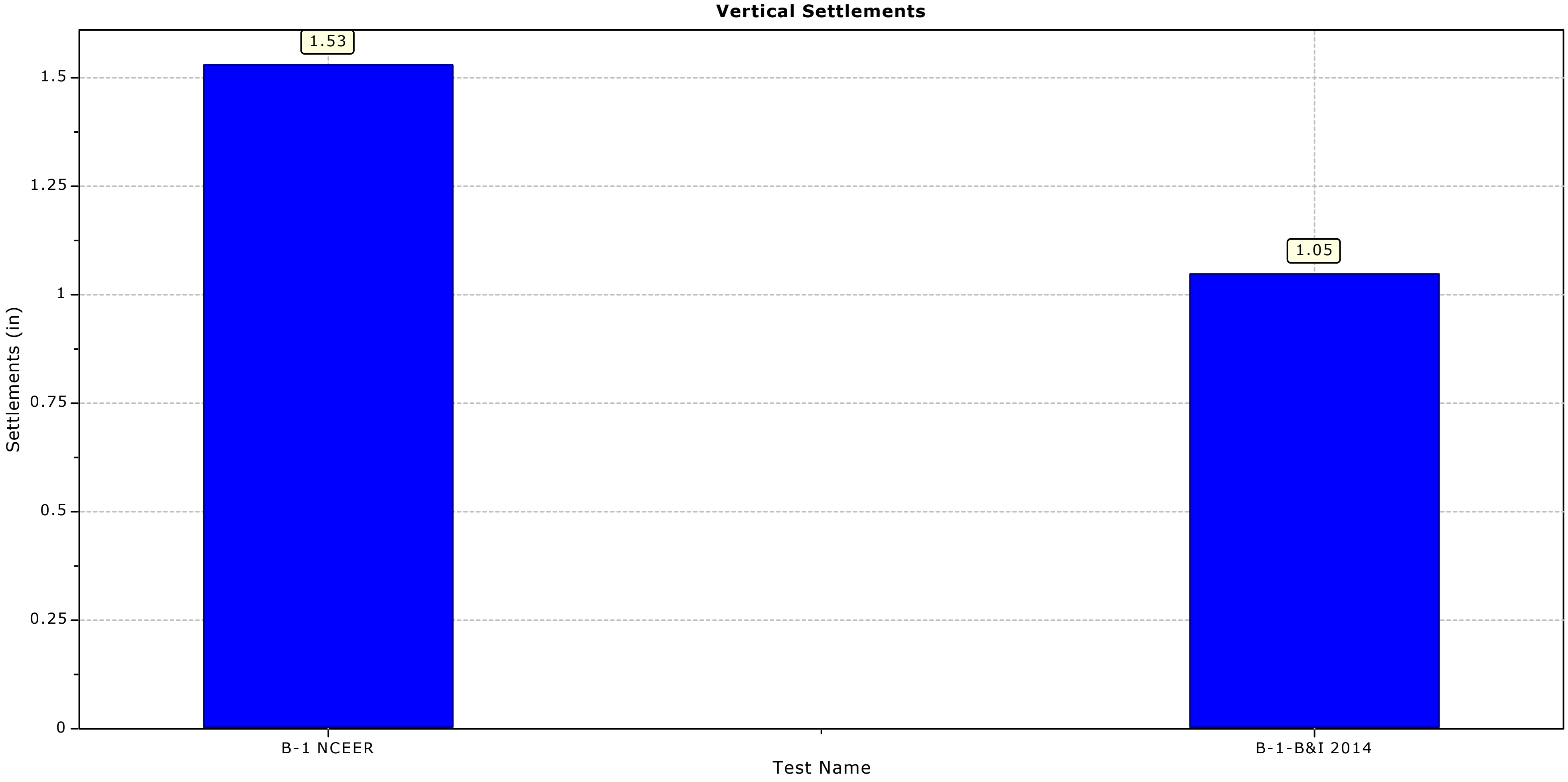
DRY SAND SETTLEMENT

Petra Geosciences, Inc.
Orange County Office
3190 Airport Loop Drive, Suite J1, Costa Mesa, California 92626
www.petra-inc.com

SUMMARY CALCULATION REPORT

Project title : 24-104 Rancho Mirage Apartments The Pacific Companies

Location : Rancho Mirage, Ca



Petra Geosciences, Inc.
Orange County Office
3190 Airport Loop Drive, Suite J1, Costa Mesa, California 92626
www.petra-inc.com

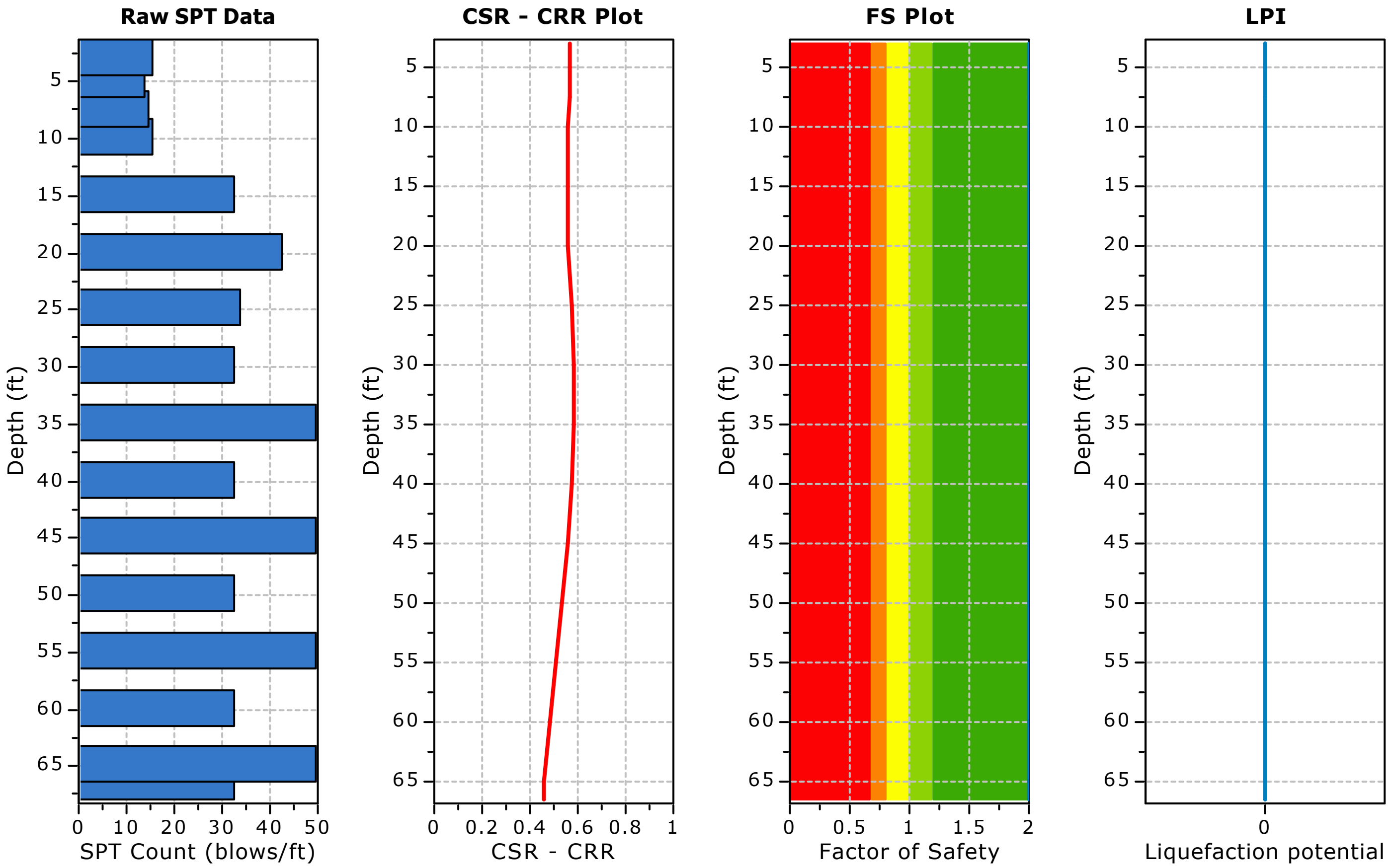
SPT BASED LIQUEFACTION ANALYSIS REPORT

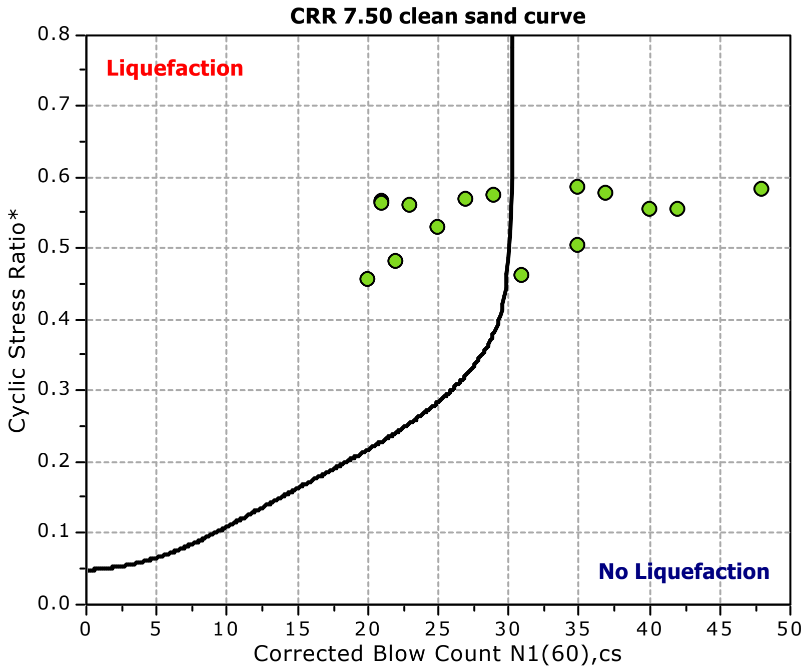
Project title : 24-104 Rancho Mirage Apartments The Pacific Companies **SPT Name: B-1 NCEER**

Location : Rancho Mirage, Ca

:: Input parameters and analysis properties ::

Analysis method:	NCEER 1998	G.W.T. (in-situ):	160.00 ft
Fines correction method:	NCEER 1998	G.W.T. (earthq.):	160.00 ft
Sampling method:	Sampler wo liners	Earthquake magnitude M_w:	7.50
Borehole diameter:	200mm	Peak ground acceleration:	0.88 g
Rod length:	3.30 ft	Eq. external load:	0.00 tsf
Hammer energy ratio:	1.00		

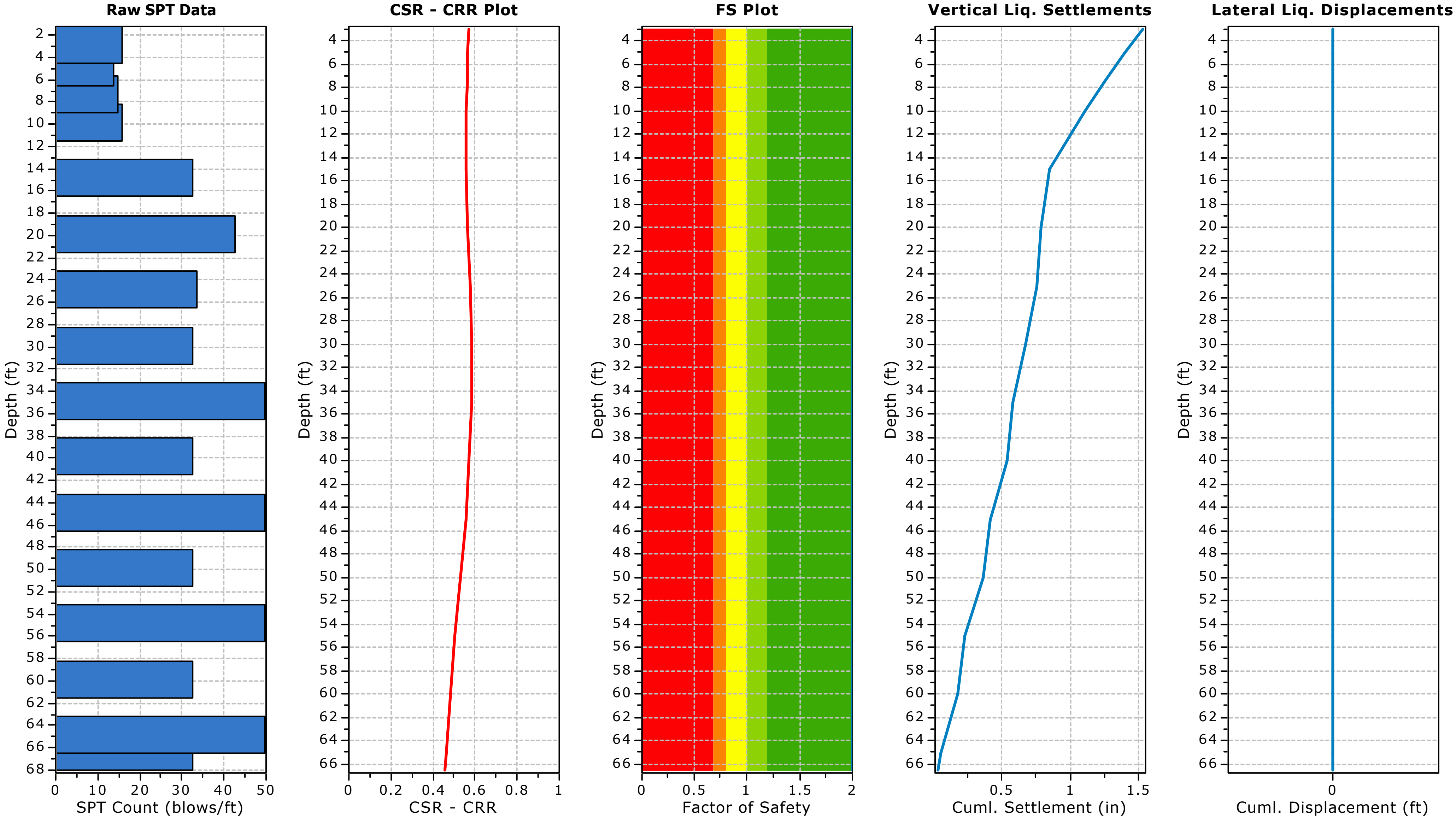




F.S. color scheme
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme
- Very high risk
- High risk
- Low risk

:: Overall Liquefaction Assessment Analysis Plots ::



:: Field input data ::

Test Depth (ft)	SPT Field Value (blows)	Fines Content (%)	Unit Weight (pcf)	Infl. Thickness (ft)	Can Liquefy
3.00	16	0.00	120.00	4.00	Yes
5.00	14	0.00	120.00	2.00	Yes
7.50	15	0.00	120.00	2.00	Yes
10.00	16	0.00	120.00	4.50	Yes
15.00	33	0.00	120.00	5.00	Yes
20.00	43	0.00	120.00	5.00	Yes
25.00	34	0.00	120.00	5.00	Yes
30.00	33	0.00	120.00	5.00	Yes
35.00	50	0.00	120.00	5.00	Yes
40.00	33	0.00	120.00	5.00	Yes
45.00	50	0.00	120.00	5.00	Yes
50.00	33	0.00	120.00	5.00	Yes
55.00	50	0.00	120.00	5.00	Yes
60.00	33	0.00	120.00	5.00	Yes
65.00	50	0.00	120.00	2.00	Yes
66.50	33	0.00	120.00	1.50	Yes

Abbreviations

Depth:	Depth at which test was performed (ft)
SPT Field Value:	Number of blows per foot
Fines Content:	Fines content at test depth (%)
Unit Weight:	Unit weight at test depth (pcf)
Infl. Thickness:	Thickness of the soil layer to be considered in settlements analysis (ft)
Can Liquefy:	User defined switch for excluding/including test depth from the analysis procedure

:: Cyclic Resistance Ratio (CRR) calculation data ::

Depth (ft)	SPT Field Value	Unit Weight (pcf)	σ_v (tsf)	u_o (tsf)	σ'_{vo} (tsf)	C_N	C_E	C_B	C_R	C_S	$(N_1)_{60}$	Fines Content (%)	α	β	$(N_1)_{60cs}$	$CRR_{7.5}$
3.00	16	120.00	0.18	0.00	0.18	1.61	1.00	1.15	0.75	1.20	27	0.00	0.00	1.00	27	4.000
5.00	14	120.00	0.30	0.00	0.30	1.48	1.00	1.15	0.75	1.20	21	0.00	0.00	1.00	21	4.000
7.50	15	120.00	0.45	0.00	0.45	1.35	1.00	1.15	0.75	1.20	21	0.00	0.00	1.00	21	4.000
10.00	16	120.00	0.60	0.00	0.60	1.25	1.00	1.15	0.85	1.20	23	0.00	0.00	1.00	23	4.000
15.00	33	120.00	0.90	0.00	0.90	1.07	1.00	1.15	0.85	1.20	42	0.00	0.00	1.00	42	4.000
20.00	43	120.00	1.20	0.00	1.20	0.94	1.00	1.15	0.95	1.20	53	0.00	0.00	1.00	53	4.000
25.00	34	120.00	1.50	0.00	1.50	0.84	1.00	1.15	0.95	1.20	37	0.00	0.00	1.00	37	4.000
30.00	33	120.00	1.80	0.00	1.80	0.76	1.00	1.15	1.00	1.20	35	0.00	0.00	1.00	35	4.000
35.00	50	120.00	2.10	0.00	2.10	0.69	1.00	1.15	1.00	1.20	48	0.00	0.00	1.00	48	4.000
40.00	33	120.00	2.40	0.00	2.40	0.63	1.00	1.15	1.00	1.20	29	0.00	0.00	1.00	29	4.000
45.00	50	120.00	2.70	0.00	2.70	0.59	1.00	1.15	1.00	1.20	40	0.00	0.00	1.00	40	4.000
50.00	33	120.00	3.00	0.00	3.00	0.55	1.00	1.15	1.00	1.20	25	0.00	0.00	1.00	25	4.000
55.00	50	120.00	3.30	0.00	3.30	0.51	1.00	1.15	1.00	1.20	35	0.00	0.00	1.00	35	4.000
60.00	33	120.00	3.60	0.00	3.60	0.48	1.00	1.15	1.00	1.20	22	0.00	0.00	1.00	22	4.000
65.00	50	120.00	3.90	0.00	3.90	0.45	1.00	1.15	1.00	1.20	31	0.00	0.00	1.00	31	4.000
66.50	33	120.00	3.99	0.00	3.99	0.44	1.00	1.15	1.00	1.20	20	0.00	0.00	1.00	20	4.000

:: Cyclic Resistance Ratio (CRR) calculation data ::

Depth (ft)	SPT Field Value	Unit Weight (pcf)	σ_v (tsf)	u_o (tsf)	σ'_{vo} (tsf)	C_N	C_E	C_B	C_R	C_S	$(N_1)_{60}$	Fines Content (%)	α	β	$(N_1)_{60cs}$	$CRR_{7.5}$

Abbreviations

σ_v: Total stress during SPT test (tsf)
u_o: Water pore pressure during SPT test (tsf)
σ'_{vo}: Effective overburden pressure during SPT test (tsf)
C_N: Overburden corretion factor
C_E: Energy correction factor
C_B: Borehole diameter correction factor
C_R: Rod length correction factor
C_S: Liner correction factor
$N_{1(60)}$: Corrected N_{SPT} to a 60% energy ratio
α, β: Clean sand equivalent clean sand formula coefficients
$N_{1(60)cs}$: Corected $N_{1(60)}$ value for fines content
$CRR_{7.5}$: Cyclic resistance ratio for M=7.5

:: Cyclic Stress Ratio calculation (CSR fully adjusted and normalized) ::

Depth (ft)	Unit Weight (pcf)	$\sigma_{v,eq}$ (tsf)	$u_{o,eq}$ (tsf)	$\sigma'_{vo,eq}$ (tsf)	r_d	α	CSR	MSF	$CSR_{eq,M=7.5}$	K_{sigma}	CSR^*	FS	
3.00	120.00	0.18	0.00	0.18	0.99	1.00	0.569	1.00	0.569	1.00	0.569	2.000	●
5.00	120.00	0.30	0.00	0.30	0.99	1.00	0.566	1.00	0.567	1.00	0.567	2.000	●
7.50	120.00	0.45	0.00	0.45	0.98	1.00	0.563	1.00	0.563	1.00	0.563	2.000	●
10.00	120.00	0.60	0.00	0.60	0.98	1.00	0.560	1.00	0.560	1.00	0.560	2.000	●
15.00	120.00	0.90	0.00	0.90	0.97	1.00	0.554	1.00	0.554	1.00	0.554	2.000	●
20.00	120.00	1.20	0.00	1.20	0.96	1.00	0.547	1.00	0.548	0.98	0.561	2.000	●
25.00	120.00	1.50	0.00	1.50	0.94	1.00	0.539	1.00	0.539	0.93	0.578	2.000	●
30.00	120.00	1.80	0.00	1.80	0.92	1.00	0.527	1.00	0.527	0.90	0.586	2.000	●
35.00	120.00	2.10	0.00	2.10	0.89	1.00	0.509	1.00	0.510	0.87	0.584	2.000	●
40.00	120.00	2.40	0.00	2.40	0.85	1.00	0.487	1.00	0.487	0.85	0.574	2.000	●
45.00	120.00	2.70	0.00	2.70	0.80	1.00	0.460	1.00	0.460	0.83	0.555	2.000	●
50.00	120.00	3.00	0.00	3.00	0.75	1.00	0.431	1.00	0.431	0.81	0.531	2.000	●
55.00	120.00	3.30	0.00	3.30	0.70	1.00	0.402	1.00	0.402	0.80	0.505	2.000	●
60.00	120.00	3.60	0.00	3.60	0.66	1.00	0.377	1.00	0.377	0.78	0.482	2.000	●
65.00	120.00	3.90	0.00	3.90	0.62	1.00	0.356	1.00	0.356	0.77	0.462	2.000	●
66.50	120.00	3.99	0.00	3.99	0.61	1.00	0.350	1.00	0.350	0.77	0.457	2.000	●

Abbreviations

$\sigma_{v,eq}$: Total overburden pressure at test point, during earthquake (tsf)
$u_{o,eq}$: Water pressure at test point, during earthquake (tsf)
$\sigma'_{vo,eq}$: Effective overburden pressure, during earthquake (tsf)
r_d : Nonlinear shear mass factor
α: Improvement factor due to stone columns
CSR : Cyclic Stress Ratio (adjusted for improvement)
MSF : Magnitude Scaling Factor
$CSR_{eq,M=7.5}$: CSR adjusted for M=7.5
K_{sigma}: Effective overburden stress factor
CSR^*: CSR fully adjusted (user FS applied)***
FS: Calculated factor of safety against soil liquefaction

*** User FS: 1.00

:: Liquefaction potential according to Iwasaki ::

Depth (ft)	FS	F	wz	Thickness (ft)	I_L
3.00	2.000	0.00	9.54	2.00	0.00
5.00	2.000	0.00	9.24	2.00	0.00

:: Liquefaction potential according to Iwasaki ::

Depth (ft)	FS	F	wz	Thickness (ft)	I_L
7.50	2.000	0.00	8.86	2.50	0.00
10.00	2.000	0.00	8.48	2.50	0.00
15.00	2.000	0.00	7.71	5.00	0.00
20.00	2.000	0.00	6.95	5.00	0.00
25.00	2.000	0.00	6.19	5.00	0.00
30.00	2.000	0.00	5.43	5.00	0.00
35.00	2.000	0.00	4.67	5.00	0.00
40.00	2.000	0.00	3.90	5.00	0.00
45.00	2.000	0.00	3.14	5.00	0.00
50.00	2.000	0.00	2.38	5.00	0.00
55.00	2.000	0.00	1.62	5.00	0.00
60.00	2.000	0.00	0.86	5.00	0.00
65.00	2.000	0.00	0.09	5.00	0.00
66.50	2.000	0.00	0.00	0.00	0.00

Overall potential I_L : 0.00

I_L = 0.00 - No liquefaction
I_L between 0.00 and 5 - Liquefaction not probable
I_L between 5 and 15 - Liquefaction probable
I_L > 15 - Liquefaction certain

:: Vertical settlements estimation for dry sands ::

Depth (ft)	$(N_1)_{60}$	τ_{av}	p	G_{max} (tsf)	α	b	γ (%)	ε_{15}	N_c	ε_{Nc} (%)	Δh (ft)	ΔS (in)
3.00	27	0.10	0.12	465.70	0.13	22770.45	0.40	0.00	15.16	0.28	4.00	0.133
5.00	21	0.17	0.20	552.90	0.13	16759.55	0.64	0.01	15.16	0.61	2.00	0.147
7.50	21	0.25	0.30	677.16	0.14	13140.37	0.64	0.01	15.16	0.61	2.00	0.147
10.00	23	0.34	0.40	805.99	0.14	11057.18	0.55	0.00	15.16	0.47	4.50	0.252
15.00	42	0.50	0.60	1206.56	0.15	8669.41	0.23	0.00	15.16	0.09	5.00	0.056
20.00	53	0.66	0.80	1505.55	0.16	7295.02	0.18	0.00	15.16	0.06	5.00	0.034
25.00	37	0.81	1.00	1493.22	0.16	6380.88	0.29	0.00	15.16	0.14	5.00	0.083
30.00	35	0.95	1.21	1605.72	0.17	5719.68	0.30	0.00	15.16	0.16	5.00	0.093
35.00	48	1.07	1.41	1926.94	0.18	5214.39	0.20	0.00	15.16	0.07	5.00	0.042
40.00	29	1.17	1.61	1741.47	0.19	4812.92	0.32	0.00	15.16	0.21	5.00	0.125
45.00	40	1.24	1.81	2056.11	0.19	4484.53	0.20	0.00	15.16	0.09	5.00	0.052
50.00	25	1.29	2.01	1853.04	0.20	4209.81	0.28	0.00	15.16	0.21	5.00	0.128
55.00	35	1.33	2.21	2174.16	0.21	3975.82	0.17	0.00	15.16	0.09	5.00	0.053
60.00	22	1.36	2.41	1945.23	0.22	3773.58	0.23	0.00	15.16	0.21	5.00	0.124
65.00	31	1.39	2.61	2269.85	0.23	3596.63	0.15	0.00	15.16	0.09	2.00	0.022
66.50	20	1.40	2.67	1983.85	0.23	3547.74	0.22	0.00	15.16	0.22	1.50	0.039

:: Vertical settlements estimation for dry sands ::

Depth (ft)	$(N_1)_{60}$	τ_{av}	p	G_{max} (tsf)	α	b	γ (%)	ε_{15}	N_c	ε_{Nc} (%)	Δh (ft)	ΔS (in)

Cumulative settlemetns: 1.528

Abbreviations

τ_{av}: Average cyclic shear stress
p: Average stress
G_{max}: Maximum shear modulus (tsf)
α, b: Shear strain formula variables
γ: Average shear strain (%)
ε_{15}: Volumetric strain after 15 cycles
N_c: Number of cycles
ε_{Nc}: Volumetric strain for number of cycles N_c (%)
Δh: Thickness of soil layer (in)
ΔS: Settlement of soil layer (in)

:: Lateral displacements estimation for saturated sands ::

Depth (ft)	$(N_1)_{60}$	D_r (%)	γ_{max} (%)	d_z (ft)	LDI	LD (ft)
3.00	27	72.75	0.00	4.00	0.000	0.00
5.00	21	64.16	0.00	2.00	0.000	0.00
7.50	21	64.16	0.00	2.00	0.000	0.00
10.00	23	67.14	0.00	4.50	0.000	0.00
15.00	42	90.73	0.00	5.00	0.000	0.00
20.00	53	100.00	0.00	5.00	0.000	0.00
25.00	37	85.16	0.00	5.00	0.000	0.00
30.00	35	82.83	0.00	5.00	0.000	0.00
35.00	48	100.00	0.00	5.00	0.000	0.00
40.00	29	75.39	0.00	5.00	0.000	0.00
45.00	40	88.54	0.00	5.00	0.000	0.00
50.00	25	70.00	0.00	5.00	0.000	0.00
55.00	35	82.83	0.00	5.00	0.000	0.00
60.00	22	65.67	0.00	5.00	0.000	0.00
65.00	31	77.95	0.00	2.00	0.000	0.00
66.50	20	62.61	0.00	1.50	0.000	0.00

Cumulative lateral displacements: 0.00

Abbreviations

D_r: Relative density (%)
γ_{max}: Maximum amplitude of cyclic shear strain (%)
d_z: Soil layer thickness (ft)
LDI: Lateral displacement index (ft)
LD: Actual estimated displacement (ft)

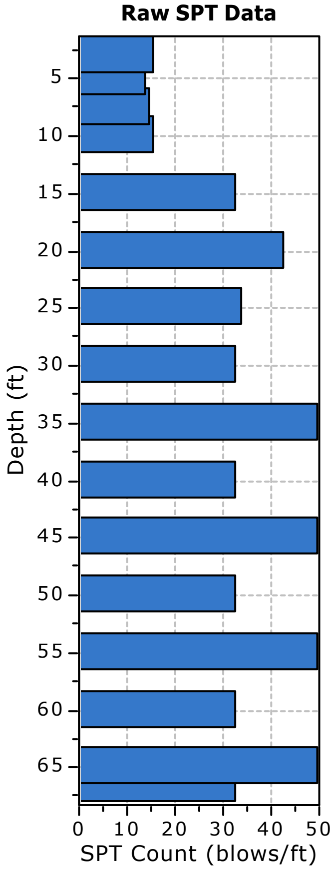
SPT BASED LIQUEFACTION ANALYSIS REPORT

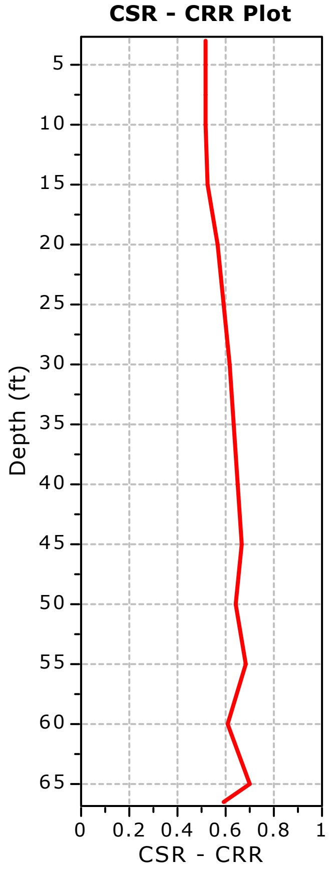
Project title : 24-104 Rancho Mirage Apartments The Pacific Companies **SPT Name: B-1-B&I 2014**

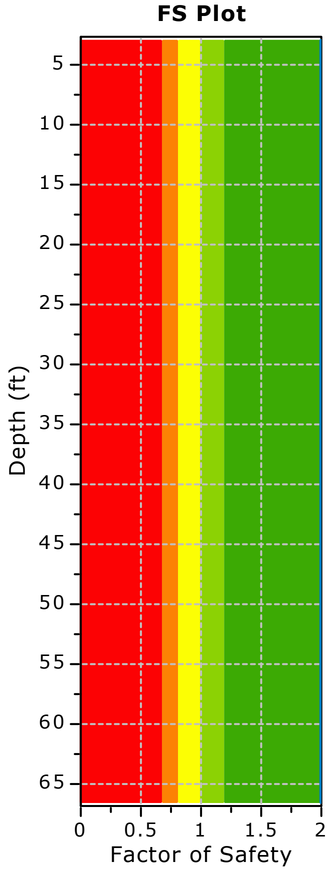
Location : Rancho Mirage, Ca

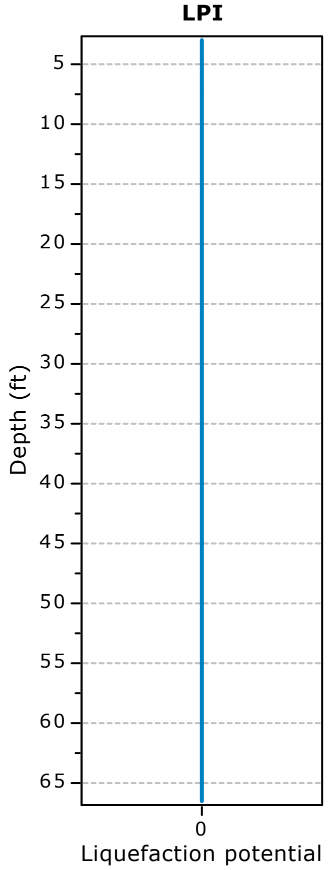
:: Input parameters and analysis properties ::

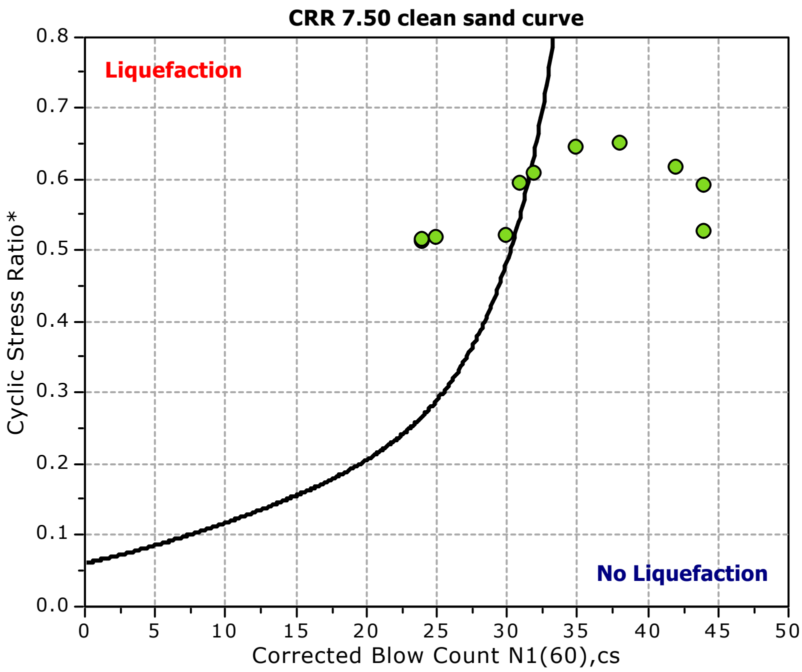
Analysis method:	Boulanger & Idriss, 2014	G.W.T. (in-situ):	160.00 ft
Fines correction method:	Boulanger & Idriss, 2014	G.W.T. (earthq.):	160.00 ft
Sampling method:	Sampler wo liners	Earthquake magnitude M_w:	7.50
Borehole diameter:	200mm	Peak ground acceleration:	0.88 g
Rod length:	3.30 ft	Eq. external load:	0.00 tsf
Hammer energy ratio:	1.00		











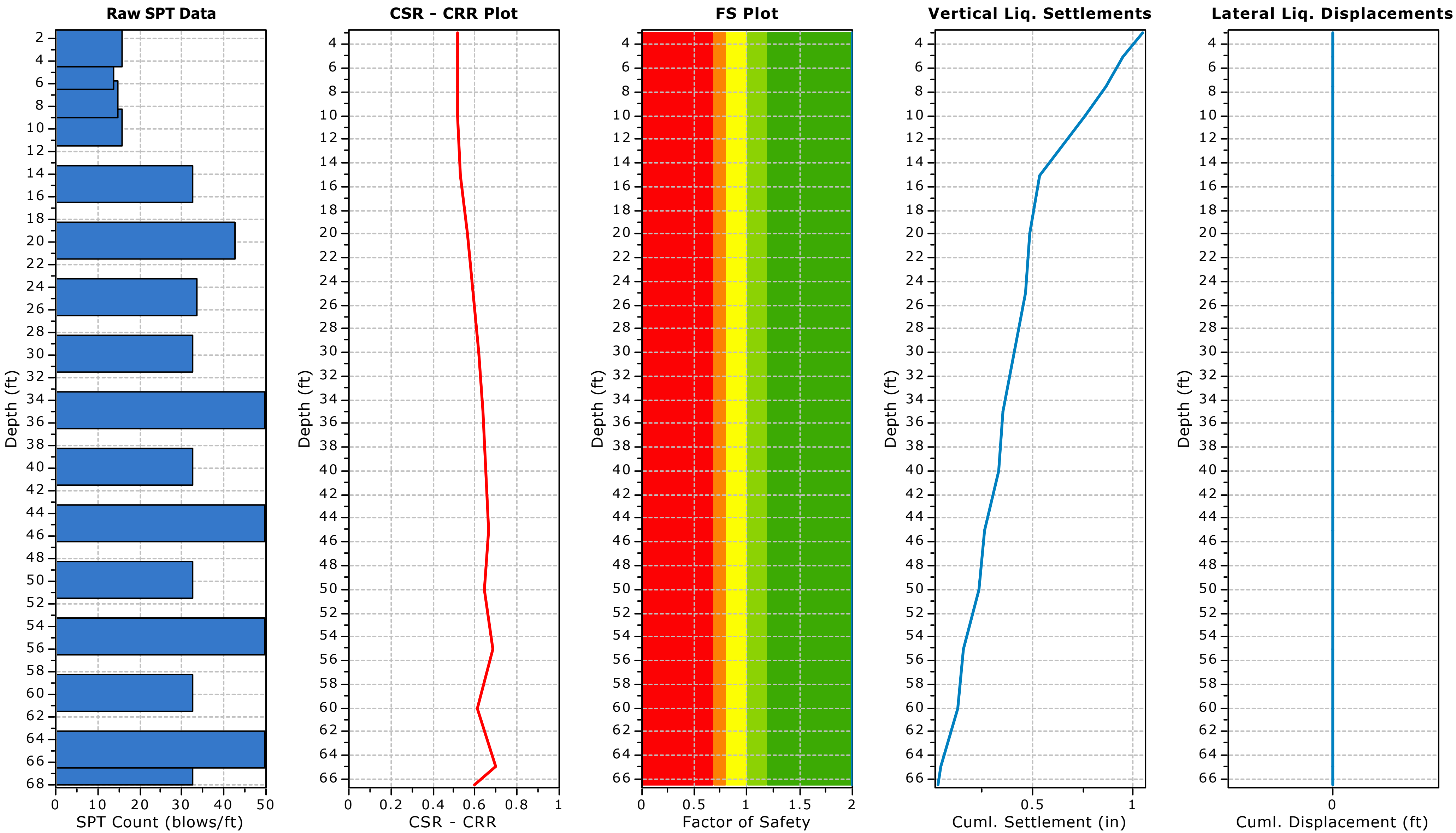
F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme

- Very high risk
- High risk
- Low risk

:: Overall Liquefaction Assessment Analysis Plots ::



:: Field input data ::

Test Depth (ft)	SPT Field Value (blows)	Fines Content (%)	Unit Weight (pcf)	Infl. Thickness (ft)	Can Liquefy
3.00	16	0.00	120.00	4.00	Yes
5.00	14	0.00	120.00	2.00	Yes
7.50	15	0.00	120.00	2.00	Yes
10.00	16	0.00	120.00	4.50	Yes
15.00	33	0.00	120.00	5.00	Yes
20.00	43	0.00	120.00	5.00	Yes
25.00	34	0.00	120.00	5.00	Yes
30.00	33	0.00	120.00	5.00	Yes
35.00	50	0.00	120.00	5.00	Yes
40.00	33	0.00	120.00	5.00	Yes
45.00	50	0.00	120.00	5.00	Yes
50.00	33	0.00	120.00	5.00	Yes
55.00	50	0.00	120.00	5.00	Yes
60.00	33	0.00	120.00	5.00	Yes
65.00	50	0.00	120.00	2.00	Yes
66.50	33	0.00	120.00	1.50	Yes

Abbreviations

Depth:	Depth at which test was performed (ft)
SPT Field Value:	Number of blows per foot
Fines Content:	Fines content at test depth (%)
Unit Weight:	Unit weight at test depth (pcf)
Infl. Thickness:	Thickness of the soil layer to be considered in settlements analysis (ft)
Can Liquefy:	User defined switch for excluding/including test depth from the analysis procedure

:: Cyclic Resistance Ratio (CRR) calculation data ::

Depth (ft)	SPT Field Value	Unit Weight (pcf)	σ_v (tsf)	u_o (tsf)	σ'_{vo} (tsf)	m	C_N	C_E	C_B	C_R	C_S	$(N_1)_{60}$	FC (%)	$\Delta(N_1)_{60}$	$(N_1)_{60cs}$	$CRR_{7.5}$
3.00	16	120.00	0.18	0.00	0.18	0.38	1.70	1.00	1.15	0.75	1.28	30	0.00	0.00	30	4.000
5.00	14	120.00	0.30	0.00	0.30	0.40	1.65	1.00	1.15	0.75	1.26	25	0.00	0.00	25	4.000
7.50	15	120.00	0.45	0.00	0.45	0.40	1.41	1.00	1.15	0.80	1.24	24	0.00	0.00	24	4.000
10.00	16	120.00	0.60	0.00	0.60	0.40	1.26	1.00	1.15	0.85	1.24	24	0.00	0.00	24	4.000
15.00	33	120.00	0.90	0.00	0.90	0.29	1.05	1.00	1.15	0.85	1.30	44	0.00	0.00	44	4.000
20.00	43	120.00	1.20	0.00	1.20	0.26	0.97	1.00	1.15	0.95	1.30	59	0.00	0.00	59	4.000
25.00	34	120.00	1.50	0.00	1.50	0.28	0.91	1.00	1.15	0.95	1.30	44	0.00	0.00	44	4.000
30.00	33	120.00	1.80	0.00	1.80	0.28	0.86	1.00	1.15	1.00	1.30	42	0.00	0.00	42	4.000
35.00	50	120.00	2.10	0.00	2.10	0.26	0.83	1.00	1.15	1.00	1.30	62	0.00	0.00	62	4.000
40.00	33	120.00	2.40	0.00	2.40	0.31	0.78	1.00	1.15	1.00	1.30	38	0.00	0.00	38	4.000
45.00	50	120.00	2.70	0.00	2.70	0.26	0.78	1.00	1.15	1.00	1.30	58	0.00	0.00	58	4.000
50.00	33	120.00	3.00	0.00	3.00	0.33	0.71	1.00	1.15	1.00	1.30	35	0.00	0.00	35	4.000
55.00	50	120.00	3.30	0.00	3.30	0.26	0.74	1.00	1.15	1.00	1.30	55	0.00	0.00	55	4.000
60.00	33	120.00	3.60	0.00	3.60	0.35	0.65	1.00	1.15	1.00	1.30	32	0.00	0.00	32	4.000
65.00	50	120.00	3.90	0.00	3.90	0.26	0.71	1.00	1.15	1.00	1.30	53	0.00	0.00	53	4.000
66.50	33	120.00	3.99	0.00	3.99	0.36	0.62	1.00	1.15	1.00	1.30	31	0.00	0.00	31	4.000

:: Cyclic Resistance Ratio (CRR) calculation data ::

Depth (ft)	SPT Field Value	Unit Weight (pcf)	σ_v (tsf)	u_o (tsf)	σ'_{vo} (tsf)	m	C_N	C_E	C_B	C_R	C_S	$(N_1)_{60}$	FC (%)	$\Delta(N_1)_{60}$	$(N_1)_{60cs}$	$CRR_{7.5}$

Abbreviations

σ_v: Total stress during SPT test (tsf)
u_o: Water pore pressure during SPT test (tsf)
σ'_{vo}: Effective overburden pressure during SPT test (tsf)
m: Stress exponent normalization factor
C_N: Overburden corretion factor
C_E: Energy correction factor
C_B: Borehole diameter correction factor
C_R: Rod length correction factor
C_S: Liner correction factor
$N_{1(60)}$: Corrected N_{SPT} to a 60% energy ratio
$\Delta(N_1)_{60}$ Equivalent clean sand adjustment
$N_{1(60)cs}$: Corected $N_{1(60)}$ value for fines content
$CRR_{7.5}$: Cyclic resistance ratio for M=7.5

:: Cyclic Stress Ratio calculation (CSR fully adjusted and normalized) ::

Depth (ft)	Unit Weight (pcf)	$\sigma_{v,eq}$ (tsf)	$u_{o,eq}$ (tsf)	$\sigma'_{vo,eq}$ (tsf)	r_d	α	CSR	MSF_{max}	$(N_1)_{60cs}$	MSF	$CSR_{eq,M=7.5}$	K_{sigma}	CSR^*	FS	
3.00	120.00	0.18	0.00	0.18	1.00	1.00	0.572	2.00	30	1.00	0.572	1.10	0.520	2.000	●
5.00	120.00	0.30	0.00	0.30	1.00	1.00	0.569	1.72	25	1.00	0.569	1.10	0.517	2.000	●
7.50	120.00	0.45	0.00	0.45	0.99	1.00	0.565	1.67	24	1.00	0.565	1.10	0.514	2.000	●
10.00	120.00	0.60	0.00	0.60	0.98	1.00	0.561	1.67	24	1.00	0.561	1.09	0.516	2.000	●
15.00	120.00	0.90	0.00	0.90	0.97	1.00	0.552	2.20	44	1.00	0.552	1.05	0.527	2.000	●
20.00	120.00	1.20	0.00	1.20	0.95	1.00	0.542	2.20	59	1.00	0.542	0.96	0.563	2.000	●
25.00	120.00	1.50	0.00	1.50	0.93	1.00	0.531	2.20	44	1.00	0.531	0.90	0.592	2.000	●
30.00	120.00	1.80	0.00	1.80	0.91	1.00	0.519	2.20	42	1.00	0.519	0.84	0.616	2.000	●
35.00	120.00	2.10	0.00	2.10	0.89	1.00	0.507	2.20	62	1.00	0.507	0.80	0.636	2.000	●
40.00	120.00	2.40	0.00	2.40	0.86	1.00	0.494	2.20	38	1.00	0.494	0.76	0.652	2.000	●
45.00	120.00	2.70	0.00	2.70	0.84	1.00	0.481	2.20	58	1.00	0.481	0.72	0.665	2.000	●
50.00	120.00	3.00	0.00	3.00	0.82	1.00	0.468	2.20	35	1.00	0.468	0.73	0.645	2.000	●
55.00	120.00	3.30	0.00	3.30	0.80	1.00	0.455	2.20	55	1.00	0.455	0.66	0.686	2.000	●
60.00	120.00	3.60	0.00	3.60	0.77	1.00	0.443	2.12	32	1.00	0.443	0.73	0.610	2.000	●
65.00	120.00	3.90	0.00	3.90	0.75	1.00	0.431	2.20	53	1.00	0.431	0.62	0.700	2.000	●
66.50	120.00	3.99	0.00	3.99	0.75	1.00	0.427	2.06	31	1.00	0.427	0.72	0.595	2.000	●

Abbreviations

$\sigma_{v,eq}$: Total overburden pressure at test point, during earthquake (tsf)
$u_{o,eq}$: Water pressure at test point, during earthquake (tsf)
$\sigma'_{vo,eq}$: Effective overburden pressure, during earthquake (tsf)
r_d: Nonlinear shear mass factor
α: Improvement factor due to stone columns
CSR : Cyclic Stress Ratio
MSF : Magnitude Scaling Factor
$CSR_{eq,M=7.5}$: CSR adjusted for M=7.5
K_{sigma}: Effective overburden stress factor
CSR^*: CSR fully adjusted (user FS applied)***
FS: Calculated factor of safety against soil liquefaction

*** User FS: 1.00

:: Liquefaction potential according to Iwasaki ::

Depth (ft)	FS	F	wz	Thickness (ft)	I_L
3.00	2.000	0.00	9.54	2.00	0.00

:: Liquefaction potential according to Iwasaki ::

Depth (ft)	FS	F	wz	Thickness (ft)	I_L
5.00	2.000	0.00	9.24	2.00	0.00
7.50	2.000	0.00	8.86	2.50	0.00
10.00	2.000	0.00	8.48	2.50	0.00
15.00	2.000	0.00	7.71	5.00	0.00
20.00	2.000	0.00	6.95	5.00	0.00
25.00	2.000	0.00	6.19	5.00	0.00
30.00	2.000	0.00	5.43	5.00	0.00
35.00	2.000	0.00	4.67	5.00	0.00
40.00	2.000	0.00	3.90	5.00	0.00
45.00	2.000	0.00	3.14	5.00	0.00
50.00	2.000	0.00	2.38	5.00	0.00
55.00	2.000	0.00	1.62	5.00	0.00
60.00	2.000	0.00	0.86	5.00	0.00
65.00	2.000	0.00	0.09	5.00	0.00
66.50	2.000	0.00	0.00	0.00	0.00

Overall potential I_L : 0.00

I_L = 0.00 - No liquefaction
I_L between 0.00 and 5 - Liquefaction not probable
I_L between 5 and 15 - Liquefaction probable
I_L > 15 - Liquefaction certain

:: Vertical settlements estimation for dry sands ::

Depth (ft)	$(N_1)_{60}$	τ_{av}	p	G_{max} (tsf)	α	b	γ	ε_{15}	N_c	ε_{Nc} weight factor	ε_{Nc} (%)	Δh (ft)	ΔS (in)
3.00	30	0.10	0.12	0.48	0.13	22770.45	0.00	0.00	15.16	0.95	0.21	4.00	0.099
5.00	25	0.17	0.20	0.59	0.13	16759.55	0.00	0.00	15.16	0.92	0.36	2.00	0.087
7.50	24	0.25	0.30	0.71	0.14	13140.37	0.01	0.00	15.16	0.88	0.42	2.00	0.100
10.00	24	0.34	0.40	0.82	0.14	11057.18	0.01	0.00	15.16	0.83	0.42	4.50	0.225
15.00	44	0.50	0.60	1.23	0.15	8669.41	0.00	0.00	15.16	0.75	0.08	5.00	0.049
20.00	59	0.65	0.80	1.56	0.16	7295.02	0.00	0.00	15.16	0.67	0.04	5.00	0.025
25.00	44	0.80	1.00	1.58	0.16	6380.88	0.00	0.00	15.16	0.58	0.09	5.00	0.051
30.00	42	0.93	1.21	1.71	0.17	5719.68	0.00	0.00	15.16	0.50	0.10	5.00	0.057
35.00	62	1.06	1.41	2.10	0.18	5214.39	0.00	0.00	15.16	0.42	0.04	5.00	0.023
40.00	38	1.19	1.61	1.91	0.19	4812.92	0.00	0.00	15.16	0.33	0.12	5.00	0.069
45.00	58	1.30	1.81	2.33	0.19	4484.53	0.00	0.00	15.16	0.25	0.04	5.00	0.027
50.00	35	1.41	2.01	2.07	0.20	4209.81	0.00	0.00	15.16	0.17	0.13	5.00	0.078
55.00	55	1.50	2.21	2.53	0.21	3975.82	0.00	0.00	15.16	0.08	0.05	5.00	0.028
60.00	32	1.59	2.41	2.20	0.22	3773.58	0.00	0.00	15.16	0.00	0.15	5.00	0.088
65.00	53	1.68	2.61	2.71	0.23	3596.63	0.00	0.00	15.16	0.00	0.05	2.00	0.012
66.50	31	1.70	2.67	2.30	0.23	3547.74	0.00	0.00	15.16	0.00	0.15	1.50	0.027

:: Vertical settlements estimation for dry sands ::

Depth (ft)	$(N_1)_{60}$	τ_{av}	p	G_{max} (tsf)	α	b	γ	ε_{15}	N_c	ε_{Nc} weight factor	ε_{Nc} (%)	Δh (ft)	ΔS (in)

Cumulative settlemetns: 1.047

Abbreviations

τ_{av}: Average cyclic shear stress
p: Average stress
G_{max}: Maximum shear modulus (tsf)
α, b: Shear strain formula variables
γ: Average shear strain
ε_{15}: Volumetric strain after 15 cycles
N_c: Number of cycles
ε_{Nc}: Volumetric strain for number of cycles N_c (%)
Δh: Thickness of soil layer (in)
ΔS: Settlement of soil layer (in)

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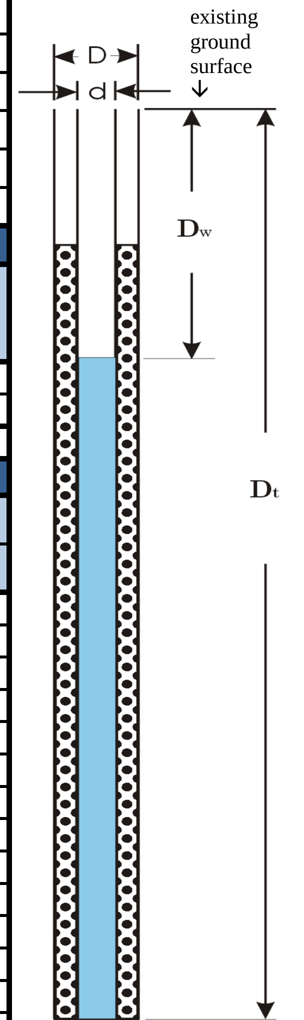
APPENDIX E

PERCOLATION / INFILTRATION

Boring/Test Number: P-1

Total Depth of Boring, D_T (ft):	10	**Test Date:**	2/16/2024
Diameter of Hole, D (in):	8	**Tested By:**	KTM
Diameter of Casing, d (in):	3	**USCS Soil Type:**	SP
Depth of Slotted Casing (ft):	5 to 10	**Depth to Groundwater (ft):**	?
Porosity of Annulus Material, *n* :	0.42	**Ground Elevation (msl ft):**	282
Depth from Existing Ground Surface to Bottom of Prop. Infiltration System (ft):			10



SANDY SOIL CRITERIA TEST

Trial No.	Time Interval Δt (min.)	Depth to Water, D_w Initial, D_o (ft.)	Depth to Water, D_w Final, D_f (ft.)	Change in Water Level ΔD (in.)	Change in Height of Water Greater Than or Equal to 6"? (Yes/No)*
1	25	8.75	10	15	yes
2	25	8.85	10	13.8	yes

Standard Time Interval Between Readings (min.), [* if yes = 10, if no = 30]: 30

PERCOLATION TEST

Trial No.	Time Interval Δt (min.)	Depth to Water, D_w Initial, D_o (ft.)	Depth to Water, D_w Final, D_f (ft.)	Change in Water Level ΔH (in.)	Percolation Rate (min/in.)	Percolation Rate (gal/day/ft^2)
1	10	8.10	10.00	22.80	0.44	153.21
2	10	8.00	10.00	24.00	0.42	154.37
3	10	8.05	10.00	23.40	0.43	153.80
4	10	8.00	10.00	24.00	0.42	154.37
5	10	7.80	10.00	26.40	0.38	156.40
6	10	7.75	9.95	26.40	0.38	150.46

TEST RESULTS**

Infiltration Rate [Porchet Method]# (inches/hour)	Percolation Rate (min/in.)	Percolation Rate (gal/day/ft^2)
13.40	**0.38**	**150.46**

**Raw Results. Does Not Include a Factor of Safety

FACTOR OF SAFETY

Testing Option	Testing Requirements	Factor of Safety per Reference
Option 2	**4 tests minimum with at least two borings per basin**	**3**

Where Infiltration Rate, It = ΔH (60r) / Δt (r + 2Havg)

$r = D / 2$

$H_o = D_T - D_o$

$H_f = D_T - D_f$

$\Delta H = \Delta D = H_o - H_f$

$H_{avg} = (H_o + H_f) / 2$

Reference:
RCFCWCD, Design Handbook for LID, dated September, 2011

PETRA GEOSCIENCES, INC.
3186 Airway Avenue, Suite K
Costa Mesa, California 92626
PHONE: (714) 549-8921
COSTA MESA TEMECULA LOS ANGELES PALM DESERT CORONA ESCONDIDO

PERCOLATION TEST SUMMARY

Key Largo Avenue
Rancho Mirage, Riverside County, CA

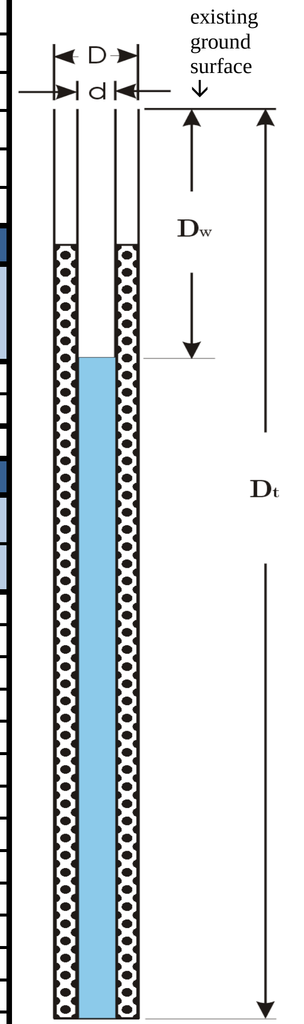
PETRA GEOSCIENCES INC.

DATE: Feb. , 2024
J.N.: 24-104

Appendix E

Boring/Test Number: P-2

Total Depth of Boring, D_T (ft):	9.9	**Test Date:**	2/16/2024
Diameter of Hole, D (in):	8	**Tested By:**	KTM
Diameter of Casing, d (in):	3	**USCS Soil Type:**	SP
Depth of Slotted Casing (ft):	5 to 10	**Depth to Groundwater (ft):**	?
Porosity of Annulus Material, *n* :	0.42	**Ground Elevation (msl ft):**	282
Depth from Existing Ground Surface to Bottom of Prop. Infiltration System (ft):			10



SANDY SOIL CRITERIA TEST

Trial No.	Time Interval Δt (min.)	Depth to Water, D_w		Change in Water Level ΔD (in.)	Change in Height of Water Greater Than or Equal to 6"? (Yes/No)*
		Initial, D_o (ft.)	Final, D_f (ft.)		
1	25	8.35	9.9	18.6	yes
2	25	8.00	9.9	22.8	yes
Standard Time Interval Between Readings (min.), [* if yes = 10, if no = 30]:					30

PERCOLATION TEST

Trial No.	Time Interval Δt (min.)	Depth to Water, D_w		Change in Water Level ΔH (in.)	Percolation Rate	
		Initial, D_o (ft.)	Final, D_f (ft.)		(min/in.)	(gal/day/ft^2)
1	10	8.25	9.90	19.80	0.51	149.83
2	10	7.90	9.90	24.00	0.42	154.37
3	10	7.75	9.90	25.80	0.39	155.92
4	10	7.50	9.90	28.80	0.35	158.13
5	10	7.40	9.80	28.80	0.35	147.35
6	10	7.40	9.80	28.80	0.35	147.35

TEST RESULTS**

Infiltration Rate [Porchet Method]# (inches/hour)	Percolation Rate	
	(min/in.)	(gal/day/ft^2)
13.06	**0.35**	**147.35**

**Raw Results. Does Not Include a Factor of Safety

FACTOR OF SAFETY

Testing Option	Testing Requirements	Factor of Safety per Reference
Option 2	**4 tests minimum with at least two borings per basin**	**3**

Where Infiltration Rate, $I_t = \Delta H\,(60r) / \Delta t\,(r + 2H_{avg})$

$r = D / 2$

$H_o = D_T - D_o$

$H_f = D_T - D_f$

$\Delta H = \Delta D = H_o - H_f$

$H_{avg} = (H_o + H_f) / 2$

Reference:
RCFCWCD, Design Handbook for LID, dated September, 2011

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COSTA MESA TEMECULA LOS ANGELES PALM DESERT CORONA ESCONDIDO

PERCOLATION TEST SUMMARY

Key Largo Avenue
Rancho Mirage, Riverside County, CA

PETRA GEOSCIENCES INC.

