Arrowhead Regional Medical Center Lot 1 Parking Structure Project

INITIAL STUDY/MITIGATED NEGATIVE DECLARATION

Arrowhead Regional Medical Center Lot 1 Parking Structure Project

Initial Study/Mitigated Negative Declaration

COUNTY OF SAN BERNARDINO, CALIFORNIA

COUNTY OF SAN BERNARDINO
385 N. Arrowhead Avenue
San Bernardino, CA 92415

CEQA Lead Agency

May 2025

May, 2025

DAVID EVANS AND ASSOCIATES INC.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

APPENDICES

ACRONYMS AND ABBREVIATIONS

AB	Assembly Bill
ADA	Americans with Disabilities Act
APN	Assessor's Parcel Number
ARMC	Arrowhead Regional Medical Center
BMP	best management practice
CalEEMod	California Emissions Estimator Model
CalEPA	California Environmental Protection Agency
CAL FIRE	California Department of Forestry and Fire Protection
CalGreen	California Green Building Standards Code
Cal/OSHA	California Division of Occupational Safety and Health
CAP	Climate Action Plan
CBC	California Building Code
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CDOC	California Department of Conservation
CEQA	California Environmental Quality Act
CNDD	California Natural Diversity Database
CNPS	California Native Plant Society
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CWA	Clean Water Act
dBA	decibels
DSF	Delhi sands flower-loving fly
EIR	Environmental Impact Report
ESA	Environmental Site Assessment
ESA	Endangered Species Act
EV	Electric Vehicle
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FIRP	Flood Insurance Rate Map
GHG	Greenhouse Gases
HCP	Habitat Conservation Plan

IPaC	Information for Planning and Consultation
IS/MND	Initial Study/Mitigated Negative Declaration
LED	Light Emitting Diode
LID	Low Impact Development
LRA	Local Responsibility Area
LUST	Leaking Underground Storage Tank
MBTA	Migratory Bird Treaty Act
MGD	Million Gallons Per Day
MRZ	Mineral Resource Zone
MTCO2e	metric tons of CO_2 equivalent
MVSL	Mid-Valley Sanitation Landfill
NCCP	Natural Community Conservation Plan
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
PM	Particulate Matter
PRC	Public Resources Code
PV	Photo Voltaic
REC	Recognized Environmental Condition
ROW	Right of Way
SB	Senate Bill
SCAQMD	South Coast Air Quality Management District
SRA	State Responsibility Area
SWPPP	Stormwater Pollution Prevention Plan
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UWMP	Urban Water Management Plan
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compound
WQMP	Water Quality Management Plan
WWTP	Wastewater Treatment Plant

PROJECT DESCRIPTION

Introduction

Project Title:	Arrowhead Regional Medical Center Lot 1 Parking Structure Project
Lead Agency:	San Bernardino County
County Staff	Javier Ruiz, Senior Project Manager, Project and Facilities Management Department
County Staff Contact:	Javier.ruiz@pfm.sbcounty.gov (909) 387-5000
Project Applicant:	San Bernardino County 382 N. Arrowhead Avenue San Bernardino County, CA 92415

CEQA Statutes and Guidelines

According to California Environmental Quality Act (CEQA) Statute Section 21064.5:

> MITIGATED NEGATIVE DECLARATION
>
> "Mitigated negative declaration" means a negative declaration prepared for a project when the initial study has identified potentially significant effects on the environment, but (1) revisions in the project plans or proposals made by, or agreed to by, the applicant before the proposed negative declaration and initial study are released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effect on the environment would occur, and (2) there is no substantial evidence in light of the whole record before the public agency that the project, as revised, may have a significant effect on the environment.

According to State CEQA Guidelines Article 6. Negative Declaration Process:

> 15070. DECISION TO PREPARE A NEGATIVE OR MITIGATED NEGATIVE DECLARATION
>
> A public agency shall prepare or have prepared a proposed negative declaration or mitigated negative declaration for a project subject to CEQA when:
>
> (a) The initial study shows that there is no substantial evidence, in light of the whole record before the agency, that the project may have a significant effect on the environment, or
>
> (b) The initial study identifies potentially significant effects, but:
>
> (i) Revisions in the project plans or proposals made by, or agreed to by the applicant before a proposed mitigated negative declaration and initial study are released for public review would avoid the

effects or mitigate the effects to a point where clearly no significant effects would occur, and

(ii) There is no substantial evidence, in light of the whole record before the agency, that the project as revised may have a significant effect on the environment.

15071. CONTENTS

A Negative Declaration circulated for public review shall include:

(a) A brief description of the project, including a commonly used name for the project, if any;

(b) The location of the project, preferably shown on a map, and the name of the project proponent;

(c) A proposed finding that the project will not have a significant effect on the environment;

(d) An attached copy of the Initial Study documenting reasons to support the finding; and

(e) Mitigation measures, if any, included in the project to avoid potentially significant effects.

Project Location

The proposed project is located at 400 North Pepper Avenue in the City of Colton in San Bernadino County (County) (Figure 1). The site is located in the southwest corner of the 70-acre Arrowhead Regional Medical Center (ARMC) campus, which is operated by San Bernardino County. It is bounded by North Pepper Avenue (Interstate 10 [I-10]) to the west, Plum Place to the north, North Meridian Avenue to the east, and West Valley Boulevard to the south. The ARMC campus includes the 456-bed California University of Science and Medicine teaching hospital.

The size of the project site is approximately 262 feet by 372 feet and is comprised of an existing 410-space surface parking lot (Figure 2). The area to the east (bounded by Plum Place, North Meridian Avenue, and West Valley Boulevard) is undeveloped, except for a dialysis center in the southeast corner. Access to the existing parking lot is from North Pepper Avenue (I-10) and requires employee badge scan to access the lot through the gated entry.

Construction staging will be located on a portion of the surface parking lot north of Plum Place between I-10 and Green Circle (Figure 2).

Purpose and Need

The purpose of the project is to provide additional employee parking. ARMC has experienced growth in demand since its construction in 1994, necessitating the expansion of employee parking by replacing the existing surface lot with a multi-story parking structure. The new parking structure provides much-needed employee parking spaces to meet this demand. Currently, greater than 5,000 employees work at ARMC. Employee badge data collected between January 6, 2025 and February 28, 2025 shows between 7,300 and 8,300 users per weekday at the ARMC campus. At this time, only 2,347 parking spaces are available to these staff members.

Proposed Project

The proposed parking garage will be up to 500,000 square feet. It will include a maximum of six levels with up to 1,600 parking spaces. The outer dimensions of the structure are anticipated to be 370 feet long by 260 feet wide; however, this may vary depending on final design. The parking garage design will utilize a post-tensioned, cast-in-place structure with the first level at grade. Levels 2 through 6 will be open-sided and have up to two banks of two elevators each. On the first floor, the structure will have a finished exterior with an architectural mesh façade on at least two sides for security. Photovoltaic (PV) panels will be installed on the top floor (i.e., Level 6) of the structure in accordance with 2022 California Building Energy Efficiency Standards (Title 24). The project will also comply with the California Building Code (CBC) and the Americans with Disabilities Act (ADA) and supply ADA spaces in accordance with those requirements. Electric vehicle charging stations will also be installed in accordance with the California Green Building Standards Code (CALGreen).

Security features including lighting, emergency call boxes, security cameras, and locked gates will be installed in the parking garage. Lighting will be light-emitting diode (LED) and be shielded to prevent light and glare. The parking structure will also have trash receptacles. Access to the parking garage will be from Plum Street with one or two exits / entrances. The parking garage will continue to be accessible only to employees with a badge required for entry at all hours on all days.

The proposed parking structure will be constructed completely within the footprint of the existing paved parking lot, therefore, there will be no increase in impervious surface. Power, water, and sewer service to the parking structure will require new tie-ins to the City of Colton's existing systems within the existing right-of-way (ROW) on Pepper Avenue. No other off-site improvements will be required.

Approximately 51 trees will be removed from landscaped areas of the existing surface lot, including broad-leaved Paperbark (*Melaleuca quinquenervia*), Monterey pine (*Pinus radiata*), red ironbark (*Eucalyptus sideroxylon*), and golden rain tree (*Koelreuteria paniculata*). No trees will be removed from public ROW. A landscape plan will be prepared and implemented to offset impacts from tree removal.

Construction staging will be on a portion of the surface parking lot north of Plum Place between I-10 and Green Circle. Alternate offsite parking with shuttle service to the ARMC campus will be provided to employees while parking spots are temporarily unavailable during construction.

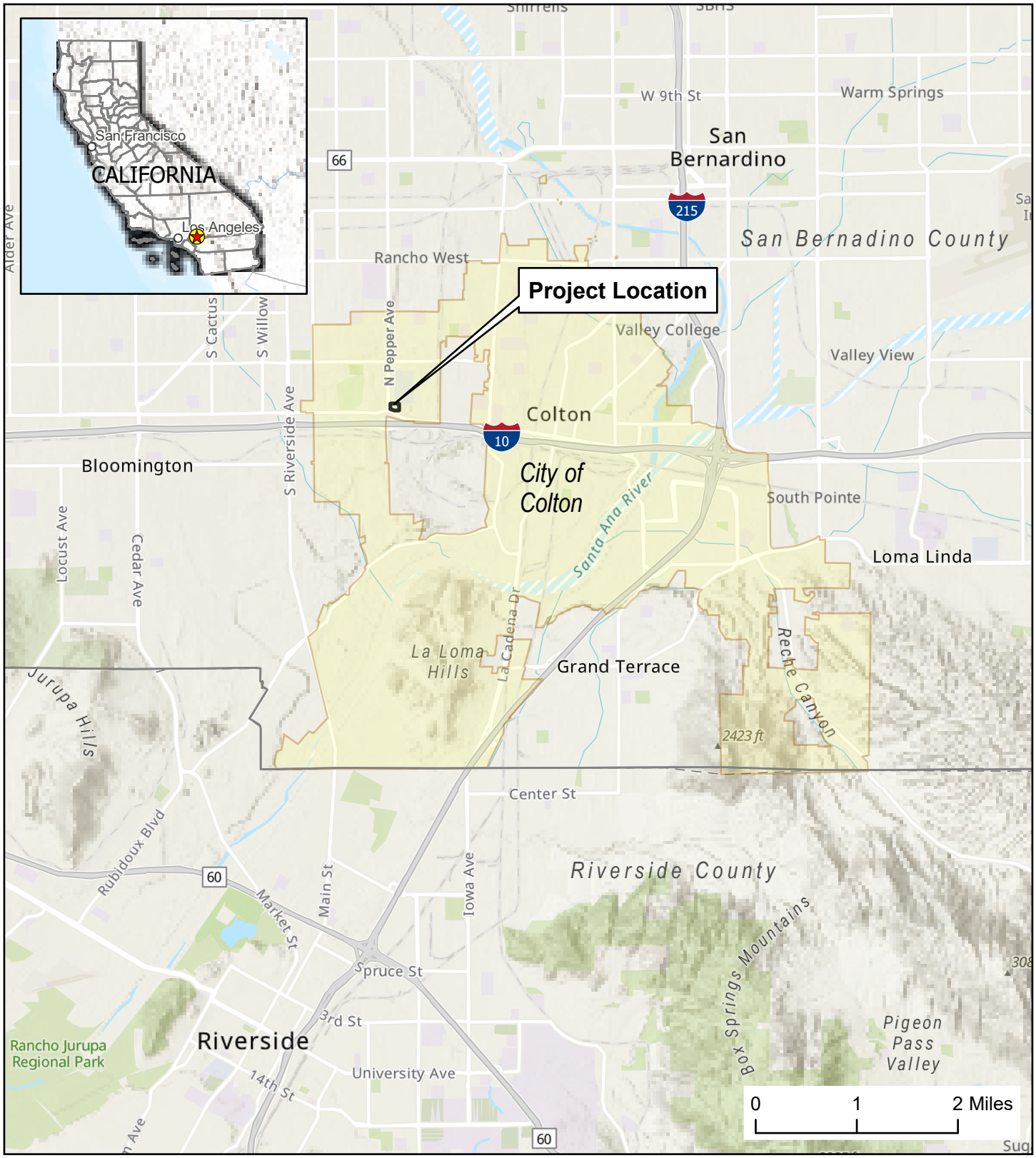
Construction

Construction is expected to begin in January 2026 and last 14 to 18 months (ending approximately winter or spring of 2027). As stated above, power, water, and sewer service to the parking structure will require new tie-ins to the City of Colton's existing systems. To conduct this work, lane closures may be necessary on Pepper Avenue for approximately 4 to 6 weeks. The County will develop a traffic control plan with the design-builder in accordance with the requirements of the City of Colton Street Cut Permit.

Demolition of the existing surface lot, site preparation and grading, foundation work, utilities, paving, finish work, and cleanup will require standard construction equipment, including excavator, loader/backhoe, concrete saw, dump trucks, water truck (for dust suppression), grader, scraper, bulldozer, compactor, drill rig (for deep foundations or piles), concrete pump,

concrete mixer trucks, crane, and concrete mixer trucks. The project will implement City of Colton construction Best Management Practices (BMPs) to reduce noise, dust, erosion, and water quality impacts and comply with all applicable City of Colton codes during construction of the project.

Figure 1:Project Vicinity



ARMC Planning and Design

Imagery: ESRI World Topo and Hillshade

Project Vicinity

3/31/2025

Path: P:\S\SNBD00000037\0600INFO\GIS\SNBD0037.aprx

Figure 2: Project Aerial

ARMC Planning and Design

Imagery: ESRI World Imagery

N

- Project Area
- Proposed Project Staging Area
- San Bernadino County Tax Parcel

Project Location

4/1/2025

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Required Permits

The project will require the following state and local permits:

- State Water Resources Control Board - National Pollutant Discharge Elimination System (NPDES) Construction Stormwater General Permit
- City of Colton - Site Plan Development Review
- City of Colton – Grading Permit
- City of Colton - Building Permit
- City of Colton - Street Cut Permit (for utility work within the roadway)

ENVIRONMENTAL CHECKLIST AND RESPONSES

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	☐	Greenhouse Gas Emissions	☐	Public Services
☐	Agriculture and Forestry Resources	☒	Hazards and Hazardous Materials	☐	Recreation
☒	Air Quality	☒	Hydrology and Water Quality	☒	Transportation
☒	Biological Resources	☐	Land Use and Planning	☒	Tribal Cultural Resources
☒	Cultural Resources	☐	Mineral Resources	☐	Utilities and Service Systems
☐	Energy	☒	Noise	☐	Wildfire
☒	Geology and Soils	☐	Population and Housing	☐	Mandatory Findings of 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 (a) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (b) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENT 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.

Signature	**Date**
Rob Gilliam	
Printed Name	

Evaluation Format

This initial study is prepared in compliance with the California Environmental Quality Act (CEQA) pursuant to Public Resources Code Section 21000, et seq. and the State CEQA Guidelines (California Code of Regulations Section 15000, et seq.). Specifically, the preparation of an Initial Study is guided by Section 15063 of the State CEQA Guidelines. This format of the project analysis is evaluated based upon its effect on 17 major categories of environmental factors. Each factor is reviewed by responding to a series of questions regarding the impact of the project on each element of the overall factor. The Initial Study Checklist provides a formatted analysis that provides a determination of the effect of the project on the factor and its elements. The effect of the project is categorized into one of the following four categories of possible determinations:

Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant	No Impact

Substantiation is then provided to justify each determination. One of the four following conclusions is then provided as a summary of the analysis for each of the major environmental factors.

1. **No Impact**: No impacts are identified or anticipated and, therefore, no mitigation measures are required.
2. **Less than Significant Impact**: No significant adverse impacts are identified or anticipated and, therefore, no mitigation measures are required.
3. **Less than Significant Impact with Mitigation Incorporated**: Possible significant adverse impacts have been identified or anticipated and the following mitigation measures are required as a condition of project approval to reduce these impacts to a level below significant.
4. **Potentially Significant Impact**: Significant adverse impacts have been identified or anticipated. An Environmental Impact Report (EIR) is required to evaluate these impacts, which are (listing the impacts requiring analysis within the EIR).

Aesthetics

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Except as provided in Public Resources Code Section 21099, would the project:				
(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 nonurbanized 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?	☐	☐	☒	☐

a. Would the project have a substantial adverse effect on a scenic vista?

Less than Significant Impact

The proposed project site is located within a fully urbanized and developed area in the City of Colton and is part of the ARMC campus. The site is not located within an area designated as a scenic vista under federal, state, or local planning documents. The project area is designated as Public/Institutional on both the General Land Use Map and the Zoning Map in the City of Colton General Plan and the proposed project is consistent with the surrounding land uses (City of Colton 2023).

Even though there are no designated scenic vistas, the City of Colton is surrounded by mountains to the northeast and southeast of the project including the San Bernardino National Forest and Box Springs Mountain Reserve. These mountainous areas are observable in the background distance from many parts of the city including from the existing parking lot at the project site. At ground level, buildings around the city block these views, but as the view location shifts these background views open up to the viewer. The project will result in blocking

portions of these views depending on where the viewer is located. However, the upper floors of the structure will allow more unobstructed distant views as the higher elevation will be above structures that could block the view. Since these background views are noticeable from many locations, the structure itself will not significantly impact the view vistas and have a less than significant impact.

b. Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings, within a scenic highway?

No Impact

The proposed project site is not located within or adjacent to a designated state scenic highway. Therefore, the project will not impact any scenic resources associated with a scenic highway.

There are no designated significant natural resources on the site. While approximately 51 trees are currently located within the project area, these trees are not considered scenic resources under CEQA. A landscape plan will be prepared and implemented to offset impacts from tree removal. Replacement planting will comply with applicable City of Colton standards and regulations. The specific number, species, and locations of replacement trees shall be determined during project design, in coordination with the City, to ensure consistency with local requirements.

There are no historic buildings near the project site. Designated historical buildings are generally located to the east of the project site and centered around North La Cadena Drive north of I-10 in the older part of the city.

The project will not substantially damage any scenic resources; therefore, the project impact will have no impact.

c. In nonurbanized areas, would the project 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?

Less than Significant Impact

The proposed project is located within the developed area of Colton on the campus of ARMC. The project area is characterized by institutional and medical uses and is surrounded by similar urban development, including medical facilities and commercial uses, some of which are multi-story structures such as the hospital. However, views of the site will irrevocably change since there will be an up to 6-story structure instead of ground level parking. This is not inconsistent with other parking structures typically associated with commercial or institutional facilities like the ARMC and will be in compliance with city standards. The structure will include aesthetic treatments on the ground floor of the structure and landscaping to help soften the view of the facility.

The project site is designated as Public/Institutional on both the General Plan Land Use Map and Zoning Map (City of Colton 2023). The proposed parking garage is a permitted use within this designation and will not conflict with any applicable zoning standards or regulations governing scenic quality. The project will not conflict with applicable zoning and have a less than significant impact on views of the site.

d. Would the project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Less than Significant

During construction, the existing parking lot lighting will be removed. In its place will be temporary lighting in place for security purposes during the construction period (even though no nighttime construction work is proposed). This lighting will be directed downward to minimize its effect on adjacent properties. Some temporary glare may be produced during construction depending on the location of the viewer and sun angle, but this is not anticipated to be a significant effect since most construction vehicles and equipment do not produce glare.

Operation of the proposed project will increase the lighting over the existing condition due to the need to light all levels of the parking structure. While lighting will be installed for security and safety purposes, the lighting will consist of shielded LED fixtures designed to direct light downward and minimize light spillover onto adjacent properties and the structure itself will shield light from some fixtures depending on their location.

The proposed parking structure will not include highly reflective materials or surfaces that will contribute to glare during the daytime. In addition, project design features will ensure that lighting is appropriately placed, shielded, and operated in a manner that minimizes potential impacts on the surrounding environment. As a result, light and glare impacts will be less than significant.

Mitigation Measures

No mitigation measures are proposed for aesthetic resources since the project will comply with the city codes, as applicable, and all impacts are anticipated to be less than significant.

Agriculture and Forestry Resources

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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 Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:				
(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 (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
(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 or conversion of forest land to non-forest use?	☐	☐	☐	☒

a. Would the project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

No Impact

The project site is entirely within an urbanized area, surrounded by the Colton's Hub City Centre Specific Plan area (City of Colton 2014). The proposed project area is shown as Public/Institutional on both the General Land Use Map and the Zoning Map (City of Colton 2023). The adjacent parcel to the north is the medical building facility, for which this parking facility is proposed. The adjacent vacant lots to the east and southeast are shown as Open Space / Resource on both maps and are protected under a conservation easement as mitigation for impacts to the Delhi sands flower-loving fly (DSF; Rhaphiomidas terminatus abdominalis) associated with the original ARMC facility. The southern border of the subject parcel abuts West Valley Boulevard. The western border of the subject parcel abuts North Pepper Avenue. The project site is not shown on maps from the Farmland Mapping and Monitoring Program as prime farmland, unique farmland, or farmland of statewide importance, thus, no impact will occur.

b. Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract?

No Impact

The project site is not zoned for agricultural use and is not subject to a Williamson Act Contract. Therefore, there will be no conflicts with respect to land zoned for agricultural use or under a Williamson Act Contract will occur.

c. Would the project conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?

No Impact

The project site is entirely within an urbanized area, surrounded by the Colton's Hub City Centre Specific Plan area (City of Colton 2014). The proposed project area is shown as Public/Institutional on both the General Land Use Map and the Zoning Map (City of Colton 2023). The Use Charts in the Colton California Municipal Code, Section 18.06, do not allow for any forestry uses in the Public/Institutional or Open Space/Resource Zones. Nurseries carrying potted plants only are allowed. As such, there are no forestry uses within the project area. The project will not conflict with existing zoning for forest lands and no impact will occur.

d. Would the project result in the loss of forest land or conversion of forest land to non-forest use?

No Impact

The project site is completely surrounded by urban uses, and as discussed in (c), above, is not located on forest land. No impact related to the loss of forest land or conversion of forest land will occur.

e. Would the project involve other changes in the existing environment, which due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?

No Impact

As described above in responses to (a)-(d), the project will not result in impacts or conversion of farmland to non-agricultural use or conversion of forest land to non-forest use.

Mitigation Measures

No mitigation measures are proposed for agricultural and forestry resources as no impacts to these resources are anticipated by the proposed project.

Air Quality

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the project:				
(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) Create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐

For the purposes of the air quality analysis, the California Emissions Estimator Model (CalEEMod) Version 2022.1.1.29 was used to estimate air emissions from construction and operation of the project.

a. Would the project conflict with or obstruct implementation of the applicable air quality plan?

Less than Significant Impact

The project is located within the South Coast Air Basin, which is under the jurisdiction of the South Coast Air Quality Management District (SCAQMD). CEQA guidelines (Section 15125) require a discussion of any project inconsistencies with applicable General Plans and Regional

Plans. The 2022 SCAQMD Air Quality Management Plan (AQMP) is the regional plan that is applicable to the project. The SCAQMD CEQA Handbook provides guidance for identifying whether or not a project is consistent with the AQMP using two key indicators:

1. Whether the project will result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay timely attainment of air quality standards or the interim emission reductions in the AQMP.

2. Whether the project will exceed the assumptions in the AQMP in 2022 or increments based on the year of project buildout and phase.

Criterion 1 - Increase in Frequency or Severity of Violations

Based on the air quality modeling analysis, construction and operation of the project will not result in significant air quality impacts based on the SCAQMD regional and local thresholds of significance (see Tables 1 and 2). Since the project is not anticipated to contribute to the exceedance any air quality standard it is consistent with the first criterion.

Criterion 2 – Exceed Assumptions in the AQMP

The AQMP uses forecasts of growth to determine if future regional air quality can meet the air quality standards mandated by federal law. Growth projections are collected from the local cities in the region and provided to the Southern California Association of Governments (SCAG). The SCAG then develops regional growth estimates that SCAQMD uses to prepare future air quality forecasts for the AQMP. The ARMC project is consistent with the City of Colton's land use designation and will not result in generating or inducing any growth given that the project is being built to meet the current demand for parking. In addition, the project as modeled will not result in exceeding any SCAQMD project-level thresholds.

b. Would the project 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?

Less than Significant Impact

A project may have a significant impact if project related emissions would exceed federal, state, or regional thresholds or if project related emissions substantially contributed to existing or project air quality violations. The project is located in the South Coast Air Basin and governed by the SCAQMD as described above. The federal and state have established health-based ambient air quality standards for seven pollutants, also known as criteria pollutants. These include ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), inhalable particulate matter with a diameter of 10 microns or less (PM_{10}), fine particulate matter with a diameter of 2.5 microns or less ($PM_{2.5}$), and lead (Pb).

Areas that are in nonattainment in respect to the federal or state air quality standards are required to prepare plans that will bring the region into attainment. Table 1 shows the attainment status for the criteria pollutants. Ozone and PM_{10} are in nonattainment of the air standard in San Bernadino County.

Table 1:South Coast Air Basin Attainment Status

Pollutant	State Status	National Status
Ozone	Nonattainment	Nonattainment
Carbon Monoxide	Attainment	Attainment
Nitrogen Dioxide	Attainment	Unclassified/Attainment
Sulfur Dioxide	Attainment	Attainment
PM_{10}	Nonattainment	Nonattainment
$PM_{2.5}$	Unclassified	Attainment

The ARMC project's air emissions were estimated by using the CalEEMod air quality model. The model was run with a worst-case scenario that did not account for many of the model features that would have resulted in lower estimates, for example construction BMPs for reducing dust generation were not used and the results shown below were unmitigated overall. The purpose was to not underestimate the potential emissions but to provide a conservative estimate for the project. Tables 2 and 3 show the estimated construction and operation emissions from the project, respectively. Table 2 shows the combined construction emissions from the various stages of construction that include demolition, site preparation, grading, building, paving and architectural coating. As shown, none of the air emissions generated by the project will exceed the project-level thresholds and there will be no cumulative impact on regional air quality.

Table 2:Construction related criteria Pollutants (unmitigated)

Criteria Air Pollutants (average lbs/day)	ROG	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
Average Daily Construction Emissions all Phases[1]	1.28	8.85	15.29	0.03	2.35	0.79
SCAQMD Project-Level Construction Thresholds	75	100	550	150	150	55
Exceeds Average Daily Threshold	No	No	No	No	No	No

[1]Construction phases include demolition, site preparation, grading, building, paving, and architectural coating.
ROG: reactive organic gases (aka volatile organic compounds), NO_x: oxides of nitrogen, CO: carbon monoxide, SO_2: sulfur dioxide, PM_{10}: particulate matter, $PM_{2.5}$: particulate matter.

Table 3 shows the combined operation emissions from area, mobile, and energy sources (note: several other operation sources were not applicable to this project). Similar to the construction emissions, operational emissions are not estimated to exceed any of the project-level thresholds, therefore, there will be no cumulative impact on regional air quality.

Table 3:Operation related criteria pollutants (unmitigated)

Criteria Air Pollutants (average lbs/day)	ROG	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
Average Daily Operation all Sources[1]	2.47	0.13	14.9	<.005	0.03	0.002
SCAQMD Project-Level Operation Thresholds	55	55	550	150	150	55
Exceeds Average Daily Threshold	No	No	No	No	No	No

[1]Sources include area, mobile, and energy.
ROG: reactive organic gases (aka volatile organic compounds), NO_x: oxides of nitrogen, CO: carbon monoxide, SO_2: sulfur dioxide, PM_{10}: particulate matter, $PM_{2.5}$: particulate matter.

c. Would the project expose sensitive receptors to substantial pollutant concentrations?

Less than Significant with Mitigation Incorporated

The project will have the most potential to affect sensitive receptors during construction when the project will create substantial exhaust emissions and dust in the project vicinity during demolition of the existing parking lot, grading the site, and operation of construction vehicles and equipment. Generally, the main air emission of concern from construction is the generation of fugitive dust from earth disturbance. Once soil is disturbed, wind can pick up and carry particles offsite, causing impacts to the environment and human health. Dust can also be caused by the movement of soil to and from the construction site, particularly if truck loads are not covered. Dust increases the levels of particulate matter in the form of Particulate Matter $PM_{2.5}$ and PM_{10} in the atmosphere. Other air emissions resulting from construction vehicle and equipment exhaust include carbon monoxide (CO), sulfur dioxide, nitrogen oxide, and particulate matter. These air emissions constitute greenhouse gases (GHGs).

Sensitive receptors in the project area are principally made up of hospital patients that are entering and exiting the medical facilities with those using the parking areas located closer to the project having more exposure to construction related air emissions. Some of these people may have respiratory problems that could be exacerbated by prolonged exposure to construction emissions especially dust. However, these exposures will typically be short in duration with patients only experiencing these emissions as they make their way to and from their vehicles. These emissions are unavoidable, but will be minimized through the use of construction best management practices which will be implemented to control construction related air emissions in accordance with Mitigation Measure AIR-1.

d. Would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Less than Significant Impact

Construction will create odors that may affect patients and medical staff entering and exiting the medical facilities. The most noticeable odor will be from asphalt paving. Asphalt paving produces a strong odor caused by the presence of aromatic hydrocarbons (i.e., volatile organic compounds or VOCs) in the asphalt. The VOCs evaporate easily, especially when the asphalt is heated, resulting in strong odors. Once asphalt cools, it stops releasing fumes and the odor dissipates, typically approximately an hour after paving is completed. Temporary exposure to

these VOCs is not anticipated to cause a health hazard, but rather it may cause a short-term odor nuisance. Movement of earth materials will produce odors although these will be less noticeable than asphalt and similarly only result in a temporary nuisance effect. Some finishing materials may have some temporary odor when new but these are not likely to be noticed off-site. Operation of the parking structure is not anticipated to create any odors or other emissions. This impact will be less than significant.

Mitigation Measures

AIR-1 The contractor will implement BMPs to reduce emissions during construction. These BMPs may include:

- Spray exposed soil with water or other suppressants to reduce fugitive dust emissions and deposition of particulate matter, when necessary.
- Minimize dust emissions during transport of fill material or soil by covering, wetting down, or by ensuring adequate freeboard (space from the top of the material to the top of the truck bed) on trucks.
- Promptly clean up spills of transported material on public roads.
- Use stabilized construction entrances to minimize tracking of dirt onto paved surfaces.
- Where feasible, locate construction equipment and truck staging areas away from sensitive receptors and in consideration of potential effects on other resources.
- Where feasible, provide wheel washers to remove particulate matter that would otherwise be carried off-site by vehicles to decrease deposition of particulate matter on area roadways.
- Reduce idling time of equipment and vehicles and ensure equipment has add-on emission control.
- Cover dirt, gravel, and debris piles as needed to reduce dust and wind-blown debris.
- Minimize odors on-site by covering loads of hot asphalt, when practical.

Biological Resources

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
(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 Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
(b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	☐	☐	☐	☒
(c) Have a substantial adverse effect on state or federally protected wetlands (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?	☐	☐	☐	☒

Methodology

A database review was conducted that consisted of a records search of current versions of the California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB 2025), and the U.S. Fish and Wildlife Service (USFWS) online Information for Planning and Consultation (IPaC) species list system (USFWS 2025). The CNDDB search consisted of a 2-mile search surrounding the project. The USFWS Critical Habitat Mapper (USFWS 2025) was queried to identify critical habitat for terrestrial and aquatic species near the project area. A field survey was conducted on March 12, 2025, by a David Evans and Associates Biologist. The biologist surveyed the entire project area and its vicinity for its potential to support special-status species, habitat types, and wildlife movement corridors.

a. Would the project have a substantial adverse effect, either directly or through habitat modification, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

Less than Significant with Mitigation Incorporated

A significant impact will occur if a project were to remove or modify habitat for any species identified or designated as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or the USFWS.

No federal or state listed plant or wildlife species were observed in the project area during the field visit on March 12, 2025. A desktop review identified 13 special-status plant species and 20 special-status wildlife species within a 2-mile search surrounding the project area. The project site is fully developed and paved as part of the existing ARMC campus. Therefore, none of the special-status plant species have potential to occur at the project site and these species are not evaluated further in this document. Of the wildlife species, only one species, the Delhi sands flower-loving fly (DSF), was determined to have some potential to occur directly adjacent to the project site. A more detailed description of this species and the potential impact from the project is provided below. An analysis of the other wildlife species is provided in Appendix A. No USFWS designated critical habitat is located within the project area.

Delhi sands flower-loving fly

DSF is a federally endangered species. The DSF is endemic to the Colton Dunes (Delhi sands series soils). Suitable habitat for this species includes loose and sandy soils for egg-laying, floral species to consume the nectar from, and possibly island habitat distribution rather than corridors (Mattoni et al. 2018). Oviposition (egg-laying) occurs within loose, sandy soils in late summer months and may primarily occur near telegraph weed (Mattoni et al. 2018). Larval stages develop completely underground and emerge as adults from July through September. Adult DSF flight period is typically July through September, when individual adults emerge, reproduce and die. The adult life span of an individual DSF is thought to last for a few weeks at most (RBF: A Baker Company 2014).

The vacant lot adjacent to the project area is part of a conservation area (Hospital Preserve Site) for the DSF, which was set aside as part of the construction of the original ARMC. This area has suitable habitat for DSF and they are known to occur in this location. However, the proposed project is entirely located on previously developed and paved land, and no construction activities will occur within the conservation area.

Although no direct impacts to DSF habitat will occur, there is potential for indirect impacts during construction if workers, vehicles, or equipment inadvertently encroach on adjacent habitat, or if dust, light, or noise generated by the project negatively affects DSF. Implementation of Mitigation Measure BIO-1 will reduce any indirect impacts to less than significant.

b. Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in the local or regional plans, policies, regulations by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

No Impact

The project site is fully developed and paved as part of the existing ARMC campus. No riparian habitat or sensitive natural communities, as defined by the CDFW or the USFWS are present on or adjacent to the project site. Because the site lacks natural hydrologic features and native

vegetation, the project will not impact any riparian corridors or sensitive natural communities. Additionally, as the project will disturb more than one acre of soil, it is subject to the National Pollutant Discharge Elimination System (NPDES) Construction General Permit, which requires the preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP will incorporate BMPs to prevent sediment, debris, or other construction-related pollutants from entering the storm drain system and potentially affecting downstream habitats. Post-construction stormwater management will also comply with City of Colton stormwater regulations, as applicable, to ensure long-term protection of water quality. Therefore, the project will result in no impact on riparian habitat or other sensitive natural communities.

c. Would the project have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

No Impact

The entire project site is fully developed and paved as part of the existing ARMC campus. The site has been previously disturbed and contains no natural features such as streams, wetlands, vernal pools, or other aquatic resources subject to jurisdiction under the U.S. Army Corps of Engineers (USACE) (Clean Water Act [CWA] Section 404), the Regional Water Quality Control Board (CWA Section 401), or the CDFW (Fish and Game Code Section 1600 et seq.). As there are no wetlands or other potentially jurisdictional waters present within the project area, the proposed project will not result in the direct removal, filling, or hydrological interruption of any state or federally protected wetlands. Therefore, the project will result in no impact on wetlands or other waters of the U.S. or State.

d. Would the project 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?

Less than Significant with Mitigation Incorporated

The project site is fully developed and paved as part of the existing ARMC campus. The site is not located within an identified wildlife movement corridor or linkage area. As such, the project will not interfere with any known native resident or migratory wildlife corridors or nursery sites.

Construction activities may temporarily deter wildlife that are adapted to humans from passing through the project area due to increased noise and construction activities. However, these impacts will only occur for a short period of time and will not lead to any permanent barriers to wildlife movement. As a result, construction impacts on wildlife movements will be less than significant.

Although the site is developed, the presence of trees on the project site provides potentially suitable nesting and foraging habitat for avian species protected under the Migratory Bird Treaty Act (MBTA) and California Fish and Game Code Sections 3511 and 3513. If tree removal or construction occurs during the bird nesting season (typically February 1 through August 31), there is potential to disturb nesting birds. Implementation of Mitigation Measure-BIO-2 will ensure that potential impacts to nesting birds will be less than significant.

e. Would the project conflict with any local policies or ordinances protecting biological resources, such as tree preservation policy or ordinance?

No Impact

The proposed project will not conflict with any local policies or ordinances related to the protection of biological resources. The project site is fully developed and does not contain natural habitat or biological resources protected under the City of Colton General Plan policies.

While the project will result in the removal of existing trees within the paved parking lot, no trees or shrubs proposed for removal are located within the public ROW, and none are identified as protected or heritage trees under local ordinances. A landscape plan will be prepared and implemented to offset impacts from tree removal. Replacement planting will comply with applicable City of Colton standards and regulations. The specific number, species, and locations of replacement trees shall be determined during project design, in coordination with the City, to ensure consistency with local requirements. Because the project is consistent with applicable tree preservation and replacement requirements and will not impact protected natural resources, there will be no conflict with any local biological resource policies. Therefore, no impact will occur.

f. Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

No Impact

The project site is not located within the boundaries of any adopted Habitat Conservation Plan (HCP), Natural Community Conservation Plan (NCCP), or other approved habitat conservation plan. Therefore, the project will not conflict with the provisions of any such plan.

Although the site is adjacent to protected habitat (Hospital Preserve Site) for the federally endangered DSF, which was set aside as part of the construction of the original ARMC, the project itself is located entirely on previously developed and paved land and does not encroach into the protected habitat area. All construction activities, including staging and access, will occur within the existing disturbed footprint (staging will occur on a nearby paved parking area). As such, the project will not result in direct impacts to conservation lands or conflict with the goals or implementation of the West Valley HCP. Therefore, the project will result in no impact.

Mitigation Measures

BIO-1 The following measures will be implemented to protect DSF on the adjacent property:

- Project boundaries will be clearly defined during construction using marking and fencing, including designating the ingress and egress routes, to ensure that no impacts will occur to the adjacent DSF conservation area.
- A fence or other appropriate barrier will be installed as part of the project along the eastern and southern edge of the project area to limit access to the DSF conservation area.
- At least one week prior to construction, a qualified biologist will inspect the site and ensure that the limits of construction have been properly defined (e.g., fenced), are readily identifiable, and are not encroaching on the adjacent DSF habitat.

- All contractors and project personnel will receive an environmental training conducted by a qualified biologist familiar with DSF. The environmental training will present information on life history, ecology, legal and conservation status of DSF, avoidance and minimization measures, and potential penalties associated with violating the Endangered Species Act (ESA). Personnel will be required to sign and date a form indicating that they have attended the training and fully understand the avoidance and minimization measures and agree to comply with them.
- Dust will be kept to a minimum during construction (e.g., water exposed areas, covering soil stockpiles).
- The construction site will be kept free of trash, refuse, and other waste.
- Permanent lighting at the project site will be shielded to minimize impacts to DSF and other wildlife.

BIO-2 Tree removal activities should be conducted outside of nesting bird season. However, if project activities are conducted during nesting bird season (generally February 1 through August 31), preconstruction nest surveys shall be conducted in and near the project (within 200 feet for large raptors and 100 feet for all other birds) by a qualified biologist no more than 3 days prior to construction activities. If nesting is identified during the preconstruction survey, then a buffer shall be established of a size determined by the project biologist to be sufficient to avoid impacts to nesting birds and/or the project shall be modified and/or delayed as necessary to avoid direct take of the identified nests, eggs, and/or young.

Cultural Resources

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
(a) Cause a substantial adverse change in the significance of a historical resource pursuant to § 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 dedicated cemeteries?	☒	☒	☐	☐

Methodology

On March 25, 2025, a qualified CRM TECH archaeologist conducted a cultural resources records search at the South Central Coastal Information Center (SCCIC), located at California State University, Fullerton, which serves as the official cultural resources records repository for

San Bernardino County. Additionally, historical maps and aerial/satellite photographs of the project area were reviewed by a CRM TECH archaeologist to identify past developments and evaluate historical context. On April 1, 2025, a CRM TECH-qualified archaeologist performed a pedestrian field inspection of the project area.

On March 24, 2025, CRM TECH also requested a records search from the California Native American Heritage Commission's (NAHC) Sacred Lands File (SLF). In a letter dated March 25, 2025, the NAHC reported that unspecified Native American cultural resources were identified within the general vicinity of the project site. Based on the NAHC's recommendations, CRM TECH contacted Chemehuevi Indian Tribe representatives Chairman Glenn Lodge and Cultural Director Kaitlyn Snodgrass via email on March 25, 2025, requesting information on potential Native American cultural resources within or near the project vicinity. To date, no response from the Chemehuevi representatives has been received.

Additionally, on April 18, 2025, in accordance with Assembly Bill (AB) 52, the County of San Bernardino mailed consultation letters to tribes identified by the NAHC in a Tribal Consultation List requested on April 19, 2025. At the time of this analysis, no responses from the contacted tribes have been received.

Documentation supporting the cultural resource evaluations, including the results of the records search, is included in Appendix B.

a. Would the project cause a substantial adverse change in significance of a historical resource as defined in State CEQA Guidelines §15064.5?

No Impact

The records search conducted at the SCCIC indicated that the entire project area was previously surveyed during two large-scale archaeological studies completed in 1986 and 1987, as well as a focused cultural resources survey conducted for the present ARMC facility in 1990 (Bixler 1986; 1987; Weisbord 1990). No cultural or historic resources were recorded within or adjacent to the project boundaries during these studies or any other previous studies in the vicinity. Within a one-mile radius of the project area, 33 additional previous cultural resource studies conducted between 1978 and 2014 identified 18 historical/archaeological sites, including six prehistoric isolates or sites (e.g., arrowheads, a ceramic sherd, lithic scatters, a mano) and 12 historic-period resources (e.g., storage tanks, transmission lines, cement plant remains, railroad segment, refuse scatter). The closest previously recorded resource is a historic transmission line approximately 800 feet west of the project site, which does not intersect or immediately adjoin the project area.

Historical maps and aerial photographs reviewed (NETR Online 1938–2022; Google Earth 1995–2025) did not indicate the presence of notable historical human-made features within or adjacent to the project area. The vicinity had been leveled and used agriculturally in the early- to mid-20th century, but agricultural activities ceased prior to the 1950s. The site itself remained vacant and undeveloped until construction of the ARMC campus began in the mid-1990s, after which it has been utilized as a paved parking lot. As a result, there would be no impact to historic resources.

b. Would the project cause a substantial adverse change in significance of an archaeological resource pursuant to State CEQA Guidelines §15064.5?

Less Than Significant With Mitigation Incorporated

The cultural resources records search results show that the entire project area was previously

included in two large-scale archaeological studies completed in 1986 and 1987, as well as a focused cultural resources survey conducted for the construction of the existing ARMC facility in 1990 (Bixler 1986; 1987; Weisbord 1990). No archaeological resources were recorded within or adjacent to the project boundaries during these surveys or in any subsequent studies conducted in the surrounding area.

The project area has been extensively disturbed by prior construction activities associated with the development of the ARMC campus and the existing parking lot since the 1990s. As a result, the site retains no vestige of its native landscape and is highly unlikely to contain intact, potentially significant archaeological deposits of prehistoric or early historic origin in near-surface soils.

However, despite the low potential for encountering archaeological resources, the possibility of unanticipated discoveries during ground-disturbing activities cannot be entirely ruled out. Implementation of Mitigation Measure CUL-1 (requiring the halting of work and evaluation by a qualified archaeologist if cultural materials are discovered) would ensure that any potential impacts to previously unknown archaeological resources are appropriately addressed. Therefore, with mitigation incorporated, the project would result in a less than significant impact on archaeological resources.

c. Would the project disturb any human remains, including those interred outside of formal cemeteries?

Less Than Significant With Mitigation Incorporated

CRM TECH submitted a request to the NAHC for a SLF search, which identified unspecified Native American cultural resources in the general vicinity of the project area. Separately, the County of San Bernardino, as the lead agency, initiated formal consultation under Assembly Bill (AB) 52 by contacting the Native American tribes identified by the NAHC. As of this time, no tribes have responded with specific concerns or requests for consultation regarding the project.

The project site has been heavily disturbed by prior development associated with the construction of the ARMC campus and existing parking facilities since the 1990s. As noted above, there is no evidence of prehistoric habitation or recorded cultural resources within the project boundaries. Therefore, the likelihood of encountering human remains during construction is considered low.

However, unanticipated discoveries of human remains during ground-disturbing activities cannot be entirely ruled out. Implementation of Mitigation Measure CUL-2 (compliance with Health and Safety Code §7050.5 and Public Resource Code (PRC) §5097.98 in the event of a discovery) would ensure that any remains are treated appropriately, with respect and in accordance with applicable regulations. With mitigation incorporated, the project would result in a less than significant impact related to the potential disturbance of human remains.

Mitigation Measures

CUL-1 If buried cultural materials are discovered during future earth-moving operations associated with the project, all work within the immediate vicinity of the discovery shall be halted or diverted until a qualified archaeologist, meeting the Secretary of the Interior's Professional Qualification Standards, evaluates the nature and significance of the find in accordance with CEQA Guidelines §15064.5 and PRC §21083.2.

If the discovery is determined to be a historical resource or a unique archaeological resource, appropriate measures shall be developed and implemented to protect the resource before ground-disturbing activities resume. Such measures may include avoidance, preservation in place, recordation, additional archaeological testing, or data recovery, as determined necessary by the qualified archaeologist and lead agency.

CUL-2 The project shall comply with the requirements of Health & Safety Code Section 7050.5 regarding the discovery of human remains:

If human remains are encountered unexpectedly during construction demolition and/or grading activities, State Health and Safety Code Section 7050.5 requires that no further disturbance shall occur until the County Coroner has made the necessary findings as to origin and disposition pursuant to California PRC Section 5097.98. In the event that human remains are discovered during excavation activities, the following procedure shall be observed:

- Stop immediately and contact the County Coroner.
- If the remains are determined to be of Native American descent, the Coroner has 24 hours to notify the NAHC.
- The NAHC will immediately notify the person it believes to be the most likely descendent of the deceased Native American.
- The most likely descendent has 48 hours to make recommendations to the owner, or representative, for the treatment or disposition, with proper dignity, of the human remains and grave goods.

Energy

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
(a) Result in a 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?	☐	☐	☐	☒

a. Would the project result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

Less than Significant

The project will not result in a potentially significant environmental impact related to wasteful, inefficient, or unnecessary consumption of energy resources. Energy use during construction will be short term and temporary, limited to fuel consumption by construction equipment and worker vehicles. Given the relatively short duration and localized nature of the work, construction activities will not constitute inefficient or excessive energy use.

During operation, the proposed parking garage will be required to comply with the 2022 California Building Energy Efficiency Standards (Title 24), which establish mandatory requirements for energy-efficient building design and systems.

The project will also be subject to CALGreen, including Section 5.106.5.3, which mandates the provision of electric vehicle (EV) charging infrastructure in new non-residential parking facilities. These requirements promote long-term energy efficiency and support California's zero-emission vehicle goals. In addition, the project is also installing PV solar panels on the structure to generate and use renewable electricity.

Additionally, the project will align with the City of Colton's greenhouse gas reduction strategies, which encourage efficient building systems and reduced vehicle emissions through EV infrastructure. Compliance with all applicable state and local energy regulations ensures that the project will not result in wasteful or inefficient energy use during either construction or operation. Therefore, impacts related to energy consumption will be less than significant.

b. Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

No Impact

The project will not conflict with or obstruct a state or local plan for renewable energy or energy efficiency. The proposed parking garage will be required to comply with the 2022 California Building Energy Efficiency Standards (Title 24) and CALGreen, both of which promote reduced energy consumption and increased use of renewable energy. These standards include energy-efficient lighting, ventilation controls for enclosed parking structures, and required EV charging infrastructure. The project is also installing photo voltaic (PV) solar panels on the structure to generate and use renewable electricity.

In addition, the project will support implementation of the City of Colton's greenhouse gas reduction measures, which encourage improved building performance and expanded EV readiness. By complying with applicable codes and supporting statewide and regional energy goals, the project will not interfere with any renewable energy or energy efficiency plan. Therefore, no impact will occur.

Mitigation Measures

No mitigation measures are proposed for energy since the project will comply with the State and local codes and all impacts are anticipated to be less than significant.

Geology and Soils

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
(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?	☐	☐	☒	☐

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
(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 direct or indirect risks to life or property?	☐	☐	☒	☐
(e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒
(f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐

a. Would the project 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.

Less Than Significant Impact

The project is not situated within a currently designated Alquist-Priolo Earthquake Fault Zone (California Department of Conservation [CDOC] 1977) and there is no evidence of major surface faults crossing through or extending towards the site (Converse Consultants 2025a). The closest active fault, the San Jacinto fault, is located 2.4 miles to the northeast. The potential for surface rupture within the project vicinity is considered low (Converse Consultants 2025a). Additionally, the design and construction of the project will comply with all standards required by the California Building Code (CBC) as adopted by the City of Colton, as applicable. Compliance with the current requirements of these codes will minimize the potential to expose people or structures to substantial risk, loss, or injury. Therefore, impacts related to rupture of a known earthquake fault will be less than significant.

ii. Strong seismic ground shaking?

Less Than Significant Impact

The project site is located in the seismically active region of Southern California. During the life of the project, moderate to strong ground shaking generated by seismic activity can be expected at the site (Converse Consultants 2025a). There are three active faults within a ten-mile radius of the project site, including the San Jacinto fault (2.4 miles northeast), the San Andreas Fault (8.3 miles northeast), and the Cucamonga fault (9.1 miles northwest). The design and construction of the project will comply with all standards required by the CBC as applicable. Compliance with the current requirements of these codes and with recommendations of the geotechnical investigation will minimize the potential to expose people or structures to substantial risk, loss, or injury. Therefore, this impact will be less than significant.

iii. Seismic-related ground failure, including liquefaction?

No Impact

Liquefaction is defined as the phenomenon in which soil within the upper 50 feet of the ground surface suffers reduction in its shear strength and temporarily behaves as a viscous liquid instead of a solid. Soil liquefaction generally occurs in submerged sandy soils during or after strong ground shaking. The geotechnical investigation at the project site determined that groundwater is below 51.5 feet and historically is deeper than 125 feet (Converse Consultants 2025a). The depth of the ground water table reduces the likelihood of liquefaction occurring at the project site.

San Bernardino County has determined that the site is not located in an area that is susceptible to liquefaction (San Bernardino County 2010). Additionally, the geotechnical investigation completed a Liquefaction and Seismic Settlement Analysis that determined the potential for liquefaction induced settlement in the project site is negligible (Converse Consultants 2025a). Therefore, the project will not exacerbate or cause substantial adverse effects including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction. Therefore, no impact will occur.

iv. Landslides?

No Impact

The project site is generally flat and there is very little topographical variation in the surrounding vicinity. San Bernardino County has determined that the site is not located in an area that is susceptible to landslides (San Bernardino County 2010) and the geotechnical investigation for the project site concluded that the potential for on-site landsliding is low (Converse Consultants 2025a). Therefore, the project will not exacerbate or cause substantial adverse effects including the risk of loss, injury, or death involving landslides. Therefore, no impact will occur.

b. Would the project result in substantial soil erosion or the loss of topsoil?

Less Than Significant Impact

The project site is generally flat and the underlying soil is mapped as Delhi fine sand, which has a slight rating (lowest rating possible) for erosion potential (U.S. Department of Agriculture [USDA] 2024). Construction activities at the project site, such as clearing, excavation, and grading, may result in short term erosion impacts if exposed to high wind or storm related events.

All construction activities that disturb one or more acres are required to obtain a NPDES permit. This project will have over one acre of ground disturbance and will be required to obtain a NPDES permit. Additionally, contractors will be required to implement a SWPPP that outlines BMPs in order to reduce the potential for erosion and sedimentation to occur during construction. The flat ground of the site and adherence to construction erosion BMPs will minimize the potential soil erosion and loss of topsoil. Therefore, this impact will be less than significant.

c. Would the project 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?

Less Than Significant With Mitigation Incorporated

As discussed above, the project site is located in a generally flat area that will have no effect associated with landslides and is not susceptible to liquification. Because the potential for liquefaction is low, the potential for lateral spreading or collapse is also low. Subsidence occurs when the surface of the ground becomes lower and appears to sink. The project is located in an area that is considered to have a medium to high risk for future subsidence, although it is not currently subsiding (City of Colton 2018). The geotechnical investigation for the project site concluded that the proposed project is considered feasible from a geotechnical standpoint, provided the recommendations presented in the geotechnical report are incorporated into the design and construction of the project (Converse Consultants 2025a). Recommendations from the geotechnical investigation will be implemented by the applicant as stated in Mitigation Measure GEO-1. Compliance with the CBC and implementation of Mitigation Measure GEO-1 will minimize the potential for geologic hazards. Therefore, this impact will be less than significant with mitigation incorporated.

d. Would the project be located on expansive soil, as defined in Table 18 1 B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?

Less Than Significant Impact

Expansive soils are characterized by their ability to shrink or swell due to variations in moisture content within the soils. The geotechnical investigation for the project site performed a laboratory analysis and found that the upper ten feet of soils had a very low expansion potential (Converse Consultants 2025a). Therefore, the risks to life and property due to expansive soils are minimal. This impact will be less than significant.

e. Would the project 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?

No Impact

The project site is located in a developed area, which is serviced by an existing wastewater collection system. Therefore, no impact will occur.

f. Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Less Than Significant Impact with Mitigation Incorporated

The project site has been previously graded and developed with a surface parking lot. The project resides within the Qa (Holocene) geological unit. This unit contains alluvial fan gravel and sand derived from rocks in the San Bernardino Mountains (U.S. Geological Survey [USGS] 2004). This unit has a low to high sensitivity for paleontological resources. This sensitivity ranges because the younger, low-sensitive alluvial sediments may overlay older, high-sensitive sediments (SWCA Environmental Consultants 2018). The alluvial sediments are over 800 feet in thickness within the project site (Converse Consultants 2025a). Because construction will not extend past the younger, low-sensitivity sediments, the project is unlikely to encounter paleontological resources. Therefore, the project site and its vicinity likely do not contain any unique geological features or paleontological resources.

Although no known paleontological resources exist at the project site, there remains a low potential to uncover unknown paleontological resources during the construction of the parking structure during excavation. In the unlikely event that a paleontological resource is discovered, the project applicants will implement Mitigation Measure GEO-2. Therefore, project activities will not directly or indirectly destroy a unique paleontological resource or site or unique geological feature, and this impact will be less than significant with mitigation incorporated

Mitigation Measures

GEO-1 Prior to building foundation and pavement construction, the applicant for the project shall comply with all recommendations listed in the Geotechnical Investigation Report (Appendix B) specific to earthwork, design, and construction. The project geotechnical consultant should review plans and specifications as the project design progresses. This review is necessary to identify design elements, assumptions, or new conditions which require revisions or additions to the geotechnical recommendations.

GEO-2. In the unlikely event that a paleontological resource is discovered, the project applicants shall comply with Public Resources Code (PRC) Division 5, Chapter 1.7, Section 5097.5, and Division 20, Chapter 3, Section 30244, which prohibit the removal, without permission, of any paleontological site or feature from lands under the jurisdiction of the state or any city, county, district, authority, or public corporation, or any agency thereof. If paleontological resources are discovered during construction, the City of Colton Department of Building and Safety shall be notified immediately, and all work in the immediate vicinity shall halt until a qualified paleontologist evaluates the find. Construction activities may continue in other areas. If the discovery proves significant under the provisions of CEQA, the paleontologist shall prescribe, and the project applicants shall implement additional measures such as testing or data recovery to avoid impacts to the resources.

Greenhouse Gas Emissions

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
(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?	☐	☐	☐	☒

a. Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

The greenhouse gas analysis used the CalEEMod Version 2022.1.1.29 to estimate greenhouse gas emissions from construction and operation of the project.

Less than Significant Impact

The project is located within the South Coast Air Basin, which is under the jurisdiction of the SCAQMD. The SCAQMD provides cumulative air quality analysis and control guidance for local public agencies and developed criteria for determining the emissions from various GHG sources, which have been incorporated into models and climate action plans.

CEQA guidelines Section 15064.4 states that the determination of significance of GHG emissions is the responsibility of the lead agency, which has discretionary authority to determine the methodology or model that will be used to quantify GHG emissions. It goes on to state that a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies or experts provided that such thresholds are supported by substantial evidence.

The City of Colton prepared and adopted a Climate Action Plan (CAP) on November 3, 2015. The CAP "presents greenhouse gas (GHG) inventories, identifies the effectiveness of California initiatives to reduce GHG emissions, and identifies local measures that were selected by the City to reduce GHG emissions under the City's jurisdictional control to achieve the City's identified GHG reduction target. The City of Colton participated in the San Bernardino County Regional Greenhouse Gas Reduction Plan which presents the collective results of all local efforts to reduce GHG emissions consistent with statewide GHG targets expressed in Assembly Bill (AB) 32, the "Global Warming Solutions Act of 2006" and Senate Bill (SB) 375."

The City of Colton tiers off the larger County GHG reduction plan and implements CEQA by requiring new projects such as the proposed project to quantify project GHG emissions and adopt feasible mitigation measures to reduce project emission levels below a significance standard. In this case, the City has adopted the County's significance standard of 3,000 metric

tons of carbon dioxide (CO_2) equivalent (MtCO2e) per year. This standard means that projects that do not exceed the 3,000 MtCO2e are not considered to contribute to a cumulative climate change.

The project's construction and operation GHG emissions were estimated using the CalEEMod to see if the project will result in cumulative GHG emission impacts that exceeded the significance threshold for GHG. The model predicts the project's generated GHG emissions from area sources, energy usage, mobile sources, off-road equipment, waste disposal, and water usage over a 30-year operation timespan. It also predicts construction emissions but unlike operation emissions, construction activities are short in nature (in this case approximately one year) and cease following construction. Because of this SCAQMD recommends amortizing construction emissions over the 30-year operational timeline. This results in a normalized emission output that can then be combined with the operation emissions to generate a more precise project related to GHG gas summary (this is reflected in Table 4).

Table 4:Project Related Greenhouse Gas Emissions

Category	Greenhouse Gase Emissions (Metric Tons/Year)			
	CO_2	CH_4	N_2O	CO_2e
Area Sources	9.76	<0.005	<0.005	9.79
Energy Usage	279	0.02	<0.005	280
Mobile Sources	47.677	0.0397	0.180	54.028
Off-Road Equipment	0	0	0	0
Solid Waste	0	0	0	0
Water/Wastewater	0	0	0	0
Construction	25.26	0	0	25.80
Total Emissions	361.697	0.0647	0.19	369.61
SCAQMD Draft Threshold				**3,000**
Exceeds Threshold				No

CO_2: carbon dioxide, CH_4: methane, N_2O: nitrous oxide, CO_2e: carbon dioxide equivalent.

According to the City/SCAQMD threshold of significance, a cumulative climate change impact would occur if GHG emissions from on-going project operations would exceed 3,000 MtCO2e per year. The data in Table 4 shows that the proposed project will result in 369.61 MtCO2e per year. Thus, a less than significant generation of GHG emissions will occur from project development.

b. Would the project conflict with an applicable plan, policy or regulations adopted for the purpose of reducing the emissions of greenhouse gases?

The City of Colton CAP described above identifies local measures to reduce GHG emissions to achieve the City's GHG reduction target. The City selected to reduce its community GHG emissions to a level that is 25 percent below its projected GHG emission levels in 2020. The City implements the standard by requiring new development GHG emissions to be below the level of significant standard of 3,000 MtCO2e per year as part of their discretionary approval process under CEQA. As shown in Table 4, the project will be in compliance with the CAP.

The City of Colton has also adopted the CBC which also includes the Green Building Standards Code. In this case, these mainly require the project to divert construction waste from landfills, install low pollutant-emitting finishing materials, and use energy efficient lighting. Other requirements in the code generally don't apply to this project. However, the project will be

compliant with the code, as well as other city codes and policies, and not interfere with implementation of these regulatory requirements. Thus, the project will not conflict with any applicable plans and the impact will be less than significant.

Mitigation Measures

No mitigation measures are proposed for GHG since the project will comply with the State and local requirements, as applicable, and all impacts are anticipated to be less than significant.

Hazards and Hazardous Materials

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
(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 or excessive noise 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?	☐	☒	☐	☐

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
(g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☐	☒

a. Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Less Than Significant Impact ith Mitigation Incorporated

Heavy equipment (e.g., dozers, excavators, tractors) will be operated on the subject property during the construction phases of the project. This heavy equipment will be fueled and maintained by petroleum-based substances such as diesel fuel, gasoline, oil, and hydraulic fluid, which is considered hazardous if improperly stored or handled. In addition, materials such as paints, adhesives, solvents, and other substances typically used in building construction will be located on the project site during construction. The use, handling, and disposal of hazardous materials during construction will occur in accordance with applicable federal, state, and local laws, including California Division of Occupational Safety and Health (Cal/OSHA) requirements. Additionally, project BMPs will be implemented in accordance with city permit conditions of approval and may include those listed in Mitigation Measure HAZ-1. Operation of the project site once constructed will not involve the routine transport, use, or disposal of hazardous materials.

Because the project will comply with applicable regulations and laws pertaining to the transport, storage, use, and disposal of potentially hazardous materials, the exposure of the public, construction workers, and the environment to hazardous materials will be less than significant.

b. Would the project 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?

Less Than Significant Impact with Mitigation Incorporated

One Leaking Underground Storage Tank (LUST) was identified within 1,000 feet of the project site (Geotracker 2025, EnviroStor 2025). This LUST site has been remediated and was closed on July 27, 2005 (Geotracker 2025). Because remediation has been completed, it is unlikely that the project will encounter any contamination due to this site.

A Phase I Environmental Site Assessment (ESA), dated February 11, 2025, was prepared for the project site. The Phase I ESA found that the project site was undeveloped as early as 1896 and was developed for dryland farming from 1930 to 1975. The site was then vacant until it was developed to its current configuration (surface parking lot) in 2002. The Phase I ESA identified one Recognized Environmental Condition (REC) in connection to the project site (Converse Consultants 2025b). The REC is regarding the likely presence of petroleum products at the project site due to multiple former gas station operations on adjoining properties to the west, southwest, and south of the project site. No controlled or historic RECs were identified on the project site (Converse Consultants 2025b). To evaluate the former adjacent gas station operations a limited soil vapor screening will be performed in accordance with Mitigation

Measure HAZ-1. Therefore, impacts due to existing hazardous contamination at the project site would be a less than significant with mitigation.

Construction of the project will use small amounts of hazardous materials such as diesel fuel. As discussed above, BMPs will be implemented that will contain minor spills during construction and will follow Cal/OSHA requirements in accordance with Mitigation Measure HAZ-2. As a result, construction impacts will be less than significant with the implementation of Mitigation Measure HAZ-2. Operation of the site is not expected to create accident conditions involving the release of hazardous materials into the environment.

c. Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

No Impact

There are no schools within a quarter mile radius of the project site. The closest schools to the project site are California University of Science and Medicine (0.35 mile north) and Colton High School (0.9 mile east). Additionally, the project is not expected to release hazardous emissions that will exceed regulatory thresholds or will pose a health hazard. No impact will occur.

d. Would the project be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code §65962.5 and, as a result, would it create a significant hazard to the public or the environment?

No Impact

The California Environmental Protection Agency (CalEPA) maintains several lists of contaminated sites that are identified as meeting the “Cortese List” requirements for hazardous materials sites. A review of the CalEPA’s Cortese List Data Resources indicates that the project site is not included on any list of hazardous materials sites compiled pursuant to Government Code 65962.5 (CalEPA). Therefore, the project site will not create a significant hazard to the public or the environment. No impact will occur.

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?

Less Than Significant Impact

The project is not located within the within an airport land use plan, or within two miles of an airport. The closest airport is the San Bernardino International Airport, which is located approximately five miles to the northeast of the project site. The Arrowhead Regional Medical Center (ARMC) has a heliport (Federal Aviation Administration (FAA) Identifier 4CL9) for private and medical use to the north of the project site. The heliport has infrequent helicopter air traffic, and the project site is not expected to impact heliport use during construction or operation; therefore, safety hazards for people working in the project area are minimal and this impact will be less than significant.

f. Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Less Than Significant Impact with Mitigation Incorporated

The project is located adjacent to City of Colton Evacuation Routes along West Valley Boulevard and North Pepper Avenue (City of Colton 2018). The project may include temporary lane closures for the purpose of utility tie-ins. The closures will be short in duration (four to six weeks) and one lane of travel will always remain open in each direction. In the event of an emergency, the full roadway will be reopened to allow for evacuations. San Bernardino County will develop a Traffic Control Plan in accordance with Mitigation Measure HAZ-3. Once the construction is complete, North Pepper Avenue will regain its full operational use, and the Emergency Evacuation Plan will not need to be altered.

Because the lane closure is temporary and short in duration, and a Traffic Control Plan will be developed, implementation of the project will not impair implementation of, or physically interfere with, an adopted response plan or emergency evacuation plan and this impact will be less than significant.

g. Would the project expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?

No Impact

The project site is located within a developed area within the City of Colton. Additionally, the project site is not located in a Very High Fire Hazard Severity Zone (California Department of Forestry and Fire Protection (Cal Fire) 2025). The closest Very High Fire Hazard Severity Zone is located approximately 3.7 miles southeast of the project site in the Jurupa Hills. Therefore, the risk of loss, injury, or death involving wildland fires is low. No impact will occur.

Mitigation Measures

HAZ-1 Prior to construction, a limited soil vapor screening at the project site will be completed to evaluate the former adjacent gas station operations. If contamination is discovered during screening, further investigation shall be conducted by a qualified environmental professional to determine the extent of contamination. Appropriate remediation actions will be implemented in compliance with applicable regulatory standards and under oversight from the relevant regulatory agency, as appropriate, prior to commencing construction activities.

HAZ-2 Contractors will be required to comply with all applicable health and safety regulations, including Cal/OSHA Standards. Best Management Practices during construction may include the following measures to reduce or control environmental health hazards:

- Any contaminated soil or groundwater encountered during construction will be collected and disposed of in accordance with federal and state regulations.
- A Spill Prevention, Control Countermeasures and Containment Plan will be prepared and implemented for the storage, handling, use or disposal of hazardous materials and will comply with the Model Toxics Control Act. A specific staging area will be designated for equipment repair, fuel storage, and refueling, which will include measures for containing spills.

- If a hazardous material spill occurred, the contractor will immediately notify the City and if necessary call the appropriate emergency response agency. The contractor will be required to have materials on-site, such as absorbent pads, to ensure the spill is contained immediately.
- All hazardous materials used in construction will have a required Material Safety Data Sheet filed on-site.

HAZ-3 Prior to construction, San Bernardino County will develop a Traffic Control Plan with the design builder. This Traffic Control Plan will incorporate measures that ensure lane closures do not significantly impact North Pepper Avenue's ability to act as an emergency evacuation route.

Hydrology and Water Quality

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
(a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☐	☒	☐	☐
(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 off-site;	☐	☐	☒	☐
(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; or	☐	☒	☐	☐
(iv) Impede or redirect flood flows?	☐	☐	☐	☒

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
(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?	☐	☐	☐	☒

a. Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

Less Than Significant Impact with Mitigation Incorporated

The proposed project will be required to comply with all applicable local, state, and federal water quality standards and waste discharge requirements. Construction of the project will disturb more than one acre of land and, therefore, is subject to the NPDES Construction General Permit administered by the State Water Resources Control Board (State Board) in accordance with the CWA.

To comply with the NPDES permit, the project applicant will submit a Notice of Intent (NOI) to the State Board and prepare a SWPPP. The SWPPP will identify and implement BMPs to control erosion, sedimentation, and pollutant discharges during construction in accordance with Mitigation Measure HYD-1. Post-construction stormwater management will also incorporate BMPs to address urban runoff and long-term water quality impacts.

The project will be designed to conform with the City of Colton's Stormwater and Groundwater Ordinances as applicable. If applicable, a Water Quality Management Plan (WQMP) will be prepared to ensure compliance with post-construction water quality objectives, including Low Impact Development (LID) practices to treat and manage runoff on-site.

Through adherence to these regulatory requirements and implementation of construction and post-construction BMPs, the project will avoid violations of water quality standards and prevent degradation of surface or groundwater quality. Therefore, impacts will be less than significant.

b. Would the project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

No Impact

The project site is fully developed and paved, currently functioning as a surface parking lot. The proposed construction of a parking garage will not result in increased impervious surface area or alter existing groundwater recharge conditions. The project will not involve the use of groundwater wells or the extraction of groundwater for any purpose. Water supply for the project will be provided by the City of Colton's municipal water system. As the project will not result in increased groundwater use or affect the natural recharge of groundwater in the area, it will not conflict with or impede sustainable groundwater management. Therefore, no impact will occur.

c. Would the project 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?

Less Than Significant Impact with Mitigation Incorporated

The project site is currently developed, relatively flat and predominantly covered by existing impervious surfaces. There are no natural streams, rivers, or drainage features on or adjacent to the site, and the project will not alter any natural watercourses.

During construction, activities such as clearing, excavation, and grading may temporarily expose soils to wind or water erosion, which could result in short-term erosion or siltation if not properly managed. However, because the project will disturb more than one acre, it is subject to the NPDES Construction General Permit. As a condition of the permit, the contractor will be required to prepare and implement a SWPPP incorporating BMPs such as silt fencing, fiber rolls, and erosion control mats to minimize potential erosion during construction (see Mitigation Measure HYD-1).

Following construction, the project site will remain primarily paved, and the net increase in impervious surface area will be negligible, as the new parking garage will be constructed on an already paved surface lot. Drainage patterns will remain largely unchanged, and stormwater will continue to be directed into the existing municipal storm drain system in accordance with local standards.

Given the flat terrain, minimal change in impervious area, and implementation of BMPs during construction, the project will not result in substantial erosion or siltation on- or off-site. Therefore, this impact will be less than significant.

ii. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

Less Than Significant Impact

The project site is already developed and predominantly paved as part of an existing surface parking lot. As such, the construction of a parking garage will not result in a substantial increase in impervious surface area or significantly alter existing surface runoff conditions.

Stormwater generated by the site will continue to be conveyed into the existing municipal storm drain system, consistent with the current drainage pattern. During construction, temporary drainage controls and BMPs will be implemented as part of the project's SWPPP to prevent localized flooding or pooling.

Post-construction, the project will maintain or upgrade on-site drainage infrastructure, as necessary, to ensure compliance with applicable stormwater design standards established by the City of Colton. Because the project will not increase impervious surface area beyond existing conditions, it will not result in a significant increase in the volume or rate of surface runoff. As such, the project will not cause on-site or off-site flooding. Therefore, impacts related to surface runoff and flooding will be less than significant.

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?

Less Than Significant Impact with Mitigation Incorporated

The proposed project will be constructed on an already developed and paved surface parking lot, and as such, will not substantially increase impervious surface area. Stormwater runoff from the project site will continue to be conveyed into the existing municipal storm drain system.

Stormwater will be managed in accordance with applicable City of Colton stormwater regulations. The project will comply with post-construction stormwater management requirements, including LID strategies and, if applicable, a WQMP. These measures are designed to ensure that stormwater volumes do not exceed the capacity of local infrastructure and that pollutants are minimized prior to discharge.

During construction, the project will be subject to the NPDES Construction General Permit and will implement a SWPPP with appropriate BMPs to reduce the potential for sediment and pollutant discharge, as described in Mitigation Measure HYD-1.

Given the existing developed conditions of the site, the lack of significant new impervious surfaces, and required adherence to stormwater quality and quantity controls, the project will not generate runoff that exceeds the capacity of local drainage systems or result in substantial polluted runoff. Therefore, the impact will be less than significant.

iv. Impede or redirect flood flows?

No Impact

A significant impact may occur if a project is located within a designated flood hazard area and could impede or redirect flood flows, thereby increasing flood risk to people or property. The project site is located within Federal Emergency Management Agency (FEMA) Flood Zone X, which represents areas of minimal flood hazard, including areas with a 0.2% annual chance of flood (FEMA, 2016).

The project does not involve the alteration of natural floodways or the placement of structures in a mapped special flood hazard area. Additionally, the parking structure will be constructed on a previously developed and paved site, and will not significantly change topography or existing drainage patterns in a way that could impede or redirect flood flows. Therefore, no impact will occur.

d. Would the project in flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

No Impact

The project site is not located within a designated flood hazard area, tsunami inundation zone, or seiche zone. According to the FEMA Flood Insurance Rate Map (FIRM), the site is within Zone X, which represents areas of minimal flood risk (FEMA, 2016).

The site is not near an enclosed body of water that will pose a seiche risk, nor is it within a coastal area subject to tsunami hazards. Therefore, there is no risk that project-related pollutants will be released as a result of inundation from flood, tsunami, or seiche events. Therefore, the project will result in no impact related to pollutant release due to inundation.

e. Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

No Impact

The project will not conflict with or obstruct implementation of a water quality control plan or a sustainable groundwater management plan. The site is already developed and existing municipal water and wastewater infrastructure are available to serve the project. The project will comply with applicable stormwater management requirements under the Santa Ana Regional Water Quality Control Board's Water Quality Control Plan, and it does not involve groundwater extraction or changes to groundwater recharge. Therefore, the project will not conflict with regional water quality or groundwater sustainability planning and no impact will occur.

Mitigation Measures

HYD-1 The SWPPP will incorporate construction BMPs that may include the following or similar measures to minimize erosion and sediment impacts:

- Mulch disturbed areas with straw or wood chips if left undisturbed for longer periods.
- Cover stockpiled soil with plastic.
- Cover disturbed soils during wet weather (if uncovered for more than two days if not being worked).
- Keep staging and travel areas clear of dirt.
- Install rock pad construction entrances.
- Install truck wheel wash as necessary.
- Install silt fencing around disturbed areas

Land Use and Planning

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
(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?	☐	☐	☐	☒

a. Would the project physically divide an established community?

No Impact

The project site is part of the ARMC campus and the surrounding area is comprised of

commercial uses. There are no residential properties close to the project site. In addition, it does not change the existing use as a parking lot. Therefore, the project will not physically divide an established community and no impact will occur.

b. Would the project 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?

No Impact

The project site is designated as Public/Institutional on both the General Plan Land Use Map and Zoning Map (City of Colton 2023). According to City of Colton Municipal Code Section 18.29.010, the Public/Institutional zone is intended to accommodate public facilities and service installations, including hospitals and related uses. The proposed parking garage, serving an existing medical center, is consistent with both the General Plan and zoning designations. Therefore, the project will not conflict with any applicable land use plan or regulation, and no impact will occur.

The project site lies adjacent to, but outside of, the Hub City Centre Specific Plan area (City of Colton 2014). Parcels associated with the ARMC, including the project site, are excluded from the Specific Plan boundaries. The Specific Plan identifies the medical center and nearby Hermosa Memorial Cemetery as long-term, compatible land uses consistent with the City's General Plan. As such, the project does not conflict with the policies of the Specific Plan or any other applicable land use policy.

Additionally, the project site is adjacent to a designated mitigation area for the federally endangered DSF established as part of the construction for the original ARMC building. However, the existing site consists entirely of paved surface parking with no suitable DSF habitat. All construction, including staging, will occur within the current disturbed footprint and/or an additional nearby parking area (Figure 2). As such, the project will not impact the HCP or conflict with any habitat-related plans or mitigation areas.

Therefore, the project will not result in a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted to avoid or mitigate environmental effects. No impact will occur.

Mitigation Measures

No mitigation measures are proposed for land use and planning as no impacts to these resources are anticipated by the proposed project.

Mineral Resources

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
(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?	☐	☐	☐	☒

a. Would the project 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?

No Impact

According to California Geological Survey's most recent Mineral Land Classification Report, the project site is located in an area zoned as Mineral Resource Zone (MRZ) 3 for aggregate mineral resources (CDOC 2008). MRZ-3 is defined as an area containing known or inferred mineral occurrences of undetermined mineral resource significance. Neither the project site nor the adjacent area is identified as an area containing mineral deposits of regional or statewide significance. Therefore, no impact on the availability of known mineral resources will occur.

b. Would the project 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?

No Impact

There are no known mineral resources within the project area and the project is not located adjacent to an existing or abandoned mine or quarry or within a locally important mineral resource recovery site. Furthermore, mining at the project site will not be compatible with the existing and planned land uses onsite. The project site is currently a surface parking lot associated with the ARMC and is listed as Public/Institution on the City of Colton Land Use Plan (City of Colton 2019). Therefore, no impact on locally-important mineral resource recovery sites delineated on a local general plan, specific plan or other land use plan will occur.

Mitigation Measures

No mitigation measures are proposed for mineral resources as no impacts to these resources are anticipated by the proposed project.

Noise

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project result in:				
(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?	☐	☐	☒	☐

a. Would the project result in 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?

Less than Significant Impact with Mitigation Incorporated

Sensitive noise receptors in the vicinity of the project site include commercial offices, restaurants, retail stores, and the ARMC. There are no residential or recreational receptors within a 1,000 feet radius of the project site.

The San Bernardino County Municipal Code (Section 83.01.080) limits the permissible hours of construction between 7:00 am and 7:00 pm, Monday through Saturday. No construction is permitted on Sundays or on federal holidays (San Bernardino County 2014). The City of Colton does not have an ordinance specific to construction noise. The project applicant will be required to comply with construction hour restrictions.

Construction Noise: Construction will require the use of heavy equipment for demolition of the existing pavement, grading, building construction and paving. Construction equipment will include excavators, jack hammers, dozers, dump trucks, rollers, compactors, cranes, cement mixers, and backhoes, as well as smaller equipment such as saws, hammers, and other power tools. Maximum construction noise levels can range from 80 to 88 decibels (dBA) at a distance of 50 feet from the sound source. There will also be secondary noise from construction worker vehicles and vendor deliveries. Thus, construction will result in a temporary increase in daytime noise levels in the vicinity of the project that will last during the construction period. However,

construction noise is exempt from the sound levels in the noise ordinance, as long as the construction activities only occur between 7 am and 7 pm Monday through Saturday (if other hours are needed a noise variance will be required). The project is not anticipated to conduct construction outside the period listed in the noise ordinance. In addition, the contractor will be required by the City to implement Mitigation Measures NOI-1. Thus, the project noise effects from construction will be less than significant with mitigation.

Operational Noise: Parking structures generate noise from vehicle engines, tires squealing, doors closing, car alarms, and people talking. Noise levels within the garage structure will fluctuate based on the types of noise sources and the overall level of activity within the garage. Noise levels will be highest during shift change hours when hospital employees are entering and exiting the parking structure. The project site is currently occupied by an existing surface parking lot. Operational noise from the project will likely remain similar to existing noise levels but may increase slightly due to the increase in parking spaces. However, the parking structure itself will shield some of this additional noise due to the solid walls. Therefore, noise impacts during operation will be less than significant.

b. Would the project result in generation of excessive groundborne vibration or groundborne noise levels?

Less than Significant Impact

The City of Colton Municipal Code (18.42.050) states that all activities shall be operated so as not to generate ground vibration by equipment other than motor vehicles, trains or by temporary construction or demolition, which is perceptible without instruments by the average person at or beyond any lot line of the lot containing the activities (Colton 1992). San Bernardino County Municipal Code (83.01.090) limits construction activities that generate vibration between 7:00 am and 7:00 pm, Monday through Saturday. No construction is permitted on Sundays or on federal holidays (San Bernardino County 2007).

Construction activities (e.g., ground-disturbing activities, including movement of heavy construction equipment and hauling of demolition debris and soil from the project site) may generate localized groundborne vibration and noise. Generally, construction-related groundborne vibration is not expected to extend beyond 25-50 feet from the generating source. The level of vibration expected will not cause any structural damage since there are no structures near the project site.

The parking structure once operational will not involve the use of stationary equipment that will result in high vibrational levels. Additionally, the parking structure is designed to accommodate standard-sized automobiles and light duty trucks. No oversized vehicles capable of producing substantial groundborne vibration will access the site. Accordingly, no permanent groundborne vibration or noise levels are expected to be produced by the project. Therefore, impacts related to groundborne noise or vibration will be minimal and this impact will be less than significant.

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?

Less than Significant Impact

The project is not located within an airport land use plan, or within two miles of an airport (San Bernardino County 2020). The closest airport is the San Bernardino International Airport, which

is located approximately five miles to the northeast of the project site. The ARMC has a heliport (FAA Identifier 4CL9) for private and medical use to the north of the project site. The heliport has infrequent helicopter air traffic that is incidental to the operation of ARMC and occurs during medical emergency evacuations. Because the operation of the heliport occurs infrequently, impacts from noise levels associated with airport uses will be minimal and this impact will be less than significant.

Mitigation Measures

NOI-1 There are typical construction BMPs related to noise mitigation, which should be implemented during construction:

- Use smart back-up (low noise) alarms on construction vehicles.
- Use low-noise emission equipment.
- Keep equipment maintained in good working order.
- Implement noise-deadening measures for truck loading and operations.
- Use acoustic enclosures, shields, or shrouds for equipment, as practical.
- Install high-grade engine exhaust silencers and engine-casing sound insulation.
- Minimize the use of generators or use whisper-quiet generators to power equipment.
- Use movable noise barriers at the source of the construction activity if possible.

Population and Housing

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
(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?	☐	☐	☐	☒

a. Would the project 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)?

No Impact

The project will not provide additional services that will be expected to induce population growth. No changes to the current labor force or required specialized capabilities are anticipated post construction; therefore, the project will not require the import of new workers. The project is an expansion of existing parking for the ARMC. The project does not include any new homes or businesses. The nearest parcel zoned for residential development is 0.3 mile to the northwest of the proposed project area, on the other side of a 68-acre section identified as retail. As a result, no impact will occur.

b. Would the project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

No Impact

There are no residential uses within or adjacent to the project site. The project site is currently used as a surface parking lot for the ARMC. Therefore, the project will not displace existing people or housing and no impact will occur.

Mitigation Measures

No mitigation measures are proposed for population and housing as no impacts to these resources are anticipated by the proposed project.

Public Services

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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:				
(a) Fire protection?	☐	☐	☒	☐
(b) Police protection?	☐	☐	☒	☐
(c) Schools?	☐	☐	☐	☒
(d) Parks?	☐	☐	☐	☒
(e) Other public facilities?	☐	☐	☐	☒

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 fire protection?

Less than Significant

Fire protection at the site is provided by the City of Colton Fire Department, which operates four fire stations. Station 212, located at 1511 North Rancho Avenue, is the closest to the project, located approximately 1.7 miles from the site. The station operates with a medic engine (a fire truck equipped and staff to provide advanced life support medical care in addition to its firefighting capabilities) and a wildland unit used for brush and wildlife fire response. The average response time to the project site is estimated to be 5 to 8 minutes under normal traffic conditions. The project area is adequately served by the four fire stations.

The project will be built to meet applicable fire safety standards, including the CBC regulations. Ongoing coordination with the Fire Marshall is taking place during the planning for the project. The City of Colton Fire Department reviews all development projects to ensure compliance with fire and life safety codes.

During construction, access will be maintained through the project area at all times for emergency vehicles. This may include the use of flaggers, maintaining one lane open for traffic at all times, and coordinating all road work and temporary lane closures with the fire department. A traffic control plan will also be developed and implemented and include measures for opening up the road during an emergency. As a result, this impact will be less than significant.

b. 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 police protection?

Less than Significant

Police protection at the site is provided by the Colton Police Department, located at 650 North La Cadena Drive, approximately 2.2 miles from the project site. The department runs 2 day and 2 night shift patrols and includes an investigations bureau, code compliance and animal services, records supervisor, dispatchers and an operations branch. Generally, average response times to the project area are estimated at 10 minutes (based on average US response times). The project area is adequately served by the existing police station.

The parking structure's ground floor will be enclosed and the facility will be gated and lighted at night to help deter any criminal activity. In addition, landscaping and lighting will be designed so as to provide deterrence to criminals (includes implementing the principles of "Crime Prevention Through Environmental Design" [CPTED]). As a result, the project will not substantially increase the demand for public services, including police protection.

During construction, access will be maintained through the project area at all times for police vehicles. This may include the use of flaggers, maintaining one lane open for traffic at all times, and coordinating all road work and temporary lane closures with the police department. A traffic

control plan will also be developed and implemented and include measures for opening up the road during an emergency. As a result, this impact will be less than significant.

c. 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 schools?

No impact

The additional parking associated with the proposed project is designed to accommodate identified staff parking needs. The additional parking is not expected to cause an increase in the number of people in the community or affect access to local schools as a traffic control plan will be implemented to move traffic through the construction zone. Therefore, no impacts to schools are anticipated.

d. 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 parks?

No impact

The nearest public recreational facility is the Colton Golf Course located at 1901 West Valley Boulevard, which is approximately 0.6 mile away. No other recreational facilities are located near the site. The project will not result in an increase in population, thus there will no increase in demand for recreational facilities. Construction will not affect access to recreational sites or parks since there will be a traffic control plan implemented to allow free flow of traffic through the construction zone. Therefore, no impacts to parks are anticipated.

e. 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 other public facilities?

No impact

The additional parking associated with the proposed project is designed to accommodate identified staff parking needs. The additional parking is not expected to cause an increase in the number of people in the community. Therefore, the project will not result in the need for new or improved public facilities. Construction will be conducted in a manner so as not to impact traffic movements around the site and no impact will occur.

Mitigation Measures

The principles of CPTED will be used to help deter criminal activity. CPTED involves strategic plant placement, lighting, controlling access, using signage and architectural features that define property boundaries, and keeping the site free of hazards to create a secure and less inviting

environment for potential offenders. No other measure are proposed as impacts are anticipated to be less than significant.

Recreation

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	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?	☐	☐	☐	☒

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?

No Impact

The nearest public recreational facility is the Colton Golf Course located at 1901 West Valley Boulevard, which is approximately 0.6 mile away. No other recreational facilities are located near the site.

The additional parking associated with the proposed project is designed to accommodate identified staff parking needs. The additional parking is not expected to cause an increase in staff or local population. Therefore, no increased demand for parks and recreational facilities are anticipated.

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?

No Impact

The project will not create new, or expand existing, recreational facilities. No impact on the environment will occur.

Mitigation Measures

No mitigation measures are proposed for recreation resources as no impacts to these resources are anticipated by the proposed project.

Transportation

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
(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 section 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?	☐	☒	☐	☐

The project will result in a temporary loss of employee parking during construction as parking spaces in ARMC Lot 1 will be lost, as well as the parking spaces in the staging area. This will temporarily increase traffic circulation as employees search for other parking spaces. In addition, construction staging will be on a portion of the surface parking lot north of Plum Place between I-10 and Green Circle and will temporarily remove approximately 401 parking spots. Alternate offsite parking with shuttle service to the ARMC campus will be provided to employees while spots are temporarily unavailable during construction. It also may be possible for the hospital to implement temporary ride sharing opportunities to offset this need for parking during the construction period.

Operation of the proposed project will provide parking spaces to augment the capacity of the existing employee parking lots in which demand currently exceeds supply. The project does not generate additional vehicle trips at the ARMC campus but will redistribute existing employee trips from current surface parking lots to the new structure.

The proposed parking structure is restricted to ARMC campus employees and will not affect patient and visitor access to the ARMC or their circulation within the campus street network. Access to the parking structure will require employees to scan identity badges to enter the facility. The project will alleviate the excess circulation caused by employees searching for an available parking space and reduce traffic congestion on the campus' internal street network.

The project's location, situated at the southern edge of the ARMC campus, will capture employee traffic destined for the ARMC — the majority (80%) of which access the site from the south via the Interstate 10 (I-10) interchange at North Pepper Avenue — and reduce traffic on

the public streets surrounding the ARMC campus. The capture of employee traffic at the south end of the campus combined with the reduction in excess circulation by employees searching for parking will have an overall effect of slightly reducing the ARMC's generation of vehicle miles travelled (VMT).

a. Would the project conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

Less than Significant Impact

The proposed project will not conflict with any agency program plan, ordinance, or policy because, except for a temporary increase in traffic during its construction, the project does not generate new vehicle trips or significantly alter traffic patterns or modify existing transit, roadway, bicycle and pedestrian facilities. The project will reduce traffic conflicts with vehicles, pedestrians, and bicyclists on ARMC's internal street network by reducing excess circulation caused by employees searching for available parking in multiple employee surface parking lots and by capturing employee traffic accessing the ARMC at the southernmost edge of the campus close the I-10 freeway interchange used by the majority of vehicles destined to the facility. This results in a less than significant impact.

b. Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?

Less than Significant Impact

The proposed project does not generate new vehicle trips over and above existing the ARMC's trip generation and will not increase VMT resulting in a less than significant transportation impact on the environment as measured using VMT. Thus, the project will not conflict or be inconsistent with Section 15064.3.

c. Would the project substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Less than Significant Impact

The proposed project does not require any offsite modifications to the adjacent streets or intersections and, thus, does not alter the existing geometric design accessing the ARMC campus or the existing parking lot.

d. Would the project result in inadequate emergency access?

Less than Significant with Mitigation Incorporated

The project is located adjacent to City of Colton Evacuation Routes along West Valley Boulevard and North Pepper Avenue (City of Colton 2018). The project may include temporary lane closures for the purpose of utility tie-ins. The closures will be short in duration (four to six weeks) and one lane of travel will always remain open in each direction. In the event of an emergency, the full roadway will be reopened to allow for evacuations. San Bernardino County will develop a Traffic Control Plan in accordance with Mitigation Measure HAZ-2. Once the

construction is complete, North Pepper Avenue will regain its full operational use, and the Emergency Evacuation Plan will not need to be altered.

Because the lane closure is temporary and short in duration, and a Traffic Control Plan will be developed, implementation of the project will not impair implementation of, or physically interfere with, an adopted response plan or emergency evacuation plan and this impact will be less than significant.

Once constructed, the proposed project will utilize the current Plum Street access used by the existing surface parking lot and not change or obstruct the current number of access points or existing circulation patterns / routing of the internal ARMC campus internal street network and, therefore, has a less-than-significant impact on emergency access.