DATE: Feb. , 2024
J.N.: 24-104

Appendix E

APPENDIX F

STANDARD GRADING SPECIFICATIONS

STANDARD GRADING SPECIFICATIONS

These specifications present the usual and minimum requirements for projects on which Petra Geosciences, Inc. (Petra) is the geotechnical consultant. No deviation from these specifications will be allowed, except where specifically superseded in the preliminary geology and soils report, or in other written communication signed by the Soils Engineer and Engineering Geologist of record (Geotechnical Consultant).

I. GENERAL

A. The Geotechnical Consultant is the Owner's or Builder's representative on the project. For the purpose of these specifications, participation by the Geotechnical Consultant includes that observation performed by any person or persons employed by, and responsible to, the licensed Soils Engineer and Engineering Geologist signing the soils report.

B. The contractor should prepare and submit to the Owner and Geotechnical Consultant a work plan that indicates the sequence of earthwork grading, the number of "spreads" and the estimated quantities of daily earthwork to be performed prior to the commencement of grading. This work plan should be reviewed by the Geotechnical Consultant to schedule personnel to perform the appropriate level of observation, mapping, and compaction testing as necessary.

C. All clearing, site preparation, or earthwork performed on the project shall be conducted by the Contractor in accordance with the recommendations presented in the geotechnical report and under the observation of the Geotechnical Consultant.

D. It is the Contractor's responsibility to prepare the ground surface to receive the fills to the satisfaction of the Geotechnical Consultant and to place, spread, mix, water, and compact the fill in accordance with the specifications of the Geotechnical Consultant. The Contractor shall also remove all material considered unsatisfactory by the Geotechnical Consultant.

E. It is the Contractor's responsibility to have suitable and sufficient compaction equipment on the job site to handle the amount of fill being placed. If necessary, excavation equipment will be shut down to permit completion of compaction to project specifications. Sufficient watering apparatus will also be provided by the Contractor, with due consideration for the fill material, rate of placement, and time of year.

F. After completion of grading a report will be submitted by the Geotechnical Consultant.

II. SITE PREPARATION

A. Clearing and Grubbing

1. All vegetation such as trees, brush, grass, roots, and deleterious material shall be disposed of offsite. This removal shall be concluded prior to placing fill.

2. Any underground structures such as cesspools, cisterns, mining shafts, tunnels, septic tanks, wells, pipe lines, etc., are to be removed or treated in a manner prescribed by the Geotechnical Consultant.

III. FILL AREA PREPARATION

A. Remedial Removals/Overexcavations

1. Remedial removals, as well as overexcavation for remedial purposes, shall be evaluated by the Geotechnical Consultant. Remedial removal depths presented in the geotechnical report and shown on the geotechnical plans are estimates only. The actual extent of removal should be determined by the Geotechnical Consultant based on the conditions exposed during grading. All soft, loose, dry, saturated, spongy, organic-rich, highly fractured or otherwise unsuitable ground shall be overexcavated to competent ground as determined by the Geotechnical Consultant.

2. Soil, alluvium, or bedrock materials determined by the Soils Engineer as being unsuitable for placement in compacted fills shall be removed from the site. Any material incorporated as a part of a compacted fill must be approved by the Geotechnical Consultant.

3. Should potentially hazardous materials be encountered, the Contractor should stop work in the affected area. An environmental consultant specializing in hazardous materials should be notified immediately for evaluation and handling of these materials prior to continuing work in the affected area.

B. Evaluation/Acceptance of Fill Areas

All areas to receive fill, including removal and processed areas, key bottoms, and benches, shall be observed, mapped, elevations recorded, and/or tested prior to being accepted by the Geotechnical Consultant as suitable to receive fill. The contractor shall obtain a written acceptance from the Geotechnical Consultant prior to fill placement. A licensed surveyor shall provide sufficient survey control for determining locations and elevations of processed areas, keys, and benches.

C. Processing

After the ground surface to receive fill has been declared satisfactory for support of fill by the Geotechnical Consultant, it shall be scarified to a minimum depth of 6 inches and until the ground surface is uniform and free from ruts, hollows, hummocks, or other uneven features which may prevent uniform compaction.

The scarified ground surface shall then be brought to optimum moisture, mixed as required, and compacted to a minimum relative compaction of 90 percent.

D. Subdrains

Subdrainage devices shall be constructed in compliance with the ordinances of the controlling governmental agency, and/or with the recommendations of the Geotechnical Consultant. (Typical Canyon Subdrain details are given on Plate SG-1).

E. Cut/Fill & Deep Fill/Shallow Fill Transitions

In order to provide uniform bearing conditions in cut/fill and deep fill/shallow fill transition lots, the cut and shallow fill portions of the lot should be overexcavated to the depths and the horizontal limits discussed in the approved geotechnical report and replaced with compacted fill. (Typical details are given on Plate SG-7.)

IV. COMPACTED FILL MATERIAL

A. General

Materials excavated on the property may be utilized in the fill, provided each material has been determined to be suitable by the Geotechnical Consultant. Material to be used for fill shall be essentially free of organic material and other deleterious substances. Roots, tree branches, and other matter missed during clearing shall be removed from the fill as recommended by the Geotechnical Consultant. Material that is spongy, subject to decay, or otherwise considered unsuitable shall not be used in the compacted fill.

Soils of poor quality, such as those with unacceptable gradation, high expansion potential, or low strength shall be placed in areas acceptable to the Geotechnical Consultant or mixed with other soils to achieve satisfactory fill material.

B. Oversize Materials

Oversize material defined as rock, or other irreducible material with a maximum dimension greater than 12 inches in diameter, shall be taken offsite or placed in accordance with the recommendations of the Geotechnical Consultant in areas designated as suitable for rock disposal (Typical details for Rock Disposal are given on Plate SG-4).

Rock fragments less than 12 inches in diameter may be utilized in the fill provided, they are not nested or placed in concentrated pockets; they are surrounded by compacted fine grained soil material and the distribution of rocks is approved by the Geotechnical Consultant.

C. Laboratory Testing

Representative samples of materials to be utilized as compacted fill shall be analyzed by the laboratory of the Geotechnical Consultant to determine their physical properties. If any material other than that previously tested is encountered during grading, the appropriate analysis of this material shall be conducted by the Geotechnical Consultant as soon as possible.

D. Import

If importing of fill material is required for grading, proposed import material should meet the requirements of the previous section. The import source shall be given to the Geotechnical Consultant at least 2 working days prior to importing so that appropriate tests can be performed and its suitability determined.

V. FILL PLACEMENT AND COMPACTION

A. Fill Layers

Material used in the compacting process shall be evenly spread, watered, processed, and compacted in thin lifts not to exceed 6 inches in thickness to obtain a uniformly dense layer. The fill shall be placed and compacted on a horizontal plane, unless otherwise approved by the Geotechnical Consultant.

B. Moisture Conditioning

Fill soils shall be watered, dried back, blended, and/or mixed, as necessary to attain a relatively uniform moisture content at or slightly above optimum moisture content.

C. Compaction

Each layer shall be compacted to 90 percent of the maximum density in compliance with the testing method specified by the controlling governmental agency. (In general, ASTM D 1557-02, will be used.)

If compaction to a lesser percentage is authorized by the controlling governmental agency because of a specific land use or expansive soils condition, the area to received fill compacted to less than 90 percent shall either be delineated on the grading plan or appropriate reference made to the area in the soils report.

D. Failing Areas

If the moisture content or relative density varies from that required by the Geotechnical Consultant, the Contractor shall rework the fill until it is approved by the Geotechnical Consultant.

E. Benching

All fills shall be keyed and benched through all topsoil, colluvium, alluvium or creep material, into sound bedrock or firm material where the slope receiving fill exceeds a ratio of 5 horizontal to 1 vertical, in accordance with the recommendations of the Geotechnical Consultant.

VI. SLOPES

A. Fill Slopes

The contractor will be required to obtain a minimum relative compaction of 90 percent out to the finish slope face of fill slopes, buttresses, and stabilization fills. This may be achieved by either overbuilding the slope and cutting back to the compacted core, or by direct compaction of the slope face with suitable equipment, or by any other procedure that produces the required compaction.

B. Side Hill Fills

The key for side hill fills shall be a minimum of 15 feet within bedrock or firm materials, unless otherwise specified in the soils report. (See detail on Plate SG-5.)

C. Fill-Over-Cut Slopes

Fill-over-cut slopes shall be properly keyed through topsoil, colluvium or creep material into rock or firm materials, and the transition shall be stripped of all soils prior to placing fill. (see detail on Plate SG-6).

D. Landscaping

All fill slopes should be planted or protected from erosion by other methods specified in the soils report.

E. Cut Slopes

1. The Geotechnical Consultant should observe all cut slopes at vertical intervals not exceeding 10 feet.

2. If any conditions not anticipated in the preliminary report such as perched water, seepage, lenticular or confined strata of a potentially adverse nature, unfavorably inclined bedding, joints or fault planes are encountered during grading, these conditions shall be evaluated by the Geotechnical Consultant, and recommendations shall be made to treat these problems (Typical details for stabilization of a portion of a cut slope are given in Plates SG-2 and SG-3.).

3. Cut slopes that face in the same direction as the prevailing drainage shall be protected from slope wash by a non-erodible interceptor swale placed at the top of the slope.

4. Unless otherwise specified in the soils and geological report, no cut slopes shall be excavated higher or steeper than that allowed by the ordinances of controlling governmental agencies.

5. Drainage terraces shall be constructed in compliance with the ordinances of controlling governmental agencies, or with the recommendations of the Geotechnical Consultant.

VII. GRADING OBSERVATION

A. General

All cleanouts, processed ground to receive fill, key excavations, subdrains, and rock disposals must be observed and approved by the Geotechnical Consultant prior to placing any fill. It shall be the Contractor's responsibility to notify the Geotechnical Consultant when such areas are ready.

B. Compaction Testing

Observation of the fill placement shall be provided by the Geotechnical Consultant during the progress of grading. Location and frequency of tests shall be at the Consultants discretion based on field conditions encountered. Compaction test locations will not necessarily be selected on a random basis. Test locations may be selected to verify adequacy of compaction levels in areas that are judged to be susceptible to inadequate compaction.

C. Frequency of Compaction Testing

In general, density tests should be made at intervals not exceeding 2 feet of fill height or every 1000 cubic yards of fill placed. This criteria will vary depending on soil conditions and the size of the job. In any event, an adequate number of field density tests shall be made to verify that the required compaction is being achieved.

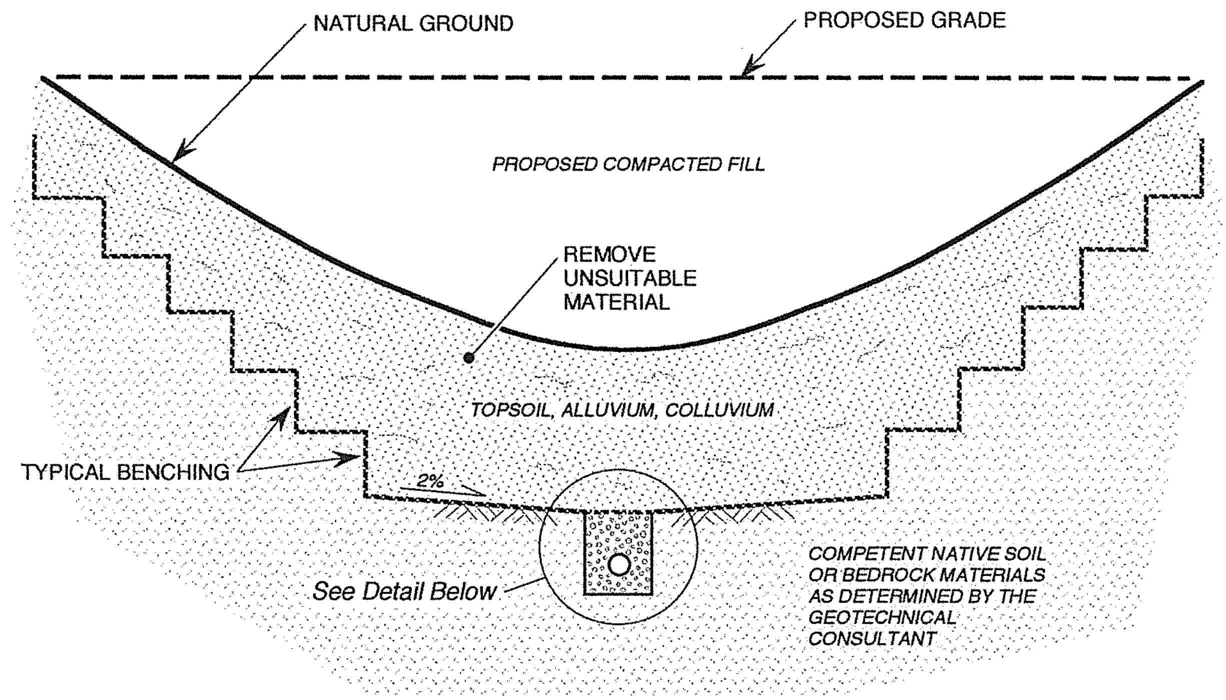
VIII. CONSTRUCTION CONSIDERATIONS

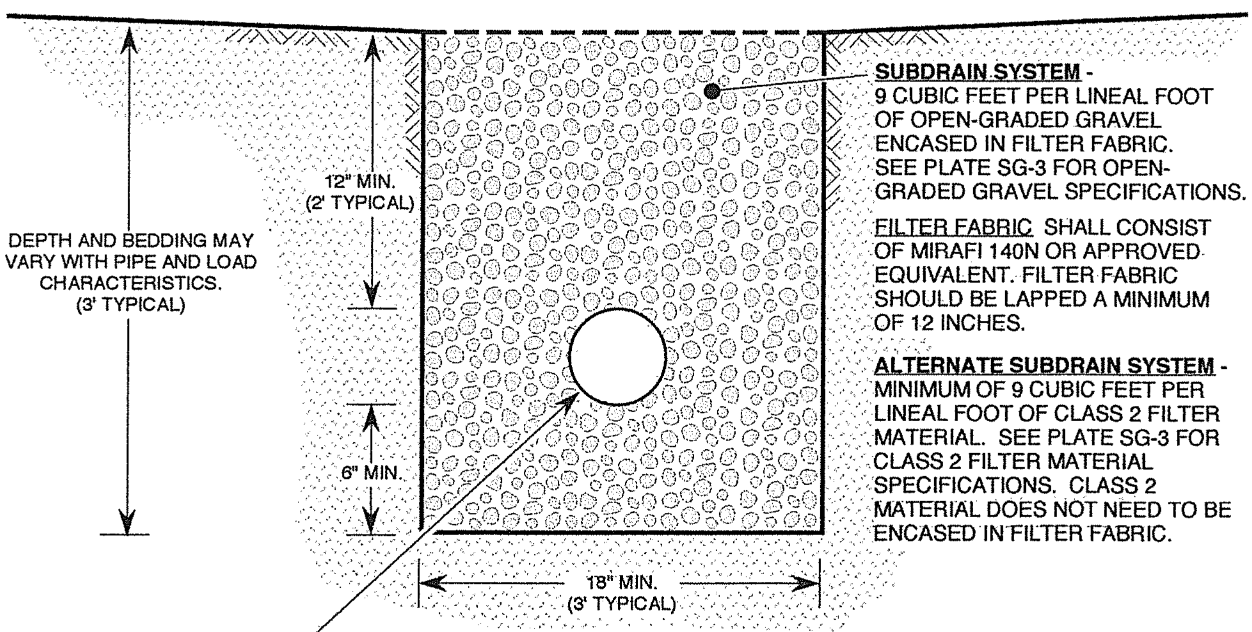
A. Erosion control measures, when necessary, shall be provided by the Contractor during grading and prior to the completion and construction of permanent drainage controls.

B. Upon completion of grading and termination of observations by the Geotechnical Consultant, no further filling or excavating, including that necessary for footings, foundations, large tree wells, retaining walls, or other features shall be performed without the approval of the Geotechnical Consultant.

C. Care shall be taken by the Contractor during final grading to preserve any berms, drainage terraces, interceptor swales, or other devices of permanent nature on or adjacent to the property.

S:\!BOILERS-WORK\REPORT INSERTS\STANDARD GRADING SPECS



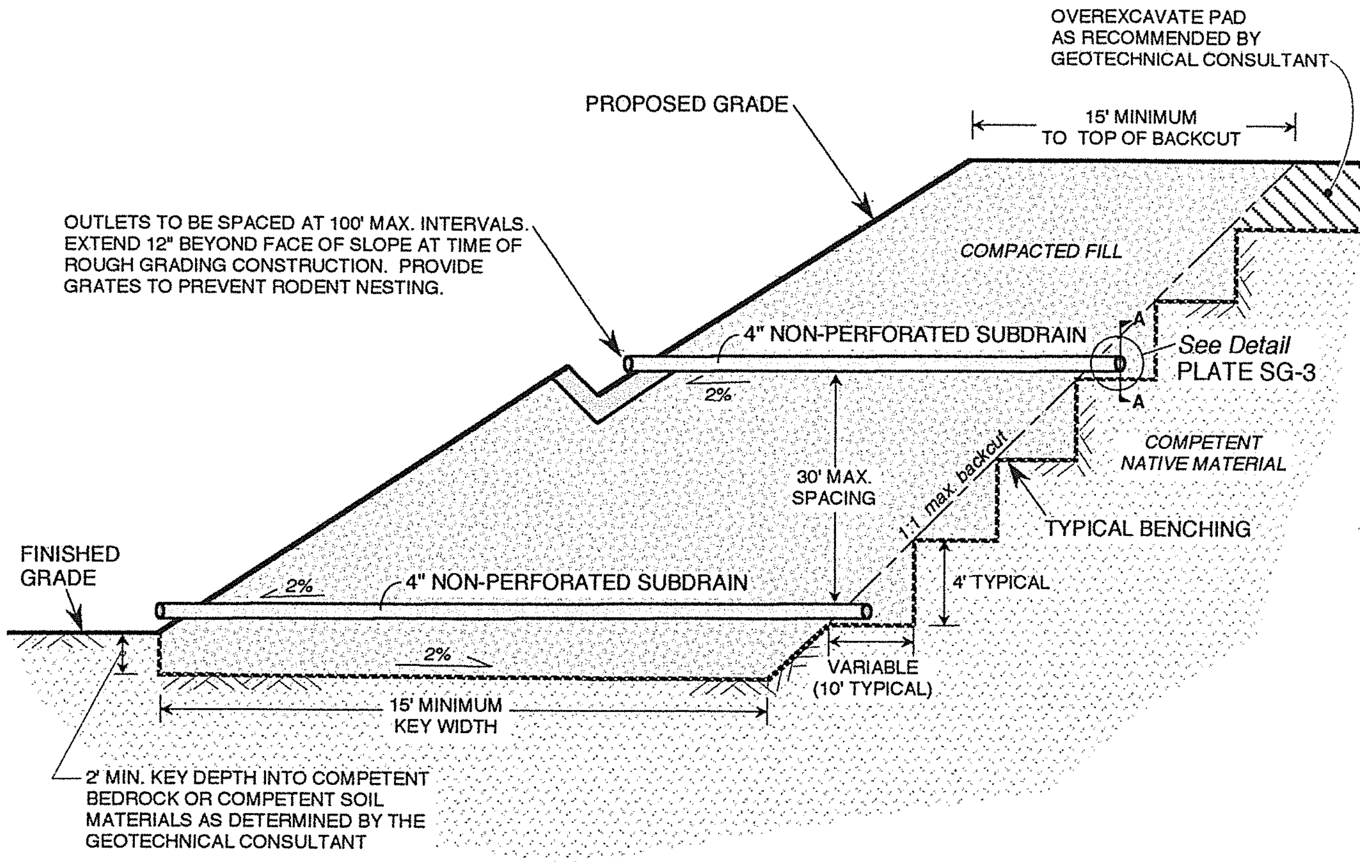


MINIMUM 6-INCH DIAMETER PVC SCHEDULE 40, OR ABS SDR-35 WITH A MINIMUM OF EIGHT 1/4-INCH DIAMETER PERFORATIONS PER LINEAL FOOT IN BOTTOM HALF OF PIPE. PIPE TO BE LAID WITH PERFORATIONS FACING DOWN.

NOTES:

1. FOR CONTINUOUS RUNS IN EXCESS OF 500 FEET USE 8-INCH DIAMETER PIPE.
2. FINAL 20 FEET OF PIPE AT OUTLET SHALL BE NON-PERFORATED AND BACKFILLED WITH FINE-GRAINED MATERIAL.

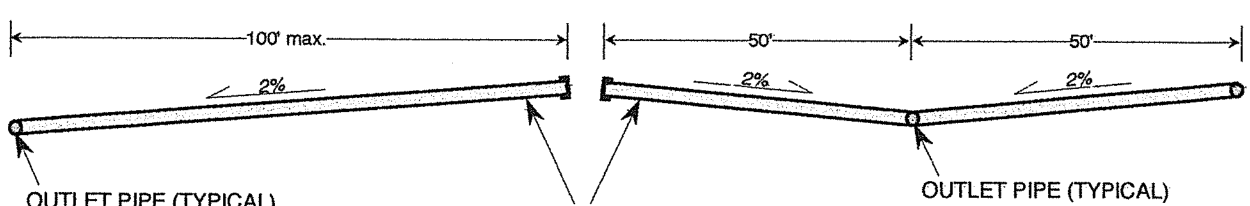
PETRA	CANYON SUBDRAIN DETAIL	PLATE SG-1



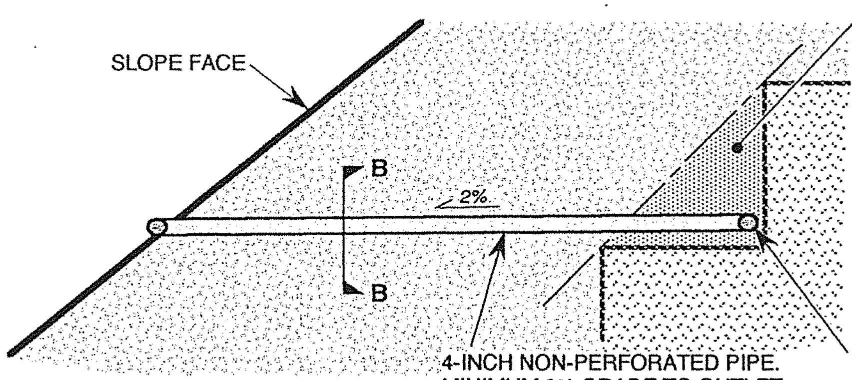
NOTES:

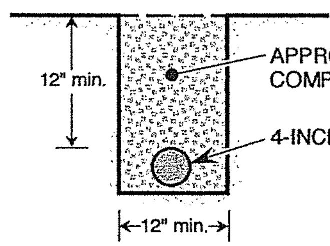
1. 30' MAXIMUM VERTICAL SPACING BETWEEN SUBDRAIN SYSTEMS.
2. 100' MAXIMUM HORIZONTAL DISTANCE BETWEEN NON-PERFORATED OUTLET PIPES. *(See Below)*
3. MINIMUM GRADIENT OF 2% FOR ALL PERFORATED AND NON-PERFORATED PIPE.

SECTION A-A (PERFORATED PIPE PROFILE)



PETRA	BUTTRESS OR STABILIZATION FILL DETAIL	PLATE SG-2





SECTION B-B (OUTLET PIPE)

PIPE SPECIFICATIONS:

1. 4-INCH MINIMUM DIAMETER, PVC SCHEDULE 40 OR ABS SDR-35.
2. FOR PERFORATED PIPE, MINIMUM 8 PERFORATIONS PER FOOT ON BOTTOM HALF OF PIPE.

FILTER MATERIAL/FABRIC SPECIFICATIONS:

OPEN-GRADED GRAVEL ENCASED IN FILTER FABRIC.
(MIRAFI 140N OR EQUIVALENT)

OPEN-GRADED GRAVEL

SIEVE SIZE	PERCENT PASSING
1 1/2-INCH	88 - 100
1-INCH	5 - 40
3/4-INCH	0 - 17
3/8-INCH	0 - 7
No. 200	0 - 3

ALTERNATE:

CLASS 2 PERMEABLE FILTER MATERIAL PER CALTRANS STANDARD SPECIFICATION 68-1.025.

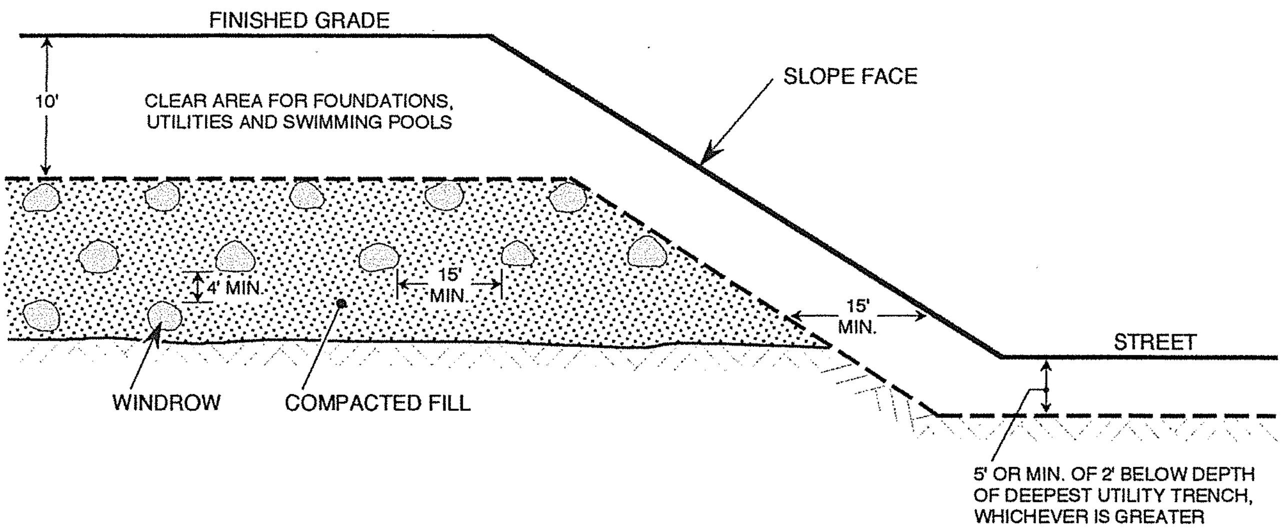
CLASS 2 FILTER MATERIAL

SIEVE SIZE	PERCENT PASSING
1-INCH	100
3/4-INCH	90 - 100
3/8-INCH	40 - 100
No. 4	25 - 40
No. 8	18 - 33
No. -30	5 - 15
No. -50	0 - 7
No. 200	0 - 3

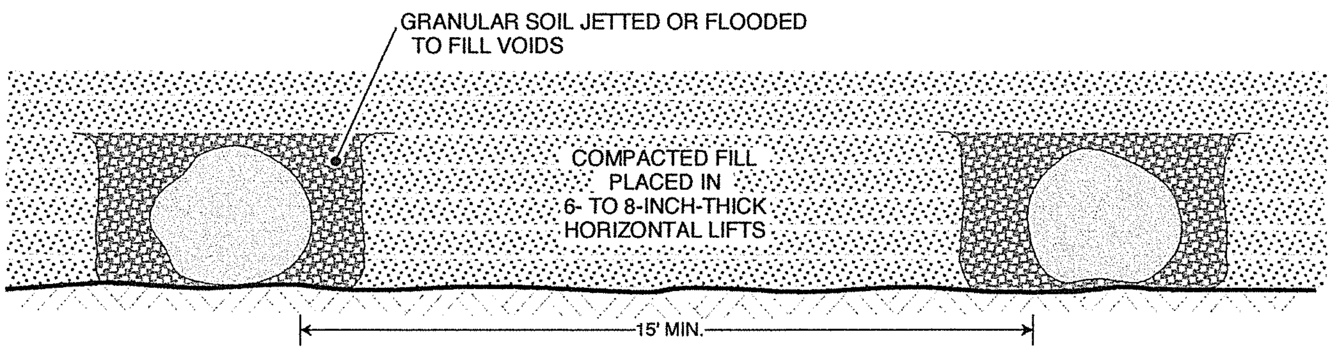
PETRA

BUTTRESS OR STABILIZATION FILL SUBDRAIN

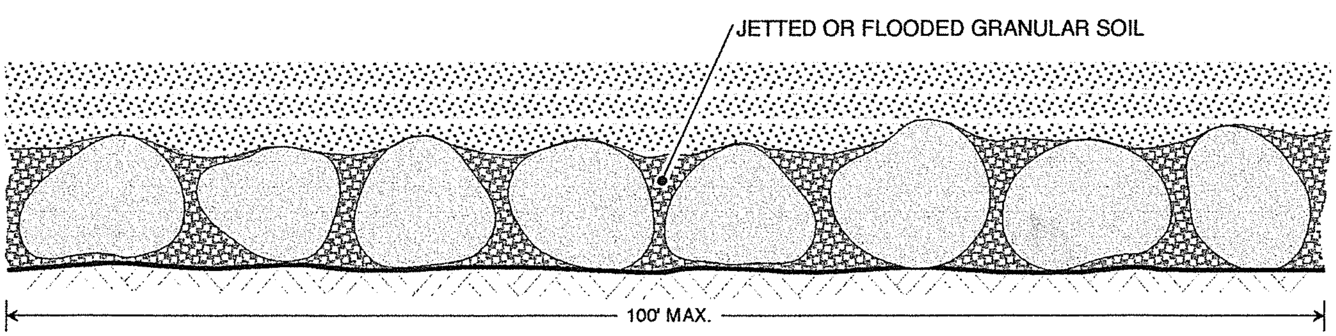
PLATE SG-3



TYPICAL WINDROW DETAIL (END VIEW)

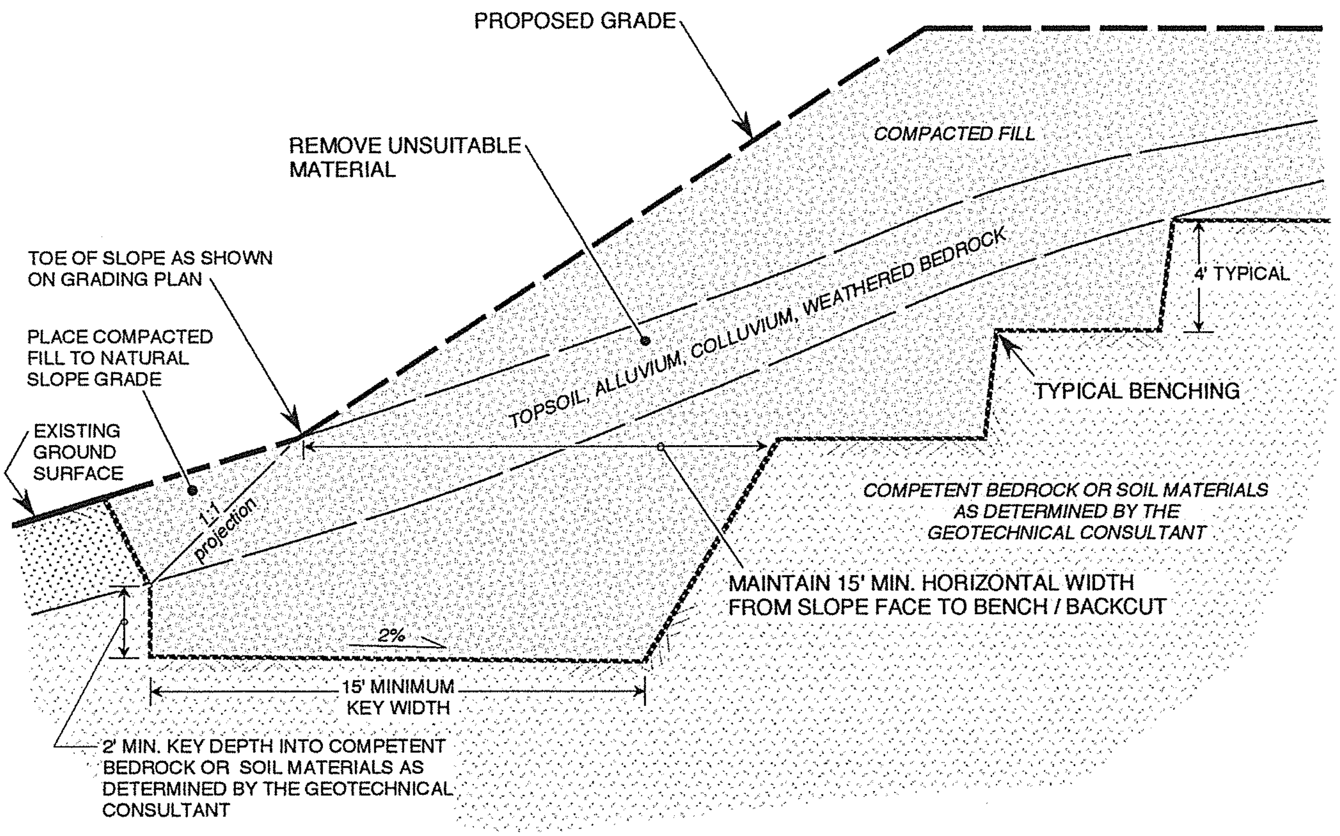


TYPICAL WINDROW DETAIL (PROFILE VIEW)



NOTE: OVERSIZE ROCK IS DEFINED AS CLASTS HAVING A MAXIMUM DIMENSION OF 12" OR LARGER

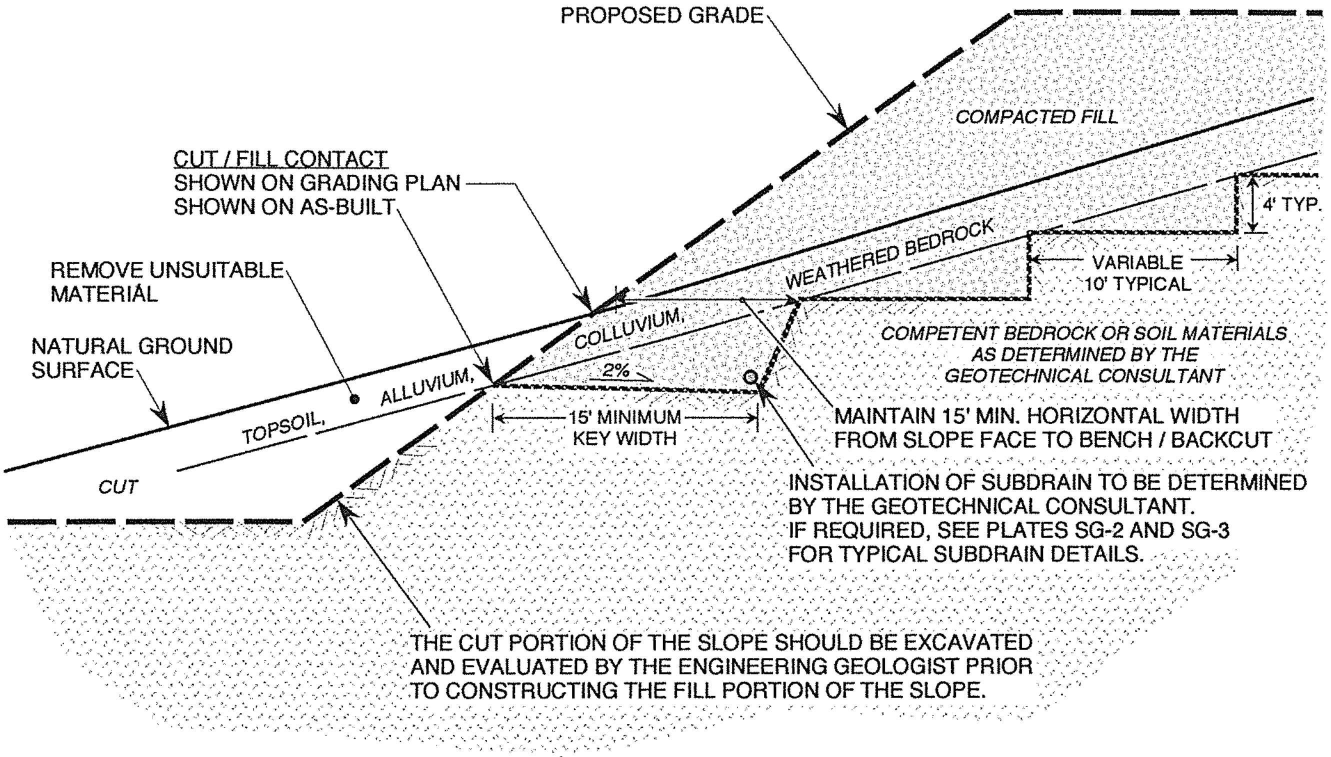
PETRA	TYPICAL ROCK DISPOSAL DETAIL	PLATE SG-4



NOTES:

1. WHERE NATURAL SLOPE GRADIENT IS 5:1 OR LESS, BENCHING IS NOT NECESSARY; HOWEVER, FILL IS NOT TO BE PLACED ON COMPRESSIBLE OR UNSUITABLE MATERIAL.
2. SOILS ENGINEER TO DETERMINE IF SUBDRAIN IS REQUIRED.

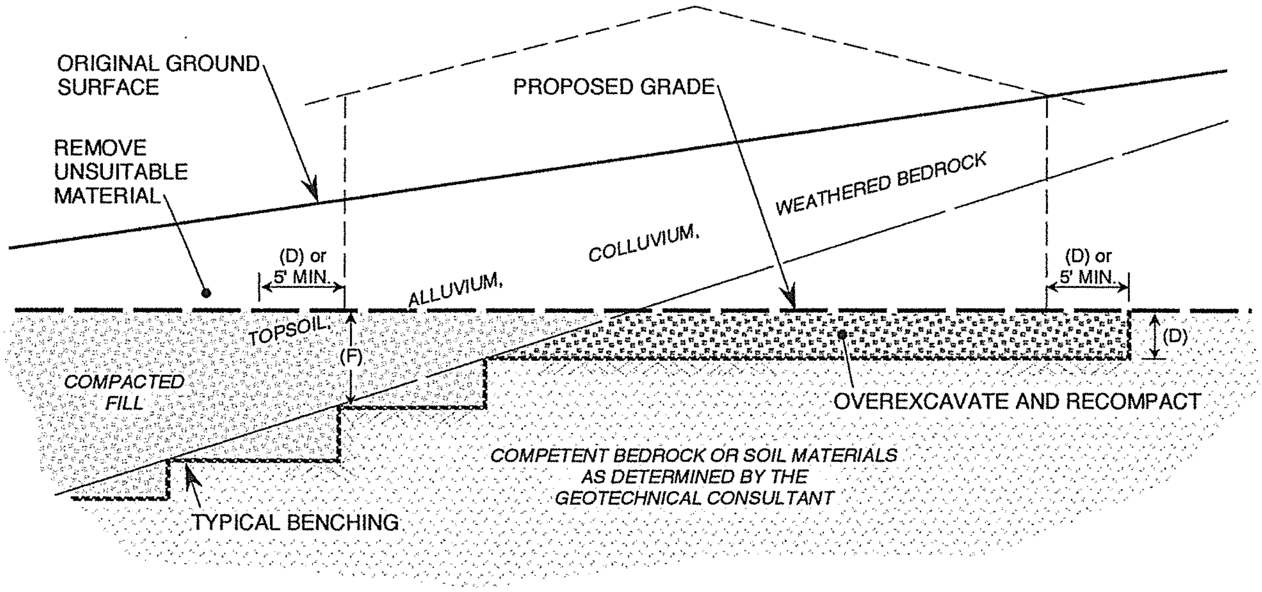
PETRA	FILL SLOPE ABOVE NATURAL SLOPE	PLATE SG-5



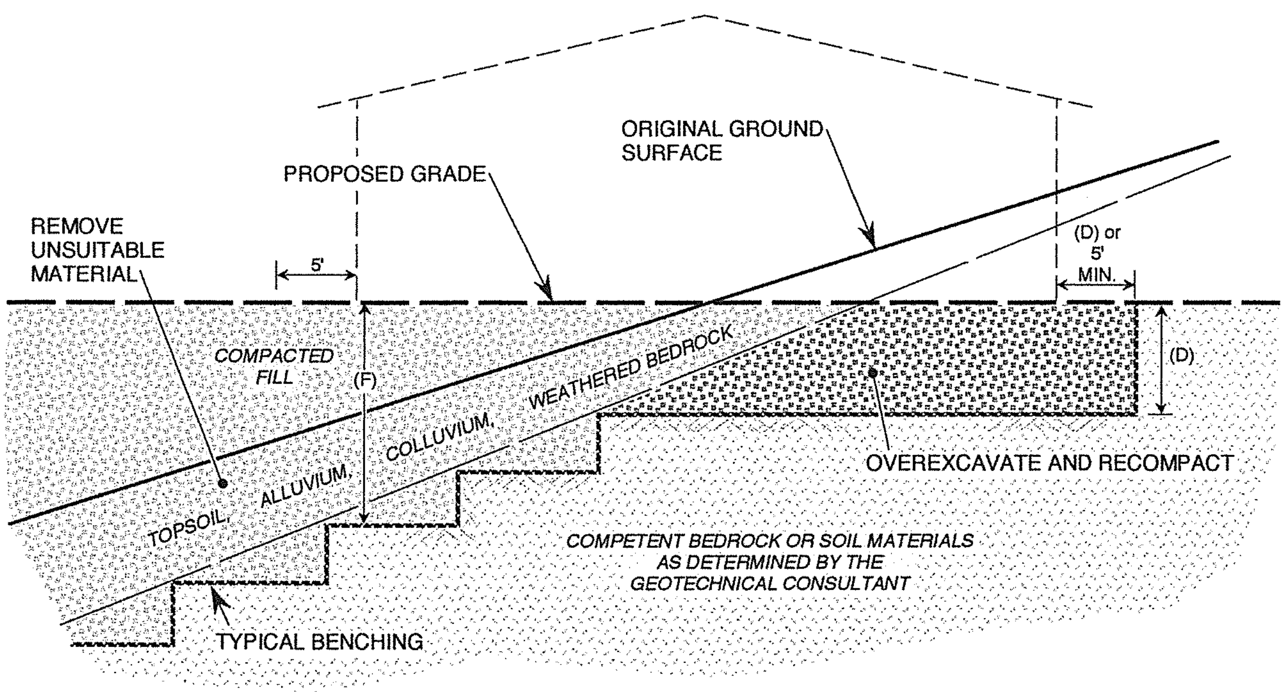
PETRA	FILL SLOPE ABOVE CUT SLOPE	PLATE SG-6

CUT LOT

UNSUITABLE MATERIAL EXPOSED IN PORTION OF CUT PAD

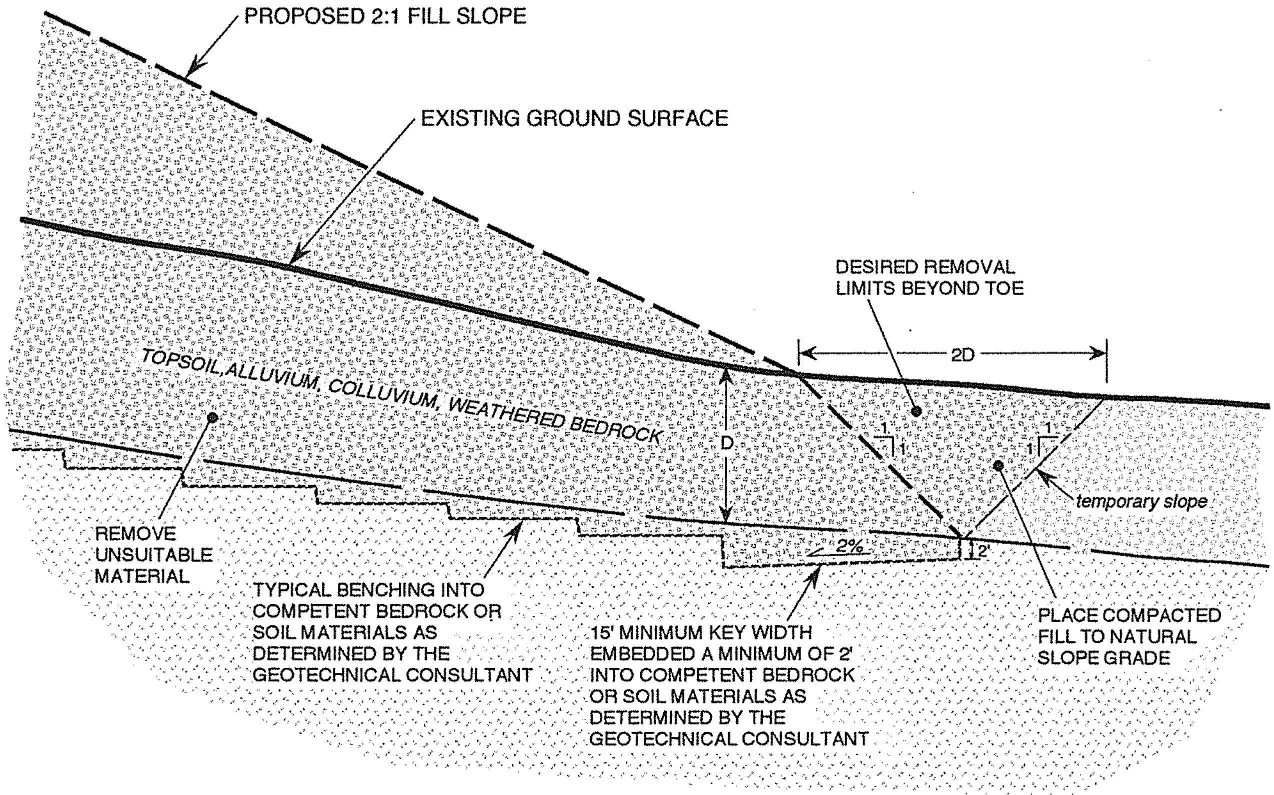


CUT-FILL TRANSITION LOT



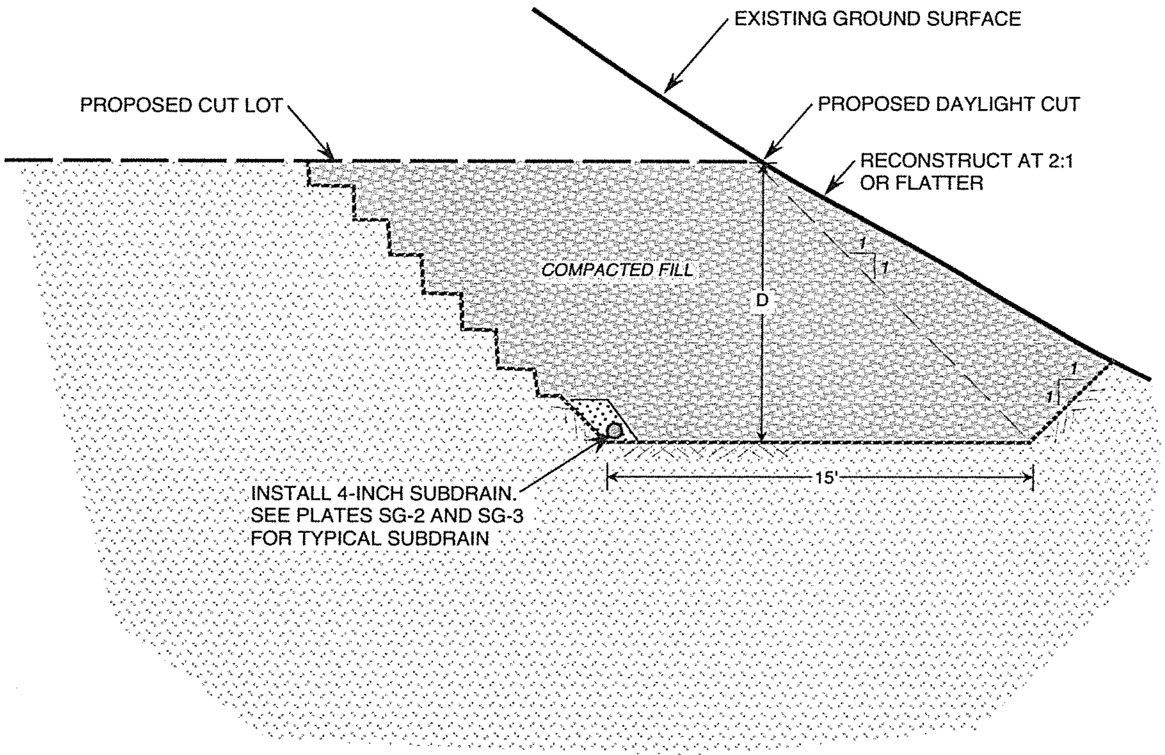
MAXIMUM FILL THICKNESS (F)	DEPTH OF OVEREXCAVATION (D)
FOOTING DEPTH TO 3 FEET	EQUAL DEPTH
3 TO 6 FEET	3 FEET
GREATER THAN 6 FEET	1/2 THE THICKNESS OF DEEPEST FILL PLACED WITHIN THE "FILL" PORTION (F) TO 15 FEET MAXIMUM

PETRA	CUT LOTS AND CUT-FILL TRANSITION LOTS	PLATE SG-7



D = RECOMMENDED DEPTH OF REMOVAL
PER GEOTECHNICAL REPORT

PETRA	TYPICAL REMOVALS BEYOND TOE OF PROPOSED FILL SLOPE	PLATE SG-8

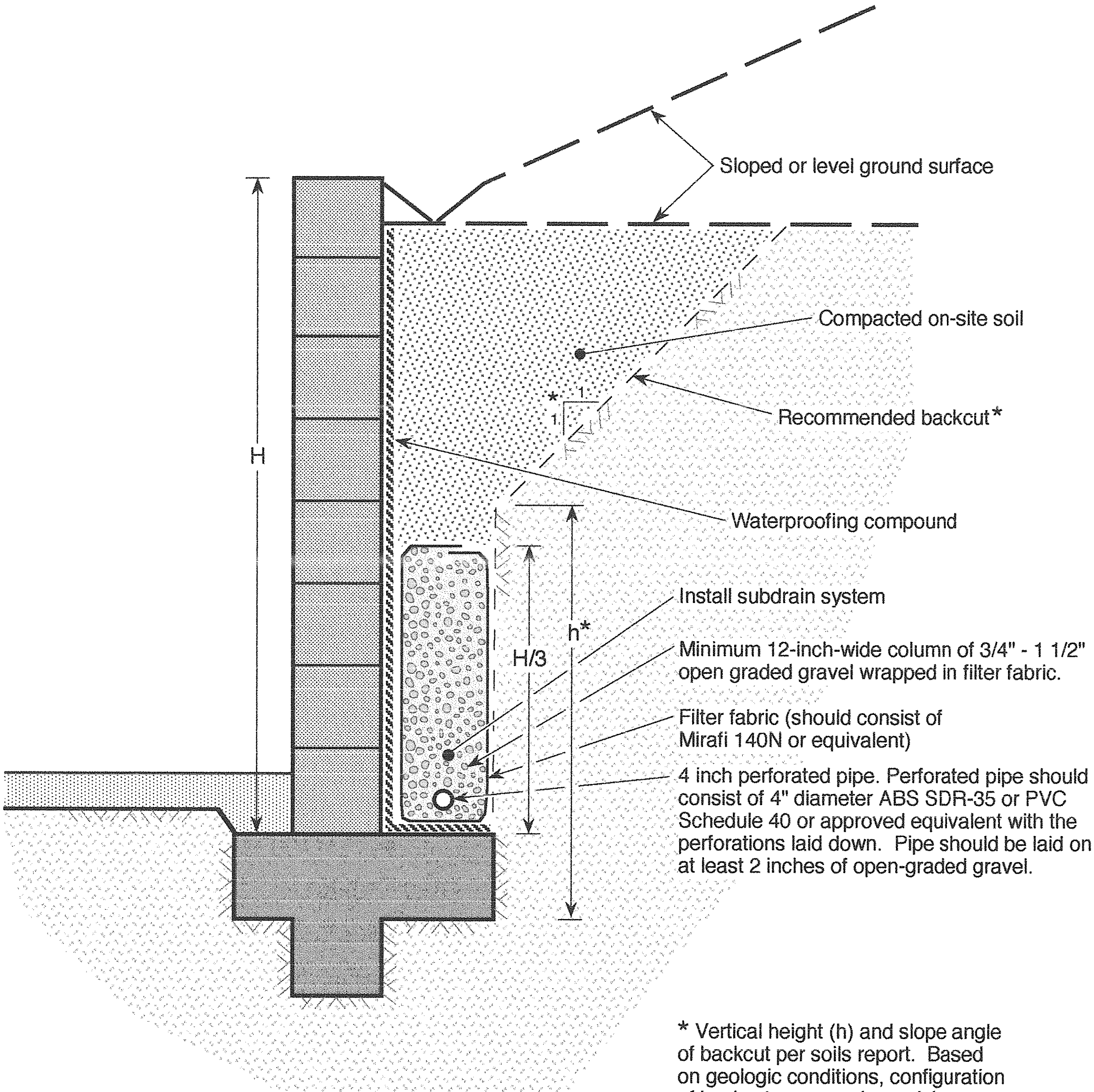


NOTE:

1. "D" SHALL BE 10 FEET MINIMUM OR AS DETERMINED BY SOILS ENGINEER.

PETRA | SHEAR KEY ON DAYLIGHT CUT LOTS | PLATE SG-9

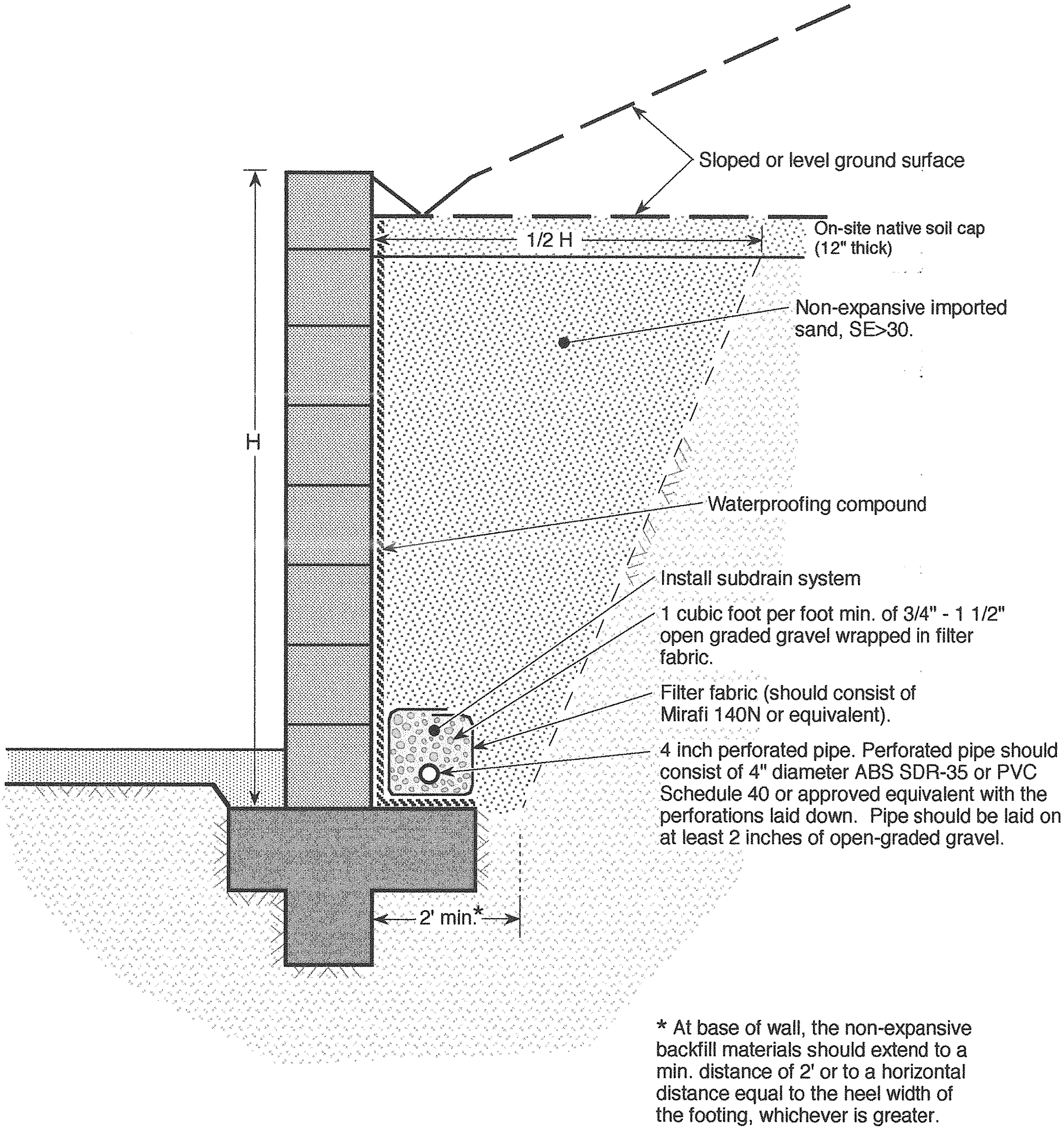
NATIVE SOIL BACKFILL



* Vertical height (h) and slope angle of backcut per soils report. Based on geologic conditions, configuration of backcut may require revisions (i.e. reduced vertical height, revised slope angle, etc.)