Mitigation Measures

The project will incorporate Mitigation Measure HAZ-2 to reduce all transportation-related impacts to less than significant.

Tribal Cultural Resources

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
(a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 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:				
(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 section 5020.1(k), or	☐	☒	☐	☐

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
(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 Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☒	☐	☐

a. Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 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:

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 section 5020.1(k)?

Less Than Significant With Mitigation Incorporated

On March 25, 2025, a cultural resources records search was conducted at the SCCIC, California State University, Fullerton, the designated cultural resources repository for San Bernardino County. The records search indicated the project area was previously surveyed through two large-scale archaeological studies completed in 1986 and 1987, as well as a focused cultural resources survey conducted specifically for the existing ARMC facility in 1990 (Bixler 1986; 1987; Weisbord 1990). These investigations identified no cultural resources within or adjacent to the current project boundaries. The entire project area has been substantially disturbed due to prior construction activities associated with development of the ARMC campus and parking areas since the 1990s. Currently, the site does not retain characteristics of the native landscape and is highly unlikely to contain intact, significant archaeological deposits related to prehistoric or historical tribal cultural resources in near-surface soils.

Nevertheless, there remains a remote possibility that previously unidentified tribal cultural resources could be encountered during construction. Implementation of Mitigation Measures CUL-1 (addressing inadvertent discovery of cultural resources) and CUL-2 (addressing inadvertent discovery of human remains) would effectively reduce potential impacts to tribal cultural resources to less-than-significant levels.

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 Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe?

Less Than Significant With Mitigation Incorporated

On March 24, 2025, CRM TECH requested a records search from the California NAHC SLF. On March 25, 2025, the NAHC indicated that the SLF identified unspecified Native American cultural resources in the general vicinity of the project area, recommending further consultation with local Native American groups, specifically the Chemehuevi Indian Tribe. CRM TECH subsequently reached out to Chemehuevi Chairman Glenn Lodge and Cultural Director Kaitlyn Snodgrass via email; however, no responses have been received to date.

On April 18, 2025, the County of San Bernardino initiated formal consultation under AB 52 by sending letters to tribes identified on the NAHC Tribal Consultation List. The consultation period under AB 52 is currently ongoing, and at the time of this evaluation, no tribes have provided additional information or expressed concerns regarding tribal cultural resources specific to the project site.

Although no known specific tribal cultural resources have been identified within the project boundaries and the site is highly disturbed by past development, the NAHC's SLF results suggest a potential, albeit limited, for previously unidentified tribal resources. Implementation of Mitigation Measures TRI-1 (addressing inadvertent discovery of tribal resources) will ensure impacts to any potential tribal cultural resources encountered during project construction are properly treated. If additional information or recommendations are provided by tribes during the ongoing AB 52 consultation process, the County will incorporate them into the project as appropriate. With mitigation incorporated, potential impacts to tribal cultural resources would be less than significant.

Mitigation Measures

TRI-1 In the event that objects, features, or artifacts that may be tribal cultural resources are encountered during the course of project construction, all work within the immediate vicinity of the find shall temporarily cease. The potential tribal cultural resource shall be properly assessed and treated in accordance with PRC Section 21074(a)(2). Appropriate measures, which may include avoidance, preservation in place, or other mutually acceptable treatment, shall be developed in consultation with the affiliated California Native American tribe(s), if applicable, prior to resumption of ground-disturbing activities.

Utilities and Service Systems

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
(a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water 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 project's projected demand in addition to the provider's 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 statutes and regulations related to solid waste?	☐	☐	☐	☒

a. Would the project require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?

Less than Significant

The proposed project will involve the construction of a parking garage to serve the ARMC and will tie into existing utility infrastructure operated by the City of Colton, including water, wastewater, stormwater, electricity, and telecommunications systems. The project is located within a fully urbanized area with established public services and utilities, and the necessary connections will be made using existing service laterals or utility corridors.

The project will not require the construction of new off-site infrastructure or the expansion of existing water or wastewater treatment facilities. Water demand and wastewater generation from the parking garage will be minimal and will not exceed the capacity of the existing municipal systems. Similarly, stormwater from the site will be managed on-site consistent with the City's stormwater requirements, as applicable, and no major storm drainage system improvements or expansions are anticipated.

Electrical service will be extended from existing City of Colton electric utility lines, and any new connections will occur within the project footprint or immediately adjacent ROWs. No new natural gas service is proposed, and telecommunications needs will be met through existing service providers and connections.

Because the project will utilize existing infrastructure with only minor extensions or tie-ins, as needed, and will not require new off-site utility facilities, the potential for significant environmental effects related to utility infrastructure is considered less than significant.

b. Would the project have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?

Less than Significant

The proposed project involves the construction of a parking garage within the ARMC campus in the City of Colton. The project will be served by the City of Colton Water Department, which provides potable water to the area and prepares an Urban Water Management Plan (UWMP) in compliance with state law.

The water demands associated with the parking garage will be minimal and primarily limited to landscaping irrigation, fire protection, and limited plumbing fixtures (e.g., in a security room, if applicable). These demands are minor compared to typical commercial or residential uses and will not significantly impact the City's overall water supply portfolio.

According to the City of Colton 2020 UWMP, the City has adequate water supplies to meet existing and projected demands through normal, single dry, and multiple dry years. The project will not require water beyond what has been planned for in the UWMP, and it will not conflict with or obstruct implementation of water supply planning. Therefore, sufficient water supplies are available, and the impact will be less than significant.

c. Would the project result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

Less than Significant

The proposed project will connect to the City of Colton's municipal sewer system, which conveys wastewater to the City of Colton Wastewater Treatment Plant (WWTP). The City of Colton operates two WWTPs that have a total treatment capacity of approximately 8 million gallons per day (MGD). The average daily wastewater flow to the WWTP ranges from 5.2 MGD to 5.6 MGD (City of Colton 2025). As a parking structure, the project will generate a negligible amount of wastewater. This incremental increase in demand will not exceed the City's existing wastewater treatment capacity or interfere with its ability to serve other planned developments.

Therefore, the City's wastewater treatment provider has adequate capacity to serve the project's projected wastewater demand in addition to existing commitments, and impacts will be less than significant.

d. Would the project 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?

Less than Significant

The proposed project will result in a limited amount of solid waste during both construction and operation. Construction-related waste, such as concrete, asphalt, and packaging materials, will be generated on a temporary basis and disposed of at a permitted solid waste facility. Contractors will be required to comply with all applicable state and local requirements for construction waste management.

During operation, the parking garage will generate minimal solid waste, primarily from maintenance and incidental employee use. Solid waste collection and disposal services will be provided by a permitted waste hauler in accordance with City of Colton regulations, as applicable.

Solid waste from the project site will be disposed of at the Mid-Valley Sanitary Landfill (MVSL), located at 2390 North Alder Avenue in Rialto. MVSL has a permitted maximum daily disposal rate of 7,500 tons and, as of recent reports, the landfill has a remaining capacity of 67,520,000 cubic yards and is projected to remain operational until 2037 (CalRecycle 2025). The project will not generate solid waste in quantities that will exceed the capacity of local infrastructure or conflict with applicable solid waste diversion or reduction goals. Therefore, impacts related to solid waste generation and disposal will be less than significant.

e. Would the project comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

No Impact

The project will comply with federal, state, and local statutes and regulations related to solid waste. As a result, no impact will occur.

Mitigation Measures

No mitigation measures are proposed for utility and service systems since the project will not exceed the City of Colton's current capacity and all impacts are anticipated to be less than significant.

Wildfires

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	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?	☐	☐	☐	☒

a. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project substantially impair an adopted emergency response plan or emergency evacuation plan?

No Impact

This proposed project area is located in a relatively flat area surrounded by urban development. The project is not within a State Responsibility Area (SRA); it is located within a Local Responsibility Area (LRA). It is in an area identified as having no Fire Hazard Severity Zone, per Government Code section 51178 (Cal Fire 2025). The closest Very High Fire Hazard Severity Zone is over a mile south of the project site (Cal Fire 2025). Project coordination has already occurred with the City Fire Marshal. The project will not substantially impair an adopted emergency response plan or emergency evacuation plan. No impact will occur.

b. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project, 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?

No Impact

The proposed project area is located in a relatively flat area surrounded by urban development. The project is not within a SRA; it is located within a LRA. The project is not within an area designated as a Fire Hazard Severity Zone, per Government Code section 51178 (Cal Fire 2025). On-site fire protection measures (e.g., fire extinguishers, sprinklers) will be implemented as part of the project. Construction of the proposed project is not anticipated to exacerbate wildfire risks and expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire. No impact will occur.

c. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project 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?

No Impact

This proposed project area is located in a relatively flat area surrounded by urban development. The project is not within a SRA; it is located within a LRA. It is located in an area identified as having a no Fire Hazard Severity Zone designation, per Government Code section 51178 (Cal Fire 2025). The project will not require the installation or maintenance of roads or fuel breaks. There are proposed utility (e.g., power, water) tie-ins with the existing City systems, however, the proposed project is not anticipated to exacerbate fire risk or that may result in temporary or ongoing impacts to the environment. Furthermore, the County Office of the Fire Marshal has requested the installation of fire suppressors (e.g., fire hydrants, sprinklers) as part of the project. No impact will occur.

d. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project 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?

No Impact

This proposed project area is located in a relatively flat area surrounded by urban development. The project is not within a SRA; it is located within a LRA. It is located in an area identified as having a no Fire Hazard Severity Zone designation, per Government Code section 51178 (Cal Fire 2025). The closest Very High Fire Hazard Severity Zone is over a mile south of the project site (Cal Fire 2025). Therefore, the project will not expose people or structures to significant risks as a result of post-fire instability including downslope or downstream flooding or landslides. No impact will occur.

Mitigation Measures

No mitigation measures are proposed for wildfire resources as no impacts to these resources are anticipated by the proposed project.

Mandatory Findings of Significance

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
(a) Does the project have the potential to substantially 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, substantially 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?	☐	☐	☒	☐

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?

Less than Significant

As evaluated in the Biological Resources and Cultural Resources sections of this document, the project site is fully developed and paved as part of the existing ARMC campus and does not contain natural habitat, wetlands, or other sensitive biological resources. No special-status plant species are present at the project site, and while the federally endangered DSF occurs adjacent to the project area, implementation of Mitigation Measure BIO-1 will ensure that no direct or

indirect impacts to DSF habitat occur during construction. Potential impacts to nesting birds protected under the MBTA will be avoided through implementation of Mitigation Measure BIO-2.

In terms of cultural resources, the site has been extensively disturbed by previous development and has low potential to contain intact historical or archaeological resources. However, the possibility of encountering previously undiscovered cultural resources, tribal cultural resources, or human remains cannot be entirely discounted. Implementation of Mitigation Measures CUL-1, CUL-2, and TRI-1 would ensure that any such discoveries are properly evaluated and treated according to applicable regulatory requirements.

With implementation of these mitigation measures, the project would not substantially degrade the quality of the environment, reduce habitat for fish or wildlife species, threaten plant or animal communities, restrict the range of rare or endangered species, or eliminate important examples of California history or prehistory. Therefore, impacts would be less than significant.

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?

Less than Significant

Given the relatively small size and limited scope of the project, along with the implementation of mitigation measures identified for specific resource areas, the incremental effects of the construction and operation of the proposed parking structure would not be considerable when viewed in connection with the effects of past, current, or probable future projects.

The project would not contribute substantially to any cumulative impacts related to cultural resources, biological resources, air quality, greenhouse gas emissions, transportation, or other environmental areas evaluated in this document. Therefore, the project would not result in cumulatively considerable impacts, and impacts would be less than significant.

c. Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?

Less than Significant

A significant impact could occur if the project would result in substantial adverse effects on human beings, either directly or indirectly, through environmental impacts such as hazards, air quality, noise, or traffic. However, as described throughout this document, the project would not result in any significant environmental impacts with implementation of the identified mitigation measures, where applicable. Accordingly, the project would not cause substantial adverse effects on human beings, and impacts would be less than significant.

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Appendix A

Special-Status Species Evaluation

Species Name	Listing Status	Life History	Potential to Occur
Invertebrates			
Crotch's bumble bee (*Bombus crotchii*)	SC	Crotch's bumble bee is found between San Diego and Redding in a variety of habitats including open grasslands, shrublands, chaparral, desert margins, and semi-urban settings.	**Unlikely** There are two California Natural Diversity Database (CNDDB) occurrences within 2 miles of the project area. The project area is in an urban environment, but some potentially suitable habitat may be present on the adjacent vacant parcel that is currently a conservation area for Delhi sands flower-loving fly. However, given the urban nature of this habitat, this species is unlikely to occur.
Delhi Sands flower-loving fly (DSF) (*Rhaphiomidas terminatus abdominalis*)	FE	The DSF is endemic to the Colton Dunes (Delhi sands series soils). Suitable habitat for this species includes loose and sandy soils for egg-laying, floral species to consume the nectar from, and possibly island habitat distribution rather than corridors. Oviposition (egg-laying) occurs within loose, sandy soils in late summer months and may primarily occur near telegraph weed (*Heterotheca grandiflora*). Larval stages develop completely underground and emerge as adults from July through September. Adult DSF flight period is typically July through September, when individual adults emerge, reproduce and die. The adult life span of an individual DSF is thought to last for a few weeks at most.	**Low Potential, but Known to Occur on Adjacent Property** There are 30 CNDDB occurrences within 2 miles of the project area. The project area is fully paved and does not contain habitat for this species. However, suitable habitat is present directly adjacent to the project site in a conservation area established for the species and the species is known to be present at this location.
Monarch butterfly (*Danaus plexippus* pop. 1)	FC	Monarch butterfly occurs along coast from northern Mendocino to Baja California, Mexico. Monarch butterfly is closely associated with its host plant, milkweed (*Asclepias spp.*). Winter roosts in wind-protected tree groves (eucalyptus [*Eucalyptus* spp.], Monterey pine [*Pinus radiata*], and cypress [*Hesperocyparis* spp.]), with nectar and water sources nearby.	**None** No suitable habitat is present in or near the project area.

Species Name	Listing Status	Life History	Potential to Occur
Fish			
Arroyo chub (*Gila orcuttii*)	SSC	Arroyo chub are native to the streams and rivers of the Los Angeles plain in southern California, including the Los Angeles, San Gabriel, San Luis Rey, Santa Ana, and Santa Margarita Rivers, and Malibu and San Juan Creeks. Arroyo chub are adapted to survive in cool to warm streams that fluctuate between large winter storm flows, and low summer flows. They are most common in slow flowing or backwater areas with sand or mud substrate. They feed on plants such as algae, and on invertebrates and mollusks.	**None** No suitable habitat is present in or near the project area.
Santa Ana Sucker (*Catostomus santaanae*)	FT SSC	The Santa Ana sucker is found in three disjunct populations that occupy portions of the San Gabriel, Los Angeles, and Santa Ana River basins in Southern California. This species relies on perennial flows with suitable water quality and substrate to support breeding, feeding and sheltering. Over different life history stages, suckers depend on a variety of coarse substrate types, such as gravel, cobble, or mixtures of gravel or cobble with sand, and a variety of riverine features, like shallow riffles and deeper runs and pools.	**None** No suitable habitat is present in or near the project area.
Steelhead-southern California Distinct Population Segment (DPS) (*Oncorhynchus mykiss irideus* pop. 10)	FE SC	The southern California steelhead DPS that inhabit coastal stream networks from the Santa Maria River in San Luis Obispo County south to the U.S. border with Mexico. It is found in clear, cool water, and well-oxygenated water. It also requires abundant in-stream cover, well-vegetated stream margins, and relatively stable water flows.	**None** No suitable habitat is present in or near the project area.
Amphibians			
Western spadefoot (*Spea hammondii*)	FPL SCC	Western spadefoots require both aquatic and terrestrial habitat components in close proximity, within the dispersal distance of the species. Suitable upland vegetation conditions consists primarily of open treeless grasslands, scrub, or mixed woodland and grassland where aquatic breeding habitat is available.	**None** No suitable habitat is present in or near the project area.

Species Name	Listing Status	Life History	Potential to Occur
Reptiles			
California glossy snake (*Arizona elegans occidentalis*)	SSC	California Glossy Snake occurs from the eastern part of the San Francisco Bay Area south to northwestern Baja California. It is absent along the central coast. There are also old reports of this snake from the Santa Monica Mountains. It inhabits arid scrub, rocky washes, grasslands, and chaparral. This species appears to prefer microhabitats of open areas and areas with soil loose enough for easy burrowing.	**Unlikely** There are three CNDDB occurrences within 2 miles of the project area. The project area is in an urban environment, but some potentially suitable habitat may be present on the adjacent vacant parcel that is currently a conservation area for DSF. However, given the urban nature of this habitat, this species is unlikely to occur.
Coastal whiptail (*Aspidoscelis tigris stejnegeri*)	SSC	Coastal whiptail is found in coastal Southern California, mostly west of the Peninsular Ranges and south of the Transverse Ranges, and north into Ventura County. Ranges south into Baja California. It is found in a variety of habitats, primarily hot and dry open areas with sparse foliage - chaparral, woodland, and riparian areas.	**None** No suitable habitat is present in or near the project area.
Southern California legless lizard (*Anniella stebbinsi*)	SSC	Southern California legless lizard is found throughout Southern California south of the Transverse Ranges into northern Baja California, Mexico. It occurs in moist warm loose soil with plant cover. Moisture is essential to this species; therefore, it typically occurs in sparsely vegetated areas of beach dunes, chaparral, pine-oak woodlands, desert scrub, sandy washes, and stream terraces with sycamores, cottonwoods, or oaks. Leaf litter under trees and bushes in sunny areas and dunes stabilized with bush lupine and mock heather often indicate suitable habitat.	**None** No suitable habitat is present in or near the project area.

Species Name	Listing Status	Life History	Potential to Occur
Southwestern pond turtle (*Actinemys pallida*)	FPL SSC	The range of the southwestern pond turtle is restricted to those populations inhabiting the central Coast Range south from the middle of Monterey Bay to the species' southern range boundary in Baja California. This species is semi-aquatic, requiring both aquatic and terrestrial habitats in close proximity to each other. As habitat generalists, this species can occur in a broad range of permanent and ephemeral aquatic water bodies from remote to urban landscapes, including, but not limited to, flowing rivers and streams, lakes, ponds, reservoirs, settling ponds, and marshes. It requires basking sites within aquatic habitat such as partially submerged logs, rocks, mats of floating vegetation, or open mud banks. Nesting habitat is terrestrial and typically characterized as having sparse vegetation with short grasses and forbs and little or no canopy cover to allow for exposure to direct sunlight. The back-and-forth movements between aquatic and terrestrial habitats are typically less than 500 meters. This species is typically found at elevations below 4,700 feet.	**None** No suitable habitat is present in or near the project area.
Birds			
Coastal California gnatcatcher (*Polioptila californica californica*)	FT SSC	Coastal California gnatcatcher is an obligate, permanent resident of coastal sage scrub vegetation. It makes limited use of adjacent habitats outside of the breeding season. The species typically occurs in areas dominated by California sagebrush (*Artemisia californica*) and California buckwheat (*Eriogonum fasciculatum*). Other shrubs in the coastal sage scrub vegetation communities occupied by coastal California gnatcatcher include California bush sunflower (*Encelia californica*), brittlebrush (*Encelia farinosa*), deerweed (*Lotus scoparius*), black sage (*Salvia mellifera*), and white sage (*Salvia apiana*). The species is restricted to elevations from sea level to approximately 2,000 feet. Coastal California gnatcatcher breeds from February to late August, but most of the breeding occurs between mid-March and mid-May.	**None** No suitable habitat is present in or near the project area.

Species Name	Listing Status	Life History	Potential to Occur
Least Bell's vireo (*Vireo bellii pusillus*)	FE SE	Least Bell's vireo is a rare and local summer visitor from about mid-March to the end of August and ranges from sea level in coastal areas to approximately 1,500 feet in the interior areas. Least Bell's vireo breeds locally in willow (*Salix* sp.) riparian thickets with good overstory and understory vegetation, preferably where flowing water is present. This species typically inhabits structurally diverse woodlands along watercourses, including oak (*Quercus* sp.) woodlands, mule fat scrub (*Baccharis salicifolia*), and cottonwood-willow forests. During the breeding season, this species may forage in adjacent upland habitats. Little is known about this species' winter habitat, but it is not exclusively dependent on riparian woodland during winter. In winter, most least Bell's vireos occur in mesquite scrub vegetation in arroyos, but some also use palm groves and hedgerows associated with agricultural fields and rural residential areas. Breeding typically occurs from late March to late September.	**None** No suitable habitat is present in or near the project area.
Burrowing owl (*Athene cunicularia*)	SC SSC	Burrowing owl lives in dry, open areas with no trees and short grass. The species is found in golf courses, cemeteries, airports, vacant lots, university campuses, pastures, and prairie dog (*Cynomys* spp.) towns. It nests in burrows that are often dug by a small mammal, especially the California ground squirrel (*Spermophilus beecheyi*). Western burrowing owl is generally found at elevations from approximately 200 to 5,000 feet. This species breeds from March to August.	**Unlikely** There are two CNDDB occurrences within 2 miles of the project area. The project area is in an urban environment, but some potentially suitable habitat may be present on the adjacent vacant parcel that is currently a conservation area for DSF. However, given the relatively small size and urban nature of this habitat, this species is unlikely to occur.
Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)	FT SE	Western yellow-billed cuckoo arrives in California as early as May and departs by mid-September. This species prefers to nest in open woodlands with clearings and dense scrubby vegetation, often along water. Breeding habitat generally consists of mixed old growth riparian forests of willow and cottonwood. Breeding generally occurs in the summer between May and August at elevations below 2,500 feet.	**None** No suitable habitat is present in or near the project area.

Species Name	Listing Status	Life History	Potential to Occur
Mammals			
Los Angeles pocket mouse (*Perognathus longimembris brevinasus*)	SSC	Los Angeles pocket mouse historically ranged from the San Fernando Valley eastward to the city of San Bernardino and southeast to Riverside County. This species is associated with fine grain, sandy or gravelly substrates in coastal strand, coastal dunes, river alluvium and coastal sage scrub habitats. This species is typically not found in areas covered by dense nonnative grasses and thatch, or shrub cover.	**None** No suitable habitat is present in or near the project area.
Pocket free-tailed bat (*Nyctinomops femorosaccus*)	SSC	The pocketed free-tailed bat is found in Riverside, San Diego, and Imperial counties. This species is rare in California, but is more common in Mexico. It uses habitats, including pinyon-juniper woodlands, desert scrub, desert succulent shrub, desert riparian, desert wash, alkali desert scrub, Joshua tree, and palm oasis.	**None** No suitable habitat is present in or near the project area.
San Bernardino Merriam's Kangaroo Rat (*Dipodomys merriami parvus*)	FE SE SSC	The San Bernardino Merriam's kangaroo rat habitats are confined to river and floodplains of southern San Bernardino County, The current distribution in San Bernardino County is San Ana Wash, Cajon and Lytle Creek, Plunge Creek, City Creeks, and area west of Rialto Drainage near the Jurupa Hills. This species occurs primarily in alluvial fan sage scrub which is a distinct habitat type of the coastal sage scrub community.	**None** No suitable habitat is present in or near the project area.
Stephens' Kangaroo Rat (*Dipodomys stephensi*)	FT ST	Stephen's kangaroo rat is known from 16 localities in and around San Jacinto Valley from Riverside County, south to vicinity of Vista in San Diego County. This species occurs primarily in annual and perennial grassland habitats, but may occur in coastal scrub or sagebrush with sparse canopy cover, or in disturbed areas.	**Unlikely** There are no CNDDB occurrences within 2 miles of the project area. The project area is in an urban environment, but some potentially suitable habitat may be present on the adjacent vacant parcel that is currently a conservation area for DSF. However, given the urban nature of this habitat and lack of known occurrences, this species is unlikely to occur.

Species Name	Listing Status	Life History	Potential to Occur
Western mastiff bat (*Eumops perotis californicus*)	SSC	Western mastiff bat inhabits arid and semi-arid lowlands in the Lower Sonoran life zone of California at elevations from 100 to 4,000 feet. This species occurs in many open, semi-arid to arid habitats, including conifer and deciduous woodland, coastal scrub, annual and perennial grassland, palm oases, chaparral, desert scrub, and urban habitats. The species primarily roosts in crevices in vertical cliffs—usually granite or consolidated sandstone—and in broken terrain with exposed rock faces. It is also found occasionally in high buildings, trees, and tunnels. Western mastiff bat roost sites may change from season to season. Due to its large size, it needs vertical faces to drop from in order to take flight. Western mastiff bat nursery roosts can be found in tight rock crevices. Breeding likely occurs from April through September.	**Unlikely** There is one CNDDB occurrence within 2 miles of the project area. The project area is in an urban environment, but some trees are present onsite. However, given the highly disturbed nature of the site and urban nature of this habitat, this species is unlikely to occur.

Status Codes:
-- = No status

Federal: FE = Federal Endangered; FT= Federal Threatened; FC= Federal Candidate; FPL=Federal Proposed for Listing
State: SSC = California Species of Special Concern; SC= State Candidate; ST= State Threatened; SE=State Endangered

Potential to Occur Designations:
Present = Species has been observed in the project area.
High = Species has high likelihood of presence in the project area, has been mapped in close proximity to the project area, and suitable habitat is present.
Moderate = Records have been mapped near the project area and/or suitable habitat is present, but records are old or far from the project area.
Low = Species has been mapped within 2 miles of the project area, but record is old/unreliable, the appropriate habitat is not present, or the record is far from the project area.
Unlikely = Records have been mapped near the project area, but no habitat is present on-site and nearby habitat is unlikely to support the species.
None = No suitable habitat is present on or near the project area.

Sources: CDFW 2025, USFWS 2025

Appendix B

Cultural Resources Due Diligence Report

CRM TECH
1016 E. Cooley Drive, Ste. B
Colton, CA 92324

MEMORANDUM

Date: April 11, 2025
From: Bai "Tom" Tang, Principal, CRM TECH
To: Sarah Betz, Senior Associate, Davis Evans and Associates, Inc.
Subject: Due-Diligence Cultural Resource Assessment, Arrowhead Regional Medical Center Parking Structure Project, City of Colton, San Bernardino County, California (CRM TECH 4251)

Dear Ms. Betz:

At your request, CRM TECH has completed a due-diligence-level cultural resource assessment on the site of a proposed parking structure on the campus of the Arrowhead Regional Medical Center (ARMC) at 400 North Pepper Avenue in the City of Colton, San Bernardino County, California. The four- to five-story, 364,000- to 455,000-square-foot parking structure will be constructed on an approximately 350x260-foot portion of a paved parking lot on the northeastern corner of Pepper Avenue and Valley Boulevard (Figs. 1, 2). The project area, measuring approximately two acres, is located in the northeast quarter of Section 24, Township 1 South, Range 5 West, San Bernardino Baseline and Meridian, as depicted in the United States Geological Survey (USGS) San Bernardino South, California, 7.5' quadrangle (Fig. 1).

The purpose of this study is to assess the sensitivity of the project area for cultural resources that may meet the statutory definition of "historical resources," as provided by the California Environmental Quality Act (CEQA; PRC §21000, et seq.), and therefore warrant proper protection for CEQA-compliance purposes. To accomplish this objective, CRM TECH conducted a cultural resources records search, initiated a Native American Sacred Lands File search, pursued historical background research, and carried out a reconnaissance-level field inspection of the project area. The following memorandum presents a summary of the findings from these research procedures.

On March 25, 2025, CRM TECH archaeologist Nina Gallardo (see App. 1 for qualifications) conducted the records search at the South Central Coastal Information Center (SCCIC), California State University, Fullerton, which is the designated cultural resource records repository for the County of San Bernardino. The records search results indicate that the entire project area was included in two large-scale archaeological studies completed in 1986 and 1987 as well as a focused cultural resources survey conducted for the present ARMC facility in 1990 (Bixler 1986; 1987; Weisbord 1990). No cultural resources were recorded within or adjacent to the project boundaries during those studies or any other previous studies in the vicinity.

Outside the project boundaries but within a one-mile radius, SCCIC records identify a total of 33 previous studies completed between 1978 and 2014, including the three referenced above. As a result, 18 historical/archaeological sites and isolates (i.e., localities with fewer than three artifacts) have been identified and recorded within the scope of the records search. Among these, six were of prehistoric (i.e., Native American) origin and included two isolated arrowheads, a ceramic sherd, and three "pending" sites representing two lithic scatters and a mano. The other 12 localities dated to the

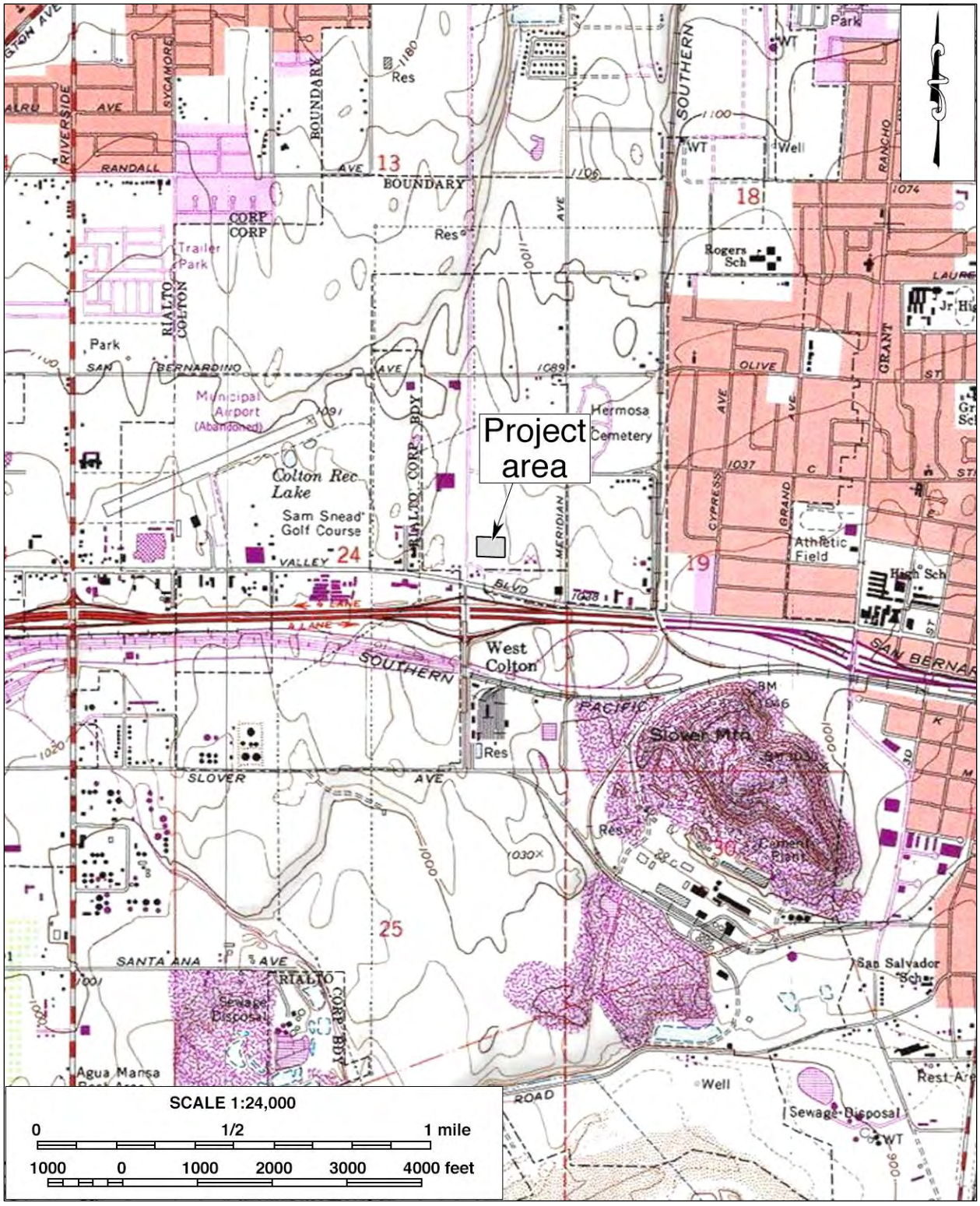


Figure 1. Project location. Based on USGS San Bernardino South, Calif., 7.5' quadrangle [USGS 1980]

Figure 2. Recent satellite image of the project area. (Based on Google Earth imagery)

historic period and included storage tanks, power transmission lines, recreational features, the remnants of a cement plant, a single-family residence from circa 1950, a segment of the Southern Pacific (now Union Pacific) Railroad, and scattered refuse. None of these sites and isolates was found in the immediate vicinity of the project area, the nearest one being a transmission line running some 800 feet to the west. Therefore, none of them requires further consideration during this study.

For the background research, CRM TECH archaeologist Deirdre Encarnación (see App. 1 for qualifications) reviewed historical maps and aerial/satellite photographs of the project vicinity for information pertaining to past development in and around the project area. These sources identify no notable human-made features within or adjacent to the project area throughout the historic period (Figs. 3-7; NETR Online 1938-1980). The surrounding area appeared to have been leveled for agricultural purposes sometime in the past, but all farming activities had evidently ceased at this location at least by the 1940s-1950s (NETR Online 1938-1959). The project site was vacant and largely unused until the mid-1990s, when the construction of the ARMC campus began (NETR Online 1959-1995; Google Earth 1995). Since that time, it has remained a part of the paved parking lot (NETR Online 1995-2022; Google Earth 1995-2025).

On March 24, 2025, 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. In response, the NAHC stated in a letter dated March 25, 2025, that the Sacred Lands File identified unspecified Native American cultural resource(s) in the general vicinity of the project area. The NAHC recommended that the Chemehuevi Indian Tribe be contacted for further information and further recommended that other local Native American groups be consulted as well. For that purpose, the NAHC provided a referral list of 25 individuals associated with 14 tribal organizations in the region (see App. 2).

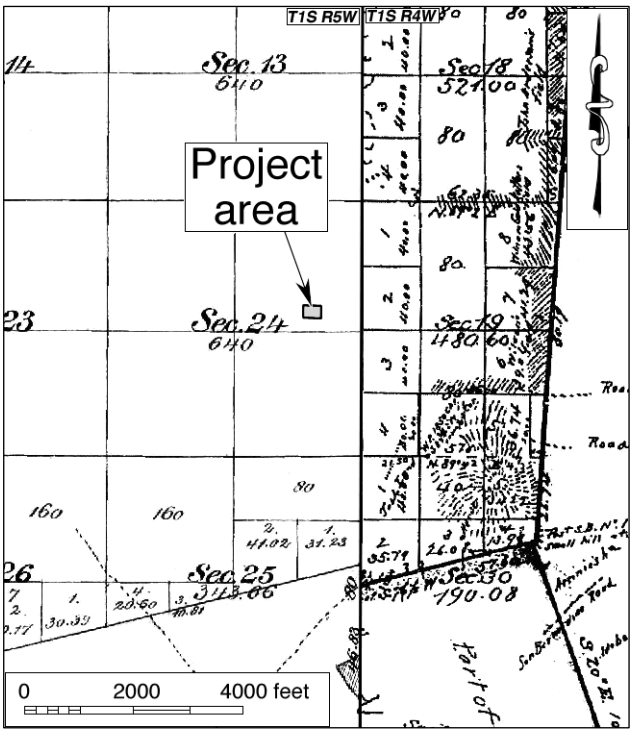


Figure 3. The project area and vicinity in 1852-1875. (Source: GLO 1873; 1876)

Upon receiving the NAHC's reply, CRM TECH contacted Chemehuevi Chairman Glenn Lodge and Cultural Director Kaitlyn Snodgrass via electronic mail on March 25, 2025, for information pertaining to any Native American cultural resources in the project vicinity. As of this time, neither of them has responded to the inquiry. The NAHC's letter and referral list are attached to this report in Appendix 2 for reference by the lead agency for the project, namely the County of San Bernardino, in future government-to-government consultations with the pertinent Native American groups, if necessary.

On April 1, 2025, CRM TECH archaeologist Salvadore Z. Boites (see App. 1 for qualifications) carried out the field inspection of the project area, and no potential cultural

Figure 4. The project area and vicinity in 1893-1894. (Source: USGS 1901)

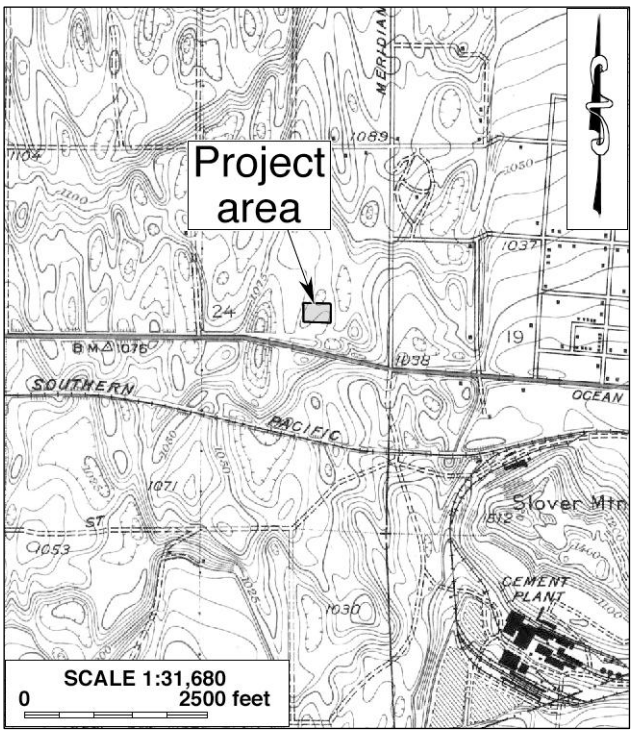


Figure 5. The project area and vicinity in 1936-1938. (Source: USGS 1943)

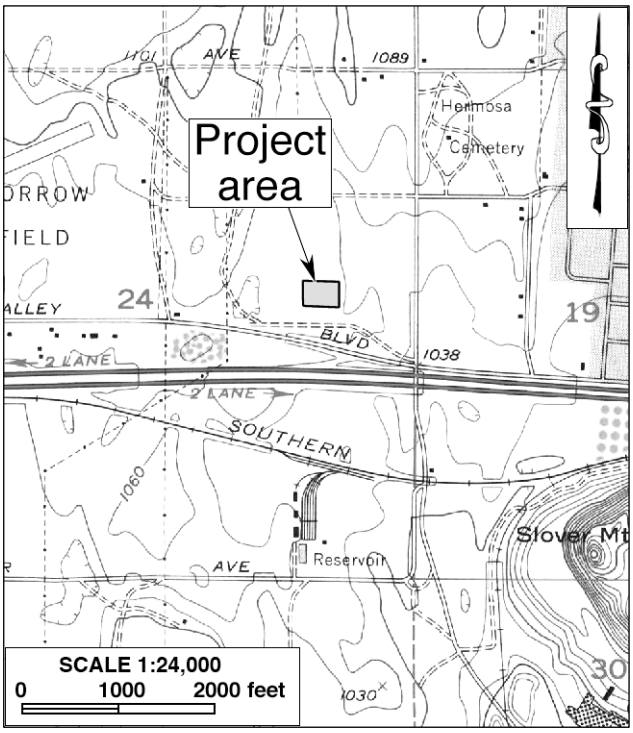


Figure 6. The project area and vicinity in 1952-1954. (Source: USGS 1954)

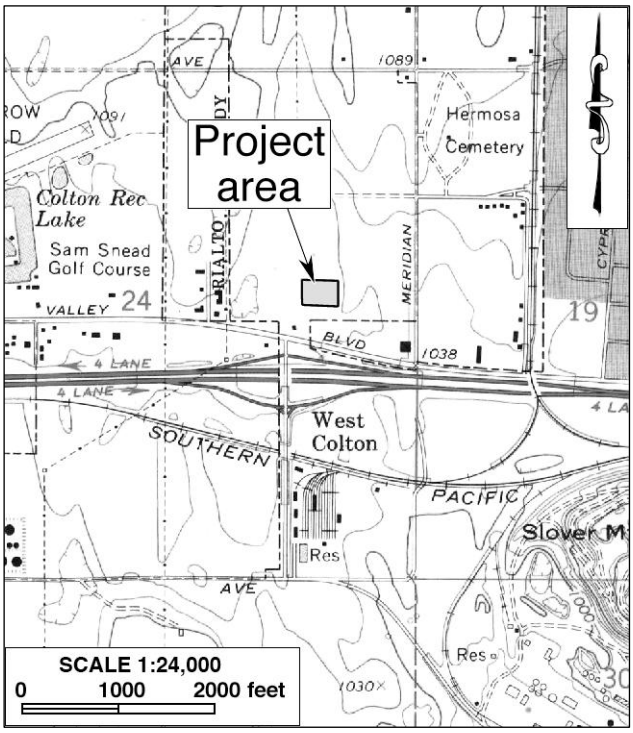


Figure 7. The project area and vicinity in 1966-1967. (Source: USGS 1967)

resources of historical or prehistoric origin were encountered within or adjacent to the project boundaries. The entire project area has been disturbed extensively by past construction activities associated with the ARMC campus and the existing parking lot since the 1990s. At the present time, it retains no vestige of the native landscape (Fig. 8) and is highly unlikely to contain any intact, potentially significant archaeological deposits of prehistoric or early historical origin in the near-surface soils.

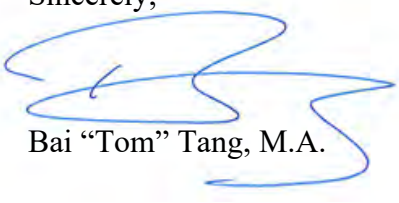
In summary of the research results presented above, the research procedures completed for this due-diligence study identified no cultural resources within or adjacent to the project boundaries, historical sources revealed no notable features in the area prior to the 1990s, and the project site appears to be relatively low in subsurface archaeological sensitivity. The NAHC reported the presence of unspecified Native American cultural resource(s) in the vicinity of the project area and referred further inquiries to the Chemehuevi Indian Tribe, but the tribe so far has not responded to CRM TECH's requests for comments. According to CEQA guidelines, the identification of "tribal cultural resources," as defined by PRC §21074, is beyond the scope of this study and needs to be addressed through government-to-government consultations between the County of San Bernardino and the local Native American groups pursuant to Assembly Bill 52.

Figure 8. Overview of the current condition of the project area. (Photograph taken on April 1, 2025; view to the south)

Based on these findings, CRM TECH recommends to the County of San Bernardino a preliminary conclusion that the proposed project in unlikely to impact any significant cultural resources, pending the completion of further Native American consultations by the County. However, if buried cultural materials are discovered during future earth-moving operations associated with the project, all work at that location should be halted or diverted until a qualified archaeologist can evaluate the nature and significance of the finds.

Thank you for this opportunity to be of service. If you need any further information regarding the findings of this study, please do not hesitate to contact our office.

Sincerely,



Bai "Tom" Tang, M.A.

References Cited:

Bixler, David
1986 Archeological Site Survey: West Valley Redevelopment Project in the City of Colton. On file, South Central Coastal Information Center, California State University, Fullerton.
1987 Archeological Surface Survey: Colton Dune Site. On file, South Central Coastal Information Center, California State University, Fullerton.

GLO (General Land Office, U.S. Department of the Interior)
1873 Plat Map: Township No. 1 South Range No. 5 West, SBBM; surveyed in 1869.
1876 Plat Map: Township No. 1 South Range No. 4 West, SBBM, surveyed in 1852-1875.

Google Earth
2002-2025 Aerial photographs of the project vicinity; taken in 2002-2007, 2009, 2011-2014, 2016; 2018-2021, and 2023-2025. Available through the Google Earth software.

NETR (Nationwide Environmental Title Research) Online
1938-2022 Aerial photographs of the project vicinity; taken in 1938, 1948; 1959; 1966, 1968, 1980, 1984, 1985, 1995, 2002, 2005, 2009, 2010, 2012, 2014, 2016, 2018, 2020, and 2022. http://www.historicaerials.com.

USGS (United States Geological Survey, U.S. Department of the Interior)
1901 Map: San Bernardino, Calif. (15', 1:62,500); surveyed in 1893-1894.
1943 Map: Colton, Calif. (1:31,680); surveyed in 1936-1938.
1954 Map: San Bernardino South, Calif. (7.5', 1:24,000); aerial photographs taken in 1952, field-checked in 1954.
1967 Map: San Bernardino South, Calif. (7.5', 1:24,000); aerial photographs taken in 1966, field-checked in 1967.
1980 Map: San Bernardino South, Calif. (7.5', 1:24,000); 1967 edition photorevised in 1979.

Weisbord, Jill
1990 County of San Bernardino Regional Medical Center Relocation Project EIR, Cultural/Paleontological Resources Technical Appendix No. 4. On file, South Central Coastal Information Center, California State University, Fullerton.