PETRA	RETAINING WALL BACKFILL AND SUBDRAIN DETAILS	FIGURE RW-1

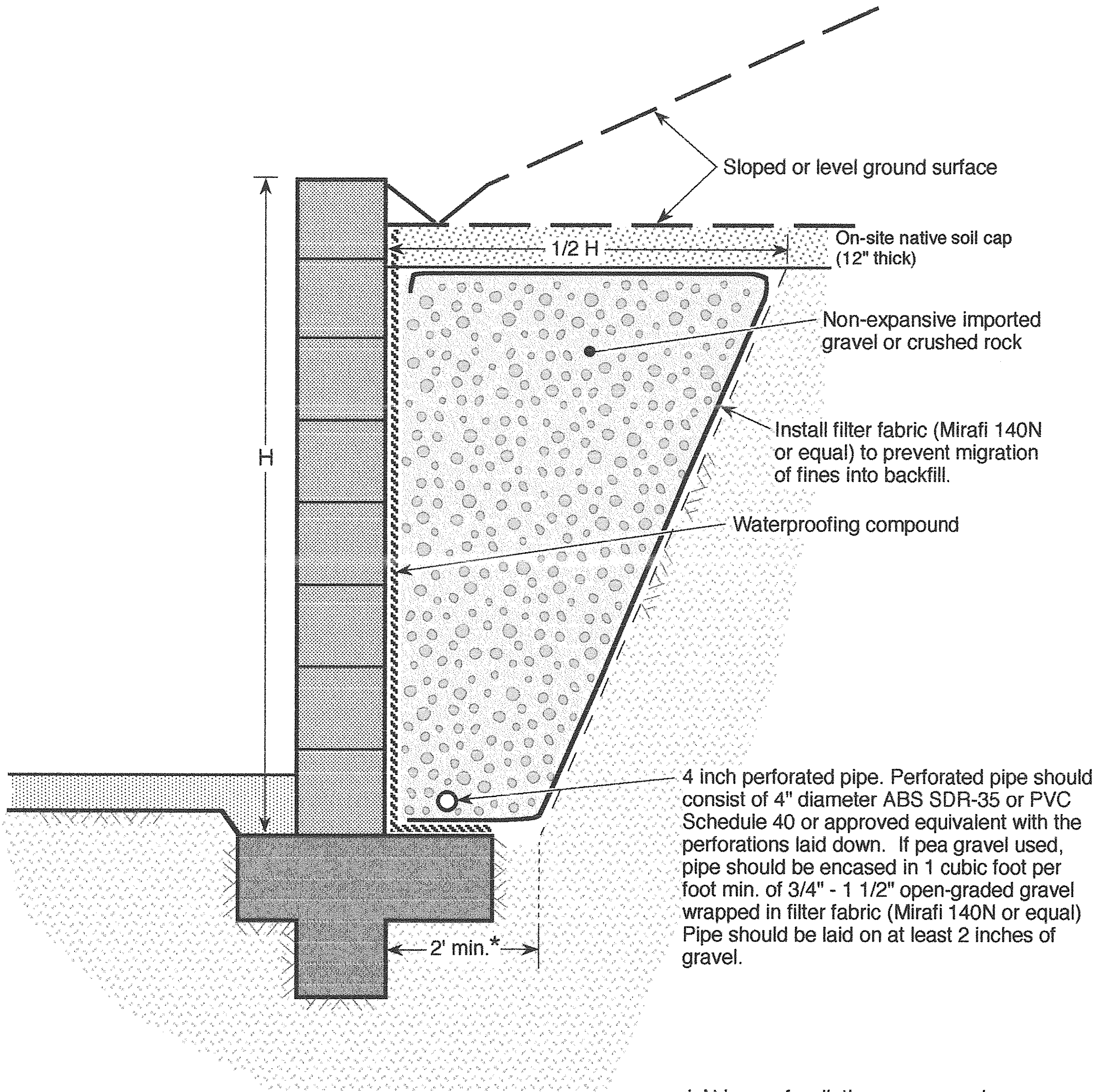
IMPORTED SAND BACKFILL



* At base of wall, the non-expansive backfill materials should extend to a min. distance of 2' or to a horizontal distance equal to the heel width of the footing, whichever is greater.

PETRA	RETAINING WALL BACKFILL AND SUBDRAIN DETAILS	FIGURE RW-2

IMPORTED GRAVEL OR CRUSHED ROCK BACKFILL



* At base of wall, the non-expansive backfill materials should extend to a min. distance of 2' or to a horizontal distance equal to the heel width of the footing, whichever is greater.

PETRA	RETAINING WALL BACKFILL AND SUBDRAIN DETAILS	FIGURE RW-3

Appendix E

Traffic Impact Analysis and Vehicle Miles Traveled (VMT) Screening Analysis

URBAN | CROSSROADS

VIA VAIL VILLAGE

TRAFFIC ANALYSIS

PREPARED BY: Janette Cachola | jcachola@urbanxroads.com
Marlie Whiteman, P.E. | mwhiteman@urbanxroads.com
John Kain, AICP | jkain@urbanxroads.com

Reference Number	Agency	Date
15868-04 TA Report.docx	City of Rancho Mirage	May 21, 2024

TABLE OF CONTENTS

APPENDICES

LIST OF EXHIBITS

LIST OF TABLES

LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
CAMUTCD	California Manual on Uniform Traffic Control Devices
Caltrans	California Department of Transportation
DIF	Development Impact Fee
DU	Dwelling Unit
HCM	Highway Capacity Manual
ICU	Intersection Capacity Utilization
ITE	Institute of Transportation Engineers
LOS	Level of Service
Project	Via Vail Village
TA	Traffic Analysis
TSF	Thousand Square Feet
TUMF	Transportation Uniform Mitigation Fee

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1 INTRODUCTION

This report presents the results of the traffic analysis (TA) for the proposed Via Vail Village ("Project"), which is located south of the future extension of Via Vail, east of Key Largo Avenue in the City of Rancho Mirage. The Project consists of 236 affordable apartment dwelling units. It is anticipated that the Project would be developed by year 2026. A preliminary site plan of the proposed Project is shown in Exhibit 1-1.

The purpose of this TA is to evaluate the potential circulation system deficiencies that may result from the development of the proposed Project and recommend improvements to achieve acceptable circulation system operational conditions. This TA has been prepared based in accordance with the City of Rancho Mirage Transportation Analysis Policy (Revised February 18, 2021) and County of Riverside's Transportation Analysis Guidelines for Level of Service & Vehicle Miles Traveled (December 2020). (1) (2)

To ensure that this TA satisfies the City of Rancho Mirage's traffic study requirements, Urban Crossroads, Inc. prepared a traffic study scoping package for review by City staff. The scope provides an outline of the Project study area, trip generation, trip distribution, and analysis methodology. The Agreement approved by the City is included in Appendix 1.1. Exhibit 1-2 shows the intersection analysis locations included in this study.

1.1 SUMMARY OF FINDINGS

The Project is proposed to have one full access and one emergency access along Via Vail. The Project is anticipated to generate a total of 1,135 trip-ends per day with 85 AM peak hour trips and 109 PM peak hour trips.

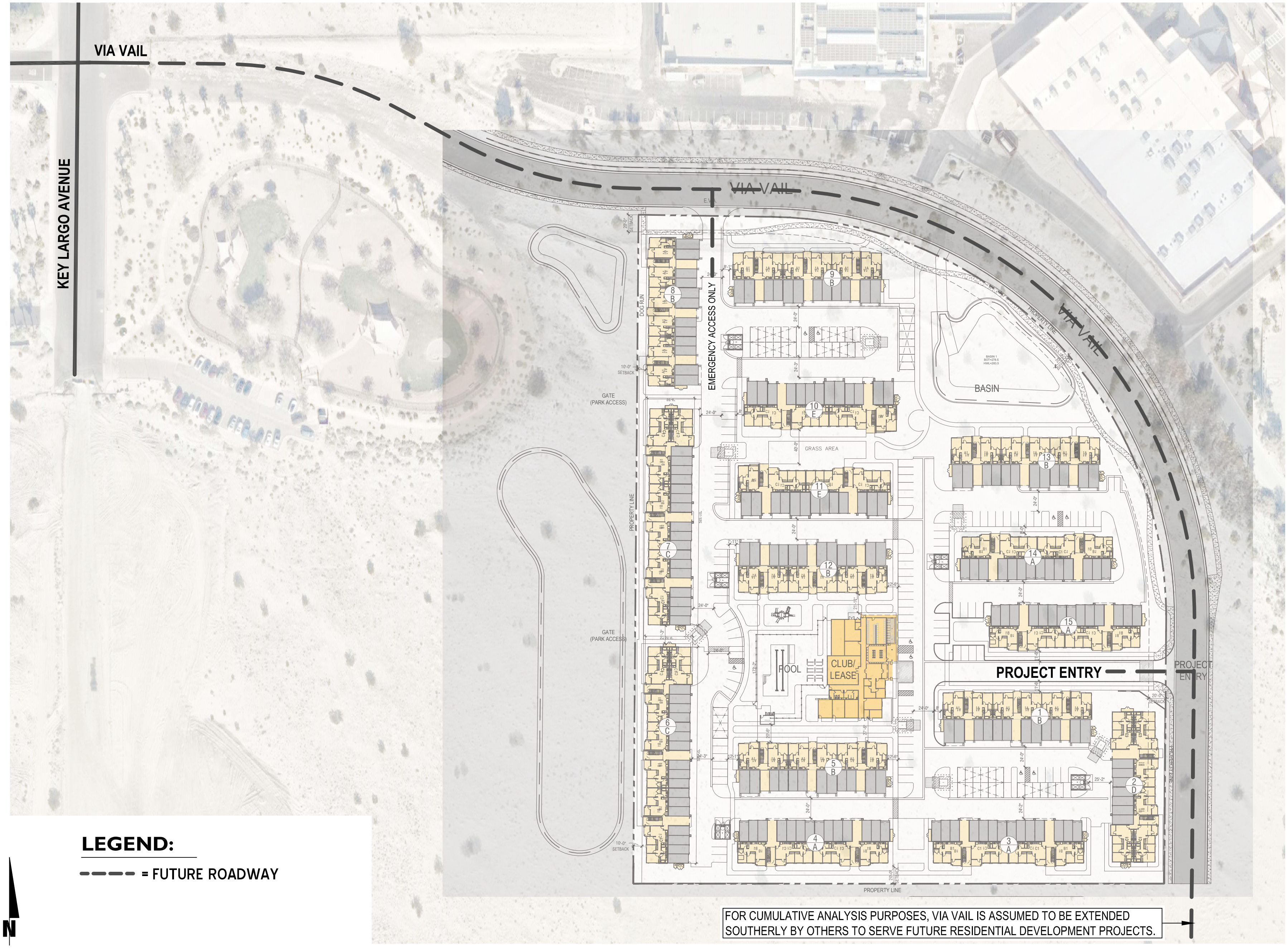
For Existing (2024) conditions, the study area intersections are currently operating at acceptable levels of service (LOS "D" or better).

For EAP (2026) and EAPC (2026), the study area intersections are estimated to continue operating at acceptable levels of service (LOS "D" or better). Study area intersections without existing traffic signals are not anticipated to satisfy traffic signal warrants.

At the Project access location, improvements to Vial Vail as a local collector (60 feet of right-of-way width and 40 feet of curb-to-curb pavement width) are recommended for near term 2026 conditions as described in Chapter 7 of this report.

A queuing analysis was performed for EAPC (2026) conditions to assess the lane geometry at the Key Largo Avenue / Via Vail intersection (#2) and Via Vail / Project Entry intersection (#6). As shown in Table 6-2 of this report, the evaluated intersection lanes provide adequate storage to accommodate the anticipated 95th percentile peak hour traffic queues for cumulative conditions.

EXHIBIT 1-1: PRELIMINARY SITE PLAN



15868 - 01 - Study Area.dwg

1.2 ANALYSIS SCENARIOS

For the purposes of this traffic study, potential impacts to traffic and circulation have been evaluated for each of the following conditions:

- Existing (2024) Conditions
- Existing plus Ambient Growth plus Project (EAP) (2026)
- Existing plus Ambient Growth plus Project plus Cumulative (EAPC) (2026)

All study area intersections are evaluated using the Highway Capacity Manual (HCM) analysis methodology.

1.2.1 EXISTING (2024) AND EAP (2026) CONDITIONS

Information for Existing (2024) conditions is disclosed to represent the baseline traffic conditions as they existed at the time this report was prepared. For a detailed discussion on the existing traffic counts, see Section 3.5 Existing Traffic Volumes.

The EAP (2026) traffic conditions analyses determine potential traffic impacts based on a comparison of the EAP traffic conditions to Existing conditions. To account for background traffic growth, an ambient growth factor of 4.04% (2 percent per year over 2 years, compounded annually) is used. The EAP analysis is intended to identify "Opening Year" deficiencies associated with the development of the proposed Project based only on the ambient background growth.

1.2.2 EAPC (2026) CONDITIONS

The EAPC (2026) traffic scenario adds known cumulative developments as an overlay to ambient growth with the proposed Project. This scenario combines the traffic associated with other known cumulative development projects to an ambient growth factor from existing conditions to determine EAPC (2026) traffic conditions. The list of other projects in the area was included in the scope and reviewed by the City of Rancho Mirage.

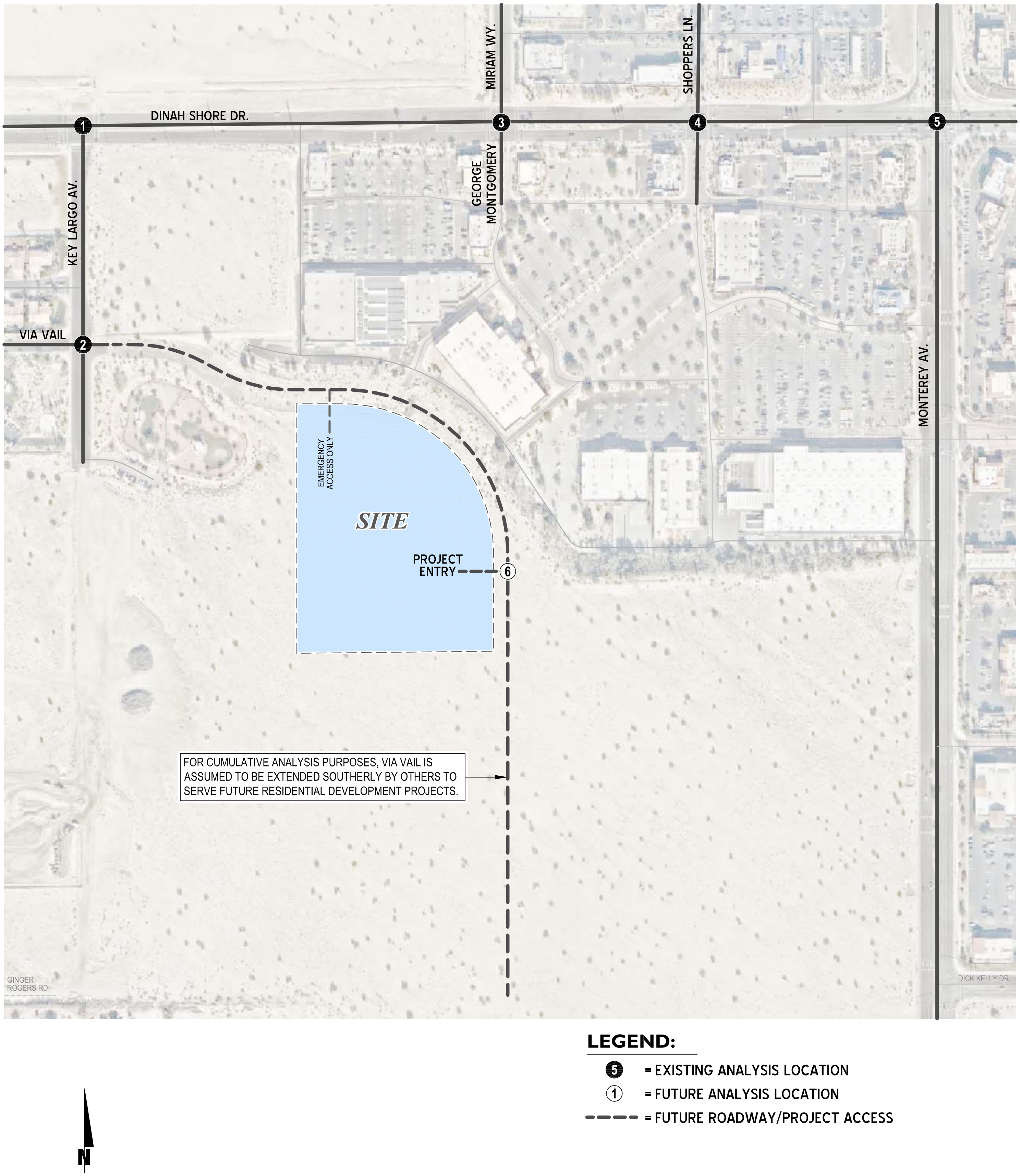
1.3 STUDY AREA

Exhibit 1-2 presents the study area and intersection analysis locations. The Project study area was defined in coordination with the City of Rancho Mirage, and it includes any intersection of "Collector" or higher classification street, with "Collector" or higher classification streets at which the proposed project will add 50 or more peak hour trips. The study area intersections are listed in Table 1-1.

TABLE 1-1: INTERSECTION ANALYSIS LOCATIONS

#	Intersection	#	Intersection
1	Key Largo Av. / Dinah Shore Dr.	4	Shoppers Ln. / Dinah Shore Dr.
2	Key Largo Av. / Via Vail	5	Monterey Av. / Dinah Shore Dr.
3	Miriam Wy. - George Montgomery / Dinah Shore Dr.	6	Via Vail / Project Entry

EXHIBIT 1-2: TRAFFIC ANALYSIS STUDY AREA



1.4 CIRCULATION IMPROVEMENTS

The following recommendations achieve acceptable peak hour operations with full occupancy of the Project:

- Project shall construct Via Vail east of Key Largo Avenue to the Project southerly boundary as a 2-lane local collector (60 feet of right-of-way width and 40 feet of curb-to-curb pavement width), with one travel lane westbound and one lane eastbound, as shown on Exhibit 7-1.
- East of Key Largo Avenue, on-street bike lanes shall be provided to accommodate bicyclists and restrict on-street parking along Via Vail as it curves from an east-west alignment to a north-south alignment around the northeast edge of the Project site.
- A sidewalk should be provided along the south side of Via Vail east of Key Largo Avenue to the Project southerly boundary.
- At the Key Largo Avenue / Via Vail intersection (#2), east-west cross street stop sign controls are recommended. Crosswalks should be provided for north-south crossings on the west leg and east leg of the Key Largo Avenue / Via Vail intersection.
- At the Via Vail / Project Entry intersection (#6), cross street stop sign control is recommended with one outbound shared left-right lane. A crosswalk should be provided for north-south crossings on the west leg of the Via Vail / Project Entry intersection. Via Vail is estimated to operate effectively with one northbound shared left-through lane and one southbound shared through-right lane at the project entry.

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2 METHODOLOGIES

This section documents the methodologies and assumptions used to perform this traffic assessment.

2.1 LEVEL OF SERVICE

Traffic operations of roadway facilities are described using the term "Level of Service" (LOS). LOS is a qualitative description of traffic flow based on several factors such as speed, travel time, delay, and freedom to maneuver. Six levels are typically defined ranging from LOS A, representing completely free-flow conditions, to LOS F, representing breakdown in flow resulting in stop-and-go conditions. LOS E represents operations at or near capacity, an unstable level where vehicles are operating with the minimum spacing for maintaining uniform flow.

2.2 INTERSECTION CAPACITY ANALYSIS

The definitions of LOS for interrupted traffic flow (flow restrained by the existence of traffic signals and other traffic control devices) differ slightly depending on the type of traffic control. The LOS is typically dependent on the quality of traffic flow at the intersections along a roadway. The *Highway Capacity Manual* (HCM) methodology expresses the LOS at an intersection in terms of delay time for the various intersection approaches. (3) The HCM uses different procedures depending on the type of intersection control.

2.2.1 SIGNALIZED INTERSECTIONS

The City of Rancho Mirage requires signalized intersection operations analysis based on the methodology described in the HCM (3). Intersection LOS operations are based on an intersection's average control delay. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. For signalized intersections LOS is directly related to the average control delay per vehicle and is correlated to a LOS designation as described in Table 2-1.

Study area intersections have been evaluated using the Synchro (Version 12) analysis software package.

Synchro is a macroscopic traffic software program that is based on the signalized intersection capacity analysis as specified in the HCM. Macroscopic level models represent traffic in terms of aggregate measures for each movement at the study intersections.

Equations are used to determine measures of effectiveness in addressing such parameters as delay and queue length. The level of service and capacity analysis performed by Synchro takes into consideration optimization and coordination of signalized intersections within a network.

TABLE 2-1: SIGNALIZED INTERSECTION DESCRIPTION OF LOS

Description	Average Control Delay (Seconds), V/C ≤ 1.0	Level of Service, V/C ≤ 1.0[1]
Operations with very low delay occurring with favorable progression and/or short cycle length.	0 to 10.00	A
Operations with low delay occurring with good progression and/or short cycle lengths.	10.01 to 20.00	B
Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.01 to 35.00	C
Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	35.01 to 55.00	D
Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	55.01 to 80.00	E
Operation with delays unacceptable to most drivers occurring due to over saturation, poor progression, or very long cycle lengths.	80.01 and up	F

Source: HCM, 6th Edition

[1] If V/C is greater than 1.0 then LOS is F per HCM.

2.2.2 UNSIGNALIZED INTERSECTIONS

The City of Rancho Mirage requires the operations of unsignalized intersections be evaluated using the methodology described in the HCM. (3) The LOS rating is based on the weighted average control delay expressed in seconds per vehicle (see Table 2-2). At two-way or side-street stop-controlled intersections, LOS is calculated for each controlled movement and for the left turn movement from the major street, as well as for the intersection as a whole. For approaches composed of a single lane, the delay is computed as the average of all movements in that lane. Delay for the intersection is reported for the worst individual movement at a two-way stop-controlled intersection. For all-way stop controlled intersections, LOS is computed for the intersection as a whole (average delay).

TABLE 2-2: UNSIGNALIZED INTERSECTION DESCRIPTION OF LOS

Description	Average Control Delay (Seconds), V/C ≤ 1.0	Level of Service, V/C ≤ 1.0[1]
Little or no delays.	0 to 10.00	A
Short traffic delays.	10.01 to 15.00	B
Average traffic delays.	15.01 to 25.00	C
Long traffic delays.	25.01 to 35.00	D
Very long traffic delays.	35.01 to 50.00	E
Extreme traffic delays with intersection capacity exceeded.	> 50.00	F

Source: HCM, 6th Edition

[1] If V/C is greater than 1.0 then LOS is F per HCM.

At two-way or side-street stop-controlled intersections, LOS is calculated for each controlled movement and for the left turn movement from the major street, as well as for the intersection as a whole. For approaches composed of a single lane, the delay is computed as the average of all movements in that lane. For all-way stop controlled intersections, LOS is computed for the intersection as a whole.

2.3 TRAFFIC SIGNAL WARRANT ANALYSIS METHODOLOGY

The term "signal warrants" refers to the list of established criteria used by Caltrans and other public agencies to quantitatively justify or ascertain the potential need for installation of a traffic signal at an otherwise unsignalized intersection. This focused TA uses the signal warrant criteria presented in the latest edition of the Caltrans California Manual on Uniform Traffic Control Devices (CA MUTCD), for all study area intersections. (5)

The signal warrant criteria for Existing conditions are based upon several factors, including volume of vehicular and pedestrian traffic, frequency of accidents, and location of school areas. The CAMUTCD indicates that the installation of a traffic signal should be considered if one or more of the signal warrants are met. (5) Specifically, this focused TA utilizes the Peak Hour Volume-based Warrant 3 as the appropriate representative traffic signal warrant analysis for existing study area intersections for all analysis scenarios. Warrant 3 is appropriate to use for this TA because it provides specialized warrant criteria for intersections with rural characteristics (e.g. located in communities with populations of less than 10,000 persons or with adjacent major streets operating above 40 miles per hour). For the purposes of this study, the speed limit was the basis for determining whether Urban or Rural warrants were used for a given intersection.

Future intersections that do not currently exist have been assessed regarding the potential need for new traffic signals based on future average daily traffic (ADT) volumes, using the Caltrans planning level ADT-based signal warrant analysis worksheets.

Traffic signal warrant analyses were performed at the Key Largo Avenue / Via Vail intersection (#2) and the Via Vail / Project Entry intersection (#6).

The Existing conditions traffic signal warrant analysis is presented in the subsequent section, Section 3 *Existing Conditions* of this report. The traffic signal warrant analysis for future conditions is presented Section 5 *EAP (2026) Traffic Analysis*, and Section 6 *EAPC (2026)* of this report.

It is important to note that a signal warrant defines the minimum condition under which the installation of a traffic signal might be warranted. Meeting this condition does not require that a traffic control signal be installed at a particular location, but rather, that other traffic factors and conditions be evaluated in order to determine whether the signal is truly justified. It should also be noted that signal warrants do not necessarily correlate with LOS. An intersection may satisfy a signal warrant condition and operate at or above acceptable LOS or operate below acceptable LOS and not meet a signal warrant.

2.4 MINIMUM LEVEL OF SERVICE (LOS)

Minimum Acceptable LOS and associated definitions of intersection deficiencies has been obtained from each of the applicable surrounding jurisdictions.

The City of Rancho Mirage's General Plan recommends a LOS standard of LOS D. If during the LOS evaluations an intersection or roadway segment is found to not meet the requisite LOS standard as established by the City's General Plan, improvement modifications will be evaluated to bring the forecasted deficiency to within acceptable LOS thresholds. It is assumed that for purposes of this Project that most facilities are built to ultimate and only in limited instances would additional improvements be needed. Improvements could include signal timing changes or other that could be achieved within the existing curb to curb distance of the intersection or roadway segment.

2.5 DEFICIENCY CRITERIA

This section outlines the methodology used in this analysis related to identifying circulation system deficiencies. To determine whether the addition of project traffic at a study intersection or roadway segment results in a traffic deficiency, the following thresholds will be utilized:

- A traffic deficiency occurs at a signalized study area intersection if the addition of project traffic results in the intersection operations to go from LOS "D" or better (i.e., acceptable) to LOS "E" or "F."
- A traffic deficiency occurs at an unsignalized study area intersection if the addition of project traffic results in the intersection operations to go from LOS "D" or better (i.e., acceptable) to LOS "E" or "F."

3 EXISTING CONDITIONS

This section provides a summary of the existing circulation network, the City of Rancho Mirage General Plan Circulation Network, and a review of existing peak hour intersection operations as well as traffic signal warrants.

3.1 EXISTING CIRCULATION NETWORK

Pursuant to the agreement with City of Rancho Mirage staff (Appendix 1.1), the study area includes a total of 5 existing intersections as shown on Exhibit 1-2. Exhibit 3-1 illustrates the study area intersections located near the proposed Project and identifies the number of through traffic lanes for existing roadways and intersection traffic controls.

3.2 CITY OF RANCHO MIRAGE GENERAL PLAN CIRCULATION ELEMENT

Exhibit 3-2 shows the adopted City of Rancho Mirage General Plan Circulation Element. Exhibit 3-3 shows the City of Rancho Mirage General Plan roadway cross-sections.

3.3 TRANSIT SERVICE

The City of Rancho Mirage is currently served by the SunLine Transit Agency (STA), a public transit agency serving various jurisdictions throughout Coachella Valley. Transit service is reviewed and updated by STA periodically to address ridership, budget and community demand needs. Changes in land use can affect these periodic adjustments which may lead to either enhanced or reduced service where appropriate. It should also be noted that SunDial service provides special services for the disabled and seniors (60+).

STA Route 4 runs along Monterey Avenue north of Dinah Shore Drive and Dinah Shore Drive west of Monterey Avenue within the study area.

3.4 PEDESTRIAN AND BICYCLE FACILITIES

The existing pedestrian facilities within the study area are shown on Exhibit 3-4. Sidewalks currently exist along the west side of Key Largo Avenue, along the south side of Via Vail west of Key Largo Avenue. On the south side of Dinah Shore Drive, sidewalks currently exist west of Key Largo Avenue and from west of Miriam Way to east of Monterey Avenue. On the north side of Dinah Shore Drive, sidewalks are currently provided from Miriam Way to east of Monterey Avenue.

Sidewalks are currently provided on Monterey Avenue, along Miriam Way, and along the west side of Shoppers Lane. Crosswalks currently exist at study area intersections with traffic signal controls.

On-street bike lanes exist on Dinah Shore Drive east of Monterey Avenue and on the west side of Monterey Avenue south of the shopping center entrance.

EXHIBIT 3-1: EXISTING NUMBER OF THROUGH LANES AND INTERSECTION CONTROLS

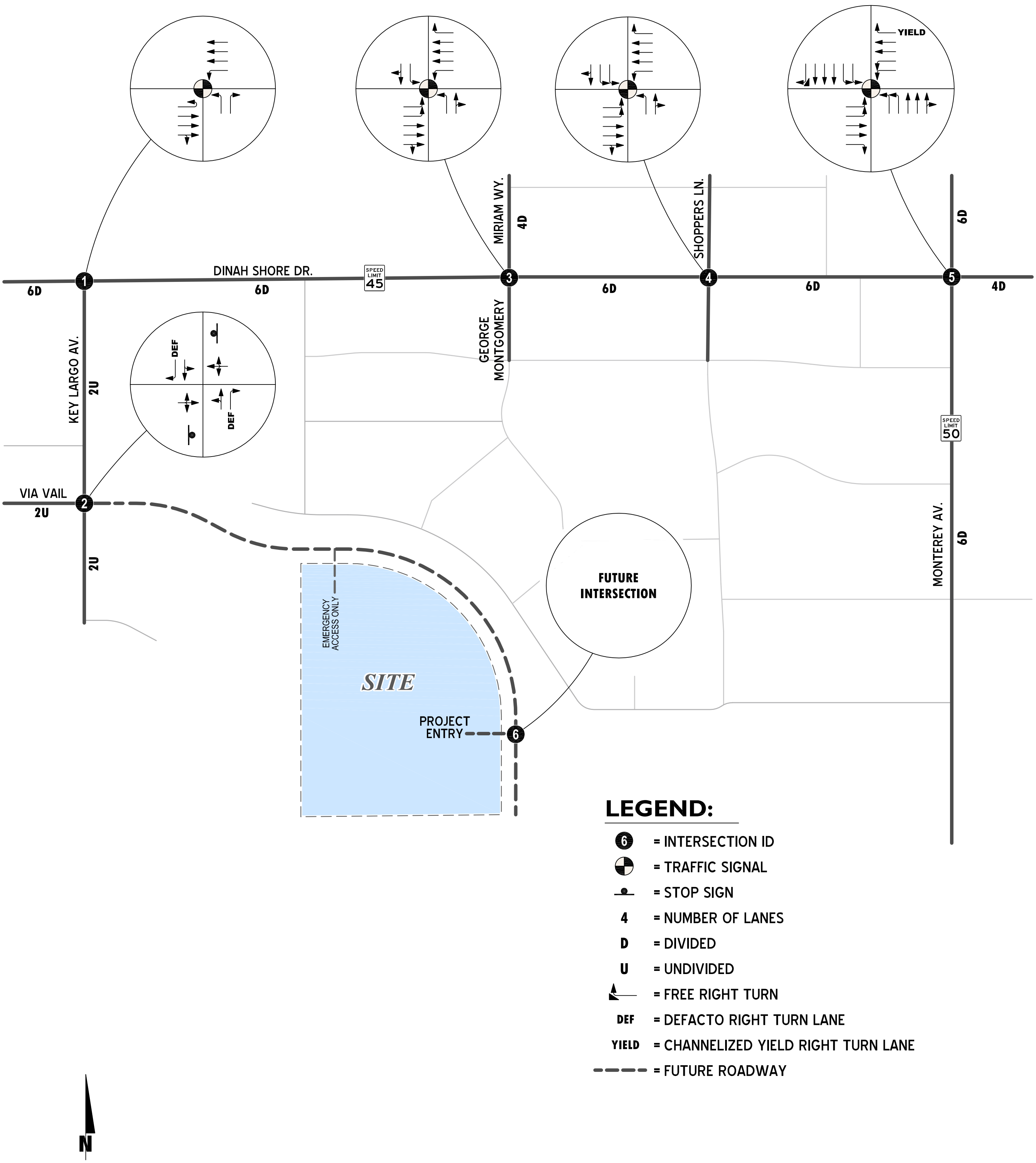

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EXHIBIT 3-2: CITY OF RANCHO MIRAGE GENERAL PLAN CIRCULATION ELEMENT

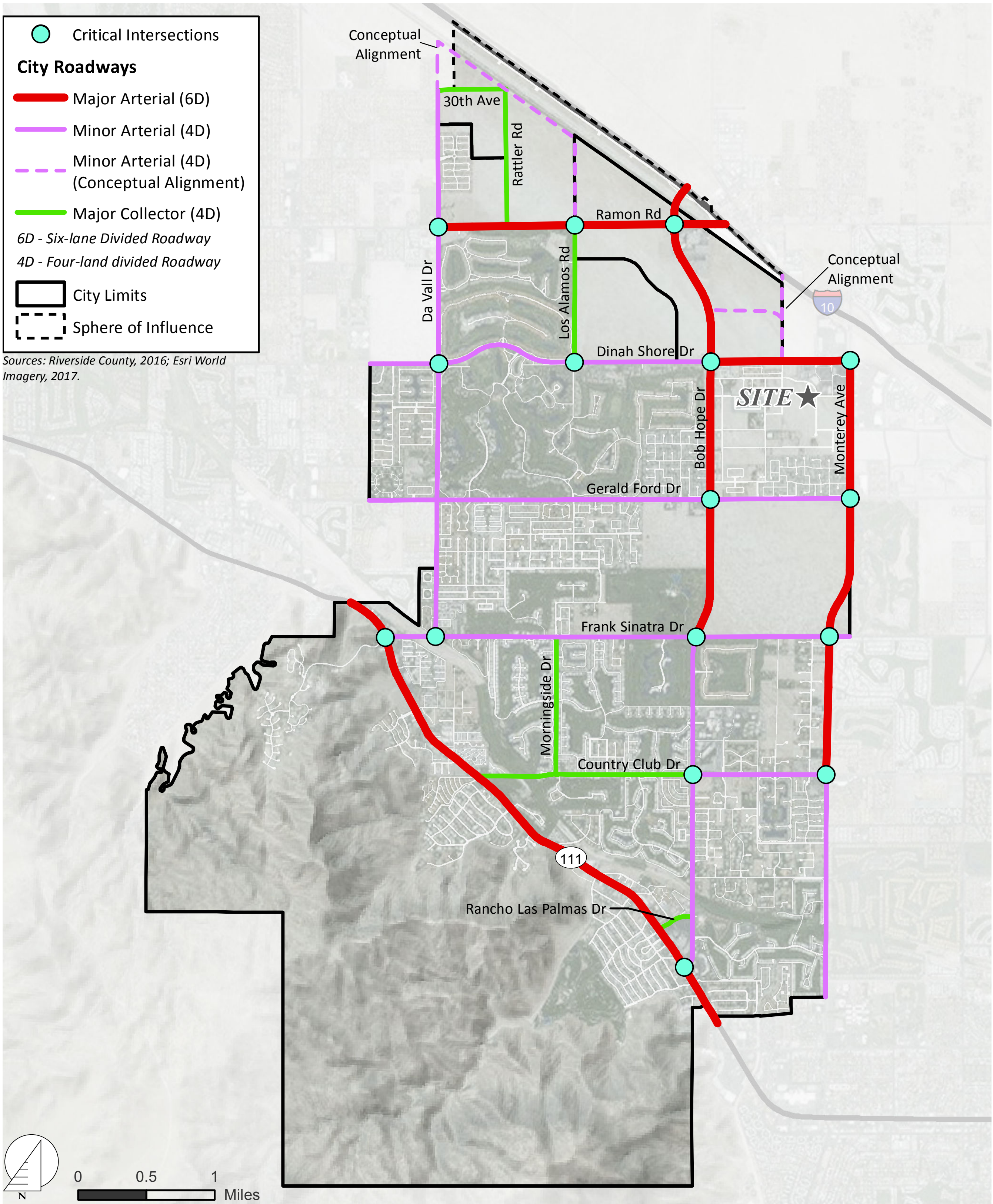
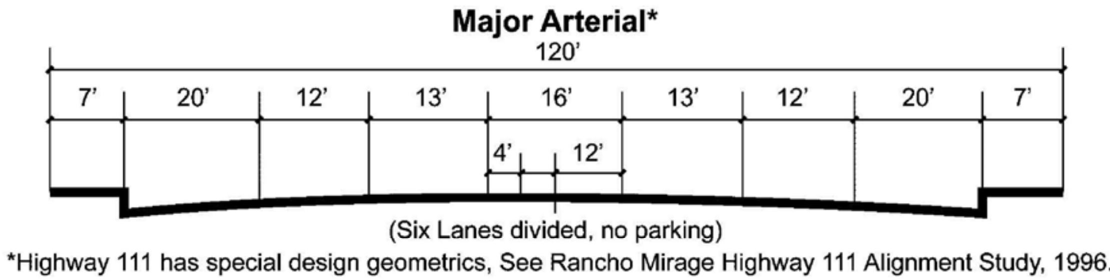
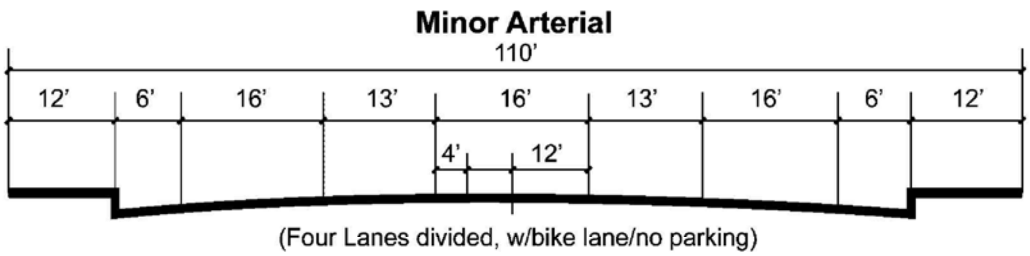
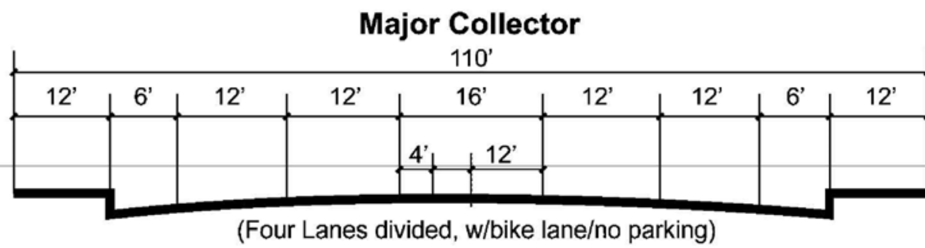
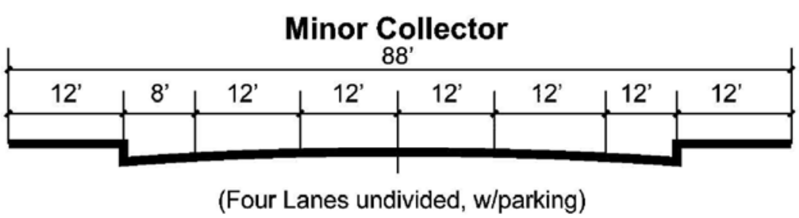


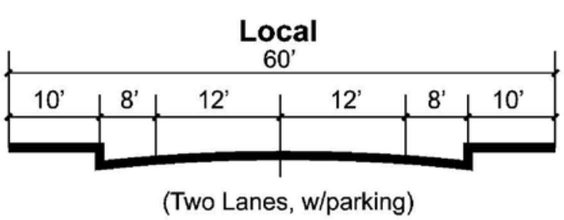
EXHIBIT 3-3: CITY OF RANCHO MIRAGE GENERAL PLAN ROADWAY CROSS-SECTIONS





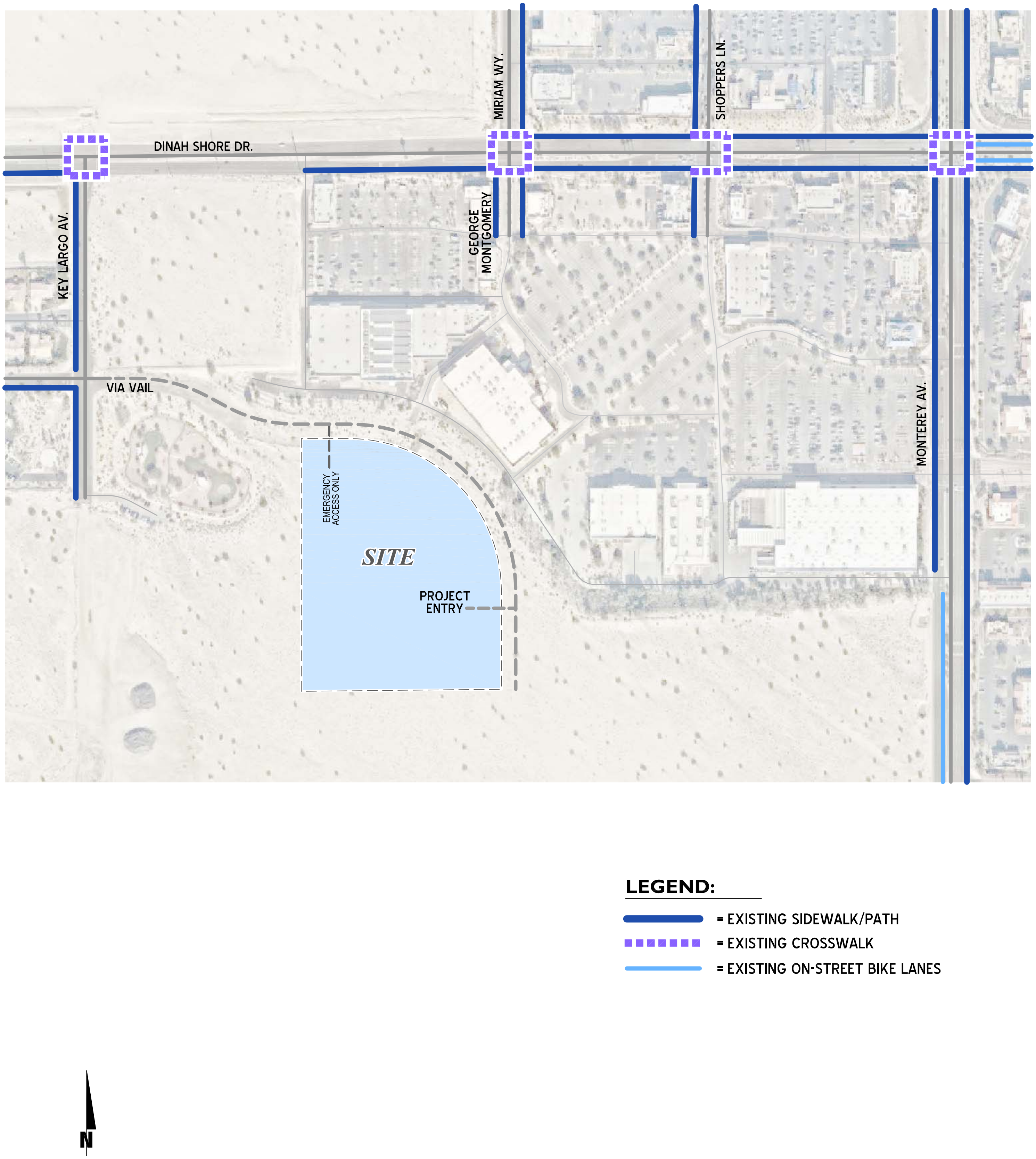






SOURCE: CITY OF RANCHO MIRAGE

EXHIBIT 3-4: EXISTING BICYCLE AND PEDESTRIAN FACILITIES



3.5 EXISTING TRAFFIC VOLUMES

The intersection LOS analysis is based on the traffic volumes observed during the peak hour conditions using traffic count data collected in April 2024.

The following peak hours were selected for analysis:

- Weekday AM Peak Hour (peak hour between 7:00 AM and 9:00 AM)
- Weekday PM Peak Hour (peak hour between 4:00 PM and 6:00 PM)

The raw manual peak hour turning movement traffic count data sheets are included in Appendix 3.1.

The City of Rancho Mirage experiences seasonal population variations over the course of the year, with relatively higher populations during the winter months from January to the end of March. To compensate for the discrepancy, counts not taken during this peak winter period (January 2 to March 31) are subject to seasonal adjustments. A 5% increase is applied to counts taken in April to estimate peak season. This factor is consistent with other nearby jurisdictions within the Coachella Valley area.

The weekday AM and PM peak hour count data are representative of typical peak hour traffic conditions in the study area. There were no observations made in the field that would indicate atypical traffic conditions on the count dates, such as construction activity that would prevent or limit roadway access and detour routes. These raw turning volumes have been flow conserved between intersections with limited access, no access and where there are currently no uses generating traffic.

Existing weekday average daily traffic (ADT) volumes on arterial highways throughout the study area are shown on Exhibit 3-5. Existing ADT volumes are based upon factored intersection peak hour counts collected by Urban Crossroads, Inc. using the following formula for each intersection leg where daily counts are unavailable:

Weekday PM Peak Hour (Approach Volume + Exit Volume) x 12.346 = Leg Volume

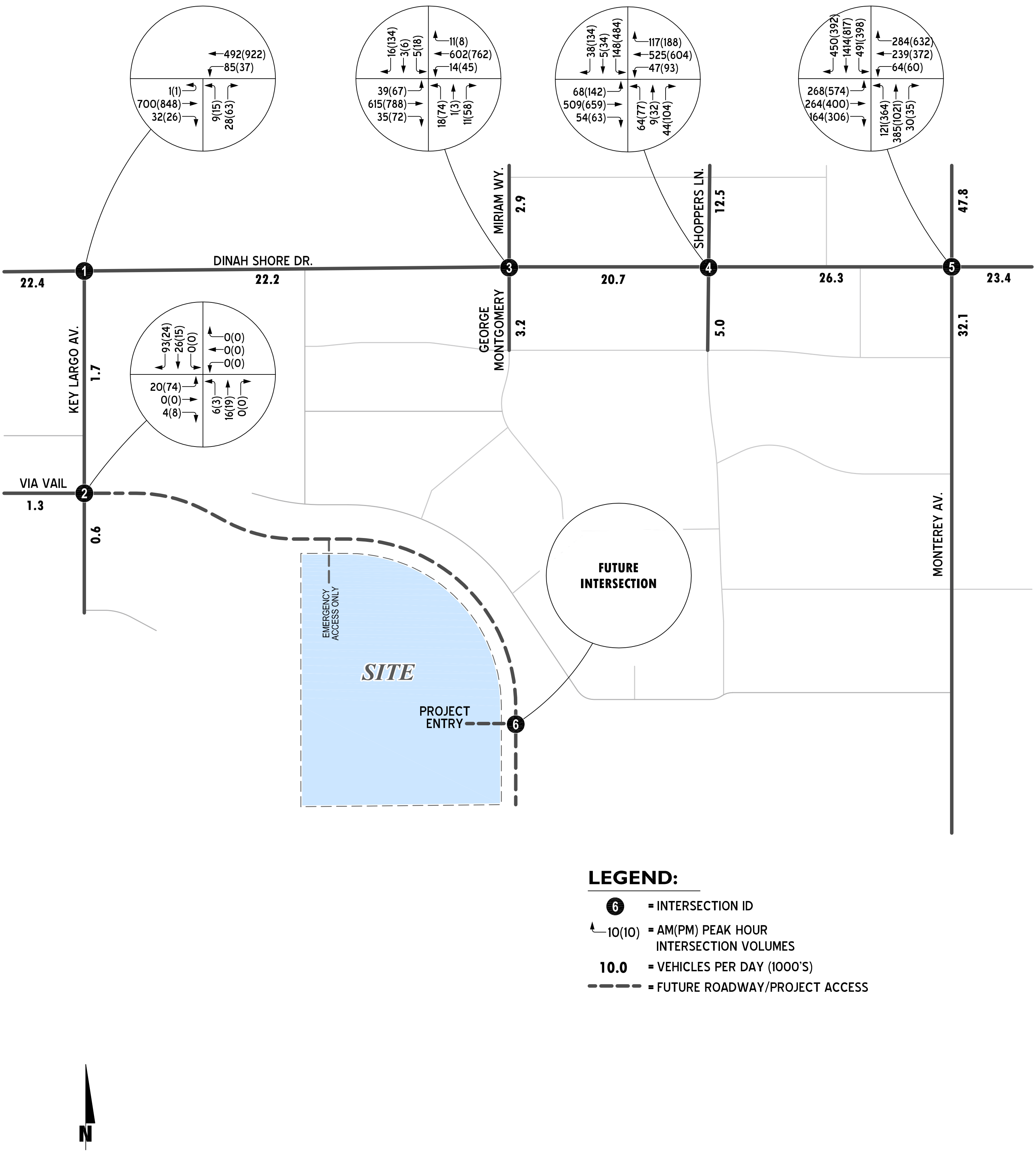
For those roadway segments which have 24-hour tube count data available in close proximity to the study area, a comparison between the PM peak hour and daily traffic volumes indicated that the peak-to-daily relationship of approximately 8.10 percent would sufficiently estimate ADT volumes for planning-level analyses. As such, the above equation utilizing a factor of 12.346 estimates the ADT volumes on the study area roadway segments assuming a peak-to-daily relationship of approximately 8.10 percent (i.e., 1/0.0820 = 12.346).

Existing weekday peak hour intersection volumes are also shown on Exhibit 3-5.

3.6 EXISTING CONDITIONS INTERSECTION OPERATIONS ANALYSIS

Existing peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2.2 *Intersection Capacity Analysis* of this report.

EXHIBIT 3-5: EXISTING (2024) TRAFFIC VOLUMES



The intersection operations analysis results are summarized in Table 3-1 which indicates that study area intersections currently operate at an acceptable LOS during peak hours.

The intersection operations analysis worksheets are included in Appendix 3.2 of this TA.

3.7 EXISTING CONDITIONS TRAFFIC SIGNAL WARRANTS ANALYSIS

Traffic signal warrants for Existing traffic conditions are based on existing peak hour intersection turning volumes. For Existing (2024) traffic conditions, the Key Largo Avenue / Via Vail intersection (#2) does not warrant a traffic signal based on peak hour traffic flows (see Appendix 3.3).

TABLE 3-1: INTERSECTION ANALYSIS FOR EXISTING (2024) CONDITIONS

#	Intersection	Traffic Control[1]	Intersection Approach Lanes[2] Northbound L	T	R	Southbound L	T	R	Eastbound L	T	R	Westbound L	T	R	Delay[3] (secs.) AM	PM	Level of Service AM	PM
1	Key Largo Av. / Dinah Shore Dr.	TS	1	0	1	0	0	0	1	3	0	1	3	0	14.7	8.1	B	A
2	Key Largo Av. / Via Vail	CSS	0.5	0.5	d	0.5	0.5	d	0	1!	0	0	1!	0	9.0	9.5	A	A
3	Miriam Wy. / Dinah Shore Dr.	TS	1	1	0	1	1	0	2	3	0	1	3	1	4.1	18.8	A	B
4	Shoppers Ln. / Dinah Shore Dr.	TS	1	1	0	2	1	0	2	3	0	1	3	1	24.9	45.4	C	D
5	Monterey Av. / Dinah Shore Dr.	TS	2	3	0	2	3	1>>	2	2	1	2	2	1	34.1	41.7	C	D
6	Via Vail / Project Entry		Future Intersection															

1 TS = Traffic Signal; CSS = Cross-street Stop

2 When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; d = Defacto Right Turn Lane; 0.5 = Shared Lane; 1! = Shared Left/Through/Right lane; >> = Free-Right Turn

3 Per the Highway Capacity Manual (7th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown. Delay and level of service is calculated using Synchro 12 analysis software.

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4 PROJECTED FUTURE TRAFFIC

This section presents the traffic volumes estimated to be generated by the Project, as well as the Project's trip assignment onto the study area roadway network.

The Project consists of 236 affordable apartment dwelling units. For the purposes of this analysis, it is assumed that the Project will be constructed in its entirety with a projected Opening Year of 2026.

The Project is proposed to have one full access and one emergency access along Via Vail.

4.1 PROJECT TRIP GENERATION

Trip generation represents the amount of traffic which is both attracted to and produced by a development. Determining traffic generation for a specific project is therefore based upon forecasting the amount of traffic that is expected to be both attracted to and produced by the specific land uses being proposed for a given development.

Trip generation rates used to estimate Project traffic and a summary of the Project's trip generation are shown in Table 4-1. The trip generation rates are based upon trip-generation statistics published in the Institute of Transportation Engineers (ITE) *Trip Generation* , 11th Edition, 2021 (3) for Affordable Housing (ITE Land Use Code 223). As shown on Table 4-1, the proposed Project is anticipated to generate a total of 1,135 trip-ends per day with 85 AM peak hour trips and 109 PM peak hour trips.

4.2 PROJECT TRIP DISTRIBUTION

The Project trip distribution and assignment process represents the directional orientation of traffic to and from the Project site. The trip distribution pattern is heavily influenced by the geographical location of the site, the location of surrounding uses, and the proximity to the regional freeway system. The Project trip distribution patterns for the proposed Project are depicted on Exhibit 4-1.

4.3 MODAL SPLIT

Although the use of public transit, walking, and/or bicycling have the potential to reduce Project-related traffic, such reductions have not been taken into considerations in this traffic study to provide a conservative analysis of the Project's potential to contribute to circulation system deficiencies.

4.4 PROJECT TRIP ASSIGNMENT

The assignment of traffic from the Project area to the adjoining roadway system is based upon the Project trip generation, trip distribution, and the arterial highway and local street system improvements in place by the time of initial occupancy of the Project.

Based on the identified Project traffic generation and trip distribution patterns, Project AM peak hour, and PM peak hour peak hour intersection turning movement volumes are shown on Exhibit 4-2.

TABLE 4-1: PROJECT TRIP GENERATION SUMMARY

Trip Generation Rates[1]

Land Use	ITE LU Code	Quantity[2]		AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily
Affordable Housing	223	236	DU	0.10	0.26	0.36	0.27	0.19	0.46	4.81

Trip Generation Results

Land Use	ITE LU Code	Quantity[2]		AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily
Affordable Housing	223	236	DU	24	61	85	64	45	109	1,135

[1] Trip Generation Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, 11th Edition (2021).
[2] DU = Dwelling Unit

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EXHIBIT 4-1: PROJECT TRIP DISTRIBUTION

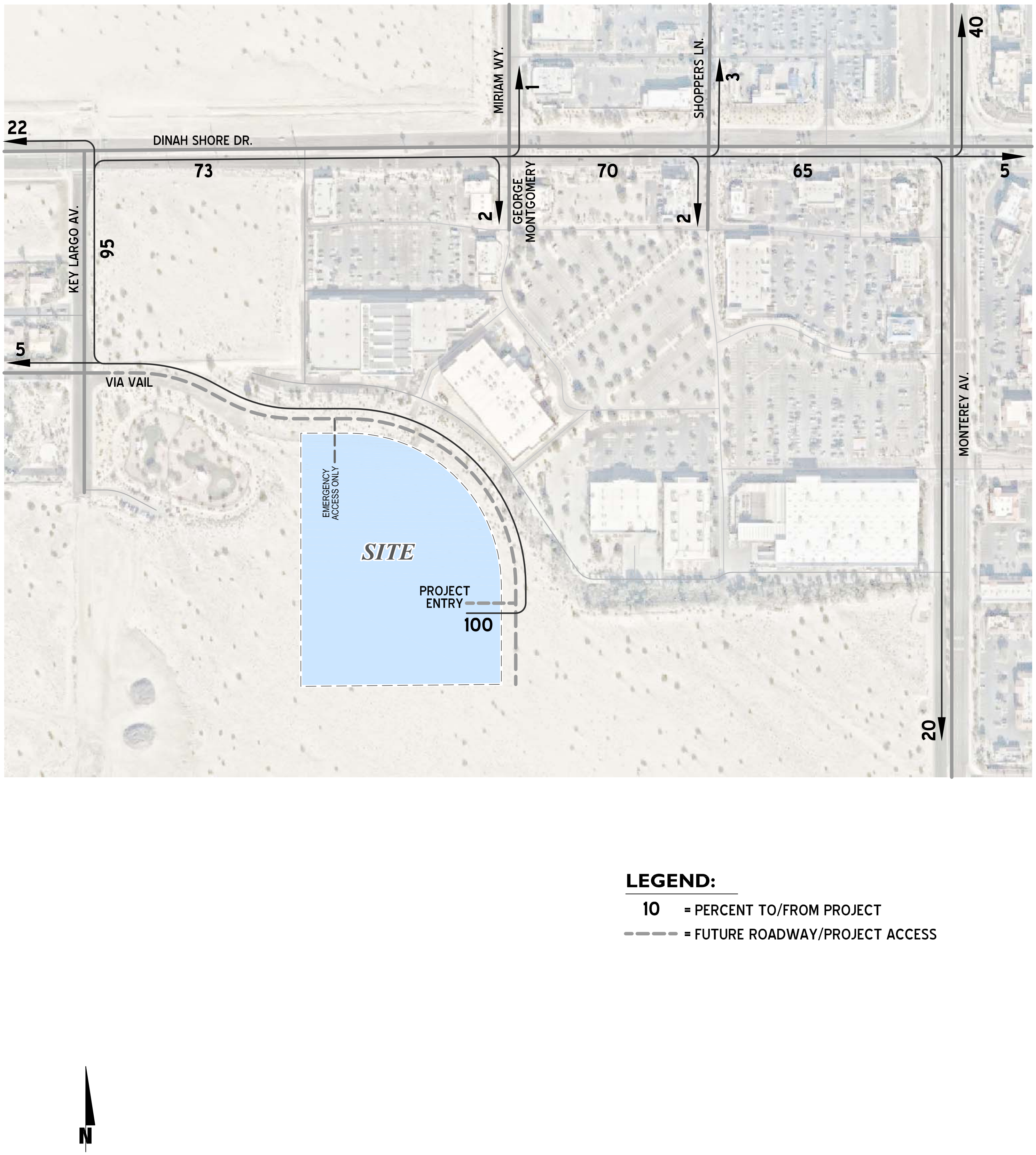
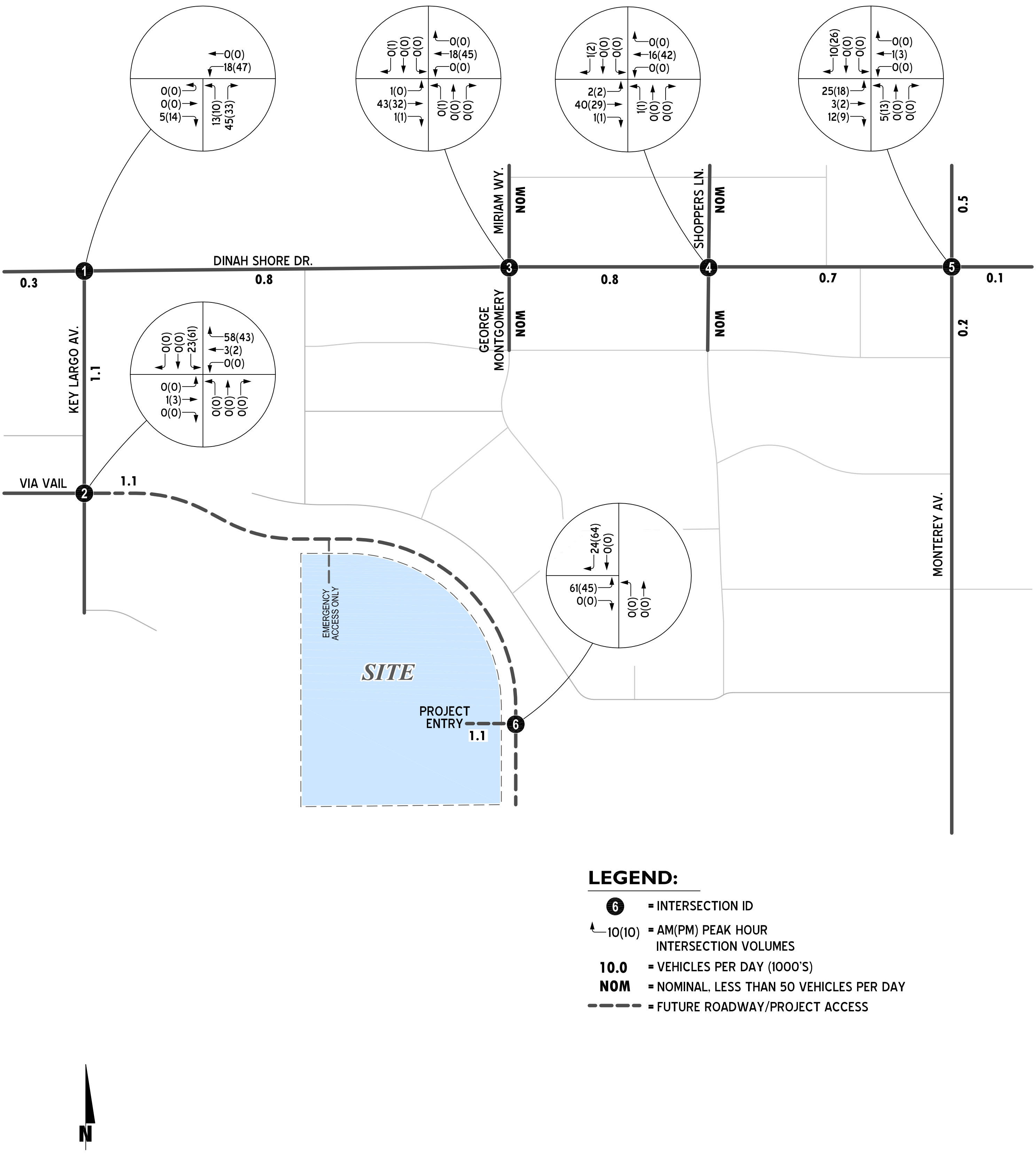


EXHIBIT 4-2: PROJECT ONLY TRAFFIC VOLUMES



4.5 CUMULATIVE GROWTH TRAFFIC

4.5.1 AMBIENT GROWTH RATE

Future year traffic forecasts have been based upon background (ambient) growth at 4.04 percent (2 percent per year over 2 years) for EAP and EAPC traffic conditions. The ambient growth factor is intended to approximate regional traffic growth. This ambient growth rate is added to existing traffic volumes to account for area-wide growth not reflected by cumulative development projects.