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.

PROJECT ARCHAEOLOGIST/REPORT WRITER
Deirdre Encarnación, M.A.

Education

2003	M.A., Anthropology, San Diego State University, California.
2000	B.A., Anthropology, minor in Biology, with honors, San Diego State University, California.
2021	Certificate of Specialization, Kumeyaay Studies, Cuyamaca College, California.
2001	Archaeological Field School, San Diego State University.
2000	Archaeological Field School, San Diego State University.

Professional Experience

2016-	Archaeological Consultant, Friends of Maha'ulepu, Koloa, Hawai'i.
2004-	Project Archaeologist/Report Writer, CRM TECH, Riverside/Colton, California.
2001-2003	Part-time Lecturer, San Diego State University, California.
2001	Research Assistant for Dr. Lynn Gamble, San Diego State University.
2001	Archaeological Collection Catalog, San Diego State University Foundation.

Presentations

2023	"The Kumeyaay-Critical Awareness, Critical Activation," Salaam, San Diego College of Continuing Education.
2023	"A Look at the Three Wise Men and Their Global Celebrations," The Epiphany Project.
2022	"Voices: A Latina Advocate Shares about Life, Stereotypes, & Rising Above," Salaam online event.
2022	"The Original Beach Town: San Diego's Coastal Heritage," San Diego Archaeological Center Living Room Lecture.

Memberships

Society for California Archaeology; Society for Hawaiian Archaeology; California Native Plant Society.

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.

PROJECT ARCHAEOLOGIST
Salvadore Z. Boites, M.A.

Education

2013 M.A., Applied Anthropology, California State University, Long Beach.
2003 B.A., Anthropology/Sociology, University of California, Riverside.
1996-1998 Archaeological Field School, Fullerton Community College, Fullerton, California.

Professional Experience

2014- Project Archaeologist, CRM TECH, Colton, California.
2010-2011 Adjunct Instructor, Anthropology, Everest College, Anaheim, California.
2003-2008 Project Archaeologist, CRM TECH, Riverside/Colton, California.
2001-2002 Teaching Assistant, Moreno Elementary School, Moreno Valley, California.
1999-2003 Research Assistant, Anthropology Department, University of California, Riverside.

Research Interests

Cultural Resource Management, Applied Archaeology/Anthropology, Indigenous Cultural Identity, Poly-culturalism.

APPENDIX 2

SACRED LANDS FILE SEARCH RESULTS

NATIVE AMERICAN HERITAGE COMMISSION

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

March 25, 2025

Nina Gallardo
CRM TECH

Via Email to: ngallardo@crmtech.us

Re: Proposed San Bernardino County ARMC Parking Structure (CRM TECH No. 4251) Project, San Bernardino County

To Whom It May Concern:

As requested, a record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed based on information submitted for the above referenced project. The results were positive. Please contact the Chemehuevi Indian Tribe on the attached list for more information. Please note that tribes do not always record their sacred sites in the SLF, nor are they required to do so. As such, a SLF search is not a substitute for consultation with all tribes that are traditionally and culturally affiliated with a project's geographic area.

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. Please contact all of those listed; if they cannot supply information, they may recommend others with specific knowledge. If within two weeks of notification, a response has not been received, the Commission requests that you follow-up with a telephone call or email to ensure that the project information was received.

If you receive notification of a change of address or phone number from a tribe, please notify the NAHC so that we can assure that our lists contain current information.

In addition to engaging in tribal consultation, you should consult the appropriate regional California Historical Research Information System (CHRIS) archaeological Information Center to determine whether it has information regarding the presence of recorded archaeological sites within the project area.

If you have any questions or need additional information, please contact me at melina.carlos@nahc.ca.gov.

Sincerely,

Melina Carlos

Melina Carlos
Cultural Resources Analyst

Attachment

Native American Heritage Commission
Native American Contact List
San Bernardino County
3/25/2025

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, Director of Historic Preservation/THPO	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
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, Los Angeles, Orange, Riverside, San Bernardino, San Diego
Cahuilla Band of Indians	F	BobbyRay Esparza, Cultural Director	52701 CA Highway 371 Anza, CA, 92539	(951) 763-5549		besparza@cahuilla-nsn.gov	Cahuilla	Imperial, Los Angeles, Orange, 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, Los Angeles, Orange, Riverside, San Bernardino, San Diego
Chemehuevi Indian Tribe	F	Glenn Lodge, Chairman	PO Box 1976 Havasu Lake, CA, 92363	(760) 858-4219		chairman@cit-nsn.gov	Chemehuevi	Imperial, Riverside, San Bernardino
Chemehuevi Indian Tribe	F	Kaitlyn Snodgrass, Cultural Director	PO Box 1976 Havasu Lake, CA, 92363	(760) 858-4219		cultural@cit-nsn.gov	Chemehuevi	Imperial, Riverside, San Bernardino
Gabrieleno Band of Mission Indians - Kizh Nation	N	Andrew Salas, Chairperson	P.O. Box 393 Covina, CA, 91723	(844) 390-0787		admin@gabrielenoindians.org	Gabrieleno	Los Angeles, Orange, Riverside, San Bernardino, Santa Barbara, Ventura
Gabrieleno Band of Mission Indians - Kizh Nation	N	Christina Swindall Martinez, Secretary	P.O. Box 393 Covina, CA, 91723	(844) 390-0787		admin@gabrielenoindians.org	Gabrieleno	Los Angeles, Orange, Riverside, San Bernardino, Santa Barbara, Ventura
Gabrieleno/Tongva San Gabriel Band of Mission Indians	N	Anthony Morales, Chairperson	P.O. Box 693 San Gabriel, CA, 91778	(626) 483-3564	(626) 286-1262	GTTribalcouncil@aol.com	Gabrieleno	Los Angeles, Orange, Riverside, San Bernardino, Santa Barbara, Ventura
Gabrielino Tongva Indians of California Tribal Council	N	Christina Conley, Cultural Resource Administrator	P.O. Box 941078 Simi Valley, CA, 93094	(626) 407-8761		christina.marsden@alumni.usc.edu	Gabrielino	Los Angeles, Orange, Riverside, San Bernardino, Santa Barbara, Ventura
Gabrielino Tongva Indians of California Tribal Council	N	Robert Dorame, Chairperson	P.O. Box 490 Bellflower, CA, 90707	(562) 761-6417	(562) 761-6417	gtongva@gmail.com	Gabrielino	Los Angeles, Orange, Riverside, San Bernardino, Santa Barbara, Ventura
Gabrielino/Tongva Nation	N	Sandonne Goad, Chairperson	106 1/2 Judge John Aiso St., #231 Los Angeles, CA, 90012	(951) 807-0479		sgoad@gabrielino-tongva.com	Gabrielino	Los Angeles, Orange, Riverside, San Bernardino, Santa Barbara, Ventura
Gabrielino-Tongva Tribe	N	Sam Dunlap, Cultural Resource Director	P.O. Box 3919 Seal Beach, CA, 90740	(909) 262-9351		tongvatcr@gmail.com	Gabrielino	Los Angeles, Orange, Riverside, San Bernardino, Santa Barbara, Ventura
Gabrielino-Tongva Tribe	N	Charles Alvarez, Chairperson	23454 Vanowen Street West Hills, CA, 91307	(310) 403-6048		Chavez1956metro@gmail.com	Gabrielino	Los Angeles, Orange, Riverside, San Bernardino, Santa Barbara, Ventura
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, Kern, Los Angeles, 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, Kern, Los Angeles, Riverside, San Bernardino, San Diego
Quechan Indian Tribe of the Fort Yuma Reservation	F	Jill McCormick, Historic Preservation Officer	P.O. Box 1899 Yuma, AZ, 85366-1899	(928) 261-0254		historicpreservation@quechantribe.com	Quechan	Imperial, Kern, Los Angeles, Riverside, San Bernardino, San Diego
Quechan Indian Tribe of the Fort Yuma Reservation	F	Jordan Joaquin, President, Quechan Tribal Council	P.O.Box 1899 Yuma, AZ, 85366-1899	(760) 919-3600		executivesecretary@quechantribe.com	Quechan	Imperial, Kern, Los Angeles, Riverside, San Bernardino, San Diego
San Manuel Band of Mission Indians	F	Alexandra McCleary, Senior Manager of Cultural Resources Management	26569 Community Center Drive Highland, CA, 92346	(909) 633-0054		alexandra.mccleary@sanmanuel-nsn.gov	Serrano	Kern, Los Angeles, Riverside, San Bernardino

Santa Rosa Band of Cahuilla Indians	F	Vanessa Minott, Tribal Administrator	P.O. Box 391820 Anza, CA, 92539	(951) 659-2700	(951) 659-2228	vminott@santarosa-nsn.gov	Cahuilla	Imperial, Los Angeles, Orange, Riverside, San Bernardino, San Diego
Santa Rosa Band of Cahuilla Indians	F	Steven Estrada, Tribal Chairman	P.O. Box 391820 Anza, CA, 92539	(951) 659-2700		sestrada@santarosa-nsn.gov	Cahuilla	Imperial, Los Angeles, Orange, Riverside, San Bernardino, San Diego
Serrano Nation of Mission Indians	N	Mark Cochrane, Co-Chairperson	P. O. Box 343 Patton, CA, 92369	(909) 578-2598		serranonation1@gmail.com	Serrano	Kern, Los Angeles, Riverside, San Bernardino
Serrano Nation of Mission Indians	N	Wayne Walker, Co-Chairperson	P. O. Box 343 Patton, CA, 92369	(253) 370-0167		serranonation1@gmail.com	Serrano	Kern, Los Angeles, Riverside, San Bernardino
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

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 San Bernardino County ARMC Parking Structure (CRM TECH No. 4251) Project, San Bernardino County.

Record: PROJ-2025-001539
Report Type: List of Tribes
Counties: San Bernardino
NAHC Group: All

Appendix C

Geotechnical Investigation Report

Converse Consultants
Geotechnical Engineering
Environmental & Groundwater Science
Inspection & Testing Services

GEOTECHNICAL INVESTIGATION REPORT

ARMC 4-STORY PARKING STRUCTURE

SOUTHEAST OF THE INTERSECTION OF PEPPER AVENUE AND PLUM PLACE
CITY OF COLTON, SAN BERNARDINO COUNTY, CA

CONVERSE PROJECT NO. 24-81-276-01

Prepared For:

ARROWHEAD REGIONAL MEDICAL CENTER
County of San Bernardino
620 S. "E" Street
San Bernardino, CA 92415

Presented By:

CONVERSE CONSULTANTS
2021 Rancho Drive, Suite 1
Redlands, CA 92373
909-796-0544

March 10, 2025

Converse Consultants
Geotechnical Engineering, Environmental & Groundwater Science, Inspection & Testing Services

March 10, 2025

Ms. Kelly Martinez
Program Manager
Arrowhead Regional Medical Center
County of San Bernardino
620 S. “E” Street
San Bernardino, CA 92415-0184

Subject: **GEOTECHNICAL INVESTIGATION REPORT**
4-Story Parking Structure
Approximately 3-Acre Site
Southeast of the Intersection of Pepper Avenue and Plum Place
City of Colton, San Bernardino County, California
Converse Project No. 24-81-276-01

Dear Ms. Martinez:

Converse Consultants (Converse) is pleased to submit this geotechnical investigation report to assist with the design and construction of the 4-Story Parking Structure, located southeast of the intersection of Pepper Avenue and Plum Place, City of Colton, San Bernardino County, California. This report was prepared in accordance with our proposal dated October 8, 2024, and your acceptance of Agreement through Purchase Order (PO# 4100381639) dated November 11, 2024.

Based upon our field investigation, laboratory data, and analyses, the proposed project is considered feasible from a geotechnical standpoint, provided the recommendations presented in this report are incorporated into the design and construction of the project.

We appreciate the opportunity to be of service to Arrowhead Regional Medical Center (ARMC) and the County of San Bernardino. Should you have any questions, please do not hesitate to contact us at 909-474-2847.

CONVERSE CONSULTANTS

Hashmi S. E. Quazi, PhD, PE, GE
Principal Engineer/Regional Manager

Dist.: 1-electronic-pdf/Addressee
HSQ/RLG/JB/SM/kvg

PROFESSIONAL CERTIFICATION

This report has been prepared by the following professionals whose seals and signatures appear hereon.

The findings, recommendations, specifications and professional opinions contained in this report were prepared in accordance with the generally accepted professional engineering and engineering geologic principle and practice in this area of Southern California. We make no other warranty, either expressed or implied.

Jason Bragg
Staff Geologist

Stephen McPherson, GIT
Senior Staff Geologist

Hashmi S. E. Quazi, PhD, PE, GE
Principal Engineer

Robert Gregorek, PG, CEG
Senior Geologist

TABLE OF CONTENTS

FIGURES

Following Page No.

TABLES

Page No.

APPENDICES

1.0 INTRODUCTION

This geotechnical/geohazard investigation report has been prepared for the Four-Story Parking Structure project located at the intersection of Pepper Avenue and Plum Place in the City of Colton, San Bernardino County, California. The approximate location of the project is shown in Figure No. 1, *Approximate Project Location Map*.

The purposes of this investigation were to determine the nature and engineering properties of the subsurface soils and to provide recommendations for site earthwork, and design and construction of foundations for the proposed project.

This report is prepared for the project described herein and is intended for use solely by the Arrowhead Regional Medical Center and their authorized agents for design purposes. It should not be used as a bidding document but may be made available to potential contractors for information on factual data only. For bidding purposes, the contractors should be responsible for making their own interpretation of the data contained in this report.

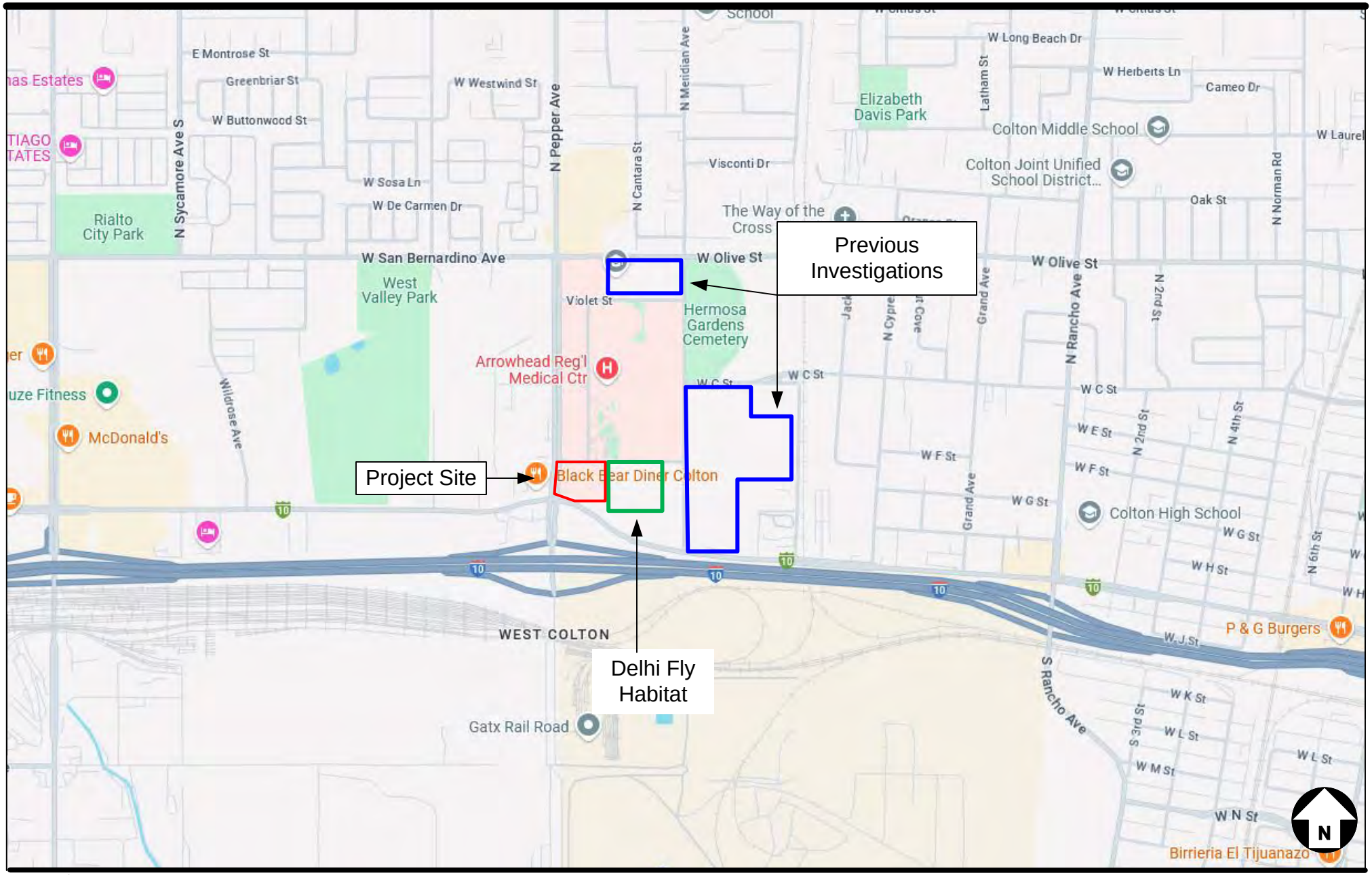
2.0 PROJECT DESCRIPTION

According to the information provided by Javier Ruiz, of Arrowhead Regional Medical Center (ARMC), the project will consist of the following.

The approximately 3-acre site is located in the southeast of the intersection of Pepper Avenue and Plum Place in the City of Colton, California. It is planned to construct a 4-story (372' x 262') parking structure with approximately 1,200 parking spaces. It will be a reinforced cement concrete column with post-tension slab. It will likely be founded on shallow footings. Nominal site grading will be required to create the pad.

3.0 SITE DESCRIPTION

The proposed site is currently a secured parking lot for the hospital. The site is bounded by Plum Place to the north, Pepper Avenue to the west, and Valley Blvd to the south. The east side is bounded by the Delhi Sands Flower Loving Fly Habitat, a protected species under the endangered species act. The site is fenced off with gates on the north side. The current site improvements include landscaping, concrete medians, light poles, trees, and is paved with asphalt concrete. The site is at grade with Plum Place and is above grade with Pepper and Valley Blvd. The parking lot was at 100% parking capacity during the site visit. The site is easily accessible by Plum Place. See photograph Nos 1 through 3 for the current site conditions.



Project: 4-Story Parking Structure
Location: Southeast of the Intersection of Pepper Avenue and Plum Place
City of Colton, County of San Bernardino, California

For: Arrowhead Regional Medical Center

Approximate Project Location Map

Project No.
24-81-276-01

Converse Consultants

Figure No.
1

Photograph No. 1: North center of parking lot overlooking bh-03, view to the south

Photograph No. 2: Northwest site of parking lot, view looking east at Delhi Sands Fly Habitat.

Photograph 3: Northside of lot looking west at Pepper Ave.

4.0 SCOPE OF WORK

The scope of Converse's investigation included the tasks described in the following sections.

4.1 Document Review

We reviewed the reference geotechnical Investigation reports for by Krazan & Associates (2018) and Leighton (2022), geologic maps, aerial photographs, groundwater data, and other information pertaining to the project area to assist in the evaluation of any geologic hazards that may be present.

4.2 Project Set-up

As part of the project set-up, our staff performed the following tasks.

- Prepared the boring locations map and submitted it for your review and approval.
- Coordinated for the site access.
- Conducted site reconnaissance and marked the locations of the borings such that equipment access to all the locations was available.
- Notified Underground Service Alert (USA) at least 48 hours prior to field work to clear the exploration locations of any conflict with existing underground utilities.
- Notified (ARMC) representative to clear boring locations from known underground utilities.

- Engaged a professional utility locator to clear boring locations.
- Engaged a California licensed driller to drill the exploratory borings.

4.3 Subsurface Exploration

Twelve exploratory borings (BH-01 through BH-12) were drilled on January 7, 8, and 10, 2025, to investigate the subsurface conditions. The borings were drilled to depths between approximately 16.5 feet and 51.5 feet below ground surface (bgs).

The approximate locations of the borings are shown on Figure No. 2, *Approximate Boring Locations Map*. A detailed discussion of the subsurface exploration is presented in Appendix A, *Field Exploration*.

4.4 Laboratory Testing

Representative samples of the site soils were tested in the laboratory to aid in the classification and to evaluate relevant engineering properties. The tests performed included the following.

- *In Situ* Moisture Content and Dry Density (ASTM D2216-19 and D7263-21)
- Expansion index (ASTM D4829-21)
- Soil Corrosivity (California Test 643, 422, 532 and 417)
- Passing Sieve No.200 (ATSM D1140-17)
- Maximum Dry Density and Optimum Moisture Content (ASTM D1557-12R21)
- Direct Shear Strength (ASTM D3080/D3080M-23)
- Consolidation (ASTM D2435-11)

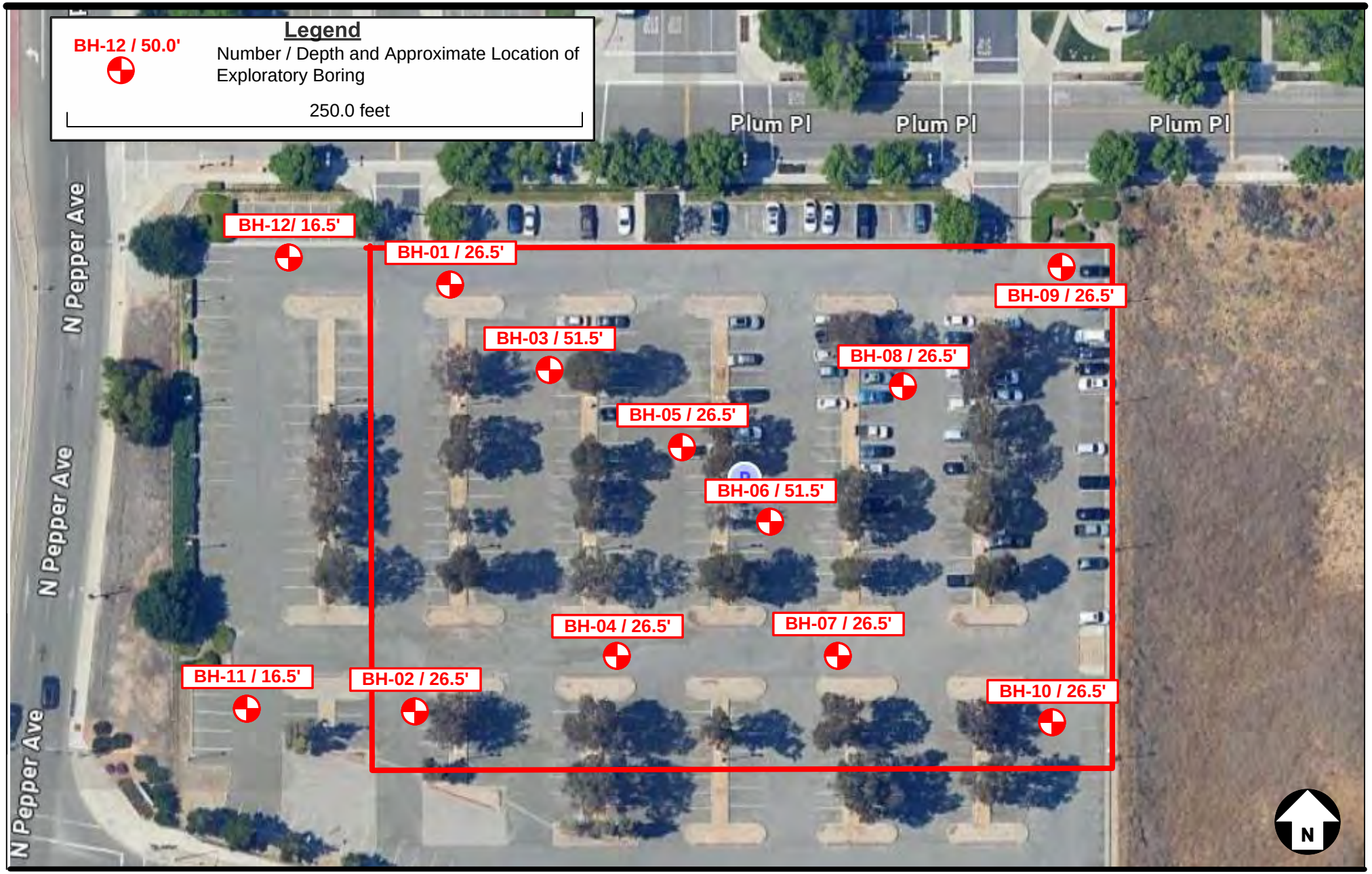
For *in situ* moisture and density data, see the Logs of Borings in Appendix A, *Field Exploration*. For a description of the other laboratory test methods and test results, see Appendix B, *Laboratory Testing Program*.

4.5 Engineering Analyses and Geotechnical Report Preparation

Data obtained from the field exploration and laboratory testing program was compiled and evaluated. Geotechnical analyses of the compiled data were performed, and this report was prepared to present our findings, conclusions and recommendations for the proposed project.

5.0 SUBSURFACE CONDITIONS

A general description of the subsurface conditions and various materials encountered during our field exploration are presented in this section.



Project: 4-Story Parking Structure
Location: Southeast of the Intersection of Pepper Avenue and Plum Place
City of Colton, County of San Bernardino, California

For: Arrowhead Regional Medical Center

Approximate Boring Locations Map

Project No.
24-81-276-01

Converse Consultants

Figure No.
2

5.1 Subsurface Profile

Based on the exploratory borings and laboratory test results, the subsurface soil at the site consists, primarily a mixture of sand, silt and gravel. Scattered to some gravel with 1.5 inches maximum dimensions were observed in some borings. These materials were generally medium dense to dense, becoming very dense below depths of about 25 feet to 35 feet, dry to moist and various shades of yellow, brown and red. Approximately 2.0 inches to 4.5 inches of aggregate base over 4.0 inches to 6.0 inches was at the surface in all of the exploratory borings.

Discernible fill soils were not encountered in our field investigation. However, the site has been previously graded for the parking lot. Therefore, fill soils are likely present. If present, the fill soils are likely derived from on-site sources and are similar to the native alluvial soils in composition and density.

For a detailed description of the subsurface materials encountered in the exploratory borings, see Drawings Nos. A-2 through A-13, Logs of Borings, in Appendix A, *Field Exploration*.

5.2 Groundwater

Groundwater was not encountered during the field investigation to the maximum explored depths of 51.5 feet bgs.

The GeoTracker database (SWRCB, 2025) was reviewed for groundwater data from sites within an approximately 1.0-mile radius of the proposed development. Results of that search are as follows:

- ARCO #1569 (Site No. #T0607135690), located approximately 5000 feet east of the project site, reported groundwater at depths of 123 to 149 feet bgs between 2002 and 2015.

The National Water Information System (USGS, 2025) was reviewed for current and historical groundwater data from sites within an approximately 1.0-mile radius of the proposed development and the results of that search are included in Table No. 1, *Summary of USGS Groundwater Depth Data,* below.

Table No. 1, Summary of USGS Groundwater Depth Data

Site No.	Location	Groundwater Depth Range (ft. bgs)	Date Range
340416117205101	Approx. 900 feet east of the project site.	185-145	1977-1997
340423117205301	Approx. 1200 feet northeast of the project site.	171-193	1999-2008
340444117205401	Approx. 2700 feet northeast of the project site.	197-228	2004-2010

The California Department of Water Resources database (DWR, 2025) was reviewed for historical groundwater data from sites within a 1.0-mile radius of the project site. No site with groundwater data was found within a 1.0-mile radius of the project site.

Based on historical groundwater data, the current groundwater depth is likely deeper than approximately 123.0 feet bgs. Based on this investigation, ground water is likely deep than 51.5 feet bgs. It should be noted that the groundwater level could vary depending upon the seasonal precipitation and possible groundwater pumping activity in the alignment vicinity. Shallow perched groundwater may be present locally, particularly following precipitation.

5.3 Expansive Soils

Expansive soils are characterized by their ability to undergo significant volume changes (shrink or swell) due to variations in moisture content. Changes in soil moisture content can result from precipitation, landscape irrigation, utility leakage, roof drainage, perched groundwater, drought, or other factors and may result in unacceptable settlement or heave of structures or concrete slabs supported on grade. Depending on the extent and location below finish subgrade, expansive soils can have a detrimental effect on structures.

Based on the laboratory test result, the expansion indices of the upper 10.0 feet soils were from 0 to 4, corresponding to very low expansion potential.

5.4 Subsurface Variations

Based on the results of the subsurface exploration and our experience, some variations in the continuity and nature of subsurface conditions within the project site should be anticipated. Because of the uncertainties involved in nature and depositional characteristics of the earth material at the site, care should be exercised in interpolating or extrapolating subsurface conditions between or beyond the boring locations.

5.5 Excavatability

The surface and subsurface soil materials at the site are expected to be excavatable by conventional heavy-duty earth moving and trenching equipment. However, excavation will be difficult if high concentrations of gravel are encountered.

The phrase “conventional heavy-duty excavation equipment” is intended to include commonly used equipment such as excavators, scrapers, and trenching machines. It does not include hydraulic hammers (“breakers”), jackhammers, blasting, or other specialized equipment and techniques used to excavate hard earth materials. The selection of appropriate excavation equipment models should be done by an experienced earthwork contractor.

6.0 GEOLOGIC SETTING

Regional and local geology are discussed in the following subsections.

6.1 Regional Geology

The proposed project site is located within the Northern Peninsular Ranges Geomorphic Province of Southern California. The Peninsular Ranges Geomorphic Province consists of a series of northwest-trending mountain ranges and valleys bounded on the north by the San Bernardino and San Gabriel Mountains, on the west by the Los Angeles Basin, and on the southwest by the Pacific Ocean.

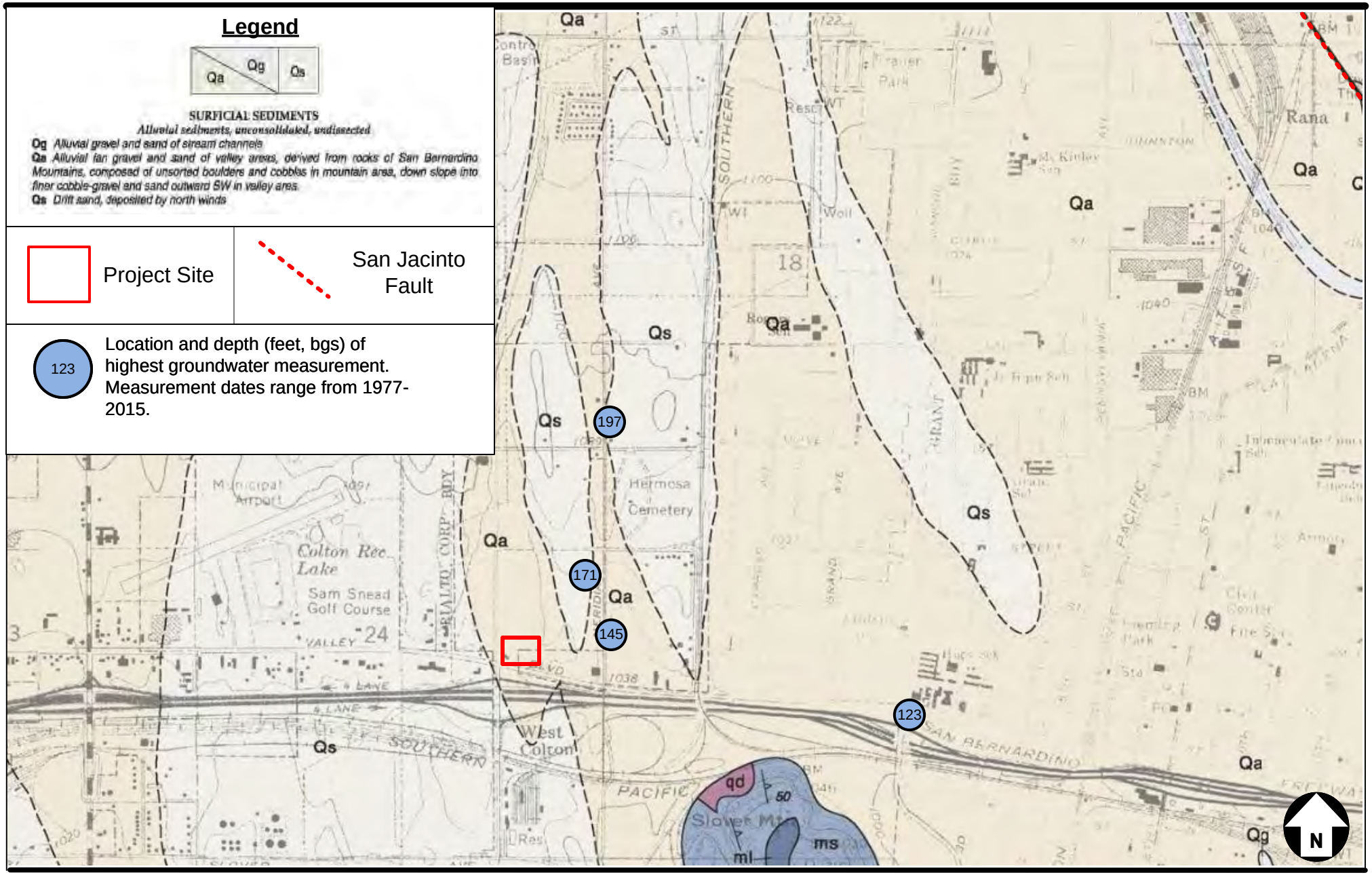
The province is a seismically active region characterized by a series of northwest-trending strike-slip faults. The most prominent of the nearby fault zones include the San Jacinto, San Andreas, and Cucamonga Fault Zones, all of which have been known to be active during Quaternary time.

Topography within the province is generally characterized by broad alluvial valleys separated by linear mountain ranges. This northwest-trending linear fabric is created by the regional faulting within the granitic basement rock of the Southern California Batholith. Broad, linear, alluvial valleys have been formed by erosion of these principally granitic mountain ranges.

Figure No. 3, *Geologic, Groundwater, and Faulting Map*, depicts the geologic setting of the project site.

6.2 Local Geology

The project site is located in the central portion of San Bernardino Valley, which is bounded by the San Bernardino Mountains and the San Andreas fault to the north, and



Project: 4-Story Parking Structure
Location: Southeast of the intersection of Pepper Ave and Plum Place
City of Colton, County of San Bernardino, California

For: Arrowhead Regional Medical Center

Geologic, Groundwater, and Faulting Map

Project No.
24-81-276-01

Converse Consultants

Figure No.
3

the San Timoteo Badlands and the San Jacinto fault to the south. The San Bernardino Valley contains alluvial sediments extending to over 800 feet in thickness in the southern portion of the valley (Dutcher and Garrett, 1963).

The vicinity of the site is underlain by Holocene alluvial and eolian deposits consisting mainly of fine to sand, gravel and some cobbles (Dibblee, T.W., and Minch, J.A, 2004).

7.0 FAULTING AND SEISMICITY

Discussion of faulting and seismicity is presented in the following sections.

7.1 Faulting

The proposed site is situated in a seismically active region. As is the case for most areas of Southern California, ground-shaking resulting from earthquakes associated with nearby and more distant faults may occur at the project site. During the life of the project, seismic activity associated with active faults can be expected to generate moderate to strong ground shaking at the site.

The project site is not located within a currently mapped State of California Earthquake Fault Zone for surface fault rupture. The table below summarizes selected data of known faults capable of seismic activity within 100 kilometers of the site (34.0712 N, 117.3518 W). The data presented below was calculated using the National Seismic Hazard Maps Database (USGS, 2008) and other published geologic data.

Table No. 2, Summary of Regional Faults

Fault Name and Section	Closest Distance (km)	Slip Sense	Length (km)	Slip Rate (mm/year)	Maximum Magnitude
San Jacinto	4	strike slip	241	n/a	7.9
S. San Andreas	13.35	strike slip	548	n/a	8.2
Cucamonga	14.7	thrust	28	5.0	6.7
Cleghorn	23.06	strike slip	25	3.0	6.8
North Frontal (West)	28.29	reverse	50	1.0	7.2
San Jose	31.64	strike slip	20	0.5	6.7
Chino, Alt 1	32.85	strike slip	24	1.0	6.7
Chino, Alt 2	32.88	strike slip	29	1.0	6.8
Elsinore	33.95	strike slip	241	n/a	7.9
Sierra Madre	36.35	reverse	57	2.0	7.2
Sierra Madre Connected	36.35	reverse	76	2.0	7.3
Clamshell-Sawpit	49.32	reverse	16	0.5	6.7
Puente Hills (Coyote Hills)	51.45	thrust	17	0.7	6.9

Fault Name and Section	Closest Distance (km)	Slip Sense	Length (km)	Slip Rate (mm/year)	Maximum Magnitude
Helendale-So Lockhart	55.51	strike slip	114	0.6	7.4
Pinto Mtn	58.25	strike slip	74	2.5	7.3
North Frontal (East)	58.73	thrust	27	0.5	7
San Joaquin Hills	59.02	thrust	27	0.5	7.1
Raymond	59.82	strike slip	22	1.5	6.8
Puente Hills (Santa Fe Springs)	63.54	thrust	11	0.7	6.7
Elysian Park (Upper)	69.12	reverse	20	1.3	6.7
Lenwood-Lockhart-Old Woman Springs	72.2	strike slip	145	0.9	7.5
Puente Hills (LA)	72.48	thrust	22	0.7	7
Newport Inglewood Connected Alt 2	73.74	strike slip	208	1.3	7.5
Newport-Inglewood, Alt 1	73.88	strike slip	65	1.0	7.2
Verdugo	74.35	reverse	29	0.5	6.9
Newport-Inglewood (Offshore)	74.39	strike slip	66	1.5	7
Johnson Valley (No)	79.37	strike slip	35	0.6	6.9
Hollywood	81.3	strike slip	17	1.0	6.7
Landers	85.45	strike slip	95	0.6	7.4
Santa Monica Connected Alt 2	86.21	strike slip	93	2.4	7.4
Burnt Mtn	86.63	strike slip	21	0.6	6.8
Elsinore; J+C	87.02	strike slip	118	3.0	7.5
Eureka Peak	88.44	strike slip	19	0.6	6.7
San Gabriel	89.89	strike slip	71	1.0	7.3
Sierra Madre (San Fernando)	90.02	thrust	18	2.0	6.7
So Emerson-Copper Mtn	90.34	strike slip	54	0.6	7.1
Palos Verdes	90.92	strike slip	99	3.0	7.3
Palos Verdes Connected	90.92	strike slip	285	3.0	7.7
Gravel Hills-Harper Lk	97.35	strike slip	65	0.7	7.1
Santa Monica, alt 1	97.91	strike slip	14	1.0	6.6
Santa Monica Connected Alt 1	97.91	strike slip	79	2.6	7.3
Northridge	98.29	thrust	33	1.5	6.9
Calico-Hidalgo	99.99	strike slip	117	1.8	7.4

(Source: https://earthquake.usgs.gov/cfusion/hazfaults_2008_search/)

7.2 Seismic Hazard Analysis

Seismic hazard analysis is presented in the following sections.

7.2.1 Seismic Design Parameters

Seismic parameters based on the 2022 California Building Code (CBSC, 2022) and ASCE 7-16 are provided in the following table. These parameters were determined using a coordinate (34.07131 N and 117.35168 W) and the ASCE 7 Hazard Tool.

Table No. 3, 2022 CBC Seismic Design Parameters

Seismic Parameters	
Site Coordinates	34.07131 N and 117.35168 W
Site Class	D*
Risk Category	IV
Mapped Short period (0.2-sec) Spectral Response Acceleration, S_s	2.020g
Mapped 1-second Spectral Response Acceleration, S_1	0.800g
Site Coefficient (from Table 11.4-1), F_a	1.0
Site Coefficient (from Table 11.4-2), F_v	1.7
MCE 0.2-sec period Spectral Response Acceleration, S_{MS}	2.02g
MCE 1-second period Spectral Response Acceleration, SM_1	1.360g
Design Spectral Response Acceleration for short period S_{DS}	1.346g
Design Spectral Response Acceleration for 1-second period, S_{D1}	0.905g
Site Modified Maximum Peak Ground Acceleration, PGA_M	0.938g

** Stiff Soil Classification*

7.2.2 Site-Specific Seismic Design Parameters

A site-specific ground motion study was performed in accordance with the 2022 CBC and ASCE 7-16 design guidelines. The methodology and results of this study are presented in Appendix D, *Site-Specific Seismic Response Spectra Analysis*. Based on the results of this study, site-specific seismic acceleration parameters were developed and summarized in the table below.

Table No. 4, 2022 CBC Site-Specific Seismic Parameters

Seismic Parameter	Value	80% of CBC Design
(1) MCE_R (5%, damped) Spectral response acceleration for short periods adjusted for site class, S_{MS}	2.202 g	1.616g
(1)MCE_R (5% damped) spectral response acceleration at 1-second period adjusted for site class, S_{M1}	1.759 g	1.632g
Design spectral response acceleration (5% damped) at short periods, S_{DS}	1.468 g	0.591g
Design Spectral response acceleration (5% damped) at 1-second period, S_{D1}	1.172 g	1.077g
Site-Modified Peak Ground Acceleration, MCE_G PGA	0.793 g	0.750 g

7.3 Secondary Effects of Seismic Activity

In general, secondary effects of seismic activity include surface fault rupture, soil liquefaction, landslides, lateral spreading, and differential settlement due to seismic shaking, tsunamis, seiches, and earthquake-induced flooding. The site-specific potential for each of these seismic hazards is discussed in the following sections.

Surface Fault Rupture: The site is not located within a San Bernardino County or State of California Earthquake Fault Zone (San Bernardino, 2010b; CGS, 1974) and no major surface fault crosses through or extends towards the site. The potential for surface rupture resulting from the movement of nearby major faults, or currently unknown faults, is not known with certainty but is considered low.

Liquefaction: Liquefaction is defined as the phenomenon in which a cohesionless soil mass within the upper 50 feet of the ground surface, suffers a substantial reduction in its shear strength, due to the development of excess pore pressures. During earthquakes, excess pore pressures in saturated soil deposits may develop as a result of induced cyclic shear stresses, resulting in liquefaction.

Soil liquefaction generally occurs in submerged granular soils and non-plastic silts during or after strong ground shaking. There are several general requirements for liquefaction to occur. They are as follows.

- Soils must be submerged.
- Soils must be primarily granular.
- Soils must be loose to medium-dense.
- Ground motion must be intense.
- Duration of shaking must be sufficient for the soils to lose shear resistance.

The site is located in an area designated by San Bernardino County as having no susceptibility to liquefaction (San Bernardino County, 2010b). Based on Dynamic Settlement Analyses presented in Appendix C, *Liquefaction and Seismic Settlement Analysis*, we estimate that the potential for liquefaction induced settlement is negligible, in the site.

***Seismic Settlement**:* Dynamic dry settlement may occur in loose, granular, unsaturated soils during large seismic events. Based on Dynamic Settlement Analyses presented in Appendix C, *Liquefaction and Seismic Settlement Analysis*, we estimate that the site will have the potential for up to 5.12 inches of dry seismic settlement with potential differential settlement of approximately 2.56 inches over a lateral distance of 125 feet.

Lateral Spreading: Seismically induced lateral spreading involves primarily lateral movement of earth materials over underlying materials which are liquefied due to ground shaking. It differs from the slope failure in that complete ground failure involving large movement does not occur due to the relatively smaller gradient of the initial ground surface. Lateral spreading is demonstrated by near-vertical cracks with predominantly horizontal movement of the soil mass involved. Due to the calculated potential for liquefaction and the relatively flat nature of the site, the potential for lateral spreading is also considered low.

Landslides: Seismically induced landslides and other slope failures are common occurrences during or soon after earthquakes. Due to the relatively flat nature of the site, the potential for on-site landsliding is considered to be low.

Tsunamis: Tsunamis are large waves generated in open bodies of water by fault displacement or major ground movement. Due to the inland location of the site, tsunamis are not considered to be a risk.

Seiches: Seiches are large waves generated in enclosed bodies of water in response to ground shaking. There are no enclosed bodies of water near the project site. Seiching is not considered to be a risk.

Earthquake-Induced Flooding: Dams or other water-retaining structures may fail as a result of large earthquakes. The project site is not located within a designated dam inundation zone (DSOD, 2025). Due to the distance from any large dams or other water-retaining structures, the risk for earthquake-induced flooding at the project site is considered low.

8.0 LABORATORY TEST RESULTS

Results of the various laboratory tests are presented in Appendix B, *Laboratory Testing Program,* except for the results of *in situ* moisture and dry density tests which are

presented on the Logs of Borings in Appendix A, *Field Exploration.* The results are also discussed below.

8.1 Physical Testing

The results of laboratory tests on samples obtained from the site are presented below.