Ambient growth is added to daily and peak hour traffic volumes on surrounding roadways, in addition to traffic generated by the development of future projects that have been approved but not yet built and/or for which development applications are actively underway.

4.5.2 CUMULATIVE DEVELOPMENT TRAFFIC

A cumulative project list was developed for the purposes of this analysis through consultation with planning and engineering staff from the City of Rancho Mirage. Exhibit 4-3 illustrates the cumulative development locations.

A summary of cumulative development projects and their proposed land uses are shown on Table 4-2. If applicable, the traffic volumes generated by individual cumulative projects were manually added to the Opening Year Cumulative forecasts to ensure that traffic generated by the listed cumulative development projects in Table 4-2 are reflected as part of the background traffic.

EXHIBIT 4-3: CUMULATIVE DEVELOPMENT LOCATION MAP

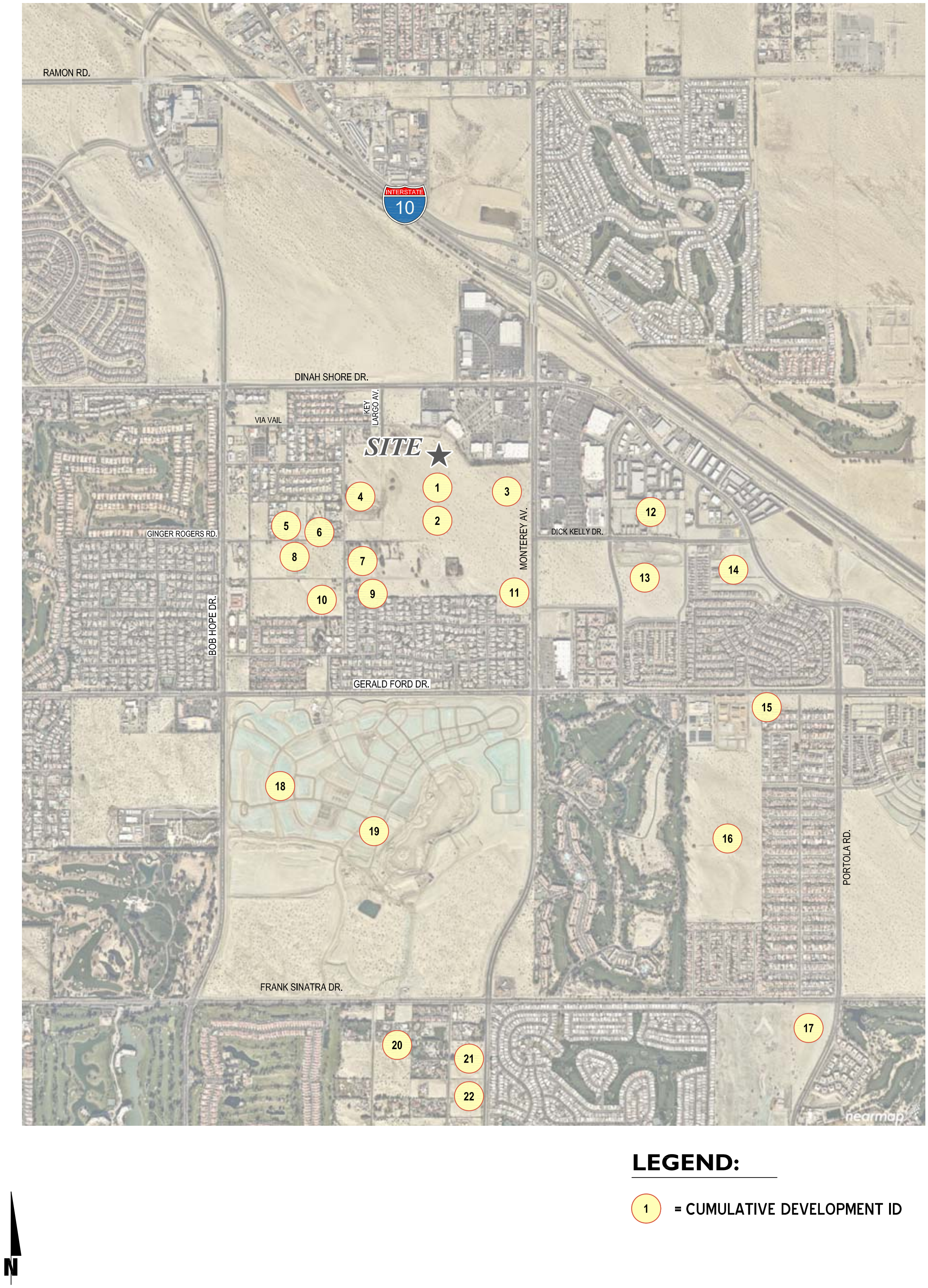


TABLE 4-2: CUMULATIVE DEVELOPMENT LAND USE SUMMARY

ID	Project	Land Use	Quantity	Units[1]
1	Parcel 3 Residential (south of Project along Via Vail)	Affordable Apartments	160	DU
2	Parcel 2 Residential (south of Parcel 3 along Via Vail)	Affordable Apartments	250	DU
3	Rancho Monterey SP	Multifamily Residential	400	DU
		Shopping Center	150	TSF
4	Miragedunes Properties	Residential	9	DU
5	Estilo	Residential	39	DU
6	Rancho Mirage LLC	Residential	4	DU
7	38 JV, LLC c/o Meriwether Companies	Residential	10	DU
8	GRV Mirage, LLC (ECHO)	Residential	9	DU
9	RM 38 JV LLC	Residential	82	DU
10	38 JV, LLC c/o Meriwether Companies	Residential	97	DU
11	Monterey Medical Center	Medical Office	75.164	TSF
12	Falling Waters	Single Family Detached Residential	159	DU
13	Urban Crossings (UHC)	Multifamily Residential	111	DU
14	Ponderosa (75% built)	Single Family Detached Residential	114	DU
		Shopping Center	150	TSF
15	Santa Barbara Apartment	Multifamily Residential	48	DU
16	Vitalia/Refuge Residential	Single Family Detached Residential	248	DU
		Multifamily Residential	571	DU
		Single Family Attached Residential	150	DU
17	Portola Av./Frank Sinatra Dr. Residential	Multifamily Residential	402	DU
18	ED Rancho Mirage	Residential	354	DU
19	Section 31 Specific Plan Project	Hotel	400	Rooms
		Commercial	175.0	TSF
		Residential	1,932	DU
20	TPM 34741	Single Family Detached Residential	4	DU
21	TTM 32308 (Los Ranchos)	Single Family Detached Residential	7	DU
22	TPM 36849	Single Family Detached Residential	3	DU

[1] DU = Dwelling Units; TSF = Thousand Square Feet

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5 EAP (2026) TRAFFIC CONDITIONS

This section discusses the methods used to develop Existing plus Ambient Growth plus Project (EAP) (2026) traffic conditions and the resulting peak hour intersection operations and traffic signal warrant analyses.

5.1 ACCESS IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for EAP conditions are consistent with existing conditions shown previously on Exhibit 3-1. In addition, the Project driveway and those facilities assumed to be constructed by the Project to provide site access (e.g., intersection and roadway improvements at the Project's frontage and driveways) are also assumed to be in place.

5.2 EAP (2026) TRAFFIC VOLUME FORECASTS

An ambient growth from Existing conditions of 4.04% (2 percent per year over 2 years, compounded annually) is included for EAP traffic conditions. Cumulative development projects are not included as part of the EAP analysis. EAP traffic volumes are shown on Exhibit 5-1.

5.3 EAP (2026) INTERSECTION OPERATIONS ANALYSIS

EAP peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2 *Methodologies* of this TA. The intersection analysis results are summarized in Table 5-1, which indicates that the study area intersections operate at an acceptable LOS with the addition of Project traffic.

The intersection operations analysis worksheets for EAP traffic conditions are included in Appendix 5.1 of this TA.

5.4 EAP (2026) CONDITIONS TRAFFIC SIGNAL WARRANTS ANALYSIS

Traffic signal warrants for EAP (2026) traffic conditions are based on EAP peak hour intersection turning volumes and ADT volumes. For EAP (2026) traffic conditions, the Key Largo Avenue / Via Vail intersection (#2) and the Via Vail / Project Entry intersection (#6) are not anticipated to warrant a traffic signal based on peak hour traffic flows (see Appendix 3.3).

EXHIBIT 5-1: EAP (2026) TRAFFIC VOLUMES

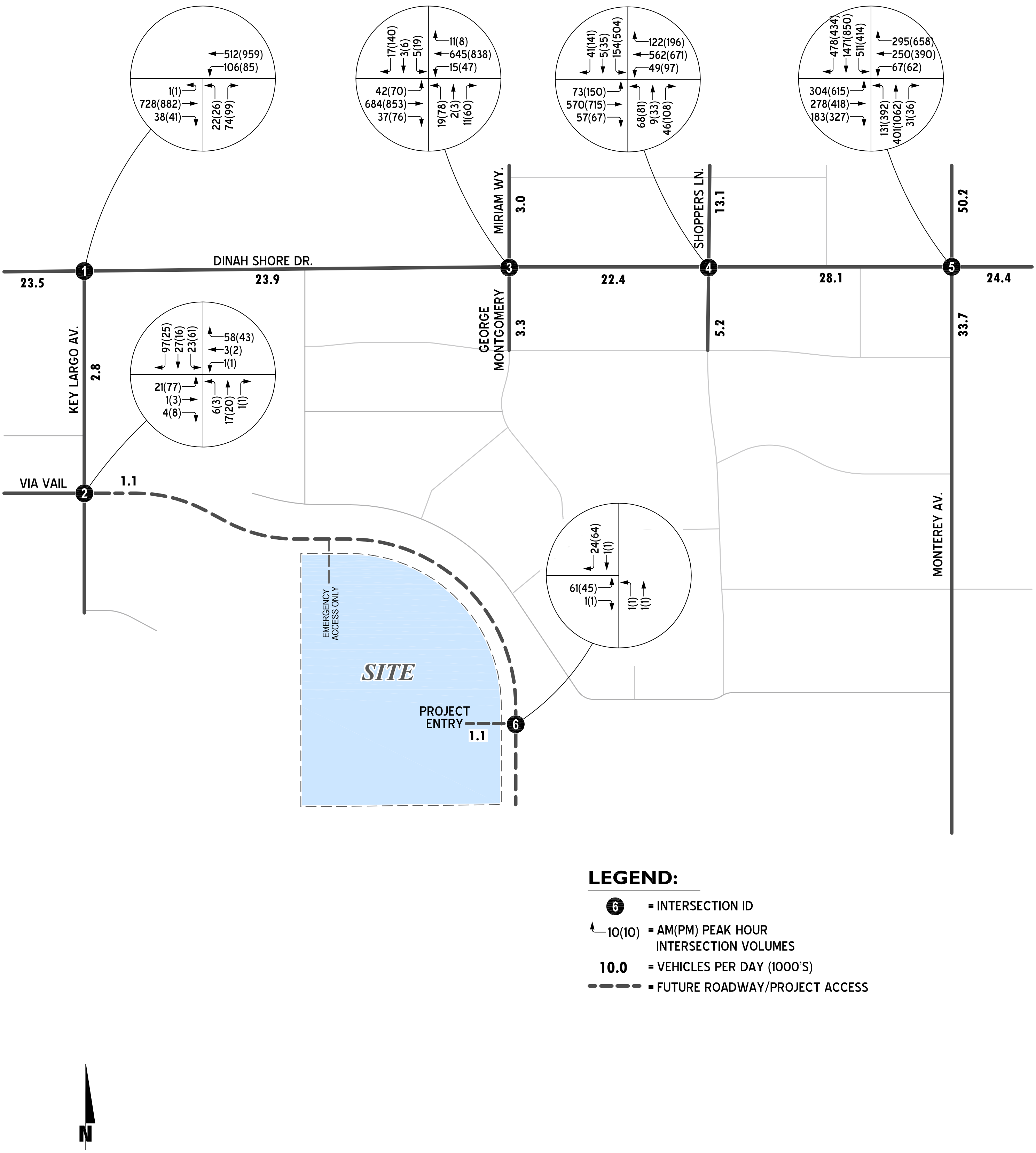

TABLE 5-1: INTERSECTION ANALYSIS FOR EAP (2026) CONDITIONS

#	Intersection	Traffic Control[1]	Intersection Approach Lanes[2]												Delay[3] (secs.)		Level of Service	
			Northbound			Southbound			Eastbound			Westbound						
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
1	Key Largo Av. / Dinah Shore Dr.	TS	1	0	1	0	0	0	1	3	0	1	3	0	15.2	10.7	B	B
2	Key Largo Av. / Via Vail	CSS	0.5	0.5	d	0.5	0.5	d	0	1!	0	0	1!	0	9.7	11.8	A	B
3	Miriam Wy. / Dinah Shore Dr.	TS	1	1	0	1	1	0	2	3	0	1	3	1	4.4	21.6	A	C
4	Shoppers Ln. / Dinah Shore Dr.	TS	1	1	0	2	1	0	2	3	0	1	3	1	26.0	46.2	C	D
5	Monterey Av. / Dinah Shore Dr.	TS	2	3	0	2	3	1>>	2	2	1	2	2	1	37.4	46.6	D	D
6	Via Vail / Project Entry	**CSS**	**0.5**	**0.5**	0	0	**1**	0	0	**1!**	0	0	0	0	9.0	9.0	A	A

1 TS = Traffic Signal; CSS = Cross-street Stop

2 When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; d = Defacto Right Turn Lane; 0.5 = Shared Lane; 1! = Shared Left/Through/Right lane;

>> = Free-Right Turn; **1** = Improvement

3 Per the Highway Capacity Manual (7th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown. Delay and level of service is calculated using Synchro 12 analysis software.

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6 EAPC (2026) TRAFFIC CONDITIONS

This section discusses the methods used to evaluate Existing plus Ambient Growth plus Project plus Cumulative (EAPC) (2026) traffic conditions and the resulting peak hour intersection operations and traffic signal warrant analyses.

6.1 EAPC (2026) TRAFFIC VOLUME FORECASTS

The lane configurations and traffic controls assumed to be in place for EAPC conditions are consistent with existing conditions shown previously on Exhibit 3-1, except for the following:

- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for EAPC conditions (e.g., intersection and roadway improvements at the Project's frontage and driveways).
- Driveways and those facilities assumed to be constructed by cumulative developments to provide site access are also assumed to be in place for EAPC conditions (e.g., intersection and roadway improvements along the cumulative development's frontages and driveways).

EAPC traffic volumes are shown on Exhibit 6-1. Other known cumulative development projects in the study area are included in addition to 4.04% of ambient growth for EAPC traffic conditions plus traffic associated with the proposed Project.

6.2 EAPC (2026) INTERSECTION OPERATIONS ANALYSIS

EAPC peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2 *Methodologies* of this TA. The intersection analysis results are summarized in Table 6-1, which indicates that there are no intersections operating at an unacceptable LOS with the addition of Project and cumulative traffic under EAPC conditions.

The intersection operations analysis worksheets for EAPC traffic conditions are included in Appendix 6.1 of this TA.

6.3 EAPC (2026) CONDITIONS TRAFFIC SIGNAL WARRANTS ANALYSIS

Traffic signal warrants for EAPC (2026) traffic conditions are based on EAPC peak hour intersection turning volumes and ADT volumes. For EAPC (2026) traffic conditions, there are no additional unsignalized study area intersections that are projected to warrant a traffic signal based on peak hour traffic flows and ADT volumes, in comparison to EAP conditions.

6.4 QUEUEING ANALYSIS

A queuing analysis was conducted at the Project Driveway and at the intersection of Key Largo Avenue at Via Vail for EAPC (2026) traffic conditions to evaluate the intersection lane geometrics which are recommended to accommodate cumulative 95th percentile peak hour traffic queues.

EXHIBIT 6-1: EAPC (2026) TRAFFIC VOLUMES

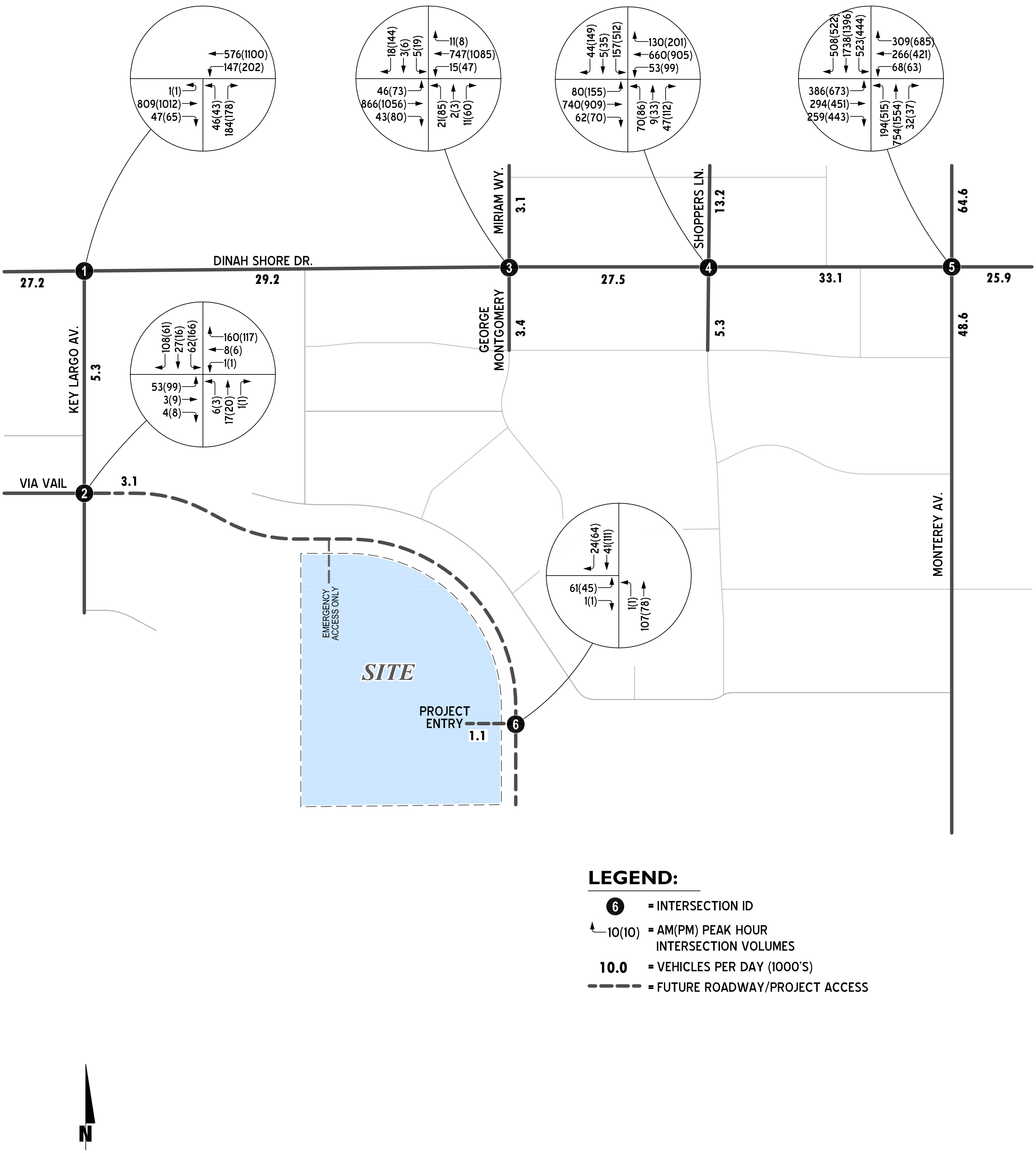

TABLE 6-1: INTERSECTION ANALYSIS FOR EAPC (2026) CONDITIONS

			Intersection Approach Lanes[2]												Delay[3] (secs.)		Level of Service	
		Traffic	Northbound			Southbound			Eastbound			Westbound						
#	Intersection	Control[1]	L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
1	Key Largo Av. / Dinah Shore Dr.	TS	1	0	1	0	0	0	1	3	0	1	3	0	18.2	15.8	B	B
2	Key Largo Av. / Via Vail	CSS	0.5	0.5	d	0.5	0.5	d	0	1!	0	0	1!	0	11.8	22.6	B	C
3	Miriam Wy. / Dinah Shore Dr.	TS	1	1	0	1	1	0	2	3	0	1	3	1	6.6	25.0	A	C
4	Shoppers Ln. / Dinah Shore Dr.	TS	1	1	0	2	1	0	2	3	0	1	3	1	27.1	46.6	C	D
5	Monterey Av. / Dinah Shore Dr.	TS	2	3	0	2	3	1>>	2	2	1	2	2	1	42.1	53.7	D	D
6	Via Vail / Project Entry	**CSS**	**0.5**	**0.5**	0	0	**1**	0	0	**1!**	0	0	0	0	9.9	10.3	A	B

[1] TS = Traffic Signal; CSS = Cross-street Stop

[2] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.
L = Left; T = Through; R = Right; d = Defacto Right Turn Lane; 0.5 = Shared Lane; 1! = Shared Left/Through/Right lane;
>> = Free-Right Turn; **1** = Improvement

[3] Per the Highway Capacity Manual (7th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown. Delay and level of service is calculated using Synchro 12 analysis software.

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The analysis was conducted for the weekday AM and weekday PM peak hours using the SimTraffic modeling software. Queuing analysis findings are presented in Table 6-2 for EAPC (2026) traffic conditions. Queueing analysis worksheets are provided in Appendix 6.2.

6.5 CONTRIBUTION TO OFF-SITE IMPROVEMENTS

The extension of Via Vail from the Project northwest boundary to Key Largo Avenue is recommended for access purposes, as discussed in Chapter 7 of this report. East of Key Largo Avenue, on-street bike lanes shall be provided to accommodate bicyclists and restrict on-street parking along Via Vail as it curves from an east-west alignment to a north-south alignment around the northeast edge of the Project site.

Project participation in other circulation system improvements will include fee payments to established programs (e.g., TUMF and City DIF).

TABLE 6-2: PROJECT ACCESS QUEUEING ANALYSIS FOR EAPC (2026) CONDITIONS

ID	Intersection	Movement	# of Lanes	Peak Hour Traffic Volume[3]				Storage Length[2] (ft.)	95th Percentile Queue Length (ft.)[1,3]	
				AM	PM	Peak	Volume		AM	PM
2	Key Largo Av. / Via Vail									
		NB L/T	1	23	23	AM	23	>100	13	NOM
		SB L/T	1	89	182	PM	182	>100	NOM	35
		EB L/T/R	1	60	116	PM	116	>100	52	77
		WB L/T/R	1	169	124	AM	169	>100	52	58
6	Via Vail / Project Entry									
		EB L/T/R	1	62	46	AM	62	**<u>250</u>**	47	50

[1] Queue length calculated using SimTraffic.
[2] 100 = Existing length of storage; **<u>100</u>** = Proposed/Planned length of storage
[3] NOM = Nominal, less than 5 feet.

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7 SUMMARY AND RECOMMENDATIONS

7.1 PROJECT TRAFFIC

The proposed Project is anticipated to generate a total of 1,135 trip-ends per day with 85 AM peak hour trips and 109 PM peak hour trips. The Project is proposed to have one full access and one emergency access along Via Vail.

7.2 TRAFFIC ANALYSIS RESULTS

Traffic count data were collected in April 2024 during the AM peak period of 7:00 AM to 9:00 AM and PM peak period of 4:00 PM to 6:00 PM.

For Existing (2024) conditions, the study area intersections are currently operating at acceptable levels of service (LOS "D" or better).

For EAP (2026) and EAPC (2026), the study area intersections are estimated to continue operating at acceptable levels of service (LOS "D" or better). Study area intersections without existing traffic signals are not anticipated to satisfy traffic signal warrants.

A queuing analysis was performed for EAPC (2026) conditions to assess the lane geometry at the Key Largo Avenue / Via Vail intersection (#2) and Via Vail / Project Entry intersection (#6). As shown in Table 6-2 of this report, the evaluated intersection lanes provide adequate storage to accommodate the anticipated 95th percentile peak hour traffic queues for cumulative conditions.

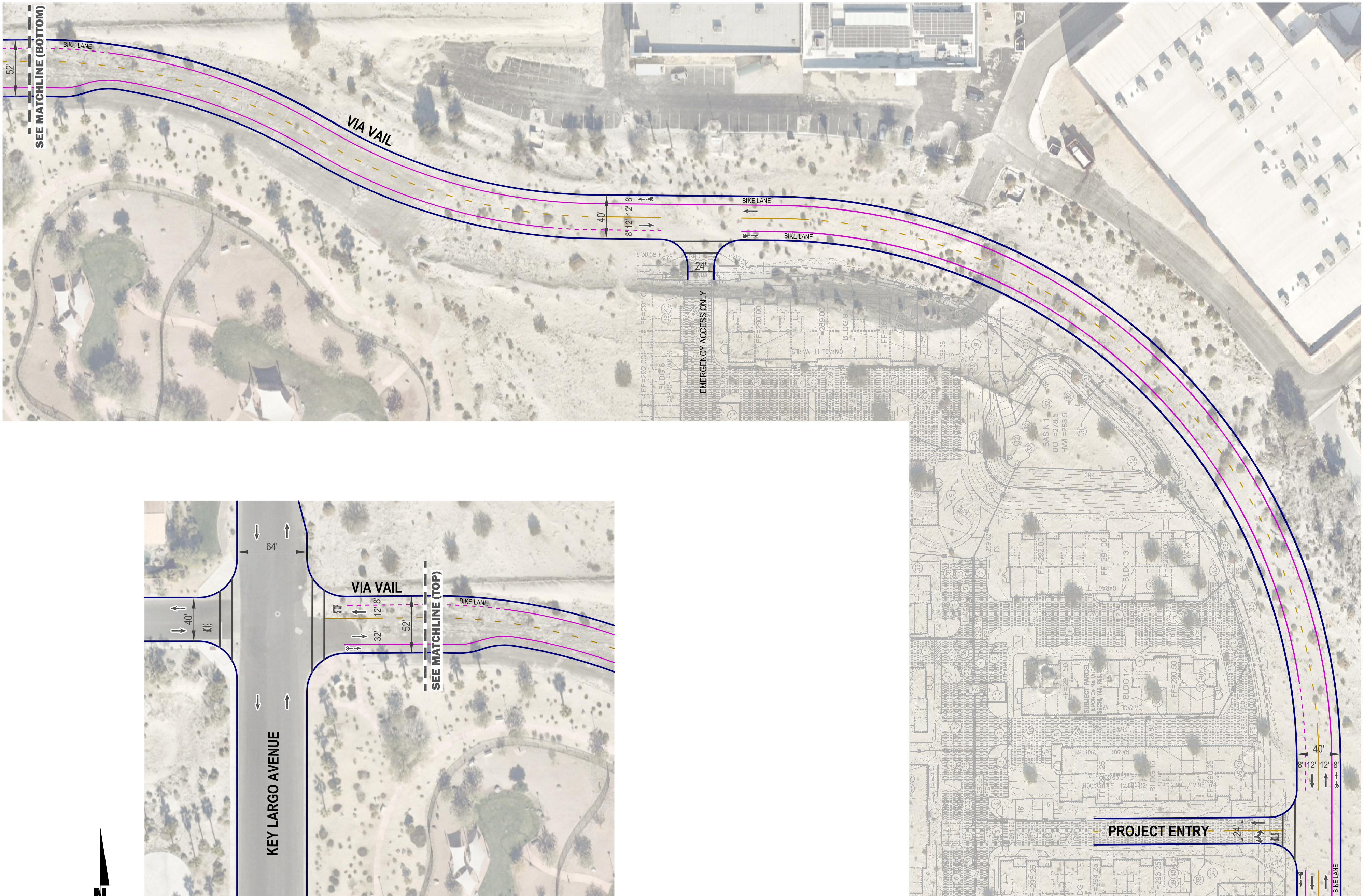
An assessment of Vehicle Miles Traveled (VMT) associated with the Project has been prepared in a separate letter *"Via Vail Village Vehicle Miles Traveled (VMT) Screening Analysis"*, dated April 2, 2024.

7.3 RECOMMENDATIONS

The following recommendations achieve acceptable peak hour operations with full occupancy of the Project:

- Project shall construct Via Vail east of Key Largo Avenue to the Project southerly boundary as a 2-lane local collector (60 feet of right-of-way width and 40 feet of curb-to-curb pavement width), with one travel lane westbound and one lane eastbound, as shown on Exhibit 7-1.
- East of Key Largo Avenue, on-street bike lanes shall be provided to accommodate bicyclists and restrict on-street parking along Via Vail as it curves from an east-west alignment to a north-south alignment around the northeast edge of the Project site.
- A sidewalk should be provided along the south side of Via Vail east of Key Largo Avenue to the Project southerly boundary.

EXHIBIT 7-1: PROJECT ACCESS ROADWAY CONCEPT STRIPING PLAN



- At the Key Largo Avenue / Via Vail intersection (#2), east-west cross street stop sign controls are recommended. Crosswalks should be provided for north-south crossings on the west leg and east leg of the Key Largo Avenue / Via Vail intersection.
- At the Via Vail / Project Entry intersection (#6), cross street stop sign control is recommended with one outbound shared left-right lane. A crosswalk should be provided for north-south crossings on the west leg of the Via Vail / Project Entry intersection. Via Vail is estimated to operate effectively with one northbound shared left-through lane and one southbound shared through-right lane at the project entry.

On-site traffic signing and striping should be implemented in conjunction with detailed construction plans for the Project site.

Sight distance at the project access point should be reviewed with respect to standard Caltrans and City of Rancho Mirage sight distance standards at the time of preparation of final grading, landscape, and street improvement plans.

Project participation in other circulation system improvements will include fee payments to established programs (e.g., TUMF and City DIF).

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8 REFERENCES

1. **Riverside County Transportation Department.** *Transportation Analysis Guideines for Level of Service & Vehicle Miles Traveled.* County of Riverside : s.n., December 2020.

2. **City of Rancho Mirage.** *Transportation Analysis Policy.* (Revised February 18, 2021).

3. **Institute of Transportation Engineers.** Trip Generation Manual. 11th Edition, 2021.

4. **Transportation Research Board.** *Highway Capacity Manual (HCM), 7th Edition.* s.l. : National Academy of Sciences, 2022.

5. **California Department of Transportation.** California Manual on Uniform Traffic Control Devices (MUTCD). California Department of Transportation. *California Manual on Uniform Traffic Control Devices (CAMUTCD).* 2014, Updated March 30, 2021 (Revision 6).

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APPENDIX 1.1: TRAFFIC STUDY SCOPING AGREEMENT

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April 2, 2024

Mr. Ryan Stendell
City of Rancho Mirage, Director of Public Works
69-825 Highway 111
Rancho Mirage, CA 92270

VIA VAIL VILLAGE TRAFFIC SCOPING LETTER AND VMT SCREENING SCOPE

Dear Mr. Ryan Stendell:

Urban Crossroads, Inc. is pleased to submit this traffic analysis scope regarding the proposed Via Vail Village development ("Project"), which is located south of the future extension of Via Vail, east of Key Largo Avenue in the City of Rancho Mirage. It is our understanding that the project is to consist of 236 affordable apartment dwelling units.

The remainder of this letter describes the proposed analysis methodology, Project trip generation, trip distribution, and Project traffic assignment/project trips on the surrounding roadway network. The following scoping assumptions have been prepared in accordance with the City of Rancho Mirage Transportation Analysis Policy (Revised February 18, 2021) and County of Riverside's Transportation Analysis Guidelines for Level of Service & Vehicle Miles Traveled (December 2020).

A preliminary site plan for the proposed Project is shown on Exhibit 1. For analysis purposes, occupancy of the Project is anticipated to occur in year 2026. The Project is proposed to have one full access and one emergency access along Via Vail.

TRIP GENERATION

In order to develop the traffic characteristics of the proposed project, trip-generation statistics published in the Institute of Transportation Engineers (ITE) *Trip Generation* (11th Edition, 2021) manual for the proposed land uses (223 – Affordable Housing) are utilized. Table 1 presents the trip generation rates and the resulting trip generation summary for the proposed Project.

As shown in Table 1, the Project is anticipated to generate a total of 1,135 trip-ends per day with 85 AM peak hour trips and 109 PM peak hour trips.

EXHIBIT 1: PRELIMINARY SITE PLAN

TABLE 1: PROJECT TRIP GENERATION SUMMARY

Trip Generation Rates[1]

Land Use	ITE LU Code	Quantity[2]		AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily
Affordable Housing	223	236	DU	0.10	0.26	0.36	0.27	0.19	0.46	4.81

Trip Generation Results

Land Use	ITE LU Code	Quantity[2]		AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily
Affordable Housing	223	236	DU	24	61	85	64	45	109	1,135

[1] Trip Generation Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, 11th Edition (2021).
[2] DU = Dwelling Unit

STUDY AREA

Intersections of "Collector" or higher classification at which the proposed project will add 50 or more peak hour trips are to be evaluated in the traffic study. Table 2 lists the intersection analysis locations. Exhibit 2 identifies the proposed study area intersection analysis locations and depicts the location of the proposed project in relation to the existing roadway network.

TABLE 2: STUDY AREA INTERSECTIONS

#	Intersection	#	Intersection
1	Key Largo Av. / Dinah Shore Dr.	4	Shoppers Ln. / Dinah Shore Dr.
2	Key Largo Av. / Via Vail	5	Monterey Av. / Dinah Shore Dr.
3	Miriam Wy. - George Montgomery / Dinah Shore Dr.	6	Via Vail / Project Entry

TRIP DISTRIBUTION AND TRIP ASSIGNMENT

The trip distribution pattern is heavily influenced by the geographical location of the site, the location of surrounding uses, and the proximity to the regional freeway system. Exhibit 3 present the Project traffic distribution patterns.

Based on the identified Project traffic generation and trip distribution patterns, Project ADT and peak hour intersection turning movement volumes are shown on Exhibit 4.

EXHIBIT 2: TRAFFIC ANALYSIS STUDY AREA

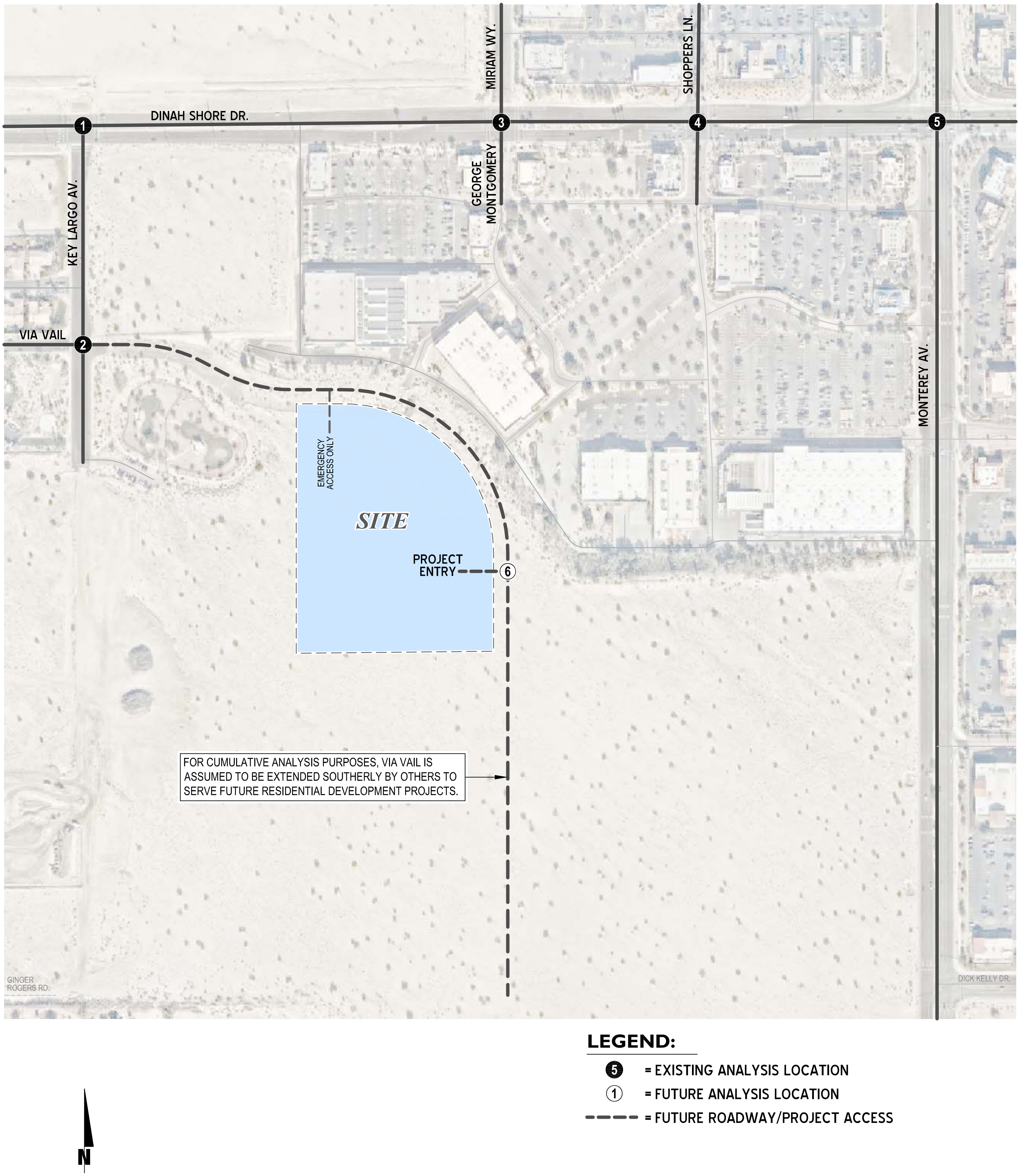


EXHIBIT 3: PROJECT TRIP DISTRIBUTION

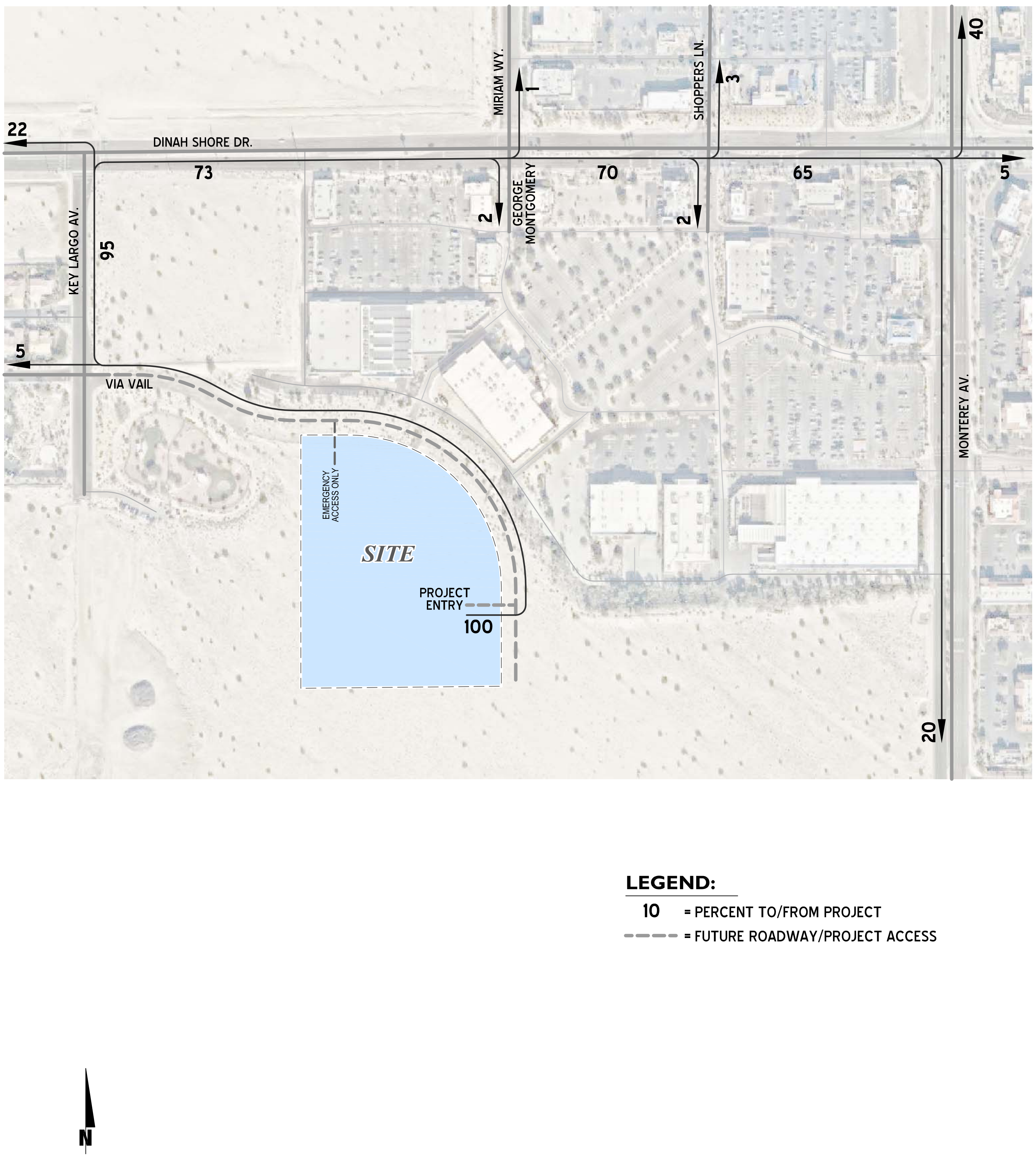
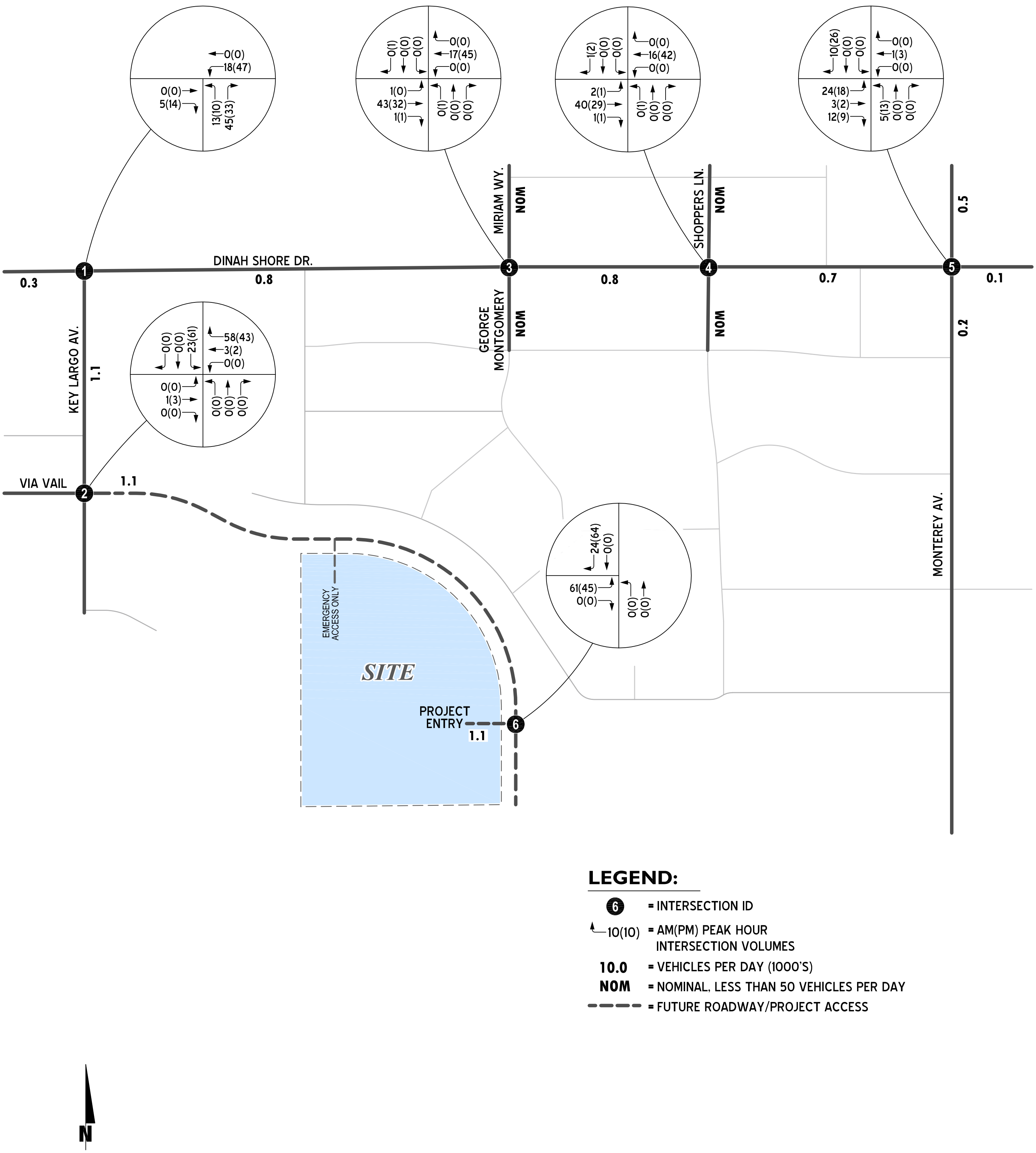


EXHIBIT 4: PROJECT ONLY TRAFFIC VOLUMES



ANALYSIS SCENARIOS

Peak hour intersection analysis will be provided for the following analysis scenarios:

- Existing (2024) Conditions
- Existing Plus Ambient Growth Plus Project (EAP) (2026)
- Existing plus Ambient plus Project plus Cumulative (EAPC) (2026)

The City of Rancho Mirage General Plan Functional Roadway Classifications are depicted on Exhibit 5.

LEVEL OF SERVICE (LOS) CRITERIA

The City of Rancho Mirage states that "While LOS C has long been considered the desirable and optimal level of traffic volume on any given roadway, it represents a standard that is progressively more difficult and less cost effective to achieve in urban areas. For peak operating periods, LOS D or a maximum volume to capacity ratio of 0.90 is now considered the generally acceptable service level."

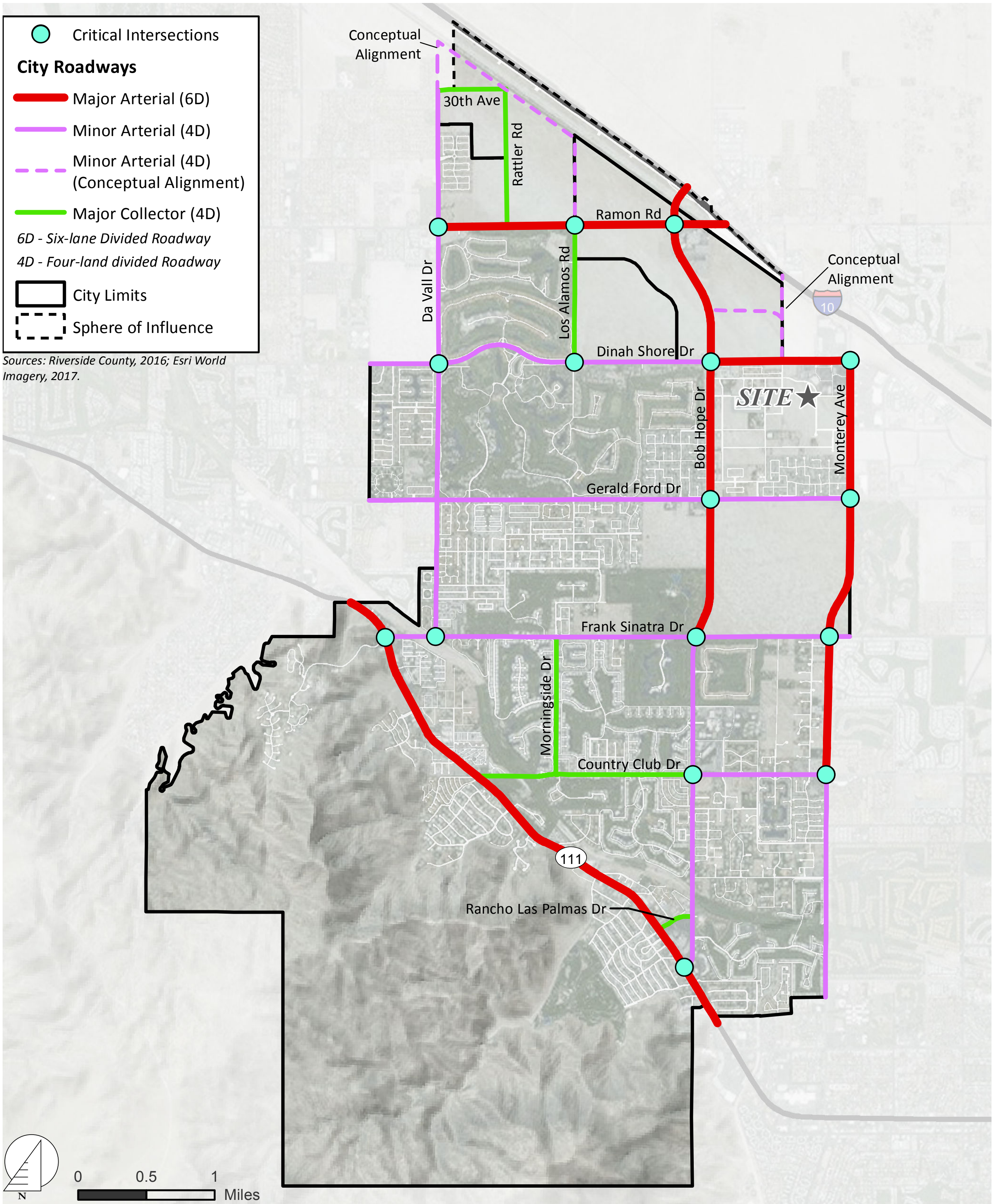
Where the average daily traffic volume (ADT) based roadway segment analysis indicates a deficiency (unacceptable LOS), a review of the more detailed peak hour intersection analysis is undertaken. The more detailed peak hour intersection analysis explicitly accounts for factors that affect roadway capacity. While this traffic study recognizes LOS D is the City's target LOS for roadway segments, a review of the more detailed peak hour intersection analysis is necessary to determine whether roadway widening along the segment is necessary. For the purposes of this analysis, if the peak hour intersection operations on either side of the roadway segment are anticipated to operate at LOS D or better, then additional roadway segment widening is not recommended. Therefore, for the purposes of this analysis, roadway segment widening is typically only recommended if the peak hour intersection analysis indicates the need for additional through lanes.

TRAFFIC COUNTS

Traffic count data will be collected in April 2024 during the AM peak period of 7:00 AM to 9:00 AM and PM peak period of 4:00 PM to 6:00 PM.

The City of Rancho Mirage experiences seasonal population variations over the course of the year, with relatively higher populations during the winter months from January to the end of March. The 2024 count data will be collected during April, so a seasonal adjustment to represent the peak period will be applied.

EXHIBIT 5: CITY OF RANCHO MIRAGE GENERAL PLAN CIRCULATION ELEMENT



CUMULATIVE DEVELOPMENT TRAFFIC

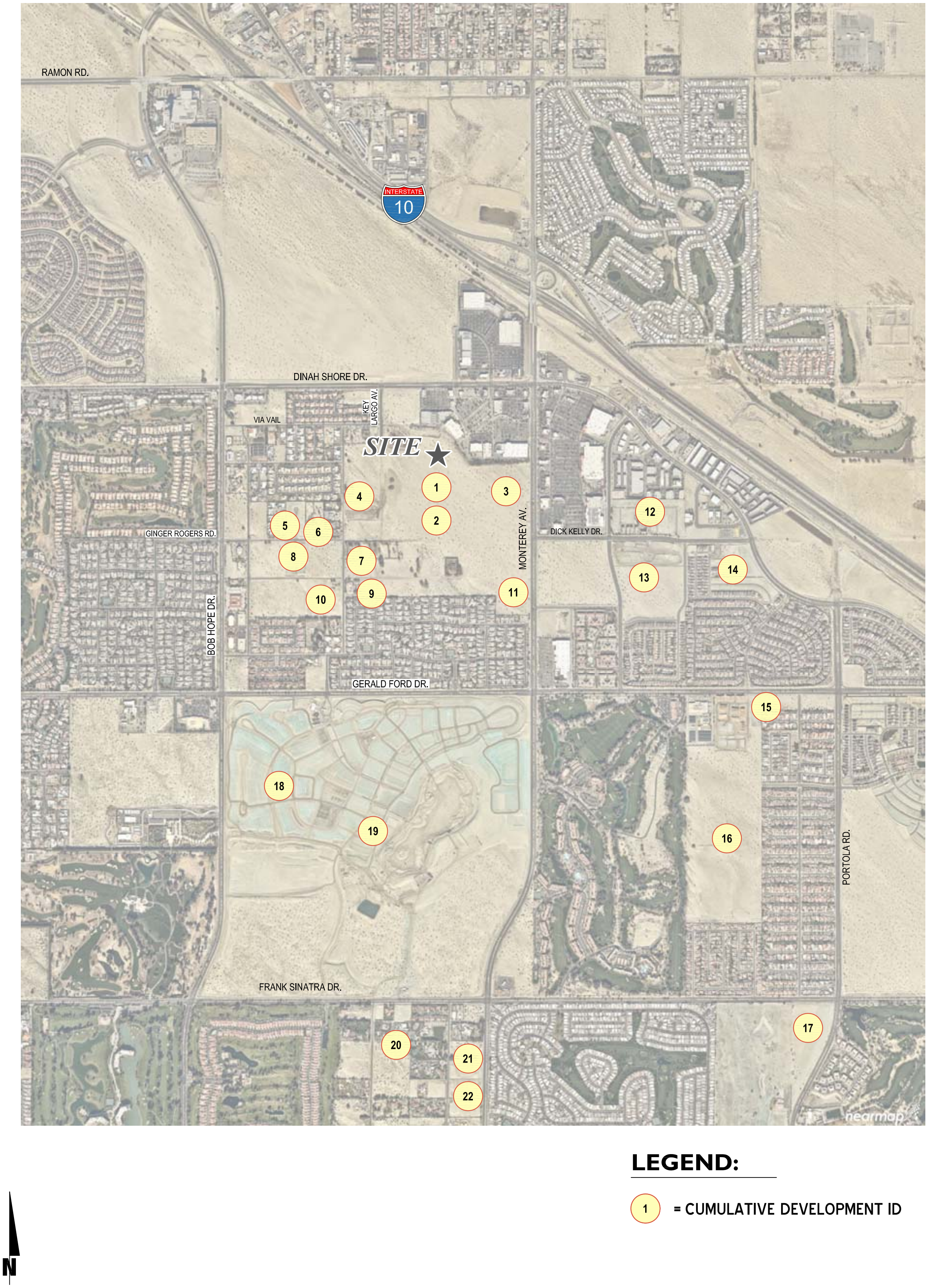
It is requested that City staff review the list of cumulative development projects (shown on Exhibit 6 and listed on Table 3) for inclusion in the traffic study. Consistent with other studies performed in the area, an ambient growth rate of 2% per year will be utilized as a minimum if necessary. The rate will be compounded over a 2-year period (i.e., 1.02^2years = 1.0404 or 4.04%) for Interim Year (2026) conditions.

TABLE 3: CUMULATIVE DEVELOPMENT LAND USE SUMMARY

ID	Project	Land Use	Quantity	Units[1]
1	Parcel 3 Residential (south of Project along Via Vail)	Affordable Apartments	160	DU
2	Parcel 2 Residential (south of Parcel 3 along Via Vail)	Affordable Apartments	250	DU
3	Rancho Monterey SP	Multifamily Residential	400	DU
		Shopping Center	150	TSF
4	Miragedunes Properties	Residential	9	DU
5	Estilo	Residential	39	DU
6	Rancho Mirage LLC	Residential	4	DU
7	38 JV, LLC c/o Meriwether Companies	Residential	10	DU
8	GRV Mirage, LLC (ECHO)	Residential	9	DU
9	RM 38 JV LLC	Residential	82	DU
10	38 JV, LLC c/o Meriwether Companies	Residential	97	DU
11	Monterey Medical Center	Medical Office	75.164	TSF
12	Falling Waters	Single Family Detached Residential	159	DU
13	Urban Crossings (UHC)	Multifamily Residential	111	DU
14	Ponderosa (75% built)	Single Family Detached Residential	114	DU
		Shopping Center	150	TSF
15	Santa Barbara Apartment	Multifamily Residential	48	DU
16	Vistali/Refuge Residential	Single Family Detached Residential	248	DU
		Multifamily Residential	571	DU
		Single Family Attached Residential	150	DU
17	Portola Av./Frank Sinatra Dr. Residential	Multifamily Residential	402	DU
18	ED Rancho Mirage	Residential	354	DU
19	Section 31 Specific Plan Project	Hotel	400	Rooms
		Commercial	175.0	TSF
		Residential	1,932	DU
20	TPM 34741	Single Family Detached Residential	4	DU
21	TTM 32308 (Los Ranchos)	Single Family Detached Residential	7	DU
22	TPM 36849	Single Family Detached Residential	3	DU

[1] DU = Dwelling Units; TSF = Thousand Square Feet

EXHIBIT 6: CUMULATIVE DEVELOPMENT LOCATION MAP



SPECIAL ISSUES

The following issues will also be addressed as part of the Traffic Analysis (TA):

- *Traffic Signal Warrant Analysis:* Signal warrant analysis will be prepared for all unsignalized study area intersections that allow for full access (no traffic signal warrants to be performed for restricted access locations due to infeasibility of installing a signal at these types of locations).