- *In-situ* Moisture and Dry Density – Results of *in-situ* moisture and dry density tests performed in accordance with ASTM Standard D2216-19 and D7263 are presented on the Logs of Borings in Appendix A, *Field Exploration.* Dry densities of upper 10 feet soils of the proposed site ranged from 98 to 115 pcf with moisture contents ranging from 1 to 7 percent. Results are presented in the log of borings in Appendix A, *Field Exploration.*
- Expansion Index (EI) – Four representative samples were tested to evaluate the expansion potential in accordance with ASTM Standard D4829-21. The test results indicated EI's of 0, 0, 3 and 4, indicating very low expansion potential.
- Passing Sieve No.200 (W) – Six representative soil samples were tested to determine the percent of material passing through a No.200 Sieve in accordance with the ASTM Standard D1140-17. The test results are presented in *Passing Sieve No.200 Test Results* in Appendix B, *Laboratory Testing Program*.
- Maximum Dry Density and Optimum Moisture Content (CP) – Typical moisture-density relationship was performed on two representative soil samples in accordance with ASTM D1557-12R21. The test results are presented in Drawing No. B-1, *Moisture-Density Relationship Result*, in Appendix B, *Laboratory Testing Program*. The laboratory maximum dry densities were 120.0 and 114.5 pounds per cubic foot (pcf) and the optimum moisture content were 8.3 and 7.0 percent respectively.
- Direct Shear (DS) – Four direct shear tests were performed in accordance with ASTM Standard D3080//3080M-23 on relatively undisturbed ring samples. The results of the direct shear test are presented in Drawing Nos. B-2 through B-5, *Direct Shear Test Results* in Appendix B, *Laboratory Testing Program*.
- Consolidation (C) – Three consolidation tests were performed on relatively undisturbed samples of the site soil, in accordance with ASTM Standard D2435-11. The test results are shown on Drawings Nos. B-6 through B-8, *Consolidation Test Results,* in Appendix B, *Laboratory Testing Program.*

For additional information on the subsurface conditions, see the Logs of Borings in Appendix A, *Field Exploration*.

8.2 Chemical Testing - Corrosivity Evaluation

Two representative soil samples were tested to determine minimum electrical resistivity, pH, and chemical contents, including soluble sulfate and chloride concentrations. The

purpose of these tests was to determine the corrosion potential of site soils when placed in contact with common construction materials. These tests were performed by Keegan Labs in accordance with California Test Methods 643, 422, 532 and 417. The test results are summarized below and are presented in Appendix B, *Laboratory Testing Program.*

- The pH measurements of the samples are 8.5 and 8.1.
- The sulfate contents of the samples are 12 ppm and 11 ppm.
- The chloride concentrations of the samples are 9.6 ppm and 9.5 ppm.
- The minimum electrical resistivities when saturated were 21,110 ohm-cm, and 35,180 ohm-cm.

9.0 EARTHWORK RECOMMENDATIONS

Recommendations for ground improvement, site preparation, remedial grading and estimates of shrinkage and subsidence are provided in the following sections.

9.1 General

This section contains our general recommendations regarding earthwork and site grading for the proposed project. These recommendations are based on our experience with similar projects in the area and the results of our field exploration, laboratory testing, and data evaluation as presented in the preceding sections. These recommendations may need to be modified based on observation of the actual field conditions during grading.

Prior to the start of construction, all existing underground utilities and appurtenances should be located at the project site. Such utilities should either be protected in-place or removed and replaced during construction as required by the project specifications. All excavations should be conducted in such a manner as not to cause loss of bearing and/or lateral support of existing utilities and structures.

The existing building (if any) will be demolished. All materials resulting from clearing, grubbing, and demolition operations should be removed from the site.

The final bottom surfaces of all overexcavations should be observed and approved by the project geotechnical consultant prior to placing any fill. Based on these observations, removal of localized areas deeper than those documented may be required during grading. Therefore, some variations in the depth and lateral extent of overexcavation recommended in this report should be anticipated.

9.2 Overexcavation

Parking structure footings, slab-on-grade and pavements should be uniformly supported by compacted fill. In order to provide uniform support, structural areas should be overexcavated, scarified, and recompacted as follows.

Table No. 5, Overexcavation Depths

Structure/Pavement	Minimum Excavation Depth
Parking Structure Foundation	36 inches below footings or 5 feet below ground surface, whichever is deeper
Slab-on-grade	24 inches below slab bottom or 3 feet below ground surface, whichever is deeper
Pavement	18 inches below finished grade or 2 feet below ground surface, whichever is deeper

The change in depth of the overexcavation below the footings and slabs-on-grade should be transitioned by a gradual slope. Generally, overexcavations should extend to at least 5 feet beyond the footprint of the structure and slabs or at least equal to the depth of overexcavation, whichever is greater. Overexcavations should extend at least 1 foot beyond the edge of pavement. The overexcavation bottom should be scarified and compacted as described in Section 9.4, *Compacted Fill Placement*.

If isolated pockets of very soft, loose, eroded, or pumping soil are encountered, the unstable soil should be excavated as needed to expose undisturbed, firm, and unyielding soils.

The contractor should determine the best way to conduct the excavations, such that there are no losses of bearing and/or lateral support to the existing structures or utilities. Consideration should be given to using slot cuts or other excavation methods which preserve lateral support during excavation operations near the existing hospital buildings.

9.3 Engineered Fill

No fill soils or aggregate base should be placed until excavations and/or natural ground preparation have been observed by the geotechnical consultant. The native soils encountered within the project site are generally considered suitable for reuse as compacted fill. Excavated soils should be processed, including cleaning roots and debris, removal of oversized particles, mixing, and moisture conditioning, before placing as compacted fill. On-site soils used as fill should meet the following criteria.

- No particles larger than 3 inches in largest dimensions.
- Rocks larger than 1 inch should not be placed within the upper 12 inches of subgrade soils.

- Free of all organic matter, debris, or other deleterious material.
- Expansion index of 30 or less.
- Sand Equivalent greater than 15 (greater than 30 for pipe bedding).
- Contain less than 30 percent by weight retained in 3/4-inch sieve.
- Contain less than 40 percent fines (passing #200 sieve).

Based on field investigation and laboratory testing results, on-site soils may be suitable as fill materials provided the above-mentioned criteria are fulfilled and appropriate corrosion mitigations are applied.

Imported materials, if required, should meet the above criteria prior to being used as compacted fill. Any imported fills should be tested and approved by the geotechnical representative prior to delivery to the site.

9.4 Compacted Fill Placement

All surfaces to receive structural fills should be scarified to a depth of 12 inches. The soil should be moisture conditioned to within ±3 percent of optimum moisture content for coarse grained soils and 0 to 2 percent above optimum moisture content for fine grained soils. The scarified soils should be recompacted to at least 90 percent of the laboratory maximum dry density.

Fill soils should be mixed thoroughly, and moisture conditioned to within ±3 percent of optimum moisture content for coarse grained soils and 0 to 2 percent above optimum moisture content for fine-grained soils. Fill soils should be evenly spread in horizontal lifts not exceeding 8 inches in uncompacted thickness.

All fill placed at the site should be compacted to at least 90 percent of the laboratory maximum dry densities as determined by ASTM Standard D1557-12R21 test method, unless a higher compaction is specified herein. At least the upper 12 inches of subgrade soils underneath pavements intended to support vehicle loads should be scarified, moisture conditioned and compacted to at least 95 percent of the laboratory maximum dry density.

To reduce differential settlement, variations in the soil type, degree of compaction and thickness of the engineered fill placed underneath the foundations should be minimized.

Fill materials should not be placed, spread or compacted during unfavorable weather conditions. When site grading is interrupted by heavy rain, filling operations should not resume until the geotechnical consultant approves the moisture and density conditions of the previously placed fill.

9.5 Shrinkage and Subsidence

The volume of excavated and recompacted soils may be expected to decrease as a result of grading. The shrinkage would depend on, among other factors, the depth of cut and/or fill, and the grading method and equipment utilized. For preliminary estimation, shrinkage factors for various units of earth material at the site may be taken as presented below.

- An average shrinkage factor (defined as a percentage of soil volume reduction when moisture conditioned and compacted to the average of 92 percent relative compaction) of 2 to 5 percent can be used for the upper 10 feet of soils for preliminary earthwork planning.
- Subsidence (defined as the settlement of native materials from the equipment load applied during grading) would depend on the construction methods including type of equipment utilized. For estimation purposes, ground subsidence may be taken as 0.15 to 0.20 feet.

Although these values are only approximate, they represent our best estimates of the factors to be used to calculate lost volume that may occur during grading. If more accurate shrinkage and subsidence factors are needed, it is recommended that field-testing using the actual equipment and grading techniques be conducted.

9.6 Site Drainage

Adequate positive drainage should be provided away from the structure to prevent ponding and to reduce percolation of water into structural backfill. A desirable slope for surface drainage is 2 percent in landscaped areas and 1 percent in paved areas. Planters and landscaped areas adjacent to the building perimeter should be designed to minimize water infiltration into the subgrade soils. Gutters and downspouts should be installed on the roofs of the structures, and runoff should be directed to the storm drain through non-erosive devices.

9.7 Utility Trench Backfill

The following section presents earthwork recommendations for utility trench backfill, including subgrade preparation and trench zone backfill.

Open cuts adjacent to existing roadways or structures are not recommended within a 1:1 (horizontal: vertical) plane extending down and away from the roadway or structure perimeter (if any).

Soils from the trench excavation should not be stockpiles more than 6 feet in heigh or within a horizontal distance from the trench edge equal to the depth of the trench, Soils

should not be stockpiled behind the shoring, if any, within a horizontal distance equal to the depth of the trench, unless the shoring has been designed for such loads.

9.7.1 Pipeline Subgrade Preparation

The final subgrade surface should be level, firm, uniform, and free of loose materials and properly graded to provide uniform bearing and support to the entire section of the pipe placed on bedding material. Protruding oversize particles larger than 2 inches in dimension, if any, should be removed from the trench bottom and replaced with compacted on-site materials.

Any loose, soft and/or unsuitable materials encountered at the pipe subgrade should be removed and replaced with adequate bedding material. During the digging of depressions for proper sealing of the pipe joints, the pipe should rest on a prepared bottom as near its full length as is practicable.

9.7.2 Pipe Bedding

Bedding is defined as the material supporting and surrounding the pipe to 1 foot above the pipe. Recommendations for pipe bedding are provided below.

To provide uniform and firm support for the pipe, compacted granular materials such as clean sand, gravel or ¾-inch crushed aggregate, or crushed rock may be used as pipe bedding material. Typically, soils with sand equivalent value of 30 or more are used as pipe bedding material. The pipe designer should determine if the soils are suitable as pipe bedding material.

The type and thickness of the granular bedding placed underneath and around the pipe, if any should be selected by the pipe designer. The load on the rigid pipes and deflection of flexible pipes and, hence, the pipe design, depends on the type and the amount of bedding placed underneath and around the pipe.

Bedding materials should be vibrated in place to achieve compaction. Care should be taken to densify the bedding material below the spring line of the pipe. Prior to placing the pipe bedding material, the pipe subgrade should be uniform and properly graded to provide uniform bearing and support to the entire section of the pipe placed on bedding material. During the digging of depressions for proper sealing of the pipe joints, the pipe should rest on a prepared bottom as near its full length as is practicable.

Based on the design groundwater depth, migration of fines from the surrounding native and/or fill soils may not be considered in selecting the gradation of any imported bedding material.

9.7.3 Trench Zone Backfill

The trench zone is defined as the portion of the trench above the pipe bedding extending up to the final grade level of the trench surface. Excavated sites soil free of oversize particles and deleterious matter may be used to backfill the trench zone. Detailed trench backfill recommendations are provided below.

- Trench excavations to receive backfill should be free of trash, debris or other unsatisfactory materials at the time of backfill placement.
- Trench zone backfill should be compacted to at least 90 percent of the laboratory maximum dry density as per ASTM D1557 test method. At least the upper 1 foot of trench backfill underlying pavement should be compacted to at least 95 percent of the laboratory maximum dry density as per ASTM D1557 test method.
- Particles larger than 1 inch should not be placed within 12 inches of the pavement subgrade. No more than 30 percent of the backfill volume should be larger than ¾-inch in the largest dimension. Gravel should be well mixed with finer soil. Rocks larger than 3 inches in the largest dimension should not be placed as trench backfill.
- Trench backfill should be compacted by mechanical methods, such as sheepsfoot, vibrating or pneumatic rollers or mechanical tampers to achieve the density specified herein. The backfill materials should be brought to within ± 3 percent of optimum moisture content for coarse-grained soil, and between optimum and 2 percent above optimum for fine-grained soil, then placed in horizontal layers. The thickness of uncompacted layers should not exceed 8 inches. Each layer should be evenly spread, moistened or dried as necessary, and then tamped or rolled until the specified density has been achieved.
- The contractor should select the equipment and processes to be used to achieve the specified density without damage to adjacent ground, structures, utilities and completed work.
- It should be the responsibility of the contractor to maintain safe working conditions during all phases of construction.
- The field density of the compacted soil should be measured by the ASTM D1556 (Sand Cone) or ASTM D6938 (Nuclear Gauge) or equivalent.
- Trench backfill should not be placed, spread or rolled during unfavorable weather conditions. When the work is interrupted by heavy rain, fill operations should not resume until field tests by the project's geotechnical consultant indicate that the moisture content and density of the fill are in compliance with project specifications.

10.0 DESIGN RECOMMENDATIONS

Recommendations for the design and construction of the proposed building are presented in the following sections. The recommendations provided are based on the assumption that, in preparing the site, the above earthwork recommendations will be implemented.

10.1 Preliminary Shallow Foundation Design Parameters

The proposed four-story parking structure and possible retaining walls may be supported on continuous or isolated spread footings founded completely within in competent compacted fill. The design of the shallow foundations should be based on the recommended parameters presented in the table below.

Table No. 6, Recommended Foundation Parameters

Parameter	4-Story Value
Minimum continuous width (interior and exterior)	18 inches
Minimum continuous or isolated footing depth of embedment below lowest adjacent grade (interior and exterior)	18 inches
Allowable net bearing capacity	2,000 psf

Isolated interior footings should be at least 24 inches wide. The footing dimensions and reinforcement should be based on structural design. The allowable bearing capacity can be increased by 500 pounds per square foot (psf) with each foot of additional embedment and 100 psf with each foot of additional width up to a maximum of 3,000 psf.

The net allowable bearing values indicated above are for the dead loads and frequently applied live loads and are obtained by applying a factor of safety of 3.0 to the net ultimate bearing capacity. If normal code requirements are applied for design, the above vertical bearing value may be increased by 33 percent for short duration loadings, which will include loadings induced by wind or seismic forces.

10.2 Shallow Foundation with Grade Beam

To mitigate the anticipated liquefaction induced settlement, continuous or isolated spread footings along the perimeter and internal grade beams may be considered to support the proposed structure, as follows.

- The footings should have a minimum width of 18 inches. The footings should extend to a minimum depth of 18 inches below lowest adjacent grade.
- Structural design elements of slabs-on-grade, including but not limited to thickness, reinforcement, joint spacing of more heavily loaded slabs will be dependent upon the anticipated loading conditions and should be designed by a structural engineer. The slab should be underlain by a 2-inch-thick layer of clean sand overlying a polyethylene vapor retarder, 10-mil or thicker. The vapor retarder should be underlain by a 2-inch-thick layer of clean sand. The vapor retarder is recommended in areas where moisture-sensitive floor covering is anticipated.

- Engineered fill underlying the slab should be moisture-conditioned and compacted in accordance with the recommendations presented in this report prior to placement of concrete. Concrete contraction joints should be constructed at intervals designed by the structural engineer to help reduce the cracking of the slab.
- Internal grade beams should be placed at a maximum spacing of 30 feet on center and should be arranged to divide the structure into squares or rectangles in accordance with the requirements of the CBC. All foundation elements, including isolated or spread footings, should be tied together with internal grade beams. Internal grade beams should extend a minimum of 18 inches below the top of the slab and should have a minimum width of 12 inches. Alternatively, the slab may be thickened to provide an equivalent section equal in stiffness as determined by the structural design engineer.
- Allowable net bearing capacity will be 2,000 psf.

10.3 Lateral Earth Pressures and Resistance to Lateral Loads

In the following subsections, the lateral earth pressures and resistance to lateral loads are estimated by using on-site native soils strength parameters obtained from laboratory testing.

10.3.1 Active Earth Pressures

The active earth pressure behind any buried wall or foundation depends primarily on the allowable wall movement, type of backfill materials, backfill slopes, wall or foundation inclination, surcharges, and any hydrostatic pressures. The recommended lateral earth pressures for the site are presented in the following table.

Table No. 7, Active and At-Rest Earth Pressures

Loading Conditions	Lateral Earth Pressure (psf/ft. depth)
Active earth conditions (wall is free to deflect at least 0.001 radian)	45
At-rest (wall is restrained)	66

These pressures assume a level ground surface around the structure for a distance greater than the structure height, no surcharge and no hydrostatic pressure. If water pressure is allowed to build up behind the structure, the active pressures should be reduced by 50 percent and added to a full hydrostatic pressure to compute the design pressures against the structure.

10.3.2 Passive Earth Pressure

Resistance to lateral loads can be assumed to be provided by friction acting at the base of foundations and by passive earth pressure. Coefficients of friction of 0.35 between mass concrete and soil, 0.30 between formed concrete and soil, and 0.25 between steel and soil may be used. A passive earth pressure of 210 psf per foot of depth may be used for the sides of footings poured against recompacted native soils. A factor of safety of 1.5 was applied in calculating passive earth pressure. The maximum value of the passive earth pressure should be limited to 2,000 psf. Passive resistance should be neglected in the upper 6 inches unless the surface is contained by a pavement or a slab.

These lateral resistances may be increased by 33 percent for seismic forces. Due to the low overburden stress of the soil at shallow depth, the upper one foot of passive resistance should be neglected unless the soil is confined by pavement or slab. Vertical and lateral bearing values indicated above are for the total dead loads and frequently applied live loads. If normal code requirements are applied for design, the above vertical bearing and lateral resistance values may be increased by 33 percent for short duration loading, which will include the effect of wind or seismic forces.

10.4 Drilled Pier Foundations

The parking structure can also be supported by drilled pier foundations deriving their support primarily through skin friction. The piers may be designed for compression using an allowable skin friction value of 150 psf for a minimum of 30 feet deep below the finished grade. This value may be increased by 33 percent for transient wind and seismic forces. For pier design in tension, 50 percent of the recommended allowable skin friction values in compression may be used. The drilled pier should have a minimum diameter of 24 inches. For design purposes, the upper 2 feet of the soil should be neglected in determining the skin friction and point of fixity can be considered in the toe of pier.

The equivalent lateral earth pressure equal to 210 pounds per square foot per foot of depth may be used for the design.

10.5 Drilled Pier Foundation Installation Recommendations

It is the responsibility of the contractor to select proper construction equipment and methods to correctly install the piers based on his own interpretation of the information presented in this report.

Groundwater was not encountered in the exploratory boreholes up to depth of 51.5 feet below existing ground surface and due to the presence of sandy soil with gravel, there is some possibility of caving. However, casing, or other methods approved by the project geotechnical consultant, may be used to support the sides of the excavation. Casing

should be used at the discretion of the contractor. The casing should be advanced as drilling proceeds by drilling with a flight or bucket auger smaller in diameter than the inside of the casing. Occasional hammering may be required to advance the casing within the excavation. The casing, when used, should not be left in place as the pier designs are based on skin friction only. The casing should be pulled as the concrete is being poured, while always maintaining a head of concrete inside the casing. The contractor should have equipment on-site with sufficient pulling capacity to pull the casing at the proper time. The casing should have an outside diameter not less than the specified diameter of the pier.

The bottoms of the excavations should be cleaned of any loose cuttings before placing concrete. All applicable state and federal OSHA safety regulations must be satisfied during construction.

Drilled pier installation shall be performed under continuous observation by the project geotechnical consultant to confirm that the subsurface soils are similar to the soils encountered during our field investigation, which have formed the basis of our pier design recommendations. The contractor shall provide access and necessary facilities, including droplights, at his expense, to accommodate pier observations. Drilled pier installation shall be performed such that compliance with all safety rules and requirements is achieved.

10.6 Settlement

The total settlement of shallow footings from static structural loads and short-term settlement of properly compacted fill is anticipated to be 1 inch or less. The differential settlement resulting from static loads is anticipated to be 0.5 inches or less over a horizontal distance of 40 feet.

Our analysis of the potential dynamic settlement is presented in Appendix C, *Liquefaction and Seismic Settlement Analysis*. We estimate that the project site has the approximate potential for up to 0.96 inches of dry seismic settlement and negligible liquefaction induced settlement during a large earthquake. The differential settlement is anticipated to be equal to one-half of the total potential liquefaction induced for 0.48 inches over a lateral distance of 125 horizontal feet.

Generally, static and dynamic settlement does not occur at the same time. For design purposes, the structural engineer should decide whether static and dynamic settlement will be combined or not.

10.7 Soil Corrosivity

Two representative soil samples were evaluated for corrosivity with respect to common construction materials such as concrete and steel. The test result is presented in

Appendix B, *Laboratory Testing Program* and design recommendations pertaining to soil corrosivity are presented below.

Soils pH values were 8.5 and 8.1, which indicates soils are alkaline in nature.

The sulfate contents of the sampled soils correspond to American Concrete Institute (ACI) exposure category S0 for these sulfate concentrations (ACI 318-19, Table 19.3.1.1). No concrete type restrictions are specified for exposure category S0 (ACI 318-14, Table 19.3.2.1). A minimum compressive strength of 2,500 psi is recommended.

We anticipate that concrete structures such as footings and slabs will be exposed to moisture from precipitation and irrigation. Based on the site locations and the results of chloride testing of the site soils, we do not anticipate that concrete structures will be exposed to external sources of chlorides, such as deicing chemicals, salt, brackish water, or seawater. ACI specifies exposure category C1 where concrete is exposed to moisture, but not to external sources of chlorides (ACI 318-19, Table 19.3.1.1). ACI provides concrete design recommendations in ACI 318-19, Table 19.3.2.1, including a compressive strength of at least 2,500 psi and a maximum chloride content of 0.3 percent. According to Keegan Labs LLC, 2024, the following table provides general guidelines of soil corrosion based on electrical resistivity.

Table No. 8a, Correlation Between Resistivity and Corrosion

Electrical Resistivity of Soil	
Soil Resistivity (ohm-cm) per Caltrans CT 643	**Corrosivity Category**
Greater than 10,000	Mildly Corrosive
2,001 to 10,000	Moderately Corrosive
1,001 to 2,000	Corrosive
0 to 1,000	Severe Corrosive

Table No. 8b, Correlation Between Sulfates and Corrosion

Sulfate in Soil per ACI 318	
Sulfate Level (mg/kg)	**Classification**
Less than 1,000 (<0.1%)	Negligible
1,000 to 2,000 (0.1 to 0.2%)	Moderate
2,000 to 20,000 (0.2 to 2.0%)	Severe
Over 20,000 (>2.0%)	Very Severe

Table No. 8c, Correlation Between Chlorides and Corrosion

Chloride in Soil	
Concentration (mg/kg)	**Classification**
ND to 100	Negligible
100 to 350	Little Added Concern
350 to 500	Potential Concern
Over 500	Definite Concern

Table No. 8d, Correlation Between pH and Corrosion

pH	
pH Range	**Description**
<3.5	Ultra Acidic
3.5 to 4.4	Extremely Acidic
4.5 to 5.0	Very Strongly Acidic
5.1 to 5.5	Strongly Acidic*
5.6 to 6.0	Moderately Acidic
6.1 to 6.5	Slightly Acidic
6.6 to 7.3	Neutral
7.4 to 7.8	Slightly Alkaline
7.9 to 8.4	Moderately Alkaline
8.5 to 9.0	Strongly Alkaline
>9.0	Very Strongly Alkaline

*This range and below should have total acidity testing performed to evaluate corrosivity

The measured value of the minimum electrical resistivities of the samples when saturated were 21,110, and 35,180 ohm-cm for the site. This indicates that the soils tested are mildly corrosive to ferrous metals in contact with the soils. (Keegan, 2024) Converse does not practice in the area of corrosion consulting. If needed, a qualified corrosion consultant should provide appropriate corrosion mitigation measures for any ferrous metals in contact with the site soils.

11.0 CONSTRUCTION RECOMMENDATIONS

Temporary sloped excavation is presented in the following sections.

11.1 General

Both sloped and vertical braced excavations can be considered for temporary excavations.

Depending on the sequence of construction, excavations may be required near existing streets or structures, which may require vertical side wall excavation. Where the side of the excavation is a vertical cut, it should be adequately supported by temporary shoring to protect workers and any adjacent structures.

All applicable requirements of the California Construction and General Industry Safety Orders, the Occupational Safety and Health Act, and the Construction Safety Act, should be met. The soils exposed in cuts should be observed during excavation by the geotechnical consultant and the competent person designated by the contractor. If potentially unstable soil conditions are encountered, modifications of slope ratios for temporary cuts may be required.

11.2 Temporary Sloped Excavations

Temporary open cut may be constructed with side slopes as recommended in the following table. Temporary cuts encountering soft and wet fine-grained soils; dry loose, cohesionless soils or loose fill from trench backfill may have to be constructed at a flatter gradient than presented below.

Table No. 9, Slope Ratios for Temporary Excavations

Soil Type	OSHA Soil Type	Depth of Excavation (ft)	Recommended Maximum Slope (Horizontal:Vertical)[1]
Sand with Gravel (SP), Sand with Silt (SP-SM), Silty Sand (SM), Sand (SP)	C	0-10	1.5:1
		10-20	2:1

[1] Slope ratio assumed to be uniform from top to toe of slope.

For shallow excavations up to 4.0 feet bgs, excavation can be vertical. For steeper temporary construction slopes or deeper excavations, or unstable soil encountered during the excavation, shoring or trenches should be provided by the contractor to protect the workers in the excavation. Design recommendations for temporary shoring can be provided if necessary.

Surfaces exposed in slope excavations should be kept moist but not saturated to retard raveling and sloughing during construction. Adequate provisions should be made to protect the slopes from erosion during periods of rainfall. Surcharge loads, including construction materials, should not be placed within 5.0 feet of the unsupported slope

edge. Stockpiled soils with a height higher than 6.0 feet will require greater distance from excavation edges.

12.0 GEOTECHNICAL SERVICES DURING CONSTRUCTION

The project geotechnical consultant should review plans and specifications as the project design progresses. Such review is necessary to identify design elements, assumptions, or new conditions which require revisions or additions to our geotechnical recommendations.

The project geotechnical consultant should be present to observe conditions during construction. Geotechnical observation and testing should be performed as needed to verify compliance with project specifications. Additional geotechnical recommendations may be required based on subsurface conditions encountered during construction.

13.0 CLOSURE

This report is prepared for the project described herein and is intended for use solely by ARMC, the County of San Bernardino and their authorized agents, to assist in the design and construction of the proposed project. Our findings and recommendations were obtained in accordance with generally accepted professional principles practiced in geotechnical engineering. We make no other warranty, either expressed or implied.

Converse Consultants is not responsible or liable for any claims or damages associated with the interpretation of available information provided to others. Site exploration identifies actual soil conditions only at those points where samples are taken, when they are taken. Data derived through sampling and laboratory testing is extrapolated by Converse employees who render an opinion about the overall soil conditions. Actual conditions in areas not sampled may differ. In the event that changes to the project occur, or additional, relevant information about the project is brought to our attention, the recommendations contained in this report may not be valid unless these changes and additional relevant information is reviewed, and the recommendations of this report are modified or verified in writing. In addition, the recommendations can only be finalized by observing actual subsurface conditions revealed during construction. Converse cannot be held responsible for misinterpretation or changes to our recommendations made by others during construction.

As the project evolves, continued consultation and construction monitoring by a qualified geotechnical consultant should be considered an extension of geotechnical investigation services performed to date. The geotechnical consultant should review plans and specifications to verify that the recommendations presented herein have been appropriately interpreted, and that the design assumptions used in this report are valid. Where significant design changes occur, Converse may be required to augment or modify

the recommendations presented herein. Subsurface conditions may differ in some locations from those encountered in the explorations, and may require additional analyses and, possibly, modified recommendations.

Design recommendations given in this report are based on the assumption that the recommendations contained in this report are implemented. Additional consultation may be prudent to interpret Converse's findings for contractors, or to possibly refine these recommendations based upon the review of the actual site conditions encountered during construction. If the scope of the project changes, if project completion is to be delayed, or if the report is to be used for another purpose, this office should be consulted.

14.0 REFERENCES

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Appendix A

Field Exploration

APPENDIX A

FIELD EXPLORATION

Our field investigation included a site reconnaissance and a subsurface exploration program consisting of drilling soil borings. During the site reconnaissance, the surface conditions were noted, and the approximate locations of the test borings were established with reference to existing site and boundary features. The mapped boring locations should be considered accurate only to the degree implied by the method used to locate them.

After marking the boring locations, The Underground Service Alert (USA) was notified, and appropriate tickets were obtained. However, since USA dose not mark private underground infrastructure, a private utility locating company, Util-locate, cleared the boring locations for potential conflict with existing private utilities.

Twelve exploratory borings (BH-01 through BH-12) were drilled on January 7, 8, and 10, 2025, to investigate the subsurface conditions. Borings were drilled to depths listed in the table below.

Table No. A-1, Summary of Borings

Boring No.	Boring Depth (ft, bgs)		Groundwater Depth (ft, bgs)	Date Completed
	Proposed	Completed		
BH-01	25.0	26.5	Not Encountered	1/07/2025
BH-02	25.0	26.5	Not Encountered	1/07/2025
BH-03	50.0	51.5	Not Encountered	1/07/2025
BH-04	25.0	26.5	Not Encountered	1/07/2025
BH-05	25.0	26.5	Not Encountered	1/07/2025
BH-06	50.0	51.5	Not Encountered	1/10/2025
BH-07	25.0	26.5	Not Encountered	1/08/2025
BH-08	25.0	26.5	Not Encountered	1/08/2025
BH-09	25.0	26.5	Not Encountered	1/08/2025
BH-10	25.0	26.5	Not Encountered	1/08/2025
Bh-11	15.0	16.5	Not Encountered	1/10/2025
BH-12	15.0	16.5	Not Encountered	1/10/2025

The borings were advanced using a truck-mounted drill rig equipped with 8-inch diameter hollow-stem augers for soils sampling. Encountered materials were continuously logged by a Converse Geologist and classified in the field by visual classification in accordance with the Unified Soil Classification System. Where appropriate, the field descriptions and classifications have been modified to reflect laboratory test results.

Relatively undisturbed samples were obtained using California Modified Samplers (2.4 inches inside diameter and 3.0 inches outside diameter) lined with thin sample rings. The steel ring sampler was driven into the bottom of the borehole with successive drops of a 140-pound driving weight falling 30 inches. Blow counts at each sample interval are presented on the boring logs. Samples were retained in brass rings (2.4 inches inside diameter and 1.0 inch in height) and carefully sealed in waterproof plastic containers for shipment to the Converse laboratory. Bulk samples of typical soil types were also obtained.

Standard Penetration Testing (SPT) was also performed in accordance with the ASTM Standard D1586 test method in borehole BH-01 through BH-10 every 10 feet bgs interval starting at 20 feet bgs using a standard (1.4 inches inside diameter and 2.0 inches outside diameter) split-barrel sampler. The mechanically driven hammer for the SPT sampler was 140 pounds, falling 30 inches for each blow. The recorded blow counts for every 6 inches for a total of 1.5 feet of sampler penetration are shown on the Logs of Borings.

The exact depths at which material changes occur cannot always be established accurately. Unless a more precise depth can be established by other means, changes in material conditions that occur between drive samples are indicated on the logs at the top of the next drive sample.

Following the completion of logging and sampling, all borings were backfilled with soil cuttings, compacted by pushing down with augers using the drill rig weight and patched with quickset cement that was dyed black to match the existing surface. If construction is delayed, the surface may settle over time. We recommend the owner monitors the boring locations and backfill any depressions that might occur or provide protection around the boring locations to prevent trip and fall injuries from occurring near the area of any potential settlement.

For a key to soil symbols and terminology used in the boring logs, refer to Drawing No. A-1a and A-1b, *Unified Soil Classification and Key to Boring Log Symbols*. For logs of borings, see Drawings Nos. A-2 through A-13, *Logs of Borings*.

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE			GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	SAND AND SANDY SOILS	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE			SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

FIELD AND LABORATORY TESTS

C	Consolidation (ASTM D 2435)
CL	Collapse Potential (ASTM D 4546)
CP	Compaction Curve (ASTM D 1557)
CR	Corrosion, Sulfates, Chlorides (CTM 643-99; 417; 422)
CU	Consolidated Undrained Triaxial (ASTM D 4767)
DS	Direct Shear (ASTM D 3080)
EI	Expansion Index (ASTM D 4829)
M	Moisture Content (ASTM D 2216)
OC	Organic Content (ASTM D 2974)
P	Permeablility (ASTM D 2434)
PA	Particle Size Analysis (ASTM D 6913 [2002])
PI	Liquid Limit, Plastic Limit, Plasticity Index (ASTM D 4318)
PL	Point Load Index (ASTM D 5731)
PM	Pressure Meter
PP	Pocket Penetrometer
R	R-Value (CTM 301)
SE	Sand Equivalent (ASTM D 2419)
SG	Specific Gravity (ASTM D 854)
SW	Swell Potential (ASTM D 4546)
TV	Pocket Torvane
UC	Unconfined Compression - Soil (ASTM D 2166)
	Unconfined Compression - Rock (ASTM D 7012)
UU	Unconsolidated Undrained Triaxial (ASTM D 2850)
UW	Unit Weight (ASTM D 2937)
WA	Passing No. 200 Sieve

BORING LOG SYMBOLS

SAMPLE TYPE

- STANDARD PENETRATION TEST — Split barrel sampler in accordance with ASTM D-1586-84 Standard Test Method
- DRIVE SAMPLE 2.42" I.D. sampler (CMS).
- DRIVE SAMPLE No recovery
- BULK SAMPLE
- GROUNDWATER WHILE DRILLING
- GROUNDWATER AFTER DRILLING

DRILLING METHOD SYMBOLS

Auger Drilling | Mud Rotary Drilling | Dynamic Cone or Hand Driven | Diamond Core

UNIFIED SOIL CLASSIFICATION AND KEY TO BORING LOG SYMBOLS

Converse Consultants

Arrowhead Regional Medical Center Parking Structure
Southeast of the Intersection of Pepper Avenue and Plum Place
City of Colton, San Bernardino County, CA
For: Arrowhead Regional Medical Center

Project No. 24-81-276-01

Drawing A-1a

CONSISTENCY OF COHESIVE SOILS

Descriptor	Unconfined Compressive Strength (tsf)	SPT Blow Counts	Pocket Penetrometer (tsf)	CA Sampler	Torvane (tsf)	Field Approximation
Very Soft	<0.25	< 2	<0.25	<3	<0.12	Easily penetrated several inches by fist
Soft	0.25 - 0.50	2 - 4	0.25 - 0.50	3 - 6	0.12 - 0.25	Easily penetrated several inches by thumb
Medium Stiff	0.50 - 1.0	5 - 8	0.50 - 1.0	7 - 12	0.25 - 0.50	Can be penetrated several inches by thumb with moderate effort
Stiff	1.0 - 2.0	9 - 15	1.0 - 2.0	13 - 25	0.50 - 1.0	Readily indented by thumb but penetrated only with great effort
Very Stiff	2.0 - 4.0	16 - 30	2.0 - 4.0	26 - 50	1.0 - 2.0	Readily indented by thumbnail
Hard	>4.0	>30	>4.0	>50	>2.0	Indented by thumbnail with difficulty

APPARENT DENSITY OF COHESIONLESS SOILS

Descriptor	SPT N_{60}- Value (blows / foot)	CA Sampler
Very Loose	<4	<5
Loose	4- 10	5 - 12
Medium Dense	11 - 30	13 - 35
Dense	31 - 50	36 - 60
Very Dense	>50	>60

MOISTURE

Descriptor	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OF PROPORTION OF SOILS

Descriptor	Criteria
Trace (fine)/ Scattered (coarse)	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

SOIL PARTICLE SIZE

Descriptor		Size
Boulder		> 12 inches
Cobble		3 to 12 inches
Gravel	Coarse	3/4 inch to 3 inches
	Fine	No. 4 Sieve to 3/4 inch
Sand	Coarse	No. 10 Sieve to No. 4 Sieve
	Medium	No. 40 Sieve to No. 10 Sieve
	Fine	No. 200 Sieve to No. No. 40 Sieve
Silt and Clay		Passing No. 200 Sieve

PLASTICITY OF FINE-GRAINED SOILS

Descriptor	Criteria
Nonplastic	A 1/8-inch thread cannot be rolled at any water content.
Low	The thread can barely be rolled, and the lump cannot be formed when drier than the plastic limit.
Medium	The thread is easy to roll, and not much time is required to reach the plastic limit; it cannot be rerolled after reaching the plastic limit. The lump crumbles when drier than the plastic limit.
High	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit.

CEMENTATION/ Induration

Descriptor	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

NOTE: This legend sheet provides descriptions and associated criteria for required soil description components only. Refer to Caltrans Soil and Rock Logging, Classification, and Presentation Manual (2010), Section 2, for tables of additional soil description components and discussion of soil description and identification.

UNIFIED SOIL CLASSIFICATION AND KEY TO BORING LOG SYMBOLS

Converse Consultants

Arrowhead Regional Medical Center Parking Structure
Southeast of the Intersection of Pepper Avenue and Plum Place
City of Colton, San Bernardino County, CA
For: Arrowhead Regional Medical Center

Project No. **24-81-276-01**

Drawing **A-1b**

Log of Boring No. BH-01

Date Drilled: 1/7/2025 Logged by: Jason Bragg Checked By: Stephen McPherson

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 1070 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		2.5" ASPHALT CONCRETE/ 4" AGGREGATE BASE						
		ALLUVIUM **SAND WITH SILT (SP-SM):** fine to medium-grained, dense, moist, yellowish brown.	■		6/23/33	4	107	
5		-@5.0': very dense.	■		20/35/50	5	109	C
		-@7.5': medium dense, light brown.	■		9/10/12	3	108	
10			■	▨	6/8/10	2	107	
15		-@15.0': dense.	■		13/22/30	3	102	
20		-@20.0': medium dense.	☒		7/13/16	3		
25		-@25.0': very dense.	■		18/30/50	4	100	
		End of Boring at 26.5 feet below ground surface. Groundwater not encounterd. Boring backfilled with soil cuttings mixed with cement and compacted with auger using the weight of the drill rig and patched with quickset concrete dyed black to match the existing surface on 01/07/2025						

Converse Consultants

Arrowhead Regional Medical Center Parking Structure
Southeast of the Intersection of Pepper Avenue and Plum Place
City of Colton, San Bernardino County, CA
For: Arrowhead Regional Medical Center

Project No. 24-81-276-01

Drawing No. A-2

Log of Boring No. BH-02

Date Drilled: 1/7/2025 Logged by: Jason Bragg Checked By: Stephen McPherson

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 1070 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		2.5" ASPHALT CONCRETE/ 4.5" AGGREGATE BASE						
		ALLUVIUM						
		SAND WITH SILT (SP-SM): fine to medium-grained, very dense, moist, yellowish brown.	■		19/30/50-5"	7	115	
5		-@5.0': medium dense.	■	▨	13/15/19	3	105	EI
			■	▨	5/7/9	2	102	DS
10		**SAND (SP):** fine-grained, trace silt, dense, moist, tan.	■		9/14/24	1		*disturbed
15		-@15.0': moist.	■		10/18/24	2	102	
20		-@20.0': medium dense.	☒		7/9/11	2		
25		-@25.0': very dense.	■		15/25/50-5"	2	101	
		End of Boring at 26.5 feet below ground surface. Groundwater not encounterd. Boring backfilled with soil cuttings mixed with cement and compacted with auger using the weight of the drill rig and patched with quickset concrete dyed black to match the existing surface on 01/07/2025						

Converse Consultants

Arrowhead Regional Medical Center Parking Structure
Southeast of the Intersection of Pepper Avenue and Plum Place
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For: Arrowhead Regional Medical Center

Project No. 24-81-276-01

Drawing No. A-3

Log of Boring No. BH-03

Date Drilled: 1/7/2025 Logged by: Jason Bragg Checked By: Stephen McPherson

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 1070 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		2" ASPHALT CONCRETE/ 4" AGGREGATE BASE						
		ALLUVIUM **SILTY SAND (SM):** fine to medium-grained, very dense, moist, light brown.	■	▨	6/28/50	3	108	CR
5			■		27/50-6"	4	113	DS
		-@7.5': medium dense.	■		6/8/8	2	105	
10		-@10.0': loose.	■		3/3/3	2		*disturbed
15		-@15.0': dry, dense.	■		13/21/30	1	85	
20		**SAND (SP):** fine-grained, trace silt, dense, dry, tan.	⊠	▨	10/14/17	1		
25		-@25.0': very dense.	■		20/27/35	1	102	
30		**SILTY SAND (SM):** fine-grained, medium dense, moist, reddish-brown.	⊠		10/12/15	2		WA

Converse Consultants

Arrowhead Regional Medical Center Parking Structure
Southeast of the Intersection of Pepper Avenue and Plum Place
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For: Arrowhead Regional Medical Center

Project No. **24-81-276-01**

Drawing No. **A-4a**

Log of Boring No. BH-03

Date Drilled: 1/7/2025 Logged by: Jason Bragg Checked By: Stephen McPherson

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 1070 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		ALLUVIUM **SILTY SAND (SM):** fine-grained, scattered gravel up to 1.5 inches in maximium dimension, very dense, moist, reddish-brown.	■	▨	8/24/45	6	118	
40		**SAND WITH GRAVEL (SP):** fine to coarse-grained, some gravel up to 1 inch maximum dimension, very dense, moist, dark tan.	☒		18/18/34	3		
45			■		50-5"	3		*disturbed
50			☒		30/36/50-5"	2		WA
		End of Boring at 51.5 feet below ground surface. Groundwater not encounterd. Boring backfilled with soil cuttings mixed with cement and compacted with auger using the weight of the drill rig and patched with quickset concrete dyed black to match the existing surface on 01/07/2025						

Converse Consultants

Arrowhead Regional Medical Center Parking Structure
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Project No. 24-81-276-01

Drawing No. A-4b

Log of Boring No. BH-04

Date Drilled: 1/7/2025 Logged by: Jason Bragg Checked By: Stephen McPherson

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 1070 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		4.5" ASPHALT CONCRETE/ 4" AGGREGATE BASE						
		ALLUVIUM **SAND (SP):** fine-grained, dense, moist, light tan.	■		18/24/24	2	107	
5		-@5.0': dry.	■		9/18/20	1		*disturbed
			■		10/16/21	1		*disturbed
10			■	▨	11/18/25	1		*disturbed
15			■		12/19/26	1		*disturbed
20			☒		8/15/20	1		
25		-@25.0': very dense.	■		20/32/43	1		*disturbed
		End of Boring at 26.5 feet below ground surface. Groundwater not encounterd. Boring backfilled with soil cuttings mixed with cement and compacted with auger using the weight of the drill rig and patched with quickset concrete dyed black to match the existing surface on 01/07/2025						

Converse Consultants

Arrowhead Regional Medical Center Parking Structure
Southeast of the Intersection of Pepper Avenue and Plum Place
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Project No. **24-81-276-01**

Drawing No. **A-5**

Log of Boring No. BH-05

Date Drilled: 1/7/2025 Logged by: Jason Bragg Checked By: Stephen McPherson

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 1070 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		3" ASPHALT CONCRETE/ 5" AGGREGATE BASE						
		ALLUVIUM						
		SAND (SP): fine-grained, very dense, dry, tan.	■		25/32/30	1	109	
5		-@5.0': medium dense.	■	▨	8/12/15	1		*disturbed CP, EI
			■	▨	10/16/18	1		*disturbed
10		-@10.0': dense.	■		8/15/20	1		*disturbed
15			■		13/25/18	1		*disturbed
20			☒		10/13/18	1		
25		-@25.0': very dense.	■		18/35/45	1		*disturbed
		End of Boring at 26.5 feet below ground surface. Groundwater not encounterd. Boring backfilled with soil cuttings mixed with cement and compacted with auger using the weight of the drill rig and patched with quickset concrete dyed black to match the existing surface on 01/07/2025						

Converse Consultants

Arrowhead Regional Medical Center Parking Structure
Southeast of the Intersection of Pepper Avenue and Plum Place
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Project No. **24-81-276-01**

Drawing No. **A-6**

Log of Boring No. BH-06

Date Drilled: 1/10/2025 Logged by: Jason Bragg Checked By: Stephen McPherson

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 1070 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		2.5" ASPHALT CONCRETE/ 4.5" AGGREGATE BASE						
		ALLUVIUM						
		SAND (SP): fine-grained, dense, dry, light brown.	■	▨	18/25/30	1	107	
5		-@5.0': moist.	■		12/18/24	3	98	DS
		-@7.5': dry.	■		11/17/25	1		*disturbed
10		-@10.0': trace silt, light tan.	■		12/18/30	1		*disturbed
15			■		14/21/32	1		*disturbed
20			⊠		12/14/18	1		WA
25		-@25.0': very dense.	■		18/30/50-5"	1		*disturbed
30		**SILTY SAND (SM):** fine to medium-grained, medium dense, moist, light brown.	⊠		9/13/17	2		WA

Converse Consultants

Arrowhead Regional Medical Center Parking Structure
Southeast of the Intersection of Pepper Avenue and Plum Place
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For: Arrowhead Regional Medical Center

Project No. **24-81-276-01**

Drawing No. **A-7a**

Log of Boring No. BH-06

Date Drilled: 1/10/2025 Logged by: Jason Bragg Checked By: Stephen McPherson

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 1070 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		ALLUVIUM **SILTY SAND (SM):** fine to medium-grained, very dense, moist, light brown.	■	▨	27/50-6"	3	109	
40		**SAND WITH SILT (SP-SM):** fine to coarse-grained, scattered gravel up to 1 inch in maximium dimension, trace silt, very dense, moist, reddish-brown.	⊠		38/50-6"	2		WA
45					50-4"			*no recovery
50		-@50.0': dense, dry.	⊠		26/16/16	1		WA
		End of Boring at 51.5 feet below ground surface. Groundwater not encounterd. Boring backfilled with soil cuttings mixed with cement and compacted with auger using the weight of the drill rig and patched with quickset concrete and dyed black to match the existing surface on 01/10/2025						

Converse Consultants

Arrowhead Regional Medical Center Parking Structure
Southeast of the Intersection of Pepper Avenue and Plum Place
City of Colton, San Bernardino County, CA
For: Arrowhead Regional Medical Center

Project No. 24-81-276-01

Drawing No. A-7b

Log of Boring No. BH-07

Date Drilled: 1/8/2025 Logged by: Jason Bragg Checked By: Stephen McPherson

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 1070 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		3" ASPHALT CONCRETE/ 4" AGGREGATE BASE						
		ALLUVIUM						
		SAND WITH SILT (SP): fine to medium-grained, dense, dry, tan.	■		15/21/27	1	104	
5			■	▨	10/16/20	1		*disturbed
			■	▨	9/16/25	1		*disturbed
10			■		12/19/30	1		*disturbed
15			■		15/20/36	1		*disturbed
20		-@20.0': medium dense.	☒		10/11/13	1		
25		-@25.0': very dense.	■		12/26/46	1		*disturbed
		End of Boring at 26.5 feet below ground surface. Groundwater not encounterd. Boring backfilled with soil cuttings mixed with cement and compacted with auger using the weight of the drill rig and patched with quickset concrete dyed black to match the existing surface on 01/08/2025						

Converse Consultants

Arrowhead Regional Medical Center Parking Structure
Southeast of the Intersection of Pepper Avenue and Plum Place
City of Colton, San Bernardino County, CA
For: Arrowhead Regional Medical Center

Project No. 24-81-276-01

Drawing No. A-8

Log of Boring No. BH-08

Date Drilled: 1/8/2025 Logged by: Jason Bragg Checked By: Stephen McPherson

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 1070 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		2.5" ASPHALT CONCRETE/ 5" AGGREGATE BASE						
		ALLUVIUM **SAND (SP):** fine to medium-grained, medium dense, dry, tan.	■		11/12/12	1		*disturbed
5			■		8/11/16	1		*disturbed
		-@7.5': moist.	■		9/14/18	5		*disturbed
10		-@10.0': dense, dry.	■	▨	11/22/28	1		*disturbed
15		-@15.0': very dense.	■		18/33/35	1		*disturbed
20		-@20.0': dense.	⊠		11/15/18	1		
25		-@25.0': very dense.	■		16/30/34	1		*disturbed
		End of Boring at 26.5 feet below ground surface. Groundwater not encounterd. Boring backfilled with soil cuttings mixed with cement and compacted with auger using the weight of the drill rig and patched with quickset concrete dyed black to match the existing surface on 01/08/2025						

Converse Consultants

Arrowhead Regional Medical Center Parking Structure
Southeast of the Intersection of Pepper Avenue and Plum Place
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For: Arrowhead Regional Medical Center

Project No. 24-81-276-01

Drawing No. A-9

Log of Boring No. BH-09

Date Drilled: 1/8/2025 Logged by: Jason Bragg Checked By: Stephen McPherson

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 1070 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		3" ASPHALT CONCRETE/ 4" AGGREGATE BASE						
		ALLUVIUM						
		SAND (SP): fine to medium-grained, trace silt, medium dense, moist, light brown.	■		6/10/13	3	103	
5			■	▨	9/13/19	3	103	C CP, EI
			■	▨	10/14/18	3	108	
10		-@10.0': dense.	■		11/20/25	3	106	DS
15			■		16/23/30	4	94	
20		-@20.0': medium dense.	⊠		9/12/16	5		
25		**SILT WITH SAND (ML-SM):** fine to medium-grained sand, dense, dark brown.	■		10/14/22	12	113	
		End of Boring at 26.5 feet below ground surface. Groundwater not encounterd. Boring backfilled with soil cuttings mixed with cement and compacted with auger using the weight of the drill rig and patched with quickset concrete dyed black to match the existing surface on 01/08/2025						

Converse Consultants

Arrowhead Regional Medical Center Parking Structure
Southeast of the Intersection of Pepper Avenue and Plum Place
City of Colton, San Bernardino County, CA
For: Arrowhead Regional Medical Center

Project No. 24-81-276-01

Drawing No. A-10

Log of Boring No. BH-10

Date Drilled: 1/8/2025 Logged by: Jason Bragg Checked By: Stephen McPherson

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 1070 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		2" ASPHALT CONCRETE/ 6" AGGREGATE BASE						
		ALLUVIUM **SAND WITH SILT (SP-SM):** fine-grained, very dense, moist, dark brown.	■	▨	23/35/41	3	115	CR C
5		-@5.0': medium dense.	■		8/12/17	1	108	
		-@7.5': dense, dry, tan.	■		11/16/20	1	105	
10			■		11/16/20	1		*disturbed
15		-@15.0': moist.	■		15/23/30	2	107	
20		-@20.0': medium dense.	⊠		8/12/16	2		
25		-@25.0': very dense.	■		17/26/50	4	104	
		End of Boring at 26.5 feet below ground surface. Groundwater not encounterd. Boring backfilled with soil cuttings mixed with cement and compacted with auger using the weight of the drill rig and patched with quickset concrete dyed black to match the existing surface on 01/08/2025						

Converse Consultants

Arrowhead Regional Medical Center Parking Structure
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For: Arrowhead Regional Medical Center

Project No. 24-81-276-01

Drawing No. A-11

Log of Boring No. BH-11

Date Drilled: 1/10/2025 Logged by: Jason Bragg Checked By: Stephen McPherson

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 1070 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		2.5" ASPHALT CONCRETE/ 5" AGGREGATE BASE						
		ALLUVIUM						
		SILTY SAND (SM): fine to coarse-grained, micaceous, very dense, moist, dark brown.	■		16/25/40	7	111	
5			■		27/50-6"	5	115	
		-@7.5': fine to medium-grained, medium dense, light brown.	■		5/9/10	5	106	
10			■	▨	7/10/16	4	101	
15		-@15.0': dense.	■	▨	10/17/25	3	103	
		End of Boring at 16.5 feet below ground surface. Groundwater not encounterd. Boring backfilled with soil cuttings mixed with cement and compacted with auger using the weight of the drill rig and patched with quickset concrete dyed black to match the existing surface on 01/10/2025						

Converse Consultants

Arrowhead Regional Medical Center Parking Structure
Southeast of the Intersection of Pepper Avenue and Plum Place
City of Colton, San Bernardino County, CA
For: Arrowhead Regional Medical Center

Project No. 24-81-276-01

Drawing No. A-12

Log of Boring No. BH-12

Date Drilled: 1/10/2025 Logged by: Jason Bragg Checked By: Stephen McPherson

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 1070 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		2.5" ASPHALT CONCRETE/ 5" AGGREGATE BASE						
		ALLUVIUM						EI
		SAND (SP): fine to medium-grained, very dense, moist, brown.	■		16/30/33	5	110	
5		-@5.0': trace silt, medium dense, light brown.	■		6/7/8	4	103	
		-@7.5': tan.	■		5/9/12	3	100	
10		-@10.0': dense.	■		9/15/20	4	101	
15			■		11/21/30	3	100	
		End of Boring at 16.5 feet below ground surface. Groundwater not encounterd. Boring backfilled with soil cuttings mixed with cement and compacted with auger using the weight of the drill rig and patched with quickset concrete dyed black to match the existing surface on 01/10/2025						

Converse Consultants

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Southeast of the Intersection of Pepper Avenue and Plum Place
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For: Arrowhead Regional Medical Center

Project No. 24-81-276-01

Drawing No. A-13

Appendix B

Laboratory Testing Program

APPENDIX B

LABORATORY TESTING PROGRAM

Tests were conducted in our laboratory on representative soil samples for the purpose of classification and evaluation of their relevant physical characteristics and engineering properties. The amount and selection of tests were based on the geotechnical requirements of the project. Summaries of the various laboratory tests conducted for this project and test results are presented below.

Moisture Content and Dry Density

In-situ dry density and moisture content tests were performed on relatively undisturbed ring samples, in accordance with ASTM Standard D2216-19 and D7263-21 to aid soils classification and to provide qualitative information on strength and compressibility characteristics of the site soils. For test results, see the Logs of Boring in Appendix A, *Field Exploration.*

Expansion Index

Four representative bulk samples were tested to evaluate the expansion potential in accordance with ASTM Standard D4829. The test results are presented in the following table.

Table No. B-1, Expansion Index Test Results

Boring No.	Depth (feet)	Soil Description	Expansion Index	Expansion Potential
BH-02	5 to 10	Sand With Silt (SP-SM)	0	Very Low
BH-05	5 to 10	Sand (SP)	0	Very Low
BH-09	5 to 10	Sand (SP)	3	Very Low
BH-12	0.6 to 5	Sand (SP)	4	Very Low

Soil Corrosivity

Two representative soil samples were tested to determine minimum electrical resistivity, pH, and chemical content, including soluble sulfate and chloride concentrations. The purpose of these tests was to determine the corrosion potential of sites soils when placed in contact with common construction materials. These tests were performed by Keegan Labs in accordance with Caltrans Test Methods 643, 422 and 417. Test results are presented in the following table.

Table No. B-2, Summary of Soil Corrosivity Test Results

Boring No.	Depth (feet)	pH	Soluble Sulfates (CA 417) (ppm)	Soluble Chlorides (CA 422) (ppm)	Min. Resistivity (CA 643) (Ohm-cm)
BH-03	0.5 to 5	8.5	12	9.6	21,110
BH-10	0.7 to 5	8.1	11	9.5	35,180

Percent Passing No. 200 Sieve (WA)

Six percent passing (No. 200 sieve) tests were performed on select samples in accordance with ASTM Standard D1140. The test results of the percent passing #200 sieves are presented in the following table.

Table No. B-3, Percentage Passing No. 200 Sieve Results

Boring No.	Depth (feet)	Description	Passing #200 Sieve (%)
BH-03	30.0-31.5	Silty Sand (SM)	21.8
BH-03	50.0-51.4	Sand With Gravel and Silt (SP)	6.1
BH-06	20.0-21.5	Sand (SP)	2.0
BH-06	30.0-31.5	Silty Sand (SM)	13.7
BH-06	40.0-41.0	Sand With Silt (SP-SM)	8.4
BH-06	50.0-50.5	Sand With Silt (SP-SM)	6.3

Maximum Density and Optimum Moisture Content

Laboratory maximum dry density-optimum moisture content relationship tests were performed on two representative bulk samples. The tests were conducted in accordance with the ASTM Standard D1557 test method. The test results are presented in Drawing No. B-2, *Moisture-Density Relationship Result,* and is also summarized in the following table.

Table No B-4, Summary of Moisture-Density Relationship Results

Boring No.	Depth (feet)	Soil Description	Optimum Moisture (%)	Maximum Density (lb/cft)
BH-05	5 to 10	Sand (SP), Tan	8.3	120.0
BH-09	5 to 10	Sand (SP), Light Brown	7.0	114.5

Direct Shear

Four direct shear tests were performed on relatively undisturbed samples in soaked moisture conditions in accordance with ASTM D3080. For each test, 3 samples contained in brass sampler rings were placed, one at a time, directly into the test apparatus and subjected to a range of normal loads appropriate for the anticipated conditions. The samples were then sheared at a constant strain rate of 0.02 inch/minute. Shear deformation was recorded until a maximum of about 0.25-inch shear displacement was achieved. Ultimate strength was selected from the shear-stress deformation data and plotted to determine the shear strength parameters. For test data, including sample density and moisture content, see Drawing No. B-2 through B-5*, Direct Shear Test Results,* and the following table.

Table No. B-5, Summary of Direct Shear Test Results

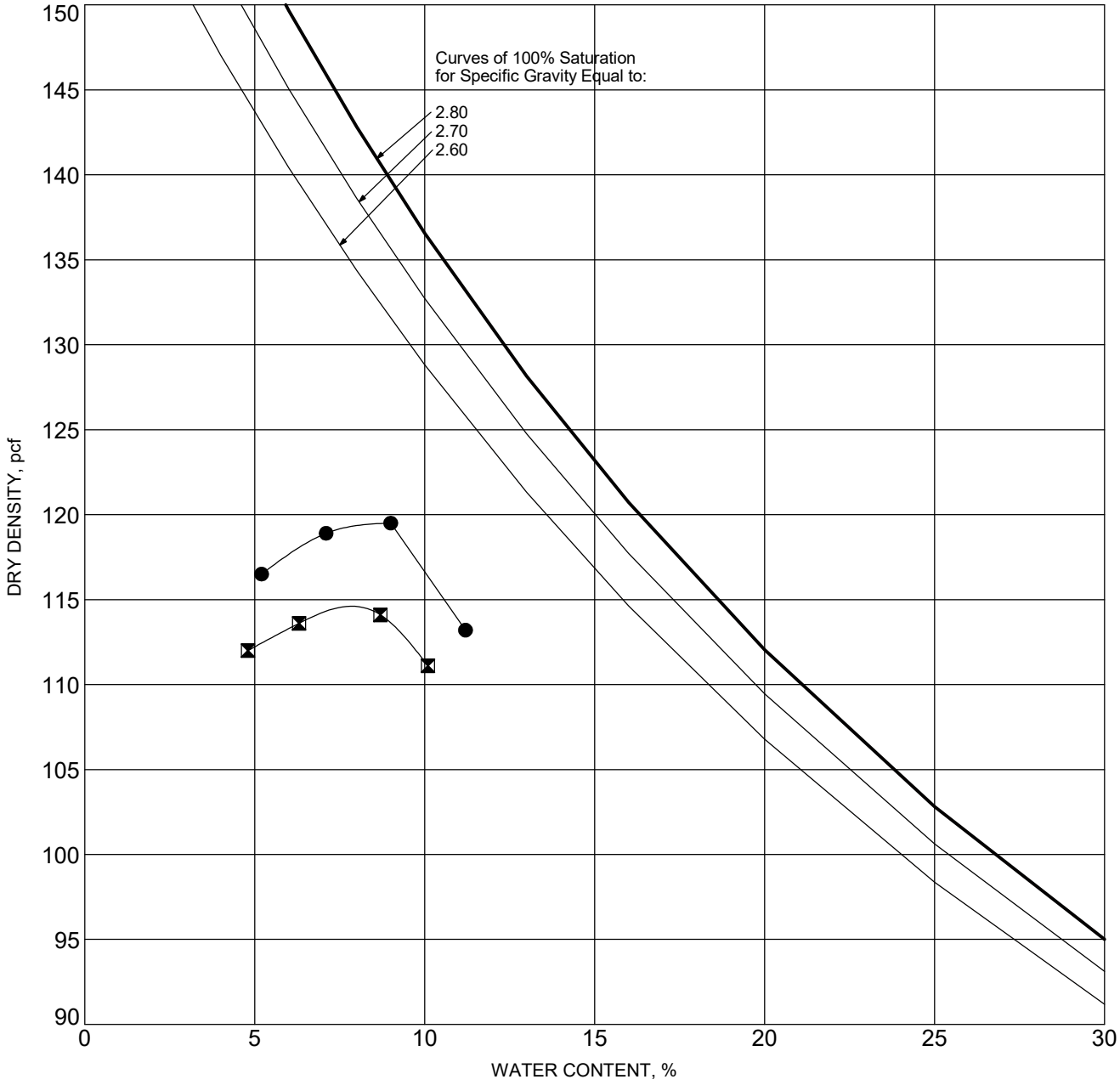
Boring No.	Depth (feet)	Soil Description	Peak Strength Parameters	
			Friction Angle (degrees)	Cohesion (psf)
BH-02	7.5-9.0	Sand With Silt (SP-SM)	27	80
BH-03	5.0-6.0	Silty Sand (SM)	30	60
BH-06	5.0-6.5	Sand (SP)	29	50
BH-09	7.5-9.5	Sand (SP)	28	40

Consolidation

Three tests were conducted in accordance with ASTM Standard D2435 method. Data obtained from these tests performed on relatively undisturbed ring samples were used to evaluate the settlement characteristics of the on-site soils under load. Preparation for these tests involved trimming the sample, placing it in a 1-inch-high brass ring, and loading it into the test apparatus, which contained porous stones to accommodate drainage during testing. Normal axial loads were applied to one end of the sample through the porous stones, and the resulting deflections were recorded at various time periods. The load was increased after the sample reached a reasonable state of equilibrium. Normal loads were applied at a constant load-increment ratio, successive loads being generally twice the preceding load. For test results, including sample density and initial moisture content, see Drawings Nos. B-6 through B-8, *Consolidation Test Results*.

Sample Storage

Soil samples stored in our laboratory will be discarded 30 days after the date of this report, unless this office receives a specific request to retain the samples for a longer period.



SYMBOL	BORING NO.	DEPTH (ft)	DESCRIPTION	ASTM TEST METHOD	OPTIMUM WATER, %	MAXIMUM DRY DENSITY, pcf
●	**BH-05**	**5.0-10.0**	**Sand (SP), Tan**	**D1557 A**	**8.3**	**120**
⊠	**BH-09**	**5.0-10.0**	**Sand (SP), Light Brown**	**D1557 A**	**7**	**114.5**

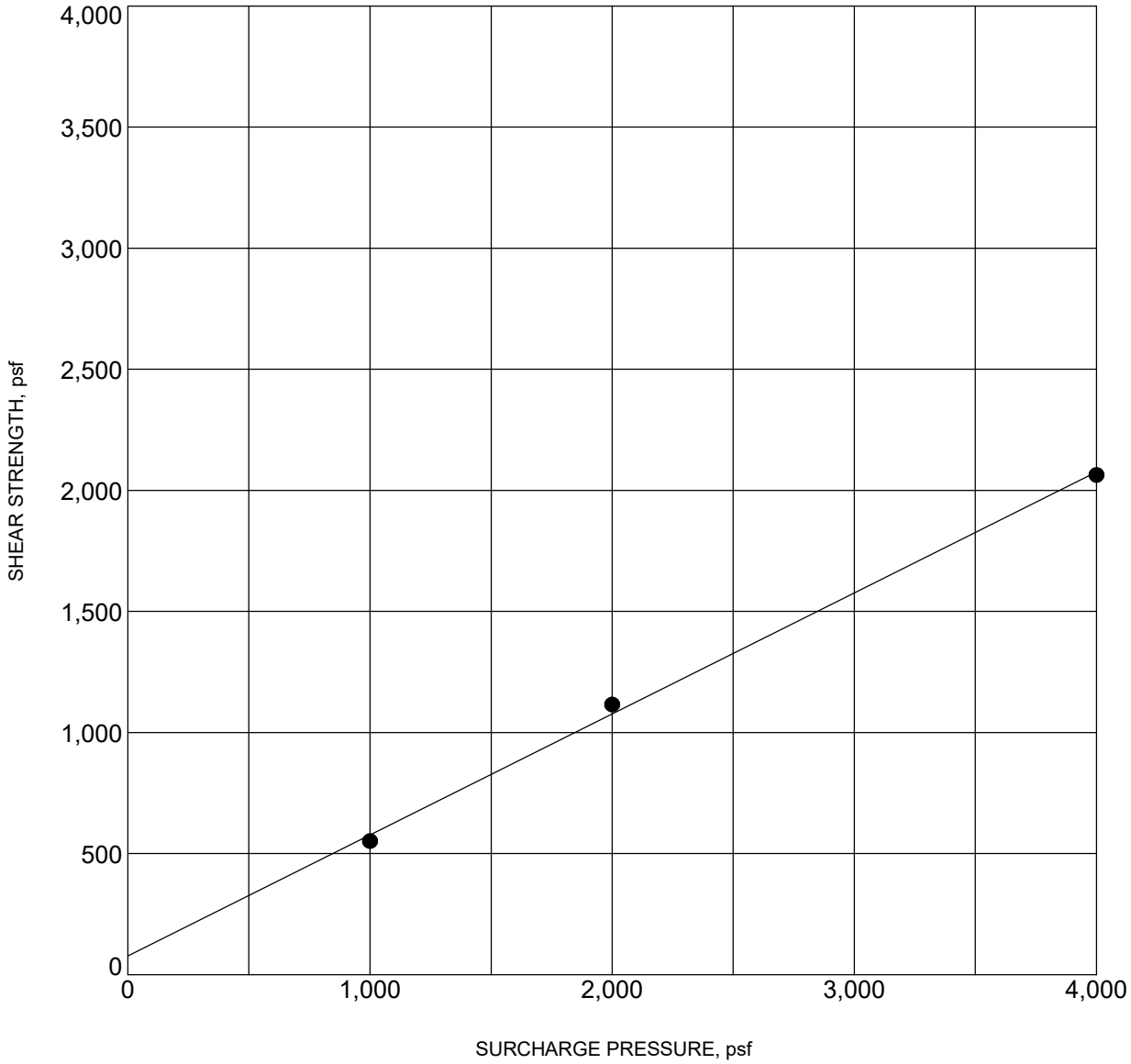
MOISTURE-DENSITY RELATIONSHIP RESULTS

Converse Consultants

Arrowhead Regional Medical Center Parking Structure
Southeast of the Intersection of Pepper Avenue and Plum Place
City of Colton, San Bernardino County, CA
For: Arrowhead Regional Medical Center

Project No. **24-81-276-01**

Drawing No. **B-1**



BORING NO.	:	**BH-02**	DEPTH (ft)	:	**7.5-9.0**
DESCRIPTION	:	**Sand With Silt (SP-SM)**			
COHESION (psf)	:	**80**	FRICTION ANGLE (degrees):		**27**
MOISTURE CONTENT (%)	:	**2.0**	DRY DENSITY (pcf)	:	**102.0**

NOTE: Ultimate Strength.

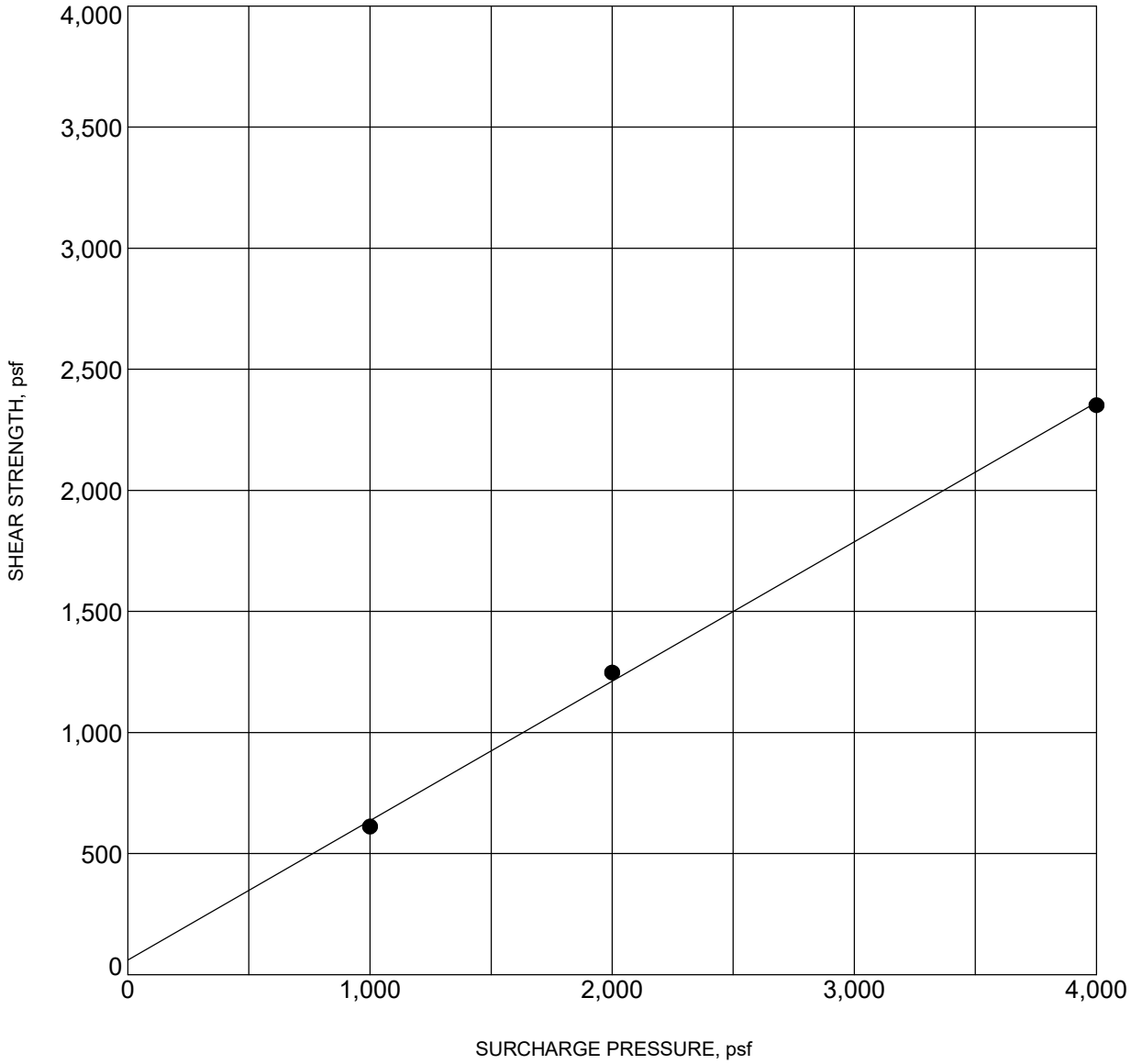
DIRECT SHEAR TEST RESULTS

Converse Consultants

Arrowhead Regional Medical Center Parking Structure
Southeast of the Intersection of Pepper Avenue and Plum Place
City of Colton, San Bernardino County, CA
For: Arrowhead Regional Medical Center

Project No. **24-81-276-01**

Drawing No. **B-2**



BORING NO.	:	**BH-03**	DEPTH (ft)	:	**5.0-6.0**
DESCRIPTION	:	**Silty Sand (SM)**			
COHESION (psf)	:	**60**	FRICTION ANGLE (degrees):		**30**
MOISTURE CONTENT (%)	:	**4.0**	DRY DENSITY (pcf)	:	**112.0**

NOTE: Ultimate Strength.

DIRECT SHEAR TEST RESULTS

Converse Consultants

Arrowhead Regional Medical Center Parking Structure
Southeast of the Intersection of Pepper Avenue and Plum Place
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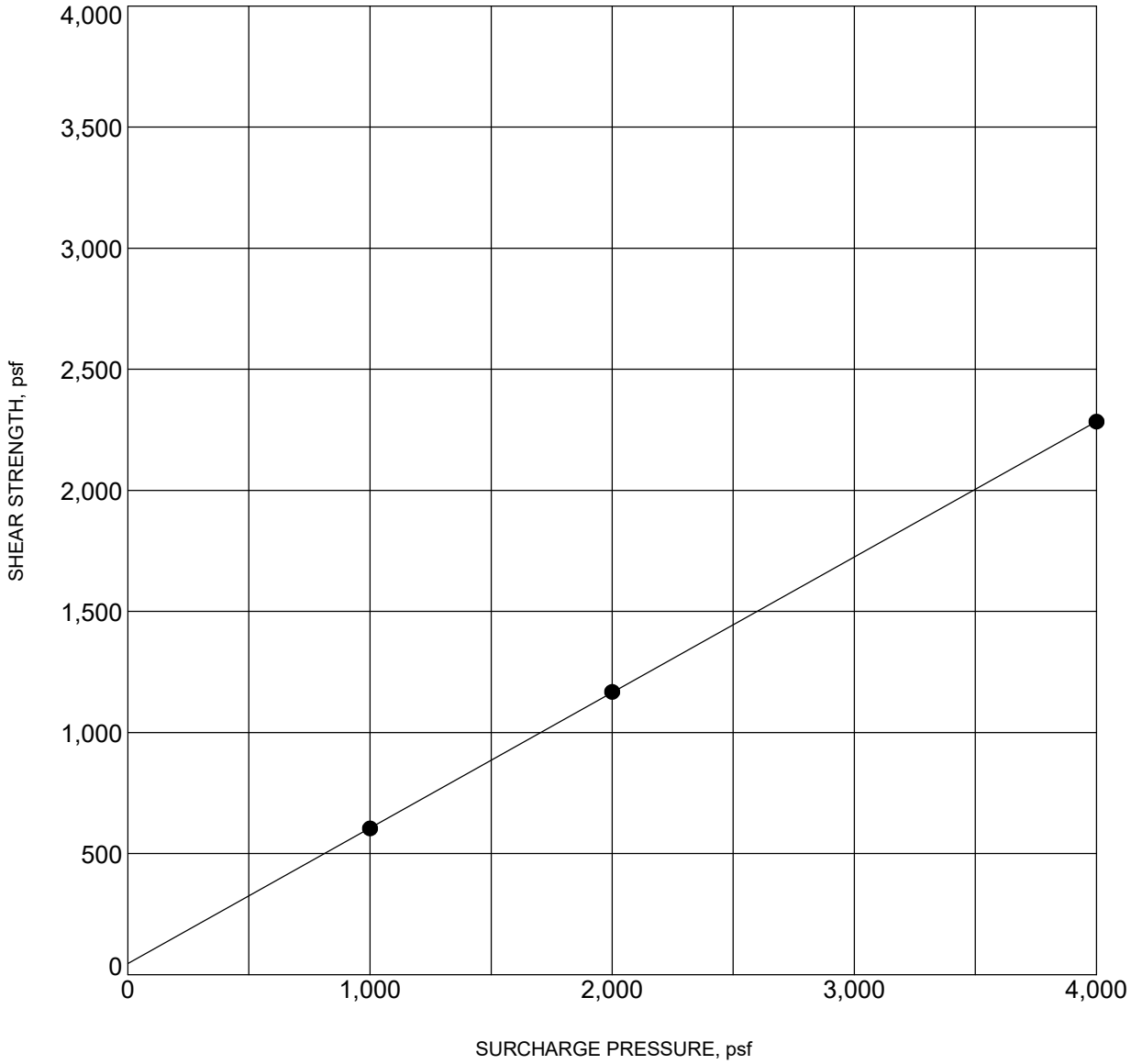
For: Arrowhead Regional Medical Center

Project No. **24-81-276-01**

Drawing No. **B-3**



BORING NO.	:	**BH-06**	DEPTH (ft)	:	**5.0-6.5**
DESCRIPTION	:	**Sand (SP)**			
COHESION (psf)	:	**50**	FRICTION ANGLE (degrees):		**29**
MOISTURE CONTENT (%)	:	**3.0**	DRY DENSITY (pcf)	:	**98.0**

NOTE: Ultimate Strength.

DIRECT SHEAR TEST RESULTS

Converse Consultants

Arrowhead Regional Medical Center Parking Structure
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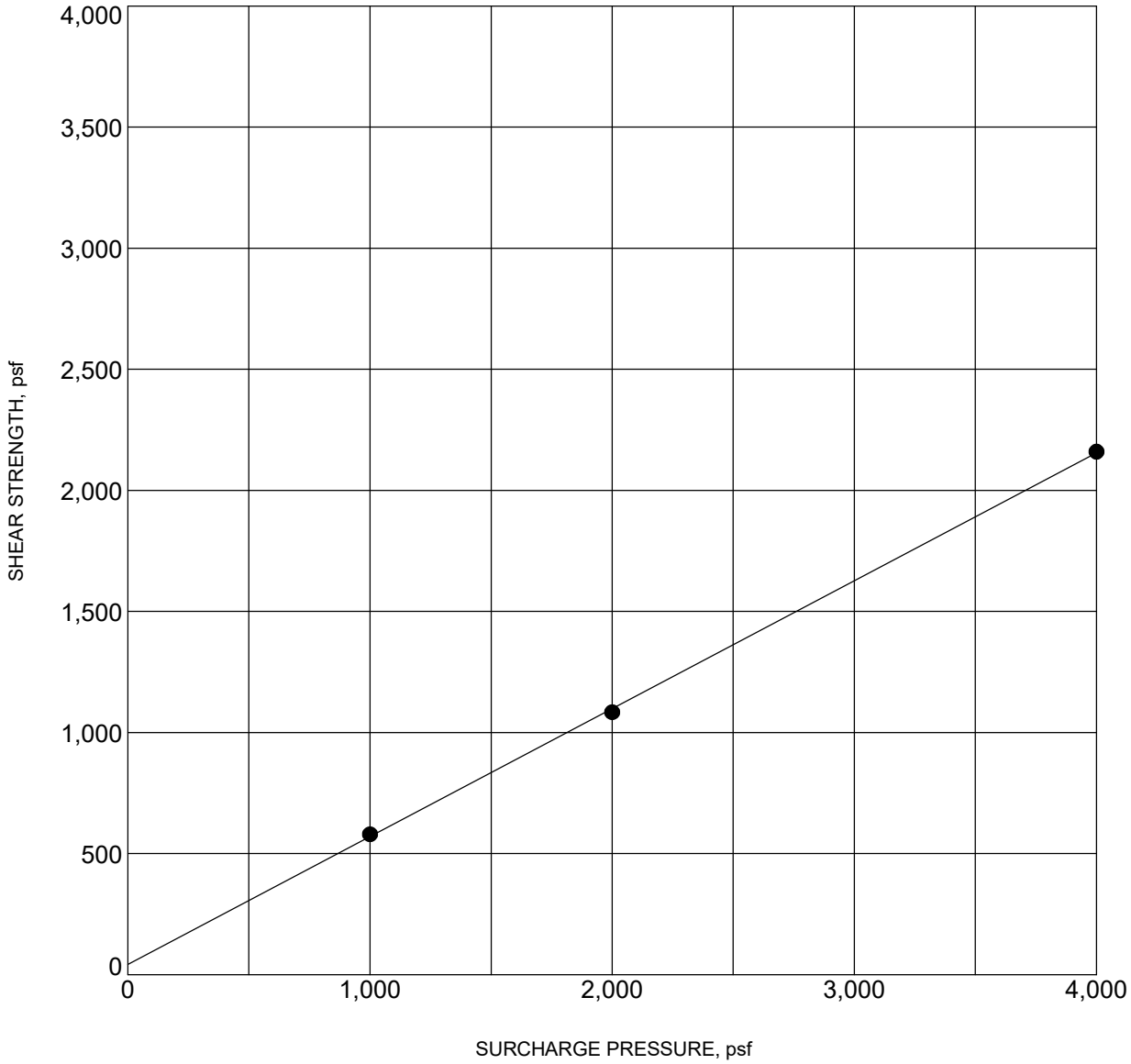
For: Arrowhead Regional Medical Center

Project No. **24-81-276-01**

Drawing No. **B-4**



BORING NO.	:	**BH-09**	DEPTH (ft)	:	**7.5-9.0**
DESCRIPTION	:	**Sand (SP)**			
COHESION (psf)	:	**40**	FRICTION ANGLE (degrees):		**28**
MOISTURE CONTENT (%)	:	**3.0**	DRY DENSITY (pcf)	:	**108.0**

NOTE: Ultimate Strength.

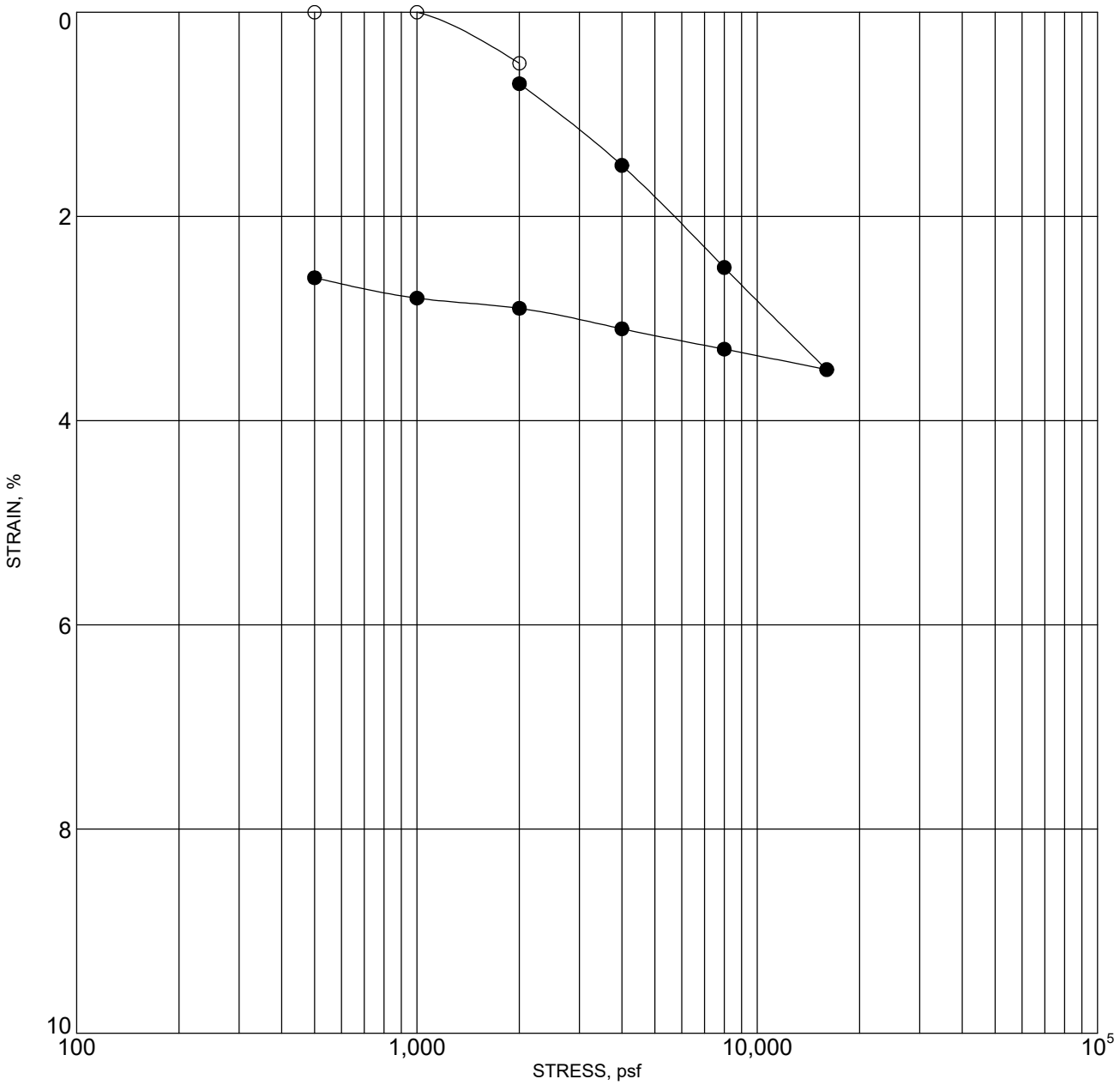
DIRECT SHEAR TEST RESULTS

Converse Consultants

Arrowhead Regional Medical Center Parking Structure
Southeast of the Intersection of Pepper Avenue and Plum Place
City of Colton, San Bernardino County, CA
For: Arrowhead Regional Medical Center

Project No. **24-81-276-01**

Drawing No. **B-5**



BORING NO. :	**BH-01**	DEPTH (ft) :	**5.0-6.5**
DESCRIPTION :	**SAND WITH SILT (SP-SM)**		

	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	PERCENT SATURATION	VOID RATIO
INITIAL	**5**	**109**	**26**	**0.513**
FINAL				

NOTE: SOLID CIRCLES INDICATE READINGS AFTER ADDITION OF WATER

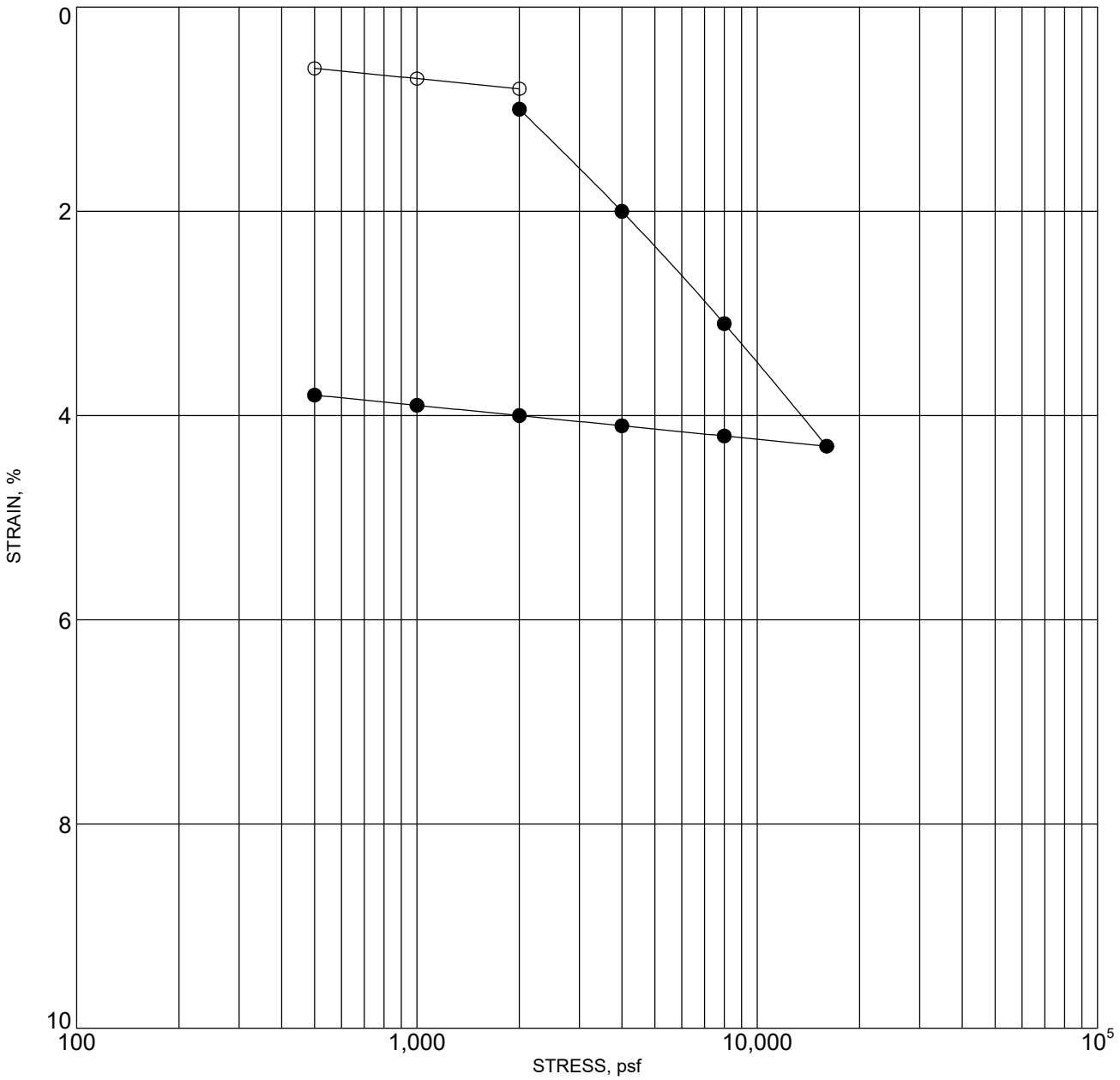
CONSOLIDATION TEST RESULTS

Converse Consultants

Arrowhead Regional Medical Center Parking Structure
Southeast of the Intersection of Pepper Avenue and Plum Place
City of Colton, San Bernardino County, CA
For: Arrowhead Regional Medical Center

Project No. **24-81-276-01**

Drawing No. **B-6**



BORING NO. :	**BH-09**	DEPTH (ft) :	**5.0-6.5**
DESCRIPTION :	**Sand (SP)**		

	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	PERCENT SATURATION	VOID RATIO
INITIAL	**3**	**103**	**13**	**0.592**
FINAL				

NOTE: SOLID CIRCLES INDICATE READINGS AFTER ADDITION OF WATER

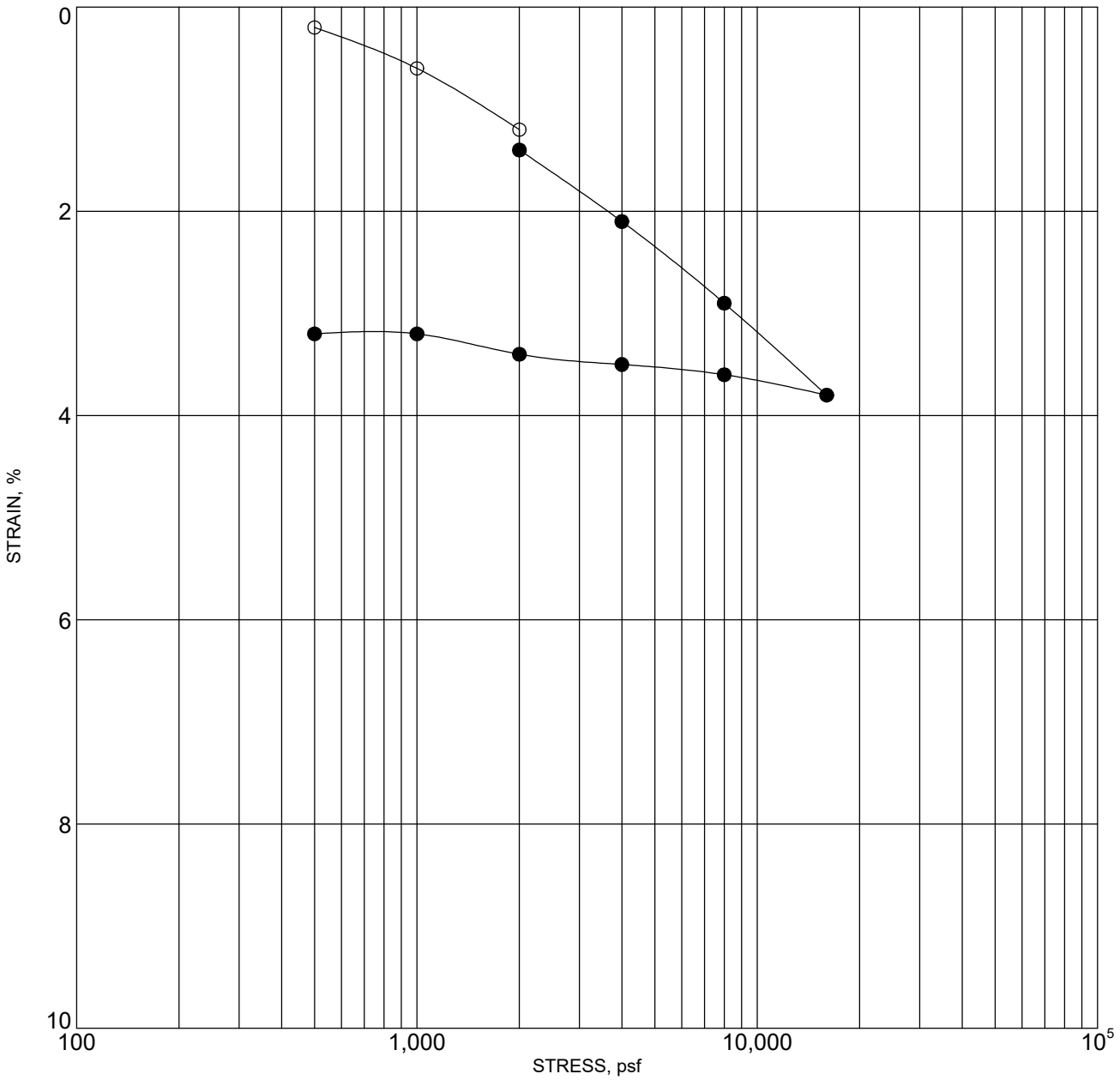
CONSOLIDATION TEST RESULTS

Converse Consultants

Arrowhead Regional Medical Center Parking Structure
Southeast of the Intersection of Pepper Avenue and Plum Place
City of Colton, San Bernardino County, CA
For: Arrowhead Regional Medical Center

Project No. **24-81-276-01**

Drawing No. **B-7**



BORING NO. :	**BH-10**	DEPTH (ft) :	**2.5-4.0**
DESCRIPTION :	**SAND WITH SILT(SP-SM)**		

	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	PERCENT SATURATION	VOID RATIO
INITIAL	**3**	**115**	**18**	**0.431**
FINAL				

NOTE: SOLID CIRCLES INDICATE READINGS AFTER ADDITION OF WATER

CONSOLIDATION TEST RESULTS

Converse Consultants

Arrowhead Regional Medical Center Parking Structure
Southeast of the Intersection of Pepper Avenue and Plum Place
City of Colton, San Bernardino County, CA
For: Arrowhead Regional Medical Center

Project No. **24-81-276-01**

Drawing No. **B-8**

Appendix C

Liquefaction & Seismic Settlement Analysis

APPENDIX C

LIQUEFACTION AND SEISMIC SETTLEMENT ANALYSIS

The subsurface data obtained from the boring BH-03 and BH-06 were used to evaluate the liquefaction potential and associated dry seismic settlement when subjected to ground shaking during earthquakes.