- *Queuing Analysis:* The analysis will identify the necessary lengths of turn pockets with storage at Project Access points, as well as the appropriate turn pocket transitions which adhere to the General Plan roadway classifications for the site adjacent roadways.

VEHICLE MILES TRAVELED

The VMT screening assessment has been prepared under separate cover (dated April 2, 2024) in accordance with SB743 and consistent with the methodology and thresholds outlined in the City of Rancho Mirage Transportation Analysis Policy (Revised February 18, 2021).

Please review this scoping agreement let us know if it is acceptable, or if the City requests any changes to this proposed scope of work. If you have any questions, please contact John Kain at (949) 375-2435 or Marlie Whiteman (714) 585-0574.

Respectfully submitted,

URBAN CROSSROADS, INC.

John Kain

John Kain, AICP
Principal

Marlie Whiteman

Marlie Whiteman, PE
Senior Associate

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APPENDIX 3.1: TRAFFIC COUNTS – APRIL 2024

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Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Rancho Mirage
N/S: Key Largo Avenue
E/W: Dinah Shore Drive
Weather: Clear

File Name : 01_RNM_Key L_Dinah AM
Site Code : 05124316
Start Date : 4/9/2024
Page No : 1

Groups Printed- Total Volume

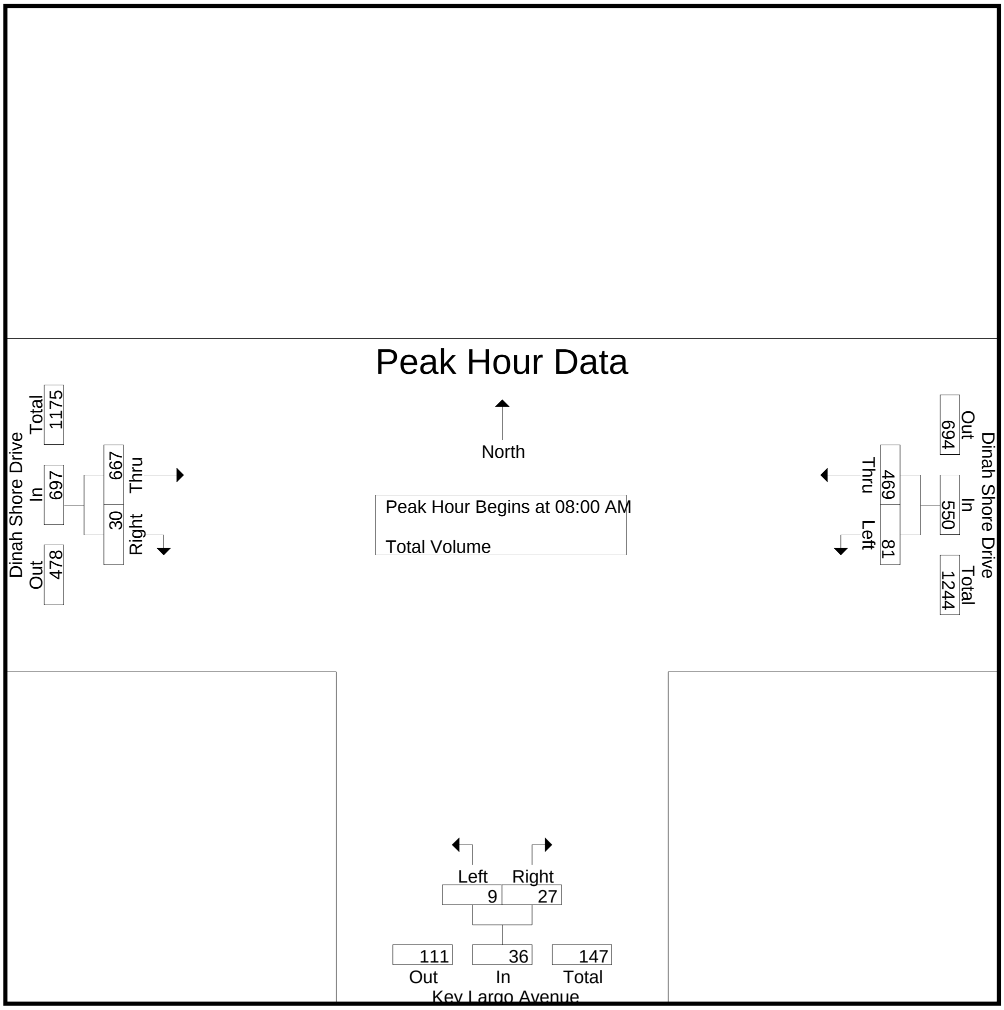
	Dinah Shore Drive Westbound			Key Largo Avenue Northbound			Dinah Shore Drive Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
07:00 AM	6	89	95	3	4	7	77	3	80	182
07:15 AM	11	107	118	4	9	13	89	2	91	222
07:30 AM	10	108	118	6	8	14	143	9	152	284
07:45 AM	19	116	135	4	8	12	159	9	168	315
Total	46	420	466	17	29	46	468	23	491	1003
08:00 AM	24	124	148	1	9	10	142	4	146	304
08:15 AM	25	126	151	3	10	13	165	12	177	341
08:30 AM	20	116	136	1	6	7	169	9	178	321
08:45 AM	12	103	115	4	2	6	191	5	196	317
Total	81	469	550	9	27	36	667	30	697	1283
Grand Total	127	889	1016	26	56	82	1135	53	1188	2286
Apprch %	12.5	87.5		31.7	68.3		95.5	4.5		
Total %	5.6	38.9	44.4	1.1	2.4	3.6	49.7	2.3	52	

	Dinah Shore Drive Westbound			Key Largo Avenue Northbound			Dinah Shore Drive Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	24	124	148	1	9	10	142	4	146	304
08:15 AM	**25**	**126**	**151**	3	**10**	**13**	165	**12**	177	**341**
08:30 AM	20	116	136	1	6	7	169	9	178	321
08:45 AM	12	103	115	**4**	2	6	**191**	5	**196**	317
Total Volume	81	469	550	9	27	36	667	30	697	1283
% App. Total	14.7	85.3		25	75		95.7	4.3		
PHF	.810	.931	.911	.563	.675	.692	.873	.625	.889	.941

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Rancho Mirage
N/S: Key Largo Avenue
E/W: Dinah Shore Drive
Weather: Clear

File Name : 01_RNM_Key L_Dinah AM
Site Code : 05124316
Start Date : 4/9/2024
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45 AM			07:15 AM			08:00 AM		
+0 mins.	19	116	135	4	**9**	13	142	4	146
+15 mins.	24	124	148	**6**	8	**14**	165	**12**	177
+30 mins.	**25**	**126**	**151**	4	8	12	169	9	178
+45 mins.	20	116	136	1	9	10	**191**	5	**196**
Total Volume	88	482	570	15	34	49	667	30	697
% App. Total	15.4	84.6		30.6	69.4		95.7	4.3	
PHF	.880	.956	.944	.625	.944	.875	.873	.625	.889

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City of Rancho Mirage
N/S: Key Largo Avenue
E/W: Dinah Shore Drive
Weather: Clear

File Name : 01_RNM_Key L_Dinah PM
Site Code : 05124316
Start Date : 4/9/2024
Page No : 1

Groups Printed- Total Volume

	Dinah Shore Drive Westbound			Key Largo Avenue Northbound			Dinah Shore Drive Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
04:00 PM	14	238	252	3	10	13	222	7	229	494
04:15 PM	7	223	230	6	16	22	196	4	200	452
04:30 PM	6	221	227	4	24	28	188	5	193	448
04:45 PM	8	196	204	1	10	11	202	9	211	426
Total	35	878	913	14	60	74	808	25	833	1820
05:00 PM	8	204	212	3	29	32	228	3	231	475
05:15 PM	6	203	209	1	16	17	190	5	195	421
05:30 PM	4	178	182	2	12	14	149	4	153	349
05:45 PM	6	184	190	0	8	8	133	6	139	337
Total	24	769	793	6	65	71	700	18	718	1582
Grand Total	59	1647	1706	20	125	145	1508	43	1551	3402
Apprch %	3.5	96.5		13.8	86.2		97.2	2.8		
Total %	1.7	48.4	50.1	0.6	3.7	4.3	44.3	1.3	45.6	

	Dinah Shore Drive Westbound			Key Largo Avenue Northbound			Dinah Shore Drive Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	**14**	**238**	**252**	3	10	13	**222**	7	**229**	**494**
04:15 PM	7	223	230	**6**	16	22	196	4	200	452
04:30 PM	6	221	227	4	**24**	**28**	188	5	193	448
04:45 PM	8	196	204	1	10	11	202	**9**	211	426
Total Volume	35	878	913	14	60	74	808	25	833	1820
% App. Total	3.8	96.2		18.9	81.1		97	3		
PHF	.625	.922	.906	.583	.625	.661	.910	.694	.909	.921

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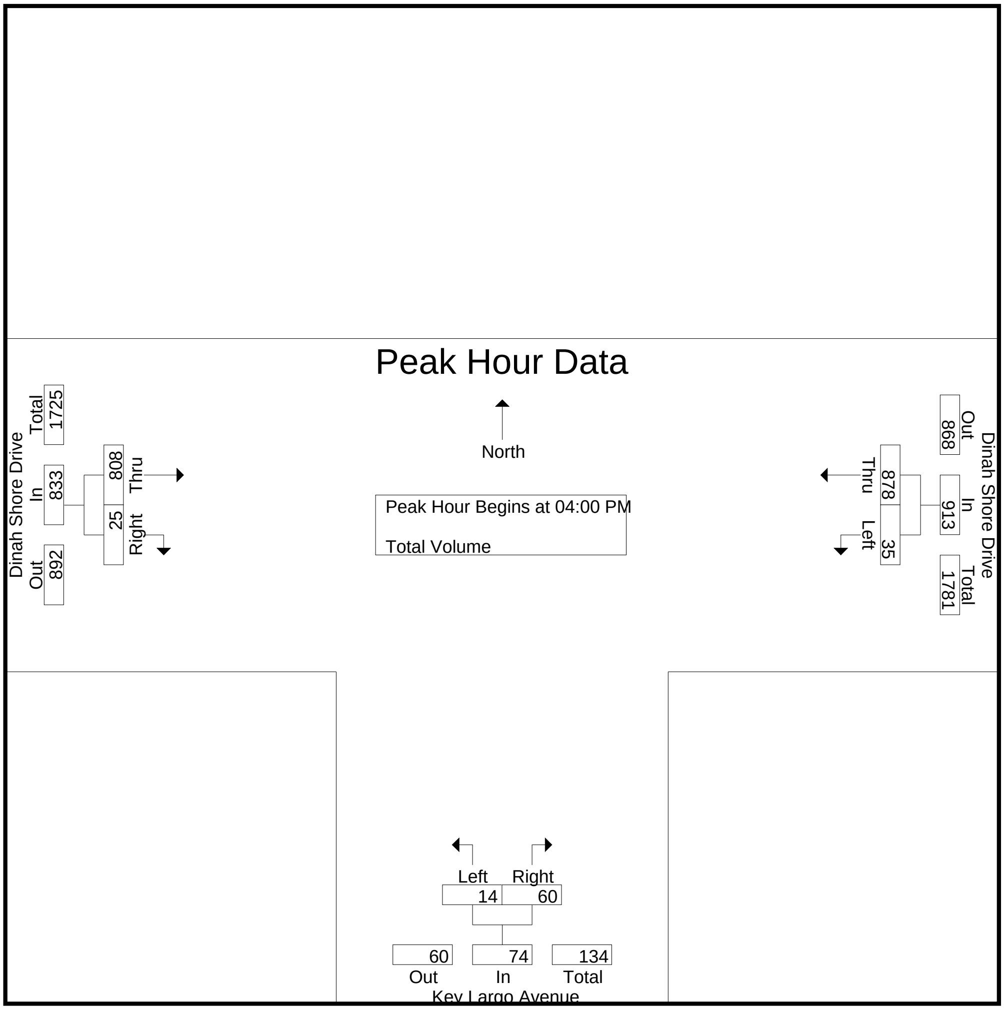
City of Rancho Mirage
N/S: Key Largo Avenue
E/W: Dinah Shore Drive
Weather: Clear

File Name : 01_RNM_Key L_Dinah PM
Site Code : 05124316
Start Date : 4/9/2024
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM			04:15 PM			04:15 PM		
+0 mins.	**14**	**238**	**252**	**6**	16	22	196	4	200
+15 mins.	7	223	230	4	24	28	188	5	193
+30 mins.	6	221	227	1	10	11	202	**9**	211
+45 mins.	8	196	204	3	**29**	**32**	**228**	3	**231**
Total Volume	35	878	913	14	79	93	814	21	835
% App. Total	3.8	96.2		15.1	84.9		97.5	2.5	
PHF	.625	.922	.906	.583	.681	.727	.893	.583	.904

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City of Rancho Mirage
N/S: Key Largo Avenue
E/W: Via Vail
Weather: Clear

File Name : 02_RNM_Key L_Via V AM
Site Code : 05124316
Start Date : 4/9/2024
Page No : 1

Groups Printed- Total Volume

	Key Largo Avenue Southbound			Key Largo Avenue Northbound			Via Vail Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
07:00 AM	4	3	7	3	3	6	0	0	0	13
07:15 AM	3	10	13	0	6	6	3	0	3	22
07:30 AM	6	14	20	0	6	6	5	2	7	33
07:45 AM	4	21	25	2	5	7	5	2	7	39
Total	17	48	65	5	20	25	13	4	17	107
08:00 AM	5	21	26	1	2	3	6	1	7	36
08:15 AM	9	24	33	0	6	6	3	1	4	43
08:30 AM	7	23	30	3	2	5	5	0	5	40
08:45 AM	4	11	15	2	3	5	3	4	7	27
Total	25	79	104	6	13	19	17	6	23	146
Grand Total	42	127	169	11	33	44	30	10	40	253
Apprch %	24.9	75.1		25	75		75	25		
Total %	16.6	50.2	66.8	4.3	13	17.4	11.9	4	15.8	

	Key Largo Avenue Southbound			Key Largo Avenue Northbound			Via Vail Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	4	21	25	2	5	**7**	5	**2**	**7**	39
08:00 AM	5	21	26	1	2	3	**6**	1	7	36
08:15 AM	**9**	**24**	**33**	0	**6**	6	3	1	4	**43**
08:30 AM	7	23	30	**3**	2	5	5	0	5	40
Total Volume	25	89	114	6	15	21	19	4	23	158
% App. Total	21.9	78.1		28.6	71.4		82.6	17.4		
PHF	.694	.927	.864	.500	.625	.750	.792	.500	.821	.919

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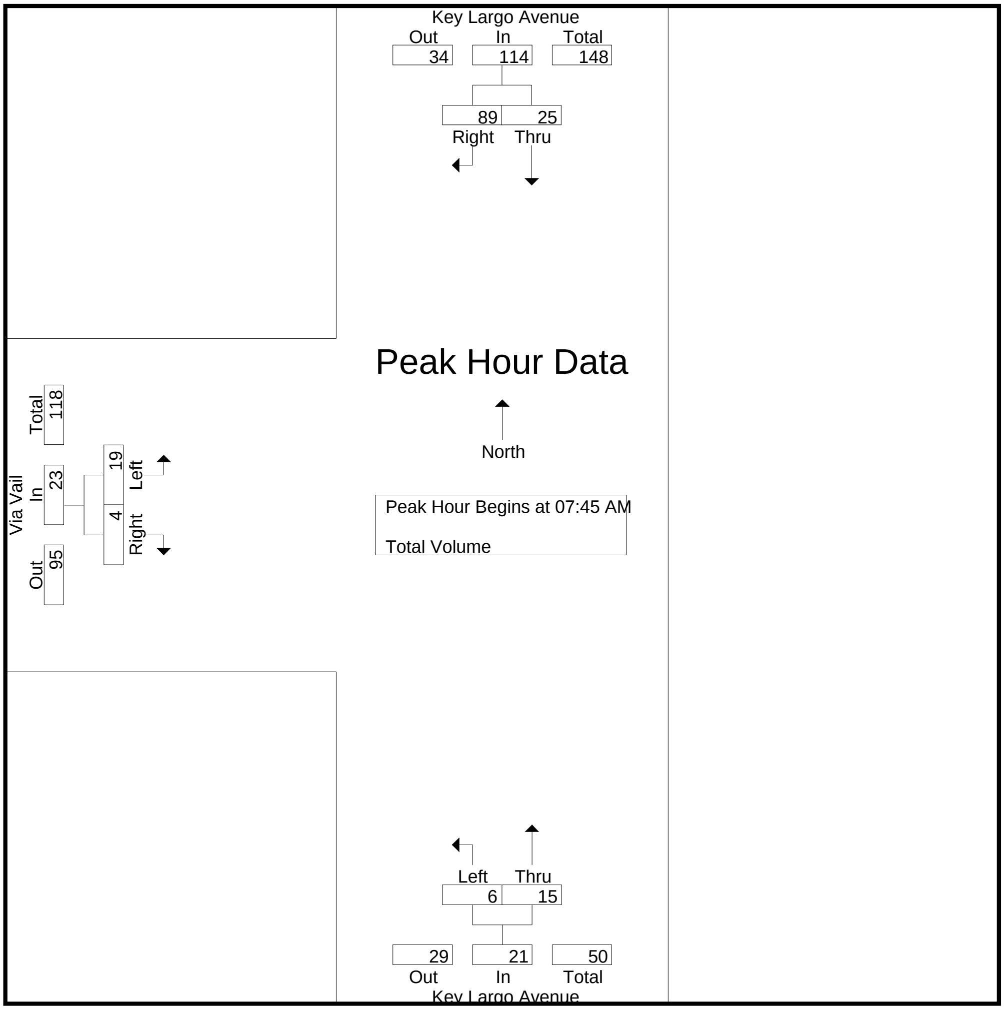
City of Rancho Mirage
N/S: Key Largo Avenue
E/W: Via Vail
Weather: Clear

File Name : 02_RNM_Key L_Via V AM
Site Code : 05124316
Start Date : 4/9/2024
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45 AM			07:00 AM			07:30 AM		
+0 mins.	4	21	25	**3**	3	6	5	**2**	**7**
+15 mins.	5	21	26	0	**6**	6	5	2	7
+30 mins.	**9**	**24**	**33**	0	6	6	**6**	1	7
+45 mins.	7	23	30	2	5	**7**	3	1	4
Total Volume	25	89	114	5	20	25	19	6	25
% App. Total	21.9	78.1		20	80		76	24	
PHF	.694	.927	.864	.417	.833	.893	.792	.750	.893

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City of Rancho Mirage
N/S: Key Largo Avenue
E/W: Via Vail
Weather: Clear

File Name : 02_RNM_Key L_Via V PM
Site Code : 05124316
Start Date : 4/9/2024
Page No : 1

Groups Printed- Total Volume

	Key Largo Avenue Southbound			Key Largo Avenue Northbound			Via Vail Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
04:00 PM	8	14	22	1	5	6	7	1	8	36
04:15 PM	1	5	6	1	8	9	13	2	15	30
04:30 PM	3	7	10	0	2	2	23	2	25	37
04:45 PM	4	7	11	1	2	3	7	3	10	24
Total	16	33	49	3	17	20	50	8	58	127
05:00 PM	6	4	10	1	6	7	27	1	28	45
05:15 PM	1	8	9	0	7	7	13	1	14	30
05:30 PM	2	2	4	2	3	5	8	0	8	17
05:45 PM	1	6	7	2	1	3	8	0	8	18
Total	10	20	30	5	17	22	56	2	58	110
Grand Total	26	53	79	8	34	42	106	10	116	237
Apprch %	32.9	67.1		19	81		91.4	8.6		
Total %	11	22.4	33.3	3.4	14.3	17.7	44.7	4.2	48.9	

	Key Largo Avenue Southbound			Key Largo Avenue Northbound			Via Vail Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	1	5	6	**1**	**8**	**9**	13	2	15	30
04:30 PM	3	**7**	10	0	2	2	23	2	25	37
04:45 PM	4	7	**11**	1	2	3	7	**3**	10	24
05:00 PM	**6**	4	10	1	6	7	**27**	1	**28**	**45**
Total Volume	14	23	37	3	18	21	70	8	78	136
% App. Total	37.8	62.2		14.3	85.7		89.7	10.3		
PHF	.583	.821	.841	.750	.563	.583	.648	.667	.696	.756

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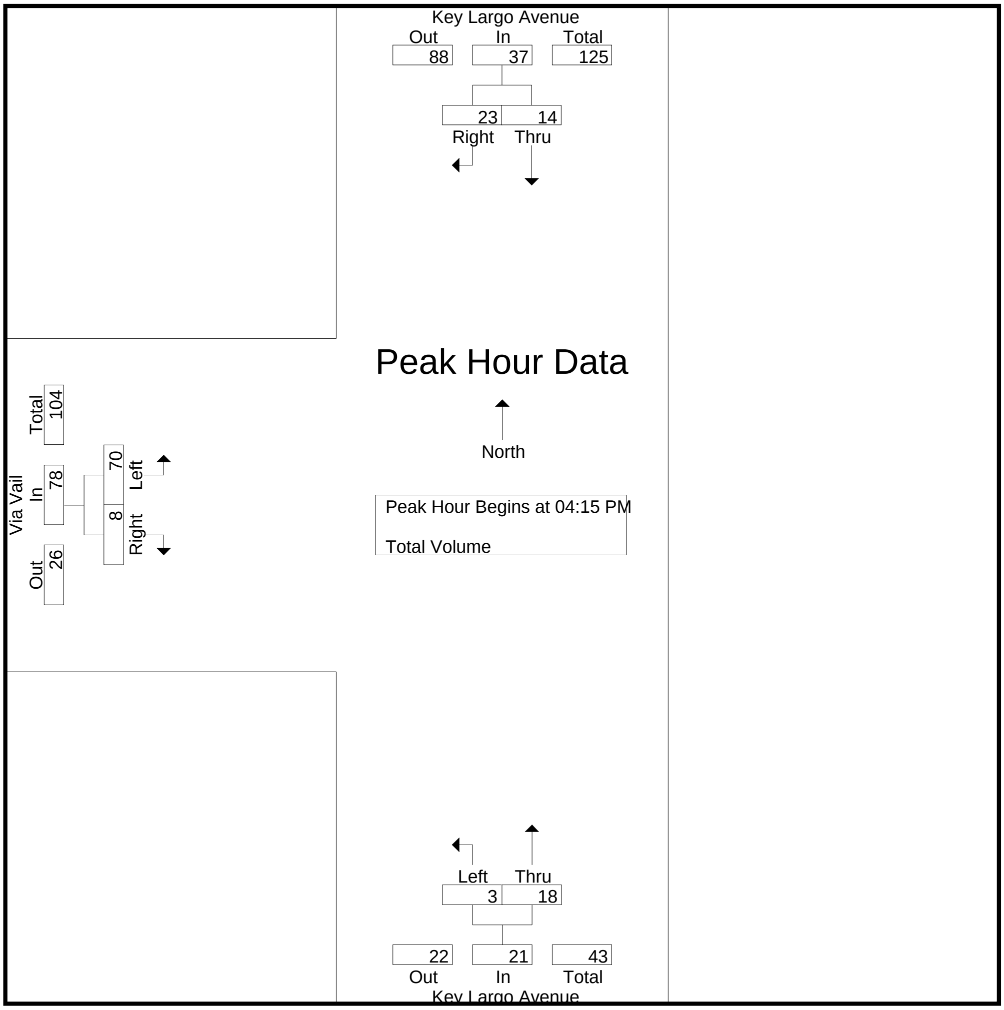
City of Rancho Mirage
N/S: Key Largo Avenue
E/W: Via Vail
Weather: Clear

File Name : 02_RNM_Key L_Via V PM
Site Code : 05124316
Start Date : 4/9/2024
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM			04:45 PM			04:15 PM		
+0 mins.	**8**	**14**	**22**	1	2	3	13	2	15
+15 mins.	1	5	6	1	6	**7**	23	2	25
+30 mins.	3	7	10	0	**7**	7	7	**3**	10
+45 mins.	4	7	11	**2**	3	5	**27**	1	**28**
Total Volume	16	33	49	4	18	22	70	8	78
% App. Total	32.7	67.3		18.2	81.8		89.7	10.3	
PHF	.500	.589	.557	.500	.643	.786	.648	.667	.696

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City of Rancho Mirage
N/S: Miriam Way/George Montgomery
E/W: Dinah Shore Drive
Weather: Clear

File Name : 03_RNM_Mir_Dinah AM
Site Code : 05124316
Start Date : 4/9/2024
Page No : 1

Groups Printed- Total Volume

	Miriam Way Southbound				Dinah Shore Drive Westbound				George Montgomery Northbound				Dinah Shore Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	1	1	1	98	1	100	0	0	4	4	4	73	6	83	188
07:15 AM	2	0	1	3	3	115	5	123	3	0	0	3	3	88	5	96	225
07:30 AM	4	0	4	8	1	130	1	132	3	0	3	6	9	127	7	143	289
07:45 AM	0	1	0	1	5	136	4	145	6	0	1	7	15	136	8	159	312
Total	6	1	6	13	10	479	11	500	12	0	8	20	31	424	26	481	1014
08:00 AM	2	0	7	9	3	156	4	163	3	0	3	6	5	141	6	152	330
08:15 AM	2	0	3	5	3	143	2	148	3	0	3	6	5	151	9	165	324
08:30 AM	1	2	5	8	2	131	0	133	5	1	3	9	12	158	10	180	330
08:45 AM	3	0	8	11	3	93	1	97	7	0	1	8	6	166	18	190	306
Total	8	2	23	33	11	523	7	541	18	1	10	29	28	616	43	687	1290
Grand Total	14	3	29	46	21	1002	18	1041	30	1	18	49	59	1040	69	1168	2304
Apprch %	30.4	6.5	63		2	96.3	1.7		61.2	2	36.7		5.1	89	5.9		
Total %	0.6	0.1	1.3	2	0.9	43.5	0.8	45.2	1.3	0	0.8	2.1	2.6	45.1	3	50.7	

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 07:45 AM

	Miriam Way Southbound				Dinah Shore Drive Westbound				George Montgomery Northbound				Dinah Shore Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:45 AM	0	1	0	1	**5**	136	**4**	145	**6**	0	1	7	**15**	136	8	159	312
08:00 AM	**2**	0	**7**	**9**	3	**156**	4	**163**	3	0	**3**	6	5	141	6	152	**330**
08:15 AM	2	0	3	5	3	143	2	148	3	0	3	6	5	151	9	165	324
08:30 AM	1	**2**	5	8	2	131	0	133	5	**1**	3	**9**	12	**158**	**10**	**180**	330
Total Volume	5	3	15	23	13	566	10	589	17	1	10	28	37	586	33	656	1296
% App. Total	21.7	13	65.2		2.2	96.1	1.7		60.7	3.6	35.7		5.6	89.3	5		
PHF	.625	.375	.536	.639	.650	.907	.625	.903	.708	.250	.833	.778	.617	.927	.825	.911	.982

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City of Rancho Mirage
N/S: Miriam Way/George Montgomery
E/W: Dinah Shore Drive
Weather: Clear

File Name : 03_RNM_Mir_Dinah AM
Site Code : 05124316
Start Date : 4/9/2024
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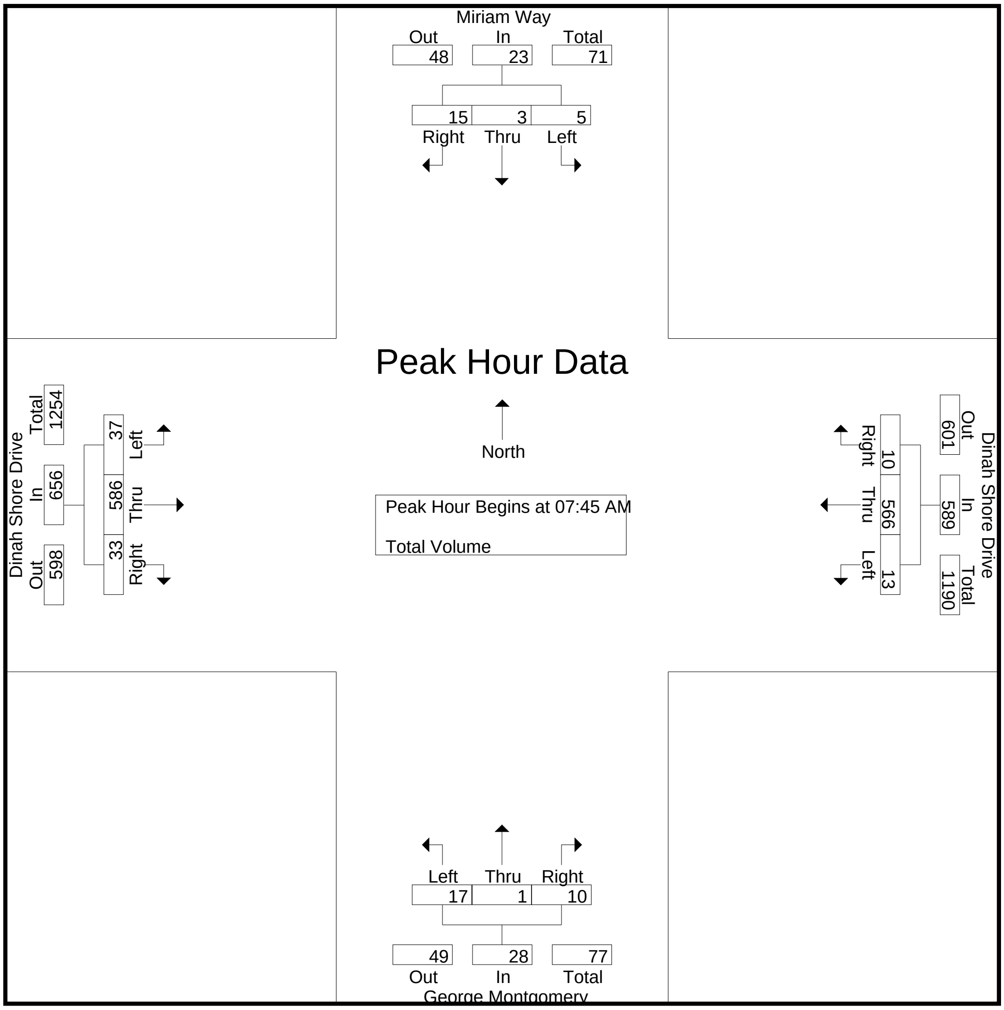

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	08:00 AM				07:45 AM				08:00 AM				08:00 AM			
+0 mins.	2	0	7	9	**5**	136	**4**	145	3	0	**3**	6	5	141	6	152
+15 mins.	2	0	3	5	3	**156**	4	**163**	3	0	3	6	5	151	9	165
+30 mins.	1	**2**	5	8	3	143	2	148	5	**1**	3	**9**	**12**	158	10	180
+45 mins.	**3**	0	**8**	**11**	2	131	0	133	**7**	0	1	8	6	**166**	**18**	**190**
Total Volume	8	2	23	33	13	566	10	589	18	1	10	29	28	616	43	687
% App. Total	24.2	6.1	69.7		2.2	96.1	1.7		62.1	3.4	34.5		4.1	89.7	6.3	
PHF	.667	.250	.719	.750	.650	.907	.625	.903	.643	.250	.833	.806	.583	.928	.597	.904

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City of Rancho Mirage
N/S: Miriam Way/George Montgomery
E/W: Dinah Shore Drive
Weather: Clear

File Name : 03_RNM_Mir_Dinah PM
Site Code : 05124316
Start Date : 4/9/2024
Page No : 1

Groups Printed- Total Volume

	Miriam Way Southbound				Dinah Shore Drive Westbound				George Montgomery Northbound				Dinah Shore Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	4	1	40	45	7	210	2	219	16	1	12	29	18	206	15	239	532
04:15 PM	3	0	28	31	8	176	3	187	15	0	13	28	19	173	16	208	454
04:30 PM	7	3	30	40	11	180	3	194	31	1	20	52	14	178	16	208	494
04:45 PM	3	2	30	35	17	159	0	176	8	1	10	19	13	163	22	198	428
Total	17	6	128	151	43	725	8	776	70	3	55	128	64	720	69	853	1908
05:00 PM	2	0	20	22	19	195	3	217	14	0	11	25	15	226	12	253	517
05:15 PM	3	2	23	28	13	167	2	182	9	1	15	25	13	148	17	178	413
05:30 PM	3	1	15	19	6	172	2	180	4	2	11	17	11	169	15	195	411
05:45 PM	2	0	19	21	11	164	0	175	11	2	16	29	8	112	15	135	360
Total	10	3	77	90	49	698	7	754	38	5	53	96	47	655	59	761	1701
Grand Total	27	9	205	241	92	1423	15	1530	108	8	108	224	111	1375	128	1614	3609
Apprch %	11.2	3.7	85.1		6	93	1		48.2	3.6	48.2		6.9	85.2	7.9		
Total %	0.7	0.2	5.7	6.7	2.5	39.4	0.4	42.4	3	0.2	3	6.2	3.1	38.1	3.5	44.7	

	Miriam Way Southbound				Dinah Shore Drive Westbound				George Montgomery Northbound				Dinah Shore Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	4	1	**40**	**45**	7	**210**	2	**219**	16	**1**	12	29	18	**206**	15	**239**	**532**
04:15 PM	3	0	28	31	8	176	**3**	187	15	0	13	28	**19**	173	16	208	454
04:30 PM	**7**	**3**	30	40	11	180	3	194	**31**	1	**20**	**52**	14	178	16	208	494
04:45 PM	3	2	30	35	**17**	159	0	176	8	1	10	19	13	163	**22**	198	428
Total Volume	17	6	128	151	43	725	8	776	70	3	55	128	64	720	69	853	1908
% App. Total	11.3	4	84.8		5.5	93.4	1		54.7	2.3	43		7.5	84.4	8.1		
PHF	.607	.500	.800	.839	.632	.863	.667	.886	.565	.750	.688	.615	.842	.874	.784	.892	.897

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City of Rancho Mirage
N/S: Miriam Way/George Montgomery
E/W: Dinah Shore Drive
Weather: Clear

File Name : 03_RNM_Mir_Dinah PM
Site Code : 05124316
Start Date : 4/9/2024
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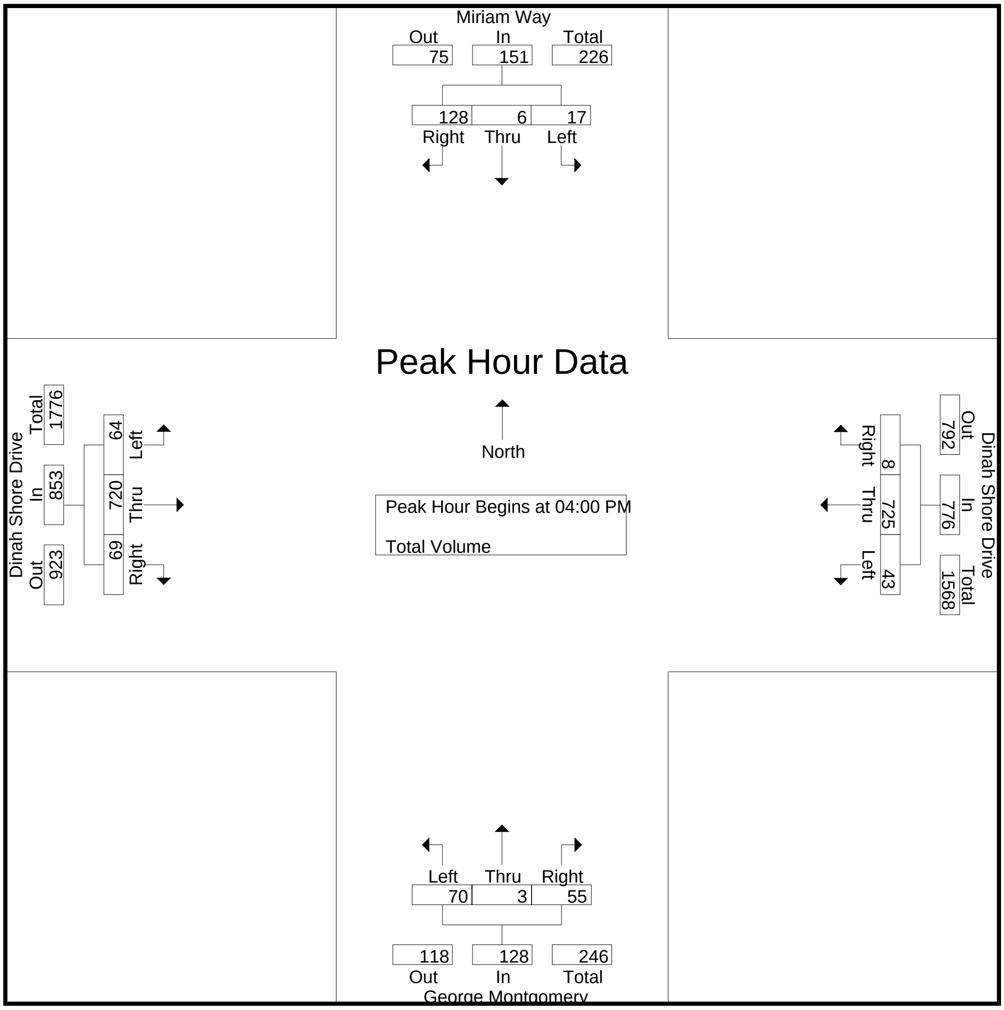

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				04:15 PM			
+0 mins.	4	1	**40**	**45**	7	**210**	2	**219**	16	**1**	12	29	**19**	173	16	208
+15 mins.	3	0	28	31	8	176	**3**	187	15	0	13	28	14	178	16	208
+30 mins.	**7**	**3**	30	40	11	180	3	194	**31**	1	**20**	**52**	13	163	**22**	198
+45 mins.	3	2	30	35	**17**	159	0	176	8	1	10	19	15	**226**	12	**253**
Total Volume	17	6	128	151	43	725	8	776	70	3	55	128	61	740	66	867
% App. Total	11.3	4	84.8		5.5	93.4	1		54.7	2.3	43		7	85.4	7.6	
PHF	.607	.500	.800	.839	.632	.863	.667	.886	.565	.750	.688	.615	.803	.819	.750	.857

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City of Rancho Mirage
N/S: Shoppers Lane
E/W: Dinah Shore Drive
Weather: Clear

File Name : 04_RNM_Shop_Dinah AM
Site Code : 05124316
Start Date : 4/9/2024
Page No : 1

Groups Printed- Total Volume

	Shoppers Lane Southbound				Dinah Shore Drive Westbound				Shoppers Lane Northbound				Dinah Shore Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	32	2	10	44	4	76	15	95	12	0	4	16	6	57	11	74	229
07:15 AM	19	0	9	28	3	115	25	143	5	2	5	12	8	75	8	91	274
07:30 AM	33	5	8	46	8	108	17	133	7	3	11	21	14	107	19	140	340
07:45 AM	33	3	8	44	12	140	44	196	12	1	7	20	17	95	15	127	387
Total	117	10	35	162	27	439	101	567	36	6	27	69	45	334	53	432	1230
08:00 AM	30	1	10	41	13	128	22	163	14	2	6	22	13	129	8	150	376
08:15 AM	31	1	12	44	12	121	23	156	19	4	14	37	11	111	16	138	375
08:30 AM	47	0	6	53	8	110	22	140	16	2	15	33	24	144	12	180	406
08:45 AM	43	6	12	61	23	79	27	129	10	3	11	24	19	122	19	160	374
Total	151	8	40	199	56	438	94	588	59	11	46	116	67	506	55	628	1531
Grand Total	268	18	75	361	83	877	195	1155	95	17	73	185	112	840	108	1060	2761
Apprch %	74.2	5	20.8		7.2	75.9	16.9		51.4	9.2	39.5		10.6	79.2	10.2		
Total %	9.7	0.7	2.7	13.1	3	31.8	7.1	41.8	3.4	0.6	2.6	6.7	4.1	30.4	3.9	38.4	

	Shoppers Lane Southbound				Dinah Shore Drive Westbound				Shoppers Lane Northbound				Dinah Shore Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	33	**3**	8	44	12	**140**	**44**	**196**	12	1	7	20	17	95	15	127	387
08:00 AM	30	1	10	41	**13**	128	22	163	14	2	6	22	13	129	8	150	376
08:15 AM	31	1	**12**	44	12	121	23	156	**19**	**4**	14	**37**	11	111	**16**	138	375
08:30 AM	**47**	0	6	**53**	8	110	22	140	16	2	**15**	33	**24**	**144**	12	**180**	**406**
Total Volume	141	5	36	182	45	499	111	655	61	9	42	112	65	479	51	595	1544
% App. Total	77.5	2.7	19.8		6.9	76.2	16.9		54.5	8	37.5		10.9	80.5	8.6		
PHF	.750	.417	.750	.858	.865	.891	.631	.835	.803	.563	.700	.757	.677	.832	.797	.826	.951

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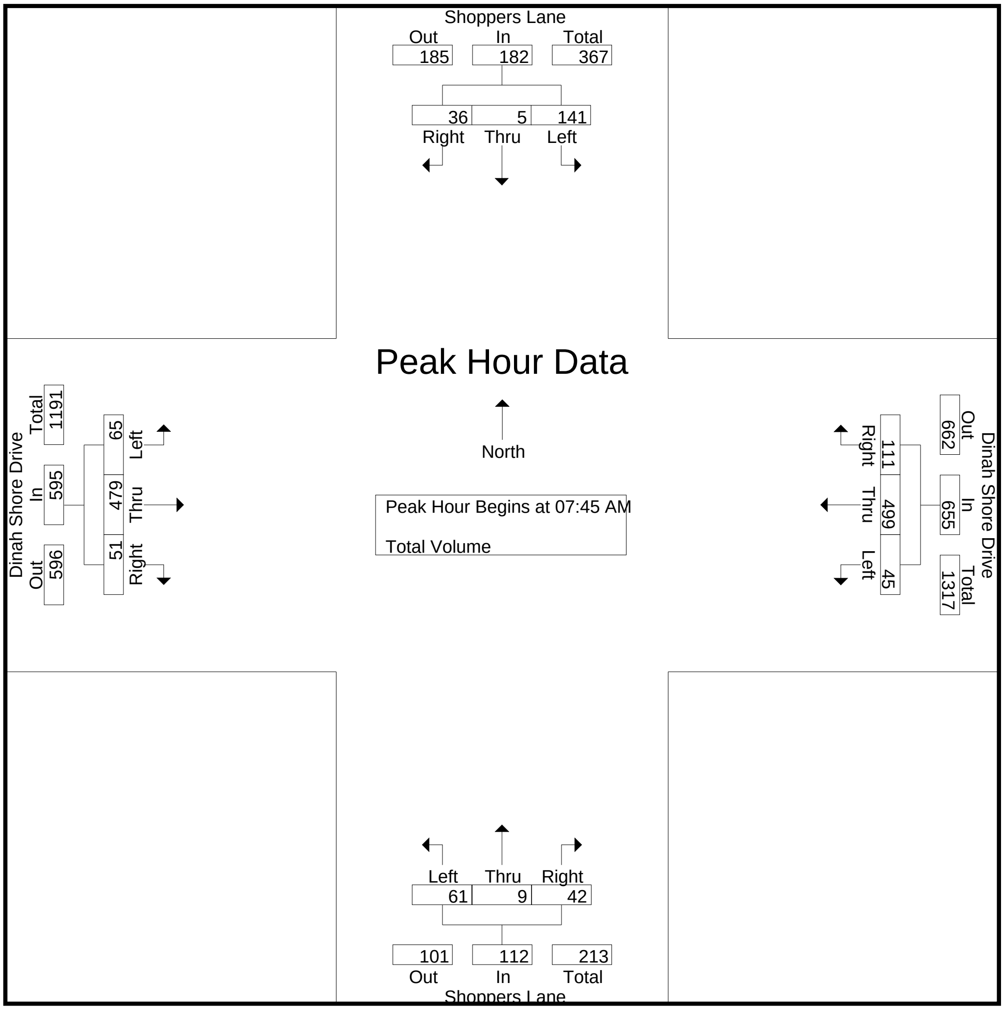
Corona, CA 92878
(951) 268-6268

City of Rancho Mirage
N/S: Shoppers Lane
E/W: Dinah Shore Drive
Weather: Clear

File Name : 04_RNM_Shop_Dinah AM
Site Code : 05124316
Start Date : 4/9/2024
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	08:00 AM				07:45 AM				08:00 AM				08:00 AM			
+0 mins.	30	1	10	41	12	**140**	**44**	**196**	14	2	6	22	13	129	8	150
+15 mins.	31	1	**12**	44	**13**	128	22	163	**19**	**4**	14	**37**	11	111	16	138
+30 mins.	**47**	0	6	53	12	121	23	156	16	2	**15**	33	**24**	**144**	12	**180**
+45 mins.	43	**6**	12	**61**	8	110	22	140	10	3	11	24	19	122	**19**	160
Total Volume	151	8	40	199	45	499	111	655	59	11	46	116	67	506	55	628
% App. Total	75.9	4	20.1		6.9	76.2	16.9		50.9	9.5	39.7		10.7	80.6	8.8	
PHF	.803	.333	.833	.816	.865	.891	.631	.835	.776	.688	.767	.784	.698	.878	.724	.872

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City of Rancho Mirage
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File Name : 04_RNM_Shop_Dinah PM
Site Code : 05124316
Start Date : 4/9/2024
Page No : 1

Groups Printed- Total Volume

	Shoppers Lane Southbound				Dinah Shore Drive Westbound				Shoppers Lane Northbound				Dinah Shore Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	121	9	27	157	19	152	48	219	23	9	31	63	26	172	18	216	655
04:15 PM	105	3	27	135	25	140	37	202	32	9	29	70	31	146	11	188	595
04:30 PM	130	8	32	170	13	144	49	206	8	9	25	42	43	167	11	221	639
04:45 PM	98	12	38	148	27	134	53	214	14	7	27	48	28	122	18	168	578
Total	454	32	124	610	84	570	187	841	77	34	112	223	128	607	58	793	2467
05:00 PM	128	9	31	168	24	156	40	220	19	5	18	42	33	192	20	245	675
05:15 PM	100	7	31	138	29	129	38	196	29	13	28	70	32	122	19	173	577
05:30 PM	102	8	25	135	21	134	32	187	7	5	24	36	32	142	5	179	537
05:45 PM	92	8	32	132	21	123	35	179	23	8	24	55	19	95	8	122	488
Total	422	32	119	573	95	542	145	782	78	31	94	203	116	551	52	719	2277
Grand Total	876	64	243	1183	179	1112	332	1623	155	65	206	426	244	1158	110	1512	4744
Apprch %	74	5.4	20.5		11	68.5	20.5		36.4	15.3	48.4		16.1	76.6	7.3		
Total %	18.5	1.3	5.1	24.9	3.8	23.4	7	34.2	3.3	1.4	4.3	9	5.1	24.4	2.3	31.9	

	Shoppers Lane Southbound				Dinah Shore Drive Westbound				Shoppers Lane Northbound				Dinah Shore Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	105	3	27	135	25	140	37	202	**32**	**9**	**29**	**70**	31	146	11	188	595
04:30 PM	**130**	8	32	**170**	13	144	49	206	8	9	25	42	**43**	167	11	221	639
04:45 PM	98	**12**	**38**	148	**27**	134	**53**	214	14	7	27	48	28	122	18	168	578
05:00 PM	128	9	31	168	24	**156**	40	**220**	19	5	18	42	33	**192**	**20**	**245**	**675**
Total Volume	461	32	128	621	89	574	179	842	73	30	99	202	135	627	60	822	2487
% App. Total	74.2	5.2	20.6		10.6	68.2	21.3		36.1	14.9	49		16.4	76.3	7.3		
PHF	.887	.667	.842	.913	.824	.920	.844	.957	.570	.833	.853	.721	.785	.816	.750	.839	.921

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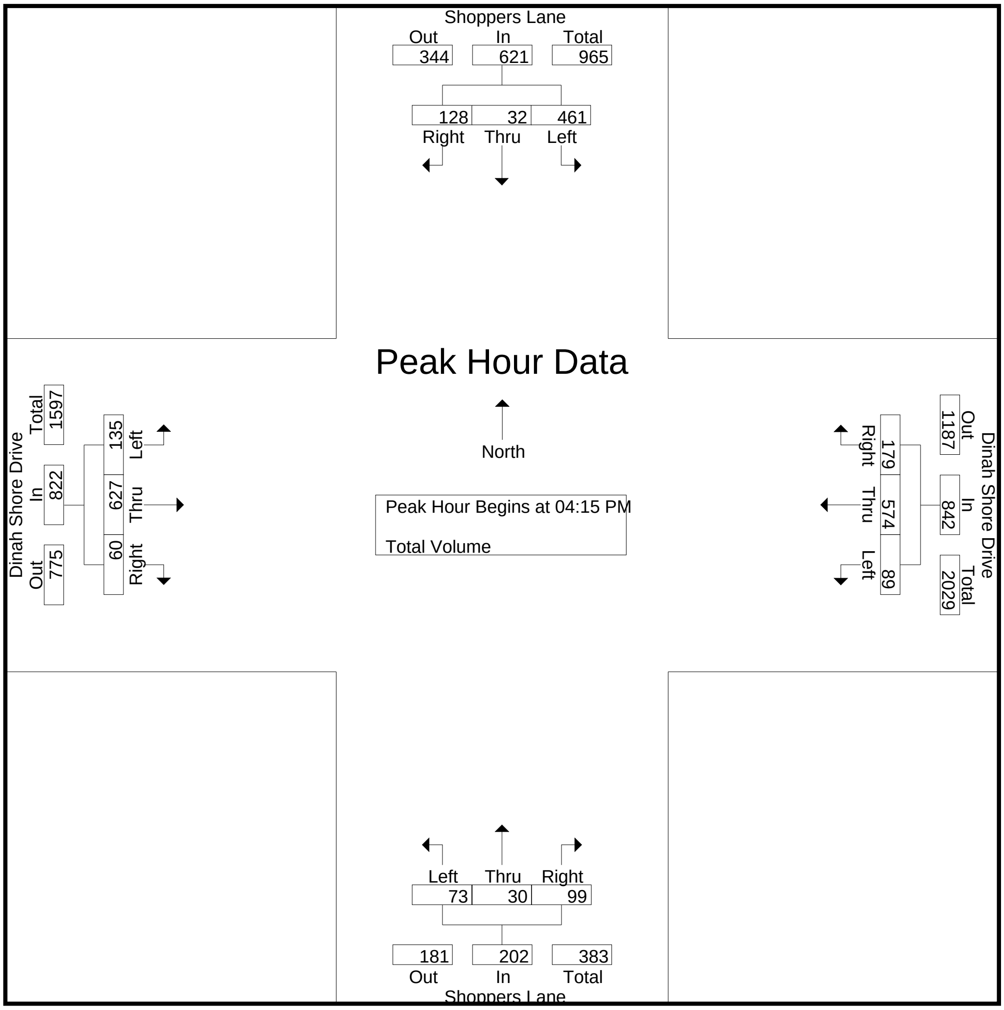
City of Rancho Mirage
N/S: Shoppers Lane
E/W: Dinah Shore Drive
Weather: Clear

File Name : 04_RNM_Shop_Dinah PM
Site Code : 05124316
Start Date : 4/9/2024
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:15 PM				04:00 PM				04:15 PM			
+0 mins.	**130**	8	32	**170**	25	140	37	202	23	**9**	**31**	63	31	146	11	188
+15 mins.	98	**12**	**38**	148	13	144	49	206	**32**	9	29	**70**	**43**	167	11	221
+30 mins.	128	9	31	168	**27**	134	**53**	214	8	9	25	42	28	122	18	168
+45 mins.	100	7	31	138	24	**156**	40	**220**	14	7	27	48	33	**192**	**20**	**245**
Total Volume	456	36	132	624	89	574	179	842	77	34	112	223	135	627	60	822
% App. Total	73.1	5.8	21.2		10.6	68.2	21.3		34.5	15.2	50.2		16.4	76.3	7.3	
PHF	.877	.750	.868	.918	.824	.920	.844	.957	.602	.944	.903	.796	.785	.816	.750	.839

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City of Rancho Mirage
N/S: Monterey Avenue
E/W: Dinah Shore Drive
Weather: Clear

File Name : 05_RNM_Mon_Dinah AM
Site Code : 05124316
Start Date : 4/9/2024
Page No : 1

Groups Printed- Total Volume

	Monterey Avenue Southbound				Dinah Shore Drive Westbound				Monterey Avenue Northbound				Dinah Shore Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	74	240	70	384	13	39	52	104	19	77	4	100	52	30	24	106	694
07:15 AM	106	232	101	439	7	45	67	119	24	96	3	123	45	27	24	96	777
07:30 AM	106	355	97	558	6	50	64	120	23	75	9	107	72	65	30	167	952
07:45 AM	133	382	122	637	18	60	64	142	35	98	3	136	54	62	29	145	1060
Total	419	1209	390	2018	44	194	247	485	101	346	19	466	223	184	107	514	3483
08:00 AM	117	301	105	523	15	57	65	137	32	91	8	131	62	78	45	185	976
08:15 AM	112	309	105	526	22	61	77	160	25	103	9	137	67	46	52	165	988
08:30 AM	56	269	78	403	22	55	80	157	38	104	8	150	80	84	56	220	930
08:45 AM	91	294	76	461	18	50	78	146	34	118	10	162	73	65	54	192	961
Total	376	1173	364	1913	77	223	300	600	129	416	35	580	282	273	207	762	3855
Grand Total	795	2382	754	3931	121	417	547	1085	230	762	54	1046	505	457	314	1276	7338
Apprch %	20.2	60.6	19.2		11.2	38.4	50.4		22	72.8	5.2		39.6	35.8	24.6		
Total %	10.8	32.5	10.3	53.6	1.6	5.7	7.5	14.8	3.1	10.4	0.7	14.3	6.9	6.2	4.3	17.4	

	Monterey Avenue Southbound				Dinah Shore Drive Westbound				Monterey Avenue Northbound				Dinah Shore Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	106	355	97	558	6	50	64	120	23	75	**9**	107	**72**	65	30	167	952
07:45 AM	**133**	**382**	**122**	**637**	18	60	64	142	**35**	98	3	136	54	62	29	145	**1060**
08:00 AM	117	301	105	523	15	57	65	137	32	91	8	131	62	**78**	45	**185**	976
08:15 AM	112	309	105	526	**22**	**61**	**77**	**160**	25	**103**	9	**137**	67	46	**52**	165	988
Total Volume	468	1347	429	2244	61	228	270	559	115	367	29	511	255	251	156	662	3976
% App. Total	20.9	60	19.1		10.9	40.8	48.3		22.5	71.8	5.7		38.5	37.9	23.6		
PHF	.880	.882	.879	.881	.693	.934	.877	.873	.821	.891	.806	.932	.885	.804	.750	.895	.938

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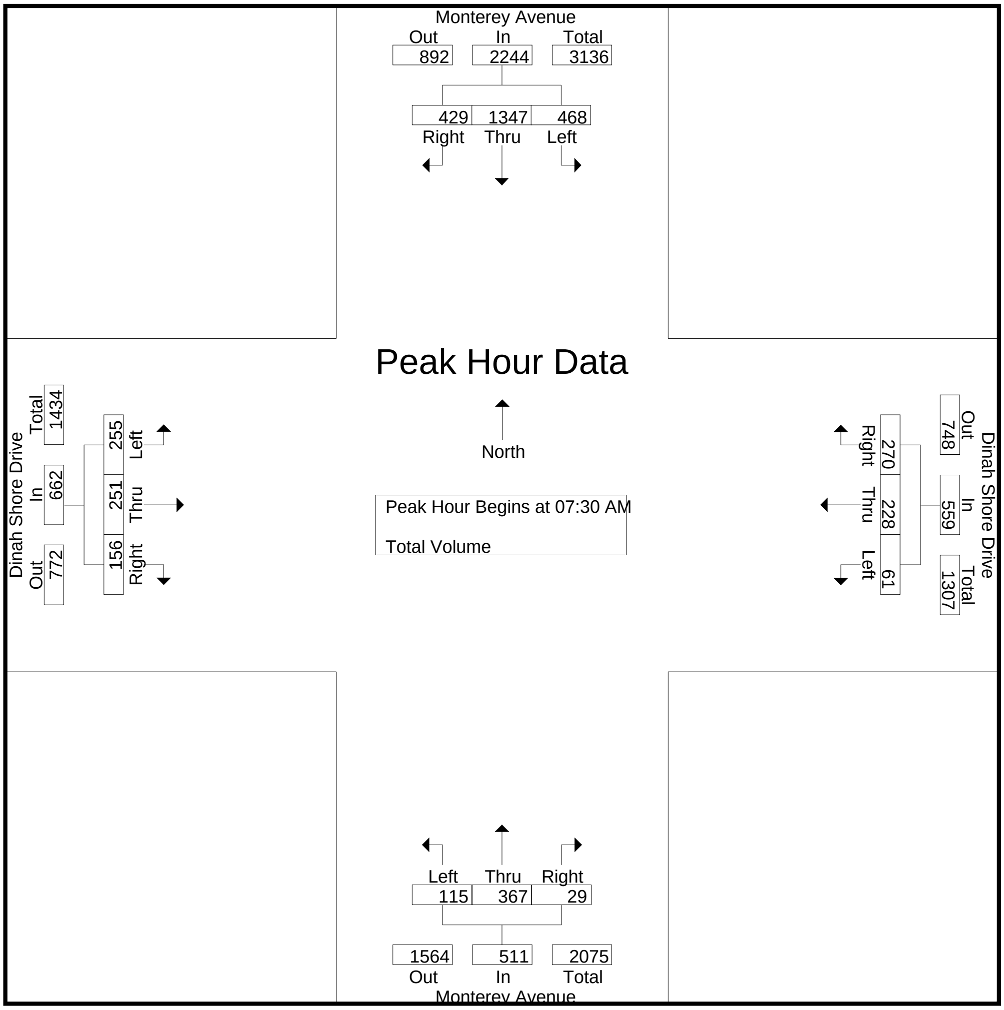
City of Rancho Mirage
N/S: Monterey Avenue
E/W: Dinah Shore Drive
Weather: Clear

File Name : 05_RNM_Mon_Dinah AM
Site Code : 05124316
Start Date : 4/9/2024



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				08:00 AM				08:00 AM				08:00 AM			
+0 mins.	106	355	97	558	15	57	65	137	32	91	8	131	62	78	45	185
+15 mins.	**133**	**382**	**122**	**637**	**22**	**61**	77	**160**	25	103	9	137	67	46	52	165
+30 mins.	117	301	105	523	22	55	**80**	157	**38**	104	8	150	**80**	**84**	**56**	**220**
+45 mins.	112	309	105	526	18	50	78	146	34	**118**	**10**	**162**	73	65	54	192
Total Volume	468	1347	429	2244	77	223	300	600	129	416	35	580	282	273	207	762
% App. Total	20.9	60	19.1		12.8	37.2	50		22.2	71.7	6		37	35.8	27.2	
PHF	.880	.882	.879	.881	.875	.914	.938	.938	.849	.881	.875	.895	.881	.813	.924	.866

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City of Rancho Mirage
N/S: Monterey Avenue
E/W: Dinah Shore Drive
Weather: Clear

File Name : 05_RNM_Mon_Dinah PM
Site Code : 05124316
Start Date : 4/9/2024
Page No : 1

Groups Printed- Total Volume

	Monterey Avenue Southbound				Dinah Shore Drive Westbound				Monterey Avenue Northbound				Dinah Shore Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	83	169	73	325	25	114	131	270	90	229	9	328	157	103	75	335	1258
04:15 PM	80	197	89	366	14	81	133	228	90	246	9	345	135	85	83	303	1242
04:30 PM	82	165	88	335	12	107	157	276	85	206	8	299	154	109	76	339	1249
04:45 PM	101	204	97	402	19	78	156	253	82	250	11	343	130	73	69	272	1270
Total	346	735	347	1428	70	380	577	1027	347	931	37	1315	576	370	303	1249	5019
05:00 PM	83	192	95	370	12	87	160	259	87	223	10	320	156	111	86	353	1302
05:15 PM	113	217	93	423	14	82	129	225	93	293	4	390	107	88	60	255	1293
05:30 PM	75	178	79	332	19	89	124	232	68	214	4	286	136	104	68	308	1158
05:45 PM	85	172	89	346	15	59	116	190	83	197	11	291	96	65	49	210	1037
Total	356	759	356	1471	60	317	529	906	331	927	29	1287	495	368	263	1126	4790
Grand Total	702	1494	703	2899	130	697	1106	1933	678	1858	66	2602	1071	738	566	2375	9809
Apprch %	24.2	51.5	24.2		6.7	36.1	57.2		26.1	71.4	2.5		45.1	31.1	23.8		
Total %	7.2	15.2	7.2	29.6	1.3	7.1	11.3	19.7	6.9	18.9	0.7	26.5	10.9	7.5	5.8	24.2	

	Monterey Avenue Southbound				Dinah Shore Drive Westbound				Monterey Avenue Northbound				Dinah Shore Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	82	165	88	335	12	**107**	157	**276**	85	206	8	299	154	109	76	339	1249
04:45 PM	101	204	**97**	402	**19**	78	156	253	82	250	**11**	343	130	73	69	272	1270
05:00 PM	83	192	95	370	12	87	**160**	259	87	223	10	320	**156**	**111**	**86**	**353**	**1302**
05:15 PM	**113**	**217**	93	**423**	14	82	129	225	**93**	**293**	4	**390**	107	88	60	255	1293
Total Volume	379	778	373	1530	57	354	602	1013	347	972	33	1352	547	381	291	1219	5114
% App. Total	24.8	50.8	24.4		5.6	34.9	59.4		25.7	71.9	2.4		44.9	31.3	23.9		
PHF	.838	.896	.961	.904	.750	.827	.941	.918	.933	.829	.750	.867	.877	.858	.846	.863	.982

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City of Rancho Mirage
N/S: Monterey Avenue
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File Name : 05_RNM_Mon_Dinah PM
Site Code : 05124316
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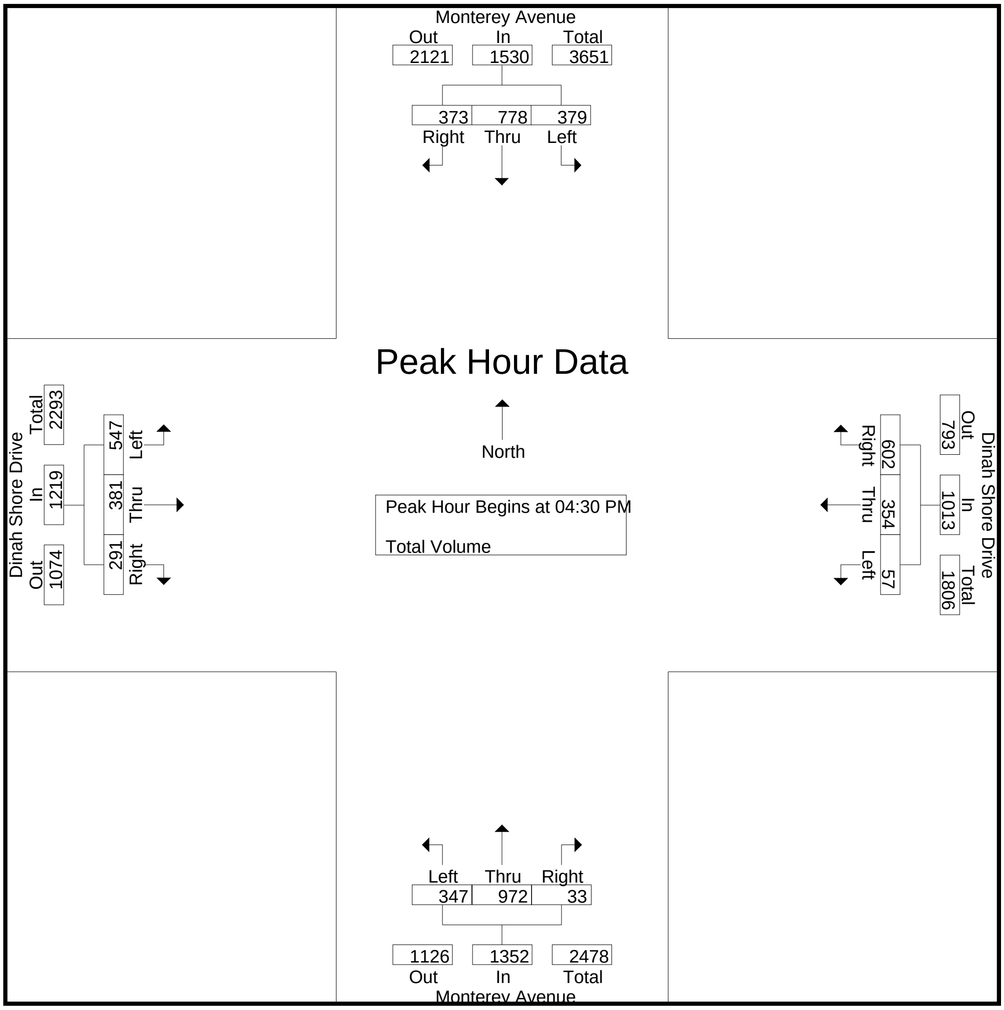

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:00 PM				04:30 PM				04:15 PM			
+0 mins.	82	165	88	335	**25**	**114**	131	270	85	206	8	299	135	85	83	303
+15 mins.	101	204	**97**	402	14	81	133	228	82	250	**11**	343	154	109	76	339
+30 mins.	83	192	95	370	12	107	**157**	**276**	87	223	10	320	130	73	69	272
+45 mins.	**113**	**217**	93	**423**	19	78	156	253	**93**	**293**	4	**390**	**156**	**111**	**86**	**353**
Total Volume	379	778	373	1530	70	380	577	1027	347	972	33	1352	575	378	314	1267
% App. Total	24.8	50.8	24.4		6.8	37	56.2		25.7	71.9	2.4		45.4	29.8	24.8	
PHF	.838	.896	.961	.904	.700	.833	.919	.930	.933	.829	.750	.867	.921	.851	.913	.897

Counts Unlimited, Inc.