While interpreting the SPT blow counts for boring BH-03, it was found that due to an error in SPT sample collection, a Silty Sand (SM) layer between 10.0 to 15.0 feet bgs was showing extremely low blow counts as compared to similar layers in other borings that were performed in the vicinity. Since the soil profile is uniform throughout the site, the low blow counts for the layer in question were discarded and replaced with the average blow counts calculated using the blow counts of the layers immediately top and bottom.

A simplified liquefaction hazard analysis was performed using the program SPTLIQ (InfraGEO Software, 2021) using the liquefaction triggering analysis method by Boulanger and Idriss (2014). A mean earthquake magnitude of M 8.1 was selected based on the results of seismic deaggregation analysis using the USGS interactive online tool (USGSb).

A peak ground acceleration (PGA_M) of 0.938g for the MCE design event, where g is the acceleration due to gravity, was selected for this analysis. The PGA was based on the 2022 CBC seismic design parameters presented in Section 7.2.1, *Mapped Seismic Design Parameters.* The result of our analysis is presented on Sheet Nos. C-1 through C-6 and summarized in the following table.

Table C-1, Estimated Dynamic Settlements

Location	Groundwater Conditions	Groundwater Depth (feet bgs)	Dry Seismic Settlement (inches)	Liquefaction Induced Settlement (inches)
BH-03	Current	>50	0.96	negligible
	Historical	>50		
BH-06	Current	>50	negligible	negligible
	Historical	>50		

Based on our analysis, the project site has the potential for up to 0.96 inches of dry seismic settlement and negligible liquefaction induced settlement.

We recommend that the planned structure be designed conservatively in anticipation of dynamic differential settlement of 0.48 inches in 125 horizontal feet.

SIMPLIFIED LIQUEFACTION HAZARDS ASSESSMENT USING STANDARD PENETRATION TEST (SPT) DATA

PROJECT INFORMATION

Project Name	4-Story Parking Structure
Project No.	24-81-276-01
Project Location	Southeast of the Intersection of Pepper Avenue and Plum Place, Colton, California
Analyzed By	Anthony Rosas
Reviewed By	Hashmi Quazi

SELECTED METHODS OF ANALYSIS

Analysis Description	
Triggering of Liquefaction	Boulanger-Idriss (2014)
Severity of Liquefaction	LPI: Liquefaction Potential Index based on Iwasaki et al. (1978)
Seismic Compression Settlement (Dry/Unsaturated Soil)	Pradel (1998)
Liquefaction-Induced Settlement (Saturated Soil)	Ishihara and Yoshimine (1992)
Liquefaction-Induced Lateral Spreading	Zhang et al. (2004)
Residual Shear Strength of Liquefied Soil	Idriss and Boulanger (2008)

SEISMIC DESIGN PARAMETERS

Earthquake Moment Magnitude, M_w	8.10
Peak Ground Acceleration, A_{max}	0.94 g
Factor of Safety Against Liquefaction, FS	1.20

BORING DATA AND SITE CONDITIONS

Boring No.	BH-03
Ground Surface Elevation	1,070.00 feet
Proposed Grade Elevation	1,070.00 feet
GWL Depth Measured During Test	50.00 feet
GWL Depth Used in Design	50.00 feet
Borehole Diameter	8.00 inches
Hammer Weight	140.00 pounds
Hammer Drop	30.00 inches
Hammer Energy Efficiency Ratio, ER (%)	80.00 %
Hammer Distance to Ground Surface	5.00 feet
Topographic Site Condition:	TSC3 (Level Ground with Nearby Free Face)
- Ground Slope, S (%)	<<= Leave this blank
- Free Face Distance to Slope Height Ratio, (L/H)	5.00 <<= Enter (L/H) Enter H =>> 15.00 feet

INPUT SOIL PROFILE DATA

Depth to Top of Soil Layer (feet)	Depth to Bottom of Soil Layer (feet)	Material Type USCS Group Symbol (ASTM D2487)	Liquefaction Screening *Susceptible Soil? (Y, N)*	Total Soil Unit Weight γ_t (pcf)	Type of Soil Sampler	Field Blow Count N_{field} (blows/ft)	Fines Content FC (%)
0.00	5.00	SM	N	111.2	MCal	78.00	20.00
5.00	7.50	SM	Y	117.5	MCal	100.00	20.00
7.50	10.00	SM	Y	107.1	MCal	16.00	20.00
10.00	15.00	SM	Y	107.1	MCal	34.00	20.00
15.00	20.00	SM	N	85.9	MCal	51.00	20.00
20.00	25.00	SP	N	85.9	SPT1	31.00	20.00
25.00	30.00	SP	N	103.0	MCal	62.00	20.00
30.00	35.00	SM	N	104.0	SPT1	27.00	21.80
35.00	40.00	SM	N	125.1	MCal	69.00	20.00
40.00	45.00	SP	N	121.5	SPT1	52.00	20.00
45.00	50.00	SP	N	121.5	MCal	100.00	20.00

SIMPLIFIED LIQUEFACTION HAZARDS ASSESSMENT USING STANDARD PENETRATION TEST (SPT) DATA

PROJECT INFORMATION	
Project Name	4-Story Parking Structure
Project No.	24-81-276-01
Project Location	Southeast of the Intersection of Pepper Avenue and Plum Place, Colton, C
Analyzed By	Anthony Rosas
Reviewed By	Hashmi Quazi

SEISMIC DESIGN PARAMETERS	
Earthquake Moment Magnitude, M_w	8.10
Peak Ground Acceleration, A_{max}	0.94 g
Factor of Safety Against Liquefaction, FS	1.20

BORING DATA AND SITE CONDITIONS		
Boring No.	BH-03	
Ground Surface Elevation	1,070.00 feet	
Proposed Grade Elevation	1,070.00 feet	
GWL Depth Measured During Test	50.00 feet	
GWL Depth Used in Design	50.00 feet	
Borehole Diameter	8.00 inches	
Hammer Weight	140.00 pounds	
Hammer Drop	30.00 inches	
Hammer Energy Efficiency Ratio, ER	80.00 %	
Hammer Distance to Ground Surface	5.00 feet	
Topographic Site Condition:	TSC3 (Level Ground with Nearby Free Face)	
- Ground Slope, S	N/A	
- Free Face (L/H) Ratio	5.00	H = 15 feet

SUMMARY OF RESULTS

Severity of Liquefaction:

Total Thickness of Liquefiable Soils: 0.00 feet (cumulative total thickness in the upper 65 feet)

Liquefaction Potential Index (LPI): 0.00 *** (Very low risk, with no surface manifestation of liquefaction)

Seismic Ground Settlements:	Analysis Method	Upper 30 feet	Upper 50 feet	Upper 65 feet	
Seismic Compression Settlement:	Pradel (1998)	0.96 inches	0.96 inches	0.96 inches	(Dry/Unsaturated Soils)
Liquefaction-Induced Settlement:	Ishihara and Yoshimine (1992)	0.00 inches	0.00 inches	0.00 inches	(Saturated Soils)
Total Seismic Settlement:		0.96 inches	0.96 inches	0.96 inches	

Seismic Lateral Displacements:	Analysis Method	Upper 30 feet	Upper 50 feet	Upper 65 feet	
Cyclic Lateral Displacement:	Tokimatsu and Asaka (1998)	0.55 inches	0.55 inches	0.55 inches	(During Ground Shaking)
Lateral Spreading Displacement:	Zhang et al. (2004)	0.00 inches	0.00 inches	0.00 inches	(After Ground Shaking)

NOTES AND REFERENCES

\+ This method of analysis is based on observed seismic performance of level ground sites using correlation with normalized and fines-corrected SPT blow count, $(N_1)_{60cs} = f\{(N_1)_{60}, FC\}$ where $(N_1)_{60} = N_{field}\, C_N\, C_E\, C_B\, C_R\, C_S$

++ Liquefaction susceptibility screening is performed to identify soil layers assessed to be non-liquefiable based on laboratory test results using the criteria proposed by Cetin and Seed (2003), Bray and Sancio (2006), or Idriss and Boulanger (2008).

* FS_{liq} = Factor of Safety against liquefaction = (CRR/CSR), where $CRR = CRR_{7.5}\, MSF\, K_\sigma\, K_\alpha$, MSF = Magnitude Scaling Factor, $K_\sigma = f[(N_1)_{60}, \sigma'_{vo}]$, K_α =1.0, (level ground), CSR = Cyclic Stress Ratio = $0.65\, A_{max}\, (\sigma_{vo}/\sigma'_{vo})\, r_d$, and $CRR_{7.5}$ = Cyclic Resistance Ratio is a function of $(N)_{60cs}$ and corrected for an earthquake magnitude M_w of 7.5.

** Residual strength values of liquefied soils are based on correlation with post-earthquake, normalized and fines-corrected SPT blow count derived by Idriss and Boulanger (2008).

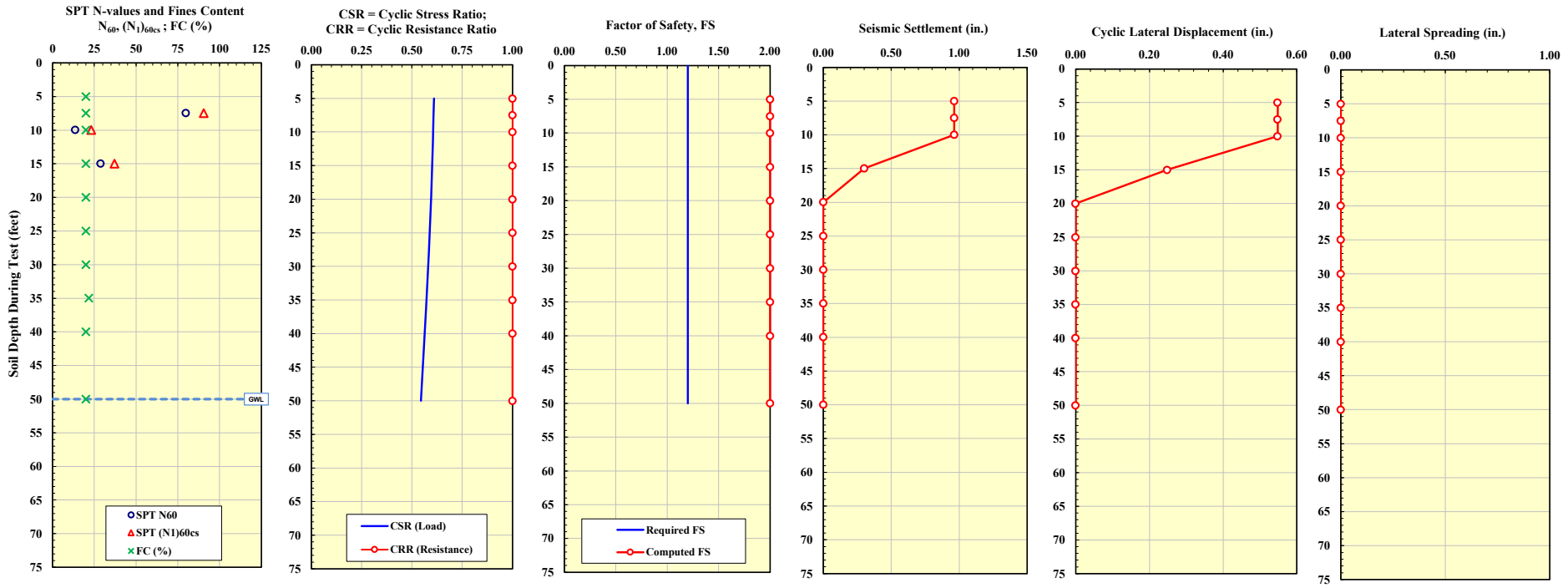
*** Based on Iwasaki et al. (1978) and Toprak and Holzer (2003)

+ Reference: Boulanger, R.W. and Idriss, I.M. (2014), "CPT and SPT Based Liquefaction Triggering Procedures," University of California Davis, Center for Geotechnical Modeling Report No. UCD/CGM-14/01, 1-134.

INPUT SOIL PROFILE DATA								LIQUEFACTION TRIGGERING ANALYSIS BASED ON R.W. BOULANGER AND I.M. IDRISS (2014) METHOD +																							
Depth to Top of Soil Layer (feet)	Depth to Bottom of Soil Layer (feet)	Material Type USCS Group Symbol (ASTM D2487)	Liquefaction Susceptibility Screening ++ Susceptible Soil? (Y/N)	Total Soil Unit Weight γ_t (pcf)	Type of Soil Sampler	Field SPT Blow Count N_{field} (blows/ft)	Fines Content FC (%)	Total Vert. Stress (Design) σ_{vo} (psf)	Effective Vert. Stress (Design) σ'_{vo} (psf)	SPT Corr. for Vert. Stress C_N	SPT Corr. for Hammer Energy C_E	SPT Corr. for Borehole Size C_B	SPT Corr. for Rod Length C_R	SPT Corr. for Sampling Method C_S	Corrected SPT Blow Count N_{60}	Normalized SPT Blow Count $(N_1)_{60}$	Fines Corrected SPT Blow Count $(N_1)_{60cs}$	Shear Stress Reduction Coefficient r_d	Correction for High Overburden Stress K_σ	Cyclic Stress Ratio CSR	Cyclic Resistance Ratio CRR	Factor of Safety * FS_{liq}	Liquefaction Analysis Results	Residual Shear Strength ** S_r (psf)	Seismic Porewater Pressure Ratio r_u (%)	Cumulative Seismic Settlement (inches)	Cumulative Cyclic Lateral Displacement (inches)	Cumulative Lateral Spreading Displacement (inches)
0.00	5.00	SM	N	111.24	MCal	78.00	20.00	278.10	278.10									1.000		0.610							0.96	0.55	0.00
5.00	7.50	SM	Y	117.52	MCal	100.00	20.00	703.10	703.10	1.078	1.333	1.150	0.800	0.650	79.7	86.0	90.4	0.997	1.100	0.608							0.96	0.55	0.00
7.50	10.00	SM	Y	107.10	MCal	16.00	20.00	983.88	983.88	1.378	1.333	1.150	0.850	0.650	13.6	18.7	23.2	0.993	1.090	0.605							0.96	0.55	0.00
10.00	15.00	SM	Y	107.10	MCal	34.00	20.00	1,385.50	1,385.50	1.135	1.333	1.150	0.850	0.650	28.8	32.7	37.2	0.986	1.085	0.601							0.30	0.25	0.00
15.00	20.00	SM	N	85.85	MCal	51.00	20.00	1,867.88	1,867.88									0.976		0.595							0.00	0.00	0.00
20.00	25.00	SP	N	85.85	SPT1	31.00	20.00	2,297.13	2,297.13									0.965		0.588							0.00	0.00	0.00
25.00	30.00	SP	N	103.02	MCal	62.00	20.00	2,769.30	2,769.30									0.952		0.581							0.00	0.00	0.00
30.00	35.00	SM	N	104.04	SPT1	27.00	21.80	3,286.95	3,286.95									0.939		0.572							0.00	0.00	0.00
35.00	40.00	SM	N	125.08	MCal	69.00	20.00	3,859.75	3,859.75									0.925		0.564							0.00	0.00	0.00
40.00	45.00	SP	N	121.54	SPT1	52.00	20.00	4,476.30	4,476.30									0.909		0.554							0.00	0.00	0.00
45.00	50.00	SP	N	121.54	MCal	100.00	20.00	5,084.00	5,084.00									0.894		0.545							0.00	0.00	0.00

SIMPLIFIED LIQUEFACTION HAZARDS ASSESSMENT USING STANDARD PENETRATION TEST (SPT) DATA

PROJECT INFORMATION	
Project Name	4-Story Parking Structure
Project No.	24-81-276-01
Project Location	Southeast of the Intersection of Pepper Avenue and Plum Place, Colton, California
Analyzed By	Anthony Rosas
Reviewed By	Hashmi Quazi



Analysis Methods Used ==>>	Liquefaction Triggering:		Seismic Settlements:	Cyclic Lateral Displacements:	Lateral Spreading:
	Boulanger-Idriss (2014)	Above GWL:	Pradel (1998)	Pradel (1998)	Zhang et al. (2004)
		Below GWL:	Ishihara and Yoshimine (1992)	Tokimatsu and Asaka (1998)	

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SIMPLIFIED LIQUEFACTION HAZARDS ASSESSMENT USING STANDARD PENETRATION TEST (SPT) DATA

PROJECT INFORMATION

Project Name	4-Story Parking Structure
Project No.	24-81-276-01
Project Location	Southeast of the Intersection of Pepper Avenue and Plum Place, Colton, California
Analyzed By	Anthony Rosas
Reviewed By	Hashmi Quazi

SELECTED METHODS OF ANALYSIS

Analysis Description	
Triggering of Liquefaction	Boulanger-Idriss (2014)
Severity of Liquefaction	LPI: Liquefaction Potential Index based on Iwasaki et al. (1978)
Seismic Compression Settlement (Dry/Unsaturated Soil)	Pradel (1998)
Liquefaction-Induced Settlement (Saturated Soil)	Ishihara and Yoshimine (1992)
Liquefaction-Induced Lateral Spreading	Zhang et al. (2004)
Residual Shear Strength of Liquefied Soil	Idriss and Boulanger (2008)

SEISMIC DESIGN PARAMETERS

Earthquake Moment Magnitude, M_w	8.10
Peak Ground Acceleration, A_{max}	0.94 g
Factor of Safety Against Liquefaction, FS	1.20

BORING DATA AND SITE CONDITIONS

Boring No.	BH-06
Ground Surface Elevation	1,070.00 feet
Proposed Grade Elevation	1,070.00 feet
GWL Depth Measured During Test	50.00 feet
GWL Depth Used in Design	50.00 feet
Borehole Diameter	8.00 inches
Hammer Weight	140.00 pounds
Hammer Drop	30.00 inches
Hammer Energy Efficiency Ratio, ER (%)	80.00 %
Hammer Distance to Ground Surface	5.00 feet
Topographic Site Condition:	TSC3 (Level Ground with Nearby Free Face)
- Ground Slope, S (%)	<<= Leave this blank
- Free Face Distance to Slope Height Ratio, (L/H)	5.00 <<= Enter (L/H) Enter H =>> 15.00 feet

INPUT SOIL PROFILE DATA

Depth to Top of Soil Layer (feet)	Depth to Bottom of Soil Layer (feet)	Material Type USCS Group Symbol (ASTM D2487)	Liquefaction Screening *Susceptible Soil? (Y, N)*	Total Soil Unit Weight γ_t (pcf)	Type of Soil Sampler	Field Blow Count N_{field} (blows/ft)	Fines Content FC (%)
0.00	5.00	SP	N	108.1	MCal	55.00	20.00
5.00	7.50	SP	Y	100.9	MCal	42.00	20.00
7.50	10.00	SP	Y	99.0	MCal	42.00	20.00
10.00	15.00	SP	Y	99.0	MCal	48.00	20.00
15.00	20.00	SP	Y	99.0	MCal	53.00	20.00
20.00	25.00	SP	Y	99.0	SPT1	32.00	2.00
25.00	30.00	SP	Y	99.0	MCal	80.00	13.70
30.00	35.00	SM	Y	100.0	SPT1	30.00	8.40
35.00	40.00	SM	Y	112.3	MCal	100.00	20.00
40.00	45.00	SP-SM	Y	111.2	SPT1	100.00	20.00
45.00	50.00	SP-SM	Y	111.2	MCal	100.00	20.00

SIMPLIFIED LIQUEFACTION HAZARDS ASSESSMENT USING STANDARD PENETRATION TEST (SPT) DATA

PROJECT INFORMATION	
Project Name	4-Story Parking Structure
Project No.	24-81-276-01
Project Location	Southeast of the Intersection of Pepper Avenue and Plum Place, Colton, C
Analyzed By	Anthony Rosas
Reviewed By	Hashmi Quazi

SEISMIC DESIGN PARAMETERS	
Earthquake Moment Magnitude, M_w	8.10
Peak Ground Acceleration, A_{max}	0.94 g
Factor of Safety Against Liquefaction, FS	1.20

BORING DATA AND SITE CONDITIONS		
Boring No.	BH-06	
Ground Surface Elevation	1,070.00 feet	
Proposed Grade Elevation	1,070.00 feet	
GWL Depth Measured During Test	50.00 feet	
GWL Depth Used in Design	50.00 feet	
Borehole Diameter	8.00 inches	
Hammer Weight	140.00 pounds	
Hammer Drop	30.00 inches	
Hammer Energy Efficiency Ratio, ER	80.00 %	
Hammer Distance to Ground Surface	5.00 feet	
Topographic Site Condition:	TSC3 (Level Ground with Nearby Free Face)	
- Ground Slope, S	N/A	
- Free Face (L/H) Ratio	5.00	H = 15 feet

SUMMARY OF RESULTS

Severity of Liquefaction:

Total Thickness of Liquefiable Soils: 0.00 feet (cumulative total thickness in the upper 65 feet)

Liquefaction Potential Index (LPI): 0.00 *** (Very low risk, with no surface manifestation of liquefaction)

Seismic Ground Settlements:	Analysis Method	Upper 30 feet	Upper 50 feet	Upper 65 feet	
Seismic Compression Settlement:	Pradel (1998)	0.00 inches	0.00 inches	0.00 inches	(Dry/Unsaturated Soils)
Liquefaction-Induced Settlement:	Ishihara and Yoshimine (1992)	0.00 inches	0.00 inches	0.00 inches	(Saturated Soils)
Total Seismic Settlement:		0.00 inches	0.00 inches	0.00 inches	

Seismic Lateral Displacements:	Analysis Method	Upper 30 feet	Upper 50 feet	Upper 65 feet	
Cyclic Lateral Displacement:	Tokimatsu and Asaka (1998)	0.00 inches	0.00 inches	0.00 inches	(During Ground Shaking)
Lateral Spreading Displacement:	Zhang et al. (2004)	0.00 inches	0.00 inches	0.00 inches	(After Ground Shaking)

NOTES AND REFERENCES

\+ This method of analysis is based on observed seismic performance of level ground sites using correlation with normalized and fines-corrected SPT blow count, $(N_1)_{60cs} = f\{(N_1)_{60}, FC\}$ where $(N_1)_{60} = N_{field}\, C_N\, C_E\, C_B\, C_R\, C_S$

++ Liquefaction susceptibility screening is performed to identify soil layers assessed to be non-liquefiable based on laboratory test results using the criteria proposed by Cetin and Seed (2003), Bray and Sancio (2006), or Idriss and Boulanger (2008).

* FS_{liq} = Factor of Safety against liquefaction = (CRR/CSR), where $CRR = CRR_{7.5}\, MSF\, K_\sigma\, K_\alpha$, MSF = Magnitude Scaling Factor, $K_\sigma = f[(N_1)_{60}, \sigma'_{vo}]$, K_α =1.0, (level ground), CSR = Cyclic Stress Ratio = $0.65\, A_{max}\, (\sigma_{vo}/\sigma'_{vo})\, r_d$, and $CRR_{7.5}$ = Cyclic Resistance Ratio is a function of $(N)_{60cs}$ and corrected for an earthquake magnitude M_w of 7.5.

** Residual strength values of liquefied soils are based on correlation with post-earthquake, normalized and fines-corrected SPT blow count derived by Idriss and Boulanger (2008).

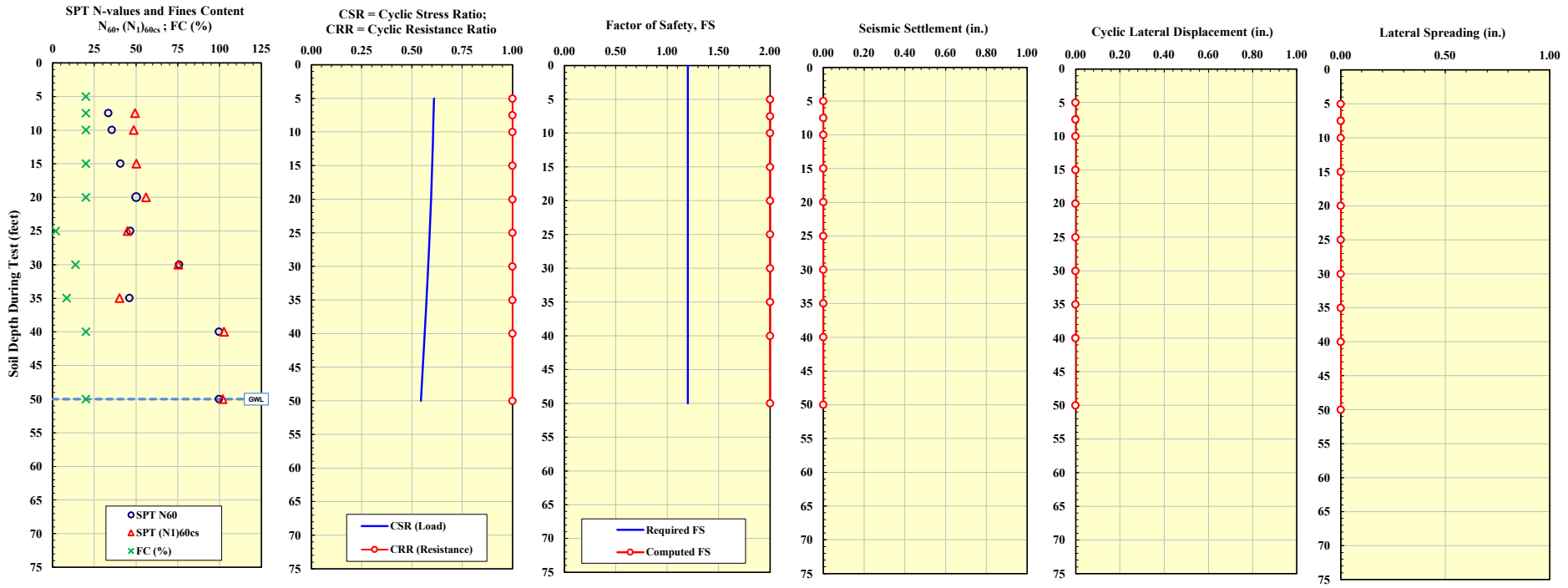
*** Based on Iwasaki et al. (1978) and Toprak and Holzer (2003)

+ Reference: Boulanger, R.W. and Idriss, I.M. (2014), "CPT and SPT Based Liquefaction Triggering Procedures," University of California Davis, Center for Geotechnical Modeling Report No. UCD/CGM-14/01, 1-134.

INPUT SOIL PROFILE DATA								LIQUEFACTION TRIGGERING ANALYSIS BASED ON R.W. BOULANGER AND I.M. IDRISS (2014) METHOD +																								
Depth to Top of Soil Layer (feet)	Depth to Bottom of Soil Layer (feet)	Material Type USCS Group Symbol (ASTM D2487)	Liquefaction Susceptibility Screening ++ Susceptible Soil? (Y/N)	Total Soil Unit Weight γ_t (pcf)	Type of Soil Sampler	Field SPT Blow Count N_{field} (blows/ft)	Fines Content FC (%)	Total Vert. Stress (Design) σ_{vo} (psf)	Effective Vert. Stress (Design) σ'_{vo} (psf)	SPT Corr. for Vert. Stress C_N	SPT Corr. for Hammer Energy C_E	SPT Corr. for Borehole Size C_B	SPT Corr. for Rod Length C_R	SPT Corr. for Sampling Method C_S	Corrected SPT Blow Count N_{60}	Normalized SPT Blow Count $(N_1)_{60}$	Fines Corrected SPT Blow Count $(N_1)_{60cs}$	Shear Stress Reduction Coefficient r_d	Correction for High Overburden Stress K_σ	Cyclic Stress Ratio CSR	Cyclic Resistance Ratio CRR	Factor of Safety * FS_{liq}	Liquefaction Analysis Results	Residual Shear Strength ** S_r (psf)	Seismic Porewater Pressure Ratio r_u (%)	Cumulative Seismic Settlement (inches)	Cumulative Cyclic Lateral Displacement (inches)	Cumulative Lateral Spreading Displacement (inches)
0.00	5.00	SP	N	108.07	MCal	55.00	20.00	270.18	270.18									1.000		0.610							0.00	0.00	0.00
5.00	7.50	SP	Y	100.94	MCal	42.00	20.00	666.53	666.53	1.344	1.333	1.150	0.800	0.650	33.5	45.0	49.5	0.997	1.100	0.608							0.00	0.00	0.00
7.50	10.00	SP	Y	98.98	MCal	42.00	20.00	916.43	916.43	1.239	1.333	1.150	0.850	0.650	35.6	44.1	48.5	0.993	1.100	0.605							0.00	0.00	0.00
10.00	15.00	SP	Y	98.98	MCal	48.00	20.00	1,287.60	1,287.60	1.124	1.333	1.150	0.850	0.650	40.7	45.7	50.2	0.986	1.100	0.601							0.00	0.00	0.00
15.00	20.00	SP	Y	98.98	MCal	53.00	20.00	1,782.50	1,782.50	1.027	1.333	1.150	0.950	0.650	50.2	51.5	56.0	0.976	1.035	0.595							0.00	0.00	0.00
20.00	25.00	SP	Y	98.98	SPT1	32.00	2.00	2,277.40	2,277.40	0.966	1.333	1.150	0.950	1.000	46.6	45.0	45.0	0.965	0.961	0.588							0.00	0.00	0.00
25.00	30.00	SP	Y	98.98	MCal	80.00	13.70	2,772.30	2,772.30	0.959	1.333	1.150	0.950	0.650	75.7	72.6	75.4	0.952	0.902	0.581							0.00	0.00	0.00
30.00	35.00	SM	Y	99.96	SPT1	30.00	8.40	3,269.65	3,269.65	0.863	1.333	1.150	1.000	1.000	46.0	39.7	40.2	0.939	0.853	0.572							0.00	0.00	0.00
35.00	40.00	SM	Y	112.27	MCal	100.00	20.00	3,800.23	3,800.23	0.985	1.333	1.150	1.000	0.650	99.7	98.2	102.7	0.925	0.807	0.564							0.00	0.00	0.00
40.00	45.00	SP-SM	Y	111.18	SPT1	100.00	20.00	4,358.85	4,358.85	1.238	1.333	1.150	1.000	1.000	153.3	189.8	194.3	0.909	0.766	0.554							0.00	0.00	0.00
45.00	50.00	SP-SM	Y	111.18	MCal	100.00	20.00	4,914.75	4,914.75	0.977	1.333	1.150	1.000	0.650	99.7	97.3	101.8	0.894	0.730	0.545							0.00	0.00	0.00

SIMPLIFIED LIQUEFACTION HAZARDS ASSESSMENT USING STANDARD PENETRATION TEST (SPT) DATA

PROJECT INFORMATION	
Project Name	4-Story Parking Structure
Project No.	24-81-276-01
Project Location	Southeast of the Intersection of Pepper Avenue and Plum Place, Colton, California
Analyzed By	Anthony Rosas
Reviewed By	Hashmi Quazi



Analysis Methods Used ==>>	Liquefaction Triggering:		Seismic Settlements:	Cyclic Lateral Displacements:	Lateral Spreading:
	Boulanger-Idriss (2014)	Above GWL:	Pradel (1998)	Pradel (1998)	Zhang et al. (2004)
		Below GWL:	Ishihara and Yoshimine (1992)	Tokimatsu and Asaka (1998)	

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1. Boulanger, R.W. and Idriss, I.M. (2014), "CPT and SPT Based Liquefaction Triggering Procedures," University of California Davis, Center for Geotechnical Modeling Report No. UCD/CGM-14/01, 1-134.
2. Bray, J.D., and Sancio, R.B. (2006). "Assessment of the liquefaction susceptibility of fine-grained soils," Journal of Geotech. and Geoenv. Engineering, ASCE 132 (9), 1165-1177.
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4. Idriss, I.M. and Boulanger, R.W. (2008), "Soil Liquefaction During Earthquakes", Earthquake Engineering Research Institute (EERI), Monograph MNO-12.
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7. Olson, S.M. and Johnson, C.I. (2008), "Analyzing Liquefaction-Induced Lateral Spreads Using Strength Ratios," Journal of Geotech. and Geoenv. Engineering, ASCE 134 (8), 1035-1049.
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9. Seed, R.B. and Harder, L.F. (1990), "SPT-based analysis of cyclic pore pressure generation and undrained residual strength, Proceedings Of Seed Memorial Symposium, Vancouver, B.C., 351-376.
10. Tokimatsu, K. and Seed, H.B. (1987), "Evaluation of settlements in sands due to earthquake shaking," Journal of Geotechnical Engineering, ASCE 113 (GT8), 861-878.
11. Tokimatsu, K. and Asaka, Y. (1998), "Effects of liquefaction-induced ground displacementson pile performance in the 1995 Hyogoken-Nambu Earthquake," Soils and Foundations, Special Issue, Japan Geotechnical Society, 163-177.
12. Toprak, S. and Holzer, T.L. (2003), "Liquefaction Potential Index: Field Assessment," Journal of Geotechnical and Geoenviromental Engineering, ASCE 129 (4), 315-322.
13. Youd, T.L, Idriss, I.M., et al. (2001), "Liquefaction resistance of soils: summary report from the 1996 NCEER and 1998 NCEER/NSF Workshops", Journal of Geotech. and Geoenv. Engineering, ASCE 127 (10), 817-833.
14. Zhang, G, Robertson, P.K. and Brachman, R.W.I. (2004), "Estimating liquefaction-induced lateral displacement using the standard penetration test or cone penetration test," Journal of Geotech. and Geoenv. Engineering, ASCE 130 (8), 861-871.

Appendix D

Site Specific Seismic Analysis

APPENDIX D

SITE-SPECIFIC SEISMIC ANALYSIS

Site-specific acceleration parameters were evaluated in accordance with the seismic provisions in Section 21 of ASCE 7-16 guidelines with Supplement 3 (ASCE, 2016), which were adopted in the 2022 California Building Code. These parameters were determined for the site coordinates from the boring data using the online calculator developed by the Utilization of Ground Motion Simulation (UGMS) committee of the Southern California Earthquake Center (SCEC). The recommended site-specific risk-targeted Maximum Considered Earthquake (MCE_R) and design response spectra are presented in the following pages. The table below summarizes the recommended 2022 CBC site-specific seismic design parameters calculated using the UGMS online tool.

Site-specific parameters were determined based on the estimated average shear wave velocity of the site in the upper 30 meters (100 feet), V_{s30} of 281.0 m/sec (921.92 ft/sec), which was calculated using the SPTPROP software (InfraGEO, 2020) based on the correlation with SPT blow counts by Brandenberg, Bellana and Shantz (2010). Extrapolation of estimated shear wave velocities were performed using the method proposed by Boore (2004). The Modified California Sampler blow counts were converted to equivalent SPT blow counts by multiplying the value by 0.65 to account for end-area effects.

A site-specific response spectrum was developed for the project for a Maximum Considered Earthquake (MCE), defined as a horizontal peak ground acceleration that has a 2 percent probability of being exceeded in 50 years (return period of approximately 2,475 years). According to ASCE 7-16 Equivalent Lateral Force Procedure, the design response spectra can be taken as 2/3 of site-specific MCER response spectra but should not be lower than 80 percent of CBC general response spectra (ASCE 7-16 Section 21.3). Structural engineers should consider appropriate values for design. The seismic deaggregation analysis was conducted using the USGS Unified Hazard online tool and the site-specific design response parameters are provided in the following tables.

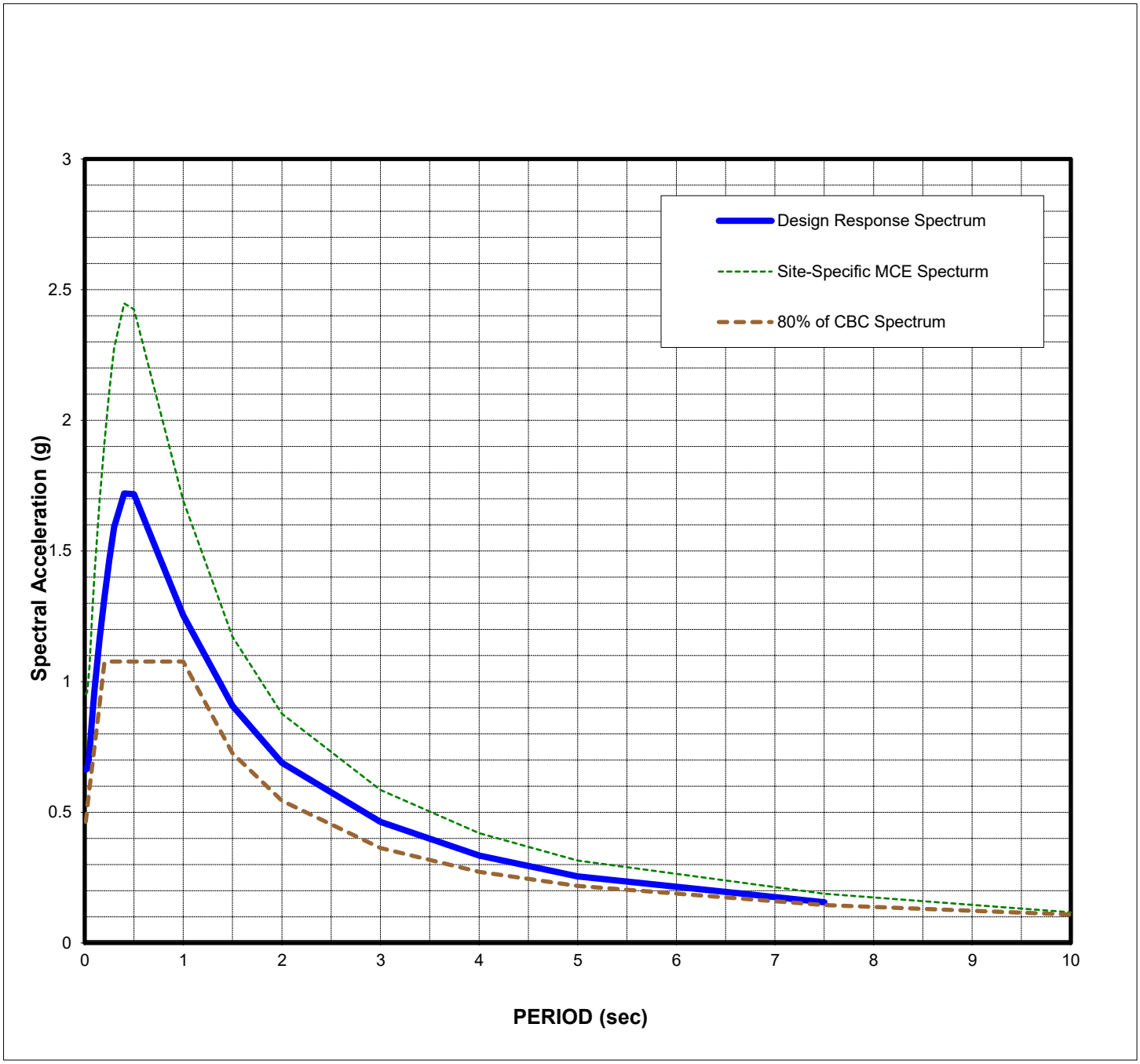
Table No. D-1, Site-Specific Response Spectrum Data

Period (sec)	Site-Specific MCE Sa (g)	2/3 of Site-Specific MCE Sa (g)	80% CBC Design Response Spectrum	Design Response Spectrum
0.010	0.952	0.663	0.463	0.663
0.020	0.956	0.665	0.495	0.665
0.030	0.967	0.669	0.527	0.669
0.050	1.057	0.727	0.591	0.727
0.075	1.247	0.855	0.671	0.855
0.100	1.412	0.969	0.751	0.969

Period (sec)	Site-Specific MCE Sa (g)	2/3 of Site-Specific MCE Sa (g)	80% CBC Design Response Spectrum	Design Response Spectrum
0.150	1.689	1.162	0.911	1.162
0.200	1.909	1.318	1.071	1.318
0.250	2.114	1.467	1.077	1.467
0.300	2.276	1.591	1.077	1.591
0.400	2.447	1.720	1.077	1.720
0.500	2.425	1.717	1.077	1.717
0.750	2.058	1.484	1.077	1.484
1.000	1.693	1.254	1.077	1.254
1.500	1.172	0.907	0.725	0.907
2.000	0.877	0.689	0.544	0.689
3.000	0.585	0.463	0.363	0.463
4.000	0.420	0.334	0.272	0.334
5.000	0.315	0.255	0.218	0.255
7.500	0.188	0.139	0.145	0.156
10.000	0.117	0.083	0.109	0.117

Table No. D-2, 2022 CBC Site-Specific Seismic Parameters

Seismic Parameter	Value	80% of CBC Design
(1) MCE_R (5%, damped) Spectral response acceleration for short periods adjusted for site class, S_{MS}	2.202 g	1.616g
(1)MCE_R (5% damped) spectral response acceleration at 1-second period adjusted for site class, S_{M1}	1.759 g	1.632g
Design spectral response acceleration (5% damped) at short periods, S_{DS}	1.468 g	0.591g
Design Spectral response acceleration (5% damped) at 1-second period, S_{D1}	1.172 g	1.077g
Site-Modified Peak Ground Acceleration, MCE_G PGA	0.793 g	0.750 g



SITE SPECIFIC DESIGN RESPONSE SPECTRUM

4-Story Parking Structure

City of Colton, San Bernardino County, California

For : Arrowhead Regional Medical Center

Project Number:

24-81-276-01

Converse Consultants

Drawing No.

D-1

Site-Specific MCE_R & Design Response Spectral Accelerations

4-Story Parking Structure (generated 03/01/2025)

SCEC
AN NSF+USGS CENTER

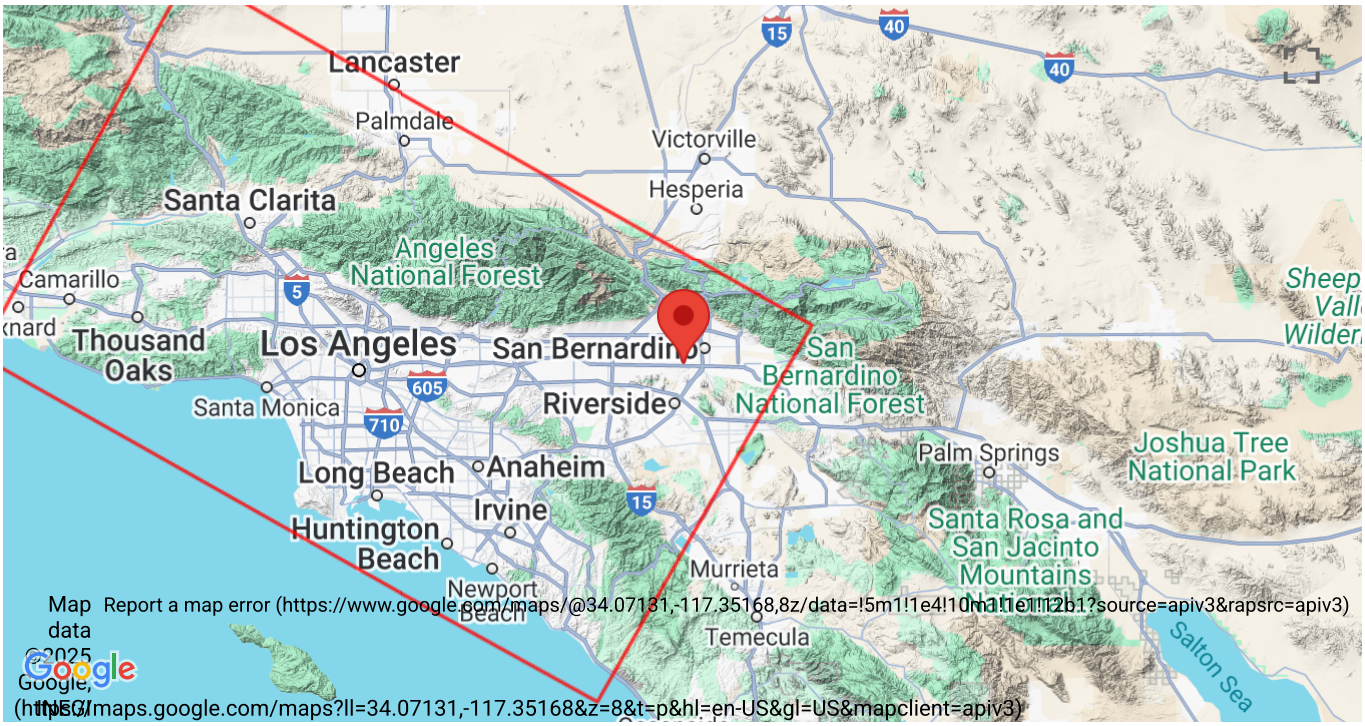
Summary (/ugms-mcerGM-tool_v18.4/report/895) Detailed Download All (/ugms-mcerGM-tool_v18.4/report/895/download)

Input Parameters

Coordinates	34.0713, -117.3517
Vs30	281 m/s

Values used in Computation

Vs30	281 m/s
Z1.0	200 m
Z2.5	350 m



Reset Map View

Computed Results

Site-Specific Design Parameters (Sect. 21.4)

S_{DS} = 1.468 S_{MS} = 2.202

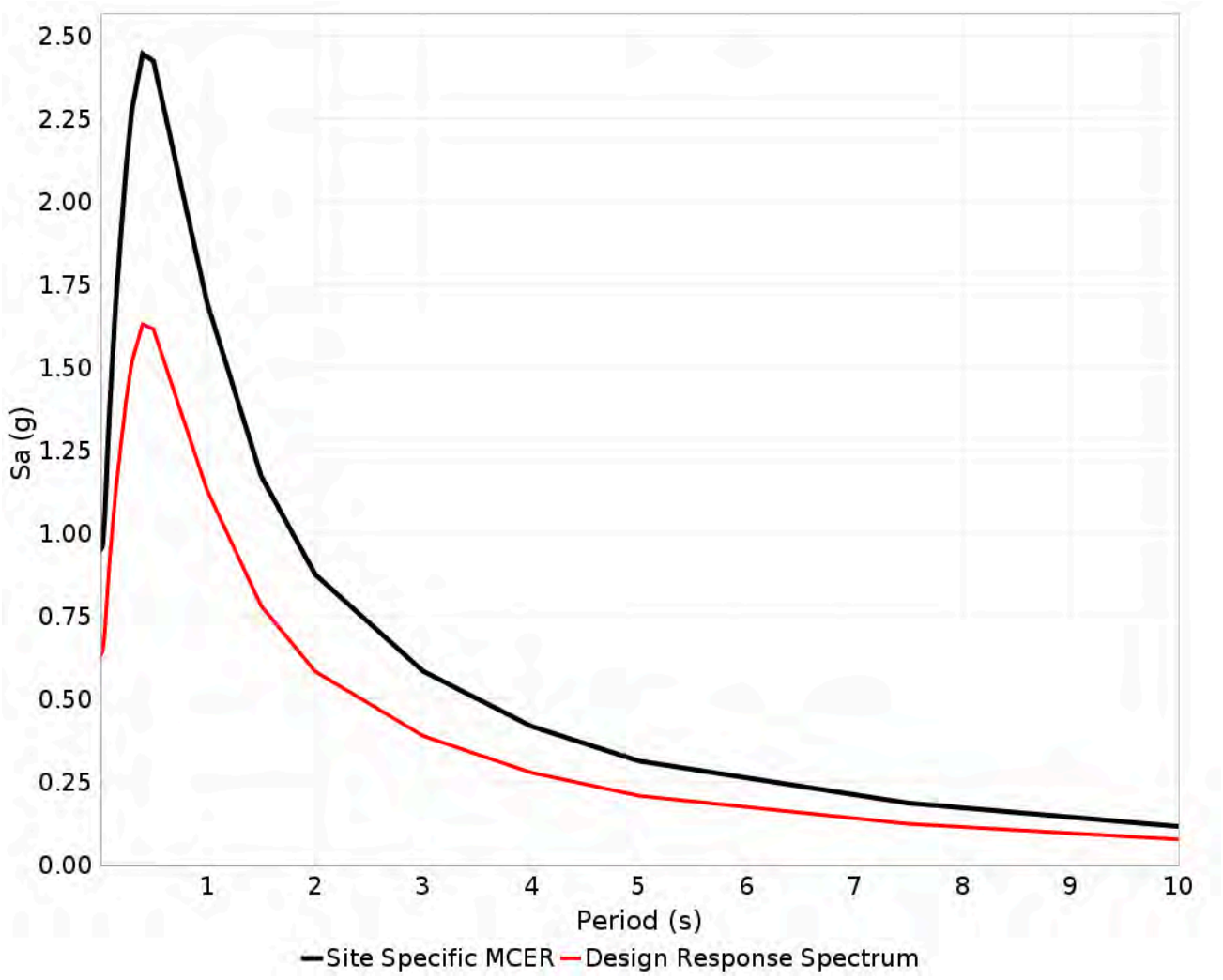
S_{D1} = 1.172 S_{M1} = 1.759

MCE_G Peak Ground Acceleration (Sect. 21.5)
PGA_M = 0.793 g

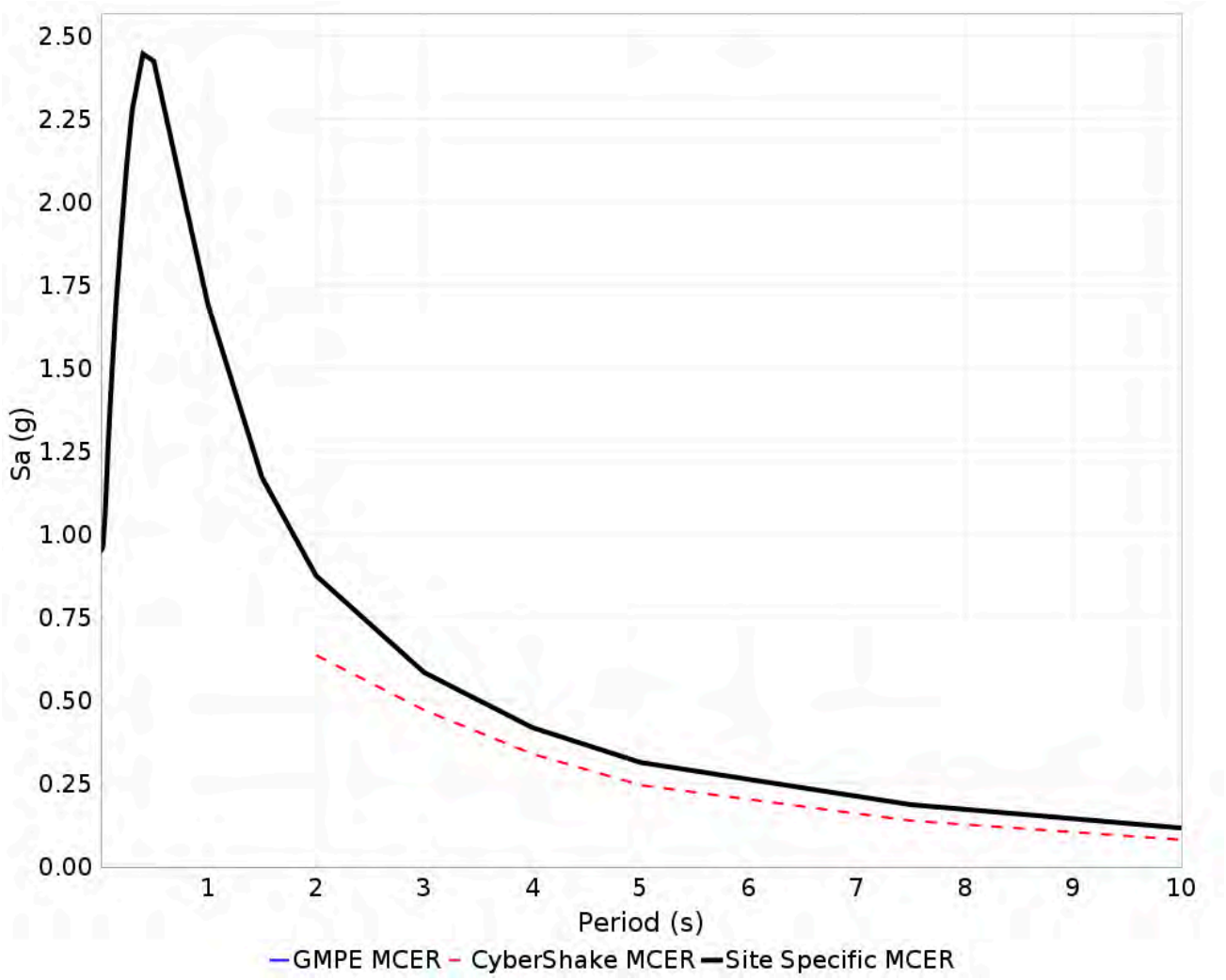
MCE_R Response Spectrum

NOTE: The MCE_R response spectrum must be checked against the minimum ASCE 7-16 requirement on the ASCE 7 Hazard Tool (https://asce7hazardtool.online/) website; see the User Guide (/ugms-mcerGM-tool_v18.4/guide) for details.

MCE_R Response Spectra



MCE_R Response Spectra Comparison



SA (g)

Period (s)	GMPE Sa (g)	CyberShake Sa (g)	Site-Specific MCE_R Sa^* (g)
0.01	0.952		0.952
0.02	0.956		0.956
0.03	0.967		0.967
0.05	1.057		1.057
0.075	1.247		1.247
0.1	1.412		1.412
0.15	1.689		1.689
0.2	1.909		1.909
0.25	2.114		2.114
0.3	2.276		2.276

0.4	2.447		2.447
0.5	2.425		2.425
0.75	2.058		2.058
1.0	1.693		1.693
1.5	1.172		1.172
2.0	0.877	0.638	0.877
3.0	0.585	0.472	0.585
4.0	0.420	0.340	0.420
5.0	0.315	0.246	0.315
7.5	0.188	0.139	0.188
10.0	0.117	0.082	0.117

* Site-Specific MCE_R response spectrum obtained using weighted geometric averaging procedure. See User Guide (/ugms-mcerGM-tool_v18.4/guide).

SIMPLIFIED EVALUATION OF SITE CLASS AND GEOTECHNICAL DESIGN PARAMETERS USING STANDARD PENETRATION TEST (SPT) DATA

PROJECT INFORMATION	
Project Name	4-Story Parking Structure
Project No.	24-81-276-01
Project Location	Southeast of the Intersection of Pepper Avenue and Plum Place, Colton,
Analyzed By	Anthony Rosas
Reviewed By	Hashmi Quazi

GENERAL INPUT DATA	
Analysis Description	Site Class and Vs30
Boring ID No.	BH-03
Ground Surface Elevation	1070.00 feet
Proposed Grade Elevation	1070.00 feet
Total Unit Weight of New Fill	129.00 pcf
Borehole Diameter	8.00 inches
Hammer Weight	140.00 pounds
Hammer Drop	30.00 inches
Hammer Efficiency Ratio, ER	80.00 %
Hammer Dist. to Ground Surface	5.00 feet
Groundwater Depth During Test	27.00 feet

SPT BLOW COUNT AND RELATIVE DENSITY

- Based on the recommendations by Idriss and Boulanger (2008), the normalized SPT blow count is defined as $(N_1)_{60} = N_{60}\, C_N$

where $N_{60} = N_{field}\, C_E\, C_B\, C_R\, C_S$

and the relative density of granular soils is estimated as

$D_r = 15\,[(N_1)_{60}]^{0.5}$ in percent

SHEAR WAVE VELOCITY AND SITE CLASSIFICATION

- Shear wave velocities are estimated based on empirical correlations with SPT N_{60} values for various soil types, as derived by Brandenberg, Bellana and Shantz (2010) from regression analyses.
- Site classification is analyzed using the method by Boore (2004).

Ave. Shear Wave Velocity (Top Depth d), $V_{s,d}$ = 230.70 m/s

Ave. Shear Wave Velocity (Top 30 m), $V_{s,30} = 10^{\,a + b \log (Vs,d)}$

where a = 0.01380

b = 1.02630

Coefficients a and b vary with depth, as derived by Boore (2004).

Computed $V_{s,30}$ = 275.0 m/s

Site Class = D

SOIL STRENGTH AND DEFORMATION MODULUS PARAMETERS

- For granular soils, the effective peak friction angle, ϕ', is estimated from correlations with the normalized SPT blow count, $(N_1)_{60}$ from Bowles (1996) and recommended adjustments from Caltrans Geotechnical Manual (2014).
- For cohesive soils, the undrained shear strength, S_u, is based on field measurements with torvane or pocket penetrometer. When only SPT values are available, S_u is estimated using the correlation chart with $(N_1)_{60}$ value provided in the Caltrans Geotechnical Manual (2014).
- Modulus of Elasticity, E_s, values for granular soils and cohesive soils are estimated from correlations with SPT N_{60} and undrained shear strength, S_u, respectively summarized by Bowles (1996).
- Shear Modulus, $G = E_s / [3\,(1 - 2\mu)]$ and Bulk Modulus, $K = E_s / [2\,(1 + \mu)]$ based on theory of elasticity where μ is the Poisson's ratio of the soil. Typical values of Poisson's ratio are estimated from various references.

REFERENCES:

1. AASHTO, 1988. Manual on Subsurface Investigations.
2. Boore, D.M., 2004. "Estimating Vs(30) (or NEHRP Site Classes) from shallow velocity models (depths < 30 m)", Bulletin of Seismological Society of America, 94(2), pp. 591-597.
3. Brandenberg, S.J., Bellana, N. and Shantz, T., 2010. "Shear Wave Velocity as a Statistical Function of Standard Penetration Test Resistance and Vertical Effective Stress at Caltrans Bridge Sites," PEER Report 201/03.
4. FHWA, 2002. Subsurface Investigations Reference Manual, Geotechnical Site Characterization.
5. Idriss, I.M. and Boulanger, R.W., 2008, "Soil Liquefaction During Earthquakes", EERI Monograph MNO-12.

INPUT SOIL PROFILE DATA

Depth to Top of Soil Layer (feet)	Depth to Bottom of Soil Layer (feet)	Material Type USCS Group Symbol (ASTM D2487)	Total Soil Unit Weight γ_t (pcf)	Type of Soil Sampler	Field Blow Count N_{field} (blows/ft)	Pocket Penetrometer Shear Test Results PP (tsf)	Torvane Shear Test Results TV (tsf)
0.00	5.00	SM	111.2	MCal	78.0		
5.00	7.50	SM	117.5	MCal	100.0		
7.50	10.00	SM	107.1	MCal	16.0		
10.00	15.00	SM	107.1	MCal	6.0		
15.00	20.00	SM	85.9	MCal	51.0		
20.00	25.00	SP	85.9	MCal	31.0		
25.00	30.00	SP	103.0	SPT1	62.0		
30.00	35.00	SM	104.0	MCal	27.0		
35.00	40.00	SM	125.1	SPT1	69.0		
40.00	45.00	SP	121.5	MCal	52.0		
45.00	50.00	SP	121.5	SPT1	100.0		

ESTIMATED GEOTECHNICAL DESIGN PARAMETERS

Bottom of Soil Layer Elevation (feet)	Soil Depth During Test (feet)	SPT Corr. For Vert. Stress C_N	SPT Corr. For Hammer Energy C_E	SPT Corr. For Borehole Size C_B	SPT Corr. For Rod Length C_R	SPT Corr. For Sampling Method C_S	Corrected SPT Blow Count N_{60}	Normalized SPT Blow Count $(N_1)_{60}$	Relative Density D_r (%)	Shear Wave Velocity V_s (ft/s)	Effective Peak Friction Angle ϕ' (deg)	Undrained Shear Strength S_u (ksf)	Apparent Density / Soil Consistency Description FHWA (2002) and AASHTO (1988)	Poisson's Ratio μ	Modulus of Elasticity E_s (ksf)	Shear Modulus G (ksf)	Bulk Modulus K (ksf)
1065.00	2.50	1.700	1.333	1.150	0.750	0.650	58.3	99.1	100.00	509.86	45.00		Very Dense Sand	0.40	853.98	1,423.30	304.99
1062.50	6.25	1.687	1.333	1.150	0.800	0.650	79.7	134.5	100.00	653.98	45.00		Very Dense Sand	0.40	1,038.89	1,731.00	371.00
1060.00	8.75	1.426	1.333	1.150	0.850	0.650	13.6	19.3	66.00	597.21	34.00		Medium Dense Sand	0.30	383.87	320.00	148.00
1055.00	12.50	1.201	1.333	1.150	0.850	0.650	5.1	6.1	37.00	589.28	30.00		Loose Sand	0.25	249.40	166.00	100.00
1050.00	17.50	1.035	1.333	1.150	0.950	0.650	48.3	50.0	100.00	784.87	39.00		Dense Sand	0.35	762.04	847.00	282.00
1045.00	22.50	0.933	1.333	1.150	0.950	0.650	29.4	27.4	79.00	785.68	37.00		Medium Dense Sand	0.30	572.63	477.00	220.00
1040.00	27.50	0.865	1.333	1.150	0.950	1.000	90.3	78.1	100.00	907.27	45.00		Very Dense Sand	0.40	1,125.85	1,876.00	402.00
1035.00	32.50	0.824	1.333	1.150	1.000	0.650	26.9	22.2	71.00	826.12	34.00		Medium Dense Sand	0.30	546.00	455.00	210.00
1030.00	37.50	0.790	1.333	1.150	1.000	1.000	105.8	83.6	100.00	961.22	44.00		Very Dense Sand	0.40	1,249.28	2,082.00	446.00
1025.00	42.50	0.755	1.333	1.150	1.000	0.650	51.8	39.1	94.00	917.01	39.00		Very Dense Sand	0.40	795.02	1,325.00	284.00
1020.00	47.50	0.725	1.333	1.150	1.000	1.000	153.3	111.2	100.00	1,037.27	45.00		Very Dense Sand	0.40	1,607.67	2,679.00	574.00

SIMPLIFIED EVALUATION OF SITE CLASS AND GEOTECHNICAL DESIGN PARAMETERS USING STANDARD PENETRATION TEST (SPT) DATA

PROJECT INFORMATION	
Project Name	4-Story Parking Structure
Project No.	24-81-276-01
Project Location	Southeast of the Intersection of Pepper Avenue and Plum Place, Colton,
Analyzed By	Anthony Rosas
Reviewed By	Hashmi Quazi

GENERAL INPUT DATA	
Analysis Description	Site Class and Vs30
Boring ID No.	BH-06
Ground Surface Elevation	1070.00 feet
Proposed Grade Elevation	1070.00 feet
Total Unit Weight of New Fill	129.00 pcf
Borehole Diameter	8.00 inches
Hammer Weight	140.00 pounds
Hammer Drop	30.00 inches
Hammer Efficiency Ratio, ER	80.00 %
Hammer Dist. to Ground Surface	5.00 feet
Groundwater Depth During Test	27.00 feet

SPT BLOW COUNT AND RELATIVE DENSITY

- Based on the recommendations by Idriss and Boulanger (2008), the normalized SPT blow count is defined as $(N_1)_{60} = N_{60}\, C_N$

where $N_{60} = N_{field}\, C_E\, C_B\, C_R\, C_S$

and the relative density of granular soils is estimated as

$D_r = 15\,[(N_1)_{60}]^{0.5}$ in percent

SHEAR WAVE VELOCITY AND SITE CLASSIFICATION

- Shear wave velocities are estimated based on empirical correlations with SPT N_{60} values for various soil types, as derived by Brandenberg, Bellana and Shantz (2010) from regression analyses.
- Site classification is analyzed using the method by Boore (2004).

Ave. Shear Wave Velocity (Top Depth d), $V_{s,d}$ = 236.00 m/s

Ave. Shear Wave Velocity (Top 30 m), $V_{s,30} = 10^{\,a + b \log (Vs,d)}$

where a = 0.01380

b = 1.02630

Coefficients a and b vary with depth, as derived by Boore (2004).

Computed $V_{s,30}$ = 281.0 m/s

Site Class = D

SOIL STRENGTH AND DEFORMATION MODULUS PARAMETERS

- For granular soils, the effective peak friction angle, ϕ', is estimated from correlations with the normalized SPT blow count, $(N_1)_{60}$ from Bowles (1996) and recommended adjustments from Caltrans Geotechnical Manual (2014).
- For cohesive soils, the undrained shear strength, S_u, is based on field measurements with torvane or pocket penetrometer. When only SPT values are available, S_u is estimated using the correlation chart with $(N_1)_{60}$ value provided in the Caltrans Geotechnical Manual (2014).
- Modulus of Elasticity, E_s, values for granular soils and cohesive soils are estimated from correlations with SPT N_{60} and undrained shear strength, S_u, respectively summarized by Bowles (1996).
- Shear Modulus, $G = E_s / [3\,(1 - 2\mu)]$ and Bulk Modulus, $K = E_s / [2\,(1 + \mu)]$ based on theory of elasticity where μ is the Poisson's ratio of the soil. Typical values of Poisson's ratio are estimated from various references.

REFERENCES:

1. AASHTO, 1988. Manual on Subsurface Investigations.
2. Boore, D.M., 2004. "Estimating Vs(30) (or NEHRP Site Classes) from shallow velocity models (depths < 30 m)", Bulletin of Seismological Society of America, 94(2), pp. 591-597.
3. Brandenberg, S.J., Bellana, N. and Shantz, T., 2010. "Shear Wave Velocity as a Statistical Function of Standard Penetration Test Resistance and Vertical Effective Stress at Caltrans Bridge Sites," PEER Report 201/03.
4. FHWA, 2002. Subsurface Investigations Reference Manual, Geotechnical Site Characterization.
5. Idriss, I.M. and Boulanger, R.W., 2008, "Soil Liquefaction During Earthquakes", EERI Monograph MNO-12.

INPUT SOIL PROFILE DATA

Depth to Top of Soil Layer (feet)	Depth to Bottom of Soil Layer (feet)	Material Type USCS Group Symbol (ASTM D2487)	Total Soil Unit Weight γ_t (pcf)	Type of Soil Sampler	Field Blow Count N_{field} (blows/ft)	Pocket Penetrometer Shear Test Results PP (tsf)	Torvane Shear Test Results TV (tsf)
0.00	5.00	SP	108.1	MCal	55.0		
5.00	7.50	SP	100.9	MCal	42.0		
7.50	10.00	SP	99.0	MCal	42.0		
10.00	15.00	SP	99.0	MCal	48.0		
15.00	20.00	SP	99.0	MCal	53.0		
20.00	25.00	SP	99.0	MCal	32.0		
25.00	30.00	SP	99.0	SPT1	80.0		
30.00	35.00	SM	100.0	MCal	30.0		
35.00	40.00	SM	112.3	SPT1	100.0		
40.00	45.00	SP-SM	111.2	MCal	100.0		
45.00	50.00	SP-SM	111.2	SPT1	100.0		

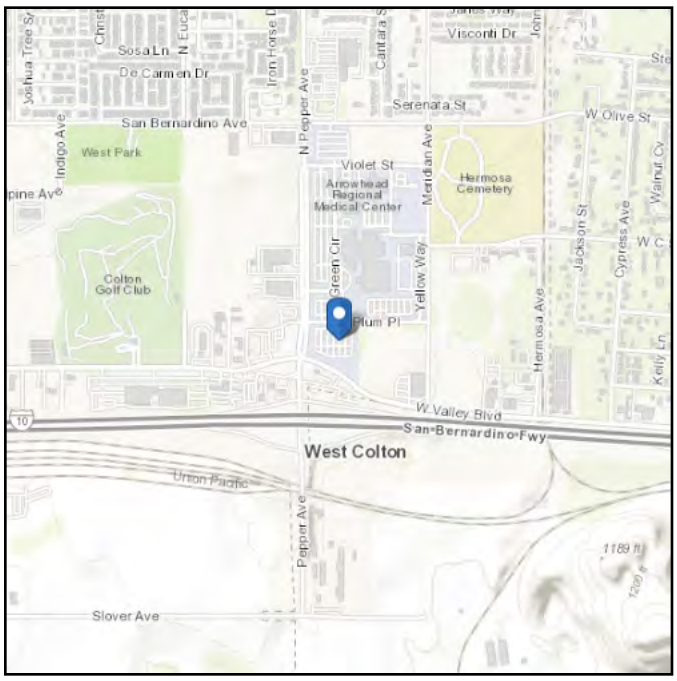
ESTIMATED GEOTECHNICAL DESIGN PARAMETERS

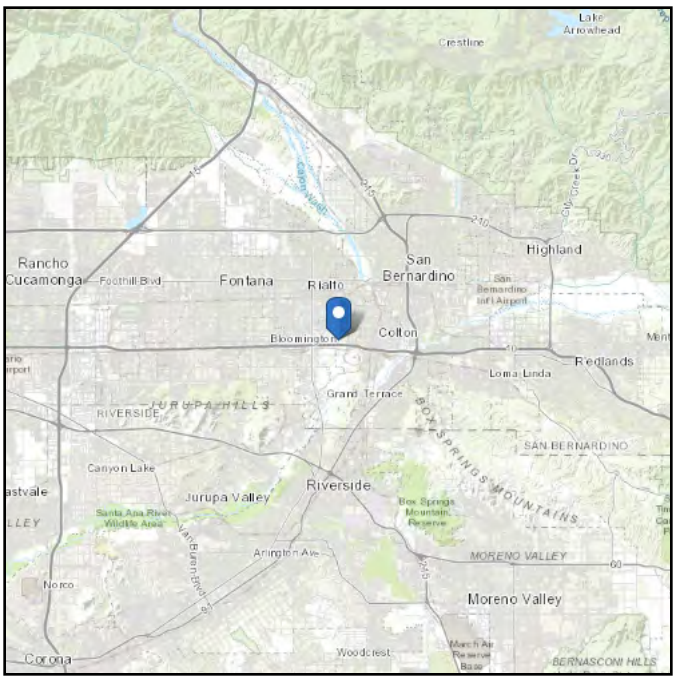
Bottom of Soil Layer Elevation (feet)	Soil Depth During Test (feet)	SPT Corr. For Vert. Stress C_N	SPT Corr. For Hammer Energy C_E	SPT Corr. For Borehole Size C_B	SPT Corr. For Rod Length C_R	SPT Corr. For Sampling Method C_S	Corrected SPT Blow Count N_{60}	Normalized SPT Blow Count $(N_1)_{60}$	Relative Density D_r (%)	Shear Wave Velocity V_s (ft/s)	Effective Peak Friction Angle ϕ' (deg)	Undrained Shear Strength S_u (ksf)	Apparent Density / Soil Consistency Description FHWA (2002) and AASHTO (1988)	Poisson's Ratio μ	Modulus of Elasticity E_s (ksf)	Shear Modulus G (ksf)	Bulk Modulus K (ksf)
1065.00	2.50	1.700	1.333	1.150	0.750	0.650	41.1	69.9	100.00	489.69	44.00		Dense Sand	0.35	693.16	770.17	256.72
1062.50	6.25	1.700	1.333	1.150	0.800	0.650	33.5	56.9	100.00	594.18	42.00		Dense Sand	0.35	616.32	685.00	228.00
1060.00	8.75	1.477	1.333	1.150	0.850	0.650	35.6	52.6	100.00	644.29	41.00		Dense Sand	0.35	637.85	709.00	236.00
1055.00	12.50	1.246	1.333	1.150	0.850	0.650	40.7	50.7	100.00	707.14	41.00		Dense Sand	0.35	688.75	765.00	255.00
1050.00	17.50	1.059	1.333	1.150	0.950	0.650	50.2	53.2	100.00	779.12	41.00		Very Dense Sand	0.40	779.77	1,300.00	278.00
1045.00	22.50	0.937	1.333	1.150	0.950	0.650	30.3	28.4	80.00	786.47	37.00		Dense Sand	0.35	582.77	648.00	216.00
1040.00	27.50	0.864	1.333	1.150	0.950	1.000	116.5	100.7	100.00	930.00	45.00		Very Dense Sand	0.40	1,332.59	2,221.00	476.00
1035.00	32.50	0.827	1.333	1.150	1.000	0.650	29.9	24.7	75.00	833.36	35.00		Medium Dense Sand	0.30	578.51	482.00	223.00
1030.00	37.50	0.797	1.333	1.150	1.000	1.000	153.3	122.3	100.00	991.68	45.00		Very Dense Sand	0.40	1,607.67	2,679.00	574.00
1025.00	42.50	0.768	1.333	1.150	1.000	0.650	99.7	76.5	100.00	968.61	45.00		Very Dense Sand	0.40	1,200.89	2,001.00	429.00
1020.00	47.50	0.742	1.333	1.150	1.000	1.000	153.3	113.7	100.00	1,026.19	45.00		Very Dense Sand	0.40	1,607.67	2,679.00	574.00

ASCE Hazards Report

Address:
No Address at This Location

Standard:	ASCE/SEI 7-16	**Latitude:**	34.07131
Risk Category:	IV	**Longitude:**	-117.35168
Soil Class:	D - Stiff Soil	**Elevation:**	1069.2015061403001 ft (NAVD 88)





Seismic

Site Soil Class: D - Stiff Soil

Results:

S_S :	2.02	S_{D1} :	N/A
S_1 :	0.8	T_L :	8
F_a :	1	PGA :	0.852
F_v :	N/A	PGA_M :	0.938
S_{MS} :	2.02	F_{PGA} :	1.1
S_{M1} :	N/A	I_e :	1.5
S_{DS} :	1.346	C_v :	1.5

Ground motion hazard analysis may be required. See ASCE/SEI 7-16 Section 11.4.8.

Data Accessed: Sat Mar 01 2025

Date Source: USGS Seismic Design Maps

The ASCE Hazard Tool is provided for your convenience, for informational purposes only, and is provided “as is” and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

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In using this Tool, you expressly assume all risks associated with your use. Under no circumstances shall ASCE or its officers, directors, employees, members, affiliates, or agents be liable to you or any other person for any direct, indirect, special, incidental, or consequential damages arising from or related to your use of, or reliance on, the Tool or any information obtained therein. To the fullest extent permitted by law, you agree to release and hold harmless ASCE from any and all liability of any nature arising out of or resulting from any use of data provided by the ASCE Hazard Tool.

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 (u…

Spectral Period

Peak Ground Acceleration

Latitude

Decimal degrees

34.07131

Time Horizon

Return period in years

2475

Longitude

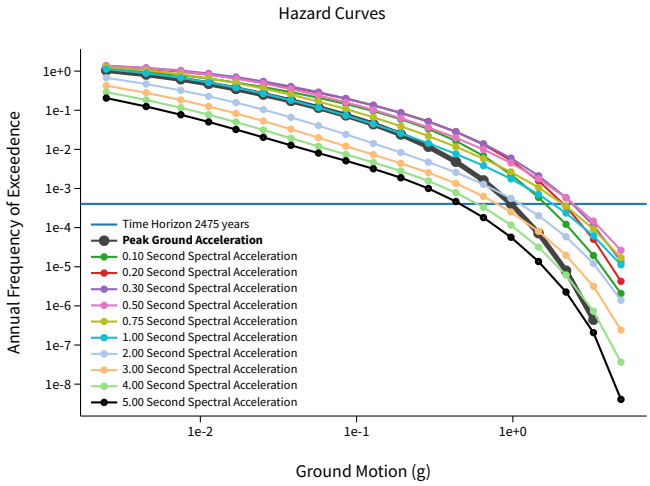
Decimal degrees, negative values for western longitudes

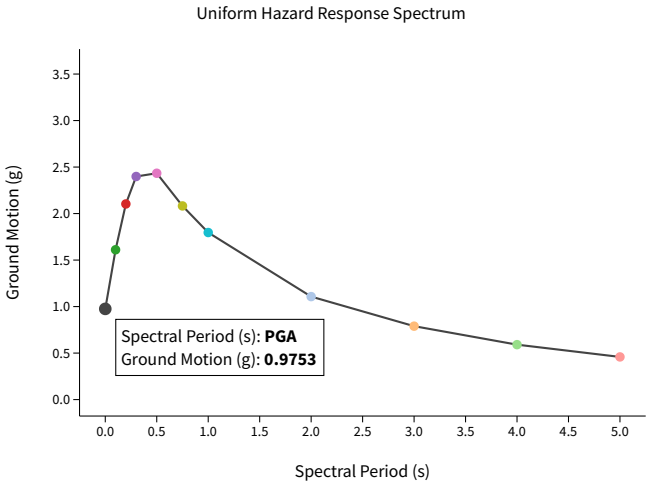
-117.35168

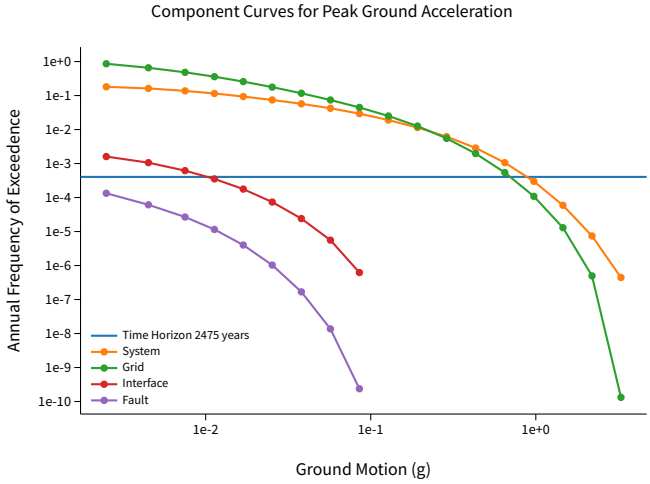
Site Class

259 m/s (Site class D)

Hazard Curve





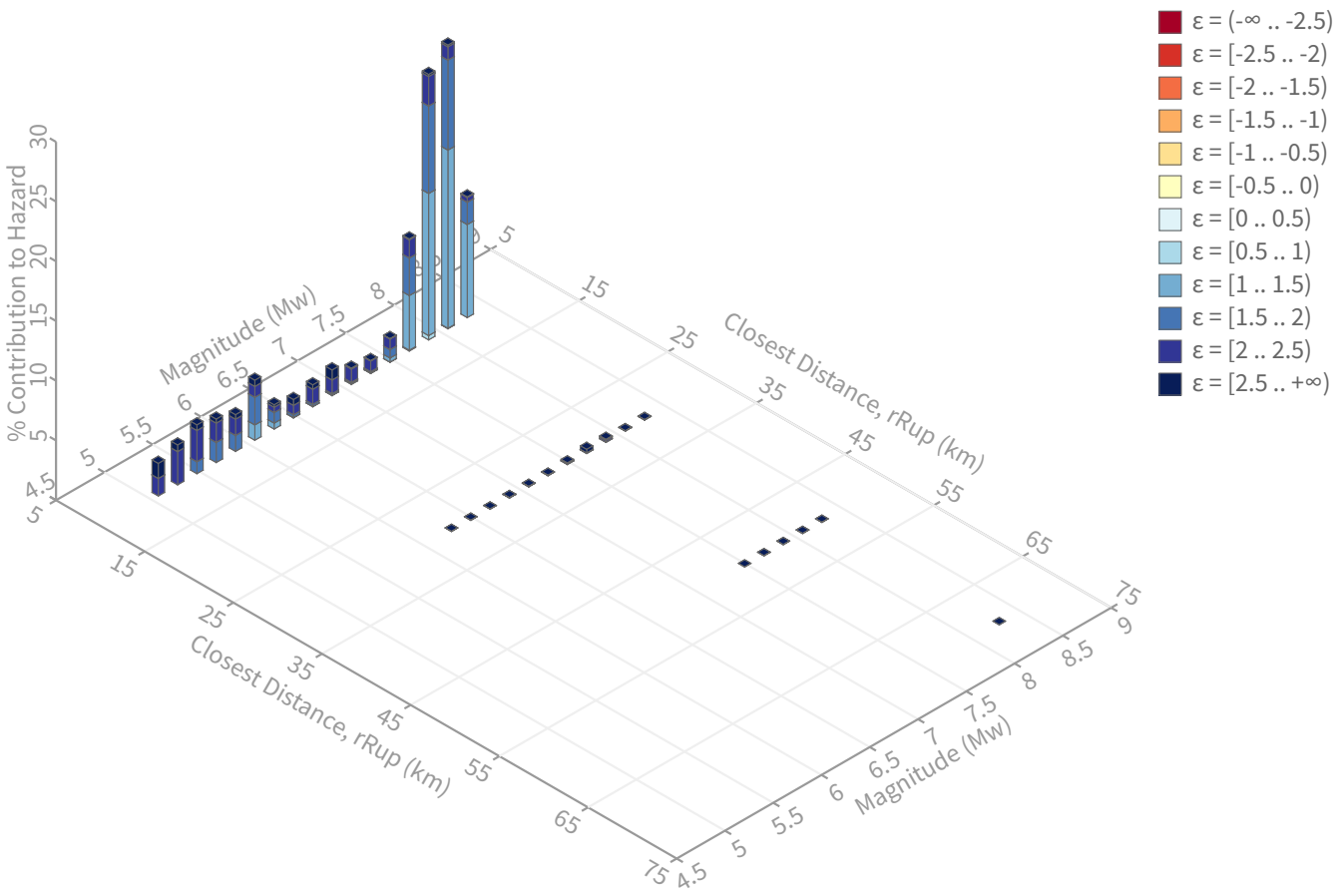


View Raw Data

Deaggregation

Component

Total



Summary statistics for, Deaggregation: Total

Deaggregation targets

Return period: 2475 yrs
Exceedance rate: 0.0004040404 yr^{-1}
PGA ground motion: 0.97529233 g

Recovered targets

Return period: 3360.1395 yrs
Exceedance rate: 0.00029760669 yr^{-1}

Totals

Binned: 100 %
Residual: 0 %
Trace: 0.04 %

Mean (over all sources)

m: 7.35
r: 8 km
ε_0: 1.68 σ

Mode (largest m-r bin)

m: 8.1
r: 6.59 km
ε_0: 1.37 σ
Contribution: 23.74 %

Mode (largest m-r-ε_0 bin)

m: 8.1
r: 4.61 km
ε_0: 1.14 σ
Contribution: 14.92 %

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							37.72
San Jacinto (San Bernardino) [3]		4.15	8.01	1.24	117.316°W	34.092°N	54.53	22.93
San Andreas (San Bernardino N) [4]		13.39	7.78	1.94	117.278°W	34.175°N	30.29	8.71
San Andreas (North Branch Mill Creek) [0]		13.06	7.99	1.67	117.270°W	34.171°N	33.91	1.93
San Andreas (San Bernardino S) [0]		14.86	7.01	2.37	117.222°W	34.150°N	53.71	1.13
UC33brAvg_FM32	System							37.68
San Jacinto (San Bernardino) [3]		4.15	8.01	1.24	117.316°W	34.092°N	54.53	22.88
San Andreas (San Bernardino N) [4]		13.39	7.79	1.94	117.278°W	34.175°N	30.29	8.76
San Andreas (North Branch Mill Creek) [0]		13.06	7.99	1.66	117.270°W	34.171°N	33.91	2.01
San Andreas (San Bernardino S) [0]		14.86	7.02	2.37	117.222°W	34.150°N	53.71	1.14
UC33brAvg_FM31 (opt)	Grid							12.30
PointSourceFinite: -117.352, 34.121		7.46	5.65	2.07	117.352°W	34.121°N	0.00	4.59
PointSourceFinite: -117.352, 34.121		7.46	5.65	2.07	117.352°W	34.121°N	0.00	4.59
PointSourceFinite: -117.352, 34.157		9.78	5.93	2.28	117.352°W	34.157°N	0.00	1.23
PointSourceFinite: -117.352, 34.157		9.78	5.93	2.28	117.352°W	34.157°N	0.00	1.23
UC33brAvg_FM32 (opt)	Grid							12.30
PointSourceFinite: -117.352, 34.121		7.46	5.65	2.07	117.352°W	34.121°N	0.00	4.59
PointSourceFinite: -117.352, 34.121		7.46	5.65	2.07	117.352°W	34.121°N	0.00	4.59
PointSourceFinite: -117.352, 34.157		9.78	5.92	2.28	117.352°W	34.157°N	0.00	1.23
PointSourceFinite: -117.352, 34.157		9.78	5.92	2.28	117.352°W	34.157°N	0.00	1.23