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City of Rancho Mirage
Dinah Shore Drive
E/ Key Largo Avenue
24 Hour Directional Volume Count

RNM002
Site Code: 051-24316

Start	4/9/2024	Eastbound		Hour Totals		Westbound		Hour Totals		Combined Totals	
Time	Tue	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		2	248			7	204				
12:15		5	209			6	223				
12:30		2	185			3	246				
12:45		2	202	11	844	4	230	20	903	31	1747
01:00		4	204			4	203				
01:15		4	187			2	208				
01:30		4	202			6	210				
01:45		6	211	18	804	5	199	17	820	35	1624
02:00		6	236			2	224				
02:15		1	202			2	236				
02:30		4	214			2	218				
02:45		4	197	15	849	4	233	10	911	25	1760
03:00		3	211			4	236				
03:15		4	227			4	**239**				
03:30		4	189			4	**222**				
03:45		12	226	23	853	7	**239**	19	936	42	1789
04:00		5	232			3	**252**				
04:15		7	**212**			9	230				
04:30		11	**212**			13	227				
04:45		17	**212**	40	868	18	204	43	913	83	1781
05:00		13	**257**			18	212				
05:15		19	206			22	209				
05:30		23	161			28	182				
05:45		31	141	86	765	31	190	99	793	185	1558
06:00		31	163			52	174				
06:15		49	146			42	172				
06:30		64	122			60	138				
06:45		90	124	234	555	78	149	232	633	466	1188
07:00		81	117			95	145				
07:15		98	111			118	119				
07:30		151	103			119	130				
07:45		167	93	497	424	135	112	467	506	964	930
08:00		151	75			148	130				
08:15		175	73			151	120				
08:30		175	40			136	105				
08:45		193	39	694	227	115	87	550	442	1244	669
09:00		137	44			115	101				
09:15		167	42			117	65				
09:30		183	36			109	66				
09:45		220	23	707	145	116	55	457	287	1164	432
10:00		188	26			133	51				
10:15		202	16			159	43				
10:30		187	21			197	24				
10:45		199	18	776	81	172	16	661	134	1437	215
11:00		**204**	10			**194**	25				
11:15		**228**	10			**217**	24				
11:30		**211**	9			**194**	13				
11:45		**219**	11	862	40	**212**	12	817	74	1679	114
Total		3963	6455	3963	6455	3392	7352	3392	7352	7355	13807
Combined Total		10418		10418		10744		10744		21162	
AM Peak	-	11:00	-	-	-	11:00	-	-	-	-	-
Vol.	-	862	-	-	-	817	-	-	-	-	-
P.H.F.		0.945				0.941					
PM Peak	-	-	04:15	-	-	-	03:15	-	-	-	-
Vol.	-	-	893	-	-	-	952	-	-	-	-
P.H.F.			0.869				0.944				
Percentage		38.0%	62.0%			31.6%	68.4%				
ADT/AADT		ADT 21,162		AADT 21,162							

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Corona, CA 92878
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email: counts@countsunlimited.com

City of Rancho Mirage
Key Largo Avenue
S/ Dinah Shore Drive
24 Hour Directional Volume Count

RNM001
Site Code: 051-24316

Start	4/9/2024	Northbound		Hour Totals		Southbound		Hour Totals		Combined Totals	
Time	Tue	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		0	17			0	18				
12:15		0	21			0	**19**				
12:30		0	17			0	**31**				
12:45		0	15	0	70	0	**16**	0	84	0	154
01:00		0	7			1	**19**				
01:15		0	15			1	10				
01:30		0	15			0	9				
01:45		1	10	1	47	1	9	3	47	4	94
02:00		0	7			0	11				
02:15		0	13			1	18				
02:30		0	11			0	9				
02:45		0	12	0	43	0	10	1	48	1	91
03:00		0	13			0	17				
03:15		0	17			2	15				
03:30		1	19			0	13				
03:45		1	16	2	65	0	14	2	59	4	124
04:00		0	13			0	21				
04:15		0	**22**			0	11				
04:30		0	**28**			0	11				
04:45		0	**11**	0	74	0	17	0	60	0	134
05:00		0	**32**			1	11				
05:15		0	17			1	11				
05:30		0	14			2	8				
05:45		2	8	2	71	2	12	6	42	8	113
06:00		1	11			9	8				
06:15		2	11			8	14				
06:30		7	6			16	7				
06:45		15	9	25	37	17	11	50	40	75	77
07:00		7	6			9	7				
07:15		13	13			13	7				
07:30		14	7			19	5				
07:45		12	8	46	34	**28**	2	69	21	115	55
08:00		10	1			**28**	7				
08:15		13	6			**37**	5				
08:30		7	1			**29**	5				
08:45		6	4	36	12	17	1	111	18	147	30
09:00		17	4			12	4				
09:15		18	3			16	1				
09:30		19	1			8	0				
09:45		5	0	59	8	18	4	54	9	113	17
10:00		11	1			8	2				
10:15		21	0			12	0				
10:30		12	0			15	1				
10:45		**28**	1	72	2	9	0	44	3	116	5
11:00		**15**	1			11	0				
11:15		**19**	0			12	0				
11:30		**15**	1			13	1				
11:45		23	0	72	2	17	1	53	2	125	4
Total		315	465	315	465	393	433	393	433	708	898
Combined Total		780		780		826		826		1606	
AM Peak	-	10:45	-	-	-	07:45	-	-	-	-	-
Vol.	-	77	-	-	-	122	-	-	-	-	-
P.H.F.		0.688				0.824					
PM Peak	-	-	04:15	-	-	-	00:15	-	-	-	-
Vol.	-	-	93	-	-	-	85	-	-	-	-
P.H.F.			0.727				0.685				
Percentage		40.4%	59.6%			47.6%	52.4%				
ADT/AADT		ADT 1,606		AADT 1,606							

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City of Rancho Mirage
Monterey Avenue
N/ Dinah Shore Drive
24 Hour Directional Volume Count

RNM003
Site Code: 051-24316

Start	4/9/2024	Northbound		Hour Totals		Southbound		Hour Totals		Combined Totals	
Time	Tue	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		16	411			18	**344**				
12:15		17	411			18	**448**				
12:30		16	435			13	**413**				
12:45		15	395	64	1652	11	**400**	60	1605	124	3257
01:00		11	421			12	342				
01:15		7	414			9	364				
01:30		8	452			9	367				
01:45		7	442	33	1729	11	404	41	1477	74	3206
02:00		9	468			7	337				
02:15		7	461			10	399				
02:30		8	476			11	353				
02:45		4	471	28	1876	8	417	36	1506	64	3382
03:00		5	528			12	363				
03:15		7	516			12	382				
03:30		12	524			24	265				
03:45		12	514	36	2082	56	369	104	1379	140	3461
04:00		17	517			31	325				
04:15		19	514			32	366				
04:30		20	**517**			50	335				
04:45		27	**536**	83	2084	106	402	219	1428	302	3512
05:00		26	**539**			66	370				
05:15		38	**529**			98	423				
05:30		49	474			131	332				
05:45		64	409	177	1951	153	346	448	1471	625	3422
06:00		91	445			189	304				
06:15		98	410			245	299				
06:30		143	342			339	230				
06:45		151	312	483	1509	460	257	1233	1090	1716	2599
07:00		181	321			384	224				
07:15		208	302			439	202				
07:30		211	307			**558**	165				
07:45		216	290	816	1220	**637**	179	2018	770	2834	1990
08:00		218	283			**523**	110				
08:15		247	257			**526**	130				
08:30		264	212			403	116				
08:45		269	248	998	1000	461	81	1913	437	2911	1437
09:00		277	233			388	109				
09:15		244	163			435	69				
09:30		257	175			406	74				
09:45		266	127	1044	698	477	73	1706	325	2750	1023
10:00		295	143			317	66				
10:15		331	103			357	56				
10:30		306	78			388	47				
10:45		323	70	1255	394	446	52	1508	221	2763	615
11:00		**364**	77			363	41				
11:15		**331**	51			427	41				
11:30		**351**	41			398	31				
11:45		**340**	36	1386	205	413	25	1601	138	2987	343
Total		6403	16400	6403	16400	10887	11847	10887	11847	17290	28247
Combined Total		22803		22803		22734		22734		45537	
AM Peak	-	11:00	-	-	-	07:30	-	-	-	-	-
Vol.	-	1386	-	-	-	2244	-	-	-	-	-
P.H.F.		0.952				0.881					
PM Peak	-	-	04:30	-	-	-	12:00	-	-	-	-
Vol.	-	-	2121	-	-	-	1605	-	-	-	-
P.H.F.			0.984				0.896				
Percentage		28.1%	71.9%			47.9%	52.1%				
ADT/AADT		ADT 45,537		AADT 45,537							

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APPENDIX 3.2: EXISTING (2024) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	1	700	32	85	492	9	28
Future Volume (vph)	1	700	32	85	492	9	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	145		0	150		0	55
Storage Lanes	1		0	1		1	1
Taper Length (ft)	120			120		90	
Right Turn on Red			Yes				Yes
Link Speed (mph)		45			45	30	
Link Distance (ft)		449			1296	688	
Travel Time (s)		6.8			19.6	15.6	
Confl. Peds. (#/hr)	5		5	5		5	5
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)							
Turn Type	Prot	NA		Prot	NA	Prot	Perm
Protected Phases	5	2		1	6	3	
Permitted Phases							8
Detector Phase	5	2		1	6	3	8
Switch Phase							
Minimum Initial (s)	5.0	5.0		10.0	5.0	10.0	5.0
Minimum Split (s)	14.5	22.5		14.5	22.5	22.5	22.5
Total Split (s)	14.5	23.0		14.5	23.0	22.5	22.5
Total Split (%)	24.2%	38.3%		24.2%	38.3%	37.5%	37.5%
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		
Recall Mode	None	C-Max		None	C-Max	Max	Max

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Splits and Phases: 1: Key Largo Av. & Dinah Shore Dr.

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (veh/h)	1	700	32	85	492	9	28
Future Volume (veh/h)	1	700	32	85	492	9	28
Initial Q (Qb), veh		0	0	0	0	0	0
Lane Width Adj.		1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)			0.99	1.00		1.00	1.00
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No	No	
Adj Sat Flow, veh/h/ln		1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h		745	34	90	523	10	30
Peak Hour Factor		0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %		2	2	2	2	2	2
Cap, veh/h		1729	79	231	2808	534	476
Arrive On Green		0.35	0.35	0.09	0.37	0.30	0.30
Sat Flow, veh/h		5172	228	1781	5274	1781	1585
Grp Volume(v), veh/h		506	273	90	523	10	30
Grp Sat Flow(s),veh/h/ln		1702	1827	1781	1702	1781	1585
Q Serve(g_s), s		6.9	6.9	2.9	4.2	0.2	0.8
Cycle Q Clear(g_c), s		6.9	6.9	2.9	4.2	0.2	0.8
Prop In Lane			0.12	1.00		1.00	1.00
Lane Grp Cap(c), veh/h		1176	631	231	2808	534	476
V/C Ratio(X)		0.43	0.43	0.39	0.19	0.02	0.06
Avail Cap(c_a), veh/h		1176	631	297	2808	534	476
HCM Platoon Ratio		1.00	1.00	0.67	0.67	1.00	1.00
Upstream Filter(I)		1.00	1.00	0.98	0.98	1.00	1.00
Uniform Delay (d), s/veh		15.1	15.1	25.2	9.8	14.8	15.0
Incr Delay (d2), s/veh		1.2	2.2	1.1	0.1	0.1	0.3
Initial Q Delay(d3), s/veh		0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		2.4	2.7	1.2	1.2	0.1	0.3
Unsig. Movement Delay, s/veh							
LnGrp Delay(d), s/veh		16.2	17.3	26.2	10.0	14.8	15.2
LnGrp LOS		B	B	C	A	B	B
Approach Vol, veh/h		779			613	40	
Approach Delay, s/veh		16.6			12.4	15.1	
Approach LOS		B			B	B	

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	12.3	25.2				37.5		22.5
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	10.0	18.5				18.5		18.0
Max Q Clear Time (g_c+I1), s	4.9	8.9				6.2		2.8
Green Ext Time (p_c), s	0.1	3.2				2.5		0.1

Intersection Summary		
HCM 7th Control Delay, s/veh		14.7
HCM 7th LOS		B

Notes
User approved ignoring U-Turning movement.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	0	4	0	0	0	6	16	0	0	26	93
Future Volume (vph)	20	0	4	0	0	0	6	16	0	0	26	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		50	0		50
Storage Lanes	0		0	0		0	0		1	0		1
Taper Length (ft)	90			90			90			90		
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		743			190			435			688	
Travel Time (s)		16.9			4.3			9.9			15.4	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	0	4	0	0	0	6	16	0	0	26	93
Future Vol, veh/h	20	0	4	0	0	0	6	16	0	0	26	93
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	50	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	0	4	0	0	0	7	17	0	0	28	101

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	69	69	38	69	170	27	134	0	0	22	0	0
Stage 1	33	33	-	35	35	-	-	-	-	-	-	-
Stage 2	35	35	-	33	134	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	924	822	1034	924	723	1048	1450	-	-	1593	-	-
Stage 1	983	867	-	980	865	-	-	-	-	-	-	-
Stage 2	980	865	-	983	785	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	911	810	1024	907	713	1038	1443	-	-	1585	-	-
Mov Cap-2 Maneuver	911	810	-	907	713	-	-	-	-	-	-	-
Stage 1	978	863	-	971	857	-	-	-	-	-	-	-
Stage 2	971	857	-	974	781	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	8.99	0	2.05	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	491	-	-	928	-	1585	-	-
HCM Lane V/C Ratio	0.005	-	-	0.028	-	-	-	-
HCM Control Delay (s/veh)	7.5	0	-	9	0	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	-	0	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	615	35	14	602	11	18	1	11	5	3	16
Future Volume (vph)	39	615	35	14	602	11	18	1	11	5	3	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	155		0	150		85	180		180	135		0
Storage Lanes	2		0	1		1	0		0	1		0
Taper Length (ft)	120			90			90			90		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		1296			597			233			614	
Travel Time (s)		19.6			9.0			5.3			14.0	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						
Detector Phase	5	2		1	6	6	3	8		7	4	
Switch Phase												
Minimum Initial (s)	10.0	5.0		10.0	5.0	5.0	10.0	5.0		10.0	5.0	
Minimum Split (s)	14.5	22.5		14.5	22.5	22.5	14.5	22.5		14.5	22.5	
Total Split (s)	20.0	53.0		19.0	52.0	52.0	21.0	29.0		19.0	27.0	
Total Split (%)	16.7%	44.2%		15.8%	43.3%	43.3%	17.5%	24.2%		15.8%	22.5%	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max		None	Max	

Intersection Summary

Area Type: Other

Cycle Length: 120

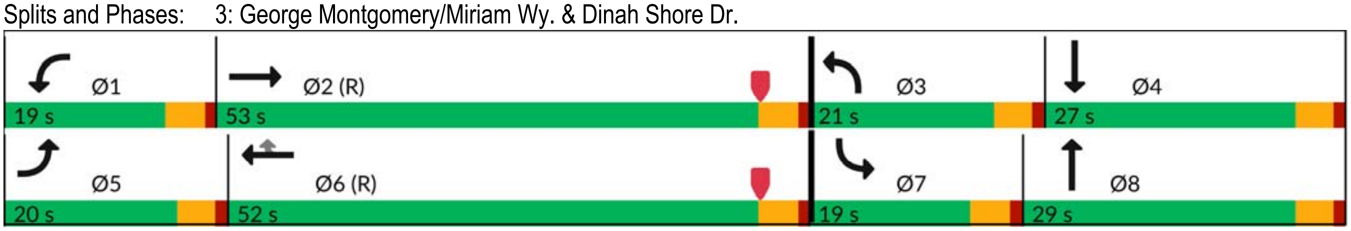
Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow

Natural Cycle: 75

Control Type: Actuated-Coordinated

Splits and Phases: 3: George Montgomery/Miriam Wy. & Dinah Shore Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	39	615	35	14	602	11	18	1	11	5	3	16
Future Volume (veh/h)	39	615	35	14	602	11	18	1	11	5	3	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	40	628	36	14	614	11	18	1	11	5	3	16
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	212	2934	167	55	2877	891	67	28	310	23	48	255
Arrive On Green	0.12	1.00	1.00	0.06	1.00	1.00	0.04	0.21	0.21	0.01	0.19	0.19
Sat Flow, veh/h	3456	4941	282	1781	5106	1581	1781	133	1462	1781	255	1358
Grp Volume(v), veh/h	40	432	232	14	614	11	18	0	12	5	0	19
Grp Sat Flow(s),veh/h/ln	1728	1702	1818	1781	1702	1581	1781	0	1595	1781	0	1613
Q Serve(g_s), s	1.2	0.0	0.0	0.9	0.0	0.0	1.2	0.0	0.7	0.3	0.0	1.2
Cycle Q Clear(g_c), s	1.2	0.0	0.0	0.9	0.0	0.0	1.2	0.0	0.7	0.3	0.0	1.2
Prop In Lane	1.00		0.15	1.00		1.00	1.00		0.92	1.00		0.84
Lane Grp Cap(c), veh/h	212	2021	1080	55	2877	891	67	0	339	23	0	302
V/C Ratio(X)	0.19	0.21	0.22	0.25	0.21	0.01	0.27	0.00	0.04	0.22	0.00	0.06
Avail Cap(c_a), veh/h	446	2021	1080	215	2877	891	245	0	339	215	0	302
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.91	0.91	0.96	0.96	0.96	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	50.0	0.0	0.0	54.9	0.0	0.0	56.1	0.0	37.5	58.6	0.0	40.1
Incr Delay (d2), s/veh	0.4	0.2	0.4	2.3	0.2	0.0	2.1	0.0	0.2	4.7	0.0	0.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.1	0.1	0.4	0.0	0.0	0.6	0.0	0.3	0.2	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	50.3	0.2	0.4	57.2	0.2	0.0	58.3	0.0	37.7	63.4	0.0	40.5
LnGrp LOS	D	A	A	E	A	A	E		D	E		D
Approach Vol, veh/h		704			639			30			24	
Approach Delay, s/veh		3.1			1.4			50.0			45.2	
Approach LOS		A			A			D			D	

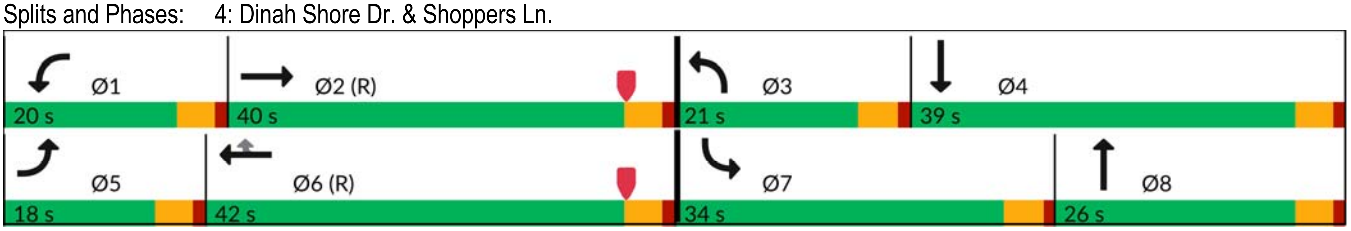
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.2	75.8	9.0	27.0	11.9	72.1	6.0	30.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	14.5	48.5	16.5	22.5	15.5	47.5	14.5	24.5
Max Q Clear Time (g_c+I1), s	2.9	2.0	3.2	3.2	3.2	2.0	2.3	2.7
Green Ext Time (p_c), s	0.0	4.3	0.0	0.0	0.0	4.3	0.0	0.0

Intersection Summary	
HCM 7th Control Delay, s/veh	4.1
HCM 7th LOS	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	509	54	47	525	117	64	9	44	148	5	38
Future Volume (vph)	68	509	54	47	525	117	64	9	44	148	5	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		0	160		115	145		145	110		110
Storage Lanes	2		0	1		1	0		0	0		1
Taper Length (ft)	120			120			90			90		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		597			738			224			460	
Travel Time (s)		9.0			11.2			5.1			10.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						
Detector Phase	5	2		1	6	6	3	8		7	4	
Switch Phase												
Minimum Initial (s)	10.0	5.0		10.0	5.0	5.0	10.0	5.0		10.0	5.0	
Minimum Split (s)	14.5	22.5		14.5	22.5	22.5	14.5	22.5		14.5	22.5	
Total Split (s)	18.0	40.0		20.0	42.0	42.0	21.0	26.0		34.0	39.0	
Total Split (%)	15.0%	33.3%		16.7%	35.0%	35.0%	17.5%	21.7%		28.3%	32.5%	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max		None	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	

Splits and Phases: 4: Dinah Shore Dr. & Shoppers Ln.

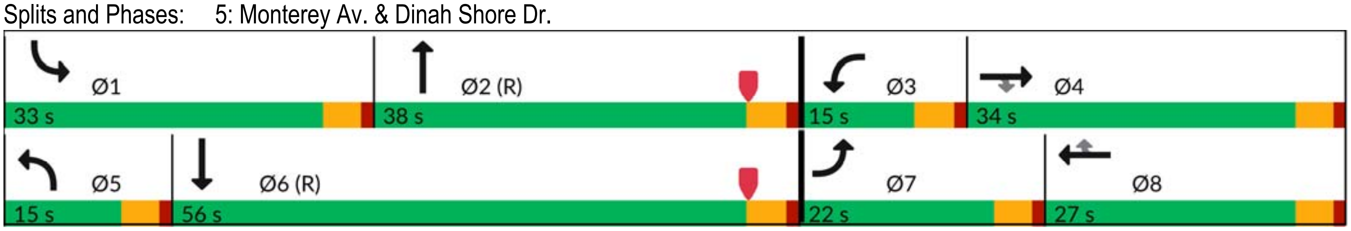


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	68	509	54	47	525	117	64	9	44	148	5	38
Future Volume (veh/h)	68	509	54	47	525	117	64	9	44	148	5	38
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	72	536	57	49	553	123	67	9	46	156	5	40
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	262	1975	207	119	2105	651	133	68	348	187	511	453
Arrive On Green	0.15	0.84	0.84	0.07	0.41	0.41	0.07	0.26	0.26	0.11	0.29	0.29
Sat Flow, veh/h	3456	4691	493	1781	5106	1579	1781	265	1353	1781	1777	1577
Grp Volume(v), veh/h	72	387	206	49	553	123	67	0	55	156	5	40
Grp Sat Flow(s),veh/h/ln	1728	1702	1780	1781	1702	1579	1781	0	1617	1781	1777	1577
Q Serve(g_s), s	2.2	2.8	2.9	3.2	8.6	6.0	4.3	0.0	3.1	10.3	0.2	2.2
Cycle Q Clear(g_c), s	2.2	2.8	2.9	3.2	8.6	6.0	4.3	0.0	3.1	10.3	0.2	2.2
Prop In Lane	1.00		0.28	1.00		1.00	1.00		0.84	1.00		1.00
Lane Grp Cap(c), veh/h	262	1433	749	119	2105	651	133	0	416	187	511	453
V/C Ratio(X)	0.27	0.27	0.27	0.41	0.26	0.19	0.51	0.00	0.13	0.83	0.01	0.09
Avail Cap(c_a), veh/h	389	1433	749	230	2105	651	245	0	416	438	511	453
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.98	0.98	0.98	0.92	0.92	0.92	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.0	5.7	5.7	53.7	23.2	22.5	53.4	0.0	34.3	52.7	30.5	31.3
Incr Delay (d2), s/veh	0.6	0.5	0.9	2.1	0.3	0.6	3.0	0.0	0.7	9.3	0.0	0.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.9	1.1	1.5	3.4	2.3	2.1	0.0	1.3	5.1	0.1	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	48.5	6.2	6.6	55.8	23.5	23.1	56.4	0.0	35.0	62.0	30.6	31.6
LnGrp LOS	D	A	A	E	C	C	E		C	E	C	C
Approach Vol, veh/h		665			725			122			201	
Approach Delay, s/veh		10.9			25.6			46.7			55.1	
Approach LOS		B			C			D			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.5	55.0	13.4	39.0	13.6	54.0	17.1	35.3				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	15.5	35.5	16.5	34.5	13.5	37.5	29.5	21.5				
Max Q Clear Time (g_c+I1), s	5.2	4.9	6.3	4.2	4.2	10.6	12.3	5.1				
Green Ext Time (p_c), s	0.0	3.6	0.1	0.2	0.1	4.0	0.4	0.2				
Intersection Summary												
HCM 7th Control Delay, s/veh			24.9									
HCM 7th LOS			C									

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	268	264	164	64	239	284	121	385	30	491	1414	450
Future Volume (vph)	268	264	164	64	239	284	121	385	30	491	1414	450
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	280		0	155		175	255		0	175		190
Storage Lanes	2		1	2		1	2		0	2		1
Taper Length (ft)	120			120			120			120		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			50			50	
Link Distance (ft)		738			479			794			571	
Travel Time (s)		11.2			7.3			10.8			7.8	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)												
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						Free
Detector Phase	7	4	4	3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	5.0	5.0	10.0	5.0	5.0	10.0	5.0		10.0	5.0	
Minimum Split (s)	14.5	22.5	22.5	14.5	22.5	22.5	14.5	22.5		14.5	22.5	
Total Split (s)	22.0	34.0	34.0	15.0	27.0	27.0	15.0	38.0		33.0	56.0	
Total Split (%)	18.3%	28.3%	28.3%	12.5%	22.5%	22.5%	12.5%	31.7%		27.5%	46.7%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	C-Max		None	C-Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 67 (56%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	

Splits and Phases: 5: Monterey Av. & Dinah Shore Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	268	264	164	64	239	284	121	385	30	491	1414	450
Future Volume (veh/h)	268	264	164	64	239	284	121	385	30	491	1414	450
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	285	281	174	68	254	0	129	410	32	522	1504	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	347	494	218	258	403		284	2233	172	602	2829	
Arrive On Green	0.17	0.23	0.23	0.07	0.11	0.00	0.08	0.46	0.46	0.17	0.55	0.00
Sat Flow, veh/h	3456	3554	1568	3456	3554	1585	3456	4833	373	3456	5106	1585
Grp Volume(v), veh/h	285	281	174	68	254	0	129	287	155	522	1504	0
Grp Sat Flow(s),veh/h/ln	1728	1777	1568	1728	1777	1585	1728	1702	1802	1728	1702	1585
Q Serve(g_s), s	9.6	8.4	12.6	2.2	8.2	0.0	4.3	5.9	6.1	17.6	22.3	0.0
Cycle Q Clear(g_c), s	9.6	8.4	12.6	2.2	8.2	0.0	4.3	5.9	6.1	17.6	22.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.21	1.00		1.00
Lane Grp Cap(c), veh/h	347	494	218	258	403		284	1572	832	602	2829	
V/C Ratio(X)	0.82	0.57	0.80	0.26	0.63		0.45	0.18	0.19	0.87	0.53	
Avail Cap(c_a), veh/h	504	874	385	302	666		302	1572	832	821	2829	
HCM Platoon Ratio	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	0.92	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	48.9	42.9	44.5	52.4	50.8	0.0	52.5	19.0	19.0	48.2	16.9	0.0
Incr Delay (d2), s/veh	6.5	0.9	6.1	0.5	1.6	0.0	1.1	0.3	0.5	7.4	0.7	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	3.5	4.7	1.0	3.6	0.0	1.8	2.3	2.5	7.9	8.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	55.4	43.8	50.6	52.9	52.4	0.0	53.6	19.2	19.5	55.6	17.6	0.0
LnGrp LOS	E	D	D	D	D		D	B	B	E	B	
Approach Vol, veh/h		740			322			571			2026	
Approach Delay, s/veh		49.9			52.5			27.1			27.4	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	25.4	59.9	13.5	21.2	14.4	71.0	16.5	18.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	28.5	33.5	10.5	29.5	10.5	51.5	17.5	22.5
Max Q Clear Time (g_c+I1), s	19.6	8.1	4.2	14.6	6.3	24.3	11.6	10.2
Green Ext Time (p_c), s	1.3	2.4	0.1	1.9	0.1	11.6	0.5	1.1

Intersection Summary	
HCM 7th Control Delay, s/veh	34.1
HCM 7th LOS	C

Notes

Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	1	848	26	37	922	15	63
Future Volume (vph)	1	848	26	37	922	15	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	145		0	150		0	55
Storage Lanes	1		0	1		1	1
Taper Length (ft)	120			120		90	
Right Turn on Red			Yes				Yes
Link Speed (mph)		45			45	30	
Link Distance (ft)		449			1296	688	
Travel Time (s)		6.8			19.6	15.6	
Confl. Peds. (#/hr)	5		5	5		5	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)							
Turn Type	Prot	NA		Prot	NA	Prot	Perm
Protected Phases	5	2		1	6	3	
Permitted Phases							8
Detector Phase	5	2		1	6	3	8
Switch Phase							
Minimum Initial (s)	5.0	5.0		10.0	5.0	10.0	5.0
Minimum Split (s)	14.5	22.5		14.5	22.5	22.5	22.5
Total Split (s)	14.5	23.0		14.5	23.0	22.5	22.5
Total Split (%)	24.2%	38.3%		24.2%	38.3%	37.5%	37.5%
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		
Recall Mode	None	C-Max		None	C-Max	Max	Max

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Splits and Phases: 1: Key Largo Av. & Dinah Shore Dr.

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations								
Traffic Volume (veh/h)	1	848	26	37	922	15	63	
Future Volume (veh/h)	1	848	26	37	922	15	63	
Initial Q (Qb), veh		0	0	0	0	0	0	
Lane Width Adj.		1.00	1.00	1.00	1.00	1.00	1.00	
Ped-Bike Adj(A_pbT)			0.99	1.00		1.00	1.00	
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No			No	No		
Adj Sat Flow, veh/h/ln		1870	1870	1870	1870	1870	1870	
Adj Flow Rate, veh/h		922	28	40	1002	16	68	
Peak Hour Factor		0.92	0.92	0.92	0.92	0.92	0.92	
Percent Heavy Veh, %		2	2	2	2	2	2	
Cap, veh/h		2005	61	144	2808	534	476	
Arrive On Green		0.39	0.39	0.16	1.00	0.30	0.30	
Sat Flow, veh/h		5259	154	1781	5274	1781	1585	
Grp Volume(v), veh/h		616	334	40	1002	16	68	
Grp Sat Flow(s),veh/h/ln		1702	1841	1781	1702	1781	1585	
Q Serve(g_s), s		8.0	8.1	1.2	0.0	0.4	1.9	
Cycle Q Clear(g_c), s		8.0	8.1	1.2	0.0	0.4	1.9	
Prop In Lane			0.08	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h		1341	725	144	2808	534	476	
V/C Ratio(X)		0.46	0.46	0.28	0.36	0.03	0.14	
Avail Cap(c_a), veh/h		1341	725	297	2808	534	476	
HCM Platoon Ratio		1.00	1.00	2.00	2.00	1.00	1.00	
Upstream Filter(I)		1.00	1.00	0.93	0.93	1.00	1.00	
Uniform Delay (d), s/veh		13.5	13.5	23.6	0.0	14.8	15.4	
Incr Delay (d2), s/veh		1.1	2.1	1.0	0.3	0.1	0.6	
Initial Q Delay(d3), s/veh		0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln		2.7	3.1	0.5	0.1	0.2	0.7	
Unsig. Movement Delay, s/veh								
LnGrp Delay(d), s/veh		14.6	15.6	24.5	0.3	14.9	16.0	
LnGrp LOS		B	B	C	A	B	B	
Approach Vol, veh/h		950			1042	84		
Approach Delay, s/veh		14.9			1.3	15.8		
Approach LOS		B			A	B		
Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	9.4	28.1				37.5		22.5
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	10.0	18.5				18.5		18.0
Max Q Clear Time (g_c+I1), s	3.2	10.1				2.0		3.9
Green Ext Time (p_c), s	0.0	3.6				5.9		0.2
Intersection Summary								
HCM 7th Control Delay, s/veh			8.1					
HCM 7th LOS			A					
Notes								
User approved ignoring U-Turning movement.								

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	0	8	0	0	0	3	19	0	0	15	24
Future Volume (vph)	74	0	8	0	0	0	3	19	0	0	15	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		50	0		0
Storage Lanes	0		0	0		0	0		1	0		0
Taper Length (ft)	90			90			90			90		
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		743			190			435			688	
Travel Time (s)		16.9			4.3			9.9			15.4	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	5.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	74	0	8	0	0	0	3	19	0	0	15	24
Future Vol, veh/h	74	0	8	0	0	0	3	19	0	0	15	24
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	50	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	76	76	76	76	76	76	76	76	76	76	76	76
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	97	0	11	0	0	0	4	25	0	0	20	32

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	78	78	46	63	94	35	56	0	0	30	0	0
Stage 1	41	41	-	38	38	-	-	-	-	-	-	-
Stage 2	38	38	-	25	56	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	910	812	1024	932	796	1038	1548	-	-	1583	-	-
Stage 1	974	861	-	977	863	-	-	-	-	-	-	-
Stage 2	977	863	-	993	848	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	899	802	1014	911	786	1028	1541	-	-	1575	-	-
Mov Cap-2 Maneuver	899	802	-	911	786	-	-	-	-	-	-	-
Stage 1	970	857	-	970	857	-	-	-	-	-	-	-
Stage 2	970	857	-	978	844	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	9.49	0	1	0
HCM LOS	A	A		

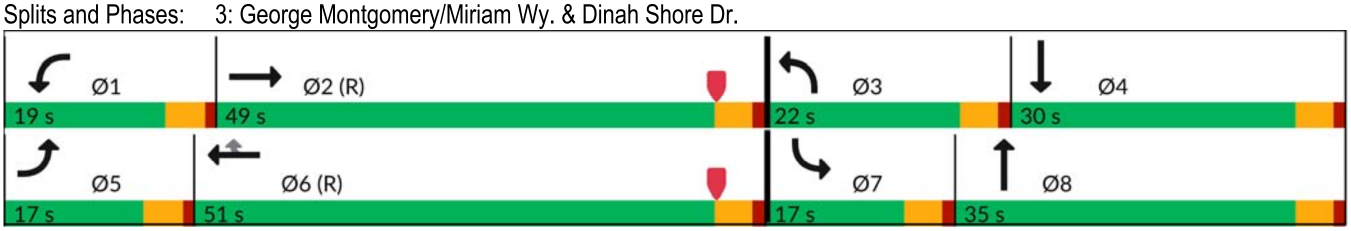
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	245	-	-	909	-	1575	-	-
HCM Lane V/C Ratio	0.003	-	-	0.119	-	-	-	-
HCM Control Delay (s/veh)	7.3	0	-	9.5	0	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	-	0	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	788	72	45	762	8	74	3	58	18	6	134
Future Volume (vph)	67	788	72	45	762	8	74	3	58	18	6	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	155		0	150		85	180		180	135		0
Storage Lanes	2		0	1		1	0		0	1		0
Taper Length (ft)	120			90			90			90		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		1296			597			233			614	
Travel Time (s)		19.6			9.0			5.3			14.0	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						
Detector Phase	5	2		1	6	6	3	8		7	4	
Switch Phase												
Minimum Initial (s)	10.0	5.0		10.0	5.0	5.0	10.0	5.0		10.0	5.0	
Minimum Split (s)	14.5	22.5		14.5	22.5	22.5	14.5	22.5		14.5	22.5	
Total Split (s)	17.0	49.0		19.0	51.0	51.0	22.0	35.0		17.0	30.0	
Total Split (%)	14.2%	40.8%		15.8%	42.5%	42.5%	18.3%	29.2%		14.2%	25.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max		None	Max	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 75
Control Type: Actuated-Coordinated

Splits and Phases: 3: George Montgomery/Miriam Wy. & Dinah Shore Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	788	72	45	762	8	74	3	58	18	6	134
Future Volume (veh/h)	67	788	72	45	762	8	74	3	58	18	6	134
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	74	876	80	50	847	9	82	3	64	20	7	149
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	264	2322	211	120	2446	757	139	18	385	72	15	328
Arrive On Green	0.08	0.49	0.49	0.14	0.96	0.96	0.08	0.25	0.25	0.04	0.22	0.22
Sat Flow, veh/h	3456	4761	433	1781	5106	1580	1781	71	1516	1781	71	1514
Grp Volume(v), veh/h	74	625	331	50	847	9	82	0	67	20	0	156
Grp Sat Flow(s),veh/h/ln	1728	1702	1790	1781	1702	1580	1781	0	1587	1781	0	1585
Q Serve(g_s), s	2.4	13.8	13.9	3.1	1.2	0.0	5.3	0.0	3.9	1.3	0.0	10.3
Cycle Q Clear(g_c), s	2.4	13.8	13.9	3.1	1.2	0.0	5.3	0.0	3.9	1.3	0.0	10.3
Prop In Lane	1.00		0.24	1.00		1.00	1.00		0.96	1.00		0.96
Lane Grp Cap(c), veh/h	264	1660	873	120	2446	757	139	0	403	72	0	344
V/C Ratio(X)	0.28	0.38	0.38	0.42	0.35	0.01	0.59	0.00	0.17	0.28	0.00	0.45
Avail Cap(c_a), veh/h	360	1660	873	215	2446	757	260	0	403	186	0	344
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	0.92	0.81	0.81	0.81	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	52.3	19.3	19.3	49.7	1.3	1.3	53.5	0.0	34.8	55.9	0.0	40.8
Incr Delay (d2), s/veh	0.5	0.6	1.2	1.8	0.3	0.0	4.0	0.0	0.9	2.0	0.0	4.3
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	5.3	5.8	1.4	0.4	0.0	2.5	0.0	1.6	0.6	0.0	4.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	52.8	19.9	20.5	51.6	1.7	1.3	57.4	0.0	35.7	57.9	0.0	45.1
LnGrp LOS	D	B	C	D	A	A	E		D	E		D
Approach Vol, veh/h		1030			906			149			176	
Approach Delay, s/veh		22.4			4.4			47.7			46.6	
Approach LOS		C			A			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.6	63.0	13.8	30.5	13.7	62.0	9.4	35.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	14.5	44.5	17.5	25.5	12.5	46.5	12.5	30.5
Max Q Clear Time (g_c+I1), s	5.1	15.9	7.3	12.3	4.4	3.2	3.3	5.9
Green Ext Time (p_c), s	0.0	6.4	0.1	0.7	0.1	6.3	0.0	0.3

Intersection Summary	
HCM 7th Control Delay, s/veh	18.8
HCM 7th LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	142	659	63	93	604	188	77	32	104	484	34	134
Future Volume (vph)	142	659	63	93	604	188	77	32	104	484	34	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		0	160		115	145		145	110		110
Storage Lanes	2		0	1		1	0		0	0		1
Taper Length (ft)	120			120			90			90		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		597			738			224			460	
Travel Time (s)		9.0			11.2			5.1			10.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						
Detector Phase	5	2		1	6	6	3	8		7	4	
Switch Phase												
Minimum Initial (s)	10.0	5.0		10.0	5.0	5.0	10.0	5.0		10.0	5.0	
Minimum Split (s)	14.5	22.5		14.5	22.5	22.5	14.5	22.5		14.5	22.5	
Total Split (s)	14.6	30.5		16.0	31.9	31.9	16.8	22.5		51.0	56.7	
Total Split (%)	12.2%	25.4%		13.3%	26.6%	26.6%	14.0%	18.8%		42.5%	47.3%	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max		None	Max	

Intersection Summary

Area Type: Other

Cycle Length: 120

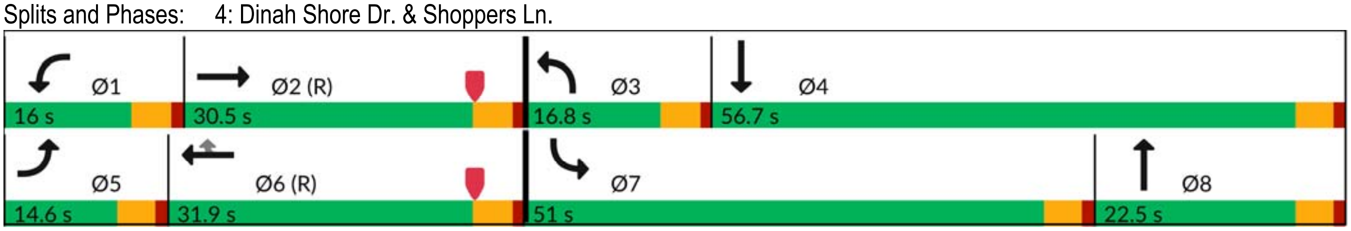
Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Splits and Phases: 4: Dinah Shore Dr. & Shoppers Ln.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	142	659	63	93	604	188	77	32	104	484	34	134
Future Volume (veh/h)	142	659	63	93	604	188	77	32	104	484	34	134
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	154	716	68	101	657	204	84	35	113	526	37	146
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	286	1216	115	143	1296	400	139	77	247	561	773	687
Arrive On Green	0.08	0.26	0.26	0.08	0.25	0.25	0.08	0.20	0.20	0.31	0.44	0.44
Sat Flow, veh/h	3456	4743	447	1781	5106	1576	1781	387	1248	1781	1777	1580
Grp Volume(v), veh/h	154	512	272	101	657	204	84	0	148	526	37	146
Grp Sat Flow(s),veh/h/ln	1728	1702	1787	1781	1702	1576	1781	0	1635	1781	1777	1580
Q Serve(g_s), s	5.1	15.8	16.0	6.6	13.2	13.3	5.5	0.0	9.6	34.4	1.4	6.9
Cycle Q Clear(g_c), s	5.1	15.8	16.0	6.6	13.2	13.3	5.5	0.0	9.6	34.4	1.4	6.9
Prop In Lane	1.00		0.25	1.00		1.00	1.00		0.76	1.00		1.00
Lane Grp Cap(c), veh/h	286	872	458	143	1296	400	139	0	324	561	773	687
V/C Ratio(X)	0.54	0.59	0.59	0.70	0.51	0.51	0.60	0.00	0.46	0.94	0.05	0.21
Avail Cap(c_a), veh/h	291	872	458	171	1296	400	183	0	324	690	773	687
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.90	0.90	0.90	0.88	0.88	0.88	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.8	39.1	39.1	53.8	38.3	38.4	53.5	0.0	42.4	40.0	19.6	21.1
Incr Delay (d2), s/veh	1.7	2.6	5.0	8.9	1.2	4.0	4.1	0.0	4.6	18.3	0.1	0.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	6.7	7.4	3.3	5.5	5.6	2.6	0.0	4.3	17.8	0.6	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	54.5	41.7	44.2	62.7	39.6	42.4	57.6	0.0	47.0	58.3	19.7	21.8
LnGrp LOS	D	D	D	E	D	D	E		D	E	B	C
Approach Vol, veh/h		938			962			232			709	
Approach Delay, s/veh		44.5			42.6			50.8			48.7	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.2	35.3	13.9	56.7	14.4	35.0	42.3	28.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	11.5	26.0	12.3	52.2	10.1	27.4	46.5	18.0
Max Q Clear Time (g_c+I1), s	8.6	18.0	7.5	8.9	7.1	15.3	36.4	11.6
Green Ext Time (p_c), s	0.0	2.9	0.1	1.2	0.1	3.8	1.3	0.4

Intersection Summary	
HCM 7th Control Delay, s/veh	45.4
HCM 7th LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	574	400	306	60	372	632	364	1021	35	398	817	392
Future Volume (vph)	574	400	306	60	372	632	364	1021	35	398	817	392
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	280		0	155		175	255		0	175		190
Storage Lanes	2		1	2		1	2		0	2		1
Taper Length (ft)	120			120			120			120		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			50			50	
Link Distance (ft)		738			479			794			571	
Travel Time (s)		11.2			7.3			10.8			7.8	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Shared Lane Traffic (%)												
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						Free
Detector Phase	7	4	4	3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	5.0	5.0	10.0	5.0	5.0	10.0	5.0		10.0	5.0	
Minimum Split (s)	14.5	22.5	22.5	14.5	22.5	22.5	14.5	22.5		14.5	22.5	
Total Split (s)	26.2	51.7	51.7	14.5	40.0	40.0	20.8	33.6		20.2	33.0	
Total Split (%)	21.8%	43.1%	43.1%	12.1%	33.3%	33.3%	17.3%	28.0%		16.8%	27.5%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	C-Max		None	C-Max	

Intersection Summary

Area Type: Other

Cycle Length: 120

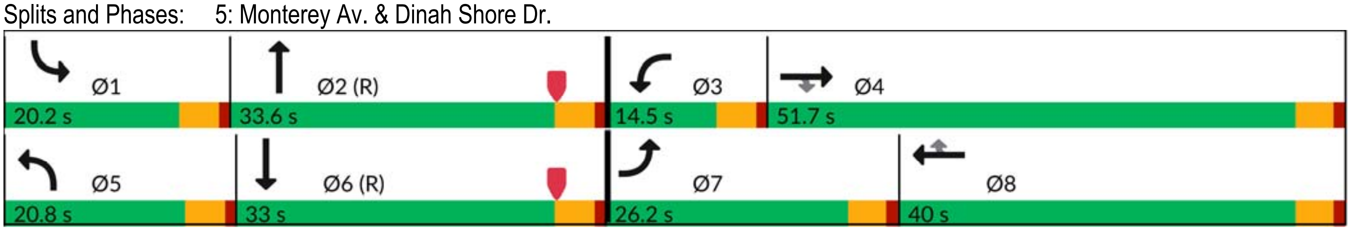
Actuated Cycle Length: 120

Offset: 50.8 (42%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow

Natural Cycle: 80

Control Type: Actuated-Coordinated

Splits and Phases: 5: Monterey Av. & Dinah Shore Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	574	400	306	60	372	632	364	1021	35	398	817	392
Future Volume (veh/h)	574	400	306	60	372	632	364	1021	35	398	817	392
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	586	408	312	61	380	0	371	1042	36	406	834	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	625	881	391	250	496		428	2021	70	452	2071	
Arrive On Green	0.30	0.41	0.41	0.07	0.14	0.00	0.12	0.40	0.40	0.13	0.41	0.00
Sat Flow, veh/h	3456	3554	1575	3456	3554	1585	3456	5067	175	3456	5106	1585
Grp Volume(v), veh/h	586	408	312	61	380	0	371	700	378	406	834	0
Grp Sat Flow(s),veh/h/ln	1728	1777	1575	1728	1777	1585	1728	1702	1838	1728	1702	1585
Q Serve(g_s), s	19.8	10.0	20.8	2.0	12.4	0.0	12.6	18.7	18.7	13.9	13.9	0.0
Cycle Q Clear(g_c), s	19.8	10.0	20.8	2.0	12.4	0.0	12.6	18.7	18.7	13.9	13.9	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	625	881	391	250	496		428	1358	733	452	2071	
V/C Ratio(X)	0.94	0.46	0.80	0.24	0.77		0.87	0.52	0.52	0.90	0.40	
Avail Cap(c_a), veh/h	625	1398	620	288	1051		469	1358	733	452	2071	
HCM Platoon Ratio	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.54	0.54	0.54	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	41.2	29.4	32.5	52.6	49.7	0.0	51.6	27.3	27.3	51.4	25.3	0.0
Incr Delay (d2), s/veh	14.1	0.2	2.1	0.5	2.5	0.0	14.6	1.4	2.6	20.4	0.6	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.3	3.8	6.6	0.9	5.5	0.0	6.2	7.4	8.3	7.1	5.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	55.3	29.6	34.7	53.1	52.3	0.0	66.2	28.7	29.9	71.7	25.9	0.0
LnGrp LOS	E	C	C	D	D		E	C	C	E	C	
Approach Vol, veh/h		1306			441			1449			1240	
Approach Delay, s/veh		42.3			52.4			38.6			40.9	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.2	52.4	13.2	34.3	19.4	53.2	26.2	21.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	15.7	29.1	10.0	47.2	16.3	28.5	21.7	35.5
Max Q Clear Time (g_c+I1), s	15.9	20.7	4.0	22.8	14.6	15.9	21.8	14.4
Green Ext Time (p_c), s	0.0	3.9	0.1	3.6	0.2	4.1	0.0	2.1

Intersection Summary	
HCM 7th Control Delay, s/veh	41.7
HCM 7th LOS	D

Notes

Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

APPENDIX 3.3: TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

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Figure 4C-3. Warrant 3, Peak Hour

Traffic Conditions = **EXISTING (2024) PM PEAK HOUR WARRANTS**

Major Street Name = **Via Vail**

Total of Both Approaches (VPH) = **82**

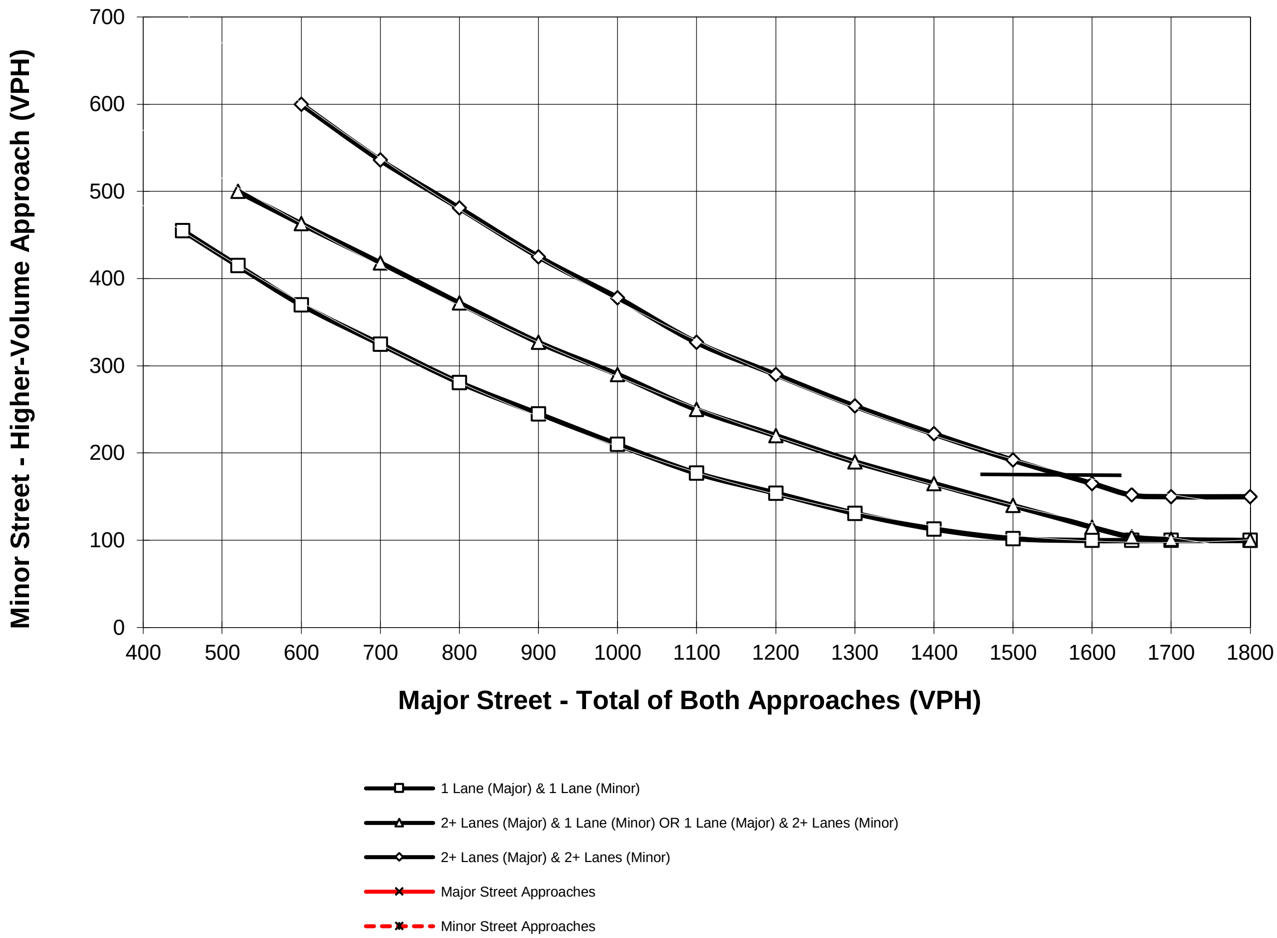
Number of Approach Lanes on Major Street = **1**

Minor Street Name = **Key Largo Av.**

High Volume Approach (VPH) = **39**

Number of Approach Lanes On Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 150 vph applies as the lower threshold for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold for a minor-street approach with one lane

Intersection ID: #2

F:\UXRjobs_15600_16000_15800\15868\02_LOS\Signal Warrants\01 - Existing\02U_PM.xls\Fig 4C-3 (Urban Peak)

Figure 4C-3. Warrant 3, Peak Hour

Traffic Conditions = **EXISTING (2024) AM PEAK HOUR WARRANTS**

Major Street Name = **Key Largo Av.**

Total of Both Approaches (VPH) = **141**

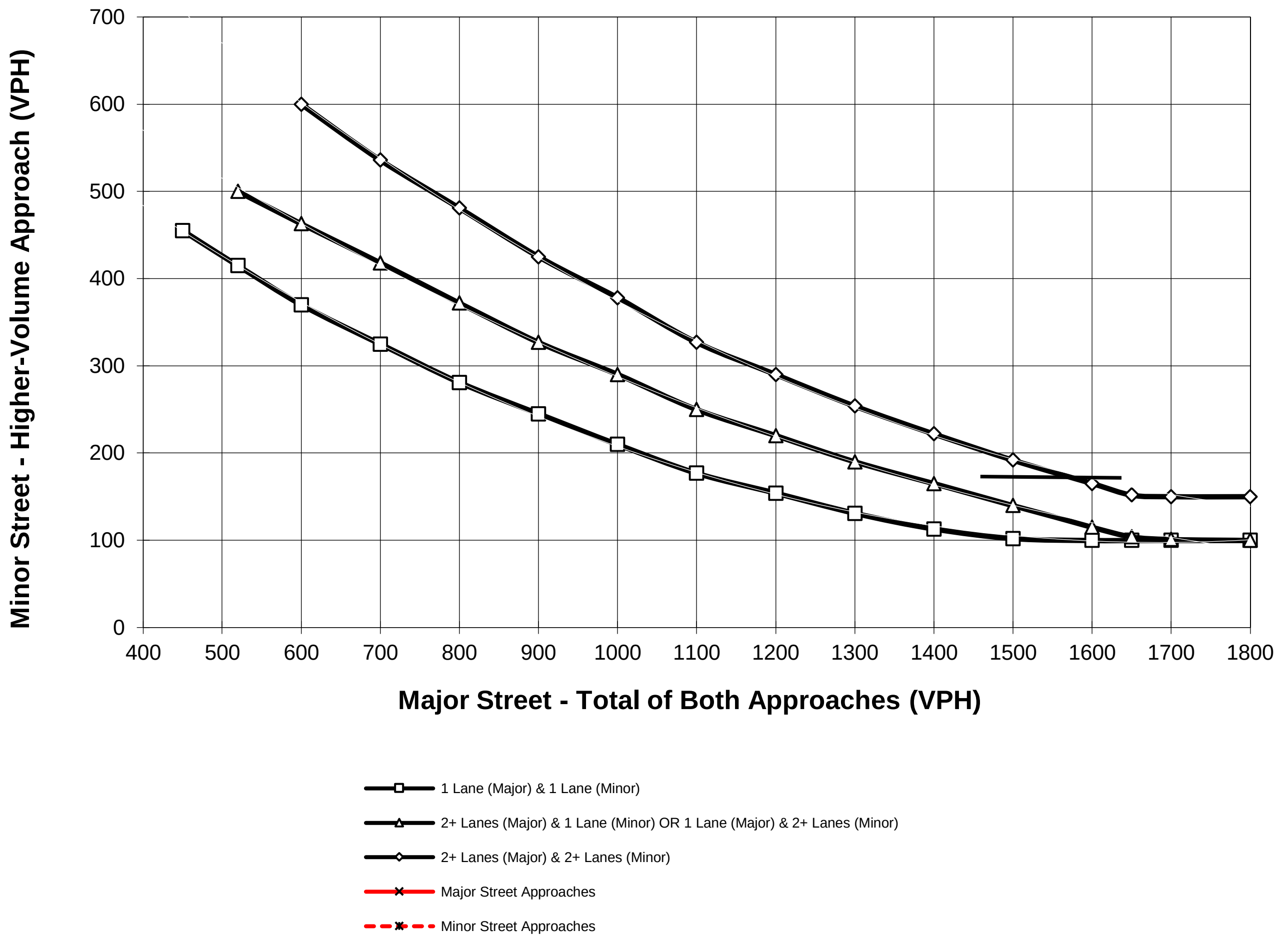
Number of Approach Lanes on Major Street = **1**

Minor Street Name = **Via Vail**

High Volume Approach (VPH) = **24**

Number of Approach Lanes On Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 150 vph applies as the lower threshold for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold for a minor-street approach with one lane

Intersection ID: #2

Figure 4C-3. Warrant 3, Peak Hour

Traffic Conditions = **E+A+P (2026) AM PEAK HOUR WARRANTS**

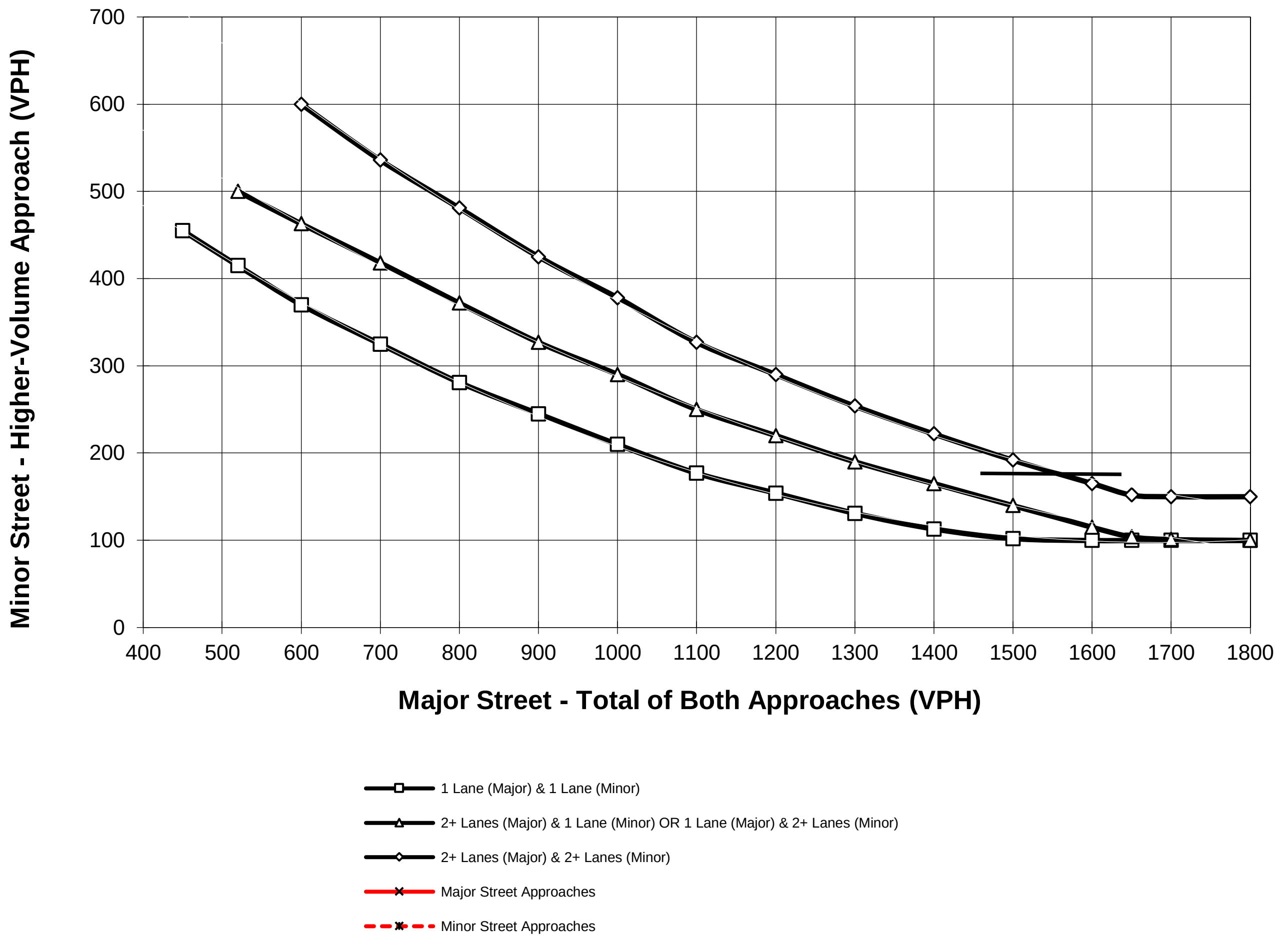
Major Street Name = **Key Largo Av.**

Total of Both Approaches (VPH) = **171**
Number of Approach Lanes on Major Street = **1**

Minor Street Name = **Via Vail**

High Volume Approach (VPH) = **62**
Number of Approach Lanes On Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 150 vph applies as the lower threshold for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold for a minor-street approach with one lane

Intersection ID: #2

F:\UXRjobs_15600_16000_15800\15868\02_LOS\Signal Warrants\02 - EAP\02U_AM.xls\Fig 4C-3 (Urban Peak)

Figure 4C-3. Warrant 3, Peak Hour

Traffic Conditions = **E+A+P (2026) PM PEAK HOUR WARRANTS**

Major Street Name = **Via Vail**

Total of Both Approaches (VPH) = **134**

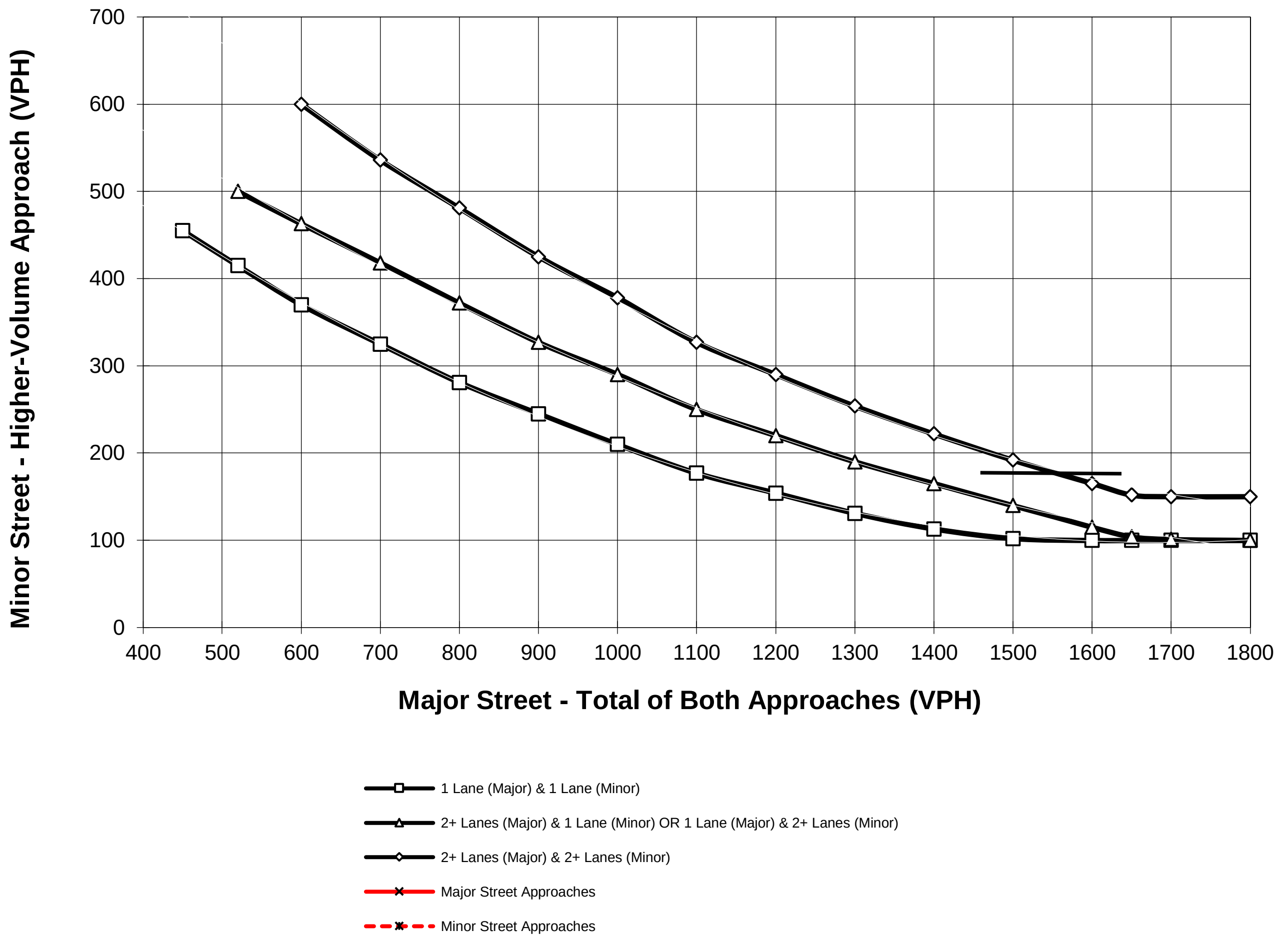
Number of Approach Lanes on Major Street = **1**

Minor Street Name = **Key Largo Av.**

High Volume Approach (VPH) = **102**

Number of Approach Lanes On Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 150 vph applies as the lower threshold for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold for a minor-street approach with one lane

Intersection ID: #2

F:\UXRjobs_15600_16000_15800\15868\02_LOS\Signal Warrants\02 - EAP\02U_PM.xls\Fig 4C-3 (Urban Peak)

Figure 4C-3. Warrant 3, Peak Hour

Traffic Conditions = **EAPC (2026) AM PEAK HOUR WARRANTS**

Major Street Name = **Via Vail**

Total of Both Approaches (VPH) = **229**

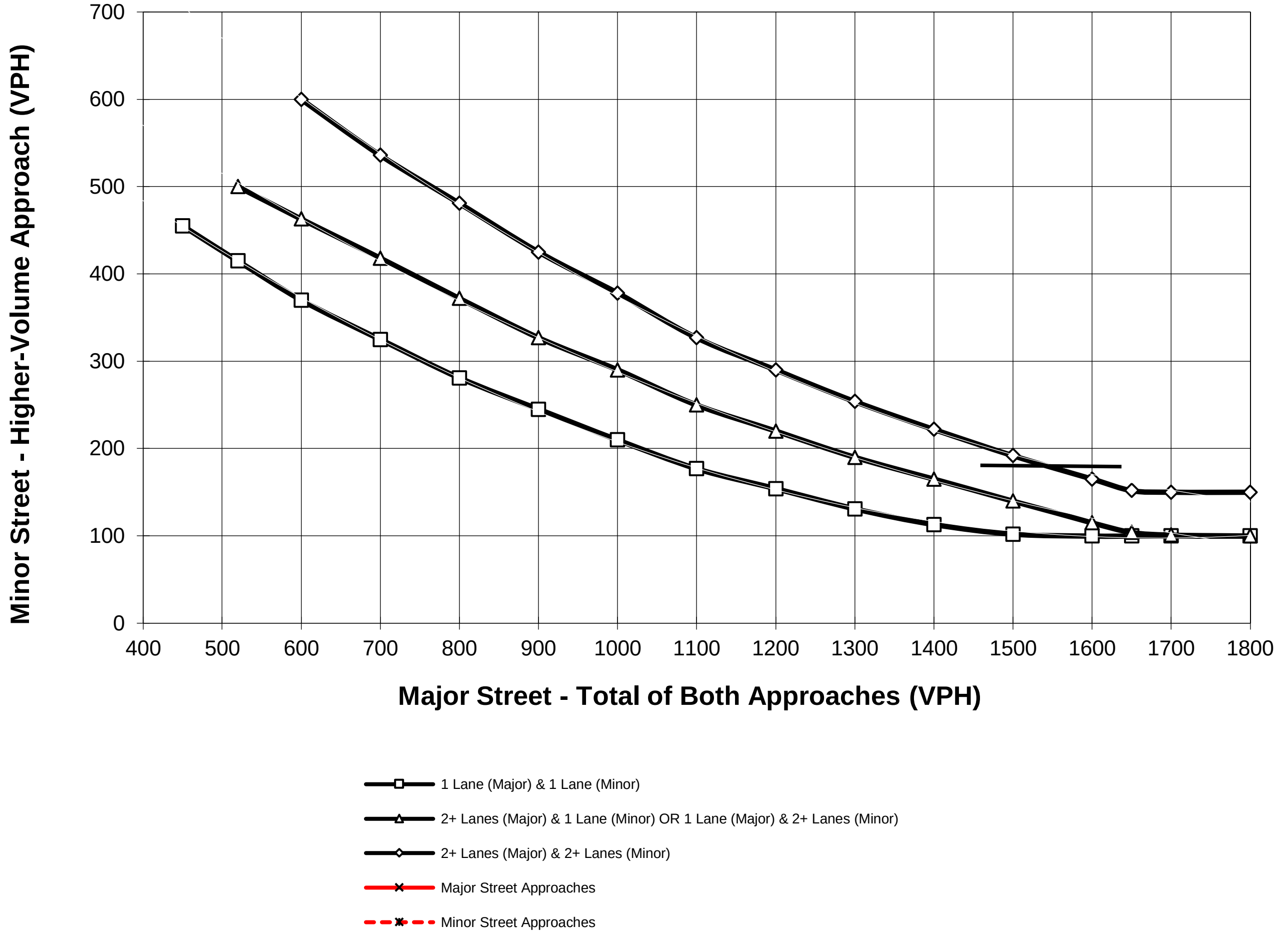
Number of Approach Lanes on Major Street = **1**

Minor Street Name = **Key Largo Av.**

High Volume Approach (VPH) = **197**

Number of Approach Lanes On Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 150 vph applies as the lower threshold for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold for a minor-street approach with one lane

Intersection ID: #2

Figure 4C-3. Warrant 3, Peak Hour

Traffic Conditions = **EAPC (2026) PM PEAK HOUR WARRANTS**

Major Street Name = **Key Largo Av.**

Total of Both Approaches (VPH) = **267**

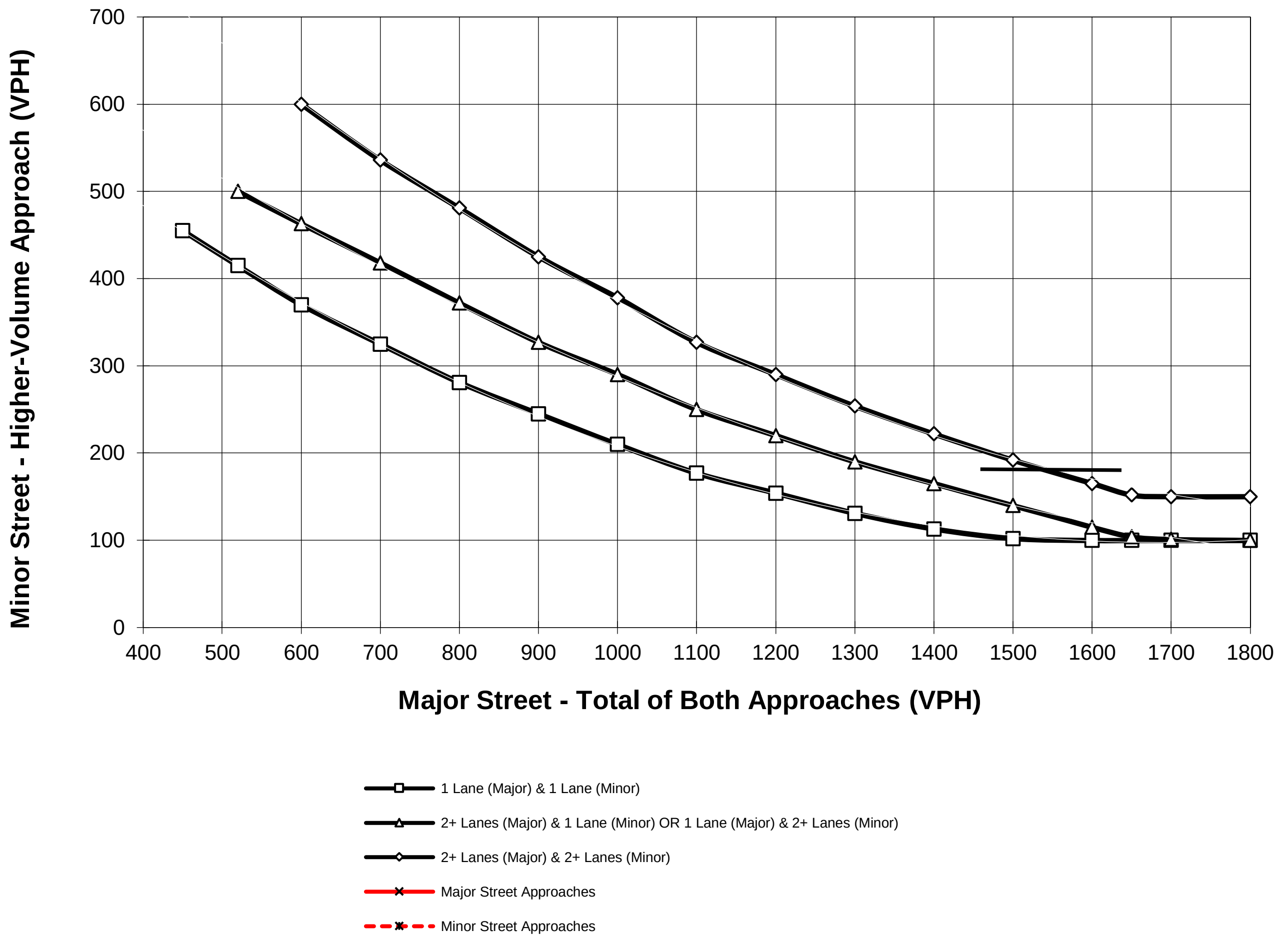
Number of Approach Lanes on Major Street = **1**

Minor Street Name = **Via Vail**

High Volume Approach (VPH) = **124**

Number of Approach Lanes On Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 150 vph applies as the lower threshold for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold for a minor-street approach with one lane

Intersection ID: #2

F:\UXRjobs_15600_16000_15800\15868\02_LOS\Signal Warrants\04 - EAPC\02U_PM.xls\Fig 4C-3 (Urban Peak)

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

TRAFFIC CONDITIONS **EAP 2026**

DIST ___ CO ___ RTE ___ PM ___

CALC JC DATE 05/20/24

CHK DATE

Jurisdiction: **City of Rancho Mirage**

Major Street: **Key Largo Av.**

Minor Street: **Via Vail**

Critical Approach Speed (Major) 35 mph

Critical Approach Speed (Minor) 35 mph

Major Street Approach Lanes = **1** lane

Minor Street Approach Lanes **1** lane

Major Street Future ADT = **1,706** vpd

Minor Street Future ADT = **728** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……….. ☐

or **URBAN (U)**

In built up area of isolated community of < 10,000 population …………………… ☐

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements ADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,706**	*1* **728**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2 +*	9,600	6,720	3,200	2,240
1	*2 +*	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,706**	*1* **728**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2 +*	14,400	10,080	1,600	1,120
1	*2 +*	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B		2 CONDITIONS 80%		2 CONDITIONS 80%	
Satisfied	Not Satisfied				
	XX				
No one condition satisfied, but following conditions fulfilled 80% of more …..					
A **21%**	**B** **14%**				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

TRAFFIC CONDITIONS **EAP 2026**

___ DIST ___ CO ___ RTE ___ PM

CALC JC DATE 05/20/24

CHK DATE

Jurisdiction: **City of Rancho Mirage**

Major Street: **Via Vail**

Minor Street: **Project Entry**

Critical Approach Speed (Major) 35 mph

Critical Approach Speed (Minor) 35 mph

Major Street Approach Lanes = **1** lane

Minor Street Approach Lanes **1** lane

Major Street Future ADT = **568** vpd

Minor Street Future ADT = **568** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ....

or **URBAN (U)**

In built up area of isolated community of < 10,000 population ....

(Based on Estimated Average Daily Traffic - See Note)

URBAN / RURAL		Minimum Requirements ADT			
URBAN: XX	RURAL				
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied: **XX**				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **568**	1 **568**	8,000	5,600	2,400	1,680
2 +	1	9,600	6,720	2,400	1,680
2 +	2 +	9,600	6,720	3,200	2,240
1	2 +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied: **XX**				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **568**	1 **568**	12,000	8,400	1,200	850
2 +	1	14,400	10,080	1,200	850
2 +	2 +	14,400	10,080	1,600	1,120
1	2 +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B		2 CONDITIONS 80%		2 CONDITIONS 80%	
Satisfied	Not Satisfied: **XX**				
No one condition satisfied, but following conditions fulfilled 80% of more	**A**: **7%** / **B**: **5%**				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM	CALC JC	DATE 05/20/24	TRAFFIC CONDITIONS **EAPC 2026**
Jurisdiction: **City of Rancho Mirage**				CHK	DATE	
Major Street: **Key Largo Av.**				Critical Approach Speed (Major)	35 mph	
Minor Street: **Via Vail**				Critical Approach Speed (Minor)	35 mph	

Major Street Approach Lanes = **1** lane — Minor Street Approach Lanes **1** lane

Major Street Future ADT = **2,938** vpd — Minor Street Future ADT = **1,555** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……….. ☐

or **URBAN (U)**

In built up area of isolated community of < 10,000 population …………………… ☐

(Based on Estimated Average Daily Traffic - See Note)

URBAN XX / RURAL		Minimum Requirements ADT			
CONDITION A - Minimum Vehicular Volume — Satisfied / Not Satisfied **XX**		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Number of lanes for moving traffic on each approach: Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **2,938**	1 **1,555**	8,000	5,600	2,400	1,680
2 +	1	9,600	6,720	2,400	1,680
2 +	2 +	9,600	6,720	3,200	2,240
1	2 +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic — Satisfied / Not Satisfied **XX**		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Number of lanes for moving traffic on each approach: Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **2,938**	1 **1,555**	12,000	8,400	1,200 *	850
2 +	1	14,400	10,080	1,200	850
2 +	2 +	14,400	10,080	1,600	1,120
1	2 +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B — Satisfied / Not Satisfied **XX**. No one condition satisfied, but following conditions fulfilled 80% of more …..	A **37%** / B **24%**	2 CONDITIONS 80%		2 CONDITIONS 80%	

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM		
				TRAFFIC CONDITIONS	**EAPC 2025**
				CALC JC	DATE 05/20/24
Jurisdiction:	**City of Rancho Mirage**			CHK	DATE
Major Street:	**Via Vail**			Critical Approach Speed (Major)	35 mph
Minor Street:	**Project Entry**			Critical Approach Speed (Minor)	35 mph

Major Street Approach Lanes = **1** lane — Minor Street Approach Lanes **1** lane

Major Street Future ADT = **2,542** vpd — Minor Street Future ADT = **568** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……….. [ ]

or — **URBAN (U)**

In built up area of isolated community of < 10,000 population …………………… [ ]

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements ADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **2,542**	*1* **568**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2 +*	9,600	6,720	3,200	2,240
1	*2 +*	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **2,542**	*1* **568**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2 +*	14,400	10,080	1,600	1,120
1	*2 +*	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B		2 CONDITIONS 80%		2 CONDITIONS 80%	
Satisfied	Not Satisfied				
	XX				
No one condition satisfied, but following conditions fulfilled 80% of more …..					
A	**B**				
24%	**21%**				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

APPENDIX 5.1: EAP (2026) INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	728	38	106	512	0	22	0	74	0	0	0
Future Volume (vph)	1	728	38	106	512	0	22	0	74	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	145		0	150		0	0		55	0		0
Storage Lanes	1		0	1		0	1		1	0		0
Taper Length (ft)	120			120			90			90		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			30			45	
Link Distance (ft)		449			1296			688			102	
Travel Time (s)		6.8			19.6			15.6			1.5	
Confl. Peds. (#/hr)			5	5			5		5			
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA		Prot		Perm			
Protected Phases	5	2		1	6		3					
Permitted Phases									8			
Detector Phase	5	2		1	6		3		8			
Switch Phase												
Minimum Initial (s)	5.0	5.0		10.0	5.0		10.0		5.0			
Minimum Split (s)	14.5	22.5		14.5	22.5		22.5		22.5			
Total Split (s)	14.5	23.0		14.5	23.0		22.5		22.5			
Total Split (%)	24.2%	38.3%		24.2%	38.3%		37.5%		37.5%			
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5		3.5			
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0		1.0			
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0		0.0			
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5		4.5			
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	C-Max		None	C-Max		Max		Max			

Intersection Summary
Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 1: Key Largo Av. & Dinah Shore Dr.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	728	38	106	512	0	22	0	74	0	0	0
Future Volume (veh/h)	1	728	38	106	512	0	22	0	74	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	0	1870	0	1870			
Adj Flow Rate, veh/h	1	774	40	113	545	0	23	0	79			
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94			
Percent Heavy Veh, %	2	2	2	2	2	0	2	0	2			
Cap, veh/h	3	1658	85	252	2418	0	534	0	476			
Arrive On Green	0.00	0.33	0.33	0.14	0.47	0.00	0.30	0.00	0.30			
Sat Flow, veh/h	1781	4970	256	1781	5274	0	1781	0	1585			
Grp Volume(v), veh/h	1	529	285	113	545	0	23	0	79			
Grp Sat Flow(s),veh/h/ln	1781	1702	1822	1781	1702	0	1781	0	1585			
Q Serve(g_s), s	0.0	7.4	7.4	3.5	3.8	0.0	0.5	0.0	2.2			
Cycle Q Clear(g_c), s	0.0	7.4	7.4	3.5	3.8	0.0	0.5	0.0	2.2			
Prop In Lane	1.00		0.14	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	3	1136	608	252	2418	0	534	0	476			
V/C Ratio(X)	0.34	0.47	0.47	0.45	0.23	0.00	0.04	0.00	0.17			
Avail Cap(c_a), veh/h	297	1136	608	297	2418	0	534	0	476			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	0.97	0.97	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	29.9	15.8	15.8	23.6	9.3	0.0	14.9	0.0	15.5			
Incr Delay (d2), s/veh	56.0	1.4	2.6	1.2	0.2	0.0	0.2	0.0	0.8			
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.1	2.6	3.0	1.4	1.1	0.0	0.2	0.0	0.8			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	85.9	17.1	18.4	24.8	9.5	0.0	15.0	0.0	16.2			
LnGrp LOS	F	B	B	C	A		B		B			
Approach Vol, veh/h		815			658			102				
Approach Delay, s/veh		17.7			12.1			16.0				
Approach LOS		B			B			B				

Timer - Assigned Phs	1	2			5	6		8				
Phs Duration (G+Y+Rc), s	13.0	24.5			4.6	32.9		22.5				
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5		4.5				
Max Green Setting (Gmax), s	10.0	18.5			10.0	18.5		18.0				
Max Q Clear Time (g_c+I1), s	5.5	9.4			2.0	5.8		4.2				
Green Ext Time (p_c), s	0.1	3.2			0.0	2.7		0.2				

Intersection Summary			
HCM 7th Control Delay, s/veh			15.2
HCM 7th LOS			B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	1	4	1	3	58	6	17	1	23	27	97
Future Volume (vph)	21	1	4	1	3	58	6	17	1	23	27	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		150	0		50	0		50
Storage Lanes	0		0	0		0	0		1	0		1
Taper Length (ft)	90			90			90			90		
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		743			784			435			688	
Travel Time (s)		16.9			4.3			9.9			15.4	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	21	1	4	1	3	58	6	17	1	23	27	97
Future Vol, veh/h	21	1	4	1	3	58	6	17	1	23	27	97
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	50	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	23	1	4	1	3	63	7	18	1	25	29	105

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	123	122	39	121	226	28	140	0	0	25	0	0
Stage 1	84	84	-	37	37	-	-	-	-	-	-	-
Stage 2	38	38	-	85	190	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	852	768	1032	854	673	1047	1444	-	-	1590	-	-
Stage 1	924	825	-	979	865	-	-	-	-	-	-	-
Stage 2	977	864	-	923	743	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	772	745	1022	822	652	1037	1437	-	-	1582	-	-
Mov Cap-2 Maneuver	772	745	-	822	652	-	-	-	-	-	-	-
Stage 1	903	807	-	970	856	-	-	-	-	-	-	-
Stage 2	906	856	-	898	727	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	9.66	8.83	1.88	1.14
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	470	-	-	801	1007	828	-	-
HCM Lane V/C Ratio	0.005	-	-	0.035	0.066	0.016	-	-
HCM Control Delay (s/veh)	7.5	0	-	9.7	8.8	7.3	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.2	0	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	684	37	15	645	11	19	1	11	5	3	17
Future Volume (vph)	42	684	37	15	645	11	19	1	11	5	3	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	155		0	150		85	180		180	135		0
Storage Lanes	2		0	1		1	0		0	1		0
Taper Length (ft)	120			90			90			90		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		1296			597			233			614	
Travel Time (s)		19.6			9.0			5.3			14.0	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						
Detector Phase	5	2		1	6	6	3	8		7	4	
Switch Phase												
Minimum Initial (s)	10.0	5.0		10.0	5.0	5.0	10.0	5.0		10.0	5.0	
Minimum Split (s)	14.5	22.5		14.5	22.5	22.5	14.5	22.5		14.5	22.5	
Total Split (s)	19.0	53.0		20.0	54.0	54.0	21.0	29.0		18.0	26.0	
Total Split (%)	15.8%	44.2%		16.7%	45.0%	45.0%	17.5%	24.2%		15.0%	21.7%	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max		None	Max	

Intersection Summary

Area Type: Other

Cycle Length: 120

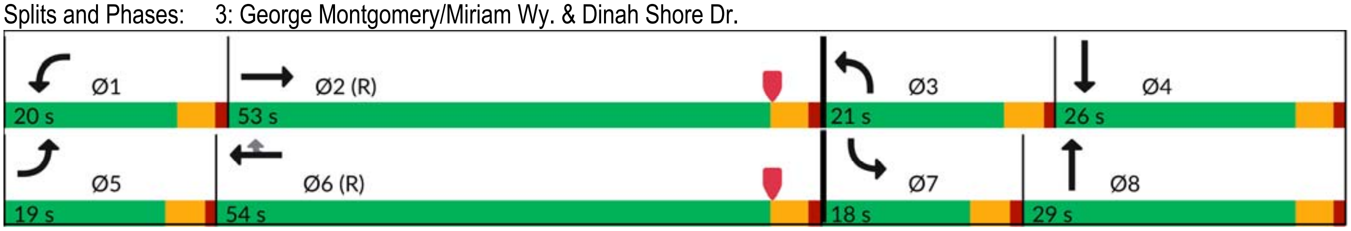
Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow

Natural Cycle: 75

Control Type: Actuated-Coordinated

Splits and Phases: 3: George Montgomery/Miriam Wy. & Dinah Shore Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	684	37	15	645	11	19	1	11	5	3	17
Future Volume (veh/h)	42	684	37	15	645	11	19	1	11	5	3	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	43	698	38	15	658	11	19	1	11	5	3	17
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	219	2968	161	58	2902	898	70	27	300	23	43	245
Arrive On Green	0.11	1.00	1.00	0.06	0.97	0.97	0.04	0.21	0.21	0.01	0.18	0.18
Sat Flow, veh/h	3456	4956	269	1781	5106	1581	1781	133	1462	1781	242	1369
Grp Volume(v), veh/h	43	478	258	15	658	11	19	0	12	5	0	20
Grp Sat Flow(s),veh/h/ln	1728	1702	1821	1781	1702	1581	1781	0	1595	1781	0	1610
Q Serve(g_s), s	1.4	0.0	0.0	1.0	0.7	0.0	1.2	0.0	0.7	0.3	0.0	1.2
Cycle Q Clear(g_c), s	1.4	0.0	0.0	1.0	0.7	0.0	1.2	0.0	0.7	0.3	0.0	1.2
Prop In Lane	1.00		0.15	1.00		1.00	1.00		0.92	1.00		0.85
Lane Grp Cap(c), veh/h	219	2039	1090	58	2902	898	70	0	328	23	0	289
V/C Ratio(X)	0.20	0.23	0.24	0.26	0.23	0.01	0.27	0.00	0.04	0.22	0.00	0.07
Avail Cap(c_a), veh/h	418	2039	1090	230	2902	898	245	0	328	200	0	289
HCM Platoon Ratio	1.70	1.70	1.70	1.70	1.70	1.70	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.91	0.91	0.95	0.95	0.95	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	50.7	0.0	0.0	55.3	0.9	0.9	56.0	0.0	38.2	58.6	0.0	40.9
Incr Delay (d2), s/veh	0.4	0.2	0.5	2.2	0.2	0.0	2.1	0.0	0.2	4.7	0.0	0.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.1	0.1	0.5	0.2	0.0	0.6	0.0	0.3	0.2	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	51.1	0.2	0.5	57.4	1.1	0.9	58.1	0.0	38.4	63.4	0.0	41.4
LnGrp LOS	D	A	A	E	A	A	E		D	E		D
Approach Vol, veh/h		779			684			31			25	
Approach Delay, s/veh		3.1			2.3			50.5			45.8	
Approach LOS		A			A			D			D	

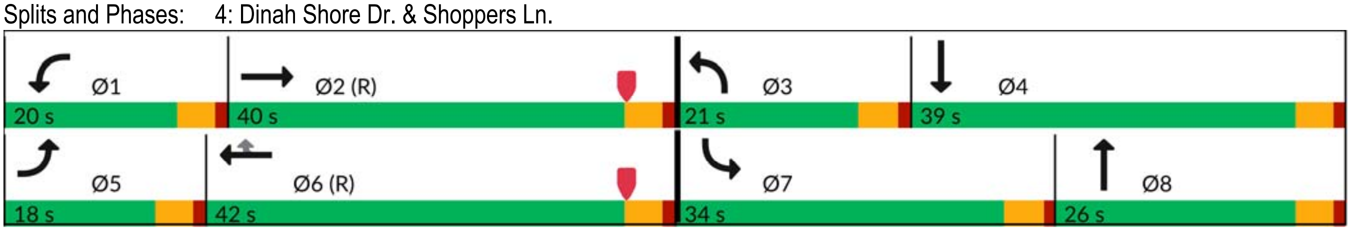
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.4	76.4	9.2	26.0	12.1	72.7	6.0	29.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	15.5	48.5	16.5	21.5	14.5	49.5	13.5	24.5
Max Q Clear Time (g_c+I1), s	3.0	2.0	3.2	3.2	3.4	2.7	2.3	2.7
Green Ext Time (p_c), s	0.0	4.9	0.0	0.0	0.0	4.7	0.0	0.0

Intersection Summary	
HCM 7th Control Delay, s/veh	4.4
HCM 7th LOS	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	570	57	49	562	122	68	9	46	154	5	41
Future Volume (vph)	73	570	57	49	562	122	68	9	46	154	5	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		0	160		115	145		145	110		110
Storage Lanes	2		0	1		1	0		0	0		1
Taper Length (ft)	120			120			90			90		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		597			738			224			460	
Travel Time (s)		9.0			11.2			5.1			10.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						
Detector Phase	5	2		1	6	6	3	8		7	4	
Switch Phase												
Minimum Initial (s)	10.0	5.0		10.0	5.0	5.0	10.0	5.0		10.0	5.0	
Minimum Split (s)	14.5	22.5		14.5	22.5	22.5	14.5	22.5		14.5	22.5	
Total Split (s)	18.0	40.0		20.0	42.0	42.0	21.0	26.0		34.0	39.0	
Total Split (%)	15.0%	33.3%		16.7%	35.0%	35.0%	17.5%	21.7%		28.3%	32.5%	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max		None	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	

Splits and Phases: 4: Dinah Shore Dr. & Shoppers Ln.

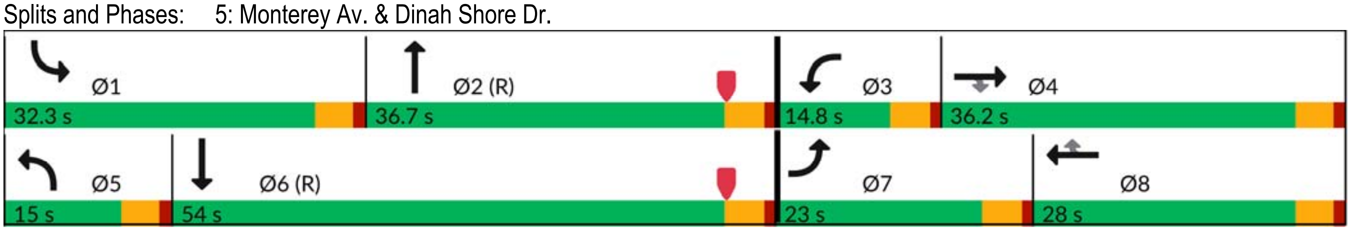


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	73	570	57	49	562	122	68	9	46	154	5	41
Future Volume (veh/h)	73	570	57	49	562	122	68	9	46	154	5	41
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	77	600	60	52	592	128	72	9	48	162	5	43
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	266	1974	195	122	2092	647	135	65	347	193	511	453
Arrive On Green	0.14	0.75	0.75	0.07	0.41	0.41	0.08	0.25	0.25	0.11	0.29	0.29
Sat Flow, veh/h	3456	4721	467	1781	5106	1579	1781	255	1361	1781	1777	1577
Grp Volume(v), veh/h	77	431	229	52	592	128	72	0	57	162	5	43
Grp Sat Flow(s),veh/h/ln	1728	1702	1784	1781	1702	1579	1781	0	1616	1781	1777	1577
Q Serve(g_s), s	2.4	4.9	5.0	3.4	9.3	6.2	4.7	0.0	3.3	10.7	0.2	2.4
Cycle Q Clear(g_c), s	2.4	4.9	5.0	3.4	9.3	6.2	4.7	0.0	3.3	10.7	0.2	2.4
Prop In Lane	1.00		0.26	1.00		1.00	1.00		0.84	1.00		1.00
Lane Grp Cap(c), veh/h	266	1423	746	122	2092	647	135	0	412	193	511	453
V/C Ratio(X)	0.29	0.30	0.31	0.43	0.28	0.20	0.53	0.00	0.14	0.84	0.01	0.09
Avail Cap(c_a), veh/h	389	1423	746	230	2092	647	245	0	412	438	511	453
HCM Platoon Ratio	1.80	1.80	1.80	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.97	0.97	0.97	0.91	0.91	0.91	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.7	9.2	9.3	53.6	23.6	22.7	53.4	0.0	34.5	52.5	30.5	31.3
Incr Delay (d2), s/veh	0.6	0.5	1.0	2.1	0.3	0.6	3.2	0.0	0.7	9.2	0.0	0.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	1.6	1.8	1.5	3.7	2.4	2.2	0.0	1.4	5.3	0.1	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	49.3	9.8	10.3	55.7	24.0	23.4	56.7	0.0	35.2	61.7	30.6	31.7
LnGrp LOS	D	A	B	E	C	C	E		D	E	C	C
Approach Vol, veh/h		737			772			129			210	
Approach Delay, s/veh		14.1			26.0			47.2			54.8	
Approach LOS		B			C			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.7	54.7	13.6	39.0	13.7	53.7	17.5	35.1				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	15.5	35.5	16.5	34.5	13.5	37.5	29.5	21.5				
Max Q Clear Time (g_c+I1), s	5.4	7.0	6.7	4.4	4.4	11.3	12.7	5.3				
Green Ext Time (p_c), s	0.1	4.1	0.1	0.2	0.1	4.3	0.4	0.2				
Intersection Summary												
HCM 7th Control Delay, s/veh			26.0									
HCM 7th LOS			C									

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	304	278	183	67	250	295	131	401	31	511	1471	478
Future Volume (vph)	304	278	183	67	250	295	131	401	31	511	1471	478
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	280		0	155		175	255		0	175		190
Storage Lanes	2		1	2		1	2		0	2		1
Taper Length (ft)	120			120			120			120		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			50			50	
Link Distance (ft)		738			479			794			571	
Travel Time (s)		11.2			7.3			10.8			7.8	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)												
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						Free
Detector Phase	7	4	4	3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	5.0	5.0	10.0	5.0	5.0	10.0	5.0		10.0	5.0	
Minimum Split (s)	14.5	22.5	22.5	14.5	22.5	22.5	14.5	22.5		14.5	22.5	
Total Split (s)	23.0	36.2	36.2	14.8	28.0	28.0	15.0	36.7		32.3	54.0	
Total Split (%)	19.2%	30.2%	30.2%	12.3%	23.3%	23.3%	12.5%	30.6%		26.9%	45.0%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	C-Max		None	C-Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 84.3 (70%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	

Splits and Phases: 5: Monterey Av. & Dinah Shore Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	304	278	183	67	250	295	131	401	31	511	1471	478
Future Volume (veh/h)	304	278	183	67	250	295	131	401	31	511	1471	478
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	323	296	195	71	266	0	139	427	33	544	1565	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	393	556	246	261	420		285	2118	162	622	2734	
Arrive On Green	0.04	0.05	0.05	0.08	0.12	0.00	0.08	0.44	0.44	0.18	0.54	0.00
Sat Flow, veh/h	3456	3554	1570	3456	3554	1585	3456	4837	369	3456	5106	1585
Grp Volume(v), veh/h	323	296	195	71	266	0	139	299	161	544	1565	0
Grp Sat Flow(s),veh/h/ln	1728	1777	1570	1728	1777	1585	1728	1702	1802	1728	1702	1585
Q Serve(g_s), s	11.1	9.7	14.7	2.3	8.6	0.0	4.6	6.5	6.6	18.4	24.6	0.0
Cycle Q Clear(g_c), s	11.1	9.7	14.7	2.3	8.6	0.0	4.6	6.5	6.6	18.4	24.6	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.20	1.00		1.00
Lane Grp Cap(c), veh/h	393	556	246	261	420		285	1491	789	622	2734	
V/C Ratio(X)	0.82	0.53	0.79	0.27	0.63		0.49	0.20	0.20	0.87	0.57	
Avail Cap(c_a), veh/h	533	939	415	297	696		302	1491	789	801	2734	
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.91	0.91	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	56.5	52.6	55.0	52.4	50.4	0.0	52.6	20.8	20.8	47.9	18.7	0.0
Incr Delay (d2), s/veh	6.7	0.7	5.2	0.6	1.6	0.0	1.3	0.3	0.6	8.7	0.9	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	4.6	6.5	1.0	3.8	0.0	2.0	2.5	2.8	8.4	9.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	63.3	53.3	60.2	52.9	52.0	0.0	53.9	21.1	21.4	56.6	19.6	0.0
LnGrp LOS	E	D	E	D	D		D	C	C	E	B	
Approach Vol, veh/h		814			337			599			2109	
Approach Delay, s/veh		58.9			52.2			28.8			29.1	
Approach LOS		E			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	26.1	57.0	13.6	23.3	14.4	68.7	18.2	18.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	27.8	32.2	10.3	31.7	10.5	49.5	18.5	23.5
Max Q Clear Time (g_c+I1), s	20.4	8.6	4.3	16.7	6.6	26.6	13.1	10.6
Green Ext Time (p_c), s	1.2	2.5	0.1	2.0	0.1	11.2	0.5	1.2

Intersection Summary	
HCM 7th Control Delay, s/veh	37.4
HCM 7th LOS	D

Notes

Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	61	1	1	1	1	24
Future Volume (vph)	61	1	1	1	1	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	30			30	30	
Link Distance (ft)	246			314	900	
Travel Time (s)	4.2			7.1	20.4	
Confl. Peds. (#/hr)	5	5	5			5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	6.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	61	1	1	1	1	24
Future Vol, veh/h	61	1	1	1	1	24
Conflicting Peds, #/hr	5	5	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
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	66	1	1	1	1	26

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	27	24	32	0	-	0
Stage 1	19	-	-	-	-	-
Stage 2	8	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	988	1052	1580	-	-	-
Stage 1	1004	-	-	-	-	-
Stage 2	1015	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	978	1042	1572	-	-	-
Mov Cap-2 Maneuver	978	-	-	-	-	-
Stage 1	998	-	-	-	-	-
Stage 2	1010	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	8.95	3.65	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	900	-	979	-	-
HCM Lane V/C Ratio	0.001	-	0.069	-	-
HCM Control Delay (s/veh)	7.3	0	9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	882	41	85	959	0	26	0	99	0	0	0
Future Volume (vph)	1	882	41	85	959	0	26	0	99	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	145		0	150		0	0		55	0		0
Storage Lanes	1		0	1		0	1		1	0		0
Taper Length (ft)	120			120			90			90		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			30			45	
Link Distance (ft)		449			1296			688			102	
Travel Time (s)		6.8			19.6			15.6			1.5	
Confl. Peds. (#/hr)			5	5			5		5			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA		Prot		Perm			
Protected Phases	5	2		1	6		3					
Permitted Phases									8			
Detector Phase	5	2		1	6		3		8			
Switch Phase												
Minimum Initial (s)	5.0	5.0		10.0	5.0		10.0		5.0			
Minimum Split (s)	14.5	22.5		14.5	22.5		22.5		22.5			
Total Split (s)	14.5	23.0		14.5	23.0		22.5		22.5			
Total Split (%)	24.2%	38.3%		24.2%	38.3%		37.5%		37.5%			
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5		3.5			
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0		1.0			
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0		0.0			
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5		4.5			
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	C-Max		None	C-Max		Max		Max			

Intersection Summary	
Area Type:	Other
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Key Largo Av. & Dinah Shore Dr.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	882	41	85	959	0	26	0	99	0	0	0
Future Volume (veh/h)	1	882	41	85	959	0	26	0	99	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	0	1870	0	1870			
Adj Flow Rate, veh/h	1	959	45	92	1042	0	28	0	108			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	2	2	2	2	2	0	2	0	2			
Cap, veh/h	3	1720	81	233	2418	0	534	0	476			
Arrive On Green	0.00	0.34	0.34	0.26	0.95	0.00	0.30	0.00	0.30			
Sat Flow, veh/h	1781	4996	234	1781	5274	0	1781	0	1585			
Grp Volume(v), veh/h	1	653	351	92	1042	0	28	0	108			
Grp Sat Flow(s),veh/h/ln	1781	1702	1826	1781	1702	0	1781	0	1585			
Q Serve(g_s), s	0.0	9.3	9.4	2.6	1.1	0.0	0.7	0.0	3.1			
Cycle Q Clear(g_c), s	0.0	9.3	9.4	2.6	1.1	0.0	0.7	0.0	3.1			
Prop In Lane	1.00		0.13	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	3	1172	629	233	2418	0	534	0	476			
V/C Ratio(X)	0.34	0.56	0.56	0.40	0.43	0.00	0.05	0.00	0.23			
Avail Cap(c_a), veh/h	297	1172	629	297	2418	0	534	0	476			
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	0.91	0.91	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	29.9	16.0	16.0	20.2	0.9	0.0	14.9	0.0	15.8			
Incr Delay (d2), s/veh	56.0	1.9	3.6	1.0	0.5	0.0	0.2	0.0	1.1			
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.1	3.3	3.8	1.0	0.3	0.0	0.3	0.0	1.2			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	85.9	17.9	19.5	21.2	1.4	0.0	15.1	0.0	16.9			
LnGrp LOS	F	B	B	C	A		B		B			
Approach Vol, veh/h		1005			1134			136				
Approach Delay, s/veh		18.5			3.0			16.5				
Approach LOS		B			A			B				

Timer - Assigned Phs	1	2			5	6		8
Phs Duration (G+Y+Rc), s	12.3	25.2			4.6	32.9		22.5
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5		4.5
Max Green Setting (Gmax), s	10.0	18.5			10.0	18.5		18.0
Max Q Clear Time (g_c+I1), s	4.6	11.4			2.0	3.1		5.1
Green Ext Time (p_c), s	0.1	3.4			0.0	6.0		0.3

Intersection Summary			
HCM 7th Control Delay, s/veh			10.7
HCM 7th LOS			B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	77	3	8	1	2	43	3	20	1	61	16	25
Future Volume (vph)	77	3	8	1	2	43	3	20	1	61	16	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		150	0		50	0		0
Storage Lanes	0		0	0		0	0		1	0		0
Taper Length (ft)	90			90			90			90		
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		743			786			435			688	
Travel Time (s)		16.9			4.3			9.9			15.4	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	7.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	77	3	8	1	2	43	3	20	1	61	16	25
Future Vol, veh/h	77	3	8	1	2	43	3	20	1	61	16	25
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	50	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	76	76	76	76	76	76	76	76	76	76	76	76
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	101	4	11	1	3	57	4	26	1	80	21	33

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	244	244	48	228	259	36	59	0	0	33	0	0
Stage 1	203	203	-	39	39	-	-	-	-	-	-	-
Stage 2	41	41	-	189	219	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	710	658	1022	727	646	1036	1545	-	-	1579	-	-
Stage 1	799	733	-	976	862	-	-	-	-	-	-	-
Stage 2	974	861	-	813	722	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	625	616	1012	670	604	1026	1538	-	-	1572	-	-
Mov Cap-2 Maneuver	625	616	-	670	604	-	-	-	-	-	-	-
Stage 1	753	691	-	969	856	-	-	-	-	-	-	-
Stage 2	911	855	-	754	680	-	-	-	-	-	-	-

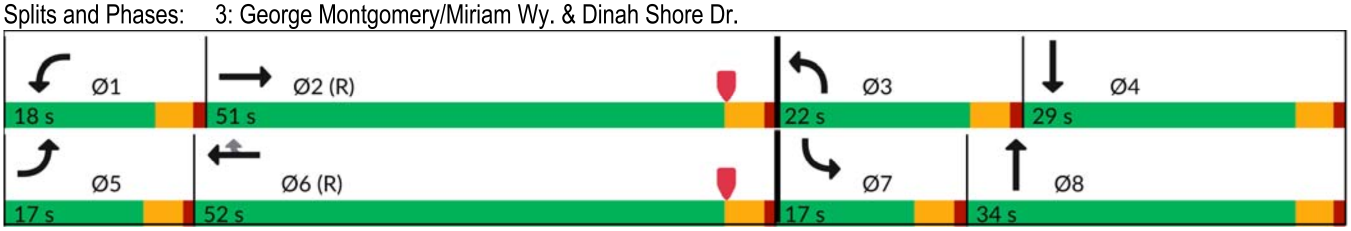
Approach	EB	WB	NB	SB
HCM Control Delay, s/v	11.77	8.89	0.92	4.43
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	235	-	-	648	985	959	-	-
HCM Lane V/C Ratio	0.003	-	-	0.179	0.061	0.051	-	-
HCM Control Delay (s/veh)	7.3	0	-	11.8	8.9	7.4	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0.2	0.2	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	853	76	47	838	8	78	3	60	19	6	140
Future Volume (vph)	70	853	76	47	838	8	78	3	60	19	6	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	155		0	150		85	180		180	135		0
Storage Lanes	2		0	1		1	0		0	1		0
Taper Length (ft)	120			90			90			90		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		1296			597			233			614	
Travel Time (s)		19.6			9.0			5.3			14.0	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						
Detector Phase	5	2		1	6	6	3	8		7	4	
Switch Phase												
Minimum Initial (s)	10.0	5.0		10.0	5.0	5.0	10.0	5.0		10.0	5.0	
Minimum Split (s)	14.5	22.5		14.5	22.5	22.5	14.5	22.5		14.5	22.5	
Total Split (s)	17.0	51.0		18.0	52.0	52.0	22.0	34.0		17.0	29.0	
Total Split (%)	14.2%	42.5%		15.0%	43.3%	43.3%	18.3%	28.3%		14.2%	24.2%	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max		None	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	

Splits and Phases: 3: George Montgomery/Miriam Wy. & Dinah Shore Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	853	76	47	838	8	78	3	60	19	6	140
Future Volume (veh/h)	70	853	76	47	838	8	78	3	60	19	6	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	78	948	84	52	931	9	87	3	67	21	7	156
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	267	2356	208	122	2477	766	140	17	373	75	14	317
Arrive On Green	0.05	0.33	0.33	0.14	0.97	0.97	0.08	0.25	0.25	0.04	0.21	0.21
Sat Flow, veh/h	3456	4774	422	1781	5106	1580	1781	68	1518	1781	68	1516
Grp Volume(v), veh/h	78	675	357	52	931	9	87	0	70	21	0	163
Grp Sat Flow(s),veh/h/ln	1728	1702	1792	1781	1702	1580	1781	0	1586	1781	0	1584
Q Serve(g_s), s	2.6	18.4	18.5	3.2	1.0	0.0	5.7	0.0	4.2	1.4	0.0	10.9
Cycle Q Clear(g_c), s	2.6	18.4	18.5	3.2	1.0	0.0	5.7	0.0	4.2	1.4	0.0	10.9
Prop In Lane	1.00		0.24	1.00		1.00	1.00		0.96	1.00		0.96
Lane Grp Cap(c), veh/h	267	1680	884	122	2477	766	140	0	390	75	0	331
V/C Ratio(X)	0.29	0.40	0.40	0.43	0.38	0.01	0.62	0.00	0.18	0.28	0.00	0.49
Avail Cap(c_a), veh/h	360	1680	884	200	2477	766	260	0	390	186	0	331
HCM Platoon Ratio	0.67	0.67	0.67	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.84	0.84	0.84	0.75	0.75	0.75	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	53.7	26.5	26.5	49.6	0.9	0.9	53.5	0.0	35.7	55.7	0.0	41.8
Incr Delay (d2), s/veh	0.5	0.6	1.2	1.8	0.3	0.0	4.4	0.0	1.0	2.0	0.0	5.2
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	7.9	8.5	1.4	0.3	0.0	2.7	0.0	1.7	0.7	0.0	4.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	54.3	27.1	27.7	51.4	1.3	0.9	58.0	0.0	36.7	57.7	0.0	47.0
LnGrp LOS	D	C	C	D	A	A	E		D	E		D
Approach Vol, veh/h		1110			992			157			184	
Approach Delay, s/veh		29.2			3.9			48.5			48.2	
Approach LOS		C			A			D			D	

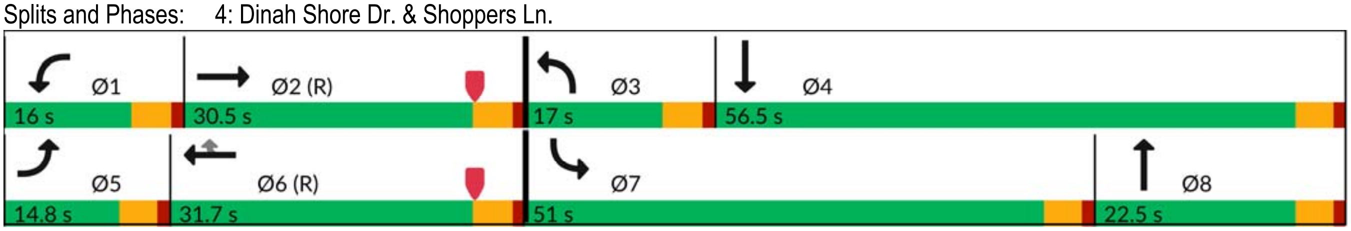
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.7	63.7	13.9	29.6	13.8	62.7	9.5	34.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	13.5	46.5	17.5	24.5	12.5	47.5	12.5	29.5
Max Q Clear Time (g_c+I1), s	5.2	20.5	7.7	12.9	4.6	3.0	3.4	6.2
Green Ext Time (p_c), s	0.0	6.8	0.1	0.7	0.1	7.1	0.0	0.3

Intersection Summary	
HCM 7th Control Delay, s/veh	21.6
HCM 7th LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	150	715	67	97	671	196	81	33	108	504	35	141
Future Volume (vph)	150	715	67	97	671	196	81	33	108	504	35	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		0	160		115	145		145	110		110
Storage Lanes	2		0	1		1	0		0	0		1
Taper Length (ft)	120			120			90			90		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		597			738			224			460	
Travel Time (s)		9.0			11.2			5.1			10.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						
Detector Phase	5	2		1	6	6	3	8		7	4	
Switch Phase												
Minimum Initial (s)	10.0	5.0		10.0	5.0	5.0	10.0	5.0		10.0	5.0	
Minimum Split (s)	14.5	22.5		14.5	22.5	22.5	14.5	22.5		14.5	22.5	
Total Split (s)	14.8	30.5		16.0	31.7	31.7	17.0	22.5		51.0	56.5	
Total Split (%)	12.3%	25.4%		13.3%	26.4%	26.4%	14.2%	18.8%		42.5%	47.1%	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max		None	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	

Splits and Phases: 4: Dinah Shore Dr. & Shoppers Ln.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	715	67	97	671	196	81	33	108	504	35	141
Future Volume (veh/h)	150	715	67	97	671	196	81	33	108	504	35	141
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	163	777	73	105	729	213	88	36	117	548	38	153
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	287	1220	114	144	1301	401	141	71	232	582	770	684
Arrive On Green	0.08	0.26	0.26	0.08	0.25	0.25	0.08	0.19	0.19	0.33	0.43	0.43
Sat Flow, veh/h	3456	4748	444	1781	5106	1576	1781	384	1249	1781	1777	1580
Grp Volume(v), veh/h	163	556	294	105	729	213	88	0	153	548	38	153
Grp Sat Flow(s),veh/h/ln	1728	1702	1787	1781	1702	1576	1781	0	1633	1781	1777	1580
Q Serve(g_s), s	5.4	17.4	17.6	6.9	14.9	14.0	5.7	0.0	10.1	35.9	1.5	7.3
Cycle Q Clear(g_c), s	5.4	17.4	17.6	6.9	14.9	14.0	5.7	0.0	10.1	35.9	1.5	7.3
Prop In Lane	1.00		0.25	1.00		1.00	1.00		0.76	1.00		1.00
Lane Grp Cap(c), veh/h	287	875	459	144	1301	401	141	0	303	582	770	684
V/C Ratio(X)	0.57	0.64	0.64	0.73	0.56	0.53	0.63	0.00	0.51	0.94	0.05	0.22
Avail Cap(c_a), veh/h	297	875	459	171	1301	401	186	0	303	690	770	684
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.88	0.88	0.88	0.87	0.87	0.87	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.0	39.6	39.7	53.9	38.9	38.5	53.6	0.0	43.9	39.3	19.7	21.3
Incr Delay (d2), s/veh	2.1	3.1	5.9	10.7	1.5	4.3	4.5	0.0	5.9	19.4	0.1	0.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	7.4	8.2	3.4	6.2	5.9	2.8	0.0	4.6	18.6	0.6	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	55.1	42.7	45.6	64.6	40.4	42.8	58.1	0.0	49.8	58.7	19.8	22.1
LnGrp LOS	E	D	D	E	D	D	E		D	E	B	C
Approach Vol, veh/h		1013			1047			241			739	
Approach Delay, s/veh		45.5			43.3			52.8			49.1	
Approach LOS		D			D			D			D	

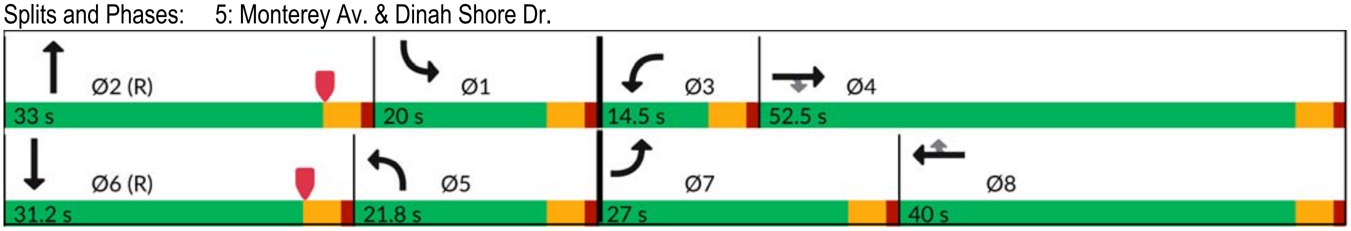
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.2	35.3	14.0	56.5	14.5	35.1	43.7	26.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	11.5	26.0	12.5	52.0	10.3	27.2	46.5	18.0
Max Q Clear Time (g_c+I1), s	8.9	19.6	7.7	9.3	7.4	16.9	37.9	12.1
Green Ext Time (p_c), s	0.0	2.7	0.1	1.3	0.1	3.8	1.3	0.4

Intersection Summary	
HCM 7th Control Delay, s/veh	46.2
HCM 7th LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	615	418	327	62	390	658	392	1062	36	414	850	434
Future Volume (vph)	615	418	327	62	390	658	392	1062	36	414	850	434
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	280		0	155		175	255		0	175		190
Storage Lanes	2		1	2		1	2		0	2		1
Taper Length (ft)	120			120			120			120		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			50			50	
Link Distance (ft)		738			479			794			571	
Travel Time (s)		11.2			7.3			10.8			7.8	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Shared Lane Traffic (%)												
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						Free
Detector Phase	7	4	4	3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	5.0	5.0	10.0	5.0	5.0	10.0	5.0		10.0	5.0	
Minimum Split (s)	14.5	22.5	22.5	14.5	22.5	22.5	14.5	22.5		14.5	22.5	
Total Split (s)	27.0	52.5	52.5	14.5	40.0	40.0	21.8	33.0		20.0	31.2	
Total Split (%)	22.5%	43.8%	43.8%	12.1%	33.3%	33.3%	18.2%	27.5%		16.7%	26.0%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lead		Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	C-Max		None	C-Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 50.6 (42%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	

Splits and Phases: 5: Monterey Av. & Dinah Shore Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	615	418	327	62	390	658	392	1062	36	414	850	434
Future Volume (veh/h)	615	418	327	62	390	658	392	1062	36	414	850	434
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	628	427	334	63	398	0	400	1084	37	422	867	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	648	919	408	253	513		1022	1204	41	970	1136	
Arrive On Green	0.31	0.43	0.43	0.07	0.14	0.00	0.30	0.24	0.24	0.28	0.22	0.00
Sat Flow, veh/h	3456	3554	1576	3456	3554	1585	3456	5069	173	3456	5106	1585
Grp Volume(v), veh/h	628	427	334	63	398	0	400	728	393	422	867	0
Grp Sat Flow(s),veh/h/ln	1728	1777	1576	1728	1777	1585	1728	1702	1838	1728	1702	1585
Q Serve(g_s), s	21.5	10.2	11.2	2.1	12.9	0.0	11.1	24.9	24.9	12.0	19.1	0.0
Cycle Q Clear(g_c), s	21.5	10.2	11.2	2.1	12.9	0.0	11.1	24.9	24.9	12.0	19.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.09	1.00		1.00
Lane Grp Cap(c), veh/h	648	919	408	253	513		1022	808	437	970	1136	
V/C Ratio(X)	0.97	0.46	0.82	0.25	0.78		0.39	0.90	0.90	0.44	0.76	
Avail Cap(c_a), veh/h	648	1421	630	288	1051		1022	808	437	970	1136	
HCM Platoon Ratio	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.47	0.47	0.47	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	40.9	28.2	7.9	52.5	49.5	0.0	33.7	44.4	44.4	35.4	43.7	0.0
Incr Delay (d2), s/veh	17.4	0.2	2.4	0.5	2.6	0.0	0.2	15.0	24.3	0.3	4.9	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.2	3.8	6.1	0.9	5.8	0.0	4.5	11.7	13.8	4.9	8.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	58.2	28.3	10.3	53.0	52.0	0.0	33.9	59.4	68.7	35.7	48.6	0.0
LnGrp LOS	E	C	B	D	D		C	E	E	D	D	
Approach Vol, veh/h		1389			461			1521			1289	
Approach Delay, s/veh		37.5			52.2			55.1			44.3	
Approach LOS		D			D			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	38.2	33.0	13.3	35.5	40.0	31.2	27.0	21.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	15.5	28.5	10.0	48.0	17.3	26.7	22.5	35.5
Max Q Clear Time (g_c+I1), s	14.0	26.9	4.1	13.2	13.1	21.1	23.5	14.9
Green Ext Time (p_c), s	0.3	1.0	0.1	4.0	0.6	2.5	0.0	2.2

Intersection Summary	
HCM 7th Control Delay, s/veh	46.6
HCM 7th LOS	D

Notes

Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	45	1	1	1	1	64
Future Volume (vph)	45	1	1	1	1	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	30			30	30	
Link Distance (ft)	246			314	900	
Travel Time (s)	4.2			7.1	20.4	
Confl. Peds. (#/hr)	5	5	5			5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection						
Int Delay, s/veh	3.7					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	45	1	1	1	1	64
Future Vol, veh/h	45	1	1	1	1	64
Conflicting Peds, #/hr	5	5	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
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	49	1	1	1	1	70

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	49	46	76	0	-	0
Stage 1	41	-	-	-	-	-
Stage 2	8	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	960	1024	1523	-	-	-
Stage 1	982	-	-	-	-	-
Stage 2	1015	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	950	1014	1516	-	-	-
Mov Cap-2 Maneuver	950	-	-	-	-	-
Stage 1	976	-	-	-	-	-
Stage 2	1010	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	8.99	3.69	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	900	-	952	-	-
HCM Lane V/C Ratio	0.001	-	0.053	-	-
HCM Control Delay (s/veh)	7.4	0	9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

APPENDIX 6.1: EAPC (2026) INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	1	809	47	147	576	46	184
Future Volume (vph)	1	809	47	147	576	46	184
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	145		0	150		0	55
Storage Lanes	1		0	1		1	1
Taper Length (ft)	120			120		90	
Right Turn on Red			Yes				Yes
Link Speed (mph)		45			45	30	
Link Distance (ft)		449			1296	688	
Travel Time (s)		6.8			19.6	15.6	
Confl. Peds. (#/hr)	5		5	5		5	5
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)							
Turn Type	custom	NA		Prot	NA	Prot	Perm
Protected Phases		2		1	6	3	
Permitted Phases	5						8
Detector Phase	5	2		1	6	3	8
Switch Phase							
Minimum Initial (s)	5.0	5.0		10.0	5.0	10.0	5.0
Minimum Split (s)	14.5	22.5		14.5	22.5	22.5	22.5
Total Split (s)	14.5	22.5		15.0	23.0	22.5	22.5
Total Split (%)	24.2%	37.5%		25.0%	38.3%	37.5%	37.5%
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		
Recall Mode	None	C-Max		None	C-Max	Max	Max

Intersection Summary	
Area Type:	Other
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Key Largo Av. & Dinah Shore Dr.

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (veh/h)	1	809	47	147	576	46	184
Future Volume (veh/h)	1	809	47	147	576	46	184
Initial Q (Qb), veh		0	0	0	0	0	0
Lane Width Adj.		1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)			0.99	1.00		1.00	1.00
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No	No	
Adj Sat Flow, veh/h/ln		1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h		861	50	156	613	49	196
Peak Hour Factor		0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %		2	2	2	2	2	2
Cap, veh/h		1583	92	275	2808	534	476
Arrive On Green		0.32	0.32	0.05	0.18	0.30	0.30
Sat Flow, veh/h		5103	286	1781	5274	1781	1585
Grp Volume(v), veh/h		593	318	156	613	49	196
Grp Sat Flow(s),veh/h/ln		1702	1816	1781	1702	1781	1585
Q Serve(g_s), s		8.6	8.6	5.1	6.1	1.2	5.9
Cycle Q Clear(g_c), s		8.6	8.6	5.1	6.1	1.2	5.9
Prop In Lane			0.16	1.00		1.00	1.00
Lane Grp Cap(c), veh/h		1092	583	275	2808	534	476
V/C Ratio(X)		0.54	0.55	0.57	0.22	0.09	0.41
Avail Cap(c_a), veh/h		1092	583	312	2808	534	476
HCM Platoon Ratio		1.00	1.00	0.33	0.33	1.00	1.00
Upstream Filter(I)		1.00	1.00	0.97	0.97	1.00	1.00
Uniform Delay (d), s/veh		16.8	16.8	26.5	13.6	15.1	16.8
Incr Delay (d2), s/veh		1.9	3.6	1.8	0.2	0.3	2.6
Initial Q Delay(d3), s/veh		0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		3.1	3.6	2.2	1.9	0.5	2.3
Unsig. Movement Delay, s/veh							
LnGrp Delay(d), s/veh		18.7	20.4	28.3	13.7	15.5	19.4
LnGrp LOS		B	C	C	B	B	B
Approach Vol, veh/h		911			769	245	
Approach Delay, s/veh		19.3			16.7	18.6	
Approach LOS		B			B	B	

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	13.8	23.7				37.5		22.5
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	10.5	18.0				18.5		18.0
Max Q Clear Time (g_c+I1), s	7.1	10.6				8.1		7.9
Green Ext Time (p_c), s	0.1	3.1				2.7		0.5

Intersection Summary	
HCM 7th Control Delay, s/veh	18.2
HCM 7th LOS	B

Notes
User approved ignoring U-Turning movement.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	3	4	1	8	160	6	17	1	62	27	108
Future Volume (vph)	53	3	4	1	8	160	6	17	1	62	27	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		150	0		50	0		50
Storage Lanes	0		0	0		0	0		1	0		1
Taper Length (ft)	90			90			90			90		
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		743			787			435			688	
Travel Time (s)		16.9			4.3			9.9			15.4	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	6.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	53	3	4	1	8	160	6	17	1	62	27	108
Future Vol, veh/h	53	3	4	1	8	160	6	17	1	62	27	108
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	50	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	58	3	4	1	9	174	7	18	1	67	29	117

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	210	207	39	207	323	28	152	0	0	25	0	0
Stage 1	169	169	-	37	37	-	-	-	-	-	-	-
Stage 2	41	38	-	171	287	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	747	690	1032	750	594	1047	1429	-	-	1590	-	-
Stage 1	833	759	-	979	865	-	-	-	-	-	-	-
Stage 2	974	864	-	831	675	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	576	648	1022	699	559	1037	1422	-	-	1582	-	-
Mov Cap-2 Maneuver	576	648	-	699	559	-	-	-	-	-	-	-
Stage 1	790	719	-	970	856	-	-	-	-	-	-	-
Stage 2	795	856	-	781	640	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	11.78	9.44	1.89	2.32
HCM LOS	B	A		

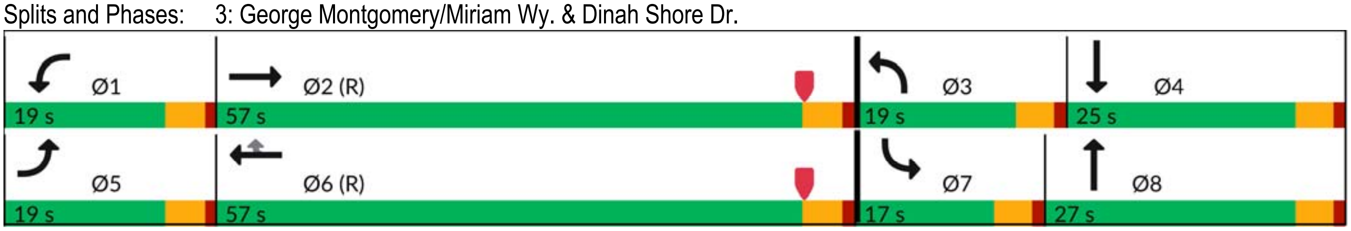
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	470	-	-	596	993	1254	-	-
HCM Lane V/C Ratio	0.005	-	-	0.109	0.185	0.043	-	-
HCM Control Delay (s/veh)	7.5	0	-	11.8	9.4	7.4	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.7	0.1	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	866	43	15	747	11	21	2	11	5	3	18
Future Volume (vph)	46	866	43	15	747	11	21	2	11	5	3	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	155		0	150		85	180		180	135		0
Storage Lanes	2		0	1		1	0		0	1		0
Taper Length (ft)	120			90			90			90		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		1296			597			233			614	
Travel Time (s)		19.6			9.0			5.3			14.0	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						
Detector Phase	5	2		1	6	6	3	8		7	4	
Switch Phase												
Minimum Initial (s)	10.0	5.0		10.0	5.0	5.0	10.0	5.0		10.0	5.0	
Minimum Split (s)	14.5	22.5		14.5	22.5	22.5	14.5	22.5		14.5	22.5	
Total Split (s)	19.0	57.0		19.0	57.0	57.0	19.0	27.0		17.0	25.0	
Total Split (%)	15.8%	47.5%		15.8%	47.5%	47.5%	15.8%	22.5%		14.2%	20.8%	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max		None	Max	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 75
Control Type: Actuated-Coordinated

Splits and Phases: 3: George Montgomery/Miriam Wy. & Dinah Shore Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	866	43	15	747	11	21	2	11	5	3	18
Future Volume (veh/h)	46	866	43	15	747	11	21	2	11	5	3	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	47	884	44	15	762	11	21	2	11	5	3	18
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	228	3011	150	58	2917	903	75	50	273	23	39	235
Arrive On Green	0.10	0.91	0.91	0.05	0.86	0.86	0.04	0.20	0.20	0.01	0.17	0.17
Sat Flow, veh/h	3456	4981	247	1781	5106	1581	1781	248	1364	1781	230	1378
Grp Volume(v), veh/h	47	603	325	15	762	11	21	0	13	5	0	21
Grp Sat Flow(s),veh/h/ln	1728	1702	1825	1781	1702	1581	1781	0	1613	1781	0	1608
Q Serve(g_s), s	1.5	2.7	2.7	1.0	3.3	0.1	1.4	0.0	0.8	0.3	0.0	1.3
Cycle Q Clear(g_c), s	1.5	2.7	2.7	1.0	3.3	0.1	1.4	0.0	0.8	0.3	0.0	1.3
Prop In Lane	1.00		0.14	1.00		1.00	1.00		0.85	1.00		0.86
Lane Grp Cap(c), veh/h	228	2058	1103	58	2917	903	75	0	323	23	0	275
V/C Ratio(X)	0.21	0.29	0.29	0.26	0.26	0.01	0.28	0.00	0.04	0.22	0.00	0.08
Avail Cap(c_a), veh/h	418	2058	1103	215	2917	903	215	0	323	186	0	275
HCM Platoon Ratio	1.50	1.50	1.50	1.50	1.50	1.50	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.87	0.87	0.87	0.94	0.94	0.94	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	51.2	2.3	2.3	55.6	3.9	3.7	55.7	0.0	38.7	58.6	0.0	41.8
Incr Delay (d2), s/veh	0.4	0.3	0.6	2.1	0.2	0.0	2.0	0.0	0.2	4.7	0.0	0.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.8	0.9	0.5	1.0	0.0	0.7	0.0	0.3	0.2	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	51.6	2.7	2.9	57.8	4.1	3.7	57.7	0.0	38.9	63.4	0.0	42.3
LnGrp LOS	D	A	A	E	A	A	E		D	E		D
Approach Vol, veh/h		975			788			34			26	
Approach Delay, s/veh		5.1			5.1			50.6			46.4	
Approach LOS		A			A			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.4	77.0	9.5	25.0	12.4	73.1	6.0	28.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	14.5	52.5	14.5	20.5	14.5	52.5	12.5	22.5
Max Q Clear Time (g_c+I1), s	3.0	4.7	3.4	3.3	3.5	5.3	2.3	2.8
Green Ext Time (p_c), s	0.0	6.5	0.0	0.0	0.1	5.6	0.0	0.0

Intersection Summary	
HCM 7th Control Delay, s/veh	6.6
HCM 7th LOS	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	740	62	53	660	130	70	9	47	157	5	44
Future Volume (vph)	80	740	62	53	660	130	70	9	47	157	5	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		0	160		115	145		145	110		110
Storage Lanes	2		0	1		1	0		0	0		1
Taper Length (ft)	120			120			90			90		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		597			738			224			460	
Travel Time (s)		9.0			11.2			5.1			10.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						
Detector Phase	5	2		1	6	6	3	8		7	4	
Switch Phase												
Minimum Initial (s)	10.0	5.0		10.0	5.0	5.0	10.0	5.0		10.0	5.0	
Minimum Split (s)	14.5	22.5		14.5	22.5	22.5	14.5	22.5		14.5	22.5	
Total Split (s)	17.0	44.0		19.0	46.0	46.0	20.0	25.0		32.0	37.0	
Total Split (%)	14.2%	36.7%		15.8%	38.3%	38.3%	16.7%	20.8%		26.7%	30.8%	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max		None	Max	

Intersection Summary

Area Type: Other

Cycle Length: 120

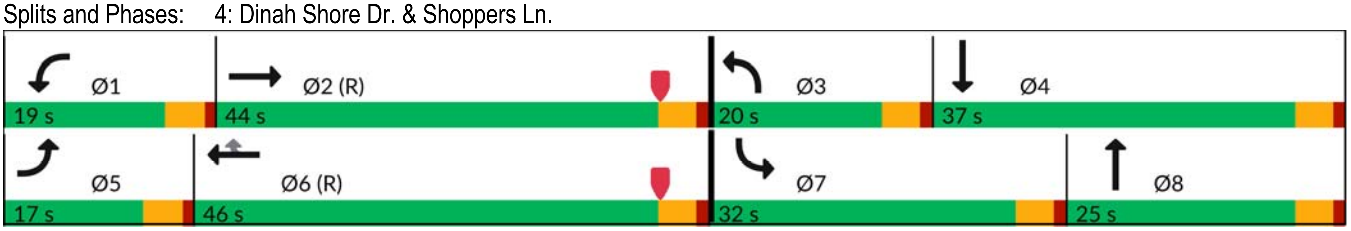
Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow

Natural Cycle: 75

Control Type: Actuated-Coordinated

Splits and Phases: 4: Dinah Shore Dr. & Shoppers Ln.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	740	62	53	660	130	70	9	47	157	5	44
Future Volume (veh/h)	80	740	62	53	660	130	70	9	47	157	5	44
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	84	779	65	56	695	137	74	9	49	165	5	46
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	270	2077	172	125	2168	671	136	59	323	196	481	427
Arrive On Green	0.11	0.61	0.61	0.07	0.42	0.42	0.08	0.24	0.24	0.11	0.27	0.27
Sat Flow, veh/h	3456	4802	399	1781	5106	1579	1781	251	1364	1781	1777	1576
Grp Volume(v), veh/h	84	551	293	56	695	137	74	0	58	165	5	46
Grp Sat Flow(s),veh/h/ln	1728	1702	1797	1781	1702	1579	1781	0	1615	1781	1777	1576
Q Serve(g_s), s	2.7	9.9	10.0	3.6	10.9	6.6	4.8	0.0	3.4	10.9	0.2	2.6
Cycle Q Clear(g_c), s	2.7	9.9	10.0	3.6	10.9	6.6	4.8	0.0	3.4	10.9	0.2	2.6
Prop In Lane	1.00		0.22	1.00		1.00	1.00		0.84	1.00		1.00
Lane Grp Cap(c), veh/h	270	1472	777	125	2168	671	136	0	383	196	481	427
V/C Ratio(X)	0.31	0.37	0.38	0.45	0.32	0.20	0.54	0.00	0.15	0.84	0.01	0.11
Avail Cap(c_a), veh/h	360	1472	777	215	2168	671	230	0	383	408	481	427
HCM Platoon Ratio	1.40	1.40	1.40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.95	0.95	0.95	0.86	0.86	0.86	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.4	15.4	15.4	53.5	23.0	21.7	53.4	0.0	36.2	52.4	32.0	32.9
Incr Delay (d2), s/veh	0.6	0.7	1.3	2.1	0.3	0.6	3.4	0.0	0.8	9.3	0.0	0.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	3.5	3.8	1.7	4.3	2.6	2.3	0.0	1.4	5.4	0.1	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	51.1	16.1	16.7	55.7	23.3	22.3	56.8	0.0	37.1	61.7	32.0	33.4
LnGrp LOS	D	B	B	E	C	C	E		D	E	C	C
Approach Vol, veh/h		928			888			132			216	
Approach Delay, s/veh		19.5			25.2			48.1			55.0	
Approach LOS		B			C			D			D	

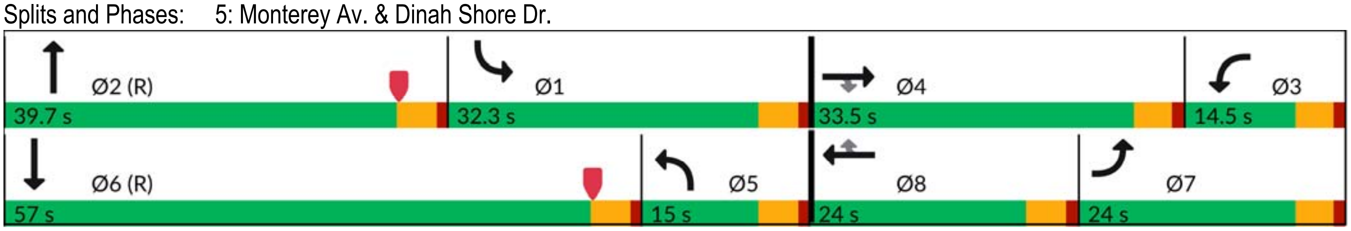
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	56.4	13.7	37.0	13.9	55.5	17.7	32.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	14.5	39.5	15.5	32.5	12.5	41.5	27.5	20.5
Max Q Clear Time (g_c+I1), s	5.6	12.0	6.8	4.6	4.7	12.9	12.9	5.4
Green Ext Time (p_c), s	0.1	5.4	0.1	0.2	0.1	5.2	0.4	0.2

Intersection Summary	
HCM 7th Control Delay, s/veh	27.1
HCM 7th LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	386	294	259	68	266	309	194	754	32	523	1738	508
Future Volume (vph)	386	294	259	68	266	309	194	754	32	523	1738	508
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	280		0	155		175	255		0	175		190
Storage Lanes	2		1	2		1	2		0	2		1
Taper Length (ft)	120			120			120			120		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			50			50	
Link Distance (ft)		738			479			794			571	
Travel Time (s)		11.2			7.3			10.8			7.8	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)												
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						Free
Detector Phase	7	4	4	3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	5.0	5.0	10.0	5.0	5.0	10.0	5.0		10.0	5.0	
Minimum Split (s)	14.5	22.5	22.5	14.5	22.5	22.5	14.5	22.5		14.5	22.5	
Total Split (s)	24.0	33.5	33.5	14.5	24.0	24.0	15.0	39.7		32.3	57.0	
Total Split (%)	20.0%	27.9%	27.9%	12.1%	20.0%	20.0%	12.5%	33.1%		26.9%	47.5%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead		Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	C-Max		None	C-Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 11.6 (10%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	

Splits and Phases: 5: Monterey Av. & Dinah Shore Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	386	294	259	68	266	309	194	754	32	523	1738	508
Future Volume (veh/h)	386	294	259	68	266	309	194	754	32	523	1738	508
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	411	313	276	72	283	0	206	802	34	556	1849	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	586	721	319	262	388		462	1473	62	961	2234	
Arrive On Green	0.06	0.07	0.07	0.08	0.11	0.00	0.13	0.29	0.29	0.28	0.44	0.00
Sat Flow, veh/h	3456	3554	1573	3456	3554	1585	3456	5023	212	3456	5106	1585
Grp Volume(v), veh/h	411	313	276	72	283	0	206	543	293	556	1849	0
Grp Sat Flow(s),veh/h/ln	1728	1777	1573	1728	1777	1585	1728	1702	1831	1728	1702	1585
Q Serve(g_s), s	14.0	10.2	20.8	2.4	9.2	0.0	6.6	16.1	16.2	16.6	38.3	0.0
Cycle Q Clear(g_c), s	14.0	10.2	20.8	2.4	9.2	0.0	6.6	16.1	16.2	16.6	38.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.12	1.00		1.00
Lane Grp Cap(c), veh/h	586	721	319	262	388		462	999	537	961	2234	
V/C Ratio(X)	0.70	0.43	0.86	0.27	0.73		0.45	0.54	0.55	0.58	0.83	
Avail Cap(c_a), veh/h	586	859	380	288	577		462	999	537	961	2234	
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.88	0.88	0.88	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	53.7	49.4	54.4	52.3	51.7	0.0	47.9	35.6	35.7	37.3	29.8	0.0
Incr Delay (d2), s/veh	3.3	0.4	14.6	0.6	2.6	0.0	0.7	2.1	4.0	0.9	3.7	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.7	4.7	10.1	1.0	4.2	0.0	2.8	6.7	7.5	6.8	15.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	57.0	49.7	68.9	52.9	54.4	0.0	48.5	37.8	39.6	38.1	33.5	0.0
LnGrp LOS	E	D	E	D	D		D	D	D	D	C	
Approach Vol, veh/h		1000			355			1042			2405	
Approach Delay, s/veh		58.0			54.1			40.4			34.5	
Approach LOS		E			D			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	37.9	39.7	13.6	28.8	20.6	57.0	24.8	17.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	27.8	35.2	10.0	29.0	10.5	52.5	19.5	19.5
Max Q Clear Time (g_c+I1), s	18.6	18.2	4.4	22.8	8.6	40.3	16.0	11.2
Green Ext Time (p_c), s	1.4	4.4	0.1	1.5	0.1	8.7	0.5	1.0

Intersection Summary	
HCM 7th Control Delay, s/veh	42.1
HCM 7th LOS	D

Notes
Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	61	1	1	107	41	24
Future Volume (vph)	61	1	1	107	41	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	30			30	30	
Link Distance (ft)	246			314	900	
Travel Time (s)	4.2			7.1	20.4	
Confl. Peds. (#/hr)	5	5	5			5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	61	1	1	107	41	24
Future Vol, veh/h	61	1	1	107	41	24
Conflicting Peds, #/hr	5	5	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
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	66	1	1	116	45	26

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	186	68	76	0	-	0
Stage 1	63	-	-	-	-	-
Stage 2	123	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	803	996	1523	-	-	-
Stage 1	960	-	-	-	-	-
Stage 2	902	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	795	986	1516	-	-	-
Mov Cap-2 Maneuver	795	-	-	-	-	-
Stage 1	955	-	-	-	-	-
Stage 2	898	-	-	-	-	-

Approach	EB		NB		SB
HCM Control Delay, s/v	9.93		0.07		0
HCM LOS	A				

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	17	-	797	-	-
HCM Lane V/C Ratio	0.001	-	0.085	-	-
HCM Control Delay (s/veh)	7.4	0	9.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	1	1012	65	202	1100	43	178
Future Volume (vph)	1	1012	65	202	1100	43	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	145		0	150		0	55
Storage Lanes	1		0	1		1	1
Taper Length (ft)	120			120		90	
Right Turn on Red			Yes				Yes
Link Speed (mph)		45			45	30	
Link Distance (ft)		449			1296	688	
Travel Time (s)		6.8			19.6	15.6	
Confl. Peds. (#/hr)	5		5	5		5	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)							
Turn Type	custom	NA		Prot	NA	Prot	Perm
Protected Phases		2		1	6	3	
Permitted Phases	5						8
Detector Phase	5	2		1	6	3	8
Switch Phase							
Minimum Initial (s)	5.0	5.0		10.0	5.0	10.0	5.0
Minimum Split (s)	14.5	22.5		14.5	22.5	22.5	22.5
Total Split (s)	14.5	22.5		15.0	23.0	22.5	22.5
Total Split (%)	24.2%	37.5%		25.0%	38.3%	37.5%	37.5%
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		
Recall Mode	None	C-Max		None	C-Max	Max	Max

Intersection Summary	
Area Type:	Other
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Key Largo Av. & Dinah Shore Dr.

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (veh/h)	1	1012	65	202	1100	43	178
Future Volume (veh/h)	1	1012	65	202	1100	43	178
Initial Q (Qb), veh		0	0	0	0	0	0
Lane Width Adj.		1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)			0.99	1.00		1.00	1.00
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No	No	
Adj Sat Flow, veh/h/ln		1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h		1100	71	220	1196	47	193
Peak Hour Factor		0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %		2	2	2	2	2	2
Cap, veh/h		1531	99	289	2808	534	476
Arrive On Green		0.31	0.31	0.22	0.73	0.30	0.30
Sat Flow, veh/h		5067	316	1781	5274	1781	1585
Grp Volume(v), veh/h		764	407	220	1196	47	193
Grp Sat Flow(s),veh/h/ln		1702	1810	1781	1702	1781	1585
Q Serve(g_s), s		11.9	12.0	7.0	5.5	1.1	5.8
Cycle Q Clear(g_c), s		11.9	12.0	7.0	5.5	1.1	5.8
Prop In Lane			0.17	1.00		1.00	1.00
Lane Grp Cap(c), veh/h		1064	566	289	2808	534	476
V/C Ratio(X)		0.72	0.72	0.76	0.43	0.09	0.41
Avail Cap(c_a), veh/h		1064	566	312	2808	534	476
HCM Platoon Ratio		1.00	1.00	1.33	1.33	1.00	1.00
Upstream Filter(I)		1.00	1.00	0.85	0.85	1.00	1.00
Uniform Delay (d), s/veh		18.3	18.3	22.4	4.4	15.1	16.7
Incr Delay (d2), s/veh		4.2	7.7	8.4	0.4	0.3	2.6
Initial Q Delay(d3), s/veh		0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		4.5	5.4	3.1	1.2	0.5	2.3
Unsig. Movement Delay, s/veh							
LnGrp Delay(d), s/veh		22.5	26.0	30.8	4.8	15.4	19.3
LnGrp LOS		C	C	C	A	B	B
Approach Vol, veh/h		1171			1416	240	
Approach Delay, s/veh		23.7			8.8	18.5	
Approach LOS		C			A	B	

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	14.2	23.3				37.5		22.5
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	10.5	18.0				18.5		18.0
Max Q Clear Time (g_c+I1), s	9.0	14.0				7.5		7.8
Green Ext Time (p_c), s	0.1	2.5				5.6		0.5

Intersection Summary			
HCM 7th Control Delay, s/veh			15.8
HCM 7th LOS			B

Notes
User approved ignoring U-Turning movement.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	99	9	8	1	6	117	3	20	1	166	16	61
Future Volume (vph)	99	9	8	1	6	117	3	20	1	166	16	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		150	0		50	0		50
Storage Lanes	0		0	0		0	0		1	0		1
Taper Length (ft)	90			90			90			90		
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		743			785			435			688	
Travel Time (s)		16.9			4.3			9.9			15.4	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	10.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	99	9	8	1	6	117	3	20	1	166	16	61
Future Vol, veh/h	99	9	8	1	6	117	3	20	1	166	16	61
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	50	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	76	76	76	76	76	76	76	76	76	76	76	76
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	130	12	11	1	8	154	4	26	1	218	21	80

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	506	503	31	508	582	36	106	0	0	33	0	0
Stage 1	463	463	-	39	39	-	-	-	-	-	-	-
Stage 2	43	41	-	469	543	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	477	471	1043	475	424	1036	1485	-	-	1579	-	-
Stage 1	579	564	-	976	862	-	-	-	-	-	-	-
Stage 2	971	861	-	575	520	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	334	396	1033	386	357	1026	1478	-	-	1572	-	-
Mov Cap-2 Maneuver	334	396	-	386	357	-	-	-	-	-	-	-
Stage 1	491	478	-	968	856	-	-	-	-	-	-	-
Stage 2	812	855	-	470	440	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	22.55	9.7	0.93	5.23
HCM LOS	C	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	235	-	-	355	929	1553	-	-
HCM Lane V/C Ratio	0.003	-	-	0.43	0.176	0.139	-	-
HCM Control Delay (s/veh)	7.4	0	-	22.6	9.7	7.7	0	-
HCM Lane LOS	A	A	-	C	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	2.1	0.6	0.5	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	1056	80	47	1085	8	85	3	60	19	6	144
Future Volume (vph)	73	1056	80	47	1085	8	85	3	60	19	6	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	155		0	150		85	180		180	135		0
Storage Lanes	2		0	1		1	0		0	1		0
Taper Length (ft)	120			90			90			90		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		1296			597			233			614	
Travel Time (s)		19.6			9.0			5.3			14.0	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						
Detector Phase	5	2		1	6	6	3	8		7	4	
Switch Phase												
Minimum Initial (s)	10.0	5.0		10.0	5.0	5.0	10.0	5.0		10.0	5.0	
Minimum Split (s)	14.5	22.5		14.5	22.5	22.5	14.5	22.5		14.5	22.5	
Total Split (s)	16.0	55.0		17.0	56.0	56.0	21.0	32.0		16.0	27.0	
Total Split (%)	13.3%	45.8%		14.2%	46.7%	46.7%	17.5%	26.7%		13.3%	22.5%	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max		None	Max	

Intersection Summary

Area Type: Other

Cycle Length: 120

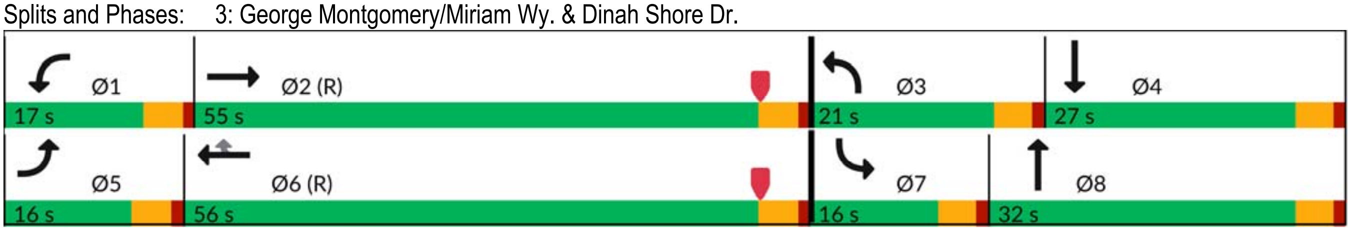
Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow

Natural Cycle: 75

Control Type: Actuated-Coordinated

Splits and Phases: 3: George Montgomery/Miriam Wy. & Dinah Shore Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	73	1056	80	47	1085	8	85	3	60	19	6	144
Future Volume (veh/h)	73	1056	80	47	1085	8	85	3	60	19	6	144
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	81	1173	89	52	1206	9	94	3	67	21	7	160
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	269	2469	187	122	2559	792	142	16	348	75	13	290
Arrive On Green	0.08	0.51	0.51	0.07	0.50	0.50	0.08	0.23	0.23	0.04	0.19	0.19
Sat Flow, veh/h	3456	4839	367	1781	5106	1580	1781	68	1517	1781	66	1517
Grp Volume(v), veh/h	81	825	437	52	1206	9	94	0	70	21	0	167
Grp Sat Flow(s),veh/h/ln	1728	1702	1802	1781	1702	1580	1781	0	1585	1781	0	1583
Q Serve(g_s), s	2.7	18.8	18.8	3.4	18.5	0.3	6.2	0.0	4.3	1.4	0.0	11.4
Cycle Q Clear(g_c), s	2.7	18.8	18.8	3.4	18.5	0.3	6.2	0.0	4.3	1.4	0.0	11.4
Prop In Lane	1.00		0.20	1.00		1.00	1.00		0.96	1.00		0.96
Lane Grp Cap(c), veh/h	269	1737	920	122	2559	792	142	0	363	75	0	303
V/C Ratio(X)	0.30	0.47	0.48	0.43	0.47	0.01	0.66	0.00	0.19	0.28	0.00	0.55
Avail Cap(c_a), veh/h	331	1737	920	186	2559	792	245	0	363	171	0	303
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.65	0.65	0.65	0.56	0.56	0.56	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	52.3	19.0	19.0	53.6	19.5	15.0	53.6	0.0	37.3	55.7	0.0	43.9
Incr Delay (d2), s/veh	0.4	0.6	1.1	1.3	0.4	0.0	5.2	0.0	1.2	2.0	0.0	7.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	7.1	7.7	1.5	7.0	0.1	3.0	0.0	1.8	0.7	0.0	5.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	52.7	19.6	20.1	54.9	19.9	15.0	58.8	0.0	38.5	57.7	0.0	50.9
LnGrp LOS	D	B	C	D	B	B	E		D	E		D
Approach Vol, veh/h		1343			1267			164			188	
Approach Delay, s/veh		21.8			21.3			50.1			51.7	
Approach LOS		C			C			D			D	

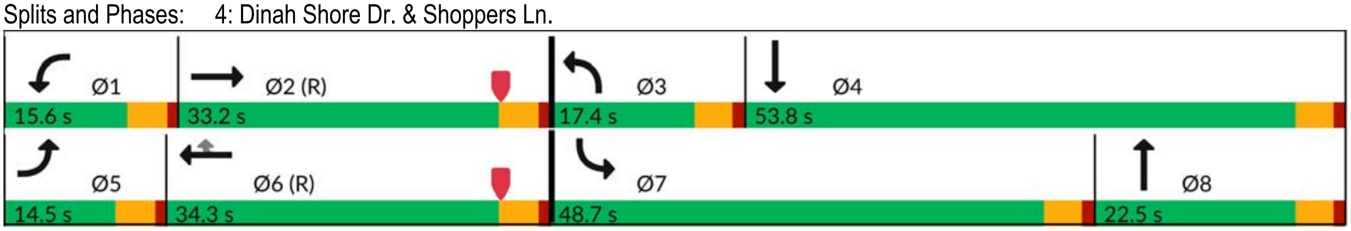
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.7	65.7	14.1	27.5	13.8	64.6	9.5	32.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	12.5	50.5	16.5	22.5	11.5	51.5	11.5	27.5
Max Q Clear Time (g_c+I1), s	5.4	20.8	8.2	13.4	4.7	20.5	3.4	6.3
Green Ext Time (p_c), s	0.0	9.2	0.1	0.6	0.1	9.4	0.0	0.3

Intersection Summary	
HCM 7th Control Delay, s/veh	25.0
HCM 7th LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	155	909	70	99	905	201	86	33	112	512	35	149
Future Volume (vph)	155	909	70	99	905	201	86	33	112	512	35	149
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		0	160		115	145		145	110		110
Storage Lanes	2		0	1		1	0		0	0		1
Taper Length (ft)	120			120			90			90		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		597			738			224			460	
Travel Time (s)		9.0			11.2			5.1			10.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						
Detector Phase	5	2		1	6	6	3	8		7	4	
Switch Phase												
Minimum Initial (s)	10.0	5.0		10.0	5.0	5.0	10.0	5.0		10.0	5.0	
Minimum Split (s)	14.5	22.5		14.5	22.5	22.5	14.5	22.5		14.5	22.5	
Total Split (s)	14.5	33.2		15.6	34.3	34.3	17.4	22.5		48.7	53.8	
Total Split (%)	12.1%	27.7%		13.0%	28.6%	28.6%	14.5%	18.8%		40.6%	44.8%	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max		None	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	

Splits and Phases: 4: Dinah Shore Dr. & Shoppers Ln.

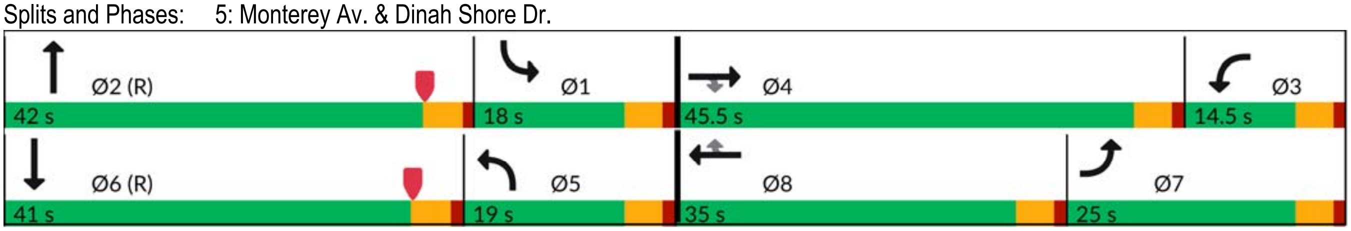


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	155	909	70	99	905	201	86	33	112	512	35	149
Future Volume (veh/h)	155	909	70	99	905	201	86	33	112	512	35	149
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	168	988	76	108	984	218	93	36	122	557	38	162
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	287	1346	103	144	1412	436	142	60	202	588	730	649
Arrive On Green	0.08	0.28	0.28	0.08	0.28	0.28	0.08	0.16	0.16	0.33	0.41	0.41
Sat Flow, veh/h	3456	4834	371	1781	5106	1576	1781	371	1258	1781	1777	1579
Grp Volume(v), veh/h	168	695	369	108	984	218	93	0	158	557	38	162
Grp Sat Flow(s),veh/h/ln	1728	1702	1801	1781	1702	1576	1781	0	1630	1781	1777	1579
Q Serve(g_s), s	5.6	22.2	22.3	7.1	20.7	13.9	6.1	0.0	10.8	36.6	1.5	8.1
Cycle Q Clear(g_c), s	5.6	22.2	22.3	7.1	20.7	13.9	6.1	0.0	10.8	36.6	1.5	8.1
Prop In Lane	1.00		0.21	1.00		1.00	1.00		0.77	1.00		1.00
Lane Grp Cap(c), veh/h	287	948	502	144	1412	436	142	0	261	588	730	649
V/C Ratio(X)	0.59	0.73	0.74	0.75	0.70	0.50	0.66	0.00	0.60	0.95	0.05	0.25
Avail Cap(c_a), veh/h	288	948	502	165	1412	436	191	0	261	656	730	649
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.83	0.83	0.83	0.64	0.64	0.64	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.0	39.2	39.3	53.9	38.9	36.4	53.6	0.0	46.8	39.2	21.3	23.2
Incr Delay (d2), s/veh	2.5	4.2	7.8	10.0	1.8	2.6	5.1	0.0	10.0	21.8	0.1	0.9
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	9.5	10.6	3.5	8.6	5.7	2.9	0.0	5.1	19.3	0.7	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	55.5	43.4	47.0	63.9	40.7	39.1	58.7	0.0	56.8	61.0	21.4	24.1
LnGrp LOS	E	D	D	E	D	D	E		E	E	C	C
Approach Vol, veh/h		1232			1310			251			757	
Approach Delay, s/veh		46.2			42.4			57.5			51.1	
Approach LOS		D			D			E			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.2	37.9	14.0	53.8	14.5	37.7	44.1	23.7				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	11.1	28.7	12.9	49.3	10.0	29.8	44.2	18.0				
Max Q Clear Time (g_c+I1), s	9.1	24.3	8.1	10.1	7.6	22.7	38.6	12.8				
Green Ext Time (p_c), s	0.0	2.4	0.1	1.3	0.1	3.8	1.0	0.3				
Intersection Summary												
HCM 7th Control Delay, s/veh			46.6									
HCM 7th LOS			D									

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	673	451	443	63	421	685	515	1554	37	444	1396	522
Future Volume (vph)	673	451	443	63	421	685	515	1554	37	444	1396	522
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	280		0	155		175	255		0	175		190
Storage Lanes	2		1	2		1	2		0	2		1
Taper Length (ft)	120			120			120			120		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			50			50	
Link Distance (ft)		738			479			794			571	
Travel Time (s)		11.2			7.3			10.8			7.8	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Shared Lane Traffic (%)												
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						Free
Detector Phase	7	4	4	3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	5.0	5.0	10.0	5.0	5.0	10.0	5.0		10.0	5.0	
Minimum Split (s)	25.0	45.5	45.5	14.5	35.0	35.0	19.0	42.0		18.0	41.0	
Total Split (s)	25.0	45.5	45.5	14.5	35.0	35.0	19.0	42.0		18.0	41.0	
Total Split (%)	20.8%	37.9%	37.9%	12.1%	29.2%	29.2%	15.8%	35.0%		15.0%	34.2%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead		Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	C-Max		None	C-Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 69.6 (58%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	

Splits and Phases: 5: Monterey Av. & Dinah Shore Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	673	451	443	63	421	685	515	1554	37	444	1396	522
Future Volume (veh/h)	673	451	443	63	421	685	515	1554	37	444	1396	522
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	687	460	452	64	430	0	526	1586	38	453	1424	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	789	1089	483	254	538		574	1603	38	545	1553	
Arrive On Green	0.38	0.51	0.51	0.07	0.15	0.00	0.17	0.31	0.31	0.16	0.30	0.00
Sat Flow, veh/h	3456	3554	1577	3456	3554	1585	3456	5129	123	3456	5106	1585
Grp Volume(v), veh/h	687	460	452	64	430	0	526	1053	571	453	1424	0
Grp Sat Flow(s),veh/h/ln	1728	1777	1577	1728	1777	1585	1728	1702	1848	1728	1702	1585
Q Serve(g_s), s	22.1	9.7	32.2	2.1	14.0	0.0	18.0	36.9	36.9	15.2	32.3	0.0
Cycle Q Clear(g_c), s	22.1	9.7	32.2	2.1	14.0	0.0	18.0	36.9	36.9	15.2	32.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	789	1089	483	254	538		574	1064	577	545	1553	
V/C Ratio(X)	0.87	0.42	0.94	0.25	0.80		0.92	0.99	0.99	0.83	0.92	
Avail Cap(c_a), veh/h	789	1214	539	288	903		574	1064	577	545	1553	
HCM Platoon Ratio	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.34	0.34	0.34	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	35.5	22.7	28.2	52.5	49.2	0.0	49.2	41.1	41.1	49.0	40.3	0.0
Incr Delay (d2), s/veh	3.9	0.1	10.2	0.5	2.8	0.0	19.7	25.2	35.0	10.5	10.1	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.0	3.5	10.3	0.9	6.3	0.0	9.0	18.3	21.4	7.1	14.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	39.4	22.8	38.4	53.0	51.9	0.0	68.9	66.2	76.1	59.5	50.4	0.0
LnGrp LOS	D	C	D	D	D		E	E	E	E	D	
Approach Vol, veh/h		1599			494			2150			1877	
Approach Delay, s/veh		34.3			52.1			69.5			52.6	
Approach LOS		C			D			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	23.4	42.0	13.3	41.3	24.4	41.0	31.9	22.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	13.5	37.5	10.0	41.0	14.5	36.5	20.5	30.5
Max Q Clear Time (g_c+I1), s	17.2	38.9	4.1	34.2	20.0	34.3	24.1	16.0
Green Ext Time (p_c), s	0.0	0.0	0.1	2.5	0.0	1.7	0.0	2.2

Intersection Summary	
HCM 7th Control Delay, s/veh	53.7
HCM 7th LOS	D

Notes

Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	45	1	1	78	111	64
Future Volume (vph)	45	1	1	78	111	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	30			30	30	
Link Distance (ft)	246			314	900	
Travel Time (s)	4.2			7.1	20.4	
Confl. Peds. (#/hr)	5	5	5			5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection						
Int Delay, s/veh	1.6					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	45	1	1	78	111	64
Future Vol, veh/h	45	1	1	78	111	64
Conflicting Peds, #/hr	5	5	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
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	49	1	1	85	121	70

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	252	165	195	0	-	0
Stage 1	160	-	-	-	-	-
Stage 2	92	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	736	879	1378	-	-	-
Stage 1	868	-	-	-	-	-
Stage 2	932	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	729	871	1371	-	-	-
Mov Cap-2 Maneuver	729	-	-	-	-	-
Stage 1	864	-	-	-	-	-
Stage 2	927	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	10.28	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	23	-	731	-	-
HCM Lane V/C Ratio	0.001	-	0.068	-	-
HCM Control Delay (s/veh)	7.6	0	10.3	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

APPENDIX 6.2: EAPC (2026) QUEUEING ANALYSIS WORKSHEETS

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Intersection: 2: Via Vail & Key Largo Av.

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LT	R
Maximum Queue (ft)	55	45	6	11
Average Queue (ft)	26	34	2	2
95th Queue (ft)	52	52	13	16
Link Distance (ft)	701	716	406	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				50
Storage Blk Time (%)				0
Queuing Penalty (veh)				0

Intersection: 6: Via Vail & Project Entry

Movement	EB
Directions Served	LR
Maximum Queue (ft)	42
Average Queue (ft)	27
95th Queue (ft)	47
Link Distance (ft)	216
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Zone Summary

Zone wide Queuing Penalty: 0

Intersection: 2: Via Vail & Key Largo Av.

Movement	EB	WB	SB
Directions Served	LTR	LTR	LT
Maximum Queue (ft)	73	55	29
Average Queue (ft)	42	34	9
95th Queue (ft)	77	58	35
Link Distance (ft)	701	714	596
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			0
Queuing Penalty (veh)			0

Intersection: 6: Via Vail & Project Entry

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	34	12
Average Queue (ft)	24	2
95th Queue (ft)	50	13
Link Distance (ft)	216	292
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

Zone wide Queuing Penalty: 0

MEMORANDUM

URBAN | CROSSROADS

DATE: April 2, 2024
TO: Nicole Criste, Terra Nova Planning & Research, Inc.
FROM: John Kain and Marlie Whiteman, Urban Crossroads, Inc.
JOB NO: 15868-03 VMT Screening.docx

VIA VAIL VILLAGE VEHICLE MILES TRAVELED (VMT) SCREENING ANALYSIS

Urban Crossroads, Inc. is pleased to provide the following Vehicle Miles Traveled (VMT) Screening Analysis for the Via Vail Village (**Project**), which is located south of the future extension of Via Vail, east of Key Largo Avenue in Rancho Mirage.

PROJECT OVERVIEW

The proposed Project includes the development of consists of 236 affordable apartment dwelling units. The preliminary Project site plan is shown on Exhibit A.

BACKGROUND

The California Environmental Quality Act (CEQA) requires all lead agencies to adopt VMT as the measure for identifying transportation impacts for land use projects. City of Rancho Mirage Resolution 2021-06 (**City Guidelines**) aligns the City's VMT analysis policy with SB 743 and the City's goals as set forth in the General Plan Update (2017). The purpose of the policy is to comply with State laws while maintaining the resort residential character of the community.

The City's VMT policy establishes VMT as the metric to measure transportation impacts in conformance with CEQA.

VMT SCREENING

Exhibit A of Resolution 2021-06 sets forth screening criteria under which Projects are not required to submit detailed VMT analysis. This guidance for determination of non-significant VMT impact is primarily intended to avoid unnecessary analysis and findings that would be inconsistent with the intent of SB 743. VMT screening criteria for development projects include the following:

EXHIBIT A: PRELIMINARY SITE PLAN

TABLE 1: SCREENING FOR LAND USE PROJECTS EXEMPT FROM VMT ANALYSIS

Screening Steps	Description	Result
1. Small Projects Screening	Projects with low trip generation based on the County Greenhouse Gas Emissions Screening Tables resulting in a 3,000 metric tons of Carbon Dioxide Equivalent per year screening level threshold. Specific examples include single family housing projects less than or equal to 110 dwelling units, multi-family housing projects less than or equal to 147 dwelling units, and retail buildings with area less than or equal to 60,000 sf.	Does not meet
2. Projects Near High Quality Transit	Projects within a half mile of an existing major transit stop which maintains a service interval frequency of 15 minutes or less during peak commute periods.	Does not meet
3. Affordable Housing	Projects with a high percentage of affordable units as determined by the Planning and Engineering departments.	Meets
4. Map Based Screening	Projects within an area of development under threshold as shown on screening map allowed by the Engineering Department.	Meets
5. Redevelopment Projects	Projects which replace an existing VMT-generating land use and do not result in a net overall increase in VMT.	Does not meet

PROJECT HIGH PERCENTAGE OF AFFORDABLE HOUSING

Resolution 2021-06 indicates that projects in which “a high percentage of affordable housing is provided as determined by the Planning and Engineering Departments” can be presumed to have non-significant VMT impacts.

The Technical Advisory on Evaluating Transportation Impacts in CEQA (California Governor’s Office of Planning and Research, December 2018) states that affordable housing generally improves jobs-housing match, shortens commutes and reduces VMT. This technical advisory concludes that low income housing generates less VMT than market-rate housing.

All (100%) of the 236 Project residential units are affordable housing. In comparison, recent residential projects in Rancho Mirage have not included an affordable housing component.

The Project is located near to existing off-site retail. Adding affordable housing to this location, with existing off-site retail/service jobs located at Monterey Marketplace and Desert Gateway shopping centers along with Costco Wholesale, etc. provides housing opportunities for current employees in the area. Low-wage workers in particular would be more likely to choose a residential location close to their workplace, if one is available.

PROJECT MAP BASED SCREENING

The County Guidelines note that “residential and office projects that locate in areas with low VMT, and that incorporate similar features (i.e., density, mix of uses, transit accessibility), will tend to exhibit similarly low VMT."1 Urban Crossroads has obtained a VMT data table from County Staff for all TAZs within Riverside County that identifies VMT per capita and VMT per employee for the purposes of identifying low VMT areas. The data utilizes the sub-regional Riverside Transportation Analysis Model (RIVTAM) to measure baseline VMT performance for individual TAZ's and a comparison was made to the applicable impact threshold (e.g., VMT per employee for office or industrial land uses and VMT per capita for residential land uses). The Project's TAZ was identified in the Riverside County Transportation Analysis Model (RIVTAM) as TAZ 4648. The County's data table identifies the Project's TAZ 4648 to generate 12.9604 VMT per capita. Whereas the County regional threshold is 15.2 VMT per capita[2]. The Project is located in a low VMT area for residential uses.

CONCLUSION

The Project was evaluated against screening criteria as outlined in the City Guidelines. Based on the results of this screening analysis the following findings are made:

- The Project's residential component meets the Project Type Screening criteria for Affordable Housing by having 100% affordable housing.
- The Project's affordable housing will allow nearby interaction between Project residents, retail jobs, and retail services which will reduce auto VMT by encouraging pedestrian and bicycle activity. This determination of non-significant VMT impact is consistent with the intent of SB-743.
- The Project's location in a low VMT area for residential uses meets the map-based screening criteria and no further analysis is necessary.

If you have any questions, please contact us directly at jkain@urbanxroads.com for John or mwhiteman@urbanxroads.com for Marlie.

[1] Technical Advisory; Page 12
[2] County Guidelines; Page 22